FOI #16367

Information:

First Name: Rick
Last Name: Calderin
Company: None
Mailing Address 1: [redacted]
Mailing Address 2:
City: [redacted]
State: [redacted]
Zip Code: [redacted]
Email Address: [redacted]
Phone: [redacted]
Required copies of the records: Yes

List of specific record(s):
Request copies of BuildingConstruction permits for all work in reference to United Airline airplane hanger building 14 located at the North Terminal at Newark Liberty Airport from 1110 to 10115. Request copies of demolitionengineer plans for the demolition of United Airlines building 14. Request copy of contract for the demolition of U.A. building 14. Request to inspect the entire building file for U.A. building 14. If there are any questions please contact me.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
PUBLIC RECORD ACCESS FORM

PRA 16367

Action by (print / type name):

William Shalewitz, Freedom of Information Administrator

Signature: William Shalewitz

Date: **06/15/2016**

On behalf of the Secretary of the Port Authority, as Records Access Officer and Custodian of Government Records of the Port Authority.

☐ The requested records are being made available.

☐ Any responsive records that may exist are currently in storage or archived, and a diligent search is being conducted. The Port Authority will respond by:

☐ A diligent search has been conducted, and no records responsive to your request have been located.

☐ The requested records that have been located are not being made available, as they are exempt from disclosure for the following specific reasons:

☑ Some requested records that have been located are being made available. The remainder are exempt from disclosure for the following specific reasons:

Privacy and security.

☐ The request does not reasonably describe or identify specific records; therefore, the Port Authority is unable to search for and locate responsive records. Please consider submitting a new request that describes or identifies the specific records requested with particularity and detail.

☑ Other:

Material responsive to your request can be found on the Port Authority's website at http://corpinfo.panynj.gov/documents/16367-C/

This form is promulgated by the Port Authority pursuant to the Port Authority Public Records Access Policy and is intended to be construed consistent with the New York Freedom of Information Law and the New Jersey Open Public Records Act. It is intended to facilitate requests for Port Authority public records and does not constitute legal advice.

THE PORT AUTHORITY OF NY & NJ

Lillian D. Valenti
Chief Procurement Officer

November 13, 2014

VIA FACSIMILE AND UPS NEXT DAY DELIVERY

VRH Construction Corp.
320 Grand Avenue
Englewood, NJ 07631

Attention: Mr. Victor D. Wortmann, Jr., President

SUBJECT: NEWARK LIBERTY INTERNATIONAL AIRPORT – OVERNIGHT AIRCRAFT PARKING – CONTRACT – **EWR-153.226 – NOTICE OF AWARD** – PURCHASE ORDER – **UEWR153226**

Dear Mr. Wortmann:

The Port Authority of New York and New Jersey (The Authority) hereby accepts your proposal on the above Contract.

The Authority elects not to require you to furnish a performance and payment bond.

Your attention is directed to the clause of the Contract entitled "Time for Completion and Damages for Delay" and to the fact that before you may commence performance of the work you must furnish whichever of the documents mentioned in that clause are applicable.

Forwarded herewith for your use and compliance are "General Instructions Relating to the Direction and Processing of Correspondence and of Those Other Items Specified to be Submitted to the Port Authority Under the Terms of the Contract".

In order to ensure that payments are processed properly, please include the above-referenced Purchase Order No. on all payment invoices and correspondence.

Sincerely,

for Lillian D. Valenti
Chief Procurement Officer

2 Montgomery Street, 3rd Floor
Jersey City, NJ 07302
T: 201 395 7477

VRH Construction Corp. (1)

THE PORT AUTHORITY OF NY & NJ

CA04153226
PQL

#
D.H.
Dewberry Engineers Inc.

NEWARK LIBERTY INTERNATIONAL AIRPORT

OVERNIGHT AIRCRAFT PARKING

CONTRACT EWR-153.226

AUGUST 2014

This proposal is not complete unless bidder's Signature appears on page 24

THE PORT AUTHORITY OF NY & NJ

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INFORMATION FOR BIDDERS

1. FORM AND SUBMISSION OF PROPOSALS

The Port Authority of New York and New Jersey, hereinafter called "the Authority", invites Proposals in the annexed form. Proposals will be received until 2:30 P.M. on Thursday, August 7, 2014 in the office of the Director of Procurement, Attn: Bid Custodian, Two Montgomery Street, 3rd Floor, Jersey City, NJ 07302 at which time they will be opened and publicly read in the Bid Room. Each Proposal must be contained in the envelope furnished by the Authority, which shall be sealed and conspicuously endorsed with the bidder's name and the number of this Contract in the space provided. This Contract booklet shall not be unstapled or taken apart.

The Proposal must be submitted upon the blank form bound herewith and must give all information required.[1] The Proposal must be signed and the acknowledgment taken on the appropriate form following the Proposal.

No effort is made to emphasize any particular provision of the Contract, but bidders must familiarize themselves with every provision and its effect.

2. PAPERS ACCOMPANYING PROPOSALS

Each Proposal must be accompanied by the following papers, which, unless otherwise indicated, should be enclosed with the Proposal:

A. If the bidder be a corporation, a statement of the names and residences of its officers, which should be included on the page following the Proposal.

If the bidder be a partnership, a statement of the names and residences of its members, indicating which are general and which are special partners, which should be included on the page following the Proposal.

If the bidder be an individual, a statement of his residence, which should be included on the page following the Proposal.

B. Either the Bid Bond bound herewith, duly executed by the bidder as principal and by one or more surety companies duly authorized to carry on the business of suretyship in the state(s) in which the construction site is located, whose names appear on the current list of the Treasury Department of the United States as acceptable as sureties upon federal contracts; or, in lieu of a Bid Bond;

A certified check, payable to the order of The Port Authority of New York and New Jersey, in the same amount appearing in the Bid Bond form, which check shall be placed in an envelope marked "Bid Security" and enclosed with the Proposal.

C.

1.) Certified financial statements, including applicable notes, reflecting the bidder's assets, liabilities, net worth, revenues, expenses, profit or loss and cash flow for the most recent calendar year or the bidder's most recent fiscal year.

---

1 While two or more copies of this booklet may be furnished to each prospective bidder, only one should be submitted. The extra copies are for the bidders use.

2.) Where such certified financial statements are not available, then either reviewed or compiled statements from an independent accountant setting forth the information described in Paragraph 1, above.

3.) Where neither certified financial statements nor financial statements from an independent accountant are available, then financial statements containing the information described in Paragraph 1, above, prepared directly by the bidder. However, such financial statements must be accompanied by a signed copy of the bidder's most recent Federal income tax return and a statement in writing, signed by a duly authorized representative of the bidder, that such statements accurately reflect the current financial condition of the bidder.

Where statements submitted pursuant to either Paragraph 1 or 2, above, show the position of the bidder as of a date more than forty-five (45) days prior to the date on which Proposals are opened, the bidder shall also submit a statement in writing signed by a duly authorized representative of the bidder, that the present financial condition of the bidder is at least as good as that shown on the statements submitted.

4.) A statement of work which the bidder has on hand, including any work on which a bid has been submitted, containing a description of the work, the dollar value, the location by city and state, the current percentage of completion and the expected date for completion.

5.) Fill in below the name and address of the bidder's chief banking representative handling the bidder's account.

Banking Institution: BANK OF AMERICA

Address: 750 WALNUT AVENUE
CRANFORD, NJ 07016

Bank Representative: DANIEL D. PREVOZNAK

Telephone Number: 908-709-5305

6.) Fill in below the bidder's Federal Employer Identification Number (i.e., the number assigned to firms by the Federal Government for tax purposes); the bidder's Dun and Bradstreet number, if any; the name of any other credit service to which the bidder has furnished information and the number, if any, assigned by such service to the bidder's account.

[redacted]

Federal Employer Identification No.

00-186-3778

Dun and Bradstreet No.

Other Credit Service

Account No.

08-27-14P03:13 RCVD

D. The Form of Contract bound herewith, with the bidder's prices inserted in the clause thereof entitled "Unit Prices and Lump Sum". The amounts must be given both in figures and in writing and, in case of discrepancy, the writing shall control. The unit prices must be extended and totaled. The Estimated Total for Classified Work and the Lump Sum must be entered in the recapitulation and totaled. One copy of each addendum, if any, issued during the bidding period shall be initialled and attached to the Proposal, but any Proposal submitted without such addendum initialled and attached will nevertheless be construed as though such addendum had been initialled and attached.

E. The bidder's analysis of bid filled in on the form furnished herewith. The Contractor will be required to furnish a more detailed analysis of bid at a later date in accordance with the requirements of the Section of Division 1 of the Specifications referring to the Analysis of Bid.

3. QUALIFICATION INFORMATION

At any time after the opening of Proposals, the Chief Engineer may give oral or written notice to one or more bidders to attend a pre-award meeting and to furnish the Authority with information relating to his qualifications to perform the Work, including the following, which information shall be furnished within seven (7) days thereafter:

A. The bidders MBE/WBE Participation Plan submitted on the form annexed hereto as Schedule C (see the clause hereof entitled "Minority and Women's Business Enterprises Program") and a detailed list of the plant and equipment which the bidder proposes to use, indicating which portions it already possesses.

B. Detailed information relating to work which the bidder has completed for others, including personal and corporate references, sufficient to the Authority to determine the bidder's responsibility, experience and capacity to perform the Work. If required by the Chief Engineer, the foregoing information shall include information to demonstrate to the satisfaction of the Chief Engineer that the bidder has within the past five years been a contractor on at least one contract of the same general type, extent and complexity as the contract on which the Proposal has been submitted, and completed the work skillfully, in a satisfactory manner and on time.

C. Information to supplement a) data shown in the financial statements and the statement of work on hand required to be submitted with the Proposal; and b) any statement submitted under the clauses hereof entitled "Certification of No Investigation (Criminal or Civil Anti-Trust), Indictment, Conviction, Suspension, Debarment, Disqualification, Prequalification Denial or Termination, etc, Disclosure of Other Required Information", "Certification of Participation in a United States Department of Labor-Registered Apprenticeship Program" or "Non-Collusive Bidding and Code of Ethics Certification; Certification of No Solicitation Based on Commission, Percentage, Brokerage, Contingent Fee or Other Fee".

D. Moreover, in the event that the bidder's performance on a past Port Authority or PATH contract or contracts has been rated less than satisfactory, the Chief Engineer may give oral or written notice to the bidder to furnish information demonstrating to the satisfaction of the Chief Engineer that, notwithstanding such rating, such performance was, in fact, satisfactory, or that the circumstances which gave rise to such unsatisfactory rating have changed or will not apply to performance of the Contract, and that such performance will be satisfactory.

E. If the bidder has performed a contract for the States of New York or New Jersey, or any governmental entity within such States and has filed a questionnaire or other document required to be submitted in order for the bidder to qualify to perform the contract, the bidder may be requested by the Chief Engineer to submit the most recent completed questionnaire or other such document, or if the most recent completed questionnaire or other such document is not available, to submit a written statement indicating the approximate date of the contract and the name of the governmental entity which awarded them the contract.

F. Any additional information relevant to the bidder's Proposal including information to supplement the bidder's initial analysis of bid..

G. Detailed information in writing setting forth the affirmative action which the bidder proposes to take to ensure equal employment opportunities as required by clause A of the clause of the Form of Contract entitled "No Discrimination in Employment". This action which for the purpose of convenience is referred to as an "Affirmative Action Program", shall be in addition to the action required under clauses B through G thereof. Solely for the information of the bidder and without in any way limiting or defining the affirmative action program to be proposed by the bidder, there are available for inspection in the office of the Director, Office of Business Diversity and Civil Rights of the Port Authority of New York and New Jersey, copies of sample affirmative action programs.

In the event that any of the foregoing is requested and is not furnished within seven days thereafter or within such additional time as the Chief Engineer, in his sole discretion, may allow, the Authority may not be in a position to determine whether the bidder is qualified, whether the bidder understands the requirements of the contract or whether the bid is responsive and may, in its sole discretion, reject the bidder's Proposal.

The giving of such notice to the bidder in connection with any of the foregoing lists, statement or information shall not be construed as an acceptance of his Proposal. However, the Authority reserves the right in its sole and absolute discretion, to accept the Proposal of a bidder despite the fact that said bidder has not submitted any information, list or statement required pursuant to this Section within the above-stated time period.

4. ACCEPTANCE OR REJECTION OF PROPOSAL

Within ninety (90) days after the opening of the Proposals, the Authority will accept one of the Proposals, if it accepts any. The acceptance of a Proposal will be only by mailing to or delivering at the office designated in the Proposal a notice in writing specifically indicating acceptance signed by an authorized representative on behalf of the Authority who is at present the Authority's Director of Procurement. No other act of the Authority, its Commissioners, officers, agents, or employees shall constitute acceptance of a Proposal. Such notice will state whether or not the Authority elects to require the bidder to furnish a Performance and Payment Bond. Rejection of a Proposal will be only by either (a) a notice in writing specifically stating that the Proposal is rejected, signed by an authorized representative on behalf of the Authority who is at present the Authority's Director of Procurement and mailed to or delivered at the office designated in the Proposal or (b) omission of the Authority to accept a Proposal within ninety (90) days after the opening of Proposals; and no other act of the Authority, its Commissioners, officers, agents or employees shall constitute rejection of a Proposal, including any counter offer or other act of the Authority, its Commissioners, officers, agents or employees.

The Authority reserves the unqualified right, in its sole and absolute discretion, to reject all Proposals or to accept that Proposal if any, which in its judgment will under all the circumstances best serve the public interest and to waive defects in any Proposal.

In the event that a successful bidder defaults upon the Contract by failing to furnish a satisfactory Performance and Payment Bond, if required, and the Authority terminates the Contract, the Authority reserves the option to accept the Proposal of any other bidder within ninety (90) days after the opening of Proposals, in which case such acceptance shall have the same effect as to such other bidder as though he were the originally successful bidder.

5. RETURN OF CERTIFIED CHECKS

Within ten (10) days after the opening of the Proposals the Authority will return all certified checks deposited by bidders, except those deposited by three bidders to be selected by the Authority, which will be returned within three days after one Proposal is accepted by the Authority; or if a Performance and Payment Bond is required, within three days after a satisfactory Performance and Payment Bond is furnished to the Authority; or if all Proposals are rejected, not later than three days after such rejection. The return of a bidder's check shall not, however, be deemed to be a rejection of his Proposal.

6. WEBSITE POSTINGS OF CONTRACT DOCUMENTS

Recipients of Contract documents marked Confidential (Privileged) may not post them or any of them to a website except in accordance with the Authority's prior written approval, which may require a written non-disclosure agreement.

Recipients of Contract documents not marked Confidential (Privileged) may not post them or any of them to a website unless the website (1) is non-public, (2) is password protected and (3) is accessible only to the recipient's prospective subcontractors and suppliers. Recipient's prospective subcontractors and suppliers shall also be deemed recipients and shall be required to conform to the terms of this numbered clause. Recipients shall be deemed to include both bidders and those who do not submit bids.

No later than 180 days after the date of receipt of Proposals, all recipients shall remove all Contract documents from their websites.

7. DISPOSAL OF CONTRACT DOCUMENTS

All recipients of Contract documents, including bidders and those who do not bid and their prospective subcontractors and suppliers who may receive all or a part of the Contract documents or copies thereof, shall make every effort to ensure the secure and appropriate disposal of the Contract documents to prevent further disclosure of the information contained in the documents. Secure and appropriate disposal includes methods of document destruction such as shredding or arrangements with refuse handlers that ensure that third persons will not have access to the documents' contents either before, during, or after disposal. Documents may also be returned for disposal purposes to the Contract Desk on the 3rd Floor, 3 Gateway Center, Newark NJ 07102 or the office of the Director of Procurement, Two Montgomery Street, 3rd Floor, Jersey City, NJ 07302.

8. AVAILABLE DOCUMENTS

Certain documents, specified below, are available for reference and examination by bidders by contacting Gary Greer at (973) 792-3934, 3 Gateway Center, 3rd Floor, Newark, NJ 07102 during regular business hours. These documents were not prepared for the purpose of providing information for bidders upon the present Contract but they were prepared for other purposes, such as for other contracts or for design purposes for this or other contracts, and they do not form a part of this Contract. The Authority makes no representation or guarantee as to, and shall not be responsible for their accuracy, completeness or pertinence, and, in addition, shall not be responsible for the conclusions to be drawn there from. They are made available to the bidders merely for the purpose of providing them with such information as is in the possession of the Authority, whether or not such information may be accurate, complete or pertinent or of any value to the bidders. Questions concerning the content of the documents shall be submitted in accordance with the clause entitled "Questions By Bidders".

Said documents are as follows:

1 CONCRETE SAMPLING RESULTS REPORT, NEWARK LIBERTY INTERNATIONAL AIRPORT – HANGAR 14", ARCADIS, MARCH 10, 2014

2 ANALYTICAL REPORT OF HCV PROJECT # 1072613.

3 NEWARK LIBERTY INTERNATIONAL AIRPORT, NORTH CARGO AREA (HANGAR 14 AND BUILDING 95 & 332) ENVIRONMENTAL SUBSURFACE CONDITIONS INVESTIGATION, FINAL REPORT APRIL 2013.

*4. Contract Drawings bearing the Title "NORTH DRAINAGE AREA" which are separately numbered and entitled as follows:

EWR-SL-476 SITE LOCATION PLAN GENERAL NOTES, ABBREVIATIONS, SOIL CLASSIFICATION AND LEGEND

EWR-SL-477 BORING LOCATION PLAN

*5. Contract Drawings bearing the Title "NORTH AREA DRAINAGE" which are separately numbered and entitled as follows:

EWR-SL-481 PRESENTATION OF BORINGS

EWR-SL-482 PRESENTATION OF BORINGS

9. MINORITY AND WOMEN'S BUSINESS ENTERPRISES PROGRAM (MBE/WBE)

The Authority has a long-standing practice of making its contract opportunities available to as many firms as possible and has taken affirmative steps to encourage Minority Business Enterprises (MBEs) and Women's Business Enterprises (WBEs) to seek business opportunities with it.

"Minority-owned business" or "MBE" means a business entity which is at least 51 percent owned by one or more members of one or more minority groups, or, in the case of a publicly held corporation, at least 51 percent of the stock of which is owned by one or more members of one or more minority groups, and whose management and daily business operations are controlled by one or more such individuals who are citizens or permanent resident aliens.

"Women-owned business" or "WBE" means a business which is at least 51 percent owned by one or more women, or, in the case of a publicly held corporation, 51 percent of the stock of which is owned by one or more women, and whose management and daily business operations are controlled by one or more women who are citizens or permanent resident aliens.

"Minority group" means any of the following racial or ethnic groups:

A. Black persons having origins in any of the black African racial groups not of Hispanic origin;

B. Hispanic persons of Puerto Rican, Mexican, Dominican, Cuban, Central, or South American culture or origin, regardless of race;

C. Asian and Pacific Islander persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent or the Pacific Islands;

D. Native American or Alaskan native persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification.

*NOTE: For the Bidder's convenience, these documents will be transmitted under separate cover

To ensure meaningful participation of MBEs and WBEs on this Contract, the Authority has set goals of 12 percent for firms owned and controlled by minorities, and 5 percent for firms owned and controlled by women.

In the event that any portion of the Work is subcontracted in accordance with the clause of the Form of Contract entitled "Assignments and Subcontracts", every good faith effort to meet the above goals for MBE and WBE participation in the Work shall be made and documented. Such good faith efforts shall include at least the following:

A. Attendance at pre-bid meetings, if any, scheduled by the Authority;

B. Utilization of the Authority's Directory of certified MBE/WBEs available on-line (see Notification of M/WBE On-line Directory and Forms in back of Contract booklet) and/or proposing for certification other MBE/WBEs which appear to meet the Authority's criteria for MBE/WBE certification and which are technically competent to perform the Work which the bidder plans to subcontract;

C. Active and affirmative solicitation of bids for subcontracts from MBE/WBEs;

D. Advertisement in general circulation media, trade association publications and minority-focused media for a reasonable period before bids or proposals are due;

E. Dividing the work to be subcontracted into smaller portions or encouraging the formation of joint ventures, partnerships or similar arrangements among subcontractors in order to increase the likelihood of achieving the MBE/WBE goals;

F. Providing a sufficient supply of drawings and specifications of prospective work to MBE/WBEs and providing appropriate materials to each in sufficient time to review; and

G. Utilizing the services of available minority and women's community organizations; contractors' groups; local, State and Federal business assistance/development offices and other organizations that provide assistance to MBE/WBEs.

Subsequent to acceptance by the Authority of the Contractor's Proposal, the Contractor shall use and document every good faith effort to comply with his MBE/WBE Participation Plan and to permit his MBE/WBE subcontractors to perform. Participation percentages shall be monitored throughout the performance of this Contract. Such good faith efforts shall include at least the following:

A. Ensuring that progress payments are made in a timely fashion in accordance with the requirements of this Contract;

B. Not requiring bonds from and/or providing bonds and insurance for subcontractors where appropriate;

C. Soliciting specific recommendations on methods for enhancing MBE/WBE participation from Authority staff responsible for such participation; and

D. Nominating subcontractors for participation in business assistance programs sponsored by the Authority or the Regional Alliance of Small Contractors such as the Loaned Executive Assistance Program (L.E.A.P.).

Subsequent to acceptance by the Authority of the Contractor's Proposal, the Contractor shall also provide the Engineer, at his request, with a trade breakdown schedule showing when the Contractor's MBE/WBE subcontractors are scheduled to perform. The Contractor shall also submit to the Engineer, on a monthly basis, the Statement of Subcontractor's Payments annexed hereto as Schedule D.

In the event that, prior to acceptance by the Authority of the Contractor's Proposal and following review of the MBE/WBE Participation Plan submitted by the bidder pursuant to the clause hereof entitled "Qualification Information", the Chief Engineer determines that the bidder has not made a good faith effort to meet the MBE/WBE participation goals set forth above and that the bidder has not demonstrated that a full or partial waiver of such goals is appropriate, the Chief Engineer may advise the bidder that it is not responsible and may reject the bidder's Proposal.

If, during the performance of the Contract, the Contractor fails to demonstrate good faith in carrying out his MBE/WBE Participation Plan and in permitting his MBE/WBE subcontractors to perform and the Contractor has not demonstrated that a full or partial waiver of the above referenced MBE/WBE participation goals is appropriate, then, upon receipt of a future proposal or proposals from the Contractor, the Chief Engineer may advise the Contractor that he is not a responsible bidder and may reject such proposal(s).

Either prior or subsequent to acceptance of the bidder's Proposal, the bidder may request a full or partial waiver of the above described MBE/WBE participation goals by providing a reasonable demonstration to the Chief Engineer that his good faith efforts will not result in compliance with the goals set forth above because participation by eligible MBE/WBEs could not be obtained at a reasonable price or that such MBE/WBEs were not available or refused to perform as subcontractors. The bidder shall provide such documentation to support his request as the Chief Engineer may require.

Once approved, the MBE/WBE Participation Plan submitted by the bidder may be modified only with the written approval of the Engineer.

Following approval by the Engineer under the clause entitled "Assignments and Subcontracts" of one or more subcontractors who are either MBEs or WBEs and listed in the MBE/WBE Directory or determined to be "eligible" by the Chief Engineer in accordance with this numbered clause, the Authority may, at its sole option, provide to said approved M/WBEs, without charge, whatever appropriate consultant services may be available under the L.E.A.P. Program; provided, however, that such consultant services will only be furnished pursuant to a request in writing from the Director, Office of Business Diversity and Civil Rights of the Port Authority of New York and New Jersey, 233 Park Avenue South - 4th Floor, New York, NY 10003.

Such services will be discontinued following a written request from the Contractor to the Director, Office of Business Diversity and Civil Rights of the Port Authority of New York and New Jersey, to discontinue them.

The L.E.A.P. services include advising on scheduling, purchasing, planning and other aspects of construction to firms to mitigate business or management problems which could negatively impact on their performance. These services do not include engineering or legal advice. The determination as to whether or not to follow the advice given lies solely with the M/WBE subcontractor. Prior to being accepted as a participant in the L.E.A.P. Program, the M/WBE subcontractor will be required to release the Authority and the individuals furnishing consultant advice of all liability and responsibility in connection therewith.

The Authority has compiled and made available on-line an MBE/WBE Directory which specifies the firms the Authority has determined to be (1) MBEs/WBEs and (2) experienced in performing work in the trades and contract dollar ranges indicated in the Directory. The Authority makes no representation as to the financial responsibility of such firms or their ability to perform Work required under this Contract. Subject to the following paragraph, only MBEs/WBEs listed in the Directory will count toward the required MBE/WBE participation.

If the Contractor wishes to perform a portion of the Work through a firm not listed in the Directory[2] but which the Contractor believes should be eligible because it is (1) an MBE/WBE, as defined above and (2) technically competent to perform portions of the Work or the Contractor believes it is such a firm, the Contractor shall submit to the Director, Office of Business Diversity and Civil Rights of the Port Authority of New York and New Jersey, a written request for a determination that the proposed firm is eligible. This shall be done by completing and forwarding a) the form labeled "Schedule A" and, if appropriate, "Schedule B" which are annexed hereto and form a part hereof and b) technical references of jobs completed of similar scope and complexity on the form annexed hereto and made a part hereof labeled "MBE/WBE Approval Request" and such other information as may be necessary to permit the Authority to determine whether the firm is in fact an MBE/WBE and technically competent to perform portions of the Work.

1. Queens Air Services Development Office
   JFK International Airport
   Building #141
   Federal Circle, First Floor
   Jamaica, NY 11430
   (718) 244-6852
   Fax (718) 244-7371
   www.asdoonline.com

2. Chinatown Manpower Project, Inc.
   70 Mulberry Street
   New York, NY 10031
   (212) 571-1690
   www.cmpny.org

3. Association of Minority Enterprises of NY, Inc.
   135-20 Liberty Avenue
   Richmond Hill, NY 11419
   (718) 291-1641
   Fax (718) 291-1641
   www.ameny.org

4. Statewide Hispanic Chamber of Commerce of New Jersey
   150 Warren Street, Suite 110
   Jersey City, NJ 07302
   (201) 451-9512
   Fax (201) 451-9547
   www.shccnj.org

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[2] The following organizations may be able to refer the Contractor to MBEs/WBEs who are technically competent to perform portions of the Work. Any referrals which are not listed in the Directory shall be submitted to the Authority for a determination as to eligibility as provided above.

5. Greater Newark Business
Development Consortium
744 Broad Street, 26th Floor
Newark, NJ 07102
(973) 242-5563
www.gnbdc.org

6. Jamaica Business Resource Center
90-33 160th Street
Jamaica, NY 11432
(718) 206-2255
Fax (718) 206-3693
www.jbrc.org

7. Council for Airport Opportunity
Newark Liberty International Airport
Building 80
Newark, NJ 07014
(973) 961-4382
www.caonj.com

8. National Hispanic Business Group
1230 Avenue of the Americas,
7th Floor
New York, NY 10020
(212) 265-2664
www.nhbg.org

9. Greater Jamaica Development Corp.
90-04 161st Street
Jamaica, NY 11432
(718) 291-0282
Fax (718) 291-7918
www.gjdc.org

10. NYS Assn. Of Minority Contractors
Brooklyn Navy Yard
Building 280, 4th Floor, Suite 414
Brooklyn, NY 11205
(212) 246-8380
Fax (718) 246-8376
www.nysamc.org

11. Professional Women in Construction
315 E. 56th Street, Suite 202
New York, NY 10022
(212) 486-7745
Fax (212) 486-0228
www.pwcusa.org

12. NY/NJ Minority Purchasing Council
330 Seventh Avenue, 8th Floor
New York, NY 10001
(212) 502-5663
www.nynjmsdc.org

13. National Minority Business Council
120 Broadway, 19th Floor
New York, NY 10271
(212) 693-5050
www.nmbc.org

14. Queens Overall Economic Development Office
120-55 Queens Boulevard, Suite 309 Kew Gardens, NY 11424
(718) 263-0546
Fax (718) 263-0594
www.queensny.org

15. York College Small Business Development Center
94-50 159th Street
York College,
Room S 107
Jamaica, NY 11451
(718) 262-2880
Fax (718) 262-2881
www.nyssbdc.org

16. Small Business Development Center - Rutgers University, University Heights
43 Bleeker Street
Newark, NJ 07102
(973) 353-1927
Fax (973) 353-1110
www.msbdc.newark.rutgers.edu

17. New Jersey Association of Women Business Owners (NJAWBO)
186 Princeton Hightstown Road
West Windsor, NJ 08550
(609) 799-5101
www.njawbo.org

18. New Jersey Air Services Development Office
Newark Liberty International Airport Building #80 - Second Floor
Newark, NJ 07114
(973) 961-4278
Fax (973) 961-4282
www.asdonline.com

19. Caribbean-American Chamber of Commerce
Brooklyn Navy Yard
63 Flushing Avenue
Brooklyn, NY 11205
(718) 834-4544
Fax (718) 834-9774
www.caribbeantradecenter.com

20. Northeast Region – Small Business Resource Transportation Center
29-10 Thomson Avenue
Long Island City, NY 11101
(718) 482-5941
www.osdbu.dot.gov/regional/northeast.cfm

21. Asian Women in Business
42 Broadway, Suite 1748
New York, NY 10004
(212) 868-1368
Fax (212) 868-1373
www.awib.org

22. Asian American Business Development Center
80 Wall Street, Suite 418
New York, NY 10005
(212) 966-0100
Fax (212) 966-2786
www.aabdc.com

23. New York State Federation of Hispanic Chambers of Commerce
2710 Broadway
New York, NY 10025
(212) 222-8300
Fax (212) 222-8412
www.nysfhcc.com

24. Orange County Chamber of Commerce
30 Scott Corners Drive
Montgomery, NY 12549
(845) 457-9700 Ext. 1101
www.orangeny.com

25. Regional Alliance For Small Contractors
625 Eighth Avenue, 2nd Floor,
North Wing
New York, NY 10018
(212) 268-2991
www.regional-alliance.org

26 Women Builders Council
500 Hampton Avenue
Brooklyn, NY 11235
(212) 367-2130
www.wbcnyc.org

All such requests shall be in writing addressed to the Chief Engineer. If any such firm is determined to be eligible it shall only be by a writing over the name of the Chief Engineer. In the event that such firm is found not to be eligible, the Chief Engineer will only consider as a substitute for such firm, a firm listed in the Authority's MBE/WBE Directory available on-line.

The Contractor shall submit the names of proposed MBEs/WBEs for work on this Contract if their names do not appear in the Authority's MBE/WBE Directory available on-line in accordance with the requirements of this clause and all other requirements of this Contract. MBEs/WBEs proposed as lessors of equipment or materialmen shall be deemed "subcontractors" for the purpose of this numbered clause and the clause hereof entitled "Assignments and Subcontracts" but shall not be deemed subcontractors for any other purpose. However only 60% of the amounts paid by the Contractor to such materialmen who are MBEs/WBEs, except in the case of firms who themselves manufacture materials for use under the Contract, shall be allowed in computing the percentages of the Contract Price required to be paid to MBEs/WBEs hereunder.

The Contractor shall ensure that all approved MBE/WBE subcontractors maintain a regular on site presence at the construction site for the portions of the Work they are subcontracted to perform and that they exercise financial and operation management and control of such portions of the Work.

Nothing herein shall be deemed to supersede or to otherwise modify the clause of the Form of Contract entitled "Assignments and Subcontracts".

10. INSPECTION OF SITE

Each bidder or his authorized representative must make proper arrangements with the Resident Engineer at the construction site before inspecting the construction site. To make such arrangements call Catherine Nigro, at (973) 961-6109 or email at cnigro@panynj.gov.

11. QUESTIONS BY BIDDERS

Questions by prospective bidders concerning the Contract may be addressed to Marjorie Crump , at or email at mcrump@panynj.gov, who however is authorized only to direct the attention of prospective bidders to various portions of the Contract so that they may read and interpret such portions for themselves. Neither Marjorie Crump nor any other employee or representative of the Authority is authorized to give interpretations of any portion of the Contract or to give information as to the requirements of the Contract in addition to that contained in the Contract. Interpretations of the Contract or additional information as to its requirements, where necessary, shall be communicated to bidders only by written addendum issued over the name of the Chief Engineer, which addendum shall be considered part of this Contract. Accordingly, nothing contained herein and no representation, statement or promise, oral or in writing, of the Authority, its Commissioners, officers, agents, representatives or employees shall impair or limit the effect of the warranties of the Contractor contained in the clause of the Form of Contract entitled "Contractor's Warranties" or elsewhere in this Contract. The provisions of this clause shall apply to questions addressed by prospective bidders both before and after their receipt of Contract Documents.

12. PREVAILING RATE OF WAGE CERTIFICATION

The bidders' attention is directed specifically to the clause of the Form of Contract entitled "Prevailing Rate of Wage" and to the fact that the Authority requires a certification in writing from the successful bidder, in such form as may be required pursuant to such clause, that he has paid and caused his subcontractors to pay at least the prevailing rate of wage and supplements required by such clause. This certification is required prior to his receipt of any payment from the Authority hereunder as provided in the clauses of the Form of Contract entitled "Monthly Advances" and "Final Payment" or at any other time.

13. CERTIFICATION OF NO INVESTIGATION (CRIMINAL OR CIVIL ANTI-TRUST), INDICTMENT, CONVICTION, SUSPENSION, DEBARMENT, DISQUALIFICATION, PREQUALIFICATION DENIAL OR TERMINATION, ETC; DISCLOSURE OF OTHER REQUIRED INFORMATION

By bidding on this Contract, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, that the bidder and each parent and/or affiliate of the bidder has not (a) been indicted or convicted in any jurisdiction; (b) been suspended, debarred, found not responsible or otherwise disqualified from entering into contracts with any governmental agency or been denied a government contract for failure to meet prequalification standards; (c) had a contract terminated by any governmental agency for breach of contract or for any cause related directly or indirectly to an indictment or conviction; (d) changed its name and/or Employer Identification Number (taxpayer identification number) following its having been indicted, convicted, suspended, debarred or otherwise disqualified, or had a contract terminated as more fully provided in (a), (b) and (c) above; (e) ever used a name, trade name or abbreviated name, or an Employer Identification Number different from those inserted in the Proposal; (f) been denied a contract by any governmental agency for failure to provide the required security, including bid, payment or performance bonds or any alternative security deemed acceptable by the agency letting the contract; (g) failed to file any required tax returns or failed to pay any applicable federal, state or local taxes; (h) had a lien imposed upon its property based on taxes owed and fines and penalties assessed by any agency of the federal, state or local government; (i) been, and is not currently, the subject of a criminal investigation by any federal, state or local prosecuting or investigative agency and/or a civil anti-trust investigation by any federal, state or local prosecuting or investigative agency, including an inspector general of a governmental agency or public authority; (j) had any sanctions imposed as a result of a judicial or administrative proceeding with respect to any professional license held or with respect to any violation of a federal, state or local environmental law, rule or regulation; and (k) shared space, staff, or equipment with any business entity.

The foregoing certification as to "(a)" through "(k)" shall be deemed to have been made by the bidder as follows: if the bidder is a corporation, such certification shall be deemed to have been made not only with respect to the bidder itself, but also with respect to each director and officer, as well as, to the best of the certifier's knowledge and belief, each stockholder with an ownership interest in excess of 10%; if the bidder is a partnership, such certification shall be deemed to have been made not only with respect to the bidder itself, but also with respect to each partner. Moreover, the foregoing certification, if made by a corporate bidder, shall be deemed to have been authorized by the Board of Directors of the bidder, and such authorization shall be deemed to include the signing and submission of the bid and the inclusion therein of such certification as the act and deed of the corporation.

In any case where the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the signed bid a signed statement which sets forth in detail the reasons therefor. If the bidder is uncertain as to whether it can make the foregoing certification, it shall so indicate in a signed statement furnished with its bid, setting forth an explanation for its uncertainty.

Notwithstanding that the certification may be an accurate representation of the bidder's status with respect to the enumerated circumstances provided for in this clause as requiring disclosure at the time that the bid is submitted, the bidder agrees to immediately notify the Authority in writing of any change in circumstances during the period of irrevocability, or any extension thereof.

The foregoing certification or signed statement shall be deemed to have been made by the bidder with full knowledge that it would become a part of the records of the Authority and that the Authority will rely on its truth and accuracy in awarding this Contract. In the event that the Authority determines at any time prior or subsequent to the award of the Contract that the bidder has falsely certified as to any material item in the foregoing certification; willfully or fraudulently submitted any signed statement pursuant to this clause which is false in any material respect; or has not completely and accurately represented its status with respect to the circumstances provided for in this clause as requiring disclosure, the Authority may determine that the bidder is not a responsible bidder with respect to its bid on this Contract or with respect to future bids and may, in addition to exercising any other rights or remedies available to it, exercise any of the rights or remedies set forth in the clause of the Form of Contract entitled "Rights and Remedies of Authority". In addition, bidders are advised that knowingly providing a false certification or statement pursuant hereto may be the basis for prosecution for offering a false instrument for filing (see e.g., New York Penal Law, Section 175.30 et seq.). Bidders are also advised that the inability to make such certification will not in and of itself disqualify a bidder, and that in each instance the Authority will evaluate the reasons therefor provided by the bidder.

Under certain circumstances the bidder may be required as a condition of this Contract award to enter into a Monitoring Agreement under which it will be required to take certain specified actions, including compensating an independent Monitor to be selected by the Port Authority. Said Monitor shall be charged with, among other things, auditing the actions of the bidder to determine whether its business practices and relationships indicate a level of integrity sufficient to permit it to continue business with the Port Authority.

As used in this clause, the following terms shall mean:

Affiliate - An entity in which the parent of the bidder owns more than fifty percent of the voting stock, or an entity in which a group of principal owners which owns more than fifty percent of the bidder also owns more than fifty percent of the voting stock.

Agency or Governmental Agency - Any federal, state, city or other local agency, including departments, offices, quasi-public agencies, public authorities and corporations, boards of education and higher education, public development corporations, local development corporations and others.

Employer Identification Number - The tax identification number assigned to firms by the Federal government for tax purposes.

Investigation - Any inquiries made by any federal, state or local criminal prosecuting or investigative agency, including an inspector general of a governmental agency or public authority, and any inquiries concerning civil anti-trust investigations made by any federal, state or local governmental agency. Except for inquiries concerning civil anti-trust investigations, the term does not include inquiries made by any civil government agency concerning compliance with any regulation, the nature of which does not carry criminal penalties, nor does it include any background investigations for employment, or Federal, state, and local inquiries into tax returns.

Officer - Any individual who serves as chief executive officer, chief financial officer, or chief operating officer of the bidder by whatever titles known.

Parent - An individual, partnership, joint venture or corporation which owns more than 50% of the voting stock of the bidder.

Space Sharing - Space shall be considered to be shared when any part of the floor space utilized by the submitting business at any of its sites is also utilized on a regular or intermittent basis for any purpose by any other business or not-for-profit organization, and where there is no lease or sublease in effect between the submitting business and any other business or not-for-profit organization that is sharing space with the submitting business.

Staff Sharing - Staff shall be considered to be shared when any individual provides the services of an employee, whether paid or unpaid, to the bidder and also, on either a regular or irregular basis, provides the services of an employee, paid or unpaid, to one or more other business(es) and/or not-for-profit organization(s), if such services are provided during any part of the same hours the individual is providing services to the bidder or if such services are provided on an alternating or interchangeable basis between the bidder and the other business(es) or not-for-profit organization(s). "The services of an employee" should be understood to include services of any type or level, including managerial or supervisory. This type of sharing may include, but is not limited to, individuals who provide the following services: telephone answering, receptionist, delivery, custodial, and driving.

Equipment Sharing - Equipment shall be considered to be shared whenever the bidder shares the ownership and/or the use of any equipment with any other business or not-for-profit organization. Such equipment may include, but is not limited to, telephones or telephone systems, photocopiers, computers, motor vehicles, and construction equipment. Equipment shall not be considered to be shared under the following two circumstances: when, although the equipment is owned by another business or not-for-profit organization, the bidder has entered into a formal lease for the use of the equipment and exercises exclusive use of the equipment; or when the bidder owns equipment that it has formally leased to another business or not-for-profit organization, and for the duration of such lease the bidder has relinquished all right to the use of such leased equipment.

14. NON-COLLUSIVE BIDDING AND CODE OF ETHICS CERTIFICATION; CERTIFICATION OF NO SOLICITATION BASED ON COMMISSION, PERCENTAGE, BROKERAGE, CONTINGENT FEE OR OTHER FEE

By bidding on this Contract, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, that: (a) the prices in its bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor; (b) the prices quoted in its bid have not been and will not be knowingly disclosed, directly or indirectly, by the bidder prior to the official opening of such bid to any other bidder or to any competitor; (c) no attempt has been made and none will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition; (d) this organization has not made any offers or agreements, or given or agreed to give anything of value (see definition of "anything of value" appearing in the clause of the Form of Contract entitled "No Gifts, Gratuities, Offers of Employment, etc.") or taken any other action with respect to any Authority employee or former employee or immediate family member of either which would constitute a breach of ethical standards under the Code of Ethics and Financial Disclosure dated as of April 11, 1996 (a copy of which is available upon request to the individual named in the clause hereof entitled "Questions by Bidders"), nor does this organization have any knowledge of any act on the part of an Authority employee or former Authority employee relating either directly or indirectly to this organization which constitutes a breach of the ethical standards set forth in said Code; (e) no person or selling agency, other than a bona fide employee or bona fide established commercial or selling agency maintained by the bidder for the purpose of securing business, has been employed or retained by the bidder to solicit or secure this Contract on the understanding that a commission, percentage, brokerage, contingent or other fee would be paid to such person or selling agency; (f) the bidder has not offered, promised or given, demanded or accepted, any undue advantage, directly or indirectly, to or from a public official or employee, political candidate, party or party official, or any private sector employee (including a person who directs or works for a private sector enterprise in any capacity), in order to obtain, retain, or direct business or to secure any other improper advantage in connection with this Contract.

The foregoing certification as to "(a)", "(b)", "(c)", "(d)", "(e)" and "(f)" shall be deemed to have been made by the bidder as follows: if the bidder is a corporation, such certification shall be deemed to have been made not only with respect to the bidder itself, but also with respect to each parent, affiliate, director and officer of the bidder, as well as, to the best of the certifier's knowledge and belief, each stockholder of the bidder with an ownership interest in excess of 10%; if the bidder is a partnership, such certification shall be deemed to have been made not only with respect to the bidder itself, but also with respect to each partner. Moreover, the foregoing certification, if made by a corporate bidder, shall be deemed to have been authorized by the Board of Directors of the bidder, and such authorization shall be deemed to include the signing and submission of the bid and the inclusion therein of such certification as the act and deed of the corporation.

In any case where the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the signed bid a signed statement which sets forth in detail the reasons therefor. If the bidder is uncertain as to whether it can make the foregoing certification, it shall so indicate in a signed statement furnished with its bid, setting forth in such statement the reasons for its uncertainty. As a result of such disclosure, the Port Authority shall take appropriate action up to and including a finding of non-responsibility.

Failure to make the required disclosures shall lead to administrative actions up to and including a finding of non-responsibility.

Notwithstanding that the bidder may be able to make the foregoing certification at the time the bid is submitted, the bidder shall immediately notify the Authority in writing during the period of irrevocability of bids on this Contract or any extension of such period, of any change of circumstances which might under this clause make it unable to make the foregoing certification or required disclosure. The foregoing certification or signed statement shall be deemed to have been made by the bidder with full knowledge that it would become a part of the records of the Authority and that the Authority will rely on its truth and accuracy in awarding this Contract. In the event that the Authority should determine at any time prior or subsequent to the award of this Contract that the bidder has falsely certified as to any material item in the foregoing certification or has willfully or fraudulently furnished a signed statement which is false in any material respect, or has not fully and accurately represented any circumstance with respect to any item in the foregoing certification required to be disclosed, the Authority may determine that the bidder is not a responsible bidder with respect to its bid on this Contract or with respect to future bids on Authority contracts and may, in addition to exercising any other rights or remedies it may have, exercise any of the rights or remedies set forth in the clause of the Form of Contract entitled "Rights and Remedies of Authority".

In addition, bidders are advised that knowingly providing a false certification or statement pursuant hereto may be the basis for prosecution for offering a false instrument for filing (see e.g., New York Penal Law, Section 175.30 et seq.). Bidders are also advised that the inability to make such certification will not in and of itself disqualify a bidder, and that in each instance the Authority will evaluate the reasons therefor provided by the bidder.

Under certain circumstances the bidder may be required as a condition of this Contract award to enter into a Monitoring Agreement under which it will be required to take certain specified actions, including compensating an independent Monitor to be selected by the Port Authority. Said Monitor shall be charged with, among other things, auditing the actions of the bidder to determine whether its business practices and relationships indicate a level of integrity sufficient to permit it to continue business with the Port Authority.

15. BIDDER ELIGIBILITY FOR AWARD OF CONTRACTS - DETERMINATIONS BY AN AGENCY OF THE STATE OF NEW YORK OR NEW JERSEY CONCERNING ELIGIBILITY TO RECEIVE PUBLIC CONTRACTS

Bidders are advised that the Authority has adopted a policy to the effect that in awarding its contracts it will honor any determination by an agency of the State of New York or New Jersey that a bidder is not eligible to bid on or be awarded public contracts because the bidder has been determined to have engaged in illegal or dishonest conduct or to have violated prevailing rate of wage legislation.

The policy permits a bidder whose ineligibility has been so determined by an agency of the State of New York or New Jersey to submit a bid on a Port Authority contract and then to establish that it is eligible to be awarded the contract on which it has bid because (i) the state agency determination relied upon does not apply to the bidder, or (ii) the state agency determination relied upon was made without affording the bidder the notice and hearing to which the bidder was entitled by the requirements of due process of law, or (iii) the state agency determination was clearly erroneous or (iv) the state agency determination relied upon was not based on a finding of conduct demonstrating a lack of integrity or a violation of a prevailing rate of wage law.

The full text of the resolution adopting the policy may be found in the Minutes of the Authority's Board of Commissioners meeting of September 9, 1993.

16. CONSTRUCTION CAREERS - APPRENTICESHIP PROGRAM

The Authority is a participant in Construction Careers, a cooperative program among New Jersey schools, unions and public agencies. Construction Careers creates career opportunities in the construction industry for high school graduates and adults by providing a systematic pathway into union-sponsored, skilled trade apprenticeship programs. The Authority encourages contractors and their subcontractors to maximize the use of apprentices under the applicable collective bargaining agreements or as contained in the applicable program approved by the United States Department of Labor. The Contractor's plan for utilizing apprentices will be discussed at the pre-construction meeting.

Each subcontractor proposed for approval under the Contract whose total amount of subcontracts under this Contract is greater than $1 million and each bidder (except as set forth in the certification below) will be required to certify as to their participation in a United States Department of Labor-registered apprenticeship program prior to acceptance by the Authority of the successful bidder's Proposal.

For information on reciprocity of apprenticeship programs between the United States Department of Labor and other states' Departments of Labor, visit the United States Department of Labor Office of Apprenticeship websites at Regs.Apprenticeship@dol.gov or www.doleta.gov/oa/regulations.cfm.

17. CERTIFICATION OF PARTICIPATION IN A UNITED STATES DEPARTMENT OF LABOR-REGISTERED APPRENTICESHIP PROGRAM

By bidding on this Contract, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, that the bidder participates in an apprenticeship program registered by the United States Department of Labor. Participation in such an apprenticeship program shall mean that the bidder either (a) is a signatory to a collective bargaining agreement with a labor organization which sponsors an apprenticeship program registered with the United States Department of Labor, (b) individually sponsors an apprenticeship program registered by the United States Department of Labor or (c) has an application or request for reciprocal approval pending with the United States Department of Labor prior to the date of opening of Proposals for this Contract and, in the case of (a), (b) and (c) above, such apprenticeship program shall be in the trade(s) in which Work is to be performed. This clause shall not apply to bidders who will perform all Work at the construction site through the use of subcontractors.

The foregoing certification, if made by a corporate bidder, shall be deemed to have been authorized by the Board of Directors of the bidder, and such authorization shall be deemed to include the signing and submission of the bid and the inclusion therein of such certification as the act and deed of the corporation.

In any case where the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the signed bid a signed statement which sets forth in detail the reasons therefor. If the bidder is uncertain as to whether it can make the foregoing certification, it shall so indicate in a signed statement furnished with its bid, setting forth an explanation for its uncertainty.

Notwithstanding that the certification may be an accurate representation of the bidder's status with respect to the enumerated circumstances provided for in this clause as requiring disclosure at the time that the bid is submitted, the bidder agrees to immediately notify the Authority in writing of any change in circumstances during the period of irrevocability, or any extension thereof.

The foregoing certification or signed statement shall be deemed to have been made by the bidder with full knowledge that it would become a part of the records of the Authority and that the Authority will rely on its truth and accuracy in awarding this Contract. In the event that the Authority determines at any time prior or subsequent to the award of the Contract that the bidder has falsely certified as to any material item in the foregoing certification; willfully or fraudulently submitted any signed statement pursuant to this clause which is false in any material respect; or has not completely and accurately represented its status with respect to the circumstances provided for in this clause as requiring disclosure, the Authority may determine that the bidder is not a responsible bidder with respect to its bid on this Contract or with respect to future bids and may, in addition to exercising any other rights or remedies available to it, exercise any of the rights or remedies set forth in the clause of the Form of Contract entitled "Rights and Remedies of Authority". In addition, bidders are advised that knowingly providing a false certification or statement pursuant hereto may be the basis for prosecution for offering a false instrument for filing (see, e.g., New York Penal Law, Section 175.30 et seq.).

18. JOB MIX SUBMITTAL

A bidder may be directed by the Chief Engineer in writing to proceed with design of the asphalt concrete mix specified in the Section of the Specifications entitled "Asphalt Concrete Paving" prior to acceptance of one of the Proposals. If so directed by the Chief Engineer, the bidder shall immediately prepare the design of the asphalt concrete mix and submit it to the Engineer for approval as specified in the aforementioned Section of the Specifications.

All drawings, data and written materials of any type whatsoever which are prepared in connection with the preparation of such design and submitted to the Authority shall be subject to the Section of the Specifications entitled "Shop Drawings, Catalog Cuts and Samples". All materials submitted to the Authority shall be subject to the Section of the Specifications entitled "Workmanship and Materials" and upon submission to the Authority, they shall become the property of the Authority.

None of the requirements of the Contract shall be altered in any way as a result of a bidder being or not being so directed by the Chief Engineer prior to acceptance of one of the Proposals.

In the event that the Proposal of the bidder who was so directed by the Chief Engineer is accepted then no compensation other than that provided in the Form of Contract shall be paid to said bidder.

In the event design of the asphalt concrete mix has been prepared and for any reason thereafter the Proposal of the bidder who was directed by the Chief Engineer to prepare such design is not accepted, then such bidder shall be reimbursed for the cost of the preparation of the design in the amount to be agreed to by the Chief Engineer and the bidder but not to exceed a total amount of Five Thousand Dollars ($5,000.00) regardless of the actual cost to such bidder connected with the preparation of such design.

As used in this numbered clause the term "cost of the preparation of the design" means the cost to the Contractor of materials submitted, the initial design submitted, any resubmittals required by the Engineer and all testing and analysis of the design.

PROPOSAL

To The Port Authority of New York and New Jersey: VRH Construction Corp.

The undersigned[3] "A corporation organized under the laws of the State of New York"

(hereinafter called "the Contractor") hereby offers to perform all the obligations and to assume all the duties and liabilities of the Contractor provided for in the annexed Contract, at the prices inserted by the undersigned in the clause of the Form of Contract entitled "Unit Prices and Lump Sum".

This offer shall be irrevocable for ninety (90) days after the date on which The Port Authority of New York and New Jersey opens this Proposal.

To induce the acceptance of this Proposal, the undersigned hereby makes each and every certification, statement, assurance, representation and warranty made by the Contractor in said Contract. Moreover as a condition to receipt and consideration by the Authority of the Proposal whether or not it is accepted, the undersigned agrees that all information of any nature whatsoever, regardless of the form of the communication, received from the undersigned (including its officers, agents, or employees) by the Authority, its Commissioners, officers, agents or employees, and notwithstanding any statement therein to the contrary, has not been given in confidence and may be used or disclosed by or on behalf of the Authority without liability of any kind except as may arise under letters patent of the undersigned, if any.

08-27-14P03:14 RCVD

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3 Insert bidder's name at the top of the page. After the bidder's name, insert one of the following phrases:

If a corporation, give state of incorporation, using the phrase, "a corporation organized under the laws of the State of ."

If a partnership, give full names of partners, using also the phrase, "co-partners doing business under the firm name of ."

If an individual using a trade name, give individual name, using also the phrase, "an individual doing business under the trade name of ."

If a joint venture, give the information required above for each participant in the joint venture.

Unless expressly stated otherwise, the Information for Bidders, all papers required by it and submitted in connection herewith at any time, said Form of Contract, and all papers made part of the Contract by the terms of the Form of Contract are made part of this Proposal.

The undersigned hereby designates the following as the bidders office[4]: 320 Grand Avenue
Englewood, NJ 07631

The telephone number of the bidder is: 201-871-4422

The fax number of the bidder is: 201-871-6727

The E-Mail address of the bidder is: info@vehcorp.com

08-27-14P03:14 RCVD

4 Insert office address.

SIGNATURE AND CERTIFICATE OF AUTHORITY[5]

Dated, July 28, 2014

(Signature of individual or name of corporation or partnership) VRH Construction Corp.

(Signature of agent, partner or corporate officer) By[6,7] Victor D. Wortmann

Victor D. Wortmann, Jr. - President

(Acknowledgment of signature to be taken on proper form on following page(s)) [redacted]

CERTIFICATE OF AUTHORITY, IF BIDDER IS A CORPORATION

I, the undersigned, as Secretary of the corporation submitting the foregoing Proposal, hereby certify that under and pursuant to the by-laws and resolutions of said corporation, each officer who has signed said Proposal on behalf of the corporation is fully and completely authorized so to do.

(Corporate Seal)

Victor D. Wortmann

Victor D. Wortmann, Jr.

---

5 If bidder is a joint venture, insert signatures as appropriate for one participant of the joint venture on this page and attach and complete an additional signature sheet in the same form as appears on this page for each other participant as required.

6 If Proposal is signed by an officer or agent, give title.

7 NOTE: The foregoing signature shall be deemed to have been provided with full knowledge that the foregoing Proposal, the accompanying Contract booklet, as well as any certification, statement, assurance, representation, warranty, schedule or other document submitted by the bidder with the Proposal will become a part of the records of the Authority and that the Authority will rely in awarding the Contract on the truth and accuracy of such Proposal and each such certification, statement, assurance, representation, warranty and schedule made therein by the Contractor. Knowingly submitting a false statement in connection with any of the foregoing may be the basis for prosecution for offering a false instrument for filing (see, e.g., N.Y. Penal Law, Section 175.30 et seq.).

08-27-14P03:14 RCVD

ACKNOWLEDGMENT[8]

ACKNOWLEDGMENT OF BIDDER, IF A CORPORATION

State of New Jersey

SS:

County of Bergen

On this 28th day of July, 2014, before me personally came and appeared Victor D. Wortmann, Jr., to me known, who, being by me duly sworn, did depose and say that he resides at Bedford, NY, that he is the President of VRH Construction Corp., the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation; and that he signed his name thereto by like order.

(Notary Seal)

Karyn A. Schuchardt

(Notary Signature)

ACKNOWLEDGMENT OF BIDDER, IF A PARTNERSHIP

State of _____

SS:

County of _____

On this _____ day of _____, 20 , before me personally came and appeared _____, to me known and known to me to be one of the members of the firm of _____, described in and who executed the foregoing instrument and he acknowledged to me that he executed the same as and for the act and deed of said firm.

(Notary Seal)

_____

(Notary Signature)

ACKNOWLEDGMENT OF BIDDER, IF AN INDIVIDUAL

State of _____

SS:

County of _____

On this _____ day of _____, 20 , before me personally came and appeared _____ to me known and known to me to be the person described in and who executed the foregoing instrument and he acknowledged to me that he executed the same.

(Notary Seal)

_____

(Notary Signature)

08-27-14P03:14 RCVD

[8] If bidder is a joint venture, insert signature as appropriate for one participant of the joint venture on this page and attach and complete an additional Acknowledgment sheet in the same form as appears on this page for each other participant as required.

STATEMENT ACCOMPANYING PROPOSAL[9]

Names and Residences of Officers, If Bidder is a Corporation

Name	Title
Victor D. Wortmann, Sr.	Chairman
Victor D. Wortmann, Jr.	President
Robert E. Wortmann, Sr.	Sect-Treas
Jeffrey P. Konen	VP
Maurice J. Corran	VP-Operations
Frank W. Hurley	CFO

[redacted]

Names and Residences of Partners, If Bidder is a Partnership

Name	General or Limited Partner	Residence[11]

Bidder's Residence, If an Individual[12]

08-27-14P03:14 RCVD

9 If bidder is a joint venture, insert signature as appropriate for one participant of the joint venture on this page and attach and complete an additional Statement Accompanying Proposal sheet in the same form as appears on this page for each other participant as required.

10 Give Street and Number of Residence. Do not give business address.

11 Give Street and Number of Residence. Do not give business address.

12 Give Street and Number of Residence. Do not give business address.

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned[13]
V.R.H. Construction Corp., a corporation organized under the laws of the State of New York of 320 Grand Avenue, Englewood, NJ 07631
as principal(s); and[14]
Travelers Casualty and Surety Company of America, One Tower Square, Hartford, CT 06183

as surety are hereby held and firmly bound unto The Port Authority of New York and New Jersey (herein called the "Authority") in the penal sum of Nine Hundred Ninety Thousand Dollars ($990,000), for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed this 7th day of August , 20 14

The condition of the above obligation is such that whereas the above named principal(s) has submitted to the Authority a certain Proposal, bound herewith and hereby made a part hereof, to perform the obligations of the Contractor under a contract in writing, known as Contract EWR-153.226, "Newark Liberty International Airport - EWR - Overnight Aircraft Parking", now therefore:

A. If said Proposal shall not be accepted, or

B. If said Proposal shall be accepted and the Authority does not require the principal(s) to furnish a Performance and Payment Bond, or

C. If said Proposal shall be accepted and the Authority requires the principal(s) to furnish a Performance and Payment Bond and either the principal(s) furnishes a Performance and Payment Bond satisfactory to the Authority in accordance with the requirements of said Proposal or the Authority does not terminate the Contract as provided therein on account of the failure to furnish such a bond,

Then, this obligation shall be void, otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

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13 Insert bidder's name. If a corporation, give the state of incorporation using the phrase "a corporation organized under the laws of the ".

If a partnership, give full names of partners, using also the phrase, "co-partners doing business under the firm name of ".

If an individual using a trade name, give individual name, using also the phrase, "an individual doing business under the trade name of ".

If a joint venture, give the information required above for each participant in the joint venture.

14 Insert name of surety.

The surety, for value received, hereby stipulates and agrees that the obligations of said surety and its bond shall be in no way impaired or affected by any extensions of the times within which the Authority may receive or accept such Proposal or within which the principal(s) may furnish a Performance and Payment Bond or by any waiver by the Authority of any of the requirements of said Proposal; and said surety does hereby waive notice of any such extensions or waivers.

IN WITNESS WHEREOF, the principal(s) and surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

V.R.H. Construction Corp.

Principal [15]

(Seal)

By[16] Victor D. Wortmann

Victor D. Wortmann, Jr. - President

Travelers Casualty and Surety Company of America

Surety

(Seal)

By[17]

Elizabeth Riga, Attorney-in-Fact

15 If bidder is a joint venture, insert signature and information required as appropriate for one participant of the joint venture on this page and attach and complete an additional sheet in the same form as appears on this page for each other participant as required.

16 If bond is signed by an officer or agent, give title; if signed by a corporation, affix corporate seal.

17 If bond is signed by an officer or agent, give title; if signed by a corporation, affix corporate seal.

ACKNOWLEDGMENT[18]

ACKNOWLEDGMENT OF BIDDER, IF A CORPORATION

State of New Jersey
SS:
County of Bergen

On this 5th day of August, 2014 before me personally came and appeared Victor D. Wortmann, Jr., to me known, who, being by me duly sworn, did depose and say that he resides at Bedford, NY, that he is the President of VRH Construction Corp., the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation; and that he signed his name thereto by like order.

(Notary Seal)

Karyn A. Schubert
(Notary Signature)

ACKNOWLEDGMENT OF BIDDER, IF A PARTNERSHIP

State of _____
SS:
County of _____

On this _____ day of _____, 20 , before me personally came and appeared _____, to me known and known to me to be one of the members of the firm of _____, described in and who executed the foregoing instrument and he acknowledged to me that he executed the same as and for the act and deed of said firm.

(Notary Seal)

_____
(Notary Signature)

ACKNOWLEDGMENT OF BIDDER, IF AN INDIVIDUAL

State of _____
SS:
County of _____

On this _____ day of _____, 20 , before me personally came and appeared _____ to me known and known to me to be the person described in and who executed the foregoing instrument and he acknowledged to me that he executed the same.

(Notary Seal)

_____
(Notary Signature)

AFFIX ACKNOWLEDGMENT AND JUSTIFICATION OF SURETY

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18 If bidder is a joint venture, insert signature as appropriate for one participant of the joint venture on this page and attach and complete an additional Acknowledgment sheet in the same form as appears on this page for each other participant as required.

WARNING: THIS POWER OF ATTORNEY IS INVALID WITHOUT THE RED BORDER

TRAVELERS

POWER OF ATTORNEY

Farmington Casualty Company
Fidelity and Guaranty Insurance Company
Fidelity and Guaranty Insurance Underwriters, Inc.
St. Paul Fire and Marine Insurance Company
St. Paul Guardian Insurance Company
St. Paul Mercury Insurance Company
Travelers Casualty and Surety Company
Travelers Casualty and Surety Company of America
United States Fidelity and Guaranty Company

Attorney-In Fact No. 227511

Certificate No. 005852729

KNOW ALL MEN BY THESE PRESENTS: That Farmington Casualty Company, St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company are corporations duly organized under the laws of the State of Connecticut, that Fidelity and Guaranty Insurance Company is a corporation duly organized under the laws of the State of Iowa, and that Fidelity and Guaranty Insurance Underwriters, Inc., is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint

A. C. Marquis, Jr., Peter H. Forenza, Robert B. Pitts, John J. Sciortino, William X. Linney, III, AnnMarie Keane, Joseph T. Charczenko, Jr., Fred Nicholson, Richard A. Nocella, Robert S. Rapp, Jr., Elizabeth Riga, Gary V. Rispoli, and Joseph J. Kent

of the City of Branchburg, State of New Jersey, their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

WARNING: THIS POWER OF ATTORNEY IS INVALID WITHOUT THE RED BORDER

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 4th day of April, 2014.

Farmington Casualty Company
Fidelity and Guaranty Insurance Company
Fidelity and Guaranty Insurance Underwriters, Inc.
St. Paul Fire and Marine Insurance Company
St. Paul Guardian Insurance Company
St. Paul Mercury Insurance Company
Travelers Casualty and Surety Company
Travelers Casualty and Surety Company of America
United States Fidelity and Guaranty Company

State of Connecticut
City of Hartford ss.

By: Robert L. Raney, Senior Vice President

On this the 4th day of April, 2014, before me personally appeared Robert L. Raney, who acknowledged himself to be the Senior Vice President of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.
My Commission expires the 30th day of June, 2016.

Marie C. Tetreault, Notary Public

58440-8-12 Printed in U.S.A.

WARNING: THIS POWER OF ATTORNEY IS INVALID WITHOUT THE RED BORDER

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, Kevin E. Hughes, the undersigned, Assistant Secretary, of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is in full force and effect and has not been revoked.

WARNING: THIS POWER OF ATTORNEY IS INVALID WITHOUT THE RED BORDER

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 7th day of August, 20 14.

Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, call 1-800-421-3880 or contact us at www.travelersbond.com. Please refer to the Attorney-In-Fact number, the above-named individuals and the details of the bond to which the power is attached.

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, Kevin E. Hughes, the undersigned, Assistant Secretary, of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is in full force and effect and has not been revoked.

WARNING: THIS POWER OF ATTORNEY IS INVALID WITHOUT THE RED BORDER

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 7th day of August, 20 14.

Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, call 1-800-421-3880 or contact us at www.travelersbond.com. Please refer to the Attorney-In-Fact number, the above-named individuals and the details of the bond to which the power is attached.

ACKNOWLEDGMENT OF SURETY COMPANY

STATE OF NEW JERSEY

COUNTY OF SOMERSET

On this **7th** day of **August, 2014** before me personally came **Elizabeth Riga** to me known, who, being by me duly sworn, did depose and say; that he is the Attorney-in-Fact of **Travelers Casualty and Surety Company of America,** the corporation described in which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by the Board of Directors of said corporation; and that he signed his name thereto by the authority of the Power of Attorney of said Company, of which a Certified Copy is hereto attached, and that he signed said Instrument as an Attorney-in-Fact of said company by like authority.

A Mahane

Notary Public

ANN MARIE KEANE
NOTARY PUBLIC OF NEW JERSEY
MY COMMISSION EXPIRES MAY 19, 2015

TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA

HARTFORD, CONNECTICUT 06183

FINANCIAL STATEMENT AS OF DECEMBER 31, 2013

AS FILED IN THE STATE OF NEW JERSEY

CAPITAL STOCK $ 6,480,000

ASSETS		LIABILITIES & SURPLUS	
CASH AND INVESTED CASH	$ 67,799,624	UNEARNED PREMIUMS	$ 808,717,671
BONDS	3,452,214,898	LOSSES	809,863,176
INVESTMENT INCOME DUE AND ACCRUED	47,758,502	LOSS ADJUSTMENT EXPENSES	460,670,453
OTHER INVESTED ASSETS	265,099,610	COMMISSIONS	31,781,136
PREMIUM BALANCES	190,836,462	TAXES, LICENSES AND FEES	12,482,322
NET DEFERRED TAX ASSET	61,575,098	OTHER EXPENSES	38,437,893
REINSURANCE RECOVERABLE	11,361,414	FUNDS HELD UNDER REINSURANCE TREATIES	94,401,464
SECURITIES LENDING REINVESTED COLLATERAL ASSETS	4,910,772	CURRENT FEDERAL AND FOREIGN INCOME TAXES	18,387,407
RECEIVABLES FROM PARENT, SUBSIDIARIES AND AFFILIATES	30,772,481	REMITTANCES AND ITEMS NOT ALLOCATED	13,577,503
STATE SURCHARGES RECEIVABLE	258,771	AMOUNTS WITHHELD / RETAINED BY COMPANY FOR OTHERS	23,615,357
OTHER ASSETS	14,872,822	RETROACTIVE REINSURANCE RESERVE ASSUMED	1,511,674
		POLICYHOLDER DIVIDENDS	6,462,513
		PROVISION FOR REINSURANCE	3,970,484
		ADVANCE PREMIUM	1,078,609
		PAYABLE FOR SECURITIES LENDING	4,910,772
		DERIVATIVES	112,003
		CEDED REINSURANCE NET PREMIUMS PAYABLE	(64,954,254)
		ESCHEAT LIABILITY	471,948
		OTHER ACCRUED EXPENSES AND LIABILITIES	242,236
		TOTAL LIABILITIES	$ 2,265,740,367
		CAPITAL STOCK	$ 6,480,000
		PAID IN SURPLUS	433,803,760
		OTHER SURPLUS	1,441,436,327
		TOTAL SURPLUS TO POLICYHOLDERS	$ 1,881,720,088
TOTAL ASSETS	$ 4,147,460,454	TOTAL LIABILITIES & SURPLUS	$ 4,147,460,454

STATE OF CONNECTICUT)

COUNTY OF HARTFORD) SS.

CITY OF HARTFORD)

MICHAEL J. DOODY, BEING DULY SWORN, SAYS THAT HE IS SECOND VICE PRESIDENT, OF TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA, AND THAT TO THE BEST OF HIS KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT STATEMENT OF THE FINANCIAL CONDITION OF SAID COMPANY AS OF THE 31ST DAY OF DECEMBER, 2013.

Michael J Doody

SECOND VICE PRESIDENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS
19TH DAY OF MARCH, 2014

NOTARY PUBLIC

SUSAN M. WEISSLEDER
Notary Public
My Commission Expires November 30, 2017

SUSAN M. WEISSLEDER NOTARY PUBLIC CONNECTICUT

August 7, 2014

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned[13]

as principal(s); and[14]

as surety are hereby held and firmly bound unto The Port Authority of New York and New Jersey (herein called the "Authority") in the penal sum of Nine Hundred Ninety Thousand Dollars ($990,000), for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed this day of , 20

The condition of the above obligation is such that whereas the above named principal(s) has submitted to the Authority a certain Proposal, bound herewith and hereby made a part hereof, to perform the obligations of the Contractor under a contract in writing, known as Contract EWR-153.226, "Newark Liberty International Airport - EWR - Overnight Aircraft Parking", now therefore:

A. If said Proposal shall not be accepted, or

B. If said Proposal shall be accepted and the Authority does not require the principal(s) to furnish a Performance and Payment Bond, or

C. If said Proposal shall be accepted and the Authority requires the principal(s) to furnish a Performance and Payment Bond and either the principal(s) furnishes a Performance and Payment Bond satisfactory to the Authority in accordance with the requirements of said Proposal or the Authority does not terminate the Contract as provided therein on account of the failure to furnish such a bond,

Then, this obligation shall be void, otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

---

13 Insert bidder's name. If a corporation, give the state of incorporation using the phrase "a corporation organized under the laws of the ".

If a partnership, give full names of partners, using also the phrase, "co-partners doing business under the firm name of ".

If an individual using a trade name, give individual name, using also the phrase, "an individual doing business under the trade name of ".

If a joint venture, give the information required above for each participant in the joint venture.

14 Insert name of surety.

The surety, for value received, hereby stipulates and agrees that the obligations of said surety and its bond shall be in no way impaired or affected by any extensions of the times within which the Authority may receive or accept such Proposal or within which the principal(s) may furnish a Performance and Payment Bond or by any waiver by the Authority of any of the requirements of said Proposal; and said surety does hereby waive notice of any such extensions or waivers.

IN WITNESS WHEREOF, the principal(s) and surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____

Principal [15]

(Seal)

By[16] _____

_____

Surety

(Seal)

By[17] _____

---

15 If bidder is a joint venture, insert signature and information required as appropriate for one participant of the joint venture on this page and attach and complete an additional sheet in the same form as appears on this page for each other participant as required.

16 If bond is signed by an officer or agent, give title; if signed by a corporation, affix corporate seal.

17 If bond is signed by an officer or agent, give title; if signed by a corporation, affix corporate seal.

ACKNOWLEDGMENT[18]

ACKNOWLEDGMENT OF BIDDER, IF A CORPORATION

State of _____

_____ SS:

County of _____

On this _____ day of _____, 20 , before me personally came and appeared _____, to me known, who, being by me duly sworn, did depose and say that he resides at _____, that he is the _____ of _____, the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation; and that he signed his name thereto by like order.

(Notary Seal)

_____

(Notary Signature)

ACKNOWLEDGMENT OF BIDDER, IF A PARTNERSHIP

State of _____

_____ SS:

County of _____

On this _____ day of _____, 20 , before me personally came and appeared _____, to me known and known to me to be one of the members of the firm of _____, described in and who executed the foregoing instrument and he acknowledged to me that he executed the same as and for the act and deed of said firm.

(Notary Seal)

_____

(Notary Signature)

ACKNOWLEDGMENT OF BIDDER, IF AN INDIVIDUAL

State of _____

_____ SS:

County of _____

On this _____ day of _____, 20 , before me personally came and appeared _____ to me known and known to me to be the person described in and who executed the foregoing instrument and he acknowledged to me that he executed the same.

(Notary Seal)

_____

(Notary Signature)

AFFIX ACKNOWLEDGMENT AND JUSTIFICATION OF SURETY

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18 If bidder is a joint venture, insert signature as appropriate for one participant of the joint venture on this page and attach and complete an additional Acknowledgment sheet in the same form as appears on this page for each other participant as required.

FORM OF CONTRACT

CHAPTER I

GENERAL PROVISIONS

19. DEFINITIONS

To avoid undue repetition, the following terms whenever they occur in this Form of Contract or any of the other papers forming a part of the Contract shall be construed as follows:

"Contract" shall mean, in addition to this Form of Contract, the Information for Bidders, the Proposal, the Authority's acceptance, the Specifications and the Contract Drawings (including written addenda issued over the name of the Chief Engineer), all of which are made part hereof as though herein set forth in full. The Contract as so defined shall constitute the complete and exclusive statement of the terms of the agreement between the parties and the Contract may not be explained or supplemented by course of dealing, usage of trade or course of performance.

The term "days" or "calendar days" in reference to a period of time shall mean consecutive calendar days, Saturdays, Sundays and holidays, included.

The term "construction site" or words of similar import shall mean Buildings 14, 95 and 332 and areas adjacent to Brewster Road in the North Cargo Area and the vicinities thereof at Newark Liberty International Airport in Newark, New Jersey..

"Work" shall mean all structures, equipment, plant, labor, materials (including materials and equipment, if any, furnished by the Authority) and other facilities and all other things necessary or proper for or incidental to performing demolish Buildings 14, 95 and 332 and remove asphalt and concrete pavement, above ground and subsurface features including retaining walls, bollards, footings, utility manholes, vaults, duct banks, gas mains, oil tanks, fences and associated appurtenances. work also includse paving over the aforementioned areas and modifications to drainage to accommodate Overnight Aircraft and Vehicular Parking. and "performance of Work" and words of similar import shall mean the furnishing of such facilities and the doing of such things.

"Work required by the Contract Drawings and Specifications in their present form" or words of similar import shall include all Work required by the Specifications in their present form (whether or not shown upon the Contract Drawings), all Work shown upon the Contract Drawings in their present form (whether or not mentioned in the Specifications), and all Work involved in or incidental to the accomplishment of the results intended by the Specifications and Contract Drawings in their present form (whether or not mentioned therein or shown thereon).

"Classified Work" shall mean the items of Work set forth in the Schedule of Unit Prices and shall include any Work hereafter required which is of the same general character as that set forth in any of said items. In determining what is of the same general character, there shall be taken into consideration the provisions for measurement for payment appearing in said clause entitled "Unit Prices and Lump Sum,", which provisions shall form a part of the items in said Schedules of Unit Prices.

"Unclassified Work" shall mean Work other than Classified Work.

"Extra Work" shall mean Work required by the Chief Engineer, Chief of Construction, Engineer of Construction or Engineer pursuant to the clause hereof entitled "Extra Work Orders", other than Classified Work, which is in addition to that required by the Contract Drawings and Specifications in their present form.

"Estimated Total for Classified Work" shall mean the result obtained by applying the prices quoted by the Contractor in the Schedule of Unit Prices to the estimated quantities given therein and totaling the results, whether or not such results are correctly shown in the Contractor's Proposal.

"Lump Sum" shall mean the Lump Sum for Unclassified Work quoted by the Contractor in the clause hereof entitled "Unit Prices and Lump Sum".

"Estimated Total Contract Price" shall mean the result obtained by adding together the Estimated Total for Classified Work and the Lump Sum, whether or not such result is correctly shown in the Contractor's Proposal.

"Contract Drawings" shall mean the Contract Drawings designated in the clause of the Specifications entitled "Contract Drawings" and, except as used in the phrase "Contract Drawings in their present form", shall include any future alterations and revisions of said drawings.

"Shop Drawings" shall mean all drawings, diagrams, illustrations, schedules, including supporting data, which are specifically prepared for this Contract and submitted by the Contractor pursuant to the requirements of the Specifications or the Engineer to illustrate some portion of the Work. The terms "shop drawings", "placing drawings" and "working drawings" are used interchangeably in this Contract.

"Catalog Cuts" shall mean all standard drawings, diagrams, illustrations, brochures, schedules, performance charts and instructions submitted by the Contractor pursuant to the requirements of the Specifications or the Engineer to illustrate some portion of the Work.

"Director of Procurement" shall mean the Director of Procurement of the Authority for the time being, or her successor in duties, acting either personally or through her duly authorized representatives acting within the scope of the particular authority vested in them.

"Chief Engineer" shall mean the Chief Engineer of the Authority for the time being, or his successor in duties, acting personally.

"Director" shall mean the Director of Aviation of the Authority for the time being, or his successor in duties for the purpose of this Contract, acting personally or through his authorized representative for the purpose of this Contract, who is at present the Authority's Director of Aviation Operations.

"Engineer" shall mean the Chief Engineer, acting either personally or through his duly authorized representatives acting within the scope of the particular authority vested in them.

"Chief of Construction" shall mean the Chief of Construction of the Authority for the time being, or his successor in duties, acting personally.

"Engineer of Construction" shall mean the designated Engineer of Construction for the facility at which the Work is being performed or his successor in duties, acting personally.

"Inspector" shall mean any representative of the Engineer designated by him as Inspector and acting within the scope of the particular authority vested in him.

The term "permanent construction" shall include all construction, installation, structures, equipment and materials (including materials and equipment, if any, furnished by the Authority) to be constructed, installed or left by the Contractor at or about the construction site (or elsewhere in the possession of the Authority) after the completion of the Work (whether or not they are yet delivered or installed), even though they are subsequently to be removed by others. The terms, "permanent installation", "permanent structure", "permanent materials", and words of similar import shall have the same meaning as the term "permanent construction".

"Subcontractor" shall mean anyone who performs Work (other than or in addition to the furnishing of materials, plant or equipment) at or about the construction site, directly or indirectly for or in behalf of the Contractor (and whether or not in privity of contract with the Contractor), but shall not include any person who furnished merely his own personal labor or his own personal services or who performs Work which consists only of the operation of construction equipment of which he is the lessor.

"Materialman" shall mean anyone who furnishes materials, plant or equipment (including temporary or consumable materials) to the Contractor or any subcontractor for use at or about the construction site in the performance of Work.

"Materialman" or "subcontractor", however, shall exclude the Contractor or any subsidiary or parent of the Contractor or any person, firm or corporation which has a substantial interest in the Contractor or in which the Contractor or the parent or the subsidiary of the Contractor, or an officer or principal of the Contractor or of the parent or the subsidiary of the Contractor has a substantial interest, provided, however, that for the purpose of the clause hereof entitled "Assignments and Subcontracts" the exclusion in this paragraph shall not apply to anyone but the Contractor himself.

"Workingman" or "workman" shall mean any employee of the Contractor or of a subcontractor who performs personal labor or personal services at the construction site.

"Notice" shall mean a written notice.

Whenever they refer to the Work or its performance, "directed", "required", "permitted", "ordered", "designated", "prescribed" and words of similar import shall mean directed, required permitted, ordered, designated or prescribed by the Engineer; and "approved", "acceptable", "satisfactory" and words of similar import shall mean approved by or acceptable or satisfactory to the Engineer; and "necessary", "reasonable", "proper", "correct" and words of similar import shall mean necessary, reasonable, proper or correct in the judgment of the Engineer.

Whenever "including", "such as" or words of similar import are used, the specific things thereafter enumerated shall not limit the generality of the things preceding such words.

20. GENERAL AGREEMENT

The Contractor agrees to perform demolish Buildings 14, 95 and 332 and remove asphalt and concrete pavement, above ground and subsurface features including retaining walls, bollards, footings, utility manholes, vaults, duct banks, gas mains, oil tanks, fences and associated appurtenances. work also includse paving over the aforementioned areas and modifications to drainage to accommodate Overnight Aircraft and Vehicular Parking. and to furnish all structures, equipment, plant, labor, materials and other facilities and to do all other things necessary or proper therefor or incidental thereto, all in strict accordance with the Contract Drawings and Specifications and any future changes therein; and the Contractor further agrees to assume and perform all other duties and obligations imposed upon him by this Contract.

The Authority agrees to pay to the Contractor and the Contractor agrees to accept from the Authority, in full consideration for the performance by the Contractor of his duties and obligations under this Contract and the whole thereof, a compensation consisting of the following amounts and such amounts only, subject only to the express provisions of this Contract specifically setting forth actual, defined additions to or deductions from such compensation.

A. An amount based upon the Classified Work performed, computed at the rates quoted in the Schedule of Unit Prices, said Classified Work to be measured and said amount to be computed in the manner provided in the clause hereof entitled "Unit Prices and Lump Sum"; and

B. The amount of the Lump Sum quoted in the clause hereof entitled "Unit Prices and Lump Sum".

This Contract is one entire contract for the accomplishment of the results and the doing of the things above specified and is not separable. Similarly, the Contractor's compensation is one entire compensation for entire performance on his part.

The enumeration in this Form of Contract and in the Specifications of particular things to be furnished or done at the Contractor's expense, or without cost or expense to the Authority without additional compensation to the Contractor shall not be deemed to imply that only things of a nature similar to those enumerated shall be so furnished and done, but the Contractor shall perform all Work as required, without other compensation than that specifically provided, whatsoever changes may be made in the Contract Drawings and Specifications whatsoever Work may be required in addition to that required by the Contract Drawings and Specifications in their present form, and whatsoever obstacles or unforeseen conditions may arise or be encountered.

21. AUTHORITY ACCESS TO RECORDS

The Authority shall have access during normal business hours to all records and documents of the Contractor relating to any amounts for which the Contractor has been compensated, or claims he should be compensated, by the Authority by payment determined on any basis other than by payment of a lump sum or unit price amount agreed upon in writing by the Contractor and the Authority; provided, however, such access shall extend to certified payroll records as described in the clause of the Form of Contract entitled "Prevailing Rate of Wage" regardless of the method by which the Contractor is compensated under this Contract. The Contractor shall obtain for the Authority similar access to similar records and documents of subcontractors. Such access shall be given or obtained both before and within a period of three years after Final Payment to the Contractor; provided, however, that if within the aforesaid three year period the Authority has notified the Contractor in writing of a pending claim by the Authority under or in connection with this Contract to which any of the aforesaid records and documents of the Contractor or of his subcontractors relate either directly or indirectly, then the period of such right of access shall be extended to the expiration of 6 years from the date of Final Payment with respect to the records and documents involved.

Upon request of the Authority, the Contractor shall furnish or provide access to the federal Form I-9 (Employment Eligibility Verification) for each individual performing Work under this Contract, including both citizens and non-citizens.

No provision in this Contract giving the Authority a right of access to records and documents is intended to impair or affect any right of access to records and documents which the Authority would have in the absence of such provision.

22. EXEMPTION FROM NEW JERSEY SALES AND USE TAXES

The tax laws of the State of New Jersey (New Jersey Sales and Tax Act, P.L. 1966, c. 30 (§54:32B et seq.)) exempt from New Jersey sales and use taxes "[r]eceipts from sales made to contractors or repairmen of materials, supplies, or services for exclusive use in erecting structures or building on, or otherwise improving, altering or repairing real property of...[o]rganizations described in subsections (a) and (b) of section 9 of the "Sales and Use Tax Act"...that are exempt from the tax imposed [thereunder]."[19] In order to qualify for this exemption, the Contractor shall comply with the rules and regulations prescribed by the State of New Jersey Division of Taxation. The attention of Contractor is directed to Form ST-13, Contractor's Exempt Purchase of Certificate, available on the State of New Jersey Division of Taxation's website: www.state.nj.us/treasury/.

The Authority is an organization of the type described in subsection (a)(1) of section 9 of the Sales and Use Tax Act.[20]

In view of the foregoing, the Contractor shall not include in his price(s) any amounts for sales and use taxes on materials, supplies, or services for use in the performance of improvements, alterations, or repairs at the construction site. However, receipts for the rental of equipment to be used at the construction site may be subject to sales and use taxes, and therefore, the Contractor should include in his price(s) any amounts for sales and use taxes on rental of equipment.

If (i) any claim is made against the Contractor by the State of New Jersey for such sales or compensating use taxes, or (ii) any claim is made against the Contractor by a materialman or a subcontractor on account of a claim against such materialman or subcontractor by the State of New Jersey for such sales or compensating use taxes, then the Authority will reimburse the Contractor in an amount equal to the amount of such tax required to be paid in accordance with the requirements of law, provided that:

A. the Contractor and any subcontractor, has or have complied with the rules and regulations of the State of New Jersey Division of Taxation relating to the procedure by which the tax exemption may be claimed, and has or have filed all the forms and certificates required by applicable laws, rules and regulations in connection with such exemption; and

B. the Authority is afforded the opportunity before any payment of tax is made, to contest said claim in the manner and to the extent that the Authority may choose and to settle or satisfy said claim, and such attorney as the Authority may designate is authorized to act for the purpose of contesting, settling and satisfying said claim; and

C. the Contractor and any subcontractor, has given immediate notice to the Authority of any such claim, has or have cooperated with the Authority and its designated attorney in contesting said claim, and has or have furnished promptly to the Authority and said attorney all information and documents necessary or convenient for contesting said claim, said information and documents to be preserved for six years after the date of Final Payment or longer if such a claim is pending or threatened at the end of such six years.

If the Authority elects to contest any such claim, it will bear the expense of such contest.

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[19] N.J.S.A. 54:32B-8.22.

[20] N.J.S.A. 54:32B-9.

23. PERFORMANCE AND PAYMENT BOND

If the Authority shall in its sole discretion so elect at the time of accepting the Contractor's Proposal, the Contractor shall furnish a bond for the faithful performance of all obligations imposed upon him by the Contract and also for the payment of all lawful claims of subcontractors, materialmen and workmen arising out of the performance of the Contract. Such bond shall be in the form bound herewith entitled, "Performance and Payment Bond", shall be in a penal sum equal to the Estimated Total Contract Price and such bond shall be signed by one or more sureties[21] satisfactory to the Authority. The bond may be executed on a separate copy of such form not physically attached to this Contract booklet. In any case, both the form of bond bound herewith and any unattached executed copy thereof shall form a part of this Form of Contract as though herein set forth in full.

At any time after the opening of Proposals, the Authority may give notice to one or more bidders to advise the Authority as to the names of their proposed sureties. Within forty-eight hours thereafter each bidder so notified shall so advise the Authority. The giving of such notice to a bidder shall not be construed as an acceptance of his Proposal, and omission to give such notice shall not be construed as an election by the Authority not to require a bond.

If the Authority elects to require the Contractor to furnish a bond, he shall deliver such bond to the Authority within seven days after receipt by him of the acceptance of his Proposal, and the sureties thereon shall be as proposed by him, provided, that if the Authority has theretofore given notice to him that his proposed sureties or any of them are not satisfactory, the bond shall be executed by other sureties satisfactory to the Authority.

The Authority shall give notice to the Contractor within ten (10) days after receipt of the Performance and Payment Bond as to whether or not such bond is satisfactory.

In the event of a default by the Contractor in his obligation to furnish a satisfactory bond within seven (7) days after he received an acceptance of his Proposal, such default shall entitle the Authority in its discretion to terminate this Contract at any time within forty-five (45) days after the acceptance of the Proposal, without any liability on the part of the Authority. Inasmuch as the damages to the Authority resulting from a termination by it upon the failure of the Contractor to furnish a satisfactory bond will include items whose accurate amount will be difficult or impossible to compute, such damages shall be liquidated in the sum of the following amounts:

A. The excess, if any, of the Estimated Total Contract Price in the Proposal finally accepted over that in the Proposal of the Contractor; and

B. The expense of such new advertisement of the Contract, if any, as may be deemed necessary by the Authority; and

C. The sum of $1000 for each day after the receipt by the Contractor of the acceptance of his Proposal that the performance of the Contract is not commenced by reason of the failure of the Contractor to furnish the required bond.

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21 Sureties must be corporations (commonly known as "surety companies"), authorized to do business as sureties in the state(s) in which the construction site is located, whose names appear on the current list of the Treasury Department of the United States in effect at the time of submission of the Performance and Payment Bond to the Authority as acceptable as sureties to the Treasury Department. In addition, the aggregate underwriting limitations on any one risk as set forth in the aforementioned list of the Treasury Department of the sureties shall equal or exceed the penal sum of the Performance and Payment Bond.

In the recovery of the damages above specified, the Authority may proceed against the sum represented by the certified check deposited with it or against the Bid Bond and take such other action as it may deem best in the public interest.

If the Contractor furnishes a bond in accordance with the requirements of the Authority under this numbered clause, the Authority shall reimburse the Contractor for the net amount actually paid by him to the surety or sureties as the premium on such bond. The Contractor shall deliver to the Engineer receipts from the surety or sureties evidencing such payment and the amount thereof. Within fifteen days after receipt of such evidence satisfactory to the Engineer, the Authority shall pay to the Contractor by check the amount provided in this numbered clause.

If at any time the Authority shall be or become dissatisfied with any surety or sureties then upon any bond furnished in accordance with the requirements of the Authority, or if for any other reason such bond shall cease to be adequate security to the Authority, the Contractor shall, within five days after notice from the Authority so to do, substitute a new bond in such form and sum and signed by such other sureties as may be necessary in the opinion of the Authority to constitute adequate security.

CHAPTER II

COMPENSATION AND PAYMENTS

24. UNIT PRICES AND LUMP SUM

The following Schedule of Unit Prices for Classified Work does not constitute an outline of the Work required by the Contract Drawings and Specifications in their present form, but is merely a list of all the items of Classified Work to be used in computing the Contractor's compensation insofar as it is based upon Classified Work, together with the rates at which such compensation will be computed. In the case of each item of Classified Work, the Work performed will be measured and the Contractor's compensation will be computed as hereinafter provided in this numbered clause. In case of discrepancy between the prices quoted in writing and those quoted in figures, the writing shall control.

The Estimated Total Contract Price is solely for the purpose of fixing the amount of security to be maintained by the Contractor for the faithful performance of the Work. Prior to the signature of the Contract by the parties, it was for the purpose of facilitating the comparison of Proposals and of computing damages in the event of a default by the successful bidder in the agreement created by the acceptance of his Proposal. The estimated quantities are given solely as a basis for the computation of the Estimated Total Contract Price. The Authority makes no representation as to what the actual quantities will be and shall not be held responsible even though the estimated quantities are not even approximately correct. Insofar as the Contractor's compensation is based upon Classified Work, it will be computed from the actual quantities of Work performed, whether greater or less than the estimated quantities.

I. SCHEDULE OF UNIT PRICES FOR CLASSIFIED WORK				
Item No.	Estimated Quantities	Items of Classified Work With Unit Prices Written	Figures: Unit Prices	Figures: Amounts[22]
1	16,500 C.Y.	DENSE GRADED AGGREGATE BASE COURSE, PER CUBIC YARD. FORTY TWO DOLLARS ZERO CENTS	$42.00	$693,000
2	7,000 TONS	PLANT MIX MACADAM, PER TON. SEVENTY TWO DOLLARS ZERO CENTS	$72.00	$504,000
3	7,000 TONS	ASPHALT CONCRETE TOP COURSE MIX 3 WITH MODIFIED ASPHALT (PG 76-22), PER TON. NINETY ONE DOLLARS ZERO CENTS	$91.00	$637,000
4	2,400 TONS	ASPHALT CONCRETE TOP COURSE MIX 3, PER TON. EIGHTY FOUR DOLLARS ZERO CENTS	$84.00	$201,600
ESTIMATED TOTAL FOR CLASSIFIED WORK[23] $2,035,600				

08-27-14P03:15 RCVD

22 The amount for each item shall be computed by multiplying the estimated quantity of that item by the unit price for the item.

23 The Estimated Total For Classified Work shall be computed by totaling the amounts inserted in the "Amounts" column.

II. LUMP SUM FOR UNCLASSIFIED WORK	
Writing	Figures
Five million, three hundred and eighty nine thousands, and four hundred Dollars Zero Cents	5,389,400.00

III. RECAPITULATION	
	Figures
ESTIMATED TOTAL FOR CLASSIFIED WORK.....	2,035,600
LUMP SUM FOR UNCLASSIFIED WORK.....	5,389,400
ESTIMATED TOTAL CONTRACT PRICE:	[24] 7,425,000.00

08-27-14P03:15 RCVD

The following provisions are applicable to the Schedule of Unit Prices for Classified Work. The quantity for payment described in the following provisions shall be the quantity of Classified Work furnished, installed, performed and/or placed in accordance with the Specifications, as shown on the Contract Drawings and where ordered by the Engineer.

No quantity of work will be included under more than one item of Classified Work.

[24] The Estimated Total Contract Price shall be computed by adding the Estimated Total for Classified Work to the Lump Sum for Unclassified Work.

In the case of Item No. 1 (Dense Graded Aggregate Base Course), the quantity for payment shall be the number of cubic yards of dense graded aggregate base course actually placed, measured in place, computed by the Engineer using the Average End Area Method, based on cross-sections taken by the Contractor before placement and after placement and compaction of dense graded aggregate base course.

In the case of Item No. 2 (Plant Mix Macadam), the quantity for payment shall be the number of tons (2000 lbs.) of plant mix macadam actually furnished and placed. The weight of plant mix macadam shall be based on the certified scale weight of plant mix macadam in trucks weighed on approved scales or, at the option of the Engineer, on certified automated printouts at plants using an automatic batching and mixing system. In case of conflict between the printout weight and the scale weight, the scale weight shall control.

In the case of Item No. 3 (Asphalt Concrete Top Course Mix 3 with Modified Asphalt (PG 76-22)), the quantity for payment shall be the number of tons (one ton equals 2,000 lbs.) of asphalt concrete top course Mix 3 with modified asphalt (PG 76-22) actually furnished and placed. The weight of asphalt concrete top course Mix 3 with modified asphalt (PG 76-22) shall be based on the certified scale weight of asphalt concrete top course Mix 3 with modified asphalt (PG 76-22) in trucks weighed on approved scales, or at the option of the Engineer, on certified automated printouts at plants using an automated batching and mixing system. In case of conflict between the printout weight and the scale weight, the scale weight shall control.

In the case of Item No. 4 (Asphalt Concrete Top Course Mix 3), the quantity for payment shall be the number of tons (one ton equals 2,000 lbs.) of asphalt concrete top course Mix 3 actually furnished and placed. The weight of asphalt concrete top course Mix 3 shall be based on the certified scale weight of asphalt concrete top course Mix 3 in trucks weighed on approved scales, or at the option of the Engineer, on certified automated printouts at plants using an automated batching and mixing system. In case of conflict between the printout weight and the scale weight, the scale weight shall control.

25. ADJUSTMENTS OF LUMP SUM

If any Unclassified Work required by the Contract Drawings and Specifications in their present form shall be countermanded or reduced, the Engineer shall have full authority on behalf of both parties to make such adjustment by way of reduction in the Lump Sum as he may in his sole discretion deem equitable and reasonable, and in making such adjustment, no allowance to the Contractor shall be made for anticipated profits.

The Chief Engineer shall have authority to agree in writing with the Contractor for adjustments by way of reduction in the Lump Sum in lieu of those for which provision is heretofore made in this numbered clause.

26. COMPENSATION FOR EXTRA WORK

The Chief Engineer shall have authority to agree in writing with the Contractor on behalf of the Authority upon lump sum or other compensation for Extra Work in lieu of the compensation for which provision is hereinafter made in this numbered clause.

If such agreement on compensation is not made, and Extra Work be performed, the Contractor's compensation shall be increased by the following amounts and such amounts only:

1.) For Extra Work consisting of refuse container services, an amount equal to the actual net cost in money of the labor and materials required for the provision of such services, plus seven per cent (7%) of such net cost.

2.) For Extra Work consisting of performance of construction work at the construction site, an amount determined as follows:

a. In the case of Extra Work performed by the Contractor personally, an amount equal to the actual net cost in money of the labor and materials required for such Extra Work, plus twenty per cent (20%) of such net cost, plus such rental for equipment (other than small tools) required for such Extra Work as the Engineer deems reasonable.

b. In the case of Extra Work performed by a subcontractor, an amount equal to the actual net cost in money of the labor and materials required for such Extra Work, plus twenty per cent (20%) of such net cost plus such rental for equipment (other than small tools) required for such Extra Work as the Engineer deems reasonable, plus seven per cent (7%) of the sum of the foregoing cost, percentage of cost, and rental.

As used in this numbered clause (and in this clause only):

"Refuse Container Services" means the delivery, removal and emptying of refuse containers as required during the performance of Extra Work subject to approval by the Engineer.

"Labor" means foremen, surveyors, laborers, mechanics and other employees below the rank of superintendent, exclusive of timekeepers, directly employed at the construction site, whether employed by the Contractor or by the subcontractors, subject to the Engineer's authority to determine what employees of any category are "required for Extra Work" and as to the portion of their time allotted to Extra Work; and "cost of labor" means the wages actually paid to and received by such employees; however, all wages actually paid that are in excess of the prevailing wages in the performance of Extra Work shall be subject, on each occasion, to the initial and continuing approval of the Engineer in advance of the performance of such Extra Work; plus a proper proportion of (a) premiums, if any, actually paid by the employer for Workers' Compensation Insurance upon the basis of such wages, (b) vacation allowances and union dues and assessments which the employer actually pays pursuant to contractual obligation upon the basis of such wages, and (c) taxes actually paid by the employer pursuant to law upon the basis of such wages. At the Contractor's option, the amount of ten per cent (10%) will be applied to all wages actually paid to cover all labor costs including (b) and (c) above, but excluding paid holidays. The Contractor shall notify the Engineer whether or not the ten per cent (10%) option will be chosen prior to the initial performance of any Extra Work or Net Cost Work, if applicable. Such selection shall also apply to all subcontractors and shall remain in effect for the duration of the Contract. "Employees" as used above means only the employees of one employer.

For whichever option is selected, in accordance with the clause of the Form of Contract entitled "Prevailing Rate of Wage", the Contractor and all subcontractors shall maintain complete and detailed payroll records, and such records shall be made available for inspection by the Authority.

"Materials" means temporary and consumable materials as well as permanent materials; and "cost of materials" means the price (including taxes actually paid by the Contractor pursuant to law upon the basis of such materials) for which such materials are sold for cash by the manufacturers or producers thereof, or by regular dealers therein, whether or not such materials are purchased directly from the manufacturer, producer or dealer (or if the Contractor is the manufacturer or producer thereof, the reasonable cost to the Contractor of the manufacture and production), plus the reasonable cost of delivering such materials to the construction site in the event that the price paid to the manufacturer, producer or dealer does not include delivery and in case of temporary materials, less their salvage value, if any.

"Work day" in reference to an item of equipment means a day other than a Saturday, Sunday or legal holiday except that if the particular item of equipment is actually utilized at the construction site by the Contractor or subcontractors under this or any other Contract with the Authority on a Saturday, Sunday or legal holiday said day shall be deemed a work day.

The rental for equipment, whether owned by the Contractor or subcontractors or rented from others and notwithstanding the actual price of any rental or actual costs associated with such equipment, shall be computed by the Engineer on the basis of the following:

A.

1.) Hourly rental for those items of equipment listed in the "Rental Rate Blue Book" published by Machinery Information Division, K-III Directory Corporation, 1735 Technology Drive, Suite 410, San Jose, California 95110, (hereinafter called "the Blue Book"), shall be 100% of the applicable rates as listed in said book, reduced to an hourly basis (see formula below) except that such applicable rates shall be reduced by 50% for all hours of rental payable hereunder in excess of 8 hours each day. The edition of this publication to be used shall be the one in effect on the date of the actual rental of the equipment. The "Estimated Operating Cost per Hour" as set forth for such item of equipment in the Blue Book shall be added to the hourly rental for each hour that such equipment is actually engaged in performing Extra Work. No amount for operating cost will be allowed during periods when such equipment is not actually engaged in performing Extra Work (i.e., standby rental time). None of the provisions of the Blue Book shall be deemed referred to or included in this Contract except as specifically set forth in this Section.

2.) If no listing of rental rate and/or hourly operating cost for the item of equipment is in the Blue Book, the Engineer shall determine the reasonable rate of rental and/or hourly operating cost of the particular item of equipment by such other means as he finds appropriate.

3.) In the event the Contractor is directed by the Engineer to immediately perform Extra Work within 24 hours of the direction to proceed, the Engineer shall determine the reasonable rate of rental and/all hourly operating cost of the items of equipment necessary to perform such Extra Work by such means as he finds appropriate. However, if the equipment is owned by the Contractor or owned by a subsidiary of the Contractor, the Blue Book rates will apply as set forth in this clause.

B. When utilizing the rental rates appearing in the Blue Book, the Engineer shall determine the applicable rate and the hourly rental determined therefrom by applying the following criteria:

1.) The rate to be applied for an item of equipment used on a particular Extra Work order shall be the monthly rates from the foregoing publication.

The pro rata portion which one hour bears to the applicable rate shall be determined in accordance with the following formula:

Hourly rate based on monthly rental.	1/176 of monthly rental from Blue Book

2.) The rental rate shall be multiplied by the applicable regional adjustment factor shown for such item of equipment in the Blue Book. The adjustment factor shall not apply to the hourly operating cost.

3.) If the Engineer should determine that the nature or size of the equipment used by the Contractor in connection with Extra Work is larger or more elaborate, as the case may be, than the size or nature of the minimum equipment determined by the Engineer to be suitable for the Extra Work, the reasonable rental will not be based upon the equipment used by the Contractor but will be based on the smallest or least elaborate equipment determined by the Engineer to have been suitable for the performance of the Extra Work.

C. In the case of equipment utilized only for Extra Work: (a) in addition to amounts determined as provided in subparagraphs A and B above, there will be added to the rental as computed above the taxes on the rental actually paid by the Contractor or subcontractor and the reasonable cost of transporting such equipment to and from the construction site, including applicable tolls, and (b) notwithstanding the number of hours during which such equipment is utilized, the minimum rental therefor will be for a period of eight hours.

In computing the Contractor's compensation insofar as it is based upon Extra Work, and notwithstanding any provision to the contrary appearing in the Blue Book, no consideration shall be given to any items of cost or expense not expressly set forth above, it being expressly agreed that the costs and percentage additions hereinbefore provided cover items of cost and expense to the Contractor of any type whatsoever, including administration, overhead, taxes (other than those enumerated above), clean-up, consumables including gas and oil, drafting (including printing or other reproduction), coordination, field measurements, maintenance, repairs, insurance, profit to the Contractor and small tools.

Whenever any Extra Work is performed (whether by the Contractor directly or through a subcontractor), the Contractor shall, at the end of each day, submit to the Engineer (a) daily time slips in such form as set forth below, showing the name and number of each workman employed on such Work and the number of hours which he is employed thereon, (b) a memorandum showing the wages to be paid to each workman, and unless the Contractor has notified the Engineer that he has chosen the ten per cent (10%) option set forth above, the rates and amounts of Workers' Compensation Insurance premiums, if any, and state and federal taxes based on such wages, and vacation allowances and union dues and assessments which the employer actually pays pursuant to contractual obligation upon the basis of such wages, (c) a memorandum showing the amount and character of the materials furnished for such Work, from whom they were purchased and the amount to be paid therefor, and (d) a memorandum of equipment used in the performance of such Work, listing the actual hours of operation for each piece of equipment, together with the rental and operating cost claimed therefor. Template forms for the daily time slips will be provided to the Contractor prior to the commencement of Work. The Contractor shall complete the forms on 8½" x 14" ledger paper, individually and sequentially numbered, for all Work performed by the Contractor and any subcontractors. Submit the completed form with the Contractor's original signature to the Engineer each day for verification by the Engineer. Upon verification, the Engineer will sign the form and provide the Contractor with a copy of the signed form. A duplicate copy of the signed form shall be submitted to the Engineer with the Contractor's billing documentation and accompanied by such memoranda as described in (b), (c) and (d) above.

Such memoranda and time slips are for the purpose of enabling the Engineer to determine the amounts to be paid by the Authority under this numbered clause; and accordingly, they shall constitute a condition precedent to such payment and the failure of the Contractor to furnish them with respect to any Work shall constitute a conclusive and binding determination on his part that such Work is not Extra Work and shall constitute a waiver by the Contractor of claims for payment for such Work. The Contractors compensation for Extra Work shall be subject to audit review by the Authority. The Engineer will notify the Contractor that an audit review will be conducted no later than 90 days from the dates of such notification. The Engineer will also provide the Contractor with an estimated duration of the audit. During the audit review, the Contractor shall provide records to substantiate the memorandum and time slips submitted to the Engineer. Failure to provide such Contractor or subcontractor records may result in a reduction or total denial of material, equipment and labor costs for Extra Work. Upon completion of the audit review, the Contractor will be provided with the audit findings of the Authority. If the Contractor disagrees in whole or in part with the audit findings, the Contractor shall notify the Authority of such disagreement in writing within 30 days of receipt of said audit findings or the Authority will deem the audit findings to be final and acceptable to the Contractor. In the event that the Chief Engineer and the Contractor shall agree in writing upon a lump sum or other compensation for Extra Work in lieu of compensation as provided in the second paragraph of this clause, the daily time slips and memoranda required by this paragraph shall not be required subsequent to the date on which such agreement has been reached.

27. COMPENSATION FOR PREMIUM TIME

Where the Engineer directs that the Contractor perform Work at times other than those elsewhere specified in the Contract, and the Contractor directly or through a subcontractor is obligated by the provisions of his applicable collective bargaining agreement to pay premium time rates for such Work then, the Contractor shall be compensated for the cost differential between regular time rates and premium time rates at an amount equal to the total of the following:

A. For premium time rates paid by the Contractor to his own forces, an amount equal to the premium time portion of the salaries and wages which the employer is required to pay and actually pays to its employees pursuant to the terms of his applicable collective bargaining agreement for the overtime period or periods described above, plus a proper proportion, if any, computed upon the basis of premium time salaries and wages of (1) taxes actually paid by the employer pursuant to law, (2) vacation allowances, other fringe benefits and union dues and assessments which the employer actually pays pursuant to contractual obligations, and (3) increased premiums paid by the Contractor personally, specifically allocable to the insurance required by this Contract, plus five per cent (5%) of such premium portion.

B. For premium time rates paid by a subcontractor, an amount equal to the premium time portion of the salaries and wages which the employer is required to pay and actually pays to his employees pursuant to the terms of his applicable collective bargaining agreement for the overtime period or periods described above, plus a proper proportion, if any, computed upon the basis of premium time salaries and wages of (1) taxes actually paid by the employer pursuant to law, (2) vacation allowances, other fringe benefits and union dues and assessments which the employer actually pays pursuant to contractual obligations, and (3) increased premiums paid by a subcontractor, specifically allocable to the insurance required by this Contract, plus five per cent (5%) of such premium portion, plus two per cent (2%) of the foregoing cost.

All additions to the Contractor's compensation provided for in this numbered clause require the prior written approval of the Engineer and are conditioned on the Contractor's verifiable by the Authority payment of such amounts to his subcontractor.

The additions to the Contractor's compensation provided in this clause shall not apply where the Engineer directs the Contractor to perform work at times other than those specified elsewhere in the Contract and also determines that such work is required to mitigate previous delays in the Contractor's performance of Work.

28. COMPENSATION FOR EMERGENCY DELAYS

If the Contractor is specifically directed by the Engineer to suspend his operations as stipulated in the Section of Division 1 of the Specifications entitled "Airport Operations and Conditions" or if the Contractor is specifically directed not to start his operations at a time when operations are permitted to start as stipulated in such Section, and if solely because of such suspension or direction not to start any of the Contractor's or subcontractor's employees or equipment then engaged in or about to start such Work are necessarily kept idle at the construction site, during the hours when they would otherwise be engaged in the performance of the Work, then the Contractor's compensation shall be increased by an amount equal to the salaries and wages in amounts approved by the Engineer which the employer is required to pay and actually pays to such employees for the period or periods of such idleness, plus a proper proportion of (a) the premiums actually paid by the employer for workers compensation insurance if any, upon the basis of such salaries and wages, (b) taxes actually paid by the employer pursuant to law upon the basis of such salaries and wages, and (c) vacation allowances and union dues and assessments which the employer actually pays pursuant to contractual obligations upon the basis of such salaries and wages, and in addition thereto such rental as the engineer deems reasonable for such equipment during the period or periods of such idleness. The rental for idle equipment shall be computed by the Engineer in accordance with the provisions of the clause of the Form of Contract entitled "Idle Salaried Men and Equipment".

In the event that the Contractor deems that any payment should be made pursuant to this numbered clause, he shall give prompt written notice to the Engineer stating the reasons why he believes such payments should be made and shall moreover, furnish to the Engineer at the end of each day, a memorandum showing the name, payroll title, salary rate and employer of each of the workingmen, and description, owner and claimed rental rate for each item of equipment claimed to have been kept idle. Said notice and memorandum are for the purpose of enabling the Engineer to verify the Contractor's claim at the time. Accordingly, notwithstanding any other provisions hereof, the failure of the Contractor to furnish such notice and memorandum shall constitute a conclusive binding determination on his part that he is not entitled to compensation as provided herein and shall constitute a waiver by the Contractor of all claims for such payment, such notice and memorandum being conditions precedent to payment under this numbered clause.

29. MONTHLY ADVANCES

On or about the first and fifteenth day of each month, the Engineer shall (upon receipt from the Contractor of such information as he may require, including a certification in writing, in such form as may be required pursuant to the clause hereunder entitled "Prevailing Rate of Wage", that he has paid and caused his subcontractors to pay at least the prevailing rate of wage and supplements required by such clause) estimate and certify to the Authority the approximate amount of Work performed and compensation earned by the Contractor up to that time showing separately:

A. The approximate amount of Classified Work performed by the Contractor up to that time and a sum determined from such Work in accordance with the units of measurement and unit prices specified in the Schedule of Unit Prices.

B. The approximate amount of Unclassified Work (other than Extra Work) performed by the Contractor up to that time and a sum bearing the same proportion to the Lump Sum as the Unclassified Work performed (other than Extra Work) bears to the total amount of such Work performed and to be performed (other than Extra Work), and

C. The increases, if any, in the Contractor's compensation for which provision is specifically made elsewhere in this Contract.

As an aid to the Contractor and to facilitate his performance, the Authority shall, within fifteen days after the receipt of each suchmonthly certificate, advance to the Contractor by check the sums so certified, minus, however, five per cent (5%) of the sum certified pursuant to subparagraph A and B of this numbered clause, and minus all prior advances and payments to the Contractor or for his account.

Within seven days of receipt of any sum attributable to Work performed by a subcontractor or materialman or within such later period as is provided in the subcontract or purchase agreement, the Contractor shall advance to the subcontractor or materialman said sum, less such amount, if any, as the Contractor is authorized to retain under the subcontract or purchase agreement.

Notwithstanding the above, the Authority shall have the right, at its sole discretion, to directly pay the subcontractors and material suppliers who perform Work for or furnish materials to the Contractor in connection with the Work of this Contract.

Prior to certifying any amount for payment hereunder, the Engineer may require that the Contractor submit a certification accurately and fully setting forth the total amount due and payable to each subcontractor and supplier for Work performed or materials provided by such subcontractor or supplier in connection with the Work of this Contract. Any payment made by the Authority to a subcontractor or supplier pursuant to the provisions of this numbered clause shall be made in reliance upon such certification and all such payments shall be considered as advances to the Contractor of the compensation payable hereunder. No such payment shall relieve the Contractor of any of its obligations hereunder.

Furthermore, within fifteen (15) days of the Contractor's receipt of the Authority acceptance of the Contractor's Proposal, the Contractor shall submit to the Engineer a listing of all subcontract and material supply agreements entered into by the Contractor for the performance of Work required by this Contract. Such listing shall include the names and addresses of each such subcontractor and supplier and the amounts payable under each such agreement. As and when any modifications are made to such agreements or any additional subcontracts or supply agreements are entered into, the Contractor shall inform the Engineer of such and shall indicate the amounts payable thereunder.

Nothing contained herein shall be deemed to create any additional rights in such subcontractors or suppliers or to alter the rights of the Authority as such are set forth in the clause hereof entitled "Withholding of Payments".

30. RELEASE OF MONIES PREVIOUSLY WITHHELD FROM MONTHLY ADVANCES UPON RENDITION OF A CERTIFICATE OF SUBSTANTIAL COMPLETION

After the rendition of the Certificate of Substantial Completion and with the approval of the Engineer, an amount up to 80% of the total amount of monies withheld from the Contractor's monthly advances in accordance with the preceding clause may be released to the Contractor. If, in the Engineer's judgment, no monies, or less than 80% of the total amount of monies withheld should be released it will be based on, but not limited to, the estimated value of the remaining Work, unresolved claims by subcontractors, the estimate of possible audit adjustments and an assessment of the risks to the Authority in making such a release of monies. This clause does not create a right to such a release of monies or to any specific percentage release, all of which shall remain purely the discretionary decision of the Engineer.

Prior to the release of any amount withheld from the Contractor's monthly advances by the Authority, the Contractor shall submit to the Engineer a certification of all unresolved requests for additional compensation including all items in dispute and potential claims which the Contractor had actual knowledge of or by reasonable inspection and inquiry should have known of, to the date of the certification. Any such items not made known to the Authority by inclusion in the certification of additional compensation requests submitted by the Contractor will be deemed to have been released by the Contractor. Notwithstanding the above provisions, before making any release of monies the Engineer may require the Contractor to submit further information for the Engineer's review and analysis, and shall require the Contractor to execute a separate written release of claims as described above in a form acceptable to the Authority.

Nothing contained herein shall be deemed to alter or diminish the rights of the Authority as such are set forth in the clauses hereof entitled "Withholding of Payments", "Final Payment", "Monthly Advances" or under any other clause of this Contract relating to compensation to the Contractor, any release of monies hereunder being purely at the discretion of the Engineer.

31. FINAL PAYMENT

After the rendition of the Certificate of Final Completion and upon receipt from the Contractor of such information as may be required, the Engineer shall certify in writing to the Authority and to the Contractor the total compensation earned by the Contractor.

See the Form of Contract clause entitled "Certificate of Final Completion" which requires as a prerequisite for the issuance of such certificate the submission of a "Summary of Asbestos Removal and Disposal Costs" and a "Summary of Lead Removal and Disposal Costs".

If so required, the Contractor shall thereupon (i) certify to the Authority in writing, in such form as may be required pursuant to the clause hereunder entitled "Prevailing Rate of Wage", that he has paid and caused his subcontractors to pay at least the prevailing rate of wage and supplements required by such clause and (ii) furnish to the Authority a detailed sworn statement of all claims, just and unjust, of subcontractors, materialmen and other third persons then outstanding and which he has reason to believe may thereafter be made on account of the Work.

Within thirty days after issuance of such certificate of total compensation earned (or within thirty days after receipt of the documents provided for in the immediately preceding paragraph, if required), the Authority shall pay to the Contractor by check the amount stated in said certificate, less all other payments and advances whatsoever to or for the account of the Contractor. All prior estimates and payments shall be subject to correction in this payment, which is throughout this Contract called the Final Payment.

The acceptance by the Contractor, or by anyone claiming by or through him, of Final Payment shall be and shall operate as a release to the Authority of all claims and of all liability to the Contractor for all things done or furnished in connection with the Contract and for every act and neglect of the Authority and others relating to or arising out of the Contract, including claims arising out of breach of contract and claims based on claims of third persons, excepting only his claims for reimbursement for certain sales taxes as hereinbefore provided. No payment, however, final or otherwise, shall operate to release the Contractor or his sureties from any obligations in connection with this Contract or the Performance and Payment Bond.

The Contractor's agreement as provided in the immediately preceding paragraph above shall be deemed to be based upon the consideration forming part of this Contract as a whole and not to be gratuitous; but in any event even if deemed gratuitous and without consideration, such agreement as provided in the immediately preceding paragraph above shall nevertheless be effective. Such release shall include all claims, whether or not in litigation and even though still under consideration by the Authority or the Engineer. Such release shall be effective notwithstanding any purported reservation of right by the Contractor to preserve such claim. The acceptance of any check designated as "Final Payment" or bearing any similar designation shall be conclusively presumed to demonstrate the intent of the Contractor that such payment was intended to be accepted as final, with the consequences provided in this numbered clause, notwithstanding any purported reservation of rights.

The Contractor agrees that he shall not be entitled to, and hereby waives any right he might otherwise have to, and shall not seek any judgment whether under this Contract or otherwise for any such Final Payment or for an amount equivalent thereto or based thereon, or for any part thereof, if such judgment would have the effect of varying, setting aside, disregarding or making inapplicable the terms of this numbered clause or have the effect in any way of entitling the Contractor to accept such Final Payment or an amount equivalent thereto or based thereon or any part thereof other than in the same fashion as a voluntary acceptance of a Final Payment subject to all the terms of this Contract including this numbered clause, unless and until the Contractor should obtain a judgment on any claim arising out of or in connection with this Contract (including a claim based on breach of contract) for an amount not included in said Final Payment. In any case in which interest is allowable on the amount of the Final Payment, such interest shall be at the rate of 6% per annum for the period, if any, in which such interest is due.

32. WITHHOLDING OF PAYMENTS

If (1) the Contractor fails to perform any of his obligations under this Contract or any other agreement between the Authority and the Contractor (including his obligation to the Authority to pay any claim lawfully made against him by any materialman, subcontractor or workman or other person which arises out of or in connection with the performance of this Contract or any other agreement with the Authority) or (2) any claim (just or unjust) which arises out of or in connection with this Contract or any other agreement between the Authority and the Contractor is made against the Authority or (3) any subcontractor under this Contract or any other agreement between the Authority and the Contractor fails to pay any claims lawfully made against him by any materialman, subcontractor, workman or other third person which arises out of or in connection with this Contract or any other agreement between the Authority and the Contractor or if in the opinion of the Chief Engineer any of the aforesaid contingencies is likely to arise, then the Authority shall have the right, in its discretion, to withhold out of any payment (final or otherwise and even though such payment has already been certified as due) such sums as the Chief Engineer may deem ample to protect it against delay or loss or to assure the payment of just claims of third persons, and to apply such sums in such manner as the Chief Engineer may deem proper to secure such protection or satisfy such claims. All sums so applied shall be deducted from the Contractor's compensation. Omission by the Authority to withhold out of any payment, final or otherwise, a sum for any of the above contingencies, even though such contingency has occurred at the time of such payment, shall not be deemed to indicate that the Authority does not intend to exercise its right with respect to such contingency. Neither the above provisions for rights of the Authority to withhold and apply monies nor any exercise or attempted exercise of, or omission to exercise, such rights by the Authority shall create any obligation of any kind to such materialmen, subcontractors, workmen or other third persons.

Until actual payment to the Contractor, his right to any amount to be paid under this Contract (even though such amount has already been certified as due) shall be subordinate to the rights of the Authority under this numbered clause.

In the event that wages and/or supplements have been paid in an amount less than as required by this Contract, the Authority shall also have the right to withhold from the Contractor out of any payment, final or otherwise, on this, or any other open contract that the Contractor has with the Authority, so much as may be necessary to pay to laborers, mechanics, architects, draftsmen, engineers and technical workers, and others employed on the Work, the difference between the sums such persons should have received as wages and/or supplements and the amounts they actually received, and to pay such sums over to such persons. All such payments shall be deemed to be payments for the Contractor's account. In addition, the Contractor shall be required to pay to the Authority an amount equal to the Authority's cost of any investigation conducted by or on behalf of the Authority, that discovers a failure to pay wages and/or supplements as required by this Contract by the Contractor or its subcontractors, the cost of such investigation to be determined by the Chief Engineer personally. If the Contractor fails or refuses to pay for the cost of any such investigation after demand by the Authority, the Authority may deduct from any amount payable to the Contractor by the Authority, under the Contract or under any other open contract between the Contractor and the Authority, an amount equal to the cost of such investigation.

If, however, the payment of any amount due to the Contractor shall be improperly delayed by the fault of the Authority, the Authority shall pay the Contractor interest thereon at the rate of six percent (6%) per annum for the period of delay, it being agreed that such interest shall be in lieu of and in liquidation of any damages to the Contractor because of such delay.

CHAPTER III

PROVISIONS RELATING TO TIME

33. TIME FOR COMPLETION AND DAMAGES FOR DELAY

The Contractor shall complete the performance of all Work under this Contract within 365 calendar days after receipt by him of the acceptance of his Proposal.

The Contractor shall not commence the performance of the Work until the later of the following dates:

A. If a Performance and Payment Bond is required, the date of receipt by him of notice from the Authority that the Performance and Payment Bond furnished by him is satisfactory;

B. The date of receipt by him of notice from the Authority that the insurance procured by him in accordance with the clauses hereof entitled "Insurance Procured by the Authority" and "Insurance Procured by Contractor", if any is required, is satisfactory, as evidenced by the certificates to be furnished in accordance with said clause.

The time for completion shall not be extended on account of the time required to furnish the documents referred to in subparagraphs A and B above, but the Authority shall give notice to the Contractor within ten days after receipt of the Performance and Payment Bond or certificate of insurance as to whether or not such bond or insurance is satisfactory.

The Contractor's obligations for the performance and completion of the Work within the time or times provided for in this Contract are of the essence of this Contract. The Contractor guarantees that he can and will complete the performance of the Work within the time hereinbefore stipulated or within the time as extended in accordance with the clause hereof entitled "Extensions of Time". Inasmuch as the damage and loss to the Authority which will result from delay in completing the performance of the Work within the time herein stipulated will include items of loss whose amount will be incapable or very difficult of accurate estimation, the damages to the Authority for each calendar day by which the Contractor does not complete performance of the Work within the time or times above stipulated or within such time or times as extended in accordance with the clause hereof entitled "Extensions of Time", shall be liquidated in the sum of One Thousand Dollars ($1,000) per calendar day.

34. EXTENSIONS OF TIME

The time above provided for completion of any part of the Contract shall be extended (subject, however, to the provisions of this numbered clause) only if in the opinion of the Engineer the Contractor is necessarily delayed in completing such part by such time solely and directly by a cause which meets all the following conditions:

A. Such cause is beyond the Contractor's control and arises without his fault;

B. Such cause comes into existence after the opening of Proposals on this Contract and neither was nor could have been anticipated by investigation before such opening.

Variations in temperature and precipitation shall be conclusively deemed to have been anticipated before opening of such Proposals on this Contract except to the extent that the actual monthly average temperature varies from a temperature which is 10 per cent (10%) above or below the monthly normal temperature and except to the extent that the actual number of days of precipitation (of 0.1 inch or more) per month exceeds a number equal to two plus the normal number of days of precipitation per month.

In any case, the variations in temperature and precipitation described in the immediately preceding sentence will be cause for an extension of time only if occurring between the actual time of commencement of the Work at the construction site and the time for completion stipulated in the clause hereof entitled "Time for Completion and Damages for Delay" (or such time as extended as provided for herein). In the case of portions of months the number of days will be pro-rated by the Engineer. Temperature and precipitation shall be as recorded by the U. S. Weather Bureau in its publications, including that entitled "Local Climatological Data with Comparative Data", which is applicable to the area in which the Work is to be performed, and in the case of precipitation, the normal number of days of precipitation (of 0.1 inch or more) per month as abstracted from the aforementioned publications are as follows:

Month	**Normal number of days per month on which precipitation exceeds 0.1 inch**
January	7
February	7
March	8
April	7
May	6
June	6
July	5
August	7
September	6
October	6
November	7
December	7

In any event, even though a cause of delay meets all the above conditions, an extension shall be granted only to the extent that (i) the performance of the Work is actually and necessarily delayed and (ii) the effect of such cause cannot be anticipated and avoided or mitigated by the exercise of all reasonable precautions, efforts and measures (including planning, scheduling and rescheduling), whether before or after the occurrence of the cause of delay, and an extension shall not be granted for a cause of delay which would not have affected the performance of the Contract were it not for the fault of the Contractor or for other delay for which the Contractor is not entitled to an extension of time.

Any reference herein to the Contractor shall be deemed to include subcontractors and materialmen, whether or not in privity of contract with the Contractor, and employees and others performing any part of the Contract and all the foregoing shall be considered as agents of the Contractor.

The period of any extension of time shall be that necessary to make up the time actually lost, subject to the provisions of this numbered clause, and shall be only for the portion of the Contract actually delayed. The Engineer may defer all or part of his decision on an extension and any extension may be rescinded or shortened if it subsequently is found that the delays can be overcome or reduced by the exercise of reasonable precautions, efforts and measures.

As a condition precedent to an extension of time, the Contractor shall give written notice to the Engineer within 48 hours after the time when he knows or should know of any cause which might under any circumstances result in delay for which he claims or may claim an extension of time (including those causes which the Authority is responsible for or has knowledge of), specifically stating that an extension is or may be claimed, identifying such cause and describing, as fully as practicable at the time, the nature and expected duration of the delay and its effect on the various portions of the Contract. Since the possible necessity for an extension of time may materially alter the scheduling, plans and other actions of the Authority, and since, with sufficient opportunity, the Authority might if it so elects attempt to mitigate the effect of a delay for which an extension of time might be claimed, and since merely oral notice may cause disputes as to the existence or substance thereof, the giving of written notice as above required shall be of the essence of the Contractor's obligations and failure of the Contractor to give written notice as above required shall be a conclusive waiver of an extension of time.

It shall in all cases be presumed that no extension, or further extension, of time is due unless the Contractor shall affirmatively demonstrate to the satisfaction of the Engineer that it is. To this end the Contractor shall maintain adequate records supporting any claim for an extension of time, and in the absence of such records, the foregoing presumption shall be deemed conclusive.

35. IDLE SALARIED MEN AND EQUIPMENT

If any salaried men or equipment of the Contractor or any subcontractor are necessarily kept continuously idle and wholly unoccupied at the construction site for a full day on each of two or more full days on which they would be engaged in the performance of the Work but for causes due solely to acts or omissions of the Authority or the Engineer occurring after the opening of Proposals on this Contract, and if such idleness is not due to any cause within the control of the Contractor or of any of his subcontractors or materialmen or his or their employees, then the Authority shall pay to the Contractor and the Contractor shall accept (in addition to any sums otherwise payable under this Contract, and in full satisfaction of and in liquidation of all claims for damages because of such act or omission of the Authority or the Engineer) an amount equal to that which the employer actually pays such salaried employees during such full days of idleness, plus a proper proportion of the premiums actually paid for Workers Compensation Insurance upon the basis of such salaries, if any, a proper proportion of vacation allowances and union dues and assessments actually paid by the employer pursuant to contractual obligations on the basis of such salaries, and a proper proportion of the taxes actually paid by the employer pursuant to law upon the basis of such salaries and plus such rental for such idle equipment as the Engineer deems reasonable. The rental for idle equipment shall be computed by the Engineer in accordance with the provisions of the clause of the Form of Contract entitled "Compensation for Extra Work"; provided, however, that the seven per cent (7%) of the rental to be paid in accordance with said clause in the case of equipment utilized by subcontractors shall not be payable in connection with such idle equipment; and provided further that the provisions of subparagraph C of said clause shall not be applicable to such idle equipment.

The Contractor shall give written notice to the Engineer before the end of the second of the above mentioned 2 or more full days (whether or not the Authority is aware of the existence of any circumstances which might constitute a basis for payment under this numbered clause), specifically stating that salaried men or equipment have been kept idle under circumstances which might result in payment under this numbered clause; and he shall furnish with such notice, for all the days that have occurred, and shall in addition furnish at the end of each additional day of the above mentioned 2 or more full days, (a) a memorandum showing the name, payroll title, salary rate and employer of each of the salaried men claimed to have been kept idle at the construction site, and the RATES and amounts of Workers' Compensation Insurance premiums, if any, and taxes based upon their salaries and the holiday and vacation allowances and union dues and assessments which the employer must actually pay pursuant to contractual obligations based on their salaries, and (b) a memorandum of the equipment claimed to be kept idle, together with the amount claimed as rental therefor. Said notice and memoranda are for the purpose of enabling the Engineer to verify the Contractor's claim at the time, and of enabling him to take such steps as may be necessary to remedy the conditions upon which the claim is based. The furnishing of such notice and memoranda shall be a condition precedent to payment under this numbered clause, so that the day on which notice is given shall be counted as not later than the second of the above mentioned 2 or more full days and no subsequent day shall be counted for which the above memoranda are not furnished at the end of such day.

36. DELAYS TO CONTRACTOR

As between the Contractor and the Authority, the Contractor assumes the risk of all suspensions of or delays in performance of the Contract, regardless of the length thereof, arising from all causes whatsoever, whether or not relating to this Contract, including wrongful acts or omissions of the Authority, its officers, agents, employees and contractors, except only to the extent, if any, that compensation or an extension of time may be due as expressly provided for elsewhere in this Contract for such suspension or delays and except to the extent, if any, that compensation may be agreed to by the Chief Engineer in writing pursuant to the clause hereof entitled "Compensation for Extra Work" for impact costs incurred by the Contractor in connection with the performance of Extra Work. Subject only to such exceptions, the Contractor shall bear the burden of all costs, expenses and liabilities which he may incur in connection with such suspensions or delays, and all such suspensions, delays, costs, expenses and liabilities of any nature whatsoever, whether or not provided for in this Contract, shall conclusively be deemed to have been within the contemplation of the parties.

Notwithstanding any provisions of this Contract, whether relating to time of performance or otherwise, the Authority makes no representation or guaranty as to when the construction site or any part thereof will be available for the performance of the Contract or as to whether conditions at the construction site will be such as to permit the Contract to be performed thereon without interruption or by any particular sequence or method or as to whether the performance of the Contract can be completed by the time required under this Contract or by any other time.

Wherever in connection with this Contract it is required, expressly or otherwise, that the Authority shall perform any act relating to the Contract, including making available or furnishing any real property, materials, or other things, no guaranty is made by the Authority as to the time of such performance and the delay of the Authority in fulfilling such requirement shall not result in liability of any kind on the part of the Authority except only to the extent, if any, that an extension of time or compensation may be due as expressly provided for elsewhere in this Contract.

37. CANCELLATION FOR DELAY

If the performance of the Contract or any portion of it shall, in the opinion of the Chief Engineer, be materially delayed, whether or not through the fault of the Contractor, by any cause which affects the Contractor's ability to perform the Contract without affecting to the same degree the Authority's own ability to perform it, either directly or through others, the Authority shall have the right at any time during the existence of such delay to cancel this Contract as to any portion not yet performed, without prejudice to the rights, liabilities and obligations of the parties under this Contract arising out of portions already performed, provided, however, that such right of cancellation shall not exist if the delay be due to any wrongful act or omission of the Authority. In the event of such cancellation, no allowance shall be made for anticipated profits.

CHAPTER IV

CONDUCT OF CONTRACT

38. AUTHORITY OF DIRECTOR

If at any time it shall be, from the viewpoint of the Authority, impracticable or undesirable in the judgment of the Director to proceed with or continue the performance of the Contract or any part thereof, whether or not for reasons beyond the control of the Authority, he shall have authority to suspend performance of any part or all of the Contract until such time as he may deem it practicable or desirable to proceed. Moreover, if at any time it shall be, from the viewpoint of the Authority impracticable or undesirable in the judgment of the Director to proceed with or continue the performance of the Contract or any part thereof whether or not for reasons beyond the control of the Authority, he shall have authority to cancel this Contract as to any or all portions not yet performed and as to any materials not yet installed even though delivered. Such cancellation shall be without prejudice to the rights and obligations of the parties arising out of portions already performed, but no allowance shall be made for anticipated profits.

39. AUTHORITY OF CHIEF ENGINEER

Inasmuch as the public interest requires that the project to which this Contract relates shall be performed in the manner which the Authority, acting through the Chief Engineer, deems best, the Chief Engineer shall have absolute authority to determine what is or is not necessary or proper for or incidental to the portion thereof specified in the clause hereof entitled "General Agreement" and the Contract Drawings and Specifications shall be deemed merely his present determination on this point. In the exercise of this authority, he shall have power to alter the Contract Drawings and Specifications; to require the performance of Work not required by them in their present form, even though of a totally different character from that now required; and to vary, increase and diminish the character, quantity and quality of, or to countermand, any Work now or hereafter required. Such variation, increase, diminution or countermanding need not be based on necessity but may be based on convenience.

To resolve all disputes and to prevent litigation the parties to this Contract authorize the Chief Engineer to decide all questions of any nature whatsoever arising out of, under, or in connection with, or in any way related to or on account of, this Contract (including claims in the nature of breach of Contract or fraud or misrepresentation before or subsequent to acceptance of the Contractor's Proposal and claims of a type which are barred by the provisions of this Contract) and his decision shall be conclusive, final and binding on the parties. His decision may be based on such assistance as he may find desirable. The effect of his decision shall not be impaired or waived by any negotiations or settlement offers in connection with the question decided, whether or not he participated therein himself, or by any prior decision of the Engineer or others, which prior decisions shall be deemed subject to review, or by any termination or cancellation of this Contract provided, however, that notwithstanding the decision reached by the Chief Engineer in a review of determinations by the Chief of Construction or Engineer of Construction or Engineer that a particular item of Work is not Extra Work the Contractor shall be compensated therefor as provided in written orders of the Chief of Construction or Engineer of Construction or Engineer expressly and unmistakably indicating his intention to treat Work described therein as Extra Work issued in accordance with the provisions of the clause hereof entitled "Extra Work Orders" for amounts not in excess of $250,000.

All such questions shall be submitted in writing by the Contractor to the Chief Engineer for his decision, together with all evidence and other pertinent information in regard to such questions, in order that a fair and impartial decision may be made. In any action against the Authority relating to any such question the Contractor must allege in his complaint and prove such submission, which shall be a condition precedent to any such action. No evidence or information shall be introduced or relied upon in such an action that has not been so presented to the Chief Engineer.

This numbered clause shall be governed by and construed in accordance with the law of the State of New York, without giving effect to its choice of law provisions.

40. AUTHORITY AND DUTIES OF ENGINEER

In the performance of the Contract, the Contractor shall conform to all orders, directions and requirements of the Engineer and shall perform the Contract to the satisfaction of the Engineer at such times and places, by such methods and in such manner and sequence as he may require, and the Contract shall at all stages be subject to his inspection. The Engineer shall determine the amount, quality, acceptability and fitness of all parts of the Work and shall interpret Contract Drawings, Specifications and any orders for Extra Work. The Contractor shall employ no equipment, materials, methods or men to which the Engineer objects, and shall remove no materials, equipment or other facilities from the construction site without permission. Upon request, the Engineer shall confirm in writing any oral order, direction, requirements or determination.

The Contractor is requested to orally advise the Engineer of questions as they arise. Although such advice will not substitute for the written notice and information for which requirements are set forth elsewhere herein, it is anticipated that it will facilitate prompt decisions on the part of the Engineer and others.

The enumeration herein or in the Specifications of particular instances in which the opinion, judgment, discretion or determination of the Engineer shall control or in which the Contract shall be performed to his satisfaction or subject to his inspection, shall not imply that only the matters of a nature similar to those enumerated shall be so governed and performed, but without exception the entire Contract shall be so governed and so performed.

41. NOTICE REQUIREMENTS

No claim against the Authority shall be made or asserted in any action or proceeding at law or in equity, and the Contractor shall not be entitled to allowance of such claim, unless the Contractor shall have complied with all requirements relating to the giving of written notice of the information with respect to such claim as provided in this numbered clause. The failure of the Contractor to give such written notice and information as to any claim shall be conclusively deemed to be a waiver by the Contractor of such claim, such written notice and information being conditions precedent to such claim. As used herein "claim" shall include any claim arising out of, under, or in connection with, or in any way related to or on account of, this Contract (including claims in the nature of breach of Contract or fraud or misrepresentation before or subsequent to acceptance of the Contractor's Proposal and claims of a type which are barred by the provisions of this Contract) for damages, payment or compensation of any nature or for extension of any time for performance of any part of this Contract.

The requirements as to the giving of written notice and information with respect to claims shall be as follows:

A. In the case of any claims for Extra Work, extension of time for completion, idle salaried men and equipment, or any other matter for which requirements are set forth elsewhere in this Contract as to notice and information, such requirements shall apply.

B. In the case of all other types of claim, notice shall have been given to the Engineer, personally, as soon as practicable, and in any case, within 48 hours, after occurrence of the act, omission, or other circumstance upon which the claim is or will be based, stating as fully as practicable at the time all information relating thereto. Such information shall be supplemented with any further information as soon as practicable after it becomes or should become known to the Contractor, including daily records showing all costs which the Contractor may be incurring or all other circumstances which will affect any claim to be made, which records shall be submitted to the Engineer, personally.

The above requirements for notices and information are for the purpose of enabling the Authority to avoid waste of public funds by affording it promptly the opportunity to cancel or revise any order, change its plans, mitigate or remedy the effects of circumstances giving rise to a claim or take such other action as may seem desirable and to verify any claimed expense or circumstances as they occur, and the requirements herein for such notice and information are essential to this Contract and are in addition to any notice required by statute with respect to suits against the Authority.

The above referred to notices and information are required whether or not the Authority is aware of the existence of any circumstances which might constitute a basis for a claim and whether or not the Authority has indicated it will consider a claim.

No act, omission, or statement of any kind shall be regarded as a waiver of any of the provisions of this numbered clause or may be relied upon as such waiver except only either a written statement signed by the Executive Director of the Authority or a resolution of the Commissioners of the Authority expressly stating that a waiver is intended as to any particular provision of this numbered clause, and more particularly no discussion, negotiations, consideration, correspondence, or requests for information with respect to a claim by any Commissioner, officer, employee or agent of the Authority shall be construed as a waiver of any provision of this numbered clause or as authority or apparent authority to effect such a waiver.

Since merely oral notice or information may cause disputes as to the existence or substance thereof, and since notice, even if written, to other than the Authority representative above designated to receive it may not be sufficient to come to the attention of the representative of the Authority with the knowledge and responsibility of dealing with the situation only notice and information complying with the express provisions of this numbered clause shall be deemed to fulfill the Contractor's obligation under this Contract.

42. EQUAL EMPLOYMENT OPPORTUNITY

In order to conform with the policy of the Authority the Contractor agrees that the provisions of N.J.S.A. 10:2-1 through 10:2-4, dealing with discrimination in employment on public contracts, and the Rules and Regulations promulgated pursuant thereto, are hereby made a part of this Contract and are binding upon him and that it shall not be a defense to the Contractor in any action arising directly or indirectly out of such legislation and Rules and Regulations that the Authority may not be subject thereto.

The provisions of this numbered clause are for the benefit of the Attorney General of the State of New Jersey, Division on Civil Rights in the Department of Law and Public Safety of the State of New Jersey, and the Director thereof, as well as for the benefit of the Authority, and said Division and Director shall have a right of action against the Contractor to effectuate the intent of this clause.

43. NO DISCRIMINATION IN EMPLOYMENT

During the performance of this Contract , the Contractor agrees as follows:

A. The Contractor will not discriminate against any employee or applicants for employment because of race, creed, color, national origin, sex, age, disability or marital status, and will undertake or continue existing programs of affirmative action to ensure that minority group persons are afforded equal employment opportunity without discrimination. Such programs shall include but not be limited to, recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, termination, rates of pay or other forms of compensation, and selections for training or retraining, including apprenticeships and on-the-job training,

B. The Contractor shall request such employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding and which is involved in the performance of the Contract to furnish a written statement that such employment agency, labor union or representative shall not discriminate because of race, creed, color, national origin, sex, age, disability or marital status and that such union or representative will cooperate in the implementation of the Contractor's obligations hereunder,

C. The Contractor will state, in all solicitations or advertisements for employees placed by or on behalf of the Contractor in the performance of the Contract with the Authority, that all qualified applicants will be afforded equal employment opportunity without discrimination because of race, creed, color, national origin, sex, age, disability or marital status,

D. The Contractor will include the provisions of A. through C. of this numbered clause in every subcontract or purchase order in such a manner that such provisions will be binding upon each subcontractor or vendor as to its work in connection with the Contract with the Authority,

E. The Contractor will submit to the Authority every two weeks a report indicating the number of workers employed at the construction site as of the 1st and 15th days of each month and the projected number of workers to be so employed during the following month. This report shall also indicate the trade in which such workers are employed and, with respect to current employment (but not projected employment), shall indicate the number of such workers who are members of the following groups:

1.) Black persons having origins in any of the Black African racial groups not of Hispanic origin;

2.) Hispanic persons of Puerto Rican, Mexican, Dominican, Cuban, Central or South American culture or origin, regardless of race;

3.) Asian and Pacific Islander persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent or the Pacific Islands;

4.) American Indian or Alaskan Native persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification.

F. The Contractor agrees that he will fully cooperate with the office of the Attorney General of the State of New Jersey and with the Authority which seeks to deal with the problem of unlawful or invidious discrimination, and with all other State efforts to guarantee fair employment practices under this Contract, and said Contractor will comply promptly with all requests and directions from the Attorney General of the State of New Jersey and the Authority in this connection, both before and during construction.

G. Full cooperation as expressed in F. foregoing shall include, but not be limited to, being a witness or complainant in any proceeding involving questions of unlawful or invidious discrimination if such is deemed necessary by the Attorney General of the State of New Jersey, permitting employees of said Contractor to be witnesses or complainants in any proceeding involving questions of unlawful or invidious discrimination, if such is deemed necessary by the Attorney General of the State of New Jersey, signing any and all documents involved in any proceeding involving questions of unlawful or invidious discrimination, the execution of which are deemed necessary by the Attorney General of the State of New Jersey, participating in meetings, submitting periodic reports on the racial aspects of present and future employment, assisting in inspection at the construction site, and promptly complying with all State directives deemed essential by the Attorney General of the State of New Jersey to insure compliance with all Federal and State laws, regulations and policies against racial or other unlawful or invidious discrimination.

H. Upon the basis of a finding by the Attorney General of the State of New Jersey that the Contractor has not complied with these nondiscrimination requirements and that by reason thereof there has been a material breach of this Contract, the Executive Director of the Authority shall have the sole discretion and power to declare this Contract null and void upon 10 days' notice to the Contractor. In such event the Contractor shall become liable for any and all damages which shall accrue to the Authority including, but not limited to, the difference between the total cost of completion and the contract price under this Contract.

I. The provisions of this numbered clause which refer to the Attorney General are inserted in this Contract for the benefit of the Attorney General of the State of New Jersey as well as for the benefit of the Authority, and said Attorney General shall have a direct right of action against the Contractor to effectuate the intent of this clause.

44. AFFIRMATIVE ACTION REQUIREMENTS - EQUAL EMPLOYMENT OPPORTUNITY

The Contractor shall comply with the provisions set forth hereinafter. These provisions are modeled on the conditions for bidding on federal government contracts adopted by the Office of Federal Contract Compliance in 1978.

The Contractor and each subcontractor must fully comply with the clause entitled "Equal Employment Opportunity" and the requirements in this numbered clause. The Contractor commits himself to the goals for minority and female utilization set forth below and all other requirements, terms and conditions of this numbered clause by submitting a properly signed Proposal.

The Contractor shall appoint a company executive to assume the responsibility for the implementation of the requirements, terms and conditions of this numbered clause.

A. The goals for minority and female participation, expressed in percentage terms, for the Contractor's workforce at the construction site under this Contract are as follows:

Minority, except laborers	30%
Minority, laborers	40%
Female, except laborers	6.9%
Female, laborers	6.9%

These goals are applicable to all construction Work performed at the construction site under the Contract.

The Contractor's compliance with this numbered clause shall be based on his implementation of the clause entitled "Equal Employment Opportunity", and specific affirmative action obligations required herein of minority and female employment and training must be substantially uniform throughout the length of the Contract and in each trade. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the Contract. Compliance with the goals will be measured against the total work hours performed.

B.

1.) The Contractor shall provide written notification to the Director, Office of Business Diversity and Civil Rights of the Port Authority of New York and New Jersey, within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under this Contract. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated start and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

2.) The Contractor shall submit a Workforce Projection Schedule, which shall be correlated to the progress schedule, within thirty days after acceptance of the Contractor's Proposal, for the approval of the Engineer. The Contractor shall maintain and periodically update it at intervals as required by the Engineer. The Workforce Projection Schedule shall include the time period in which each trade shall be utilized, the average number of workers required per trade on a weekly basis, the peak period for each trade, and the number of workers required per trade for the peak period on a weekly basis.

C.

1.) As used in this numbered clause:

a. "Director" means Director, Office of Business Diversity and Civil Rights of the Authority;

b. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U. S. Treasury Department Form 941;

c. "Minority" includes:

(i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

(ii) Hispanic persons of Puerto Rican, Mexican, Dominican, Cuban, Central or South American culture or origin, regardless of race;

(iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

(iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2.) Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the Work involving any construction trade, he shall physically include in each subcontract in excess of $10,000 such provisions as are necessary for the Contractor to achieve the aggregate goals set forth above.

3.) The Contractor shall implement the specific affirmative action standards provided in 6.) a. through p. hereof. The goals set forth above are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in the total workforce at the construction site under the Contract including employees of the Contractor and the subcontractors. The Contractor is expected to make substantially uniform progress toward his goals in each craft during the period specified. These goals may be achieved through utilization of journeyworkers and apprentices. In the event they are not achieved through the utilization of journeyworkers, the maximum number of apprentices provided for in the applicable collective bargaining agreement may be utilized to achieve said goals.

4.) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations hereunder.

5.) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

6.) The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these provisions shall be based upon his effort to achieve maximum results from his actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

a. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or his unions have employment opportunities available, and maintain a record of the organizations' responses.

b. Develop maximum job opportunities for apprentices appropriate to the conditions of the Work and subject to the applicable collective bargaining agreement, in conjunction with training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 6.) a. above.

c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet his obligations.

e. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting his EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations hereunder with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and subcontractors with whom the Contractor does or anticipates doing business.

i. Direct his recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth.

k. Tests and other selection requirements shall comply with 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations hereunder are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

7.) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (6.) a. through p.). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of his obligations under 6.) a. through p. hereof provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet his individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's non-compliance.

8.) Goals for minorities and for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation hereof if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved his goals for women generally, the Contractor may be in violation hereof if a specific minority group of women is under-utilized).

9.) The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

10.) The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

11.) The Contractor shall carry out such sanctions and penalties for violation of this clause and of the clause entitled "Equal Employment Opportunity", including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered by the Authority. Any Contractor who fails to carry out such sanctions and penalties shall be in violation hereof.

12.) The Contractor, in fulfilling his obligations hereunder shall implement specific affirmative action steps, at least as extensive as those standards prescribed in 6.) hereof so as to achieve maximum results from his efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of these provisions, the Authority shall proceed accordingly.

13.) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports, including the Monthly Employment Utilization Report, relating to the provisions hereof as may be required and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

14.) Nothing herein provided shall be construed as a limitation upon the application of any laws which establish standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

45. AFFIRMATIVE ACTION PROGRAMS

The Contractor assures that he will undertake an affirmative action program as required by 14 CFR Part 152, Subpart E, to insure that no person shall on the grounds of race, creed, color, national origin, or sex be excluded from participating in any employment activities covered in 14 CFR Part 152, Subpart E. The Contractor assures that no person shall be excluded on these grounds from participating in or receiving the services or benefits of any program or activity covered by this subpart. The Contractor assures that he will require that his covered suborganizations provide assurances to the Contractor that they similarly will undertake affirmative action programs and that they will require assurances from their suborganizations, as required by 14 CFR Part 152, Subpart E, to the same effect.

46. PREVAILING RATE OF WAGE

The Contractor shall pay or provide (and shall cause all subcontractors to pay or provide) to his or their workmen, laborers and mechanics (who are employed by him or them to work on an hourly or daily basis at any trade or occupation at or about the construction site) at least the prevailing rate of wage and supplements for others engaged in the same trade or occupation in the locality in which the Work is being performed as determined by the Engineer.

For purposes of this Contract, the Engineer has determined that the prevailing rates of wage and supplements are those established by the Secretary of Labor of the United States pursuant to the Davis-Bacon Act (40 U.S.C.A. 276a) for the locality in which the Work is to be performed. The schedule of wages and supplemental benefits which are currently in effect is attached hereto. However, the applicable rates shall be those which are in effect on the date of opening of Proposals.

The provisions of this numbered clause are inserted in this Contract for the benefit of such workmen, laborers and mechanics as well as for the benefit of the Authority; and if the Contractor or any subcontractor shall pay or provide any such workman, laborer or mechanic less than the rates of wages and supplements above described, such workman, laborer or mechanic shall have a direct right of action against the Contractor or such subcontractor for the difference between the wages and supplements actually paid or provided and those to which he is entitled under this clause. If such workman, laborer or mechanic is employed by any subcontractor whose subcontract does not contain a provision substantially similar to the provisions of this clause (requiring the payment or provision of at least the above minimum, and providing for a cause of action in the event of the subcontractor's failure to pay or provide such wages and supplements) such workman, laborer or mechanic shall have a direct right of action against the Contractor. The Authority shall not be a necessary party to any action brought by any workman, laborer or mechanic to obtain a money judgment against the Contractor or any subcontractor pursuant to this numbered clause.

Nothing herein contained shall be construed to prevent the Contractor or any subcontractor from paying higher rates of wages or providing higher supplements than the minimum hereinbefore prescribed; and nothing herein contained shall be construed to constitute a representation or guarantee that the Contractor or any subcontractor can obtain workmen, laborers and mechanics for the minimum herein before prescribed. All wages actually paid that are in excess of the prevailing wages in the performance of Extra Work and Net Cost Work, if applicable, shall be subject, on each occasion, to the initial and continuing approval of the Engineer in advance of the performance of such Extra Work and Net Cost Work, if applicable.

The Contractor shall post at the Work site, in a place that is prominent, accessible and visible to all employees of the Contractor and his subcontractors during the daily time period that the Contractor and/or subcontractor performs Work at the site, the appropriate prevailing wage and supplement schedules. The Contractor must inform all employees, including those of his subcontractors, that they may obtain a copy of the prevailing wage and supplement schedule from the Contractor.

The Contractor and every subcontractor shall make and maintain weekly payroll records during the course of the Work and for the period set forth in the clause hereof entitled "Authority Access to Records" for all employees employed in the Work. Such records shall contain the name, address and last four digits of the social security number of each such employee (Contractors and subcontractors must maintain the full social security number of each employee and shall provide them upon request to the Port Authority Inspector General), the employee's correct payroll classification, rate of pay and supplements, daily and weekly number of hours worked, deductions made and actual wages and supplements paid. The Contractor shall submit these weekly payroll records to the Authority (on forms furnished by the Authority) of all his payroll records and those of each of his subcontractors as the Authority may require with the Contractor's monthly Payment Application, together with an affidavit by the Contractor and by each subcontractor to the effect that such payroll records are correct and complete, the wage and supplement rates contained therein are not less than those required by the provisions of this Contract, and the classifications set forth for each employee conform with the Work performed. Such copies and summaries and the original payroll records shall be available for inspection by the Authority (including its Inspector General), and the Contractor and his subcontractors shall permit such representatives to interview employees during Work hours at the construction site.

The Contractor shall prepare a daily report on the Authority form entitled *Contractor Daily Sign-In Sheet*, copies of which can be obtained from the Engineer. The *Contractor Daily Sign-In Sheet* shall be completed as follows:

1.) At the beginning of each workday the Contractor shall:

   a. fill in the top of the *Contractor Daily Sign-In Sheet*, including the location, date, contractor/subcontractor name and contract number;

   b. ensure that each employee, including those of subcontractors, has printed and signed his or her name and indicated his or her work classifications, the last four digits of his or her social security number, and his or her starting time;

2.) At the end of each workday, the Contractor shall:

   a. ensure that each employee, including those of subcontractors, has signed out and indicated his or her ending time;

   b. sign the Certification Statement at the bottom of the form to indicate that the information contained in the *Contractor Daily Sign-In Sheet* is true and accurate; and

   c. submit the original completed form to the Engineer's representative.

In an area of his office at the site of the Work which is accessible to his employees, the Contractor shall display such printed material as may be provided by the Engineer setting forth information for the employees of the Contractor and his subcontractors concerning the wage and supplemental benefit requirements set forth in this numbered clause. The Contractor shall also cause each of his subcontractors to display such material in a similarly accessible place in any office which the subcontractor maintains at the site of the Work.

The Contractor's failure to comply with any provision of this numbered clause shall be deemed a substantial breach of this Contract.

47. EXTRA WORK ORDERS

No Extra Work of a cost in excess of $250,000 shall be performed except pursuant to written orders of the Chief Engineer expressly and unmistakably indicating his intention to treat the Work described therein as Extra Work; and, no Extra Work of a cost of $250,000 or less shall be performed except pursuant to written orders of the Chief Engineer, Chief of Construction, Engineer of Construction or Engineer expressly and unmistakably indicating his intention to treat the Work described therein as Extra Work.

In the absence of such an order signed by the Chief Engineer in the case of Extra Work of a cost in excess of $250,000 and by the Chief Engineer or Chief of Construction or Engineer of Construction or Engineer in the case of Extra Work of a cost of $250,000 or less, if the Engineer shall direct, order or require any Work, whether orally or in writing, which the Contractor deems to be Extra Work, the Contractor shall nevertheless comply therewith, but shall within twenty-four (24) hours give written notice thereof to the Chief Engineer and the Engineer, stating why he deems it to be Extra Work, and shall moreover furnish to the Engineer time slips and memoranda as required by the clause hereof entitled "Compensation for Extra Work". Said notice, time slips and memoranda are for the purpose of affording to the Chief Engineer an opportunity to verify the Contractor's claim at the time and (if he desires so to do) to cancel promptly such order, direction or requirement of the Engineer, of affording to the Engineer an opportunity of keeping an accurate record of the materials, labor and other items involved, and generally of affording to the Authority an opportunity to take such action as it may deem desirable in light of the Contractor's claims. Accordingly, the failure of the Contractor to serve such notice or to furnish such time slips and memoranda shall be deemed to be a conclusive and binding determination on his part that the direction, order or requirement of the Engineer does not involve the performance of Extra Work, and shall be deemed to be a waiver by the Contractor of all claims for additional compensation or damages by reason thereof, such written notice, time slips and memoranda being a condition precedent to such claims.

48. PERFORMANCE OF EXTRA WORK

The provisions of this Form of Contract relating generally to Work and its performance shall apply without exception to any Extra Work required and to the performance thereof. Moreover, the provisions of the Specifications relating generally to the Work and its performance shall also apply to any Extra Work required and to the performance thereof, except to the extent that a written order in connection with any particular item of Extra Work may expressly provide otherwise.

49. TITLE TO MATERIALS

All materials to become part of the permanent construction shall be and become the property of the Authority upon delivery at the construction site or upon being especially adapted for use in or as a part of the permanent construction, whichever may first occur, subject however to the Contractor's assumption of risk under the clause hereof entitled "Risks Assumed by the Contractor", subparagraph A.

The Contractor shall promptly furnish to the Authority such bills of sale and other instruments as may be required by it, properly executed, acknowledged and delivered, assuring to it title to such materials, free of encumbrances and shall mark or otherwise identify all such materials as the property of the Authority.

50. ASSIGNMENTS AND SUBCONTRACTS

Any assignment or other transfer by the Contractor of this Contract or any part hereof or of any of his rights hereunder or of any monies due or to become due hereunder and any delegation of any of his duties hereunder without the express consent in writing of the Authority shall be void and of no effect as to the Authority, provided, however, that the Contractor may subcontract portions of the Work to such persons as the Engineer may, from time to time, expressly approve in writing. For each individual, partnership or corporation proposed by the Contractor as a subcontractor, the Contractor shall submit to the Authority a certification or, if a certification cannot be made, a statement by such person, partnership or corporation to the same effect as the certification or statement required from the Contractor pursuant to the clauses of the "Information For Bidders" entitled "Certification of No Investigation (Criminal or Civil Anti-Trust), Indictment, Conviction, Suspension, Debarment, Disqualification, Prequalification Denial or Termination, Etc; Disclosure of Other Required Information", "Non-Collusive Bidding and Code of Ethics Certification; Certification of No Solicitation Based on Commission, Percentage, Brokerage, Contingent Fee or Other Fee" and "Certification of Participation in a United States Department of Labor-Registered Apprenticeship Program". The Certification of Participation in a United States Department of Labor-Registered Apprenticeship Program shall only be applicable to each subcontractor whose total amount of subcontract under this Contract is greater than $1 million. All further subcontracting by any subcontractor shall also be subject to such approval of the Engineer. Approval of a subcontractor may be conditioned on (among other things) the furnishing, without expense to the Authority, of a surety bond guaranteeing payment by the subcontractor of claims of materialmen, subcontractors, workmen and other third persons arising out of the subcontractor's performance of any part of the Work. Approval of a subcontractor may be rescinded for, among other things, failure of the Contractor to furnish the subcontractor's certificate of insurance, as required by the Form of Contract clause entitled "Insurance Procured by Contractor", within the time set forth in said clause.

No consent to any assignment or other transfer, and no approval of any subcontractor, shall under any circumstances operate to relieve the Contractor of any of his obligations; no subcontract, no approval of any subcontractor and no act or omission of the Authority or the Engineer shall create any rights in favor of such subcontractor and against the Authority; and as between the Authority and the Contractor, all assignees, subcontractors, and other transferees shall for all purposes be deemed to be agents of the Contractor. Moreover, all subcontracts and all approvals of subcontractors shall be and, regardless of their form, shall be deemed to be conditioned upon performance by the subcontractor in accordance with this Contract; and if any subcontractor shall fail to perform the Contract to the satisfaction of the Engineer, the Engineer shall have the absolute right to rescind his approval forthwith and to require the performance of the Contract by the Contractor personally or through other approved subcontractors.

51. CLAIMS OF THIRD PERSONS

The Contractor undertakes to pay all claims lawfully made against him by subcontractors, materialmen and workmen, and all claims lawfully made against him by other third persons arising out of or in connection with or because of the performance of this Contract and to cause all subcontractors to pay all such claims lawfully made against them.

52. CERTIFICATES OF PARTIAL COMPLETION

If at any time prior to the rendition of the Certificate of Final Completion, any portion of the permanent construction has been satisfactorily completed, and if in the judgment of the Engineer such portion of the permanent construction is not necessary for the operations of the Contractor but will be immediately useful to and is needed by the Authority for other purposes, the Engineer may render to the Authority and to the Contractor a certificate in writing to that effect (herein called a Certificate of Partial Completion), and thereupon or at any time thereafter the Authority may take over and use the portion of the permanent construction described in such Certificate and exclude the Contractor therefrom.

The rendition of a Certificate of Partial Completion shall not be construed to constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates in the event that he has failed to complete the same in accordance with the terms of this Contract. Moreover, the acceptance of a Certificate of Partial Completion by the Authority shall not operate to release the Contractor or his sureties from any obligations under or upon this Contract or the Performance and Payment Bond.

53. CERTIFICATE OF SUBSTANTIAL COMPLETION

Prior to the rendition of the Certificate of Final Completion, the Engineer may deem the entire Work to be substantially completed when, in the judgment of the Engineer, the permanent construction has been satisfactorily completed to the point where the Work is fit for its intended purpose and use. The Engineer may, if such a determination of substantial completion is made and at such time, render to the Authority and to the Contractor a certificate in writing to that effect (herein called the Certificate of Substantial Completion), and thereupon or at any time thereafter the Authority may take over and use the permanent construction described in such Certificate and exclude the Contractor therefrom. Whether to make a determination of a substantial completion as to any portion of the Work, and whether to render such a Certificate, shall be the discretionary determination of the Engineer based upon an examination and appraisal of the completed Work, and no right to such a determination or certification is established in the Contractor by this provision.

The rendition of such Certificate of Substantial Completion shall not relieve the Contractor of his obligation hereunder to complete the Work of this Contract nor shall it be construed to constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates in the event that he has failed to complete the same in accordance with the terms of this Contract. Moreover, the acceptance of a Certificate of Substantial Completion by the Authority shall not operate to release the Contractor or his sureties from any obligations under or upon this Contract or the Performance and Payment Bond.

When the Contractor is of the opinion that the Work is substantially complete as described above, the Contractor may submit to the Engineer a written request that the Engineer inspect the Work so as to determine, in the Engineer's sole opinion, whether substantial completion has been achieved. The Contractor's written request shall list the specific items of Work that are incomplete. Upon such a request, the Engineer will respond within 30 days with a Certificate of Substantial Completion or provide a written explanation of the reasons why the Work is not substantially complete including a list of open items necessary to achieve substantial completion. Nothing contained herein shall be deemed to preclude the Engineer from making a determination of substantial completion in the absence of a request therefor by the Contractor.

54. CERTIFICATE OF FINAL COMPLETION

After the satisfactory completion of all Work whatsoever required and the making of such tests and inspections as may be necessary or desirable, the Engineer shall render to the Authority and to the Contractor a certificate in writing (herein called the Certificate of Final Completion) certifying that in his opinion all Work under this Contract including Extra Work, has been completed in accordance with the Contract Drawings and Specifications and the requirements of the Engineer, and certifying the date as of which it was so completed.

The rendition of the Certificate of Final Completion shall not be construed to constitute an extension of the Contractor's time for performance in the event that he has failed to complete the Work in accordance with the terms of this Contract. Moreover, the acceptance of the Certificate of Final Completion by the Authority shall not operate to release the Contractor or his sureties from any obligations under or upon this Contract or the Performance and Payment Bond.

As a condition precedent to rendition of the Certificate of Final Completion, the Contractor shall submit the "Summary of Asbestos Removal and Disposal Costs" and the "Summary of Lead Removal and Disposal Costs" in accordance with the Sections of Division 1 - GENERAL PROVISIONS entitled "Asbestos Cost Summary Submittal" and "Lead Cost Summary Submittal".

55. NO GIFTS, GRATUITIES, OFFERS OF EMPLOYMENT, ETC.

During the term of this Contract, the Contractor shall not offer, give or agree to give anything of value either to an Authority employee, agent, job shopper, consultant, construction manager or other person or firm representing the Authority, or to a member of the immediate family (i.e., a spouse, child, parent, brother or sister) of any of the foregoing, in connection with the performance by such employee, agent, job shopper, consultant, construction manager or other person or firm representing the Authority of duties involving transactions with the Contractor on behalf of the Authority, whether or not such duties are related to this Contract or any other Authority contract or matter. Any such conduct shall be deemed a material breach of this Contract.

As used herein "anything of value" shall include but not be limited to any (a) favors, such as meals, entertainment, transportation (other than that contemplated by the Contract or any other Authority contract), etc., which might tend to obligate the Authority employee to the Contractor; and (b) gift, gratuity, money, goods, equipment, services, lodging, discounts not available to the general public, offers or promises of employment, loans or the cancellation thereof, preferential treatment or business opportunity. Such term shall not include compensation contemplated by this Contract or any other Authority contract.

Where used in this clause, the term "Authority" shall be deemed to include all subsidiaries of the Authority. Currently, those subsidiaries are the Port Authority Trans-Hudson Corporation (PATH), the Newark Legal and Communications Center and the New York and New Jersey Railroad Corporation.

In addition, during the term of this Contract, the Contractor shall not make an offer of employment or use confidential information in a manner proscribed by the Code of Ethics and Financial Disclosure dated as of April 11, 1996 (a copy of which is available upon request to the Office of the Secretary of the Authority).

The Contractor shall include the provisions of this clause in each subcontract entered into under this Contract.

CHAPTER V

WARRANTIES MADE AND LIABILITY ASSUMED BY THE CONTRACTOR

56. CONTRACTOR'S WARRANTIES

The Contractor represents and warrants:

A. That he is financially solvent, that he is experienced in and competent to perform the type of services contemplated by this Contract, that the facts stated or shown in any papers submitted or referred to in connection with his Proposal are true, and, if the Contractor be a corporation, that it is authorized to perform this Contract;

B. That he has carefully examined and analyzed the provisions and requirements of this Contract and inspected the construction site, that from his own investigations he has satisfied himself as to the nature of all things needed for the performance of this Contract, the general and local conditions and all other matters which in any way affect this Contract or its performance, and that the time available to him for such examination, analysis, inspection and investigations was adequate;

C. That the Contract is feasible of performance in accordance with all its provisions and requirements and that he can and will perform it in strict accordance with such provisions and requirements;

D. That no Commissioner, officer, agent or employee of the Authority is personally interested directly or indirectly in this Contract or the compensation to be paid hereunder; and

E. That, except only for those representations, statements or promises expressly contained in this Contract, no representation, statement or promise, oral or in writing, of any kind whatsoever by the Authority, its Commissioners, officers, agents, employees or consultants has induced the Contractor to enter into this Contract or has been relied upon by the Contractor, including any with reference to: (1) the meaning, correctness, suitability, or completeness of any provisions or requirements of this Contract; (2) the nature, existence or location of materials, structures, obstructions, utilities or conditions, surface or subsurface, which may be encountered at the construction site; (3) the nature, quantity, quality or size of the materials, equipment, labor and other facilities needed for the performance of this Contract; (4) the general or local conditions which may in any way affect this Contract or its performance; (5) the price of the Contract; or (6) any other matters, whether similar to or different from those referred to in (1) through (5) immediately above, affecting or having any connection with this Contract, the bidding thereon, any discussions thereof, the performance thereof or those employed therein or connected or concerned therewith.

Moreover, the Contractor accepts the conditions at the construction site as they may eventually be found to exist and warrants and represents that he can and will perform the Contract under such conditions and that all materials, equipment, labor and other facilities required because of any unforeseen conditions (physical or otherwise) shall be wholly at his own cost and expense, unless specifically provided for elsewhere in this Contract.

Nothing in the Contract Drawings or Specifications or any other part of the Contract is intended as or shall constitute a representation by the Authority as to the feasibility of performance of this Contract or any part thereof. Moreover, the Authority does not warrant or represent either by issuance of the Contract Drawings and Specifications or by any provision of this Contract as to time for performance or completion or otherwise that the Contract may be performed or completed by the times required herein or by any other times.

The Contractor further represents and warrants that he was given ample opportunity and time and by means of this paragraph was requested by the Authority to review thoroughly all documents forming this Contract prior to opening of Proposals on this Contract in order that he might request inclusion in this Contract of any statement, representation, promise or provision which he desired or on which he wished to place reliance; that he did so review said documents, that either every such statement, representation, promise or provision has been included in this Contract or else, if omitted, that he expressly relinquishes the benefit of any such omitted statement, representation, promise or provision and is willing to perform this Contract without claiming reliance thereon or making any other claim on account of such omission.

The Contractor further recognizes that the provisions of this numbered clause (though not only such provisions) are essential to the Authority's consent to enter into this Contract and that without such provisions, the Authority would not have entered into this Contract.

57. RISKS ASSUMED BY THE CONTRACTOR

The Contractor assumes the following distinct and several risks, whether they arise from acts or omissions (whether negligent or not) of the Contractor, of the Authority, or of third persons, or from any other cause, and whether such risks are within or beyond the control of the Contractor, excepting only risks which arise solely from affirmative acts done by the Authority subsequent to the opening of Proposals on this Contract with actual and wilful intent to cause the loss, damage and injuries described in subparagraphs A through D below:

A. The risk of loss or damage to the permanent construction prior to the rendition of the Certificate of Final Completion (other than loss or damage to the portions of the permanent construction with respect to which Certificates of Partial Completion have been issued), and the Contractor shall forthwith repair, replace and make good any such loss or damage to the permanent construction without cost to the Authority;

B. The risk of loss, damage to or alterations of the structures to be demolished occurring prior to completion of demolition by the Contractor (such structures being still included, however, in the term "Work"). In the event of such loss, damage or alterations, the Contractor shall nevertheless complete the performance of the Work, including the demolition, without additional cost to the Authority and without compensation for lost salvage value;

C. The risk of claims, fines or penalties, just or unjust, made by third persons or assessed by courts or governmental agencies or entities against the Contractor or the Authority on account of injuries (including wrongful death), loss, damage or liability of any kind whatsoever arising or alleged to arise out of or in connection with the performance of the Work (whether or not actually caused by or resulting from the performance of the Work) or out of or in connection with the Contractor's operations or presence at or in the vicinity of the construction site or Authority premises, including claims against the Contractor or the Authority for the payment of workers' compensation, whether such claims, fines or penalties are made or assessed and whether such injuries, damage, loss and liability are sustained at any time both before and after the rendition of the Certificate of Final Completion;

D. The risk of loss or damage to any property of the Contractor, and of claims made against the Contractor or the Authority for loss or damage to any property of subcontractors, materialmen, workmen and others performing the Work, occurring at any time prior to completion of removal of such property from the construction site or Authority premises or the vicinity thereof.

The Contractor shall indemnify the Authority against all claims described in subparagraphs C and D above and for all expense incurred by it in the defense, settlement or satisfaction thereof, including expenses of attorneys, except where indemnity would be precluded by applicable law. If so directed, the Contractor shall defend against any claim described in subparagraphs C and D above, in which event he shall not without obtaining express advance permission from the General Counsel of the Authority raise any defense involving in any way jurisdiction of the tribunal, immunity of the Authority, governmental nature of the Authority or the provisions of any statutes respecting suits against the Authority, such defense to be at the Contractor's cost.

The provisions of this numbered clause shall also be for the benefit of the Commissioners, officers, agents and employees of the Authority, so that they shall have all the rights which they would have under this numbered clause if they were named at each place above at which the Authority is named, including a direct right of action against the Contractor to enforce the foregoing indemnity, except, however, that the Authority by action of its Board of Commissioners may at any time in its sole discretion and without liability on its part cancel the benefit conferred on any of them by this numbered clause, whether or not the occasion for invoking such benefit has already arisen at the time of such cancellation.

Neither the issuance of a Certificate of Completion nor the making of Final Payment shall release the Contractor from his obligations under this numbered clause. Moreover, neither the enumeration in this numbered clause nor the enumeration elsewhere in this Contract of particular risks assumed by the Contractor or of particular claims for which he is responsible shall be deemed (a) to limit the effect of the provisions of this numbered clause or of any other clause of this Contract relating to such risks or claims, (b) to imply that he assumes or is responsible for risks or claims only of the type enumerated in this numbered clause or in any other clause of this Contract, or (c) to limit the risks which he would assume or the claims for which he would be responsible in the absence of such enumerations.

Inasmuch as the Authority has agreed to indemnify the City of Newark against claims of the types described in subparagraph C above made against said city, the Contractor's obligation under subparagraph C above shall include claims by said city against the Authority for such indemnification, including those arising from acts or omissions (whether negligent or not) of said city.

58. NO THIRD PARTY RIGHTS

Nothing contained in this Contract is intended for the benefit of third persons, except to the extent that the Contract specifically provides otherwise by use of the words "benefit" or "direct right of action".

59. INSURANCE PROCURED BY THE AUTHORITY

In order to reduce the cost of this Contract, the Authority will procure and will maintain in force and pay the premiums on:

A. A policy of public liability (Comprehensive - Commercial General Liability, including Contractual) insurance on which the Contractor and the subcontractors will be insureds issued by an insurance company satisfactory to the Authority, with current coverage limits of $50 million per occurrence for bodily injury and property damage liability.

B. A policy of builder's risk insurance, covering the improvements or other Work to be effectuated by the Contractor and the subcontractors, with coverage limits of $50 million per occurrence for all locations combined (subject to a $50 million annual aggregate for flood and earthquake damage and a limit of $10 million per occurrence for damage to off-site storage and property in-transit). The deductible is $10,000 per occurrence for all losses except those caused by flood and earthquake, where a $50,000 deductible per occurrence with respect to flood, and a $25,000 deductible per occurrence with respect to earthquake are in effect. The policy form contains various exclusions, including but not limited to the following property exclusions: automobiles; aircraft; and Contractors' and subcontractors' machinery, tools, and equipment and property of a similar nature, including forms, shoring, scaffolding and similar property, not intended to become a permanent part of a building or structure. The Contractor and the subcontractors must refer to the policy form to determine all properties and perils included and excluded and to determine their rights and responsibilities as insureds under the policy form. The Contractor and the subcontractors are responsible for payment for all losses within the deductibles and losses not covered by the builder's risk policies.

The current policies described in A and B of this numbered clause are available for examination by appointment in the office of the General Manager, Risk Financing, The Port Authority of NY & NJ, Treasury Department, 225 Park Avenue South, 12th Floor, New York, N.Y. 10003. The policy under A above is subject to certain liability coverage exclusions, which include, but are not limited to, exclusions from liability from claims arising from pollution and exposure to asbestos.

The Contractor and subcontractors shall comply with all obligations of the insured under or in connection with all of the policies described in A and B above.

The Authority shall have the right at any time and from time to time at its option to procure insurance substituting in whole or in part for any or all of the policies described in A and B above or to require that the Contractor and the subcontractors themselves obtain insurance substituting in whole or part for that above referred to, provided always, however, that the Contractor and the subcontractors shall be afforded coverage as stipulated by the Authority and the Authority shall either pay the premiums on such substitute insurance or reimburse the Contractor and the subcontractors therefor.

Neither the procurement of the above insurance or any substitute insurance nor the extent of the coverage or the limits of liability thereunder shall be construed to be a limitation on the nature or extent of the Contractor's obligations, or to relieve the Contractor of any such obligations, and the procurement of the above insurance is only for the purpose of reducing the cost of the Contract without constituting any representation by the Authority as to the adequacy of the insurance to protect the Contractor against the obligations imposed on the Contractor by law (except the applicable State Workers' Compensation Law) or by this or any other contract.

Notwithstanding any provision of this clause, however, no subcontractor shall be or have the right to be covered under the policies of insurance above referred to until the subcontractor has been expressly approved in writing by the Engineer, as required under this Contract, and such approval may be withheld, among other reasons, until execution by the subcontractor of agreements affirming his obligations provided in this clause with respect to the above insurance.

The provisions of this numbered clause are not intended to create any rights for the Contractor other than rights which may be available to the Contractor under said policies themselves, whatever such rights may be. Moreover, the Authority makes no representation or guaranty, either by the provisions of this numbered clause or otherwise, as to the effect of or the coverage under said policies, and no employee or agent of the Authority is authorized to make any such representation or guaranty, either by the provisions of this numbered clause or otherwise, as to the effect of or the coverage under said policies, and no employee or agent of the Authority is authorized to make any such representation or guaranty or to offer any interpretation of or information on said policies. The Contractor warrants and represents that he has examined and is familiar with the above stated coverages and that in submitting his Proposal he has relied solely on his own interpretation thereof and not on any representations or statements, oral or written, of the Authority, its Commissioners, officers, agents, employees, consultants or contractors.

All negotiations and adjustments with any insurer concerning payment for any loss, the risk of which is borne by the Contractor under this Contract, shall be the responsibility of and shall be conducted by the Contractor unless the applicable policy provides otherwise. The Contractor shall, however, inform the Engineer of the progress of all such negotiations and notify the Engineer sufficiently in advance of all meetings thereon so that the Engineer or designated representatives may attend said negotiations if they so desire.

The Authority shall be entitled to all returned premiums, dividends and credits which may become payable at any time for any reason whatsoever in connection with the aforementioned insurance. The Contractor hereby assigns to the Authority all such returned premiums, dividends and credits and the subcontractors shall be deemed to have assigned to the Authority all such returned premiums, dividends and credits by becoming subcontractors under this Contract. The Contractor shall execute and cause the subcontractors to execute any instrument necessary or convenient to evidence the Authority's right to such returned premiums, dividends and credits.

Notwithstanding any payment by the Authority of any insurance premiums, the Authority shall not be deemed the employer of any employees hired by the Contractor or any subcontractor covered by such insurance nor shall it be liable for any of the obligations of such employer.

The Contractor and the subcontractors shall cooperate to the fullest extent with the Authority in all matters relating to the aforementioned insurance and shall comply with all requirements of all insurance policies procured by the Authority. They shall also at their own expense furnish the Engineer or a duly authorized representative with copies of all payrolls, correspondence, papers, records and other things necessary or convenient for dealing with or defending against any claims and for procuring or administering the aforementioned insurance including furnishing the name of any of their employees, officers, or agents whose presence or testimony is necessary or convenient in any negotiations or proceedings involving such insurance.

60. INSURANCE PROCURED BY CONTRACTOR

The Contractor, and all subcontractors, shall maintain and pay the premiums on the policy or policies of insurance for coverage(s) as hereinafter described, which shall cover their operations hereunder, shall be effective throughout the effective period of this Contract, and shall afford coverage(s) in not less than the amounts set forth below:

A. Commercial Automobile Liability Insurance covering "any" vehicles on the broadest commercially available form:

1.) Vehicles operating in the Air Operations Area without an authorized escort require a Combined single limit for bodily injury and property damage liability – $25 million per each accident.

2.) Vehicles operating in the Air Operations Area with an authorized escort require a Combined single limit for bodily injury and property damage liability - $5 million per each accident.

3) Vehicles operating outside of the Air Operations Area require a Combined single limit for bodily injury and property damage liability - $2 million per each accident.

B. Workers' Compensation Insurance and Employers' Liability Insurance:

The Contractor and subcontractors shall procure and maintain, at their own expense, a policy of workers' compensation insurance as required by law where the Work will take place and employers' liability insurance with limits of not less than $1 million per accident. And where applicable, the Contractor and/or the subcontractor shall also include one or more endorsements to cover for (i) Federal Employers' Liability Act (work near railroad), (ii) Longshore and Harbor Workers' Compensation Act (work on or around navigable waters), (iii) Maritime Coverage (for masters or members of the crews of vessels).

Compensation for such Workers' Compensation Insurance and Employers' Liability Insurance shall be in accordance with the clause of the Form of Contract entitled "Net Cost".

C. Contractors Pollution Legal Liability (CPL) Insurance

The Contractor, or his subcontractor, shall procure, maintain and pay premiums on a CPL Policy, including lead abatement liability, on an occurrence basis, providing coverage for bodily injury liability, property damage liability or environmental damage liability caused by pollution conditions, with a limit of liability of not less than $5 million per occurrence and $5 million in the aggregate. The Policy shall name all subcontractors, and the environmental cleanup on land, in air and in/on water. The policy shall include coverage for completed operations (for a minimum of 2 years after the completion of the Contract), gradual and sudden and accidental pollution coverage, with a time element of no less than 7 days notice and 30 days reporting. The policy shall not contain a sunset provision or any other provision which would prohibit the reporting of a claim and the subsequent defense and indemnity that would normally be provided by the policy. Self-funded, policy fronting, or other non-risk insurance transfer mechanisms are not acceptable to the Authority, unless full disclosure is made to the Authority in writing prior to any consideration being given and the Authority has provided written approval of same. The Authority shall be provided a waiver of subrogation.

Deductibles are subject to the approval of the Authority and shall not reduce the limit of liability. The policy must "pay on behalf of" rather than "indemnify the insured". The insurance shall be primary insurance as respects the Authority, its representatives, officials and employees. Any insurance or self-insurance maintained by the Authority shall be excess of this insurance and shall not contribute with it. The policy shall provide pollution coverage as respects lead-based materials, including but not limited to lead paint for all phases of the abatement process. The policy shall not contain any provisions or definition that would serve to eliminate third party over-claims, including exclusions of the premises owner.

In addition, the liability policy(ies) shall name the Port Authority of New York and New Jersey, its related entities, their commissioners, directors, officers, partners, employees and agents as additional insureds. The liability policy(ies) and the certificate(s) of insurance shall contain separation of insured conditions and severability of interests clauses for all policies. These insurance requirements shall be in effect for the duration of the Contract and include any warrantee/guarantee period and any maintenance period. An act or omission of one of the insureds shall not reduce or void coverage to the other insureds. Furthermore, the Contractor's insurance shall be primary insurance as respects to the above additional insureds. Any insurance or self-insurance maintained by the above additional insureds shall not contribute to any loss or claim.

The certificate(s) of insurance and liability policy(ies) must contain the following endorsement for the above liability coverages:

> "The insurer(s) shall not, without obtaining the express advance written permission from the General Counsel of the Authority, raise any defense involving in any way the jurisdiction of the Tribunal over the person of the Authority, the immunity of the Authority, its Commissioners, officers, agents or employees, the governmental nature of the Authority or the provisions of any statutes respecting suits against the Authority".

The Contractor shall deliver certified copies of the policy(ies) described above or certificate(s) of insurance evidencing the existence thereof to the Engineer at the location where the Work will be performed, within ten (10) days after the acceptance of his Proposal. Such policy(ies) or certificate(s) shall state the Contract number and shall contain a valid provision or endorsement that the policy(ies) may not be canceled, terminated, changed or modified without giving thirty (30) days written advance notice thereof to the Authority.

Certified copies of all renewal policies or certificates evidencing their existence shall be delivered to the Engineer at the location where the Work will be performed at least ten (10) days prior to the expiration date of each expiring policy. If at any time any of the certificates or policies shall be or become unsatisfactory to the Authority as to form or substance, or if the carrier issuing any such certificate or policy shall be or become unsatisfactory to the Authority, the Contractor shall promptly obtain a new and satisfactory certificate and policy. Upon request of the General Manager, Risk Financing, the Contractor shall furnish the Authority with a certified copy of each policy stated above.

The requirements for insurance procured by the Contractor shall not in any way be construed as a limitation on the nature or extent of the contractual obligations assumed by the Contractor under this Contract. The insurance requirements are not a representation by the Authority as to the adequacy of the insurance to protect the Contractor against the obligations imposed on him by law or by this or any other contract.

CHAPTER VI

RIGHTS AND REMEDIES

61. RIGHTS AND REMEDIES OF AUTHORITY

The Authority shall have the following rights in the event the Chief Engineer shall deem the Contractor guilty of a breach of any term whatsoever of this Contract:

A. The right to take over and complete the Work or any part thereof as agent for and at the expense of the Contractor, either directly or through other contractors.

B. The right to cancel this Contract as to any or all of the Work yet to be performed.

C. The right to specific performance, an injunction or any other appropriate equitable remedy.

D. The right to money damages.

For the purpose of this Contract, breach shall include but not be limited to the Contractor's failure to procure insurance satisfactory to the Authority within the time limit specified in the Clause hereof entitled "Insurance Procured by Contractor" and the following, whether or not the time has yet arrived for performance of an obligation under this Contract: a statement by the Contractor to any representative of the Authority indicating that he cannot or will not perform any one or more of his obligations under this Contract; any act or omission of the Contractor or any other occurrence which makes it improbable at the time that he will be able to perform any one or more of his obligations under this Contract; any suspension of or failure to proceed with any part of the Work by the Contractor which makes it improbable at the time that he will be able to perform any one or more of his obligations under this Contract; any false certification at any time by the Contractor as to any material item certified pursuant to the clauses of the Information For Bidders entitled "Certification of No Investigation (Criminal or Civil Anti-Trust), Indictment, Conviction, Suspension, Debarment, Disqualification, Prequalification Denial or Termination, Etc; Disclosure of Other Required Information", "Non-Collusive Bidding and Code of Ethics Certification; Certification of No Solicitation Based on Commission, Percentage, Brokerage, Contingent Fee or Other Fee", and "Certification of Participation in a United States Department of Labor-Registered Apprenticeship Program", any false certification at any time by the Contractor or a subcontractor pursuant to the clause "Prevailing Rate of Wage Certification" set forth in the Information for Bidders, or the willful or fraudulent submission of any signed statement pursuant to such clauses which is false in any material respect; or the Contractor's incomplete or inaccurate representation of its status with respect to the circumstances provided for in such clauses.

The enumeration in this numbered clause or elsewhere in this Contract of specific rights and remedies of the Authority shall not be deemed to limit any other rights or remedies which the Authority would have in the absence of such enumeration; and no exercise by the Authority of any right or remedy shall operate as a waiver of any other of its rights or remedies not inconsistent therewith or to estop it from exercising such other rights or remedies.

62. RIGHTS AND REMEDIES OF CONTRACTOR

Inasmuch as the Contractor can be adequately compensated by money damages for any breach of this Contract which may be committed by the Authority, the Contractor expressly agrees that no default, act or omission of the Authority shall constitute a material breach of this Contract, entitling him to cancel or rescind it or (unless the Engineer shall so direct) to suspend or abandon performance.

63. PERFORMANCE OF WORK AS AGENT FOR CONTRACTOR

In the exercise of its right to take over and complete Work as agent for the Contractor, for which provision is made in the clause hereof entitled "Rights and Remedies of Authority", the Authority shall have the right to take possession of and use or permit the use of any and all plant, materials, equipment and other facilities provided by the Contractor for the purpose of the Work and the Contractor shall not remove any of the same from the site of the Work without express permission. Unless expressly directed to discontinue the performance of all Work, the Contractor shall continue to perform the remainder thereof in such manner as in no way will hinder or interfere with the portions taken over by the Authority.

In the certificate of total compensation earned, for which provision is made in the clause hereof entitled "Final Payment", the Engineer will separately state the amount of Work performed by the Authority as agent for the Contractor, credit to the Authority the cost thereof, and credit to the Contractor the compensation earned thereby; and the difference between them shall be payable by the Contractor to the Authority, or vice versa as the case may be. If such difference is in its favor, the Authority may deduct it from any moneys due the Contractor, and if such moneys be insufficient, the balance thereof shall be payable to it on demand; if in the Contractor's favor, it shall constitute part of the Final Payment.

The exercise by the Authority of its right to take over the Work shall not release the Contractor or his sureties from any of his or their obligations or liabilities under this Contract or the Performance and Payment Bond.

64. NO ESTOPPEL OR WAIVER

The Authority shall not be precluded or estopped by any acceptance, certificate or payment, final or otherwise, issued or made under this Contract or otherwise issued or made by it, the Engineer, or any officer, agent or employee of the Authority, from showing at any time the true amount and character of Work performed, or from showing that any such acceptance, certificate or payment is incorrect or was improperly issued or made; and the Authority shall not be precluded or estopped, notwithstanding any such acceptance, certificate or payment, from recovering from the Contractor any damages which it may sustain by reason of any failure on his part to comply strictly with this Contract, and any moneys which may be paid to him or for his account in excess of those to which he is lawfully entitled.

Neither the acceptance of the Work or any part thereof, nor any payment therefor, nor any order or certificate issued under this Contract or otherwise issued by the Authority, the Engineer, or any officer, agent or employee of the Authority, nor any permission or direction to continue with the performance of Work, nor any performance by the Authority of any of the Contractor's duties or obligations, nor any aid lent to the Contractor by the Authority in his performance of such duties or obligations, nor any other thing done or omitted to be done by the Authority, its Commissioners , officers, agents or employees shall be deemed to be a waiver of any provision of this Contract or of any rights or remedies to which the Authority may be entitled because of any breach thereof, excepting only a resolution of its Commissioners, providing expressly for such waiver. No cancellation, rescission or annulment hereof, in whole or as to any part of the Work, because of any breach hereof, shall be deemed a waiver of any money damages to which the Authority may be entitled because of such breach. Moreover, no waiver by the Authority of any breach of this Contract shall be deemed to be a waiver of any other or any subsequent breach.

CHAPTER VII

MISCELLANEOUS

65. SUBMISSION TO JURISDICTION

The Contractor hereby irrevocably submits himself to the jurisdiction of the Courts of the State of New York and to the jurisdiction of the Courts of the State of New Jersey in regard to any controversy arising out of, connected with, or in any way concerning the Proposal or this Contract. The Contractor agrees that service of process on the Contractor in relation to such jurisdiction may be made, at the option of the Authority, either by registered or certified mail addressed to the applicable office as provided for in the clause hereof entitled "Service of Notices on the Contractor", by registered or certified mail addressed to any office actually maintained by the Contractor or by actual personal delivery to the Contractor if the Contractor be an individual, to any partner if the Contractor be a partnership or to an officer, director or managing or general agent if the Contractor be a corporation.

Such service shall be deemed to be sufficient when jurisdiction would not lie because of the lack of basis to serve process in the manner otherwise provided by law. In any case, however, process may be served as stated above whether or not it might otherwise have been served in a different manner.

66. PROVISIONS OF LAW DEEMED INSERTED

Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included therein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

67. INVALID CLAUSES

If any provision of this Contract shall be such as to destroy its mutuality or to render it invalid or illegal, then, if it shall not appear to have been so material that without it the Contract would not have been made by the parties, it shall not be deemed to form part thereof but the balance of the Contract shall remain in full force and effect.

68. NON-LIABILITY OF THE AUTHORITY REPRESENTATIVES

Neither the Commissioners of the Authority nor any officer, agent, or employee thereof shall be charged personally by the Contractor with any liability or held liable to him under any term or provision of this Contract, or because of its execution or attempted execution, or because of any breach hereof.

69. SERVICE OF NOTICES ON THE CONTRACTOR

Whenever provision is made in this Contract for the giving of any notice to the Contractor, its deposit in any post office or post office box, enclosed in a postpaid wrapper addressed to the Contractor at his office, or its delivery to his office, shall be sufficient service thereof as of the date of such deposit or delivery, except to the extent, if any, otherwise provided in the clause entitled "Submission to Jurisdiction". Until further notice to the Authority the Contractor's office will be that stated in his Proposal. Notices may also be served personally upon the Contractor; or if a corporation, upon any officer, director, or managing or general agent; or if a partnership upon any partner.

70. MODIFICATION OF CONTRACT

No change in or modification, termination or discharge of this Contract, in any form whatsoever, shall be valid or enforceable unless it is in writing and signed by the party to be charged therewith or his duly authorized representative, provided, however, that any change in or modification, termination or discharge of this Contract expressly provided for in this Contract shall be effective as so provided.

The authority of any person to order Extra Work or to alter the Contract Drawings and Specifications does not include the power to cancel, modify or waive any provision of the Form of Contract, and no officer or other representative of the Authority shall have the power so to do unless and until hereafter so authorized by or pursuant to a resolution of the Commissioners of the Authority or by or pursuant to a resolution of their appropriate Committee.

71. PUBLIC RELEASE OF INFORMATION

The Contractor and all his subcontractors shall not issue or permit to be issued any press release, advertisement, or literature of any kind, which refers to the Authority or the services performed in connection with this Contract, without first obtaining the written approval of the Chief Engineer. Such approval may be withheld if for any reason the Chief Engineer believes that the publication of such information would be harmful to the public interest or is in any way undesirable. This provision shall survive termination or expiration of this Contract.

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that we, the undersigned[25] Contractor and surety company (or companies), as principal and surety (or sureties), respectively,

Contractor	Surety

25 Insert names of the Contractor and surety company (or companies) in the appropriate columns. If space is insufficient add rider.

If the Contractor is a corporation, give the state of incorporation, using also the phrase "a corporation organized under the laws of _____".

If the Contractor is a partnership, give full names of partners, using the phrase "co-partners doing business under the firm name of _____".

If the Contractor is an individual using a trade name, give individual name, using also the phrase "an individual doing business under the trade name of _____.".

are hereby held and firmly bound unto The Port Authority of New York and New Jersey (herein called the "Authority") in the penal sum of _____ Dollars

and _____ Cents ($ _____.), for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, representatives, executors, administrators, successors and assigns. Each surety, however, if there is more than one, shall be jointly and severally liable for said penal sum.

Signed this _____ day of _____ 20

The condition of the above obligation is that

WHEREAS, the above named principal has entered into a Contract in writing with the Authority, a copy of which is hereby made a part of this bond as though herein set forth in full and which is designated Contract EWR-153.226 - "Newark Liberty International Airport - EWR - Overnight Aircraft Parking", and

WHEREAS, the Authority has required this bond for the faithful performance of all obligations imposed by said Contract and also for the payment of all lawful claims of subcontractors, materialmen and workmen arising out of the performance of said Contract;

NOW, if the said principal shall well and faithfully do and perform the things agreed by him to be done and performed according to the terms and true intent and meaning of said Contract and if all lawful claims of subcontractors, materialmen and workmen arising out of the performance of said Contract are paid, then this obligation shall be void, otherwise the same shall remain in full force and effect; it being expressly understood and agreed that, provided the sureties shall comply with the provisions hereof, the aggregate liability of all sureties for any and all claims hereunder shall in no event exceed the penal amount of this obligation as hereinbefore stated.

This undertaking is for the benefit of the Authority and all subcontractors, materialmen and workmen having lawful claims arising out of the performance of said Contract, and all such subcontractors, materialmen and workmen (as well as the Authority itself) shall have a direct right of action upon this bond; but the rights and equities of such subcontractors, materialmen and workmen shall be subject and subordinate to those of the Authority.

The sureties, for value received, hereby stipulate and agree that the obligations of said sureties and their bond shall be in no way impaired or affected by any extensions of time, modification, omission, addition or change in or to the said Contract or the construction to be performed thereunder, or by any supervision or inspection or omission to supervise or inspect the construction, or by any payment thereunder before the time required therein, or by any waiver of any provision or condition thereof (whether precedent or subsequent), or by any assignment, subletting or other transfer thereof or of any part thereof or of any construction to be performed or any moneys due or to become due thereunder; and said sureties do hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulate and agree that any and all things done and omitted to be done by and in relation to assignees, subcontractors and other transferees shall have the same effect as to said sureties as though done by or in relation to said principal.

The sureties shall give the General Counsel of the Authority the following notices:

A. Written notice of an intent to pay any claim of a subcontractor, materialman or workman hereunder;

B. Written notice within five days of the institution of an action by a subcontractor, materialman or workman hereunder.

The sureties shall not pay the claim of any subcontractor, materialman or workman hereunder until the expiration of thirty days after receipt by said General Counsel of notice under either subparagraph A or B above, describing the claim to be paid.

IN WITNESS WHEREOF, the principal and the sureties have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____
Principal

(Seal) By [26] _____

_____
Surety

By[27] _____

APPROVED AS TO ACCEPTABILITY OF SURETIES:

_____
Credit Manager

_____20

[26] If bond is signed by an officer or agent, give title; if signed by a corporation, affix corporate seal.

[27] Add signatures of additional sureties, if any.

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of _____

_____ SS:

County of _____

On this _____ day of _____, 20 , before me personally came and appeared _____, to me known, who being by me duly sworn, did depose and say that he resides at _____; that he is the _____. of _____ the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation, and that he signed his name thereto by like order.

(Notary Seal) _____

(Notary Signature)

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____

_____ SS:

County of _____

On this _____ day of _____, 20 , before me personally came and appeared _____, to me known, and known to me to be one of the members of the firm of _____ _____ described in and who executed the foregoing instrument and he acknowledged to me that he executed the same as and for the act and deed of said firm.

(Notary Seal) _____

(Notary Signature)

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of _____

_____ SS:

County of _____

On this _____ day of _____, 20 , before me personally came and appeared _____, to me known and known to me to be the person described in and who executed the foregoing instrument and he acknowledged to me that he executed the same.

(Notary Seal) _____

(Notary Signature)

AFFIX ACKNOWLEDGMENT AND JUSTIFICATION OF SURETY

SPECIFICATIONS

DIVISION 1

GENERAL PROVISIONS

72. CONSTRUCTION REQUIRED BY THE SPECIFICATIONS

These Specifications relate generally to performing demolish Buildings 14, 95 and 332 and remove asphalt and concrete pavement, above ground and subsurface features including retaining walls, bollards, footings, utility manholes, vaults, duct banks, gas mains, oil tanks, fences and associated appurtenances. work also includse paving over the aforementioned areas and modifications to drainage to accommodate Overnight Aircraft and Vehicular Parking..

These Specifications require the doing of all things necessary or proper for or incidental to the matter referred to in the immediately preceding paragraph, as shown on the Contract Drawings in their present form. In addition, all things shown on the Contract Drawings even though not expressly mentioned in these Specifications, all things mentioned in these Specifications even though not shown on the Contract Drawings, and all things not specified either on the Contract Drawings, or in the Specifications but involved in carrying out their intent and in the complete and proper execution of the matter referred to in the immediately preceding paragraph are required by these Specifications; and the Contractor shall perform the same as though they were specifically delineated, described and mentioned.

In case of a conflict between a requirement of the Contract Drawings and a requirement in Division 1 of the Specifications, the requirement of Division 1 shall control. In case of a conflict between a requirement contained in other Divisions of the Specifications and a requirement of the Contract Drawings, the requirement of the Contract Drawings shall control.

Some Sections of the Specifications make cross references to construction specified in other Sections of the Specifications, including cross references intended to avoid duplication by the bidders in quoting prices and to point out some of the necessity for coordination. Such cross references are not intended to be complete or all inclusive, and the Contractor shall ascertain for himself both the nature and the extent of all construction which may be related to that under each Section of the Specifications whether or not expressly referred to.

Some Sections of the Specifications contain a general description of the construction under such Sections. Such description is merely a very general one and is not intended to outline the construction required by the Specifications and Contract Drawings. Accordingly, such description shall be construed as in aid of and supplemental to, but in no case limiting, impairing or decreasing, the requirements elsewhere set forth with respect to the construction to be performed.

The Contractor's compensation for all construction whatsoever referred to in the Specifications and Contract Drawings in their present form, even though the need for certain items of such construction may be contingent upon future occurrences or determinations or upon other circumstances, shall be deemed to be included in the price(s) quoted by the Contractor in the Form of Contract unless the Specifications or Contract Drawings expressly state that compensation in addition to such price shall be payable for such items of construction. The express statement in some cases to the effect that certain construction shall be without additional cost to the Authority shall not impair the application of this paragraph in other cases.

The distribution of various parts of the construction among the Divisions and Sections of the Specifications or among the Contract Drawings is not intended as a representation of the most effective or logical method of organizing, scheduling, or subcontracting the construction, and the Contractor shall ascertain for himself how to do so unless otherwise expressly prescribed in this Contract.

In all cases the provisions of the second paragraph of this numbered Section shall control.

73. AVAILABLE PROPERTY

Subject to the conditions elsewhere stated herein, those areas to be occupied by the permanent construction will be made available to the Contractor upon the commencement of his first operations at the construction site, together with an area shown on Contract Drawing No. G106 and designated "Area Available For Contractor's Use".

Any additional property which the Contractor desires for his operations shall be obtained by him at his own expense.

The Contractor will be permitted to use only so much of the aforesaid areas as is necessary for the performance of the Contract, and he must at all times so conduct his operations as not to encroach upon or block the portions used by others. The Engineer may at any time make joint or exclusive assignments of particular portions thereof, either to the Contractor or to others, and may take over and use for other purposes any portions which, in the opinion of Engineer, are not required for the performance of the Contract.

The Contractor shall daily clean up the areas made available to him so that they are free at all times of refuse, rubbish, scrap material or debris.

74. CONSTRUCTION SITE SECURITY REQUIREMENTS

The Port Authority of New York and New Jersey operates facilities and systems at which terrorism or other criminal acts may have a significant impact on life safety and key infrastructures. The Authority reserves the right to impose multiple layers of security requirements on the performance of the Work of the Contract, including on the Contractor, subcontractors and materialmen, depending upon the level of security required, as determined by the Authority. The Contractor shall comply, and shall ensure that his subcontractors and materialmen comply, with the following security requirements:

A. Identity Checks, Background Screening and Issuance of Photo Identification Cards

No person will be permitted on or about the construction site without a Facility Photo ID issued by the Authority. Facility Photo IDs are required for employees of the Contractor, subcontractors and materialmen. All employees of the Contractor, subcontractors and materialmen shall wear Facility Photo IDs in a conspicuous and clearly visible position whenever they are working at the construction site.

As part of the requirement for the issuance of Facility Photo IDs, the Contractor shall perform background checks through the Secure Worker Access Consortium (SWAC) and obtain SWAC ID cards with a "HIGH" SWAC approval level for all workmen and materialmen on this Contract. Information on the SWAC process, including office locations and hours of operation, is available on the following website: http://www.secureworker.com/ .

The Contractor shall coordinate with the Engineer at least 5 business days in advance to obtain Facility Photo IDs. The SWAC ID card, a state issued driver's license and an additional form of identification shall be presented by each workman and materialman in order to be issued a Facility Photo ID by the Authority. Facility Photo IDs will be issued at no cost to the Contractor.

The Contractor shall ensure that all workmen and materialmen renew their SWAC ID and Facility Photo ID prior to the respective ID cards' expiration dates. Any workman or materialman with an expired SWAC ID or expired Facility Photo ID shall not be permitted access to the construction site.

B. Construction Site Access Control

1.) The Authority may provide for construction site access control, inspection and monitoring by security guards retained by the Authority. However, this provision shall not relieve the Contractor of his responsibility to secure equipment and Work at the construction site at his own expense.

2.) At the beginning of each work period or work shift, the Contractor shall furnish to the security guards, if any, or to the Engineer a memorandum showing for that work period or work shift:

a. The name and company affiliation of each employee of the Contractor or of a subcontractor who is expected to enter the construction site and,

b. The name of each firm expected to deliver materials, service equipment or perform other services and a description of such materials or services.

C. High Security Areas

1.) If Work under this Contract is required in high security areas, as may be designated as such by the Authority, the Contractor shall comply with certain security procedures while performing Work in such areas. The security procedures may require that the Contractor, subcontractors or materialmen performing Work in such areas be escorted to and from these areas by security personnel designated by the Authority. Further, the Contractor, subcontractors or materialmen may be required to be monitored by security personnel designated by the Authority while performing Work in certain high security areas.

2.) Prior to the start of Work at the construction site, the Contractor will be provided with a description of the high security areas from the Authority, which will be in effect on the date that Work commences. The description of high security areas may be changed at any time by the Authority during the duration of this Contract. The Contractor shall notify the Authority no less than twenty-four hours prior to the performance of any Work in a high security area. The Contractor shall conform to the security procedures as may be established by the Authority and the escorting and monitoring of workmen and materialmen hereunder.

The Authority may impose, increase, and/or upgrade security requirements for the Contractor, subcontractors and materialmen during the duration of this Contract to address changing security conditions and/or new governmental regulations. The Contractor will be compensated for changes to the security requirements as directed by the Engineer at the Net Cost of such Work. "Net Cost" shall be computed in the same manner as is compensation for Extra Work, including any percentage addition to cost, as set forth in the clause of the Form of Contract entitled "Compensation for Extra Work". Performance of such Net Cost Work shall be as directed by the Engineer and shall be subject to all provisions of the Contract relating to performance of Extra Work. Compensation for said Net Cost Work shall not be charged against the total amount of compensation authorized for Extra Work.

75. OPERATIONS OF OTHERS

During the time that the Contractor is performing the Contract, other persons will be engaged in other operations on or about the construction site including facility maintenace and operations all of which shall remain uninterrupted.

The Contractor shall so plan and conduct his operations as to work in harmony with others engaged at the construction site and not to delay, endanger or interfere with the operations of others (whether or not specifically mentioned above), all to the best interests of the Authority and the public and as may be directed by the Engineer.

76. LABOR ACTIONS

Whenever any labor strike, slowdown, work stoppage, picketing or other labor action which might interfere with the performance of the Contract, or of other Authority or PATH contracts or the operation of any Authority or PATH facility occurs at the construction site or at any other Authority or PATH facility as a result of the Contractor's (or its subcontractor's) utilization of particular means, methods or manpower to perform the Work required by the Contract, the Contractor shall pursue all remedies which are appropriate and available to him to avoid such interference.

77. CONTRACTOR'S MEETINGS

The Contractor shall conduct job progress and coordination meetings with subcontractors in his field office every two weeks, or as frequently as job conditions require or the Engineer may request. The Engineer shall be notified and, at his option, may attend these meetings. The Contractor shall prepare and distribute minutes to the Engineer and the subcontractors within forty-eight (48) hours of the day following the meetings.

The Contractor shall attend separate job progress and coordination meetings with the Engineer every two weeks, or at times otherwise requested by the Engineer.

78. CONTRACT DRAWINGS

The Contract Drawings which accompany and form a part of these Specifications bear the general title "The Port Authority of NY & NJ - Newark Liberty International Airport - EWR - Overnight Aircraft Parking - Contract EWR-153.226" and are separately numbered and entitled as follows:

G101	TITLE SHEET	General
G102	INDEX OF DRAWINGS, ABBREVIATIONS AND DRAWING CONVENTIONS	General
G103	NOTES - 1-	General
G104	NOTES - 2-	General

G105	NOTES - 3-	General
G106	LOCATION PLAN	General
C101	CIVIL LEGEND, ABBREVIATIONS AND NOTES	Civil
C201	EXISTING CONDITIONS PLAN	Civil
C202	CIVIL DEMOLITION PLAN	Civil
C301	ALIGNMENT AND PAVING PLAN -1-	Civil
C302	ALIGNMENT AND PAVING PLAN -2-	Civil
C401	GRADING AND UTILITY PLAN -1-	Civil
C402	GRADING AND UTILITY PLAN -2-	Civil
C501	DETAILS -1-	Civil
C502	DETAILS -2-	Civil
C503	DETAILS -3-	Civil
C504	DETAILS -4-	Civil
C505	DETAILS -5-	Civil
C506	DETAILS -6-	Civil
N001	SOIL EROSION AND SEDIMENT CONTROL PLAN	Environmental
N002	SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	Environmental
P101	NOTES, SYMBOLS, AND ABBREVIATIONS	Plumbing
P102	KEY PLAN	Plumbing
P103	BUILDING 340 NORTH REMOVALS AND INSTALLATION PLANS AND SECTIONS	Plumbing
P104	BUILDING 340 SOUTH REMOVALS AND INSTALLATION PLANS AND SECTIONS	Plumbing
P105	BUILDING 58 REMOVALS PLAN AND SECTIONS	Plumbing
P106	BUILDING 58 INSTALLATION PLAN AND SECTIONS	Plumbing
S101	BUILDING 14 PLAN	Structural
S102	BUILDING 14 SECTIONS	Structural
S103	BUILDING 95 PLAN	Structural
S104	BUILDING 95 SECTIONS	Structural
S105	BUILDING 332 PLAN	Structural
S106	BUILDING 332 SECTIONS	Structural
MT001	MAINTENANCE OF TRAFFIC NOTES, LEGEND, ABBREVIATIONS AND STANDARD DETAIL	Traffic
MT002	MAINTENANCE OF TRAFFIC BARRIER LAYOUT	Traffic
MT003	MAINTENANCE OF TRAFFIC STANDARD DETAILS	Traffic

E101	BUILDING 58 ELECTRICAL NOTES AND ABBREVIATIONS	Electrical
E102	BUILDING 58 TAMPER & LIMIT SWITCH INSTALLATION PLAN AND SECTIONS	Electrical
E201	GENERAL NOTES, LEGENDS, AND ABBREVIATIONS	Electrical
E202	SITE LIGHTING PLAN -1-	Electrical
E203	SITE LIGHTING PLAN -2-	Electrical
E204	OBSTRUCTION LIGHTING DETAILS -1-	Electrical
E205	OBSTRUCTION LIGHTING DETAILS -2-	Electrical
E206	OBSTRUCTION LIGHTING DETAILS -3-	Electrical
E207	PARKING LOT LIGHTING DETAILS -1-	Electrical
E208	PARKING LOT LIGHTING DETAILS -2-	Electrical
E209	PARKING LOT LIGHTING DETAILS -3-	Electrical
E210	PARKING LOT LIGHTING DETAILS -4-	Electrical
E211	SITE LIGHTING DETAILS -1-	Electrical
E212	SITE LIGHTING DETAILS -2-	Electrical
E213	LIGHTING POLE SCHEDULE	Electrical
ES001	LEGEND, ABBREVIATIONS, GENERAL NOTES AND REMOVAL NOTES	Electrical - Electronics
ES002	BLOCK DIAGRAM ELECTRIC SYSTEMS	Electrical - Electronics
ES003	FIRST FLOOR PLAN BUILDING 14 REMOVALS	Electrical - Electronics
ES004	ROOF PLAN BUILDING 14 REMOVALS	Electrical - Electronics
ES005	FIRST FLOOR PLAN BUILDING 95 REMOVALS	Electrical - Electronics
ES006	FIRST FLOOR PLAN BUILDING 332 REMOVALS	Electrical - Electronics
ES007	PART PLANS BUILDING 95 AND BUILDING 332 COMMUNICATION ROOM	Electrical - Electronics
ES008	ELEVATIONS	Electrical - Electronics

The Contract Drawings do not show all of the details of the Work and are intended only to illustrate the character and extent of the Work to be performed. Accordingly, they may be supplemented during the performance of the Work by the Engineer or by the Contractor subject to the approval of the Engineer, to the extent necessary to further illustrate the Work.

An indication on the Contract Drawings of the existence, nature or location of any utilities, structures, obstructions, conditions or materials does not constitute a representation as to the conclusions to be drawn therefrom nor a representation that no others exist in addition to those shown, even in the same location; nor does the absence of any indication on said drawings of the existence, nature or location of any utilities, structures, obstructions, conditions or materials constitute a representation that none exist.

After the Contract has been executed, the Contractor will be furnished six (6) copies of the Specifications and Contract Drawings without charge.

79. REFERENCE DOCUMENTS

The following drawings, called Reference Drawings, were not prepared by the Authority or by others for use in connection with this Contract, but they were prepared for other purposes, such as for other contracts or for design purposes for this or other contracts, and are furnished to the Contractor to give him such information as may be in the possession of the Authority. Said drawings are as follows:

A. Contract Drawings bearing the general title "NEWARK AIRPORT HANGAR No. 14 – SUPERSTRUCTURE, CONTRACT NA-380.003" which are separately numbered and entitled as follows:

DRAWING	TITLE
201	GRADE BEAM DETAILS & LEAN-TO FLOOR SLAB
202	SECOND FLOOR SLAB DETAILS
203	HANGAR FLOOR DETAILS
204	LEAN-TO FLOOR SLAB DETAILS & MISCELLANEOUS DETAILS
205	UNDERGROUND TANKS AND DETAILS
206	MISC. STEEL DETAILS
301	1ST FLOOR PLAN MECHANICAL HEATING & VENTILATING
302	2ND FLOOR PLAN MECHANICAL HEATING & VENTILATING
303	BOILER ROOM PLAN & DETAILS
304	MISCELLANEOUS DETAILS

B. Contract Drawings bearing the general title "NEWARK AIRPORT HANGAR No. 14 – SUPERSTRUCTURE, CONTRACT NA-380.007" which are separately numbered and entitled as follows:

DRAWING	TITLE
1	PILES AND PILE CAPS STEEL PILES AND CAPS
R1	PILES AND PILE CAPS REVISED PILE CAP LAYOUT
2	PILES AND PILE CAPS TIMBER PILES AND CAPS

C. Contract Drawings bearing the general title "UNITED AIRLINES NEWARK CARGO 1999 Newark International Airport, Newark NJ – AIR CARGO FACILITY – Contract Number N-2707" which are separately numbered and entitled as follows:

DRAWING	TITLE
R22907	STRUCTURAL
R31083	STRUCTURAL
S-1	STRUCTURAL FOUNDATION PLAN PART 1
S-2	STRUCTURAL FOUNDATION PLAN PART 2
S-3	MEZZANINE FLOOR/LOW ROOF FRAMING PLAN
S-4	HIGH ROOF FRAMING PLAN
S-5	FOUNDATION DETAILS & SECTIONS
S-6	COLUMN SCHEDULE GENERAL NOTES TYPICAL DETAILS
S-7	SUPERSTRUCTURE DETAILS
H-2	CARGO AREA HVAC PLAN – AREA 1
H-3	CARGO AREA HVAC PLAN – AREA 2
H-4	FIRST FLOOR AND MEZZANINE PLANS
H-5	HVAC SCHEDULES
D.	INSPECTION REPORT FOR ASBESTOS CONTAINING MATERIALS, LEAD CONTAINING PAINT AND UNIVERSAL/REGULATED MATERIALS PERFORMED AT HANGAR14", ATC ASSOCIATES, REVISED DECEMBER 21, 2012.
E.	INSPECTION REPORT FOR ASBESTOS CONTAINING MATERIALS, LEAD CONTAINING PAINT AND UNIVERSAL/REGULATED MATERIALS PERFORMED AT BUILDING 95", ATC ASSOCIATES, REVISED DECEMBER 21, 2012.
F.	INSPECTION REPORT FOR ASBESTOS CONTAINING MATERIALS, LEAD CONTAINING PAINT AND UNIVERSAL/REGULATED MATERIALS PERFORMED AT BUILDING 332", ATC ASSOCIATES, REVISED DECEMBER 21, 2012.
G.	USEPA REGISTRATION FOR PCB TRANSFORMER SERIAL # 67769.
H.	PIPING & INSTRUMENTATION DIAGRAM "THE AFRICAN QUEEN" KENETT CORPORATION, APEX ENVIRONMENTAL .

An indication on the Reference Drawings of the existence, nature or location of any utilities, structures, obstructions, conditions or materials does not constitute a representation as to the conclusions to be drawn there from nor a representation that no others exist in addition to those shown, even in the same location; nor does the absence of any indication on said drawings of the existence, nature or location of any utilities, structures, obstructions, conditions or materials constitute a representation that none exist.

80. SHOP DRAWINGS, CATALOG CUTS AND SAMPLES

The Contractor shall specifically prepare for this Contract all Shop Drawings which may be required in addition to the Contract Drawings or in addition to any other drawings which the Engineer may issue in supplementing the Contract Drawings.

The specific requirements elsewhere set forth in the Specifications for furnishing Shop Drawings, Catalog Cuts and samples for any particular portion of the Contract shall not limit the obligation of the Contractor to furnish Shop Drawings, Catalog Cuts and samples for any other portion when so required by the Engineer.

The Contractor shall submit a general "Submittal Schedule" for the Engineer's review and approval listing the planned transmittal date and estimated number in each specification section category of Shop Drawings, Catalog Cuts, pages of calculations and samples within 30 days after receipt by the Contractor of the acceptance of the Proposal. A more detailed schedule shall be submitted no less than 30 calendar days prior to the actual date of any submittal.

After checking and verifying all field measurements and after complying with applicable procedures specified hereunder, the Contractor shall submit to the Engineer for review and approval, in accordance with the approved schedule of Shop Drawing submissions, or for other action if so indicated by the Engineer, six copies, unless otherwise requested, of all Shop Drawings which will bear a specific written indication that the Contractor has reviewed the submission for conformance to the requirements of the Contract Drawings and Specifications.

The Authority uses Oracle Primavera Contract Management (formerly known as Expedition) software to track the status of Submittals provided by the Contractor. In order to facilitate this electronic tracking, the Contractor shall use the transmittal form that is provided at the pre-construction meeting, and shall forward it to the Engineer via a MAPI compliant e-mail system (e.g., Microsoft Outlook, CC mail, Lotus notes, etc.).

The Contractor's transmittals of Submittal data shall fully comply with the numbering and naming conventions and other procedures that will be provided by the Engineer to the Contractor at the pre-construction meeting.

All submissions shall contain specific reference to the contract drawing and technical specification section to which they apply, as indicated below or as otherwise identified, as the Engineer may require. In general, submissions shall specifically reference Contract Drawing numbers or Specification section numbers for which the item pertains. The data shown on the Shop Drawings shall be complete with respect to quantities, dimensions, conformance to the specified performance and design criteria, materials, test results and similar information to enable the Engineer to review the submittal as required.

The Contractor shall also submit six copies to the Engineer for review and approval pursuant to the approved submittal schedule, of all Catalog Cuts and samples for conformance to the requirements of the Contract Drawings and Specifications. All Catalog Cuts and samples shall have been reviewed by the Contractor and shall be accompanied by a specific written indication that the Contractor has reviewed the submittal for conformance with the Contract Drawings and Specifications and shall be identified clearly as to material, supplier, manufacturer's procedures and pertinent data such as catalog numbers and the use for which intended.

Before submission of each Shop Drawing, Catalog Cut and sample, the Contractor shall have determined and verified all quantities, dimensions, conformance to the specified performance and design criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed and coordinated each Shop Drawing or Catalog Cut with other Shop Drawings and Catalog Cuts and with other requirements of the Work.

At the time of each submission, the Contractor shall give the Engineer specific written notice of each variation in any Shop Drawing, Catalog Cut and sample from the requirements of the Contract Drawings or Specifications and, in addition, shall cause a specific notation of each such variation to be made on each submittal to the Engineer, for review and approval of each such variation.

The Engineer's review and approval of Shop Drawings, Catalog Cuts or samples shall not relieve the Contractor from responsibility for any variation from the requirements of the Contract Drawings or Specifications unless the Contractor has in writing called the Engineer's attention to each such variation at the time of submission as required hereunder and the Chief Engineer has given written approval of each by an express specific written notation thereof incorporated in or accompanying the Shop Drawing, Catalog Cut or sample approval. Approval of Shop Drawings, Catalog Cuts and samples which are inconsistent with the requirements of the Contract Drawings and Specifications shall not be deemed to waive or change such requirements or to relieve the Contractor of his obligations to perform such requirements unless the Chief Engineer shall expressly and specifically state that he is waiving or changing such requirements, as stated above.

Where a Shop Drawing, Catalog Cut or sample is required no related Work shall be performed prior to the Engineer's review and approval of the submission.

The format for Shop Drawings prepared by the Contractor shall be as follows: Standard "D" size drawings with outside cut line dimensions of 22 inches by 34 inches and showing in detail all dimensions and description of materials. Two borders shall be drawn. The first shall be drawn one-half inch from the outside edges (top, bottom, left and right). The second shall be drawn inward to the drawing, one-half inch from the top, bottom and right border lines and one and one-half inch from the left border line. The inside borders on these drawings shall be 20 inches by 31 inches. A title block shall be shown on the right side of the drawing adjacent to the inside border identifying the Contractor's Name, Contract Title, Contract Number, cross-referenced Contract drawing number, Specification reference number and related paragraph and applicable signatures. These drawings shall be arranged in systematic order and numbered consecutively.

Upon receipt of the submittal, the Engineer will review the Shop Drawing, Catalog Cut or sample for conformance to the design information and materials shown on the Contract Drawings and contained in the Specifications. Approval by the Engineer shall not constitute a complete review or approval of the means, methods, techniques, sequences or procedures of construction, except where a specific means, method, technique, sequence or procedure of construction is specifically delineated in or required by the Contract Drawings or Specifications, and the approval shall not constitute a review and approval in regard to safety precautions or programs incident thereto. The review and approval of a separate item will not in itself indicate approval of the assembly in which the item functions. Any design shown on the Shop Drawings and prepared by the Contractor, his subcontractors, their detailers, or their professional engineers is the complete responsibility of the Contractor.

Within the number of working days hereinafter specified after receipt of the Shop Drawing prints, the Engineer shall approve or not approve the same or require corrections or additions to be made thereon. When a shop drawing is not approved or if additions or corrections are required, the Engineer shall return within this period one of the six copies submitted and the Contractor shall make the revisions, corrections or additions shown thereon to be made. The Contractor shall resubmit six prints showing the drawing corrected as required. The Contractor shall direct specific attention in writing to revisions other than the corrections called for by the Engineer on the previous submittal. Each drawing shall be corrected as required until the approval of the Engineer is obtained. After each resubmission, the Engineer shall have the number of working days hereinafter specified in which to approve revisions or corrections.

The number of working days within which the Engineer will advise the Contractor as to whether the Shop Drawings are approved, not approved, or require corrections or additions to be made thereto shall be as follows, except that 20 working days shall be required for the Engineer to review shop drawings submitted with design calculations.

No. of Dwgs. Submitted Within 5 Consecutive Working Days for Each Discipline(*)	No. of Working Days for Engineer to Review Shop Drawings
Up to 50	10
51 to 75	15
More than 75	20
* Disciplines shall be defined as follows: Structural, Architectural, Civil, Geotechnical, Mechanical, Electrical, Traffic and Environmental.	

Failure of the Contractor to provide 30 calendar days advance notice to the Engineer of any submittal shall result in a five (5) working day extension of the number of working days stated in the chart above. In no event shall an extension of the Engineer's review time provided for in this section relieve the Contractor from its duty to meet all contractual Milestone dates.

After approval has been given to any Shop Drawing or Catalog Cut no change will be permitted thereon unless approved in writing by the Engineer.

Before final payment for the Work is made, the Contractor shall submit to the Engineer only those previously approved or approved as noted Shop Drawings, which have been revised by field changes.

The Contractor shall mark-up the approved and approved as noted Shop Drawings directing specific attention to revisions reflecting the permanent construction as actually made. In accordance with the requirements specified in this numbered Section, the Contractor shall submit one original print of these drawings, marked "FINAL SHOP DRAWING – NOT FOR REVIEW", dated, and signed by the Contractor to the Engineer for verification. By signature, the Contractor is verifying that the drawing reflects the as-constructed condition.

All drawings, data, calculations and other papers of any type whatsoever, whether in the form of writing, figures or delineations, which are prepared in connection with this Contract and submitted to the Authority shall become the property of the Authority. The Authority shall have the non-exclusive right to use or permit the use of all such drawings, data and other papers and any ideas or methods represented thereby for any purpose and at any time without additional compensation. No such papers shall be deemed to have been given in confidence. Any statement or legend to the contrary in connection with such drawings, data or other papers and in conflict with the provisions of this paragraph shall be void and of no effect.

81. SUBSTITUTION

Where a proprietary item or make is specified or mentioned herein or called for or mentioned on the Contract Drawings and the phrases "similar and equal to" or "approved equal" are used in connection therewith, the utilization of any other item or make will be deemed a substitution. Substitution for the proprietary item or make specifically named may be made only in accordance with the Section hereof entitled "Workmanship and Materials" and in accordance with the following.

Whenever materials or equipment are specified or described in the Contract Drawings or Specifications by using the name of a proprietary item or the name of a particular supplier, the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of another supplier or manufacturer may be accepted by the Engineer if sufficient information and proof is submitted by the Contractor to permit the Engineer to determine that the material or equipment proposed is equivalent or equal to that named and the Engineer approves the substitution. The procedure for review by the Engineer will include the following. Requests for review of substitute items of material and equipment will not be accepted by the Engineer from anyone other than the Contractor. If the Contractor wishes to furnish or use a substitute item of material or equipment, the Contractor shall make a timely written application to the Engineer for approval thereof, certifying that the proposed substitution will perform at least the identical functions and achieve at least the identical results called for by the specified product and otherwise be equal to the specified product with regard to, but not limited to, durability, maintenance, strength, energy costs and record of proven performance. The application shall state that the evaluation and approval of the proposed substitution shall not delay the Contractor's completion of the Work as required by the Contract, whether or not approval of the substitution will require a change in the construction and, in no event will the Contractor be granted an extension of time for completion of any portion of the Work for reasons related directly or indirectly to the evaluation of the proposed substitution or to the proposed substitution itself. Any variations of the proposed substitution from that specified shall be identified in the application, and maintenance, repair and replacement services for the substitution shall be indicated. The Engineer may require the Contractor to furnish at the Contractor's expense additional laboratory test data concerning the proposed substitution.

Such submission to the Engineer shall be made only by including the requested substitution in the list of materials required to be submitted to the Engineer in accordance with the Section hereof entitled "Inspections and Rejections" within forty-five calendar days after the receipt of the acceptance of the Contractor's Proposal. After the approval of said list, no substitutions will be permitted, except that a brand or make named in the Specifications may be submitted for approval in lieu of a brand or make on said list. Any such submission shall not imply, or impose on the Engineer, any obligation whatsoever to discuss, disclose or justify the reasons for his opinion, approval, acceptance or rejection.

The Engineer shall be the sole judge of as to whether a proposed substitution will be approved, and no substitution shall be ordered or utilized without the Engineer's prior written approval. The Engineer may require Contractor to furnish at Contractor's expense a special performance guarantee or other assurance with respect to any approved substitution. Furthermore, the approval of any substitute proprietary item or make shall not in any way entitle the Contractor to additional compensation therefor.

Notwithstanding such approval, however, the Contractor assumes the risk that such approved substitute item or make is not equal to that shown or specified and if at any time the substitution shall appear not to be so equal he shall replace the substitution with that originally shown on the Contract Drawings or called for in the Specifications at his own cost and reimburse the Authority for any loss occurring on account of the substitution failing to be equal, notwithstanding that it had been previously approved for use by the Engineer.

The construction called for by the Contract Drawings and Specifications may be adapted for a particular proprietary item or make of material or equipment. Therefore, if any construction not required by the Contract Drawings or Specifications in their present form is necessary or desirable because of the use of substitute item or make of material or equipment (even though such other item or make is approved by the Engineer), such construction shall be furnished or performed by the Contractor at his expense and subject to the approval of the Engineer.

82. WORKMANSHIP AND MATERIALS

Workmanship and materials shall in every respect be free from defects of any kind and shall be in accordance with the best modern practice and whenever the Contract Drawings, Specifications or directions of the Engineer admit of a doubt as to what is permissible or fail to note the quality of any construction the interpretation which calls for the best quality is to be followed. Workmanship shall conform to applicable Specifications, manufacturer's instructions and recommendations for installation of products for the applications shown on the Contract Drawings, all of which shall be subject to the provisions of the Section of Division 1 GENERAL PROVISIONS entitled "Inspections and Rejections".

Materials and Equipment incorporated into the Work shall be new except as may be otherwise herein specifically required, and shall comply with make, size, type and quality specified, or as specifically approved in writing by the Chief Engineer in accordance with the Section of Division 1 GENERAL PROVISIONS entitled "Substitution".

Reference to standards of any society, institution, association, or governmental authority in the Specifications or on the Contract Drawings, whether specific or by implication, shall mean for such standards which are part of the building code in effect for Work of this Contract, the edition date published in such code; and such references which are not part of the building code, shall mean the latest edition date in effect at the time of opening of Proposals upon the present Contract unless specifically stated otherwise.

In addition, various paragraphs of these Specifications may contain references to certain standard or tentative specifications or requirements of various organizations. Unless otherwise stated, these references are to be construed as referring to the specifications and requirements in effect on the date set for opening Proposals upon the present Contract.

If required by the Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment to be employed by the Contractor in performing the Work. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the approved instructions of the applicable supplier except as otherwise provided in the Contract Drawings or Specifications.

In case of a discrepancy between a description or requirement in the Contract Drawings and Specifications for any material or equipment and a catalog number or other designation for the same material or equipment (even though stated to be acceptable), the description or requirements shall control.

All inventions, ideas, designs and methods contained in the Specifications and Contract Drawings in which the Authority has or may acquire patent, copyright or other property rights are hereby expressly reserved for the exclusive use of the Authority. The Specifications and Contract Drawings contain confidential information which is disclosed only to enable this Contract to be performed. Said Specifications and Drawings must not be used for any purpose detrimental to the interest of the Authority and must not be produced or copied in whole or in part or used for furnishing information to others without the written consent of the Authority, provided, however, that the Contractor may, when the performance of the Contract so requires, furnish said information to others for the purpose of engaging or informing subcontractors and materialmen.

If, in accordance with this Contract, the Contractor furnishes research, development or consultative services in connection with the performance of the Contract and if in the course of such research, development or consultation patentable subject matter is produced by the Contractor, its officers, agents, employees, subcontractors or materialmen, the Authority shall have, without cost or expense to it, an irrevocable, non-exclusive, royalty-free license to make, have made, and use, either itself or by anyone on its behalf, such subject matter in connection with any activity now or hereafter engaged in or permitted by the Authority. Promptly upon request by the Authority, the Contractor shall furnish or obtain from the appropriate person a form of license satisfactory to the Authority, but as between the Contractor and the Authority the license herein provided for shall nevertheless arise for the benefit of the Authority immediately upon the production of said subject matter and shall not await formal exemplification in a written license agreement as provided for above. Such license may be transferred by the Authority to its successors, immediate or otherwise, in the operation or ownership of any real or personal property now or hereafter owned or operated by the Authority, but such license shall not be otherwise transferable.

The right to use all material, software, firmware, compositions of matter, manufactures, apparatus, appliances, processes of manufacture or types of construction required in connection with this Contract and to which a patent, copyright or other intellectual property right applies or may apply shall be obtained by the Contractor without separate or additional compensation whether the same is patented, copyrighted or otherwise protected as an intellectual property right before, during or after the performance of the Contract.

The Contractor shall indemnify the Authority against and save it harmless from all loss and expense incurred in the defense, settlement or satisfaction of any claims in the nature of patent, copyright or other intellectual property right infringement arising out of or in connection with the Authority use, in accordance with the preceding two paragraphs of this numbered Section, of such subject matter or material, software, firmware, compositions of matter, manufactures, apparatus, appliances, processes of manufacture or types of construction to which a patent, copyright or other intellectual property right applies or may apply. If requested by the Authority and if notified promptly in writing of any such claim, the Contractor shall conduct all negotiations with respect to and defend such claim without expense to the Authority. If the Authority be enjoined from using any of the facilities which form the subject matter of this Contract and as to which the Contractor is to indemnify the Authority against patent, copyright or other intellectual property right claims, the Authority may, at its option and without thereby limiting any other right it may have hereunder or at law or in equity, require the Contractor to supply, temporarily or permanently, facilities not subject to such injunction and not infringing any patent, copyright or other intellectual property right or to remove all such facilities and refund the cost thereof to the Authority or to take such steps as may be necessary to ensure compliance by the Authority with such injunction, all to the satisfaction of the Authority and all without cost or expense to the Authority.

83. INSPECTIONS AND REJECTIONS

All Work and all construction, processes of manufacture and methods of construction involved in or related to the performance of the Work shall be at all times and places subject to the inspection of the Engineer, acting personally or through his Inspectors, and the enumeration in these Specifications of particular portions of such Work, construction, processes of manufacture or methods of construction which will or may be inspected by the Engineer or such Inspectors shall not be deemed to imply that only such Work, construction, processes of manufacture and methods of construction will or may be so inspected. The Engineer shall be the judge of the quality and suitability of the Work, construction, processes of manufacture and methods of construction for the purposes for which they are used or to be used. Should they fail to meet his approval they shall be forthwith reconstructed, made good, replaced or corrected, as the case may be, by the Contractor at his own expense. Rejected material shall be removed immediately from the site. The fact that the Inspectors have approved the materials and workmanship shall not relieve the Contractor from his obligation to supply other material and workmanship when so ordered by the Engineer.

The Contractor, at his own expense, shall furnish such facilities and give such assistance for inspection as the Engineer may direct. In the case of materials required by the Specifications to be inspected in the factory or plant, and in the case of any other items which the Engineer may designate, the Contractor shall secure for the Engineer and his Inspectors free access to all parts of such factories or plants and shall furnish to the Engineer three copies of purchase orders, two copies of mill shipping statements and four copies of shipping statements. Moreover, in the case of such materials to be factory or plant inspected, the Contractor shall give at least ten days' notice to the Engineer of his intention to commence the manufacture or preparation of such materials.

Other than the materials and equipment specifically required to be inspected at the manufacturer's factory or plant, all materials will be inspected at the construction site and any portions thereof which are rejected by the Engineer shall be immediately removed from the construction site by the Contractor and shall be replaced with new materials by the Contractor at his own expense.

In the case of materials to be inspected at the construction site, the Contractor shall submit a list of all such materials in triplicate to the Engineer for his approval prior to ordering same. The list shall be submitted within forty-five calendar days after receipt of the notice of acceptance and shall contain the following information:

A. Classification of submittal in accordance with the following:

Class I - A submittal for record of an expressly specified item.

Class II - A submittal of an item which conforms to an express generic specification or a submittal which is deemed by the Contractor to be identical to an expressly specified item.

Class III - A submittal which is deemed by the Contractor to be functionally equivalent but not identical to a specified item.

B. In the case of Class II and Class III, the Contractor shall supply adequate information to the Engineer to enable the Engineer to compare the specified item and the proposed substitution. Information shall include, but need not be limited to, technical specifications, Catalog Cuts, drawings, references to existing installations and test data, or any other data required by the Engineer.

C. In the case of fabricated materials for which Shop Drawings are to be prepared, a brief description of the material and the statement "see Shop Drawings".

D. In the case of materials or equipment listed in manufacturer's catalogs, the list shall contain the vendor's name, the manufacturer's name, brand name, style designation, catalog number and, where the Specifications require catalog cuts, the statement "see catalog cut".

E. In the case of materials or equipment for which Shop Drawings are not to be prepared, and which are not listed in any catalog, the list shall contain a complete description of the material or equipment, which shall be in sufficient detail to describe completely the materials or equipment and quality therefor.

The Engineer shall advise the Contractor whether said list is approved or requires corrections or additions within the number of working days indicated in the chart below:

Type of Submittal	No. of Working Days for Engineer to Approve/Disapprove Items
Class I Material submittals	10
Portland Cement mix designs that require confirmation of the 28-day properties	35
Changes in asphalt mix designs that need to be confirmed with a batch mix at the plant	35
Class II Material submittals	20
Class III Material submittals	30

Failure of the Contractor to provide 30 calendar days advance notice to the Engineer of any submittal shall result in a five (5) working day extension of the number of days stated in the chart above. In no event shall an extension of the Engineer's review time provided for in this section relieve the Contractor from its duty to meet all contractual Milestone dates.

Within ten working days after receipt of said list, the Engineer shall notify the Contractor of which items are approved and which disapproved. Within two working days thereafter, the Contractor shall resubmit a new list covering those items which were disapproved. After each such re-submission the Engineer shall have a similar period of ten days in which to approve or disapprove.

Should materials or equipment be delivered to the construction site without having been placed on the aforementioned list and approved, it shall be immediately removed from the construction site by the Contractor at his own expense.

84. MANUFACTURERS' CERTIFICATION

Where materials and equipment are required by these Specifications to conform to certain standard or tentative specifications or requirements of any organizations, including American Society for Testing and Materials, American National Standards Institute, Association Rules for Grading Lumber, Federal Specifications, National Electrical Manufacturers Association, American Association of State Highway and Transportation Officials, American Water Works Association and the International Municipal Signal Association, the Contractor shall furnish to the Engineer the manufacturer's written certification that each of the materials or equipment conforms to the foregoing standard or tentative specifications. The certification shall be delivered to the Engineer prior to installation of the materials to which it refers. Such certifications shall not be binding or conclusive on the Authority and may be rejected at any time by the Engineer if incorrect, improper or otherwise unsatisfactory in his opinion.

85. NO RELEASE OF CONTRACTOR

Any provision of this Contract for testing, inspection or approval, and any actual testing, inspection or approval, of any materials, workmanship, plant, equipment, drawings, program, methods of procedure, or of any other thing done or furnished or proposed by the Contractor to be done or furnished in connection with the Contract is for the benefit of the Authority not the Contractor. Any approval of such things shall be construed merely to mean that at that time the Engineer knows of no good reason for objecting thereto. No such provision for testing or inspection, no omission of testing or inspection, and no such approval shall release the Contractor from his full responsibility for the accurate and complete performance of the Contract in accordance with the Contract Drawings and Specifications or from any duty, obligation or liability imposed upon him by the Contract or from responsibility for injuries to persons or damage to property.

86. ERRORS AND DISCREPANCIES

If, in the performance of the Contract, the Contractor discovers any errors or omissions in the Contract Drawings or Specifications, or in the marks, lines and elevations furnished by the Authority in the construction undertaken and executed by him, he shall immediately notify the Engineer and the Engineer shall promptly verify the same.

If with the knowledge of such error or omission and prior to the correction thereof, the Contractor proceeds with any construction affected thereby, he shall do so at his own risk and the construction so done shall not be considered as construction done under and in performance of this Contract unless and until approved and accepted.

87. DIFFERING SUBSURFACE CONDITIONS

If during the performance of Work, the Contractor becomes aware of any unanticipated subsurface conditions or has cause to suspect the presence of such condition, then the Contractor shall immediately notify the Engineer, or designee thereof verbally, to be followed immediately by written notification. The Contractor shall specify the nature, location, and impact on the Work of such conditions. The Contractor shall immediately stop Work in and secure the area against injury to persons or damage to property pending further instructions from the Engineer.

The Contractor shall then conduct all necessary investigations and testing of the subsurface conditions as directed by the Engineer to identify the character and extent of the unanticipated subsurface conditions and/or to satisfy applicable Federal, State and local laws, codes and ordinances and regulations and shall notify the Engineer accordingly. The investigation program shall be submitted to the Engineer for review and approval.

In the event the Contractor discovers such subsurface conditions during the performance of the Work and (i) special handling of such condition is necessary and required for the performance of the Work as determined by the Engineer; (ii) such special handling cannot be avoided or mitigated by the exercise of reasonable measures by the Contractor; and (iii) the Contractor actually incurs increased costs caused by such condition that could not have been reasonably anticipated from the Contract Drawings, Reference Drawings and Specifications and inspection of the construction site; then in such event, as approved by the Engineer, the Contractor shall, notwithstanding any provision in this Contract to the contrary, be compensated for such costs for special handling, including the necessary investigations and testing of subsurface conditions, in accordance with the provisions of the Form of Contract clause entitled "Compensation For Extra Work".

88. ACCIDENTS AND FIRST AID PROVISIONS

The Contractor shall promptly report in writing to the Engineer and to the Authority Manager, Claims Administration all accidents whatsoever arising out of or in connection with the performance of the Contract, whether on or adjacent to the construction site, which result in death, injuries or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damage is caused, the accident shall be reported immediately by telephone to both of the said representatives of the Authority.

The Contractor shall provide at the construction site such equipment and medical facilities as are necessary to supply first aid service, in case of accident, to any who may be injured in the progress of the Contract. He shall have standing arrangements for the removal and hospital treatment of any person who may be injured while engaged in the performance of the Contract.

If any claim is made by any third person against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the fact in writing to the aforementioned representatives of the Authority, giving full details of the claim.

89. SAFETY PROVISIONS

In the performance of the Contract, the Contractor shall exercise every precaution to prevent injury to workers and the public or damage to property.

He shall, at his own expense, provide temporary structures, place such watchmen, design and erect such barricades, fences and railings, give such warnings, display such lights, signals and signs, exercise such precaution against fire, adopt and enforce such rules and regulations, and take such other precautions as may be necessary, desirable or proper, or as may be directed.

The Contractor shall employ for Work of the Contract a competent person conforming to the requirements of the Code of Federal Regulations 29 CFR 1926.32(f) who shall be designated by the Contractor as authorized to perform the duties required by 29 CFR 1926 et seq. as applicable for Work of this Contract.

Obtain and submit to the Engineer one copy of material safety data sheet (MSDS) conforming to the requirements of 29 CFR 1910.1200(g) for each hazardous chemical utilized for permanent and consumable materials employed for Work of this Contract.

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss, including but not limited to:

A. All employees on the Work, the public, and other persons and entities who may be affected thereby;

B. All the Work, materials and equipment to be incorporated therein, whether in storage on or off the site; and

C. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and underground facilities not designated for removal, relocation or replacement in the course of construction.

The Contractor's duties and responsibilities for the safety and protection of the Work shall continue until such time as all the Work is completed and the Contractor has removed all workers, material and equipment from the construction site, or the issuance of the Certificate of Final Completion, whichever shall occur last.

Until fire protection needs are supplied by permanent facilities under this Contract, install and maintain temporary fire protection facilities. Comply with requirements of National Fire Protection Association NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alteration and Demolition Operations".

The Contractor shall employ only such men as are physically fit and are free from contagious or communicable diseases.

The Contractor shall use only machinery and equipment adapted to operate with the least possible noise, and shall so conduct his operations that annoyance to occupants of nearby property and the general public will be reduced to a minimum.

The bringing of intoxicating substances onto the construction site and the use or consumption of intoxicating substances at the construction site are prohibited. It shall be the responsibility of the Contractor to insure that all employees of the Contractor and of all subcontractors, materialmen and any other persons under contract to or under the control of the Contractor shall comply with the provisions of this paragraph.

The Contractor shall daily clean up all refuse, rubbish, scrap materials and debris caused by his operations, to the end that at all times the construction site shall present a neat, orderly and workmanlike appearance. Before the Certificate of Final Completion of Work will be issued, the Contractor shall remove all surplus materials, falsework, temporary fences and other temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his operations and shall put the construction site in a neat, orderly condition.

In the event the Contractor encounters at the construction site, material reasonably believed to be asbestos, polychlorinated biphenyl (PCB) or any other hazardous material not shown on the Contract Drawings or mentioned in the Specifications, the Contractor shall immediately stop Work in the area affected and report the condition in writing to the Engineer. Work in the affected area shall not thereafter be resumed by the Contractor except upon the issuance of a written order to that effect from the Engineer.

Within 15 days of the acceptance of his Proposal, the Contractor shall submit to the Engineer for review, the Contractor's Site Safety Program, which shall be specific for the construction site and include a description of the Work to be performed, a hazard assessment of the Work to be performed and the means by which such hazards shall be mitigated. The Contractor's Site Safety Program shall comply with all applicable federal, state, municipal and local and departmental laws and shall include, among other things, the designation by the Contractor of a qualified individual to administer such Site Safety Program.

90. DIESEL-POWERED EQUIPMENT

A. The Contractor and its subcontractors shall minimize all air-borne pollutants generated by diesel-powered equipment and vehicles at all times during the performance of this Contract in accordance with this numbered Section. The requirements herein apply to all land-based and barge-mounted diesel-powered construction equipment. Marine propulsion engines, marine auxiliary engines, and dredges used in construction activity are exempt from these requirements.

B. No diesel-powered equipment shall be brought on the construction site without meeting the following requirements unless a waiver has been granted as specified in D. below. In addition, all such equipment and engines shall comply with all Federal, state and local regulations applicable to exhaust emission controls and safety.

1.) Ultra Low Sulfur Diesel (ULSD) Fuel

All diesel-powered equipment to be used in the performance of the Work of this Contract shall use ULSD fuel with an average sulfur content of no more than 15 parts per million (ppm). This requirement applies to on-road and non-road diesel engines. The Engineer may collect samples of the ULSD fuel directly from the fuel tanks of the diesel-powered equipment used on the construction site in order to verify that sulfur concentrations do not exceed 15 ppm. Diesel-powered equipment not using ULSD shall be removed from the construction site or shall immediately comply with the ULSD fuel requirements in this Section as directed by the Engineer and at no additional cost to the Authority.

2.) Emissions Control Devices – Best Available Technology (BAT)

All non-road diesel-powered equipment with a rated horsepower of 50 horse power (hp) or greater and active on the construction site for any portion of a 24-hour workday for more than 20 total consecutive and non-consecutive days shall be retrofitted with Emissions Control Devices (Devices) utilizing the best available technology (BAT). The Devices shall consist of Diesel Particulate Filters (DPFs) or other measures with equivalent particulate matter (PM) removal efficiency, wherever the implementation of such a Device is feasible in the opinion of the Engineer. For non-road diesel-powered equipment rated between 50 hp and 75 hp, Diesel Oxidation Catalysts (DOCs) may be used in place of DPFs.

Both active and passive filter regeneration mechanisms shall be considered for DPFs. In cases where DPFs are not feasible for safety considerations, mechanical reasons, or where the technology would not function properly, the Contractor shall submit a request for a waiver to the Engineer for review and approval prior to the use of such diesel-powered equipment. If the Engineer grants a waiver under these circumstances, then the Contractor shall retrofit the diesel-powered equipment with Flow Through Filters (FTF) if feasible in the opinion of the Engineer. DOCs shall be used in place of DPFs or FTFs unless it is proven to the Engineer by the Contractor that the application of this type of technology is also technically infeasible.

The use of diesel-powered engines greater than 50 hp without tailpipe reduction measures will be permitted pursuant to the Engineer's approval of a written request for a waiver submitted by the Contractor in accordance with D. below.

The use of Devices shall be targeted primarily toward the reduction of PM and secondarily to the reduction of nitrogen oxides (NOX), and shall in no event result in an increase in the emissions of either pollutant. The Devices of best available technology shall be defined as those that are contained in the U.S. Environmental Protection Agency (EPA) Verified Retrofit Technology List, the list of California Air Resources Board (CARB), Verifications, Europe's Verified Technology List (VERT), or as otherwise approved by the Engineer to provide the maximal level of pollutant reductions intended by this Section. For more information, refer to the following websites:

U.S. Environmental Protection Agency Verified Technology List:
http://www.epa.gov/otaq/retrofit/nonroad-list.htm

California Air Resources Board Verified Technology List:
http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm

Europe's Verified Technology List:
http://www.akpf.org/pub/vert_filterliste.pdf

3.) Diesel Construction Equipment Age Requirements

To facilitate the application of verified Emission Control Devices, as well as provide lower baseline emissions, Tier 0 engines shall not be used in the performance of this Contract unless they have been upgraded to Tier 1 and then retrofitted with best available technology devices. As determined by the Engineer, exceptions will be made only for specific engines that are not readily upgraded to Tier 1, and where the Work of this Contract cannot reasonably be performed using alternative engines that comply with this Section. In such cases, the Contractor shall submit a written request for a waiver to the Engineer for review and approval prior to bringing such equipment onto the construction site.

4.) Diesel Engine Idling Policy

The idling time of non-road and on-road vehicles shall be limited to three (3) consecutive minutes as determined by the Engineer with the following exceptions:

a. An on-road or non-road vehicle is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control, or is in queue when engaged in an active operation with other equipment.

b. It is necessary to operate defrosting, heating, or cooling equipment to ensure the safety or health of the driver or passengers.

c. To ensure the safe and proper operation of auxiliary equipment that is located in or on the vehicle, to accomplish the intended use of the vehicle or equipment, but only to the extent so necessary (for example - cranes and concrete mixers).

d. To bring the vehicle to the manufacturer's recommended operating temperature, but only to the extent so necessary.

e. The outdoor ambient temperature is below twenty (20) degrees Fahrenheit.

f. A vehicle is being actively worked on for repairs or maintenance and engine idling is necessary to effectuate such repairs or maintenance.

5.) Electrification

Where electric power is distributed to and available throughout a construction site, electrically powered equipment shall be preferred over diesel-powered versions of that equipment.

C. Submittals:

The Contractor shall submit to the Engineer for review and approval an inventory list for all non-road diesel equipment and engines, and verified Emissions Control Devices. No Work shall commence utilizing diesel-powered non-road equipment rated at 50 hp or greater until the Contractor submits a comprehensive and complete inventory list inclusive of all such equipment, including the specifics of each as detailed below, and same is approved by the Engineer.

1.) The inventory list shall be provided in an electronic format (e.g., Microsoft Word, Access or Excel), and shall include the following:

a. Contract number and title.

b. Owner of equipment's name, address, telephone number and contact person familiar with the operation and maintenance of the equipment and the emission control technologies; whether owner is the Contractor, subcontractor or rental firm.

c. Dates that equipment is anticipated to arrive at and depart from the site.

d. Number, type, make, year of manufacture, manufacturer and serial number.

e. Engine type, tier level, make, horsepower rating, year of manufacture, and serial number.

f. Approximate fuel consumption rate per shift.

g. Anticipated function, duration of use, and days and hours of operation.

h. Retrofit type, make, model, manufacturer, installation date, EPA, VERT or CARB verification number or supporting documentation related to emission control devices.

i. Previous acceptance or waivers granted by the Authority, or the City of New York, or the Metropolitan Transportation Authority, or another public agency that issued a waiver under the same or substantially the same standards.

2.) On-Going Equipment Updates:

Whenever a new or additional piece of diesel-powered non-road equipment is required to complete the Work of this Contract, the Contractor shall submit to the Engineer an update of the equipment inventory list. These updates shall include the actual dates the equipment arrives and departs from the site.

D. Waivers:

The Contractor shall submit a written request for a waiver to the Engineer for review and approval prior to bringing equipment that does not conform to the above requirements onto the construction site. The Contractor shall demonstrate due diligence by providing written documentation of efforts to comply with this Section. For waivers based upon the unavailability of retrofit devices for certain equipment, the Contractor will generally be required to provide written documentation from more than one vendor or supplier of retrofit devices to satisfy this requirement. Waiver requests related to the use of DPFs shall take into consideration actively regenerating filters for equipment with low temperature profiles that typically preclude the application of passively regenerating filtration systems.

Equipment retrofitted with an approved device in connection with another construction contract of the Authority, or the City of New York, or the Metropolitan Transportation Authority is exempt from further retrofitting for three (3) years from the date the retrofit was approved, even if new BAT retrofit devices are available. The Contractor shall submit to the Engineer documentation of approval of a retrofit device by the Authority, or the City of New York, or the Metropolitan Transportation Authority, or another public agency that issued a waiver under the same or substantially the same standards for the equipment in question. In addition, if the Authority, or the City of New York, or the Metropolitan Transportation Authority, another public agency that issued a waiver under the same or substantially the same standards previously waived a requirement contained in this Section for a particular piece of equipment, that equipment shall be exempt from the requirement for three (3) years from the date the initial waiver was granted.

1.) In responding to waiver requests, the following conditions will be taken into consideration with applicable documentation:

a. A BAT retrofit device would pose a safety hazard or impair operator visibility; or

b. A BAT retrofit device would void the engine warranty; or

c. A BAT retrofit device cannot be used for mechanical reasons; or

d. A BAT retrofit device or the engine would not function properly if the BAT retrofit device were installed; or

e. A Tier 0 engine is not readily upgraded to Tier 1, and where the task cannot be reasonably accomplished using alternative engines that do comply with this Section; or

f. The furnishing and installation of a BAT retrofit is more than 30 percent of the fair market value of the construction equipment; or

g. The Authority, or the City of New York, or the Metropolitan Transportation Authority, or another public agency that issued a waiver under the same or substantially the same standards previously approved a BAT retrofit device for the equipment in question. Such approval is valid for three years from the date it was issued; or

h. The Authority, or the City of New York, or the Metropolitan Transportation Authority, or another public agency that issued a waiver under the same or substantially the same standards previously granted a waiver for the equipment in question. Such waiver is valid for three years from the date it was issued.

In addition, the Engineer may, in his or her discretion, grant a waiver based upon excessive costs to satisfy the requirements of this Section, undue burden on the Contractor, marginal benefits, or other relevant factors, provided adequate supporting documentation is submitted by the Contractor.

2.) Waiver requests shall include the following:

a. Name of contractor applying for the waiver.

b. Contract number and title.

c. Owner of equipment's name, address, telephone number and contact person familiar with the operation and maintenance of the equipment and the emission control technologies, whether owner is the Contractor, subcontractor or rental firm.

d. Number, type, make, year of manufacture, manufacturer and serial number.

e. Engine type, make, horsepower rating, year of manufacture, and serial number.

f. Approximate fuel consumption rate per shift.

g. Anticipated function, duration of use, and days and hours of operation.

h. Technical explanation of safety hazard, mechanical constraint, warranty, limited availability, or functionality issues cited as basis for waiver.

i. Written documentation from retrofit device manufacturers, engine manufacturers, or rental companies, as appropriate, supporting the stated reasons for the waiver; for waivers based upon the unavailability of a retrofit device for specified equipment, the Contractor shall provide documents from more than one supplier.

j. If applicable, documentation of previous BAT retrofit approvals granted by the Authority, or the City of New York, or the Metropolitan Transportation Authority, or another public agency that issued a waiver under the same or substantially the same standards for the equipment in question.

k. If applicable, documentation of previous waivers granted by the Authority, or the City of New York, or the Metropolitan Transportation Authority, or another public agency that issued a waiver under the same or substantially the same standards for the equipment in question.

3.) Review of Waiver Application

The Engineer will make a determination whether to approve the Waiver Request no later than 10 days after its receipt.

91. DAILY PROGRESS, EQUIPMENT AND LABOR REPORTS

The Contractor shall furnish to the Engineer at the end of each day Work is performed at the construction site, a memorandum showing for that day (a) the construction performed, (b) the type of equipment used identifying each piece of equipment as owned by the Contractor or rented from others; (c) a statement of any unusual happening that occurred, and (d) the names and number of workers in each trade classification that were employed. Such memorandum shall not be deemed to be a substitute for the notices, time slips, memoranda or other data required under the clauses of the Form of Contract relating to compensation for Extra Work, nor shall such memorandum be deemed to be a substitute for the daily log required by the Section(s) of the Specifications pertaining to asbestos removal.

92. LAWS AND ORDINANCES

In order to effectuate the policy of the Authority, the Contractor shall comply with all provisions of federal, state, municipal, local and departmental laws, ordinances, rules, regulations and orders which would affect the Contract and the performance thereof and those engaged therein if said Contract were being performed for a private corporation, except where stricter requirements are contained in the Specifications or Contract Drawings, in which event the latter requirements shall apply. However, the Contractor shall not apply for any permits, licenses or variances in the name of or on behalf of the Authority, but shall do so in his own name where required by law, regulation or order or by the immediately preceding sentence. Nor shall the Contractor apply for permits, licenses, or any variance in his own name without first obtaining the approval of the Authority.

The Contractor shall verify that employees performing Work under this Contract in the United States are legally present in the United States and authorized to work by means of the federally required I-9 program.

The Authority has applied/will apply for the following permit(s) in connection with this Contract in its own name:

A. Hudson-Essex-Passaic Soil Conservation District, Soil Erosion and Sediment Control Authorization

B. State of New Jersey Department of Environmental Protection, Authorization To Discarge 5G3 – Construction Activity Stormwater (GP)

The Contractor shall comply with all provisions of the said permit(s).

93. SIGNS

No advertisement or sign, other than the name and address of the Contractor, will be permitted on any fences, temporary structures or elsewhere on the construction site and such advertisement will be permitted only upon the condition that it is first approved by the Engineer. In any event, the advertisement shall not exceed six feet by eight feet in overall dimensions.

94. CONTRACTOR'S FIELD OFFICE AND REPRESENTATIVE

At a readily accessible point on or near the construction site, the Contractor shall maintain a field office provided with a telephone.

During the performance of any Work at the construction site, the Contractor shall have a representative thereat who shall be authorized by the Contractor to receive and put into effect promptly all orders, directions and instructions from the Engineer. The Contractor's representative shall be provided, at all times, with a conformed copy of this Contract and a set of the Contract Drawings.

Orders and directions may be given orally by the Engineer and shall be received and promptly obeyed by the Contractor or his representative or any superintendent, foreman or other employee of the Contractor who may have charge of the particular part of the Work in relation to which the orders or directions are given. A confirmation in writing of such orders or directions will be given by the Engineer when so requested by the Contractor.

95. SURVEYS

The Engineer will establish a bench mark and a base line at or adjacent to the location of the Contractor's operations. The Contractor shall perform all surveys which may be required for the performance of the Contract. He shall carefully preserve any base line and bench mark which may be established by the Engineer.

The Contractor shall, in addition, furnish to the Engineer, without additional compensation therefor, any or all information and data regarding points, lines, grades, elevations and other survey information established by the Contractor during the performance of the Contract.

Surveys and measurements of quantities for purposes of computing Contractor's compensation shall be made by the Contractor as directed by and in the presence of, or jointly with, the Engineer, at the Engineer's option. Computations of quantities for payment shall be made by the Contractor and shall be subject to the approval of the Engineer.

96. TEMPORARY STRUCTURES

Unless otherwise provided in this Contract, the Contractor shall determine the need for and shall design, furnish and construct all barricades, fences, staging, falsework, formwork, shoring, scaffolding and other temporary structures required in the performance of the Contract, whether or not of the type enumerated in the Specifications or on the Contract Drawings, including those which would be required by law or regulation if this Contract were being performed for a private corporation. All such temporary structures shall be of adequate strength for the purposes for which they are constructed and shall be provided with graphics, warning signs and warning lights as required to inform personnel and the public of the hazards being protected against, and the Contractor shall maintain them in satisfactory condition. The design and drawings for such structures shall be prepared by the Contractor utilizing a professional engineer licensed in the state where the structure will be constructed, and when requested by the Engineer they shall be submitted for his review before being used.

The Contractor shall ensure that each temporary structure is inspected by the professional engineer who designed the temporary structure prior to initial use and submit a schedule of periodic inspections to be performed by such professional engineer to the Engineer for review. The number of periodic inspections of temporary structures to be performed by the professional engineer shall be the minimum required by law or regulation if this Contract were being performed for a private corporation. The Contractor shall also submit a signed and sealed statement of inspection from the professional engineer performing the inspection of the temporary structure, including a statement of fitness for use for the intended purpose of the temporary structure, to the Engineer for review.

Neither such approval, however, nor any requirements of the Engineer, the Specifications or the Contract Drawings shall relieve the Contractor of his responsibility for the design, construction and use of the temporary structures or from any obligations and risks imposed on him under this Contract, and any such approval or requirements shall be deemed merely to relate to minimum standards and not to indicate that the temporary structures are adequate or that they meet the Contractor's obligations under this Contract.

Temporary structures shall be painted with an approved dark color paint and shall be repainted whenever necessary during the period that the Contract is being performed. Upon completion of all Work under this Contract, the temporary structures shall be removed from the construction site.

97. PERMIT AND REQUIREMENTS FOR WELDING

Prior to the commencement of any cutting or welding operations at the construction site, the Contractor shall notify the Engineer and obtain an Authority cutting and welding permit. The Authority will issue this permit without payment of a fee, and application forms may be obtained from any Resident Engineer of the Authority, at his office at the facility. Unless otherwise approved by the Engineer, all cutting and welding operations shall be performed in accordance with the conditions which form a part of said permit. The permit application must be filled out and submitted in duplicate to the Engineer at least forty-eight hours prior to commencing welding or cutting operations at the construction site.

98. FINAL INSPECTION

When, in the opinion of the Contractor, the construction is completed and ready for final inspection, he shall so notify the Engineer in writing and the Engineer will give said construction (including any portions with respect to which Certificates of Partial Completion have been issued) a minute and thorough inspection. Before any Certificate of Final Completion will be issued, any defects or omissions noted on this inspection must be corrected by the Contractor.

99. WARRANTIES

The Specifications may provide for certain warranties of portions of the permanent construction. These warranties are intended for the greater assurance of the Authority and not as a substitute for rights which the Authority might otherwise have. Although such warranties shall be enforceable as provided, neither any requirement of this Contract with respect to warranties by the Contractor nor any guarantee or warranty given to the Contractor or the Authority by any manufacturer shall be deemed to be a limitation upon any rights which the Authority would have, either expressed or implied, in the absence of such guarantees or warranties.

100. UTILITY DATA COLLECTION

In order to assist the Authority with the collection of as-built utility data, notify the Engineer within 48 hours prior to the covering of all underground structures, piping, conduit, cable or duct banks.

Do not build-in, backfill, fill over, around, or in any way cover underground structures, piping, conduit, cable or duct banks until given notice to proceed by the Engineer.

Nothing contained herein shall relieve the Contractor from performing the Work in accordance with the Contract Drawings and Specifications nor release the Contractor from any obligations under or upon this Contract.

101. TEMPORARY UTILITY SERVICES

Operate and maintain temporary services and facilities in a safe and efficient manner. Modify as required throughout progress of the Contract, and remove from Authority property when no longer required, or replaced by the use of completed permanent facilities as approved by the Engineer.

Make arrangements for securing, and pay all costs for heat, light, power, water, and other services which may be required for the performance of the Contract.

102. TEMPORARY SANITARY FACILITIES

Make arrangements for securing and pay all costs for temporary toilets, wash facilities and drinking water including toilet tissue, paper towels, paper cups and similar disposable materials for use by the Contractor, subcontractors, materialmen or other persons over whom the Contractor has control. Comply with regulations and health codes, which would be applicable if the Authority were a private corporation, for the type, number, location, operation and maintenance of fixtures and facilities. Install facilities where directed by the Engineer, and remove from Authority property when no longer required.

103. ASBESTOS COST SUMMARY SUBMITTAL

Upon satisfactory completion of asbestos removal Work under this Contract, submit a Summary of Asbestos Removal and Disposal Costs on the form bound herewith, with all spaces filled in without exception. Such summary shall include costs associated with the Work computed in accordance with the stipulations of the clauses contained in CHAPTER II of the Form of Contract.

For purposes of completing such Summary of Asbestos Removal and Disposal Costs, the specific locations of asbestos removal and disposal are:

104. LEAD COST SUMMARY SUBMITTAL

Upon satisfactory completion of lead removal Work, all as directed by the Engineer and in accordance with Work Orders issued by the Engineer under this Contract, submit a Summary of Lead Removal and Disposal Costs on the form bound herewith, with all spaces filled in without exception. Such summary shall include costs associated with the Work computed in accordance with the stipulations of the clauses contained in CHAPTER II of the Form of Contract.

The specific locations of lead removal and disposal will be as indicated on the Work Order(s) issued by the Engineer.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
SUMMARY OF ASBESTOS REMOVAL AND DISPOSAL COSTS
(FOR COMPLETED WORK)

CONTRACTOR _____ CONTRACT NO. EWR-153.226
DATE _____
FACILITY TITLE: NEWARK LIBERTY INTERNATIONAL AIRPORT
SPECIFIC LOCATION OF REMOVAL _____

	ASBESTOS CONTAINING MATERIALS[28]		
ITEM DESCRIPTION	Sprayed-on[29]	Pipe and Boiler Insulation[30]	Miscellaneous[31]
Removal[32]			
Encapsulation[33]			
Enclosures [34]			
Insurance[35]			
Replacement of Removed ACM[36]			
Clean up[37]			
On-site Monitoring of Abatement[38]			
Disposal of ACM[39]			
Purchase of Capital Equipment[40]			
Purchase of Protective Equipment[41]			
TOTALS:			

28 Where a particular type of asbestos containing material (ACM) is not present in the specific removal location described above, cross out ACM description and fill in NA (Not Applicable) for the associated description items.

29 Sprayed-on and trowelled-on fireproofing, acoustical plasters, simulated acoustical plasters, textures and other ACM such as those found on ceiling systems, fireproofing systems and structural steel.

30 Insulation or treatment on pipes, fittings, elbows, boilers, breachings, ducts, tanks or other mechanical equipment.

31 Specify as to type of material, i.e.; surface treatments such as floor and ceiling tiles, roofing materials, refractory insulation and structural insulation, electrical cable, asbestos cloth, "Transite" board, exterior siding/shingles, tape, roll board, brake shoes, or other asbestos containing items.

32 Include actual labor costs for removal of asbestos containing material.

33 Include actual labor costs for encapsulation of asbestos containing material.

34 Include actual labor costs for enclosure of asbestos containing material.

35 Include all premiums directly related to Work of this Contract only.

36 Include actual labor costs for re-insulating, re-wrapping with substitute material and actual material cost.

37 Include actual labor costs for, e.g., HEPA vacuuming, assembly of discarded materials and abated asbestos at Work site and preparation of materials for disposal.

38 Include actual costs of air monitoring and analysis.

39 Include actual costs for hauling and disposal in accordance with applicable Specification Sections.

40 Include actual costs for purchase of capital equipment, e.g., negative air pumps and tools, if directly related to this Contract.

41 Include actual costs for purchase of protective equipment, e.g., "Tyvek" suits, masks, HEPA filters, amended water, and plastic sheeting if directly related to this Contract.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
SUMMARY OF LEAD REMOVAL AND DISPOSAL COSTS
(FOR COMPLETED WORK)

CONTRACTOR _____ CONTRACT NO. EWR-153.226
DATE _____
FACILITY TITLE: NEWARK LIBERTY INTERNATIONAL AIRPORT _____
SPECIFIC LOCATION OF REMOVAL[42] _____

	LEAD CONTAINING MATERIALS (LCM)		
ITEM DESCRIPTION			
Removal[43]			
Encapsulation[44]			
Enclosures[45]			
Insurance[46]			
Replacement of Removed LCM[47]			
Clean up[48]			
On-site Monitoring of Abatement[49]			
Disposal of LCM[50]			
Purchase of Capital Equipment[51]			
Purchase of Protective Equipment[52]			
TOTALS:			

42 Summary tabulation shall only include the costs for the item descriptions specifically listed herein as applicable at the specific removal location described above. No information herein (whether supplied by the Authority or the Contractor) and no information deduced from information hereon, including quantities of materials or work, shall be deemed to vary, alter or modify any provision of the Contract, including provisions therein as to compensation and performance. The items of materials or work contained hereon shall not be deemed to be an exhaustive list of the items of materials or work required by the Contract Drawings and Specifications in their present form.

43 Include actual labor costs for removal of lead containing material.

44 Include actual labor costs for encapsulation of lead containing material.

45 Include actual labor costs for enclosure of lead containing material.

46 Include all premiums directly related to Work of this Contract only.

47 Include actual labor costs for repainting with substitute material and actual material cost.

48 Include actual labor costs for, e.g., HEPA vacuuming, assembly of discarded materials and abated lead at Work site and preparation of materials for disposal.

49 Include actual costs of air monitoring and analysis.

50 Include actual costs for hauling and disposal in accordance with applicable Specification Sections.

51 Include actual costs for purchase of capital equipment, e.g., negative air pumps and tools, if directly related to this Contract.

52 Include actual costs for purchase of protective equipment, e.g., "Tyvek" suits, masks, HEPA filters, amended water, and plastic sheeting if directly related to this Contract.

105. PROGRESS SCHEDULE

A. Schedule Requirements

1.) The Contractor shall, at his own expense, prepare, maintain and update detailed electronic progress schedules for the Engineer's review and approval. All submittals required herein shall be in the form and content stipulated in this Section. Each progress schedule shall bear the signature of the Contractor's authorized representative. The progress schedules/graphics required by this Contract shall be produced using the latest version of Oracle – Primavera P6 scheduling software.

2.) The schedule shall be prepared by a scheduler who is an employee of the Contractor with 3 (three) years minimum experience in the development and updating of Critical Path Method schedule networks for projects of a complexity comparable to this Contract, or by an outside entity with similar experience specializing in project controls. The Contractor's senior management personnel shall actively participate in the development and updating of the schedule.

3.) Progress schedules shall be sufficiently detailed to accurately depict all the Work and milestones (including acquisition of any required permits, design progress, procurement of subcontractors, key submittals and approvals, materials procurement and construction activities performed by the Contractor and his subcontractors) and shall graphically represent the logical sequence and duration of activities, all in accordance with the requirements of the Contract. The information provided in progress schedules shall also include, but not be limited to, the interdependencies between the Contractors' Activities and all other Activities required for the successful completion of the Contract, e.g., those to be performed by utility companies or by other entities. All Milestone dates specified in the Contract shall be represented in the schedule by Milestone activities that are logically interrelated to the Work that must be accomplished in order to achieve the Milestone.

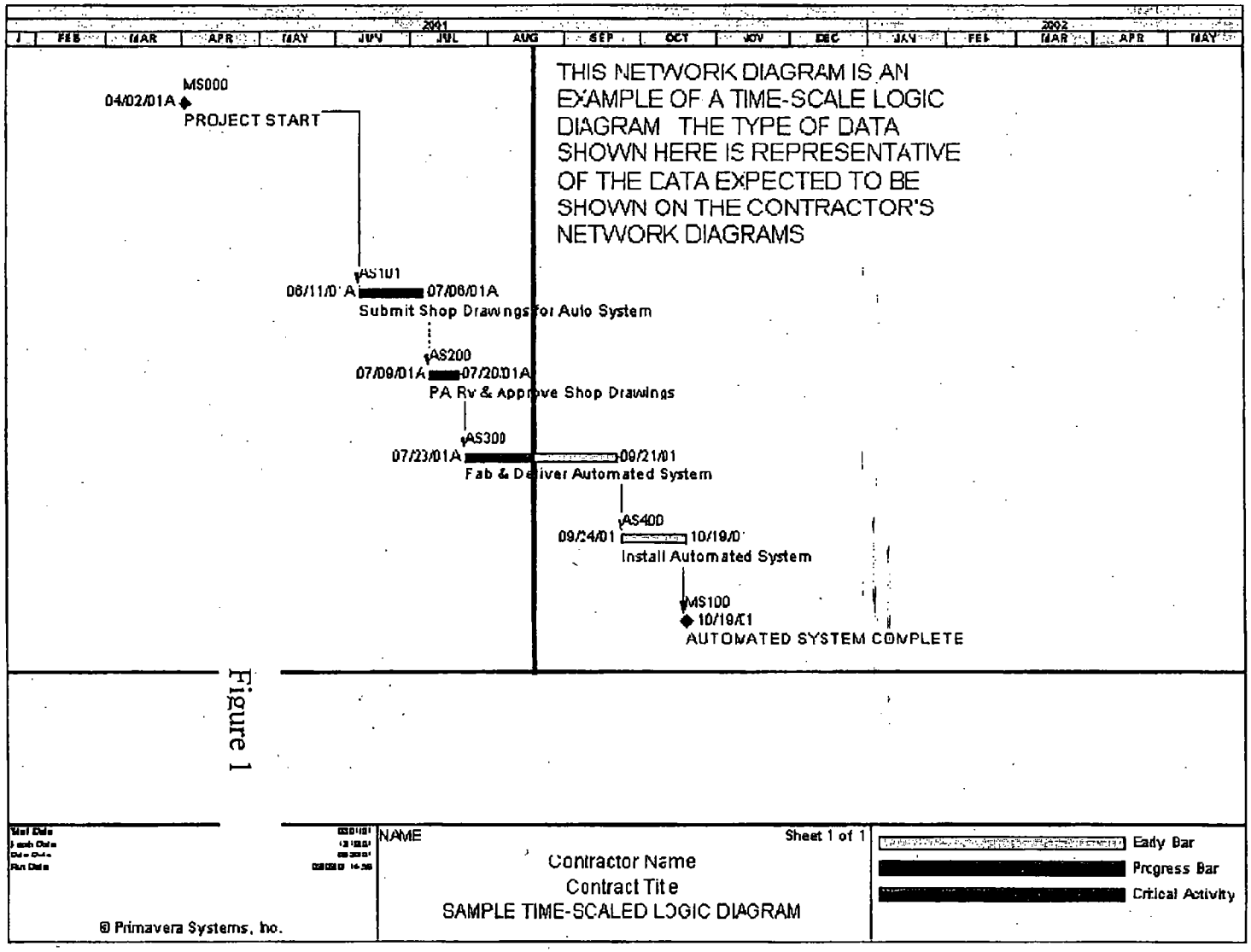
4.) All activities, except the Contract Start Milestone and Contract Completion Milestone shall be linked to predecessor(s) and successor(s).

5.) The Contractor's schedule shall incorporate the Activity Code Structure shown in Attachment A, and such other coding as may be required by the Engineer.

6.) The Contractor shall load construction activities with budget information and shall identify the cost to perform Work for each construction and management activity. The sum of the costs assigned to all activities shall be equal to the Contract value. No activity costs shall be assigned to the preparation and review of submittals and materials fabrication or procurement.

7.) To assist the Contractor in preparing its progress schedule, a sample Network Diagram is shown in Figure 1. The sample is intended merely as an example of a format for the Contractor's guidance. The types of data shown are the types of data expected to be shown on the Contractor's Network Diagram. However, the information presented in the sample Network Diagram shall not be misinterpreted as either representing a plan for the Contractor's Network Diagram or a depiction of the level of detail which will be required in such diagram.

8.) The submittal of Progress Schedules under this Section shall not be deemed to be a substitute for the reporting requirements of the Section of Division 1 entitled "Daily Progress, Equipment and Labor Reports".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AS200
07/09/01A
07/20/01A
PA Rv & Approve Shop Drawings
AS300
07/23/01A
09/21/01
Fab & Deliver Automated System
AS400
09/24/01
10/19/01
Install Automated System
MS100
10/19/01
AUTOMATED SYSTEM COMPLETE
THIS NETWORK DIAGRAM IS AN EXAMPLE OF A TIME-SCALE LOGIC DIAGRAM THE TYPE OF DATA SHOWN HERE IS REPRESENTATIVE OF THE DATA EXPECTED TO BE SHOWN ON THE CONTRACTOR'S NETWORK DIAGRAMS
© Primavera Systems, Inc.
NAME
Sheet 1 of 1
Contractor Name
Contract Title
SAMPLE TIME-SCALED LOGIC DIAGRAM
Early Bar
Progress Bar
Critical Activity

Figure 1

B. Schedule Terminology

Schedule terminology used in this Contract shall have the meaning described below:

1.) Activity: A discrete item of Work with a Duration that can be clearly defined; a synonym for task. Unless otherwise permitted in writing by the Engineer, an activity's duration shall be not more than 14 calendar days or 10 working days except for non-construction activities, such as procurement cycles, material delivery, soil consolidation, etc. Each activity (task) description shall clearly identify the Work to be performed. No two or more activities in the schedule shall have exactly the same description.

2.) Activity Codes: Activity Codes allow each activity to be grouped into specific classifications such as area, responsibility, phase, system, or location. The codes consist of specific values and descriptive titles that are entered into the data dictionary of the scheduling software. Activities shall be assigned specific Activity Codes as appropriate.

3.) Alternative Solutions: Analyses of various options for dealing with encountered or anticipated Contract problems. Alternative solutions shall be developed to assist in determining the best method(s) of preventing or correcting any impediments to the progress of the Work. Alternative Solutions analysis shall indicate impacts on scheduling and resources.

4.) Analysis Report: A report that displays the impacts of all variances reported in the Current Progress Schedule. The Analysis Report focuses attention on the impacts of variances between planned and actual performance, so as to support an assessment of such impacts. The Analysis Report shall include Alternative Solutions.

5.) Bar Chart: A schedule display designed to complement the Network Diagram. The Bar Chart is a traditional Gantt chart to which the Early Start Dates, Early Finish Dates, Late Start Dates, Late Finish Dates and Critical Path have been added.

6.) Calendar: A calendar defines when Work on an activity can occur (i.e. Mon – Fri for a standard Work week). Activities shall be assigned to a calendar that represents the planned Work days. The calendar shall incorporate the Authority holidays listed below. The use of multiple calendars will be permitted.

New Year's Day
Martin Luther King, Jr. Day
Presidents' Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veterans Day
Thanksgiving Day
Day After Thanksgiving
Christmas Day

7.) Constraint: A constraint is a restriction imposed on the start or finish of an activity or the Contract. An example of the use of constraints is the imposition of a "finish no later than" constraint[53] on the Contract Completion Milestone that is equal to the Contract completion date. This constraint facilitates the identification of activities that control or do not support the completion date. Constraints shall be limited to start and finish constraints on milestone activities that represent critical Contract dates, unless otherwise approved by the Engineer in writing.

8.) Critical Path: The longest path through the network in estimated total elapsed time from the start of the first Activity through the completion of the last Activity. The Critical Path consists of a series of Activities which must be completed on their scheduled completion dates in order for the Contract to be completed on schedule.

9.) Current Progress Schedule: The most recent progress schedule which has been approved by the Engineer. The Original Baseline Schedule shall be referred to as "Revision 0". Each time a different Current Progress Schedule is accepted by the Engineer, the revision number shall be increased by 1 and the old schedule shall be electronically archived so as to permit an audit trail.

10.) Duration: The estimated and/or actual length of time required to fully perform a specific Activity. The Duration for construction activities shall be expressed in Work days.

11.) Early Finish Date: The date upon which an Activity can be completed if it is begun on the Early Start Date.

12.) Early Start Date: The earliest date upon which an Activity can begin.

13.) Hammock: A hammock activity summarizing the early and late dates of a set of activities is used for reporting durations of groups of important activities. An activity shall be designated as a hammock by selecting Hammock as the activity type in the Primavera activity form.

14.) Lag: The interval between the completion of a Predecessor Activity and the start of a Successor Activity. For example, ten days of positive Lag will cause the Successor Activity to begin ten days after the Predecessor Activity has been completed. Negative Lag will cause the Activities to overlap. The amount of Lag between each Activity shall be clearly represented on the Network Diagram.

15.) Late Finish Date: The latest date by which an Activity shall be completed if the succeeding Activity is to be started on schedule.

16.) Late Start Date: The latest date by which an Activity shall be started to allow completion by the Late Finish Date.

17.) Milestone: A significant point in the performance of the Work. A milestone has no Duration, and represents the start of a portion of the Work or the completion of a portion of the Work. A milestone may also represent either the beginning or the completion of a task or action being performed by entities other than the Contractor (e.g., obtaining a permit, notification to proceed with certain Work, etc.).

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53 A late finish or "finish no later than" constraint limits the latest time an activity can complete

18.) Negative Float: The amount of time that the planned completion date of an Activity is later than its required (Late Finish) date. An Activity with Negative Float must be completed ahead of schedule if the Work is to be completed on time. Negative Float usually indicates the need for corrective and/or preventive action to complete the Work on schedule.

19.) Network Diagram: A logic diagram prepared according to the Precedence Diagram Method, which displays each Activity required for the performance of the Contract in the sequence in which it is to be performed with appropriate logic ties between activities displayed.

20.) Original Baseline Schedule: The detailed progress schedule first approved by the Engineer as specified herein. All performance of Work will be measured against the Original Baseline Schedule.

21.) Precedence Diagram Method (PDM): A particular type of graphic representation of all Activities and Constraints. The Activities are represented by nodes; the Constraints are represented by lines between nodes. A sample PDM Network Diagram is shown in Figure 1 of this Section.

22.) Predecessor Activity: The partial or full completion of an Activity which is a prerequisite to commencement of another Activity.

23.) Relationship: A logic tie between two activities representing restrictions on the start or completion of the subsequent activity. Relationships may cause either positive or negative lag. The four basic types of relationships are finish to start, start to start, finish to finish and start to finish.

24.) Successor Activity: An Activity which cannot be started or completed without the prior partial or full completion of a Predecessor Activity.

25.) Total Float: The amount of time by which an Activity or series of Activities may be delayed without affecting the date of completion of the Work. Total Float is not for exclusive use or benefit of either the Contractor or the Authority but shall be used for the benefit of the Work in such manner as the Engineer may in his discretion decide. Use of float suppression and manipulation techniques, such as preferential sequencing, lag logic restraints, inflated activity duration and/or constrained dates, other than as may be required by the Contract, shall be cause for rejection of the Original Baseline Schedule and any subsequent schedule revisions and updates.

C. Schedule Submittal, Review & Approval Process

1.) Baseline Schedule

a. Within forty five (45) calendar days of the acceptance of the Contractor's Proposal, the Contractor shall submit a proposed Baseline Schedule containing the Contractor's projected plan and schedule to complete all Work required by the Contract within the time(s) for completion required by the Contract. A schedule showing time(s) for completion later than those required by the Contract will not be accepted.

b. The Engineer will review the Baseline Schedule and return it to the Contractor with comments, or accept it as the Original Baseline Schedule, within fifteen (15) calendar days. The Contractor shall participate in any meetings called to resolve issues with the schedule.

c. If it is not accepted, the Contractor shall revise the Baseline Schedule in accordance with the Engineer's comments and resubmit it for the Engineer's approval within fifteen (15) calendar days of the receipt by the Contractor of the Engineer's comments. Until such time as acceptance of the Baseline Schedule by the Engineer, the Contractor shall continue to resubmit the Baseline Schedule as directed by the Engineer within the same time frame and in the same format as the initial resubmission.

d. After the approval of the Original Baseline Schedule, no changes shall be made therein without the written approval of the Engineer. No other act or omission on the part of the Engineer shall be deemed to constitute such approval. The Contractor shall not be entitled to any damages by reason of the failure of the Engineer to give timely approval or comments on any progress schedule submitted hereunder.

2.) Progress Schedule Updates---

a. The Contractor shall submit to the Engineer not less frequently than once a month, on a date specified by the Engineer, an updated Current Progress Schedule. The Engineer may require that the Contractor also include scheduling updates with his monthly payment request. Schedule updates shall status the actual performance and progress of the Work and depict any changes. Schedule updates where early start or early finish of any activity is positioned on the data line but not actualized will not be approved.

b. If directed by the Engineer, within seven (7) calendar days after receipt by the Engineer of a updated progress schedule, the Contractor shall meet with the Engineer for the purpose of reviewing and obtaining the Engineer's approval of it.

c. The Engineer may require the Contractor to furnish a revised update which shall include any other information he may request to assist him in evaluating the Contractor's progress, including but not limited to manpower loading charts and equipment schedules; "what-if" analysis performed in a copy of the current progress schedule, etc.

d. In the event that the Engineer requests the Contractor to revise the updated schedule submitted, and/or to submit such additional information, the Contractor shall make the requested revisions and/or submit the updated schedule to the Engineer for approval along with the additional information requested within seven (7) calendar days of the Engineer's request.

D. Schedule Reporting Requirements

1.) The Original Baseline Schedule submittal shall include the following:

a. One PDF printout file and one Primavera file submitted electronically.

b. Six copies of the following output reports:

(i) A Schedule narrative in writing that provides a general description of the Contractor's approach to meeting the Contract goals and the Critical Path.

(ii) Explanation for any constrained dates.

(iii) A time-scale logic diagram in PDM format containing all activities displaying Activity ID, Activity Description, Calendar, original and remaining durations, percent complete, Early Dates and Total Float, and sorted by:

(a.) Early Start, Total Float

(b.) Total Float, Early Start (Critical Path report)

c. Supporting data showing all activities with their associated cost, budgets or estimates.

d. The Contractor shall electronically archive all accepted schedules.

2.) In addition to the reports required for the Baseline Schedule submittal, all Progress Schedule Update Reports shall include the following:

a. A narrative comparing the current Dates to the respective Milestone Dates, describing the physical progress during the current report period, explaining plans for continuing the Work during the next report period and describing and explaining changes in crewing and construction equipment. The narrative shall also explain changes in Activity durations, logic ties and Activity Values and the reason why the changes were made.

b. Whenever there is any delay or negative float prediction in the schedule, the Contractor shall submit an alternative solutions report that describes the delay, explains when it started and finished or is expected to finish and the basis for those dates and lists the affected schedule activities by activity ID, and he shall present reasons for the delay. Any revisions to durations or the logical sequence of Activities made to reflect these delays shall be explained. The report shall include proposed schedule recovery efforts such as multiple shifts or overtime to mitigate any potential delay to the overall Contract completion date, or request an extension of time, as appropriate.

c. Critical Path Analysis.

d. An Analysis Report indicating Activities and/or Milestones which are behind schedule by at least 30 calendar days (commonly evidenced by Negative Float).

e. A report that compares the Current Progress Schedule update with the Original Baseline Schedule and prior month's accepted schedule update and lists all changes made to the schedule.

E. General Schedule Provisions

1.) Should the Contractor fail to comply with any provision of this Section, The Engineer shall have the right in his discretion to withhold out of any payment (final or otherwise and even though such payment has already been certified as due) such sums as he deems necessary or desirable, all as more fully provided in the clause of the Form of Contract entitled "Withholding of Payments".

2.) Neither the acceptance, review or approval of any progress schedule or other data submitted by the Contractor pursuant to this Section, nor any other action on the part of the Engineer under this Section shall in any way be deemed to be a representation by the Engineer that the Contractor may or will be permitted to follow a particular schedule or sequence of operations or that by following any such schedule or sequence he may or will complete the Work by the time(s) required by the Contract or by any other time(s). Nor shall the approval of any progress schedule or other such data relieve the Contractor of his obligation to complete the Contract by the time(s) required in the Contract, even though the schedule may be inconsistent with such completion.

3.) Any approval under this Section shall be construed merely to mean that the Engineer knew of no good reason at that time to object thereto. No acceptance, review or approval or any other action under this Section shall limit, affect or impair the Contractor's obligation to perform all Work by time(s) required by the Contract and in accordance with all other provisions of the Contract.

4.) The performance of the Work by the time(s) required in the Contract, after taking into account extensions to which the Contractor may be entitled under the clause of the Form of Contract entitled "Extensions of Time", may require the Contractor to perform the Work using overtime labor, additional shifts or additional plant and equipment and/or other measures at no additional cost to the Authority. The Contractor shall anticipate, avoid and mitigate the effects of all delays.

5.) The Engineer shall have the right at any time when in his judgment the Work is not proceeding in accordance with the approved progress schedule or at any time when it is likely that the Work might not be completed by the time(s) required in the Form of Contract even though the Contractor is proceeding in accordance with the approved progress schedule, to order the Contractor without additional compensation to employ additional shifts to increase the number of men employed, to use additional plant or equipment, or to take such other steps as may be necessary or required to assure the completion within the time(s) shown in the accepted schedule.

6.) No action on the part of the Contractor pursuant to this Section shall be construed as a request by him for an extension of the time(s) for completion required by the Contract. A request for an extension of time shall be deemed made only if it complies with the requirements of the clause of the Form of Contract entitled "Extensions of Time". No extension of the time(s) for completion shall be inferred because of any action, omission to act, or statement on behalf of the Engineer pursuant to this Section. Extension of time, if any, shall be granted only pursuant to the clause of the Form of Contract entitled "Extensions of Time".

7.) The Contractor acknowledges and agrees that he is not entitled to an extension of time for impacts that do not extend the contractual end date of the Contract.

ATTACHMENT A

MANDATORY ACTIVITY CODE STRUCTURE

1.) Responsibility (Authority, Contractor)

8.) Area (building, floor or area)

9.) Trade/CSI code (concrete, steel, etc as required)

10.) Location (3rd Fl, etc)

11.) Phase of Work, if applicable

12.) Change Order work, if applicable

13.) Other, as required by the Engineer

PRIMAVERA PROJECT PLANNER

Date 01/02/0 -----ACTIVITY CODES DICTIONARY----- Page 1

NAME - Project Title

CODE	VALUE	TITLE	SEQUENCE
Activity Codes:			
RESP	Responsibility		
	AE	Architect/Engineer	
	C	Contractor	
	O	Port Authority	
AREA	Area		
	G	General Area	1
	CTL	Air Traffic Control Tower	2
MILE	Milestone		
CSI	Trade/CSI Code		
	03000	Concrete	
	04000	Masonry	
	07000	Thermal & Moisture Protection	
	15000	Mechanical	
	16000	Electrical	
LOCN	Location		
PHAS	Phase		
	D	Design	1
	P	Procurement	2
	C	Construction	3
CO	Change Order Wor		
OTH	As Req'd by Engr		

106. ANALYSIS OF BID

Within fifteen calendar days after acceptance of the Proposal, the Contractor shall prepare a detailed analysis of bid on forms furnished by the Authority with all of the spaces filled in without exception, and containing such information as the Engineer may require for each of the items enumerated in such form.

107. AIRPORT OPERATIONS AND CONDITIONS

A. General:

1.) Place "Water" identification signs on all water vehicles or water tanks, which are to be used for the transportation or storage of water during the course of the Work at the airport.

2.) At least 7 days but not more than 10 days prior to performing excavation, call 1-800-272-4480 and provide the information required for excavation(s) in New York and call 1-800-272-1000 and provide the information required for excavation(s) in New Jersey.

3.) Do not place temporary structures or store materials or equipment required in the performance of the Work within any of the buildings on the airport without specific prior approval of the Engineer.

4.) Do not store petroleum or combustible products, or any other flammable materials, within any buildings or in any part of the airport except as designated by the Engineer.

5.) Do not burn or bury debris of any type on Authority property, or wash waste materials down sewers or into waterways.

6.) Maintain haul routes in a satisfactory condition, and repair damage to such routes, resulting from the Contractor's operations. Unless otherwise approved by the Engineer, clean haul routes each work period and remove earth or other materials, which fall or are otherwise placed on such routes during the performance of Work.

7.) Do not park vehicles on any grass or unauthorized area. Free parking of vehicles in any of the airport parking lots will not be permitted.

8.) Protect against damaging existing lights, pavement, curbs and other fixed items that are to remain. Such items, which are damaged, either directly or indirectly, by the Contractor during the performance of the Contract, whether negligently or not, shall be restored to the condition that existed prior to such damage.

9.) Take all precautions necessary for protection of persons, traffic and property during dust or fragment generating operations, concrete mixing or placing, or other operations which may stain, soil or damage property or injure persons.

10.) Provide sound suppression devices on gasoline and diesel powered construction equipment and pneumatic tools as required to maintain noise exposures below the limits specified in the Code of Federal Regulations (CFR) 29 CFR 1926 U.S. Occupational Health and Safety Administration (OSHA). Maintain such sound suppression devices in proper operating condition throughout the time of their use, and adjust and repair as required to maintain noise within exposure levels stipulated in 29 CFR 1926.52, Table D-2.

11.) Remove on an on-going basis, and before the end of each work period, all paving materials left in the grass shoulder areas, in manholes, catch basins or handholes as a result of the cleaning of the Contractor's equipment.

12.) Food or food related debris shall not to be left on or disposed of on the construction site.

13.) Equipment, vehicles and materials, not being utilized in the current work period shall be removed and stored in the area designated by the Engineer for such purpose, or if there is no such area designated then such items shall be removed from the airport.

B. Construction Site Conditions at Air Operations Areas:

1.) "Air Operations Area" (AOA) means that portion of the airport designed and used for landing, takeoff, parking or surface maneuvering of aircraft, as well as the Restricted Service Roads (RSR).

2.) During the time that the Contractor is performing the Work, the Air Operations Areas will remain in use by aircraft. To the extent feasible and convenient in the opinion of the Engineer, and to the extent permitted by the Federal Aviation Administration (FAA), the use by aircraft of aprons, runways and taxiways adjacent to areas where the Contractor is working will be so scheduled as to reduce disturbance to the Contractor's operations. However, during these periods aircraft may be taxiing through and around the construction areas. In order to minimize conflicts between aircraft operations and construction operations, the Contractor shall proceed with performance of the Work in a safe manner and in accordance with the requirements hereinafter stipulated, at all times coordinating operations with the Engineer, however no representation or guarantee is made that the disturbance can or will be reduced. Also, it is anticipated but not guaranteed that certain aprons, runways, taxiways, and taxilanes will be shut down to aircraft operations for limited periods at the times required by the Contractor. In any event, however, aircraft operations shall always have priority over any and all of the Contractor's operations.

3.) Should the Contractor be specifically directed to suspend operations or be directed as hereinafter described, and if solely because of such direction the Contractor is necessarily kept idle at the construction site, the Contractor will be compensated as stipulated in the provisions of the Contract concerning compensation for emergency delays.

a. Should aprons, runways, taxiways or taxilanes be required for the use of aircraft and should the Engineer solely deem the Contractor to be too close to the portion used by aircraft, the Contractor may be directed to suspend operations, remove personnel, plant, equipment and materials to a safe distance and stand by until the aprons, runways, taxiways or taxilanes are no longer required for use by aircraft, at which time the Contractor shall immediately resume operations in the vacated areas when so directed by the Engineer.

4.) The Contractor, subcontractors, materialmen, deliveryman or other persons over whom the Contractor has control shall not enter upon or allow any plant or material to be located upon any part of the Air Operations Areas without specific prior approval of the Engineer.

5.) The Contractor, employees of the Contractor, subcontractors, materialmen and all other persons over whom the Contractor has control shall comply with the following:

a. Clearly display on their person an identification tag indicating their name and company before entry upon any Air Operations Area. The Contractor shall provide tags and holders for such identification. The Contractor is advised that security requirements are subject to change and will be addressed further in the pre-construction meeting.

b. Do not enter upon any Air Operations Area unless accompanied by a representative of the Authority designated by the Engineer to escort the Contractor and equipment to and from the point or points of operation within the limits of such areas, and do not traverse back and forth between points within such areas unless accompanied by said Authority representative.

c. Do not enter or remain upon or allow any plant or materials to be brought or to remain upon any part of the Air Operations Areas if in the opinion of the Engineer they would create a hazard to aircraft or airport operations.

d. Smoking is not permitted in the Air Operations Area.

6.) No two adjacent taxiways shall be closed at the same time unless otherwise directed by the Engineer.

7.) Materials tracked onto movement areas shall be removed continuously during each work period.

a. "Movement Areas" means areas within the AOA comprised of the runways, taxiways and other areas of the airport that are used for taxiing or hover taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and aircraft parking area. The Air Traffic Control Tower or Ground Control typically controls these areas.

8.) At the end of each work period, remove plant, materials, equipment and any other obstructions away from the work area to a non-AOA site as designated by the Engineer.

9.) Information on Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) weather conditions or Category II operations at the airport is available to the Contractor at the Operations Supervisor's Office of the airport. Category II operations only apply at EWR and JFK.

At the following Air Operations Area locations, conform to the following requirements:

a. Approach to Runways: When a runway is active, keep obstructions due to Work below or outside the VFR and IFR approach surfaces.

(i) "Obstruction" shall be defined as any obstacle exceeding the obstruction standards specified by 14 CFR Part 77, subpart C.

b. Adjacent to Runways:

(i) When a runway is active, no construction activities shall be permitted within 250-feet from the runway centerline. Place barricades in accordance with the Section herein entitled "Barricades."

(ii) During VFR weather conditions, obstruction mark all construction equipment, material, or debris penetrating a surface originating along a line 250-feet from the runway centerline at runway elevation, and extending upward and away from the runway at a slope of one foot vertically for every seven feet horizontally, in accordance with the paragraph herein entitled "Obstruction Marking and Lighting". In addition, all penetrations above runway elevation between 200-feet and 250-feet from the runway centerline shall be obstruction lighted with omni-directional lenses.

(iii) During IFR weather conditions; in addition to obstruction marking, provide obstruction lights on fixed obstructions, construction equipment, materials, or debris penetrating a surface originating along a line 500-feet from the runway centerline at runway elevations, and extending upward and away from the runway at a slope of one foot vertically for every seven feet horizontally. For such lighting, provide, locate and operate in accordance with the paragraph herein entitled "Obstruction Marking and Lighting". In addition, all penetrations above runway elevation between 250-feet and 500-feet from the runway centerline shall be obstruction lighted with omni-directional lenses.

(iv) When Category II landing operations are being conducted on runways during IFR weather conditions, as defined by Federal Aviation Administration United States Terminal Procedures, no construction operations, equipment, materials or debris shall be within the Category II Touchdown Area, the Missed Approach Area and Transitional Surfaces as hereinafter defined.

(a.) "Touchdown Area" means an area longitudinally centered on the runway centerline, extending from a point 200-feet in advance of the runway approach threshold (normal or displaced) for a distance of 3,200-feet in the direction of landing, and having a total width of 1,000-feet.

i. "Threshold" is defined as the beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced.

ii. "Displaced Threshold" is the portion of pavement behind a threshold that may be available for takeoffs in either direction or landing from the opposite direction.

(b.) "Missed Approach Area" means an area, which begins at the end of the touchdown area at the height of the runway and extends upward at a slope of one foot vertically for each 40-feet horizontally. In plan view, it has the same width as the touchdown area at the point of beginning with the width increasing uniformly to 3,100-feet at 6,000-feet from the point of beginning.

(c.) "Transitional Surfaces" means surfaces sloped at 7:1 extending outward and upward from the edges of the touchdown area or the missed approach area to a height of 150-feet above the elevation of the runway centerline or the end of the Touchdown Area.

(v) Perform Work so that when the runway is being made available for aircraft operations, the maximum grade difference in any paved surface within the Safety Area shall not exceed 1 inch on runway surface and 3 inches within any part of the Safety Area.

(a.) "Runway Safety Area" means surfaces within 250-feet measured from and parallel to the centerline of the runway, and extending 1,000-feet beyond and parallel to the end of the runway. It is a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway, in accordance with AC 150/5300-13.

(vi) On active runways, open excavations, debris, construction equipment, personnel or materials are not permitted within the Safety Area.

(a.) "Open Excavation" means any trench in unpaved areas exceeding 6" in width or 3" in depth; and in paved areas, a drop of 3" or greater within a 6" horizontal measure.

(vii) Do not permit material capable of being dislodged by aircraft blast within 250-feet from the runway centerline. Remove or stabilize such loose materials in this area as approved by the Engineer.

c. Adjacent to Taxiways (T/W) or Taxilanes (T/L):

(i) Neither construction activity nor personnel are permitted within the Object Free Area (OFA),

(a.) "Object Free Area" means an area on the ground centered on the runway, taxiway, or taxilane centerline provided to enhance safety of aircraft operations by having the area free of objects except for those objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

(ii) Perform Work within the specified limits shown in Table I below only when the taxiway/taxilane is closed to air operations.

(iii) Open excavations as close as the edge of the taxiway are permitted provided they are delineated by placing obstruction marked and lighted collapsible barricades, in accordance with "Barricades" hereof, along the edge of the taxiway.

(iv) Do not permit loose material capable of being dislodged by aircraft blast and becoming a hazard within the Taxiway Safety Area (TSA), shown in Table 1 when the T/W or T/L is active. Remove or stabilize such loose materials in this area as approved by the Engineer.

(a.) "Taxiway Safety Area" means a surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

(v) Waste and loose material shall not be placed in active movement areas.

Table 1

	TEB	LGA	EWR	SWF	JFK
T/W OFA	186 feet	259-feet	320-feet	386-feet	386-feet
(From centerline)	(93 feet)	(129.5-feet)	(160-feet)	(193-feet)	(193-feet)
T SA	118 feet	171-feet	214-feet	262-feet	262-feet
(From centerline)	(59 feet)	(85.5-feet)	(107-feet)	(131-feet)	(131-feet)
T/L OFA	162 feet	225-feet	276-feet	334-feet	334-feet
(From	(81 feet)	(112.5-	(138-feet)	(167-feet)	(167-feet)

centerline)	-	feet)			

C. Construction Site Conditions Outside Airport Operations Areas:

1.) During the time the Contractor is performing the Work, it may at times be necessary because of emergency or abnormal traffic conditions to suspend the Contractor's operations, or to postpone the time at which traffic lanes, parking or other areas become available for performance of Work. Should the Contractor be specifically directed to suspend operations in traffic lanes, parking or other areas, and remove personnel, and obstructing plant, equipment and materials from such lanes or areas, or should such lanes or areas not be available by the times specified, and if solely because of such suspension of operations or late availability of traffic lanes, parking, or other areas the Contractor is necessarily kept idle at the construction site, the Contractor will be compensated as stipulated in the provisions of the Contract concerning compensation for emergency delays.

2.) Limit the maximum height of construction equipment to 25-feet unless otherwise shown on the Contract Drawings or expressly approved by the Engineer, obstruction light in accordance with the paragraph herein entitled "Obstruction Marking and Lighting" and obstruction mark and light that portion of equipment which exceeds 25-feet in height in accordance with FAA Advisory Circular 70/7460-1K Current Revision.

3.) Perform such duties as the Engineer may direct and as may be necessary in the opinion of the Engineer for the rerouting of traffic in the performance of the Work.

4.) Restrict smoking to areas designated by the Engineer for this purpose.

D. Obstruction Marking and Lighting:

1.) Material, temporary construction and facilities for obstruction marking and lighting constitute temporary facilities that are and shall remain the property of the Contractor unless otherwise shown on the Contract Drawings or specifically directed by the Engineer to be turned over to the Authority.

2.) Provide new materials, or undamaged previously used materials in serviceable condition conforming to the requirements specified herein.

3.) In Air Operations Areas or airport areas where obstructions occur within navigable airspace provide obstruction lights, Model UF-60-7-75A-PE-BI as manufactured by Julian A. McDermott Corp., Ridgewood, N.Y., or approved equal.

a. Unless otherwise shown on the Contract Drawings, mount an obstruction light on the highest point of construction equipment or obstruction.

b. Ensure that obstruction lights are maintained in proper operating condition throughout Work of this Contract, and operate at night seven (7) days a week and during IFR weather conditions.

(i) "Night" means the time between the end of evening civil twilight, and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time.

E. Paving and Surfacing in Air Operations Areas:

1.) Paving and Surfacing in Air Operations Areas are designed to meet stringent requirements for aircraft operations. Exercise extreme care in machine and hand placing material to achieve the finished elevations shown on the Contract Drawings within the tolerances specified elsewhere herein.

2.) When applying tack coat, sealcoat, or pavement marking paint near or around edge lights and any in-pavement lights, provide temporary covers to protect glass fixtures. Remove covers prior to resuming air operations.

3.) Deactivate and adjust elevation of all existing edge lights and all in-pavement lights prior to paving operations in any given area and reactivate them prior to resuming air operations.

4.) Prior to reactivating a runway or a taxiway, any portion of a raised manhole, catch basin hand hole, edge light, or subsurface structure, located within 250 feet of a runway centerline or within the Taxiway Safety Area (TSA) shown in Table 1, protruding by more than three inches shall be ramped in accordance with details shown on the Contract Drawings or, if not shown, as directed by the Engineer.

5.) In areas that are to be opened to aircraft prior to completion of paving top course, ramp all lifts which exceed a maximum of one inch in depth. Ramp in accordance with details shown on the Contract Drawings or, if not shown, as directed by the Engineer. When paving operations are resumed, cut and trim ramp to expose unsealed or granular surface for a depth of one inch, paint the edge of the lift with a thin coat of hot asphalt cement and place fresh asphalt against the edge of the lift and compact.

6.) Remove sand and other debris from the taxiway, runway, apron, taxilanes, and restricted service road surfaces crossing air traffic lanes. Completely sweep with a power driven sweeper and flush with water on an ongoing basis so that such surfaces are ready for use by aircraft as required.

F. Night Illumination of Paving and Surfacing Operations:

1.) Paving and surfacing operations conducted at Night shall, in addition to the requirements of the paragraph entitled "Obstruction Marking and Lighting" hereof, conform to the following requirements:

a. In Air Operations Areas, locate and shield night illumination to prevent interference with air traffic control or impairment of safe aeronautical operations.

b. Outside Air Operations Areas, locate and shield night illumination to prevent interference with motorists and pedestrians or impairment of traffic and pedestrian movement.

2.) Illumination of Area of Work: Provide and operate portable floodlight units similar and equal to "Maxi-Lite 695" as manufactured by Allmand Brothers Inc., Holdredge, NE.

3.) Equipment Illumination: Provide and operate electric beam lights with a capacity of not less than 3,000 watts affixed to paving machines, rollers, distribution trucks and other vehicles to provide not less than twenty foot candles of illumination on the following horizontal surfaces:

a. During operation of paving machines, an area 12-feet by 12-feet immediately behind the machine;

b. During operation of rolling equipment, an area 12-feet wide by 30-feet long immediately in front of and behind the machine; and

c. During application of tack coat, an area 12-feet by 12-feet on the area being coated.

G. Existing Airport Lights in Air Operations Areas:

1.) Various types of lights are installed in the areas in which the Work is to be performed. Prior to the commencement of operations, note the exact number and location of lights in such areas and provide adequate protection therefor. Any light fixture which is damaged by the Contractor, whether negligently or not, during the performance of the Work shall be repaired or replaced in an approved manner before the end of each work period. Should the Contractor not repair or replace any such damaged lights by the end of each work period, the Authority will undertake such restoration and the cost thereof, as determined by the Engineer, will be deducted from the Contractor's compensation hereunder. The number and locations of lights shown on the Contract Drawings are approximate only and the Authority does not guarantee their accuracy.

H. Subsurface Structures:

1.) Attention is called to the fact that some of the manholes, chambers or other subsurface structures, in which Work is to be performed under this Contract, contain energized high and low voltage cables, and that various insects, snakes, spiders and rodents may be present.

2.) Apply to the Engineer in writing at least 24-hours in advance of the time of: a. entry into existing manholes, handholes, or other subsurface structure or, b. interruption or disruption of utility services. Perform interruptions of electrical services, and entry into subsurface structures in accordance with the provisions of the Section hereof entitled "PERMIT AND REQUIREMENTS FOR ELECTRICAL DISTRIBUTION WORK". Service shall not be cut off on existing installations until all operations have been completed except for connections or reconnections to power source of wiring to be installed under this Contract. Notice to the Engineer shall specifically state which utilities will be affected and the time and the duration of such interruption. Keep all such interruptions to a minimum. No interruption of utility services shall be made without approval of the Engineer whose decision in all cases shall be final.

3.) Test each subsurface structure for combustible, toxic or otherwise harmful, gases or vapors in accordance with NFPA No. 328 "Recommended Practice for the Control of Flammable and Combustible Liquids and Gases in Manholes, Sewers and Similar Underground Structures" before permitting personnel to enter. If such gases or vapors are detected, ventilate the subsurface structure until the gases have dissipated to an acceptable level as determined by the OSHA Air Quality regulations prior to entry.

4.) Manholes and other subsurface structures in which Work is to be performed under this Contract may contain water. Remove water encountered in such locations and keep the floors of such locations free of standing water at all times workers are in such locations.

5.) Verify the exact locations of underground utilities and subsurface structures in the field, and assume all risks of whatever nature, if any, as to the locations of such utilities and structures.

I. No requirement of or omission to require any precautions under this Contract shall be deemed to limit or impair any responsibility or obligation assumed by the Contractor under or in connection with this Contract and the Contractor shall at all times maintain adequate protection to safeguard the public and all persons engaged in the Work and shall take such precautions as will accomplish such end, without undue interference with the public or the operations of the Authority.

108. PERMIT AND REQUIREMENTS FOR ELECTRICAL DISTRIBUTION WORK

A. Notify the Engineer at least 24 hours prior to the commencement of operations at the construction site which in any way may affect existing electrical circuits or require entry into any electrical manhole at the airport, and obtain from the Engineer, Authority Form PA 2497A entitled, "Electrical Work Permit". Execute such form in triplicate each morning prior to commencement of Work on existing electrical circuits or entry into manholes. The Authority will issue this form to the Contractor without payment of a fee.

B. Allow sufficient time for loads to be transferred to other circuits from the circuits upon which Work is to be performed and for lock out of circuits which are within existing load centers. Comply with other requirements contained on the back of the "Electrical Work Permit" insofar as they are applicable to the Work to be performed under this Contract. In any event, reconnect and place back in operation electrical circuits activating parking field, roadway, runway operations, apron and taxiway lights prior to the close of operations on each day, and in any event before sunset of each day. Overtime operations or premium time required to be paid by the Contractor for or in connection with this numbered Section shall be borne by the Contractor without separate or additional compensation therefor.

109. AIRPORT CONSTRUCTION SAFETY REQUIREMENTS

A. General Safety Requirements:

1.) The Contractor shall adhere to all safety precautions described in the current edition of the U. S. Department, Federal Aviation Administration Advisory Circular AC 150/5370-2, current edition, Operational Safety on Airports During Construction. The Contractor is to strictly conduct all activities as not to violate safety standards contained in said Advisory Circular.

2.) Throughout the construction period, the following safety and operational practices shall be followed:

a. Operational safety shall be a standing agenda item during work progress meetings throughout the duration of the Contract.

b. The Contractor shall perform onsite inspections of the construction site throughout the duration of the Contract, with immediate remedy of any safety deficiencies.

c. The Contractor, employees of the Contractor, subcontractors, materialmen or any other support workers over whom the Contractor has control, who are required to enter the Aircraft Operations Area will be required to wear a reflective safety vest, day or night.

d. Construction that is within the safety area of an active runway, taxiway, or apron must be performed when the runway, taxiway, or apron is closed or use-restricted and initiated only with prior permission from the Engineer.

e. The Engineer may order the Contractor to suspend operations and move personnel, equipment, and materials to a safe location at any time he deems it necessary.

B. Maintenance of Construction Site:

1.) Inspect all construction and storage areas as often as necessary to be aware of conditions.

2.) Promptly take all actions necessary to prevent or remedy any unsafe or potentially unsafe conditions as soon as they are discovered.

3.) Provide continuous clean-up operations including a mechanical sweeper for all haul operations or other related traffic to and from the construction site.

4.) The Contractor, at the direction of the Engineer, may be required to provide and maintain an emergency response route through the work area, for Airport Emergency Vehicles. Construction vehicles accessing this road will give way to emergency vehicles at all times. Parking or staging of any construction equipment or stockpiling of materials blocking the road or access to the road will not be permitted.

C. Approach Clearance to Runways:

1.) Runway thresholds must provide an unobstructed approach surface over equipment and materials. (Refer to Contract Drawings for construction clearance surfaces.)

2.) Ensure all personnel, materials, and/or equipment are clear of the applicable runway end slope criteria (Refer to Contract Drawings for construction clearance surfaces.)

D. Runway and Taxiway Safety Area (RSA and TSA):

1.) Limit construction to outside of the approved RSA and TSA, as defined elsewhere in this section—unless the runway is closed or restricted to aircraft operations, requiring a lesser standard RSA that is equal to the RSA available during construction.

2.) Procedures for Protecting Runway Edges:

a. Limit construction to no closer than 250 feet from the runway centerline—unless the runway is closed to aircraft operations.

b. Personnel, material, and/or equipment shall not penetrate the Obstacle Free Zone (OFZ) as defined in the U. S. Department, Federal Aviation Administration Advisory Circular AC 150/5300-13, current edition, Airport Design, Paragraph 306, "Obstacle Free Zone"

(i) "Obstacle Free Zone" means the airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual Navaids that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway and for missed approaches.

3.) Procedures for Protecting Runway Ends.

a. Maintain the RSA as it existed before construction activity—unless the runway is closed to aircraft operations.

b. Prevent personnel, material, and/or equipment, from penetrating the OFZ.

E. Closed Runways:

1.) For work that necessitates the closure of a runway or runways, the Contractor shall furnish and install and subsequently remove or relocate a lighted "X" as per FAA Advisory Circular 150/5345-55 "Lighted Visual Aid to Indicate Temporary Runway Closure", at each end of the closed runway on or near each of the runway designation numbers as directed by the Engineer. The Contractor shall be responsible for the storage, mobilization, and demobilization of the lighted "X's" for each runway closure period and they remain the property of the Contractor unless otherwise noted on the Contract Drawings.

2.) The lighted "X's" shall be the Sweepster Lighted Runway Closure Marker Model LXD06, or approved equal conforming to NTSB Safety Recommendation A-03-05 and 06.

F. Barricades

1.) Use barricades to indicate construction locations in non-movement areas, which no part of an aircraft may enter. Barricades may be of different shapes and made from various materials, including railroad ties, sawhorses, jersey barriers, or barrels and shall be marked with diagonal, alternating orange and white stripes. During reduced visibility or night hours, supplement the barricades with red lights, flashing or steady burning, meeting the luminance requirements of the State Highway Department.

a. "Non-movement areas" are areas within the AOA not controlled by the Air Traffic Control Tower or Ground Control. These areas are typically aircraft ramp and parking areas as well as vehicular service roads.

2.) Indicate construction locations in movement areas in which aircraft may enter with orange traffic cones, red lights (either flashing or steady burning), and collapsible barricades marked with diagonal, alternating orange and white stripes. All barricades, temporary markers, and other objects left in the safety area associated with the open runway, taxiway, and taxi lanes must be as low as possible to the ground, of low mass and easily collapsible upon contact with an aircraft or any of its components. The barricade shall be properly weighted or attached to the surface to prevent displacement by prop wash, jet blast, wing vortex or other surface wind currents. If affixed to the surface, they must be frangible at grade level or as low as possible, not to exceed 3-inches in height. Barricades shall be Neubert Aero Corp., Model NAC-PC2410 or Model NAC-PC9642, Multi-Barrier Safety Barricade Corp., Model AR-10X96, YODOCK APC or an approved equal.

3.) Barricades shall be spaced no greater than 10 feet apart.

G. Temporary Lighting and Markings

1.) The Contractor will be required to provide and maintain temporary pavement markings, remove existing markings and remove temporary markings, all in accordance with the Contract Drawings and Specifications.

H. Airport Air Operations Area Access and Control

1.) The Contractor, staff, employees, subcontractors, delivery and haul operators, or anyone required to enter the Air Operations Area related to the Contract Work, shall produce valid government issued photo identification.

2.) The Contractor shall supply daily lists of all workers as well as list of all planned or anticipated deliveries. All vehicle operators must have, in their possession and produce on request, a valid drivers license.

3.) Individual Contractor Identification is required for each worker. Identification badges are to be displayed on their outermost garment at all times. The Contractor Identification Badge shall be a minimum of 2" x 2" in size and include the following:

a. Minimum 1" x 1" current color photo of the individual

b. Laminated

c. Company name (and/or subcontractor where applicable)

d. Person's name

e. Unique badge number

f. Expiration date in accordance with the Contract

I. Vehicle Operation Marking and Control

1.) All Contractor vehicles (including equipment, subcontractors, delivery vehicles, etc.) that must enter the Air Operations Area for the required Work of the Contract, must be escorted and properly identified. To operate during daylight hours, construction equipment must have a 3' x 3' orange and white "Airfield Vehicle" identification flag (ANNIN & Co. NYL-GLO #319733 or approved equivalent) or flashing beacon. Any vehicle operating on the movement areas during hours of darkness or reduced visibility must be equipped with a flashing amber beacon light. In addition, vehicles must display permanently affixed company identification media acceptable to the Authority.

2.) Neither the Contractor nor any construction support personnel will be permitted access to the AOA or work site in a private or personal vehicle. There is no employee parking on the Air Operations Areas.

3.) At Air Operations Areas provide obstruction marking flags equipped with approved stiffeners as follows:

a. For Marking of Equipment, Material and Debris: 3-feet by 3-feet colored orange and white in a checkerboard pattern, mounted on a staff of not less than 8-feet in length. Maintain flag in a vertical position at all times and display on each fixed obstruction, truck or other piece of equipment, and at each separate group of workers and material or debris stack.

J. Navigational Aids

1.) The Contractor shall not conduct any construction activity within navigational aid critical areas or affect the visual signal, transmitted signal or power supply of any navigational aid. Navigational aid restricted areas affected by the area of work are depicted on Contract Drawings. Work in these restricted areas is subject to availability based on runway configuration and weather conditions at the time, and may be cancelled by the Engineer without advance warning based on the aforementioned conditions. If the Contractor is specifically directed by the Engineer to suspend his operations in these areas, the Contractor will be compensated as stipulated in the provisions of the Contract concerning compensation for emergency delays.

2.) Navigational aids include instrument landing system components and very high-frequency omni-directional range, airport surveillance radar.

3.) Do not operate ultrasonic, X-ray, radio-type transmitter, magnetic or similar electro-magnetic devices, which affect or may affect the operation of airport navigational aids, unless the Engineer has granted specific prior approval for their operation or use.

K. Limitations on Construction

1.) The Contractor shall obtain Authority permits for open-flame welding or torch cutting operations and electrical power shut-downs prior to start of the Work.

2.) All site storage of supplies and equipment requires approval by the Engineer. All site storage must be in containers and must have company name and 24 hour contact telephone number clearly displayed.

L. Radio Communications

1.) The Contractor is not required to have two-way radio communications with the Engineer.

2.) The Contractor is prohibited from having any communications, including two-way radio, with the Airport Air Traffic Control Tower. All movements within the AOA shall be escorted by the Facility Staff.

110. ACCESS TO CUSTOMS SECURITY AREAS

A. The Contractor shall at his own cost provide to each of his employees and cause to be provided to each employee of his subcontractors, materialmen and others performing services for or on behalf of the Contractor hereunder and who are required to enter a Customs Security Area, a customs identification security card, strip or seal meeting the requirements of the U.S. Customs and Border Protection, Department of Homeland Security (U.S. Customs). See 19 Code of Federal Regulations Section 122.14.

B. The Contractor shall also at his own cost post a bond with U.S. Customs in an amount determined by the U.S. Customs Security Area Director assuring compliance with Customs Regulations applicable to Customs Security Areas. See 19 Code of Federal Regulations Part 113, Appendix A.

C. Under U.S. Customs Regulations, each violation of a Customs Security Area Regulation subjects the Contractor to liquidated damages of $1,000 per violation, which may be assessed by U.S. Customs against the bond posted by the Contractor with U.S. Customs.

D. The Contractor shall advise each of his employees, and cause to be advised each of the employees of subcontractors, materialmen, and others performing services for or on behalf of the Contractor hereunder, of the provisions of the U.S. Customs Regulations with regard to Security Areas and shall require them to comply therewith. Violations of U.S. Customs Regulations giving rise to the imposition of liquidated damages by U.S. Customs include, but are not limited to:

1.) Failure to advise employees of provisions of Customs Regulations relative to Security Areas or to require them to familiarize themselves with said provisions or to comply therewith;

2.) Failure to perform background checks;

3.) Failure to return Customs approved identification card, strip, or seal;

4.) Failure to notify Customs that employee(s) no longer require access to the Customs Security Area;

5.) Entry into Customs Security Area without Customs approved identification card, strip, or seal;

6.) Failure to openly display or produce, upon demand, Customs approved identification card, strip, or seal;

7.) Entry into a Customs security area for a purpose other than to perform duties authorized by Customs;

8.) All other violations that in the judgment of the Area Director endanger the revenue or the security of the area.

E. Further information concerning U.S. Customs Security Area Requirements shall be obtained from the U.S. Customs and Border Protection Hologram Office, at 718-553-1653 for New York facilities, and at 973-565-8000 x6581 for New Jersey facilities.

111. HOURS OF WORK AND CONSTRUCTION STAGING

A. Hours of Work

1.) The Contractor will be permitted to perform the Work of this Contract without restrictions as to Work hours.

2.) The Contractor shall submit to the Engineer, at least one week in advance, his scheduled hours of Work for each week.

3.) Do not perform Work at the construction site on a Federal legal holiday or a holiday of the state(s) in which Work is being performed, unless otherwise permitted by the Engineer.

4.) Because of the arrivals and departures of aircraft, the Authority makes no representation as to the periods of time when conditions at or near the runways or elsewhere at the airport will be such as to permit the Work to be performed without interruption, or as to when any Work can be performed or completed. Arrivals and departures of aircraft are under the control of the FAA Control Tower operator and emergencies and operating conditions may necessitate sudden changes, both in airport operations and in the operations of the Contractor.

B. Construction Staging

1.) Refer to General Note 2 on Contract Drawing G103 for sequence of demolition.

2.) Stage shutdowns in such a manner that interruptions are kept to a minimum and give at least 72 hours advance notice to the Engineer prior to shutdowns.

3.) Perform Work on only one system at a time. Do not start Work on the next system until the Engineer has accepted the installation and test of the previous device. Submit Work schedule for approval at least 72 hours in advance to the Engineer before commencing Work at the next location.

112. MAINTENANCE OF TRAFFIC AND WORK AREA PROTECTION

A. Definitions

As used in this numbered Section, and this Section only, the terms used herein shall have the following meaning:

1.) The terms "Traffic Lane", "Lane", "Active Roadway", "Street", and "Roadway" shall mean, in addition to the normally traveled pavement areas, other areas including but not limited to ramp terminal gore areas, roadway shoulders and all other areas that may foreseeably be occupied by moving vehicles.

2.) "Slow-Moving Vehicles" shall mean vehicles or equipment that travel at or under a speed corresponding to 15 mph less than the posted speed limit.

3.) "Work Area" shall mean the area immediately surrounding the Work in progress, typically where workers are afoot, and/or the space within a Roadway where Work on the Roadway is being done by the Contractor.

B. General Requirements

Conform to requirements of this numbered Section, the Contract Drawings and the following:

1.) Portions of the latest editions, including all amendments thereto, of the Federal Highway Administration (FHWA): "Manual on Uniform Traffic Control Devices" (MUTCD) Part VI as hereinafter specified and applicable portions of the companion "Traffic Control Devices Handbook" (TCDH); "Standard Highway Signs"; "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects"; and the "Standard Color Tolerance Charts".

2.) American Association of State Highway and Transportation Officials (AASHTO): "Roadside Design Guide", Chapter 9: Safety Appurtenances for Work Zones; and "Standard Specifications for Highway Bridges", as hereinafter specified.

3.) The requirements of the Americans with Disabilities Act (ADA) laws in all respects as specified in the "ADA Accessibility Guidelines for Buildings and Facilities" (ADAAG).

4.) Maintenance of traffic and Work Area protection features specified herein and as shown on Contract Drawings and/or sketches to be furnished to the Contractor.

5.) In the event of a technical conflict between a requirement in the publications referenced herein and the Specifications and Contract Drawings, the requirements of the Specifications and Contract Drawings shall control.

C. Contractor-Furnished Materials and Equipment

1.) Provide and maintain in good working order all materials, equipment, and facilities required for proper maintenance of traffic and Work Area protection, as specified herein and/or shown on the Contract Drawings. All said equipment/devices shall remain the property of the Contractor, unless otherwise shown on the Contract Drawings.

2.) All items provided under paragraph C.1 shall be new or undamaged previously used materials in serviceable condition conforming to requirements specified herein.

3.) Provide and maintain in serviceable condition the following, as shown on the Contract Drawings:

a. Vehicle-strong Barriers.

(i) Precast Concrete Barrier

(a.) Concrete Barriers: Conform to the Contract Drawings and Specification Section 02842 "Temporary Traffic Barriers";

b. Back-Up Trucks: Nominal actual weight of 15,000 lbs. with nominal 24,000 lbs. gross vehicle weight registration and rear-most wheels situated close to rear of truck body. Standard "ICC" type rear bumpers are not an acceptable substitute for the required rear wheel location. Actual vehicle weight may vary depending on recommendations of the manufacturer of the vehicle-mounted impact attenuator selected. In addition, equip truck(s) with:

(i) Standard 4-lamp flashing hazard signal lights (parking and tail lights);

(ii) Four-lamp sealed beam rotating yellow warning light providing 35,000 candle power per lamp with an apparent flash rate of 120 flashes per minute. Truck mount such lights 7 to 10 feet above the Roadway and located so as to be visually unobstructed by any part of truck body, load or equipment.

(iii) Vehicle-Mounted Impact Attenuator: "TMA" units as manufactured by Energy Absorption Systems, Inc., Chicago, IL; or approved equal;

4.) Submit the following to the Engineer in accordance with Division 1 - GENERAL PROVISIONS entitled "Shop Drawings, Catalog Cuts and Samples":

a. Catalog Cuts and Data Sheets: Complete manufacturer's data for all equipment and materials.

D. General Work Area Protection

1.) Contractor shall establish a Traffic Maintenance Crew, properly trained, supplied, staffed and equipped to deploy and remove the maintenance of traffic and Work Area protection elements required for each of the Contractor's construction activities, as described on the Contract Drawings and/or paragraph E.3 herein. The Contractor shall identify and maintain one individual, per work period, as the central or key contact for the Traffic Maintenance Crew and their associated activities.

2.) Contractor's Traffic Maintenance training shall be specifically developed from this Section. The contents of Contractor's Training programs shall specifically include the Contract Drawings Traffic Standard Details and all other requirements included on the Contract Drawings.

3.) Prior to commencement of each day's Work, periodically inspect, maintain, relocate, replace, cover, remove or reconstruct the barriers as required throughout the progress of construction operations. Maintain safe control of traffic flow and demarcate areas of Work at all times.

a. Ensure that construction material and equipment not removed from areas of Work during non-working periods are protected in such a manner that they shall not constitute a traffic hazard.

b. Do not park any vehicles other than construction vehicles required for construction operations within the demarcated protected areas of Work.

c. Prior to the end of each work period and not less than twice a day on non-work days, the Contractor's Traffic Maintenance crew shall visually inspect and maintain all elements of the maintenance of traffic and Work Area protection installations.

4.) Throughout Progress of Work of This Numbered Section

a. Maintain visual and physical accessibility to fire hydrants. Provide 24-hour advance notice to the Engineer in the event of hydrant obstruction.

5.) Placement and Removal Traffic Control Devices

a. the Work of installing and removing traffic control devices shall be protected, as a minimum, in accordance with Contract Drawing Standard Traffic Details and/or the MUTCD Part 6, as applicable.

6.) Vehicles used by the Contractor during performance of Work shall be considered as equipment vehicles and when not protected by a Vehicle-strong Barrier, said vehicle shall be protected by a back-up truck, unless otherwise shown on the Contract Drawings.

7.) Slow-Moving Vehicles traveling on a Roadway outside of demarcated protected Work Areas shall be followed (approximately 50 feet behind) by a vehicle displaying the same flashing hazard signal lights and sealed beam rotating yellow warning light as required for back-up trucks.

E. Notwithstanding provisions herein requiring or permitting the Authority to approve or disapprove of any traffic control or delineation and guiding device provided by the Contractor, the Contractor shall ensure the suitability and performance of all such traffic control devices such that inconvenience to the traveling public is held to an absolute minimum.

(END OF SECTION)

DIVISION 2

SECTION 02070

REMOVAL OF UNDERGROUND PETROLEUM STORAGE TANKS AND ANCILLARY EQUIPMENT AND MATERIALS

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for removal of underground petroleum storage tanks and ancillary equipment and materials registered with the New Jersey Department of Environmental Protection (NJDEP). or the New York State Department of Environmental Conservation (NYSDEC).

B. Existing underground petroleum storage tanks, ancillary equipment and materials scheduled for removal under this Contract shall become the property of the Contractor and be disposed of away from Port Authority property in accordance with local, State and Federal governmental rules and regulations.

C. Secure all required United States Environmental Protection Agency (EPA), NJDEP, NYSDEC and United States Department of Transportation (USDOT) identification numbers, manifests and placards for off-site transportation and disposal of removed equipment and materials.

D. Supply USDOT approved drums or containers for filling with materials, which may include but are not limited to: residual product extracted from underground tanks; residue from washing/cleaning of tanks; product contaminated adsorbent materials used in tank cleaning; product contaminated sorbent materials from on-site spill control procedures; rinse water from decontamination of equipment and materials; and personal protective equipment. Place filled drums or containers in drum/container impoundment area as specified hereinafter.

E. Place excavated soil that is excess and/or unsuitable, as determined by the Engineer, in soil impoundment area as specified hereinafter. Notify Engineer immediately of a product leak or spill or if groundwater contamination is detected or suspected.

F. Provide protective clothing and equipment for workers and enforce proper use of same, all in strict accordance with the applicable provisions of 29 CFR 1910 and 1926.

G. Decontaminate equipment and materials that have come in contact with soil described in 1.01 E in the decontamination area as specified hereinafter.

H. Furnish and characterize backfill material used to restore the site. Backfill material shall meet the requirements specified in 3.06.

I. Work by the Authority

The following Work will be performed by the Authority:

1. Removal of useable product from underground tanks down to its lowest draw-off level.

2. Installation of soil borings and monitoring wells; collection and laboratory testing of soil and groundwater samples.
3. The preparation and submittal of Underground Storage Tank (UST) ClosureSite Investigations reports including associated forms, UST registration documents and Regulatory Agency UST closure notification.

1.02 REFERENCES

Comply with the latest edition of all of the applicable industry codes, standards, and practices, including the following, and supplement these references with any available, appropriate material.

American Petroleum Institute (API)

API RP 1604	Closure of Underground Storage tanks, latest edition
API Publication 2217A	Work in Inert Confined Spaces in the Petroleum Industry
API Publication 2219	Safe Operating Guidelines for Vacuum Trucks in Petroleum Service
API Std 2015	Safe Entry and Cleaning of Petroleum Storage Tanks
RP 2003	Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents

New Jersey Department of Environmental Protection (NJDEP) for work performed in New Jersey

NJAC 7:26C	Administrative Requirements for the Remediation of Contaminated Sites
NJAC 7:26E	Technical Requirements for Site Remediation
NJAC 7:14B	New Jersey Underground Storage Tank Regulations
NJAC 7:26	New Jersey Solid and Hazardous Waste Regulations
NJAC 5:23	New Jersey Uniform Construction Code
NJSA 58:4A	Subsurface and Percolating Waters Act

New York State Department of Environmental Conservation (NYSDEC) for work performed in New York

6 NYCRR 612-613	New York Petroleum Bulk Storage Regulations
DER-10	Technical Guidance for Site Investigation and Remediation

New York City Administrative Code for work performed in New York City (NYC)

NYCAC Title 29	NYC Fire Code, Chapter 1 FC 3404.213

Underwriters Laboratories, Inc. (UL)

National Fire Protection Association (NFPA)

NFPA 10	Standard for Portable Fire Extinguishers
NFPA 30	Flammable and Combustible Liquids Code

NFPA 30A	Code for Motor Fuel Dispensing Facilities and Repair Garages
NFPA 70	National Electric Code
NFPA 70B	Electrical Equipment Maintenance
NFPA 326	Safe Entry of Underground Storage Tanks
NFPA 327	Standard Procedure For Cleaning or Safeguarding Small Tanks and Containers
NFPA 329M Section 1-3.5	Guide to Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids

United States Occupational Safety and Health Administration Agency (OSHA)

29 CFR Parts1910 and 1926	Occupational Safety and Health Standards

United States Environmental Protection Agency (USEPA)

40 CFR Part 172	Transportation of Hazardous Materials
40 CFR Part 260- 265 et. Seq.	General Regulations for Hazardous Waste Management
40 CFR Part 280 et. Seq.	Underground Storage Tank Regulations

1.03 QUALIFICATIONS

A. Verify that all entities, including sub-contractors and personnel performing the Work of this section, have at least three years demonstrable experience in removal of underground petroleum storage tanks and are certified as required in the state in which the Work is to be performed. Experience shall include removal, transportation and disposal of underground storage tanks and associated piping in conformance with section 1.02 references and all applicable safety, rules and regulations

1.04 JOB CONDITIONS

A. Contractor will notify local and County health and fire officials prior to the performance of any Work. Contractor shall obtain local Fire Department permits and/or licenses as required for all Work of this Section.

B. Display or have available at all times on the site a Health and Safety Plan (HASP). The site-specific HASP shall be approved by a certified Industrial Hygienist and signed by all affected personnel as described in 1.05 SUBMITTALS.

C. Ensure that a "Safety Officer" as described in 1.05 SUBMITTALS is present at all times during the Work.

D. Condition of Adjacent Construction:

1. Prior to start of Work of this Section, make an inspection with the Engineer to determine the physical condition of the existing adjacent construction and structures that will remain.
2. Prepare and submit to the Engineer a written description of such construction and structures for approval, including photographic documentation, if requested by the Engineer.

3. Furnish and install sheeting as specified in Section entitled 02221 EXCAVATION, BACKFILLING AND FILLING, where shown on the Contract Drawings, and where required to ensure that movement, settling or damage to existing adjacent construction or structures does not occur.

E. Utility Services and Product Lines

1. Do not interrupt any existing utility or other service without prior approval from the Engineer.

2. Give the Engineer 5 days notice in advance of performance of any Work on existing utility lines or service lines. Identify capped, plugged, sealed or rerouted underground lines.

F. A designated area will be provided to the Contractor as shown on the Contract Drawings for the purpose of soil and drum/container impoundment and decontamination of equipment and materials.

G. Establish and maintain a surface impoundment area within the designated area indicated on the Contract Drawings for on-site storage of soil described in Item 1.01 E.

H. Establish and maintain a surface impoundment area within the designated area indicated on the Contract Drawings for on-site storage of drums and containers filled under Item 1.01 D.

I. Provide sorbent pads, pillows, booms and blankets to contain and clean product spills at all areas of product pumping, transfer and holding; tank cleaning, and decontamination.

J. Provide, operate, maintain and calibrate combustible gas indicators (CGI), portable photoionization devices (PID), and percent oxygen indicators to assess gas/ vapor concentrations in tanks in accordance with the HASP specified hereinafter with regard to maintenance and use of this equipment:

1. Perform instrument cleaning, maintenance and calibration in accordance with manufacturer's instructions.

2. Use of personnel meeting the requirements of 1.05 A.3 to perform such testing is mandatory.

K. Use of flame cutting and operations that may create sparks are prohibited, unless permitted by the Engineer. Such operation may be permitted only when the tank is inert and the surrounding area is free of flammable vapors to the extent necessary to begin dismantling of the tank.

L. Equipment used for Work of this Section shall be capable of safe operation in NFPA 70 Class I, Division 1 locations, and equipment used for handling petroleum products shall be UL listed where such listings are available.

M. Use of CO2 fire extinguishers for inerting of tanks is prohibited.

N. Use of an eductor-type air mover for purging of the tanks is prohibited.

O. Perform excavation and backfilling in accordance with Section 02221 EXCAVATION, BACKFILLING AND FILLING.

P. Perform tank cleaning and removals in accordance with API Bulletins 1604 and 2015 and the requirements of this Section.

1.05 SUBMITTALS

A. Within 5 calendar days after the acceptance of the Proposal, submit:

1. Tank Closure Certification and proof of tank closure training for employees.
2. For the entity performing tank removal hereunder, a demonstration of previous underground tank removal experience by submission of a list of tank removal contracts performed during the past three years including: the names, addresses, and telephone numbers of owners for whom projects were performed; and the cost, year of work, and description of work of each such project.
3. The name and qualifications of the Industrial Hygienist responsible for reviewing and approving the Health and Safety Plan.
4. The name and qualifications of the Safety Officer proposed for use in performing the Work. The Contractor, however, shall be responsible for the implementation and enforcement of the HASP. As a minimum, the Safety Officer must have the following qualifications:
   a. Certification of completion of accredited courses in cardiopulmonary resuscitation (CPR) and First Aid, within the last 12 months.
   b. Certification of completion of the OSHA (29 CFR 1910.120) or EPA Training Course 165.5, "Hazardous Materials Incident Response Operations" (40 hours or 8 hour annual refresher course), or equivalent, within the last 12 months.
   c. Certification of completion of the OSHA (29 CFR 1910.120) training course for Site Management and Supervision, or equivalent, within the last 12 months.
   d. Documented experience as a Safety Officer on at least one project of similar size and scope.
5. Identify, within the designated area shown on the Contract Drawings, specific dimensions and locations for soil and drum/container staging and decontamination.

B. Within 5 calendar days after the acceptance of the Proposal, submit the site-specific Health and Safety Plan (HASP), bearing confirmation of review and approval by an Industrial Hygienist possessing valid certification by the American Board of Industrial Hygiene, proposed for use in performing the Work to be in accordance with all applicable OSHA regulations. As a minimum, the HASP shall:

1. Identify key personnel responsible for site safety.
2. Address levels of personal protection to be employed during Work, setting forth specific criteria for choice of protective clothing and equipment.
3. Designate Work area exclusion zone and decontamination zone boundaries. Describe how zones will be marked/barricaded and made known to all persons at the site
4. Include site entry and exit procedures.
5. Establish site emergency procedures, for example, escape routes, signals for evacuating work parties, emergency communications, procedures for response to fire and explosions. Describe emergency equipment to be made available on site, such as portable extinguishers, first aid kit, etc.
6. Identify, provide location of, and list arrangements with the nearest medical facility.
7. Set forth a program for air monitoring in the Work area (exclusion zone). List and describe equipment to be used.
8. Set forth a program for monitoring for vapors and hazardous conditions in the tanks. List and describe equipment to be used.
9. Identify Confined Space entry and perform its entry in accordance with the facility standard protocol and as directed by the Engineer.

C. Provide a UST closure plan that includes the following:

1. An excavation and material handling plan that describes the methods, means, equipment, sequence of operations and schedule to be employed in excavation, transport, handling, and stockpiling of soil during UST removal, shoring requirements, and lists the phases of dealing with contaminated soil and water as it relates to the proposed UST(s) and piping removal.

2. A tank and piping removal and disposal plan that include the following: Describes the methods, means, and sequence of operations and schedule to be employed in the pumping, cleaning, de-vaporizing, cutting, removal and disposal of the UST(s) and its associated piping.

D. Provide a comprehensive spill and discharge control plan that addresses contingency measures for potential spills and discharges from handling and transporting contaminated soil and water.

E. Provide backfill documentation in accordance with Section 3.06.

F. Contractor shall submit the above for approval in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS.

PART 2. PRODUCTS

(None)

PART 3. EXECUTION

3.01 GENERAL

A. As required, obtain local, State, or Federal permits and licenses that directly affect the Contractor's ability to perform the Work prior to commencing UST removal operations

B. All Work shall be performed in conformance with the HASP.

C. Contractor shall install visible barricades around Work area. Barricades shall be maintained throughout entire contract duration.

D. Contractor shall verify that all appropriate utilities are disconnected, locked out, and tagged prior to starting Work on that utility. Locations of utilities are shown on the Contract Drawings.

E. Safety Officer shall test for presence of explosive and asphyxiating (i.e. confined space entry) conditions using portable CGIs, PIDs, and percent oxygen indicators in accordance with the HASP.

F. Contractor shall construct the impoundment areas described in 1.04 JOB CONDITIONS as follows:

1. Furnish and install hay bale berm around the perimeter of impoundment area. Allow sufficient space for vehicle access.
2. Place 10-mil polyethylene sheet barrier membrane of the largest practical size to cover the impoundment area and extend over the perimeter of the berm with a minimum of joints. Overlap sheet joints at least 8" and seal with a double layer of duct tape. Secure polyethylene sheet to the outer limits of the berm perimeter.
3. Completely cover impounded soils and materials with a 10 mil thick well-secured polyethylene sheet in order to prevent contaminants from being released into the surrounding soil, surface water, or groundwater.
4. When stored within the same impoundment area, soils and drums shall be separated from each other by an impervious barrier.

G. Deploy sorbent pads, pillows, booms and blankets as required to prevent surface water or product run-off from area of Work.

3.02 PRE-REMOVAL

A. Place hay bales or other barricades around surrounding drain inlets to prevent accidental discharge into other utility systems. Take precautions to avoid any spillage from removal activities and maintain spill clean-up materials on site.

B. Excavate exploratory trenches as necessary to determine tank location, limits and the location of ancillary equipment. Remove drop tubes and check valves from tanks, if present. Drain and flush with water all piping back into the tank being careful to avoid any spillage to the surrounding area.

C. Remove and haul any remaining product from tank utilizing a vacuum tank truck with explosion proof or air driven pumps. Alternatively, remove the remaining product via a temporary closed system into USDOT approved drums or containers. After filling drums or containers, seal closed, identify contents (See 3.02 E), and store in the impoundment area.

The vacuum truck operator should be trained to identify or recognize hazards connected with truck operations including spills, hose failures, and discharges of toxic and flammable vapor.

The vacuum truck operator shall be provided with and trained in the use of all required personal protective equipment. In addition the tank operator must be knowledgeable of potential flammable conditions, fire prevention, first aid and of the use of portable fire extinguishers.

D. Operate Vacuum truck upwind of any pick up point and outside path of vapor travel.

E. Drums or containers shall be labeled as follows:

- SPECIFIC WORK SITE (e.g., EWR Building 14-UST)
- DRUM (CONTAINER) NUMBER (in increasing sequence as filled)
- CONTENTS (e.g., rinse water from tank cleaning)
- THE START AND END DATES OF WASTE ACCUMULATION

Maintain a written inventory of drums and containers

F. Where indicated on the Contract Drawings, remove cover materials over tank and piping, and excavate additional soil as required to expose top of tanks, fittings and product lines. Disconnect and remove all piping, except vent line. Place excavated soil specified in 1.01 E within prepared soil impoundment areas. Separately stockpile remaining soil for use as backfill at a location directed by the Engineer. Concrete and asphalt shall be properly disposed of off Authority site.

G. Cap or plug all tank openings, except vent line.

3.03 TANK CLEANING AND REMOVAL

A. Purge tank of vapors and oxygen by one of the following methods:

1. Displacement with bottled, inert gas (e.g. CO_2).

   Pressure in the tank shall not exceed 5 pounds per square inch gauge. Use a minimum of one 75 lb. cylinder of CO_2 gas per 2000 gallons of tank volume. Exercise care to prevent buildup of any static charge. The nozzle must be bonded or grounded and the gas introduced slowly to reduce static.

2. Displacement with dry ice (minimum 1.5 lbs. per 100 gallon of tank capacity).

   Crushed dry ice shall be distributed evenly inside of the tank to promote rapid dissipation and removal of ignitable vapors.

B. Vent all of the vapors from the tank at a minimum height of 12 feet above grade and 3 feet above any adjacent roof level.

C. Remove non-enterable tanks from the excavation in order to gain access to the interior for cleaning.

D. Gain access to tank interior by careful use of a cold cut with a cement/concrete saw, or equivalent. The cut shall be wetted with water to reduce the propagation of sparks.

E. Clean inside of tanks in accordance with API 2015 using high-pressure water rinse. Use as little water as possible for proper cleaning. Remove and containerize wash water, residual liquids, sediment (sludge) and debris. After filling disposable containers, seal closed mark and placard contents in accordance with USDOT standards and place in the impoundment area.

F. Provide tank removal/lifting equipment of a size adequate to safely remove tank. Front-end loaders and backhoes cannot be used for lifting unless they are equipped with a factory attached hook designed with adequate lift capacity for the tank and the tank does not exceed the published lifting capacity for the equipment. Remove the tank from the excavation and place in a level surface. Use wooden blocks to prevent movement of the tank after and prior to loading on a truck for transportation. Remove external scale and attached soil from the tank.

3.04 DISPOSAL OF TANK AND ANCILLARY EQUIPMENT

A. Permanently and legibly label each tank with letters not less than 2 inches high as follows:

TANK HAS CONTAINED (Name material, e.g., "gasoline")
NOT VAPOR FREE
NOT SUITABLE FOR STORAGE OF FOOD OR LIQUIDS INTENDED FOR HUMAN OR ANIMAL CONSUMPTION
DATE OF REMOVAL (month, day, year)

B. In addition, for tanks that have either stored leaded motor fuel or whose use history is unknown, permanently and legibly label each such tank with letters not less than 2 inches high as follows:

TANK HAS CONTAINED LEADED GASOLINE. LEAD VAPORS MAY BE RELEASED IF HEAT IS APPLIED TO TANK SHELL.

C. Comply with State of New Jersey requirements for additional labeling of the tank specifying the site of origin, ultimate destination site and the substance(s) that were stored in it during its use as a storage tank

D. Prior to off-site transportation of tanks, perform a final flammability test in accordance with API procedures of any residual vapors within the tank. Ensure that tank vapors do not contain more than 10 percent of the Lower Explosive Limit specific to the product stored in the tank.

E. Ensure tank is unfit for further use by drilling or puncturing multiple holes in all surfaces.

F. Transport and dispose of tanks, ancillary equipment and materials away from Authority property in accordance with all applicable regulations and guidelines.

G. If the excavation is to remain open during breaks or after the Contractor leaves the site, protect the excavation perimeter with a fence 6' high and secure entry with a padlock to prevent unauthorized personnel access.

3.05 DECONTAMINATION OF EQUIPMENT AND MATERIALS

A. All decontamination procedures of equipment and materials shall conform to the requirements of applicable USEPA and NYSDEC or NJDEP regulations, as appropriate.

B. Prior to their removal from the site, decontaminate all recoverable equipment and materials, which have been in contact with excavated soil described in 1.01 E. As used herein "recoverable" shall mean all items which are non-absorptive in nature and which can successfully be decontaminated. All items for which decontamination is difficult or uncertain shall be considered non-recoverable, as determined by the Engineer.

C. Furnish and install a non-porous barrier membrane of appropriate size and material under items being decontaminated to catch and hold rinse fluids and protect adjacent grade area. This barrier membrane and the rinse fluids shall be considered non-recoverable.

D. Decontaminate recoverable Contractor owned equipment and materials with pressurized steam. Do not utilize any detergent agents.

E. Deposit non-liquid, non-recoverable materials into USDOT containers described in 1.01 D, as directed by the Engineer.

F. Deposit rinse fluids into USDOT containers described in 1.01 D, as directed by the Engineer.

G. Mark and placard drummed decontamination materials (See 3.02 E) and place in the impoundment area.

3.06 CLOSE-OUT

A. When directed by the Engineer, place backfill in excavation and compact in accordance with Section 02221 EXCAVATION, BACKFILLING, AND FILLING except as noted herein.

B. In the State of New York, backfilling requirements shall comply with DER-10 Technical Guidance for Site Investigation and Remediation Section 5.4 [3(c) 2(i) thru (iv)].

C. In the State of New Jersey, excavated material may be reused as backfill in the excavation in accordance with the requirements of the NJDEP Site Remediation Program "Technical Guidance for Investigation of Underground Storage Tank Systems" guidance document.. Imported backfill material shall meet the clean fill requirements specified in the NJDEP Site Remediation Program "Alternative and Clean Fill Guidance for SRP Sites."

D. Restore pavement, if any, as shown on the Contract Drawings at no cost to the Authority.

E. Submit one copy of bill of lading (or Certificate of Destruction) for disposing of tank, piping, equipment, and materials. Such bill of lading (or Certification of Destruction) shall include the Contractor's acknowledgement that he assumes all liability for disposal of the tanks, piping, equipment, and materials removed.

END OF SECTION

DIVISION 2

SECTION 02081

ASBESTOS REMOVAL AND DISPOSAL FOR PORT AUTHORITY OF NEW YORK AND NEW JERSEY

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for removal and disposal of asbestos-containing materials and/or asbestos-contaminated objects from facilities owned and/or operated by the Port Authority of New York and New Jersey or The Port Authority Trans-Hudson Corporation (PATH), hereinafter called the "Authority" at facilities in the States of New York and/or New Jersey.

B. This Section is organized as follows:

Parts 1 through 3 represent the general portions of the specification. These sections are supplemented with Appendixes "A", "B" and "C" based on project specific abatement tasks for the State in which the work is to be performed (New York or New Jersey).

C. In accordance with Appendixes "A", "B" and "C" herein and the Contract Drawings, perform the following:

1. Prepare the "Work Area" for the removal of asbestos materials.
2. Remove, package, transport and dispose of the type(s) of asbestos-containing materials and/or asbestos-contaminated objects from the "Work Area(s)".
3. Decontaminate and seal surfaces in contact with asbestos-containing materials.
4. If removed materials are to be replaced, new materials shall be approved non-asbestos materials.
5. Re-establish "Work Area" and/or "Work Site" systems and objects.

D. Transport asbestos-containing materials and/or asbestos contaminated objects in accordance with 1.04 A.2 herein.

E. Dispose of asbestos-containing materials and/or asbestos contaminated objects at an approved landfill in accordance with 1.04 A.3 herein.

1.02 REGULATORY COMPLIANCE

A. Unless specifically directed otherwise by the Engineer, the Authority shall be sole entity to administer the regulatory compliance, the Work of this Section, and enforce the provisions herein.

B. Notifications

1. The Authority will notify the U.S. EPA for Work of this Section in accordance with 40 CFR Part 61, Section 65 (a)(b), for asbestos-containing materials.
2. The Contractor shall make arrangements for, and ensure that, the entity performing the Work of this Section performs the following:

a. As directed by the Engineer, comply with the notification and re-notification requirements for the State in which Work is being performed and provide proof of notification and renotification prior to starting or continuing with Work.

C. In accordance with the requirements of the Section of Division 1 - GENERAL PROVISIONS, Entitled "Laws and Ordinances," Work under this Section shall conform to the provisions of the following codes and regulations, except where otherwise noted herein or on the Contract Drawings. Where the requirements of this Section or the Contract Drawings and the following codes and regulations differ, the stricter requirements shall control. Where methods or procedures are specified, they shall constitute minimum measures and shall in no way relieve the contractor of sole responsibility for the means, methods, techniques, sequences, or safety measures in connection with the work.

1. For Work of this Section performed in New York State:

   a. Part 56 of Title 12 of the Official Compilation of Codes, Rules and Regulations of the State of New York: (12 NYCRR, Part 56) - Industrial Code Rule 56 ASBESTOS.

   b. 6 NYCRR Chapter II Title, 10, Part 73 - Asbestos Safety Program Requirements.

   c. 6 NYCRR, Part 364 - Waste Transporter Permits.

   d. 6 NYCRR, Part 360 - Solid Waste Management Facilities (if disposal site is in New York State).

   e. Administrative Code of the City of New YorkSection 755 (2) - 6.3 - Transport, Storage and Disposal of Waste Containing Asbestos, and Section B32 - 267.0 et. SEQ. - Commercial Refuse Removal.

2. For Work of this Section performed in New Jersey:

   a. New Jersey Administrative Code (N.J.A.C.): Section 5:23-8, Subchapter 8 - Asbestos Hazard Abatement Subcode.

   b. Section 7:26 - Division of Waste Management Rules.

   c. Section 8:60 - Department of Labor Asbestos Certifications.

   d. Section 12:120 - Safety and Health Standards.

3. For Work of this Section performed in New York State and/or New Jersey:

   a. 29 CFR (Code of Federal Regulations) Part 1926.1101, U.S. Occupational Safety and Health Administration (OSHA) - Asbestos Standard for the Construction Industry.

   b. 29 CFR 1910.134 – OSHA, Respiratory Protection

   c. 29 CFR 1910.146 - OSHA, Confined Space Entry.

   d. 29 CFR 1926.20 – OSHA, General Safety and Health Provisions.

   e. 29 CFR 1926.21 – OSHA, Safety Training and Education.

   f. 29 CFR 1926.22 – OSHA, Recording and Reporting of Injuries.

   g. 29 CFR 1926.23 – OSHA First Aid and Medical Attention.

   h. 29 CFR 1926.24 – OSHA, Fire Protection and Prevention.

   i. 29 CFR 1926.25 – OSHA, Housekeeping.

   j. 29 CFR 1926.26 – OSHA, Illumination.

   k. 29 CFR 1926.27 – OSHA, Sanitation.

   l. 29 CFR 1926.28 – OSHA, Personal Protective Equipment.

m. 29 CFR 1926.32 – OSHA, Definitions.

n. 29 CFR 1926.35 - OSHA, Employee Emergency Action Plans.

o. 29 CFR 1926.56 - OSHA, Illumination.

p. 29 CFR 1926.59 - OSHA, Hazard Communications.

q. 29 CFR 1926.95 – OSHA, Criteria for Personal Protective Equipment.

r. 29 CFR 1926.96 – OSHA, Occupational Foot Protection.

s. 29 CFR 1926.100 – OSHA, Head Protection.

t. 29 CFR 1926.101 – OSHA, Hearing Protection.

u. 29 CFR 1926.102 – OSHA, Eye and Face Protection.

v. 29 CFR 1926.103 – OSHA, Respiratory Protection.

w. 29 CFR 1926.104 – OSHA, Safety Belts, Lifelines, and Lanyards.

x. 29 CFR 1926.105 – OSHA, Safety Nets.

y. 29 CFR 1926.106 – OSHA, Working Over or Near Water.

z. 29 CFR 1926.107 – OSHA, Definitions Applicable to this Subpart.

aa. 29 CFR 1926.150 - OSHA, Fire Protection.

bb. 29 CFR 1926.151 – OSHA, Fire Prevention.

cc. 29 CFR 1926.152 – OSHA, Flammable and Combustible Liquids.

dd. 29 CFR 1926.153 – OSHA, Liquified Petroleum Gas.

ee. 29 CFR 1926.154 – OSHA, Temporary Heating Devices.

ff. 29 CFR 1926.153 – OSHA, Definitions Applicable to this Subpart.

gg. 29 CFR Part 1926 Subpart G OSHA, Signs, Signals and Barricades.

hh. 29 CFR Part 1926 Subpart K - OSHA, Electrical.

ii. 29 CFR 1926 Subpart L - OSHA, Scaffolding.

jj. 29 CFR 1926 Subpart X - OSHA, Stairways and Ladders.

kk. 40 CFR Part 61, Subparts A and M, U.S. Environmental Protection Agency (EPA), National Emission Standards for Hazardous Air Pollutants (NESHAP) - Asbestos.

ll. National Fire Protection Association (NFPA), Standard 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

mm. The American National Standard Institute (ANSI) Practices for Respiratory Protection ANSI 88.2-1980.

D. References in this Section to laws, codes, ordinances, regulations, standards or other Federal, state, municipal, local or departmental legal requirements shall be deemed to mean the latest version or revision thereof or successor thereto, notwithstanding any change in numbering, designation or titles in effect at the time of bid opening.

E. Unless specifically directed otherwise by the Engineer, the Authority will be the sole entity to monitor the project.

1.03 DEFINITIONS

A. Definitions and other terms used in this Section shall have the meanings set forth in 29 CFR 1910.1101; and for Work in New York State, as set forth in 12 NYCRR Part 56: Subpart 56-1.4, and for Work in New Jersey, as set forth in N.J.A.C. 5:23-8.2; and the following:

1. "Asbestos Abatement Permit Placard" shall mean a permit issued by the Port Authority authorizing the entity performing Work of this Section to commence with such Work

2. Authorized Person" shall mean a person provided by the Authority in accordance with U.S. EPA NESHAP, 40 CFR Part 61, Section 61.145 (c)(8).

3. "Certified Project Designer" shall mean a U.S. EPA Asbestos Hazardous Emergency Response Act (AHERA) Certified Project Designer for Work in New Jersey, or a New York State Department of Labor Certified Project Designer for Work in New York State.

4. "Emergency Exit" or "Egress" shall mean an area on the isolation barrier (i.e.: door or kick-out panel) that may be opened or broken for the immediate egress of people from the work area in case of an emergency.

5. "Initial Exposure Assessment", including "Negative Initial Exposure Assessment" are terms used in the OSHA construction standards. It means a required assessment by a "competent person" concerning the exposure potential of a specific asbestos job, or series of similar asbestos jobs. A "Negative Initial Exposure Assessment" is such an assessment in which it is concluded that employee exposures during the job are likely to be consistently below the Permissible Exposure Level (PEL). Assessments must be based on information and data which are allowed pursuant to criteria in OSHA Standard 1926.1101.

6. "Site Security/Fire Watch" shall mean an employee of the entity performing Work of the Section, who shall at a minimum possess the appropriate, valid state certification as an asbestos handler, who shall be on the "Work Site" at all times during periods of non-Work of this Section to ensure "Work Area" containment integrity, continuous operation of negative air filtration devices, security of the "Work Area" and security of asbestos waste stored at the "Work Site". In addition, when the operation of the existing fire protection system is impaired, deactivated, or compromised, the "Site Security/Fire Watch" person shall, in addition to being familiar with responsibilities of maintaining "Work Area" integrity, be familiar with the emergency response plans and procedures, and the use of the fire extinguisher provided at the "Work Site" for Work of this Section.

7. "Support Structures" shall mean any temporary structure constructed to reach, inspect, or perform Work of this Section.

8. "Work Area" shall mean the designated area within a "Work Site" where Work of this Section occurs which is isolated as required and to which access is restricted.

9. "Work Site" shall mean the construction site location(s) where Work of this Section is being performed.

1.04 QUALITY ASSURANCE

A. QUALIFICATIONS:

1. The entity performing Work of this Section shall be approved by the Authority prior to the commencement of Work of this Section and shall:

   a. Possess valid licenses, permits and certificates for the State in which the Work is to be performed.

   b. Employ for Work of this Section "Certified Project Designers", asbestos abatement handlers, restricted handlers, supervisors and air compressor operators who possess valid certifications and licenses for the State in which the Work is to be performed.

c. Provide at the "Work Area" a "Competent Person" conforming to the requirements of 29 CFR 1926.32 (f), 1926.1101 (b), 40 CFR 61 Subpart M, and in addition, such person shall have at least three years of experience on asbestos abatement projects as an asbestos abatement supervisor in the State in which Work of this Section is being performed.

d. Provide a Certified Industrial Hygienist (CIH) with at least three years of applicable experience in asbestos abatement, and with a certification by the American Board of Industrial Hygiene.

e. Employ an environmental laboratory, approved by the Authority, that conforms to the Quality Control Procedures of 29 CFR 1926.1101 Appendix A, participates in a national sampling testing scheme such as the Proficiency Analytical Testing Program (PAT) or the Asbestos Registry sponsored by the American Industrial Hygiene Association.

f. All subcontractors shall be approved by the Engineer or shall submit subcontractor(s) qualifications with the bid for all proposed Subcontractor(s). Any proposed subcontractor(s) performing work under this specification shall have appropriate qualifications. Subcontractor qualifications submitted shall be in such form and number as may be required by the Authority.

2. The asbestos waste transporter providing transportation services for Work of this Section shall be approved by the Authority prior to the commencement of Work of this Section, and hold the appropriate transporter permits, licenses and certifications for each State in which asbestos transportation is to take place. Such transporter shall transport asbestos-containing materials and/or asbestos-contaminated objects by licensed motor vehicle operators, in vehicles with valid motor vehicle registrations.

3. The landfill disposal site for the asbestos-containing materials and/or asbestos-contaminated objects shall be a site or a facility with valid municipal, state, federal permits (where applicable) and approved by the Authority prior to the commencement of Work at the "Work Area".

1.05 WORK AREA CONDITIONS

A. The Authority will perform the following air monitoring and analysis, and will provide analytical results of such air monitoring to the entity performing Work of this Section:

1. Baseline sample results collected within and adjacent to the "Work Area(s)" during normal occupancy conditions prior to the commencement of asbestos abatement activities.

2. Pre-abatement (area preparation) sample results collected within and adjacent to the "Work Areas" during asbestos abatement preparation activities (applicable to work performed in New York State only).

3. Sample results taken outside the "Work Area(s)" during abatement activities.

   a. If during the performance of abatement Work, area air sample results taken outside the "Work Area" exceed normal occupancy baseline levels or fiber concentrations in air at or in excess of 0.01 fibers per cubic centimeter (whichever is greater), the entity performing Work of this Section shall take the appropriate corrective action until acceptable levels are achieved, as determined solely by the Engineer.

4. Post-abatement air clearance results.

B. The Entity Performing Work of This Section Shall:

1. Perform initial employee exposure air monitoring in accordance with 29 CFR 1926.1101 (f)(2).
2. Perform full shift daily monitoring for a minimum of twenty (20%) percent of the workers performing a particular task within the "Work Area" each working shift in accordance with 29 CFR 1926.1101 (f)(3).
3. Throughout Work of this Section, the CIH, or the CIH's authorized representative, shall review and sign all air monitoring reports prior to the release of the data to the Contractor. Based upon employee exposure monitoring and analysis of airborne fiber concentration levels, the CIH shall determine the required level of respiratory protection established in accordance with 29 CFR 1926.1101(h).
   a. If based upon the results of employee exposure air monitoring the entity performing Work of this Section requests that monitoring be suspended in accordance with 29 CFR 1926.1101 (f)(4), the CIH shall determine if full shift monitoring accurately represented the airborne exposure to asbestos for the Work, and submit to the Engineer in writing for approval, a recommendation with reasons why monitoring may be suspended.
   b. Report results of employee exposure air monitoring analyses to the Engineer not more than twenty-four (24) hours after the collection of the sample, and post written laboratory results, signed by the CIH, or the CIH's authorized representative, in accordance with 3.01 E.3 herein within two (2) business days.
4. For post-abatement air clearance sampling provide, install, maintain and operate aggressive forced air equipment, e.g., fans, leaf blowers, in accordance with the requirements of the State in which Work is being performed.
5. Re-cleaning, if the "Work Area" fails the Post-abatement air clearance test on the first attempt, shall be performed by the entity performing Work of this Section at no additional cost to the Authority.
6. Ensure that the "Competent Person" stipulated in 1.04 A.1.c attend all meetings related to Work of this Section.
7. Perform Work in accordance with the Contract Documents.

C. Unless otherwise stipulated in Appendix "B" to this Section or as shown on the Contract Drawings, utilities and services, such as water, gas, sewers, electricity, steam heating/cooling ventilation, elevators, fire protection systems, sprinklers and smoke detectors, passing through the "Work Area(s)" shall continue service to areas outside of the "Work Area(s)". Where stipulated in Appendix "B" herein, or shown on the Contract Drawings shutdown and lock-out as necessary to perform Work of this Section. The Contractor shall provide that the entity performing Work of this Section shall coordinate with the Engineer prior to interrupting, re-routing or otherwise affecting any operating system, utility or service. The Authority will perform, and provide certification of utility and service shutdown(s), lockouts, and of required pressurization of ventilation duct systems. Notify the Engineer prior to the impairment or deactivation of the existing "Work Area(s)" and/or "Work Site" fire protection system.

1.06 SUBMITTALS

A. See Appendix "A"

PART 2. PRODUCTS

2.01 EQUIPMENT

A. Ensure that the entity performing Work of this Section provides, maintains, and/or uses the following equipment as required:

1. Respirators selected by the CIH based upon airborne fiber concentrations determined in accordance with 1.05 B. herein.
2. Daily employee exposure air monitoring equipment for not less than twenty percent (20%) of workers employed in each particular task per work shift in accordance with 1.05 B. herein.
3. Protective clothing and equipment for personnel exposed to airborne concentrations of asbestos fibers, including but not limited to whole body disposable covering, gloves, head covering, foot covering, hard hats and eye protection.
4. The Contractor shall maintain stocked first aid kits in the clean room of the decontamination unit and in the work area including, but not limited to bandages, antiseptic wipes, burn cream, eye flushing solution, and tourniquet.
5. Dedicated respirators and personal protective clothing and equipment for the Engineer, and a maximum of three (3) for "Authorized Visitors".
6. Twenty-pound A-B-C multipurpose dry chemical fire extinguishers located in the clean and equipment rooms of the personnel and waste decontamination enclosure, emergency egress locations, and the "Work Area".
7. Negative pressure air filtration equipment.
8. Continuous chart recording manometers to measure differential air pressure.
9. Forced air equipment, e.g., leaf blowers and fans, for use during post-abatement air clearance sampling.
10. Fully enclosed and lockable waste dumpsters, trailers, or roll-offs, with the interior walls and floors lined with one (1) layer of 6-mil fire retardant polyethylene.
11. Asbestos warning signs, leak-tight containers, and transportation labels conforming to 29 CFR 1926.1101(k), and 40 CFR Part 61, Section 61.1(a).
12. Spare containers and labels at the "Work Site", and on the waste transport vehicle for use in case of accidental loss or breakage.
13. HEPA vacuums, rubber or plastic dustpans, squeegees or non-metallic shovels with rounded edges, hand tools, OSHA approved ladders and scaffolds, and inclined chutes where required for Work at heights ten (10) feet or greater above the floor or adjacent ground surface.
14. When "Work Site" electricity is furnished from an existing electrical system, provide temporary electric and lighting from a panel outside of the "Work Area". Furnish and install a temporary electric panel equipped with ground fault circuit interrupters conforming to the National Electric Code for Work in New Jersey, and to the Electrical Code of the City of New York for Work in New York State. Temporary lighting level within the "Work Area" shall at a minimum conform to 29 CFR 1926.56, Illumination.
15. Battery operated emergency lighting within the "Work Area", personnel and waste decontamination enclosures, and emergency egress locations. Self-luminous emergency fire exit and directional signs identifying the path to, and location of, the personnel and waste decontamination enclosures, and emergency egress locations.

2.02 MATERIALS

A. Ensure that the entity performing Work of this Section provides, maintains, and/or uses the following materials as required for Work of this Section:

1. Leak-tight containment waste bags of clear or colored plastic, at least 6-mil in thickness with approved warning and transportation labels.
2. Commercially available glove bags of at least 6-mil transparent polyethylene with approved asbestos warning labels.
3. Surfactant, lock-down sealant, and encapsulating products which are recommended by the manufacturers for the specific type of asbestos being abated, and approved by the Engineer.
4. Lumber having a U.L. rating of FR-S. Lumber for temporary support structures shall be U.L. rated FR-S.
5. Minimum 6-mil polyethylene and reinforced polyethylene, with a fire retardant rating conforming to the requirements set forth by the NFPA Standard 701.
6. Other materials such as water-resistant duct tape, adhesives, caulking, nails, fasteners and hardware, as required to perform the Work of this Section.

PART 3. EXECUTION

3.01 PRE-ASBESTOS REMOVAL MEETING AND WORK SITE PREPARATION

A. Prior to the start of Work of this Section at the "Work Site", and after the submission and approval of the information required under 1.04 A and and Appendix "A", the Engineer will schedule a pre-asbestos removal meeting.

B. The following will be performed at the "Work Area" and "Work Site" by the Authority:

1. Post the U.S. EPA notification letter, and if applicable, all re-notifications.
2. Post the Authority "Asbestos Abatement Permit Placard".
3. Post bulk sampling results.
4. As required, isolate, shutdown, pressurize, de-energize and lockout those utilities and services listed in applicable appendices herein.
5. Inspect and evaluate waste container(s) upon arrival at the "Work Site". Damaged, improperly sealing or locking waste container(s) shall be rejected.
6. Place locks on all waste containers.
7. Field-verify the efficiency of the negative air units utilizing velometers and/or manometers.

C. If Appendix "B" to this Section stipulates that a "Work Area" is a Confined Space as defined by 29 CFR 1926.21 and 29 CFR 1910.146, the Contractor shall ensure that entity performing Work of this Section shall be responsible for and shall take the appropriate safety measures stipulated therein.

D. The Contractor shall ensure that the entity performing Work of this Section notifies the building occupants who may be impacted by Work of this Section with a letter, prepared by the Authority, a minimum of ten (10) days prior to the start of Work.

1. The Contractor shall ensure that entity performing Work of this Section posts the "Notice of Abatement Project" signs, provided by the Authority, ten (10) days prior to the start of Work; posted at locations determined by the Engineer.

E. Ensure that the entity performing Work of Section posts the following items on a notification board located at the entrance to the clean room of the personal decontamination enclosure:

1. A copy of the Abatement Contractor's State license.
2. Copies of the air-sampling technician's, project monitor's, supervisor's, handler's and restricted handler's State certificates.
3. OSHA air monitoring results (Within 48 hours of Sample Collection).
4. Emergency first aid procedures and notification telephone numbers.
5. If applicable, air compressor operator certificates of approval or fitness.
6. Name of the Work Site "Competent Person", and a list of names of workers who are authorized to enter the "Work Area(s)".
7. Chain-of-command and telephone numbers in accordance with Appendix "A" (C)(8) herein.
8. Copies of all required City and State asbestos transporter licenses, certificates, and permits.
9. Signs as required by 29 CFR 1926.1101(k) at all entrances to the "Work Area".
10. "No Smoking" signs.
11. A copy of this Specification Section and Appendices.
12. A copy of approved applicable, or project-specific, state variances pertinent to the project.
13. Laboratory results of environmental air samples as defined in Section 1.05 B.3.b.

F. The Contractor shall ensure that the following items shall be available at the "Work Area" and/or "Work Site" by the entity performing Work of this Section for inspection by the Authority or their duly appointed representative:

1. The Contract booklet and Contract Drawings and in addition, a copy of all approved submitted drawings and procedures.
2. Copies of applicable City, State and Federal regulations.
3. Material Safety Data Sheets.
4. NESHAP asbestos generator shipping labels.
5. The record of all manometer recordings.

3.02 WORK AREA PREPARATION

A. Work of this Section at the "Work Area" and/or "Work Site" shall not commence until all submittals are approved, and an "Asbestos Abatement Placard" has been issued by the Authority.

B. Work at the "Work Area" shall proceed only when the "Competent Person" and Authority "Authorized Person" are present at the "Work Area".

C. If the scheduled starting date cannot be met, the Contractor shall ensure that the entity performing Work of this Section requests a start date change in writing to the Engineer at least seventy-two (72) hours before the initial notice start date. Schedule changes are subject to the approval of the Engineer. Regulatory re-notifications shall be performed in accordance with 1.02 B.1 and B.2.

1. In the event of failure to commence with Work of this Section on the approved date without the consent of the Engineer to a start date change, the Contractor shall be responsible for the payment of all Authority administrative fees, including, but not limited to, preparation of and courier service for the hand delivery of the U.S. EPA re-notification letter.

D. Submit staging procedures and shift schedules. Notify the Engineer in writing of any shift changes not less than forty-eight (48) hours in advance. Such shift changes shall be subject to the approval of the Engineer.

E. The Contractor shall provide that the entity performing Work of this Section shall perform the following in accordance with Contract Drawings and Appendix "B" herein:

1. After utility shutdown in accordance with 1.05 C., remove filters from the HVAC system, double bag, store and dispose of as asbestos-contaminated waste. Seal all openings in the HVAC and other utility systems within the "Work Area(s)" with at least two (2) layers of 6-mil fire-retardant polyethylene sheeting.
2. Prior to the construction of the decontamination enclosure(s), remove asbestos that may be disturbed by such installation utilizing an approved isolation tent removal procedure to remove a one-foot wide strip at the locations where asbestos may be disturbed.
3. Pre-clean the location where the decontamination enclosure(s) will be constructed using HEPA vacuuming and/or wet cleaning in accordance with Appendix "B" herein.
4. Construct the decontamination enclosure(s) in accordance with the Contract Drawings, Appendix "B" herein, and/or approved Contractor submittals. Provide electric, water, and drainage to make the decontamination enclosure(s) and sanitary facility unit(s) operational.
5. Pre-clean the "Work Area" using HEPA vacuuming and/or wet cleaning methods.
6. Establish the "Isolation Barrier Partitions", "Critical Barriers", "Surface Barriers", or demarcate an area, and seal all openings. Stationary equipment within the "Work Area(s)" shall be enclosed, protected, and ventilated, as required in accordance with the Contract Drawings and/or applicable appendices herein.
7. Pre-clean fixed objects within the "Work Area(s)" and enclose objects to remain in accordance with the Contract Drawings and Appendix "B" herein. Pre-clean movable items before removal from the "Work Area" in accordance with the Contract Drawings and Appendix "B" herein.
8. Paint, or apply tape, in a fluorescent color at the fire extinguisher locations, door frames(s) of the personal and waste decontamination enclosures, emergency egress locations, kick-out panels and along wall bases showing direction towards the nearest exit.
9. Install and continuously operate the negative air filtration system in accordance with the Contract Drawings and/or applicable appendices herein.
10. Provide temporary lighting and power in accordance with 2.01 (A)(14) and Appendix "B" herein.

F. Notify the Engineer in writing that asbestos removal is ready to commence. No less than twenty-four (24) hours after such notification, a pre-removal inspection will be performed by the Engineer.

1. After a successful pre-removal inspection and approval of the Engineer, commence with asbestos removal.

3.03 ASBESTOS REMOVAL

A. The Contractor shall provide that the "Competent Person" employed by the entity performing Work of this Section performs the following:

1. Ensures that workers are equipped with respiratory protection and personnel protective equipment in accordance with Section 1.05 B.3.
2. Ensures that the negative air filtration system and manometers are maintained and continuously operated throughout "Work Area" preparation, asbestos removal, clean up, and post-abatement air clearance sampling in accordance with Appendix "B" and the Contract Drawings herein.
3. Ensures that the procedures of 29 CFR 1926.1101, Appendix "F" - "Wetting Agents" are complied with.
4. Ensures that "Site Security/Fire Watch" personnel to keep watch during non-work hours are utilized in accordance with Appendix "B" herein.
5. Ensures that prior to asbestos removal, all asbestos-containing materials are adequately wetted as regulated by the state in which the work occurs and as specified by the manufacturer.
6. Ensures that the removal of the asbestos-containing material is in accordance with Appendix "B" herein, and the Contractor's approved submittals.
7. Ensures that debris and water does not remain or pond on the floor and/or temporary "Support Structures". Adequately wet down, remove, and bag material while wet, concurrently during removal operations utilizing HEPA vacuums, rubber or plastic dustpans, squeegees or plastic shovels for continuous water and debris removal.
8. Ensures that disposal of waste water from the "Work Area" is performed in accordance with Appendix "B" herein.
9. Ensures that a permanently bound entry logbook for each "Work Area" is maintained and made available for the Engineer's inspection signed by all individuals who enter and leave the "Work Area(s)". The log shall identify the abatement contractor, the Authority contract and job number, and the respiratory protection used.
10. Ensures that the permanently bound daily log book for each "Work Area" is maintained with records of the Engineer's inspections and all findings, events, and required corrective action regarding, but not limited to daily inspections, integrity of the decontamination enclosure system(s), "Isolation Barrier Partitions", "Critical Barriers", "Surface Barriers", the negative air filtration system, and all "Work Area" cleanings.
11. Unless directed by the Engineer to do otherwise, ensures that the condition of the waste container is examined by the "Site Security/Fire Watch" person (or "Competent Person" in the event that a Site Security/Fire Watch Person is not required) at least once every twenty-four (24) hours during non-work periods, and that repairs of torn or missing signs on the waste container, or damage affecting the integrity of the waste container are performed or that replacement containers are provided.
12. Ensures that for Work in New York State, the cleaning and surface lock-down encapsulation procedures in Subpart 56-12.1(i) of Industrial Code 56 are complied with.
13. Ensures that for Work in New Jersey, the cleaning and surface lock-down encapsulation procedure in 5:23-8.15(h) of the Asbestos Hazard Abatement Subcode is complied with.

14. Whenever possible, gross removal, packaging and cleaning shall proceed generally from the top downward.

15. Ensures that gross removal, packaging and cleaning shall proceed from locations which are remote from the HEPA units toward the areas of the units.

16. Ensures that wire brushes are not used for asbestos removal.

17. Ensures that compressed air and high-pressure water or steam are not used for asbestos removal.

3.04 DISPOSAL

A. Notify the Engineer in writing at least twenty-four (24) hours in advance of any bag out operations or waste container removal.

B. Remove asbestos waste from the "Work Site" only with the approval from the Engineer and an accompanying, properly signed Asbestos Waste Shipping Document issued by the Authority (Waste Shipment Record).

C. Transport the waste consignment to the landfill designated in the Contractor's approved submittals, U.S. EPA notification letter, and indicated on the Waste Shipment Record in accordance with 1.04 A.

D. The collection, co-mingling and transport of generated Authority asbestos waste with the asbestos waste from other generator sources is prohibited. Temporary storage or secondary transfer of the asbestos waste before final disposal is prohibited unless otherwise approved in writing by the Engineer prior to the waste leaving the "Work Site".

3.05 FINAL REPORT

A. This final report shall not be a substitute for the requirements of the Section of Division 1 entitled "Asbestos Cost Summary Submittal".

B. Final payment will not be approved prior to the Contractor preparing, itemizing and submitting to the Engineer four (4) copies of a final report containing:

1. A cover page identifying the entity performing Work of this Section with their phone number and business address, name of the "Competent Person", name and business address of the CIH and analytical laboratory, name and business address of the waste transporter, and name and business address of the landfill.

2. Summarize the type(s) of material removed, quantity of material removed, description of containment and engineering controls, amount of waste generated and date(s) transported from facility.

3. Daily project logs, entry logs, and if applicable, time and material sheets.

4. Analytical results of employee exposure air monitoring performed during Work of this Section, and strip or disk chart recordings of differential air pressure to areas adjacent to the "Work Area(s)".

5. Waste Shipment Record signed by the operator of the disposal site indicated in the Contractor's approved submittals.

6. Manometer recording logs. Manometer chart or tape shall include a date and time marker at least once per 24-hour period, and shall clearly indicate scale and zero.

7. The name, title and signature of the person preparing the final report.

END OF SECTION

SECTION 02081

ASBESTOS REMOVAL AND DISPOSAL FOR PORT AUTHORITY OF NEW YORK AND NEW JERSEY

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

02081A01 Detailed site-specific drawings prepared and signed by a "Certified Project Designer" which shall include, but not be limited to Negative Air Unit Calculations.

02081A02 Detailed site-specific drawings prepared and signed by a "Certified Project Designer" which shall include, but not be limited to Engineering Controls (i.e.: work area enclosure; decontamination enclosure system layout and location; work area boundaries; etc.).

02081A03 Detailed site-specific drawings prepared and signed by a "Certified Project Designer" which shall include, but not be limited to "Emergency Egress" location(s).

02081A04 Detailed site-specific drawings prepared and signed by a "Certified Project Designer" which shall include, but not be limited to requirements for electric power, water supply and drainage.

02081A05 Detailed site-specific drawings prepared and signed by a "Certified Project Designer" which shall include, but not be limited to requirements for storage and staging location(s).

02081A06 Support Structures – Drawings, design details and calculations for temporary "Support Structure(s)", signed and sealed by a Professional Engineer (P.E.) licensed in the State in which the Work of this Section is to be performed. Following installation of "Support Structure(s)", submit P.E. signed inspection report verifying compliance with design.

Product Data

02081D01 List of all materials and equipment to be used.

02081D02 Catalog cuts for all materials and equipment to be used for Work of this Section, in accordance with the Section of Division 1 entitled "Shop Drawings, Catalog Cuts and Samples,"

02081D03 Material Safety Data Sheets and a copy of the product labels for all chemicals to be used for Work of this Section.

Construction and Installation Procedures

02081G01 "Work Area" and "Work Site" procedures.

02081G02 Fire Prevention and First Aid Procedures.

02081G03 Work site communication with police, fire department, Facility Operations and the Engineer.

Schedules

02081J01 A construction Critical Path Method (CPM) or Bar Graph Schedule stating critical dates of the job including start of mobilization, the preparation, removal, and reactivation of each work Area, and completion of deactivation.

02081J02 A staffing schedule stating number of workers per shift, name and number of supervisor(s) per shift, hours per shift, shifts per day, and total days to be worked. Any changes in schedule or staffing shall be submitted in writing to the Engineer 48 hours prior to implementation, or as directed by the Engineer.

Qualifications

02081K01 Copy of valid Asbestos Contractor's License

02081K02 Information on Competent Person (i.e.: resume) showing: 3 years project supervision experience.

02081K03 Copy of valid Asbestos abatement Supervisor Certificate.

02081K04 Copies of Asbestos Handler Certificates for the proposed staff.

02081K05 Information (i.e.: resume) on the "Certified Project Designer" the Contractor plans to utilize showing 3 years asbestos project design experience and a copy of valid Asbestos Project Designer Certificate

02081K06 Information (i.e.: resume) on the Certified Industrial Hygienist (CIH)the Contractor plans to utilize showing 3 years asbestos related experience and a copy of valid American Board Industrial Hygiene Certificate.

02081K07 Information on the Environmental Laboratory the Contractor plans to utilize, including Proof of participation in the American Industrial Hygiene Association's Proficiency Analytical Testing Program [PAT].

02081K08 List of subcontractors Contractor plans to utilize. Submit all their appropriate qualifications as per Section 02081, Part 1 (1.04)(A)(1)(a) and (f) herein.

02081K09 Name of Asbestos Waste Transporter Contractor plans to utilize -- the entity providing transportation services shall be approved by the Authority prior to the commencement of Work of this Section. Provide documentation showing, for each State in which transportation is to occur, the following:
a. Copies of Transporter's Permits, Licenses and/or Certificates as required by state agencies to operate.
b. Name and title of Transporter's contact person.
c. Business, mobile and pager telephone numbers.
d. U.S. DOT statement of reportable accidents and reportable environmental incidents as per 49 CFR 171.15 and 171.16

02081K10 Name of landfill Contractor plans to utilize. Contractor shall obtain approval from the Authority for utilization of proposed facility prior to commencement of Work of this Section [refer to Appendix "C" herein]; and submit the following documentation for the proposed facility:
a. Municipal permits and/or licenses required to operate.
b. State permits and/or licenses required to operate.
c. Federal permits and/or licenses required to operate.
d. Name, title and telephone number of Landfill's contact person.

Quality Assurance-Quality Control

02081L01 Outline of Respiratory Protection Program for Employees conforming with current regulations - The outline shall bear the signature and approval of a CIH.

02081L02 Copies of notifications and re-notifications, prior to sending, in accordance with Section 02081(1.02) (B) herein.

02081L03 Copies of project-specific variances obtained by the Contractor for Work of this Section.

Record Documents

02081M01 The Contractor shall maintain records signed by a physician documenting worker medical examinations with chest X-rays and pulmonary function tests. The form from Appendix D of OSHA CFR 1926.1101 Title 29 or equal shall be used. These records shall be kept on file by the Contractor for the duration of employment, plus 30 years.

Contact Information

02081P01 Project Specific Chain of Command -- Show on Chain of Command form(s) office, beeper, mobile and home telephone numbers of persons having the authority to dispatch personnel to the Project location and commit such persons to the tasks as directed by the Engineer. At a minimum include numbers for Project Supervisor, Competent Person and CIH.

Closeout Submittals

02081R01 Copies of the Final Report as stipulated in Section 02081(3.05) herein.

Information

02081S01 Prior to the "Asbestos Removal Meeting" the entity performing Work of this Section shall submit to the Engineer for approval the items listed below and any additional items requested by the Engineer.

02081S02 Identify each set of submittals with the corresponding paragraph number for which the submittal is being presented.

END OF APPENDIX "A"

SECTION 02081

ASBESTOS REMOVAL AND DISPOSAL FOR PORT AUTHORITY OF NEW YORK AND NEW JERSEY

APPENDIX "B"

JOB SPECIFIC REQUIREMENTS

[Edit below as required for Work of the Contract.]

A. Description

This Section specifies removal of asbestos material from the "Work Area(s)" (shown on the Contract Drawings) (listed below).

[List areas if not shown on Contract Drawings.]

B. Asbestos Type(s)

Test results of asbestos-containing material to be removed indicate that such material contains the following type(s) of asbestos:

Asbestos-Containing Material	Asbestos Type	Approx. % by Volume of Asbestos in Asbestos-Bearing Material
	Chrysotile	
	Amosite	
	Crocidolite	
	Anthophyllite	
	Tremolite	
	Actinolite	

C. Items in "Work Area" to be Removed

Remove the items (listed below) (shown on the Contract Drawings) (and store at the "Work Site" at the location(s) shown on the Contract Drawings:) (and remove from the "Work Site" asbestos-contaminated items:) **[List items to be removed if not shown on the Contract Drawings.]**

D. Items Remaining in "Work Area" to be Protected

Protect the items (listed below:) **[or]** (shown on the Contract Drawings:) **[List items to be protected if not shown on the Contract Drawings.]**

E. Utilities for Work of this Section

[Select from below as appropriate for the Contract.]

1. Drainage:

[SELECT FROM BELOW AS APPROPRIATE FOR THE CONTRACT.]

Drainage is available at the "Work Site" without charge at the location(s) designated by the Engineer, subject to such conditions and precautions upon its use as stipulated in "Water Disposal Procedures" herein. Completely remove temporary materials, clean and decontaminate by wet cleaning and/or HEPA vacuuming in the "Work Area", or dispose of as ACM waste. Restore existing facilities to their original condition.

[OR - FOR WORK IN NEW YORK STATE]

Drainage is not available at the "Work Site". Provide a closed piping or hose system and filter through 5.0 micron filters, drum collect and dispose of as stipulated in "Water Disposal Procedures" herein. In the event of asbestos contamination of temporary materials, clean and decontaminate by wet cleaning and/or HEPA vacuuming in the "Work Area" or dispose of as ACM waste.

[OR - FOR WORK IN NEW JERSEY]

Drainage is not available at the "Work Site". All waste water generated at the "Work Area" or from the decontamination facility shall be collected and disposed of as stipulated in "Water Disposal Procedures" herein.

F. Utilities and Services in Work Area to be Shut Down and to Remain in Service

[LIST UTILITIES AND SERVICES TO BE SHUTDOWN AND THOSE TO REMAIN IN SERVICE.]

G. "Work Site Security/Fire Watch"

Provide Security/Fire Watch.

[OR]

Security/Fire Watch is not required.

H. "Work Area" Procedures

[INSERT JOB-SPECIFIC WORK AREA PROCEDURES]

I. "Water Disposal" Procedures

[For Work in New York State where "Work Site" drainage is available, insert the following:]

Prior to disposal of waste water, filter through a new three stage filter system where the final stage is a 5.0 micron filter to remove asbestos fibers.

[For Work in New York State where "Work Site" drainage is <u>not</u> available, insert the following:]

Prior to disposal of waste water, filter through a new three stage filter system where the final stage is a 5.0 micron filter to remove asbestos, and dispose of water away from Authority property in an appropriate sanitary sewage system. Do not re-use waste water.

[For Work in New Jersey where "Work Site" drainage is available, insert the following:]

Prior to disposal of waste water, collect free water, add to asbestos-contaminated material and/or solidify with an approved polymer and dispose of as asbestos-contaminated material; or filter water through a new three stage filter system where the final stage is a 5.0 micron filter to remove asbestos and dispose of in the sanitary drain, if allowed by local treatment works by regulation or as allowed by permit.

J. "Sealing Asbestos-Containing Contact Surfaces"

[For Work in New York State, insert the following:]

After removal, cleaning and final air clearance of the work areas seal surfaces which were the subject of asbestos removal with a sealer approved by the Engineer and compatible with the replacement fireproofing and insulation. Also, seal end surfaces of asbestos-containing material that is to be enclosed and remain, if any, with a sealer approved by the Engineer.

[For Work in New Jersey, insert the following:]

After removal and cleaning of the work areas seal surfaces which were the subject of asbestos removal with a sealer approved by the Engineer and compatible with the replacement fireproofing and insulation. Also, seal end surfaces of asbestos-containing material that is to be enclosed and remain, if any, with a sealer approved by the Engineer.

K. Removal of "Work Area Containment and Protection of Items that Remained in the Work Area"

[Select from below as appropriate for the Contract.]

Remove "Work Area" containment and dispose of as asbestos contaminated material. Remove item wrapping and relocate and/or re-secure objects and items which were moved, wrapped and sealed and remained within the "Work area". Dispose of item wrapping as asbestos contaminated material.

[or if asbestos has been removed in construction to be demolished, or if asbestos removal area(s) will have additional renovation work to be performed under other specification sections or other Contracts use the following text:]

Remove "Work Area" containment and discard as asbestos contaminated material.

L. Re-establishment of Utilities and Services

[Select from below as appropriate for the Contract.]

Re-establish utilities and services that were disconnected and install new filters in air moving system(s) affected by the Work of this section.

[or if asbestos has been removed in construction to be demolished, or if asbestos removal area(s) will have additional renovation work to be performed under other specification sections or other Contracts use the following text:]

Do not re-establish utility services or replace air moving system filters.

M. Re-establishment of Items and Objects in the Work Area

[Select from below as appropriate for the Contract.]

Relocate to their original locations (and re-secure as required) items and objects that were cleaned and removed from the "Work Area" prior to commencement of abatement activities.

[or if asbestos has been removed in construction to be demolished, or if asbestos removal area(s) will have additional renovation work to be performed under other specification sections or other Contracts, use the following text:]

Do not relocate items and objects that were cleaned and removed from the "Work Area" prior to commencement of abatement activities.

N. Replacement of Insulation and Fireproofing

[Select from below as appropriate for the Contract.]

[Delete Article 14.0 if no replacement is to be performed as when construction material is to be removed or demolished.]

1. Replace pipe insulation with insulation (in accordance with Section 15491 hereof.) **[or]** (as shown on the Contract Drawings.)

2. Replace cable insulation in accordance with Section 16128 hereof.
3. Replace fireproofing in accordance with Section (07250, 07252 or 07255) hereof.

[or]

Replacement of pipe insulation will be performed by others (under other sections of this Contract) **[or]** (under another Contract).

4. Replacement of cable insulation will be performed by others (under other sections of this Contract) **[or]** (under another Contract).
5. Replacement of fireproofing will be performed by others (under other sections of this Contract) **[or]** (under another Contract.)

END OF APPENDIX "B"

SECTION 02081

ASBESTOS REMOVAL AND DISPOSAL FOR PORT AUTHORITY OF NEW YORK AND NEW JERSEY

APPENDIX "C"

Listed below are landfill disposal sites that are currently used, or have previously been used, by the Authority for the disposal of asbestos-containing material and/or asbestos contaminated objects. This list is provided for reference only and does not relieve the Contractor from verifying the facilities current valid state approvals or from submitting required documentation as outlined in Appendix "A". Furthermore, the Contractor is not limited to use of these disposal facilities:

WETZEL COUNTY SANITARY LANDFILL
New Martinsville, West Virginia 26155
304 455-3800

WASTE MANAGEMENT OF NEW YORK, Inc.
Varick Ave, Brooklyn, New York
617 271-9292

TULLYTOWN LANDFILL
(Tullytown Resource Recovery), Tullytown, Pennsylvania
215 736-9400

SUPERIOR GREEN TREE LANDFILL
Kersey, Pennsylvania
800 257-5705

SOUTHERN ALLEGHENIES LANDFILL
Conemaugh Twshp., Pennsylvania
814 479-2537

SOIL REMEDIATION INC.
Lowellville, Ohio

S&S LANDFILL
Route 5, Box 559
Clarkesburg, West Virginia 26155
304 745-3234

PENNSAUKEN SANITARY LANDFILL
Pennsauken, New Jersey

OTTAWA COUNTY LANDFILL

Port Clinton, Ohio 43452 (BFI Ohio)
419 635-2615

NEW MORGAN LANDFILL CO.,INC.
New Morgan Borough, Exton Pennsylvania
610 286-6844
MINERVA ENTERPRISE INC
900 Minerva Road, Waynesburg, Ohio 46688

MEADOWFILL CORPORATION
Route 2, Box 68
Clarkesburg, West Virginia 26330
304753-9470

MAPLEWOOD RECYCLING & SANITARY LANDFILL
Route 640, Amelia County, Virginia
609 273-5818

M.C. ARNONI LANDFILL
Library, Pennsylvania

KELLY RUN LANDFILL
Elizabeth, Alleghany County, Pennsylvania
412 384-3133

IESI BLUE RIDGE LANDFILL
(Formerly R & A Bender Landfill,)
Greene Twnshp, Franklin County, Pennsylvania
717 264-4678

HAM SANITARY LANDFILL
1 Pozoo Road
Peterstown, West Virginia 24963
304-753-9470

HACKENSACK MEADOWLANDS DEVELOPMENT COMMISSION BALER FACILITY
(Use this facility only for Work performed in Hudson County New Jersey)
100 Baler Boulevard
North Arlington, New Jersey 07031

G.R.O.W.S. LANDFILL, INC.
1000 New Ford Mill Road
Morrisville, Pennsylvania 19067

215-736-9400

GREENRIDGE RECLAMATION LANDFILL
East Huntington, Westmoreland County, Pennsylvania

GRAND CENTRAL LANDFILL
Painfield, Northampton County, Pennsylvania

CONESTOGA LANDFILL (BFI)
Exton, Berks County, Pennsylvania
610 286-6844

CENTRAL WASTE INC.
Smith Twnshp., Mahoning County, Ohio
330 823-6220

BROWNING FERRIS INDUSTRIES (BFI)
Fall River, Pennsylvania

110 CLEAN FILL DISPOSAL SITE
136 Spagnioli Road
Melville, New York 11704

END OF APPENDIX "C"

DIVISION 2

SECTION 02221

EXCAVATION, BACKFILLING AND FILLING

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for excavation, backfilling and filling.

B. Definitions

1. As used herein, excavation shall mean the removal of existing pavement, concrete foundations and all materials other than bedrock (ledge rock) encountered within the limits of excavation that are not specified to be removed under Division 2 Section entitled "CUTTING, PATCHING AND REMOVAL".
2. As used herein, backfilling shall mean the filling of excavations made for construction purposes and shall extend only to existing grades or design grades, whichever are lower.
3. As used herein, filling shall mean the placement of fill material in conformance with requirements of this Section at or above existing grade or design grade, whichever is lower.
4. As used herein, suitable shall mean material conforming to the gradation, compaction, and environmental requirements of this Section.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Society for Testing and Materials (ASTM International)

ASTM C 88	Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
ASTM C 117	Test Method for Materials Finer than 75 µm (No. 200) Sieve in Mineral Aggregates by Washing.
ASTM C 131	Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
ASTM C 136	Test Method for Sieve Analysis of Fine and Coarse Aggregates.
ASTM D 422	Standard Test Method for Particle-Size Analysis of Soils.
ASTM D 1556	Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
ASTM C 1557	Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 or 2,700 kN-m/m3).
ASTM D 2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
ASTM D 2922	Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

ASTM D 3017 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

ASTM D 4318 Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

New Jersey Interagency Engineering Committee (NJIEC)

Standard Soil Aggregate Gradations.

1.03 QUALITY ASSURANCE

A. Where sheet piling or sheeting is required or is shown on the Contract Drawings, shop drawings and calculations shall be prepared, signed and sealed by a Professional Engineer, licensed in the State in which the work will be performed, who has a minimum of five years experience in the design of soil retaining structures.

1.04 SITE CONDITIONS

A. Protect excavations as follows:

1. Prevent water from entering excavated areas and, if it does, remove it immediately to maintain a dry condition at all times.
2. Dispose of water in a manner not to cause injury to the public health or damage to public or private property.
3. If water enters excavated areas and weakens or disturbs underlying soil, remove the weakened or disturbed soil and replace it in conformance with 3.02 A.5.
4. Where shown on the Contract Drawings or where required for protection of adjacent utilities or structures or where required for performance of the Work, secure the sides of excavations against movement as follows:
   a. Install sheet piling or sheeting held in place by waling and bracing members. Top of sheeting shall extend at least six inches above ground or as otherwise shown on the Contract Drawings.
   b. Do not excavate below the bottom of sheet piling or sheeting except as necessary to install sheeting.
   c. Fill voids behind sheeting immediately with material conforming to I-12 designation defined in 2.01 A or with other material as otherwise approved by the Engineer.
   d. Comply with all other requirements of the Specifications that may impose additional or stricter requirements.
5. For excavations extending to a depth of 5 feet or more, and where sheeting is not required to conform with 1.04 A.4 above, excavate slopes to a safe angle of repose, or protect trench excavations by use of a portable trench shield.
6. Restore all areas impacted by excavation to their original condition, matching pavement types and sections to meet original pavement grades.

B. Do not traverse paved areas with tracked vehicles or equipment, such as carry-all scrapers, which may damage such pavement unless protected to the satisfaction of the Engineer.

C. Do not place fill or backfill on frozen subgrade.

D. Do not perform rolling or other compaction at any time when the ground water level is above a plane two feet below the surface to be compacted. When the ground water level is above such plane, lower it by approved methods and maintain it below such level prior to and during the compaction operations.

E. Protect from damage trees and other vegetation that are to remain in place.

1.05 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. Fill

1. Unless otherwise shown on the Contract Drawings, fill shall consist of clean sand and gravel containing no organic matter, conforming to the following NJIEC "Standard Soil Aggregate Gradations", except that in lieu of the standard gradation given below, up to 10 percent passing the No. 200 sieve will be acceptable as I-12:

	Total Percent Passing by Weight NJIEC Designation		
	I-7	I-10	I-12
Sieve Sizes			
4 inch		100	100
2 inch		80-100	
1 inch	100		
3/4 inch		60-100	70-100
1/2 inch	80-100		
No. 4		40-100	
No. 8	35-100		
No. 16	25-90	20-70	
No. 50	5-50	5-40	0-75
No. 100	0-8	0-30	
No. 200	0-2	0-20	0-5

2. The clean sand and gravel shall not contain more than 0.1% of Wood; 4% of Brick, Mica Schist, or other friable material; or 10% of asphalt concrete. The total of all of these components shall be less than 10%. The Contractor shall submit to the Engineer a "Certificate of Clean Fill" for all imported fill materials.

3. Comply with fill designations shown on the Contract Drawings and place designated fill in the locations shown.

B. Backfill

1. Unless otherwise shown on the Contract Drawings, material shall conform to the requirements for I-12 designation.

C. Sources

1. When fill and backfill material are furnished by the Authority, refer to the Contract Drawings for the location of the existing stockpile, the NJIEC Designation (if applicable), and the estimated quantity of available material. Samples of Authority-furnished material will not be required for testing.
2. Unless otherwise approved by the Engineer, material excavated at the construction site shall be used only for backfill and shall be used to the extent that it conforms to the requirements specified in 2.01 A and as noted on Contract Drawings. Submit samples for testing by the Engineer for verification of conformance with the requirements of this Section.
3. If sufficient quantities of suitable material are unavailable from sources described in 2.01 C.1 and C.2 above, furnish material from sources off site, as directed by the Engineer. The Contractor will be compensated for the cost of furnishing only (excluding cost of placing and compacting the fill and backfill) such fill or backfill material from sources off site at the "Net Cost" thereof.

D. Recycled Concrete Aggregate

Recycled Concrete Aggregate (RCA) conforming to the requirements given below and to the gradations specified in 2.01 A.1 may be used as fill or backfill.

1. The RCA shall consist of at least 90 percent, by weight, Portland cement concrete, with the following materials making up the remaining 10 percent:
   a. Wood: 0.1 percent, maximum.
   b. Brick, Mica schist, or other friable material: 4 percent, maximum.
   c. Asphalt Concrete: 10 percent, maximum.
2. Virgin aggregate may be added to meet the 90 percent minimum concrete requirement.
3. The percentage of asphalt concrete and other deleterious material shall be determined by weighing that material retained on the No. 4 sieve, and dividing by the total weight of RCA material retained on the No. 4 sieve.
4. Soundness of Aggregates

   Loss limitation shall not be more than 10 percent loss by weight, using sodium sulfate for 5-cycle test period, or not more than 15 percent loss by weight, using magnesium sulfate for a 5-cycle test period as determined by ASTM C 88.
5. Resistance to Degradation

   Percentage loss between the original weight and the final weight of the test sample shall not exceed 45 percent as determined by ASTM C 131.
6. RCA, if used, shall be from permitted or State registered Construction and Demolition Debris Processing Facilities (C&DDPF). Obtain and submit a copy of the permit or registration to the Engineer.
   a. In New York, the source of the RCA shall be C&DDPF conforming to 6 NYSRR Part 360-16: Construction and Demolition Debris Processing Facilities.
   b. In New Jersey, the source of the RCA shall be a Class B C&DDPF conforming to NJAC - Title 7: Environmental Protection; Chapter 26A: Recycling Rules.

E. Environmental Compliance

1. Fill material brought on site must meet residential use criteria for the State in which it is used. Sample and analyze all fill material brought on site, according to the following criteria, to characterize potential contaminants and to demonstrate all contaminants are below the State's residential use clean up criteria or remediation standard threshholds.

   a. Up to 1,000 cubic yards, collect a minimum of two grab samples.

   b. Greater than 1,000 cubic yards up to 10,000 cubic yards, collect a minimum of one grab sample for every 500 cubic yards.

   c. For volumes greater than 10,000 cubic yards, follow the sampling frequency specified above and collect one grab sample per each additional 1,000 cubic yards.

   d. Analyze all samples for all parameters included in the State's residential use clean up criteria or remediation standards.

   e. Each firm and laboratory performing the sampling and analysis shall be certified and/or licensed to perform such work in the State the fill material will be used.

2. Submit to the Engineer for approval three copies of a Clean Fill Certification Report signed by a Professional Engineer licensed in the State in which the fill material will be used. The report shall include the following:

   a. Quantity of fill material for use and certification that it meets the residential use criteria.

   b. Location information for each facility supplying the fill material, including State, County, Municipality, address, and Block and Lot numbers.

   c. A copy of the current State permit for each facility supplying fill material that indicates the material produced will meet residential use criteria and a contact name, title and phone number for the facility representative responsible for permit compliance.

   d. Name, contact information, and copies of certifications and/or licenses for each entity performing the sampling and laboratory analysis. Include a signed statement by an officer of each laboratory certifying that all sampling and analysis was performed by licensed or certified personnel and in accordance with applicable State regulations, manuals, and guidance documents.

   e. A sampling plan for the samples collected, including a sample location drawing, and a completed chain of custody for the samples.

   f. A summary data table, in Excel spreadsheet format, of sample analytical results compared to State residential use clean up criteria or remediation standards. The table shall present for each sample the parameters analyzed, analytical method, sample date, sample identification number, results, reporting detection limits, and units.

   g. A copy of the complete laboratory report in PDF format on "read only" disc signed and sealed by the responsible individual of the laboratory completing the analyses.

   h. A signed statement from the Professional Engineer certifying that this report, to the best of their knowledge, is accurate and is representative of the fill material specified herein, and that the fill material does not exceed the residential use clean up criteria or remediation standard threshholds for the State in which it will be used.

3. At the Engineer's discretion, the Engineer will perform quality assurance testing of fill material brought to the site to confirm compliance with the specified requirements. Remove and replace, at no additional cost to the Authority, fill material determined by the Engineer to be not in compliance.

4. The allowance of a small percentage of asphalt concrete in fill and RCA materials shall not be construed as a contradiction to the above requirements. If the composition of the asphalt concrete is such that the limits given in the residential use criteria for the State in which it is used are exceeded, submit material from an alternate source.

PART 3. EXECUTION

3.01 PREPARATION

A. Clearing and Grubbing

Remove trees, clear and grub areas to be excavated or in which construction is to be performed, as follows:

1. Remove trees, stumps, all roots larger than 2 inches in diameter, and all matted root systems.
2. Remove all topsoil, debris, organic matter and any other objectionable material not suitable for use as backfill or fill or for support of structures or pavements.
3. Backfill all holes and other low spots resulting from clearing and grubbing with material conforming to 2.01 B or 2.01 D before proceeding with compaction of fill as specified in 3.03 or with other construction in the area.

3.02 EXCAVATION

A. General

1. Excavation shall consist of the removal of materials as defined in 1.01 B.1, and the removed materials shall be segregated by material type (e.g., sand fill, miscellaneous fill, sand, gravel, clay) and stockpiled at the location shown on the Contract Drawings.
2. When excavation of bedrock (ledge rock) is shown on the Contract Drawings, refer to Division 2 Section entitled "ROCK EXCAVATION" for removal requirements.
3. Excavate to elevations required for installation of permanent construction in such manner as not to disturb the subgrade below such elevations.
4. Where existing foundations or other existing construction are encountered which may cause hard spots, remove them to a minimum of two feet below subgrade for pavement or structures and backfill with material conforming to 2.01 B or 2.01 D.
5. Should the bottom of excavation be weakened or disturbed or carried below required depth:
   a. Under Footings: Compact bottom as specified in 3.03 below and replace over-excavation with the same concrete as that specified for the footing or foundation.
   b. Locations other than Under Footings: Compact bottom as approved by the Engineer and refill with material conforming to 2.01 B or 2.01 D.

6. Perform excavation around and adjacent to existing structures, pipes and conduits which are to remain in place, without damage to or movement of existing construction. Use hand excavation to locate and expose near-surface structures, pipes and conduits. When excavation is to be performed under such structures, pipes and conduits, support them in a manner as approved by the Engineer to ensure uninterrupted operation of the supported items.

B. Dewatering

1. Where excavations are to extend below the water table, prior to placement of any permanent construction or filling or backfilling any excavated area, lower the water table in such an area to two feet below the elevation of the required subgrade and maintain this condition until the construction or pavement is placed thereon.
2. Dewater in a manner to prevent the loss of ground due to the migration of soil fines into the dewatering system.

C. Trenching for Utilities

1. Shape bottom of trench to uniform invert section.
2. When excavating in soft soils which may be subject to lateral movement or bottom heave, conform to requirements shown on the Contract Drawings.

D. Disposal of Excavated Material

1. All debris and all material either unsuitable for or in excess of that required for backfill or fill, shall be reused, recycled or disposed of away from the construction site in accordance with Division 1 Section entitled "Recycling of Construction Debris Material".

E. Restrictions

1. Do not place backfill until the Engineer has inspected and approved the Work and has indicated where backfill may be placed.
2. Leave all pipe joints exposed until all tests, required by other Sections of the Specifications on such pipe, have been performed.
3. Remove all temporary structures, sheet piles, sheeting, bracing and forms and all organic materials and debris of every nature, taking care, upon the removal of sheet piling, sheeting and temporary supports, not to cause movement of adjacent ground or structures or create the danger of a slide.

3.03 PLACEMENT AND COMPACTION

A. Equipment

1. Steel vibratory rollers shall have provision for regulation of vibration frequency. Submit and obtain Engineer approval of the type and size of compaction, placing and spreading equipment to be used before the start of any compaction efforts.
2. Unless otherwise shown on the Contract Drawings, pneumatic-tired rollers shall have minimum weight of 20 tons and a tire pressure of between 60 and 150 psi. For aircraft pavements, the minimum roller weight shall be 50 tons.
3. When mechanical tampers are used, submit and obtain Engineer approval of the type and size of tamper before compaction efforts begin.

B. Subgrade, Excavated and Existing Surfaces

Compaction of subgrade, excavated and existing surfaces shall consist of a proofrolling operation performed as follows, unless otherwise shown on the Contract Drawings that proofrolling is not required:

1. Compact surface with a minimum of six passes of an approved vibratory steel roller operated at a speed not to exceed three miles per hour and at the optimum operating frequency recommended by the manufacturer. Overlap passes of roller a minimum of six inches.
2. In areas where surface consists of a fine grained soil, compact with a minimum of six passes of an approved pneumatic-tired roller. Overlap passes of roller a minimum of six inches.
3. In areas where use of a roller is impractical, compact surface while at or near optimum moisture content with mechanical tampers.
4. If, in the sole determination of the Engineer, the proofrolling produces noticeable weaving of the surface, excavation of unsuitable material and replacement with backfill may be required below subgrade, within the limits and to the depth as directed by the Engineer. The Contractor will compensated for any such excavation of unsuitable material below the elevation of subgrade or under footing and subsequent backfilling at the "Net Cost" thereof.

C. Backfill and Fill

1. Moisture content of backfill and fill material shall be within a range of plus or minus two percent of optimum, as determined by Procedure C of ASTM D 1557.
2. Backfill and fill shall be compacted to achieve a density of 95 percent of the maximum density as determined by Procedure C of ASTM D 1557, except where alternate density requirements are approved by the Engineer or shown on the Contract Drawings.
3. Backfill conforming with I-12 gradation, and fill conforming with I-7 and I-12 gradation, shall be placed in 14-inch, loose layers. In areas where a 14-inch layer over existing material is not adequate to support the construction equipment, increase thickness of first lift as approved by the Engineer.
4. When shown on the Contract Drawings, backfill and fill, conforming to I-10 gradation, shall be placed in 12-inch, loose layers.
5. In areas adjacent to structures and utilities as shown on the Contract Drawings, compaction equipment shall be restricted as shown on the Contract Drawings.
6. In areas where use of a roller is impractical, place fill in maximum 8-inch, loose layers and compact with approved mechanical tampers to the specified density. In pipe trenches, each layer of backfill shall be not more than 8 inches in thickness before compaction. Place backfill on both sides of the pipe, simultaneously.
7. The surface of filled or backfilled areas, which are to receive pavement or on which a structure is to be placed, shall be within plus or minus 1/2 inch of the elevations shown on the Contract Drawings and shall be free of depressions or projections greater than 1/2 inch when tested with a 16-foot straight edge.
8. The surface of filled areas at other locations shall be within plus or minus one inch of elevations shown on the Contract Drawings unless a closer tolerance is necessary to meet requirements of other Sections of the Specifications or meet requirements shown on the Contract Drawings.

3.04 QUALITY CONTROL

A. Field Inspection and Testing - General

1. The Engineer will test delivered field samples of material submitted from each source, for conformance with 2.01. Gradation will be determined in accordance with ASTM C 117, C 136 and D 422 and maximum density will be determined in accordance with Procedure C of ASTM D 1557. If deemed appropriate by the Engineer, Atterberg Limits will be determined on fine-grained soils in accordance with ASTM D 4318.

   a. Notify the Engineer when backfill and fill material are on site at least seven days prior to placement to allow sufficient time for testing.

   b. If the Engineer's maximum density will be used for QC testing, the Contractor must first obtain this laboratory value from the Engineer prior to placement.

2. If the sample from a source is approved, upon the Engineer's request, conduct the Engineer to that source. Additional samples will be selected and tested by the Engineer.

3. The Engineer will notify the Contractor of approval of material source within seven days after receiving samples. Approval of a source of backfill or fill material will be subject to material continuing to meet the requirements of 2.01.

4. Do not deliver any material until the Engineer has reviewed and approved material supplier and source submittal. Delivered material must receive on-site approval prior to use.

5. The Engineer will check conformance to elevations shown on the Contract Drawings and required tolerance for surface straightness.

6. Provide labor and equipment to take samples as directed and to assist the Engineer in other tests.

B. Testing Requirements for Fill and Backfill

Testing will include control tests by the Engineer, quality control testing by the Contractor, and quality assurance testing by the Engineer. Testing frequencies are dependent on the type of fill or backfill, the nature and size of the installation, and the structural significance of the installation. The minimum frequency of testing shall be as shown on the Contract Drawings.

1. Control Tests

   a. Fill and backfill material field samples will be tested in the laboratory by the Engineer at the frequency shown on the Contract Drawings. These control tests consist of determining maximum density and optimum water content by Procedure C of ASTM D 1557, and gradation by ASTM C117, C136, and D 422. When deemed appropriate by the Engineer, Atterberg Limits will be determined on fine-grained soils in accordance with ASTM D 4318.

2. Quality Control Testing by the Contractor

   a. Implement and maintain quality control plans and procedures that ensure all fill and backfill materials and completed construction conform to this Section. The Engineer shall be permitted access to the Contractor's plant, equipment and field operations at all times for checking compliance with the approved quality control procedures. Provide labor and equipment to take samples as directed and assist the Engineer in other tests. Repair all areas from which samples are taken to meet all requirements of this Section.

b. Perform quality control consisting of in-place density testing to determine densities achieved after compaction efforts. The frequency of testing shall be as shown on the Contract Drawings.

c. The quality control plan shall include as a minimum:

(1) Assignment of quality control responsibility to specifically-named individuals.

(2) Outline of sampling location procedures and in-place density testing methodologies and frequencies.

(3) Performance of regularly scheduled inspections of the material source in the case of RCA.

(4) Provisions for the prompt implementation of control and corrective measures.

(5) Provisions for liaison with the Engineer at all times.

(6) Performance of necessary quality control tests, including use of a nuclear gauge.

(7) Description of equipment type, calibration and maintenance; operator identity and qualifications.

d. For RCA, quality control procedures shall include, in addition to that required under 3.04 B.2.b, performing the following tests on dedicated stockpiles being produced for use under this Contract:

(1) Gradation tests (ASTM C 117 and C 136) shall be performed at least once per day.

(2) Composition tests shall be a continuous visual inspection and shall include removal of any objectionable material to ensure compliance with 2.01 B.

(3) Soundness of Aggregates (ASTM C 88) and Resistance to Degradation (ASTM C 131) shall be performed a minimum of once every two weeks, unless otherwise directed by the Engineer.

The size of the stockpiles shall be as shown on the Contract Drawings.

3. Quality Assurance Testing

a. Quality Assurance testing to verify field densities will be performed by the Engineer after compaction operations, at the frequencies shown on the Contract Drawings. Test methods may be either sand-cone (ASTM D 1556), rubber balloon (ASTM D 2167), or nuclear device (ASTM D 2922), with moisture content for nuclear method determined by ASTM D 3017. Tests will measure the density of the layer immediately below each compacted layer and the density of the uppermost or final layer.

b. Quality Assurance testing will also include periodic sampling and testing of backfill and fill materials to verify continued conformance with the requirements of 2.01 and to verify the value of maximum density used as the control value, as per 3.04 B.3.d.

c. When performing Quality Assurance testing, the Engineer will determine the density of compacted fill or backfill by in-place density tests or from undisturbed samples cut from the compacted fill or backfill as required. Notify the Engineer 72 hours prior to start of filling or backfilling to allow the Engineer time to make provisions for such testing.

d. To evaluate whether material has been compacted to specified density the Engineer will compare results of in-place density tests with results of control tests on material of the same designation using Procedure C of ASTM D 1557.

e. If fill or backfill have not been sufficiently compacted as determined by in-place density tests, the Contractor shall continue compaction effort and shall adjust the moisture content as necessary until the specified compaction is obtained, at no additional cost to the Authority.

END OF SECTION

SECTION 02221

EXCAVATION, BACKFILLING AND FILLING

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Product Data

02221D01 Submit to the Chief of Materials Engineering, Materials Engineering Unit, Port Authority Technical Center, 241 Erie Street, Jersey City, N.J. 07310-1397, material suppliers and sources for each designation of fill or backfill used under this Contract. Include, at a minimum, the Contract location, title and number; designation of intended material use; and source and supplier of material. Submit such information at least three weeks prior to delivery of material to the site.

Certificates

02221E01 Submit three copies of a "Clean Fill Certification Report" and a "Certificate of Clean Fill" for all imported fill materials.

END OF APPENDIX "A"

DIVISION 2

SECTION 02231

AGGREGATE BASE COURSE

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for dense graded aggregate base course (DGABC) and open graded aggregate base course (OGABC) each where shown on the Contract Drawings including the use of recycled concrete aggregate (RCA) as an alternate for virgin aggregate.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Society for Testing and Materials (ASTM)

ASTM C 88	Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 117	Test Method for Material Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregate by Washing
ASTM C 131	Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D 1556	Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3(2,700 kN m/m^3))
ASTM D 1883	Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils
ASTM D 2167	Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2434	Test Method for Permeability of Granular Soils (Constant Head)
ASTM D 2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 3665	Practice for Random Sampling of Construction Materials
ASTM D 4318	Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. Job Conditions

1. Aggregate Base Course shall not be placed or spread unless subgrade is free of frost and standing water.

2. Do not place aggregate base course, or perform any compaction operations when ground water level is above a plane two feet below the bottom of the base course. This condition would be indicated by existing water level readings, known site conditions or by the results of probes performed by the Contractor before material placement.

3. When necessary, lower and maintain ground water below the required plane by methods approved by the Engineer.

B. Design and Tolerance

1. The compacted base course, shall have a minimum California Bearing Ratio (CBR) of 80 as determined by ASTM D 1883. In the case of open graded aggregate base course the permeability, as tested in accordance with ASTM D 2434, shall be a minimum of 1.0×10^{-3} centimeters per second.

2. Surface of the base course shall be within plus or minus 1/2 inch of elevations shown on the Contract Drawings and free of depressions or projections greater than 3/8 inch when tested with a 16-foot straight edge applied parallel with or at right angles to the centerline.

3. Thickness of base course at any point shall not be deficient by more than 1/2 inch from the required thickness shown on the Contract Drawings.

4. The field density of the base course after compaction shall be at least 95 percent (100 percent for runways, taxiways and aprons) of the maximum density as determined by Procedure "C" of ASTM D 1557, with the exception that base course material passing the 1-1/2-inch sieve shall be used instead of the material passing the 3/4-inch sieve specified.

1.04 QUALITY CONTROL AND ASSURANCE

A. Provide and maintain quality control plans and procedures that shall ensure all base course materials and completed construction conform to this Section. The Engineer shall be afforded access to the Contractor's plant, equipment and field operations at all times for checking compliance with the approved quality control procedures. Provide labor and equipment to take samples as directed and assist the Engineer in other tests. Repair all areas from which samples are taken to meet all requirements of this Section.

B. The quality control plan shall include as a minimum:

1. Assignment of quality control responsibility to specifically-named individuals.
2. Outline of sampling location procedures and in-place density testing methodologies.
3. Performance of regularly scheduled inspections of the material source in the case of RCA.
4. Provisions for the prompt implementation of control and corrective measures.
5. Provisions for liaison with the Engineer at all times
6. Performance of necessary quality control tests, including use of a nuclear gauge.

C. For RCA, Quality Control procedures shall include performing the following tests on dedicated stockpiles being produced for use under this Contract:

1. Gradation tests (ASTM C 117 and C 136) shall be performed at least once per day.
2. Composition tests shall be a continuous visual inspection and shall include removal of any objectionable material to ensure compliance with 2.01B.

3. Soundness of Aggregates (ASTM C 88) and Resistance to Degradation (ASTM C 131) shall be performed a minimum of once every two weeks, unless otherwise directed by the Engineer.

D. For Contracts requiring over 500 cubic yards of aggregate base course, and where otherwise directed by the Engineer, select an area from the first day's production to be called a control strip. The control strip shall be a minimum of 2500 square feet and shall be constructed to meet the requirements of this section and in the same manner as the remainder of the course it represents. The purpose of the control strip is to have the contractor establish the compaction pattern, methods and effort required to achieve the quality requirements and to calibrate the Contractor's nuclear gage. Additional control strips shall be constructed whenever a significant change occurs in the type or source of the material and whenever a significant change occurs in the composition of the material from the same source.

E. Engineer's Sampling and Testing

1. The Engineer may elect to inspect, test, and approve aggregate base course at the source. At least five days prior to delivery of material to site, the Engineer shall be notified.

2. Base course material delivered to the construction site will be sampled and tested by the Engineer for conformance to the requirements specified in 2.01 A copy of the test analyses will be on file with the Engineer. The samples will be taken from stockpiles on site, prior to material placement operations. Minimum testing frequencies will be as follows:

<u>Aggregate Base Course Using Virgin Aggregate</u>

Gradation	1 test per Lot
Moisture-Density	
Proctor Test	1 test per Lot

A Lot shall be defined as one day's production but no more than 400 cubic yards.

<u>Aggregate Base Course Using Recycled Concrete Aggregate</u>

Gradation	4 tests per Lot (one test from each sublot)
Moisture-Density	
Proctor Test	4 tests per Lot
Composition	4 tests per Lot

3. The Engineer will check base course thickness at least once every 2500 sq. ft.

4. The Engineer will determine field density of compacted base course from in-place density tests. Frequency of testing will be at least one test every 2500 square feet per lift. Locations of random sampling shall be determined in accordance with ASTM D 3665. The in-place field density shall be determined in accordance with ASTM D 2922 and ASTM D 3017, or ASTM D 2167, or ASTM D 1556.

5. The Engineer will check conformance to elevations required by the Contract Drawings and required tolerance for surface straightness.

1.05 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. Virgin aggregate for base course shall be quarry processed, crushed dolomite, limestone, gneiss, or trap rock free from coatings of clay, silt, vegetable matter, and other objectionable materials, and shall contain no clay balls.

B. Recycled concrete aggregate for base course shall be as follows:

1. The RCA shall consist of at least 90 percent, by weight, Portland cement concrete, with the following materials making up the remaining 10 percent:

   Wood-0.1%, maximum
   Brick, Mica schist, or other friable material-4%, maximum
   Asphalt Concrete-10%, maximum

2. Virgin aggregate may be added to meet the 90% minimum concrete requirement.

3. The percentage of asphalt concrete and other deleterious material shall be determined by weighing that material retained on the No. 4 sieve, and dividing by the total weight of RCA material retained on the No. 4 sieve.

C. Gradation for aggregate base course shall be as follows:

1.

	Percentage Passing By Weight	
Sieve Size	DGABC	OGABC
1 1/2"	100	100
3/4"	55-90	60-95
3/8"		40-80
No.4	25-60	15-35
No. 50	5-25	8-20
No. 200	3-12	0-7

2. The portion passing the No. 40 sieve shall be non-plastic when tested in accordance with ASTM D 4318.

1. The aggregate base course shall have not less than 90% by weight with at least two fractured faces and 100% with at least one fractured face, and with a maximum of 7% of flat or elongated pieces. A flat piece is one having a ratio of length to width greater than five.

D. Soundness of Aggregates:

Loss limitation shall not be more than 10% loss by weight, using sodium sulfate for 5-cycle test period, or not more than 15% loss by weight, using magnesium sulfate for a 5-cycle test period as determined by ASTM C 88.

E. Resistance to Degradation:

Percentage loss between the original weight and the final weight of the test sample, shall not exceed 45% as determined by ASTM C 131.

F. Recycled Concrete Aggregate Stockpile Approval:

RCA will be sampled from lots as specified in 1.04 E.2. Each sublot of each lot shall meet all applicable test requirements of this Section. If any one sublot does not meet these requirements, the entire lot will be disapproved and shall not be used for the purposes of this Contract.

The Engineer will approve or disapprove the RCA within 4 days after sampling, unless the Engineer determines that soundness of aggregate or resistance to degradation tests specified in this Section 2.01 are required, in which case 21 days will be required for approval or disapproval. Do not deliver RCA until it has been approved by the Engineer.

After a lot has been approved, no additional material shall be added to the lot stockpile until that stockpile is exhausted. Any new stockpile formed shall be subject to testing and acceptance as described above.

PART 3. EXECUTION

3.01 INSTALLATION

A. Equipment

1. Placing and spreading equipment shall be approved by the Engineer and be capable of spreading material without segregation of aggregate sizes.
2. Steel vibratory rollers to be used for compaction, shall have provision for regulation of vibration frequency. Pneumatic rubber-tired rollers shall have a minimum weight of 20 tons and tire pressure of between 60 and 150 psi, as directed by the Engineer. All compaction equipment, including mechanical tampers when proposed, is subject to review an approval by Engineer.

B. Preparation of Subgrade

1. Verify that job conditions specified in 1.03 A have been met and there are no high points in the subgrade which would interfere with meeting the tolerance requirements specified in 1.03 B.
2. For granular subgrades, compact subgrade with a minimum of 6 passes of an approved vibratory steel roller, operating at the optimum operating frequency as recommended by the manufacturer.
3. For fine-grained soil subgrades, compact subgrade with a minimum of 6 passes of an approved pneumatic rubber-tired roller.
4. Rollers shall be operated at a speed not to exceed 3 miles per hour. Roller passes shall be overlapped a minimum of 6 inches.
5. All subgrade compaction operations shall be performed at or near optimum moisture content. In areas where use of a roller is impractical, compact subgrade with approved mechanical tampers.
6. Provide grade control as follows:
   a. Set grade stakes on a rectangular grid not more than 25 feet on centers.
   b. After firmly driving stakes, offset mark each 6 inches above the top of base course.
   c. Maintain stakes during placement and compaction of base course.

C. Placement and Compaction

1. Place base course materials evenly over the prepared subgrade with approved spreading equipment. In multi-layer construction, the previously constructed layer should be cleaned of loose of foreign material prior to placing the next layer. The surface of the compacted material shall be kept moist until covered by the next layer.

2. When spread, base course materials shall be at or near optimum moisture content and of a thickness such that the maximum depth of a compacted layer shall be 6 inches. In multi-layer construction, the base course shall be placed in approximately equal-depth layers.
3. Compact immediately after spreading, while at or near optimum moisture content, by rolling. The number, type and weight of rollers shall be sufficient to compact the material to the required density.
4. In areas where use of rollers is impractical, compact with manually operated equipment while at or near optimum moisture content.
5. The base course shall be maintained in a condition that will meet all specification requirements until the Work is accepted. Equipment used in the construction of an adjoining section may be routed over completed portions of the base course, provided no damage results and provided that the equipment is routed over the full width of the base course to avoid rutting or uneven compaction.
6. If, in the opinion of the Engineer, the compacted base course softened due to exposure to the elements, drain off all freestanding water and recompact the base course until density requirements are met.

D. Adjustment of Deficiencies

1. Scrape, add or remove material or replace deficient material, and recompact to meet specified density, grade or smoothness criteria.
2. In no case will the addition of thin layers of material be added to the top layer of base course to meet grade. If the elevation of the top layer is 1/2 inch or more below grade, the top layer of base shall be scarified to a depth of at least 3 inches, new material added, and the layer shall be cut back to grade and rerolled.

END OF SECTION

SECTION 02231

AGGREGATE BASE COURSE

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Samples

02231C01 Submit to the Engineer of Materials, Engineering Materials Laboratory, Port Authority Technical Center, 241 Erie Street, Jersey City, NJ 07310-1397, all of the following:
In the case of RCA, an actual material submittal from the proposed source may be required as the result of a new, unfamiliar or unsatisfactory supplier submittal. Two 75 pound representative samples from a dedicated stockpile proposed for use under this contract must then be supplied as follows:
a. Submit RCA samples in clean, sturdy containers or bags that shall not permit loss of any of the material.
b. Clearly label samples with the Contract location, title, and number; identification of the material supplied; and the location of the source.
The Engineer will approve or disapprove within 21 days after receipt of sample. When an actual sample is required, do not deliver material to the site until Engineer has approved of the sample.

Product Data

02231D01 Submit to the Engineer of Materials, Engineering Materials Laboratory, Port Authority Technical Center, 241 Erie Street, Jersey City, NJ 07310-1397, all of the following:
The proposed source of material. Material must come from a source approved by either NYDOT or NJDOT. The Engineer will approve or disapprove within 10 working days after receipt of submittal. Do not deliver material until the Engineer has approved of the source.

02231D02 If the source and/or the supplier of the aggregate base course material changes, resubmittals for approval must be made in accordance with 1.05, above.

Certificates

02231E01 Submit to the Engineer of Materials, Engineering Materials Laboratory, Port Authority Technical Center, 241 Erie Street, Jersey City, NJ 07310-1397, all of the following:
In the case of RCA, the name of the intended supplier and certified test data demonstrating the supplier's compliance with the material requirements of 2.01, at least 21 days prior to delivery of any RCA to the construction site. The Engineer will approve or disapprove within 10 working days after receipt of submittal. Do not deliver material until the Engineer has approved of the source.

END OF APPENDIX "A"

DIVISION 2

SECTION 02561

ASPHALT CONCRETE PAVING (FAA)

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for plant mix macadam base course, bottom course, top course, tack coat and overlay of existing pavement with asphalt concrete. This Section includes the requirements, with FAA-approved modifications, of FAA AC 150/5370 Item P-401, "Plant Mix Bituminous Pavements".

B. Do not use reclaimed asphalt pavement in mixes used for the final surface courses, or in mixes where modified asphalt is used. For all other mixes, use reclaimed asphalt pavement in accordance with the percentages specified in 1.04 C.2.b.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M320	Specification for Performance Graded Asphalt Binder.
AASHTO R028	Practice for Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV).
AASHTO T313	Method of test for Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR).
AASHTO T315	Method of test for Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR).
AASHTO T048	Method of Test for Flash and Fire Points by Cleveland Open Cup .
AASHTO T240	Method of Test for Effect of Heat and Air on a Moving Film of Asphalt Binder (Rolling Thin Film Oven Test).

American Society for Testing and Materials (ASTM)

ASTM C 88	Test Method For Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
ASTM C 117	Test Method for Materials Finer than 75-micrometers (No. 200) Sieve in Mineral Aggregates by Washing.
ASTM C 127	Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.
ASTM C 128	Test Method for Density, Relative Density (Specific Gravity) and Absorption of Fine Aggregate.
ASTM C 131	Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
ASTM C 136	Test Method for Sieve Analysis of Fine and Coarse Aggregates.

ASTM C 566	Test Method for Total Evaporable Moisture Content of Aggregate by Drying.
ASTM C 1252	Test Methods for Uncompacted Void Content of Fine Aggregate (as Influenced by Particle Shape, Surface Texture, and Grading).
ASTM D 75	Practice for Sampling Aggregates.
ASTM D 242	Specification for Mineral Filler for Bituminous Paving Mixtures.
ASTM D 692	Specification for Coarse Aggregate for Bituminous Paving Mixtures.
ASTM D 979	Practice for Sampling Bituminous Paving Mixtures.
ASTM D 1073	Fine Aggregate for Bituminous Paving Mixtures.
ASTM D 2041	Specification for Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.
ASTM D 2172	Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.
ASTM D 2419	Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
ASTM D 2726	Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
ASTM D 3203	Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
ASTM D 3549	Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
ASTM D 3666	Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials.
ASTM D 4125	Test Methods for Asphalt Content of Bituminous Mixtures by the Nuclear Method.
ASTM D 4318	Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
ASTM D 4402	Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer.
ASTM D 4791	Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
ASTM D 4867	Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures.
ASTM D 5444	Test Method for Mechanical Size Analysis of Extracted Aggregate.
ASTM D 5821	Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.
ASTM D 6084	Test Method for Elastic Recovery of Bituminous Materials by Ductilometer.
ASTM D 6307	Test Method for Asphalt Content of Hot-Mix Asphalt by Ignition Method.
ASTM D 6926	Practice for Preparation of Bituminous Specimens Using Marshall Apparatus.
ASTM D 6927	Test Method for Marshall Stability and Flow of Bituminous Mixtures.
ASTM E 178	Practice for Dealing With Outlying Observations.

ASTM E 950	Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Intertial Profiling Reference.
ASTM E 1274	Test Method for Measuring Pavement Roughness Using a Profilograph.

Asphalt Institute - Manual Series

MS - 2	Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.

Dept. of Transportation - Federal Aviation Administration (FAA)

FAA ERLPM	Eastern Region Laboratory Procedures Manual.
FAA AC 150/ 5370	Standards for Specifying Construction of Airports - Plant Mix Bituminous Pavements Item P-401.

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. Job Conditions

1. Apply tack coat only when the base surface is dry and the ambient temperature in the shade has not been below 32 degrees F for 12 hours immediately prior to application, unless otherwise approved by the Engineer.
2. Do not place asphalt concrete upon a wet or frozen surface.
3. The minimum laydown temperature shall be not less than 310 degrees F, when the base surface temperature is below 50 degrees F and not less than 275 degrees F when the base surface temperature is 50 degrees F or greater. The Engineer will measure the temperature of the asphalt concrete in the truck at the paver.
4. The minimum allowable base temperature for a lift thickness is shown in the following table:

Nominal Lift Thickness (inches)	Minimum Allowable Base Temperature (Degrees F)
2 or greater	32
1-1/2 or greater, but less than 2	40
Less than 1-1/2	50

5. If nominal lift thickness is two inches or greater and the base temperature is below 32 degrees F, the Engineer may approve paving operations if the Contractor can demonstrate, prior to commencing with paving, that density and mat texture uniformity can be achieved. All other requirements apply.
6. In case of sudden rain, the Engineer may at his sole discretion permit placing of mixture already in transit from the plant, provided the surface to be paved is free from pools of water and laydown temperatures conform to the above tabulation. Such permission, however, shall not be interpreted as a waiver of any of the quality requirements.

B. Asphalt Concrete Mix Design

1. Design asphalt concrete job mix formula based on the "Mix Design Table" specified in 2.03 A and specimen compaction temperature specified in 1.04 E.3
2. Design top and bottom courses to the following target values:

	Bottom Course	Top Course	
Design Properties	Mix 1[54]	Mix 2	Mix 3
Marshall Stability, lbs. @ 75 Blows (ASTM D 6927)	2150 min.	2150 min.	2150 min.
Flow Value, 0.01 inch gradation (ASTM D 6927)	8 - 16	8 - 16	8 - 16
Air Voids, Percent[55] (ASTM D 3203)	3.8 - 5.2	2.8 - 4.2	2.8 - 4.2
Percent Voids Filled With Bitumen	70 - 80	70 - 80	70 - 80
Voids in the Mineral Aggregate (VMA) Minimum %	12	13	14

3. Plant mix macadam base course shall be a mixture designed within the gradation limits specified in 2.03 A.
4. The design job mix formula shall indicate definite percentages passing for each sieve fraction of aggregate and the asphalt content.
5. Design new job mix formula for each asphalt plant used, whenever there is a change in material or when field conditions dictate a need for redesign.
6. When required by the Engineer, determine the Tensile Strength Ratio (TSR) of specimens of the composite paving mixture by procedures specified in ASTM D 4867. The value shall be not less than 80 percent.

C. Plant Production Requirements

1. The asphalt concrete mixture or its components shall not be heated to a temperature outside the limits specified in 3.02 A.
2. Plant production tolerance limits for Marshall stability and flow value are as follows:

   Marshall Stability at 75 blows (ASTM D 6927) - 1800 lbs. min.[56]

   Flow Value, 0.01inch gradation (ASTM D 6927) - 8 to 16.[56]

   Acceptance shall be on a lot basis as set forth in 1.04 E.3. The acceptance of each lot shall be based on the Percent of Material Within Tolerance Limits (PWL), as set forth in 4.03 B.5. If the PWL of the lot for either parameter is less than 90 percent, the Contractor shall take corrective actions as set forth in 3.03 C.
3. Modified Asphalt Performance Grade

   Modified asphalt shall meet the performance grade requirements set forth in 2.02 B, when tested in accordance with 1.04 E.12. When material fails to meet the requirements, make corrections in accordance with 3.03 E.

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54 For asphalt concrete mixes with five percent of the aggregate or greater retained on the 1inch sieve, the Engineer may require the use of six inch molds to increase the repeatability of Marshall test results. For six-inch molds Marshall stability shall be 4800 lbs. minimum at 113 blows with 22.5 lb. hammer and 18 inch drop and the flow value shall be within the 12 to 24 range.

55 Determine by comparing bulk specific gravity (ASTM D 2726) to maximum specific gravity (ASTM D 2041).

56 If six inch molds are required as set forth in 1.03 B.2 Marshall stability shall be 4000 lbs. minimum at 113 blows with 22.5 lb. hammer, 18 inch drop and the flow value shall be within the 12 to 24 range.

4. Marshall Air Voids

Targets for Marshall air voids are 4.5 percent for Mix 1, and 3.5 percent for Mixes 2 and 3. Acceptance shall be on a lot basis as specified in 1.04 E.3. The acceptance of each lot shall be based on the Percent of Material Within Tolerance Limits (PWL) as set forth in 4.03 B.5. Adjustment to Contract compensation shall be made if the PWL of the lot is less than 90 percent as set forth in 4.03 C. If the PWL of the lot equals or exceeds 90 percent and the PWL for pavement mat and joint densities for the lot equals or exceeds 90 percent, the percentage adjustment to compensation may be between 100 and 106 as set forth in 4.03 C.

The tolerance limits for Mix 1 are 3.0 and 6.0 percent (2.5 and 6.5 percent for mixes containing reclaimed asphalt pavement), and for Mixes 2 and 3 are 2 and 5 percent (1.5 and 5.5 percent for mixes containing reclaimed asphalt pavement).

5. Tensile Strength Ratio

The Tensile Strength Ratio (TSR) shall meet the requirement set forth in 1.04 E.15. When material that is produced fails to meet the requirements, make corrections in accordance with 3.03 F.

D. In-Place Pavement Requirements

1. Final Surface Smoothness

a. Longitudinal Within Runway or Taxiway Edge Markings

The final surface shall have a Profile Index of 15.0 inches per mile or less and no deviations 0.4 inch or greater in 25 feet. Testing and acceptance shall be on a lot basis as set forth in 1.04 E.10.a. Adjustment to Contract compensation will be made based on the Profile Index of the lot as set forth in 4.03 E. Make corrections for deficiencies in surface smoothness as set forth in 3.03 A.

b. Transverse direction for areas within runway or taxiway edge markings and longitudinal and transverse direction for aprons and paved areas outside runway or taxiway edge markings:

Final surface shall be smooth and free from roller marks and irregularities greater than 1/4 inch when tested with a 16-foot straight edge. Testing and acceptance shall be on a lot basis as set forth in 1.04 E.10.b. Make corrections for deficiencies in surface smoothness as set forth in 3.03 A.

c. Notwithstanding the requirements of D 1.a and D 1.b, pave to tighter paving tolerances as required to meet surface smoothness requirements if and when using staged final surface paving techniques.

2. Density

a. In-Place Mat Density

The target for in-place mat density shall be 98 percent or better. Acceptance shall be on a lot basis as set forth in 1.04 E.5. The acceptance of each lot will be based on the Percent of Material Within Tolerance Limits (PWL), as set forth in 4.03 B.5. Adjustment to Contract compensation will be made based on the PWL of the lot as set forth in 4.03 C. The lower tolerance limit for pavement mat density is 96.3 percent.

b. In-Place Joint Density

The target for in-place joint density shall be 97 percent or better. Acceptance will be on a lot basis as set forth in 1.04 E.6. The acceptance of each lot will be based on the Percent of Material Within Tolerance Limits (PWL), as set forth in 4.03 B.5. Adjustment to Contract compensation will be made based on the PWL of the lot for surface course only as set forth in 4.03 F. The lower tolerance limit for pavement joint density is 94.3 percent.

c. Plant mix macadam base course shall have stone thoroughly interlocked, interstices reduced to a minimum and creeping of mixture no longer visible and with no further increase in density achievable by additional rolling.

3. Thickness

The Engineer will test for thickness only after all corrections for final surface smoothness and grade are completed.

Pavement courses shall conform to thicknesses shown on the Contract Drawings within the following tolerances:

Course or Combination of Courses	Tolerance (in inches) Plus or Minus[57]
Thickness of top course	1/4
Total thickness of top course and bottom course	1/4
Total thickness of plant mix macadam base course, bottom course, and top course	1/4
Overlay thickness shall be as required to meet the final surface grade tolerance	--

[57] All measurements for this purpose shall be to the nearest 1/8th inch.

4. Final Surface Grade

The final surface shall conform to the finished grades shown on the Contract Drawings within a target tolerance of plus or minus 0.04 foot, except where closer tolerance is required for proper functioning of appurtenant structures and drainage. The final surface abutting existing pavements shall smoothly transition to the existing surface grades. The Engineer will test the final surface, which he will accept or reject on a lot basis as set forth in 1.04 E.11. For areas within the runway or taxiway edge markings, the Engineer will adjust Contract compensation based on the percentage of grade measurements exceeding the target tolerance as set forth in 4.03 D. For all areas when 15 percent or more of the grade measurements exceed the target grade tolerance or any individual measurement exceeds a 0.06 foot grade tolerance, make corrections for deficiencies in final surface grade as set forth in 3.03 D.

5. In-Place Air Voids

Asphalt concrete shall have in-place mat air voids between 2.0 percent and 8.0 percent (9.0 percent for bottom course). The Engineer will test in-place air voids in accordance with 1.04 E.7. When material fails to meet the requirements, correct in accordance with 3.03 B.

1.04 QUALITY CONTROL/ASSURANCE

A. General

1. Establish and maintain effective quality control procedures which shall ensure that the materials and completed construction submitted for acceptance conform to Contract requirements whether manufactured or processed by the Contractor or procured from subcontractors or vendors.

2. Pre-Pavement Construction Meeting

   a. A pre-paving meeting will be conducted at the construction site by the Engineer a minimum of 20 days prior to the first day of laydown to discuss Contractor (suppliers) mixes, plant quality control, field quality control, tack coat, control strip, requirements for mat and joint densities, equipment (rollers, material transfer unit and paver), smoothness and grade control, segregation, workmanship, quality assurance testing, incentive and disincentive criteria, and any other pertinent specified requirements.

   b. Record, type and distribute meeting minutes to all attendees of the meeting within 5 days of the date of the meeting.

   c. Do not schedule the pre-paving construction meeting until all submittals pertaining to the paving operation have been submitted and approved.

3. At no additional cost to the Authority, make arrangements for the project superintendent and a qualified Contractor's representative to be present at every segment of the paving operations, including but not limited to the following:

   (1) Asphalt Producer's Quality Control Manager

   (2) Contractor's representative for site quality control testing

   (3) Paving crew foreman

   (4) Smoothness testing personnel

   (5) Survey crew chief

4. Provide the Engineer certification in writing stating that all of the testing equipment to be used is properly calibrated and will meet the specifications applicable for the specified test procedures. Upon Engineer's request, test samples to demonstrate an acceptable level of performance.

5. Perform quality control sampling, testing, and inspection during all phases of the Work at rates sufficient to ensure that the Work conforms to the Contract requirements, and at minimum test frequencies required by 1.04 D.

B. Quality Control Plan

1. Establish and maintain a Quality Control Plan (Plan) along with all the personnel, equipment, supplies and facilities necessary to obtain samples, perform and document tests and meet Specification requirements. For Contracts requiring 10,000 tons of asphalt concrete or greater, the Plan is required. For Contracts requiring less than 10,000 tons of asphalt concrete, the Plan is optional.

2. Describe the Plan in a written document. Submit the written Plan to the Chief of Materials Engineering, Materials Engineering Unit for review at least 28 calendar days prior to the start of paving operations.

3. In the absence of an approved Quality Control Plan the Authority will make no payments for materials which are subject to specific quality control.

4. The Plan may be carried out wholly or in part by the Contractor or by an independent organization but it shall in all cases remain the responsibility of the Contractor.

5. Plan Contents: The Plan shall be organized to address at least the following items:

   a. Quality control organization chart.

   b. Area of responsibility and authority of each individual.

   c. Names and qualifications of personnel as required by 1.04 B.7.d.

   d. A listing of any outside organizations such as testing laboratories that will be employed by the Contractor and a description of the services they will provide.

   e. A testing plan which lists the tests required to be performed by the Contractor, the frequency of testing, sampling locations and the location of the testing facilities.

   f. Procedures for ensuring that tests are taken in accordance with the testing plan, that they are documented and that proper corrective actions are taken when necessary.

   g. Procedures for ensuring that testing equipment is available, that it complies with specified standards and that it has been calibrated against certified standards.

   h. Procedures for verifying that tests are taken in accordance with the appropriate AASHTO and ASTM standards.

   i. Procedures for daily submittal of test results to the Engineer.

   j. An action plan detailing procedures to be used to correct unsatisfactory production processes and construction practices, when tests indicate materials are failing to meet specification for the following:

      (1) Aggregate gradation

      (2) Mat and joint density

      (3) Marshall air voids

      (4) Surface smoothness

      (5) Grades

6. Plan Elements. The Plan shall address all elements which affect the quality of the pavement including but not limited to:

   a. Mix design
   b. Aggregate gradation
   c. Quality of materials
   d. Stockpile management
   e. Proportioning/temperature control of mixture components
   f. Mixing and transportation
   g. Placing and finishing
   h. Joints
   i. Compaction
   j. Surface smoothness and grades

7. Quality Control Organization

   a. Implement the Quality Control Plan by the establishment of a separate Quality Control Organization. Develop and submit an organization chart to show all quality control personnel integrated with other management, production and construction functions and personnel.

   b. The organization chart shall identify all quality control staff required to implement all elements of the quality control program, including inspection and testing functions for different items of work.

   c. If an outside organization or independent testing laboratory is used for implementation of all or part of the Plan, the personnel assigned will be subject to the qualification requirements of 1.04 B.7.d. The organization chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

   d. The Quality Control Organization shall consist of at least the following personnel:

      (1) Plan Administrator

      The Plan Administrator shall be an employee of the Contractor. The Plan Administrator shall have prior quality control experience on a project of comparable size and scope. In addition, the Plan Administrator shall meet one of the following requirements:

      (a.) Licensed Professional Engineer with one year of airport paving experience as approved by the Engineer.

      (b.) Engineer-in-Training with two years of airport paving experience as approved by the Engineer.

      (c.) An individual with three years of highway and/or airport paving experience as approved by the Engineer and with a Bachelor Degree in Civil Engineering, Civil Engineering Technology or Construction.

      (d.) Construction Materials Technician certified at Level III by the National Institute for Certification in Engineering Technologies (NICET).

      (e.) Highway Materials Technician certified at Level III by NICET.

      (f.) Highway Construction Technician certified at Level III by NICET.

      (g.) A NICET certified Engineering Technician in Civil Engineering Technology with 5 years of highway and/or airport paving experience as approved by the Engineer.

Certification at an equivalent level by a State or nationally recognized organization will be acceptable in lieu of NICET certification. The Plan Administrator shall have full authority to institute any and all actions necessary for the successful operation of the Plan to ensure compliance with the Specifications. The Plan Administrator shall report directly to a responsible officer in the Contractor's organization. The Administrator may supervise the Plan on more than one project provided that he can upon request be at the construction site within one hour.

(2) Quality Control Technicians

Provide a sufficient number of Quality Control Technicians to adequately implement the Plan. Quality Control Technicians shall be engineers, engineering technicians or experienced craftsmen holding a current certificate issued by the New Jersey Society of Asphalt Technologists, Inc. (NJSAT) or other Engineer-approved certifying agency or organization. (Information regarding the certification procedure can be obtained by contacting NJSAT.)

The Quality Control Technicians shall report directly to the Plan Administrator and shall perform the following functions:

(a.) Inspection of all plant equipment used in proportioning and mixing to ensure proper calibration and operating conditions.

(b.) Performance of quality control tests necessary or desirable to adjust and control mix proportioning in accordance with the job mix formula.

(c.) Inspection of all equipment used in placing, finishing and compacting material to ensure proper operating conditions.

(d.) Inspection during construction to ensure that placement, joint construction and compaction are in conformance with the Specifications and will produce a finished product that meets Specification requirements.

(e.) Performance of all quality control testing as required by 1.04 D, including density monitoring.

8. Testing Laboratory

a. The Plan must provide for a fully equipped asphalt laboratory located at the plant or construction site. It shall be available for joint use by the Contractor for quality control testing and by the Engineer for acceptance testing and must have adequate equipment for the performance of the tests required by these Specifications. The Engineer shall have priority in use of the equipment necessary for acceptance testing.

b. The effective working area of the laboratory shall be a minimum of 250 square feet with a ceiling height of not less than 7.5 feet. Lighting shall be adequate to illuminate all working areas. It shall be equipped with heating and air conditioning units to maintain a temperature of 70 degrees F plus or minus 5 degrees F.

c. In addition to the equipment required for testing, the laboratory shall be equipped with a telephone, a paper copier, a facsimile machine, and a space solely dedicated for the Engineer. Equip the space solely dedicated for the Engineer with a desk, a four-drawer locking filing cabinet and a locking storage cabinet with a minimum size of 18 cubic feet of space.

d. Keep laboratory facilities clean and maintain all equipment in proper working condition. Allow the Engineer unrestricted access to inspect the Contractor's laboratory facility and to witness quality control activities. The Engineer will advise the Contractor in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies or testing personnel and procedures. When in the Engineer's opinion deficiencies may adversely affect test results, immediately suspend delivery and placement of asphalt materials and do not resume until the deficiencies are satisfactorily corrected.

9. Noncompliance

In cases where quality control activities do not comply with either the Contractor's Quality Control Program or the Contract provisions, or where the Contractor fails to properly operate and maintain an effective Quality Control Program, the Engineer may order the Contractor to replace ineffective or unqualified quality control personnel.

C. Source of Aggregate and Sampling

1. Virgin Aggregate

a. Select sources of virgin aggregates well in advance of the time the materials are required for the construction. When the aggregates are obtained from a previously approved source, submit random hot bin samples, if requested by the Chief of Materials Engineering, Materials Engineering Unit, a minimum of 14 calendar days prior to the start of production and if from a source not previously approved, submit random hot bin samples a minimum 45 calendar days prior to the start of production. Sampling of the hot bin materials for job mix formulation will be observed by the Engineer and identical samples will be obtained for verification of the job mix formulation by the Authority's Materials Engineering Unit. The Engineer may require the proposed mix formulation to be batched at the asphalt plant and tested in the presence of the Engineer.

b. Where previously used or concurrent job mix formulations are to be used, the taking of hot bin samples may be waived by the Engineer.

2. Reclaimed Asphalt Pavement

a. Where reclaimed asphalt pavement is permitted, it shall have 100 percent passing 1/2 inch sieve and shall be a mixture of only coarse aggregate, fine aggregate and asphalt cement, free of solvents or other contaminating substances. The fine aggregate contained in the reclaimed asphalt pavement shall have a plasticity index of not greater than 4 when tested in accordance with ASTM D 4318.

(1) Maintain stockpiles of reclaimed asphalt pavement in a manner to prevent contamination with virgin aggregates and keep covered in order to maintain a low moisture content of the reclaimed asphalt pavement.

b. Unless otherwise shown on the Contract Drawings, a minimum of 10 percent to a maximum of 25 percent reclaimed asphalt pavement is required in all asphalt mixes, except for the final surface course and all mixes containing modified asphalts. Fifty percent of the asphalt cement content contained in the reclaimed asphalt pavement will be deducted from the optimum asphalt content for an asphalt mix design.

c. Contractor's reclaimed asphalt pavement will be considered for use provided that the Engineer is notified of the intended use and that he approves the reclaimed asphalt pavement. Take at least six representative samples, each at least 7 pounds, from each stockpile. Stockpile shall not exceed 3000 tons. Sample in accordance with ASTM D 75. Sampling will be observed by the Engineer. Take duplicate samples and submit them with mix design for verification. Test samples in accordance with ASTM D 2172 to determine asphalt cement content; test recovered aggregate in accordance with ASTM C 136 for gradation.

d. Once a reclaimed asphalt pavement stockpile is approved for use, the stockpile shall be dedicated to the Contract and no reclaimed asphalt pavement may be added to the stockpile. If there is an insufficient amount of reclaimed asphalt pavement in the stockpile to complete the Work, a new, separate stockpile may be made and shall be tested for approval in accordance with 1.04 C.2.c.

3. Locate stockpiles of reclaimed asphalt pavement and of virgin aggregate so as to prevent intermingling.

4. When more than one asphalt plant is to be used to supply asphalt concrete to the construction site, each asphalt plant shall use a similar job mix formula, as approved by the Engineer.

5. Locations and timing of random sampling shall be determined in accordance with Section 6 of FAA ERLPM.

D. Contractor's Quality Control Tests

1. Perform all quality control tests necessary to control the production and construction processes. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, Marshall properties and temperatures. Obtain samples at the direction of the Engineer for the purpose of quality control testing. Random sampling procedures specified in Section 6 of FAA ERLPM shall be used for determining the selection of samples as follows:

a. Take four samples of freshly mixed material per each lot (one sample from each sublot) for top, bottom and base courses. Take samples in accordance with ASTM D 979 from material at the mixing plant.

A lot will be defined as one day's production for each mix. Production rates for each mix will be obtained by the Engineer from the asphalt plant at the start of each day's production. A sublot will be defined as a quarter of a lot based on the initial production forecast for the mix. Maximum lot size will be 2000 tons. If a day's production is forecast over 2000 tons, the forecast quantity shall be divided into two or more equal lots. Should actual production be greater than the initial forecast of production for a given mix, the additional production will be divided into the same sublot sizes as initially calculated. If one or two additional sublots are produced they will be added to that day's lot with n=5 or 6 for sublots. If three or more additional sublots are produced in a day, an additional lot will be established for that particular day.

If actual production is less than the initial forecast for a given mix but sufficient material was produced to constitute three sublots, a lot will be formed with three sublots (n=3). Should actual production constitute only one or two sublots, the sublots will be added either to the previous lot or the next production lot, whichever is closer in time. Each sublot shall contain a minimum of 75 tons of material.

Where more than one plant is simultaneously producing material for the job, the lot sizes shall apply separately for each plant.

b. Test samples to determine asphalt content in accordance with ASTM D 2172, ASTM D□4125 or ASTM D 6307. Test recovered aggregate to determine gradation in accordance with ASTM D 5444. In addition, when automated recording plants are used, submit printouts of asphalt content to the Engineer.

c. Prepare three plugs from each sample and test them in accordance with ASTM D 6926 using automatic compaction procedures. Marshall air voids shall be determined in accordance with ASTM D 3203. For each sublot, the maximum theoretical density shall be determined in accordance with ASTM D 2041.

Voids filled with asphalt, for each plant sample, shall be computed as follows:

(1) Determine asphalt content in percentage by volume (I) using:

$$I = \frac{P_b \times G_{mb}}{G_b}$$

Where:

I = Percentage by volume of asphalt

P_b = Percentage by weight of asphalt

G_{mb} = Bulk specific gravity of compacted mixture

G_b = Specific gravity of asphalt

(2) Determine percent voids filled with asphalt (VF) as follows:

$$VF = \frac{I \times 100}{I + P_a}$$

Where:

VF = Percent voids filled with asphalt

I = Percentage by volume of asphalt

Pa = Percent Marshall air voids

Voids in the Mineral Aggregate (VMA) will be estimated by adding the asphalt content in percentage by volume to the percent of air voids. Bulk specific gravities will be used to calculate VMA.

d. Take hot bin or feeder belt composite samples of top, bottom and base course aggregates for mixes at least twice daily and check gradation in accordance with ASTM C 136, including washing material passing No. 8 sieve in accordance with ASTM C 117.

e. At least six times daily, check and record temperatures at necessary locations to determine the temperatures of:

(1) aggregates and asphalt immediately before introduction to the pugmill or dryer drum;

(2) the mixture immediately after discharge from the pugmill or dryer drum;

(3) the mixture at the spreader on the construction site.

f. Reclaimed Asphalt Pavement

(1) Where reclaimed asphalt pavement is being used as a substitute for some of the virgin aggregate, take a sample of freshly mixed reclaimed asphalt pavement in accordance with ASTM D 979 and determine the moisture content at least twice daily. Moisture determinations shall be based on the weight loss by heating an approximately 4 pound sample of the freshly mixed materials for one hour in an oven at 280 plus or minus 5 degrees F. The moisture content of the freshly mixed reclaimed asphalt pavement shall not exceed 0.5 percent.

(2) Take a sample of reclaimed asphalt pavement from the approved stockpile at least once daily and test in accordance with ASTM D 2172 to determine asphalt content and gradation in accordance with ASTM D 5444. The resulting asphalt content and aggregate gradation shall be similar to the average test results of the reclaimed asphalt pavement submitted with Design Job Mix Formula. If there is a variation of plus or minus 1.0 percent in the asphalt content or plus or minus 10 percent in aggregate gradation on any sieve, a second sample shall be taken and tested in the same manner as the first sample. If the results are similar to that of the first sample, appropriate measures shall be taken to adjust the mixture to compensate for the variation in the reclaimed asphalt pavement.

g. Moisture Content of Aggregate

For drum plants the moisture content of aggregate used for production shall be determined a minimum of once per lot in accordance with ASTM C 566.

h. Moisture Content of Mixture

The moisture content of the mixture shall be determined once per lot in accordance with the procedure given in 1.04 D.1.f. (1). The moisture content in the freshly mixed asphalt concrete shall not exceed 0.5 percent. If the moisture content is 0.5 percent or greater, stop production and adjust plant operation.

i. Perform additional testing as required to ensure that mixtures produced meet the requirements of this Section.

2. Control Charts

Maintain linear control charts both for individual measurements and range (i.e., difference between highest and lowest measurements) for aggregate gradation and asphalt content. When test results exceed certain limiting values, take action to bring the asphalt concrete production process under tighter control. The Action Limit is the limiting value at which corrective actions shall be made while production may continue. The Suspension Limit is the limiting value at which production must be suspended while corrections are made. Production shall not resume until Contractor's corrections are approved by the Engineer.

Post control charts in a location satisfactory to the Engineer and keep charts current. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits applicable to each test parameter and the Contractor's test results. Use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If in the Engineer's opinion the Contractor's projected data during production indicates a problem and the Contractor is not taking satisfactory corrective action, the Engineer may suspend production or acceptance of the material.

a. Individual Measurements

Establish control charts for individual measurements to maintain process control within tolerance for aggregate gradation and asphalt content. The control charts shall use the job mix formula target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

CONTROL CHART LIMITS FOR INDIVIDUAL MEASUREMENTS		
Sieve	Action Limit	Suspension Limit
1"	±6 %	±9 %
3/4"	±6 %	±9 %
1/2"	±6 %	±9 %
3/8"	±6 %	±9 %
No. 4	±6 %	±9 %
No. 8	±5 %	±7.5 %
No. 16	±5 %	±7.5 %
No. 30	±3 %	±4.5 %
No. 50	±3 %	±4.5 %
No. 100	±2 %	±3 %
No. 200	±2 %	±3 %
Asphalt Content	±0.45 %	±0.7 %

b. Range

Establish control charts for range to control process variability for the test parameters and Suspension Limits listed below. Compute the range for each lot as the difference between the two test results for each control parameter. The Suspension Limits specified below are based on a sample size of n = 2. Should the Contractor elect to perform more than two tests per lot, the Suspension Limits shall be adjusted by multiplying the Suspension Limit by 1.18 for n = 3 and by 1.27 for n = 4.

CONTROL CHART LIMITS BASED ON RANGE	
(Based on n = 2)	
Sieve	Suspension Limit
1"	11 %
3/4"	11 %
1/2"	11 %
3/8"	11 %
No. 4	11 %
No. 8	9 %
No. 16	9 %
No. 30	6 %
No. 50	6%
No. 100	3.5%
No. 200	3.5%
Asphalt Content	0.8%

c. Corrective Action

The Quality Control Plan shall provide for appropriate action to be taken when the asphalt concrete production process is out of tolerance. The Plan shall contain sets of rules to gauge when a process is out of control and shall describe Contractor's actions to bring the process into control. A process shall be deemed out of control and production stopped and corrective action taken, if:

(1) One point falls outside the Suspension Limit line for individual measurements or range; or

(2) Two consecutive points fall outside the Action Limit line for individual measurements.

3. Document quality control efforts using copies of the sample forms contained in the FAA ERLPM, Appendix C, in its entirety, or use Authority forms obtained from the Engineer. Make test results available to the Engineer daily.

4. If a storage silo is used:

a. Check the silo to see that it can properly store the asphalt concrete for the time involved.

b. Take samples of asphalt concrete as it is unloaded from the silo and check them for conformance to this Section. If the asphalt concrete appears segregated, stop using the storage silo until it is demonstrated to the Engineer that the condition has been corrected.

c. Silo storage time shall be governed by previous State DOT approval, not to exceed 24 hours.

5. Unless otherwise noted on the Contract Drawings, and subject to the approval of the Engineer, select an area to be called a Control Strip from the first day's production of each mix. Each Control Strip shall be a minimum of 100 feet long and two spreader widths wide and shall be constructed to meet the requirements of this Section and in the same manner as the remainder of the course it represents. Take three random samples at the plant and test them for stability, flow and air voids in accordance with ASTM D 6927 and 1.04 D.1.c. Take three randomly selected cores from the pavement mat and three along the longitudinal pavement joint and test them to determine density in accordance with 1.04 E.5 and E.6. Use the same means and methods which will be used to construct longitudinal and transverse joints as referred to in 1.04 B.6.h and 3.02 F.1 and 2.

The purpose of the Control Strip is to demonstrate that the pavement may be constructed using the proposed equipment and methods of operation and to obtain all quality requirements prior to the start of full production. Construct a new Control Strip whenever a change is made in equipment, methods of operation or type or source of material or whenever there is a change in the job mix formula. The Control Strip may become part of the completed pavement if it meets the requirements of this Section.

6. Include, as part of the Quality Control Plan, the use of a nuclear density device to aid in meeting the specified target densities. Calibrate the nuclear density device with the control strip cores. If other than a nuclear density device is used it shall be calibrated with an additional set of pavement cores.

7. Final Surface Smoothness

Perform quality control smoothness testing of the final surface. Testing equipment shall be capable of measuring the Profile Index of the final surface in inches per mile using a 0.2 inch blanking band, in accordance with ASTM E 1274. As a minimum test the final surface of pavement, along the center of each paving lane once during each day of paving. Provide written test results to the Engineer after each test. Test results shall identify the location of each test including starting and end stations and offset from centerline of pavement. Upon completion of all quality control testing and any required corrective work, the Engineer, in accordance with 1.04 E.10, will perform acceptance testing.

8. Final Surface Grade

Perform quality control surveys immediately after the top course has been compacted, to check final grades. Measure elevations at the finished grade locations shown on the Contract Drawings. Provide the Engineer with the survey results at the end of each work period. The survey results shall identify the location of each measurement by station and offset, measured elevations to the nearest 0.01 foot, required finished grades from the Contract Drawings and the difference between measured elevations and required elevations to the nearest 0.01 foot. This survey is for Contractor's quality control. Acceptance of the finished surface shall be as specified in 1.04 E.11.

9. For Work performed, either wholly or in part, in the State of New Jersey, provide a representative present during all paving operations who shall be certified by the New Jersey Society of Asphalt Technologists, Inc. (NJSAT) as an Asphalt Paving Construction Technologist.

E. Engineer's Sampling and Testing

1. Produce asphalt concrete in approved automated plants equipped with interlocks and printouts and subject to the following:

   a. Plant interlocks and printouts shall be in operation during production and two (2) copies of all printouts shall be furnished to the Engineer daily.

   b. Scales shall be certified by an approved agency at least every 180 calendar days and copies of certifications shall be submitted to the Engineer upon request.

2. Provide labor and equipment to take samples, except cores, to check thickness and density.

3. The Engineer will perform acceptance testing for Marshall air voids, stability and flow. Samples will be taken from trucks at the plant, in accordance with FAA ERLPM, Section 6. These samples will be from the sublots that were sampled in 1.04 D.1.a. The Engineer will prepare three plugs from each sample and test them in accordance with ASTM D 6926 and ASTM D 6927 using automatic compaction procedures. The specimen compaction temperatures will be within the following range as measured within 1/2 inch from the outside edge:

Performance Grade	Temperature Degrees F
PG 64-22, PG 70-22	275 - 295
PG 76-22	300 - 320
PG 82-22	305 - 325

Air voids, voids in mineral aggregate and voids filled with asphalt will be determined in accordance with ASTM D 3203 and 1.04 D.1.c. The average test values obtained from each lot of top and bottom courses must conform to the parameters specified in 1.03 C.

In lieu of sampling and testing in the field, the Engineer may sample and perform acceptance testing at the plant. The Contractor will be advised at the start of Work where the Engineer will sample and test.

4. For thickness determination, exclusive of overlay pavement, the Engineer will divide each course into area lots consisting of the area covered by the lot sampled as specified in 1.04 D.1.a and he will further subdivide each lot into four equal sublots. The Engineer will take one 4-inch diameter core randomly in each sublot to check thickness of the top and bottom courses. One-fourth of all such cores will continue through the plant mix macadam base course. Thickness will be determined in accordance with ASTM D 3549.

5. Mat Density

a. The Engineer will determine the in-place density of the Control Strip and subsequently placed pavements by taking cores at random locations as specified below.

b. Cores taken from the top and bottom course in place and any other specimens taken at the construction site, sampled in accordance with the random sampling procedures as specified in 1.04 D.l, will be tested by the Engineer for bulk specific gravity in accordance with ASTM D 2726. Cores will not be taken closer than one foot from a transverse or longitudinal joint for pavement mat density determination. The in-place density of the pavement course will be the ratio of the in-place specific gravity to the laboratory Marshall bulk specific gravity expressed as a percentage.

c. Cores taken from courses containing more than 10 percent air voids will be tested by the Engineer for density (Bulk Specific Gravity) according to the following equation:

$$S.G. = \frac{W}{12.87\, d^2 h}$$

S.G. = Bulk Specific Gravity
W = Weight, Dry Specimen (grams)
d = Measured Diameter[58] (inches)
h = Measured Height[58] (inches)

Laboratory bulk specific gravity and computation of in-place density will be as specified in 1.04 E.5.b above.

d. The average in-place density determination, taken from the area covered by the lot sampled as specified in 1.04 D.l.a, will be determined by the Engineer by summing up the sublot in-place density readings obtained from a lot and dividing the total by the number of sublots. The in-place density from each sublot will be obtained using a core reading taken from each sublot on a random basis and dividing by the Marshall bulk density (ASTM D 6926 and ASTM D 2726) taken for that sublot. Any core with a thickness less than twice the largest sieve size to retain more than 5 percent of any aggregate will be discarded and additional random cores will be taken as required to ensure representative readings.

e. The Engineer will repeat the procedure specified in a. through d. above whenever a change is made in the type or source of material or whenever a new job mix formula is approved for material from the same source.

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58 Average of 5 equally spaced measurements around the core.

6. Joint Density

The Engineer will take one core from each sublot of all surface courses or from the underlying lifts as defined in 1.04 D.l.a and will test it in accordance with 1.04 E.5. For joint cores the lowest Marshall bulk density for sublots forming the joint will be used to compute the in-place density. The Engineer will take cores from directly over the longitudinal joint in line with the location of the random cores taken under 1.04 E.5.b. When a paving lane has two longitudinal joints, both joints will be cored. The in-place joint density will be determined separately for each joint, and the joint producing the lowest in-place density will be used to determine payment. Based on site and placement conditions the Engineer may elect to core only one joint.

7. In-Place Air Voids

The Engineer will calculate the in-place mat air voids for each sublot in accordance with ASTM D 3203, by comparing the bulk specific gravity (ASTM D 2726) of the cores taken as specified in 1.04 E.5.b to the maximum laboratory specific gravity (ASTM D 2041).

8. Patch all areas where samples are taken with an approved asphalt concrete or Portland cement concrete properly tamped to fill all voids and struck off flush with the surface within 24 hours after sampling.

9. The Engineer may at any time, notwithstanding previous plant approval, reject and require the Contractor to dispose of any batch of asphalt concrete mixture which is rendered unfit for use due to contamination, segregation or incomplete coating of aggregate. Such rejection may be based on only visual inspection. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the Engineer and, if the Contractor can demonstrate in the laboratory, in the presence of and to the satisfaction of the Engineer, that such material was erroneously rejected, the Contractor will be compensated for the material.

10. Final Surface Smoothness

a. Longitudinal Within Runway or Taxiway Edge Markings

(1) The Engineer will test the final surface parallel to the runway or taxiway centerline for smoothness. A lightweight profilometer meeting the requirements of ASTM E 950 Class 1 will be used to measure the final surface profile and smoothness.

(2) The profilometer test results will be used to simulate California profilograph testing of the pavement. The simulation will be used to compute the Profile Index in inches per mile using a 0.2 inch blanking band, in accordance with ASTM E 1274. A third-order Butterworth low pass filter with a filter length (cutoff wavelength) of 2.0 feet will be used. Scallops will be rounded to the nearest 0.01 inch. The blanking band will be centered on a straight line determined by least - squares fit over the length of the lot. The simulation will also be used to identify any surface deviations in excess of 0.4 inch in 25 feet. Designed breaks in grade shown on the Contract Drawings will not be included in the Profile Index computations.

(3) Testing will be performed on a lot basis. A lot is defined as 500 linear feet of paving lane. When less than 250 feet remains after dividing the pavement into 500 linear foot lots, the remaining length will be added to the adjacent lot. When more than 250 feet remains a short lot will be tested.

(4) For paving lanes up to 20 feet in width, three measurements will be made along the centerline of paving lanes. The Profile Index of the lot will be computed by averaging the Profile Index of each measurement.

(5) For paving lanes greater than 20 feet in width, three measurements will be made at two locations, each six feet from and parallel to the centerline of the paving lane. The Profile Index of the lot will be computed by averaging the Profile Index of each of the measured profiles.

(6) The Profile Index for the length of paving lane in each lot is converted to the Profile Index of the lot in inches per mile using the following formula:

$$PI = PT \times \frac{5280}{L}$$

Where:

PI = Profile Index, inches per mile

PT = Profile Index, inches per length in feet of paving lane in a lot

L = Length of the paving lane in the lot in feet.

b. Transverse direction for areas within runway or taxiway edge markings and longitudinal and transverse direction for aprons and paved areas outside runway or taxiway edge markings:

(1) A lot is defined as 50,000 square feet of final paved surface. Where paving areas are not equally divisible into 50,000 square foot lots, odd sized lots between 25,000 and 75,000 square feet will be used. The odd sized lots will be used for the area remaining after the paved area is divided into 50,000 square foot lots.

(2) Each lot will be evaluated by the Engineer with a 16-foot rolling straightedge provided by the Contractor and subject to approval by the Engineer. The Engineer at his sole discretion may elect to use a lightweight profilometer and straightedge simulation in lieu of rolling straightedge testing. Measurements will be made perpendicular to the centerline of the paving lanes at distances not to exceed 25 feet; longitudinal measurements will be made along the centerline of the paving lane. Designed breaks in grade shown on the Contract Drawings will not be included in the measurements. When more than 15 percent of all measurements within a lot exceed the tolerance specified in 1.03□D.1.b, the Contractor shall correct the deficiency in accordance with 3.03 A.

11. Final Surface Grade

The grades of the final surface of each lot will be measured at the finished grade locations shown on the Contract Drawings. Where paving lanes are 20 feet or greater in width, an additional line of grades, located at the center of the paving lane and spaced at 25 feet longitudinally, will be measured. A lot is defined as 50,000 square feet of final pavement surface. The transverse limit of the lot will be the transverse limit of paving. Lots will be divided into areas within the runway or taxiway edge markings and areas outside the edge marking. Where paving areas are not equally divisible into 50,000 square foot lots, odd sized lots between 25,000 and 75,000 square feet will be used. The odd sized lots will be used for the area remaining after the paved area is divided into 50,000 square foot lots. The Contractor shall perform the survey jointly with the Engineer.

12. The Engineer will perform acceptance testing of modified asphalt to determine if it meets the performance grade requirements set forth in 2.02 B. Samples will be collected at the asphalt plant for each lot of asphalt concrete produced, as specified in 1.04 D.1.a. The Engineer will sample the liquid asphalt from the plant storage tanks which must be equipped with a sample valve.

13. The Engineer will measure the temperature of each load of asphalt concrete. Any load of asphalt concrete with temperature exceeding 350 degrees F will be rejected.

14. Where there is a discrepancy between the Contractor's test results and those of the Engineer, the Engineer's test results shall govern.

15. The Engineer may perform acceptance testing during production to determine whether the asphalt concrete meets the TSR requirements of this paragraph. For each lot of asphalt concrete, defined in 1.04 D.1.a, one sample will be obtained from a truck at the plant and tested in accordance with ASTM D 4867. Suspend production if test results indicate that the TSR is less than or equal to 80 percent. Submit a plan to the Engineer for approval indicating how the problem will be corrected and ensure that TSR values greater than 80 percent will be consistently produced before commencing production once again.

1.05 SUBMITTALS

A. See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer of asphalt cement shall be approved by either the New York State Department of Transportation (NYSDOT) or the New Jersey Department of Transportation (NJDOT).

B. Modified Asphalt shall be one of the following. No substitution is permitted.

1. "StellarFlex SP" – NuStar Asphalt Refining LLC; Paulsboro, NJ.
2. "Elvaloy RET" - DuPont Co.; Wilmington, DE.
3. "Kraton" (SEBS) - Kraton Polymers, LLC; Houston, TX.
4. "Polykote" - Suit-Kote Corp.; Cortland, NY.
5. "Vestoplast S" modifier - Evonik Degussa Corp.; Parsippany, NJ.

2.02 MATERIALS

A. Aggregates

1. If the tensile strength ratio of the specimens of composite mixture is less than 80 percent, as specified in 1.03 B.6, the aggregates will be rejected unless the Contractor treats the asphalt with an approved anti-stripping agent. The amount of anti-stripping agent added to the asphalt shall be sufficient to produce a tensile strength ratio of not less than 80 percent.

2. Coarse Aggregate - Material retained on the No. 8 sieve

a. Except as specified in 2.02 A.2.b., coarse aggregate shall conform to ASTM D 692, except as follows: use broken stone or crushed gravel having not less than 75 percent by weight of pieces with two or more fractured faces and 85 percent by weight having at least one fractured face (ASTM D 5821), with a maximum of 8 percent of flat or elongated pieces (ASTM D 4791), with a maximum percentage of wear (ASTM C 131) of 40 percent and with a magnesium sulfate loss (ASTM C 88) of not more than 12 percent for a five-cycle test period.

b. For the final surface course within the roadway pavement edge markings as shown on the Contract Drawings, coarse aggregate shall conform to ASTM D 692 except as follows: use broken stone which shall be trap rock or gneiss of uniform quality obtained from a source approved by the NYSDOT or the NJDOT for use in asphalt concrete. The aggregate shall have not less than 75 percent by weight of pieces with two or more fractured faces, with a maximum of 8 percent of flat or elongated pieces (ASTM D 4791), with a maximum percentage of wear (ASTM C 131) of 30 percent and with a magnesium sulfate loss (ASTM C 88) of not more than 12 percent for a five-cycle test period.

c. A flat particle is one having a ratio of width to thickness greater than five; an elongated particle is one having a ratio of length to width greater than five.

3. Fine Aggregate: Material passing the No. 8 sieve and retained on the No. 200 sieve

Fine aggregate shall be a blend of washed, textured sand and stone screenings conforming to ASTM D 1073, with a maximum percentage of wear (ASTM C 131) of 30 percent and with a magnesium sulfate loss (ASTM C 88) of not more than 18 percent for a five-cycle test period, a plasticity index of not more than 6 and a liquid limit of not more than 25 when tested in accordance with ASTM D 4318. When tested in accordance with ASTM D 2419, the sand equivalent value shall be 35 or greater.

Textured sand shall be defined as a sand which when tested in accordance with ASTM C 1252, Method A, and results in uncompacted voids greater than 45.0 percent. Sand that has a low texture value and slag shall not be used.

4. Mineral filler shall conform to ASTM D 242 and have a ratio to asphalt cement by weight not exceeding 1.2.

B. Asphalt

Asphalt shall be one of the following conforming to the requirements of AASHTO MP1 and as specified within the table entitled "Requirements for Performance Graded Asphalts" for the Performance Grade (PG) as shown on the Contract Drawings:

1. Asphalt Cement

Asphalt cement shall meet the requirements for PG 64-22, unless otherwise shown on the Contract Drawings.

2. Modified Asphalt

Modified Asphalt shall be one of the following. No substitution is permitted.

a. "Kraton "(SEBS), "Polykote", "Elvaloy RET" or "Stellarflex SP" meeting the requirements for PG 76-22 or PG 82-22 as shown on the Contract Drawings.

b. Asphalt cement modified with "Vestoplast S", may be used where PG 76-22 is specified and subject to the following:

(1) Add "Vestoplast S" modifier to the asphalt concrete mixture at a rate of 7 percent by weight of asphalt cement, by substitution.

C. Tack Coat

Unless otherwise shown on the Contract Drawings, tack coat shall be asphalt cement as specified in 2.02 B.1 above.

D. Resultant Asphalt Cement

Resultant asphalt cement shall be a mixture of new asphalt cement as specified in 2.02 B.1 above, asphalt cement extracted from the reclaimed asphalt pavement and recycling agents if required.

REQUIREMENTS FOR PERFORMANCE GRADED ASPHALTS

PERFORMANCE GRADE (PG)	64-22	70-22	76-22	82-22
These Tests Performed on Original Binder:				
Flash Point Temperature (AASHTO T048): Minimum, Degrees Celsius.	230	230	230	230
Dynamic Shear (AASHTO T315): G*/SIN DELTA, Minimum, 1.00 kPa, Test Temperature at 10 Rad/s, Degrees Celsius.	64	70	76	82
Rotational Viscosity (ASTM D 4402): Maximum, 3 Pa-s, Test Temperature, Degrees Celsius.	135	135	135	135
Separation Test - R&B: Percent Difference Maximum Degrees Celsius.	--	--	4.5	4.5
These Tests Performed on Rolling Thin Film Oven Test (RTFOT) Residue:				
Mass Loss (AASHTO T240): Maximum Percent.	1.00	1.00	1.00	1.00
Dynamic Shear (AASHTO T315): G*/SIN DELTA, Minimum, 2.20 kPA, Test Temperature at 10 Rad/s, Degrees Celsius.	64	70	76	82
Elastic Recovery (ASTM D 6084) 25 Degrees Celsius, 5 cm/minute Elongation, 60 Minutes, Minimum Percent.	--	--	75	80
These Tests Performed on Pressure Aging Vessel (PAV) Residue:				
PAV Aging Temperature (AASHTO R028): Degrees Celsius.	100	100	100	100
Dynamic Shear (AASHTO T315): G*/SIN DELTA, Maximum, 5000 kPa, Test Temperature at 10 Rad/s, Degrees Celsius.	25	28	31	34
Creep Stiffness (AASHTO T313): S, Maximum, 300 MPa m-Value, Minimum 0.300, Test Temperature at 60 Seconds, Degrees Celsius.	-12	-12	-12	-12

2.03 MIXES

A. Mix Design Table

Mix Designation and Percentage by Weight Passing Sieves				
Sieve Size	Plant Mix Macadam Base Course	Bottom Course Mix 1	Top Course Mix 2	Top Course Mix 3
1-1/4"	100	100	---	---
1"	90 - 100	90 - 100	100	---
3/4"	60 - 80	70 - 84	78 - 98	100
1/2"	---	54 - 68	64 - 77	72 - 98
3/8"	15 - 40	44 - 54	52 - 67	60 - 82
No. 4	0 - 10	28 - 36	33 - 46	40 - 56
No. 8	---	17 - 25	27 - 35	31 - 39
No. 16	---	12 - 20	17 - 23	19 - 25
No. 30	---	7 - 15	12 - 18	13 - 19
No. 50	---	5 - 11	8 - 12	8 - 16
No. 100	---	3 - 9	6 - 10	5 - 10
No. 200	---	1 - 5	3 - 6	3 - 6
Asphalt, Weight by Percent of Total Mixture				
	2.5 - 3.1	3.5 - 4.5	4.4 - 5.2	5.2 - 6.2

Note No. 1 - Material passing the No. 200, sieve may consist of fine particles of the aggregate, mineral filler or both. Material passing the No. 30 sieve shall be non-plastic when tested in accordance with the requirements of ASTM D 4318.

Note No. 2 - Lift Thickness shall be no less than two times the nominal maximum size of the aggregate (See Note No. 6).

Note No. 3 - If the aggregate does not satisfy tensile strength ratio requirements, add an approved anti-stripping agent (see 2.02 A.1).

Note No. 4 - Job Mix Formula shall follow a smooth curve within the specified limits for all sieve sizes of the Mix Design Table, but should not fall on the maximum density line and should not cross the maximum density line below the No. 4 sieve. The maximum density line will be determined by plotting the gradations on a 0.45 power graph paper, and drawing a straight line between the amount passing the No. 200 sieve and the amount which is retained on the largest sieve.

Note No. 5 - Notify the Engineer if a satisfactory Job Mix Formula using the Mix Design Table cannot be obtained.

Note No. 6 - Nominal maximum size is one sieve size larger than the first sieve to retain more than 10 percent of the aggregate, based on the Contractor's job mix formula.

B. Job Mix Formula and Checklist

1. The laboratory used to develop the job mix formula shall meet the requirements of ASTM D 3666. Before construction starts, submit to the Engineer a certification signed by the manager of the laboratory stating that it meets these requirements. The certification shall contain as a minimum:

   a. Qualifications of Personnel: Laboratory manager, supervising technician and testing technicians.

b. A listing of equipment to be used in developing the job mix.

c. A copy of the laboratory's quality control system.

2. Develop Job Mix Formula using procedures contained in Chapter V, "Marshall Method of Mix Design" of the Asphalt Institute's Manual Series No. 2 (MS-2) and where applicable, and furnish information for the following checklist:

a. General

(1) Contractor and Contract number.

(2) Type of bituminous mixture.

(3) Type and source of aggregates.

(4) Type and source of asphalt.

b. Aggregates

(1) Sieve analysis of each aggregate to be used in mixture in accordance with ASTM C 136. The minus 200 fraction shall be tested by the laboratory or technician doing the mix design in accordance with ASTM C 117.

(2) Physical test of aggregates - soundness, wear, percent fractured faces and percent flat or elongated particles.

(3) Bulk specific gravity and absorption in accordance with ASTM C 127 for coarse aggregate and ASTM C 128 for fine aggregate. The aggregate shall be sampled by the laboratory or technician doing the mix design from the plant hot bins or feeder belt.

(4) Proportion used of each type aggregate.

(5) Theoretical gradation of combined proportions of aggregates.

c. Asphalt

(1) Type and grade.

(2) Specific gravity.

(3) Type of antistripping agent (if required).

d. Optimum Asphalt Content Determination in accordance with ASTM D 6926 and ASTM D 6927

(1) Compactive effort (75 or 113 blows applied to specimen, each face, as appropriate).

(2) Actual specific gravity and unit weight of each specimen.

(3) Percentage of asphalt in each specimen.

(4) Theoretical specific gravity of each specimen calculated.

(5) Graph of stabilities vs. asphalt content.

(6) Graph of flow values vs. asphalt content.

(7) Graph of voids filled with asphalt vs. asphalt content.

(8) Graph of Marshall air voids vs. asphalt content.

(9) Graph of voids in the mineral aggregate vs. asphalt content.

(10) Graph of unit weight vs. asphalt content.

(11) Visual description of specimens at optimum asphalt content (i.e., dry, flushing, etc.).

(12) Graph of Temperature vs. Viscosity of Asphalt.

e. Summation of Established Job Mix Formula

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(1) Combined gradation of aggregates.
(2) Optimum asphalt content from above graphs.
(3) Specified job mix tolerance range.
(4) Mixing temperature.
(5) Temperature of mix at point of discharge into haul units.
(6) Compaction temperature.

f. Summation of the Characteristics of the Mixture at Optimum Asphalt Content
(1) Stability, pounds.
(2) Flow value, hundredths of an inch.
(3) Actual specific gravity of laboratory compacted mixture.
(4) Maximum specific gravity of paving mix at optimum asphalt content in accordance with ASTM D 2041.
(5) Total voids (air), percent, in laboratory compacted mixture.
(6) Voids filled with asphalt, percent, in laboratory compacted mixture.
(7) Voids in the mineral aggregate, percent, in laboratory compacted mixture.
(8) Actual unit weight, lbs./cu. ft. of laboratory compacted mixture.
(9) Tensile Strength Ratio (TSR) - ASTM D 4867.

g. Verification of Job Mix Formula Characteristics
Where the asphalt content for the proposed Job Mix Formula does not coincide with the asphalt content used in the trial specimens, prepare an additional set of specimens for the proposed Job Mix Formula asphalt content to verify that actual Marshall results duplicate those anticipated from the curves.

PART 3. EXECUTION

3.01 PREPARATION

A. Clean all underlying pavement surfaces and previous courses of all loose and foreign material by sweeping with hand brooms, power sweepers or blowers as directed by the Engineer.

B. Verify that required grade and density tolerances of previous courses have been obtained before placing asphalt concrete.

C. Construct keyways for overlay pavements as shown on the Contract Drawings by using longitudinal or transverse cuts into the existing pavement, and removing the necessary amount of pavement to provide a smooth transition from the new to existing asphalt concrete surfaces.

D. Verify in-pavement castings are set to finished grade and in-pavement light fixtures are located and covered.

E. Remove pavement markings.

F. Tack Coat
1. Apply tack coat by brush on edges of all previously placed or existing pavement and on surfaces of manholes and other structures that will be in contact with pavement course to be placed.

2. Apply tack coat by pressure distributor to existing pavement surface to receive new pavement course or where a course is not placed within 24 hours for roadway areas (7 days for runway, taxiway and apron areas) after placement of the underlying course, except as specified in 3.02 E.7 and 3.02 F.2. However, if the underlying pavement course has not been exposed to traffic and, in the opinion of the Engineer, is kept clean, tack coat shall not be required when a course is placed beyond the time frame mentioned above.

3. Unless otherwise shown on the Contract Drawings, apply tack coat at a rate of 0.05 to 0.10 gallons per square yard on asphalt concrete pavement surfaces and 0.10 to 0.15 gallons per square yard on Portland cement concrete pavement surfaces. Apply tack coat at a temperature between 275 and 350 degrees F.

4. Protect structures such as manhole frames and covers and joints within areas to be tack coated, prior to tack coating, by masking them with tar paper, polyethylene film or other approved materials.

5. After the application of tack coat, follow immediately with placement of asphalt concrete pavement course. Take precautions necessary to maintain and protect the tack coated surface from damage until the next course is placed, including placement and removal of sand as necessary to blot up excess material.

6. Pave or protect all tack coated surfaces prior to opening the area to traffic.

G. Mixing Plant Requirements for Reclaimed Asphalt Pavement

1. Batch plants shall have an appropriately located metering device for adding the reclaimed asphalt pavement to the heated virgin aggregates and shall provide an accurate method for proportioning the reclaimed asphalt pavement into the mixture.

2. The batch plant's dryer may have to be operated at temperatures higher than with all virgin aggregates. If necessary, modify the dryer and the dust collection system to prevent damage.

3. Drum-mix plants shall have an appropriately located metering device for adding the reclaimed asphalt pavement to the dryer-mixer in a manner that does not damage the asphalt in the reclaimed asphalt pavement. Ensure that an accurate method for proportioning the reclaimed asphalt pavement into the mixture is provided. Make provisions for compensating for moisture in reclaimed asphalt pavement.

4. The mixing for a drum-mix plant shall be such as to achieve an intimate blending of virgin aggregates and reclaimed asphalt pavement and a complete coating of all aggregate particles.

5. At the Contractor's option the batch or drum-mix plant may be equipped with a surge-storage bin at the mixture discharge point.

3.02 APPLICATION

A. Mixing in Plant

1. Place aggregate through a dryer and heat to temperature not exceeding 350 degrees F.

2. Screen aggregate to appropriate fractions and place each fraction in a storage bin over mixer unit.

3. Use one bin for fine aggregate, three for coarse aggregate and one for reclaimed asphalt pavement (if applicable).

4. Introduce aggregate into mixer at between 250 and 350 degrees F and dry mix for minimum of 5 seconds (7 seconds for mixtures containing "Vestoplast S") before adding asphalt. Where reclaimed asphalt pavement or "Vestoplast S" is used, add to mixer after dry mixing and before adding asphalt cement.

5. Heat asphalt cement to a temperature not exceeding 325 degrees F (350 degrees F for modified asphalt) and introduce it into mixer at a temperature of not less than 275 degrees F (300 degrees F for modified asphalt).

6. Mix as long as necessary, but not less than 30 seconds after introduction of asphalt cement, to completely and uniformly coat aggregate particles.

7. Regulate temperature of mixture according to outdoor temperature and as necessary to meet minimum laydown temperatures specified in 1.03 A.3. However, asphalt concrete mix production temperatures leaving the plant shall be as follows:

Type of Asphalt	Temperature Degrees F
Asphalt Cement	275 - 325
Modified Asphalt- PG 76-22	305 - 335
Modified Asphalt - PG 82-22	310 - 340

Any deviation from these temperatures must be approved by the Chief of Materials Engineering, Materials Engineering Unit.

8. Use of storage silos will be permitted provided such silos are approved as specified in 1.04 D.4.

B. Delivery, Placing and Spreading

1. Trucks used for hauling asphalt concrete mixtures shall have tight, clean, and smooth metal beds free from kerosene and other solvents. To prevent the mixture from adhering to them, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other approved material. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

2. Load trucks using a minimum of three drops. About 40 percent of the total weight of the mix to be hauled shall be loaded into the center of the front half of the truck. The truck shall then be pulled forward so that the next 40 percent or so of the total load can be deposited into the center of the back half of the bed, near the tailgate. The vehicle shall then be moved backward so that the remaining 20 percent of the mix can be dropped into the center of the bed, between the first two piles.

3. Deliveries shall be scheduled so that placing and compacting of mixture is uniform without stopping and starting of the paver. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified herein, and allowed to cool to ambient temperature.

4. Spread evenly, screed and finish each course to tolerances and requirements specified in this Section.

5. Asphalt concrete pavers shall be self-propelled, with an activated screed, heated as necessary, and shall be capable of spreading and finishing courses of asphalt concrete which will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface.

The paver shall have a receiving hopper of sufficient capacity to permit a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed without segregation. The screed shall effectively produce a finished surface of the required smoothness and texture without tearing, shoving or gouging the mixture.

6. An automatic screed control system shall be used which is capable of automatically maintaining the specified screed elevation and transverse slope. The control system shall be automatically actuated from a reference system by a sensor.

   The control system shall be capable of working in conjunction with any of the following reference systems:

   a. Ski-type device 40 to 60 feet in length.
   b. Taut stringline (wire) set to grade.
   c. Laser beam set to grade.

   For paving operations within the runway or taxiway pavement edge markings, it is recommended that grade control for each lift be performed using either a taut stringline (wire) or laser control as the automatic grade control system. Taut stringline or laser control should be used on both sides of the paver for the initial pass for each lift. Subsequent passes may be controlled by a ski on the newly paved side of the paver and a taut stringline or laser control on the opposite side.

7. Before commencing each day's paving, clean the paver of any material left from previous paving operations.

8. Place in minimum of 10-foot wide strips, except that the last strip may be a lesser width if necessary.

9. Begin along high sides of areas and proceed towards low side of areas with a one directional slope. Start on centerline and work both ways for crowned pavements.

10. The longitudinal joint in one lift shall offset the longitudinal joint in the lift immediately below by at least 1 foot; however, the longitudinal joint in the surface lift shall be at the centerline of the pavement. Transverse joints in one lift shall be offset by at least 10 feet from transverse joints in the previous lift. Within the same lift, transverse joints in adjacent lanes shall be offset a minimum of 10 feet.

11. When starting paving operations at transverse joints, provide four starting block strips under full length of paver screed. Blocks shall be of a thickness appropriate for the lift being placed.

12. The paver's hopper shall be kept half full throughout the paving day. The wings shall not be emptied until the end of the paving day. Residual material shall be disposed of off Authority property.

13. No raked asphalt concrete material shall be broadcast back onto the pavement mat. Raked material shall be placed back in the paver hopper or disposed of.

14. Use hand placing and finishing methods, as approved by the Engineer, in small areas where use of power equipment is impractical. Lutes shall be used for hand spreading.

C. Grade Control

1. Remove grade stakes just prior to rolling of the plant mix macadam base course.
2. The Engineer will provide bench marks and alignment controls adjacent to each area of construction, which shall be checked and maintained by the Contractor.

3. Perform Contractor's quality control surveys immediately after top course has been rolled to check final surface grades, in accordance with 1.04 D.8.

4. Establish and maintain required lines and grades, including crown and cross slope, for each course during paving operations.

5. Use only qualified surveyors licensed in the State in which Work is being performed.

D. Compaction Equipment

1. Use power rollers weighing not less than 10 tons, having wheel loads of at least 250 lbs./linear inch of combined static and dynamic force and equipped with adjustable scrapers to keep wheel surfaces clean and with efficient means of keeping them wet to prevent the mixture from sticking to the roller.

2. Use types and quantities of equipment as necessary to meet all quality and production requirements of this Section.

3. Do not use steel rollers with pits, flat spots or grooves worn into rolling surface. Roller shall be capable of reversing without backlash.

4. Keep roller on asphalt concrete to avoid contamination of pavement with foreign material.

E. Rolling

1. Commence as soon as material will sustain roller without undue displacement, cracking or shoving.

2. The speed of the roller shall at all times be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Immediately correct any displacement occurring as a result of reversing the direction of the roller, or from any other cause.

3. The sequence of rolling operations shall be at the discretion of the Contractor.

4. Perform rolling with types and quantity of rollers as may be necessary to satisfy all of the pavement quality requirements specified herein.

5. Do not re-roll cold in-place asphalt concrete with a steel wheel or vibratory roller to attempt to increase density. A pneumatic tire roller may be used, subject to approval by the Engineer.

6. At end of each day's operations or when paving is interrupted sufficiently to allow mixture to cool, make a stop by means of tapering the course and form a transverse joint.

7. When resuming operations, cut back joint to expose a granular surface for full depth of the course, paint exposed edge with tack coat, place fresh mixture against joint, tamp and roll.

8. Any pavement that becomes loose and broken or mixed with dirt, develops check-cracking, or is in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at no cost to the Authority. Skin patching shall not be allowed.

F. Joints

1. Form all joints in such a manner as to ensure a continuous bond between the courses and to obtain the required density, as demonstrated, tested and approved in the control strip. All joints shall have the same texture as other sections of the course and shall meet the requirements for density, smoothness and grade. Minimize raking of joints. Any mix raked from joint shall be discarded and not broadcast back onto the mat.

2. For transverse joints, the roller shall not pass over the unprotected end of the freshly laid mixture except when necessary to form a temporary stop. After a temporary stop and prior to the continuation of paving, the tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face before placing the adjacent pavement. Apply tack coat on all newly exposed contact surfaces before placing any fresh mixture against the joint.

3.03 CORRECTIONS OF DEFICIENCIES

A. Deficiencies in Surface Smoothness

1. Make corrections as specified below at no cost to the Authority in the event of the following:

   a. Longitudinal Smoothness within Runway or Taxiway Edge Markings – the Profile Index exceeds 22.0 inches per mile, or the surface profile deviations exceed 0.4 inches in 25 feet, when tested in accordance with 1.04 E.10.a., unless the Engineer elects to accept the deficient surface subject to an adjustment to Contract compensation. Adjustments to Contract compensation will be made as set forth in 4.01 I.

   b. Transverse direction within runway or taxiway edge markings, longitudinal and transverse for aprons and paved areas outside runway or taxiway.

      (1) 15 percent of all measurements in a lot exceed the requirements of 1.03 D.1.b when tested in accordance with 1.04 E.10.b.

      (2) Any deviations exceed 1/2 inch when tested with a 16- foot straightedge.

2. The area of deficiencies in surface smoothness and/or surface grade tolerance shall be defined as the area of the lot defined in 1.04 E.10.a.(3), b.(1).

3. Remove and replace, or diamond grind, pavement deficient in surface smoothness, in accordance with all applicable requirements of the Contract Drawings and this Section, at times approved by the Engineer, so as not to interfere with operations of the Authority or others using the area.

4. Remove and replace shall mean milling a minimum thickness of 3 inches within runway and taxiway pavement edge markings and a minimum of 1-1/2 inches elsewhere and repaving to the finished grade shown on the Contract Drawings with the same type asphalt concrete mix as removed.

5. Diamond grinding may be used to correct deficiencies in surface smoothness and surface grade tolerance subject to approval by the Engineer. However, if removal of more than 3/4 inch of pavement is required to correct any deficiency, the deficient area shall be removed and replaced.

6. Diamond grinding equipment shall be approved by the Engineer and have a minimum grinding head of 36 inches and at least 5 blades per inch of shaft. Do not perform diamond grinding when the temperature of the asphalt concrete surface exceeds 80 degrees F. Slurry produced from grinding operations shall be properly disposed of off Authority property.

7. Where corrections are required, the entire width of the paving lane by the length of defective area shall be corrected. In the sole opinion of the Engineer, if the deficiencies are closely spaced and correcting individual areas will adversely affect ride, the entire pavement surface shall be corrected.

8. Following the correction of deficiencies, the Engineer will retest the finished surface of the asphalt concrete. In the event the Profile Index or surface profile deviations exceed the required values, make additional corrections at no cost to the Authority.

B. Deficiencies in In-Place Air Voids of Top and Bottom Courses

1. Runway, Taxiway and Apron Pavements

Any pavement sublot with in-place mat air voids less than 2.0 percent or greater than 8.0 percent (9.0 percent for bottom course) shall be removed and replaced at no additional cost to the Authority. For paving lifts other than the top lift of asphalt concrete the Engineer may elect to accept deficient material subject to an adjustment to Contract compensation. Adjustments to Contract compensation will be made as set forth in 4.01 G.

2. Shoulder and In-field Area Pavements

Remove and replace material on a sublot basis, unless the Engineer elects to accept the deficient material subject to an adjustment to Contract compensation. Adjustments to Contract compensation will be made as set forth in 4.01 G.

C. Deficiencies in Marshall Stability and Flow

In accordance with 1.03 C.2 for Marshall stability and flow, if the Percentage of Material Within Tolerance Limits (PWL) of a lot for either parameter as set forth in 4.03 B.5 equals or exceeds 90 percent, the lot will be acceptable. If the PWL for either parameter is less than 90 percent, determine the reason and take corrective action immediately. If the PWL is below 80 percent for either parameter, stop production and make adjustments to the mix.

D. Deficiency in Final Surface Grade

1. When more than 15 percent of all measurements within a lot exceed the grade tolerance, measured in accordance with 1.04 E.11, remove and replace or diamond grind the entire lot in accordance with 3.03 A.

2. When any individual measurement exceeds a grade tolerance of plus or minus 0.06 foot, remove and replace the surface of the area exceeding the tolerance in accordance with 3.03 A.

3. Following the correction of deficiencies, the Engineer will retest the final surface of the asphalt concrete. In the event grade tolerance is exceeded, make additional corrections at no cost to the Authority.

E. Deficiencies in the Performance Grade Requirements of Modified Asphalt

F. Remove and replace the deficient material on a lot basis, unless the Engineer elects to accept the deficient material subject to an adjustment to Contract compensation. Adjustments to Contract compensation will be made as set forth in 4.01 G.

G. Deficiencies for Tensile Strength Ratio

Remove and replace the deficient material on a lot basis if the TSR is less than or equal to 60 percent , unless the Engineer elects to accept the deficient material subject to an adjustment to Contract compensation. Adjustments to Contract compensation will be made as set forth in 4.01 G.

PART 4. ADJUSTMENTS TO CONTRACT COMPENSATION

4.01 GENERAL

A. Where the Contract requires less than 500 tons of asphalt concrete, no adjustments to Contract compensation will be made as specified herein.

B. Where the Contract requires 500 tons or more of asphalt concrete, adjustments to Contract compensation will be made as specified in 4.03 A, B, C, D and E.

C. Notwithstanding other adjustments to Contract compensation or corrections specified herein for various deficiencies, no payment will be made for material placed above the allowable tolerance above required grade as specified in 1.03 D.4, or for material that must be removed to correct deficiencies, or for that material placed in excess of the plus tolerance for the total thickness of each course as specified in 1.03 D.3.

D. The computations for adjustments to Contract compensation may require conversion between tons and square yards. Such conversion will be made using the actual computed weight per square yard per inch of thickness determined from the lot's average bulk specific gravity for each type of course times the density of water at 70 degrees F.

E. Adjustments to Contract compensation for in-place mat densities, in-place joint densities for surface courses and Marshall air voids shall be determined by applying percentages, calculated as specified in 4.03 B, to the assigned unit price of Sixty Dollars ($60.00) per ton of asphalt concrete; or in the case of Classified Work, by applying such percentages to the actual Contract Unit Price bid for the appropriate asphalt concrete item in the Schedule of Unit Prices For Classified Work, but in no case less than Sixty Dollars ($60.00) per ton of asphalt concrete.

F. The percentage adjustment to the unit price specified in 4.01 E for Marshall air voids, mat density and joint density of the surface course shall be as follows, except as set forth in 4.01 G:

1. When all values calculated in accordance with 4.03 B are 100 percent or greater, the highest value will be used to adjust Contract compensation.
2. When all values calculated in accordance with 4.03 B are less than 100 percent, the lowest value will be used to adjust Contract compensation.
3. When values calculated in accordance with 4.03 B are both greater and less than 100 percent, the product of the highest and lowest value will be used to adjust Contract compensation.

G. When the Engineer elects to adjust Contract compensation in lieu of removal and replacement of material with deficient in-place mat air voids in shoulder and in-field area pavements, deficiencies in TSR or deficiencies in the modified asphalt performance grade, the percentage adjustment to the unit price specified in 4.01 E will be set at 50 percent. No further adjustment will be made for Marshall air voids, mat density or joint density of the surface course.

H. Adjustments for surface smoothness and final surface grade will be based on the final test results, which will be determined after the correction of deficiencies. Reductions in payment will be determined by the following:

$$R = A \times D \times F \times 0.01938$$

Where:

R = Reduction in payment per lot for surface smoothness or final surface grade, dollars

A = Area of lot, square feet

D = Price per ton of asphalt concrete, assigned unit price or Contract Unit Price as set forth in 4.01 E

F = Contract Unit Price Adjustment Factor specified in 4.03 D and 4.03 E

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Reductions in payment for failure to meet surface smoothness and final surface grades will be calculated separately for the entire pavement or overlay surface. Deductions from Contract compensation will be made for the requirement (surface smoothness or final surface grade) which results in the greatest payment reduction. Reductions for surface smoothness or final surface grade will be in addition to all other adjustments to Contract compensation.

I. When the Engineer elects to adjust Contract compensation in lieu of correcting areas with deficiencies in surface smoothness, the Contract Unit Price Adjustment Factor specified in 4.01 H will set at 0.10.

4.02 ADJUSTMENT TO CONTRACT COMPENSATION FOR THICKNESS DEFICIENCY IN PLANT MIX MACADAM BASE COURSE

A. Where the deficiency of a plant mix macadam base course core exceeds the allowable minus tolerance in plant mix macadam base course thickness, one additional core will be taken by the Engineer in each of the other three sublots adjacent to the core taken in accordance with 1.04 E.4. Plant mix thickness for the area of entire lot will be the average of the four cores[59]. Where there is a deficiency in the average of the four cores in excess of the allowable minus tolerance, the total thickness of succeeding courses in the area of entire lot shall be increased by the amount by which the deficiency exceeds the allowable tolerance.

B. For each additional lot resampled in accordance with 4.02 A above, there will be deducted from the Contract compensation, in addition to adjustments for deficiencies as hereinafter specified, an amount of One Thousand Dollars ($1,000.00).

4.03 ADJUSTMENT TO CONTRACT COMPENSATION FOR DEFICIENCIES IN TOP AND BOTTOM COURSES

A. Deficiency in Thickness

Thickness of each course, excluding overlay, will be the average of the four cores in the lot for each course[60]. Deductions from Contract compensation for deficiencies in thickness of top course or the total of top and bottom courses, modified as may be required by 4.02 A, will be the following amounts (deducted per square yard) for the entire area lot:

Amount of Minus Deficiency (inches)	Amount of Payment Deduction (Dollars per Square Yard)
Greater than 1/4 and up to 1/2	1.00
Greater than 1/2 and up to 3/4	2.00

For minus deficiencies in excess of 3/4 inch either in average of four cores or in any individual core, at the Engineer's option, remove and replace deficient pavement or place an overlay that will satisfy all requirements of this Section.

B. Deficiency in In-Place Mat Density, In-Place Joint Densities and Marshall Air Voids

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59 In determining average thickness, if any core exceeds required thickness by more than 1/2 inch, the thickness of that core will be assumed to be 1/2 inch in excess of required thickness.

60 In determining average thickness, if any core exceeds required thickness by more than 1/4 inch, the thickness of that core will be assumed to be 1/4 inch in excess of required thickness.

1. Top and bottom courses will be evaluated on a lot basis with each lot coinciding with that defined in 1.04 D.1.a.

2. Density

   a. In-place mat density specified in 1.03 D.2.a will be evaluated for Section compliance using the average of the random sublot in-place density determinations from cores of the area covered by the lot specified in 1.04 D.l.a.

   b. In-place joint density specified in 1.03 D.2.b will be evaluated for Section compliance using the average of random sublot in place joint density determinations from cores of the area covered by the lot specified in 1.04 D.1.a.

3. Marshall air voids will be evaluated for Section compliance using the average of the random sublot void determinations from hot mix samples from the lot specified in 1.04 D.1.a.

4. The Engineer will check each lot for in-place mat densities, in-place joint densities for surface courses only, and Marshall air voids with adjustments to Contract compensation based on the Percentage of Material Within Tolerance Limits (PWL) as determined by 4.03□B.5 below and by the "Table For Estimating Percent of Lot Within Tolerance Limits-PWL (Standard Deviation Method)". No deficient lot will be approved without an adjustment to Contract compensation made in accordance with the tables entitled "Adjustment to Contract Compensation For In-Place Mat Density and Marshall Air Voids", and "Adjustment to Contract Compensation for In-Place Joint Density".

5. Method of Estimating Percentage of Material within Tolerance Limits (PWL)

   a. Locate sampling positions on the lot by use of random sampling procedures specified in FAA ERLPM, Section 6.

   b. Make a measurement at each location, or take a test portion and make the measurement on the test portion in accordance with 1.04 D and E.

   c. Determine the average value of all samples ($\overline{X}$).

   d. Find the standard deviation (S n) by use of the following formula:

$$S_n = \sqrt{d_1^2 + d_2^2 + d_3^2 + \ldots + d_n^2/n-1}$$

Where

S_n = standard deviation of the number in the set

$d_1, d_2,$ = deviation of the individual sample values $X_1, X_2, \ldots$ from the average value that is,

d_1 = $(X_1 - \overline{X})$, $d_2 = (X_2 - \overline{X})$, $d_n = (X_n - \overline{X})$

n = number of sublots

   e. Find the Lower Quality Index (Q_L) by subtracting the lower tolerance limit (L) from the average values ($\overline{X}$) and dividing the result by standard deviation (S_n).

$$Q_L = \frac{\overline{X} - L}{S_n}$$

   f. Find the Upper Quality Index (Q_U) by subtracting the average value ($\overline{X}$) from the upper tolerance limit (U) and dividing the result by standard deviation (S_n).

$$Q_U = \frac{U - \overline{X}}{S_n}$$

g. The percentage of material above lower tolerance limit (PL) and the percentage of material below upper tolerance limit (PU) will be found by entering the "Table For Estimating Percent of Lot Within Tolerance Limits - PWL (Standard Deviation Method)" with QL and Qu, using the column appropriate to the total number (n) of sublots and reading the number under the column headed "Percent Within Tolerance Limits (PWL)". If the values fall between values shown on the table, use the next higher value for PL or PU.

h. For asphalt concrete properties with only a lower tolerance limit (stability, mat density, joint density), the Percentage of Material Within Tolerance Limits (PWL) equals PL. For asphalt properties with upper and lower tolerance limits (air voids and flow) determine PWL using the following formula:

$PWL = (P_U + P_L) - 100$

i. If the tests within a lot include a very large or a very small value which appears to be outside the limits of variation, the Engineer will check for an outlier in accordance with ASTM E 178, at a significance level of 5 percent, to determine if this value will be discarded when computing Percentage of Material Within Tolerance Limits (PWL).

C. Adjustment to Contract compensation for each lot will be made in accordance with the formula contained in the table entitled "Adjustment to Contract Compensation For In Place Mat Density and Marshall Air Voids" by entering the appropriate row with the value of PWL and performing the calculation indicated for that PWL to determine the percentage adjustment of the unit price (specified in 4.01 E).

ADJUSTMENT TO CONTRACT COMPENSATION FOR IN-PLACE MAT DENSITY AND MARSHALL AIR VOIDS	
Percentage of Material Within Tolerance Limits (PWL)	Percentage Adjustment of the Unit Price (specified in 4.01 E and 4.01 F)
96-100	106
90-96	PWL + 10
80-90	0.5 (PWL) + 55
65-80	2.0 (PWL) - 65
Below 65	[61]

D. Deficiency in Final Surface Grade Tolerance

Adjustment to Contract Compensation for each lot will be made using the table entitled "Adjustment to Contract Compensation for Exceeding Final Surface Grade Tolerance" by entering the appropriate row with the percentage of all measurements within a lot which exceed the grade tolerance, measured in accordance with 1.04 E.11, and reading the number under the column headed "Contract Unit Price Adjustment Factor".

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61 Remove and replace the lot to meet Section requirements as ordered by the Engineer. In lieu thereof, and subject to the provisions in 3.03 B for mandatory removal and replacement, the Contractor and the Engineer may agree in writing that, for purposes of practicality, the deficient lot shall not be removed and adjustment to Contract compensation shall be made at 50 percent of the unit price specified in 4.01 E.

ADJUSTMENT TO CONTRACT COMPENSATION FOR EXCEEDING FINAL SURFACE GRADE TOLERANCE	
Measurements Exceeding Grade Tolerance (Percent)	Contract Unit Price Adjustment Factor
0.0 – 5.0	0
5.1 – 10.0	0.05
10.1 – 15.0	0.25
15.1 and up	Corrective work required as specified in 3.03 D.

The Contract Unit Price Adjustment Factor is used to calculate adjustments to Contract compensation as specified in 4.01 H.

E. Deficiency in Surface Smoothness

Adjustment to Contract Compensation for each lot will be made using the table entitled "Adjustment to Contract Compensation for Surface Smoothness", by entering the appropriate row with the Profile Index, measured and calculated in accordance with 1.04 E.10., and reading the number under the column headed "Contract Unit Price Adjustment Factor".

ADJUSTMENT TO CONTRACT COMPENSATION FOR SURFACE SMOOTHNESS	
Average Profile Index (inches per mile)	Contract Unit Price Adjustment Factor
0.0 - 15.0	0.00
15.1 - 16.0	.02
16.1 - 17.0	.04
17.1 - 18.0	.06
18.1 - 20.0	.08
20.1 - 22.0	.10
22.1 and up	Corrective work required as specified in 3.03 A

The Contract Unit Price Adjustment Factor is used to calculate adjustments to Contract compensation as specified in 4.01 H.

F. Adjustment to Contract compensation for each lot will be made in accordance with the formula contained in the table entitled "Adjustment to Contract Compensation for In-Place Joint Density" by entering the appropriate row with the value of PWL and performing the calculation indicated for that PWL to determine the percentage adjustment of the unit price (specified in 4.01 E.).

ADJUSTMENT TO CONTRACT COMPENSATION FOR IN-PLACE JOINT DENSITY	
Percentage of Material Within Tolerance Limits (PWL)	Percentage Adjustment of the Unit Price (specified in 4.01 E and 4.01 F)
96 - 100	106
90 - 96	PWL + 10
80 - 90	0.25 x PWL + 77.5
65 - 80	PWL + 17.5

Below 65	62

62 Remove and replace the lot to meet Section requirements as ordered by the Engineer. In lieu thereof, and subject to the provisions in 3.03 B for mandatory removal and replacement, the Contractor and the Engineer may agree in writing that, for purposes of practicality, the deficient lot shall not be removed and adjustment to Contract compensation shall be made at 75 percent of the unit price specified in 4.01 E.

TABLE FOR ESTIMATING PERCENT OF LOT WITHIN TOLERANCE LIMITS - PWL (STANDARD DEVIATION METHOD)

Percent Within Tolerance Limits (PWL)	Positive Values of Q_L or Q_U n = Number of Sublots					
	n = 3	n = 4	n = 5	n = 6	n = 7	n = 8
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4716
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630
87	1.0597	1.1100	1.1173	1.1191	1.1199	1.1204
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015
83	0.9939	0.9900	0.9785	0.9715	0.9672	0.9643
82	0.9749	0.9600	0.9452	0.9367	0.9325	0.9281
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958

TABLE FOR ESTIMATING PERCENT OF LOT WITHIN TOLERANCE LIMITS - PWL (STANDARD DEVIATION METHOD)

Percent Within Tolerance Limits (PWL)	Positive Values of Q_L or Q_U n = Number of Sublots					
	n = 3	n = 4	n = 5	n = 6	n = 7	n = 8
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747
70	0.6787	0.6000	0.5719	0.5583	0.5504	0.5454
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592
66	0.5563	0.4800	0.4545	0.4424	0.4354	0.4310
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4031
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855
56	0.2164	0.1800	0.1688	0.1636	0.1613	0.1592
55	0.1806	0.1500	0.1408	0.1363	0.1338	0.1322
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0792
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264
50	0.0	0.0	0.0	0.0	0.0	0.0

G. Additional Tests

1. In the event the Contractor elects to question the original density test results obtained from a particular lot for either the mat density or joint density, the Contractor may request additional testing of that lot in writing within 48 hours of receipt of the written test results from the Engineer. Upon written request received from the Contractor for such additional testing, the Engineer will test one additional sample from each sublot from randomly selected locations in the pavement where the lot was placed. The redefined test will consist of the Engineer's original samples and the additional Contractor's requested samples. The "Percent of Material Within Tolerance Limits-PWL" will be determined in accordance with 4.03 B.5. The value will be used to determine any adjustment to Contract compensation. Only one resampling per lot will be permitted.

2. Additional tests requested by the Contractor shall be paid for by the Contractor to the Authority at a cost of One Thousand Dollars ($1,000.00) per lot tested.

4.04 ADJUSTMENT TO CONTRACT COMPENSATION FOR CHANGES IN THE INDEX PRICE OF ASPHALT CEMENT

A. General

An adjustment to Contract compensation will be made for changes in the index price of the asphalt cement in asphalt concrete and plant mix macadam base course and for tack coat, as set forth in 4.04 C, provided that the Contract requires a total of 500 tons or more of asphalt concrete and plant mix macadam base course.

B. Method of Measurement

1. Asphalt concrete including top course and bottom course and plant mix macadam base course will be measured by the ton. The weight will be determined by one of the following methods:

   a. A weigh ticket printed by an automatic printer system used in conjunction with an automated batching and mixing system. The printed ticket shall show the date, the individual weights of the various components of the asphalt concrete or plant mix macadam base course mixture in a batch, the total weight of each batch, and the sum of the all batch weights in the truckload. At the completion of each day's work, a producer's representative shall certify in writing that the total weight supplied was correct.

   b. A weigh ticket printed by an automatic scale showing the tare and gross weights of the truck as determined for each trip and the time and date indicating when the empty truck was tarred and when the loaded truck departed from the plant. Time and date may be printed automatically by a time clock. However, the net weight must be documented on each delivery ticket by a State certified weigh master.

   In the event of a breakdown of an automatic printer system, weigh tickets showing the gross, tare and net weight of each truck, as entered and certified by a weigh master, will be accepted for a period not exceeding the necessary repair time as certified by a State licensed repairman.

   Provide a weigh ticket for each truckload. Material will not be accepted unless accompanied by a weigh ticket, which shall be legible and which shall clearly indicate the printed heading of the supplier and location of the batch plant, the title of the Contract for which delivery is intended, the time and date, truck number, lot number and mix number of material being furnished and the total net weight in each truckload.

2. Tack coat will be measured by the gallon at a temperature of 285 degrees F.

C. Asphalt Price Adjustment

1. The asphalt price adjustment for the asphalt cement in asphalt concrete or plant mix macadam base course will be determined monthly using the following formula:

$$Ac = (A - BA) \times T$$

Where Ac = Asphalt Cement Price Adjustment, in dollars
A = Asphalt Cement Price Index[63], in dollars per ton
BA = Basic Asphalt Cement Price Index[64], in dollars per ton
T = Tons of New Asphalt Cement[65]

2. The asphalt price adjustment for tack coat will be determined on a monthly basis using the following formula:

$$At = (A - BA) \times (C) \times (G) \times 0.003986$$

Where At = Asphalt Cement Price Adjustment for tack coat, in dollars
C = Petroleum Content of the Tack Coat in Percent by Volume: Use 1.0 for asphalt cement and cutbacks
A = Asphalt Cement Price Index[63], in dollars per ton
G = Tack Coat Furnished in Gallons and Applied at 285 degrees F, where one gallon is equal to 0.003986 ton
BA = Basic Asphalt Cement Price Index[64], in dollars per ton

3. Should a Monthly Asphalt Cement Price Index increase 50 percent or more over the Basic Asphalt Cement Price Index, no additional asphalt concrete, or plant mix macadam base shall be furnished for the Contract without written approval from the Engineer.

4. Should a Monthly Asphalt Price Index decrease from the Basic Asphalt Cement Price Index, payments will be decreased accordingly.

5. Asphalt price adjustments will not be made in those months for which the Monthly Asphalt Cement Price Index has changed by less than five percent from the Basic Asphalt Cement Price Index.

6. If the Asphalt Cement Price Index is adjusted more than once in a month, the asphalt price adjustment may be made.

END OF SECTION

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63 The Asphalt Cement Price Index is the price in dollars per English ton published by the New Jersey Department of Transportation for the area North of Route 195, for the month during which the asphalt concrete paving or tack coat application occurred.

64 The Basic Asphalt Cement Price Index is the price in dollars per English ton, published by the New Jersey Department of Transportation, for the area North of Route 195, for the month immediately prior to the month during which bids are received.

65 The weight of asphalt cement eligible for price adjustment including all conventional and modified asphalt concrete and plant mix macadam base course will be determined by multiplying the percentage of new asphalt cement in the approved job mix formula by the weight of asphalt concrete mixture, measured in accordance with 4.04 B.

SECTION 02561

ASPHALT CONCRETE PAVING (FAA)

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Samples

02561C01 If requested, submit to the Chief of Materials, Materials Engineering Unit, samples of each type aggregate to be used and from each source with proper identification as to source, type of aggregate and Contract number. Submit in clean, sturdy bags and in the following amounts for each sample when requested:

Reclaimed Asphalt Pavement (when used)	50 lbs.
Coarse Aggregate	25 lbs.
Fine Aggregate	25 lbs.
Mineral Filler	5 lbs.

Submit to the Chief of Materials, Materials Engineering Unit, for approval, four one-quart samples of the asphalt cement proposed for use together with the following data:

1. The name of the supplier.
2. An analysis of such asphalt cement by the supplier, certifying that the results of tests comply with the requirements of AASHTO M320 and this Section.

Resubmit the above data each time asphalt cement from a different source is proposed.

Product Data

02561D01 Submit to the Chief of Materials, Materials Engineering Unit, Port Authority Technical Center, 241 Erie Street, Jersey City, New Jersey, 07310-1397, for approval, all Job Mix Formulae with Checklist (specified in 2.03 B) for each type of asphalt concrete mix, from each plant and each new source of material at least 10 days prior to the start of production.

02561D02 Submit certified test data, location of each type aggregate to be used and quantities to be obtained from each location and make arrangements for the Materials Engineering Division to obtain samples from each such location for checking against the samples submitted. Take all samples in accordance with requirements of ASTM D 75 and ASTM D 242.

02561D03 Submit to the Chief of Materials, Materials Engineering Unit, the name of the supplier and an analysis of the asphalt tack coat to be used on the project.

Quality Assurance-Quality Control

02561L01 Submit quality control plan and control charts to the Chief of Materials, Materials Engineering Unit for approval, at least 5 days prior to the start of production.

END OF APPENDIX "A"

DIVISION 2

SECTION 02572

KERF CUTS FOR ELECTRICAL CONDUITS

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for cutting kerfs for installation of electrical conduit in existing runway and taxiway pavement and for placing concrete in such kerfs.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Society for Testing and Materials International (ASTM)

ASTM C 33	Specification for Concrete Aggregates.
ASTM C 39	Test Method for Compressive Strength of Cylindrical Concrete Specimens.
ASTM C 94	Specification for Ready-Mixed Concrete.
ASTM C 150	Specification for Portland Cement.
ASTM C 260	Specification for Air-Entraining Admixtures for Concrete.
ASTM C 309	Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
ASTM C 494	Specification for Chemical Admixtures for Concrete.
ASTM C 1074	Standard Practice for Estimating Concrete Strength by the Maturity Method.

American Concrete Institute (ACI)

ACI 304R	Guide for Measuring, Mixing, Transporting and Placing Concrete.

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. Do not place concrete when:

1. Ambient temperature is below 40 degrees F or is apt to fall below 40 degrees F.
2. Pavement which concrete will contact is not frost-free.
3. Weather conditions would result in rapid drying or stiffening of concrete before it can be consolidated, or would result in excessive evaporation of mixing water.

B. Unless otherwise specified, concrete, when deposited, shall have a temperature of not less than 50 degrees F and not more than 90 degrees F.

C. In-Place Concrete Strength

Concrete shall reach a minimum compressive strength of 1500 psi within the available curing time after placement and at the actual site conditions and temperatures at the time.

D. Ready-Mix, High Early Strength Concrete

In order to avoid premature setting of ready-mix concrete when using 2 or 4 hour mixes, both the ambient temperature and concrete temperature shall not exceed 80 degrees F. The concrete quantity shall be limited to 4 cubic yards per truck.

1.04 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

A. Model CC-155 "Concrete Cutter" manufactured by Vermeer Manufacturing Co., Holbrook, NY, or approved equal.

2.02 MATERIALS

A. Cement – For uses as specified in 2.03 – no substitutions will be permitted. Use one of the following:

1. Portland Cement: ASTM C 150, Type I, II or III from a manufacturer approved by either New York State Department of Transportation or New Jersey Department of Transportation.
2. "Five Star Fast Set Cement" as manufactured by Five Star Products, Fairfield, CT.
3. "Rapid Set" as manufactured by CTS Cement Manufacturing Corp., Cypress, CA.
4. "Ultimax" as manufactured by Ultimax Cement Co., Inc, Garden Grove, CA.

B. Fine Aggregate: ASTM C 33.

C. Coarse Aggregate: ASTM C 33, size No. 8, Class 4S (regardless of type).

D. Water: Clean water suitable for drinking purposes, for both mixing and curing concrete.

E. Air Entraining Agent (AEA): ASTM C 260.

F. High Range Water Reducer (High Range WR): ASTM C 494, Type F or G.

G. Water Reducer Retarder (WR, Retarder): ASTM C 494, Type D.

H. Preblended Concrete (for 2 hour cure at 70 degrees F) – no substitutions will be permitted. Use one of the following:

1. "EMACO T415" as manufactured by BASF Building Systems, Shakopee, MN.
2. "Five Star Highway Patch" as manufactured by Five Star Products, Fairfield, CT.
3. "Dayton HD-50" as manufactured by Dayton Superior, Kansas City, KS.
4. "Rapid Set DOT Repair Mortar" as manufactured by CTS Cement Manufacturing Corp., Cypress, CA.
5. "Rapid Set Mortar Mix" as manufactured by CTS Cement Manufacturing Corp., Cypress, CA.

I. Liquid Curing Membrane: ASTM C 309, Class A or B.

1. Type 1D, with fugitive dye when requested by the Engineer, to identify areas coated.
2. Type 2, white pigmented, where exposed to the sun in warm weather.

2.03 ACCELERATOR

Accelerator shall conform to ASTM C 494, Type C, non-chloride. In addition, when mixed in the proportions hereinafter specified, concrete containing accelerator shall develop a minimum compressive strength of 1500 psi within 10 or 16 hours of placement depending on the mix, based on an ambient temperature of 70 degrees F or above, and an internal concrete temperature of 70 degrees F or higher. Accelerator shall be compatible with and shall be a product of the air entraining agent manufacturer.

2.04 PROPORTIONING OF INGREDIENTS

A. Design Mix Strength: The below mixes were designed to produce concrete in the laboratory with compressive strength, F'c = 2000 psi, within the specified curing times based on ambient temperature of 70 degrees F. Allow longer cure time or supply a faster mix (e.g., 4 hour in lieu of a 6 hour) if temperature is forecast to fall to below 70 degrees F before the cure time has been reached.

1. Where 2 hour cure time is available prior to overlay or opening to traffic, mix concrete in the proportions specified in the following table:

	Rapid Set (Mobile Mixer or Cement Bulk Bagged on Site Only)	Ultimax (Truck Mixer Permitted)
Cement	658 pounds	675 pounds
Fine Aggregate	1472 pounds	1350 pounds
Coarse Aggregate	1500 pounds	1755 pounds
Water	303 pounds	270 pounds
High Range WR	158 ounces	As required
AEA	As required	As required
Retarder	As required	As required

In lieu of the above, use one of the preblended concrete mixes specified, extended with coarse aggregate (size No. 8) as per manufacturer's recommendation.

2. Where 4 hour cure time is available prior to overlay or opening to traffic, mix concrete in proportions specified in the following table:

	(Truck Mixer or Cement Bulk Bagged On Site)
Cement: Five Star Fast Set	750 pounds
Fine Aggregate	1450 pounds
Coarse Aggregate	1500 pounds
Water	250 pounds
Retarder	0.5% to 1.0% as required

3. Where 6 hour cure time is available prior to overlay or opening to traffic, mix concrete in proportions specified in the following table:

	(Truck Mixer or Rapid-Set Bulk Bagged On Site)
Cement 1: Rapid Set	500 pounds
Cement 2: Type I or II	150 pounds

Fine Aggregate	1245 pounds
Coarse Aggregate	1770 pounds
Water	300 pounds
Retarder	0 to 2% as required
AEA	As required to obtain 4.5% to 7.5% Retained Air

4. Where 10 hour cure time is available prior to overlay or opening to traffic, mix concrete in proportions specified in the following table:

	(Truck Mixer Permitted)
Cement: Type III	826 pounds
Fine Aggregate	1200 pounds
Coarse Aggregate	1650 pounds
Water	270 pounds
High Range WR	145 ounces
Accelerator, non-chloride	334 ounces
AEA	As required to obtain 4.5% to 7.5% Retained Air

5. Where 16 hour cure time is available prior to overlay or opening to traffic, mix concrete in proportions specified in the following table:

	(Truck Mixer Permitted)
Cement: Type III	705 pounds
Fine Aggregate	1350 pounds
Coarse Aggregate	1600 pounds
Water	255 pounds
High Range WR	130 ounces
Accelerator, non-chloride	320 ounces
AEA	As required to obtain 4.5% to 7.5% Retained Air

B. Adjustment of Proportions

Design Mixture Aggregates: The above mixes for standard weight concrete were designed using fine aggregates with a specific gravity of 2.65 in a saturated surface-dry condition and coarse aggregate with a specific gravity of 2.83. If the materials proposed for use differ from the above, adjust the listed proportions to achieve proper yield.

PART 3. EXECUTION

3.01 CUTTING AND CLEANING

A. Cut kerfs in existing pavement in one pass, leaving a neat vertical edge in the existing pavement at the locations and to the dimensions shown on the Contract Drawings.

B. Clean all kerfs using compressed air at not less than 90 psi and 100 cubic feet per minute. Compressed air shall be free from oil and moisture.

3.02 CONDUIT INSTALLATION

Secure conduit at intervals sufficient to prevent movement, including "floating" during placement of concrete.

3.03 MIXING CONCRETE

A. All concrete batching shall be in conformance with ASTM C 94 and ACI 304R.

B. Where preblended concrete specified in 2.01 H. is used, mix concrete in a power operated batch mixer in accordance with manufacturer's written instructions.

C. Where Truck Mixers Are Used:

1. Plants and truck mixers shall conform to ASTM C 94, and shall be New Jersey or New York State Department of Transportation approved. Make documentation of such conformance available to the Engineer at all times.
2. Use a sufficient number of trucks to ensure continuous delivery of the concrete.
3. Limit load sizes to prevent concrete from approaching initial set prior to total discharge of batch.
4. The Engineer will permit one re-tempering of the concrete. The redosage of high range water reducer shall not exceed the manufacturer's recommended limitation, nor shall it retard the initial set of the concrete by more than 30 minutes.
5. Concrete that has partially hardened or has attained its initial set shall not be re-mixed or re-tempered, will be rejected and must be disposed of away from Authority property at no additional cost to the Authority.

D. Where Truck Mixers Are Used:

1. Mixers shall be of a self-contained, self-propelled, continuous mixing type capable of carrying sufficient cement, aggregates, water and admixtures to produce not less than 6 cubic yards of concrete. Maintain a back-up unit on-site, calibrated, and available for use where the pavement is to be reopened to traffic at the end of the work period.
2. Mixer shall be capable of being calibrated to automatically proportion and blend all components. Notify the Engineer a minimum of 48 hours prior to when the calibration of the truck mixers take place. The Engineer will witness the calibration of the truck mixer.
3. The Contractor is responsible for the calibration, within the following tolerances (by weight):

Coarse Aggregate	+/- 2%
Fine Aggregate	+/- 2%
Cement	+/- 1%
Water	+/- 1%
Admixture	+/- 3%

3.04 DEPOSITING CONCRETE

A. After the installation of electrical conduit in kerfs has been approved by the Engineer, deposit concrete in the presence of the Engineer and by methods approved by the Engineer.

B. Thoroughly consolidate the concrete so that it is worked into all corners and around all embedded conduits. Vibrate by hand or with spud vibrators and float the surface so that the resulting concrete does not have excessive voids or honeycombing of the surface.

3.05 FINISHING, CURING, TESTING AND PROTECTION OF CONCRETE

A. Concrete which is to remain exposed shall receive a "Broom Finish" and shall be treated with liquid curing compound in accordance with the manufacturer's printed instructions. Concrete to be overlaid with asphalt concrete shall receive a float finish.

B. Do not open to traffic or overlay with asphalt concrete until concrete attains a minimum compressive strength of 1500 psi.

C. The Engineer will determine in-situ strength by the molding and testing of cylinders in accordance with ASTM C 39, or by the use of a calibrated maturity testing method in accordance with ASTM C 1074.

END OF SECTION

SECTION 02572

KERF CUTS FOR ELECTRICAL CONDUITS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Samples
02572C01 Submit to the Engineer for approval samples of all the concrete ingredients intended for use during the course of the Contract. Submit in sufficient quantity to obtain 5 cu. ft. of concrete. Submit all required materials to the Chief of Materials Engineering, Materials Engineering Unit, Port Authority Technical Center, 241 Erie Street, Jersey City, NJ 07310-1397. Resubmit samples for approval any time a change in materials is intended.

Construction and Installation Procedures
02572G01 Submit plans, methods, equipment and procedures as applicable for:

1. Concrete cutting equipment as specified in 3.01 A.
2. Power operated batch mixer as specified in 3.03 B.
3. Type and method of operation when using mobile mixers or ready-mixed truck mixers as specified in 3.03 C and D.
4. Method of depositing concrete as specified in 3.04 A.

END OF APPENDIX "A"

DIVISION 2

SECTION 02720

MANHOLES AND DRAINAGE STRUCTURES

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for precast and cast-in-place concrete manholes and drainage structures.

B. Definition of terms shall be in accordance with ASTM C 822.

1.02 REFERENCES

A. The following is a listing of the publications referenced in this Section:

American Concrete Institute (ACI)

ACI 318	Building Code Requirements for Structural Concrete and Commentary.

American Society for Testing and Materials (ASTM)

ASTM A 48	Specification for Gray Iron Castings.
ASTM A 536	Specification for Ductile Iron Castings.
ASTM B26	Specification for Aluminum-Alloy Sand Castings.
ASTM C 39	Test Method for Compressive Strength of Cylindrical Concrete Specimens.
ASTM C 55	Specification for Concrete Building Brick.
ASTM C 117	Test Method for Materials Finer than 75μm (No. 200) Sieve in Mineral Aggregates by Washing.
ASTM C 136	Test Method for Sieve Analysis of Fine and Coarse Aggregates.
ASTM C 150	Specification for Portland Cement.
ASTM C 1329	Specification for Mortar Cement.
ASTM C 443	Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
ASTM C 497	Test Methods for Concrete Pipe, Manhole Sections, or Tile.
ASTM C 822	Terminology Relating to Concrete Pipe and Related Products.
ASTM C 891	Practice for Installation of Underground Precast Concrete Utility Structures.
ASTM C 913	Specification for Precast Concrete Water and Wastewater Structures.
ASTM C 923	Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.
ASTM C 990	Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.

1.03 ENVIRONMENTAL REQUIREMENTS

Cold and hot weather requirements shall conform to the applicable requirements of Section 03301 entitled "PORTLAND CEMENT CONCRETE, LONG FORM" except that in a precast plant the ambient temperature may be below 40 degrees F providing that forms and product are preheated and heat cured and protected. Temperature recording devices shall be used.

1.04 DESIGN AND PERFORMANCE REQUIREMENTS

A. As approved by the Engineer, the Contractor may substitute cast-in-place concrete manholes and drainage structures which conform in size and strength to the precast concrete structures shown on the Contract Drawings and as specified in this Section. As approved by the Engineer, the Contractor may also substitute precast concrete structures which conform in size and strength to the cast-in-place concrete structures shown on the Contract Drawings and as specified in this Section. Equivalent strength of substituted structures shall be based on structural design of reinforced concrete as outlined in ACI 318.

B. Design of lifting devices for precast structures shall conform to ASTM C 913.

C. Design of joints for precast concrete structures shall conform to ASTM C 913. Unless otherwise shown on the Contract Drawings, joints shall be designed for leakage not to exceed 0.025 gallons per hour per foot of joint at 3 feet of head.

1.05 QUALITY ASSURANCE

A. Workmen shall be experienced and skilled in the fabrication and installation of precast and cast-in-place concrete manholes and drainage structures.

B. Precast concrete manholes and drainage structures, including castings, will be visually inspected by the Engineer when delivered to the construction site. Damaged material or material not meeting the requirements of this Section shall be removed from the construction site and replaced, at no additional cost to the Authority.

C. Precast concrete manholes and drainage structures may be inspected by the Engineer at the place of manufacture.

D. Where manholes and drainage structures are cast-in-place, do not place concrete until the Engineer has inspected the formwork and verified that the dimensions and concrete reinforcing are in accordance with details shown on the Contract Drawings, on approved shop drawings and as specified in this Section.

E. Conform to the applicable requirements for quality assurance of Section 03301 entitled "PORTLAND CEMENT CONCRETE, LONG FORM" except that, if the concrete is precast, the producer shall maintain a fully equipped testing lab and employ a Quality Control Technician to perform Quality Control Tests. Unless otherwise shown on the Contract Drawings, Quality Control Tests for precast concrete shall consist of compression tests on a minimum of two cylinders for each day's production tested in accordance with ASTM C 39 for cylinders or ASTM C 497 for drilled cores. Acceptance shall be based on the requirements of ACI 318.

F. Tolerances of dimensions, squareness, joint surfaces, reinforcement location, and thickness of slabs and walls for precast structures shall conform to ASTM C 913.

G. Castings shall be of uniform quality, free from sand holes, shrinkage cracks and other defects. Surface of the castings shall be free from burnt-on sand and shall be smooth. Bearing surfaces between grates or covers and frames shall be cast or machined with such precision that continuous, full and uniform bearing is provided throughout the perimeter area of contact. The bearing contact with the frame shall be non-rocking when in place and under the influence of traffic or other loads. Pairs of machined castings shall be match marked to facilitate subsequent identification at installation.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with precast concrete manufacturer's instructions for unloading, storing and moving precast manholes and drainage structures.

B. Care shall be taken when storing precast concrete manholes and drainage structures to prevent damage to Authority or other public or private property, and any property so damaged shall be repaired at no additional cost to the Authority.

C. Each precast concrete structure shall be clearly marked by indentation or waterproof paint to indicate the date of manufacture, manufacturer and identifying symbols and/or numbers shown on the Contract Drawings to indicate its intended use.

1.07 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

For each of the specified materials, manufacturer shall be one of the following, or approved equal:

A. Manhole and Drainage Structure Frames, Covers and Grates

Frames, cover and grates shall be as shown on the Contract Drawings.

B. Resilient Connectors

1. NPC Inc., Milford, NH 03055.
2. Press-Seal Gasket Corporation, Fort Wayne, IN 46804.
3. A-Lok Products Inc., Tullytown, PA 19007.

2.02 MATERIALS

A. Concrete

1. Concrete including concrete mixes shall be Category VI with a minimum 28-day compressive strength of 5000 psi for precast and 4000 psi for cast-in-place concrete manholes and drainage structures in accordance with the applicable requirements of Section 03301 entitled "PORTLAND CEMENT CONCRETE, LONG FORM".

B. Joints

1. Unless otherwise shown on the Contract Drawings, joints shall not be permitted in manholes and drainage structures.
2. Joints between precast sections, which occur four feet or more below finished grade, shall be sealed with rubber gaskets conforming to ASTM C 443 or a preformed flexible plastic gasket as specified in 2.02 B.3.

3. Where a preformed flexible plastic gasket is shown on the Contract Drawings, joints between precast sections shall be sealed with a preformed flexible plastic gasket conforming to ASTM C 990, except that gasket size, lengths, quantity of primer and packing material shall be in accordance with the manufacturer's recommendation. Preformed flexible plastic gaskets shall be one of the following, or approved equal:

   a. "Ram-Nek", as manufactured by Henry Co., El Segundo, CA.

   b. "CONSEAL CS-102", as manufactured by the Concrete Sealants, Inc, New Carlisle, OH.

   c. "PRO-STIK", as manufactured by Press-Seal Gasket Corporation, Fort Wayne, IN.

C. Steel Reinforcement

1. Steel reinforcement shall conform to Section 03200 entitled "CONCRETE REINFORCEMENT".

2. There shall be a continuity of reinforcement at all corners of the structure.

D. Silt Buckets

1. Cast aluminum silt bucket shall be furnished and installed for all sanitary sewer manhole structures shown on the Contract Drawings and shall be fabricated of aluminum Alloy 319, conforming to ASTM B 26.

E. Frames, Grates and Covers

1. Frames shall be of the type shown on the Contract Drawings and shall be fabricated of Class 35B cast iron, conforming to ASTM A 48.

2. Covers and grates shall be of the types and materials shown on the Contract Drawings. Where cast iron is shown, manhole covers and drainage grates shall be fabricated of Class 35B cast iron, conforming to ASTM A 48. Where ductile iron is shown, manhole covers and drainage grates shall be fabricated of Grade 65-45-12, or Grade 80-55-06 ductile iron and castings, conforming to ASTM A 536 and shall bear the letters "D.I." in a clearly visible manner on the upper surface.

3. Frames, covers or grates of other materials shall be as shown on the Contract Drawings.

4. Each casting shall be identified by the name of the producing foundry, origin and date of manufacture, ASTM designation number and class of cast or ductile iron.

F. Masonry Collar for Frame

1. Concrete Building Brick: ASTM C 55.

2. Mortar Cement

   ASTM C 1329, Type M.

G. Crushed Stone Bedding

Crushed limestone, gneiss, trap rock or recycled Portland cement concrete aggregate conforming to ASTM C 33, size number 67. Recycled concrete aggregate shall contain not less than 90 percent crushed Portland cement concrete and shall be in accordance with the requirements of the Section 02231 entitled "AGGREGATE BASE COURSE".

H. Connection Between Structure and Pipe

1. Unless otherwise shown on the Contract Drawings, the opening between the wall of the structure and the wall of the pipe shall be sealed with mortar cement conforming to ASTM C 1329, Type M or a resilient connector.

2. Resilient connector shall conform to ASTM C 923. If resilient connector is not integrally cast into the wall of the structure, provide cast or cored opening of the size specified by manufacturer of the resilient connector.

2.03 FABRICATION

Manufacture of precast concrete structures shall conform to ASTM C 913.

PART 3. EXECUTION

3.01 PREPARATION

A. Ensure proper orientation of the structure to accommodate pipes.

B. Immediately prior to placement in the excavation, precast concrete structures shall be inspected in the presence of the Engineer to verify that they are internally clean and free of damage. Damaged units shall be removed from the construction site and replaced, at no additional cost to the Authority. Subject to the approval of the Engineer, damaged precast concrete structures may be repaired in a manner that ensures that the structure will conform to the requirements of this Section and its intended use. Acceptance of repaired units is at the sole discretion of the Engineer.

3.02 INSTALLATION

A. Excavation and Backfill

1. Excavate for manhole or drainage structure in accordance with Section 02221 entitled "EXCAVATION, BACKFILLING AND FILLING" in the location and to depth shown on the Contract Drawings. Provide clearance around the sidewalls of the structure as required for construction.
2. If ground water is encountered, prevent accumulation of water in excavations by methods approved by the Engineer. Manhole or drainage structure shall be placed in a dry trench.
3. Where the possibility exists of a watertight structure becoming buoyant in a flooded excavation, take necessary steps to avoid flotation of the structure.

B. Support and Backfilling

1. Manhole or drainage structure shall be supported at proper grade and alignment on crushed stone bedding or other support system, as shown on the Contract Drawings.
2. Backfill excavation for manhole or drainage structure in accordance with Section 02221 entitled "EXCAVATION, BACKFILLING AND FILLING".

C. Installation of Precast Concrete Sructure

1. To ensure safety, precast concrete structures shall be lifted only at the lifting points so designated by the manufacturer.
2. When lowering manhole or drainage structure into the excavation and joining pipe to the structure, take precautions to ensure that the interior of the pipes and structure remains clean.
3. Set precast concrete structure so that it is fully bearing on crushed stone bedding, compacted in accordance with Section 02221 entitled "EXCAVATION, BACKFILLING AND FILLING" or set on other support system as shown on the Contract Drawings.

4. For multiple section structures, lower and set the base section before placing additional sections. Ensure joint integrity by removing all foreign materials from joint surfaces and verify that sealing materials are placed properly. Avoid misalignment by using guide devices affixed to the lower section or as otherwise approved by the Engineer. Joint seal material may be installed at the manufacturer's plant prior to delivering to construction site.

5. Verify that manholes and drainage structures installed satisfy required alignment and grade.

6. Remove knockout or core the structure for pipe so as not to create an opening in excess of that required. Fill resultant annular space with mortar cement or with a resilient connector installed in accordance with manufacturer's instructions.

7. Cut pipe to finish flush with interior of structure.

8. Shape inverts through manhole as shown on the Contract Drawings.

D. Installation of Cast-In-Place Concrete Structure

1. Prepare crushed stone bedding or other support system shown on the Contract Drawings, to receive the base slab as specified for precast structures in 3.02 C.3.

2. Erect forms in accordance with Section 03100 entitled "CONCRETE FORMWORK" and ensure that forms are braced against all movement.

3. Furnish and install reinforcing steel in accordance with the details shown on the Contract Drawings and in accordance with Section 03200 entitled "CONCRETE REINFORCEMENT".

4. After formwork and reinforcing steel are inspected and approved by the Engineer, place and cure concrete in accordance with Section 03301 entitled "PORTLAND CEMENT CONCRETE, LONG FORM".

5. Complete installation in accordance with 3.02 C above.

E. Installation of Frame and Cover or Grate

1. Set frame using mortar cement and masonry as shown on the Contract Drawings. Radially laid concrete brick shall have 1/4-inch thick vertical joints at inside perimeter. Lay all concrete brick in a full bed of mortar cement and completely fill all joints. Where more than one course of concrete brick is required, stagger vertical joints.

2. Set frame and cover two inches above finished grade for manhole structure located in unpaved area. Otherwise, set frame and cover flush with finished grade.

3. Set frame and grate flush with finished grade for all catch basins or drainage inlets, unless otherwise shown on the Contract Drawings.

4. Manhole, inlet and catch basin frames, grates, and covers shall be fitted together and match-marked to avoid rocking of covers and grates. All castings shall be set firm and snug and shall not rattle.

3.03 VERTICAL ADJUSTMENT OF EXISTING STRUCTURES

A. Where shown on the Contract Drawings, adjust the elevation of existing manhole or drainage structure to finished grade.

B. Existing frame and grate or cover shall be carefully removed, cleaned of all mortar fragments to the satisfaction of the Engineer and set to the finished grade in accordance with 3.02 E.

C. When removal of an existing reinforced concrete wall is required, the concrete shall be removed so as not to damage the existing reinforcing bars. The bars shall be cleaned of all concrete to the satisfaction of the Engineer and bent into the new concrete top slab or spliced to vertical reinforcement, as shown on the Contract Drawings.

D. Bond new concrete to existing concrete in accordance with requirements specified in Section 03301 entitled "PORTLAND CEMENT CONCRETE, LONG FORM".

3.04 FIELD TESTS

Field tests will be used by the Engineer to evaluate and approve cast-in-place concrete in accordance with Section 03301 entitled "PORTLAND CEMENT CONCRETE, LONG FORM".

3.05 PROTECTION

Protection and curing of concrete shall be in accordance with Section 03301 entitled "PORTLAND CEMENT CONCRETE, LONG FORM".

END OF SECTION

SECTION 02720

MANHOLES AND DRAINAGE STRUCTURES

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

02720A01 Shop drawings of precast concrete manholes and drainage structures and of concrete reinforcement for cast-in-place concrete manholes and drainage structures, if used;

Catalog Cuts

02720B01 Catalog cuts of frames, grates and covers.

02720B02 Catalog cuts of gaskets for joints in precast concrete manholes and drainage structures, including manufacturer's installation instructions.

02720B03 Catalog cuts of resilient connectors.

Certificates

02720E01 Submit certificate from gasket manufacturer certifying that the gaskets comply with the specified requirements and that the gaskets are compatible with the type of joint used.

Manufacturer Test Reports

02720F01 Submit to the Chief of Materials Engineering, Materials Engineering Unit, Port Authority Technical Center, 241 Erie Street, Jersey City, New Jersey 07310-1397, certified test data covering gradation and composition of the crushed stone for bedding proposed for use.

1. Do not deliver material to the construction site from any source until the Engineer has approved the material from that source.

Calculations

02720H01 Submit design calculations prepared by a Professional Engineer, licensed in the State where the Work is being performed:

1. For substitute designs of manholes and drainage structures, submit calculations which verify that the substituted design is equivalent to the design shown on the Contract Drawings.

END OF APPENDIX "A"

DIVISION 2

SECTION 02722

STORM DRAINAGE SYSTEM

(INFILTRATION/EXFILTRATION TESTING NOT REQUIRED)

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for exterior storm drainage systems not requiring infiltration/ exfilitration testing.

B. Definition of terms relating to Reinforced Concrete Pipe and Plastic Pipe shall be in accordance with ASTM C 822 and ASTM D 883 respectively.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Society for Testing and Materials (ASTM)

ASTM A 746	Ductile Iron Gravity Sewer Pipe
ASTM C 76	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C 117	Test Method for Material Finer Than .075mm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 136	Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C 150	Portland Cement
ASTM C 443	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
ASTM C 507	Reinforced Concrete Elliptical Culvert Storm Drain and Sewer Pipe
ASTM C 655	Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe
ASTM C 822	Terminology Relating to Concrete Pipe and Related Products
ASTM D 883	Standard Terminology relating to Plastics
ASTM D 2321	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewer and Other Gravity-Flow Applications
ASTM D 3212	Standard Specification for Joints for Drain and sewer Plastic Pipes Using flexible Elastometric Seals
ASTM F 2306	12 to 60 in. Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity Flow Storm Sewer and Subsurface Drainage application

American Water Works Association (AWWA)

AWWA C 104	Cement- Mortar Lining for Ductile-Iron Pipe Fittings for Water
AWWA C 105	Polyethylene Encasement for Ductile-Iron Piping for Water and Other

	Liquids
AWWA C 110	Ductile-Iron Fittings, 3 Inch Through 48 Inch, for Water and Other Liquids
AWWA C 111	Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings

1.03 QUALITY ASSURANCE

A. Any entity performing the Work of this Section shall have at least three years of installation experience on projects with piping systems of types and sizes similar to that required under this Contract.

B. Pipe will be visually inspected by the Engineer when delivered to the construction site. Damaged material or material not meeting the requirements of this Section shall be removed from the construction site and replaced at no additional cost to the Authority.

C. Pipe may be inspected at the place of manufacture by the Engineer.

1.04 DELIVERY, STORAGE AND HANDLING

A. Comply with manufacturer's instructions for unloading, storing and moving pipe.

B. Care shall be taken when storing pipe and appurtenances so as not to damage Authority or other public or private property, and any property so damaged shall be repaired at the Contractor's expense.

1.05 SUBMITTALS

A. For Submittals, see Appendix "A".

PART 2. PRODUCTS

2.01 MATERIALS

Use any of the pipe sytems specified below unless otherwise shown on the Contract Drawings.

A. Reinforced Concrete Pipe

1. ASTM C 76, Class V, Wall B or Wall C for Circular Reinforced Concrete Pipe, ASTM C 507, Class HE-IV for Horizontal Elliptical Pipe and Class VE-VI for Vertical Elliptical Pipe, unless otherwise shown on the Contract Drawings. Use ASTM C 150, Type II Portland cement. Pipe joints shall be tongue and groove or bell and spigot, and shall be sealed with a continuous gasket. Lifting holes in pipe will not be permitted.

2. Pipe joints shall be sealed with rubber gaskets. Design of joints and physical requirements for rubber gaskets shall conform to ASTM C 443. Rubber gaskets shall be the following types of rubber gaskets, manufactured by Hamilton Kent Manufacturing Co., Toronto, Ontario or approved equal:

   a. "Tylox Type C" for straight tongue and groove pipe

   b. "Tylox Superseal " for offset pipe

   c. "Tylox Type 0" for recessed pipe

B. Ductile Iron Pipe

1. ASTM A 746, minimum wall thickness Class 50 unless otherwise shown on the Contract Drawings, with push-on joints, and cement mortar lining, which shall be twice the standard thickness in AWWA C 104.
2. Joints shall be sealed with continuous ring rubber gaskets conforming to AWWA C 111.
3. Polyethylene Encasement for Ductile Iron Sewer Pipe: AWWA C 105, Class C polyethylene, 8-mil thickness.

C. Corrugated Polyethylene Pipe

1. ASTM F 2306, high density Polyethylene pipe, joints shall be bell and spigot and sealed with a continuous gasket.
2. Pipe joints shall be sealed with continuous ring rubber gaskets and conforming to ASTM F 477 and meet the requirements of ASTM D 3212.

D. Crushed Stone for Pipe Bedding

Crushed limestone, gneiss, trap rock or recycled Portland cement concrete aggregate conforming to ASTM C 33, size number 67. Recycled concrete aggregate shall contain not less than 90 percent crushed Portland cement concrete and shall be in accordance with the requirements of the Section 02231 entitled "AGGREGATE BASE COURSE".

PART 3. EXECUTION

3.01 EXAMINATION

Where the storm drain is to cross existing utilities, the Contractor shall verify their elevation and horizontal location through excavation of the test pits shown on the Contract Drawings.

3.02 INSTALLATION

A. Excavation

1. Excavate pipe trench in accordance with Section 02221 entitled "EXCAVATION, BACKFILLING AND FILLING" in the location and to the depth shown on the Contract Drawings.
2. In the course of excavation, should the trench or subtrench width exceed the outside diameter of pipe plus two feet for nominal diameters up to 18 inches or outside diameter plus three feet for nominal diameters in excess of 18 inches, the Engineer may require remedial measures to reduce the load on the pipe such as the use of concrete cradle or concrete arch bedding, or reinforced concrete encasement. Or the Engineer may require the Contractor to substitute a stronger pipe capable of withstanding the increased load such as ASTM C 655 or ASTM A 746. A subtrench is defined as a trench excavated for pipe placement within a wider trench.
3. If ground water is encountered, prevent accumulation of water in trench by methods approved by the Engineer. Pipe shall be laid in a dry trench.

B. Pipe Support and Backfilling

1. Where concrete cradles are shown on the Contract Drawings, support the pipe at proper alignment and grade, place concrete (as specified in the Section entitled "CONCRETE") to dimensions shown and vibrate same. Concrete, when cured, shall support the full length of pipe.

2. Where crushed stone bedding is shown on the Contract Drawings, place and compact crushed stone bedding material in the bottom of the trench to provide a firm but slightly yielding surface and to an elevation such that pipe laid on same will be at the proper grade and alignment. Make suitable excavations for the pipe bells, where applicable so that the bottom reaction and support are confined to the pipe barrel. After installation of pipe on the compacted layer, place and compact additional bedding material in small lifts to the dimensions shown.

3. a. Reinforced Concrete Pipe and Ductile Iron Pipe

   Continue backfilling of the trench from the pipe support limits reached in 3.02 B.1 and 2 above in accordance with the Section entitled "EXCAVATION, BACKFILLING AND FILLING".

   b. Corrugated Polyethylene Pipe

   Place pipe embedment and backfilled in accordance with ASTM D 2321.

C. Polyethylene Encasement for Ductile Iron Pipe

1. Install polyethylene encasement on all ductile iron pipes using one of the installation methods described in AWWA C 105.
2. Pipe surface shall be totally cleaned prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or bedding material from becoming trapped between the pipe and the polyethylene encasement.
3. The polyethylene film shall be fitted to the contour of the pipe to effect a snug, but not tight, encasement with the minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, or fittings, and to prevent damage to the polyethylene due to backfilling operations.
4. Overlaps and ends shall be secured with adhesive tape, string or plastic tie straps to hold the polyethylene encasement in place until backfilling operations are complete.

D. Pipe Installation

1. Immediately prior to placement in the trench, all pipe shall be inspected in the presence of the Engineer to verify that it is internally clean and free of damage. Damaged units shall be removed from the construction site and replaced to the satisfaction of the Engineer, at no additional cost to the Authority.
2. When lowering pipe into the trench and joining the units, take precautions to ensure that the interior of the pipeline remains clean.
3. Lay pipe true to line and grade, with uniform bearing under the full length of its barrel, without break from structure to structure, and with bell or grooved end facing upgrade. Adjustments to line and grade shall be made by scraping away or adding bedding material under the pipe.
4. Prior to start of construction, the method for control of alignment and grade shall be submitted for approval. The method shall be a laser system or gradeboard setup to establish a reference grade and alignment control directly above or within the pipe. Use of other equipment may be substituted if, in the opinion of the Engineer, the alternate system produces equivalent accuracy.
5. Make up pipe joints in accordance with the manufacturer's instructions and taking extreme care that joints are clean and free of foreign materials. Support pipe free of the bedding during the joining process to avoid disturbing the subgrade.

6. In large diameter sewers with compression-type pipe joints, or where considerable force will be required to insert the spigot fully into the bell, come-alongs and winches or other equipment may be rigged to provide the necessary force. Inserts shall be used to prevent the sewer pipe from being thrust completely home prior to checking gasket location. After the gasket is checked, the inserts shall be removed and the joint completed.

7. Close all openings in the pipeline with watertight plugs when pipelaying is stopped at the conclusion of the work period or if work is interrupted for any reason.

8. Install polyethylene encasement prior to backfilling ductile iron pipe.

3.03 PROTECTION

A. Care shall be taken not to damage or displace installed pipes and joints during construction of pipe supports, backfilling and other operations.

B. Where pipe is damaged or displaced, take remedial measures as directed by the Engineer including but not limited to relaying pipe or replacing the pipe and/or testing of joints. All such remedial measures shall be performed at no additional cost to the Authority.

END OF SECTION

DIVISION 2

SECTION 02722

STORM DRAINAGE SYSTEM -

(INFILTRATION/EXFILTRATION TESTING NOT REQUIRED)

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Catalog Cuts
02722B01 Submit catalog cuts of gaskets for pipejoints including manufacturer's installation instructions.

Certificates
02722E01 Submit certificate from gasket manufacturer certifying that the proposed gaskets comply with the specified requirements and that the gaskets are compatible with the type of pipe joint used.
Submit certificate from the pipe manufacturer certifying that such pipe complies with the requirements specified in this Section.
Submit certificate from the polyethylene film manufacturer that such polyethylene film complies with the requirements specified in this Section.

Manufacturer Test Reports
02722F01 Submit to the Manager, Materials, Engineering Division, Port Authority Technical Center, 241 Erie Street, Jersey City, New Jersey 07310 1397, certified test data covering gradation and composition of the crushed stone for pipe bedding proposed for use, together with one 75 pound representative sample of the material.

1. Submit the sample in a clean, sturdy container or bag which shall not permit loss of any of the material.
2. Clearly label the container or bag of the sample with: Contract location, title and number; the name of the material supplied; and location of the source.
3. The Engineer will approve or disapprove the proposed material within 21 days after receipt of the sample.
4. Do not deliver material to the construction site from any source until the Engineer has approved the material from that source.

Construction and Installation Procedures
02722G01 Submit plans, methods, equipment and procedures as applicable for:

1. Prevention of accumulation of groundwater specified in 3.02.
2. Alternate method of line and grade control specified in 3.02.

END OF APPENDIX "A"

DIVISION 2

SECTION 02842

TEMPORARY TRAFFIC BARRIERS

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for temporary traffic barriers.

B. Coordinate the Work of this Section with the requirements of "Maintenance of Traffic and Work Area Protection" of Division 1 - GENERAL PROVISIONS.

C. Materials and constructions of this Section constitute temporary facilities that are and shall remain the property of the Contractor unless otherwise shown on the Contract Drawings.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Society for Testing and Materials (ASTM)

ASTM A 36	Structural Steel
ASTM A 123	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 307	Carbon Steel Externally Threaded Standard Fasteners
ASTM D 1751	Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

West Coast Lumber Inspection Bureau (WCLIB)

Standard Grading Rules

1.03 SUBMITTALS

Refer to Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. General

Provide new materials or, if acceptable to the Engineer, undamaged previously used materials in serviceable condition conforming to requirements specified in this Section. Provide materials suitable for the use intended.

B. Precast Concrete Barriers

1. White Portland cement proportioned to produce 3000 psi reinforced concrete.
2. Joint fillers shall conform to ASTM D 1751

C. Timber Barriers and Curbs

1. Lumber

Douglas Fir or Hem-Fir, WCLIB Standard Grade, Dressed on 4 sides (S4S).

2. Penetrating Sealer

Transparent colorless wood sealer which is effective in retarding transmission of moisture at cross-grain cuts and which shall not interfere with paint finish.

3. Paint Finish

Exterior alkyd resin reflectorized paint in colors shown on the Contract Drawings.

D. Connector, Anchors, Accessories

Fabricated ASTM A 36 shapes, plates and bars welded into assemblies required, with ASTM A 307 steel bolts, lag bolts and other fasteners as required. Finish each assembly and fastener with ASTM A 123 hot-dip zinc coating.

E. Concrete Barrier Flags

Aluminum, 6 x 6 inch, with weather-resistant reflective silver sheet suitable for daylight and night hours.

F. Concrete Barrier Lights

High intensity flashers of type specified in "Maintenance of Traffic and Work Area Protection" of Division 1 - GENERAL PROVISIONS.

G. Timber Barrier Markers

Light-retroreflective markers as shown on the Contract Drawings.

2.02 CONSTRUCTION FEATURES

A. Fabricate exposed traffic approach end of barriers with a gradual taper with no blunt ends, arranged to redirect the path of a vehicle parallel to the line of normal traffic flow.

B. Fabricate concrete barriers with a cross section of a portable, concrete safety shape barrier as shown on the Contract Drawings.

1. Fabricate in lengths of 20 feet or less with the rectangular footing cut out at regular intervals to ensure storm water runoff.

2. Furnish connections at vertical joints that will develop the full strength of the barrier system and ensure that the individual elements are aligned to provide a smooth, continuous barrier face.

3. Provide barrier lights as shown on the Contract Drawings.

C. Fabricate timber barriers and curbs of type and size shown on the Contract Drawings. Paint as shown on the Contract Drawings, or if not shown, paint white with rails of alternating orange and white stripes that slope down toward the side on which traffic is to pass. All paint shall be reflectorized.

PART 3. EXECUTION

3.01 PREPARATION

Provide and place temporary traffic control devices in accordance with the requirements of "Maintenance of Traffic and Work Area Protection" of Division 1.

3.02 INSTALLATION

A. Install barriers and curbs at locations shown on the Contract Drawings.

B. Provide bituminous pavement shimming and leveling as required to ensure smooth, continuously aligned barriers and curbs.

C. Provide 1/2 inch wide joints between ends of barriers and curbs. At concrete barriers, fill joint with premolded bituminous joint filler.

D. Secure barriers against lateral displacement by use of drift pins or anchor bolts drilled into roadway surface.

E. Connect, and continuously operate, concrete barrier lights.

3.03 ADJUSTMENTS

A. Maintain, clean, relocate and replace barriers and curbs as required to protect motorists, pedestrians and workers throughout the Work of this Contract.

B. Remove barriers away from Authority property, when the need has ended, when replaced by approved use of permanent construction, or when directed by the Engineer.

C. Complete, or if necessary, restore permanent construction. Replace construction that cannot be satisfactorily repaired. Remove temporary paving that is not intended for or acceptable for integration into permanent paving.

END OF SECTION

SECTION 02842

TEMPORARY TRAFFIC BARRIERS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

02842A01 Submit shop drawings of concrete barriers, including details of vertical joint connections, and details of proposed method of relocating concrete barriers in accordance with the requirements of "Shop Drawings, Catalog Cuts, and Samples" of Division 1 – GENERAL PROVISIONS.

END OF APPENDIX "A"

DIVISION 2

SECTION 02844

TEMPORARY CONCRETE BARRIER

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for temporary concrete barriers.

B. Coordinate the Work of this Section with the requirements of "MAINTENANCE OF TRAFFIC AND WORK AREA PROTECTION" of DIVISION 1 - GENERAL PROVISIONS.

C. Materials and constructions of this Section constitute temporary facilities that are and shall remain the property of the Contractor unless otherwise shown on the Contract Drawings.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Society for Testing and Materials (ASTM)

ASTM A 36	Structural Steel
ASTM A 123	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 307	Carbon Steel Externally Threaded Standard Fasteners
ASTM C 150	Portland Cement

1.03 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 CONSTRUCTION FEATURES AND MATERIALS

A. General

Provide new barriers and materials or, if acceptable to the Engineer, undamaged previously used barriers and materials in serviceable condition conforming to the requirements specified in this Section, and as shown on the Contract Drawings.

After delivery, a construction site inspection of the barriers and equipment will be made by the Engineer. If any barriers and equipment has been damaged or if, for any reason, the equipment does not comply with the requirements herein, the Contractor shall repair or replace the barriers and equipment at its own cost and expense, even though the barriers and equipment had been inspected for shipment. After such satisfactory replacement and/or repair and subsequent Engineer written approval, the barriers shall be installed.

B. Precast Concrete Barriers

1. Shall be manufactured with white portland cement concrete in accordance with the Contract Drawings which depict New York and New Jersey requirements. If the Contract Drawings are superseded by later New York or New Jersey Standards, then the most recent Standards shall be used, and the Contractor shall furnish Shop Drawing(s) in accordance with paragraph 1.03 B highlighting the change(s).
2. Concrete shall be proportioned to produce 3000 psi reinforced concrete.
3. Barrier sections less than 10 feet shall have one drainage pocket, and sections greater than 10 feet shall have two drainage pockets conforming to the size shown on the Contract Drawings, or styrofoam pads shall be provided to allow adequate drainage, as shown on the Contract Drawings.
4. Connectors, Anchors and Accessories:- Fabricated ASTM A 36 shapes, plates and bars welded into assemblies required, with ASTM A 307 steel bolts, and other fasteners as required. Finish each assembly and fastener with ASTM A 123 hot-dip zinc coating.

C. Barrier Reflectors

If specified on the Contract Drawings, barrier reflectors shall be 6" x 6", high intensity reflectorized, spaced at 20 feet on center with a minimum mounting height of 30 inches to the bottom of the reflectors. The reflector shall be white or yellow, matching the pavement edgeline, or as shown on the Contract Drawings.

D. Barrier Lights

If specified on the Contract Drawings barrier lights shall be steady burn Type C, spaced at 20 feet on center with a minimum mounting height of 30 inches to the bottom of the lens or as specified on the Contract Drawings. Type B flashing lights shall be placed on the approach end of barrier at 10 feet on center or as shown on the Contract Drawings.

E. Chain Link Fence

If specified in the Contract Drawings, chain link fence shall be placed on top of the temporary concrete barrier as shown on the Contract Drawings.

F. Glare/Gawk Shield

Install glare / gawk shield as specified by the manufacturer or as shown on the Contract Drawings.

PART 3. EXECUTION

3.01 PREPARATION

Protect the installation, maintenance, relocation and removal by providing and placing temporary traffic control devices in accordance with the requirements of the specification titled "Maintenance of Traffic and Work Area Protection" in Division 1.

3.02 INSTALLATION

A. Install barriers at locations shown on the Contract Drawings.

B. Provide styrofoam pad shimming and leveling as required to ensure smooth and continuously aligned barriers.

C. Taper ends of barriers shall be flared away from traffic at a rate of 10 to 1 or flatter. Terminate blunt approach end with an impact attenuator as approved by the Engineer in accordance with paragraph 1.03 D or as specified on the Contract Drawings.

D. Secure barriers against lateral displacement by use of drift pins or anchor bolts drilled into roadway surface or as shown on the Contract Drawings.

E. Install reflectors and lights as specified herein, and as shown on the Contract Drawings.

3.03 MAINTENANCE

A. Maintain, clean, relocate and replace barriers, reflectors and lights as required to protect motorists, pedestrians, and workers throughout the Work of this Contract.

3.04 REMOVAL

A. Remove barriers away from Authority property, when the need has ended, when replaced by approved use of permanent construction, or when directed by the Engineer.

B. Restore damaged permanent construction, and replace construction that cannot be satisfactorily repaired, all at no cost to the Authority.

END OF SECTION

SECTION 02844

TEMPORARY CONCRETE BARRIER

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings
02844A01 Shop Drawings detailing departures from the Standard Drawings included in the Contract Documents.

Catalog Cuts
02844B01 Proposed equipment Catalog Cuts and procedures to be used for installing, maintaining, relocating and removing the barrier(s).

Certificates
02844E01 Certification from the concrete barrier supplier stating that the concrete barrier(s) meet the requirements of the Contract Drawings.

Construction and Installation Procedures
02844G01 Proposed end treatment details and Catalog Cuts including but not limited to impact attenuator type.

END OF APPENDIX "A"

DIVISION 2

SECTION 02920

SOIL TESTING

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for subgrade preparation and the testing of on-site fill material prior to seeding and/or planting operations.

1.02 DESIGN AND PERFORMANCE REQUIREMENTS

A. As a guide to determine local weather predictions use the National and Local Forecast, Hurricane, Radar and Report website at http://www.weather.com as published by the Weather Channel.

B. Soil Testing Procedures shall be as per "Recommended Soil Testing Procedures For The Northeastern United States, Current Edition, Northeastern Regional Publication No. 493 as provided by the Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and West Virginia.

1.03 ENVIRONMENTAL REQUIREMENTS

A. Obtain soil samples only during the following weather conditions:

1. There shall be no frost in the ground and the soil temperature shall be above 32 degrees F.
2. There shall be no form of precipitation falling or forecast to fall within the next two hours. Following a period of precipitation, resume operations only after the soil has drained.

1.04 QUALITY ASSURANCE

A. Qualifications

1. Verify that the laboratory performing the soil testing of this Section is a certified testing laboratory such as the Rutgers Soil Testing Laboratory, Rutgers Cooperative Research & Extension, New Jersey Agricultural Experiment Station, Milltown, NJ 08850 or an approved equal in either the States of New Jersey or New York, that it has experience in soil testing for soil properties important for plant and turf management and that is capable of performing a "Technical Topsoil Evaluation" as specified in 2.01 and in accordance with Appendix B of this Section.

B. Test Requirements

1. Prior to seeding and/or planting, submit a representative sample of on-site soil material for analysis to a certified independent laboratory to ensure conformance to requirements specified in 2.01.
2. Provide the number of soil samples to the testing laboratory in accordance with 1.04 B3. No substitutions for testing parameters will be permitted.

3. Take samples only in the presence of the Engineer and at sites ready for planting operations to commence.
4. Provide a minimum of two (2) test samples representative of the range of existing soil found within areas to receive seed.
5. Provide a plan designating the locations where soil samples were taken and submit to the Engineer for approval.
6. Allow a minimum of 2 weeks for processing soil analysis at the testing laboratory.
7. Identify the type of "crop" to be grown as "Lawn" with each test sample requisition sent to the testing laboratory in order to obtain recommendations for nutrient and pH adjustments.

C. Do not commence seeding and/or planting until the Engineer has approved in writing the certified results of the soil analysis and recommendations from the approved soil testing laboratory for the representative samples and approved a report from the Contractor verifying that the Contractor has reviewed the soil analysis and will comply with the recommendations.

1.05 SUBMITTALS

A. See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. Soil Testing conforming to the following:

1. Soil to be tested shall be of uniform quality, free from hard clods, stiff clay, hard pan, sods, partially disintegrated stone, lime, cement, ashes, slag, concrete, tar residues, tarred paper, boards, chips, sticks, glass or any other undesirable material.
2. Provide a soil nutrient analysis providing the percentage Nitrogen (N), Phosphorus (P) and Potassium (K) in pounds per Acre.
3. Provide soil micronutrient analysis providing the percentage of Zinc, Copper, Manganese, Boron and Iron, in parts per million.
4. Provide a soil analysis for organic matter as determined by loss on ignition of moisture-free samples.
5. Provide soil pH range.
6. Provide soluble salts in micromhos per centimeter.
7. Grade soil as follows:

PASSING	RETAINED ON	PERCENTAGE
1" screen		100%
1" screen	2 mm (No. 10) Sieve	%*

*The portion retained shall be no larger than 3/8" in size and composed of homogeneous clods and/or stones.

8. Provide a mechanical analysis of the portion of soil passing the 2 mm sieve, based on the mechanical analysis of the soil as determined by the Bouyoucous Hydrometer method, and shall consist of the following, based on dry (air-dried only) weight of sample:

a. Sand min% - max%, inclusive;

b. Silt min% - max%, inclusive;

c. Clay min% - max%, inclusive.

9. Provide recommendations for pH adjustment, fertilization and micronutrients.

PART 3. EXECUTION

3.01 PREPARATION

A. Soil Sample(s) Taken From Areas of Changed Grades

Verify that areas of changed grades shown on the Contract Drawing have a smooth, uniform surface and finish grade elevations (excepting the addition of soil amendments) have been established.

1. Obtain grab samples for the minimum of test samples representative of the range of existing soil found within the each, separate area of existing soils to receive seed.
2. Grab sample shall be made up of a two-pound sample, each.
3. Remove stones over two inches in any dimension, roots, rubbish and other extraneous materials from the sample.
4. Implement all soil recommendations received from the soil testing laboratory.
5. Do not commence with any planting or soil related activities prior to receipt of written acceptance of the soil sample analysis and recommendations, by the Engineer as per 1.04 and 2.01.

B. Soil Sample(s) Taken From Unaltered Areas

Verify that subgrade areas shown on the Contract Drawings are unaltered or undisturbed by excavation, grading or stripping operations as follows:

1. Follow steps listed in 3.01 A., 1-4 above.

C. Soil Sample Results

1. Submit all soil sample analyses listed in 2.01 above.

END OF SECTION

SECTION 02920

SOIL TESTING

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Product Data

02920D01 Submit in accordance with the requirements of "Inspections and Rejections" of Division 1 - GENERAL PROVISIONS a complete "Product List", listing the product to be used under this Section, to the Engineer.

02920D02 Submit the locations of grab samples of soil (as many as required), the individual results of the soil analyses, and the amendment recommendations to the Engineer in accordance with 1.04 and 2.01.

Certificates

02920E01 Submit to the Engineer certification required by 1.04 A & B.

Manufacturer Test Reports

02920F01 Submit laboratory analyses of soil and the results of the "Technical Topsoil Evaluation" to the Engineer, in accordance with 1.04, 2.01 and Appendix B.

Qualifications

02920K01 Submit qualifications of the entity performing the laboratory testing of this Section to the Engineer in accordance with 1.04 A. Include the name, address and telephone number of the testing laboratory performing the Work of this Section.

END OF APPENDIX "A"

SECTION 02920

SOIL TESTING

APPENDIX "B"

The following is a sample testing form to be used by the Contractor:

Material: Soil

Specification: Section 02920 – "Soil Testing"

Crop: Lawn

Source of Sample:

Contract or P.O.#:

Quality Characteristics:	Spec.		
Visual Examination:	No hard clods, etc.		
Nutrients: Inorganic Nitrogen-Nitrate (ppm)			
Nutrients: Inorganic Nitrogen-Ammonium (ppm)			
Total Kjeldahl Nitrogen (%)			
Nutrients: P (pounds/acre)			
Nutrients: K (pounds/acre)			
Micro Nutrients: Zinc (ppm)			
Micro Nutrients: Copper (ppm)			
Micro Nutrients: Manganese (ppm)			
Micro Nutrients: Boron (ppm)			
Micro Nutrients: Iron (ppm)			
Organic Matter: (Loss of Ignition)	Min. % Max. %		
Soluble Salts: - Micromhos/Cm - PPM	Max. Max.		
pH:			
Mechanical Analysis: Passing - 1"	100%		
Passing - 1" Retain 2 mm (#10)	Max. % The portion retained shall be no larger than 3/8" in size and shall be composed of homogeneous clods and/or stones		
Passing 2mm (#10) Retain Pan	Min. %		
Bouyoucous Hydrometer Test of Material:			
Passing 2 mm (#10) Percent - Sand	min%-max%		
Percent – Silt	min%-max%		
Percent – Clay	min%-max%		

END OF APPENDIX "B"

DIVISION 2

SECTION 02930

SEEDING

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for endophyte seed, seeding and the application of dust retardant at airports.

1.02 DEFINITIONS

A. The term "Blue Tag Certified" refers to the original certification tag, blue in color, which certifies that the seed was produced in Oregon, of the latest crop, bearing the lot number that matches the lot number on the Oregon State University Seed Laboratory Report of Seed Analysis.

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. Use product-testing methods adopted and published by the Association of Official Analytical Chemists, 1111 19th Street Suite 210, Arlington, VA 22209.

B. As a guide to determine local weather predictions, use the National and Local Forecast, Hurricane, Radar and Report website at http://www.weather.com as published by the Weather Channel.

C. Seed and installation practices shall comply with Federal Aviation Administration (FAA) Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants On Or Near Airports, August 28, 2007.

D. Pest control for turfgrass shall be in accordance with the "2009 Pest Management Guidelines for Commercial Turfgrass", published by Cornell University, Ithaca, NY. This publication is available from The Resource Center, Cornell University, Ithaca, NY 14853. Telephone (607) 255-9946.

E. Grass seed shall have attached thereto or in a conspicuous place on the exterior of the container a plainly printed label in the English language, in legible type specifying:

1. All endophyte seed lots shall be Blue Tag Certified, produced in Oregon, of the latest crop and shall be seed harvested within the calendar year seeding operations are to occur. The state of origin shall be Oregon, no exceptions permitted.
2. Submit a copy of the Oregon State University Seed Laboratory Report of Seed Analysis bearing the lot number matching all the bags of seed delivered to the Work site.
3. Submit the name of Seed Company located in Oregon, along with the Blue Tag Certified seed variety, date of harvest and proof of storage in cold and dry conditions of the seed delivered to the Work site.

4. Submit the name and address of the person who labeled said seed, or who sells or offers the seed for sale to the Contractor if the seed being delivered to the Work site is not directly supplied to the Contractor from the originating seed company from Oregon.

5. Submit certification and the date seed was shipped, from 4 above, identifying that the seed delivered to the Work site shall have been shipped directly from Oregon and never stored anywhere else except the production facility in Oregon.

6. Submit the commonly accepted name of the kind or kind and variety, or both, of each agricultural seed component in excess of 5.0% of the whole and the percentage by weight of pure seed of each.

7. Percentage by weight of all weed seeds. Maximum weed seed content shall not exceed 1% by weight.

8. Lot number or other lot identification.

9. The percentage of germination, exclusive of hard seed; hard seed, if present, and the calendar month and year that the germination test was completed. If a single test date is used, it shall be that of the oldest tested component.

10. All delivered endophyte seed shall be fresh seed, having a proof of harvest date, and delivered to the Work site for immediate application. Seed delivered to the Work site for immediate application exceeding two months from the date it left storage in Oregon shall not be accepted. (See 1-5 above)

11. Any bag of seed without a blue tag and corresponding Oregon State University Seed Laboratory Report of Seed Analysis bearing the lot number matching all the bags of seed delivered to the Work site will be rejected by the Engineer and the Contractor shall immediately remove it from the Work site and replace with seed that complies with this Specification.

12. The percentage of endophyte level shall meet or exceed the level specified herein. Any test results as per 1.05 B. 5 of the bags of seed with a seed label indicating that the percentage level of endophyte is less than specified will be rejected by the Engineer and the Contractor shall immediately remove it from the Work site and replace it with seed that complies with this Specification.

F. Fertilizer application for turfgrass shall be as per all federal, state and local regulations.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Perform operations only during the following weather conditions:

1. There shall be no frost in the ground and the soil temperature at each planting area shall be above 32 degrees F.

2. There shall be no form of precipitation falling or forecast to fall within the next two hours. Following a period of precipitation, resume operations only after the soil has drained.

3. Apply chemicals only when wind velocity is below 5 mph, drift hazard is negligible, the air temperature is above 40 degrees F and below 70 degrees F.

4. Do not perform any product application if precipitation has fallen within two hours prior to the planned application time or is forecast during the next 12-hour period.

B. Seeding Calendar Limitations

1. Seed as per Appendix "B" of this Section.

1.05 QUALITY ASSURANCE

A. Qualifications

1. Verify that the entity and its workers performing the Work of this Section are experienced in seeding and have been engaged in work of a complexity similar to that required under this Section for a period of at least three years.
2. Verify that the entity performing pesticide applications has a valid license as a commercial applicator from the state in which the Work is being performed.
3. Verify that the entity performing fertilizer applications in New Jersey, has a valid certificate as a certified professional fertilizer applicator.
4. Verify that the entity performing the Work has a Brillion Turfmaker II Seeder to install the seed for this Work. Hydroseeding will not be permitted to be used.
5. Verify that the entity performing the Work has a Hydromulcher with a "mechanical agitator paddle" as manufactured by one of the following: Bowie, Epic, Finn, Kincaid or Turfmaker. A hydromulcher that uses "jet agitation" will not be permitted to be used.

B. General Requirements for Operations and Products

1. After delivery to the construction site, allow the Engineer, at his discretion, to take for analysis representative samples of any item listed in PART 2 - PRODUCTS.
2. Seed
   a. Submit all the information specified in 1.03 E 1 -12 to the Engineer for review and approval prior to delivery to the Work site.
   b. Do not furnish or plant the following turfgrasses under any circumstance:

      Winter Wheat

      Tall Fescue Grass with less than 90% Endophyte levels.

      Tall Fescue Grass without Endophyte

      Kentucky Blue Grass

      Buffalo Grass

      Bent Grass

      Bermuda Grass

      Fine Fescue Grass

      Annual Rye Grass

      Perennial Rye Grass with less than 90% Endophyte levels

      Perennial Rye Grass without Endophyte

      Native Grasses
3. Fertilizer
   a. Do not apply fertilizer applications between December 1 and March 1 or any time when the ground is frozen.
   b. Do not apply fertilizer during or just before a heavy rainfall or onto an impervious surface.
   c. Apply only a fertilizer with a Water Insoluble Nitrogen (WIN) and other clearly marked sources of Slow Release Nitrogen equal to or greater than specified herein under PART 2 – PRODUCTS.

d. Apply fertilizer only at rate specified herein under PART 3 – EXECUTION or as recommended in the analysis issued by the New Jersey Agricultural Experiment Station at Rutgers, the State University, whichever provision recommends the least amounts of N, P & K.

e. Do not apply fertilizer containing nitrogen or phosphorous within 25 feet of any waterbody, except where a drop spreader, rotary spreader with a deflector, or targeted spray liquid is used, then the buffer may be reduced to 10 feet.

f. Prior to application of any fertilizer containing phosphorous, submit the results from the "Technical Topsoil Evaluation" from the Rutgers Soil Testing Laboratory as specified in Section 02920 – Soil Testing of the soil to be fertilized to determine the need for phosphorous. Apply only the amount of phosphorous recommended in the analysis issued by the New Jersey Agricultural Experiment Station at Rutgers, the State University.

g. Submit to the Engineer for his review and approval the fertilizer label including the chemical trade name, the full chemical analysis (N, P, K, WIN & other slow release % for N) and application rate.

4. Pesticide

a. Select specific pesticide(s) to act on identified pest and use the manufacturer's recommended formula, application rate and safety instructions at all times.

b. Prepare and maintain all records that are or may be required by Federal, State or Local laws. Submit copies of these records to the Engineer within 5 days when so requested.

c. Not less than forty-eight hours prior to a proposed spray operation, submit to the Engineer for his review and approval a tabulated list indicating the target to be treated, the chemical trade name and quantity of mix being prepared.

5. Testing for Endophytes

a. Submit the test result for "Seed Immunoblot Assay Testing". No later than two months prior to delivery of endophyte seed to the Work site, submit a sample of seed for testing in accordance with Appendix "B" and submit the results to the Engineer prior to delivery. Submit a minimum of one (1) pint of seed per every twenty (20) bags of seed delivered to the Work site.

b. Submit the test results for "Seed Grow-out Testing". No later than two months prior to delivery of endophyte seed to the Work site, submit a sample of seed for testing in accordance with Appendix "B" and submit the results to the Engineer prior to delivery. Submit a minimum of one hundred (100) seeds per every twenty (20) bags of seed delivered to the Work site.

c. Submit the test results for "Tiller Testing". No later than two months after on-site germination, submit tiller samples for testing in accordance with Appendix "B" and submit the results to the Engineer. Submit a minimum of fifty (50) tillers per every one (1) Acre of seeded area.

6. Soil Testing

a. Submit to the Engineer the "Technical Topsoil Evaluation" from the Rutgers Soil Testing Laboratory as specified in Section 02920 – Soil Testing. "Technical Topsoil Evaluation" lab request shall specify the crop to be grown as lawn.

b. Perform nutrient controls and pH adjustments as recommended in the "Technical Topsoil Evaluation" for establishing lawn. Nutrient and pH control adjustments shall be performed at no additional cost to the Authority.

7. Lawn Mower Equipment

a. Verify that the entity performing lawn mowing utilizes a Mulching Mower, capable of producing a fine mulch and produce no windrows. Furnish a list of lawn mowers to be used as well as the manufacturer catalog cuts describing how the mulching mower operates to produce a fine mulch and produce no windrows.

C. Reseeding

1. Replace unsatisfactory seeded areas for a period of six months from the date of rendition of the Certificate of Final Completion. Reseed all areas, at no additional cost to the Authority, that:

(a.) are dead

(b.) have weed and/or pest infestations

(c.) have not provided 85% vegetative coverage as per Appendix "B"

(d.) <90% endophyte viability proved by tiller testing performed on seed grow-outs and/or germinated seed at the construction site.

2. Perform replacement of unsatisfactory seeded areas with products and by operations that comply with all requirements of this Specification, and on such date(s) as ordered by the Engineer.

D. Application of Dust Retardant

1. Apply dust retardant on all unsatisfactory seeded areas and/or areas where soil is exposed, but cannot be seeded because the calendar seeding date limits have expired, all in accordance with 3.02 C.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver all products in the manufacturer's unopened containers bearing the trade name, manufacturer's name, weight and analysis.

B. Store products away from moisture and extreme temperatures and in such a manner that their effectiveness will not be impaired.

1.07 SUBMITTALS

A. See Appendix "A" for submittals requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. Nutrient Controls

1. Fertilizer

Granular – 20-0-8, slow release fertilizer conforming to the following or approved equal:

a. Commercial fertilizer 20-0-8, dust-free, homogenous, granular fertilizer as follows:

Guaranteed analysis shall be:

20% Nitrogen

8.2 % Ammoniacal Nitrogen

6.0% W.I.N. (water-insoluble nitrogen)*

1.2% Urea Nitrogen

4.6% Water Soluble Nitrogen*

(*10.6% slowly available Nitrogen from Methylene Ureas)

8% Potash (K_2O)

1.0 % Iron (Fe)(0.1% water soluble Iron)

2. Soil pH adjustment

a. Aqua-pHix

A blend of chelated, buffered acid, spray applied to alkaline soil to reduce high pH soils as manufactured by Profile Products, LLC, Buffalo Grove, IL 60089.

Aqua-pHix is available from the following suppliers:

(1) Pinelands Nursery, Columbus, NJ 08022

(2) All Pro Horticulture, Copiague, NY

(3) ACF Environmental, Brookfield, CT 06804

(4) Merritt Seed Company, Syracuse NY

(5) Pennington Seed, Laurel, MD 20723

b. Soil pH adjustment - Elemental Sulfur

Guaranteed analysis shall be

0% Nitrogen

0% Phosphorus

0% Potassium

90% Sulfur

B. Turf Seed

1. Turf seed shall be the latest crop, clean, pure and free of noxious weed seed, of the variety and mix in accordance with Appendix "B" and to 1.03 E. 1- 12 and 1.05 B. 5.

2. Turf seed shall have a demonstrated cultivar performance, which includes Lateral Spread Technology (LS), high levels of rhizome expression, high density, insect resistance, greater than 90% viable endophyte and superior stress tolerance.

C. Dust Retardant

1. "Coherex" as manufactured by Golden Bear Division of the Witco Corporation, Chandler, AZ 85244

2. "Soil-Sement" as manufactured by Midwest Industrial Supply, Inc., Canton, OH 44711

3. "Soil Seal Concentrate" as manufactured by Soil Seal Corporation, Los Angeles, CA 90017

4. Or approved equal.

D. High Performance Flexible Growth Medium

1. See Section 02936 – Hydraulically-Applied Erosion Control: High Performance Flexible Growth Medium

E. Weed Control/Glyphosate

1. "Round-up Pro" as manufactured by Monsanto, St. Louis, MO 63167 or approved equal.

41% - Glyphosate N - (phosphonomethyl) glycine

59% - Inert Ingredients

PART 3. EXECUTION

3.01 PREPARATION

A. Areas of Changed Grades

Verify that areas of changed grades, which are to be seeded as shown on the Contract Drawings, are in conformance with the grading plans and have a smooth, uniform surface. Rototill subgrade to a minimum six (6) inch depth. Remove stones over two inches in any dimension, roots, rubbish and other extraneous materials. Limit preparation to areas, which will be seeded promptly after preparation.

Subgrade shall be defined as either existing in-place soil or clean fill placed after removing unsuitable existing soil or existing pavement and base aggregate.

B. Unaltered Areas

Where seeding is to be performed within areas that have not been altered or disturbed by excavation, grading or stripping operations, as shown on the Contract Drawings, prepare subgrade as follows:

1. Remove existing vegetation by applying "Roundup Pro" as per manufacturer's instructions, at least ten days prior to seeding. Dispose of such materials away from Authority property.
2. Rototill to a depth of not less than six inches to produce a homogenous mixture of fine texture, free of clods, stones, roots and other extraneous materials. Dispose of such materials away from Authority property.
3. Rake and drag soil surface to remove high areas and fill depressions.
4. Limit preparation to areas, which will be seeded promptly after preparation.

C. Sustainable Measures

Remove all debris resulting from the soil preparation operations promptly. Thoroughly clean the Work area to the satisfaction of the Engineer. Remove and transport off Authority property all debris materials resulting from the soil preparation operation in accordance with Division 1 clause entitled "Recycling of Construction Debris Materials".

D. Formulation, Application and Equipment

1. Use the manufacturers recommended formula, application rate and safety instructions at all times.
2. Mix and agitate products and use equipment according to the manufacturer's directions. Mix and agitate only in an area designated by the Engineer.
3. Dispose of spilled materials and surplus products away from Authority property.

E. Erosion Control and Sedimentation Measures

Apply erosion and sediment control measures at all times as required by this Contract and the governing regulatory agencies.

3.02 INSTALLATION

A. Seeding Operations

1. Apply two (2) inches of compost as per Section 02960 to all areas prepared to receive seed.

2. Apply a liquid form of "Soil pH adjustment" such as Aqua pHix per the results of Section 02920 – Soil Testing of the existing soil and as per the manufacturer's instructions, to all areas to be seeded if PH adjustments are required in accordance with Section 02920 – Soil Testing.

3. Apply 20-0-8 fertilizer, uniformly by machine at the rate of 1 pound of Nitrogen per 1000 square feet or in accordance with the analysis results of Section 02920 – Soil Testing of the existing soil and as per the manufacturer's instructions. Work fertilizer lightly into the top six inches of soil, to all areas receiving seed if nutrient adjustments are required in accordance with Section 02920 – Soil Testing.

4. Sow grass seed at the rate provided in Appendix B "Permanent Seeding" of this Section and cover in such manner that a uniform stand would result.

5. Seed the area uniformly in two passes using a Brillion Turfmaker II Seeder and in uniform rows that cross each other at an angle of 30 degrees. Apply seed at designated seeding rates for both passes as per Appendix B "Permanent Seeding".

6. For areas too small for the use of a Brillion Turfmaker II Seeder, apply seed at the designated seeding rates per 1000 square feet with a broadcast spreader.

7. Hydroseeding will not be permitted.

B. Mulching Seeded Areas

1. See Section 02936 – Hydraulically Applied Erosion Control: High Performance Flexible Growth Medium

C. Application of Dust Retardant

1. Apply dust retardant on all completed areas that have not been seeded and/or where seed germination is less that 50% after 3 weeks from date seed was sown and when the calendar seeding date limits (See Appendix "B") have expired and seeding can no longer be performed or as approved by the Engineer.

2. Apply dust retardant with an approved pressurized sprayer with a rating of 40-60 PSI.

3. Do not apply dust retardant if precipitation is forecast within 24-hours after application.

4. Apply dust retardant as many times as necessary to control stormwater and wind erosion, all at no additional cost to the Authority.

D. Care of Seeded Areas

As per Appendix "B" of this Section, provide "Full" Care conforming to the following:

1. Full Care

Upon completion of seeding operations, maintain seeded area(s) in accordance with Appendix "B" for Permanent Seeding of this Section.

END OF SECTION

SECTION 02930

SEEDING

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Product Data

02930D01 Submit in accordance with the requirements of "Inspections and Rejections" of Division 1 -GENERAL PROVISIONS, a complete "Product List", listing all products to be used under this Section.

02930D02 Submit for approval to the Engineer the seed requirements in accordance with 1.03 E, 1 – 12.

02930D03 Submit for approval by the Engineer, the fertilizer requirements in accordance with 1.05 B. 3. f & g.

02930D04 Submit for approval by the Engineer, that the entity performing the seeding has a Brillion Turfmaker II Seeder and a hydromulcher in accordance with 1.05 A. 4-5 and verify that it will used for this Contract

02930D05 Submit for approval by the Engineer, that the entity performing the lawn mowing has a Mulching Mower, in accordance with 1.05 B. 7 and to verify that it will be used for this Contract

02930D06 Submit the total number of bags of seed, applied at the minimum rate of 10 pounds per 1000 SF furnished and installed at the construction site in accordance with the amount of square feet of area prepared by the Contractor for seed

02930D07 Submit to the Engineer one copy of U.S. Department of Labor Material Safety Data Sheets (MSDS) and product labels for all hazardous chemicals utilized during the Work of this Section.

Certificates

02930E01 Submit certification from the manufacturer of High Performance Flexible Growth Medium that the installation meets or exceeds the required product preparation and application rates.

Manufacturer Test Reports

02930F01 Submit to the Engineer the Oregon State University Seed Laboratory Report of Seed Analysis bearing the Lot number matching all the bags of seed delivered to the Work Site.

02930F02 Submit to the Engineer the test results for Endophyte level analysis as specified in 1.05 B. 5 of this Section.

02930F03 Submit to the Engineer the test results for "Technical Topsoil Evaluation" as specified in Section 02920 and 1.05 B. 6. of this Section

02930F04 Submit to the Engineer the recommendations for the nutrient and pH controls in the "Technical Topsoil Evaluation" as specified in Section 02920 and 1.05 B. 6 of this Section.

Qualifications

02930K01 Submit qualifications of the entity and its workers performing the Work of this Section to the Engineer in accordance with 1.05 A. Include names of clients, telephone numbers, and contract amounts for work performed in the last three years and experience records of workers performing the Work of this Section

02930K02 Submit evidence of a valid pesticide applicator's license

02930K03 Submit evidence of a valid professional fertilizer applicator certificate.

02930K04 Submit a list of equipment owned and to be used in this Contract in accordance with 1.05 A of this Section

02930K05 Submit a list of contracts or similar scope including contracts using similar construction methods, products and equipment. Provide Client Name, date of completion, number of acres seeded, Construction Cost, Contact Name and Phone Number

END OF APPENDIX "A"

APPENDIX "B"

SECTION 02930

SEEDING

A. SEED MIX

Permanent Seeding

1. Seed Mixture shall have originated in Oregon and be as distributed by F M Brown Seed, Sinking Spring, PA 19608 (800) 345-3344, Lesco, Inc., Mountainside, NJ 07092 (908) 317-0509, Jonathan Green, Farmingdale, NJ, (732) 938-7007, All Pro Horticulture, Inc. ,721 Main Street, Farmingdale, NY 11735, (631) 789-6680, Pennington Seed, 9327 US RTE 1, Laurel, MD 20723, (301)-362-0106, or approved equal and as follows:

Kind of Seed	% Mix:	% Min. Purity:	% Min. Germ:	% Min. Endophyte Infection:
Firecracker LS or Spider LS Tall Fescue	100	99	95	>90

2. Seeding rate shall be 10 pounds per 1000 square feet.
3. Seeding shall be performed only during the following periods:
   a. August 25 - October 30 (latest crop, fresh seed, seed harvested within the calendar year seeding operations are to occur, subject to proper storage and testing results)
4. Provide full care upon completion of seeding until issuance of Certificate of Final Completion. Full care shall include irrigation when bi-weekly rainfall does not exceed one (1) inch of rainfall per week at the construction site and a weed-free installation at all times, at no additional cost to the Authority.
5. Successful seeding shall be defined by the following:
   a. 85% survival of the specified turfgrass at the end of the Full care period as determined solely by the Engineer.
   b. Endophyte test results for tillers that meet the minimum % endophyte viability levels as specified on the "blue tag certified" label and matching Oregon State University Seed Laboratory Report Seed Analysis when submitted to the Engineer.

B. SEED MIX

C. Temporary Seeding for Soil Erosion and Sedimentation Control

1. Seed Mix shall be as distributed by F M Brown Seed, Sinking Spring, PA 19608 (800) 345-3344, Lesco, Inc., Mountainside, NJ 07092 (908) 317-0509, Jonathan Green, Farmingdale, NJ, (732) 938-7007, All Pro Horticulture, Inc, 721 Main St., Farmingdale, NY 11735 (631) 789-6680, Pennington Seed, 9327 US RTE 1, Laurel, MD 20723, (301)-362-0106, or approved equal and as follows:

Kind of Seed	% Mix:	% Min. Purity:	% Min. Germ:	% Min. Endophyte Infection:
Assure, Legacy II or Wilmington Perennial	100	97	90	>90

Ryegrass

2. Seeding rate shall be 8 pounds per 1000 square feet.
3. Seeding shall be performed:
   a. April 1 - October 15 (latest crop, fresh seed, subject to proper storage and testing results)
4. Provide full care upon completion of seeding. Full care shall include irrigation when weekly rainfall does not exceed one (1) inch of rainfall per week at the construction site.
5. Successful seeding shall be defined by the following:
   a. 85% survival of the specified turfgrass at the end of the Full care period as determined solely by the Engineer.
   b. Endophyte test results for tillers that meet the minimum % endophyte viability levels as specified on the "blue tag certified" label and matching Oregon State University Seed Laboratory Report Seed Analysis when submitted to the Engineer.

TESTING LABS/CONTACTS

1.) Oregon State University Seed Laboratory
3291 SW Campus Way
Corvallis, OR 97331-3801
Contact: Dr. Adriel Garay, Lab Manager
e-mail: adriel.garay@oregonstate.edu
Website: www.seedlab.oscs.oregonstate.edu
Tele: (541)-737-4464
Fax: (541)-737-2126
Endophyte Tests offered:

- Seed Testing: Immunoblot assay*
  Lab requires one-pint seed sample
- Seed Grow-out/Plant Tissue Endophyte Analysis*
- Plant Tissue: Grass Tillers Endophyte Analysis*

2.) Plant Diagnostic Lab
New Jersey Agricultural Experiment Station
Rutgers University
P.O. Box 550
Milltown, NJ 08850-0550
Contact: Richard Buckley
Tele: (732)-932-9140
Website: www.njaes.rutgers.edu/services
Endophyte Tests offered:

- Seed Testing: Endophyte Screening*
  Lab requires one pint of seed for testing.
- Plant Tissue: Grass Tiller Endophyte Analysis Test *
  Lab requires minimum of 50 tillers for tissue testing.

* Verify Fees/Sampling Procedures with Lab

END OF APPENDIX "B"

DIVISION 2

SECTION 02936

HYDRAULICALLY-APPLIED EROSION CONTROL: HIGH PERFORMANCE FLEXIBLE GROWTH MEDIUM

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for the application of flexible growth medium (FGM) at airports.

1.02 DEFINITIONS

A. The term "High Performance-Flexible Growth Medium (HP-FGM)" specifies a hydraulically-applied 100% biodegradable, 100% recycled, thermally processed (within a pressure vessel) wood fibers, crimped, interlocking biodegradable fibers, and performance enhancing additives. The HP-FGM is phytosanitized, free from plastic netting, requires no curing period and upon application forms an intimate bond with the soil surface to create a continuous, porous, absorbent and flexible erosion resistant blanket that allows for rapid germination plant growth.

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. As a guide to determine local weather predictions, use the National and Local Forecast, Hurricane, Radar and Report website at http://www.weather.com as published by the Weather Channel.

B.

Property:	Test Method:	Req. Value (English)
Physical		
Mass Per Unit Area	ASTM D6566'	12 oz/yd2 minimum
Thickness	ASTM D6525'	0.22 inch minimum
Wet Bond Strength	ASTM D6818'	9 lb/ft
Ground Cover	ASTM D6567'	99% minimum
Water Holding Capacity	ASTM D7367	1700% minimum
Material Color	Observed	Green
Performance		
Cover Factor(6 in/hr)	ECTC Test Method No.2	0.01 max.
% Effectiveness	ECTC Test Method No.2	99% min.
Shear Stress	ECTC Test Method No.2	1 lb/ft2
Cure time	Observed	0 – 2 hours
Vegetation Establ.	ASTM D7322'	800% min.
Environmental		

Functional Longevity	ASTM D5338	Up to 18 months
Biodegradability	ASTM D5338	100% minimum

1. ASTM test methods developed for Rolled Erosion Control Products and have been modified to accommodate Hydraulically-Applied Erosion Control Products.
2. Cover Factor is calculated as soil loss ratio of treated surface versus an untreated control surface.
3. % Effectiveness = One minus Cover Factor multiplies by 100%.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Perform operations only during the following weather conditions:

1. There shall be no frost in the ground and the soil temperature at each planting area shall be above 32 degrees F.
2. There shall be no form of precipitation falling or forecast to fall within the next two hours. Following a period of precipitation, resume operations only after the soil has drained.
3. Apply chemicals only when wind velocity is below 5 mph, drift hazard is negligible, the air temperature is above 40 degrees F and below 70 degrees F.
4. Do not perform any product application if precipitation has fallen within two hours prior to the planned application time or is forecast during the next 12-hour period.

1.05 QUALITY ASSURANCE

A. Qualifications

1. Verify that the entity and its workers performing the Work of this Section are experienced in applying FGM and have been engaged in work of a complexity similar to that required under this Section for a period of at least three years.
2. Verify that the entity performing the Work has a Hydromulcher with a "mechanical agitator paddle" as manufactured by one of the following: Bowie, Epic, Finn, Kincaide or Turfmaker. A hydromulcher that uses "jet agitation" will not be permitted to be used.

B. General Requirements for Operations and Products

1. After delivery to the construction site, allow the Engineer, at his discretion, to take for analysis representative samples of any item listed in PART 2 - PRODUCTS.
2. Submit certification from the manufacturer of HP-FGM that the installation meets or exceeds the required product preparation and application rates.
3. Submit the total number of bags of HP-FGM, applied at the minimum rate of 4500 pounds per Acres furnished and installed at the construction site in accordance with the amount of square feet of area prepared by the Contractor for seed.
4. Submit one copy of the U. S. Department of Labor Material Safety Data Shets (MSDS) and product labels for HP-FGM.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver all products in the manufacturer's unopened containers bearing the trade name, manufacturer's name, weight and analysis.

B. Store products away from moisture and extreme temperatures and in such a manner that their effectiveness will not be impaired.

1.07 SUBMITTALS

A. See Appendix "A" for submittals requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. High Performance Flexible Growth Medium

1. "High Performance-Flexible Growth Medium (HP-FGM) as manufactured by Profile Products, LLC. Buffalo Grove, IL 60089.

   Or approved equal conforming to the following:

   Clean, uniform, nontoxic, and free of seeds, fungi, and other plant pathogens;

   Thermally-processed in such a manner as to contain no growth or germination inhibiting factors.

   Interlocking crimped polyester fibers combined with wood fiber and crosslinked tackifier having the following physical properties:

Moisture Content	12% +-3
Wood Fiber	80% ± 3%
Locking Fibers	5.0% +-1
Crosslinked Tackifier	10% +-1
Water Holding Capacity	1700% Min
Organic Material	95% Min
pH	4.8 +-2

2. Flexible Growth Medium is available from the following suppliers:

   a. Pinelands Nursery, 232 Island Avenue, Columbus, NJ 08022
   b. All Pro Horticulture, 55 Motor Avenue, Farmingdale, NY 11735
   c. ACF Environmental, 48 Old Grays Brook Rd., Brookfield, CT 06804
   d. AH Harris & Sons, 17 Commercial Drive, Albany, NY 12205
   e. Pennington Seed, 9327 US RTE 1, Laurel, MD 20723

PART 3. EXECUTION

3.01 PREPARATION

A. Areas of Changed Grades

Verify that areas of changed grades, which are to be seeded as shown on the Contract Drawings, are in conformance with the grading plans and have a smooth, uniform surface. Apply HP-FGM to geotechnically stable slopes that have been designed and constructed to divert runoff away from the face of the slope. Do not proceed with installation until satisfactory conditions are established. Limit preparation to areas, which will be seeded promptly after preparation.

B. Sustainable Measures

Remove all debris resulting from the soil preparation operations promptly. Thoroughly clean the Work area to the satisfaction of the Engineer. Remove and transport off Authority property all debris materials resulting from the soil preparation operation in accordance with Division 1 clause entitled "Recycling of Construction Debris Materials".

C. Formulation, Application and Equipment

1. Use the manufacturers recommended formula, application rate and safety instructions at all times.
2. Mix and agitate products and use equipment according to the manufacturer's directions. Mix and agitate only in an area designated by the Engineer.
3. Dispose of spilled materials and surplus products away from Authority property.

D. Erosion Control and Sedimentation Measures

Apply erosion and sediment control measures at all times as required by this Contract and the governing regulatory agencies.

3.02 INSTALLATION

A. Seeding Operations

1. See Section 02930 – Seeding.

B. Hydraulically-Applied Erosion Control of HP-FGM of Seeded Areas

1. Strictly comply with manufacturer's installation instructions and recommendations. Use approved mechanically agitated, hydraulic mulching machines with a fan-type nozzle (50-degree tip).
   a. Fill tank to middle of agitator or tank about 1/3 full of water. Turn on pump to wet or purge lines. Begin agitating. Keep adding water slowly while adding the FGM at a steady rate.
   b. Mix at a rate of 50 lbs of FGM per 125 gallons of water. Verify with the equipment manufacturer the optimum mixing rates for the FGM.
   c. All FGM should be added once the tank is approximately ¾ full.
   d. Thoroughly agitate and mix slurry for at least 10 minutes after adding the last of the FGM to fully activate all the bonding additives and to attain proper viscosity.
   e. Turn off recirculation valve to minimize potential for air entrainment within the slurry.
2. Apply FGM uniformly in successive layers, from two or more directions, to accomplish 100% coverage of the soil surface at following rates:
   a. Minimum application shall be 4,500 lbs/Acre.
3. Do not over-spray the hydromulch onto runways, taxiways, roadway, sidewalks, signs, fences, gravel swales or any structure or surface feature. Any over-spray found anywhere except where seed is required, shall be thoroughly cleaned and repaired, all at no additional cost to the Authority.

SECTION 02936

HYDRAULICALLY-APPLIED EROSION CONTROL:

HIGH PERFORMANCE FLEXIBLE GROWTH MEDIUM

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Product Data

02936D01 Submit in accordance with the requirements of "Inspections and Rejections" of Division 1 -GENERAL PROVISIONS, a complete "Product List", listing all products to be used under this Section.

02936D02 Submit the total number of bags of FGM, applied at the minimum rate 4500lbs per Acre furnished and installed at the construction site in accordance with the amount of square feet of area prepared by the Contractor for seed.

02936D03 Submit to the Engineer one copy of U.S. Department of Labor Material Safety Data Sheets (MSDS) and product labels for all hazardous chemicals utilized during the Work of this Section

Certificates

02936E01 Submit certification from the manufacturer of Flexible Growth Medium that the installation meets or exceeds the required product preparation and application rates.

Qualifications

02936K01 Submit qualifications of the entity and its workers performing the Work of this Section to the Engineer in accordance with 1.05 A. Include names of clients, telephone numbers, and contract amounts for work performed in the last three years and experience records of workers performing the Work of this Section.

02936K02 Submit a list of equipment owned and to be used in this Contract in accordance with 1.05 A of this Section.

02936K03 Submit a list of contracts or similar scope including contracts using similar construction methods, products and equipment. Provide Client Name, date of completion, number of acres seeded, Construction Cost, Contact Name and Phone Number.

END OF APPENDIX "A"

DIVISION 2

SECTION 02960

ADDING COMPOST

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for amending soil with compost prior to seeding and/or landscaping.

1.02 DESIGN AND PERFORMANCE REQUIREMENTS

A. Use product testing methods adopted and published by the Association of Official Analytical Chemists, 1111 19th Street Suite 210, Arlington, VA 22209.

B. As a guide to determine local weather predictions, use the National and Local Forecast, Hurricane, Radar and Report website at http://www.weather.com as published by the Weather Channel.

C. Use testing methods for 'Assessing Compost Quality' as provided by the Rutgers Soil Testing Laboratory, Rutgers New Jersey Agicultural Experiment Station, New Brunswick, NJ 08901.

1.03 ENVIRONMENTAL REQUIREMENTS

A. Perform operations only during the following weather conditions:

1. There shall be no frost in the ground and the topsoil temperature shall be above 32 degrees F.
2. There shall be no form of precipitation falling or forecast to fall within the next two hours. Following a period of precipitation, resume operations only after the soil has drained.

1.04 QUALITY ASSURANCE

A. Verify that the entity and its workers performing the Work of this Section are experienced in landscaping and have been engaged in work of a complexity similar to that required under this Section for a period of at least three years. Include names of clients, telephone numbers, and contract amounts for work performed in the last three years and experience records of workers performing the Work of this Section.

B. Test Requirements

1. Submit a representative sample of compost material for analysis to a certified independent laboratory to ensure conformance to requirements specified in 2.01 prior to delivery and at the commencement of each 100 cubic yards of compost delivered to the construction site. No substitutions for testing parameters will be permitted.
2. Take on-site samples only in the presence of the Engineer and at sites ready for operations to commence.
3. Test Soluble salts in Compost utilizing the Saturated Paste Extract method.

C. General Requirements for Operations and Products

1. Products listed in PART 2 - PRODUCTS shall be approved in writing by the Engineer prior to delivery to the construction site.
2. Prior to delivery of compost to the construction site, submit to the Engineer the following:
   a. The location of the source of compost and the name and address of the supplier.
   b. A certified analysis of the compost that it meets the requirements of this Section. Any analysis of which the date of testing by the certified independent laboratory is in excess of one month prior to the actual date of delivery to the construction site will not be accepted.
   c. A ¼ pound sample to the Chief of Materials Engineering.
   d. In the event that the sample/analysis does not conform to the specified requirements, submit additional samples/analyses until the results do conform to this Section, all at no additional cost to the Authority.
3. After delivery to the construction site, the Engineer may, at his discretion, take for analysis representative samples of any item listed in PART 2 - PRODUCTS.
4. At the commencement of each 100 cubic yards of compost delivered to the construction site, the Engineer may, at his discretion, take a sample of compost for analysis to determine if the product is in conformance to this Section.
5. In the event that the analysis of the compost sample is not consistent with the requirements specified in 2.01, remove the delivered compost from the construction site and replace it with material that does conform, all at no additional cost to the Authority.

1.05 DELIVERY, STORAGE AND HANDLING

A. Do not deliver bulk compost to the construction site until the Engineer has approved in writing that the product meets requirements of this Section.

B. Deliver all products in the manufacturer's unopened containers bearing the trade name, manufacturer's name, weight and analysis.

C. Store products away from moisture and extreme temperatures and in such a manner that their effectiveness will not be impaired.

1.06 SUBMITTALS

A. See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. Compost

1. Compost shall be derived from leaves and or biosolids, free of viable weed seeds and contain material of a generally humus nature. The product shall not contain any materials toxic to plant growth or produce objectionable odors. Compost shall meet EPA Exceptional Quality Standards and all State Environmental Agency requirements. Variations in the following specified physical properties are not acceptable. Compost shall conform to the following:

Parameters:	Allowable Range:	Test Method:
Moisture Content		Wet Basis
% water	35% - 60%	
% solids	65% - 40%	
pH	5.7 – 7.7	Saturated Media Extract (SME)
Soluble Salt Level		
SME	<5.0 mmhos/cm (ds/m)	Saturated Media Extract
1:5 dilution	<1.5 mmhos/cm (ds/m)	1:5 dilution
Inorganic Nitrogen		
ppm nitrate-N	50 -200 ppm	SME
ppm ammonium-N	6 – 18 ppm	SME
Organic Matter Content	30% - 60%	
Organic Carbon Content	20% - 25%	
Total Kjeldahl	1.0% - 2.5%	
Carbon-to-Nitrogen Ratio	15 – 30:1	
Maturity Index	6 – 8	Solvita Test

*See Appendix "B" for allowable compost application rates based upon soluble salts levels.

PART 3. EXECUTION

3.01 PREPARATION

A. Areas of Changed Grades

1. Areas of changed grades shown on the Contract Drawings that have a smooth, uniform surface, where compost is to be spread:

   a. Rototill existing soil to a depth of not less than six inches to produce a homogeneous mixture of fine texture, free of clods, stones, roots and other extraneous materials. Remove and dispose of such materials away from Authority property.

   b. Rake and drag soil surface to remove high areas and fill depressions.

   c. Limit preparation to areas that will receive compost immediately following preparation.

B. Unaltered Areas

Prepare areas shown on the Contract Drawings as unaltered or undisturbed by excavation, grading or stripping operations as follows:

1. Remove existing vegetation and turf. Dispose of vegetative matter away from Authority property.
2. Rototill to a depth of not less than six inches to produce a homogeneous mixture of fine texture, free of clods, stones, roots and other extraneous materials. Remove and dispose of such materials away from Authority property.
3. Rake and drag to remove high areas and fill depressions.
4. Limit preparation to areas that will receive compost immediately after preparation.

C. Sustainable Measures

Remove all debris resulting from the soil preparation operations promptly. Thoroughly clean the Work area to the satisfaction of the Engineer. Remove and transport off Authority property all debris materials resulting from the soil preparation operation in accordance with Division 1 clause entitled "Recycling of Construction Debris Material".

3.02 INSTALLATION

A. Formulation, Application, and Equipment - General

1. Use the manufacturer's recommended formula, application rate and safety instructions at all times.
2. Mix and agitate products and use equipment according to the manufacturer's directions. Mix and agitate only in an area designated by the Engineer.
3. Dispose of spilled materials and surplus products away from Authority property.

B. Apply a minimum of 2" of compost evenly over area and uniformly incorporate (rototill) into the soil to a minimum depth of six inches.

C. Commence seeding and/or landscaping applications immediately after incorporating compost.

END OF SECTION

SECTION 02960

ADDING COMPOST

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Samples
02960C01 Submit a 1/4-pound representative sample of compost (as many as required) to the Chief of Materials Engineering, and the location of the source of the compost and test results to the Engineer.

Product Data
02960D01 Within fifteen (15) days of receipt by the Contractor of the acceptance of his Proposal, submit the following in accordance with the requirements of "Inspections and Rejections" of Division 1 - GENERAL PROVISIONS:

a. A complete "Products List", listing all products to be used under this Section including: Product name, manufacturer, catalog cuts, details, samples, manufacturer's specifications and certified test data/analysis of each product.
b. Material Data Safety Sheets for all toxic or hazardous materials to be used under this Section.

Manufacturer Test Reports
02960F01 Submit laboratory analyses of the compost to the Engineer, in accordance with the testing parameters set forth in 2.01 A. No exceptions.

Qualifications
02960K01 Within fifteen (15) days of receipt by the Contractor of the acceptance of his Proposal, submit qualifications of the entity and its workers performing the Work of this Section to the Engineer in accordance with 1.04 A. . Include names of clients, telephone numbers, and contract amounts for work performed in the last three years and experience records of workers performing the Work of this Section.

END OF APPENDIX "A"

SECTION 02960

ADDING COMPOST

APPENDIX "B"

COMPOST – SOLUBLE SALTS LEVELS

Use the following table to determine the maximum allowable ECe(dS/m of saturation extract) of compost at the desired application rate:

Desired Use Rate		Salinity (ECe) of On-Site Soil		
Cubic Yards Amendment per 1000 Sq. Ft. for incorporation to 6" depth	Volume Percentage of Amendment	3 dS/m	2 dS/m	1 dS/m
		Maximum ECe of Compost		
1	5	14	28	42
2	11	7	14	21
3	16	5	9. 5	14
4	22	3. 5	7	10. 5
5	27	3	5. 5	8. 5
6	32	2. 5	4. 5	7

Example: If Specification calls for 6 cubic yards compost per 1000/sq. ft. to be incorporated into the top 6" depth, and site soil has an ECe of 2.0. In order to avoid exceeding an ECe of 4 in the final blend, compost ECe should be less than 4.5 dS/m.

END OF APPENDIX "B"

DIVISION 3

SECTION 03200

CONCRETE REINFORCEMENT

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for furnishing and installing concrete reinforcement.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M32	Steel Wire, Plain, for Concrete Reinforcement
AASHTO M55	Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement
AASHTO M221	Welded Deformed Steel Wire Fabric for Concrete Reinforcement
AASHTO M31	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
AASHTO M284	Epoxy-Coated Reinforcing Steel Bars

American Concrete Institute (ACI)

ACI 315	Details and Detailing of Concrete Reinforcement
ACI 318	Building Code Requirements for Reinforced Concrete

American Society for Testing and Materials (ASTM)

ASTM A 82	Steel Wire, Plain, for Concrete Reinforcement
ASTM A 184	Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A 185	Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement
ASTM A 497	Welded Deformed Steel Wire Fabric for Concrete Reinforcement
ASTM A 615	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 767	Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement
ASTM A 775	Epoxy-Coated Reinforcing Steel Bars

American Welding Society (AWS)

AWS D 1.4	Structural Welding Code - Reinforcing Steel

Concrete Reinforcing Steel Institute (CRSI)

Manual of Standard Practice Placing Reinforcing Bars

1.03 BRIDGE WORK

For Work of this Section involving bridges, the Contractor shall comply with the applicable provisions of "Standard Specifications for Highway Bridges" of the American Association of State Highway and Transportation Officials (AASHTO). Materials shall be in accordance with AASHTO designations where shown after the ASTM designation in parenthesis. Where not shown, comply with ASTM Designation.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver concrete reinforcement in bundles marked with metal tags indicating size, length and mark number.

B. Store and handle materials to prevent corrosion, damage to coating or contamination that could impair bond.

1.05 SUBMITTALS

For submittals see Appendix "A".

PART 2. PRODUCTS

2.01 MATERIALS

A. Reinforcing Bars: ASTM A 615 (AASHTO M31), deformed, Grade 60, unless otherwise shown on the Contract Drawings.

Coated bars where shown on the Contract Drawings shall comply with the following:

1. Galvanized Reinforcing Bars

ASTM A 767, Class-I hot-dip galvanized, after fabrication and bending.

Repair sheared and cut ends and damaged coating with a zinc-rich formulation conforming to ASTM A 767 in accordance with the material manufacturers' recommendations.

2. Epoxy-coated Reinforcing Bars: ASTM A 775 (AASHTO M284)

Repair sheared and cut ends and damaged coating with an epoxy patching material conforming to ASTM A 775 (AASHTO M284) in accordance with the patching material manufacturers recommendations.

B. Welded Wire Fabric

Types shall be as shown on the Contract Drawings and shall comply with the following:

1. Plain, ASTM A 185 (AASHTO M55), flat sheets for size W5 and larger and coiled rolls for sizes below W5.
2. Deformed, ASTM A 497 (AASHTO M221), flat sheets for sizes D5 and larger and coiled rolls for sizes below D5.

C. Fabricated Steel Bar Mats

Fabricated steel bar mats shall be in accordance with ASTM A 184, when shown on the Contract Drawings, and as follows:

1. Bar grade, size and spacing as shown on the Contract Drawings.
2. Welded connections, unless otherwise shown on the Contract Drawings.

D. Steel Wire

Steel wire shall comply with ASTM A 82 (AASHTO M32), plain finish, unless otherwise shown on the Contract Drawings.

2.02 ACCESSORIES

A. Tie Wire

Provide minimum 16-gage, annealed type. Provide nylon, plastic or epoxy-coated wire for use with epoxy-coated and galvanized reinforcing bars, if any.

B. Supports for Reinforcement

Provide bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use galvanized steel wire bar type supports complying with CRSI standards and as follows:

1. For supporting epoxy-coated reinforcing bars, use plastic coated supports, or supports fabricated from or coated with a dielectric material.
2. For slabs-on-grade, use supports with horizontal plate runners.
3. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, use supports with plastic capped legs (CRSI, Class 1).
4. Where architectural concrete is shown on the Contract Drawings, use plastic side form spacers.

2.03 FABRICATION

A. Fabricate concrete reinforcement as shown on the Contract Drawings and on approved shop drawings, in accordance with ACI 315 "Tolerances".

B. Bend all concrete reinforcement cold. Heating of bars or wire fabric is prohibited.

C. Where welding of concrete reinforcement is shown on the Contract Drawings, weld in accordance with AWS Dl.4.

PART 3. EXECUTION

3.01 INSTALLATION

A. Place concrete reinforcement as shown on the Contract Drawings and on approved shop drawings. Where not shown on the Contract Drawings, comply with CRSI "Placing Reinforcing Bars".

B. Clean concrete reinforcement of loose rust, mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.

C. Accurately position, support and secure concrete reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support concrete reinforcement by chairs, runners, bolsters, spacers, and hangers in accordance with CRSI Manual of Standard Practice". Do not interfere with placement of embedded items.

D. When a vapor barrier is shown on the Contract Drawings, do not cut or puncture during concrete reinforcement placement.

E. Place concrete reinforcement to obtain covers shown on the Contract Drawings for concrete protection, or in accordance with ACI 318 "Concrete Protection for Reinforcement", if not shown on the Contract Drawings. Arrange, space and securely tie bars and bar supports to hold concrete reinforcement in position during concrete placement operations. Set ties so ends are directed into concrete, not toward exposed concrete surfaces.

F. Install welded wire fabric in lengths as long as practical. Lap adjoining pieces at least one full mesh and lace splices with wire, but in no case shall lap be less than requirements of ACI 318 "Splices of Welded Deformed Wire Fabric in Tension" or "Splices of Welded Plain Wire Fabric in Tension". Offset end laps in adjacent widths to prevent continuous laps in either direction.

G. After concrete placement, do not field bend partially embedded concrete reinforcement except as shown on the Contract Drawings.

H. Repair damaged bars and welds, if any, in accordance with 2.O1A.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings 03200A01	Detailed indicating placement, cover, splice locations, lap lengths, mechanical splice hardware, grade, bar size, length, mark number, bending schedule, bending diagram, weld designations, type of coating, material used to repair coating, and types of chairs, spacers, hangers and tie wire for all concrete reinforcement.
Catalog Cuts 03200B01	Catalog cuts for chair, spacers, hangers

END OF APPENDIX "A"

DIVISION 3

SECTION 03301

PORTLAND CEMENT CONCRETE, LONG FORM

PART 1. GENERAL

1.01 SUMMARY

This Section and its appendices specify requirements for Portland Cement Concrete mix proportions, materials used in concrete mixes, placing, finishing (with the exception of concrete for pavements), curing, control joints, end result property requirements of the in-place concrete, and the evaluation of these properties through Quality Acceptance testing performed by the Authority for determining Adjustments to Contract Compensation. The Specifications herein establish minimum standards for concrete construction. This does not relieve the Contractor from following more stringent standards to achieve the quality acceptance limits for applicable performance parameters and their respective Percent Within Limit (PWL) measurements.

1.02 REFERENCES

The following is a listing of the publications, standards and codes referenced in this Section, of which the latest edition shall govern:

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO HB	Standard Specifications for Highway Bridges.
AASHTO M182	Burlap Cloth Made From Jute or Kenaf.
AASHTO T 26	Standard Method of Test for Quality of Water to Be Used in Concrete.
AASHTO T 277	Electrical Indication of Concrete's Ability to Resist Chloride.
AASHTO T 318	Water Content of Freshly Mixed Concrete Using Microwave Oven Drying.

American Concrete Institute (ACI)

ACI 207	Mass Concrete.
ACI 211	Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
ACI 213	Guide for Structural Lightweight-Aggregate Concrete.
ACI 222R	Protection of Metals in Concrete Against Corrosion.
ACI 301	Specifications for Structural Concrete for Buildings.
ACI 302.1	Guide for Concrete Floor and Slab Construction.
ACI 303.1	Specification for Cast in Place Architectural Concrete.
ACI 304R	Guide for Measuring, Mixing, Transporting, and Placing Concrete. Chapter 8: Concrete Placed Under Water.
ACI 305R	Hot Weather Concreting.
ACI 306R	Cold Weather Concreting.
ACI 308	Standard Practice for Curing Concrete.

ACI 309R	Guide for Consolidation of Concrete.
ACI 318	Building Code Requirements for Structural Concrete.
ACI 548.4	Standard Specification for Latex-Modified Concrete (LMC) Overlays.

ASTM International (ASTM)

ASTM C 31	Practice for Making and Curing Concrete Test Specimens in the Field.
ASTM C 33	Specification for Concrete Aggregates.
ASTM C 39	Test Method for Compressive Strength of Cylindrical Concrete Specimens.
ASTM C 42	Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
ASTM C 78	Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
ASTM C 88	Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
ASTM C 94	Specification for Ready-Mixed Concrete.
ASTM C 114	Test Methods for Chemical Analysis of Hydraulic Cement.
ASTM C 131	Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
ASTM C 136	Test Method for Sieve Analysis of Fine and Coarse Aggregates.
ASTM C 138	Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
ASTM C 143	Test Method for Slump of Hydraulic-Cement Concrete.
ASTM C 150	Specification for Portland Cement.
ASTM C 156	Test Method for Water Retention by Liquid Membrane-Forming Curing Compounds for Concrete.
ASTM C 157	Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
ASTM C 171	Specification for Sheet Materials for Curing Concrete.
ASTM C 172	Practice for Sampling Freshly Mixed Concrete.
ASTM C 173	Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
ASTM C 174	Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores.
ASTM C 191	Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle.
ASTM C 227	Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method).
ASTM C 231	Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
ASTM C 260	Specification for Air-Entraining Admixtures for Concrete.
ASTM C 289	Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).
ASTM C 309	Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
ASTM C 311	Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans

	for Use in Portland-Cement Concrete.
ASTM C 330	Specification for Lightweight Aggregates for Structural Concrete.
ASTM C 494	Specification for Chemical Admixtures for Concrete.
ASTM C 535	Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
ASTM C 566	Test Method for Total Evaporable Moisture Content of Aggregate by Drying.
ASTM C 567	Test Method for Determining Density of Structural Lightweight Concrete.
ASTM C 618	Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
ASTM C 979	Specification for Pigments for Integrally Colored Concrete.
ASTM C 989	Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
ASTM C 1064	Test Method for Temperature of Freshly Mixed Hydraulic Cement Concrete.
ASTM C 1116	Specification for Fiber-Reinforced Concrete.
ASTM C 1152	Test Method for Acid-Soluble Chloride in Mortar and Concrete.
ASTM C 1218	Test Method for Water-Soluble Chloride in Mortar and Concrete.
ASTM C 1240	Specification for Silica Fume Used in Cementitious Mixtures.
ASTM C 1260	Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method).
ASTM C 1399	Test Method for Obtaining Average Residual-Strength of Fiber-Reinforced Concrete.
ASTM C 1583	Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials By Direct Tension (Pull-Off Method).
ASTM C 1611	Slump Flow of Self-Consolidating Concrete.
ASTM D 1751	Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
ASTM D 1752	Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
ASTM D 3665	Practice for Random Sampling of Construction Materials.
ASTM D 4580	Practice for Measuring Delaminations in Concrete Bridge Decks by Sounding.
ASTM D 4791	Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
ASTM D 4833	Test Method for Index Puncture Resistance of Geomembranes, and Related Products.
ASTM D 5199	Test Method for Measuring the Nominal Thickness of Geosynthetics.

ASTM E 965	Test Method for Measuring Pavement Macrotexture Depth Using a Volumetric Technique.
ASTM E 1347	Test Method for Color and Color-Difference Measurement by Tristimulus (Filter) Colorimetry.

Federal Aviation Administration (FAA) Advisory Circular (AC)

FAA AC 150/ 5370, Item P-501-6	Standards for Specifying Construction of Airports - Portland Cement Concrete Pavement - Contractor Quality Control Program.

Federal Specifications

SS-S-1401	Sealants, Joint, Non-Jet-Fuel-Resistant, Hot-Applied, for Portland Cement and Asphalt Concrete Pavements.

New Jersey Department of Transportation (NJDOT)

Standard Specifications for Road and Bridge Construction 2007.

US Army Corps of Engineers (USACE)

Handbook of Concrete and Cement.

1.03 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements

1. Cold weather concrete construction shall conform to ACI 306R.
2. Submit a Cold Weather Concrete Construction Plan, and have it approved prior to concrete placements when the ambient temperature falls below 50 deg F. This Plan shall conform to ACI 306R and shall include but not be limited to the demonstration of how the in situ concrete temperature will be maintained at 50 deg F and monitored, or at temperatures specified in ACI 306R, Table 3.1, whichever is more stringent. In addition, demonstrate that the specified concrete properties can be achieved within the time requirements specified while maintaining a minimum curing temperature of 50 deg F.
3. Do not mix or place concrete when the ambient temperature is below 35 deg F, or when conditions indicate that the temperature will fall below 35 deg F within 72 hours, unless the areas to receive fresh concrete are insulated or enclosed, and maintain the concrete temperature at 50 deg F or in accordance with Table 3.1 in ACI 306.
4. Reinforcement, forms and soils with which concrete will be in contact shall not be frozen and must be maintained completely frost-free. If required, apply heat to raise their temperature to a minimum of 35 deg F. The use of chemicals to eliminate frost will not be permitted.

B. Hot Weather Requirements

1. Hot weather concrete construction shall conform to ACI 305R.
2. Submit a Hot Weather Concrete Construction Plan and have it approved prior to concrete placements when the ambient temperature exceeds 80 deg F. This Plan shall conform to ACI 305R and shall include but not be limited to the demonstration of how the concrete temperature during batching and mixing will be kept below 90 deg F, how the concrete will be protected from rapid evaporation of surface moisture, the proper use of water reducing retarders with re-dosing charts and procedures and curing procedures.

3. Do not place concrete for pavements, overlays, bridge decks or ramps when the ambient temperature exceeds 85 deg F; schedule Work so that concrete can be placed during the coolest part of the day. Do not place concrete for structural decks, slabs or pavements when the rate of concrete surface evaporation exceeds 0.15 lbs/ft^2/hr, as defined in ACI 305R, Figure 2.1.5. If ambient conditions exceed this limit, demonstrate through the use of windscreens, fogging or other suitable means that the concrete evaporation rate is less than 0.15 lbs/ft^2/hr.

4. If the concrete temperature reaches 92 deg F as measured at the construction site in accordance with ASTM C 1064, it may be rejected.

1.04 QUALITY CONTROL

A. General

1. Maintain a level of Quality Control sufficient to consistently achieve the end result performance properties specified herein. In addition:

   a. Submit the approved mix proportions including an automated, time-date stamp on each delivery ticket indicating the batch weights of all batching constituents.

   b. Ensure that all plant mixing equipment and trucks are calibrated and approved by either the New Jersey or New York State Department of Transportation. Documentation of such conformance shall be available to the Engineer at all times.

   c. Ensure that all personnel performing concrete testing are certified ACI Grade I Concrete Laboratory Testing Technicians or Concrete Field Testing Technicians, as appropriate.

   d. When placing aeronautical pavement concrete, the quality control plan shall conform to the provisions of the Federal Aviation Administration Advisory Circular 150/5730-10D- Rigid Pavement Items P-501 Contractor Quality Control Program.

B. Quality Control Plan: Submit a Quality Control Plan a minimum of 10 days prior to the pre-concrete construction meeting described in 1.06. Do not start production before the Quality Control Plan has been approved by the Engineer. The Quality Control Plan shall include the following:

1. Quality Control Organization

   a. A chart showing all Quality Control personnel and a description of how these personnel integrate with and report to other management or field construction personnel. Include names, company name and each person's function, telephone number and fax number.

   b. The quality control organization chart shall include a Program Administrator who shall ensure that all QA procedures are followed and enforced and who shall have a minimum of 5 years experience on projects of size and scope comparable to the Work of the Contract. The Program Administrator shall be a full-time employee of the Contractor or a consultant engaged by the Contractor. Additional qualifications shall include at least one of the following:

      (1) Professional Engineer, Engineer-In-Training, Bachelor of Science in Civil Engineering, Civil Engineering Technology or five years experience with airport and/or highway concrete construction.

(2) Completed New Jersey ACI Chapter's "Concrete Construction Technology" course with 5 years of airport and/or highway concrete construction experience.

(3) Qualified as ACI Concrete Transportation Construction Inspector or possessing Concrete Construction Special Inspector certification with 5 years of airport and/or highway concrete construction experience.

2. Intended project progress schedule for each mix and application, including quantities and a submittal schedule.

3. Quality Control Testing Plan, including a list of testing standards and the frequency at which each test is to be performed.

   a. Include gradation and moisture content testing for fine and coarse aggregates in accordance with ASTM C 136 and ASTM C 566, respectively. Perform both tests (1) prior to production, (2) every 3 hours during production or every 100 cubic yards of concrete produced (whichever is longer in time) and (3) when aggregates are used from a new stockpile that has not been tested for gradation or moisture content.

4. Documentation of Quality Control activities, including the location where recorded test results and other information such as mill test certificates for all cementitious material will be stored, which shall be made available to the Engineer at any time upon request.

5. Procedures for corrective action when QA and/or QC test results do not conform to the requirements of the Contract.

1.05 TRIAL BATCHING AND TEST POUR VERIFICATIONS

A. Trial Batching

1. The Engineer may prepare and test trial batches as specified herein and in accordance with ACI 318, Section 5.3. At the Engineer's request, submit representative samples of all materials in sufficient quantities to the Port Authority Materials Engineering Unit. In the event of a conflict between tests performed by the Engineer and tests performed by or for the Contractor, all tests performed by the Engineer shall control.

2. The Engineer may perform the following tests to verify trial batches submitted by the Contractor: compressive strength, flexural strength, permeability by the Coulomb test, air content, unit weight, water content of freshly mixed concrete using the microwave oven drying test, shrinkage, chloride ion concentration, corrosion inhibitor concentration, bond strength, slump, time of set, gradation of fine and coarse aggregates, and the fineness modulus of the fine aggregate.

B. Test Pours

1. Unless otherwise noted on the Contract Drawings, perform a test pour a minimum of 14 calendar days prior to production pouring in order to demonstrate and verify proper workability, finishability, setting characteristics, consolidation and curing procedures and to confirm that specified physical properties are attained for the approved mix proportions. For tremie concrete applications, construct a mock-up to verify acceptable consolidation and that the specified compressive strength is achieved by testing three in-place cores taken from the test placement at locations designated by the Engineer. In addition, for architectural cast in place concrete, construct a full-scale mock-up in accordance with 2.03 C.3. If in the sole opinion of the Engineer the test pour is acceptable, follow the procedures established during the test pour during production.

2. Test Pour Size: For flatwork, the minimum test pour size shall be a length of 100 feet for the entire thickness of the pavement and width of the screed planned to be used. For all other concrete construction, the test pour size shall be full-size for the cross sectional area, including the location of all steel reinforcement. However, at the option of the Engineer, the length of the member may be reduced from its design size, provided it is adequate to demonstrate workability, finishability, setting characteristics, consolidation, finish and curing procedures, as determined solely by the Engineer. Perform all test pours using the same personnel, equipment, procedures and materials that will be used for full production.

3. The test section will be considered acceptable if, in the sole opinion of the Engineer, it meets the specifications for surface preparation, batching, mixing, placement, consolidation, curing, finish and applicable performance properties of the concrete. In addition, for architectural concrete, color and texture will be considered acceptable according to the sole opinion of the Engineer.

4. In the event that the Engineer deems the test section unsatisfactory, remove the test section and repeat the test at no cost to the Authority.

5. The test pour location will be determined by the Engineer at the pre-concrete construction meeting, and will be located close to, if not within, the area of Work, unless otherwise noted on the Contract Drawings.

1.06 PRE-CONCRETE CONSTRUCTION MEETING

A. A pre concrete placement meeting will be conducted at the construction site by the Engineer a minimum of 20 days prior to the first pour to review the Contractor's submitted mix proportions, hot and cold weather concreting plans (as applicable), curing procedures plan and test pour and to discuss the methods and procedures to achieve the specified concrete quality. Notify the Engineer and send a pre-concrete meeting agenda to all attendees a minimum of 15 days prior to the scheduled date of the meeting indicating review subjects. At no additional cost to the Authority make arrangements for the Contractor's superintendent and a qualified representative from each segment of the concrete operations to be present, including, but not limited to the following:

1. Concrete supplier.
2. Laboratory representative responsible for the concrete proportion mix and Quality Control.
3. Contractor's Program Administrator for Quality Control.
4. Concrete subcontractor.
5. Admixtures and curing membrane suppliers.
6. Concrete pumping subcontractor.
7. Mobile mixer subcontractor.
8. Precast concrete fabricator and installer.
9. Joint sawing subcontractor.
10. The Engineer.

B. Record, type, and print meeting minutes and distribute them to all attendees of the meeting within 5 days of the date of the meeting.

C. Do not schedule the pre-concrete construction meeting until all of the following have been submitted and approved, as applicable to the Work of the Contract:

1. Mix Proportions.

2. Admixture dosage charts showing the effects of concrete temperatures from 50 deg F to 90 deg F.
3. Sample panels (12" x 12" x 2" for architectural concrete).
4. Hot and Cold Weather Concrete Construction Plans.
5. Independent testing laboratory AASHTO Accreditation Certification.
6. ACI Grade I certifications for concrete testing personnel.
7. Placement methods and procedures, including surface preparation.
8. Pumping Procedure Plan.
9. Curing Procedure Plan.
10. Joint Location Plan and Timing of Cuts.
11. Quality Control Plan.
12. Procedure for Curing Field Concrete Specimens.

1.07 SUBMITTALS

A. See Appendix "A" for submittal requirements.

B. Do not deliver any concrete to the construction site until all approvals have been obtained.

PART 2. PRODUCTS

2.01 MANUFACTURERS AND SOURCES OF SUPPLY

A. Use no cement, fly ash, slag, silica fume, metakaolin or fine or coarse aggregates that have not been approved by either the New Jersey or New York State Department of Transportation.

2.02 MATERIALS

A. Cement: Conforming to ASTM C 150, Type I and II, and Type III where early strength gain is required, or others specified on the Contract Drawings.

B. Very High Early Strength Cement: Defined as cement used to produce concrete with the compressive strength shown on the Contract Drawings within 12 hours or less and conforming to the following:

1. The compressive strength shall be greater than or equal to the specified strength at the curing time specified on the Contract Drawings, when tested in accordance with ASTM C 39. During cold weather concrete construction, demonstrate that the specified compressive strength can be obtained at a curing temperature of 50 deg F.
2. Absolute drying shrinkage less than or equal to 0.04% at 28 days for the mix proportions containing the Very High Early Strength Cement in accordance with ASTM C 157 modified (Air Drying Method), where the initial reading shall be taken at 3 hours after the addition of the mixing water to the dry materials in the mix.
3. Setting time, determined in accordance with ASTM C 191, shall be sufficient to provide adequate workability, meet the specified strength requirement, and allow enough time in the field to finish and begin curing the concrete for its intended use.

4. The Very High Early Strength Cement shall meet the properties in 2.02 B.1, 2.02 B.2 and 2.02 B.3, for each Lot of cement not to exceed every 50,000 pounds. Submit certification from an independent testing laboratory employed by the Contractor and approved by the Engineer that the cement meets these properties.

C. Silica Fume: Shall conform to ASTM C 1240 and the following:

1. Silicon Dioxide Content: 90% minimum.
2. Loss On Ignition: 6% maximum.
3. Surface Area: (nitrogen absorption): 15,000 m2kg.
4. Crystallinity: Non-crystalline within limits of detection by XRD.
5. Oversize Foreign Materials (in fume): 5% maximum on 45-micron sieve (wet).

D. Metakaolin: Conforming to ASTM C 618, Class N. Use one of the following products, or approved equal:

1. "MetaMax", as manufactured by Engelhard, Iselin, New Jersey.
2. "PowerPozz", as manufactured by Advanced Cement Technologies, LLC, Blaine, Washington.

E. Fly Ash: Conforming to ASTM C 311 and ASTM C 618, Class F except the maximum loss on ignition shall be less than 4%.

F. Slag: Conforming to ASTM C 989, Grade 100 or 120.

G. Fine Aggregate: Conforming to ASTM C 33, ASTM C 227, ASTM C 289 and ASTM C 131 with a maximum percentage of wear of 30%.

H. Coarse Aggregate (Normal Weight Concrete): Conforming to ASTM C 33, ASTM C 227, ASTM C 289, ASTM C 535 with a maximum percentage of wear of 40%, and ASTM C 88 with a magnesium sulfate loss of not more than 12% for a five-cycle test period. Use trap rock or gneiss for all pavement wearing surfaces. The aggregate in any size group shall not contain more than 8% by weight of flat or elongated pieces, as tested in accordance with ASTM D 4791. A flat or elongated piece is one having a ratio between the maximum and minimum dimensions of a circumscribing rectangular prism exceeding 5 to 1. In accordance with ACI 318, Section 3.3.2, the nominal maximum size of coarse aggregate shall be not larger than: (1) one-fifth the narrowest dimension between sides of forms, (2) one-third the depth of slabs, or (3) three-quarters the minimum clear spacing between individual reinforcing bars or wires, bundles of bars, or prestressing tendons or ducts. The nominal maximum size of coarse aggregate used shall be the largest size aggregate that conforms to ACI 318, Section 3.3.2, unless otherwise noted herein or shown on the Contract Drawings.

1. For full depth pavement concretes unless otherwise shown on the Contract Drawings the combined aggregate volume shall be a minimum of 70 percent. The combined gradation of the fine and coarse aggregate shall conform to the following, when tested in accordance with ASTM C 136:

	For Pavement 10 Inches or Greater in Thickness		For Pavement Less Than 10 Inches in Thickness	
Sieve Size % Passing	Min.	Max.	Min.	Max.
2-1/2"	100			
2"	90	98	100	
1-1/2"	76	88	89	98

1"	67	79	74	86
3/4"	65	77	64	76
3/8"	48	60	48	60
No. 4	30	42	30	42
No. 8	27	37	27	37
No. 16	20	30	20	30
No. 30	16	22	16	22
No. 50	4	10	4	10
No. 100	0	4	0	4

2. Pile Jackets: As a minimum, the mix proportion shall contain an ASTM C 33 Size No. 8 coarse aggregate. The ratio of coarse aggregate to fine aggregate by volume shall be not less than one to one.
3. Pipe Piles: Reduce the amount of coarse aggregate to minimize segregation. The volume of coarse aggregate shall not exceed 9.0 cubic feet per cubic yard of concrete. The maximum size coarse aggregate shall be ASTM C 33 Size No. 8.
4. Minimum Volume of Coarse Aggregate: All mixes shall contain a minimum of 39% coarse aggregate by volume, with the exception of 1) applications specified in Part 2.02 H.1-4, H.2), Performance Category VI applications, 3) bridge decks and 4) mixes containing ASTM C 33 Size No. 8 aggregate. Bridge deck concrete mixes shall contain a minimum of 41% coarse aggregate and total minimum aggregate volume of 67%. Mixes containing ASTM C 33 Size No. 8 stone not covered in 2.02 H.2-4 shall contain a minimum of 36% coarse aggregate by volume. These minimum requirements apply to all methods of placement, including pump mixes.
5. When requested by the Engineer, supply independent laboratory test results in accordance with ASTM C 1260 indicating the potential alkali reactivity of the aggregates and cementitious materials proposed for use. Expansion at 16 days shall be less than 0.10%.

I. Coarse Aggregate (Lightweight Concrete)

1. Expanded clay or shale produced by the rotary kiln process conforming to ASTM C 330 shall be graded in accordance with the requirements for 3/4" to No. 4 sieve sizes shown in Table I of that specification.
2. The oven dry unit weight of plant-tested, lightweight aggregate shall vary not more than +/- 3.0 pounds from the unit weight (pounds per cubic foot) determined from the sample quantity submitted in accordance with 1.05 A.1.

J. Water: Conforming to AASHTO T 26. Clean and potable for both mixing and curing concrete.

K. Formulated Latex Modifier: Latex modifier shall be modifier "A/NA", as manufactured by Dow Chemical, Midland, Michigan. Add latex emulsion at a rate of 3.5 gallons per 94 lbs. of cementitious material in the concrete mix.

L. Air Entraining Agent: Conforming to ASTM C 260.

M. Admixtures: All admixtures shall conform to ASTM C 494. They shall contain not more than 0.05% chloride ions, and shall be used in accordance with the manufacturer's recommendations. Submit dosage charts, including the effects of concrete temperatures from 50 deg F to 90 deg F, to the Engineer. All admixtures shall be manufactured by one of the following:

1. Euclid Chemical Company.
2. W.R. Grace & Company.
3. Master Builders Technologies.
4. Sika Corporation.

N. Polycarboxylate High Range Water Reducer: For use when self-compacting concrete is desired and approved by the Engineer. Conforming to ASTM C 494, Type F or Type G. Dosage rate shall be as recommended by the manufacturer to produce a spread of the concrete mixture measuring between 21 and 27 inches in diameter without segregation when released from a slump cone in accordance with ASTM C 1611. Use one of the following products, no substitutions:

1. "Plastol 5000" or "Plastol 341", as manufactured by The Euclid Chemical Company.
2. "ADVA Flow 530" or "ADVA Flow 540", as manufactured by W.R. Grace & Company.
3. "Glenium 3030 NS" or "Glenium 3200 HES", as manufactured by Master Builders Technologies.

O. Corrosion Inhibitors

1. Corrosion inhibitor shall be one of the following:
   a. For cast in place or precast:
      (1) "DCI-S", as manufactured by W.R. Grace & Company.
      (2) "Eucon CIA", as manufactured by Euclid Chemical Company.
      (3) An approved equal.
   b. For precast applications only:
      (1) "Sika CNI", as manufactured by Sika Corporation.
      (2) "Rheocrete CNI", as manufactured by Master Builders Technologies.
      (3) "DCI", as manufactured by W.R. Grace & Company.
2. The concentration of calcium nitrite shall be 30% +/- 2% by weight of solids per gallon.
3. The Engineer will sample the corrosion inhibitor for testing to verify the calcium nitrite solids content. The amount of calcium nitrite in fresh concrete may also be tested at any time, to verify if the proper quantity of the corrosion inhibitor is being batched in the mix.
4. Corrosion inhibitor admixtures shall not accelerate the setting time of the concrete mixture. Use a retarder and/or other admixtures to ensure that acceleration of setting time does not occur, while maintaining the applicable performance criteria, as stipulated in 2.04. Submit procedures for the placement of concrete mixes containing a corrosion inhibitor when a retarder is required for the range of concrete temperatures from 50 deg F to 90 deg F.

P. Viscosity Modifying and/or Self-Consolidating Admixtures: May be required for tremie concrete applications at the rate recommended by the manufacturer. Test concrete in accordance with CRD-C6189A US Army Corps of Engineers "Handbook of Concrete and Cement". Maximum percentage of washout weight loss shall not exceed 5% after three standard test drops in water.

Q. Pigments: Conforming to ASTM C 979.

R. Curing Materials

1. Curing compound shall be one of the following:
   a. "DOT Resin Cure (Type II)", as manufactured by Conspec Marketing & Manufacturing Company, Inc.
   b. "Euco Kurez Vox (White)", as manufactured by Euclid Chemical Company.
   c. "1200 White", as manufactured by W.R. Meadows.
   d. "AHT Type II Class B Cure", as manufactured by American Highway Technology, a Dayton Superior Company.
   e. "Certi-Vex Envio Cure White-1000", as manufactured by Vexcon Chemicals Inc.
   f. "Day-Chem White Pigmented Cure (J-10-W)", as manufactured by Dayton Superior.
   g. Or an approved equal meeting the requirements specified in 2.02 R.2.
2. Liquid Membrane Forming Curing Compound conforming to the following:
   a. For horizontal exterior applications, curing membranes are restricted to ASTM C 309 Type 2, Class B materials. ASTM C 309 Type 1-D, Class B membranes are acceptable for other exterior applications. ASTM C 309 Type 1, Class B membranes are acceptable for interior applications only.
   b. Curing membranes shall be wax free when used on concrete where overlays, coatings, paints, sealers or any topping is to be applied, or where vehicular, pedestrian or aircraft traffic will pass over.
   c. Membranes shall be volatile organic compound (VOC) compliant for the states of both New York and New Jersey. Submit certification of compliance to the Engineer upon request.
   d. The membrane shall restrict the loss of water to not more than 0.40 kilograms per square meter in 72 hours at a coverage rate of 300 square feet per gallon per coat for Type I curing compounds, and 200 square feet per gallon per coat for Type 2 curing compounds when tested in accordance with ASTM C 156.
3. Burlap: Conforming to AASHTO M 182, Class 3, weighing approximately 9 oz./sq. yd. dry.
4. Sheet Material: Conforming to ASTM C 171.
   a. Shall be White Burlap Polyethylene Sheet.
5. Cotton Mats: conforming to ASTM D 5199 with a minimum thickness of 40 mils, ASTM C 156 with a maximum water loss of 0.0065 oz./in.^{2}, ASTM D 4833 with a minimum puncture strength of 70 pounds and ASTM E 1347 with a minimum reflectance of 75%. The following cotton mats may be used in lieu of burlap for wet curing operations:
   a. "Transguard 4000", as manufactured by Reef Industries, Inc., Houston, Texas, or
   b. An approved equal conforming to the requirements specified in 2.02 R.5.

S. Evaporation Retardant: This material shall be used to retain moisture in the concrete during finishing operations. Use one of the following:

1. "Euco-Bar", as manufactured by Euclid Chemical Company.
2. "E-Con", as manufactured by L&M Construction Chemicals, Inc.
3. "Confilm", as manufactured by Master Builders Technologies.
4. "SikaFilm", as manufactured by Sika Corporation.
5. "Aquafilm", as manufactured by Conspec Marketing & Manufacturing Company, Inc.

T. Fiber Reinforcement:

1. Polypropylene Micro Fibers
   a. Use one of the following products, subject to compliance with the Contract requirements:
      (1) "Fiberstrand", as manufactured by Euclid Chemical Company.
      (2) "Fibermesh", as manufactured by Fibermesh, Inc.
      (3) "Forta", as manufactured by Forta Corporation.
      (4) "Grace Fibers" or "Grace Microfibers", as manufactured by W.R. Grace & Company.
      (5) "Durafiber", as manufactured by Industrial Systems, Ltd.
      (6) Or an approved equal.
   b. Additional requirements:
      (1) Collated fibrillated materials: Dosage rate shall be a minimum of 1.5 lb./cu. yd.
      (2) Multifilament fibers: Dosage rate shall be a minimum of 1 lb./cu. yd. The minimum length shall be 0.75 inches.
      (3) Conformance with ASTM C 1116, designation Type III, 4.1.3.
      (4) Conformance with a minimum plastic shrinkage crack reduction of 70 percent when tested in accordance with ICBO ES, Appendix B (7-92).
      (5) Use of fibers shall not change the water requirements of the mix.
      (6) Conform to the manufacturer's recommendations for the quantity of fiber, which shall be not less than the minimum requirements of 2.02 T.1.b.1 and 2.02 T.1.b.2.
      (7) Arrange for the fiber manufacturer to provide the services of a qualified representative at the pre-concrete construction meeting and for the first two days of fibrous concrete placement production.
2. Structural Polypropylene/Polyethylene Macro Fibers
   a. Use one of the following products, subject to compliance with the Contract requirements:
      (1) "Tuf-Strand SF", as manufactured by Euclid Chemical Company.
      (2) "Strux 90/40", as manufactured by W.R. Grace & Company.
      (3) Or approved equal.
   b. Additional requirements:
      (1) Dosage rate shall be a minimum of 4.0 lb./cu. yd. Higher dosages may be noted on Contract Drawings.

(2) The minimum length shall be 1.50 inches.

(3) Fiber shall have an Aspect Ratio of 50 to 90.

(4) Conformance with ASTM C 1116, designation Type III, 4.1.3.

(5) The structural macro fiber concrete shall have an average residual strength of 200 psi when tested in accordance with ASTM C 1399.

(6) Use of fibers shall not change the water requirements of the mix.

(7) Conform to the manufacturer's recommendations for the quantity of fiber, which shall be not less than the minimum requirements of 2.02 T.2.b.1.

(8) Arrange for the fiber manufacturer to provide the services of a qualified representative at the pre-concrete construction meeting and for the first two days of fibrous concrete placement production.

U. Expansion Joints (Except for Bridge Decks) and Contraction Joints (Except for Pavements)

1. Vinyl plastic water stops shall be of types and sizes shown on the Contract Drawings and conforming to Corps of Engineers "Specifications for Polyvinylchloride Waterstop" (Designation: CRD-C 572-60, latest revision).

2. Premoulded expansion joint filler, when shown on the Contract Drawings:

   a. Cork type shall be ASTM D 1752, Type II.

   b. Bituminous type shall be ASTM D 1751.

3. Joint Sealant when shown on Contract Drawings: Federal Specification SS-S-1401, latest revision.

2.03 MIX PROPORTIONS

A. Develop mixes in accordance with the latest editions of ACI 211, ACI 301 and ACI 318 to achieve the proportion performance criteria in accordance with the Contract Documents, with a degree of excess as determined by Chapter 5 of ACI 318, and meet all of the applicable performance criteria as specified in the Contract Documents. In addition, all concrete placed underwater shall conform to ACI 304R, Chapter 8, and lightweight aggregate concrete shall conform to ACI 213. Submit an underwater concrete placement procedure that is in conformance with ACI 304R, Chapter 8. Prior to concrete construction and after approval of all materials to be used in the concrete, submit a mix proportion showing that all performance criteria have been met. Mix proportions submitted shall be based upon laboratory trial mix test results and/or mixes successfully used within the two years preceding the date of the submittal of the mix for the Work of this Section. The independent testing laboratory used to develop the mix proportions and to perform testing shall have AASHTO Accreditation for all test methods required to be performed and to develop the required mix. Submit proof of certification to the Engineer prior to the start of development of the mix proportions and testing. The mix proportions shall include copies of test reports, including test dates, and a complete list of materials, including type, brand and source. The trial mix design performed in the testing laboratory shall use the same materials, cement, pozzolons, aggregates and admixtures that will be used at the proposed batch plant. Show fineness modulus, gradations and absorptions of aggregates. If any of the approved mix constituents change in source, properties or proportion, submit a new mix. The mix proportions shall also conform to the following:

1. Substitute either fly ash or slag at the minimum rate of 20% by weight of cement. The maximum rates of substitution shall be 30% for fly ash and 40% for slag, unless otherwise approved by the Engineer. Fly ash and slag substitution in the same mix may be permitted upon approval by the Engineer.

2. For concrete placed underwater, the minimum cementitious material content shall be 700 pounds per cubic yard of concrete.

3. Compute water to cement ratio using the weight of cementitious material that is equal to the total weight of cement plus fly ash, slag and silica fume. Any admixtures which increase the water to cement ratio by 0.01 or greater shall be accounted for in the mix proportion to meet the specified water to cement ratio.

4. For Categories II, III and IV concrete applications, the mix water to cement ratio shall not exceed 0.40 and the absolute drying shrinkage at 28 days shall not exceed 0.04% in accordance with ASTM C 157 (Air Drying Method), modified to start measuring at 10 hours. In addition for Categories III and IV, the maximum Coulomb count at 28 days shall be 1,000 for mixes without calcium nitrite and 1,500 when the mix contains calcium nitrite. For mixes that do not have silica fume, latex or metakaolin but contain either fly ash or slag, the Coulomb count requirements shall remain the same; however, the test shall be performed at 90 days instead of 28 days. For concrete pavements and Categories I and V applications where the concrete will be exposed to freeze-thaw cycles and/or sulfates, the mix proportion water to cement ratio shall not exceed 0.40 and the absolute drying shrinkage at 28 days shall not exceed 0.04% in accordance with ASTM C 157 (Air Drying Method). For other concrete applications, the mix water to cement ratio shall not exceed 0.50, unless otherwise shown on the Contract Drawings.

5. High Range Water Reducer shall not be added to the concrete mix at the plant. It shall be delivered to the construction site in a tank fixed to the truck that discharges directly into the mixing drum, or it may be added to the drum from a calibrated dispensing unit. A calibrated dispensing unit shall be defined as a manufactured dispenser with clear volume indications marked on the outside of the unit. It shall be available at all times during the concrete placement for re-dosing purposes. Submit a re-dosing chart showing the dosages necessary to increase the slump, in inches per cubic yard of concrete remaining in the drum, over the range of concrete temperatures from 50 deg F to 90 deg F. If re-dosing occurs, the re-dosing chart shall be used, but under no circumstances shall the total dosage exceed the maximum dosage recommended by the manufacturer. The truck shall mix the load for a minimum of an additional 5 minutes prior to releasing the load.

6. The percentage of air in the mix shall fall within the range of the Lower Quality Limit (LQL) and the Upper Quality Limit (UQL) as outlined in the table shown in 2.04 A.6 entitled "Air Content Target Range for Freshly Mixed Concrete". Air content shall be determined by testing in accordance with ASTM C 231 for normal and heavyweight concrete mixes and ASTM C 173 for porous, lightweight aggregate.

7. Make adjustments to the weight of coarse, lightweight aggregate in accordance with the following:

   a. Design lightweight concrete mix proportions not to exceed 123 pounds per cubic foot, unless otherwise specified.

   b. Adjust the proportion of lightweight aggregate to compensate for the difference between the wet unit weight determined in 3.05 B.5 and the dry unit weight of the material submitted in accordance with 1.05 A.1 and the approved mix proportions.

c. For lightweight aggregate mixes, advise the batch plant 72 hours prior to pouring in order to saturate the aggregate. Presoak lightweight coarse aggregate a minimum of 72 hours prior to mixing of concrete. The lightweight aggregate shall reach an absorbed moisture content not less than the manufacturer's written recommendations or the concrete will be rejected.

B. Where Latex Modified Concrete is specified in the Contract Documents, conform to ACI 548.4. The mix maximum water to cement ratio shall not exceed 0.37. The minimum volume of coarse aggregate shall be not less than 7.6 cubic feet (absolute volume) per cubic yard.

C. Architectural Concrete

Concrete that will be permanently exposed to view and which therefore requires special care in selection of concrete ingredients including color, forming, placing, consolidating and finishing to obtain the desired architectural appearance is designated as "Architectural Concrete".

1. A minimum of 35 days prior to construction of a mock-up, submit mix proportions and two sample panels (a minimum of 12" x 12" x 2") for each mix to the Engineer for approval. The materials used for the sample panels shall be from the same sources of material supply for all constituents in the approved mix. When requested by the Engineer, submit samples of all constituents for trial batching to the Port Authority Materials Engineering Unit to verify that the physical property requirements are met. Obtain approval for both sample panels for color and texture, as well as for the mix proportions for physical properties prior to constructing a mock-up.
2. Pigments, in conformance with ASTM C 979, shall be used when matching the color of existing concrete or when a specific color of concrete is required by the Engineer.
3. Construct mock-up only after the Engineer has approved both the mix proportions for physical properties and the sample panels for color and texture. For cast in place concrete, a mock-up in accordance with ACI 303.1 Section 1.6 Quality Assurance will be required for approval by the Engineer. For walls, a mock-up shall include all details that will be encountered in a typical day's pour. The mock-up may be constructed at the construction site as part of the permanent Work at the sole risk of the Contractor. If the Engineer rejects the mock-up, it shall be removed and recast at the sole expense of the Contractor. For precast architectural concrete, the mock-up shall consist of a full member selected in advance by the Engineer. Keep the approved mock-up at the precast concrete production facility for the Engineer to compare with the production units for acceptance or rejection. Acceptance or rejection shall be determined solely by the Engineer.
4. Construct mock-ups only with all of the actual constituents of the approved mix proportions. Do not proceed with production until the mix proportions, sample panels, full-scale mock-up and shop drawings have been approved by the Engineer. Once production begins, do not change suppliers or sources of supply for any of the constituents in the approved mix for the duration of the Contract.
5. In addition to the mix proportions and sample panels, submit the following for approval: forms, form liners and form oil or release agents.
6. Architectural Concrete shall conform to the Quality Assurance performance criteria specified in 4.01 B, Table 2 for the appropriate placement application and the associated Quality Acceptance Limits specified in 2.04.

7. Noticeable differences in color and/or texture of the finished product, as determined solely by the Engineer, shall be corrected by means and materials approved by the Engineer.

D. Pipe Piles: The target range for slump shall be 4 to 6 inches.

2.04 QUALITY ACCEPTANCE LIMITS

A. Develop mixes to meet the following performance criteria Quality Acceptance Limits in accordance with the relevant application properties specified in 4.01.B., Table 2, unless otherwise noted on the Contract Drawings:

1. Compressive Strength (ASTM C 39): The Lower Quality Limit, LQL, shall be the specified mix compressive strength at 28 days, unless otherwise noted on the Contract Drawings.
2. Flexural Strength (ASTM C 78): The Lower Quality Limit, LQL, shall be 700 psi at 28 days, unless otherwise noted on the Contract Drawings.
3. Permeability (AASHTO T 277): The Upper Quality Limit, UQL, shall be 1700 Coulombs for mixes not containing a corrosion inhibitor and 2200 Coulombs for mixes that do contain a corrosion inhibitor. Performance testing shall be performed at 28 days, except for mixes containing only fly ash and/or slag substitution for cement but no silica fume or metakaolin, which shall be evaluated at 90 days.
4. Bond Strength (ASTM C 1583): The Lower Quality Limit, LQL, shall be 150 psi at 28 days.
5. Water Content (AASHTO T 318): The Upper Quality Limit, UQL, for water content shall be the specified water to cementitious ratio specified in 2.03 A.4 plus 0.05.
6. Air Content (ASTM C 138, ASTM C 173 or ASTM C 231): Both the Lower Quality Limit, LQL, and the Upper Quality Limit, UQL, shall be as specified in the table below:

AIR CONTENT TARGET RANGE FOR FRESHLY MIXED CONCRETE

MAXIMUM SIZE AGGREGATE (SIZE #)	AIR CONTENT LQL	AIR CONTENT UQL
2" or above (# 467 and above)	3.5%	7.5%
1-1/2" (# 57)	4.0%	8.0%
1" (# 67)	4.5%	8.5%
1/2" (# 8)	5.5%	9.5%
3/8"	6.0%	10.0%
Latex modified concrete	2.5%	6.5%

Note: For a specified compressive strength greater than 5000 psi, the LQL and UQL for air content, as indicated above, shall both be reduced by 1.0%. For all concrete applications not exposed to freeze-thaw cycling or chlorides, no air entrainment is required.

7. Chloride Ion Concentration by Weight of Cementitious Material (ASTM C 1152, ASTM C 1218, ASTM C 114, ACI 222R): The acid soluble chloride ions by weight of cementitious material in the concrete mix shall be less than or equal to 0.10% for reinforced concrete and 0.08% for prestressed concrete, as per ACI 222R. The water soluble chloride ions by weight of cementitious material in the concrete mix shall be less than or equal to 0.08% for reinforced concrete and 0.06% for prestressed concrete, as per ACI 222R.

8. Pavement Thickness: The Lower Quality Limit, LQL, for pavement thickness shall be 97.0% of the thickness shown on the Contract Drawings.

9. Delaminations: The total surface area tested for any given Lot of concrete shall indicate less than 5.00% delaminated area when tested using the chain drag in accordance with ASTM D 4580.

B. For concrete bridge decks where riding surface tolerances are required, as shown on the Contract Drawings, the following requirements shall be met:

1. Surface smoothness deviations shall not exceed 1/4 inch in 16 feet.

2. Vertical deviation from the grade shown on the Contract Drawings shall not exceed plus or minus 0.04 foot at any point.

C. For mass concrete as defined in ACI 207 or as specified on Contract Drawings the temperature at the core of the in situ concrete shall not exceed 160 deg F nor shall the maximum difference in temperature between the core and the surface of the structure exceed 35 deg F at any time. The drop in temperature in the first 24 hours after the end of protection shall not exceed the limits of ACI 306R Table 3.1.

D. Unless otherwise specified on the Contract Drawings, the above specified Quality Acceptance Limits will be used to calculate Adjustments to Contract Compensation in accordance with Part 4 of this Section.

PART 3. EXECUTION

3.01 SURFACE PREPARATION

A. Bonded Overlays and Patching Applications

1. Bond strength tests will be performed by the Engineer in accordance with ASTM C 1583, using 4-inch by 4-inch steel plates, to determine the adequacy of the surface preparation. A minimum average bond strength of 200 psi shall be attained, with no single test value less than 180 psi. If time does not permit the above test to be performed, as determined solely by the Engineer, the Engineer will measure the macrotexture depth in accordance with ASTM E 965. A minimum of four tests will be performed and the average macrotexture depth shall be a minimum of 0.06 inches. Prior to the placement of any overlay or patching material, obtain the Engineer's approval of the surface preparation.

B. Latex Modified Concrete and Silica Fume Concrete

1. The Engineer will sound the concrete surface to identify areas of unsound or deteriorated concrete. Areas so identified shall be removed to the limits and depths as ordered by the Engineer. Perform abrasive blasting of all exposed reinforcing steel that is to remain in place.

C. Construction Joints (excluding joints in pavements)

1. Number, locations and details shall be as shown on the approved shop drawings.

2. Planes of joints shall be normal to direction of pressure and shall include suitable keys and dowels.

3. Locate joints at points of minimum shear, unless otherwise shown on approved shop drawings or directed by the Engineer.

4. Avoid lips and other irregularities between adjoining sections of concrete. Secure forms tightly against previously placed concrete.

D. Expansion and Contraction Joints (excluding joints in pavements)

1. After curing concrete, clean grooves or saw cuts to receive joint sealant by scrubbing with a mechanical wire brush to loosen dirt and other foreign matter and blowing out loose matter with compressed air.

2. Install joint sealant to finish flush with concrete surface, except where otherwise shown on the Contract Drawings.

E. Preparation for Placing Concrete (excluding pavements)

1. Straighten bent dowels, whether placed under this Contract or by others, using tools approved by the Engineer. Do not apply heat to dowels.

2. Clean all dowels and all steel, that will be embedded in concrete, of all loose rust, scale, paint, grease and other objectionable materials.

3. Examine coated reinforcement for integrity of coating. Repair all damaged areas in accordance with the requirements of Specification Section 03200 entitled "Concrete Reinforcement". Make the repair crew available at the time of examination.

4. Check all formwork locking devices to ensure that they are in place and properly secured.

5. Do not place concrete for piles, footings, pile caps or slabs supported on pile caps or piles until the pile survey has been completed and additional reinforcing steel, if necessary, has been added as directed by the Engineer.

6. For preparation of surfaces to receive concrete, conform to the Contract Drawings for all procedures, equipment limitations and requirements to be performed prior to placing concrete.

7. Do not place concrete for slabs-on-grade, grade beams or footings until the subgrade has been inspected and approved by the Engineer, and until any base course or fill has been properly compacted in accordance with the Contract requirements.

8. Provide vent holes (1/4 inch diameter, minimum) edge angles or embedded plates at joints where vibrating alone will not ensure elimination of voids. Locate such holes at high points and with uniform spacing along joints for escape of air during concreting operations. Evidence of voids adjacent to embedments will be cause for rejection of work. Submit all vent holes and procedures for placement of concrete at joints with the shop drawings for review and approval.

9. Make provisions for the concrete to pass through the reinforcing steel without segregating during placement.

F. For preparations for placing concrete pavements, see Section 02513 entitled "PLACEMENT OF PORTLAND CEMENT CONCRETE PAVING (FAA)".

3.02 BATCHING AND MIXING CONCRETE

A. Measurement of Proportions

1. All concrete batching shall be in conformance with ASTM C 94 and ACI 304R.

2. For Very High Early Strength Concrete requiring 2000 psi or greater in 6 hours or less time, the method of batching will be restricted to a calibrated mobile mixer, or to a transit mixer that is loaded at the construction site with bulk bags of the Very High Early Strength Cement. Bulk bags shall contain sufficient Very High Early Strength Cement by weight to batch for a minimum of 3 cubic yards of concrete.

B. Mixing Concrete

1. Arrange for transit mix trucks to be inspected and approved annually by either the New Jersey or New York State Departments of Transportation.

   a. Mixers shall be equipped with a metal plate attached by the manufacturer, indicating the volume of mixed concrete the equipment is intended to produce. The quantities of materials transported and the volume of mixed concrete produced shall not exceed the mixer's rated capacity. In locations where the rate of depositing is slow, the Engineer may restrict the volume of concrete that may be mixed in a mixer to a volume less than the manufacturer's rated capacity of the mixer.

   b. Immediately repair or withdraw from use any mixer which is determined to be mechanically unsatisfactory.

2. If truck mixers are used, keep available a sufficient number to ensure continuous delivery of the concrete at the rate required for the proper handling, placing, finishing and curing of the concrete. If a plant at the construction site is used, it shall be of sufficient capacity to meet such requirements.

   a. Mixers shall be of the revolving-drum type, with drums suitably mounted and fitted with adequate blades capable of discharging the mixture without segregation. All truck mixers shall be equipped with an accurate, operable counter to measure the number of drum revolutions and an accurate, working water site gage or manometer to measure the volume of water introduced into the drum. Truck mixers without an accurately operating counter or water site gage shall be immediately withdrawn from use.

3. The Engineer may permit one re-tempering of the concrete subject to the following:

   a. When the measured water content in the batch is less than the water in the approved mix proportion.

   b. The redosage of high range water reducer shall conform to the Engineer-approved redosage chart and shall not exceed the manufacturer's recommended limitation, nor shall it retard the initial set of the concrete by more than 30 minutes.

   c. When air content is below the lower quality limit specified in 2.04 A.6.

4. The Engineer may reject concrete in the following instances:

   a. Concrete has not been placed within 90 minutes from the time the cement had first contact with water.

   b. Concrete temperature reaches 92 deg F.

   c. The mix appears to be segregated.

5. The Engineer will reject concrete subject to the following:

   a. Concrete that has partially hardened or has attained its initial set prior to placement.

   b. The water to cement ratio as determined by AASHTO T 318 exceeds that given in 2.03 A.4 by 25%.

6. Construction Site Mixing: Measure mix components in accordance with tolerances given in ASTM C 94. Weigh all non-liquid components and measure all liquid components immediately prior to batching. Use a calibrated flask with clear indication markings for ounces, pints, etc. when measuring liquid components. Measures without calibrated clear indication markings will not be permitted. Mix concrete materials in an approved drum-type batch machine mixer.

   a. For a mixer capacity of 1 cubic yard or less, continue mixing a minimum of 3 minutes, but not more than 5 minutes after ingredients are in the mixer and before any portion of the batch is released.

   b. For a mixer capacity of greater than 1 cubic yard, increase the mixing time by 1 minute for each additional 1 cubic yard.

   c. Provide a batch ticket to the Engineer for each batch discharged and used in the Work, indicating the Contract number and title, date, time, mix type, mixing time, quantity of each constituent, volume of concrete and amount of water added. Record a location of the deposit in the structure that can be easily identified.

C. Mobile Mixers: When application requires the use of a mobile mixer, it shall meet the following criteria:

1. Proportioning and Mixing Equipment

   a. Mixer shall be a self-contained, self-propelled, continuous mixing type capable of carrying sufficient unmixed dry cement, aggregates, water and admixtures to produce not less than 6 cubic yards of concrete. Maintain a calibrated back-up unit at the construction site ready for use.

   b. Mixer shall be capable of positive measurement of cement being introduced into the mix. A recording meter, visible at all times and equipped with a ticket printout, shall indicate this quantity.

   c. Mixer shall provide positive control of the flow of water and admixtures. Water flow shall be indicated by flow meter and shall be readily adjustable to accommodate minor variations in aggregate moisture.

   d. Mixer shall be capable of being calibrated to automatically proportion and blend all components of indicated composition on continuous or intermittent basis as required by the finishing operation, and shall discharge mixed material through a chute directly in front of the finishing machine. Notify the Engineer a minimum of 48 hours prior to calibration of the mobile mixers. Before approving the calibration of the mobile mixer, the Engineer will witness the calibration of the mobile mixer. However, the Contractor is responsible for testing the mix produced. Allow the Engineer to test the concrete mix at any time.

e. Calibrate mixer to accurately proportion the specified mix. Certification of calibration by an Engineer approved testing agency will be accepted as evidence of this accuracy, provided such certification attests the yield to be true within the following tolerances (by weight):

Coarse Aggregate	+/- 2%
Fine Aggregate	+/- 2%
Cement	+/- 1%
Water	+/- 1%
Admixtures	+/- 3%
Latex	+/- 1%

f. Mix in accordance with the specified requirements for the equipment used. The concrete, as discharged from the mixer, shall be such that finishing operations can proceed at a steady pace with final finishing completed before the formation of the plastic surface film.

g. Repair mixers not functioning in a manner the Engineer considers acceptable. If repair is not practical, remove the mobile mixer from the construction site and replace it with one which functions properly.

h. Prior to production, test the moisture content of the fine aggregate and coarse aggregate. Adjust the water gage setting only in the presence of the Engineer, to produce the approved mix water to cement ratio. Test the moisture content of the fine aggregate and coarse aggregate every 3 hours during production, or when the mobile mixer is loaded with aggregates from a stockpile different from the one for which moisture content tests were performed, whichever occurs first. Make adjustments in the presence of the Engineer. For Latex Modified Concrete, the maximum permissible moisture content of fine aggregate and coarse aggregate shall be 6.0% and 3.0%, respectively, as determined in accordance with ASTM C 566. If these limits are exceeded, stop concreting operations until drier aggregates are obtained. Allow the Engineer to view and copy all records for moisture content testing at any time.

3.03 PLACEMENT FIELD REQUIREMENTS

A. During all concrete placements at the construction site, the Contractor shall have an individual in a supervisory capacity present with a valid certification from one of the following programs:

1. ACI Concrete Transportation Construction Inspector or Concrete Construction Special Inspector.
2. New Jersey ACI Chapter's "Concrete Construction Technology" course.

B. Prior to any construction site delivery of concrete, furnish, deliver and maintain insulated curing boxes of sufficient size and strength to contain all the specimens (cylinders and beams) made by the Engineer in any two (2) consecutive Work periods. Such boxes shall be equipped to regulate the temperature in the range of 60 deg F to 80 deg F or 68 deg F to 78 deg F when the design compressive strength is 6000 psi or greater, and to provide the moisture to maintain the curing conditions specified in ASTM C 31. During hot weather when the temperature is greater than 80 deg F, maintain the temperature of the concrete specimens in the required range by immersing them in a water bath. Cover the water bath to prevent direct sunlight from raising the water temperature. Completely remove and replace the water in the bath every day. Locate the boxes where directed by the Engineer. Protect boxes from vibration and other disturbances during specimen curing.

C. Keep this Specification and the following ACI publications available at all times at the construction site:

1. ACI 301.
2. ACI 302.1R.
3. ACI 305R.
4. ACI 306R.
5. ACI 308.
6. ACI 309R.
7. ACI 318.

D. Ensure that the concrete supplier keeps this Specification and the following ACI publications available at all times at the batching location:

1. ACI 211.
2. ACI 213.
3. ACI 304R.

E. Bonding New Concrete to Existing Concrete

Where new concrete will be placed against existing concrete surfaces:

1. Surface to receive concrete shall be soaked and kept wet with water for one (1) hour prior to placement of material. Puddles of standing water shall be removed immediately prior to placement.
2. A thin layer of material from the leading edge of the concrete being placed shall be broomed into the wetted surface. Care shall be exercised to ensure that all vertical as well as horizontal surfaces receive a thorough, even coating and that the rate of progress is controlled so that the broomed material does not dry before being covered with additional material as required for final grade.

F. Placing Concrete (excluding pavements)

1. Place concrete only in the presence of the Engineer and by methods approved by him.
2. For concrete cast against earth or an approved compacted subgrade, and for concrete overlays, place concrete against surfaces in a saturated surface dry condition.
3. Prior to placing concrete, remove all standing water or puddles.
4. Do not place concrete on or next to frozen surfaces.
5. Transfer concrete from mixer to place of deposit as rapidly as practical to prevent formation of cold joints.

6. Use equipment and methods for placing which permit rapid placement of concrete of the required consistency and which preclude segregation.

7. The method and equipment used to transfer concrete from mixer to forms will be subject to prior approval by the Engineer. Do not use any pipes, chutes or other equipment made of aluminum.

8. Subject to the foregoing requirements, convey concrete by approved conveyors, pipes, chutes or spouts to a point not more than five feet horizontally or vertically from its final position, unless otherwise approved by the Engineer.

9. Concrete for fill in steel reinforced pipe piles, steel shells or caissons shall be deposited using a metal (not aluminum) hopper and an elephant trunk. The hopper and elephant trunk shall be set above the top of piles, steel shells or caissons to permit the escape of air as the concrete is placed. Elephant trunks shall be removed in sections while filling piles, steel shells or caissons from bottom of reinforcing cage to top of piles, steel shells or caissons. Elephant trunks shall extend a minimum distance of 10 feet below top of pile, steel shell or caisson or to bottom of reinforcing cage, whichever is greater. The top 15 feet of the concrete poured from the top shall be vibrated or rodded. No cold joints will be permitted during concreting operations, unless otherwise noted on the Contract Drawings.

10. Except where otherwise approved by the Engineer, consolidate concrete by internal mechanical vibration subject to the following:

    a. Type, number and method of application of vibrators will be subject to prior approval by the Engineer.

    b. Apply vibrators at points not more than 30 inches apart for time intervals of approximately 10 seconds.

    c. Do not use vibrators to move concrete horizontally.

    d. In locations where spading is approved in lieu of mechanical vibration, spade coarse aggregate away from the forms and into the plastic mass; rod concrete around embedded materials and into corners and spaces to be filled and use only approved equipment.

11. Prevent formation of laitance and accumulation of excessive water on surface of concrete as it is deposited. Remove any accumulated bleed water by approved means before placing other concrete.

12. Place concrete so as to require as little rehandling as possible. Place and spread concrete using an approved mechanical spreading device that prevents segregation of the materials. Place continuously between contraction joints. Perform necessary hand spreading with shovels, not rakes.

13. Deposit concrete as near to joints as possible without disturbing them but do not discharge onto a joint assembly unless placement is centered above the joint assembly.

14. Thoroughly consolidate concrete against and along the faces of all forms and previously placed concrete and along the full length and on both sides of all joint assemblies by means of vibrators inserted in the concrete. Do not permit vibrators to come in contact with a joint assembly, base course or a side form. In no case shall the vibrators be used to move the concrete.

15. Screed and float concrete for riding surfaces as it is placed and use an approved evaporation retardant or fog spray.

G. Concrete Placing and Finishing Equipment for Bridge Decks and other Riding Surfaces (except for FAA pavements)

1. For slab or overlays 8 inches or more thick use internal vibrators. Internal vibrators shall be gang-mounted and supplemented with manual vibrators subject to the following:

   a. Use manual, hand-held vibrators adjacent to joint assemblies and similar locations where gang-mounted vibrators are not practical.

   b. Check all vibrators prior to the start of Work and periodically during construction progress to verify that they are working properly.

2. For slab or overlays less than 8 inches thick, vibrating surface pans or screeds will be allowed.

3. Manual tools such as bull floats, trowels, brooms and other similar hand tools are acceptable.

H. For placement and finishing of concrete pavements, see Section 02513 entitled "PLACEMENT OF PORTLAND CEMENT CONCRETE PAVING (FAA)".

I. Consolidation and Finishing

1. Bridge Decks and other Riding Surfaces

   a. Machine finishing shall conform to NJDOT Standard Specifications for Road and Bridge Construction 2007 Subsection 1005.02, .03 and .04.

   b. Finishing at and adjacent to joints shall conform to NJDOT Standard Specifications for Road and Bridge Construction 2007 Subsection 405.03.02 Item C.

   c. Hand finishing methods will not be permitted, except under the following conditions: (1) in the event of breakdown of the mechanical equipment, hand methods may be used to finish the concrete already deposited on the grade; (2) in areas of narrow widths or of irregular dimensions where operation of the mechanical equipment is impractical. Concrete, as soon as placed, shall be struck off and screeded using an approved portable screed. Use a second screed shall for striking off the bottom layer of concrete when reinforcement is used.

      The screed for the surface shall be at least 2 feet longer than the maximum width of the slab to be struck off. It shall be of approved design, sufficiently rigid to retain its shape, and shall be constructed either of metal (not aluminum) or of other suitable material covered with metal. Consolidation shall be achieved by the use of suitable vibrators.

   d. After the concrete has been struck off and consolidated, it shall be further smoothed and trued by means of a longitudinal float using one of the following methods:

      (1) Long-handled floats shall be not less than 12 feet in length and 6 inches in width, stiffened to prevent flexibility and warping. The float shall be operated from foot bridges spanning but not touching the concrete or from the edge of the pavement. Floating shall pass gradually from one side of the bridge deck to the other. Forward movement along the centerline of the pavement shall be in successive advances of not more than one-half the length of the float. Any excess water or laitance in excess of 1/8-inch thick shall be removed and wasted.

(2) The Contractor may use a machine composed of a cutting and smoothing float(s), suspended from and guided by a rigid frame and constantly in contact with, the side forms or underlying surface. If necessary, long-handled floats having blades not less than 5 feet in length and 6 inches in width may be used to smooth and fill in open-textured areas in the pavement. When the crown of the bridge deck will not permit the use of the mechanical float, the surface shall be floated transversely by means of a long-handled float. Care shall be taken not to work the crown out of the pavement during the operation. After floating, any excess water and laitance in excess of 1/8-inch thick shall be removed and wasted. Successive drags shall be lapped one-half the length of the blade.

e. While the concrete is still in a workable condition, test it for trueness with a Contractor-furnished 16-foot straightedge swung from handles 3 feet (1 m) longer than one-half the width of the slab. The straightedge shall be held in contact with the surface in successive positions parallel to the centerline and the whole area gone over from one side of the slab to the other, as necessary. Advance in successive stages of not more than one-half the length of the straightedge. Any excess water and laitance in excess of 1/8-inch thick shall be removed from the surface of the bridge deck and wasted. Any depressions shall be immediately filled with freshly mixed concrete, struck off, consolidated and refinished. High areas shall be cut down and refinished. Special attention shall be given to ensure that the surface across joints meets the smoothness requirements set forth in 2.04 B. Straightedge testing and surface corrections shall continue until the entire surface is free from observable departures from the straightedge and until the slab conforms to the required grade and cross section. The use of long-handled wood floats shall be confined to a minimum; they may be used only in emergencies and in areas not accessible to finishing equipment. Test the surface across the joints with a 16-foot straightedge as the joints are finished and correct any irregularities in excess of 1/4 inch before the concrete has hardened.

2. Specified concrete finishes, as shown on the Contract Drawings, shall be in accordance with the following requirements:

a. "Smooth Finish": A surface of concrete obtained by the use of special forms as specified in Division 3 Section entitled "Concrete Formwork". Remove all fins and other irregularities in the exposed surfaces of concrete by rubbing the irregularities with a carborundum brick and clean fresh water. Any mortar patches shall be rubbed with a carborundum brick as above specified.

b. "Scored Finish": A surface of concrete obtained by roughening in an approved manner or by etching with sharp-pointed steel tools to key or otherwise improve the mechanical bond of the surface. Such scoring shall roughen at least ten percent of the area so scored.

c. "Float Finish": A surface of concrete obtained by the use of a wood float. Apply float finish to horizontal surfaces immediately after screeding and before initial setting has begun.

d. "Trowel Finish": A surface of concrete obtained by the use of a steel trowel, after screeding and floating the surface of the concrete to produce a dense, smooth, even surface suitable for painting or the application of floor covering. The troweling shall not take place until the surfaces have set sufficiently to sustain knee boards without damage. Troweling shall eliminate all irregularities and leave the concrete surface with a smooth, hard finish, free from marks and blemishes to the satisfaction of the Engineer.

e. "Traction Finish": A monolithic layer of abrasive concrete having a minimum thickness of 3/4 inch and which shall be "Emericrete SH", as manufactured by the Sika Corporation, or approved equal. Prepare the base and install the monolithic finish in accordance with the recommendations of the manufacturer of the abrasive concrete. The surface shall be given a wood float finish. The sides and edges of pavement slabs shall be rounded with an approved edging tool to the minimum radius obtainable in the sole opinion of the Engineer.

f. "Burlap Finish": A surface of concrete obtained by the use of a burlap drag, after screeding and floating the surface of the concrete. Drag the burlap in one direction in a straight line before initial setting has begun and in such a manner that the full width of the slab being finished is dragged in one operation. Prepare the surface prior to dragging by working from a bridge that does not come in contact with the fresh concrete at any point. The use of any burlap that causes irregularities or grooves greater than 1/16 inch in depth in the concrete surface will not be permitted. Rinse or wash burlap as often as is necessary to prevent the presence of hardened particles and consequent scarring of the concrete.

g. Stair treads and platforms of steel stairs shall be filled with mortar mixed in the proportions of one part Portland cement to three parts of fine aggregate, mixed with water to a satisfactory consistency. Coat the surface of the mortar with three pounds of aluminum oxide crystals per square yard of surface, uniformly applied, and trowel the surface to a smooth hard finish. Aluminum oxide crystals shall be grade AL203 crystals ranging from No. 12 to No. 30 in size and shall contain not more than six percent of iron or other impurities.

h. "Broom Finish" shall be subject to the following:

(1) Finish the concrete when the water sheen has practically disappeared. Use push broom or floor brush type, not less than 18 inches wide and made of good quality bass or bassine fibers not more than 4-1/2 inches long and with handles longer than half the width of the slab.

(2) Use an adequate number of brooms to keep up with other operations. Achieve proper finish prior to initial set of the concrete.

(3) Wash and thoroughly dry brooms at frequent intervals and remove worn or damaged brooms from the construction site.

(4) Draw broom across previously finished surface from the centerline to each edge of the slab with a slight overlap of strokes.

(5) Corrugations made in surface shall be uniform, approximately 1/16 inch in depth, and not more than 1/8 inch in depth.

(6) Complete brooming before concrete reaches a condition that would result in the surface becoming torn or unduly roughened and before initial set of concrete.

(7) Immediately following brooming, carefully finish the edges of slab along sides and at joints with an approved edging tool to form a smooth rounded surface of required radius and subject to the following:

(a.) Where corners or edges of slabs have crumbled and at any areas which have leaked sufficient mortar to make proper finishing difficult, remove loose fragments and soupy mortar, fill solidly with a mixture of correct proportions and consistency and finish.

(b.) Edges shall be smooth, true to line and free of unnecessary tool marks.

i. "Saw Cut Grooved Surface" for deck slabs and overlays shall conform to the requirements of the NJDOT Standard Specifications, Division 500 Subsection 507.03.02, Item L.

j. Concrete Curbs and Sidewalks

(1) Give sidewalks a "Float Finish", tool edges and joints for a width of 2 inches and round corners to a radius of 1/4 inch with an approved edging tool.

(2) Install expansion joints at not more than 20-foot intervals in sidewalks with matching joints in curbs. Use 1/4-inch bituminous joint filler.

(3) Score sidewalks in squares as approved by the Engineer.

J. Pump Concrete

1. Grout used to prime the pump line shall not be included in the placement. Dispose of the grout at the end of the pump line off Authority property. Do not begin placement until concrete is visible at the end of the pump line.

2. Allow no water to enter the pump hopper at any time during placement operations.

3. Submit written procedures for pumping to the Engineer for approval. The procedures shall contain, but shall not be limited to, pumping scheme, pump description, line diameter, line length and the number of turns and line offsets.

K. Silica Fume Concrete and Fibrous Concrete

1. Arrange for qualified technical representatives from the silica fume and the fiber suppliers, who are experienced in the batching and placement of silica fume and fibrous concrete, to be present for the pre-concrete construction meeting, all test pours and the first two production pours.

L. Fog spray forms, steel reinforcement and subgrade with potable water immediately prior to the placement of fresh concrete. Maintain uniform moisture of the subgrade without standing water, soft spots or dry areas.

3.04 CURING

A. Carefully cure all concrete. Submit a curing procedure plan for approval by the Engineer prior to placing any fresh concrete. Perform curing in accordance with ACI 308 and the following specifications. Commence curing procedures immediately after fresh concrete has been placed.

1. Provide suitable means, such as insulating blankets or heated enclosures, for maintaining a concrete temperature of at least 50 deg F after placement. At the end of this period, remove protection in such a manner that the drop in temperature of any portion of concrete is gradual and does not exceed the following within the first 24 hours after removal of protection, in accordance with ACI 306R, Table 3.1: 50 deg F for applications with a minimum dimension less than 12 inches; 40 deg F for applications with a minimum dimension between 12 and 36 inches; 30 deg F for applications with a minimum dimension between 36 and 72 inches; and 20 deg F for applications with a minimum dimension greater than 72 inches.
2. Allow all concrete to attain 4,000 psi compressive strength before exposure to freeze-thaw cycles.
3. Choice of curing material and method shall be as approved by the Engineer.

B. Wet Curing

1. All pavement concrete and structural slabs: Immediately after screeding of the concrete, apply an evaporation retardant, or commence the operation of a fog spraying system to keep moisture in the atmosphere surrounding the concrete until all concrete finishing has been completed. Do not direct fogging at the fresh concrete and do not permit ponding of water on the fresh concrete surface.
2. Perform wet curing for the following concrete applications: overlays, deck slabs, ramps, any concrete mixes containing silica fume, Very High Early Strength Cement and formulated latex modifier.
3. Immediately after finishing concrete, cover the surfaces with wet burlap or cotton mats which have been presoaked for a minimum of 24 hours in potable water, so that no marring of the surface occurs. Keep the burlap or cotton mats continuously moist, 24 hours per day, through the use of a fog spraying system or soaker hoses arranged at the high points of the concrete pour. Burlap, which shall consist of two or more layers, or cotton mats shall overlap a minimum of one foot, and shall be at least one foot longer than necessary to cover the entire width and edges of the pavement lane. The burlap or cotton mats shall be weighted down to prevent displacement.
   a. Inspect sheet material before reuse. Repair all holes and tears with cemented patches, subject to approval by the Engineer.
4. Wet curing procedures may be stopped only (1) when the ambient temperature is expected to fall below 35 deg F within 24 hours, (2) when placing concrete for slabs directly adjacent to the fog spraying system or soaker hoses or (3) when concrete is to receive traffic.
   a. When the ambient temperature at the surface of placement is 35 deg F and falling, wet curing will not be permitted; instead, apply a liquid membrane forming curing compound in accordance with 2.02 R and 3.04 C.1.a.

b. When wet curing is temporarily interrupted for an adjacent placement, remove all standing water in areas to receive fresh concrete prior to placement. Occasionally spray a fine mist of water over the wet curing areas. Do not puddle water on the surface of the fresh concrete. When the fresh concrete is finished and covered with burlap or cotton mats, reassemble the continuous fog spraying system or soaker hoses and continue wet curing immediately.

c. Areas in which the concrete will be exposed to traffic shall be wet cured for as long as possible. Wet curing may stop only when there is just enough time to apply a liquid membrane forming curing compound over the entire area prior to reopening it to traffic. In this case, apply the liquid membrane forming curing compound when the surface has no standing water or puddles on the surface, but is in a damp condition.

5. Wet cure for 7 days, or until 75% of the design compressive strength is obtained, whichever is longer, when determined by strength tests performed on sample cylinders cast in the field and cured in the same manner as the concrete.

6. Immediately after wet curing procedures are completed, apply a liquid membrane forming curing compound in accordance with 2.02 R and 3.04 C.1.a.

7. Contain water within the area of work.

8. For latex modified concrete, wet cure for a maximum of 48 hours, unless otherwise directed by the Engineer.

C. Liquid Membrane Forming Curing Compounds and Sheet Materials for Curing

1. Immediately after placing or finishing, commence the curing process of concrete not covered by forms from loss of moisture. Use one of the curing materials listed in 2.02 R, which may be supplemented by initially using an evaporation retardant listed in 2.02 S, as long as wet curing is not required, subject to the following:

a. Apply white pigmented liquid membrane forming curing compound as soon as surface moisture has evaporated by approved pressure spraying or distributing equipment in two uniform full applications perpendicular to each other as recommended by the manufacturer. Allow the first coat to become tacky before applying the second coat. Each application shall be the full quantity recommended by the manufacturer. The entire surface shall be white after the second application.

(1) Recoat areas subjected to heavy rainfall within 3 hours after rain.

(2) Follow manufacturer's recommendations for agitation during application and warming where necessary during cold weather. Do not use liquid membrane forming curing compound where the surface being cured is to receive a finish that will be bonded to the concrete surface or where a floor hardener is to be applied, unless a certification of compatibility and a minimum five-year performance record is submitted in advance to the Engineer for approval.

(3) The Engineer will check for uniformity through random sampling and testing. Testing may include determination of membrane infrared spectrum, pH, specific gravity and solids content.

2. Removal of Forms

Removal of forms shall be subject to the following:

a. Remove forms in accordance with the requirements of Specification Section 03100 entitled "Concrete Formwork" or Section 02513 entitled "Placement of Portland Cement Concrete Paving (FAA)".

b. After removal of forms, patch areas of concrete which in the opinion of the Engineer show excessive honeycomb by cutting out defective areas, keying and refilling them with a mortar of cement and sand in the same proportions as those in the approved concrete mix design and sufficient water to provide a workable mix.

c. After forms are removed, cure sides of slabs greater than 12 inches in thickness in accordance with 3.04 C.

d. Immediately after removal of forms, holes and voids in the surfaces of concrete, resulting from bolts and ties, shall be wetted and filled with a mortar containing cement and fine aggregate in the same proportions as in the approved concrete mix design, and utilizing cement which shall produce mortar of the same color as the concrete. Exposed mortar surfaces shall then be finished smooth and even with a wood float, except that those surfaces exposed to view in the finished structure shall be finished with a steel trowel to match adjacent surfaces. All fins and other surface irregularities shall be removed promptly by chipping, grinding or other methods approved by the Engineer to give a uniform finish. Where no specific surface finish for formed concrete surfaces is indicated on the Contract Drawings, no further finishing will be required.

e. Drop in concrete surface temperature over the first 24 hours shall be controlled in accordance with ACI 306.

3.05 QUALITY ASSURANCE TESTING, SAMPLING AND INSPECTIONS

A. The Engineer will perform Quality Assurance testing during mixing and placing of concrete on samples taken from the end of the pump line or at the point of discharge in accordance with ASTM C 172. The Engineer will take samples of concrete from each Lot during a single Work period based on random sampling procedures contained in ASTM D 3665. A Lot of concrete is defined as the production of a single Work period. For each Sublot, the Engineer will cast cylinders in accordance with ASTM C 31 when testing for compressive strength, as well as 4" x 8" cylinders when permeability is being tested and beams when flexural strength is being tested. The cylinders and beams will be tested in accordance with ASTM C 39 and ASTM C 78, respectively, for each Sublot to determine the compressive strength and flexural strength at the time requirements specified.

TABLE 1

LOTS AND SUBLOTS

Daily Placement Quantity (Cubic Yards)	Number of Lots	Number of Sublots
Less than 50	Note 1	Notes 1 and 3
50 – 100	1	3 equally divided
101 – 450	1	4 equally divided
Greater than 450	1	Note 2

Table 1 Notes:

1. If one Work period's placement of a given Class of concrete is less than 50 cubic yards, it will not constitute a Lot. It will be added either to the previous or the next Work period's Lot, whichever is closer in time, or until a minimum of 3 Sublots are completed constituting a Lot.

2. For concrete placements of 450 cubic yards or greater, a Sublot will be deemed to be one fourth of a Lot of concrete, or 150 cubic yards of concrete, whichever is less. For larger pours the Engineer may increase the number of cubic yards that constitute a Sublot.

3. If the total concrete quantity under the Contract for any type of mix is less than 50 cubic yards, it will constitute one Lot and will be divided into a minimum of 3 Sublots, regardless of the placement schedule.

B. Quality Assurance Testing Standards and Frequency of Testing: Some or all of the following procedures will be used by the Engineer to approve the concrete mix proportions and evaluate the in-place concrete for Adjustments to Contract Compensation:

1. Compressive Strength: In accordance with ASTM C 31 and ACI 318 Part 3, Chapter 5, Item 5.6, entitled "Evaluation and Acceptance of Concrete", except that the Engineer will take samples on a random basis and 4" x 8" cylinders will be used when the nominal maximum size of the coarse aggregate allows. Latex Modified Concrete samples will be wet cured by the Engineer for 1 day and dry cured for 27 days. The cylinders will be tested in accordance with ASTM C 39. The Engineer will calculate the average of two test specimens at the compressive strength time requirement. The average of the two test specimen result values for each Sublot will be considered the Sublot compressive strength value.

2. Flexural Strength: From each Sublot sample, cast beams in accordance with ASTM C 31. The Engineer will test the beams in accordance with ASTM C 78 and will calculate the average of two test specimens at the flexural strength time requirement. The average of the two test specimen result values for each Sublot will be considered the Sublot flexural strength value.

3. Slump Test: Performed by the Engineer at the point of delivery during the time of placement in accordance with ASTM C 143 or ASTM C 1611 when self-consolidating concrete is used. For Latex Modified Concrete, the Engineer will perform slump tests 5 minutes after sampling from the mixer. For pile concrete applications, the slump shall be no less than 4 inches and no greater than 6 inches.

4. Air Content Test: Performed during the placement in accordance with ASTM C 138, ASTM C 173 or ASTM C 231. The Engineer will perform one test for each Sublot, which will be considered the Sublot air content test value.

   a. When results for either two consecutive tests or three tests in one lot or one day's production indicate that the air content is outside the Quality Limits specified in 2.04 A.6 by +1.0 or –0.50% do not place the next load until it has first been tested and satisfactory test results have been obtained. If the air content for the next load is outside the Quality Limits specified in 2.04 A.6, it will be rejected. The Engineer will test subsequent loads until the air content is found to be within the specified limits of 2.04 A.6.

5. Unit Weight: The Engineer will determine the plastic unit weight of concrete (taken at the same frequency as specified in 3.05 B.4 according to ASTM C 138). For lightweight concrete, the plastic unit weight, as determined in accordance with ASTM C 567, shall not exceed 125 pounds per cubic foot, unless otherwise specified.

6. Water Content Test: The Engineer will test for water content during the placement using a Microwave Drying Oven, in accordance with AASHTO T 318. He may adjust drying times depending on the mix constituents to achieve a constant dry weight. Once the water content has been determined, it will be divided by the cementitious content in the mix design to determine the water to cement ratio. When the maximum aggregate size exceeds 1-1/2 inches, the Engineer will obtain a sample of approximately 5000 grams. This sample will be split and the Engineer will perform two separate analyses. The weighted average of the two separate analyses will be considered the Sublot water content value. Likewise, the Engineer will compute the sublot water cement ratio as given above.

   a. When results for either two consecutive tests or three tests in one lot or one day's production indicate that the water content exceeds the limits given in 2.03 A.4 by 0.10, do not place the next load until it has first been tested and satisfactory test results have been obtained. If the water content for this load is greater than the Upper Limit given in 2.04 A.5, it will be rejected. The Engineer will test subsequent loads until the water content is found to be within the limit given in 2.04 A.5.

7. Coulomb Test: To evaluate the permeability of the concrete the Upper Quality Limit, UQL, shall be 1700 Coulombs for mixes without a corrosion inhibitor and 2200 Coulombs for mixes containing a corrosion inhibitor, as tested by the Engineer in accordance with AASHTO T 277 after a 28-day wet cure. For mixes containing only fly ash or slag (no silica fume or metakaolin) permeability will be evaluated at 90 days, using the same performance requirements stated above (1700 Coulombs for mixes without a corrosion inhibitor and 2200 Coulombs for mixes with a corrosion inhibitor). For Latex Modified Concrete applications, samples will be wet cured for 7 days and dry cured for 21 days. For each Sublot, the Engineer will cast two (2) 4" x 8" cylinder specimens for each Sublot. The Engineer will cut 2-inch thick samples from the center of each cylinder for testing. The average of the two test specimen result values for each Sublot will be considered the Sublot Coulomb test value.

8. Bond Strength: The bond strength between overlay concrete and parent concrete will be evaluated in accordance with ASTM C 1583. For each Sublot, the Engineer will perform three tests. Three 4-inch diameter cores will be cut 1/2 inch into the parent concrete to isolate the overlay concrete. The average of the three test result values for the Sublot will be considered the Sublot bond strength test value. The locations for each test will be randomly determined by the Engineer.

9. Chloride Ion Concentration by Weight of Cement: The Engineer may perform testing for both the acid soluble and water soluble chloride ion concentrations by weight of cementitious material, which will be evaluated as follows. Powder samples from 28-day concrete cylinders, cast from the concrete mix delivered to the construction site, will be tested to assess both the acid soluble and water soluble chloride ion concentrations by weight of cementitious material. Samples will be obtained using a rotary hammer drill from the mid-height of a minimum of two Sublot specimens from each Lot. The sample will be obtained from the inner three inches of the cylinder specimen, and must be a minimum of 40 grams in weight. The acid soluble and water soluble chloride ion concentrations by weight of cementitious material will be determined by the Materials Engineering Unit in accordance with preparatory standards ASTM C 1152 and ASTM C 1218, respectively, followed by ASTM C 114 (silver nitrate titration) for both the acid soluble and water soluble chloride ion analysis.

10. Pavement Thickness: The Engineer will perform acoustical testing using Impact Echo instrumentation to determine the pavement thickness. Areas indicating pavement thickness below the requirements shown on the Contract Drawings will be cored for verification. The cores will be measured in accordance with ASTM C 174. The average of three test result values for the Sublot will be considered the Sublot test value.

11. Where specified the Engineer will place Remote Temperature Sensing Devices in the in situ concrete to record maximum core temperature and maximum drop of temperature for 24 hours after protection has been removed.

12. Test Cores for Tremie Concrete

    a. The Engineer will drill test cores for every 100 cubic yards of concrete placed in mass pours, such as tremie seal, or one core for every 1000 square feet of surface of thin pours, such as bulkheads or wall facings. Cores will be obtained in accordance with ASTM C 42 and will be drilled full depth (or thickness) through the pour horizontally or vertically as applicable.

    b. Recovery of less than 95 percent will be considered to indicate defective concrete requiring corrective action by the Contractor.

    c. If the cores reveal voids, honeycombing, seams or other defects, the concrete will be subject to rejection for non-uniformity. Additional cores may be obtained by the Engineer for further investigation. The number and location of cores will be determined by the Engineer. All additional cores will be taken at the sole expense of the Contractor.

    d. Fill all test core holes by pressure grouting from the bottom upward, or from the inside out, as the case may be.

    e. Clean out and fill all voids, honeycombing, seams and other defects by pressure grouting with cement or sand-cement to the Engineer's satisfaction. At the Engineer's request and at the sole expense of the Contractor, drill additional cores to verify grouting.

C. In accordance with the Section of Division 1 entitled "Inspections and Rejections", provide labor and means for obtaining all samples required for trial batches and field testing performed by the Engineer. At no additional cost to the Authority, furnish and deliver the following when requested by the Engineer:

1. Provide a representative sample, in the quantity requested by the Engineer, of all cement, fly ash, slag, silica fume, fine and coarse aggregate, admixtures, corrosion inhibitor, latex, fibers, pigment, evaporation retardant and liquid membrane forming curing compound during any day of production the Engineer requests a sample. Take such samples in the presence of the Engineer at the point of storage used for the Work of this Contract. For cement, fly ash, slag and silica fume samples, only use a sampling port on the silo, or drop material in a loader bucket between loads, or take samples from the boot using a "Sample Thief" during loading. Notify the Engineer of aggregates being loaded at their source of supply at least 48 hours in advance of each loading.
2. Provide the cement, fly ash, slag, silica fume or metakaolin manufacturer's Mill Test Certificate and Bill of Lading, if such documents are requested by the Engineer.
3. Allow the Engineer to sample any mix proportion constituents at any time.

D. The Engineer may direct an inspection of the Contractor's concrete plant or precast concrete fabricator to observe operations and review the Quality Control procedures being implemented. Notify the Engineer, in writing, a minimum of 15 days prior to the commencement of production and submit a schedule and Quality Control Plan for all production for the Work of the Contract.

E. Precast Concrete: Obtain from the fabricator and submit to the Engineer a set of approved shop drawings for the Work of the Contract. Fabrication without shop drawings will not be permitted. Clearly mark all precast units with identification numbers for each unit. The Engineer will provide a manifest ticket to be attached to the driver's shipping ticket listing the approved unit identification numbers. Any units shipped to the construction site that are not approved or are not listed on the manifest will not be permitted to be unloaded at the construction site. Shipments not accompanied by a manifest upon delivery will not be permitted to be unloaded at the construction site.

F. For concrete where riding surface tolerances are required, other than pavements, as indicated on the Contract Drawings, the following requirements must be met:

1. The Engineer will test the entire surface of the hardened concrete with a rolling straight edge for conformance to the smoothness requirements. Surface smoothness deviations must not exceed 1/4 inch in 16 feet. Tests will be made in both the longitudinal and transverse direction of the slab and shall span joints. Correct any deficiencies as specified in 4.01 G.1.H and at no cost to the Authority.
2. The Engineer will survey the slab surface for vertical deviation from grade. Vertical deviation from the grade shown on the Contract Drawings must not exceed plus or minus 0.04 foot at any point.
3. The Engineer will determine finished grade by running levels at intervals of 25 feet longitudinally and transversely. Correct all deficiencies as specified in 4.01 G.1.H and at no cost to the Authority.

G. Specified concrete finishes, as shown on the Contract Drawings, must conform to the requirements set forth in 3.03 H.2. Correct all deficiencies as specified in 4.01 G.1.I and at no cost to the Authority.

PART 4. ADJUSTMENTS TO CONTRACT COMPENSATION

4.01 GENERAL

A. Unless otherwise shown on the Contract Drawings, acceptance of material will be based on the method of estimating Percentage of Lot Within Specification Limits (PWL), where the PWL will be determined in accordance with this Section. All Sublot test result values for a Lot, as defined in 3.05 A, Table 1, will be analyzed statistically to determine the total estimated Percent of the Lot that is Within specification Limits, as shown in 4.01 B. The PWL is computed using the Lot sample Average value, $\overline{X}$, as defined in 4.01 D.3 and the Lot sample standard deviation, S_N, as defined in 4.01 D.4, for the specified number of Sublots, n, and for the specification Quality Acceptance Limits, as defined in 2.04 A, where LQL represents the Lower Quality Limit, and UQL represents the Upper Quality Limit, as they apply to each particular acceptance parameter. From these values, the respective Quality Index(ices), Q_L for Lower Quality Index and/or Q_U for Upper Quality Index, is computed in accordance with 4.01 D.5 and 4.01 D.6. Then the PWL for the Lot for the specified number of Sublots, n, is determined from Table 4, "Percent of Lot Within Limits (PWL) (Standard Deviation Method)". The Adjustment to Contract Compensation for each Lot is then calculated using the formulas specified in 4.01 F.

B. Depending on the application, concrete will be tested for the properties shown below. The PWL of each Lot for each parameter will be determined as specified in 4.01 D. Payments will be based on the concrete application for a Lot and the criteria defined below.

Performance Parameters	Minimum PWL
Flexural Strength	95
Compressive Strength	95
Permeability	90
Bond Strength	80
Water to Cement Ratio	80
Air Content	70*
Pavement Thickness	90
Chloride Content	100**

*denotes that in addition to the minimum PWL, the air content will also be evaluated for the average of test results for a given Lot of concrete as per 3.05 B.4 and 4.01 J.

**denotes that the chloride content (acid soluble and water soluble) will be analyzed only for the average of test results for any given Lot of concrete, as per 3.05 B.9 and 4.01 G.1.b.

Table 2 defines the Quality Acceptance performance criteria to be evaluated for Adjustments to Contract Compensation for a given concrete application. In addition, all concrete shall conform to the requirements of 4.01 G. Any deficiencies found to exist as specified in 4.01 G will govern and the Contractor shall either:

1. Remove and replace the concrete in that particular Lot at no cost to the Authority, or

2. Accept a deduction of 50% of the Base Price per cubic yard, as indicated on the Contract Drawings, for that particular Lot of concrete.

TABLE 2
PERFORMANCE CRITERIA PARAMETERS

Category/ Application	Water/Cement Ratio (W/C)	% Air	Permeability	Bond Strength	Compressive Strength	Flexural Strength	Pavement Thickness
Category I - Full Depth Pavements & Unbonded Overlays							
	I	I	---	---	---	P	
LQL:	---	*	---	---	---	700 psi	97%
UQL:	0.45	*	---	---	---	---	---
Category II - Bonded Pavement Overlays							
	I	I	---	P	I	---	---
LQL:	---	*	---	150 psi	***	---	---
UQL:	0.45	*	---	---	---	---	---
Category III - Elevated Structural Overlays							
	I	I	I	P	I	---	---
LQL:	---	*	---	150 psi	***	---	---
UQL:	0.45	*	**	---	---	---	---
Category IV - Structural (exposed to freeze-thaw and/or sulfates, in addition to chlorides or a marine environment)							
	I	I	P	---	I	---	---
LQL:	---	*	---	---	***	---	---
UQL:	0.45	*	**	---	---	---	---
Category V - Structural (exposed to freeze/thaw and/or sulfates only; no exposure to chlorides or a marine environment)							
	I	I	---	---	P	---	---
LQL:	---	*	---	---	***	---	---
SQL:	0.45	*	---	---	---	---	---
Category VI - Standard Structural (not exposed to freeze-thaw cycles) and Miscellaneous Applications (at-grade sidewalks, at-grade curbs, kerfs, foundations, footings, drainage structures, manholes, pipe pile fill and all concrete applications below grade)							
	---	---	---	---	P	---	---
LQL:	---	---	---	---	***	---	---
UQL:	---	---	---	---	---	---	---

* - Refer to 2.04 A.6.

** - 1700 Coulomb counts for mixes without a corrosion inhibitor and 2200 Coulomb counts for mixes with a corrosion inhibitor.

*** - The proportion compressive strength at 28 days or as specified on the Contract Drawings.

P - Used to Calculate Pay Factor per cubic yard. It denotes the concrete property that will be used to calculate payment for a given concrete application. No incentive payments will be made if the performance criteria parameters labeled T for a given application have a PWL less than specified in 4.01 B.

I - Used to Calculate Incentive only when the Pay Factor for the parameter labeled 'P' is greater than 0.00.

C. Full Depth Pavement and Unbonded Overlay (Category I) Final Pay Factor: The Pay Factor for Pavement Thickness will govern only when the Pay Factor for Pavement Thickness is less than the Pay Factor for Flexural Strength, with the exception of when the Pay Factor for Pavement Thickness is 0.00.

D. Method of Estimating Percentage of Material Within Limits (PWL)

1. Locate sampling positions on the Lot by use of random sampling procedures specified in 3.05 A.

2. Take a test sample and make the test specimens on the test sample in accordance with 3.05 A.

3. Determine the Lot sample Average value, $\overline{X}$, by calculating the average of all Sublot test values.

4. Find the Lot sample standard deviation, S_N, by using the following formula:

$$S_N = \sqrt{\frac{d_1^2+d_2^2+d_3^2+ +d_n^2}{n-1}}$$

Where:

S_N = standard deviation of the Sublot test values

$d_1, d_2 ....$ = deviation from the individual Sublot test values

$X_1, X_2, ...$ from the Average value, $\overline{X}$, that is,

$d_1 = (X_1 - \overline{X}), d_2 = (X_2 - \overline{X}), ..., d_n = (X_n - \overline{X})$

n = number of Sublots

5. Find the Lower Quality Index, Q_L, by subtracting the Lower Quality Limit, LQL, from the Average value, $\overline{X}$, and dividing the result by S_N.

$$Q_L = \frac{\overline{X} - LQL}{S_N}$$

6. Find the Upper Quality Index, Q_U, by subtracting the Average value, $\overline{X}$, from the Upper Quality Limit, UQL, and dividing the result by S_N.

$$Q_U = \frac{UQL - \overline{X}}{S_N}$$

7. The percentage of material above lower tolerance limit, P_L, and the percentage of material below upper tolerance limit, P_U, will be found by referring to Table 4, "Percent of Lot Within Tolerance Limit (PWL) (Standard Deviation Method)". Locate Q_L and/or Q_U in the column appropriate to the total number of Sublots, n, and reading the number under the column heading "PWL".

8. For concrete properties with only an Upper Quality Limit (ratio of water to cementitious material, permeability), PWL equals P_U. For concrete properties with a Lower Quality Limit (bond strength, compressive strength, flexural strength, pavement thickness), PWL equals P_L. For concrete properties with both Upper and Lower Quality Limits (air content), first calculate of the Upper Quality Index, Q_U, and the Lower Quality Index, Q_L, by using the Upper Quality Limit, UQL, and the Lower Quality Limit, LQL, respectively, as stipulated in 2.03 A.6. Then determine PWL using the following formula:

$$PWL = (P_U + P_L) - 100$$

E. Pay Factors for each Lot will be computed in accordance with the formulas contained in 4.01 F, Table 3 entitled, "Adjustments to Contract Compensation", by entering the PWL value and performing the calculation indicated for the appropriate PWL range to determine the Pay Factor.

F. Adjustments to Contract Compensation shall be calculated as follows:

TABLE 3

ADJUSTMENTS TO CONTRACT COMPENSATION PER CUBIC YARD

Percent Within Limits (PWL)	Compressive Strength Pay Factor
98 - 100	0.02 (PWL-100) +0.06
95 - 97	0.0
55 - 94	(PWL-95)/100
0 - 54	-0.50

Percent Within Limits (PWL)	Permeability & Bond Strength Pay Factor
91 - 100	0.006 (PWL - 90)
80 - 90	0.0
55 - 79	$0.00017PWL^2 - 0.0105PWL - 0.30$
0 - 54	-0.50

Percent Within Limits (PWL)	Flexural Strength Pay Factor
95 - 100	(PWL-95/100)+.01
55 - 94	(PWL-95)/100
0 - 54	-0.50

Percent Within Limits (PWL)	Pavement Thickness Pay Factor
90 - 100	0.00
55 - 89	(PWL-90)/100
0 - 54	-0.50

Pay Factors are multiplied by the Base Price per cubic yard established in the table below, unless otherwise indicated on the Contract Drawings. The result is the amount to be added or deducted from the compensation for that particular Lot of concrete.

Category	Base Prices for Adjustments to Contract Compensation Per Cubic Yd
I	$100
II	$90
III	$130
IV	$130
IV	$110 when silica fume or metakaolin are not included
V	$90
VI	$80

G. Correction or Cost Adjustments for Deficiencies

1. Remove and Replace Concrete: Remove and replace concrete in a manner approved by the Engineer and at no additional cost to the Authority if any of the following deficiencies exist, unless the Engineer elects to accept the concrete, at which time the Contractor will be compensated at 50% of the Base Price per cubic yard, regardless of the Pay Factors calculated in 4.01 F, Table 3:

   a. Percent Within Limits (PWL) for compressive strength, flexural strength, permeability, bond strength or pavement thickness is below 55.

   b. The average acid soluble chloride ions by weight of cementitious material test results for any given Lot of concrete exceed the limit of 0.10% (reinforced concrete) or 0.08% (prestressed concrete) weight of chloride ions by weight of cementitious material, in accordance with ASTM C 1152 and ASTM C 114, and the average water soluble chloride ions by weight of cementitious material test results for any given Lot of concrete exceed the limit of 0.08% (reinforced concrete) or 0.06% (prestressed concrete) weight of chloride ions by weight of cementitious material, in accordance with ASTM C 1218 and ASTM C 114. The Soxhlet test referenced in ACI 222R will not be considered for chloride evaluations.

   c. For all concrete applications, the cylinder compressive strength shall conform to the following:

      (1) The calculated average of any three consecutive compressive strength tests shall be equal to or shall exceed the specified compressive strength.

      (2) No individual compressive strength test result shall be below the specified compressive strength by more than 500 psi. When the required strength is 5000 psi or less, or by more than 0.10 of the specified strength when greater than 5000 psi is required.

      (3) If either or both of the requirements specified in 4.01 G.1.c.1 and 4.01 G.1.c.2 are not met, investigate the in-place compressive strength in accordance with ACI 318-02, Section 5.6.5, at no additional cost to the Authority. If the compressive strength test results of the in-place concrete fail to meet either or both of the requirements specified in 4.01 G.1.c.1 and 4.01 G.1.c.2, the concrete will be considered deficient, and 4.01 G.1 will apply.

d. Concrete slabs or structures that exhibit any cracks prior to opening to vehicular/aircraft operations or loading will be subject to the actions specified in 4.01 G.1. If the concrete is accepted by the Engineer, seal cracks in accordance with Specification Section 03734 entitled "Concrete Crack Repair" in a manner approved by the Engineer, and at no cost to the Authority.

e. Delamination Testing: The Engineer will check all concrete overlays using the chain drag method in accordance with ASTM D 4580. If more than 5.00% of the total surface area of the Lot is found to be delaminated, remove these areas and replace them at no cost to the Authority. The determination by the Engineer as to the existence of delaminations shall be final and binding.

f. Slabs showing high or low spots exceeding 1/2 inch when tested in accordance with 3.05 F.2.

H. Diamond Grinding and Partial Depth Removal

1. Cured riding surfaces, except pavements, that do not meet the smoothness or finished grade requirements set forth in 2.04 B shall be corrected, to obtain the specified smoothness deviation, as follows:

   a. High spots between 1/4 inch and 1/2 inch and surfaces that exceed the finished grade requirements shall be identified and ground with diamond grinding equipment.

   b. Low spots between 1/4 inch and 1/2inch and surfaces that are below the finished grade requirements shall be corrected by partial depth removal of the entire slab to 1 inch below rebars by hydrodemolition, or by hydromilling and constructing an overlay in conformance with this Specification.

2. The diamond grinding equipment shall be as approved by the Engineer and shall have a grinding head at least 36-inches wide.

3. Where grinding is required, grind the entire width of the riding surface by the length of defective area. In the sole opinion of the Engineer, if the deficiencies are closely spaced and grinding individual areas will adversely affect ride, grind the entire surface.

4. Dispose of slurry produced from grinding operations off Authority property.

5. Perform diamond grinding, partial depth removal and construction of an overlay, if required to correct deficiencies, at no additional cost to the Authority.

I. If concrete finishes do not meet the requirements set forth for the specified finishes, refinish the hardened concrete as directed by the Engineer, at no additional cost to the Authority.

J. If the average air content for a Lot exceeds either the LQL or the UQL by more than 1% (with the exception of concrete not exposed to freeze/thaw cycles) 10% of the Base Price per cubic yard will be deducted from the compensation for that particular Lot of concrete.

K. If the core temperature of the in situ concrete exceeds 160 deg F, the Engineer will evaluate concrete quality using cores taken from the concrete in question. The cores will be tested in accordance with ASTM C 42 and their compressive strength results will be used to calculate the PWL for payment adjustments.

TABLE 4

PERCENT OF LOT WITHIN TOLERANCE LIMIT (PWL)

(STANDARD DEVIATION METHOD)

Positive Values of Quality Index (QI)

(n = Number of Sublots in the Lot)

PWL	n=3	n=4	n=5	n=6	n=7	n=8
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4716
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630
87	1.0597	1.1100	1.1173	1.1191	1.1199	1.1204
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015
83	.9939	.9900	.9785	.9715	.9672	.9643
82	.9749	.9600	.9452	.9367	.9325	.9281
81	.9550	.9300	.9123	.9025	.8966	.8928
80	.9342	.9000	.8799	.8690	.8625	.8583
79	.9124	.8700	.8478	.8360	.8291	.8245
78	.8897	.8400	.8160	.8036	.7962	.7915
77	.8662	.8100	.7846	.7716	.7640	.7590
76	.8417	.7800	.7535	.7401	.7322	.7271
75	.8165	.7500	.7226	.7089	.7009	.6958
74	.7904	.7200	.6921	.6781	.6701	.6649
73	.7636	.6900	.6617	.6477	.6396	.6344
72	.7360	.6600	.6316	.6176	.6095	.6044
71	.7077	.6300	.6016	.5878	.5798	.5747
70	.6787	.6000	.5719	.5583	.5504	.5454
69	.6490	.5700	.5423	.5290	.5213	.5164
68	.6187	.5400	.5129	.4999	.4924	.4877
67	.5878	.5100	.4836	.4710	.4638	.4592
66	.5563	.4800	.4545	.4424	.4354	.4310
65	.5242	.4500	.4255	.4139	.4073	.4031
64	.4916	.4200	.3967	.3856	.3793	.3753
63	.4586	.3900	.3679	.3575	.3515	.3477
62	.4251	.3600	.3392	.3295	.3239	.3203

61	.3911	.3300	.3107	.3016	.2964	.2931
60	.3568	.3000	.2822	.2738	.2691	.2660
59	.3222	.2700	.2537	.2461	.2418	.2391
58	.2872	.2400	.2254	.2186	.2147	.2122
57	.2519	.2100	.1971	.1911	.1877	.1855
56	.2164	.1800	.1688	.1636	.1613	.1592
55	.1806	.1500	.1408	.1363	.1338	.1322
54	.1447	.1200	.1125	.1090	.1070	.1057

END OF SECTION

SECTION 03301

PORTLAND CEMENT CONCRETE, LONG FORM

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Catalog Cuts

03301B01 At least 35 calendar days prior to concrete placement, the following:
Name and address of proposed concrete supplier, type of plant, documentation of State Certification for plant and ready mix trucks, AASHTO Accreditation certification for the independent testing laboratory and certification for an on-site individual in a supervisory capacity from one of the programs specified in 3.03 A.

Samples

03301C02 List of materials for Work of this Section.

03301C04 At the request of the Engineer, submit cement, fly ash, slag, and/or silica fume samples to check the Mill Certification at any time in accordance with 3.05.C.

Product Data

03301D01 Concrete Mix Proportions:
Appendix "B" "Concrete Materials and Mix Proportion Data" at least 35 calendar days prior to concrete placement in accordance with 2.03 A of the Specification. To substantiate the mix proportions, submit all data and field results in accordance with 2.03 A.

Certificates

03301E01 At least 35 calendar days prior to concrete placement, the following:
b. Material certifications, source, brand name and test results (where required) of cement, fine and coarse aggregate, fly ash, slag, silica fume, metakaolin and concrete admixtures following guidelines of Appendix "B". In addition, arrange for an independent testing laboratory to verify that Very High Early Strength Cement meets compressive strength, absolute drying shrinkage and setting time requirements specified in 2.02 B at the testing frequency specified therein.

03301E02 At least 35 calendar days prior to concrete placement, the following:
Certification of compatibility and five-year performance record for liquid membrane forming curing compound, when used under conditions specified in 3.04.C, and the requirements of 2.02.R.2.

03301E03 At least 35 calendar days prior to concrete placement, the following:
Certification that admixtures conform to the requirements of 2.02.M. submitted with Appendix "B" "Concrete Materials and Mix Proportion Data". Include dosing and re-dosing charts, which shall demonstrate the effects of concrete temperatures from 50 deg F and 90 deg F.

Construction and Installation Procedures

03301G01 At least 35 calendar days prior to concrete placement, the following:
Cold and Hot Weather Concreting Plans in accordance with 1.03 of the Specification.
Materials and methods for protecting concrete from freezing.

03301G06 At least 35 calendar days prior to concrete placement, the following:
Curing Procedure Plan in accordance with 3.04, including the method and materials for curing.

Quality Assurance-Quality Control

03301L01 At least 35 calendar days prior to concrete placement, the following:
Contractors Quality Control Plan in accordance with 1.04.B.

END OF APPENDIX "A"

SECTION 03301

PORTLAND CEMENT CONCRETE, LONG FORM

APPENDIX "B"

CONCRETE MATERIALS AND MIX PROPORTION DATA

A. Materials:

1. Cement: Type.....Source/Brand.....
2. Sand: Fineness Modulus.....Source.....
3. Stone: Size.....Class.....Source.....
4. Fly Ash: Type.....Source.....
5. Slag: Grade.....Source.....
6. Microsilica (Silica Fume): Source/Brand.....
7. Metakaolin: Source/Brand.....
8. Admixtures (Source/Brand):

   Air Entraining Agent.....

   Non-Chloride Accelerator.....

   Retarder.....

   Water Reducer.....

   Water Reducer - Retarder.....

   High Range Water Reducer.....

   High Range Water Reducer - Retarder.....

   Polycarboxylate High Range Water Reducer

   Anti-Washout Admixture.....

   Corrosion Inhibitor.....

   Latex.....

   Pigment.....

B. Mix Proportions

1. Proposed method of placement:.....Tremie/Mobile

   .....Mixer/Transit Mixer/Portable Mixer/

   Pumping/Tube Diameter:.....

2. Proportion of Ingredients:

   Cement.....lbs./cu. yd.

   Fly Ash.....lbs./cu. yd.

   Slag.....lbs./cu. yd.

   Silica Fume.....lbs./cu. yd.

Metakaolin.....lbs./cu. yd.

Pigment.....lbs./cu. yd.

Stone.....lbs./cu. yd.

Sand.....lbs./cu. yd.

Water.....lbs./cu. yd.....gallons

Air Entraining Agent:.....ounces/cu. yd.

Admixtures (specify type and amount):

.....at.....ounces/cu. yd.

.....at.....ounces/cu. yd.

.....at.....ounces/cu. yd.

.....at.....ounces/cu. yd.

3. Mix Properties:

Compressive Strength: f'c =.....psi at.....days/hours

Flexural Strength:.....psi at.....days/hours

Permeability at 28 days:.....Coulombs

Slump:.....inches

Water to Cementitious Ratio:.....

Air Entrainment:.....%

Sand/Stone Ratio:

Combined aggregate gradation chart (% retained on each sieve)

Unit Weight:.....lbs./cu. ft.

C. Conformance with ACI 318

Attach a report on mix proportion and test/statistical data documenting conformance with ACI 318, Chapter 5, or ACI 304R, Chapter 8, as they apply to the Work of the Contract.

D. Concrete Supplier/Batch Plant

1. Name:.....
2. Address:.....
3. Contact Name:.....
4. Telephone number/Fax number/E-mail address:.....
5. Quality Control technician(s):.....

   Name(s):.....

   Telephone number(s):.....

END OF APPENDIX "B"

DIVISION 3

SECTION 03602

GROUTING (NON-METALLIC)

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for non-metallic, non-shrink, cement-based grouting.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Society for Testing and Materials (ASTM)

ASTM C 109	Test Method for Compressive Strength of Hydraulic Cement Mortars
ASTM C 191	Test Method for Time of Setting of Hydraulic Cement by Vicat Needle
ASTM C 827	Test Method for Early Volume Change of Cementitious Mixtures

1.03 JOB CONDITIONS

Do not mix or place grout when the ambient temperature is below 40 degrees F or conditions indicate that the ambient temperature will fall below 40 degrees F within 72 hours, unless the areas to be grouted are enclosed and heated in an approved manner or otherwise approved by the Engineer.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver grout in the manufacturer's sealed original bags or containers bearing the manufacturer's name and product identification, in a manner to prevent damage by breakage, water or moisture.

B. Store all material on platforms and cover as necessary to protect it from water and moisture.

C. Deliver, protect and handle all tools and equipment in a manner to prevent damage that may make them defective for the purpose for which they are intended.

1.05 SUBMITTALS

See Appendix "A" for Submittal Requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. Grout shall be one of the following:

1. "Masterflow 713" - manufactured by Master Builders
2. "Five Star Grout" - manufactured By U.S. Grout Corporation
3. "Euco N-S Grout" - manufactured by Euclid Chemical Co.

B. Grout shall be premeasured and prepacked by the manufacturer, requiring only addition of potable water for mixing.

PART 3. EXECUTION

3.01 PREPARATION

Areas to be grouted as shown on the Contract Drawings shall be cleaned of all foreign materials, to the satisfaction of the Engineer.

3.02 MIXING AND PLACING

A. Use only the crew trained by the manufacturer's representative.

B. Mix and place the grout in accordance with manufacturer's methods approved by the Engineer.

C. Placement shall be continuous to avoid cold joints and voids. Grout shall be rodded or spaded to prevent the formation of air pockets.

3.03 FIELD TESTS

A. The Engineer may take and test samples of the grout being placed in accordance with ASTM C 109, C 191 and C 827.

B. In the event that tests of the grout placed reveal any failure to meet requirements of this Section, the Engineer will require removal and replacement of all portions of grout from the batch from which the sample was taken and the discontinuance of grouting until the Contractor has demonstrated to the satisfaction of the Engineer that the causes for failure have been corrected.

END OF SECTION

SECTION 03602

GROUTING (NON-METALLIC)

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Samples

03602C01 Submit to the Manager, Materials Engineering Division, Port Authority Technical Center, 241 Erie Street, Jersey City, NJ 07310-1397, a sample of the grout material for approval.

Construction and Installation Procedures

03602G01 Submit manufacturer's instructions and methods for handling, storage, mixing and placing of the grout, for approval.

END OF APPENDIX "A"

DIVISION 5

SECTION 05506

MISCELLANEOUS STEEL

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for metal fabrications, including but not limited to structural steel and iron shapes, plates, bars, tubes and pipe.

B. Items specified in this Section include but are not limited to the following, where shown on the Contract Drawings:

1. Loose steel lintels.
2. Shelf angles.
3. Ladders and safety cages.
4. Floor plates.
5. Nosings and treads.
6. Pipe bollards.
7. Miscellaneous steel framing and supports.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	American National Standards Institute (ANSI)
ANSI A 14.3	Safety Requirements for Fixed Ladders.
	American Society of Mechanical Engineers (ASME)
ASME B 18.2.1	Square and Hex Bolts and Screws, Inch Series.
ASME B 18.6.1	Wood Screws (Inch Series).
ASME B 18.6.3	Machine Screws and Machine Screw Nuts.
ASME B 18.21.1	Lock Washers (Inch Series).
ASME B 18.22.1	Plain Washers.
	American Society for Testing and Materials (ASTM)
ASTM A 27	Specification for Steel Castings, Carbon, for General Application.
ASTM A 36	Specification for Carbon Structural Steel.
ASTM A 47	Specification for Ferritic Malleable Iron Castings.
ASTM A 48	Specification for Gray Iron Castings.
ASTM A 53	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
ASTM A 123	Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
ASTM A 153	Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

ASTM A 307	Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
ASTM A 500	Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
ASTM A 501	Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
ASTM A 563	Specification for Carbon and Alloy Steel Nuts.
ASTM A 780	Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
ASTM A 786	Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
ASTM A 1011	Specification for Sheet, Steel and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
ASTM B 633	Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
ASTM C 1028	Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.
ASTM C 1107	Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
ASTM D 1187	Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
ASTM E 488	Test Method for Strength of Anchors in Concrete and Masonry Elements.
ASTM E 935	Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
ASTM F 568M	Specification for Carbon and Alloy Steel Externally Threaded Metric Fasteners.
ASTM F 593	Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
ASTM F 594	Specification for Stainless Steel Nuts.
	American Welding Society, Inc. (AWS)
AWS D1.1	Structural Welding Code – Steel.
AWS D1.3	Structural Welding Code – Sheet Steel.
	Code of Federal Regulations (CFR)
29 CFR Part 1910, Subpart D	Fixed Ladders.
	The Society for Protective Coatings (SSPC)
SSPC-Paint 20	Paint Specification No. 20 – Zinc Rich Primers (Type I, Inorganic, and Type II, Organic).
SSPC-PA 1	Shop, Field and Maintenance Painting of Steel.
SSPC-SP 3	Surface Preparation Specification No. 3 – Power Tool Cleaning.
SSPC-SP 6	Surface Preparation Specification No. 6 – Commercial Blast Cleaning.

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. Ladders

When installed, if any, shall comply with the following minimum requirements for structural performance, unless otherwise shown on the Contract Drawings:

1. Treads and Platforms

   Capable of withstanding a uniform load of 100 lbs. per sq. ft. and a concentrated load of 300 lbs., so located as to produce maximum stress conditions.

2. Handrails and Toprails

   Capable of withstanding the following loads applied as indicated below:

   a. Uniform load of 50 lbs. per linear ft. applied simultaneously in both vertical and horizontal directions.

   b. Concentrated load of 200 lbs. applied at any point in any direction when tested per ASTM E 935.

   c. Uniform and concentrated loads above need not be assumed to act concurrently.

3. Guards

   Intermediate rail balusters and panel fillers capable of withstanding a horizontal uniform load of 50 lbs. per sq. ft. of gross area of guard, including open areas of which they are part, of fabrication required or as shown on the Contract Drawings.

1.04 QUALITY ASSURANCE

A. When required by Appendix "A", submit design calculations for ladders, signed and sealed by a Professional Engineer licensed in the state in which Work is to be performed, indicating compliance with these Design and Performance Requirements.

B. Fabricator Qualifications

Firm experienced in producing metal fabrications similar to those indicated for Work of this Contract with a record of successful in-service performance and with sufficient production capacity to produce required units without delaying the Work.

C. Engineer Qualifications

A professional engineer who is legally qualified to practice in jurisdiction where construction site is located and who is experienced in providing engineering services required for applications shown on the Contract Drawings.

D. Welding Standards

Comply with applicable provisions of AWS D1.1 *Structural Welding Code – Steel* and AWS D1.3 *Structural Welding Code – Sheet Steel.*

1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

E. Field Measurements

Check actual locations of walls and other construction to which metal fabrications must fit by accurate field measurements before fabricating. Show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.05 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. Ferrous Metals

1. Metal Surfaces: For fabrication of Work exposed to view, use materials that are smooth and free of surface blemishes including pitting, roughness, seam marks, roller marks and rolled trade names.
2. Steel Plates, Shapes and Bars: ASTM A 36.
3. Rolled Steel Floor Plates: ASTM A 786.
4. Steel Bar Grating: ASTM A 1011 or ASTM A 36.
5. Steel Tubing: ASTM A 500, cold-formed; or ASTM A 501, hot-rolled; for exterior installations. Steel tubing shall be hot-dip galvanized coated per ASTM A 53.
6. Steel Pipe: ASTM A 53; type and grade (if applicable) as selected by fabricator and as required for design loading; Schedule 40 (standard weight), unless otherwise shown on the Contract Drawings; black finish, unless galvanized coating is shown on the Contract Drawings.
7. Brackets, Flanges and Fittings: Cast or formed metal of the same type material and finish as supported construction.
8. Gray Iron Castings: ASTM A 48, Class 30.
9. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47 Grade 32510, or cast steel, ASTM A 27. Furnish bolts, washers and shims as required, hot-dip galvanized per ASTM A 153.

B. Fasteners

1. General

   Zinc-Plated: ASTM B 633, Class Fe/Zn 25 (Service Condition 4–very severe) for exterior use and Class Fe/Zn 8 (Service Condition 2–moderate) where built into exterior walls. Select fasteners for type, grade and class required for application shown on the Contract Drawings.
2. Bolts and Nuts: Regular hexagon head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563, and where indicated, flat washers.
3. Machine Screws: ASME B18.6.3.
4. Lag Bolts: ASME B18.2.1.
5. Wood Screws: Flat head, carbon steel, ASME B18.6.1.
6. Lock Washers: Helical, spring type, carbon steel, ASME B18.21.1.

7. Plain Washers: Round, carbon steel, ASME B18.22.1.

8. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

   a. Interior Locations: Carbon steel components zinc-plated complying with ASTM B 633, Class Fe/Zn 8.

   b. Exterior Locations: Alloy Group 1 stainless steel bolts complying with ASTM F 593 and nuts complying with ASTM F 594.

C. Paint

1. Shop Primer for Ferrous Metal

   Zinc-rich primer, complying with SSPC-Paint 20, compatible with substrates and finish paint systems shown on the Contract Drawings. Comply with applicable requirements of Division 9 Section on Painting.

2. Galvanizing Repair Paint

   High zinc dust content paint for regalvanizing welds in galvanized steel with dry film containing minimum 94 percent zinc dust content, complying with SSPC-Paint 20.

3. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

D. Grout

Pre-mixed, factory-packaged, nonshrink type, complying with ASTM C 1107, as manufactured by one of the following, or approved equal, for specified application:

1. Non-Metallic:

   "Five Star Grout", Five Star Products, Inc., Fairfield, CT
   "Masterflow 713 Plus", Master Builders, Inc. (Degussa), Cleveland, OH
   "NS Grout", Euclid Chemical Co., Cleveland, OH

2. Metallic:

   "Embeco 636 Plus", Master Builders, Inc. (Degussa), Cleveland, OH
   "Five Star Metallic Grout", Five Star Products, Inc., Fairfield, CT
   "NS Metallic Grout", Euclid Chemical Co., Cleveland, OH

3. Use metallic grout in concealed locations where not exposed to moisture. Use non-metallic nonstaining grout in exposed, wet and exterior locations, unless otherwise shown on the Contract Drawings.

2.02 FABRICATION

A. General

Fabricate items to sizes, shapes, profiles and dimensions required for application shown on the Contract Drawings or approved Shop Drawings, using proven details of fabrication and support. Use materials of type and thickness shown on the Contract Drawings or specified in this Section for various components of Work or, if not shown, as required to produce strength and durability in finished product for intended use.

1. Shop Assembly: Preassemble items in shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly match mark units for reassembly and coordinated installation.
2. Form exposed Work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of 1/32 inch, unless otherwise shown. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
3. Weld corners and seams continuously, complying with AWS D1.1 and D1.3 recommendations as applicable. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
4. Form exposed connections with hairline joints flush and smooth, using concealed fasteners wherever possible. Exposed fasteners, where used, shall be of type as shown on the Contract Drawings or, if not shown, Phillips flathead (countersunk) screws or bolts.
5. Fabricate joints that will be exposed to weather in a manner to exclude water, or with weep holes where water may accumulate.
6. Cut, drill and tap units to receive anchorage, hardware and similar items.
7. Furnish anchorage of type shown on the Contract Drawings, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use and for design loads. Furnish steel washers, except that where heads and nuts bear on wood structural connections, furnish malleable-iron washers.
8. Galvanizing

   Zinc coating by the hot-dip process for items shown on the Contract Drawings or specified in this Section to be galvanized. Coating thickness shall be as specified in the referenced standards.

   a. Rolled, pressed and forged iron and steel shapes, castings, plates, bars and strip 1/8 inch thick and heavier and assembled fabrications: ASTM A 123.
   b. Iron and steel hardware: ASTM A 153.

B. Steel Ladders

1. Fabricate ladders for locations shown on the Contract Drawings, with dimensions, spacings, details and anchorages as shown. Comply with requirements of ANSI A 14.3 or OSHA 29 CFR 1910, whichever is more stringent.
   a. Side rails shall be 1/2 inch by 2-1/2 inches continuous structural steel flat bar with eased edges, spaced 18 inches apart, unless otherwise shown.

b. Bar rungs shall be 3/4-inch diameter solid structural steel, spaced 12 inches on center.

2. Fit rungs in centerline of side rails, plug weld and grind smooth on outer rail faces.

3. Top surface of each rung shall be non-slip; either coat the rung with aluminum oxide (corundum) granules set in epoxy resin adhesive or use a type of manufactured rung that is filled with aluminum oxide grout.

4. Support each ladder at top and bottom and at equally spaced intermediate points, so that no unsupported length of ladder shall exceed 5 feet. Use welded or bolted steel brackets, designed for adequate support and anchorage and to hold ladder clear of the wall surface with a minimum 7-inch clearance from wall to centerline of rungs.

5. Extend rails 42 inches above top rung and return rails to wall or structure, unless other secure handholds are furnished. If the adjacent structure does not extend above the top rung, gooseneck the extended rails back to the structure for secure ladder access.

6. Galvanize ladders, brackets and fasteners.

7. Ship's Ladders, if any

Fabricate of open type construction with structural steel channel or steel plate stringers, pipe handrails and open steel grating treads, unless otherwise shown on the Contract Drawings. Furnish brackets and fittings necessary for installation.

C. Ladder Safety Cages

Fabricate from structural steel flat bars, assembled by welding. Comply with requirements of ANSI A 14.3 or OSHA 29 CFR 1910, whichever is more stringent.

1. Top and bottom primary hoops shall be 5/16 inch by 4-inch bar. For cages longer than 20 feet, space intermediate hoops not more than 4 feet on center from 5/16 inch by 2-inch bar between the primary hoops. Vertical flat bars 5/16 inch by 2 inches shall be secured to each hoop at maximum 9-1/2 inches on center, unless otherwise shown on the Contract Drawings. Secure assembled safety cage to ladder rails and adjacent construction shown.

2. Galvanize ladder safety cages and fasteners.

D. Loose Bearing and Leveling Plates

For steel items bearing on masonry or concrete construction, flat, free from warps or twists and of the required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

E. Loose Steel Lintels

1. Fabricate from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.

2. Weld adjoining members together to form a single unit where shown on the Contract Drawings.

3. Size loose steel lintels for equal bearing of 1 inch per foot of clear span, but not less than 8 inches bearing at each side of openings, unless otherwise shown on the Contract Drawings.

4. Galvanize loose steel lintels located in exterior walls.

F. Shelf and Relieving Angles

1. Fabricate from steel angles of sizes indicated and for attachment to concrete framing. Fabricate with slotted holes to receive 3/4 inch bolts, spaced not more than 6 inches from ends and not more than 24 inches on center, unless otherwise shown on the Contract Drawings.
2. Miter and weld corners. Provide open joints at expansion and control joints. Joint width shall be 2 inches larger than expansion or control joint.
3. Galvanize shelf and relieving angles located in exterior walls.

G. Miscellaneous Framing and Supports

1. Furnish miscellaneous steel framing and supports not part of structural steel framework, as required by the Contract Drawings to complete the Work.
2. Fabricate miscellaneous units as shown on the Contract Drawings or, if not shown, of required dimensions to receive adjacent other Work to be retained by framing. Fabricate from structural steel shapes, plates and bars of welded construction using mitered joints for field connection, except as otherwise shown on the Contract Drawings.
3. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed. Space anchors 24 inches on center and furnish minimum anchor units of 1-1/4 inch by 1/4 inch by 8 inch steel straps, except as otherwise shown on the Contract Drawings.
4. Fabricate support for suspended toilet partitions as follows:
   a. Beams

      Continuous steel shapes of size required to limit deflection to L/360 between hangers, but use not less than C8 by 11.5 channels or another shape with equivalent structural properties.
   b. Hangers

      Steel rods, 1/2-inch minimum diameter, spaced not more than 36 inches on center. Thread rods to receive anchor and stop nuts. Fit hangers with wedge-shaped washers for full bearing on sloping flanges of support beam.
   c. Braces and Angles

      Steel angles of size required for rigid support of beam and for secure anchorage.
5. Galvanize miscellaneous framing and supports at exterior locations and where shown on the Contract Drawings.

H. Miscellaneous Steel Trim

1. Fabricate units from structural steel shapes, plates and bars, with continuously welded joints and smooth exposed edges, unless otherwise shown on the Contract Drawings. Miter corners and use concealed field splices wherever possible. Furnish cutouts, fittings and anchorages as required for coordination of assembly and installation with other Work.
2. Galvanize miscellaneous steel trim at exterior locations. Galvanize miscellaneous steel trim at interior locations where shown on the Contract Drawings.

I. Floor Plate

1. Fabricate raised-pattern floor plates from rolled-steel floor plate of thickness and in pattern shown on the Contract Drawings.
2. Abrasive-Surface: Manufacturer's standard abrasive granules rolled into surface of steel plate where shown on the Contract Drawings. Coefficient of friction (COF) shall be 0.6 or higher when tested according to ASTM C 1028.
3. Include steel angle stiffeners and fixed and removable sections with steel bar drop handles for lifting as indicated.

J. Extruded Nosings and Treads

1. Fabricate of material, color, sizes and configurations shown on the Contract Drawings. If not shown, fabricate cast-iron units with an integral abrasive finish. Lengths shall be as required to accurately fit each opening or conditions.
   a. Integral abrasive filler shall consist of aluminum oxide (corundum), silicon carbide or a combination of both, in an epoxy resin binder.
   b. Solid abrasive type units without ribs.
2. Available Manufacturers

   Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

   American Safety Tread Co., Inc., Helena, AL
   Balco Inc., Wichita, KS
   Safe-T-Metal Co., Inc., Mineola, NY
   Wooster Products Inc., Wooster, OH
3. Drill for mechanical anchors with countersunk holes located not more than 4 inches from ends and not more than 12 inches on center, evenly spaced between ends, unless otherwise shown on the Contract Drawings. Use closer spacing if recommended by the manufacturer.

K. Cast Nosings, Treads and Thresholds

1. Fabricate units of material, color, sizes and configurations shown on the Contract Drawings. If not shown, furnish cast-iron units with an integral abrasive finish. Lengths shall be as required to accurately fit each opening or conditions.
   a. Cast units with an integral abrasive grit consisting of aluminum oxide (corundum), silicon carbide or a combination of both.
   b. Plain surface texture, except where fluted or cross-hatched surfaces are shown on the Contract Drawings.
2. Available Manufacturers

   Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

   American Safety Tread Co., Inc., Helena, AL
   Balco Inc., Wichita, KS
   Safe-T-Metal Co., Inc., Mineola, NY
   Wooster Products Inc., Wooster, OH
3. Furnish anchors for embedding units in concrete, either integral or applied to units, as standard with the manufacturer.

4. Drill for mechanical anchors with countersunk holes located not more than 4 inches from ends and not more than 12 inches on center, evenly spaced between ends, unless otherwise shown on the Contract Drawings. Use closer spacing if recommended by the manufacturer.

L. Corner Guards

Fabricate from steel angles of sizes as shown on the Contract Drawings, but not less than 3 by 3 by 5/16 inch extending from floor to 42 inches above floor. Fabricate with 3/8 inch steel base plates for bolting to floor and with 1/4 by 2 inch steel strap braces at top. Furnish at least 2 vertical angles at each location along the length of the ladder where connections are made (except at internal corners), with strap extended between angles and from each angle to wall or column.

M. Wheel Guards

Fabricate from 3/4-inch thick, hollow-core, gray-iron castings of size and shape shown on the Contract Drawings. Fabricate with holes for countersunk anchor bolts and grouting.

N. Pipe Bollards

1. Fabricate from Schedule 40 black steel pipe, unless otherwise shown on the Contract Drawings. Prime and finish with two coats of paint as specified in Division 9 Section on Painting. Cap bollards with 1/4-inch minimum steel plate finished to match pipe, unless indicated to be concrete filled.
2. Fabricate sleeves for bollard anchorage from steel pipe, matching shape and configuration of bollard and with outside dimensions not less than 3/4 inch greater than outside dimensions of bollard. Weld 1/4-inch thick steel plate closures to bottoms of sleeves. Plate closures shall be 1 inch greater in length and width than outside dimensions of sleeves.
3. Reflective marking tape, if any, shall be in color shown and as specified in Division 2 Section on removable retro-reflective pavement marking tape.

2.03 SHOP PAINTING

A. Surface Preparation

Prepare ferrous metal surfaces to comply with requirements for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications as follows:

1. Exterior: SSPC-SP 6.
2. Interior: SSPC-SP 3.

B. Apply shop primer to surfaces of metal fabrications, except those that are galvanized or shown on the Contract Drawings to be embedded in concrete or masonry, in compliance with requirements of SSPC-PA 1 for shop painting.

PART 3. EXECUTION

3.01 PREPARATION

Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to the construction site in time for installation.

3.02 INSTALLATION

A. Furnish and install anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction, including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.

B. Cutting, Fitting and Placement

Perform cutting, drilling and fitting required for installation of metal fabrications. Set Work accurately in location, alignment and elevation plus level, true and free of rack, measured from established lines and levels. Furnish and install temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.

C. Fit exposed connections accurately together to form tight hairline joints. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

D. Field Welding

Comply with AWS D1.1 and D1.3 for procedures of manual shielded metal-arc welding, appearance and quality of welds made and methods used in correcting welding Work.

E. Setting Loose Plates

1. Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of bearing plates or surfaces.
2. Set loose leveling and bearing plates on wedges or other adjustable devices. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with edge of bearing plate before packing with grout.

F. Miscellaneous Framing and Supports

Install framing and supports in compliance with requirements of items being supported, including manufacturer's written instructions and requirements.

G. Supports for Toilet Partitions

Anchor supports securely to and rigidly brace from overhead building structure.

H. Nosings, Treads and Thresholds

1. Install with anchorage system indicated complying with manufacturer's recommendations.
2. Apply black bituminous coating to concealed bottoms, sides and edges of cast-iron units set into concrete.
3. Seal thresholds exposed to exterior with elastomeric sealant, complying with the applicable Division 7 Section on Sealants, for a watertight installation.

I. Wheel Guards

Anchor wheel guards to concrete or masonry construction complying with manufacturer's instructions. Fill cores solidly with concrete.

J. Bollards

1. Install bollards vertical to line and grade shown on the Contract Drawings.
2. Anchor bollards with 4 bolts through bottom plate with minimum 4 inch embedment into concrete, by core-drilling and grouting into concrete or by anchoring in place with concrete footings, as shown on the Contract Drawings.
3. Vibrate and tamp concrete to consolidate. Support and brace bollard until concrete has cured.
4. Seal joint between concrete footings and surrounding pavement and sidewalk in accordance with Division 2 Section on Pavement Joint Sealing.

3.03 ADJUSTING

A. Touch-Up Painting

1. Shop Painted Surfaces: Immediately after erection, clean field welds, bolted connections and abraded areas of shop paint. Paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop painted surfaces. Apply by brush or spray in a minimum dry film thickness of 2.0 mils.
2. Galvanized Surfaces: Immediately after erection, clean field welds, bolted connections and abraded areas. Apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 05506

MISCELLANEOUS STEEL

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

05506A01 Shop Drawings
For fabrication and erection of miscellaneous metal fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Furnish templates for anchor and bolt installation under other Sections if required.

Product Data

05506D01 Product Data
Manufacturer's technical information, specifications, anchor details and installation instructions for miscellaneous steel products used, including grout and paint products.

END OF APPENDIX "A"

DIVISION 9

SECTION 09910

PAINTING

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for shop and construction site application of paint as shown on the Contract Drawings.

B. Work of this Section includes surface preparation and painting of the following items and surfaces:

1. Exterior and interior painting in accordance with Appendix "B" to this Section.
2. Exposed bare and covered pipes, ducts and conduits, including color coding (if any), and hangers and supports.
3. Galvanized steel, iron work and miscellaneous metal items, and surfaces of architectural, mechanical and electrical items, if any.
4. Architectural woodwork and casework, if any.
   a. Surface preparation and shop staining or painting of architectural woodwork and casework is specified in other Sections of the Specifications.

C. These and similar items shall not be painted:

1. Items with factory-applied top coat.
2. Finished metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished metals.
3. Concealed pipes, ducts and conduits.
4. Concealed or inaccessible surfaces.
5. Code required labels such as Underwriters Laboratories and Factory Mutual.
6. Identification, performance rating, name or nomenclature plates of mechanical, electrical and fire equipment.
7. Operating and moving parts of operating units and mechanical and electrical equipment such as: valves, damper operators, linkages, sinkages, sensing devices, motors, shafts and sheaves.
8. Surfaces shown or scheduled on the Contract Drawings to receive spray-applied fire resistive material.

D. Definitions: "QC" refers to quality control or a quality control program. This is a methodology employed by the Contractor to ensure compliance with Contract requirements.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Society for Testing and Materials (ASTM)

ASTM A 780	Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
ASTM D 521	Standard Test Methods for Chemical Analysis of Zinc Dust (Metallic Zinc Powder).
ASTM D 523	Test Method for Specular Gloss.
ASTM D 562	Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer.
ASTM D 1475	Standard Test Method for Density of Liquid Coatings, Inks, and Related Products.
ASTM D 2369	Standard Test Method for Volatile Content of Coatings.
ASTM D 2371	Standard Test Method for Pigment Content of Solvent-Reducible Paints.
ASTM D 2697	Standard Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings.
ASTM D 3359	Standard Test Method for Measuring Adhesion by Tape Test.
ASTM D 4263	Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
ASTM D 4285	Standard Test Method for Indicating Oil or Water in Compressed Air.
ASTM D 4414	Standard Practice for Measurement of Wet Film Thickness by Notch Gages.
ASTM D 4417	Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel.
ASTM D 4541	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
ASTM D 6386	Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
ASTM F 1869	Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor using Anhydrous Calcium Chloride.

Northeast Protective Coating Committee (NEPCOAT)

NEPCOAT QPL	Qualified Products List

The Society for Protective Coatings (SSPC)

SSPC-PA 1	Shop, Field and Maintenance Painting of Steel
SSPC-PA 2	Measurement of Dry Coating Thickness with Magnetic Gages.
SSPC-SP 1	Solvent Cleaning.
SSPC-SP 2	Hand Tool Cleaning.
SSPC-SP 3	Power Tool Cleaning.

SSPC-SP 5	White Metal Blast Cleaning.
SSPC-SP 6	Commercial Blast Cleaning.
SSPC-SP 7	Brush-Off Blast Cleaning.
SSPC-SP 10	Near-White Blast Cleaning.
SSPC-SP 11	Power Tool Cleaning to Bare Metal.
SSPC-VIS 1	Visual Standard for Abrasive Blast Cleaned Steel.

1.03 AMBIENT TEMPERATURE AND HUMIDITY REQUIREMENTS

A. Comply with the manufacturer's technical data sheets subject to approval by the Engineer as to environmental conditions under which paint and finishes may be applied, and with the following:

1. Do not apply paints in rain, snow, fog or mist, or when relative humidity exceeds 85 percent. Painting may be performed during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by the manufacturer(s) during application and drying periods.
2. Apply solvent based paint only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degrees F and 95 degrees F.
3. Apply water-based paint only when temperature of surfaces to be painted and surrounding air temperatures are between 50 degrees F and 90 degrees F.
4. Apply paint to surfaces only when the surface temperature is at least 5 degrees F above the dew point.
5. Apply primer to non-metal surfaces only when the moisture content of surfaces meets the following criteria:
   a. Gypsum Wallboard: 0.5 percent maximum, when measured with an electronic moisture meter.
   b. Wood: 15 percent maximum, when measured with an electronic moisture meter.
   c. Concrete, Masonry and Plaster Walls: No visible moisture when measured in accordance with ASTM D 4263.
6. Do not apply primer to concrete floors unless the moisture vapor emission rate is less than 3 pounds/1,000 square feet/24 hours when tested in accordance with ASTM F 1869.

B. When painting and/or abrasive blasting operations are performed out of doors, no Work shall be performed when the U.S. Weather Bureau forecasts precipitation to commence prior to or within two hours after completion of such procedures and application of paint.

1.04 QUALITY ASSURANCE

A. Paint System Compatibility

The paint system, including all primers and undercoats, shall be produced by the manufacturer of the topcoat. Where this is not possible (as in cases of specialized primers used in the coating of miscellaneous components) review other Sections of the Specifications to determine the primer, surface preparation and treatment for the substrates and items to be field painted or finished as Work of this Section.

1. Notify the Engineer in writing of compatibility problems associated with the Work of this Section and substrates primed under other Sections of these Specifications.

B. Where shown on the Contract Drawings, provide not less than a 100 square foot full-coat finish sample(s) on actual surface(s) of coating material to be applied as Work of this Section, at a location selected by the Engineer. Such sample(s), when approved by the Engineer, may be incorporated into the Work and shall establish standards for color, texture and workmanship for the remainder of the Work of this Section.

C. Painting of Structural Steel - Requirements

All painting of structural steel must be done by firms that are approved by the Engineer. The firm shall have as a minimum the following:

1. Technical Capabilities

   a. Shops shall have areas available for specific operations, such as: receiving and lay down for steel to be coated; pre-cleaning of items to be coated; surface preparation; coating application; drying and curing of coated items; storage of coating materials.

   b. Blasters and painters must be trained. This training shall consist of at least 4 hours of instruction by a qualified instructor and shall cover various types of surface preparation equipment, paints and application equipment. Maintain instructor qualifications and training records and produce them when requested.

   c. There shall be procedures or processes in place to record specifications and revisions and to clarify ambiguous or incomplete specifications.

   d. There shall be a procedure for informing quality control and production personnel of job/shop procedures to meet requirements of this Specification.

2. Quality Control (QC)

   The entity performing painting of steel and galvanized steel shall have a written quality control program. The program shall contain, but not be limited to, the following:

   a. The qualifications of QC staff, including training records and experience.

   b. The authority of QC staff and reporting lines in the firm organization chart.

   c. Standards and specifications used by QC staff for inspection purposes.

   d. Inspection reports and other records documenting compliance with Authority requirements.

   e. Inspection equipment and calibration standards used by QC staff and calibration procedures.

   f. Procedure for QC staff to advise the shop foreman, in writing, of non-conforming Work.

3. Contractor's Responsibility

   a. The Contractor is responsible for Quality Control, which entails the daily inspection of all painting. The Quality Control Program shall ensure that coating systems are applied according to the coating manufacturer's technical data sheets subject to approval by the Engineer for surface preparation, ambient conditions, application parameters, curing and film thickness.

   b. The Engineer will perform Quality Assurance inspections to verify that the Contractor's Quality Control program is being followed.

4. Technical Advisor

Obtain the services of a technical advisor employed by the coating manufacturer to assist the Engineer and the Contractor during this Work. The technical advisor shall be a qualified representative, approved by the Engineer and shall be at the shop or work site prior to the opening of the coating containers. Consult with the technical advisor for instruction in the proper mixing of components and application of the materials. Arrange for the technical advisor to remain at the site until the Engineer is satisfied that the Contractor's personnel have mastered the proper handling, mixing and application of the materials.

5. Schedule and Engineer Approval

a. Submit a schedule for surface preparation and painting at least 30 days prior to beginning Work.

b. At least 10 days prior to painting, notify the Engineer.

c. Do not paint steel until approval to proceed is given by the Engineer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in the manufacturer's original unopened packages and containers bearing manufacturer's name, label and the following information:

1. Manufacturer's name.
2. Name or title of material.
3. Manufacturer's stock number and date of manufacture.
4. Shelf life.
5. Contract or order number under which the material has been ordered.
6. Lot and batch numbers.

B. Store materials not in actual use in tightly covered containers at a minimum ambient temperature of 45 degrees F and a maximum temperature of 90 degrees F in a well-ventilated area. Maintain containers used in storage of coatings in a clean condition, free of foreign materials and residue. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take all necessary precautionary measures to ensure that workmen and Work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of materials.

C. Provide paint ready mixed to approved colors. Construction site tinting is prohibited.

D. Extra Material

Where requirements for extra materials are shown on the Contract Drawings, deliver to the Engineer prior to issuance of the Certificate of Final Completion not less than one gallon of each color of each coating applied as Work of this Section. Deliver extra material in the manufacturer's original, unopened containers, clearly labeled with product identification and Contract number.

1.06 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

A. Provide paint systems and products of manufacturers in accordance with Appendix "B" to this Section, or approved equal.

B. When materials or products proposed to be used are products of manufacturers other than manufacturers specified in Appendix "B" to this Section, submit product information in accordance with the requirements of Division 1 - GENERAL PROVISIONS clause entitled "Substitution".

2.02 MATERIALS

A. Provide colors as shown on the Contract Drawings, or if not shown as required by the Engineer.

2.03 MIXES

A. Verify that the paint to be mixed has not exceeded its shelf life.

B. Mix and prepare painting materials in accordance with the manufacturer's technical data sheets subject to approval by the Engineer and 1.05 C.

C. Stir materials before application, and as required during application to produce a mixture of uniform density. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

D. Mix only complete kits of multi-component materials.

E. Colors

Each undercoat shall be a contrasting color to facilitate identification of each coat where multiple coats are to be applied as shown on the Contract Drawings.

2.04 ABRASIVES

A. Provide expendable or recyclable abrasives that are dry and free of oil, grease and corrosion-producing or other deleterious contaminants.

B. For the preparation of steel that is specified to be blasted, provide abrasives that are sized to produce a sharp, angular, uniform anchor pattern with a profile height of 2-3 mils, unless the requirements of the coating manufacturer are more restrictive. In this case, comply with profile requirements specified by coating manufacturer.

2.05 EQUIPMENT

A. Surface Preparation Equipment

1. Provide brushes, discs, wheels, scrapers, water jetting, blast cleaning and other surface preparation equipment sized properly to conduct the Work as specified in this Section and shown on the Contract Drawings.
2. Provide specialized equipment for the surface preparation of difficult-to-clean areas. Specialized equipment may include, but is not limited to:
   a. Angled nozzles or short nozzles for abrasive blast cleaning.
   b. Spin blast equipment.

B. Paint Application Equipment

1. Provide paint brushes, rollers and spray equipment to conduct the Work as specified in this Section.
2. Provide specialized equipment as required for the painting of difficult-to-paint areas. Specialized equipment may include, but is not limited to:
   a. Angled brushes for backs of nuts and bolts and other hard to reach areas.
   b. Mitts, daubers or other methods to supplement brush application.

PART 3. EXECUTION

3.01 PREPARATION

A. General

Perform preparation and cleaning procedures in accordance with the paint manufacturer's technical data sheets subject to approval by the Engineer and as specified in this Section, for each particular substrate condition.

1. Ensure paint system compatibility in accordance with 1.04 A.
2. Do not conduct final surface preparation which exposes the substrate to damp environmental conditions, or when the surface temperature is less than 5 degrees F above the dew point.
3. Remove hardware, hardware accessories, machined surfaces, lighting fixtures and similar items in place and not to be painted, or provide surface-applied protection prior to surface preparation and painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
4. When previously painted surfaces requiring field top coating are glossy (greater than 50 units at 60 degrees), first dull them using a 120 grit or greater (finer) grade sandpaper.
5. Thoroughly clean and remove all dust, oil, grease and other contaminants from surfaces to be painted. Schedule cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.

B. Surface Preparation

1. Steel

Remove slag, flux deposits, weld splatter and surface irregularities such as slivers, tears, fins and hackles; follow AWS Guidelines. Grind any resulting burrs smooth, including burrs around holes, if any. Do not remove any welding material that will weaken weld strength.

Prior to preparation, break sharp edges such as those created by flame cutting and shearing. Do not break rolled edges of angles, channels and wide flange beams without Engineer's approval.

Clean surfaces to remove oil, grease, soil and other soluble contaminants in accordance with SSPC-SP1 Solvent Cleaning. Where shown on the Contract Drawings, prepare surface in accordance with one or more of the following: SSPC-SP 2, SSPC-SP 3, SSPC-SP 5, SSPC-SP 6, SSPC-SP 7, SSPC-SP 10 and SSPC-SP 11. For welds, edges and holes, prepare surfaces to the same cleanliness level and profile as the surrounding steel.

a. Steel – Blast Cleaned

Unless otherwise shown on the Contract Drawings, perform abrasive blasting in accordance with SSPC-SP 10 Near White Blast Cleaning using a production line shot and grit blast machine or by air blast. Maintain the abrasive work mix such that the final surface profile is within the required range. Use SSPC-VIS 1 to evaluate the degree of cleaning.

b. Provide expendable or recyclable abrasives that are dry and free of oil, grease, and corrosion producing, or other deleterious contaminants. Daily (or more frequently if required) check the abrasive for oil, grease or dirt contamination with the vial test. The test consists of adding a sample of abrasive from the inside of the blast machine to a sealable vial filled with deionized water. The vial is shaken for one minute and allowed to settle for five minutes. If any oil or grease is floating on top of the water, then the abrasive is contaminated. If the water becomes cloudy, then it contains dirt. Do not use contaminated or dirty abrasives to blast steel surfaces.

c. Compressed Air Cleanliness

(1) Provide compressed air that is free from moisture and oil contamination.

(2) Use the white blotter test in accordance with ASTM D 4285 to verify the cleanliness of the compressed air. Conduct the test at least once per day for each compressor system. Sufficient freedom from oil and moisture is confirmed if soiling or discoloration are not visible on the paper.

(3) If air contamination is observed, change filters, clean traps, add moisture separators or filters or make adjustments as necessary to achieve clean, dry air. Reinspect surfaces prepared or coated since the last satisfactory test and repair, at no cost to the Authority, defective Work caused by contaminated air.

d. Surface Profile

The steel surface profile shall be 2-3 mils. Measure the surface profile of each girder, beam or diaphragm at three locations, paying special attention to areas that may have been shielded during blasting. Measure the surface profile using Testex Replica Tape in accordance with ASTM D 4417. File the impressed tapes with the Quality Control inspection records.

2. Galvanized Steel Surfaces

a. Hot-dip galvanizing shall be by the "dry kettle" process. Do not quench galvanized items following galvanizing nor shall galvanized surfaces be treated with waxes, oils or chromates.

b. Chemical Treatment

Prepare the surface for painting in accordance with ASTM D 6386 Zinc Phosphate Treatment. Follow the manufacturer's instructions for use of the materials. Prior to chemical treatment, remove white rust and other contaminants.

3. Aluminum Surfaces

Clean surfaces of oil, grease, dirt, and other foreign substances. Do not damage the aluminum. Use solvent cleaning in accordance with SSPC-SP 1.

4. Cementitious Materials

Prepare cementitious surfaces (concrete, concrete block and cement plaster) by removing efflorescence, chalk, dust, dirt, grease and oils. Remove oil and grease by detergent water cleaning and steam cleaning. Do not use solvents. For concrete surfaces, after removing oil and grease, prepare the surface for painting by abrasive blasting.

a. For concrete and other cementitious materials, perform appropriate tests as described in 1.03 A.5 to ensure that the moisture content is at or below the limit for painting and use only materials that are capable of being applied to alkaline surfaces. Do not paint over surfaces where moisture content exceeds that permitted in 1.03 A.5.

5. Wood

Wipe off dust and grit from miscellaneous wood items and millwork prior to priming, using a solution of tri-sodium phosphate and water. Rinse off surfaces with clean water. Spot coat knots, pitch streaks and sappy sections with sealer. Fill nail holes and cracks after primer has dried and sand with a fine grade sand paper between coats. Back prime interior and exterior woodwork.

a. Where clear finishes are shown on the Contract Drawings, ensure that fillers match wood tint. Work fillers into grain. Wipe excess from the surface.

3.02 APPLICATION

A. General

1. Apply paint in accordance with SSPC-PA 1 and the manufacturer's technical data sheets subject to approval by the Engineer. Use applicators and techniques best suited for substrate and type of material being applied. Follow the manufacturer's technical data sheets, subject to approval by the Engineer, for cure times, temperature and humidity conditions and recoat times as the individual coats of the specified system are applied.

   a. For blast cleaned steel, apply the prime coat on the same day (within 12 hours) that the substrate was cleaned. If the base substrate is allowed to remain uncoated for more than 12 hours, or rerusting is observed, reblast the steel prior to painting.

2. Do not apply paint in areas where dust is being generated.

3. Apply each coat at proper consistency. After each coat has dried, visually examine for pinholes, fish eyes, blisters, runs, sags and missed areas. Repair defects and repaint.

4. Apply additional coats when undercoats, stains or other conditions show through top coat of paint, until paint film is of uniform finish, color and appearance. Apply stripe coats of the prime and finish coat to all edges, corners, crevices, welds and other surface irregularities.

5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.

6. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.

7. Paint backsides of access panels, and removable or hinged covers to match exposed surfaces.
8. Finish exterior doors on tops, bottoms and side edges the same as exterior faces.
9. Sand lightly between each succeeding enamel or varnish coat.
10. Omit first coat (primer) on metal surfaces which have been shop-primed.
11. Paint primed surfaces to color shown on the Contract Drawings.
12. Where shown on the Contract Drawings, prime and paint the following to match adjacent surface: exposed bare pipes, ducts, conduits, boxes, hangers, brackets and supports, except where items are covered with a prefinished coating.
13. Color code equipment, piping conduit and exposed ductwork as shown on the Contract Drawings.

B. Scheduling Painting

Apply paint to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Allow sufficient time between successive coats to permit proper drying. Abide by the coating manufacturer's minimum and maximum recoat times subject to approval by the Engineer. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

C. Coating Thickness

Apply materials at the manufacturer's recommended spreading rate, to establish a total dry film thickness as shown on the Contract Drawings or, if not shown, as recommended by coating manufacturer and as approved by the Engineer. Monitor paint application rate by use of wet film thickness gage in accordance with ASTM D 4414. For metal surfaces, measure dry film thickness in accordance with SSPC-PA 2. Use a non-ferrous guage to measure coating thickness on galvanized surfaces or aluminum.

1. Give special attention to ensure that surfaces such as edges, corners, crevices, welds and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
2. Apply additional coating to areas of insufficient thickness. Use care during application to assure that all repairs blend in with the surrounding surfaces.
3. Unless directed otherwise by the Engineer, remove excessive coating thickness and reapply the affected coat(s).

D. Coating Adhesion

1. Apply all coats in such a manner to assure that they are well-adhered to each other and to the substrate. If the application of any coat causes lifting of an underlying coat, or if there is poor adhesion between coats or to the substrate, remove the coating in the affected area to adjacent sound, adherent coating and reapply the material.
2. If adhesion is suspect, conduct adhesion tests in accordance with ASTM D 3359 or ASTM D 4541 as directed by the Engineer and repair all test areas. The acceptance criteria for the testing will be established by the Engineer. Replace all defective coating that is revealed by the testing.

E. Completed Work

Match approved samples for color, texture and coverage. Remove, refinish or repair Work not in compliance with the requirements specified in this Section.

F. Field Painting – Fasteners

1. After erection or installation, all rust, scale, dirt, grease and other foreign material on bolts, nuts and washers shall be completely removed by solvent cleaning in accordance with SSPC-SP 1 followed by hand tool cleaning SSPC-SP 2, or power tool cleaning SSPC-SP 3.
2. Apply brush applications of primer and intermediate to bolts, nuts and washers after tensioning. Apply topcoat by spray application. Give careful attention to bolted connections to ensure that all bolts, nuts and washers are fully coated.

G. Repair of Damaged and Unacceptable Coatings

1. Surface Preparation of Localized Areas
   a. Repair localized damage, corrosion and unacceptable coatings.
   b. Prepare the surface by cleaning in accordance with SSPC-SP 1 Solvent Cleaning followed by SSPC-SP 2 Hand Tool Cleaning or SSPC-SP 3 Power Tool Cleaning. Use a solvent that is acceptable to the paint manufacturer.
   c. For previously blast-cleaned steel, if the damage exposes the substrate, remove all loose material and prepare the steel in accordance with SSPC-SP 11.
   d. For galvanized steel, repair damaged galvanizing in accordance with ASTM A 780. Use a zinc-rich coating containing a minimum of 92 percent zinc in the dry film.
2. Surface Preparation of Extensive Areas
   a. Repair extensive areas of damage or unacceptable coating by methods acceptable to the Engineer, based on the nature of the defect.
   b. For previously blast-cleaned steel, blast surfaces back to original requirements. Use extreme care to avoid overblast damage to the surrounding coating.
3. Feathering of Repair Areas
   a. Feather the existing coatings surrounding each repair location. Feather for a distance of 1 to 2 inches to provide a smooth, tapered transition into the coating.
   b. Verify that the edges of coating around the periphery of the repair areas are tight and intact by probing with a putty knife in accordance with the requirements of SSPC-SP 3 Power Tool Cleaning. Roughen the existing coating in the feathered area to assure proper adhesion of the repair coats.

H. Coating Application in Repair Areas

1. When the bare substrate is exposed in the repair area, apply all coats of the system to the specified thicknesses.
2. When the damage does not extend to the bare substrate, apply only the affected coats.
3. Maintain the thickness of the system in overlap areas within the specified total thickness tolerances.

I. Clean-up

During progress of Work, remove discarded paint materials, rubbish, cans and rags daily. Upon completion of painting Work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

3.03 PAINT TESTING

A. The Authority reserves the right to conduct tests of the materials at any time, and any number of times during shop or field painting.

1. The Engineer may sample the paint(s) being used. A representative pint or quart sample of each component of paint(s) at the construction site will be transferred to metal containers, identified, sealed and certified in the presence of the Contractor.

2. Tests on paint samples may be conducted by the Engineer to confirm manufacturer's submittals made under Appendix "A". Any or all of the following tests may be conducted:

   a. Viscosity (Stormer @ 25 degrees C) KU, ASTM D 562.

   b. Percent Total Solids by Weight, ASTM D 2369.

   c. Volatile Organic Compounds (VOC), ASTM D 2369.

   d. Weight per Gallon, ASTM D 1475.

   e. Volume Nonvolatile Matter, ASTM D 2697.

   f. Pigment Content, ASTM D 2371.

   g. Percent Metallic Zinc in Primer, ASTM D 521.

   h. Specular Gloss of Finish Coat, ASTM D 523.

   i. Infrared Identification - of individual components and of the mixed coatings for 2 component materials. Obtain each spectrum by sandwiching a small quantity (i.e., 1-2 drops) of material between 2 potassium bromide plates and obtaining a transmission infrared spectrum. For the mixed and cured material, use a solid sampling technique.

3. If the Engineer determines upon review of laboratory tests that the material being used does not comply with the requirements specified in this Section, he may direct the Contractor to stop painting Work and remove non-complying paint, to repaint surfaces coated with rejected paint or to remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are incompatible.

3.04 PROTECTION

Protect other adjacent Work against damage by painting and finishing Work. Correct damage by cleaning, repairing or replacing, and repainting, as approved by the Engineer.

A. Provide "Wet Paint" signs to protect newly painted finishes. After completion of painting operations, remove temporary protective wrappings for protection of adjacent and existing conditions.

B. At completion of Work of other trades, touch-up and restore damaged or defaced painted surfaces.

C. Ensure that coated items are not shipped until cured. Protect all fully coated and cured items from handling and shipping damages using padded slings, dunnage, separators and tie-downs.

END OF SECTION

SECTION 09910

PAINTING

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Product Data

09910D01 Manufacturer's technical data sheets including the following information for each coating:

- DFT maximum
- Zinc content (zinc primers only)
- Slip coefficient (zinc primers only)
- Substrates
- Surface preparation
- Profile
- Storage temperature
- Primers
- Topcoats
- Application equipment, including touchup
- Sweat-in-time
- Pot life
- Application schedule -
  Minimum surface/air temperatures and humidity
  Maximum surface/air temperatures and humidity
- Drying schedule -
  Dry to handle
  Dry to topcoat
  Maximum recoat
  Cure

Quality Assurance-Quality Control

09910L01 Submit a copy of the quality control program, as required by 1.04 C.2 of this Section, if requested by the Engineer.

END OF APPENDIX "A"

SECTION 09910

PAINTING

APPENDIX "B"

PAINT SCHEDULE

A. Exterior

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Concrete Gloss	C-1G	Water Based Primer Sealer	Carboline Carbocrylic 120 PPG Perma-Crete 4-603 SW Loxon Acrylic Primer A24W8300	Acrylic Gloss	Carboline Carbocrylic 3359 DTM PPG Pitt-Tech Plus 90-1310 SW DTM Acrylic B66-100 Series	Acrylic Gloss	Carboline Carbocrylic 3359 DTM PPG Pitt-Tech Plus 90-1310 SW DTM Acrylic B66-100 Series
Concrete Semi-Gloss	C-1S	Water Based Primer Sealer	Carboline Carbocrylic 120 PPG Perma-Crete 4-603 SW Loxon Acrylic Primer A24W8300	Acrylic	Carboline Sanitile 155 PPG Pitt-Tech Plus 90-1210 SW DTM Acrylic B66-200 Series	Acrylic Semi-Gloss	Carboline Sanitile 155 PPG Pitt-Tech Plus 90-1210 SW DTM Acrylic B66-200 Series
Concrete Masonry Gloss	CM-1G	Water Based Block Filler	Carboline Sanitile 100 SW Heavy Duty Block Filler B42W46 PPG Speedhide 6-15	Acrylic Gloss	Carboline Carbocrylic 3359 DTM SW DTM Acrylic B66-100 Series PPG Pitt-Tech Plus 90-1310	Acrylic Gloss	Carboline Carbocrylic 3359 DTM SW DTM Acrylic B66-100 Series PPG Pitt-Tech Plus 90-1310

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Concrete Masonry Semi-Gloss	CM-1S	Water Based Block Filler	Carboline Sanitile 100 PPG Speedhide 6-15 SW Heavy Duty Block Filler B42W46	Acrylic Semi-Gloss	Carboline Sanitile 155 PPG Pitt-Tech Plus 90-1210 SW DTM Acrylic B66-200 Series	Acrylic Semi-Gloss	Carboline Sanitile 155 PPG Pitt-Tech Plus 90-1210 SW DTM Acrylic B66-200 Series
Cement Plaster Walls & Soffits Gloss	P-1G	Water Based Primer Sealer	Carboline Carbocrylic 120 PPG Perma-Crete 4-603 SW Loxon Acrylic Primer A24W8300	Alkyd Gloss	Carboline Carbocoat 30R PPG 95-5000 Series SW Industrial Enamel HS B54Z-400 Series	Alkyd Gloss	Carboline Carbocoat 30R PPG 95-5000 Series SW Industrial Enamel HS B54Z-400 Series
Steel Gloss	S-1G*	Organic Zinc Rich	Carboline Carbozinc 859 PPG PMC Amercoat 68 HS SW Zinc Clad III HS	Epoxy	Carboline Carboguard 888 PPG PMC Amercoat 399 SW Macropoxy 646	Aliphatic Polyurethane Gloss	Carboline Carbothane 134 HG PPG PMC Amercoat 450 H SW Acrolon 218 B65-600
*Paint system S-1G must be on the current New England Protective Coatings (NEPCOAT) Qualified Product List.							
Steel Gloss	S-2G	Inorganic Zinc Rich	Carboline Carbozinc 11 HS PPG PMC Dimetcote 9 HS Sherwin-Williams Zinc Clad II	Epoxy	Carboline Carboguard 893 PPG PMC Amercoat 385 Sherwin Williams Macropoxy 646	Aliphatic Polyurethane Gloss	Carboline Carbothane 134 HG PPG PMC Amercoat 450 H Sherwin-Williams Acrolon 218HS B65-600

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Steel Semi-Gloss	S-1S*	Organic Zinc Rich	Carboline Carbozinc 859	Epoxy	Carboline Carboguard 888	Aliphatic Polyurethane Semi-Gloss	Carboline Carbothane 133 LH
			PPG PMC Amercoat 68 HS		PPG PMC Amercoat 399		PPG PMC Amercoat 450 HSG
			SW Zinc Clad III HS		SW Macropoxy 646		SW Acrolon 218 HS
*Paint system S-1S must be on the current New England Protective Coatings (NEPCOAT) Qualified Product List.							
Steel Semi-Gloss	S-2S	Inorganic Zinc Rich	Carboline Carbozinc 11 HS	Epoxy	Carboline Carboguard 893	Aliphatic Polyurethane Semi-Gloss	Carboline Carbothane 133 LH
			PPG PMC Dimetcote D9 HS		PPG PMC Amercoat 385		Amercoat 450 HSG
			Sherwin-Williams Zinc Clad II		Sherwin-Williams Macropoxy 646		Sherwin-Williams Acrolon 218 HS
Steel Semi-Gloss	S-3S	Aluminum Epoxy Mastic	Carboline Carbomastic 15	Epoxy	Carboline Carboguard 890	Aliphatic Polyurethane Semi-Gloss	Carboline Carbothane 133 LH
			PPG PMC Amerlock 2 AL		PPG PMC Amercoat 385		PPG PMC Amercoat 450 HSG
			SW Epoxy Mastic Aluminum II		SW Macropoxy 646		SW Acrolon 218 HS
Galvanized & Aluminum Gloss	N-1G	Primer	PPG Pitt-Tech Plus 90-912		N/A	Acrylic Gloss	PPG Pitt-Tech Plus 90-1310
			SW Pro-Cryl B66 - 310 Series				SW DTM Acrylic B66-100 Series
			Carboline Galoseal WB				Carboline 3359 DTM
Galvanized & Aluminum Semi-Gloss	N-1S	Primer	PPG Pitt-Tech Plus 90-912		N/A	Acrylic Semi-Gloss	PPG Pitt-Tech Plus 90-1210
			SW Pro-Cryl B66 - 310 Series				SW DTM Acrylic B66-200 Series
			Carboline Galoseal WB				Carboline 3359

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Galvanized & Aluminum (Marine & Bridge)	N-2S	Epoxy Primer	Carboline Carboguard 888 SW Macropoxy 646 PPG PMC Amercoat 385		N/A	Aliphatic Polyurethane	Carboline Carbothane 133 LH SW Acrolon 218 HS PPG PMC Amercoat 450 HSG
Galvanized & Aluminum (Marine & Bridge) Gloss	N-2G	Epoxy Primer	Carboline Carboguard 888 PPG PMC Amercoat 385 SW Macropoxy 646		N/A	Aliphatic Polyurethane Gloss	Carboline Carbothane 134 HG PPG PMC Amercoat 450 H SW Acrolon 218 HS B65-600
Plywood Semi-Gloss	PW-1S	Acrylic Wood Primer	Carboline Carbocrylic 120 SW A-100 Latex B42W42 PPG Speedhide 6-609	Acrylic Semi-Gloss	Carboline Carbocrylic 3359 SW Metalatex B42 Series PPG Speedhide 6-900	Acrylic Semi-Gloss	Carboline Carbocrylic 3359 SW Metalatex B42 Series PPG Speedhide 6-900
Concrete, Brick & Granite Clear Gloss Anti-Graffiti	AG-1	Primer Sealer	Carboline Carboguard 1340 Visual Pollution Tech. Crystal Clear		N/A	Aliphatic Urethane	Carboline Carbothane 130 Visual Pollution Tech. Crystal Clear
Concrete, Brick & Granite Clear Flat Anti-Graffiti	AG-2	Primer Sealer	Degussa Tagguard Sivento Protectosil Tristar Proteus Masonry Sealer		N/A	Various	Degussa Tagguard Sivento Protectosil Tristar Proteus 940

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Steel & Concrete Saltwater Immersion	CT-1	Coal Tar Epoxy (C-200A)	Carboline Bitumastic 300M International Intertuf 702 Sherwin-Williams Targuard		N/A	Coal Tar Epoxy (C-200A)	Carboline Bitumastic 300M International Intertuf 702 Sherwin-Williams Targuard
Steel, Jet Fuel Splash & Spill	S-4	Organic Zinc Rich	Carboline Carbozinc 859 Tnemec 90-97 Tneme-Zinc SW Zinc Clad III HS	Epoxy	Carboline Carboguard 890 Tnemec Epoxoline II Series N69 SW Macropoxy 646	Polyester Polyurethane	Carboline Carbothane 133 LH Tnemec CRU Series 290 SW Poly-Lon HP
Steel Slip Critical "B"	S-5	Organic Zinc Rich	Carboline Carbozinc 859 PPG PMC Amercoat 68 HS SW Zinc Clad III HS		N/A		N/A
Steel Slip Critical "B"	S-6	Inorganic Zinc Rich (Shop Only)	PPG PMC Dimetcote 9 Carboline Carbozinc 11 HS Sherwin-Williams Zinc Clad II		N/A		N/A
Steel (under concrete or grout)	S-7	Epoxy Mastic	Carboline Carboguard 890 PPG PMC Amerlock 2 Sherwin-Williams Macropoxy 646		N/A	Epoxy (immersion grade)	Carboline Carboguard 890 PPG PMC Amerlock 2 Sherwin-Williams Macropoxy 646

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Steel, Saltwater, Tidal	S-8	Epoxy	Duramar 2510 UW International Interzone 954 Sherwin-Williams Sher-Glass	N/A		Epoxy	Duramar 2510 UW International Interzone 954 Sherwin-Williams Sher-Glass
Steel, Ultra-Weatherable	S-9	Zinc Rich	Carboline Carbozinc 859 SW Zinc Clad III HS PPG PMC Amercoat 68 HS	Urethane	Carboline Carbothane 134 HG SW Acrolon 218 HS PPG BRP 1000 Series	Fluorocarbon	Carboline Carboxane 950 SW FluoroKem PPG Coraflon ADS
Steel, Rapid Deployment	S-10	Zinc Rich	PPG PMC 68 HS Sherwin-Williams Corothane I - Galvapac		N/A		PPG PMC PSX 700 Sherwin-Williams Fast Clad Urethane
Aluminum Ultra-Weatherable	N-3	Epoxy	Carboline Carboguard 888 Sherwin-Williams Macropoxy 646 PPG PMC Amercoat 385	Urethane	Carboline Carbothane 133 LH Sherwin-Williams Acrolon 218 HS PPG BRP 1000 Series	Fluorocarbon	Carboline Carboxane 950 Sherwin-Williams FluoroKem PPG Coraflon ADS
B. Interior							
Steel, water tank	S-11	Epoxy	PPG PMC Amerlock 2 Carboline Carboguard 891 SW Duraplate 235 NSF	Epoxy	PPG PMC Amerlock 2 Carboline Carboguard 891 SW Duraplate 235 NSF	Epoxy	PPG PMC Amerlock 2 Carboline Carboguard 891 SW Duraplate 235 NSF

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Steel, jet fuel tank	S-12	Epoxy Amine	PPG PMC Amercoat 395 FD Carboline Plasite 9060 SW Shelcote II		N/A	Epoxy Amine	PPG PMC Amercoat 395 FD Carboline Plasite 9060 SW Shelcote II
Concrete Flat	C-2F	Water Based Sealer	PPG Speedhide 6-2 ProMar B28W8200 Carboline 120	Acrylic	PPG Speedhide 6-70 SW ProMar B30W200 Carboline 3130	Acrylic Flat	PPG Speedhide 6-70 SW ProMar B30W200 Carboline 3130
Concrete Semi-Gloss	C-2S	Water Based Sealer	Carboline Carbocrylic 120 SW ProMar B28W8200 PPG Speedhide 6-2	Acrylic	Carboline Carbocrylic 3359 SW ProMar B31W200 PPG Speedhide 6-500	Acrylic Semi-Gloss	Carboline Carbocrylic 3359 SW ProMar B31W200 PPG Speedhide 6-500
Concrete Heavy-Duty Gloss	C-3G	Epoxy	Carboline Carboguard 1340 SW Macropoxy HS Epoxy	Epoxy	Carboline Carboguard 890 SW HP Epoxy B67-200	Epoxy Gloss	Carboline Carboguard 890 SW HP Epoxy B67-200
Concrete Masonry Flat	CM-2F	Block Filler	PPG Speedhide 6-7 SW PrepRite B25W25 Carboline Sanitile 100	Acrylic	PPG Speedhide 6-70 SW ProMar B30W200 Carboline 3130	Acrylic Flat	PPG Speedhide 6-70 SW ProMar B30W200 Carboline 3130
Concrete Masonry Semi-Gloss	CM-2S	Block Filler	Carboline Sanitile 100 SW PrepRite B25W25 PPG Speedhide 6-7	Acrylic	Carboline Carbocrylic 3359 SW ProMar B31W200 PPG Speedhide 6-500	Acrylic Semi-Gloss	Carboline Carbocrylic 3359 SW ProMar B31W200 PPG Speedhide 6-500
Concrete Masonry Heavy-Duty Gloss	CM-3	Epoxy Block Filler	Carboline Carboguard 954HB SW Kem Cati-Coat HS B42W400	Epoxy	Carboline Carboguard 890 SW HP Epoxy B67-200	Epoxy Gloss	Carboline Carboguard 890 SW HP Epoxy B67-200

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Cement & Gypsum Plaster Walls & Soffits Flat	P-1F	Acrylic Sealer	SW PrepRite B28W300 PPG Speedhide 6-2 Carboline Sanitile 120	Acrylic	SW ProMar B30W200 PPG Speedhide 6-70 Carboline 3130	Acrylic Flat	SW ProMar B30W200 PPG Speedhide 6-70 Carboline 3130
Cement & Gypsum Plaster Walls & Soffits Semi-Gloss	P-1S	Acrylic Sealer	Carboline Carbocrylic 120 SW PrepRite B28W300 PPG Speedhide 6-2	Acrylic	Carboline Carbocrylic 3359 SW ProMar B31W200 PPG Speedhide 6-500	Acrylic Semi-Gloss	Carboline Carbocrylic 3359 SW ProMar B31W200 PPG Speedhide 6-500
Gypsum Board Flat	GB-1F	Acrylic Sealer	SW PrepRite B28W8200 PPG Speedhide 6-2 Carboline Sanitile 120	Acrylic	SW ProMar B30W200 PPG Speedhide 6-70 Carboline 3130	Acrylic Flat	SW ProMar B30W200 PPG Speedhide 6-70 Carboline 3130
Gypsum Board Semi-Gloss	GB-1S	Acrylic Sealer	Carboline Carbocrylic 120 SW PrepRite B28W8200 PPG Speedhide 6-2	Acrylic	Carboline Carbocrylic 3359 SW ProMar B31W200 PPG Speedhide 6-500	Acrylic Semi-Gloss	Carboline Carbocrylic 3359 SW ProMar B31W200 PPG Speedhide 6-500
Steel Semi-Gloss	S-13S	Acrylic Steel Primer	PPG Pitt-Tech Plus 90-912 SW DTM B66 W1 Carboline 3358	Acrylic	PPG Pitt-Tech Plus 90-1210 SW Sher-Cryl B66-350 Carboline 3359	Acrylic Semi-Gloss	PPG Pitt-Tech Plus 90-1210 SW Sher-Cryl B66-350 Carboline 3359

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Steel Gloss	S-14G	Acrylic Steel Primer	Carboline Carbocrylic 3358 SW DTM B66W1 PPG Pitt-Tech Plus 90-912	Acrylic	Carboline Carbocrylic 3359 DTM SW DTM Sher-Cryl B66-300 PPG Pitt-Tech Plus 90-1310	Acrylic Semi-Gloss	Carboline Carbocrylic 3359 DTM SW DTM Sher-Cryl B66-300 PPG Pitt-Tech Plus 90-1310
Steel Heavy-Duty Semi-Gloss (UV Exposure)	S-14S	Organic Zinc Rich	Carboline Carbozinc 859 PPG PMC Amercoat 68 HS SW Zinc Clad III HS	Epoxy	Carboline Carboguard 888 PPG PMC Amercoat 399 SW Macropoxy 646	Aliphatic Polyurethane Semi-Gloss	Carboline Carbothane 133 LH PPG PMC Amercoat 450 HSG SW Acrolon 218 HS
Steel Heavy-Duty	S-15	Organic Zinc Rich	Carboline Carbozinc 859 SW Zinc Clad III HS PPG PMC Amercoat 68 HS	Epoxy	Carboline Carboguard 890 SW Macropoxy 646 PPG PMC Amerlock 2	Epoxy	Carboline Carboguard 890 SW Macropoxy 646 PPG PMC Amerlock 2
Galvanized & Aluminum Gloss	N-4G	Primer	Carboline Carbocrylic 120 PPG Pitt-Tech Plus 90-912 SW Pro-Cryl B66-310 Series		N/A	Acrylic Gloss	Carboline Carbocrylic 3359 DTM PPG Pitt-Tech Plus 90-1310 SW Sher-Cryl B66-300
Galvanized & Aluminum Semi-Gloss	N-4S	Primer	PPG Pitt-Tech Plus 90-912 SW Pro-Cryl B66-310 Series Carboline Carbocrylic 120		N/A	Acrylic Semi-Gloss	PPG Pitt-Tech Plus 90-1210 SW Sher-Cryl B66-350 Carboline 3359

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Galvanized & Aluminum Heavy Duty Semi-Gloss	N-5S	Epoxy	Carboline Carboguard 888 SW Macropoxy 646 PPG PMC Amercoat 385		N/A	Aliphatic Polyurethane Semi-Gloss	Carboline Carbothane 133 LH SW Acrolon 218 HS B65-650 PPG Amercoat 450 HSG
Plywood Flat	PW-2F	Acrylic	Carboline Carbocrylic 120 SW PrepRite ProBlock B51W20 PPG SealGrip 17-921	Acrylic	Carboline 3130 SW ProMar B30W200 PPG Speedhide 6-70	Acrylic	Carboline 3130 SW ProMar B30W200 PPG Speedhide 6-70
Plywood Semi-Gloss	PW-2S	Acrylic	Carboline Carbocrylic 120 SW Preprite ProBlock B51W20 PPG SealGrip 17-921	Acrylic	Carboline Carbocrylic 3359 SW ProMar B31W200 PPG Speedhide 6-500	Acrylic	Carboline Carbocrylic 3359 SW ProMar B31W200 PPG Speedhide 6-500
Concrete Floor Clear Finish	CF-2	Epoxy	PPG MegaSeal HSPC 99-12700 SW ArmorSeal 33 Carboline Carboguard 1340		N/A	Epoxy	PPG MegaSeal SL 99-12600 SW 650 SL/RC Carboline Sanitile 925
Concrete Floor Color Finish Heavy-Duty Gloss	CF-3	Epoxy	Carboline Semstone 110 SW ArmorSeal 33 PPG MegaSeal HSPC 99-12710	Epoxy	Carboline Sanitile 945 SL SW ArmorSeal 650 SL/RC PPG MegaSeal SL	Epoxy	Carboline Sanitile 945 SL SW ArmorSeal 650 SL/RC PPG MegaSeal SL

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Concrete Color Finish Anti-Graffiti	AG-3	Epoxy	Carboline Rustbond Penetrating Sealer SW Macropoxy 920		N/A	Polyester Urethane	Carboline Carbothane 133 LH SW Polylon HP
Concrete Masonry, Color Finish Anti-Graffiti	AG-4	Concrete Block Filler	Carboline Carboguard 954 HB SW Kem Cati-Coat HS		N/A	Polyester Urethane	Carboline Carbothane 133 LH Sherwin-Williams Polylon HP

C. Overcoat Systems

Steel	S-16	Alkyd Spot Primer	Carboline Carbocoat 8215C SW Kromik Metal Primer PPG Multiprime 97-680		N/A	Silicone Alkyd	Carboline 30 R SW Steel Master 9500 B56-300 Series PPG Sil-Shield 95-5000
Steel	S-17	MC Urethane Spot Primer	Wasser MC-Prepbond Xymax MonoLock PP SW Corothane I Mio-Aluminum	MC Urethane	Wasser MC-Prepbond Xymax MonoLock PP SW Corothane I Ironox B	MC Urethane	Wasser MC-Luster Xymax Bridge Finish SW Corothane I HS
Galvanized & Aluminum Semi-Gloss	N-6S	Epoxy Spot Primer	Carboline 888 Epoxy SW Macropoxy 646 PPG PMC Amercoat 385	Tie Coat	Carboline Rustbond SW Macropoxy 920 Pre-Prime PPG PMC Amerlock Sealer	Urethane	Carboline 133LH SW Acrolon 218 HS PPG PMC 450 HSG

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Steel Semi-Gloss	S-18	Epoxy Mastic Spot Primer	PPG PMC Amerlock 2AL	Tie Coat	PPG PMC Amerlock Sealer	Polyurethane	PPG PMC Amercoat 450 HSG
			Carboline Carbomastic 615 HS		Carboline Rustbond		Carboline 133 LH
			SW Epoxy Mastic Aluminum II		SW Macropoxy 920 Pre-Prime		SW Acrolon 218 HS
Concrete Semi-Gloss	C-4S	Spot Primer	Carboline Sanitile 120	Acrylic	Carboline Sanitile 155	Acrylic	Carboline Sanitile 155
			PPG Perma-Crete 4-603		PPG Pitt-Tech Plus 90-1210		PPG Pitt-Tech Plus 90-1210
			SW Loxon A24W8300		SW DTM Acrylic B66-200		SW DTM Acrylic B66-200
Concrete Masonry Semi-Gloss	CM-4S	Block Filler Spot Primer	Carboline Sanitile 100	Acrylic	Carboline Sanitile 155	Acrylic	Carboline Sanitile 155
			SW H.D. Block Filler B42W46		SW DTM Acrylic B66-200		SW DTM Acrylic B66-200
			PPG Pitt-Glaze 16-90		PPG Pitt-Tech Plus 90-1210		PPG Pitt-Tech Plus 90-1210

D. Interior - Sustainable Design

Concrete Masonry Flat	CM-5F	Block Filler	PPG 6-7 Speedhide Latex Block Filler	Acrylic Flat	PPG 9-100 Pure Performance Flat Interior Latex	Acrylic Flat	PPG 9-100 Pure Performance Flat Interior Latex
			SW PrepRite B25W25		SW ProGreen B30-600		SW ProGreen B30-600
			Carboline Sanitile 100		Carboline 3130		Carboline 3130

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Concrete Masonry Semi-Gloss	CM-5S	Block Filler	PPG 6-7 Speedhide Latex Block Filler	Acrylic	PPG 9-500 Pure Performance Interior Latex Primer	Acrylic Semi-Gloss	PPG 9-500 Performance Interior Latex Finish Semi-Gloss
			SW PrepRite B25W25		SW ProGreen B31-600		SW ProGreen B31-600
			Carboline Sanitile 100		Carboline 3234		Carboline 3234
Cement & Gypsum Plaster Walls & Soffits Semi-Gloss	P-2S	Acrylic Sealer	PPG 9-900 Pure Performance Interior Latex Primer	Acrylic	PPG 9-500 Pure Performance Interior Latex	Acrylic Semi-Gloss	PPG 9-500 Pure Performance Interior Latex
			SW Loxon A24W8300		SW ProGreen B31-600		ProGreen B31-600
			Carboline Sanitile 120		Carboline 3234		Carboline 3234
Gypsum Board Flat	GB-2F	Acrylic Sealer	PPG 9-900 Pure Performance Latex Primer	Acrylic	PPG 9-100 Pure Performance Latex	Acrylic Flat	PPG 9-100 Pure Performance Latex
			SW ProGreen 200 B28W600		SW ProGreen 200 B30-600		SW ProGreen 200 B30-600
			Carboline Sanitile 120		Carboline 3130		Carboline 3130
Gypsum Board Semi-Gloss	GB-2S	Acrylic Sealer	PPG 9-900 Pure Performance Latex	Acrylic	PPG 9-500 Pure Performance Latex	Acrylic Semi-Gloss	PPG 9-500 Pure Performance Latex
			SW ProGreen 200 B28W600		SW ProGreen 200 B31-600		SW ProGreen 200 B31-600
			Carboline Sanitile 120		Carboline 3234		Carboline 3234
Steel Semi-Gloss	S-19S	Acrylic Steel Primer	PPG 90-912 Series Pitt-Tech DTM Industrial Enamel	Acrylic	PPG Pitt-Tech Plus 90-1210	Acrylic Semi-Gloss	PPG Pitt-Tech Plus 90-1210
			Carboline Carbocrylic 3358 MC		Carboline 3234		Carboline 3234
			SW Pro-Cryl Universal Primer		SW Pro Industrial B66-650		SW Pro Industrial B66-650

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Steel-Heavy Duty Gloss	S-20G	Organic Zinc-Rich	PPG PMC Amercoat 68 HS VOC	Epoxy	PPG PMC Amercoat 399	Urethane	PPG PMC Amershield VOC
			Carboline Carbozinc 859 VOC		Carboline Carboguard 894		Carboline Carbothane 134 VOC
			SW Zinc Clad III HS-100		SW Macropoxy 646-100		SW Hi-Solids Polyurethane-100
Galvanized & Aluminum Semi-Gloss	N-7S	Primer	PPG 90-912 Series Pitt-Tech DTM Industrial Enamel		N/A	Acrylic Semi-Gloss	PPG Pitt-Tech Plus 90-1210
			Carboline Galoseal WB				Carboline Carbocrylic 3234
			SW Pro-Cryl Universal Primer				SW Pro Industrial B66-650
Plywood Semi-Gloss	PW-3S	Acrylic	PPG 9-900 Pure Performance Interior Latex Primer	Acrylic	PPG Speedhide 6-500	Acrylic Semi-Gloss	PPG Speedhide 6-500
			SW Wood Primer B28W8111		SW Pro Industrial B66-650		SW Pro Industrial B66-650
			Carboline Carbocrylic 120		Carboline 3234		Carboline 3234
Concrete Floor Clear Finish	CF-4	Epoxy	PPG MegaSeal HSPC 99-12700		N/A	Epoxy	PPG MegaSeal SL 99-12600
			Carboline Carboguard 1340				Carboline Sanitile 925
			SW ArmorSeal 33 B58CQ33				SW ArmorSeal 650 SL/RC Clear

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Concrete Floor Color Finish	CF-5	Epoxy	PPG MegaSeal HSPC Carboline Carboguard 1340 SW ArmorSeal 33 B58 AQ33		N/A	Epoxy	PPG MegaSeal SL Carboline Sanitile 555 SW ArmorSeal 650 SL/RC
Concrete, Heavy Duty	C-5	Epoxy	Carboline Carboguard 1340 PPG PMC Amerlock Sealer	Epoxy	Carboline Carboguard 890 VOC PPG PMC Amerlock 400 VOC	Epoxy	Carboline Carboguard 890 VOC PPG PMC Amerlock 400 VOC
Concrete Masonry, Heavy Duty	CM-6	Epoxy block filler	Carboline Carboguard 954 HB	Epoxy	Carboline Carboguard 890 VOC		Carboline Carboguard 890 VOC

END OF APPENDIX "B"

DIVISION 15

SECTION 15310

SPRINKLER FIRE PROTECTION - PIPING AND APPURTENANCES

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements of piping and appurtenances for automatic sprinkler fire protection systems.

B. Automatic sprinkler fire protection systems specified in this Section are:

1. Wet-Pipe System
2. Dry-Pipe System
3. Pre-Action System
4. Deluge System
5. Combined Dry-Pipe and Pre-Action System

C. Sprinker water service installed under this Section ends at the building line unless otherwise shown on the contract Drawings. The continuation of the sprinkler water service is specified under Division 2 of the Specifications. Types of material and installation of the piping under this Section shall be compatible with types of material and installation specified under Division 2.

D. Trenching and backfilling required in conjunction with underground piping furnished under this Section shall be as specified in applicable Sections of Division 2 and shall be included as Work under this Section.

1.02 DESIGN AND PERFORMANCE REQUIREMENTS

A. Design and performance of components and methods specified herein shall comply with all applicable Federal , State and Local laws, ordinances, regulations and codes, and the latest industry standards including, but not limited to the entities listed below.

New York City Building Code

New York City Board of Standards and Appeals

New Jersey Uniform Construction Code

The BOCA National Building Code

The BOCA National Fire Prevention Code

Municipal Water Company

American National Standards Institute (ANSI)

American Society for Testing and Materials (ASTM)

American Water works Association (AWWA)

Factory Mutual Engineering Corp. (FM)

Manufacturer Standardization Society of the Valves and Fittings Industry, Inc. (MSS)

National Fire Protection Association (NFPA)

National Electrical Manufacturers Association (NEMA)

Underwriters Laboratories Inc. (UL)

In addition, specific provisions cited herein shall govern for the associated specific application.

B. The sprinkler installation shall be designed in accordance with NFPA 13 and shall be either a pipe schedule system or a hydraulically designed system.

C. In buildings requiring specialized sprinkler systems, additional applicable standards as referenced in NFPA 13 shall be used for design, including but not limited to the following: NFPA 15, 16, 231, 231C, 231D and 409.

D. Sprinkler fire protection piping and appurtenances shall be UL listed, and approved by FM and those authorities having jurisdiction.

E. Design shall be based on water supply information as shown on the Contract Drawings or, if not shown, as determined by a water flow test by the Contractor.

1.03 QUALITY ASSURANCE

A. Fire protection piping and appurtenances, of types and sizes required, shall have been satisfactorily used for purposes similar to those intended herein for not less than three years.

B. Entities performing Work shall have experience on at least two projects involving complexities similar to those required under this Contract.

C. Contract Drawings, as well as this Specification indicate sprinkler fire protection piping appurtenances based on specific manufacturers' types and models. Appurtenances having equal physical and performance characteristics by other approved manufacturers may be considered, provided that deviations do not alter the design concepts or intended performances, as judged by the Engineer. The burden of proof of equality of sprinkler fire protection piping appurtenances is on Contractor.

D. Manufacturer Qualifications: Firms whose equipment, specialties and accessories are listed by product name and manufacturer in UL Fire Protection Equipment Directory and FM Approval Guide, and that conform to other requirements indicated.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Clean all pipe sections of foreign matter and cover ends with temporary sheet metal closures or plastic end caps of sufficient tightness to prevent entry of foreign matter prior to shipping to the construction site.

B. Store pipe, fittings, valves and other components at the construction site on pallets or raised platforms with suitable coverings satisfactory to the Engineer to protect them against damage and weather.

C. Inspect all pipe, fittings, valves and other components for damage before moving them from storage to the point of installation at the construction site.

1.05 SPARE PARTS

A. Provide a red, steel cabinet containing the following spare sprinkler heads with their respective installing wrenches:

1. Systems of up to 300 heads - 6 spares.
2. Systems of 300 to 1000 heads - 12 spares.
3. Systems of above 1000 heads - 24 spares.

Stock of spare sprinkler heads shall include all types and temperature ratings installed and shall not be less than six for each type and rating.

1.06 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 PIPE, FITTINGS, AND FLANGES

A. Provide pipe, fittings and flanges in accordance with the "PIPE, FITTINGS AND FLANGES SCHEDULE" specified below, including gaskets, bolts, nuts, washers and other pressure containing parts necessary for the complete installation of piping systems.

B. Nipples shall be extra-heavy shoulder type of same material as pipe; close nipples are not acceptable.

C. Unless otherwise shown on the Contract Drawings, piping connections to equipment shall be made up with unions for piping 2 inches and smaller and shall be flanged for piping 2-1/2 inches and larger.

D. Gasket for flanges shall be 1/16-inch thick (after compression), rubber or neoprene, full-faced, and punched bolt holes.

E. Provide insulating flanges, couplings or unions where brass or copper pipe connects to ferrous pipe material. Flanged connections shall be made with gaskets, sleeves and washers of dielectric material for complete insulation between flanges, bolts, nuts and washers.

F. Grooved Piping Mechanical Couplings

1. Couplings shall be complete with gaskets, bolts and nuts recommended by the manufacturer for the service. Use vandal proof nuts and bolts on vertical piping in stairs.
2. Couplings shall be Victaulic "Style 75" lightweight for system pressure not exceeding 400 psi (including shut-off pressure of fire pump and static street pressure of water main) and Victaulic "Style 77" couplings for system pressure exceeding 400 psi, or approved equal. Flush-seal gaskets shall be used for all dry and pre-action systems.
3. Couplings shall be manufactured by Victaulic Co. of America; Tyler Pipe Subsidiary, Tyler Corp./Gustin-Bacon Division; Gruvlock couplings by Grinnell; or approved equal.

Systems	Pipes	Fittings and Flanges
Wet-Pipe, Dry-Pipe,	Black Steel,	A. Black Cast Iron, ANSI B16.4 or Malleable

Deluge, Pre-Action, and Combined Dry-Pipe and Pre-Action Systems	ASTM A 795, A 53, or A 135, Schedule 40 (*)	Iron, ANSI B16.3, 175 psi w.w.p., Threaded B. Companion Flanges, Cast Iron, ANSI B16.1, 125 lb. Class C. Ductile Iron, ASTM A 536, Roll-Grooved, Mechanical Type Couplings & Gaskets(*)
Any System where piping is subject to a corrosive environment or weather; Water- Motor Gong Piping; Piping between Siamese Connection and Check Valve and Automatic Ball Drip Drain	Galvanized Steel, ASTM A 795 or A 53, Schedule 40	Galvanized Cast Iron, ANSI B16.4 or Galvanized Malleable Iron, ANSI B16.3, 175 psi exposed to the w.w.p., Threaded
Drain Piping	Galvanized Steel, ASTM A 53, Schedule 40	Galvanized Cast Iron (Drainage), ANSI B16.12, 125 lb. Class, Threaded

(*) Schedule 10 or lightweight steel pipe in accordance with NFPA 13 may be used for piping 2-1/2 inches and larger unless otherwise noted on the Contract Drawings. Threaded or cut-grooved connections will not be permitted for this pipe.

2.02 VALVES

A. Control Valves

1. Valves

a. Valves shall be OS&Y, solid wedge gate valves with rising stem and wheel handles, rated for 175 psi w.w.p. Valves shall have gland followers in stuffing box and shall be repackable while open and under pressure.

b. Each valve shall be stamped with manufacturer's name and working pressure of the valve.

c. Valves, 2 inches and smaller, shall be threaded, bronze body.

d. Valves, 2-1/2 inches and larger, shall be flanged, iron body. Provide valved by-pass for valves 6 inches and larger.

e. Valves shall be manufactured by Crane Co., Walworth Co., Stockham Valves & Fittings, or approved equal.

2. Tamper Switches

a. Install tamper switches in accordance with manufacturer's recommendations.

b. Tamper switches shall monitor the control valves to detect and indicate when a valve has been closed.

c. Unless otherwise shown on the Contract Drawings, tamper switches shall be completely factory assembled and wired and shall be mounted on the control valve. The valve stem shall be prepared as required to accept the actuating roller rod. Switches shall be Potter Electric Signal Co. Model OSYS-U-1 or -2, or approved equal.

d. Wiring to control circuit shall be as specified in Division 16.

e. Tamper switches shall be manufactured by Potter Electric Signal Co., Fire Control Instruments Inc., or approved equal.

B. Drain and Test Valves

1. Valves shall be threaded, bronze, angle or globe type with composition disc, 175 psi w.w.p.
2. At system low points where drain piping does not extend to a drain receptacle, provide a threaded hose end adapter at the valve outlet.
3. For dry-pipe systems, provide drum-drip drains on all low points in the systems. Enclose drum-drips in cabinets as shown on the Contract Drawings. Provide heating for drum-drip cabinets as shown on the Contract Drawings. Provide the drum-drip drains in protected locations. Extend auxiliary drains from drum-drips to the drain shown on the Contract Drawings.
4. The numbers and locations of drum-drips shown on the Contract Drawings are minimum; actual installation requirements and quantities shall be determined by the Contractor based on approved working drawings.
5. Valves shall be manufactured by Crane Co., Walworth Co., Stockham Valves & Fittings, or approved equal.

C. Check Valves

1. Check valves shall be swing type with renewable composition disc, bronze seat ring, and bolted cover.
2. Valves, 2 inches and smaller, shall be threaded, bronze, 175 psi w.w.p.
3. Valves, 2-1/2 inches and larger, shall be flanged, iron body, 175 psi w.w.p., unless otherwise shown on the Contract Drawings.
4. Valves shall be manufactured by Crane Co., Walworth Co., Stockham Valve & Fittings, or approved equal.

D. Sprinkler System Automatic Valves

1. General
   a. Size of automatic valve (except for deluge system deluge valves) shall be at least as large as the system riser and related to system demand and friction loss limitations in hydraulically designed systems.
   b. Automatic valves shall be manufactured by Reliable Automatic Sprinkler Co. Inc., Star Sprinkler Corp., Viking Corp., or approved equal.
2. Wet-Pipe Alarm Valves
   a. Alarm check valves shall be complete with all trimming including, but not limited to, retard chamber, water-motor gong, piping, fittings, electric alarm switch, drip cup, valves, pressure gauges, sight glass, etc.
   b. Alarm valves shall be Reliable "Model E" with "Model E-1" trimmings, or approved equal.
3. Dry-Pipe System or Combined Dry-Pipe and Pre-Action System Dry-Pipe Valves
   a. Dry-pipe valves shall be complete with all trimmings including, but not limited to, piping, fittings, electric alarm switch, priming chamber and fill lines, pressure gauge, and quick-opening devices as required by NFPA 13.
   b. Dry-pipe valve shall be Reliable "Model A" for 2-1/2-inch size and "Model D" for 4- and 6-inch sizes, or approved equal. Provide "Model A-2" automatic air maintenance device or approved equal, when compressed air is supplied from the building air supply.

c. Provide an air compressor capable of filling the largest system to 40 psi within a period of 30 minutes, complete with Reliable "Model B-1" automatic air maintenance device, or approved equal.

4. Pre-Action System Deluge Valves

a. Deluge valve shall be complete with all trimming including, but not limited to, piping, valves, fittings, electric alarm switch, alarm gauges, pilot trim, etc.

b. Deluge valve shall be Reliable "Model A" for 2-1/2-inch size and "Model BX" with external reset for 4- and 6-inch sizes, or approved equal.

c. Provide a self-contained supervisory air compressor panel. The panel shall supply approximately 24 oz./square in. air pressure and sound an alarm when pressure drops below 16 oz./square in. Panel shall be Reliable "Model B", or approved equal.

d. Deluge system shall be controlled by an approved detection and actuation system (smoke, thermal, infrared, ultra-violet), as specified in Division 16.

5. Deluge System Deluge Valves

a. Deluge valves shall be of the differential type, depending upon water pressure in the diaphragm chamber to hold the clapper closed against the water supply pressure. The valve shall be Reliable "Model A" for 2 1/2-inch size and "Model BX" with external reset for 4- and 6-inch sizes, or approved equal.

b. The valve shall have approved trim and shall have actuation means shown on the Contract Drawings.

2.03 SIAMESE CONNECTIONS

A. Siamese connections shall be two-way type, having a brass body, with clapper valves, hose thread swivels and painted plugs as required by local code, with brass chains or breakable caps and shall be Potter-Roemer Series 5950 or 5953, or approved equal. Siamese connection escutcheon shall be lettered in accordance with code requirements. Threads shall conform to local fire department requirements.

B. Where automatic ball drip is shown on the Contract Drawings to extend to the exterior at the siamese connection location, the siamese connection escutcheon shall be modified with a sillcock flange. In lieu of a sillcock flange, a drain elbow may be provided.

C. Flush type siamese connection shall be Potter-Roemer Series 5020, or approved equal. Size and location of outlet shall be as shown on the Contract Drawings. Extra-heavy nipple extensions shall be installed to connect the yoke to the outside assembly.

D. Exposed type siamese connection shall be Potter-Roemer Series 5720 or 5730, or approved equal. Size and location of outlet shall be as shown on the Contract Drawings.

E. Finish of siamese connection assembly including escutcheon shall be polished brass unless otherwise shown on the Contract Drawings.

F. Siamese connections shall be manufactured by Potter-Roemer Inc., Elkhart Brass Manufacturing Co. Inc., or approved equal.

2.04 ALARM ACTUATING DEVICES

A. All water flow signal devices shall be of the pressure-activated type provided with sprinkler system automatic valve. Vane type water flow devices may be used in zoned sections of sprinkler systems.

B. All pressure operated water flow alarm devices and vane-type switches shall be installed in accordance with manufacturer's recommendations, be completely factory assembled, piped and wired to meet the field conditions. Wiring to control circuit shall be as specified in Division 16.

C. Water flow devices of the vane type shall have adjustable pneumatic retard to prevent alarm signals due to surges and two single-pole, double-throw microswitches. Water flow devices shall be Potter Electric Signal Co. switch Model VSR-F, or approved equal.

D. The vane type device shall be provided a minimum of 18 inches from any flange, elbow, check valve or other fitting to minimize water surges and flow turbulence.

E. Tamper switches are specified in 2.02 A.2.

2.05 SPRINKLER SERVICE BACKFLOW PREVENTER

Provide a backflow preventer on each sprinkler water service. The installation shall be in accordance with the regulations of the local authorities. Backflow preventer shall be one or combination of the following devices and as specified on the Contract Drawings:

A. Single detector check with by-pass meter.

B. Double detector check with by-pass meter.

C. Reduced pressure zone device.

2.06 SPRINKLER HEADS

A. Sprinkler heads shall have 1/2-inch orifice and ordinary temperature rating (160-165 degrees F), unless otherwise shown on the Contract Drawings.

B. Sprinkler heads in areas without hung ceiling shall be bronze, upright or pendent type, Reliable "Model G", or approved equal.

C. Sprinkler heads in hung ceilings, where shown on the Contract Drawings, shall be chrome-plated, flush pendent type, Reliable "Model B" with chrome-plated escutcheon, or approved equal.

D. Sprinkler heads in hung ceilings, where shown on the Contract Drawings, shall be chrome-plated, recessed type, Reliable "Model G", or approved equal.

E. Sprinkler heads in hung ceilings, where shown on the Contract Drawings, shall be chrome-plated, concealed type, Reliable "Model G1" or "Model G4", or approved equal.

F. Sprinkler heads for dry-pipe system provided in areas without hung ceilings shall be bronze, closed fusible link upright type, Reliable "Model G", or approved equal.

G. Sprinkler heads for dry-pipe system concealed within hung ceiling shall be chrome-plated, pendent dry type, Reliable "Model G3" with chrome-plated escutcheon, or approved equal.

H. Sprinkler heads for concealed sidewall locations shall be polished, chrome-plated bronze type, Reliable "Model ZX" with chrome-plated recessed escutcheon, or approved equal.

I. Sprinkler heads for exposed sidewall locations shall be polished, chrome-plated bronze type, Reliable "Model G" with "Type B" chrome-plated escutcheon, or approved equal.

J. Provide sprinkler guards, Reliable "Model C1 or C2" with a zinc finish or approved equal, for pendent and upright heads to be installed in areas where the sprinkler head is subject to damage.

K. Sprinkler heads and guards shall be manufactured by Reliable Automatic Sprinkler Co. Inc., Star Sprinkler Corp., Viking Corp., Central Sprinkler Corp. or approved equal.

2.07 ACCESSORIES

A. Automatic Ball Drips

For each siamese connection and wherever shown on the Contract Drawings, provide a Potter-Roemer Model 5982 automatic ball drip, or approved equal. Provide pipe discharge to exterior or a drain receptacle. Where static pressure at location requiring drainage exceeds the ball drip operating characteristics, a valved drain shall be used.

B. Pressure Gauges

Gauges shall have aluminum case, 4-1/2-inch-diameter aluminum ring-bronze bourdon tube, stainless steel linkage, 1/2-inch bottom connection, black pointer, white face with black figures and segment range of 0-200 psi, 20 psi figure intervals, 2 psi intermediate graduations. Dial shall have red marker at 175 psi. Gauges shall be Dresser Industries Inc. "Ashcroft Series 1379", or approved equal.

C. Sight Glass

1. Where test connections connect to closed drains or spill to receptacles located remotely from test control valves, a sight test connection, having a smooth bore non-corrosive orifice giving a flow equivalent to one sprinkler, shall be provided.
2. Where sprinkler drain lines connect to closed drain lines or spill to receptacles located remotely from drain valve, a glass sight drain shall be provided.

D. Water-Motor Gong

Water-motor gong shall be provided for exterior building wall as required. Miscellaneous framing shall be installed to secure gong rigidly as required. Water-motor gong shall be a minimum of 10 inches in diameter and shall be mounted on the exterior wall in accordance with the manufacturer's recommendations. Water-motor gong shall be Reliable "Model C", or approved equal.

E. Pipe and Valve Identification

1. Adhesive Bands
   a. Provide approved adhesive bands in sets of two, one identifying the piping system type and the second, the direction of flow. Sets shall be provided in quantities sufficient to accommodate the requirements of 3.05 A of this Section.
   b. For 3-inch or larger pipe, the adhesive band identifying the piping system shall display the name of the service in white letters at least two inches high and the band indicating direction of flow shall display a white arrow of similar size. For 2-1/2 inch or smaller pipe, the letters and the arrow shall be white and shall be not less than one inch high. Bands shall have red backgrounds and shall conform to ANSI A13.1.
   c. Adhesive bands shall be W.H. Brady Co. "Quik-Label", or approved equal.

2. Valve Tags, Charts and Schedules

a. Provide each valve with a 2-inch diameter 18 gauge brass tag with brass chain. Service designation shall be 1/4-inch high and valve number shall be 1/2-inch high, on two lines with service designation on the upper line, and valve number on the lower line. The characters shall be indented and filled with durable black compound.

b. Provide diagrammatic valve charts and schedules, using a valve numbering system which differentiates between classes of service and indicates floor level of valve location.

c. Tags shall conform to the numbers, locations, and uses listed in the valve charts and schedules.

d. Valve charts and schedules shall be mounted under glass in wood frames or aluminum self-closing frames.

e. Tags and the frames for valve charts and schedules shall be manufactured by Seton Name Plate Corp., or approved equal.

3. Identification Signs

a. Provide identification signs for all control valves, test valves, and system drain valves in accordance with NFPA 13. Identification signs shall be Reliable Style A and B, or approved equal.

b. On the outside of doors to rooms where control valves are located, provide suitable signs making note of such valve locations.

c. For hydraulically designed systems, a hydraulic calculation data sign shall be mounted at the system control valve assembly. The sign shall contain such data as design density, designed area of discharge, discharge rate, residual pressure available and pressure required.

F. Access Ladders

Control valves located seven feet or more above the finished floor shall be provided with a permanent steel access ladder. Ladder construction shall be approved by the Engineer.

G. Access Doors

Provide a complete list of all access doors required in finished walls, ceilings, partitions and any other area for access to all valves, water flow alarms, flushing connections, drains, etc., concealed behind such finished construction. Access doors shall be furnished and installed under other Sections.

2.08 PIPE HANGERS AND SUPPORTS

A. Design, fabricate and provide all pipe hangers and supports adequate to support and guide the piping, allow for forces imposed by expansion joints, satisfy structural and seismic requirements and maintain proper clearances with respect to adjacent piping, equipment and structures.

B. Provide hangers and supports, with beam clamps, restraints, supplemental steel, inserts, fish plates, mounting devices and similar items to support piping in alignment without sagging or interference, and to permit complete drainage and free expansion and contraction. Provide retaining straps when installing beam clamps or C clamps.

C. All hangers and supports shall be capable of screw adjustment after piping is erected and shall be provided with a locking nut (double nut) to prevent loss of adjustment.

D. Where required, provide anchors, sway bracing, blocking and steel to connect to structure to prevent excessive pipe movement that could cause damage due to expansion, contraction or thrust.

E. All pipe hangers, inserts, supports, supplemental steel, rods and components shall be galvanized.

F. Pipe hanger spacing, rod diameter, etc., shall be in accordance with the requirements of NFPA 13.

G. Support hangers from building steel framing wherever possible. Provide any additional miscellaneous steel supports between existing framing members as required. Do not support piping from other piping, ductwork and conduit.

H. Tabs in metal deck construction shall not be used to support piping.

I. Perforated band iron, strap iron or wire are not acceptable materials to be used and will not be approved.

J. Where required, provide supplemental channels and steel to support Work specified in this Section. Cut ends of steel shall be ground smooth, free from burrs and sprayed with a galvanized coating.

K. Where several pipes rest on a common trapeze, increase hanger rod diameter and decrease spacing in accordance with maximum and minimum pipe sizes, respectively.

L. Expansion anchors, self-drilling expansion shields, power driven studs and similar devices shall not be used, unless specifically approved by the Engineer.

M. Provide pipe restraints to prevent movement by an upward thrust in the pipe risers.

N. Support vertical piping at the lowest level, at each alternate level above and below offsets, and at the top of the riser by use of riser clamps. Provide additional intermediate support brackets, secured to structure, on piping utilizing gasket coupling joints.

O. Support horizontal piping as follows:

1. For piping 3 inches and smaller, support on adjustable swivel pipe rings or clevis type hangers.
2. For piping sizes of 4 to 8 inches, support on clevis type hangers.
3. For piping 10 inches and larger, support on trapeze hangers constructed of channel iron and hung from rod and insert assembly. Load calculations shall be performed.

P. Hanger system shall not penetrate waterproofing.

Q. If removal of existing fireproofing is required for installation purposes, such removal shall be performed by the Contractor and shall be kept to a minimum. The Contractor shall replace all removed fireproofing with new fireproofing to the satisfaction of the Engineer at no additional cost to the Authority.

R. Provide thrust restraint on underground piping entering the building through the floor or wall to serve the sprinkler systems.

S. Hangers and supports shall be manufactured by Grinnell Corp., Pipe Support Div.; Carpenter & Patterson Inc.; Michigan Hanger Co. Inc.; or approved equal.

2.09 SLEEVES, SEALS, AND ESCUTCHEONS

A. Piping passing through masonry or concrete walls and framed partitions shall have a trim opening cut no greater than necessary for the installation of a sleeve secured therein. Sleeve shall be 1/2 inch in diameter larger than the outside diameter of the pipe. Sleeve shall be flush with the finished wall or partition surface.

B. Sleeves through concrete floors for piping shall have the opening 1/2 inch in diameter larger than the outside diameter of the pipe passing through. Floor sleeves shall project one inch above floor slab.

C. Annular spaces between piping and sleeves shall be packed with mineral wool and sealed to retain the fire integrity of the walls, partitions, and floors with a non-hardening through-penetration firestops having F ratings compatible with the fire ratings of the barriers in which they are installed, per ASTM E-814. Firestop systems shall be UL approved, and shall be as manufactured by 3M, Bio Fireshield, Inc., General Electric Co., Dow Corning Corporation, or approved equal.

D. Sleeves in walls and floors shall be galvanized steel pipe, Schedule 40 for sizes up to 10 inches and 3/8-inch wall thickness for 12 inches and larger. Sleeves in partitions shall be 20-gauge galvanized sheet metal.

E. Piping in exposed areas, passing through walls, floors or ceilings shall be fitted with chromium-plated cast brass escutcheons with fastening set screws.

F. Piping passing through floor waterproofing membrane shall be provided with a 4-pound lead flashing or a 16-ounce copper flashing, each within an integral skirt or flange. Flashing shall be suitably formed, and the skirt or flange shall extend not less than 8 inches from the pipe and shall be set over the floor membrane in a solid coating of bituminous cement. The flashing shall extend up the pipe a minimum of 10 inches above the floor. The annular space between the flashing and the pipe shall be sealed watertight.

PART 3. EXECUTION

3.01 INSTALLATION

A. General

1. Install piping and appurtenances in accordance with manufacturers' installation procedures, requirements of NFPA 13, and as specified.
2. Coordinate piping installation with other Work to avoid interference. Coordinate as necessary to ensure that all hangers, supports, sleeves and other built-in devices are incorporated in forms or in masonry to avoid necessity of cutting finished structure.
3. All measurements, both horizontal and vertical, shall be based on established benchmarks. All Work shall agree with these established lines and levels. Verify all measurements at site and check the correctness of same as related to the Work.
4. Perform necessary cutting and patching in accordance with requirements specified in Division 2 Section entitled "CUTTING, PATCHING AND REMOVAL". All openings in existing slabs required for pipe penetrations shall be core drilled.
5. Electrical installation of appurtenances furnished under this Section shall be in accordance with requirements specified under Division 16.
6. Installation requirements for pipe hangers and supports and pipe penetration sleeves, seals and escutcheons are specified in 2.08 and 2.09, respectively.

B. Piping

1. Install piping as shown on the Contract Drawings and straight and direct as possible, forming right angles or parallel lines with building walls, neatly spaced, with risers plumb and true.
2. Sprinkler piping shall be installed so that the system can be drained.
3. Avoid tool marks and unnecessary pipe threads. Burrs formed when cutting pipe shall be removed by reaming. Before installing pipe, thoroughly clean the inside free of cutting and foreign matter. Cut all piping square and smooth and make up all joints to required limits.
4. Make changes in pipe size by the use of reducing fittings. Do not use reducing bushings except by approval of the Engineer.
5. Install piping so that no part thereof will interfere with doors, windows, heating, plumbing or electrical equipment. Coordinate Work specified in this Section with Work specified in other Sections to avoid any interference with potential effectiveness of the automatic sprinkler systems.
6. Provide protective pans under pipes passing over high voltage electric bus duct or switchgear equipment. Construct the pans of 18-gauge copper, suitably reinforced to prevent sagging. Turn the edges of the pans up to 6 inches on all sides with corners brazed to make the pans watertight. Support the pan with hangers and provide drainage clear of the electrical work.
7. Provide flushing connections for flushing scale and foreign material from sprinkler system in accordance with NFPA 13.
8. Before final piping connections are made to equipment and before sprinkler heads are installed, all piping shall be thoroughly blown out, rodded out, or washed out at least twice, in a manner as directed and approved by the Engineer, to remove all accumulation of dirt, chips or other deleterious materials. Make all temporary connections and furnish all appliances required for the purpose of cleaning.

C. Pipe Joints

1. Threaded joints shall be made up tight using pipe joint Teflon compound or tape, applied on the male threads only.
2. Roll-grooved pipe and fittings shall be clean and free from indentations, projections and tool marks in the area from pipe end to groove for proper gasket sealing. Provide a thin uniform coat of lubricant on the suitable gasket intended for specified service as recommended by the manufacturer. Place the gasket over one pipe end, align pipe ends and bring together, positioning the gasket between the groove on each pipe end. Assemble the housing over the gasket with housing key section engaging both grooves. The bolts shall be inserted, nuts started and uniformly tightened until the housing bolt pads are firmly seated together, metal to metal.
3. Flanged joints shall be made up square and tight with gaskets. Dip bolts and nuts in mixture of graphite and oil immediately prior to installation.
4. Joints between copper or brass and steel pipe shall be made by using a dielectric coupling.

3.02 FIELD TESTS

A. Notify the Engineer and those authorities which would have jurisdiction, at least 48 hours in advance of making the required tests, so that arrangements may be made for their presence to witness the tests.

B. Perform all tests prior to painting or concealing.

C. Isolate all equipment, controls and instruments from the piping system during the required tests.

D. Provide and install necessary equipment, instruments, hardware, temporary piping, vents, drains, and include necessary personnel required to perform all tests.

E. Perform hydrostatic tests for all sections of the piping systems installed under this Section, at not less than 200 psi pressure for two hours, or at 50 psi in excess of the maximum pressure, when the maximum pressure to be maintained in the system is in excess of 150 psi. The test pressure shall be read from a gauge located at the low elevation point of the individual system or portion of the system being tested.

F. Test dry-pipe system with air at 40 psi for 24 hours, prior to performing the hydrostatic tests specified in 3.02 E above. Permissible air leakage shall not exceed the value specified in NFPA 13.

G. Systems may be tested in sections, when directed by the Engineer, to permit construction to proceed. Testing on a section-by-section basis may be done with standard air pressure test. When the sprinkler system is completely installed, it shall be subjected to the hydrostatic test herein specified.

H. Test all components in the system including alarm devices and demonstrate that the equipment complies with the requirements and function for which they are intended. Testing through the Inspector's Test Connection shall be included to demonstrate that flow and time parameters are satisfied.

I. With the entire system under normal operating pressure, each control valve shall be opened and closed to demonstrate proper operation.

J. All tests shall conform to the requirements of NFPA 13. Records of all tests shall be made available for the Engineer's inspection, as required.

K. Should the tests reveal any leaks or deficiencies in piping installed under this Section, make necessary corrections immediately and flush, clean and retest the system for the Engineer's approval at no cost to the Authority.

L. Repair or replace any portion of the system installed under this Section that is damaged as a result of test operations at no cost to the Authority.

M. Where piping installed under this Section is connected to any existing system, such installed piping shall be isolated from the existing system during the performance of the required field tests, unless otherwise directed by the Engineer.

N. The Engineer reserves the right to direct the Contractor not to isolate the newly installed piping from the existing system during the performance of the required field tests. In such event, the Contractor shall correct any revealed leaks or other deficiencies within the first 20 feet of the existing system, measured in any direction from the point of connection with the newly installed piping, all as directed by the Engineer and at no additional cost to the Authority.

O. Dispose of water removed from pipelines in a manner that shall not cause damage to any property.

3.03 PROTECTION

As soon as sprinkler heads are in place, cover each head with a small paper bag of a UL approved type which shall be removed only after all painting is complete and then all heads shall be cleaned.

3.04 PAINTING

Upon completion of the installation, remove all protecting materials, thoroughly remove all scale and grease and leave in a clean condition for painting. Piping to be painted shall be as shown on the Contract Drawings. Painting shall be in accordance with the requirements of Division 9 Section entitled "PAINTING".

3.05 PIPE AND VALVE IDENTIFICATION

A. Pipe Identification

Affix sets of pipe adhesive bands specified in 2.07 E.1 where they can be easily read, with their long dimension parallel to the axis of the pipe and no more than 40 feet apart on a piping system.

At least one set of identifying bands shall be affixed in all occupied and unoccupied rooms as well as in all other spaces, such as hung ceilings or shafts, where piping may be viewed and the identity of the piping system cannot be readily ascertained.

B. Valve Tags

Securely fasten valve tags specified in 2.07 E.2 with approved brass chain.

END OF SECTION

SECTION 15310

SPRINKLER FIRE PROTECTION - PIPING AND APPURTENANCES

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

15310A01 Sprinkler Fire Protection Piping Shop Drawings
Shop and coordination drawings shall be double line at a minimum of 3/8"=1'-0" scale.

15310A02 Detailed shop drawings, including hydraulic calculations in accordance with the requirements of NFPA 13. The drawings shall include all partitions, lights, ceiling construction, sprinkler heads, piping, hanger locations, vertical and horizontal piping offsets, pipe elevations, room designations, control valves and water supply information. Shop drawings shall show the specific standards, codes and sections thereof which apply and the design hydraulic areas and parameters, and available water supply test results.

a. Piping layout and installation drawings including, at a minimum, the following:

(1) Plans, elevation, sections and riser diagram.

(2) Hanger, support locations and details. Indicate methods of attachment to building structure.

(3) Pipe elevations and dimensions from main piping runs to a reference point.

(4) Penetrations through fire rated and other partitions.

(5) Electrical wiring diagram showing connection of tamper switches and alarm devices.

(6) Location for sprinkler heads and piping accessories, including valves and access ladders and doors.

b. Piping coordination drawings showing plan views and sections, drawn to scale, on which all items are shown and coordinated with all Work of other Sections.

Catalog Cuts

15310B01 Catalog cuts, including product performance data, for all items furnished under this Contract, including the following at a minimum:

a. Sprinkler heads.
b. Pipe, pipe fittings and flanges.
c. Valves, including valve charts and schedules.
d. Tamper switches/alarm devices.
e. Siamese and other fire department connections.
f. Sprinkler service backflow preventer.
g. Adjustable pressure restricting devices.
h. Pressure gauges.
i. Pipe and valve tags identification bands.
j. Access ladders.
k. Access doors, including list of their locations.
l. Pipe hangers and supports, including schedule showing manufacturer's figure number, size, location and features of each required hanger and support.
m. Sleeves and escutcheons.

Product Data

15310D01 Piping and appurtenances.

15310D02 Sprinkler pipe materials and schedule for each piping system.

Inspection Reports

15310O01 Field test results.

END OF APPENDIX "A"

DIVISION 15

SECTION 15375

FIRE STANDPIPE SYSTEM PIPING AND APPURTENANCES

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements of piping and appurtenances for the fire standpipe systems.

B. Standpipe water service installed under this Section ends at the building line unless otherwise shown on the Contract Drawings. The continuation of the standpipe water service is specified under Division 2 of the Specifications. Types of material and installation of the piping under this Section shall be compatible with types of material and installation specified under Division 2.

C. Trenching and backfilling required in conjunction with underground piping furnished under this Section shall be as specified in applicable Sections of Division 2 and shall be included as Work under this Section.

1.02 DESIGN AND PERFORMANCE REQUIREMENTS

A. Design and performance of components and methods specified herein shall comply with all applicable Federal, State and Local laws, ordinances, regulations and codes, as though the Authority were a private corporation, and with the latest industry standards including, but not limited to, the entities listed below:

New York City Building Code
New Jersey Uniform Construction Code
Municipal Water Company
American National Standards Institute (ANSI)
American Society for Testing and Materials (ASTM)
American Water Works Association (AWWA)
Factory Mutual Engineering Corp. (FM)
National Fire Protection Association (NFPA)
Underwriters Laboratories Inc. (UL)

In addition, specific provisions cited herein shall govern for the associated specific application.

B. The fire standpipe system design shall be based on water supply information as shown on the Contract Drawings or, if not shown, as determined by a water flow test by the Contractor.

1.03 QUALITY ASSURANCE

A. Fire standpipe system piping and appurtenances, of types and sizes required, shall have been satisfactorily used for purposes similar to those intended herein for not less than three years.

B. Entities performing Work shall have experience on at least two projects involving complexities similar to those required under this Contract.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Clean all pipe sections of foreign matter and cover ends with temporary sheet metal closures or plastic end caps of sufficient tightness to prevent entry of foreign matter prior to shipping to the construction site.

B. Store pipe, fittings, valves and other components at the construction site on pallets or raised platforms with suitable coverings satisfactory to the Engineer to protect them against damage and weather.

C. Inspect all pipe, fittings, valves and other components for damage before moving them from storage to the point of installation at the construction site.

1.05 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 PIPE, FITTINGS, AND FLANGES

A. Provide pipe, fittings, and flanges in accordance with the "Pipe, Fittings and Flanges Schedule" specified below, including gaskets, bolts, nuts, washers and other pressure containing parts necessary for the complete installation of piping systems.

B. Nipples shall be extra-heavy shoulder-type of same material as pipe; close nipples are not acceptable.

C. Gaskets for flanges shall be 1/16-inch thick (after compression), rubber or neoprene, full-faced, and punched bolt holes.

D. Grooved Piping Mechanical Couplings

1. Couplings shall be complete with gaskets, bolts and nuts recommended by the manufacturer for the service. Use vandal proof nuts and bolts on vertical piping in stairs.

2. Couplings shall be Victaulic "Style 75" lightweight for system pressure not exceeding 400 psi (including shutoff pressure of fire pump and static street pressure of water main) and Victaulic "Style 77" for system pressure exceeding 400 psi, or approved equal. Flush-seal gaskets shall be used on all dry standpipe system piping.

3. Couplings shall be manufactured by Victaulic Co. of America; Tyler Pipe Subsidiary, Tyler Corp./Gustin-Bacon Division; Gruvlock Couplings by Grinnell; or approved equal.

Pipe, Fittings and Flanges Schedule

Systems	Pipe	Fittings and Flanges

Wet Standpipe	Black Steel, ASTM A 795, A 53, or A 135, Schedule 40	A. Black Malleable Iron, ANSI B16.3 or Ductile Iron AWWA C110, 300 lb. Class, 500 psi w.w.p., Threaded B. Companion Flanges, Cast Iron, ANSI B16.1, 125 lb. Class C. Ductile Iron ASTM A 536, Grooved, Mechanical Type Couplings and Gaskets
Dry Standpipe, or piping subject to corrosion; Piping between Siamese connection and check Valve and Automatic Ball Drip Drain	Galvanized Steel, ASTM A 795 or A 53, Schedule 40	Same as for Wet Standpipe except all fittings and flanges shall be galvanized
Drain Piping	Galvanized Steel, ASTM or A 53, Schedule 40	Galvanized Cast Iron (Drainage), ANSI B16.12, 125 lb. Class, Threaded
Piping at Standpipe Water Meter Assembly	Galvanized Steel, ASTM or A 53, Schedule 40	Galvanized Cast Iron (Drainage), ANSI B16.1, 125 lb. Class, Flanged

2.02 VALVES

A. Control Valves

1. Valves

   a. Valves shall be flanged, iron body, bronze mounted, OS&Y, solid wedge gate valves with rising stem and wheel handles, rated for 175 psi w.w.p., or as shown on the Contract Drawings. Valves shall have gland followers in stuffing box and shall be repackable while open and under pressure. Provide valved bypass around valves six inches and larger.

   b. Valves shall be manufactured by Crane Co., Walworth Co., Stockham Valves & Fittings, or approved equal.

2. Tamper Switches

   a. Provide tamper switches in accordance with manufacturer's recommendations.

   b. Tamper switches shall monitor the control valves to detect and indicate when a valve has been closed.

   c. Unless otherwise shown on the Contract Drawings, tamper switches shall be completely factory assembled and wired and shall be mounted on the control valve. The valve stem shall be prepared as required to accept the actuating roller rod. Switches shall be Potter Electric Signal Co. Model OSYS-U-1 or -2, or approved equal.

   d. Wiring to control circuit shall be as specified in Division 16.

   e. Tamper switches shall be manufactured by Potter Electric Signal Co., Fire Control Instruments Inc., or approved equal.

B. Drain Valves (Dry Systems)

1. Valves shall be threaded, bronze, angle or globe type with composition disc, 200 psi w.w.p, or as shown on the Contract Drawings.

2. At system low points where drain piping does not extend to a drain receptacle, provide a threaded hose end adapter at the valve outlet.

3. For dry standpipe system to be filled with compressed air, provide drum-drip drains on all low points in the systems. Enclose drum-drips in cabinets as shown on the Contract Drawings. Provide heating for drum-drip cabinets as shown on the Contract Drawings. Provide the drum-drip drains in protected locations. Extend auxiliary drains from drum-drips to the drain shown on the Contract Drawings.

4. The numbers and locations of drum-drips shown on the Contract Drawings are minimum; actual installation requirements and quantities shall be determined by the Contractor based on approved shop drawings.

5. Valves shall be manufactured by Crane Co., Walworth Co., Stockham Valves & Fittings, or approved equal.

C. Check Valves

1. Check valves shall be swing type, flanged, iron body, bronze mounted with renewable composition disc, bronze seat ring, and bolted cover, rated for 175 psi w.w.p., or as shown on the Contract Drawings.

2. Valves shall be manufactured by Crane Co., Walworth Co., Stockham Valve & Fittings, or approved equal.

D. Dry Standpipe System Automatic Valves

1. For dry fire standpipe system, activation shall occur through one of the applicable automatic valves specified below and as shown on the Contract Drawings:

a. Deluge valve shall be electrically operated, release type with manual trip device complete with all drains, accessories, and controls. Deluge valve shall be operational from electrically operated, remote control stations located at each hose rack. All drains shall be connected and discharged into the drain receptor. Valve shall be Star Sprinkler "Model D", or approved equal. Controls, switches, panels, alarms, etc. shall be as specified in Division 16.

b. Dry-pipe valve shall be of the differential type, only. The dry-pipe valve shall be furnished with bronze clapper and latch and shall be Star Sprinkler "Model A", or approved equal.

c. Provide opening device on all systems. The device shall be of the exhauster pattern, designed and installed so as to provide for a full 2 inches air release from the system and designed to operate upon a 2 psi differential pressure within 7 seconds after fully opening the standard test connections. Exhauster shall be Star Sprinkler "Model BB", or approved equal.

2. Automatic valves shall be manufactured by Reliable Automatic Sprinkler Co. Inc., Star Sprinkler Corp., Viking Corp., or approved equal.

2.03 SIAMESE CONNECTIONS

A. Siamese connections shall be two-way type, having a brass body, with clapper valves, hose thread swivels and red painted plugs, as required by local code. Provide the siamese connections with breakable caps, unless indicated otherwise on the Contract Drawings. Siamese connection escutcheon shall be lettered in accordance with code requirements. Threads shall conform to local fire department requirements.

B. Where automatic ball drip is shown on the Contract Drawings to extend to the exterior at the siamese connection location, the siamese connection escutcheon shall be modified with a sillcock flange. In lieu of a sillcock flange, a drain elbow may be provided.

C. Flush type siamese connection shall be Potter-Roemer Series 5020, or approved equal. Size and location of outlet shall be as shown on the Contract Drawings. Extra-heavy nipple extensions shall be installed to connect the yoke to the outside assembly.

D. Exposed type siamese connection shall be Potter-Roemer Series 5720 (back outlet) or 5730 (90° angle outlet) as shown on the Contract Drawings, or approved equal. Size and location of outlet shall be as shown on the Contract Drawings.

E. Finish of siamese connection assembly including escutcheon shall be polished brass, unless otherwise shown on the Contract Drawings.

F. Siamese connections shall be manufactured by Potter-Roemer Inc., Elkhart Brass Manufacturing Co. Inc., or approved equal.

2.04 FIRE LINE BACKFLOW PREVENTER

Provide a backflow preventer on the fire standpipe system water service. The installation shall be in accordance with the regulations of the local authorities. Backflow preventer shall be one or combination of the following devices and as specified on the Contract Drawings:

A. Single detector check with bypass meter.

B. Double detector check with bypass meter.

C. Reduced pressure zone device.

2.05 FIRE HOSE STATIONS

A. Fire standpipe equipment shall be manufactured by Potter-Roemer Inc., Elkhart Brass Manufacturing Co. Inc., or approved equal.

B. All the fire standpipe equipment numbers specified herein are those of Potter-Roemer Inc.

C. Hose Racks (2-1/2 inch Valve with 1-1/2 inch Hose)

At each hose station, exposed or in a hose cabinet, where shown on the Contract Drawings, provide a Figure (Fig.) 4075, 2-1/2 inch brass angle valve, complete with 2-1/2 inch brass rack supporting hose nipple, a Fig. 2810, 2-1/2 inch x 1-1/2 inch reducer, with 1-1/2 inch Fig. 2915, Polyflex synthetic fire hose (length of hose is shown on the Contract Drawings, in 25- or 50-foot sections); Fig. 2930, satin cast brass expansion ring couplings attached; Fig. 2960 adjustable fog nozzles of molded polycarbonate/Lexan plastic; Fig. 2794, all steel, red enameled hose rack with non-detachable sliding pins and spring clip nozzle holder and trigger mechanism; and Fig. 6057, Universal Spanner with brass chain.

D. Hose Racks (2-1/2 inch Valve with 2-1/2 inch Hose)

At each hose station, exposed or in a hose cabinet, where shown on the Contract Drawings, provide a Fig. 4075, 2-1/2 inch brass angle valve, complete with 2-1/2 inch brass rack supporting hose nipple, with 2-1/2 inch Fig. 2916, Polyflex synthetic fire hose (length of hose is shown on the Contract Drawings, in 25- or 50-foot sections); Fig. 2936, satin cast brass expansion ring couplings attached; Fig. 2961 adjustable fog nozzles of molded Polycarbonate/Lexan plastic; Fig. 2887, all steel, red enameled hose rack with non-detachable sliding pins and spring clip nozzle holder and trigger mechanism; and Fig. 6057, Universal Spanner with brass chain.

E. Hose Cabinets

Selection of hose cabinet shall be as shown on the Contract Drawings and shall conform to the applicable description specified below:

1. Hose Cabinets (Recessed/Space for Extinguisher)

   Cabinet for hose station and extinguisher shall be Fig. 1300 Series for 1-1/2 inch valve (Fig. 1400 Series for 2-1/2 inch valve), recessed cabinet with 20-gauge steel body and 18-gauge trim, having 20-gauge door of style "AW" Full Panel wire glass. Cabinet shall be white enamel inside and prime coated outside.

2. Hose Cabinets (Surface-Mounted/Space for Extinguisher)

   Cabinet for hose station and extinguisher shall be Fig. 1350 Series for 1-1/2 inch valve (Fig. 1450 Series for 2-1/2 inch valve), surface-mounted cabinet with 20-gauge steel body and trim, having 20-gauge door of style "AW" Full Panel wire glass. Cabinet shall be white enamel inside and prime coated outside.

3. Hose Cabinets (Recessed/No Space for Extinguisher)

   Cabinet for hose station shall be Fig. 1000 Series for 1-1/2 inch valve (Fig. 1100 Series for 2-1/2 inch valve), recessed cabinet with 20-gauge steel body and 18-gauge trim having 20-gauge door of style "DW" Duo Panel wire glass. Cabinet shall be white enamel inside and prime coated outside.

4. Hose Cabinets (Surface-Mounted/No Space for Extinguisher)

   Cabinet for hose station shall be Fig. 1050 Series for 1-1/2 inch valve (Fig. 1150 Series for 2-1/2 inch valve), surface-mounted cabinet with 20-gauge steel body and trim, having 20-gauge door of style "DW" Duo Panel wire glass. Cabinet shall be white enamel inside and prime coated outside.

5. Valve Cabinets (2-1/2 inch Valve)

   Hose valve cabinet for recessed or surface-mounted use shall be Fig. 1800 Series with 20-gauge steel body, 18-gauge trim having 20-gauge door of style "AW" Full Panel wire glass. Cabinets shall accommodate 2-1/2 inch angle valve with cap and chain and shall be white enamel inside and prime coated outside.

F. Adjustable Pressure Restricting Devices

Where shown on the Contract Drawings, provide Fig. 2765, 1-1/2 inch, or Fig. 2766, 2-1/2 inch, brass, suitable outlet pressure reducer where hydrostatic pressure exceeds 85 psi for 1-1/2 inch hose and 55 psi for 2-1/2 inch hose.

G. Fire Extinguisher Cabinets (All)

Fire extinguisher cabinet for recessed or surface-mounted use shall be Fig. 1700 Series with 22-gauge steel body, 18-gauge trim having tubular door of style "AW" Full Panel wire glass. Cabinet shall be of size to accommodate extinguisher type, as shown on the Contract Drawings, and shall be white enamel inside and prime coated outside.

H. Roof Manifolds

Size and position of roof manifold shall be as shown on the Contract Drawings and shall be Fig. 5890 Series vertical, or Fig. 5880 Series horizontal, complete with three Fig. 4065, 2-1/2 inch brass valves with Fig. 4625 brass caps and chains.

2.06 ACCESSORIES

A. Automatic Ball Drips

For each siamese connection and wherever shown on the Contract Drawings, provide a Potter-Roemer Model 5982 automatic ball drip, or approved equal. Provide pipe discharge to exterior or a drain receptacle. Where static pressure at location requiring drainage exceeds the ball drip operating characteristics, a valved drain shall be used.

B. Pressure Gauges

Gauges shall have aluminum case, 4-1/2 inch diameter aluminum ring-bronze bourdon tube, stainless steel linkage, 1/2 inch bottom connection, black pointer, white face with black figures and segment range of 0-200 psi, 20 psi figure intervals, 2 psi intermediate graduations. Dial shall have red marker at 175 psi. Gauges shall be Dresser Industries Inc. "Ashcroft Series 1379", or approved equal.

C. Pipe and Valve Identification

1. Adhesive Bands

a. Provide approved adhesive bands in sets of two, one identifying the piping system type and the second, the direction of flow. Sets shall be provided in quantities sufficient to accommodate the requirements of 3.04 A of this Section.

b. For 3-inch or larger pipe, the adhesive band identifying the piping system shall display the name of the service in white letters at least two inches high and the band indicating direction of flow shall display a white arrow of similar size. For 2-1/2 inch or smaller pipe, the letters and the arrow shall be white and shall be not less than one inch high. Bands shall have red backgrounds and shall conform to ANSI A 13.1.

c. Adhesive bands shall be W. H. Brady Co. "Quik-Label", or approved equal.

2. Valve Tags, Charts and Schedules

a. Provide each valve with a 2-inch diameter 18 gauge brass tag with brass chain. Service designation shall be 1/4-inch high and valve number shall be 1/2-inch high, on two lines with service designation on the upper line and valve number on the lower line. The characters shall be indented and filled with durable black compound.

b. Provide diagrammatic valve charts and schedules, using a valve numbering system which differentiates between classes of service and indicates floor level of valve location.

c. Tags shall conform to the numbers, locations and uses listed in the valve charts and schedules.

d. Valve charts and schedules shall be mounted under glass in wood frames or aluminum self-closing frames.

e. Tags and the frames for valve charts and schedules shall be manufactured by Seton Name Plate Corp., or approved equal.

3. Identification Signs

a. Provide identification signs for control valves. Identification signs shall be Reliable Style A and B, or approved equal.

b. On the outside of doors to rooms where control valves are located, provide suitable signs making note of such valve locations.

D. Access Ladders

Control valves located seven feet or more above the finished floor shall be provided with a permanent steel access ladder. Ladder construction shall be approved by the Engineer.

E. Access Doors

Provide a complete list of all access doors (including locations) that are required in finished walls, ceilings, partitions and any other areas for access to all valves and drains concealed behind such finished construction. Access doors shall be furnished and installed under appropriate Access Door Sections of Division 8.

2.07 PIPE HANGERS AND SUPPORTS

A. Design, fabricate and provide all pipe hangers and supports adequate to support and guide the piping, allow for forces imposed by expansion joints, satisfy structural requirements and maintain proper clearances with respect to adjacent piping, equipment and structures.

B. Provide hangers and supports, with beam clamps, restraints, supplemental steel, inserts, fish plates, mounting devices, and similar items to support piping in alignment without sagging or interference, and to permit complete drainage and free expansion and contraction.

C. All hangers and supports shall be capable of screw adjustment after piping is erected and shall be provided with a locking nut (double nut) to prevent loss of adjustment.

D. Where required, provide anchors, sway bracing, blocking and steel to connect to structure to prevent excessive pipe movement that could cause damage due to expansion, contraction or thrust.

E. All pipe hangers, inserts, supports, supplemental steel, rods and components shall be galvanized.

F. Support hangers from building steel framing wherever possible. Provide any additional miscellaneous steel supports between existing framing members as required. Do not support piping from other piping, ductwork and conduit.

G. Tabs in metal deck construction shall not be used to support piping.

H. Where required, provide supplemental channels and steel to support Work of this Section. Cut ends of steel shall be ground smooth, free from burrs and sprayed with a galvanized coating.

I. Where several pipes rest on a common trapeze, increase hanger rod diameter and decrease spacing in accordance with maximum and minimum pipe sizes, respectively.

J. Expansion anchors, self-drilling expansion shields, power driven studs and similar devices shall not be used, unless specifically approved by the Engineer.

K. Provide pipe restraints to prevent movement by an upward thrust in the pipe risers.

L. Support vertical piping at the lowest level, at each alternate level above and below offsets, and at the top of the riser by use of riser clamps. Provide additional intermediate support brackets, secured to structure, on piping utilizing gasket coupling joints.

M. Support horizontal piping as follows:

1. For piping sizes of 3 to 8 inches, support on clevis type hangers.
2. For piping 10 inches and larger, support on trapeze hangers constructed of channel iron and hung from rod and insert assembly. Load calculations shall be performed.

N. Hanger system shall not penetrate waterproofing.

O. If removal of existing fireproofing is required for installation purposes, such removal shall be performed by the Contractor and shall be kept to a minimum. The Contractor shall replace all removed fireproofing with new fireproofing to the satisfaction of the Engineer and at no additional cost to the Authority.

P. Unless otherwise specifically approved, hanger rod size and spacing shall be within the following limits:

Pipe Size	Maximum Hanger Spacing	Minimum Rod Size
2-1/2" to 3-1/2"	12 ft. o.c.	1/2"
4" and 5"	12 ft. o.c.	5/8"
6"	12 ft. o.c.	3/4"
8"	12 ft. o.c.	7/8"
10" and 12"	12 ft. o.c.	7/8"

Q. Provide thrust restraint on underground piping entering the building through the floor or wall to serve the fire standpipe systems.

R. Hangers and supports shall be manufactured by Grinnell Corp., Carpenter & Patterson Inc., Michigan Hanger Co. Inc., or approved equal.

2.08 SLEEVES, SEALS AND ESCUTCHEONS

A. Piping passing through masonry or concrete walls and framed partitions shall have a trim opening cut no greater than necessary for the installation of a sleeve secured therein. Sleeve shall be 1/2 inch in diameter larger than the outside diameter of the pipe. Sleeve shall be flush with the finished wall or partition surface.

B. Sleeves through concrete floors for piping shall have the opening 1/2 inch in diameter larger than the outside diameter of the pipe passing through. Floor sleeves shall project one inch above floor slab.

C. Pipe insulation shall be omitted at penetrations through fire-rated barriers. In all cases, pack the annular space between the pipe and sleeve with mineral wool. Additionally at penetrations through fire-rated barriers, seal the annular space to retain the fire rating integrity of the barrier with non-hardening through-penetration firestops having F-ratings compatible with fire ratings of the barriers in which they are installed, per ASTM, E 814. Firestop systems shall be UL-approved, and shall be as manufactured by 3M, Bio-fireshield, Inc., General Electric Co., Dow Corning Corp., or approved equal.

D. Sleeves in walls and floors shall be galvanized steel pipe, Schedule 40 for sizes up to 10 inches and 3/8-inch wall thickness for 12 inches and larger. Sleeves in partitions shall be 20-gauge galvanized sheet metal.

E. Piping in exposed areas, passing through walls, floors or ceilings shall be fitted with chromium-plated cast brass escutcheons with fastening set screws.

F. Piping passing through floor waterproofing membrane shall be provided with a 4-pound lead flashing or a 16-ounce copper flashing, each within an integral skirt or flange. Flashing shall be suitably formed, and the skirt or flange shall extend not less than 8 inches from the pipe and shall be set over the floor membrane in a solid coating of bituminous cement. The flashing shall extend up the pipe a minimum of 10 inches above the floor. The annular space between the flashing and the pipe shall be sealed watertight.

PART 3. EXECUTION

3.01 INSTALLATION

A. General

1. Install piping and appurtenances in accordance with manufacturers' installation procedures, requirements of NFPA 14, and as specified.
2. Coordinate piping installation with other Work to avoid interference. Coordinate as necessary to ensure that all hangers, supports, sleeves and other built-in devices are incorporated in forms or in masonry to avoid necessity of cutting finished structure.
3. All measurements, both horizontal and vertical, shall be based on established benchmarks. All Work shall agree with these established lines and levels. Verify all measurements at site and check the correctness of same as related to the Work.
4. Perform necessary cutting and patching in accordance with requirements specified in Division 2 Section entitled "CUTTING, PATCHING AND REMOVAL". All openings in existing slabs required for pipe penetrations shall be core drilled.
5. Electrical installation of appurtenances furnished under this Section shall be in accordance with requirements specified under Division 16.
6. Installation requirements for pipe hangers and supports and pipe penetration sleeves, seals, and escutcheons are specified in 2.07 and 2.08, respectively.

B. Piping

1. Install piping as shown on the Contract Drawings and straight and direct as possible, forming right angles or parallel lines with building walls, neatly spaced, with risers plumb and true.
2. Avoid tool marks and unnecessary pipe threads. Burrs formed when cutting pipe shall be removed by reaming. Before installing pipe, thoroughly clean the inside free of cutting and foreign matter. Cut all piping square and smooth and make up all joints to required limits.
3. Make changes in pipe size by the use of reducing fittings. Do not use reducing bushings except by approval of the Engineer.
4. Install piping so that no part thereof will interfere with doors, windows, heating, plumbing or electrical equipment. Coordinate Work specified in this Section with that specified in other Sections to avoid any interference with potential effectiveness of the fire standpipe systems.
5. Provide protective pans under pipes passing over high voltage electric bus duct or switchgear equipment. Construct the pans of 18-gauge copper, suitably reinforced to prevent sagging. Turn the edges of the pans up to 6 inches on all sides with corners brazed to make the pans watertight. Support the pan with hangers and provide drainage clear of the electrical work.

6. Dry systems shall be installed so that the system can be drained.

7. All piping shall be thoroughly blown out, rodded out, or washed out at least twice, in a manner as directed and approved by the Engineer, to remove all accumulation of dirt, chips or other deleterious materials. Make all temporary connections and furnish all appliances required for the purpose of cleaning.

C. Pipe Joints

1. Threaded joints shall be made up tight using pipe joint Teflon compound or tape, applied on the male threads only.

2. Grooved pipe and fittings shall be clean and free from indentations, projections and tool marks in the area from pipe end to groove for proper gasket sealing. Provide a thin uniform coat of lubricant on the suitable gasket intended for specified service as recommended by the manufacturer. Place the gasket over one pipe end, align pipe ends and bring together, positioning the gasket between the groove on each pipe end. Assemble the housing over the gasket with housing key section engaging both grooves. The bolts shall be inserted, nuts started and uniformly tightened until the housing bolt pads are firmly seated together, metal to metal.

3. Flanged joints shall be made up square and tight with gaskets. Dip bolts and nuts in mixture of graphite and oil immediately prior to installation.

4. Joints between copper or brass and steel pipe shall be made by using a dielectric coupling.

3.02 FIELD TESTS

A. Notify the Engineer and those authorities having jurisdiction, at least 48 hours in advance of making the required tests, so that arrangements may be made for their presence to witness the tests.

B. Perform all tests prior to painting or concealing.

C. Isolate all equipment, controls and instruments from the piping system during the required tests.

D. Provide and install necessary equipment, instruments, hardware, temporary piping, vents, drains, and include necessary personnel required to perform all tests.

E. Perform hydrostatic tests for all sections of the piping systems (except siamese connections), at not less than 200 psi pressure for two hours, or at 50 psi in excess of the maximum pressure, when the maximum pressure to be maintained in the system is in excess of 150 psi. Test pressure for siamese connections shall not be less than 300 psi. The test pressure shall be read from a gauge located at the low elevation point of the individual system or portion of the system being tested.

F. Test dry-pipe systems with air at 40 psi for 24 hours, prior to performing the hydrostatic tests specified in 3.02 E above. Permissible air leakage shall not exceed the value specified in NFPA 14.

G. Set the adjustable pressure reducing devices according to the manufacturer's instructions to produce flows at the required rate and pressure in accordance with the applicable code requirements, as if this Contract were being performed for a private corporation. A written record shall be furnished to the Engineer of all settings throughout the system.

H. With the entire system under normal operating pressure, each control valve shall be opened and closed to demonstrate proper operation.

I. All tests shall conform to the requirements of NFPA 14. Records of all tests shall be made available for the Engineer's inspection, as required.

J. Should the tests reveal any leaks or deficiencies in piping installed under this Section, make necessary corrections immediately and flush, clean and retest the system for the Engineer's approval at no additional cost to the Authority.

K. Repair or replace any portion of the system installed under this Section that is damaged as a result of test operations at no additional cost to the Authority.

L. Where piping installed under this Section is connected to any existing system, such installed piping shall be isolated from the existing system during the performance of the required field tests, unless otherwise directed by the Engineer.

M. The Engineer reserves the right to direct the Contractor not to isolate the newly-installed piping from the existing system during the performance of the required field tests. In such event, the Contractor shall correct any revealed leaks or other deficiencies within the first 20 feet of the existing system, measured in any direction from the point of connection with the newly installed piping, all as directed by the Engineer and at no additional cost to the Authority.

N. Dispose of water removed from pipelines in a manner that shall not cause damage to any property.

3.03 PAINTING

Upon completion of the installation, remove all protecting materials, thoroughly remove all scale and grease and leave in a clean condition for painting. Piping to be painted shall be as shown on the Contract Drawings. Painting shall be in accordance with the requirements of Division 9 Section entitled "PAINTING".

3.04 PIPE AND VALVE IDENTIFICATION

A. Pipe Identification

1. Affix sets of pipe adhesive bands specified in 2.06 C.1 where they can be easily read, with their long dimension parallel to the axis of the pipe and no more than 40 feet apart on a piping system.
2. At least one set of identifying bands shall be affixed in all occupied and unoccupied rooms as well as in all other spaces, such as hung ceilings or shafts, where piping may be viewed and the identity of the piping system cannot be readily ascertained.

B. Valve Tags

Securely fasten valve tags specified in 2.06 C.2 with approved brass chain.

END OF SECTION

SECTION 15375

FIRE STANDPIPE SYSTEM PIPING AND APPURTENANCES

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

15375A01 Fire Standpipe Shop Drawings

Shop and coordination drawings shall be double line at a minimum of 3/8"=1'-0" scale.

a. Piping layout and installation drawings including, at a minimum, the following:

(1) Plans, elevation, sections and riser diagram.

(2) Hanger, support locations and details. Indicate methods of attachment to building structure.

(3) Pipe elevations and dimensions from main piping runs to a reference point.

(4) Penetrations through fire rated and other partitions.

(5) Electrical wiring diagram showing connection of tamper switches and alarm devices.

(6) Location for piping accessories, including valves and access ladders and doors.

b. Piping coordination drawings showing plan views and sections, drawn to scale, on which all items are shown and coordinated with all Work of other Sections.

Catalog Cuts

15375B01 Catalog cuts, including product performance data, for all items furnished under this Contract, including the following at a minimum:

a. Pipe, pipe fittings and flanges,
b. Valves, including valve charts and schedules.
c. Tamper switches/alarm devices.
d. Siamese and other fire department connections.
e. Fire line backflow preventer.
f. Fire hose stations.
g. Adjustable pressure restricting devices.
h. Automatic ball drips.
i. Pressure gauges.
j. Pipe and valve tags identification bands.
k. Access ladders.
l. Access doors, including list of their locations.
m. Hangers and supports, including schedule showing manufacturer's figure number, size, location and features of each required hanger and support.
n. Sleeves and escutcheons.

Product Data

15375D01 Standpipe piping and appurtenances.

15375D02 Standpipe material and schedule.

Inspection Reports
15375O01 Field test results.

END OF APPENDIX "A"

DIVISION 15

SECTION 15410

PLUMBING PIPING AND APPURTENANCES

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for domestic water service piping, storm and sanitary sewer piping, and appurtenances.

B. Domestic water service and storm and sanitary sewers installed under this Section end at the building line unless otherwise shown on the Contract Drawings. The continuation of the domestic water service and storm and sanitary sewers is specified under Division 2 of the Specifications. Types of material and installation of the piping under this Section shall be compatible with types of material and installation specified under Division 2.

C. Trenching and backfilling required in conjunction with underground piping furnished under this Section shall be as specified in applicable Sections of Division 2 and shall be included as Work under this Section.

1.02 DESIGN AND PERFORMANCE REQUIREMENTS

Design and performance of components and methods specified herein shall comply with all applicable Federal, State and Local laws, ordinances, regulations and codes, and the latest industry standards including, but not limited to the entities listed below.

New York City Building Code

New Jersey Uniform Construction Code

Municipal Water Company

American National Standards Institute (ANSI)

American Society for Testing and Materials (ASTM)

American Society of Mechanical Engineers (ASME)

Cast Iron Soil Pipe Institute (CISPI)

American Water Works Association (AWWA)

In addition, specific provisions cited herein shall govern for the associated specific application.

1.03 QUALITY ASSURANCE

A. Plumbing piping and appurtenances, of types and sizes required, shall have been satisfactorily used for purposes similar to those intended herein for not less than three years.

B. Entities performing the Work of this Section shall have experience on at least two projects involving complexities similar to those required under this Contract.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Clean all pipe sections of foreign matter and cover ends with temporary sheet metal closures or plastic end caps of sufficient tightness to prevent entry of foreign matter prior to shipping to the construction site.

B. Store pipe, fittings, valves and other components at the construction site on pallets or raised platforms with suitable coverings satisfactory to the Engineer to protect them against damage and weather.

C. Inspect all pipe, fittings, valves and other components for damage before moving them from storage to the point of installation at the construction site.

1.05 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 PIPE, FITTINGS, AND FLANGES

A. Unless otherwise shown on the Contract Drawings, provide pipe (and tube), fittings and flanges in accordance with the "Pipe, Fittings, and Flanges Schedule" specified below, including gaskets, bolts, nuts, washers and other pressure containing parts necessary for the complete installation of piping systems.

B. Nipples shall be extra-heavy shoulder type. No close nipples shall be used. All nipples shall have designation mark of the manufacturer and shall conform to ASTM pipe specifications for system served.

C. Gaskets for flanges shall be 1/16-inch thick (after compression) rubber or neoprene, full-faced, and punched bolt holes.

D. Unions shall be malleable iron, threaded, conforming to ANSI B16.39.

Pipe, Fittings and Flanges Schedule

Systems	Pipe	Fitting and Flanges
Storm & Sanitary Drainage & Vent (underground)	Cast Iron, ASTM A 74, Service Weight Hub & Spigot Type	Cast Iron, ASTM A 74, Service Weight Hub & Spigot Type; caulked or compression type joints
Storm & Sanitary Drainage & Vent (above ground and underground)	Cast Iron, CISPI-301, ASTM A888, Service Weight Hubless Type	Cast Iron, CISPI-301, ASTM A 888, Service Weight, Hubless Type
Storm & Sanitary Pump Discharge	Galvanized Steel, ASTM A 53, Schedule 40	Galvanized Malleable Iron, ANSI B16.3, 150 lb. Class, Threaded
Sanitary Indirect Drainage	Galvanized Steel, ASTM A 53, Schedule 40	Galvanized Cast Iron (Drainage), ANSI B16.12, 125 lb. Class, Threaded
Domestic Water	Copper Tubing, ASTM B 88, Type L, Drawn, Nominal Wall	Cast Bronze, ANSI B16.18, Same Wall as Tube, Solder Joints
Domestic Water at Meter Assembly (3 inches and larger)	Galvanized Steel, ASTM A 53, Schedule 40	Galvanized Cast Iron, ANSI B16.1, 125 lb. Class, Flanged (Companion)

2.02 VALVES

A. General

1. Provide types of valves as and where shown on the Contract Drawings.
2. All gate and globe valves shall be the products of one manufacturer.
3. Valves shall be of one of the following manufacturers, or approved equal:
   a. Stockham Valves and Fittings.
   b. Crane Co.
   c. Walworth Co.
   d. NIBCO Inc.

B. Gate Valves

1. For piping 2 inches and smaller: Class 125, bronze body, screw-in bonnet, rising stem, solid wedge, approved equal of Stockham Fig. B-122 (threaded ends), or Fig. B-109 (soldered ends).
2. For piping 2-1/2 inches and 3 inches
   a. Class 125, iron body, bolted bonnet, rising stem, solid wedge, bronze mounted, flanged ends, similar to Stockham Fig. G-623, or approved equal.
   b. Class 150, bronze body, screw-in bonnet, rising stem, solid wedge, threaded ends, similar to Stockham Fig. B-122, or approved equal.
3. For piping 4 inches and larger: Class 125, iron body, bolted bonnet, solid wedge, bronze mounted, OS&Y, flanged ends, similar to Stockham Fig. G-623, or approved equal.

C. Globe Valves

Class 150, bronze body, screw-in bonnet, rising stem, integral seat, renewable disc, approved equal of Stockham Fig. B-22 (threaded ends), or Fig. B-24 (soldered ends).

D. Drain Valves

Class 125, gate valve, bronze body, screw-in bonnet, non-rising stem, solid wedge, threaded ends on inlet side of valve and hose end thread with cap and chain on the outlet side, similar to NIBCO Fig. T-113-HC, or approved equal.

E. Check Valves

1. For pipe 2 inches and smaller: Class 125, bronze body, horizontal swing, renewable disc, approved equal of Stockham Fig. B-321 (threaded ends), or Fig. B-319 (soldered ends).
2. For piping 2-1/2 inches and larger: Class 125, iron body, bronze mounted, bolted bonnet, horizontal swing, renewable seat, flanged ends, similar to Stockham Fig. G-931, or approved equal.
3. Ball Valves

   For piping 1 inch and smaller: Class 150, bronze body, full port, bronze trim, approved equal of Stockham Fig. S-216 BRRT (threaded ends) or Fig. S-216 BRRS (soldered ends).

2.03 ACCESSORIES

A. Pipe and Valve Identification

1. Adhesive Bands

a. Provide approved adhesive bands in sets of two, one identifying the piping system type and the second, the direction of flow. Sets shall be provided in quantities sufficient to accommodate the requirements of 3.04 A of this Section.

b. For 3-inch or larger pipe, the adhesive band identifying the piping system shall display the name of the service in letters at least two inches high and the band indicating direction of flow shall display an arrow of similar size. For 2-1/2 inch or smaller pipe, the letters and the arrow shall be not less than one inch high. Bands shall be in colors and shall conform to ANSI A13.1.

c. Adhesive bands shall be W.H. Brady Co. "Quik-Label", or approved equal.

2. Valve Tags, Charts and Schedules

a. Provide each valve with a 2-inch diameter 18 gauge brass tag with brass chain. Service designation shall be 1/4-inch high and valve number shall be 1/2-inch high, on two lines with service designation on the upper line, and valve number on the lower line. The characters shall be indented and filled with durable black compound.

b. Provide diagrammatic valve charts and schedules, using a valve numbering system that differentiates between classes of service and indicates floor level of valve location.

c. Tags shall conform to the numbers, locations, and uses listed in the valve charts and schedules.

d. Valve charts and schedules shall be mounted under glass in wood frames or aluminum self-closing frames.

e. Tags and the frames for valve charts and schedules shall be manufactured by Seton Name Plate Corp., or approved equal.

B. Access Doors

Provide a complete list of all access doors required in finished walls, ceilings, partitions and any other areas for access to all valves concealed behind such finished construction. Access doors will be furnished and installed under other Sections.

2.04 PIPE HANGERS AND SUPPORTS

A. Design, fabricate and provide all pipe hangers and supports adequate to support and guide the piping, allow for forces imposed by expansion joints, satisfy structural requirements and maintain proper clearances with respect to adjacent piping, equipment and structures.

B. Hangers and supports shall include guides, anchors, stops, restraints, welded attachments, insulation shields, saddle strands, stays, braces, bolts, nuts, washers, expansion bolts, pipe clamps, beam clamps, and supplementary structural steel for pipe hangers and supports.

C. Keep the different types of hangers to a minimum. Provide clevis type hangers for sizes 3 inches and above.

D. Suspend hangers from beam clamps, brackets, fish plates, inserts or other approved means. Furnish and install any additional miscellaneous steel supports between building framing members as may be required. The installation of "C" clamps on beams must include retaining straps to prevent separation of beam and clamp.

E. Copper plate all hangers that will be in direct contact with brass or copper tubing.

F. Support vertical piping with steel riser clamps. Additional intermediate support brackets, secured to the structure, shall be installed on piping utilizing gasket or coupling joints in accordance with the manufacturer's recommendations.

G. Trapeze type hangers of steel construction, with hold-down U-bolts, may be used for two or more pipes which have a uniform slope throughout.

H. Base hanger loads on weight of pipe supported, weight of insulation covering and weight of fluid being transported.

I. When loads between supports can be expected to cause a sag in the pipe in excess of 1/4 inch, reduce spacing as necessary to stay within such a limit.

J. Provide and install on all supporting rods, a forged steel turnbuckle with top and bottom lockouts having a vertical adjustment of 6 inches, minimum.

K. All pipe hangers, rods, supports, insulation shields, clamps, and other associated components shall be galvanized.

L. Do not hang piping from other piping and ductwork, except for small water branches in pipe enclosures behind toilet rooms or as approved by the Engineer.

M. Vertical pipes shall be supported on every floor and at intervals between floors so that no more than 10 feet of pipe is unsupported.

N. Provide protection shields for all insulated piping at all points of support. Shields shall be 12 inches long, galvanized steel plate with a radius suitable for the required applications, including insulation.

O. Tabs in metal deck construction shall not be used to support pipe or equipment.

P. Provide pipe anchors where necessary to restrain forces due to thermal expansion and contraction of pipe.

Q. Anchors shall be adequately designed to rigidly oppose forces acting on them and shall be embedded in structural concrete or connected to the building structural steel framework.

R. Provide pipe guides where necessary to confine movement along the centerline of the pipe due to thermal expansion and contraction between anchors. Guides shall be adequately designed and placed, generally between 20 to 30 feet on centers and an equal distance from the expansion loop.

S. Expansion anchors, self-drilling expansion shields, power driven studs and similar devices shall not be used, unless specifically approved by the Engineer.

T. Unless otherwise specifically approved, hanger rod size and spacing shall be within the following limits:

1. Steel Pipe

Pipe Size	Maximum Hanger Spacing	Minimum Rod Size
1/2" to 1"	8 ft. o.c.	3/8"
1-1/4" to 2"	10 ft. o.c.	3/8"
2-1/2" to 3-1/2"	12 ft. o.c.	1/2"
4" and 5"	12 ft. o.c.	5/8"

6"	12 ft. o.c.	3/4"
8"	12 ft. o.c.	7/8"
10" and 12"	12 ft. o.c.	7/8"

2. Copper Tube

Pipe Size	Maximum Hanger Spacing	Minimum Rod Size
1/2" to 1-1/4"	6 ft. o.c.	3/8"
1-1/2" and 2"	8 ft. o.c.	3/8"
2-1/2" to 3-1/2"	10 ft. o.c.	5/8"

3. Cast Iron Soil Pipe (No-Hub)

Supports for horizontal or vertical no-hub pipe shall be on each side of every stainless steel coupling except for spaces behind toilet rooms or where many fittings are installed at one location. At these points, support every 5'-0" o.c. and on as many fittings as necessary so that no more than one fitting shall be without a hanger in any 5'-0" space. Rod size shall be the same as for steel pipe above for corresponding pipe size.

4. Cast Iron Soil Pipe (Hub and Spigot)

a. Support vertical piping at base and at each story height but in no case at intervals greater than 20 feet.

b. Support horizontal piping at 5-foot intervals and behind every hub except for spaces behind toilet rooms or where many fittings are installed at one location. At these points, support every 5'-0" o.c. and on as many fittings as necessary so that no more than one fitting shall be without a hanger in any 5'-0" space. Rod size shall be the same as for steel pipe above for corresponding pipe size.

5. Base of Cast Iron Stacks

Bases of cast iron stacks shall be supported on concrete, on brick laid in cement mortar, by metal bracket attached to the building construction, or by equivalent methods. All stacks shall be anchored so as to relieve the load from the base of the stack.

U. Hangers and supports shall be manufactured by Grinnell Corp., Carpenter & Patterson Inc., Michigan Hanger Co. Inc., or approved equal.

2.05 SLEEVES, SEALS, AND ESCUTCHEONS

A. Pipe Penetration through Walls, Partitions and Floors

1. Piping passing through masonry or concrete walls and framed partitions shall have a trim opening cut no greater than necessary for the installation of a sleeve secured therein. Sleeve shall be 1/2 inch in diameter larger than the diameter of the insulated pipe. Sleeve shall be flush with the finished wall or partition surface.

2. Sleeves through concrete floors for piping shall have the opening 1/2 inch in diameter larger than the diameter of the insulated pipe passing through. Floor sleeves shall project one inch above floor slab.

3. Pipe insulation shall be omitted at penetrations through fire-rated barriers. In all cases pack the annular space between the pipe (whether insulated or uninsulated) and sleeve with mineral wool. Additionally, at penetrations through fire-rated barriers seal the annular space to retain the fire integrity of the fire-rated barrier with nonhardening through-penetration firestops having F-ratings, compatible with the fire ratings of the barriers in which they are installed, per ASTM E 814. Firestop systems shall be UL-approved, and shall be as manufactured by 3M, Bio Fireshield, Inc., General Electric Company, Dow Corning Corporation, or approved equal.

4. Sleeves in walls and floors shall be galvanized steel pipe, Schedule 40 for sizes up to 10 inches and 3/8-inch wall thickness for 12 inches and larger. Sleeves in partitions shall be 20-gauge galvanized sheet metal.

5. Piping in exposed areas, passing through walls, floors or ceilings shall be fitted with chromium-plated cast brass escutcheons with fastening set screws.

6. Piping passing through floor waterproofing membrane shall be provided with a 4-pound lead flashing or a 16-ounce copper flashing, each within an integral skirt or flange. Flashing shall be suitably formed, and the skirt or flange shall extend not less than 8 inches from the pipe and shall be set over the floor membrane in a solid coating of bituminous cement. The flashing shall extend up the pipe a minimum of 10 inches above the floor. The annular space between the flashing and the pipe shall be sealed watertight.

7. Piping passing through roof construction shall be provided with counterflashing, consisting of steel rainhood secured all around the pipe and overlapping the flashing.

B. Pipe Penetration through Exterior Foundation and Pit Walls

1. General

a. All penetrations for piping through perimeter foundation walls and subgrade pit walls shall be provided with the pipe sleeves and seals as shown on the Contract Drawings.

b. Sleeves shall be Schedule 40 for sizes up to 10 inches and 3/8-inch wall thickness for sizes 12 inches and larger. All pipe sleeves shall be galvanized steel, set into foundation walls with anchors and water stop plates.

2. Lead-Oakum Seals

Where "Lead-Oakum" seal is shown on the Contract Drawing, the annular space between the pipe and the sleeve shall be made watertight by caulking with oakum and poured lead, edged and trimmed.

3. Interlocking Modular Seals (Link-Seal)

a. Where "Link Seal" is shown on the Contract Drawings, seal shall be modular mechanical type, consisting of interlocking sealing element links shaped to continuously fill the annular space between the pipe and the sleeve. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the sealing elements to expand and provide a watertight seal between the pipe and the sleeved opening. The seal shall provide electrical insulation between the pipe and wall.

b. The inside diameter of each wall sleeve shall be sized as recommended by the manufacturer to fit the pipe, seal, and any coating or insulation to ensure a watertight joint.

c. Install sleeves and seals in accordance with the seal manufacturer's instructions to provide a watertight installation.

d. Seals for perimeter foundation wall penetrations shall be two individual sealing units in tandem unless otherwise shown on the Contract Drawings. Single sealing unit shall be used for pit wall penetration unless otherwise shown on the Contract Drawings.

e. Seals shall be Thunderline Corp. "Link-Seal", or approved equal.

PART 3. EXECUTION

3.01 INSTALLATION

A. General

1. Install piping and appurtenances in accordance with manufacturers' installation procedures, applicable codes and standards, and as specified.
2. Coordinate piping installation with other Work to avoid interference. Coordinate as necessary to ensure that all hangers, supports, sleeves and other built-in devices are incorporated in forms or in masonry to avoid necessity of cutting finished structure.
3. All measurements, both horizontal and vertical, shall be based on established benchmarks. All Work shall agree with these established lines and levels. Verify all measurements at site and check the correctness of same as related to the Work.
4. Perform necessary cutting and patching in accordance with requirements specified in Division 2 Section entitled "CUTTING, PATCHING AND REMOVAL". All openings in existing slabs required for pipe penetrations shall be core drilled.
5. Installation requirements for pipe hangers and supports and pipe penetration sleeves, seals, and escutcheons are specified in 2.04 and 2.05, respectively.

B. Piping

1. Install piping as shown on the Contract Drawings and straight and direct as possible, forming right angles or parallel lines with building walls, neatly spaced, with risers plumb and true.
2. Piping shall pitch back toward system drain valve and any installed low points or pockets shall have a hose end drain valve.
3. Avoid tool marks and unnecessary pipe threads. Burrs formed when cutting pipe shall be removed by reaming. Before installing pipe, thoroughly clean the inside, free of cuttings and foreign matter. Cut all piping square and smooth and make up all joints to required limits.
4. Erect all piping to obtain sufficient flexibility to prevent excessive stresses in materials and excessive bending moments at joints or connections.
5. Make changes in pipe size by the use of reducing fittings. Do not use reducing bushings except by approval of the Engineer. Do not use close or shoulder nipples.
6. Arrange water piping so that system can be completely drained. Where lines are purposely pitched for drainage, a uniform grade shall be maintained. Lines shall be so supported as to prevent pocketing of water. No lines shall have pockets due to changes in elevation unless proper provisions for draining are made.

7. Installed piping shall not interfere with the operation or accessibility of doors and windows; shall not encroach on aisles, passageways and equipment; and shall not interfere with the servicing or maintenance of any equipment. Adjacent pipelines shall be grouped in the same horizontal or vertical plane.

C. Pipe Joints

1. Threaded Joints

   Make up threaded joints tight using pipe joint Teflon compound or tape, applied on the male thread only.

2. Flanged Joints

   Make up flanged joints square and tight with gaskets. Dip bolts and nuts in mixture of graphite and oil immediately prior to installation.

3. Soldered Joints

   a. Cut ends of tubing square and remove all burrs. Clean inside and outside of tubing with steel wool.

   b. Make joints with non-corrosive paste flux and 95 per cent tin and 5 per cent antimony solder. Cored or lead-containing solder is not permitted.

   c. Remove excess solder while still in plastic state.

   d. Leave a fillet at the wall of the fitting.

   e. Prior to silver soldering, remove the internal parts of all valves or other devices to be installed directly in line.

4. Caulked Joints

   For cast iron pipe with hub, pack hub firmly with hemp or picked oakum and fill with molten lead, using a minimum of twelve ounces of lead for each inch of pipe size per joint and to a one-inch minimum depth. After the lead has cooled, the joints shall be thoroughly caulked, using approved caulking irons, faced smooth and made tight without the use of putty, paint or cement.

5. Compression Joints

   Make compression joint with ASTM C564 neoprene rubber gaskets and lubricant. Gaskets shall match class of pipe and fittings. Make joints in accordance with recommendations of CISPI.

6. Cast Iron No-Hub Joints

No-hub cast iron pipe joint shall be of a coupling type. Each joint shall consist of 2 spigot ends of pipe or fitting, and a sealing sleeve assembly, consisting of a stainless steel shield over a neoprene gasket, held together by stainless steel clamps. The gasket shall be slid over the ends of the two pipes to be joined, then the shield and clamps shall be placed over the gasket. The entire coupling shall be held firmly together by the clamps, by alternately turning the screws to 100-115 in.-lb. torque. Couplings shall be "Clamp-All" type manufactured by Clamp-All Corp., or Husky SD Series 4000 type manufactured by Anaheim Foundry Company, or approved equal.

3.02 FIELD TESTS

A. General

1. Perform tests as herein specified on the various piping systems or portions thereof prior to backfilling, painting, concealing or insulating.
2. Notify the Engineer and those authorities having jurisdiction, at least 48 hours in advance of making the required tests, so that arrangements may be made for their presence to witness the tests.
3. Provide and install all equipment and devices required in connection with tests. Provide all necessary materials, supplies, labor and power for the tests.
4. Should the tests reveal any leaks or deficiencies in piping installed under this Section, make the necessary repairs immediately, or, if required by the Engineer, replace defective work with new work without additional cost to the Authority. Repeat tests as directed until the entire installation is proven satisfactory. No temporary method of repairing leaks will be permitted.
5. Where piping installed under this Section is connected to any existing system, such installed piping shall be isolated from the existing system during the performance of the required field tests, unless otherwise directed by the Engineer.
6. The Engineer reserves the right to direct the Contractor not to isolate the newly-installed piping from the existing system during the performance of the required field tests. In such event, the Contractor shall correct any revealed leaks or other deficiencies within the first 20 feet of the existing system, measured in any direction from the point of connection with the newly installed piping, all as directed by the Engineer and at no additional cost to the Authority.
7. Dispose of water removed from pipelines in a manner that will not cause damage to any property.
8. Provide and install the required air vents in the piping system tested.
9. All equipment, including water coolers, and all controls and instruments shall be isolated from the piping system during test, as well as during cleaning, disinfecting and flushing procedures.

B. Hydrostatic Tests

1. Storm and Sanitary Drainage and Vent
   a. Tightly close all openings in the entire system and fill it with water to the point of overflow above the roof. The water level shall be maintained for one hour.
   b. When piping is tested in sections, test piping with a pressure equivalent to a 10-foot water head. The water level shall be maintained for one hour.

c. For piping added, relocated or replaced on existing systems, install a test tee at the lowest elevation of each added, relocated or replaced piece of pipe and fill it with water to overflow level of next highest fixture outlet or drain. The water level shall be maintained for one hour.

2. Domestic Water

a. Cap or plug all outlets, apply a hydrostatic pressure of 125 psi and sustain such pressure for one hour.

b. For piping added, relocated or replaced on existing systems, apply a hydrostatic pressure of 50 psi above the existing system pressure for one hour.

C. Cleaning and Disinfecting

The potable water system shall be disinfected prior to use by a method of disinfection in accordance with the applicable code.

3.03 PAINTING

Upon completion of the installation, remove all protecting materials, thoroughly remove all scale and grease and leave in a clean condition for painting. Piping to be painted shall be as shown on the Contract Drawings. Painting shall be in accordance with the requirements of Division 9 Section entitled "PAINTING".

3.04 PIPE AND VALVE IDENTIFICATION

A. Pipe Identification

Affix sets of pipe adhesive bands specified in 2.03 A.1 where they can be easily read, with their long dimension parallel to the axis of the pipe and no more than 40 feet apart on a piping system. At least one set of identifying bands shall be affixed in all occupied and unoccupied rooms as well as in all other spaces, such as hung ceilings or shafts, where piping may be viewed and the identity of the piping system cannot be readily ascertained. A set of such bands shall be affixed at each branch and riser takeoff; adjacent to each valve; at each pipe passage through floor and ceiling construction; at each capped line; and at each pipe passage to an underground area.

B. Valve Tags

Securely fasten valve tags specified in 2.03 A.2 with approved brass chain.

END OF SECTION

SECTION 15410

PLUMBING PIPING AND APPURTENANCES

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

15410A01 Piping Shop Drawings

Shop and coordination drawings shall be double line at a minimum of 3/8"=1'-0" scale.

a. Piping layout and installation drawings including, at a minimum, the following:

(1) Plans, elevation, sections and riser diagram.

(2) Hanger, support locations and details. Indicate methods of attachment to building structure.

(3) Pipe elevations and dimensions from main piping runs to a reference point.

(4) Penetrations through fire rated and other partitions.

(5) Location for piping accessories, including valves and access doors.

b. Piping coordination drawings showing plan views and sections, drawn to scale, on which all items are shown and coordinated with all Work of other Sections.

Catalog Cuts

15410B01 Catalog cuts, including product performance data, for all items furnished under this Contract, including the following at a minimum:

a. Pipe, pipe fittings and flanges including piping materials and schedule for each piping system.

b. Valves, including valve charts and schedules.

c. Hangers and supports, including schedule showing manufacturer's figure number, size, location and features of each required hanger and support.

d. Sleeves and escutcheons.

e. Pipe and valve tags identification bands.

Construction and Installation Procedures

15410G01 Field hydrostatic test procedure.

Manuals, Warrantees/Guarantees

15410I01 Operation and maintenance manuals providing comprehensive information for the specific approved equipment; including approved shop drawings and catalog cuts, sequence of operation, test results, troubleshooting, maintenance requirements, spare parts lists, electrical/control devices and electrical/control wiring diagram(s).

Inspection Reports

15410O01 Field hydrostatic test results.

END OF APPENDIX "A"

DIVISION 15

SECTION 15430

PLUMBING SPECIALTIES

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for plumbing specialties.

1.02 DESIGN AND PERFORMANCE REQUIREMENTS

Design and performance of components and methods specified herein shall comply with all applicable Federal, State and Local laws, ordinances, regulations and codes, and the latest industry standards including, but not limited to the entities listed below:

American National Standards Institute (ANSI)
American Society of Mechanical Engineers (ASME)
American Society of Sanitary Engineering (ASSE)
American Society for Testing and Materials (ASTM)
Plumbing and Drainage Institute (PDI)

In addition, specific provisions cited herein shall govern for the associated specific application.

1.03 QUALITY ASSURANCE

A. Plumbing specialties of the types and sizes required shall have performed satisfactorily for purposes similar to those intended herein, for not less than three years.

B. Entities performing the work of this Section shall have experience on at least two projects involving complexities similar to those required under this Contract.

1.04 DELIVERY, STORAGE, AND HANDLING

A. All specialties shall be factory-cleaned, wrapped and packaged in boxes prior to shipping to construction site.

B. Store specialties in clean, dry spaces and protect them from weather.

C. Prior to installation, inspect specialties for damage.

1.05 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 DRAINS

A. General

1. Drains shall be of types and sizes shown on the Contract Drawings.

2. Special type drains other than those specified in 2.01 B and C below shall be provided as shown on the Contract Drawings.

3. Floor drains shall be provided with vandal proof grates in all areas except mechanical equipment rooms.

4. Drains shall be manufactured by Jay R. Smith Manufacturing Co., Josam Manufacturing Co., Zurn Industries Inc., Tyler Pipe Industries Inc./Wade Division, or approved equal.

B. Floor Drains

1. Toilet Rooms and Finished Areas

   Floor drains shall have cast iron body, with flashing collar, round top with nickel bronze adjustable strainer head; Jay R. Smith No. 2005-A or 2010-A, or approved equal.

2. Mechanical Equipment Rooms

   Floor drains shall have cast iron body, with flashing collar, round cast iron grate and slotted sediment bucket; Jay R. Smith No. 2230, or approved equal.

3. Drains receiving indirect waste shall be fitted with a cast iron funnel; Jay R. Smith No. 3581, or approved equal.

C. Roof Drains

1. Roof drains shall have cast iron body with adjustable extension sleeve, flashing collar and cast iron dome. Provide sump receiver and underdeck clamp for all roofs except poured-in place installations. Drain shall be Jay R. Smith No. 1015, or approved equal.

2. Install roof drains with 6-lb. lead flashing extending 12 inches beyond the outside diameter of the roof drain. Coordinate the installation with other affected Work.

2.02 VENT FLASHING COUPLINGS

A. Where shown on the Contract Drawings, provide cast iron, threaded (upper end) counterflashing sleeves; Jay R. Smith No. 1750, or approved equal.

B. Vents extending through roof shall be flashed watertight. Flashing shall be 6-lb. lead extending not less than 12 inches around the perimeter of the pipe, outside the barrel and terminate 12 inches above the roof with the vent flashing couplings specified above.

2.03 CLEANOUTS

A. Use "Y" (and "TY") fittings for cleanouts; full size "Y" for piping up to 4 inches and not less than 4-inch "Y" outlets for piping 5 inches and larger.

B. Provide cleanouts for storm and sanitary piping at bases of stacks, at changes in direction of horizontal piping, and at 50-foot intervals, minimum, on horizontal runs.

C. Floor cleanout deckplates shall be the following, or approved equal:

1. Unfinished areas: Jay R. Smith No. 4226.
2. Finished areas: Jay R. Smith No. 4026.
3. Tiled areas: Jay R. Smith No. 4146.
4. Carpeted areas: Jay R. Smith No. 4026-Y (with carpet marker).

D. Toilet room wall cleanouts shall be cast iron caulk ferrule and cast iron head seal plug with stainless steel cover and center screw; Jay R. Smith No. 4402, or approved equal.

E. Cleanouts at changes of direction of above-floor piping shall be cast iron caulk ferrule with straight threaded, tapered bronze plug; Jay R. Smith No. 4420, or approved equal.

F. All cleanout plugs shall be lubricated with graphite before installation.

G. Cleanouts shall be manufactured by Jay R. Smith Manufacturing Co., Josam Manufacturing Co., Zurn Industries Inc., Tyler Pipe Industries Inc./Wade Division, or approved equal.

2.04 FRESH AIR INLETS

A. Where shown on the Contract Drawings, provide fresh air inlets of perforated wall plate with pipe expander type securing device and spanner type tamperproof locking device; Jay R. Smith No. 9005, or approved equal.

B. Finish of plate shall be polished bronze, unless otherwise shown on the Contract Drawings.

2.05 DOMESTIC WATER METERS

Provide water meter(s) of the type and size(s) shown on the Contract Drawings. The meter shall be set horizontally, dial facing upward not more than three feet above floor, properly supported, and installed in accordance with the regulations of the local municipal water company.

2.06 STRAINERS

Where shown on the Contract Drawings, provide strainers of "Y" type with tapped blowdown connections, 150 psi w.w.p., bronze body, and bronze screens. Strainers shall be manufactured by Spirax Sarco Inc., Mueller Steam Specialty Co./MUESSCO, or approved equal.

2.07 GAUGES

A. Provide pressure gauges on water main, at pressure reducing valve assemblies and at other locations shown on the Contract Drawings.

B. Gauges shall be of bronze bourdon tube material, with 4-1/2-inch dial face and aluminum case and shall have a range of 160 psi with an accuracy of 0.5 percent of the scale range. Each gauge shall be provided with a snubber and cock. Pressure gauges shall be Weiss Instruments Inc. "Series UG-1", or approved equal.

2.08 THERMOMETERS

A. Provide thermometers on inlets and outlets of water heaters and circulating pumps, and where shown on the Contract Drawings.

B. Thermometers shall be of "red reading" Mercury, industrial glass type with V-shaped cast aluminum case, adjustable angle face, and stainless steel extension necks to suit insulation thickness, having a 9-inch long scale and a temperature range of 20 degrees F to 180 degrees F with an accuracy of one per cent of the scale range. Thermometers shall be provided with immersion bulb and separable socket. Thermometers shall be Weiss "Vari-Angle Industrial Thermometers", or approved equal.

2.09 AIR CHAMBERS

A. Provide full pipe size, 12-inch high air chambers at each plumbing fixture domestic water supply connection.

B. Provide full pipe size, 24-inch high air chambers at the top of each domestic water riser.

2.10 WATER HAMMER ARRESTORS

A. Provide water hammer arrestors adjacent to all equipment where quick-closing valves are provided and at other locations shown on the Contract Drawings.

B. Sizes and installation procedures of water hammer arrestors shall be in accordance with PDI Standards.

C. Water hammer arrestors shall be Jay R. Smith "Series 5000", or approved equal.

2.11 AIR RELIEF VALVES

A. Provide automatic air relief valves at high points in hot water piping and where shown on the Contract Drawings, with 3/4 inch threaded inlet; class 150 cast iron body and cap; valve, float, leverage and valve seat and compressed non-asbestos gasket. Pipe drain from relief valves shall spill over to adjacent floor drain, mop sink, or as shown on the Contract Drawings.

B. Relief valves shall be Taco Air Vent, Model 409, or approved equal.

2.12 NON-FREEZE WALL HYDRANTS

Where shown on the Contract Drawings, provide non-freeze wall hydrants, key operated with 3/4-inch, threaded inlets. Hydrant shall be all-bronze nickel-plated with hose connection, integral vacuum breaker, and stainless steel box with full 180 deg door opening, nickel-bronze face. Hydrants shall be Jay R. Smith No. 5509 QT, or approved equal.

2.13 HOSE BIBBS

Where shown on the Contract Drawings, provide Woodford Manufacturing Co. Model 24 C hose bibbs, or approved equal. Finish shall be rough brass in mechanical or non-finished spaces, and polished chrome-plated in all finished areas. Provide matching finish vacuum breakers at each hose bibb.

2.14 VACUUM BREAKERS

Vacuum breakers shall be bronze body, chrome-plated Watts Regulator Co. Model No. 288A-C, or approved equal. Check valve shall be provided at the outlet side of vacuum breaker.

2.15 BACKFLOW PREVENTERS

A. Where shown on the Contract Drawings, provide backflow preventers to prevent the backflow of contaminated water into the potable water supply. Each backflow preventer shall be a complete assembly, including tight-closing shutoff valves before and after the device, and shall be protected by a strainer. The design shall include test cocks and a pressure-differential relief valve located between two positive seating check valves. The device shall meet the requirements of ASSE Standards.

B. Backflow preventers shall be of a size shown on the Contract Drawings and shall be CMB Industries/FEBCO Division Model No. 825, Watts Regulator Co. Model No. 909, or approved equal.

2.16 DIELECTRIC FITTINGS

Connections between ferrous and non-ferrous pipe or equipment connections shall be made using isolating union or flange joints as manufactured by Watts Regulator Company, Series 3000, or approved equal.

PART 3. EXECUTION

3.01 INSTALLATION

Install plumbing specialties in accordance with the manufacturers' installation instructions.

3.02 PROTECTION

Upon completion of the installation, remove all protective materials and thoroughly clean all specialties to the satisfaction of the Engineer.

END OF SECTION

SECTION 15430

PLUMBING SPECIALTIES

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Catalog Cuts

15430B01 Plumbing Specialties

Catalog cuts, including product performance data, dimensions, components, weights and assembly details, for each item furnished under this Contract, including the following at a minimum:

(1) Drain, floor and roof.
(2) Vent flashing coupling.
(3) Cleanouts.
(4) Fresh air inlets.
(5) Domestic water meters.
(6) Backflow prevention devices.
(7) Strainers.
(8) Gauges.
(9) Thermometers.
(10) Air chambers.
(11) Water hammers arrestors.
(12) Air relief valves.
(13) Non-freeze wall hydrants.
(14) Hose bibs.
(15) Vacuum breakers.
(16) Dielectric fittings.

Construction and Installation Procedures

15430G01 Field test procedure.

Manuals, Warrantees/Guarantees

15430I01 Operation and maintenance manuals providing comprehensive information for the specific approved equipment; including approved shop drawings and catalog cuts, sequence of operation, test results, troubleshooting, maintenance requirements, spare parts lists, electrical/control devices and electrical/control wiring diagram(s).

END OF APPENDIX "A"

DIVISION 16

SECTION 16000

ELECTRICAL GENERAL REQUIREMENTS

PART 1. GENERAL

1.01 SUMMARY

Unless otherwise shown on the Contract Drawings, or unless otherwise specified in other Sections of these Specifications, the general requirements specified in this Section are applicable to all electrical work of this Contract. Additional requirements applicable to individual Sections of these Specifications are specified in those Sections, or are shown on the Contract Drawings.

1.02 REFERENCES

The following is a listing of publications referenced in this Section:

	American National Standards Institute (ANSI)
ANSI C 2	National Electrical Safety Code.
	American Society of Testing and Materials (ASTM)
ASTM D 178	Standard Specification for Rubber Insulation Matting.
	National Fire Protection Association (NFPA)
NFPA 70	National Electrical Code.
	Occupational Safety and Health Administration (OSHA)

1.03 QUALITY ASSURANCE

A. Any entity performing Work shall have had experience on at least two projects involving quantities and complexities at least equal to those required under this Division or the applicable Section thereof.

B. All workmen performing under this Division shall be skilled workers of the trade involved. Where specialty work, such as splicing or welding are required, submit proof of training, experience and work history for each workman, for review by the Engineer. Only approved workmen shall perform specialty work.

C. All electrical work shall be performed under the supervision of an electrical contractor, licensed in the state (and the city as required) in which the work is to be performed. Submit a copy of the qualifying license for review by the Engineer.

D. All calculations required by this and other various Sections of these Specifications, or as shown on the Contract Drawings, shall be certified and sealed by a Professional Engineer licensed in the state in which the Work is to be performed, and shall be submitted to the Engineer for review.

E. Various Sections of these Specifications contain the requirement for the specific material or equipment to be furnished with an experience statement "satisfactorily used for purposes similar to those intended herein" or words of similar intent and a statement that specifies the required experience time. These statements shall mean that the manufacturer of the material or equipment being furnished for the Work specified in this Contract shall have manufactured similar material or equipment to that specified, for at least the time specified.

F. In various Sections of this Division there is a statement that refers to the length of required experience that must be satisfied.

G. Polyvinyl Chloride (PVC): PVC conduits, PVC-insulated power wiring, or items containing PVC, except PVC-insulated wiring for communications systems, remote control, signaling, and power limited circuits, shall not be installed in any indoor area. PVC-insulated wiring for communications systems, remote control, signaling, and power-limited circuits shall be furnished and installed in accordance with NFPA 70.

H. Asbestos

Asbestos or items containing asbestos shall not be furnished or installed.

I. Conformance Labels

All electrical materials and equipment for which there is a nationally recognized standard shall bear the conformance labeling of the third party inspection authority, such as Underwriters Laboratories Inc., Factory Mutual, ETL, or approved equal. Where the phrase "where there are established UL standards, shall bear the UL label", or words of similar intent appear in other Sections, the instructions for the conformance label above shall apply.

1.04 CODES AND STANDARDS

A. The electrical installation shall conform to all requirements of ANSI C2, NFPA 70, and the codes and standards specified in other Sections, all local codes and the requirements of OSHA, which would be applicable if the Authority were a private corporation.

B. Standards publications of technical organizations and regulatory agencies are referenced in other Sections, and unless stricter requirements are indicated, materials and equipment so specified shall be manufactured, tested and installed to conform, as a minimum, to the requirements of such reference standards and publications.

C. Installations for aeronautical markers, lighting, guidance signs, and other work as shown on the Contract Drawings, shall comply with the standards of the Federal Aviation Administration (FAA), where applicable.

D. In case of conflict between provisions of codes, laws and ordinances, the more stringent requirement shall apply.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver material in manufacturers' original unopened protective packaging.

B. Store materials in original packaging in a manner to prevent soiling, physical damage, wetting or corrosion prior to installation.

C. Handle in a manner to prevent damage to finished surfaces.

D. Where possible maintain protective coverings until installation is complete and remove such covers as part of final cleanup.

E. Touch up any damage to finishes to match adjacent surfaces to the satisfaction of the Engineer.

1.06 SUBMITTALS

See Appendix "A" for submittal requirements.

1.07 SPECIAL TERMS

Throughout this and other Sections of this Division the term "Authority" is used. In PATH contracts, substitute the term "PATH" is deemed substituted for the term "Authority".

PART 2. PRODUCTS

2.01 MATERIAL AND EQUIPMENT TO BE FURNISHED

Equipment and materials furnished shall be new and unused, prior to this installation, first grade commercial quality and shall be essentially the standard cataloged products of a manufacturer regularly engaged in the manufacture of the products. Only those items specifically shown on the Contract Drawings as existing, relocated or Authority furnished shall be reused in this installation. Rebuilt or remanufactured equipment will not be permitted.

2.02 IDENTIFICATION

A. All parts of equipment, such as switchboards, panel boards, safety switches, motor starters, circuit breakers, time clocks, contactors and similar items shall be identified by name, function or control with laminated plastic nameplates consisting of two black sheets with one white sheet bonded to and between the two outer sheets and having letters machine engraved in the face sheet to the depth of the white plastic. Nameplates shall not be smaller than 1 inch by 3 inches with characters not less than one-quarter inch. Where letter sizes are not specified, use one-inch high letters for panel boards, switchboards and motor control centers and one quarter inch high elsewhere. Nomenclature shall be according to a schedule approved by the Engineer.

B. All device plates other than lighting switch plates, telephone and 120 volt, single phase, 15 or 20 ampere receptacles, shall have black or white (as directed) silk-screened lettering Helvetica Medium type face (or other type face as directed by the Engineer) designating:

1. System.
2. Voltage (where applicable).
3. Number of phases (where applicable).
4. Current rating (where applicable).
5. Frequency (where applicable).

C. Before placing orders for nameplates or silk-screened device plates, submit a typewritten list to the Engineer for review.

D. The outside of the covers of all junction or pull boxes located above hung ceilings and the inside of the covers of all junction or pull boxes exposed shall be labeled with an indelible marker indicating the operating voltage and the system contained therein.

E. All device plates of receptacles connected to a standby or emergency power distribution system shall be labeled with an orange plastic nameplate, engraved with the panel board and circuit number to which the receptacle is connected. Nameplate character engraved shall be not less than one-quarter inch in height.

F. Unless otherwise shown on the Contract Drawings, all panel boards, switchboards, switchgear, circuit breakers, switches and transformers connected to a standby or emergency power distribution system shall be finished Federal Safety Orange in color.

2.03 RUBBER MATTING

A. Provide continuous insulated rubber matting not less than 36 inches wide and not less than one quarter inch thick in one piece in front of:

1. Substation transformers.
2. Switchgear.
3. Switchboards.
4. Motor control centers.
5. Panel boards.
6. On each side and end of a standby or emergency generator set.
7. Other locations as shown on the Contract Drawings.

B. Matting shall conform to ASTM D 178, Type 2.

PART 3. EXECUTION

3.01 GENERAL

A. Work of this Division shall include all labor, material and apparatus necessary for the completion of all electrical work as shown on the Contract Drawings and as hereinafter specified, left ready for satisfactory operation.

B. Coordinate with Authority operations and construction by other trades.

1. Coordinate with the Work of all trades as necessary to facilitate timely completion, avoid unnecessary cutting and patching and to ensure proper installation and operation of all equipment.
2. Coordinate all components and aspects of the Work, in order to minimize power shutdowns to the power distribution systems. Should any part of the Work require an "off-hours" shutdown in excess of 8 hours, supply temporary services or feeders as required to maintain operation of the existing systems and equipment.
3. Furnish to appropriate trades, shop drawings, catalog cuts and instructions necessary for construction of concrete bases, concrete encasement, anchor bolts, and other construction required to accommodate installations under other Sections.
4. Obtain all wiring diagrams and other instructions required for proper electrical connection of equipment installed or furnished under other Divisions of these Specifications and coordinate the installation, wiring and connections for equipment furnished under this Division, or other various Divisions.

C. The arrangement of electrical equipment and conduit runs as shown on the Contract Drawings and described in the Specifications is schematic. Locate and install electrical work in coordination with other trades so that all electrical equipment and material is installed with working clearances in accordance with NFPA 70. Route conduit to avoid interference with existing installation and with work to be performed by other trades.

D. The location of equipment and motors shown on the Contract Drawings shall be subject to minor revisions due to field conditions or coordination with other trades without any increase in Contractor's compensation. Prior to roughing-in, verify the exact location of all electrical connections to equipment and motors from reviewed shop drawings and field verification.

E. Maintain records of all inspections, testing, overload and overcurrent settings throughout the construction and any corrective actions taken, and submit records to the Engineer for review.

F. All electrical work shall be subject to inspection by the Engineer. Correct any deficient work, as required for the approval of the Engineer.

G. Any equipment, materials, wiring or labor that are a necessary part of the electrical work and to its proper performance, although not specifically mentioned herein or shown on the Contract Drawings, shall be furnished and installed as if called for in detail, without additional cost to the Authority.

3.02 REMOVALS, RELOCATIONS, RECONNECTIONS, RESTORATIONS

A. Relocate existing equipment and materials as shown on the Contract Drawings.

B. Unless otherwise shown on the Contract Drawings, existing equipment and materials that are to be removed and not required to be relocated under this Contract, will become the property of the Contractor and shall be removed from the property of the Authority, and shall be properly disposed of. Disposal of equipment and materials shall comply with all local, state and Federal laws and regulations as if the Authority was a private corporation.

C. Unless specifically shown on the Contract Drawings, salvaged equipment and materials shall not be reused in the installation.

D. If existing electrical feeders, wiring, conduit, lighting fixtures or equipment interfere with the installation of new construction of any trade, the existing electrical feeder, wiring and conduit shall be rerouted or the equipment relocated in a manner approved by the Engineer to permit installation of the new construction. Where existing circuits or devices, or portions of the existing wiring system are to remain in service, but are interrupted by the construction, continue the existing wiring to maintain the remainder of the wiring system in operation.

E. Notify the Engineer immediately of any damage caused by the Contractor to existing wiring, services or feeders that are to remain in service. Repair the damage in a workmanlike manner to restore to service, at no cost to the Authority.

F. Before shutdown or discontinuation of service on any circuit, system or feeder, coordinate such activities with the Engineer in order to minimize shutdown periods. Provide a minimum of two weeks notice in writing to the Engineer before performing any shutdowns. The minimum period may be reduced with the express written permission of the Engineer.

3.03 LOCATION OF EQUIPMENT

A. Unless otherwise shown on the Contract Drawings, the location of outlets or devices, from finished floor to center of plate or device, shall be as follows:

1. Lighting switches: 48 inches.
2. Thermal switches: 48 inches.
3. Receptacles: 16 inches.
4. Telephone outlets: 16 inches.
5. Fire alarm stations: 48 inches.
6. Fire alarm horn/light signals: 7 feet 6 inches.
7. Clocks: 7 feet 8 inches.

B. Unless otherwise shown on the Contract Drawings, the location of equipment, from finished floor to top of enclosures shall not exceed 6 feet, 6 inches, and shall not protrude more than 4 inches if higher than 27 inches.

1. In exposed or public locations, panel boards and cabinets shall generally be flush mounted and all covers shall be identical in layout and size, and shall be installed to maintain a level and straight top and bottom alignment.
2. In concealed locations, or in closets or electrical or mechanical rooms, or non-public locations, panel boards and cabinets shall generally be surface mounted and shall be installed to maintain a level and straight top alignment.

3.04 DISSIMILAR METALS

A. Dissimilar metals shall mean those metals that are incompatible with one another in the presence of moisture, as determined from their relative positions in the Electrochemical Series, or from test data. Where dissimilar metals come in contact, paint the joint both inside and out with approved coating so as to exclude moisture from the joint, or provide a suitable insulating barrier separating the metals.

B. Transitions in raceways, from one metal to a dissimilar metal shall only be made at boxes or other enclosures, except where shown on the Contract Drawings.

3.05 NAMEPLATES

Secure nameplates on equipment or walls with stainless steel or brass screws.

3.06 RUBBER MATS

A. Install rubber mats in front of each panelboard, switchboard, motor control center, switchgear and substation transformers, and along each side and the end or each generator set, or as shown on the Contract Drawings.

B. Rubber mats, when installed, shall lay flat without curling.

3.07 CUTTING AND PATCHING

A. Perform all cutting and patching of existing construction required for installation of all materials and equipment as specified in this Division.

B. Perform all patching to match existing adjacent construction to the satisfaction of the Engineer and using the best possible workmanship of the various trades involved.

3.08 FINAL FIELD TESTS

A. The entire electrical installation shall be inspected prior to final acceptance testing, thoroughly cleaned, and damaged finishes touched up after final completion and prior to final acceptance testing being performed. Not less than 30 days prior to the testing, furnish a test plan, to the Engineer for review, outlining all aspects of the testing, including tests to be performed and the expected results.

B. Perform the following field test in the presence of the Engineer to demonstrate the reliability of the electrical installation. Give the Engineer a minimum of one-week advance notice of such tests.

1. Operate all electrical systems and equipment for a period of 24 hours, unless in the opinion of the Engineer, a different test period is required, to prove the operation and performance of a system and its equipment.

2. Should the foregoing test reveal any defects, promptly correct such defects and re-run the tests until the entire installation conforms to the requirements of these Specifications and the Contract Drawings.

C. Tests requiring certified reports and those requiring factory or field inspection shall be conducted and reported to the Engineer in conformance with standards herein specified.

D. In addition to the tests outlined above, after completion of the electrical system and prior to occupancy:

1. The following equipment and devices, as a minimum, shall be thermographically inspected utilizing a Hughes Aircraft Probeye infrared detector, or approved equal, with videotaping attachment.

   a. High voltage cable splices and connections.

   b. Switchboard.

   c. Transformer.

   d. Switchgear.

   e. Panelboards.

   f. Motor control centers.

   g. Automatic transfer switch and emergency power system connections.

   h. Chiller motor and starter connections.

   i. All 600 volt (nominal) cable connections rated 100 amperes (#3 AWG) or greater.

   j. Other equipment as shown on the Contract Drawings.

2. The inspection shall be made by an independent inspection company such as Infrared Services, Inc, Montville, N.J., General Electric Apparatus Service Division, or approved equal. The inspection shall be made with all equipment, motors, lighting fixtures, and miscellaneous loads operating and with all equipment covers removed. Inspection reports complete with color photographs of the infrared scan and control photographs indicating the ambient temperature and any hot spots of each item inspected shall be submitted to the Engineer for approval. Any equipment, connections or devices indicated to be operating improperly performing equipment shall be replaced or repaired by the Contractor at no cost to the Authority. The cost of the inspections and necessary repairs shall be included in the Contract.

E. Demonstrate to the Engineer equipment or systems installed or modified in this Contract.

1. After completion of all testing, and prior to placing equipment or systems in operation, demonstrate the features and operation of the equipment or systems to the Engineer, and all other staff or interested parties, as designed by the Engineer, so that operational and maintenance personnel are familiarized with the equipment and systems, as follows:
   a. Switchboards and panelboards.
   b. Transformer.
   c. Switchgear.
   d. Motor control centers.
   e. Fire alarm and smoke detection systems.
   f. Automatic transfer switches.
   g. Standby/Emergency generator sets.
   h. Other equipment as shown on the Contract Drawings.
2. Provide the necessary accessories, test equipment, and personnel, for each demonstration.
3. Complete all arrangements for the demonstrations through the Engineer.
4. Upon the completion of each demonstration or instructional session, obtain "sign-off" from the Engineer. The "sign-off" shall state that the demonstration or instructions for use were provided, that they were complete and were given to the designated personnel.

END OF SECTION

SECTION 16000

ELECTRICAL GENERAL REQUIREMENTS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Catalog Cuts

16000B01	Conduit, and fittings.
16000B02	Wire and cable.
16000B03	Wiring devices.
16000B05	"Standard" outlet and junction boxes.
16000B07	Lightning arresters.
16000B09	Panel boards and cabinets.
16000B10	General purpose transformers.
16000B12	Lighting fixtures.
16000B15	Supporting devices.

END OF APPENDIX "A"

DIVISION 16

SECTION 16110

RACEWAYS

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for raceways.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	American National Standards Institute (ANSI)
ANSI C 80.1	Rigid Steel Conduit - Zinc Coated
ANSI C 80.3	Electrical Metallic Tubing - Zinc Coated
ANSI C 80.5	Rigid Aluminum Conduit
ANSI C 80.6	Intermediate Metal Conduit - Zinc Coated
	National Electrical Manufacturers Association (NEMA)
ANSI/NEMA FB 1	Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies
NEMA RN 1	Polyvinyl – Chloride (PVC) externally coated galvanized rigid steel conduit and intermediate metal conduit
NEMA TC-3	PVC Fittings for use with rigid PVC Conduit and Tubing
NEMA TC-6	PVC and ABS plastic utilities duct for underground installation
NEMA TC-8	Extra-strength PVC plastic utilities duct for underground installation
NEMA TC-14	Filament – Wound Reinforced Thermosetting Resin Conduit and Fittings
	National Fire Protection Association (NFPA)
NFPA 70	National Electric Code
	Underwriters Laboratories Inc. (UL)
ANSI/UL 1	Flexible Metal Conduit
ANSI/UL 5	Surface Metal Raceways and Fittings
ANSI/UL 6	Rigid Metal Conduit
ANSI/UL 209	Cellular Metal Floor Raceways and Fittings
ANSI/UL 360	Electrical Liquid-tight Flexible Steel Conduit
ANSI/UL 514B	Fittings for Conduit and Outlet Boxes
ANSI/UL 651	Schedule 40 and 80 Rigid PVC Conduit
ANSI/UL 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit
ANSI/UL 797	Electrical Metallic Tubing
ANSI/UL 870	Wireways, Auxiliary Gutters, and Associated Fittings

ANSI/UL 884	Underfloor Raceways and Fittings
ANSI/UL 1242	Intermediate Metal Conduit
ANSI/UL 1479	Fire Tests of Through-Penetration Firestops

1.03 DELIVERY, STORAGE, AND HANDLING

A. Deliver material in manufacturer's original, unopened, protective packaging. Protective caps shall be removed only upon installation of conduit.

B. Store materials in a clean, dry space and protect them from weather.

C. Handle in a manner to prevent damage to finished surfaces.

1.04 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. General

1. Locations, types and sizes of raceways are shown on the Contract Drawings.
2. Minimum size of conduit shall be 3/4 inch.
3. Conduit shall be supplied in a minimum of 10-foot lengths and accordance with UL 6.

B. Rigid Metal Conduit

1. RGS - Rigid galvanized steel conduit (Heavy-wall) hot dipped galvanized inside and out, with hot dipped galvanized threads, conduit shall conform to UL 6 and ANSI C80.1.
2. RGS/PVC - PVC coated, rigid galvanized steel conduit (Heavy-wall) hot dipped galvanized inside and out with hot dipped galvanized threads. The interior of the conduit shall have a thermoplastic or thermosetting coating of a nominal thickness of .007 (7 mils) and shall conform to NEMA TC-14. All PVC coated conduit shall conform to NEMA RN-1.
3. IMC - Intermediate metal conduit, galvanized steel (medium-wall) conduit, threads shall be galvanized and shall conform to ANSI/UL 1242 and ANSI C80.6.
4. ALC - Aluminum conduit shall conform to UL 6 and ANSI C 80.5.
5. All preformed elbows shall be the same in construction to and of a type designed for use with the appropriate conduit and shall conform to UL 6.
6. All fittings shall be threaded and shall conform to NEMA FB-1.
7. If threads are cut after the zinc coating has been applied, the threads shall be treated with protective coating of zinc equivalent to hot-dipped process and conform to NEMA RN-1.

C. Electrical Metallic Tubing

1. EMT - Electrical metallic tubing (thin-wall) shall be galvanized steel and shall conform to ANSI/UL 797 and ANSI C 80.3.
2. All fittings shall be indenter or compression type made of malleable or pressed steel and shall conform to ANSI/NEMA FB 1.

D. Cellular Metal Floor Raceway

Cellular Metal Floor Raceway and Fittings shall conform to NFPA 70 and ANSI/UL 209.

E. Flexible Metal Conduit

1. FSC - Flexible steel (galvanized) conduit shall conform to ANSI/UL 1.
2. LSC - Liquid-tight flexible metal conduit shall conform to ANSI/UL 360.
3. Fittings shall be of a type designed for use with the respective conduit and shall conform to ANSI/UL 514B.

F. Surface Metal Raceways

1. Surface raceways shall conform to ANSI/UL 5.
2. Surface metal raceways shall come complete with all necessary accessories for installation.

G. Underfloor Raceways

1. Duct, fittings, and accessories shall be suitable for encasement in concrete and shall conform to NFPA 70 and ANSI/UL 884.
2. Underfloor raceways shall come complete with all necessary accessories for installation.

H. Rigid Nonmetallic Conduit

1. PVC Type 40 Standard Wall polyvinyl chloride (PVC) conduit shall conform to ANSI/UL 651 and NEMA TC-3.
2. PVC Type 80 Heavy wall polyvinyl chloride (PVC) conduit shall conform to ANSI/UL 651.
3. PVC Type "A" Light wall polyvinyl chloride (PVC) conduit shall conform to ANSI/UL 651A
4. PVC Type EB Light wall polyvinyl chloride (PVC) conduit shall conform to ANSI/UL 651A and NEMA TC-8.
5. PVC Type DB Light wall polyvinyl chloride (PVC) conduit shall conform to ANSI/UL 651A and NEMA TC-8.
6. HDPE Type 40 Standard wall High-Density Polyethylene (HDPE) Conduit shall conform to ANSI/UL 651A and NEMA TC-6.
7. FRE - Fiberglass Reinforced Epoxy (FRE) conduit shall conform to ANSI/NEMA TC-14.

I. Fire stops, Through Penetrations of Conduits

1. Where raceways penetrate wall or floor, fire stops with a fire rating equal or greater than the rating of the penetrated wall or floor shall be provided.
2. All fire stops shall conform to the UL 1479.

J. Wireways

1. Wireways shall be seamless galvanized steel construction, cover to be locked with captive screws and shall conform to ANSI/UL 870.
2. Wireways shall come complete with all necessary accessories for installation.

K. Fastening Devices

Provide inserts, clamps, bolts and washers, or any other type of fastening devices conforming to the requirements of the Section entitled "SUPPORTING DEVICES", required to secure conduits to walls or above hung ceilings. Unless otherwise shown on the Contract Drawings, all fasteners shall be hot dipped galvanized and of sizes and types recommended by the equipment manufacturer.

PART 3. EXECUTION

3.01 INSTALLATION

A. General

1. All conduit bends shall be accomplished with a trade approved bending tool and in accordance with the manufacturer's recommendations and NFPA 70.
2. Ream conduit ends free from burrs prior to installation, and draw joints up tight.
3. Make transitions in conduit from one metal to a dissimilar metal only at boxes or other enclosures, unless otherwise shown on the Contract Drawings.
4. Install concealed conduits or tubing in as direct a line as possible.
5. Install exposed raceways, located above hung or accessible ceilings, parallel with or at right angles to the lines of buildings and as close to the ceiling as possible, unless otherwise shown on the Contract Drawings.
6. Install expansion fittings in all conduits that cross expansion joints, where conduits attach to independent structures, or where exposed to large temperature changes.
7. Securely fasten threaded conduits entering enclosures, other than threaded cast boxes, by means of two lock-nuts, one on each side of the enclosure. Terminate the conduits in insulated bushings.
8. Cap all free ends of empty conduit to prevent water entrance.
9. Conduit through roofs and external walls of buildings, manholes and other structures shall be watertight. Contractor shall submit detailed shop drawings for the Engineer's approval.
10. Where portions of an interior raceway system are exposed to widely different temperatures, make provisions to prevent circulation of air from a warmer to a colder section through the raceways.
11. Apply zinc rich paint to all exposed threads after joints have been made up clean and tight.
12. Support all conduits as required in these Specifications under Section entitled "SUPPORTING DEVICES".
13. All conduit runs shall leave or enter structures perpendicularly.
14. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel or mono-filament plastic line having not less than 200-lb tensile strength. Leave not less than 12 inches of slack at each end of the pull wire.

B. Rigid Metal Conduit

1. RGS shall be used where Fire Alarm Systems are installed.
2. RGS/PVC shall not be used indoors.
3. IMC may not be used in wet locations, or high corrosive area, otherwise NFPA 70 Article 345 fully applies.

C. Electrical Metallic Tubing

EMT used for power feeder or branch circuits, shall not exceed 2-inch trade size. EMT used for control circuits and communications systems shall not exceed 4-inch trade size.

D. Cellular Metal Floor Raceway

Installation limits shall be defined by NFPA 70.

E. Flexible Metal Conduit

1. Install FSC for motor connections and for other equipment connections where subject to movement and vibration. Conduit shall be installed to permit maximum flexibility, without crushing or permanent deformation, and shall not exceed 18 inches in length, without approval of the Engineer.
2. Use LSC for the same installation conditions as FSC above, and where also subjected to one or more of the following conditions:
   a. Exterior locations;
   b. Condensating, moist, wet or humid conditions;
   c. Corrosive atmospheres;
   d. Water spray;
   e. Dripping oil, grease or water.
3. Install FSC and LSC with a separate, insulated copper, code-sized, equipment-grounding conductor, installed inside the flexible conduit.

F. Surface Metal Raceways

1. Only metallic surface metal raceways will be permitted, unless otherwise shown on the Contract Drawings. Installation shall be in accordance with manufacturer's written recommendations and instructions accompanying the raceways.
2. Provide surface raceway system with means for assuring a continuous ground path throughout.
3. Use fittings without sharp edges introduced into any part of the raceway system.

G. Underfloor Raceways

Install underfloor raceways in accordance with the Contract Drawings NFPA 70, ANSI/UL 884 and the recommendations and requirements of the manufacturer.

H. Polyvinyl Chloride (PVC) Conduit

1. PVC Conduit shall not be used indoors.
2. PVC Conduits Types 40 and 80 conform to NFPA 70 Article 347 except it shall not be used indoors.
3. PVC Conduits Types 40, A and EB shall be used for concrete encasement.
4. PVC Conduit Type DB shall be used for direct burial, sand encased.

I. High-Density Polyethylene (HDPE) Conduit

1. HDPE conduit shall not be used indoors.
2. HDPE Type 40 shall be used for direct burial or encased in concrete.

J. Fiberglass Reinforced Epoxy (FRE) Conduit

1. Shall be installed as described in NFPA 70.
2. All sweeps, bends, or changes in direction shall be done with fittings only.
3. Elbows and fittings shall be manufactured from the same resin/hardener/glass system as the conduit.

K. Dissimilar Metals

1. "Dissimilar metals" shall mean those metals which are incompatible with one another in the presence of moisture, as determined from their relative positions in the Electrochemical Series, or from test data.

2. Where dissimilar metals come in contact, paint the joint both inside and out with approved coating to exclude moisture from the joint, or provide a suitable insulating barrier separating the metals.

3.02 FIELD TESTS

A. Conduit Cleaning and Testing

1. After installation of conduits and accessories and completion of all concreting operations, if any, carefully clean and clear all conduit runs of all obstructions and foreign matter to the satisfaction of the Engineer.

2. Test conduits, in the presence of the Engineer, by pulling through each conduit a flexible cylindrical mandrel having an outside diameter not more than 1/4 inch smaller than the inside diameter of the conduit, but nominally 85 percent of the trade diameter, whichever is larger. Only nylon cable of adequate strength shall be used to pull the mandrel through the conduit system. The use of rope will not be permitted.

B. Connections to Existing Conduits

1. Where conduits installed under this Contract are connected to existing conduits, or conduits installed by others, test the entire run to the nearest box, manhole, handhole, or equipment enclosure as specified in 3.02 A.2 above.

2. Report immediately to the Engineer any defect or stoppage found in portions of the conduit system not installed under this Contract. Do not attempt to rectify any defect or stoppage found in conduit not installed under this Contract unless specifically instructed to do so by the Engineer. The Contractor's compensation for the rectifying of such defects or stoppages at the direction of the Engineer will be determined in accordance with the Clause of the Contract providing compensation for Extra Work.

3. The Engineer shall be the sole judge as to whether a defect or stoppage exists. Perform all tests required by the Engineer to enable him to make his decision.

END OF SECTION

SECTION 16110

RACEWAYS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16110A01	Raceway systems - only when shop drawings are required by the Contract Drawings.

Catalog Cuts

16110B01	Conduit and Tubing.
16110B04	Wireways and Auxiliary Gutters.

END OF APPENDIX "A"

DIVISION 16

SECTION 16115

UNDERGROUND CONDUIT SYSTEMS

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for underground conduits, manholes, handholes, vaults and accessories.

B. Definitions

1. Conduit: A single enclosed raceway for wires or cables; duct.
2. Ductbank: A structure containing one or more ducts or conduits.
3. Conduit System: A combination of conduit, conduits, manholes, handholes and vaults joined to form an integrated whole.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	American National Standards Institute (ANSI)
ANSI C 2	National Electrical Safety Code
ANSI C 80.1	Rigid Steel Conduit - Zinc Coated
	American Society for Testing and Materials (ASTM)
ASTM A 185	Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
	Institute of Electrical and Electronics Engineers, Inc. (IEEE)
IEEE 837	Standard for Qualifying Permanent Connections Used in Substation Grounding
	National Electrical Manufacturers Association (NEMA)
NEMA RN 1	Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
NEMA TC 2	Electric Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)
NEMA TC 14	Filament-Wound Reinforced Thermosetting Resin Conduit and Fittings
	National Fire Protection Association (NFPA)
NFPA 70	National Electrical Code
OSHA	Occupation Safety and Health Administration
	Underwriters Laboratories Inc. (UL)
UL 6	Rigid Metal Conduit
UL 514B	Fittings for Conduits and Outlet Boxes
UL 467	Electrical Grounding and Bonding Equipment
UL 651	Schedule 40 and 80 Rigid PVC Conduit

UL 651A Type EB and A Rigid PVC Conduit and HDPE Conduit

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

The underground conduit system shall be furnished and installed in accordance with this Section and as specified on the Contract Drawings.

A. Components of the underground conduit system manufactured, supplied, and installed shall comply with the requirements of NFPA 70, all local codes, and the requirements of OSHA.

1.04 QUALITY ASSURANCE

A. The manufacturer shall have had a minimum of three years experience within the last five years in manufacturing the products of the type(s) and size(s) described in this Section. Those products shall have been satisfactorily used for purposes similar to those intended herein. The Contractor shall provide a list of installations and contracts for which the manufacturer has produced such materials.

B. All electrical materials and equipment for which there is a nationally recognized standard, shall bear the conformance label of the nationally recognized third party inspection authority, such as Underwriters Laboratories Inc. (UL), Factory Mutual (FM) or ETL.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened, protective packaging. Protective caps shall be removed immediately prior to installation of conduit.

B. Store materials in a clean, dry space and protect them from weather.

C. Handle in a manner to prevent damage to finished surfaces.

1.06 SUBMITTALS

For submittal requirements, see Appendix "A".

PART 2. PRODUCTS

2.01 MATERIALS

A. General

1. Location, types and sizes of conduits and conduit systems are shown on the Contract Drawings.
2. Conduits shall be supplied in standard lengths in accordance with applicable UL standards.
3. Unless otherwise shown on the Contract Drawings, conduit or duct shall be type RGS as specified in this Section.

B. Rigid Metal Conduit

1. RGS - Galvanized steel conduit (heavy-wall) shall be hot dipped galvanized after cutting and threading and shall conform to UL 6 and ANSI C 80.1.
2. RGS-PV - PVC coated, galvanized steel conduit (heavy-wall) shall be hot dipped galvanized after cutting and threading, shall be coated with 40 mils of PVC and shall conform to NEMA RN 1, Type A 40.

3. All preformed elbows shall be similar in construction to and of a type designed for use with the appropriate conduit and shall conform to UL 6.

4. All fittings shall be threaded.

C. Rigid Nonmetallic Conduit

1. PVC-T - Schedule 20 (thin-wall) polyvinyl chloride (PVC) conduit shall conform to UL 651A.

2. PVC-H - Schedule 40 (standard-wall) polyvinyl chloride (PVC) conduit shall conform to UL 651.

3. PVC-80 - Schedule 80 (extra heavy-wall) polyvinyl chloride (PVC) conduit and elbows shall conform to NEMA TC 2 and UL 651.

4. Fiberglass reinforced epoxy conduit shall be glass filament wound, embedded in ultra-violet resistant epoxy. Conduit fittings and elbows shall conform to NEMA TC 14 and the following:

   a. FGS-T - Standard-wall conduit, wall thickness shall be not less than 70 mils for all sizes. Type FGS-T conduit shall be used only where encased in concrete.

   b. FGS-S - Heavy wall conduit, UL listed, with a wall thickness not less than 70 mils for conduits less than 4 inch trade size, not less than 90 mils for conduits 4 inch trade size and not less than 110 mils for conduits larger than 4 inch trade size. Type FGS-H shall be used where direct buried, encased in concrete, or where conduit risers extend to above grade, in accordance with the requirements of the UL listing.

   c. FGS-E - Extra-heavy wall conduit, with a wall thickness not less than one-quarter inch. Type FGS-E conduit shall be used for exposed exterior conduit runs on bridges and elevated structures.

5. Elbows, fittings, offsets, etc. shall be preformed and similar in materials and construction to the conduit.

6. Couplings shall be of a type to provide a watertight installation of the conduit system.

D. Manholes, Handholes, and Vaults

1. Precast manholes, handholes and vaults shall be as shown on the Contract Drawings. Concrete shall be in accordance with the requirements of Division 3 Section on concrete.

2. Cast-in-place manholes, handholes and vaults conforming in size and strength to the precast manholes, handholes and vaults shown on the Contract Drawings may be substituted, subject to the approval of the Engineer.

3. Continuous inserts shown on the Contract Drawings shall be hot-dipped galvanized steel, and shall be supplied complete with end caps and waxed cardboard closure strips. All metallic parts shall have a hot-dipped galvanized finish.

4. Racking assemblies shall be capable of being mounted on the continuous inserts supplied in manhole, handhole and vault walls, without modification, utilizing hot-dipped galvanized spring nuts and bolts.

   a. The racking assemblies shall, at a minimum, include supports on each wall of the manhole, handhole or vault, with arms on each support for each cable or arc-proofed cable group. Each arm shall have insulators to support each cable or cable group. Provide additional arms and insulators as shown on the Contract Drawings.

b. Racking assembly arms and insulators, for installation on existing supports, shall match the existing supports without modification.

5. Manhole, handhole and vault frames and covers shall be as shown on the Contract Drawings.

6. Provide pulling hooks shall be Hubbard Co. No. 9119, or approved equal.

E. Grounding Assemblies

1. Grounding bushings shall be plated malleable iron body, insulated type, rated 150 degrees C.

2. Ground rods shall be minimum 3/4-inch diameter, copper-clad steel. Unless otherwise shown on the Contract Drawings, ground rods shall be 10 feet long.

3. Unless otherwise shown on the Contract Drawings, conductors for grounding assemblies within manholes, handholes, or vaults shall be copper, minimum #4 AWG.

4. Ground rod connections shall be either exothermic welds, or high-strength compression-crimp system conforming to the requirements of IEEE 837 and UL 467, or approved equal.

5. Ground cable clamps shall be split-bolt, high strength, copper alloy connectors.

PART 3. EXECUTION

3.01 EXAMINATION

A. Inspect all conduit, equipment and accessories prior to installation. Replace any damaged items.

3.02 PREPARATION

A. The Contractor shall be responsible for field verification of dimensions and existing underground utilities.

3.03 INSTALLATION

A. General

Underground conduit systems shall be installed in accordance with the requirements of ANSI C 2, NFPA 70 and as shown on the Contract Drawings.

B. Excavation and Backfill

Excavation and backfill for underground conduits, handholes, manholes and shall be in accordance with the applicable requirements of the Section entitled "EXCAVATION, BACKFILLING AND FILLING" of these Specifications.

C. Concrete Encased Conduit

1. Concrete encasement of conduit shall conform to the details shown on the Contract Drawings and the requirements of Division 3 Section on concrete.

2. The dead-ending of conduit shall be accomplished as shown on the Contract Drawings.

3. No variation from a straight line of greater than 1/2 inch in fifty feet will be permitted when installing a concrete encased conduit.

4. Reinforce junctions with existing concrete encased conduit, or existing systems, with W8 x W4 - 10 x 10 welded wire fabric, conforming to ASTM A 185, encased in four inches additional thickness of concrete around each set of conduits. The additional encasement shall extend at least four feet in each direction from the junction.

5. Where the placing of concrete is interrupted for one hour or more, reinforce the concrete encasement at the point of interruption with W4 x W4 - 10 x 10 welded wire fabric, conforming to ASTM A 185.

6. Preformed or precast conduit may be substituted for the field-encased type, subject to the approval of the Engineer. All precast conduit shall meet the same requirements specified herein or shown on the Contract Drawings.

7. All conduits shall leave or enter structures perpendicularly.

8. Changes in direction of conduits shall be made by bends having a minimum radius of 15 feet. Elbows or sweeps to equipment or foundations shall have a radius not less than 10 times the trade diameter of the conduit.

9. Conduits shall be installed in true alignment and shall be sloped for drainage toward manholes or handholes. All free ends of empty conduits shall be sealed to prevent water entrance.

10. Openings for conduits in manhole construction shall be sealed and made watertight in an approved manner.

11. Transitions between conduits of different materials shall be made using the manufacturer's standard adapters.

12. Terminations of rigid nonmetallic conduits in manholes, handholes, and other concrete structures, shall be made with end bells, set flush with the inside face of the concrete.

13. Terminations of rigid metal conduits in manholes, handholes, vaults and other concrete structures, shall be made with insulated grounding bushings, projecting 2 inches beyond the inside face of the concrete.

D. Direct-Buried, Rigid Nonmetallic Conduit (PVC-H or FRE)

1. Direct-buried conduits shall be laid on firmly tamped and graded stone-free sand not less than 2 inches deep. Backfill in contact with the conduits shall be sand to a minimum of 3 inches above the conduits and the remainder of the backfill shall be unfrozen, stone-free earth. Buried depth shall be as shown on the Contract Drawings.

2. Conduit entering or exiting manholes, handholes, vaults and other concrete structures shall be a 10-foot length of rigid metal conduit protected with two coats of asphaltic paint.

3. Terminations of conduits in manholes, handholes, vaults and other concrete structures shall be made with insulated grounding bushings projecting 2 inches beyond the inside face of the concrete.

E. Manholes, Handholes, and Vaults

1. Set precast manholes, handholes and vaults so that they are firmly and fully bedded at required grades.

2. Set frames and covers using mortar and masonry as required. Radially laid concrete brick shall have 1/4-inch thick vertical joints at inside perimeter. Lay all concrete brick in a full bed of mortar and completely fill all joints. Where more than one course of concrete brick is required, stagger vertical joints.

3. Set racking assemblies as required so that the unsupported length of wires or cables shall not exceed 30 inches.

F. Vertical Adjustment of Existing Manholes, Handholes, and Vaults

1. Adjust the top elevation of existing structures to suit new finished grades in accordance with the details shown on the Contract Drawings.
2. Existing frames and covers shall be carefully removed, cleaned of all mortar fragments to the satisfaction of the Engineer and reset at the required elevation in accordance with the requirements shown on the Contract Drawings.

G. Grounding

1. Install a complete grounding system in each manhole or vault, and in selected handholes shown on the Contract Drawings. Electrically bond all arm supports, insulated grounding bushings, and ground rods together.
2. After installation, coat all bare surfaces or connections in the grounding system with asphaltic paint.

H. Testing

1. Test conduits, in the presence of the Engineer, by pulling through each conduit a flexible cylindrical mandrel having an outside diameter not more than 1/4 inch smaller than the inside diameter of the conduit, but nominally 85 percent of the trade diameter, whichever is larger. Only nylon cable of adequate strength shall be used to pull the mandrel through the conduit system. The use of rope will not be permitted.

I. Connections to Existing Conduits

1. Where conduits installed under this Contract are connected to existing conduits, test the entire run to the nearest box, manhole, handhole, vault or equipment enclosure, including all existing conduits installed by others, that will be used under this Contract.
2. Where any work shall be performed in conduits emanating from a manhole, handhole, vault or equipment enclosure, all existing spare conduits (conduits containing no electric wire or cable) shall be tested to the nearest manhole, handhole, vault or equipment and a pull line shall be left in place in each such conduit.
3. Report immediately to the Engineer any defect or stoppage found in portions of the conduit system not installed under this Contract. Do not attempt to rectify any defect or stoppage found in conduit not installed under this Contract unless specifically instructed to do so by the Engineer. The Contractor's compensation for the rectifying of such defects or stoppages at the direction of the Engineer will be determined in accordance with the clause of the Contract providing compensation for Extra Work.
4. The Engineer shall be the sole judge as to whether a defect or stoppage exists. Perform all tests required by the Engineer to enable him to make his decision.

3.04 ADJUSTMENTS

A. Conduit Cleaning

After installation of conduits, manholes, handholes, vaults, accessories and completion of all concreting operations, if any, carefully clean and clear all conduits of all obstructions and foreign matter to the satisfaction of the Engineer.

END OF SECTION

SECTION 16115

UNDERGROUND CONDUIT SYSTEMS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16115A01	Handholes.
16115A04	Manholes, including "exploded" views with complete details as to the location of all existing and new conduits, wires and cables identified by permanent feeder numbers, racking assemblies and grounding assemblies. Manhole drawing blanks will be furnished by the Engineer.

Catalog Cuts

16115B01	Conduit.
16115B02	Racking assemblies.
16115B03	Grounding assemblies.

END OF APPENDIX "A"

DIVISION 16

SECTION 16120

WIRES, CABLES, SPLICES, TERMINATIONS (600 VOLTS OR LESS)

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for wires, cables, splices, terminations, and appurtenances for electrical systems of 600 volts or less.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	American Society for Testing and Materials (ASTM)
ASTM B 1	Hard-Drawn Copper Wire
ASTM B 2	Medium-Hard-Drawn Copper Wire
ASTM B 3	Soft or Annealed Copper Wire
ASTM B 8	Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B 33	Tinned Soft or Annealed Copper Wire for Electrical Purposes
ASTM B 174	Bunch-Stranded Copper Conductors for Electrical Conductors
ASTM B 189	Lead-Coated and Lead-Alloy-Coated Soft Copper Wire for Electrical Purposes
ASTM D 2802	Ozone-Resistant Ethylene-Propylene-Rubber Insulation for Wire and Cable
ASTM D 3005	Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape
ASTM E 662	Standard Test Method for specific Optical Density of Smoke Generated by Solid Materials
	Federal Specifications (FS)
HH-I-553	Insulation Tape, Electrical (Rubber, Natural and Synthetic)
	Insulated Cable Engineers Association (ICEA)
ICEA S-19-81	Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (NEMA WC 3)
ICEA S-61-402	Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (NEMA WC 5)
ICEA S-66-524	Cross-Linked-Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (NEMA WC 7)

ICEA S-68-516	Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (NEMA WC 8)
ICEA T-33-655	Guide for Low Smoke, Halogen-Free (LSHF) Polymeric Cable Jackets
	Institute of Electrical and Electronics Engineers (IEEE)
IEEE 383	Type Test of Class 1E Electric Cables, Field Splices and Connections for Nuclear Power Generating Stations
IEEE 837	Standard for Qualifying Permanent Connections Used in Substation Grounding
	Military Specifications
MIL C-24643	Electrical Cable and Cord for Shipboard Use, Testing for Low Smoke and Halogens
	National Fire Protection Association (NFPA)
NFPA 70	National Electrical Code
	Naval Engineering Standards
NES 713	Determination of Toxicity Index of Products of Combustion From Small Specimens of Materials
	Underwriters Laboratories Inc. (UL)
UL 44	Rubber-Insulated Wires and Cables
UL 62	Flexible Cord and Fixture Wire
UL 83	Thermoplastic-Insulated Wires and Cables
UL 467	Grounding and Bonding Equipment
UL 510	Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape
UL 854	Service-Entrance Cables
UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
UL 1685	Standards for Safety Vertical Tray Fire Propagation and Smoke Release Test for Electrical and Optical Fiber Cables

1.03 QUALITY ASSURANCE

A. Wires and cables which have been manufactured more than two years prior to installation shall not be used in the Work of this Section.

B. Tapes for splices or terminations shall be dated by the tape manufacturer to indicate that they have been manufactured no longer than six months prior to use in the Work of this Section.

C. Polyvinyl Chloride (PVC): PVC-insulated power wiring and items containing PVC, except PVC-insulated wiring for communications systems, remote control, signaling, and power-limited circuits, shall not be installed in indoor area. PVC-insulated wiring for communications systems, remote control, signaling, and power-limited circuits shall be furnished and installed in accordance with NFPA 70.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Single conductor wire or cable sizes #4/0 AWG and larger that are to be installed in the same raceway shall be paralleled by the cable manufacturer prior to shipment. Cable assembly overall diameter shall be kept to a minimum.

B. Wire and cable sizes #4/0 AWG and larger shall be provided with fctory-applied caps unless otherwise shown on the Contract Drawings. End seals shall be heat-shrink, irradiated, modified polyolefin, and shall be sized for individual wires and cables.

C. Store material in a clean, dry space and protect it from the weather.

1.05 SUBMITTALS

See Appendix "A" for submittals requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

Subject to compliance with requirements of this Section, provide wires, cables, wire and cable splicing, terminating and arcproofing materials of manufacturers as shown on the Contract Drawings.

2.02 WIRES AND CABLES

A. General

1. Definitions

a. Wire shall be defined as a solid or stranded conductor smaller than No. 6 AWG with or without insulation.

b. Cable shall be defined as a single conductor No. 6 AWG or larger, or two or more conductors of any size wire under a common covering.

2. Locations, types, sizes and numbers of wires and cables are shown on the Contract Drawings. Where not indicated, provide proper wire and cable selection to comply with this section and NFPA 70 Standards.

3. Unless otherwise shown on the Contract Drawings, solid conductors shall be soft or annealed copper, conforming to ASTM B 33 (tinned), ASTM B 189 (lead-coated or lead-alloy coated), or ASTM B 3 (uncoated). Unless otherwise specified in this Section or unless otherwise shown on the Contract Drawings, stranded copper conductors shall be concentric stranding conforming to ASTM B 8.

4. Unless otherwise shown on the Contract Drawings, cable jackets for interior use shall be low smoke, low toxicity, non-halogen, flame retardant type and shall meet the following performance characteristics:

a. Cables shall pass the flame propagatory and smoke release criteria according to the test method of UL 1685.

b. The halogen content of cable jackets shall not exceed 0.2 percent according to the test method of MIL-C-24643. The Authority classifies 0.2 percent or less halogen content as "non-halogen".

c. The toxicity index of cable jackets shall not exceed 4.0 according to the test method of NES 713.

d. The cable jackets shall comply with ICEA T-33-655 for smoke generation.

e. The acid gas content of cable jackets shall not exceed a maximum of 3.0 percent according to the test method of MIL-C-24643.

5. Use the additional performance characteristics for wires and cables which will be installed in subway areas, substations, tunnels, etc. where stringent flame retardency, low smoke, low toxicity, zero halogen and good circuit integrity during a fire are required.

a. Wires shall pass the flame propagatory criteria according to the test method of VW-1.

b. The halogen content of both the wire and cable insulation and cable jacket(s) shall not exceed 0.2 percent according to the test method of MIL-C-24643. The Authority classifies 0.2 percent or less halogen content as "non-halogen".

c. The toxicity index of both the wire and cable insulation and cable jacket(s) shall not exceed 2.0 according to the test method of NES 713.

d. The acid gas content of both wire and cable insulation and cable jacket(s) shall not exceed a maximum of 2.0 percent according to the test method of MIL-C-24643.

e. The wire and cable insulation materials shall pass the smoke generation test in accordance with ASTM E 662. Wire and cable insulation when tested on a specimen of 80 mils thick slab shall not exceed the following values:

Flaming Avg. Ds (4 minutes)	100
Flaming Avg. Dm (20 Minutes)	200
Non-Flaming Avg. Ds (4 minutes)	100
Non-Flaming Avg. Dm (20 minutes)	350

f. The cable jacket materials shall pass the smoke generation test in accordance with ASTM E 662. Wire and cable jacket when tested on a specimen of 80 mils thick slab shall not exceed the following values:

Flaming Avg. Ds (4 minutes)	50
Flaming Avg. Dm (20 minutes)	150
Non-Flaming Avg. Ds (4 minutes)	50
Non-Flaming Avg. Dm (20 minutes)	250

6. Color-Coding for Power and Lighting Conductors

a. Insulation or covering of wires and cables shall be factory color-coded by the use of colored compounds or coatings. The color-code shall be followed consistently throughout the performance of the Work.

b. Upon written request of the Contractor, the Engineer may permit the use of the following methods in lieu of the wire or cable manufacturer's color-coding, when limited quantities of wire and cable are involved, for sizes #8 AWG and larger.

(1) For dry locations only, spiral application of 3/4 inch wide, colored pressure sensitive plastic tape, half lapped for a distance of not less than six inches may be used. To prevent unwinding, the last two wraps of tape shall be applied with no tension.

(2) For wet or dry locations, application of three, 3/16 inch wide, colored, fungus-inert, self-extinguishing, self-locking, nylon cable ties spaced 3 inches apart may be used. The ties shall be snugly applied with a special tool or pliers, and any excess removed.

(3) Each wire and cable shall be color-coded at all terminal points, in all manholes, boxes, or other similar enclosures.

(4) Color markings shall be applied so as not to obliterate the manufacturer's identification markings.

c. Color code chart shall be as follows:

	System Voltage	
Conductor	208Y/120V	480Y/277V
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green

7. All wires, cables, splices and terminations, for which there are established UL standards, shall bear the UL label.

B. General-Purpose Wires and Cables

Unless otherwise shown on the Contract Drawings, general purpose wires and cables shall be as follows:

1. General-purpose wires and cables shall be single conductor, ASTMB8, Class B stranded for sizes #8 AWG and larger, and solid for sizes #10 AWG and smaller.

2. Select from the following list of UL wire and cable types:

a. Type XHHW: Flame retarding, Cross-linked-polyolifin insulation, conforming to UL 44, for dry locations only.

b. Type XHHW-2: Flame retardant, Cross-linked-polyolifin insulation, conforming to UL 44.

c. Type THWN: Flame retardant, moisture and heat resistant thermoplastic insulation with a nylon jacket or equivalent; Double rated THHN-THWN gasoline-oil resistant II; conforming to UL 83.

The use of this cable shall be in accordance with the requirements of paragraph 1.03C of this Section.

d. Type USE: Heat and moisture resistant ethylene- propylene-rubber insulation with heavy duty thermosetting chlrosulphanated polyethylene or heavy- duty neoprene jacket; multiple rated "USE-RHH-RHW"; conforming to ASTM D 2802, ICEA S-68-516, UL 44 and UL 854. Unless otherwise indicated, Type USE shall be the only wire and cable used for underground installations.

C. Overhead Service Cables

Unless otherwise shown on the Contract Drawings, overhead service cables shall be two or more type SE, ASTM B 8, Class B or Class C stranded, hard-drawn copper conductors, ethylene-propylene-rubber insulation, with heavy duty neoprene or heavy duty thermosetting chloro-sulphonated polyethylene jacketed, marked "sunlight resistant", conforming to ASTM D 2802, UL 44 and UL 854. Cable shall be factory assembled with copper-clad messenger conforming to ICEA S-68-516.

D. Portable Cords

Unless otherwise shown on the Contract Drawings, portable cords shall be as follows:

1. Type S shall be 60 degrees C rated, with heavy-duty thermosetting insulation and jacket, conforming to UL 62, 600-volt rated.
2. Type SO shall be oil resistant, 60 degrees C rated, with heavy-duty thermosetting insulation and jacket, conforming to UL 62, 600-volt rated.
3. Type G or Type W shall be 90 degrees C rated, with ethylene-propylene-rubber insulation and Hypalon jacket, 600-volt rated.
4. Special types shall be used only where shown on the Contract Drawings.

E. Lighting Fixture Wires

Unless otherwise shown on the Contract Drawings, lighting fixture wires shall be stranded only, and shall be Type SF-2, silicone rubber insulated conforming to UL 62.

F. Grounding Wires and Cables

Unless otherwise shown on the Contract Drawings, grounding wires and Cables shall be as follows:

1. Insulated
   a. Solid for sizes #8 AWG and smaller; ASTM B 8, Class B stranded for sizes #6 AWG and larger; and of the same insulation type as the power conductors.
   b. Covering shall be a continuous green color and conform to ASTM B 33 and UL 44.
2. Uninsulated
   a. General

      Solid for sizes #8 AWG and smaller; ASTM B8, Class B stranded for sizes #6 AWG and larger.

   a. In raceways

      Soft-drawn and conforming to ASTM B 3.

   b. Direct buried or encased in concrete

      Soft-drawn, medium-hard-drawn, or hard-drawn and conforming to ASTM B 1, B 2 or B 3, respectively.

G. Control Wires and Cables

Unless otherwise shown on the Contract Drawings, control wires and cables shall be as follows:

1. Single conductor wires and cables shall be ASTM B 8, Class B stranded, type XHHW or XHHW-2 flame retardent, cross-linked-polyolifin insulation. Both shall conform to UL44 and ICEA S-66-524.

2. Multiconductor cables shall be ASTM B 8, Class B or Class C stranded, Control Cable Type B, conforming to ICEA S-61-402. Color-coded as per ICEA S-61-402, Method No. 1 for NFPA 70 applications (with white and green) or ICEA S-19-81, for paired conductor cables. Select from the following list of cable types.

   a. Individual ethylene-propylene rubberinsulation with overall flame retardent, cross-linked-polyolifin jacket; conforming to ICEA S-68-516, UL 44, and UL 1581.

   b. Individual ethylene-propylene-rubber insulation with individual and overall flame-retardent, cross-linked polyolifin jackets; conforming to ICEA S-68-516 and UL 44.

   c. Individual flame retardent, cross-linked-polyolifin insulation with and overall flame retardent, cross-linked-polyolifin jacket; conforming to ICEA S-66-524.

   d. Individual cross-linked-polyolifin insulation with overall polyvinyl chloride jacket conforming to ICEA S-66-524.

   e. Individual polyolifin insulation with individual and overall polyvinyl chloride jackets conforming to ICEA S-61-402.

H. Switchboard Wires and Cables

Unless otherwise shown on the Contract Drawings, switchboard wires and and cables shall be as follows:

1. Switchboard wires and cables shall be single conductor, ASTM B 8, Class B stranded, except that for wires and cables crossing hinged joints and swinging panels, and where "Extra Flexible" wire or cable is shown on the Contract Drawings, conductors shall be ASTM B 174, Class K stranded.

2. Wires and cables shall be Type SIS, cross-linked-thermosetting-polyethylene insulation, conforming to ICEA S-61-402, IEEE383 and UL 44.

I. Cable Tags

1. Dry Locations

   a. Fiberglass tags, 1/16 inch thick and 3/4 inch wide, indented with letters and numbers 5/16 inch high, with #14 AWG copper or nylon, weather-resistant cable ties.

   b. Lighting branch circuit wiring and single conductor signal and control wiring may be identified with "Quiklables" manufactured by W. H. Brady Company, or approved equal.

2. Wet Locations

   Stainless steel metal tags, No. 28 gauge and 3/4 inch wide, embossed with letters and numbers 5/16 inch high, with #14 AWG copper or nylon, weather-resistant cable ties, or stainless steel cable ties.

2.03 SPLICING, TERMINATING AND ARCPROOFING MATERIALS

A. General

1. All splicing, terminating and arcproofing materials shall be compatible so that no one material will adversely affect the physical or electrical properties of any other, or of the wire or cable itself.
2. All materials for making splices and terminations shall be specifically designed for use with the type of wire or cable, insulation and installation and operating conditions of the specific application.

B. Connectors

Subject to compliance with requirements of this Section, provide connectors of the following types:

1. Solderless, uninsulated, high conductivity, corrosion resistant, compression connectors conforming to UL 467 and IEEE 837;
2. Insulated, indenter type compression butt connectors;
3. Insulated, integral self-locking flexible shell, expandable spring connectors;
4. Uninsulated, indenter type compression pigtail connectors;
5. Welded type connectors.

C. Terminals

Subject to compliance with requirements of this Section, provide terminals of the following types:

1. Solderless, uninsulated, high conductivity, corrosion resistant, compression terminals conforming to UL 467 and IEEE 837;
2. Insulated, compression terminals;
3. Solderless, high conductivity, corrosion resistant, hex screw type, bolted terminals;
4. Welded type terminals.

D. Shrinkable Tubing

Subject to compliance with requirements of this Section, provide shrinkable tubing of the following types:

1. Either irradiated modified polyvinyl chloride or irradiated modified polyolefin heat shrinkable tubing;
2. Cold shrinkable tubing.

E. Tapes and Sealers

1. Vinyl Tapes

   Flame-retardent, cold and weather-resistant, 3/4 inch or 11/2 inches wide, as required, and conforming to UL 510 and ASTM D 3005.

   a. For interior, dry locations, provide 7 mils, conforming to ASTM D 3005 (Type I); Scotch (3M) No. 33, or approved equal.
   b. For exterior or damp and wet locations, provide 8.5 mils, conforming to ASTM D 3005 (Type II); Scotch (3M) No. 88, or approved equal.

2. Rubber Tapes

   Ethylene-propylene, rubber-based, 30-mil splicing tape, rated for 130 degrees C operation; 3/4inch and wider (1, 1 1/2, 2 inches) as shown on the Contract Drawings or approved by the Engineer, conforming to Federal Specification HH-I-553 (Grade A); Scotch (3M) No. 130C, or approved equal.

3. Insulating Putty

Rubber-based, 125-mil elastic filler putty; 1 1/2 inches wide; Scotch (3M) Scotchfil, or approved equal.

4. Silicone Rubber Tapes

Inorganic silicone rubber, 12-mil, 130 degrees C rated, anti-tracking, self-fusing tape; 1 inch wide; Scotch (3M) No. 70, or approved equal.

5. Sealer

Liquid applied, fast-drying sealant; Scotch (3M) Scotchkote, or approved equal.

F. Resin Filled Splices

1. Epoxy Molded Type

Two-piece, snap-together molded bodies, sized for wire or cable, with two-part low viscosity polyurethane insulating and sealing compound, rated for 600 volts, using crimp-type wire connector; Scotch (3M) No. 82-A1, 82-A2 or 82-A3 compound, or approved equal.

2. Re-Enterable Type

Transparent, molded bodies clamped with stainless steel strain-relief bar and shield continuity connectors, sized for wire or cable, with loosely woven polyester spacer web and jelly-like urethane formulation for permanent re-entry capability; Scotch (3M) No. 78-R1 thru 78-R5, with No. 2114 compound, or approved equal.

G. Arcproofing Materials

1. Fire resistant tapes shall be Scotch (3M) No. 77, or approved equal.
2. Glass cloth binding tapes shall be Scotch (3M) No. 69, or approved equal.

H. Special splicing materials and methods shall be as shown on the Contract Drawings.

2.04 SHOP TESTS

A. For quantities as shown on the Contract Drawings, regular dielectric-withstand and insulation-resistance in water tests for wires and cables shall be performed in accordance with UL44.

B. Flame tests for wires and cables shall be performed in accordance with IEEE 383.

C. The test results shall be certified for each reel/coil/box of wire or cable.

D. Factory inspection and witnessing of tests by the Engineer shall be required for all wires and cables furnished under this Contract. The Engineer reserves the right to require additional testing, or to waive factory inspection or witnessing of tests. The Contractor shall notify the Engineer 14 days in advance of the scheduling of such factory tests.

PART 3. EXECUTION

3.01 PREPARATION

A. Prior to pulling wires and cables, clean raceway systems of all foreign matter and perform all operations necessary so as not to cause damage to wires and cables while pulling.

B. Prior to pulling wires and cables into underground conduit systems, place a feeding tube approved by the Engineer at the entrance end of such systems.

3.02 INSTALLATION

A. Wire and Cable Installation

1. General

   a. Keep wires and cables dry at all times.

   b. Seal wire and cable ends with watertight end seals if splicing or terminating does not follow at once.

   c. Before splicing or terminating wires and cables, make a thorough inspection to determine that water has not entered the wires and cables or that the wires and cables have not been damaged.

   d. Use adequate lubrication when installing cables in conduits or raceways. Any pulling compounds shall be compatible with the finish of the wires and cables furnished.

2. General Purpose Wires and Cables

   a. Minimum wire or cable size shall be #12 AWG for light and power service.

   b. Wires or cables shall be at least #10 AWG for the entire length of branch circuits, where distances to first outlets are as follows:

      (1) 100 feet or more on 480Y/277 Volt systems.

      (2) 70 feet or more on 208Y/120 Volt systems.

3. Lighting Fixture Wires

   a. For wiring within lighting fixtures only, where sizes #14 AWG or smaller are required, use Type SF-2 fixture hookup wire. Type SF-2 wire shall not be used for wiring end-to-end connected fluorescent fixtures.

   b. For connecting lighting fixtures to branch circuit conductors, use either Type RHH-VW-1, XHHW or USE, up to 90 degrees C, in dry locations.

4. Grounding Wires and Cables

   a. Use bare, uninsulated wire and cable only where shown on the Contract Drawings or where approved by the Engineer.

   b. Insulated grounding cable shall be of the type specified in this Section or as shown on the Contract Drawings.

5. Control Wires and Cables

   Control wires and cables shall not be smaller than #14 AWG unless otherwise shown on the Contract Drawings.

B. Splicing and Terminating

1. General

Splicing and terminating shall be as specified in this Section. Details of special splicing and terminating shall be as shown on the Contract Drawings. Any splicing or terminating methods other than those specified below, for which the components are in accordance with the requirements of this Section, shall be submitted to the Engineer for approval.

2. General Purpose Wires and Cables

a. Splices in dry locations for sizes #10 AWG and smaller

Splicing shall be completed using one of the following:

(1) Insulated, integral, self-locking flexible shell, expandable spring connectors shall be applied to the twisted conductors. Two, half-lapped layers of vinyl tape, extending to a distance of not less than one inch from the connector, shall be applied.

(2) Compression type, insulated butt connectors shall be applied to the butted conductors by means of an appropriate crimping tool, providing controlled indentation. Two, half-lapped layers of vinyl tape, extending to a distance of not less than one inch from the connector, shall be applied.

(3) Compression type, pigtail connectors shall be applied to the conductors by means of an appropriate crimping tool, providing controlled indentation. The connector shall be covered with a polyamide cap and two, half-lapped layers of vinyl tape, extending to a distance of not less than one inch from the connector, shall be applied.

b. Splices in dry locations for sizes #8 AWG and larger

Splicing shall be completed using all of the following:

(1) Connectors shall be split sleeve solderless type or solderless compression type.

(2) Fill indents of connectors with Scotchfil insulation putty.

(3) Apply rubber splicing tape equal to the original insulation rating.

(4) Apply two, half-lapped layers of vinyl tape, or a shrinkable tubing.

c. Splices in wet locations

(1) Same as dry locations specified in 3.02B.2.a and 2.b, except that after vinyl tape is applied, cover with two coats of sealer or shrinkable tubing.

(2) Resin-filled splice shall be covered with two, half-lapped layers of vinyl tape and two coats of sealer or shrinkable tubing.

d. Terminations in dry locations for sizes #10 AWG and smaller

Terminations shall be compression terminals, insulated or uninsulated.

e. Terminations in dry locations for sizes #8 AWG through #3/0 AWG

(1) Ring tongue terminals shall be solderless, uninsulated compression crimp type.

(2) Ring tongue lugs shall be bolted hex screw type.

f. Terminations in dry locations for sizes #4/0 AWG and larger.

Ring tongue terminals shall be solderless, uninsulated compression crimp type.

g. Terminations in wet locations

In addition to the dry location terminations specified in 3.02 B.2.d, 2.e and 2.f, cover the entire termination area with two, half-lapped layers of vinyl tape and apply two coats of sealer over the tape.

3. Overhead Service Cables

Splices and terminations in overhead service cables shall be the same as specified in 3.02 B.2.c and 2.g, respectively, appropriate for overhead service.

4. Portable Cords

a. Splices shall not be made in portable cords.

b. Terminations shall be made only at apparatus to be served or at branch circuit connection by means of any of the following:

(1) Insulated, integral, self-locking flexible shell, expandable spring, or crimp type connectors;

(2) Insulated, crimp type, compression connectors;

(3) Uninsulated, ring tongue terminals for connection to wire terminal strip block.

5. Lighting Fixture Wires

Connections to branch circuit and to fixture wiring shall be made by either insulated, integral, self-locking flexible shell, expandable spring, or crimp type connectors.

6. Grounding Wires and Cables

a. Splices and terminations shall be installed in accordance with the manufacturer's recommendations.

b. In hazardous or classified locations, splices and terminations shall be solderless high conductivity, corrosion resistant, compression type connectors and terminations shall be clamp type pressure connectors, suitable for such use.

c. All underground connections shall be covered with two coats of asphalt base paint.

7. Control Wires and Cables

a. Splices shall be made in accordance with the requirements specified in 3.02 B.2.c and shall be enclosed in a re-enterable splicing case. Where shielded cable is shown on the Contract Drawings, the shielding shall be continued through the splice. Shields shall be grounded at one location only unless otherwise shown on the Contract Drawings.

b. Terminations shall be insulated, indenter type ring tongue terminals.

8. Switchboard Wires

a. No splices are permitted.

b. Terminations shall be insulated, indenter type ring tongue terminals.

C. Arcproofing

1. Arcproofing shall be applied where shown on the Contract Drawings.

2. Arcproofing, which has been disturbed for any reason, shall be reinstalled as soon as possible after the disturbance.

3. Arcproofing shall be installed as follows:

   a. Wires and cables shall be grouped by circuit and arcproofing applied over the group of wires and cables comprising one circuit. Splices shall be arcproofed individually and the taping shall join with and be overlapped by the group taping.

   b. Arcproofing shall be applied in two wrappings of half-lapped tape, bound with glass cloth tape applied at the ends of the fire resistant tape, and at intervals not to exceed 24 inches along the entire length of the cables. The two wrappings shall be applied with opposing-lays.

   c. Arcproofing shall be extended into the conduit opening or end bell of the raceway entering a handhole, manhole or box.

   d. Arcproofing tape shall be 1 1/2 inches wide where the diameter of the individual cable, or of the circumscribed circle for the circuit group, is less than 1 3/4 inches. For larger diameters, the tape shall be 3 inches wide.

D. Identification of Wires and Cables

1. Each wire and cable shall be identified by its circuit in all cabinets, boxes, manholes, handholes, wireways and other enclosures and access locations, and at all terminal points.

2. The circuit designations shall be as shown on the Contract Drawings. Tags shall be attached to wires and cables in such a manner as to be readily visible.

3. The tag ties shall be wrapped around all conductors comprising the circuit or feeder to be identified.

4. Wires and cables which are arcproofed shall also be identified outside the applied arcproofing.

3.03 FIELD TESTS

Test all wires and cables up to equipment installed under this Contract with a 1000-volt Megohmmeter. Furnish the Engineer with a copy of the "Megger" readings together with an outline of the method used. If, in the opinion of the Engineer, any reading is lower than that required by applicable codes, promptly replace the materials involved, at the Contractor's expense, and retest.

END OF SECTION

SECTION 16120

WIRE, CABLES, SPLICES, TERMINATIONS (600 VOLTS OR LESS)

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Catalog Cuts

16120B01 Catalog Cuts
a. Wires and cables for each type and size
b. Splice kit materials and installation procedures

Record Documents

16120M01 Submit field test results for wires and cables, including "Megger" readings with the test method used.

END OF APPENDIX "A"

DIVISION 16

SECTION 16135

BOXES AND FITTINGS

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for electrical boxes and fittings.

B. Types of electrical boxes and fittings specified in this Section are:

1. Outlet Boxes
2. Device Boxes
3. Pull Boxes
4. Junction Boxes
5. Conduit Bodies
6. Fittings

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	National Electrical Manufacturers Association (NEMA)
NEMA OS1	Sheet-Steel Outlet Boxes, Device Boxes, Covers and Box Supports
NEMA OS2	Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports
NEMA 250	Enclosures for Electrical Equipment (1000 Volts Maximum)
	National Fire Protection Association (NFPA)
NFPA 70	National Electrical Code
	Underwriters Laboratories Inc. (UL)
UL 50	Cabinets and Boxes
UL 514A	Metallic Outlet Boxes
UL 514B	Fittings for Conduit and Outlet Boxes
UL 514C	Nonmetallic Outlet Boxes, Flush Device Boxes, and Covers
UL 886	Outlet Boxes and Fittings for Use in Hazardous (Classified) Locations

1.03 QUALITY ASSURANCE

Boxes and fittings, of types and sizes required, shall have been satisfactorily used for purposes similar to those intended herein for not less than three years. A list of acceptable manufacturers is shown on Contract Drawing.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver material in manufacturer's original, unopened, protective packaging.

B. Store materials in a clean, dry space and protect them from weather.

C. Handle in a manner to prevent damage to finished surfaces.

D. Where possible, maintain protective coverings until installation is complete and remove such coverings as part of final cleanup.

E. Touch up any damage to finishes to match adjacent surfaces.

1.05 SUBMITTALS

"Submittal Requirements" shall be in accordance with Appendix A.

PART 2. PRODUCTS

2.01 MATERIALS

A. General

1. Locations, types and sizes of boxes and fittings are shown on the Contract Drawings.
2. Boxes and fittings shall be metallic, unless otherwise shown on the Contract Drawings, and shall conform to NEMA 0S1, NEMA 250, UL 50, UL 514A, UL 514B, and NFPA 70.
3. Nonmetallic boxes and fittings, shown on the Contract Drawings, shall conform to NEMA 0S2, NEMA 250, UL 50, UL 514C, and NFPA 70.
4. Boxes and fittings to be located in hazardous (classified) areas, as shown by "area plans" on the Contract Drawings shall conform to UL 886 & NFPA 70.
5. All electrical materials and equipment, for which there are established UL standards, shall bear the UL label.
6. Where the sizes or dimensions of a box are not shown on the Contract Drawings, all boxes, whether for use on power, communications, signaling, control, telephone, or other purposes, shall be sized as follows:
   a. In straight pulls, the length of the box shall not be less than 8 times the trade diameter (nominal inside diameter) of the largest raceway.
   b. Where angle or "U" pulls are made, the distance between each raceway entry inside the box and the opposite wall of the box shall not be less than 6 times the trade diameter of the largest raceway. The distance shall be increased for additional entries by the amount of the sum of the diameters of all other raceway entries in any row on the same wall of the box. The distance between raceway entries enclosing the same conductor shall not be less than 6 times the trade diameter of the larger raceway.
   c. Where a conduit entry is in the wall of a box opposite a removable cover, the minimum distance between the entry and the cover shall be as follows:

Conduit Size	Distance Between Entry and Cover
Up to 1-1/4"	4"
1-1/4" and 1-1/2"	6"
2" and 2-1/2"	8"
3" and larger	12"

   d. The minimum depth of a box shall be not less than two times the trade diameter of the conduit entries in a single row and not less than 1-1/2 times the sum of the trade diameter of the largest raceway in each row for multiple rows.

7. Weatherproof cast boxes shall be used for exterior or damp locations. Weatherproof boxes shall be hot-dipped galvanized cast-steel or cast-aluminum. Cast boxes shall be threaded conduit entrance type provided with mounting lugs. Materials shall match the type of conduit i.e., galvanized steel or aluminum, used in the conduit run.

8. Covers for boxes located in public spaces or where shown on the Contract Drawings shall be furnished with tamper-resistant hardware.

9. Cover plates for outlet boxes are specified in the Section 16140 entitled "WIRING DEVICES".

B. Interior Outlet and Device Boxes

1. Provide galvanized, flat-rolled, sheet-steel interior outlet wiring boxes, of types, shapes and sizes, including box depths, to suit each respective location and installation; construct boxes with stamped knockouts in back and sides, and with threaded screw holes with corrosion-resistant screws for securing box covers and wiring devices.

2. Outlet boxes shall be of proper sizes and shapes for conduits and wires entering them, and equipped with plaster ring or cover as necessary for the wiring devices to be installed.

3. Boxes for switches and receptacles shall be 4-inch square, minimum 2 1/8-inch deep, for up to two devices; solid, ganged boxes for over two devices; and installed so that device covers shall be tight and plumb with wall finish.

4. Provide suitable barrier in boxes where two or more 277-volt switches are to be installed, to isolate each on its own phase.

5. Boxes for lighting fixture installation shall be 4-inch square, minimum 2 1/8-inch deep, and provided with 3/8-inch studs.

6. Boxes to be installed in ceilings, plenums, or spaces used for supply or return of environmental air shall be UL listed for such use, without holes, openings or penetrations, and complete with gasketed cover plates.

7. Provide all sheet-steel boxes with suitable knockouts.

C. Exterior Outlet and Device Boxes

1. Provide corrosion-resistant, cast metal, weatherproof outlet wiring boxes, of types, shapes and sizes, including box depths, to suit each respective location and installation.

2. For outlet boxes to be installed flush or recessed in exterior walls, provide galvanized, sheet-steel boxes, with suitable depth and tile, plaster or masonry rings for the wall construction.

3. Provide cast-metal faceplates with spring-hinged, waterproof caps suitably configured for each application, including faceplate gaskets and stainless steel or brass screws or fasteners. Faceplate material shall match the type of box i.e., galvanized steel or aluminum.

D. Junction and Pull Boxes

1. General

a. Unless otherwise shown on the Contract Drawings, provide galvanized, code-gauge, sheet-steel junction and pull boxes and covers for interior locations and cast-metal boxes and covers for exterior locations of types, shapes and sizes to suit each respective location and installation, and equipped with stainless steel hinges, nuts, bolts, screws and washers.

b. Junction or pull boxes having any dimension larger than 36 inches shall contain racks or supports for all cables or conductors.

c. Provide pull boxes with suitable insulating barriers where shown on the Contract Drawings or required by code. Vertical-offset pull boxes shall contain cable supports at turns to prevent cables from resting on corners.

d. Where shown on the Contract Drawings, provide boxes with provisions for padlocking.

e. Special boxes shall be as shown on the Contract Drawings.

f. Where shown on the Contract Drawings, catches or vault handles shall be lockable. Locks shall be keyed alike for the same service, such as power, communications, signal or telephone. Each service type shall be keyed differently.

g. All covers in exposed exterior locations, or other areas as shown on the Contract Drawings, shall be gasketed.

h. For covers heavier than 20 pounds or more than 24 inches in any dimension, provide two replaceable studs, located on each side of the box flange, to support the cover during installation.

i. Boxes containing, or designated for, conductors operating at greater than 600 volts (phase-to-phase) shall be constructed of minimum 12-gauge steel.

2. Interior Junction and Pull Boxes

a. Finished Areas

(1) Junction and pull boxes, located in finished areas and having any dimension larger than 12 inches, shall be furnished with flush-mounting, lockable, hinged covers, similar to adjacent panelboard cabinets. Locks shall be keyed alike for the same service, such as power, communications, signal or telephone. Each service type shall be keyed differently. Hinged covers shall contain catches to keep covers closed. Covers having any dimension larger than 36 inches and all multiple-section doors shall contain 3-point vault handles. Covers shall be furnished shop-primed for field painting, and shall be finished with a color as selected by the Engineer.

(2) Boxes having any cover dimension 12 inches or less shall be furnished with flush-mounting, screw-on covers, unless otherwise shown on the Contract Drawings.

b. Unfinished Areas

Junction and pull boxes, located in electrical or telephone closets or rooms, in mechanical equipment rooms, in areas above hung or accessible ceilings or in areas shown on the Contract Drawings as "unfinished," shall be furnished with screw-on covers for boxes having any cover dimension 24 inches or less, and with either single or multiple-section hinged covers for boxes having any cover dimension larger than 24 inches.

3. Exterior Junction and Pull Boxes

a. Junction and pull boxes, located in sidewalks, decks and in areas shown on the Contract Drawings as "finished", shall be furnished with flush-mounting, screw-on covers.

(1) Boxes having any cover dimension 24 inches or less shall be cast-steel. Boxes shall be furnished with asphaltic paint finish on surfaces to be embedded in earth or concrete.

(2) Covers having any dimension larger than 24 inches shall be cast-steel "sidewalk" frames and covers, suitable for installation on a concrete box or handhole.

b. Unfinished Areas

Junction and pull boxes, located in areas shown on the Contract Drawings as "unfinished", shall be furnished with screw-on covers for boxes having any cover dimension 24 inches or less, and with hinged, bolt-on covers for boxes having any cover dimension larger than 24 inches.

E. Floor Boxes

Provide cast-steel, waterproof, adjustable floor boxes with threaded-conduit entrance hubs, and vertical adjusting rings, gaskets, brass floor plates and flush, screw-on covers. All unused conduit openings shall be closed with appropriate plugs.

F. Conduit Bodies

Provide galvanized, cast-metal, conduit bodies, of types, shapes and sizes to suit each respective location and installation; construct with threaded-conduit entrance hubs, removable covers, and stainless steel or brass screws.

G. Bushings, Locknuts and Knockout Closures

Provide corrosion-resistant knockout closures and conduit locknuts, and insulated, malleable-iron, conduit bushings and offset connectors, of types and sizes to suit each respective use and installation.

H. Supporting Devices

Provide inserts, expansion shield lugs, bolts with nuts and washers, shims or any other type of fastening devices required to secure boxes, in accordance with the Section 16190 entitled "SUPPORTING DEVICES". Unless otherwise shown on the Contract Drawings, all fasteners shall be hot-dipped galvanized and of sizes and types recommended by the equipment manufacturer and as approved by the Engineer.

PART 3. EXECUTION

3.01 INSTALLATION

A. Install boxes and conduit bodies at the locations shown on the Contract Drawings and as required by NFPA 70 at any other location where they are required to facilitate the pulling, supporting or connection of wires and cables.

B. Securely mount all boxes in a manner approved by the Engineer and support the boxes independently of conduits entering them.

C. Install boxes and conduit bodies in classified (hazardous) locations in accordance with their listing or label requirements. Conduit seal fittings shall be packed and filled only after proper operation of equipment and systems has been demonstrated and approved by the Engineer.

D. Paint exteriors of boxes exposed in mechanical equipment rooms or in electrical rooms or closets or spaces shown as "unfinished" on the Contract Drawings, and the exteriors of boxes installed above hung or accessible ceilings, as follows:

1. Emergency: Orange
2. Fire Alarm: Red
3. High Voltage: Red with 1-inch, white block letters reading "HIGH VOLTAGE" on each exposed face and cover.

E. All installations shall conform to NFPA 70.

F. Dissimilar Metals

1. "Dissimilar metals" shall mean those metals which are incompatible with one another in the presence of moisture, as determined from their relative positions in the Electrochemical Series, or from test data.
2. Where dissimilar metals come in contact, paint the joint both inside and out with approved coating to exclude moisture from the joint, or provide a suitable insulating barrier separating the metals.

END OF SECTION

SECTION 16135

BOXES AND FITTINGS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16135A01	Shop drawings a. Special boxes b. Boxes lager than 12 inches c. Ancillary equipment if shown on Contract Drawings

Catalog Cuts

16135B01	All boxes and fittings

END OF APPENDIX "A"

DIVISION 16

SECTION 16140

WIRING DEVICES

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for wiring devices.

1.02 REFERENCES

The wiring devices specified in this Section shall be constructed, installed and tested in accordance with requirements of the following publications:

	Federal Specifications
W-C-596	Electrical Power Connector, plug, Receptacle and Cable
W-S-896	Outlet Toggle and Lock, Flush Mounted Switches
	Institute of Electrical and Electronic Engineers (IEEE)
IEEE 241	Electric Power Systems in Commercial Buildings
	National Electrical Manufacturers Association (NEMA)
NEMA WD 1	General Requirements for Wiring Devices
NEMA WD 6	Wiring Devices - Dimensional Requirement
	National Fire Protection Association (NFPA)
NFPA 70	National Electrical Code
	Underwriters Laboratories Inc. (UL)
UL 20	General Use Snap Switches
UL 498	Electrical Attachment Plugs and Receptacles
UL 917	Clock-Operated Switches
UL 943	Ground Fault Circuit Interrupters
UL 1054	Special - Use Switches

1.03 QUALITY ASSURANCE

Wiring devices, of types and ratings required, shall have been satisfactorily used for purposes similar to those intended herein for not less than three years.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's original, unopened, protective packaging.

B. Store materials in clean, dry space and protect them from weather.

C. Handle in manner to prevent damage to finished surfaces.

D. Where possible, maintain protective coverings until installation is complete and remove such coverings as part of final cleanup.

1.05 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with requirements of this Section, provide wiring devices of the acceptable manufacturers as shown on Contract Drawings.

B. All devices for wall system outlets shall be furnished by one manufacturer.

C. All device plates shall be furnished by one manufacturer.

2.02 CONSTRUCTION FEATURES

A. General

1. All wiring devices shall be heavy-duty, specification grade, conforming to the NEMA configurations and requirements of NEMA WD 1 and UL 498, including the requirements for pressure-blade contacts. NEMA configurations shall be as shown on the Contract Drawings and shall match the requirements of the connected appliances.
2. Locations, types and sizes of wiring devices shall be as shown on the Contract Drawings.
3. All devices shall be one gang wide, except as required for devices rated greater than 20 Amp.
4. All devices shall be terminated with screw terminals or screw-driven pressure clamps. Patented spring or torsion pressure clamps shall not be used.
5. All electrical materials and equipment, for which there are established UL standards, shall bear the UL label.

B. Switches

Switches shall be silent operating type, 20 Amp, 120 - 127 Volts AC, T-rated, flush mounted, conforming to requirements of Federal Specification W-S-896 and UL 20, 917 and 1054. Single-pole or double-pole, and 3-way or 4-way devices shall be as shown on Contract Drawings.

C. Receptacles

1. Duplex convenience receptacles shall be 125 V, straight blade, 2-pole, 3-wire grounding type units with break-off terminal ties for two-circuits application. Receptacles shall be 15 Amp or 20 Amp as shown on Contract Drawings.
2. Single receptacles shall be 20 Amp, 125 V, straight blade, 2-pole, 3-wire, grounding type units.
3. Clock outlets shall be single recessed receptacles rated 15 Amp, 125 V, 2-pole, 3-wire grounding type with a combination plate cover and clock hanger bracket.
4. Floor service receptacle outlets shall be furnished with 20A, 125V, 2-pole 3-wire grounding type duplex receptacle. Were shown on contract drawings receptacle shall be flush mounted in floor box or installed in metallic above-floor service fitting.
5. Factory assembled "poke through" assembly device shall be furnished with 20A, 125v, 2-pole, 3-wire grounding receptacle and capable of maintaining floor fire rating of 3 hours.

6. Ground fault circuit interrupter receptacle shall be 20A, 125V, 60 Hz heavy duty grounding type duplex receptacle with ground fault circuit interrupter with solid-state ground fault sensing device having 5 (±1) milliampere ground-fault trip level and shall be "feed through" ready, for protecting downstream receptacles on a single circuit; suitable for installation in a 2-1/2" deep outlet box without adapter.

7. Special purpose receptacles as shown on Contract Drawings shall conform to requirements of NEMA WD 6.

D. Device Plates

1. All device plates shall be 0.04" thick minimum with struck-up beveled edges and free of sharp corners and burrs. All device plates shall be one-piece sectional plates shall not be used.

2. Unless otherwise shown on Contract Drawings, all device plates for wall outlets shall be satin finish anodized aluminum.

3. Device plates for wall telephone outlets shall contain a bushed hole.

4. Device plates for exposed work shall be stamped steel.

E. Color Selection

Wiring devices shall be available in standard white, ivory, gray, brown and black. The Engineer will select different colors for various areas and for different devices. No wiring device shall be ordered or installed until the engineer's final color selections have been made.

PART 3. EXECUTION

3.01 INSTALLATION

A. Install wiring devices in accordance with manufacturer's installation procedures and applicable requirements of NFPA 70 and IEEE 241.

B. In areas where exposed conduit is used, receptacles and switches shall be surface mounted as shown on the Contract Drawings.

C. Receptacles and switches located in finished areas, where concealed conduits are used shall be flush-mounted and provided with approved cover plates, installed level and plumb, with all four corners and edges in contact with finish surface.

3.02 FIELD TESTS

Prior to energizing circuitry, test wiring for electrical continuity and short circuits. Ensure proper polarity of connections is maintained. Subsequent to energization, test wiring devices to demonstrate compliance with requirements of this Specification.

3.03 PROTECTION

After receptacles and wall plates have been installed, exercise care in use of convenience outlets. Prior to final inspection, replace devices that have been damaged.

END OF SECTION

SECTION 16140

WIRING DEVICES

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16140A01 Shop drawings

a. Installation details for surface mounted receptacles and switches
b. Installation details for "poke-through" assemblies
c. Installation details for floor service receptacles

Catalog Cuts

16140B01 Catalog cuts

a. Receptacles
b. Switches
c. Wallplates
d. Ground fault circuit interrupter receptacles
e. Poke-through assembly devices

END OF APPENDIX "A"

DIVISION 16

SECTION 16190

SUPPORTING DEVICES

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for hangers and supports, sleeves and fasteners used to support electrical raceways and equipment, except as specified in B below.

B. Supporting devices, furnished as part of factory-fabricated equipment, are specified as part of equipment assembly in other Sections of the Specifications.

1.02 REFERENCE

The supporting devices, specified in this Section shall be constructed, installed and tested in accordance with requirements of the following publications:

	American Institute of Steel Construction Inc. (AISC)
AISC	Manual of Steel Construction
	American Iron and Steel Institute (AISI)
AISI	Specifications for the Design of Cold-Formed Steel Structural Members
	American Society for Testing and Materials (ASTM)
ASTM A 36	Structural Steel
	American Welding Society (AWS)
AWS D1.1	Structural Welding Code, Steel
	National Electrical Contractors Association (NECA)
NECA 5055	Standard of Installation
	National Fire Protection Association (NFPA)
NFPA 70	National Electrical Code

1.03 QUALITY ASSURANCE

Supporting devices, of types and sizes required, shall have been satisfactory used for purposes similar to those intended herein for not less than three years.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's original, unopened, protective packaging.

B. Store materials in a clean, dry space and protect them from weather.

C. Handle in a manner to prevent damage to finished surfaces.

D. Where possible, maintain protective coverings until installation is complete and remove such coverings as part of final cleanup.

E. Touch up damage to finishes to match adjacent surfaces, including re-coating of galvanized or plated surfaces where damaged, cut or drilled.

1.05 SUBMITTALS

See Appendix "A" For Submittal Requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

Subject to compliance with requirements of this Section, provide supporting devices of the acceptable manufacturers as shown on Contract Drawings.

2.02 HANGERS AND SUPPORTS

A. General

1. Unless otherwise shown on the Contract Drawings, provide hangers and supports as specified below.
2. Where more than one type of hanger or support is suitable for the intended use, selection is at the Contractor's option, subject to approval by the Engineer.
3. Hangers and supports, for which there are established Underwriters Laboratories Inc. (UL) standards, shall bear the UL label.

B. Raceway Support

1. Clevis Hangers

   For supporting horizontal conduit; galvanized steel; with hole for treaded steel rod.
2. Riser Clamps

   For supporting vertical conduits; galvanized steel; with two or three bolts and nuts, and 4-inch ears.
3. Reducing Couplings

   Steel rod reducing coupling; size as required; galvanized or plated steel
4. C-Clamps

   Black malleable iron or galvanized or plated steel; with hole for threaded rod.
5. I-Beam Clamps

   Galvanized or plated steel, 1-1/4-inch x 3/16-inch stock; 3/8-inch cross bolt; 2-inch flange width
6. Right Angle or Parallel beam Clamps

   Galvanized steel clamps for supporting or fastening conduit up to 2-inch trade size
7. One-Hole Conduit Straps

   For supporting up to 1-inch conduit or electrical metallic tubing (EMT); galvanized steel
8. Two-Hole Conduit straps

   For supporting conduit or EMT larger than 1-inch galvanized steel; 3/4" strap width.
9. Hexagon Nuts: galvanized steel
10. Round Steel Rod: galvanized or plated steel; threaded
11. Trapeze Hangers: Same as Specified in 2.02 C below
12. The following types of hangers and supports shall not be used:

a. Perforated metal strapping;

b. Slotted, perforated angles;

c. Spring pressure or torsion clips, hangers or supports.

C. Equipment Supports

1. U-channel strut system shall be 12-gauge, hot-dipped galvanized steel. Provide with drilled or slotted holes as required for the application and with the following fittings which mate and match with U-channel:

a. Fixture hangers

b. Channel hangers

c. End caps

d. Beam clamps

e. Wiring stud

f. Thin wall conduit clamps

g. Rigid conduit clamps

h. Conduit hangers

i. U-bolts

D. Supporting Steel Sections and Channels

Supporting steel sections and channels shall be fabricated of ASTM A 36 steel in accordance with the appropriate requirements of the AISC, AISI, and AWS publications specified in 1.02, and shall be hot-dipped galvanized after fabrication.

E. Cable Supports

1. Provide cable supports with insulating wedging plug for non-armored type electrical cables in risers. Assembly shall include body of galvanized malleable iron with insulating wedging plug.

2. Provide cable supports for armored type electrical cables in risers. Assembly shall include body and pressure plates of galvanized steel.

2.03 SLEEVES AND SEALS

A. General

1. Unless otherwise shown on the Contract Drawings, provide sleeves and seals as specified below.

2. Where more than one type of sleeve or seal is suitable for the intended use, selection is at the Contractor's option, subject to approval by the Engineer.

3. Sleeves and seals, for which there are established, UL standard, shall bear the UL label.

B. Pipe Sleeves

1. Provide pipe sleeves for conduits penetrating concrete or masonry floor and walls, as follows:

a. Steel Pipe

Fabricate from schedule 40, galvanized steel pipe; remove burrs.

b. Iron Pipe

Fabricate from cast iron or ductile iron pipe; remove burrs.

c. Plastic Pipe

Fabricate from either fiberglass or Schedule 40, PVC plastic pipe; remove burrs. Fiberglass sleeves may be utilized for interior or exterior usages, but PVC sleeves shall be utilized for exterior usage only.

2. Sleeves shall have a minimum inside diameter as shown below, based on the installed raceway diameter.

Raceway Diameter (inches)	Sleeve Inside Diameter (inches)
1 or less	2
1-1/4 to 2	3
2-1/2 to 3	4
3-1/2 to 4	5
5	6
6	7

3. Where a sleeve encloses only one conductor, phase or polarity, or a ground wire or cable, the sleeve shall be non-ferrous.

C. Interlocking Modular Seals

Provide interlocking modular type seals for conduit access located in exterior foundation and pit walls. The seals shall be multi-link, stainless steel bolted connection, high-temperature fittings.

D. Sealing Bushings

Provide sealing bushings for conduit access core-drilled through foundation walls or floors. The bushings shall be molded, one-piece neoprene sealing rings with PVC coated steel or uncoated aluminum pressure plates, stainless steel hex socket head cap screws and flat washers.

E. Fire Seals

Provide UL listed, 3 hour rating, silicone based foam, fire resistive, waterproof joint sealing system to prevent the passage of hot gases and fire.

F. Wall and Floor Seals

Provide watertight and pressure-tight wall and floor seals suitable for sealing around conduit passing through exterior concrete floors and walls. Assembly shall include steel sleeves, galvanized malleable iron body, neoprene sealing grommets and rings, metal pressure rings, membrane clamp were required by foundation design and pressure clamps with type 316 stainless steel hex head cap screws. Seal sizes shall be maximum published size for conduit to be installed therein.

2.04 FASTENERS

A. General

1. Unless otherwise shown on the Contract Drawings, provide fasteners as specified below.
2. Where more than one type of fasteners is suitable for the intended use, selection is at the Contractor's option, subject to approval by the Engineer.

B. Toggle Bolts

Toggle bolts shall be spring head, galvanized or plated steel, 1/4-inch to 1/2-inch sizes, length as required.

C. Expansion Anchors

Expansion anchors shall be metallic expansion anchors or shields, including drop-in anchors, wedge and sleeve anchors, and two-piece and three-piece shields for lag screws or machine screws or bolts.

D. Powder activated Fasteners

Powder activated fasteners shall be steel, pin or stud type, selected for proper length and penetration for the equipment, clamp or strap to be installed, and the base material.

E. Bolts, Nuts, Lockwashers and Washers

1. All hardware shall be galvanized or plated steel, unless otherwise shown on the Contract Drawings.
2. Bolts and nuts, 1/4-inch trade size and larger, shall be hex head or hex socket type, standard American sizes.
3. Lockwashers shall match the finish of the furnished bolts and nuts, and generally be installed one-per-bolt, at the nut end of the assembly.
4. Washers shall be standard or fender type, as required, and sized to match the installed bolts or screws.

F. The following types of fasteners shall not be used:

1. Lead anchors or studs;
2. Wooden plugs or anchors;
3. Plastic anchors;
4. "Nail-in" anchors, either of plastic or metal type.

PART 3. EXECUTION

3.01 EXAMINATION

A. Verify that electrical installations, structural, mechanical and other related Work satisfy the requirements for performance of the Work of this Section in accordance with the Contract Documents.

B. Report immediately to the Engineer any electrical, structural or related construction defects in areas where supporting devices are to be installed, and do not attempt to rectify any defect unless specifically instructed to do so by the Engineer.

3.02 PREPARATION

Before installation the supporting devices, the Contractor shall investigate the site condition to determine, what preparatory work, if any, will be needed.

3.03 INSTALLATION

A. General

1. Install hangers and supports, sleeves and fasteners in accordance with approved printed manufacturer's installation procedures, and as specified.
2. Coordinate all affected trades and all aspects of the electrical work, including installation of raceways and wiring as necessary to interface installation of supporting devices with other work.

3. Install hangers and supports, and attachments to properly support raceways, equipment and accessories from building structure. Arrange for grouping of parallel runs of horizontal conduits to be supported together on trapeze hangers where possible. Install hangers and supports with maximum spacing not to exceed that permitted by NFPA 70 and NECA 5055, as applicable, unless otherwise shown on the Contract Drawings.
4. Secure threaded rod couplings, trapeze hangers or supports or similar horizontal elements, using lock washers and jam nuts to prevent loosening.

B. Conduit and Raceway supports

1. Do not support raceways from hung ceiling supports or members, or metal roof deck.
2. Do not support raceways from mechanical ductwork, ductwork supports, piping or piping supports.
3. Threaded rod for the support of conduits, raceways or trapeze hangers of the given size, shall be not less than the following:

Conduit, Raceway, Hanger Size (inches)	Threaded Rod Size (inches)
2 or less	3/8
2-1/2 to 3-1/2	1/2
4 to 5	5/8
6	3/4

4. Where trapeze hangers are used, bolt or clamp the raceways in place to at least every third hanger and to the first hanger on each side of a bend, fitting, junction or pull box or change in direction.

C. Sleeves

1. Unless otherwise shown on the Contract Drawings, extend sleeves for raceways and risers one inch beyond top of finished floor, curb or building element being penetrated.
2. Install sleeves level and plumb, accurately located and positioned to conform to the requirements of the equipment and in accordance with the approved layout drawings.
3. Install interlocking modular seals in tandem, one at the interior and one at the exterior face of the pipe sleeve.
4. Tighten sleeve seal nuts until sealing grommets have expanded to form watertight seal.

D. Fasteners

1. Wood screws, lag screws, carriage bolts or machine screws shall be utilized for wood or materials of similar fibrous nature.
2. Welded or blazed threaded studs, bolts or machine screws or clamps shall be utilized for structural and miscellaneous steel, iron or other metals.
3. Metallic expansion shields, wedge anchors or drop-in anchors, with lag screws, bolts or machine screws shall be utilized for solid masonry or concrete.
4. Sleeve anchors, drop-in anchors or toggle bolts shall be utilized for concrete masonry units (CMU). Do not use powder-activated fasteners in CMU.

E. Dissimilar Metals

1. "Dissimilar metals" shall mean those metals which are incompatible with one another in the presence of moisture, as determined from their relative positions in the Electrochemical Series, or from test data.

2. Where dissimilar metals come in contact, paint the joint both inside and out with approved coating to exclude moisture from the joint, or provide a suitable insulating barrier separating the metals.

END OF SECTION

SECTION 16190

SUPPORTING DEVICES

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Catalog Cuts

16190B01	Catalog cuts a. Hangers and supports b. Sleeves c. Fasteners

END OF APPENDIX "A"

A

DIVISION 16

SECTION 16320

DRY-TYPE TRANSFORMERS
GENERAL PURPOSE - 600 VOLTS OR LESS

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for general purpose, dry-type transformers 600 volts or less.

1.02 REFERENCES

Not Used.

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

The transformers shall be designed, manufactured and tested in accordance with the applicable provisions of the codes, standards and recommendations of the following entities:

American Welding Society (AWS)
American National Standards Institute (ANSI)
Institute of Electrical and Electric Engineers (IEEE)
National Electric Manufacturers Association (NEMA)
National Fire Protection Association (NFPA)
Underwriter Laboratories Inc. (UL)

In addition, specific provisions cited herein and as shown on the Contract Drawings shall govern for the associated specific application.

1.04 QUALITY ASSURANCE

A. The manufacturer of transformers shall have manufactured equipment of the voltage and KVA rating(s) described herein and as shown on the Contract Drawings, and they shall have been satisfactorily used for the purposes similar to those intended herein for a minimum of three years. When directed by the Engineer, the Contractor shall have the manufacturer provide a list of installations and contracts for which he has produced such materials.

B. All Work of this Section shall be performed and completed in a thorough, workmanlike manner and shall follow the best modern practice in the manufacture of high-grade equipment. All Work of this Section shall be performed by mechanics skilled in their respective trades.

C. All parts shall be made accurately to standard gauge, where applicable, for ease of replacement and repairs.

D. All material selected for the manufacture of the transformer units shall be the best available for the purpose for which they are intended to be used, considering strength, ductility, durability and the best engineering practice.

E. All parts shall be readily accessible and like parts shall be interchangeable insofar as possible.

F. Surfaces to be welded shall be clean and free from dirt, rust or other foreign matter. The welding processes shall be in accordance with the requirements specified by AWS.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Transformers shall be delivered complete, in the manufacturer's original, unopened protective packaging. All accessories, including but not limited to meters, temperature gauges, lightning arrestors, fan controls and relays, shall be in place and wired. Packing materials shall be such as to prevent damage to components due to vibration, jarring or the like during transportation and handling.

B. Accessories or spare parts shipped loose shall be delivered in the manufacturer's original unopened protective packaging and shall be identified with a non-corrosive tag.

C. The transformers shall be handled in a manner to prevent damage to finished surfaces.

D. Where possible, maintain protective coverings until installation is complete and remove such coverings as part of final cleanup.

E. Touch up any damage to finishes to match adjacent surfaces.

1.06 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 CONSTRUCTION FEATURES

A. General

Unless otherwise shown on the Contract Drawings, transformers shall conform to the following requirements:

1. Transformers shall be self-cooled, with properly designed steel enclosures. Openings for ventilation or similar use shall be so designed as to deflect foreign objects inserted through these openings away from contact with energized parts. Enclosures shall be suitable for floor or wall mounting, as required to fit within the constraints of each specific application. Transformers larger than 112.5 KVA shall be designed for floor mounting only. Outside dimensions of enclosures shall not exceed the dimensions shown on the Contract Drawings.
2. Transformers shall be provided with four 2-1/2 percent full capacity taps in the primary winding, two above and two below the nominal voltage rating. The taps shall be factory-wired to terminals accessible only by removal of external access plates or panels.
3. The maximum temperature at any spot on the exterior surface of the enclosure shall not exceed 50 degrees C rise above a 40 degrees C ambient.
4. Each transformer as a unit shall be capable of withstanding the stresses resulting from operating conditions, including external and internal short circuits, without distortion or other damage.

B. Core and Coil

1. Core and coil shall be completely isolated from the enclosure by rubber vibration isolating pads. The core shall be visibly grounded to the enclosure by a flexible grounding conductor, sized in accordance with applicable NEMA, IEEE and ANSI standards.

   a. Transformer neutral lead shall be ungrounded and brought-out to an isolated terminal.

   b. The enclosure shall include ground connection lugs for the incoming and outgoing conduits, and provisions for grounding the isolated neutral lead, all as shown on the Contract Drawings.

2. All cores shall be constructed of high grade, non-aging silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Magnetic flux densities shall be kept well below saturation to allow for a minimum of 10 percent overvoltage excitation. Cores shall be clamped with structural angles and bolted to the enclosure to prevent damage during shipment or rough handling. All laminations shall be cut with the direction of the grain and be free of burrs, core plated and stacked without gaps.

3. Windings shall be copper-formed wire or sheet, continuous from start to finish. Splices in windings will not be permitted. Material incorporated must have at least a minimum of one year of proven field usage. Accelerated laboratory tests will not be acceptable.

4. Internal primary and secondary bus shall be rectangular copper. All buses shall be hot-dipped, silver-plated over the entire area where incoming or internal cable or bus are to be bolted.

5. Transformer impedance shall be within 7-1/2 percent of the impedance value shown on the Contract Drawings.

6. All joints and leads to the transformer terminals shall be braced or welded.

7. The basic impulse level (BIL) windings shall be a minimum of 10 KV.

C. Insulation Systems

Transformers shall be vacuum-impregnated with non-hygroscopic thermosetting varnish.

1. Transformer capacity shall be based upon a temperature rise of 80 degrees C for transformers 30 KVA and larger, and 115 degrees C for transformers less than 30 KVA above an ambient temperature of 40 degrees C.

   a. Transformer design for 115 degrees C rise shall be capable of delivering a 15 percent continuous overload, above nominal rating, without exceeding 150 degrees C rise above a 40 degrees C ambient temperature.

   b. Transformer design for 80 degrees C rise shall be capable of delivering a 30 percent continuous overload, above nominal rating, without exceeding 150 degrees C rise above a 40 degrees C ambient temperature.

2. Transformer insulation systems shall be 220 degrees C for transformers 30 KVA and larger, and 185 degrees C for transformers less than 30 KVA. All insulating materials shall conform to the requirements of NEMA ST 20, for 220 degrees C, UL recognized insulation systems.

D. Sound Levels

Transformers shall operate at sound levels at or below ANSI C 89.1, and as follows:

Transformer Size	Maximum Sound Level
0.1 to 9 KVA	40 db
10 to 50 KVA	45 db
51 to 150 KVA	50 db
151 to 300 KVA	55 db
301 to 500 KVA	60 db

E. Painting

The entire transformer enclosure shall be degreased, cleaned, phosphatized, primed and finished with two coats of ANSI 61 light gray, baked enamel.

2.02 FACTORY INSPECTION AND TESTS

A. The Engineer reserves the right to inspect each transformer 112.5 KVA and larger at the factory and to witness each factory test. The Engineer shall be notified 15 working days in advance of each test. Failure to notify the Engineer of testing may necessitate retesting in the presence of the Engineer at no additional cost to the Authority.

B. The accuracy of the calibration of all instruments to be utilized during the tests shall be ascertained and recorded at the beginning of the tests.

C. Factory tests shall include, but not be limited to, the following:

Submit certified test data of new transformer designs, or of electrically duplicate transformer designs. The required test data shall be:

1. Efficiency at 25, 50, 75 and 100 percent load.
2. Percent regulation at 80 and 100 percent power factor.
3. No load and full loss in watts.
4. Impedance based on reference temperature.
5. Sound level in db of transformer in enclosure.
6. Average temperature rise based on 40 degrees C ambient temperature.

PART 3. EXECUTION

3.01 INSTALLATION

A. Install transformers in accordance with the Contract Drawings, the manufacturer's instructions and in compliance with the applicable requirements of ANSI, IEEE, NFPA and UL.

B. All conduit and bus connections to the transformer enclosures shall be made with flexible or other approved vibrationless connectors.

3.02 FIELD TESTS

A. General

1. Provide all labor and materials for functional tests required. Unless otherwise shown on the Contract Drawings, power for the tests will be furnished by the Authority.

2. Should the tests reveal any defects in transformers installed under this Section, promptly correct such defects and rerun the tests until the entire installation is satisfactory to the Engineer.

B. Perform the following field test in the presence of the Engineer to demonstrate the proper phasing of each transformer installation and submit a written field report to the Engineer for record:

1. Verify that the proper phase sequence is maintained.
2. Use a phase sequence meter or demonstrate the proper rotation of a small 3-phase motor whose direction of rotation was verified prior to the transformer installation.
3. Should the foregoing test reveal any incorrect phasing, promptly correct such defects and retest until the entire installation is satisfactory to the Engineer.

END OF SECTION

SECTION 16320

DRY-TYPE TRANSFORMERS
GENERAL PURPOSE - 600 VOLTS OR LESS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16320A01 Shop Drawings

a. Physical dimensions of each transformer
b. Nameplate drawing for each transformer
c. Drawings showing location of all specified accessories
d. Technical specification for proposed transformer
e. Wiring diagram of fan cooling provisions
f. Details of current transformers

END OF APPENDIX "A"

DIVISION 16

SECTION 16450

GROUNDING

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for grounding.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	Administrative Code
	Electrical Code of the City of New York
	American National Standards Institute (ANSI)
ANSI C 2	National Electrical Safety Code
	Institute of Electrical and Electronics Engineers (IEEE)
IEEE Std 142-1991	Recommended Practice for Grounding of Industrial and Commercial Power Systems
IEEE Std 1100-1992	Recommended Practice for Powering and Grounding Sensitive Electronic Equipment
	National Fire Protection Agency (NFPA)
NFPA 70	National Electrical Code
	Underwriters Laboratories Inc. (UL)
UL 467	Grounding and Bonding Equipment

1.03 QUALITY ASSURANCE

A. Components and installation shall comply with NFPA 70, "National Electric Code."

B. Provide products specified in this Section that are listed and labeled. The terms "listed" and "labeled" shall be defined as they are in NFPA 70 Article 100.

1.04 SUBMITTALS

See Appendix A for Submittal Requirements.

PART 2. PRODUCTS

2.01 GENERAL

Furnish grounding elements for switchgear, transformers, cabinets panelboards, starters, and miscellaneous electrical equipment, for all non-current-carrying metallic portions of the entire electrical system and for exposed non-electrical systems located in electrical substations or switchgear rooms as required by ANSI C 2, NFPA 70, and building codes which would be applicable, if the Authority were a private corporation.

2.02 MANUFACTURERS

Subject to compliance with the requirements of this Section, provide grounding products of manufacturers as shown on the Contract Drawings.

2.03 GROUND RODS

Ground rods shall be copper clad steel. Unless otherwise shown on the Contract Drawings, the rods shall be 3/4-inch diameter by 10 feet long.

2.04 GROUNDING CONDUCTORS

A. Provide grounding conductors in accordance with the requirements of NFPA 70, Sections entitled "WIRES, CABLES, SPLICES, TERMINATIONS (600 VOLTS OR LESS)," "WIRES, CABLES, SPLICES, TERMINATIONS (MEDIUM VOLTAGE)," and "TAXIWAY/RUNWAY WIRES AND CABLES," as applicable, and as specified on the Contract Drawings.

B. Equipment grounding conductors shall be green insulated.

C. Isolated grounding conductors shall be green insulated with yellow striping.

2.05 ABOVE GRADE CONNECTIONS

Connectors to piping, fencing, and conduit systems shall be listed and labeled as grounding connectors for the materials used.

2.06 BELOW GRADE CONNECTIONS

Buried Cable and ground rod connections shall be exothermic welds. Welded connections shall be provided in kit form and selected for the specific types, sizes, and combinations of conductors shown on the Contract Drawings.

2.07 GROUNDING BUSHINGS

Grounding Bushing shall be insulated type.

2.08 LIGHTNING PROTECTION COMPONENTS

Lightning protection components shall be provided as specified in Section entitled "LIGHTNING PROTECTION SYSTEM."

PART 3. EXECUTION

3.01 INSTALLATION

A. General

Install grounding elements for switchgear, transformers, cabinets, panelboards, starters, and miscellaneous electrical equipment, for all metallic non-current carrying portions of the entire electrical system and for exposed non-electrical systems located in electrical substations or switchgear rooms as required by ANSI C 2, NFPA 70 and building codes which would be applicable, if the Authority were a private corporation.

B. Install grounding as shown on the Contract Drawings.

C. Grounding and bonding equipment for use in connection with interior wiring systems shall conform to UL 467.

D. Install separate insulated equipment grounding conductors with circuit conductors to maintain grounding system at equipotential. Raceway system shall not be utilized as the equipment ground.

E. Connect exposed metallic piping or ductwork of any non-electrical system that is located in an electric substation or switchgear room, to ground in the room. Where the run through the room exceeds 15 feet in length, make ground connections at both the entering and leaving points of the piping or ductwork.

F. Ground all non-current-carrying metallic enclosures of electrical conductors, or exposed non-current-carrying metallic parts of electrical equipment, or of power apparatus.

G. Connections:

1. General

   Make connections in such a manner as to minimize possibility of galvanic action or electrolysis. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

2. Use electroplated or hot-tin-coated materials to assure high conductivity and make contact points closer in order of galvanic series.

3. Make connections with clean bare metal at points of contact.

4. Make all connections of grounding connector cables to ground rods by exothermic welding method. Welds that are puffed up, or that show convex surfaces indicating improper cleaning are not acceptable.

5. Terminate insulated equipment grounding conductors for feeders and branch circuits with pressure-type grounding lugs. Where metallic raceways terminate at metallic housings without mechanical and electrical connection to the housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to the ground bus in the housing. Bond electrically non-continuous conduits at both entrances and exits with grounding bushings and bare grounding conductors.

6. Tighten grounding and bonding conductors and terminals, including screws and bolts, in accordance with manufacturer's published torque-tightening values for connectors and bolts.

7. Where insulated grounding conductors are connected to ground rods, or ground buses, insulate the entire area of the connection and seal against moisture penetration of the insulation and cable.

H. All sensitive electronic equipment including computers and other components specified on the Contract Drawings, shall be connected to an isolated grounding system. The isolated grounding system shall be installed as specified on the Contract Drawings. The isolated grounding system and the electrical power equipment grounding system must be connected together at a single point, as shown on the Contract Drawings and in accordance with the requirements of NFPA 70, and all applicable local codes. Utilization of a grounding electrode separate from, and not connected to, the electrical power equipment grounding system is not acceptable

I. All ground rods in grounding loops shall have less than 5 ohms resistance to ground. All individual or isolated ground rods shall have a maximum of 25 ohms resistance to ground. The maximum overall grounding system resistance to ground shall be as shown on the Contract Drawings.

3.02 FIELD TESTS

Make ground resistance tests at all ground rods to verify that grounding system is at equipotential and to ensure compliance with the requirements specified in 3.01 I above, in the presence of the Engineer, and prepare all test results in tabulated form indicating location and time of each test and soil resistivity measured. If ground resistance on a grounding resistance test is higher than the value specified in 3.01 I, either increase the length of the rod or add more rods to the grounding system until the required ground resistance is achieved.

END OF SECTION

SECTION 16450

GROUNDING

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Catalog Cuts

16450B01 Catalog Cuts for ground rods, connectors and connection materials, and grounding fittings.

Record Documents

16450M01 Ground Resistance Test Results

END OF APPENDIX "A"

DIVISION 16

SECTION 16452

ELECTRICAL BONDING

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for furnishing, installing and testing an electrical bonding system for corrosion control/stray current mitigation on all underground structures.

1.02 REFERENCES

	American Society for Testing and Materials (ASTM)
ASTM B 3	Soft or Annealed Copper Wire
ASTM B 8	Concentric-Lay Stranded Copper Conductors, Hard, Medium-Hard, or Soft
	Military Specifications (MIL)
MIL A-18001	Anode, Corrosion Preventative Zinc, Slab, Disk and Rod Shapes
	National Association of Corrosion Engineers (NACE)
NACE RP 0169	Control of External Erosion on Underground or Submerged Metallic Pipe Systems

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

The Electrical Bonding System shall be designed, manufactured and installed in accordance with the latest revision of applicable standards ASTM, MIL and NACE. In case of conflict between various standards, the more stringent requirement shall apply.

1.04 QUALITY ASSURANCE

A. The Contractor shall provide the Electrical Bonding System design, certified by a NACE accredited Corrosion Engineer, licensed as a Professional Engineer in the state in which the work is to be performed, and experienced in corrosion control procedures. Submit the qualifications of the Corrosion Specialist, for review by the Engineer.

B. Electrical bonding devices, of type and sizes required, shall have been satisfactory used for the purposes similar to those herein, for not less than three years.

1.05 DELIVERY, STORAGE AND HANDLING

A. Store materials in original packaging in a manner to prevent soiling, damage, wetting or corrosion prior to installation.

B. Handle in a manner to prevent damage to finished surfaces.

C. Where possible, maintain protective coverings until installation is complete and remove such covers as part of final cleanup.

1.06 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

Subject to compliance with requirements of this Section, provide electrical bonding materials and equipment of the manufacturers listed on the Contract Drawings.

2.02 MATERIALS

A. Electrical Bonding Devices

Unless otherwise shown on the Contract Drawings, furnish materials and products in accordance with the following requirements:

1. Cables shall be stranded copper, #8 AWG minimum, conforming to ASTM B 3 and B 8, insulated with 0.11 inches of high molecular weight polyethylene.
2. Zinc Reference Electrode shall conform to the requirements of MIL A-18001, 1-1/4 inches by 1-1/4 inches by 9 inches long, 5 pound, 1/4" dia. steel core package electrode, and in accordance with the following requirements:
   a. Lead wire shall comply with 2.02.A.1, and shall be factory connected to the anode center with the connection sealed in cast epoxy resin encapsulation.
   b. Electrode shall be packaged in a permeable package cloth sack, total weight as recommended by the manufacturer, containing compacted backfill of mixture with the following requirements:

Material	Percent
Hydrated Gypsum	50
Bentonite	50

   c. Epoxy resin encapsulation shall be two-piece, snap-together molded bodies, sized for cable, with two-part low viscosity polyurethane insulating and sealing compound, rated for 600 volts.

B. Buried cable and ground rod connection shall be exothermic welded.

C. Junction boxes shall be in accordance with Section 16135, entitled "BOXES AND FITTINGS".

PART 3. EXECUTION

3.01 EXAMINATION

A. Verify that electrical installations, structural, mechanical and other related work satisfy the requirements for performance of the work for this Section in accordance with the Contract Documents.

B. Report immediately to the Engineer any electrical, structural or related construction defects in areas where bonding devices are to be installed, and do not attempt to rectify any defect unless specifically instructed to do so by the Engineer.

C. Provide control and inspection of all exothermic bonding connections before casting them in concrete and for proper electrical connections of all underground structural members.

3.02 PREPARATION

Before installation of electrical bonding devices, the Contractor shall investigate the site condition to determine, what preparatory work, if any, will be needed.

3.03 INSTALLATION

A. General

1. Install electrical bonding devices in accordance with approved printed manufacturer's installation procedures, and as specified.
2. Coordinate with other trades, to electrically bond all structural steel and reinforcing bars, embedded in the concrete below grade. Bonding shall be completed in closed circuit to minimize corrosion activity, and shall conform to the Corrosion Specialist design.

B. Bonding Connections

1. Bond bare or uncoated reinforcing steel using single insulated conductors or straps, exothermically welded to steel beams.
2. Cross bond all bare or reinforcing steel, using exothermic welds.
3. Make welds in accordance with manufacturer's requirements.

C. Conductors

1. Use continuous, insulated conductors, without splices, between welded connections.
2. At the end of line of bonded steel beams, connect the insulated header cable, using exothermic welds, and terminate this cable inside the test junction box as shown on Contract Drawings. Where structural beams or steel members are coated, clean and coat with coal tar epoxy after completion and cooling of welded area.

D. Test Electrode Wells and Junction Boxes

1. Bury electrodes of type and at locations shown on the Contract Drawings. Excavate and backfill holes in accordance with the manufacturer's written instructions and in accordance with the following requirements:
   a. Wet packaged electrode thoroughly before backfilling the hole.
   b. Use fine clay soil, free from stones and bricks, for backfilling.
2. Install header cables of size, and at location shown on the Contract Drawings.
3. Install test junction box of type, and at locations, shown on the Contract Drawings in accordance with Section 16135 entitled "BOXES AND FITTINGS".
4. Run electrode lead wires to test junction boxes as shown on the Contract Drawings.
5. Install size and type of conduit shown on the Contract Drawings, in accordance with the requirements of Section 16110 entitled "RACEWAYS".
6. Install cable, leaving slack in test junction boxes.
7. Use exothermic welds, sealed with cast epoxy resin encapsulation, for splices made in direct buried cable.

E. Identification

Identify all cables, in each test junction box, using fiber tags (1/16 inch thick and 3/4 inches wide) intended with letters and numbers 5/16 inch high, fastened to cables with #14 AWG weatherproof copper wire.

F. Field Tests

Test that materials are installed and connected as shown on the Contract Drawings, and as required by the Corrosion Specialist's certified design.

1. Test the complete Electrical Bonding System to ensure electrical continuity. The tests must show that the elements of the structure are electrically bonded and prepared for connection to the test box.
2. Testing shall be in accordance with NACE RP 0169 requirements.
3. All test data shall be included in a final report, prepared by the Corrosion Specialist, indicating the initial conditions, with a listing of further recommendations pertaining to the maintenance and periodic testing of the system(s).
4. The Contractor shall correct any deficiencies discovered during the tests.

END OF SECTION

SECTION 16452

ELECTRICAL BONDING

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16452A01 Shop Drawings

a. Details of bonding of structural steel and reinforcing bars encased in concrete below grade

b. Steel and concrete shop drawings, including all required welds, bonding connections and recoating or patching of protective coatings

c. Layout drawings of test electrodes, cabling and test junction boxes

END OF APPENDIX "A"

DIVISION 16

SECTION 16470

PANELBOARDS

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for electrical panelboards and cabinets.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

National Electrical Manufacturers Association (NEMA)

NEMA PB 1	Panelboard
NEMA PB 1.1	General instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less
NEMA PB 250	Enclosures for Electrical Equipment (1000 Volts maximum)
NEMA AB 1	Molded Case Circuit Breakers and Molded Case Switches
NEMA AB 3	Molded case Circuit Breakers and Their Application
NEMA 280	Application Guide for Ground Fault Circuit Interrupters
NEMA AB 4	Guidelines for Inspection and Preventive Maintenance of Molded Case Circuit Breakers Used in Commercial and Industrial Applications
NEMA Z535.4	Product Safety Signs and Labels

National Fire Protection Association (NFPA)

NFPA 70	National Electric Code

Underwriters Laboratories Inc. (UL)

ANSI/UL 67	Panelboards
ANSI/ UL 50	Cabinets and Boxes
UL 1059	Electrical Terminal Blocks
ANSI/UL 65	Electric Wired Cabinets
ANSI/ UL 486E	Equipment Wiring Terminals for Use With Aluminum and/or Copper Conductors
ANSI/UL 486A	Wire Connectors and Soldering Lugs for Use With Copper Conductors
ANSI/UL 969	Marking and Labeling systems
ANSI/UL 467	Electrical Grounding and Bonding Equipment
ANSI/UL 437	Key Locks

Federal Specifications

Panelboards, W-P-115a,c

Type 1 - Circuit Breaker Equipped

Class 1- Panelboards

Class 2 - Load Centers
Molded Case Circuit Breakers, W-C-375a,b
Fusible Switches, W-S-865c

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. Panelboards shall be designed in accordance with applicable standards of ANSI, NEMA, NFPA and UL. A list of acceptable manufacturers is shown on the Contract Drawings.

B. Unless otherwise shown on the Contract Drawings, Panelboard cabinets shall meet the following environmental requirements:

1. Cabinets located in heated areas shall be NEMA Type 1.
2. Cabinets located in unheated areas or in areas subject to dust or oil, shall be NEMA Type 12.
3. Cabinets located in exterior areas or locations subject to rain, dripping liquid, or hosing shall be NEMA Type 4X, stainless steel.

C. ANSI design test shall have been made on a prototype of each type of panelboard.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Panelboards shall be delivered to the construction site complete. All circuit breakers, other electrical devices, and accessories, shall be in place and wired.

B. Panelboards and accessories shall be packaged to prevent damage due to vibration, jarring and the like during transportation and handling.

C. If any electrical devices or accessories must be shipped loose they shall be delivered in the manufacturer's original unopened protective packaging and shall be identified with suitable non-corrosive tag.

D. Store components and devices in clean and dry space, protected from weather.

E. Where possible, maintain protective covering until installation is complete and remove such covering as part of final cleanup.

F. Touch up any damage to finishes to match adjacent surfaces.

1.05 SPARE PARTS AND TOOLS

A. One set of all special tools and wrenches required for assembly or disassembly of the panelboard and the installation of breakers shall be furnished.

B. Furnish a list of recommended spare parts for each panelboard. This list shall contain the prices and availability of the spare parts recommended.

1.06 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 GENERAL

A. List of acceptable manufacturers is shown on contract drawings.

B. The size, rating, and number of circuit breaker in the panelboard shall be as shown on the Contract Drawings.

C. All panelboards, for which there are established UL standards, shall bear the UL label.

D. Location of panelboards and their approximate dimensions shall be as shown on the Contract Drawings.

E. Each panelboard shall be factory assembled, tested and shipped as a single complete unit, with all circuit breakers and buses installed, unless written permission is given by the Engineer to disassemble any parts for shipment.

2.02 CONSTRUCTION FEATURES

A. Panelboard interior

1. Panelboard interiors shall be designed and assembled so that individual breakers may be added, removed, or replaced without disturbing adjacent units and without removing main bus or brunch circuit connectors.
2. All parts shall be readily accessible and like parts shall be interchangeable insofar as possible.
3. Modifications and optional features such as silver plated copper bus, subfeed lugs, shunt trips, meters, etc., shall be as shown on the Contract Drawings.

B. Panelboard Enclosures (Cabinets)

1. The panelboard assembly shall be mounted in a galvanized steel or stainless steel enclosure (cabinets) as shown on the Contract Drawings. Cabinets and trims shall be surface-mounted or recessed installation as shown on the Contract Drawings.
2. Cabinets shall be arranged to provide side gutters 6 inches wide. Cabinets shall be provided with top and bottom gutters not less than 6 inches wide. For 400A or 600A mains, top and bottom gutters shall be 8 inches. Where feeder cables supplying the mains of a panelboard are carried through its box to other panelboards, the cabinet shall be provided with adequate additional side gutters space for the riser cable and taps.
3. The cabinet shall have a galvanized sheet-steel one-piece frame with a hinged door.
4. Recessed or flush-mounted cover frames shall extend 3/4 inch beyond each side of the cabinets and shall be set with their backs flush with the finished wall. Covers shall have adjustable trim clamps to compensate for misalignment and shall be completely concealed when door is closed.
5. Surface-mounted cover frames shall be sized to match the overall dimensions of the cabinet or flanged around to cover the edge of the cabinet.
6. Breakers and interior bus shall be covered by a removable framed trim, mounted inside the cabinet.
7. Doors shall close against a rabbet placed all around the inside edge of the frame, with a close-fitting joint between the door and frame
8. Doors shall be fitted with concealed, continuous, flush piano hinges.
9. Fastening screws on front panel shall be stainless steel and shall be of the captive, tamper proof type. Front panels shall not be removable with door in locked position.
10. Provide a metal frame with clear impact resistant plastic cover, mounted inside of each panelboard door to hold circuit directory.

C. Overcurrent protective devices and buses

1. Overcurrent protective devices shall be circuit breakers, fully rated, bolt on, thermal magnetic, inverse time delay, molded case. Breakers shall be 1, 2 or 3 pole with an integral crossbar or an internal common trip element, to assure simultaneous opening of all poles of a multi-pole circuit breaker. All circuit breakers shall meet requirements specified in the section of these Specifications entitled "OVERCURRENT PROTECTIVE DEVICES"
2. Connections of the branch circuits to the main bus shall be of the phase sequence type, that is, adjacent poles shall be of unlike polarity and rotated in sequence. This shall allow complete flexibility of circuit arrangement (1, 2 or 3 poles) to evenly balance the electrical load on each phase.
3. Main bus bars, including full capacity isolated neutral, shall have an ampere rating not less than that of the main breaker or lugs, and shall be braced for a momentary short circuit as specified on the Contract Drawings. The minimum short circuit rating shall be equal or be greater than the rating of the panelboard integrated equipment.
4. Buses shall be designed in such a manner that no machining, drilling, or tapping shall be required to change circuits or add new breakers.
5. All main and branch circuit bus shall be copper with a 1000 Amperes per square inch current density, and contact surfaces shall be silver plated and shall have no more than 200 Amperes per square inch current density.
6. A copper ground bus shall be furnished and installed by the panelboard manufacturer for equipment grounding. When shown on the Contract Drawings the Manufacturer shall install an isolated type grounding bus.
7. Main lugs shall be solderless, mechanical type and shall be secured in line with UL standards to prevent lugs from turning or loosening when incoming cables are installed.
8. Where circuit breakers with ground fault protection are shown on Contract Drawings, they shall be UL class A type and shall be identified on the panelboard.
9. Lighting fixture circuits controlled only by a circuit breaker shall each be identified by a 1 inch long by 3/4-inch high black laminated plastic nameplate with white letters.
10. Circuit breakers used for switching fluorescent lighting shall be rated and identified with a SWD tag.

2.03 ACCESSORIES

A. Nameplates

1. Provide approved nameplates on the front cover of each cabinet, indicating the panel name and number.
2. Unless otherwise shown on the Contract Drawings, fabricate nameplates from an approved type of lamacoid plastic with letters engraved on the plate in white on black background. Where letter sizes are not shown on the Contract drawings, use 1/2-inch high letters. Nomenclature shall comply with a schedule approved by the Engineer.
3. Secure nameplates on equipment with brass or stainless steel screws with locking hardware.

B. Panelboard cabinet locks

Each locked cabinet shall be furnished with a combination catch and flat lock with spring loaded type door pull. Locks shall be fitted to separate keying for each system. Furnish one key for each cabinet installed and a maximum of 20 keys per system.

C. Provide a typewritten directory identifying each brunch circuit as to the load which it serves, and install the directory in metal frame inside the panelboard door.

2.04 PAINTING

A. Surfaces to be painted shall be prepared by the removal of all grease, oil, rust, scale or other foreign material.

B. A prime coat of zinc chromate paint and two (2) finish coats of enamel paint conforming to ANSI Z 55.1 shall be applied. The gray prime and finish paints shall be a compatible finish system. In public areas the cabinets shall be painted as above, unless otherwise shown on Contract Drawings.

C. Furnish a can of touch-up paint for use after equipment is positioned.

D. Stainless steel panels shall not be painted. Galvanized panels shall be painted if shown on the Contract Drawings.

2.05 SHOP TESTS

A. Shop tests shall be in accordance with NEMA, ANSI and IEEE specifications.

B. During the period of shop drawing submission complete information outlining the test methods and procedures to be followed shall be submitted to the Engineer for approval. A copy of test forms and a set of sample computations to be used shall be furnished at the time.

C. The Engineer shall be permitted to inspect any equipment, material or work to be furnished under this specification and shall have the right to reject any parts considered defective, unsuitable for the purposes or not in accordance with these specifications.

D. The Engineer shall be notified at least two weeks before testing. This notification shall list type and number of units to be tested. The Engineer reserves the right to require additional testing or to waive factory inspection or witnessing of tests.

E. Five (5) certified copies of all test results shall be furnished to the Engineer. Certification shall be by a Professional Engineer licensed in the State in which the tests are performed, and stamped.

F. Circuit breakers shall be tested individually in the following sequence:

1. Calibration test
2. Overload performance test
3. Continuous current test
4. Endurance performance test
5. Calibration test (repeated)
6. Determination of interrupting rating
7. Dielectric test

Results of tests on prototype circuit breakers of each size and type will be acceptable.

G. Panelboards shall be marked with their maximum short circuit rating at the supply voltage. The short circuit rating of each panelboard shall be determined after complete assembly. The short circuit tests on the breakers and panelboard structure shall be made simultaneously by connecting the fault to each overcurrent device with the panelboard connected to its rated voltage source. The method of testing shall be in accordance with UL 67. The source shall be capable of supplying specified panelboard short circuit current or grater.

H. Release of equipment shall not relieve the Contractor of the responsibility of furnishing equipment conforming to all specification requirements.

PART 3. EXECUTION

3.01 EXAMINATION

A. Verify that electrical installations, structural, mechanical and other related Work satisfy the requirements for performance of the work of this Section in accordance with the Contract Documents.

B. Before delivering the equipment to the site, the Contractor shall investigate the site conditions to determine the best method of shipment, what preparatory work, if any, will be needed to bring the equipment onto the site, and what will be the best and quickest method of unloading the equipment and setting it in place.

C. Report immediately to the Engineer any electrical, structural or related construction defects in areas where control panels or cabinets are to be installed, and do not attempt to rectify any defect unless specifically instructed to do so by the Engineer.

D. Before unloading the equipment it shall be inspected for damage during shipment. Any damage shall immediately be brought to the attention of the Engineer for resolution.

3.02 PREPARATION

A. Install any channels, angles or other supports that are required to support or mount the panelboards.

B. Use supports and fasteners as specified in the Section of the Specifications entitled "SUPPORTING DEVICES" or as shown on the Contract Drawings.

3.03 INSTALLATION

A. Surface and flush mounted panelboards shall be installed with tops 6 feet-6 inches above the floor, unless otherwise shown on the Contract Drawings.

B. Panelboards shall be installed true and plumb on supporting struts and shall not be mounted directly on concrete, concrete block walls, or any other walls subject to moisture. Leave a minimum gap of 1/2 inch between the back of the enclosure/cabinet and the wall, using stainless steel hardware.

C. Where mounting directly on the wall is unavoidable the back of the enclosure shall be painted with two coats, minimum, of a bituminous paint.

D. Cables shall be neatly racked and bundled with nonflammable nylon ties, routed and supported within the enclosures/cabinets or gutters. Minimum bending radii as recommended by cable manufacturers shall not be reduced.

E. After conduits and cables are installed, the enclosures/cabinets shall be inspected for foreign materials and shall be vacuumed clean. Prior to energization the panels shall be tested as described below.

F. A typewritten directory shall be furnished and installed in the frame inside the panelboard.

3.04 FIELD TESTS

A. Visually inspect each breaker in the panelboard and operate manually.

B. Check all connections for tightness

C. Check current rating of all circuit breakers. To each pole of the circuit breakers apply current 3 times its rating, recording currents and breaker trip times. Apply rapidly increasing currents and record the value that consistently causes instantaneous tripping of the breaker. Compare these recorded times with manufacturer's time current curves.

D. Perform megger and hi-pot test on each pole.

E. All discrepancies found by the contractor shall be brought to the attention of the Engineer

F. All testing shall be performed in the presence of and as directed by the Engineer. The Contractor shall notify the Engineer when the equipment is installed and ready for testing.

END OF SECTION

SECTION 16470

PANELBOARDS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16470A01 Shop Drawings for each enclosure/cabinet shall include:

a. Data sheet for each panelboard with the following information

1. Job name
2. Item number
3. Panelboard nameplate(s) in accordance with the design drawings
4. Quantity of this panelboard configuration
5. Phase, wire and voltage
6. Main and neutral Bus material, continuous current, current density, and momentary capacity.
7. Short- circuit rating
8. Main connection information:
   (1) Circuit Breaker - rating, interrupting rating, number of poles, type, manufacturer, and catalog number
   (2) Lugs per phase, Cables per phase, Cable size range
   (3) Location (top, bottom)
9. Thru feed lugs, subfeed
10. Ground bar with main lug on frame
11. Branch connection information:
   (1) Circuit breakers rating, number of poles, type, manufacturer, and catalog number
   (2) Lugs and cables per phase, Cable size range
12. Panelboard circuits breaker's arrangement for left and right side-top to bottom.
13. Panelboard overall dimensions H x W x D
14. Panelboard NEMA rating

b. Panelboard dimensional drawing. Indicate conduit entrance space at the top and bottom, knockout diagram and mounting details

c. Panelboard directory

Catalog Cuts

16470B01 Catalog Cuts

a. Panelboards and Cabinets

b. Circuit breakers

c. Family of time current characteristic curves for all types

Record Documents

16470M01 As-built Documentation acceptable to the Engineer, with typewritten copy of completed panelboard directories.

END OF APPENDIX "A"

DIVISION 16

SECTION 16475

OVERCURRENT PROTECTIVE DEVICES (600 VOLTS OR LESS)

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for overcurrent protective devices.

B. The types of overcurrent protective devices specified in this Section are:

1. Low Voltage Power Air Circuit Breakers
2. Molded Case Circuit Breakers
3. Safety Switches
4. Fuses

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	American National Standards Institute (ANSI)
ANSI C 37.13	Low Voltage AC Power Circuit Breakers used in enclosures
ANSI C 37.16	Related Requirements and application recommendation for Low Voltage Power Circuit Breakers
ANSI C 37.50	Test Procedures for Low Voltage AC Power Circuit Breakers
ANSI C 97.1	Low Voltage Cartridge Fuses 600 Volts or Less
	National Electrical Manufacturers Association (NEMA)
NEMA AB-1	Molded Case Circuit Breakers and Molded Case Switches
NEMA KS-1	Enclosed Switches
	National Fire Protection Association (NFPA)
NFPA 70	National Electrical Code
	Underwriters Laboratories Inc. (UL)
UL 98	Enclosed and Dead Front Switches
UL 198	Safety Standard for Fuses
UL 489	Molded Case Circuit Breakers and Circuit Breaker Enclosures
UL 943	Standard for Ground Fault Circuit Interrupters
	Federal Specifications (FS)
W-C-375B/Gen	Circuit Breakers, Molded Case; Branch Circuit and Service
FSW –S-865	Covers Surface-mounted, Air-break, Box or Enclosed Switches for Ratings through 500 Volts, 1200 Amperes and 50 Horsepower

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

The overcurrent protective devices and associated materials shall conform to all applicable standards, and shall also conform to the requirements specified herein and shown on the Contract Drawings.

1.04 QUALITY ASSURANCE

Overcurrent protective devices of types and ratings required, shall have been satisfactorily used for purposes similar to those intended herein for not less than three years.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Overcurrent protective devices to be installed in an assembly, as shown on the Contract Drawings, shall be mounted in the assembly and delivered in accordance with the manufacturer's specifications for such assembly.

B. Overcurrent protective devices to be installed in their own enclosures, as shown on the Contract Drawings, shall conform to the following requirements:

1. Enclosures shall be packaged with material to prevent damage to components due to vibration, jarring and the like during transportation and handling.

2. Enclosures shall be delivered in the manufacturer's original, unopened, protective packaging and shall be identified with suitable non-corrosive tags.

C. Where possible, maintain protective coverings until installation is complete and remove such coverings as part of the final cleanup.

1.06 SUBMITTALS

See Appendix "A" for submittal requirements.

1.07 SPARE PARTS

Furnish a minimum of three but not less than 10% spare fuses of each type and rating required and shown on the Contract Drawings.

PART 2. PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with the requirements of this Section, provide low voltage power circuit breakers, molded case circuit breakers, safety switches and fuses of one of the manufacturers specified on the Contract Drawings.

2.02 MATERIALS

A. General

1. Location, types, sizes, ratings and enclosures for overcurrent protective devices are shown on the Contract Drawings.

2. Overcurrent protective devices mounted in their own enclosures as shown on the Contract Drawings shall conform to the requirements of NEMA, UL, and NFPA. Enclosures shall be as specified in the Section of these Specifications entitled "PANELBOARDS ".

3. Overcurrent protective devices, to be installed as part of an assembly unit, shall be installed in accordance with the manufacturer's requirements for the specified assembly or as shown on the Contract Drawings.

4. Overcurrent protective devices and enclosures for which there are established UL standards, shall bear the UL label.

B. Low Voltage Power Air Circuit Breakers

1. General

a. All circuit breakers shall be 3 pole, single throw, 600V AC class, 60 Hz, trip free, with stored energy closing. Controls shall be as shown on the Contract Drawings.

b. Circuit breakers shall be of the draw-out type with self-aligning fingers to engage the line and load primary terminals.

c. The draw-out mechanism shall firmly support the breaker from the fully connected to the fully disconnected positions and shall be so designed as to permit racking the breaker without opening the door in all three positions: connected, test, and disconnected.

d. Interlocks shall be provided to prevent racking the breaker from the connected position to the test or disconnected position, or moving the breaker into the connected position while the breaker is closed.

e. Required circuit breaker sizes and ratings shall be as shown on the Contract Drawings.

f. In addition to all contract requirements to achieve the operation indicated on the Contract Drawings and specifications, provide the following spare contacts rated 125 VDC, 20 amperes continuous.

(1) A minimum of two normally open and two normally closed contacts, which shall operate when the breaker is in the fully connected position.

(2) A minimum of one normally open and one normally closed contacts, which shall operate when the breaker is withdrawn from the fully connected position. Contacts shall be rated 125V DC, 20 amperes continuous.

g. Provide a position indicator visible from the front of the switchgear for each breaker to indicate whether the breaker is open, tripped or closed.

h. Tripping shall be through integrally mounted solid state overcurrent and short circuit trip units with adjustable settings for long time, short time and instantaneous trip unless otherwise shown on the Contract Drawings.

2. Manually Operated Breakers

a. Provide manually operated circuit breakers with a front mounted handle to manually charge the stored energy closing mechanism.

b. Breakers shall be mechanically trip free and shall be furnished with provisions for the future addition of a control solenoid for remote closing.

c. Provide a mechanical trip and close button on the front of each breaker.

d. Provide a maintenance handle for slow closing during contact adjustment.

3. Electrically Operated Breakers

a. Provide electrically operated breakers with a motor- operated, stored-energy, closing mechanism. Motor voltage shall be as shown on the Contract Drawings.

b. Breakers shall be electrically and mechanically trip-free and each shall be provided with an electrically operated spring release to close the breaker.

c. Provide a mechanical trip button on the front of each breaker.

d. Provided an electrical close button or control switch on the front of each breaker.

e. Provide a maintenance handle for slow closing during contact adjustment.

f. Provide breakers with a shunt trip device for remote operation, arranged for both local and remote control of the closing and tripping functions.

4. Fused Circuit Breakers

a. Where shown on the Contract Drawings, fused circuit breakers shall be provided.

b. The fuses shall be current limiting type and shall be integrally or separately mounted units coordinated with overcurrent trip devices so as to avoid unnecessary blowing of the fuses.

c. Fused breakers shall have a blown fuse indicator and lockout device. The lockout device shall trip all phases upon blowing and prevent the breaker from being closed with any fuse element blown. Operation of the breaker shall not be permitted by this device until the fuse is replaced and the lockout reset.

d. The blown fuse indicator shall be visible from the front of the breaker and shall indicate which fuse has blown.

e. When a Protective Device Coordination Study is performed, the fuse rating shall be in accordance with the requirements of the protective study.

C. Molded Case Circuit Breakers

1. General

a. Molded case circuit breakers for panel or individual mounting shall be molded-case type, quick-make and quick-break on manual or automatic operation. The handle mechanism shall be trip-free to prevent holding contacts closed on a fault. Tripping shall be indicated by the handle automatically assuming a position between the manual "off" and "on" positions.

b. Molded case circuit breaker contacts shall be of the high-pressure type and shall be made of a silver composition material. Arc shields shall be provided to confine, cool, and quench the arc drawn at interruption.

c. Continuous ampere ratings and number of poles shall be as shown on the Contract Drawings.

d. Molded case circuit breakers shall be bolt-on type. Unless otherwise shown on the Contract Drawings or as required by the system interrupting rating, all 120V or 208V circuit breakers shall have a minimum short circuit interrupting rating of not less than 10,000 amperes (RMS symmetrical) and all 277V or 480V breakers shall have a minimum short circuit interrupting rating of not less than 18,000 amperes (RMS symmetrical).

e. All molded case circuit breakers feeding 120V or 277V lighting circuits that are not controlled by local wall switches shall be UL approved type "SWD" circuit breakers.

f. Each molded case circuit breaker shall be suitable for the circuit on which it is applied and the load that it controls.

g. Accessories including, but not limited to, auxiliary switches, shunt trips, undervoltage trips, ground fault sensing and tripping shall be as shown on the Contract Drawings.

2. Thermal-Magnetic Circuit Breakers

   a. Circuit breakers up to, but not including 400 amperes shall be thermal magnetic trip. Electronic trip circuit breakers rated 100 amperes or higher may be provided in lieu of thermal magnetic type.

   b. Automatic operation of the molded case circuit breaker shall be obtained by means of calibrated thermal and magnetic tripping devices for each pole of the breaker. The thermal device shall provide time-delay tripping on overloads, and the magnetic device shall provide instantaneous tripping on short circuits. The instantaneous magnetic trip shall be adjustable and accessible from the front of the breaker on frame sizes above 100 amperes.

3. Electronic Trip Circuit Breakers

   a. Circuit breakers rated 400 amperes and higher shall be electronic trip.

   b. The integral trip system shall be independent of any external power source and shall contain industrial grade electronic components as a minimum.

   c. Circuit breakers shall be equipped with back-up thermal magnetic trip system unless otherwise indicated on the Contract Drawings.

   d. Circuit breaker trip system shall be a microprocessor based true rms sensing design.

   e. The sensor size rating plug and adjustment positions shall be clearly marked on the face of the circuit breaker.

   f. The following time/current adjustments shall be provided. Each adjustment shall have discrete settings and shall be independent of all other adjustments.

      Long time pick up
      Long time delay
      Short time pick up
      Short time delay
      Instantaneous pick up
      Ground fault pick up
      Ground fault delay

   g. A means to seal the trip unit adjustments in accordance with NEC shall be provided.

   h. Local visual trip indication for overload short circuit and ground fault trip occurrences shall be provided.

D. Safety Switches

1. Safety switches shall conform to NEMA KS-1, UL 98 and FSW-S-865.

2. Safety switches shall conform to the NEMA classification and shall be rated, as shown on the Contract Drawings.

3. Safety switches utilized for service entrance shall include a groundable insulated neutral.

4. Safety switches shall be of the quick-make, quick-break type with terminals suitable for copper conductors, shall be padlockable in the "off" position and shall be equipped with defeatable door interlocks.

E. Fuses

1. Fuses shall be of the class, size and ratings (current, voltage, interrupting capacity, type, NEMA class) as shown on the Contract Drawings.

2. Fuses shall conform to UL 198 and ANSI C97.1 for low voltage fuses.
3. Unless otherwise shown on the Contract Drawings, fuses used in conjunction with motor protection shall be current limiting, dual element, time-delay type.

PART 3. EXECUTION

3.01 INSTALLATION

A. General

Unless otherwise shown on the Contract Drawings, overcurrent protective devices shall be installed in conformance with NFPA 70, and UL 98, in accordance with the manufacturer's instructions and in accordance with the requirements of this Section.

B. Fuses

1. All fuses rendered inoperative during the Work shall be replaced before the issuance of the Certificate of Final Completion.
2. All replacement fuses shall be provided in addition to the spare fuses specified in 1.07 herein.

END OF SECTION

SECTION 16475

OVERCURRENT PROTECTIVE DEVICES (600 VOLTS OR LESS)

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16475A01	Fuses; time-current and current-limiting curves for both melting and clearing.
16475A02	Circuit breakers; time-current curves.

Catalog Cuts

16475B02	Molded case circuit breakers.
16475B03	Safety Switches
16475B04	Fuses

END OF APPENDIX "A"

DIVISION 16

SECTION 16510

LIGHTING SYSTEMS

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for Lighting Systems.

1.02 REFERENCES

American National Standards Institute (ANSI)

ANSI C 78.379	Electric Lamps - Incandescent and High-Intensity Discharge Reflector Lamps - Classification of Beam Patterns
ANSI C 82.1	Ballasts for Fluorescent Lamps – Specifications
ANSI C 82.4	Ballasts for High-Intensity Discharge and Low Pressure Sodium Lamps

Illuminating Engineering Society of North America (IESNA)

National Equipment Manufacturers Association (NEMA)

NEMA WD6	Wiring Devices - Dimensional Requirements

National Fire Protection Association (NFPA)

NFPA 70	National Electrical Code
NFPA 101	Life Safety Code

Administrative Code

NYCEC	Electrical Code of the City of New York

Underwriters Laboratories (UL)

UL 57	Electric Lighting Fixtures
UL 844	Electric Lighting Fixtures for Use in Hazardous (Classified) Locations
UL 924	Emergency Lighting and Power Equipment
UL 935	Fluorescent Lamp Ballasts
UL 1029	High-Intensity-Discharge Lamp Ballasts
UL 1570	Fluorescent Lighting Fixtures
UL 1571	Incandescent Lighting Fixtures
UL 1572	High Intensity Discharge Lighting Fixtures

OSHA Occupation Safety and Health Administration

The Energy Policy Act of 1992

Lamp Efficiency Labeling and Standards

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. Lighting System shall be furnished, supplied, installed and adjusted in accordance with this Section and as specified on the Contract Documents.

B. Components of the Lighting System manufactured, supplied, and installed shall comply with the requirements of NFPA 70, NFPA 101, all local codes, and the requirements of OSHA.

1.04 QUALITY ASSURANCE

A. Entities manufacturing lighting fixtures, equipment, and components specified herein, and as shown on the Contract Drawings, shall have a minimum of five years of manufacturing experience and shall demonstrate prior experience on at least two projects involving complexities similar to those required under this Contract.

B. Lighting equipment for which there is a nationally recognized standard shall be safety tested and bear the conformance labeling of the third party inspection authority, such as Underwriters Laboratories Inc. (UL), ETL, Factory Mutual, or approved equal, certifying that the lighting fixtures and equipment are listed as suitable for the purpose specified and shown on the Contract Drawings.

C. Lighting equipment shall be manufactured and installed in compliance with applicable articles of NFPA 70, NFPA 101 and NYCEC.

1.05 DELIVERY, STORAGE AND HANDLING

A. Lighting fixtures shall be wrapped for protection during delivery, storage, and handling. Wet or damp wrapping shall be removed, and disposed of, to prevent staining finish.

B. Deliver materials in manufacturer's original, unopened, protective packaging.

C. Store materials in original packaging in a manner to prevent soiling and physical damage, prior to installation.

D. Handle in a manner to prevent damage to finished surfaces.

E. Where possible, maintain protective covering until installation is complete and remove such coverings as part of final cleanup.

1.06 SPARE PARTS

A. Unless otherwise noted on the Contract Document, provide 10% (or minimum of 12) replacement lamps for each type of lamp installed.

B. Unless otherwise noted on the Contract Document, provide 5% (or minimum of 2) replacement ballasts for each type of ballast installed.

1.07 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

A. General

All components of the lighting system shall be manufactured by the companies shown on the Contract Drawings.

2.02 MATERIALS

A. General

The location, number, size, and type of all lighting fixtures and accessories to be installed shall be as shown on the Contract Drawings.

B. Lighting Fixtures

Lighting fixtures shall be furnished with lamps, which comply with the requirements of this Section, and as shown on the Contract Drawings. All fluorescent and high intensity discharge lighting fixtures supplied shall come with factory installed ballasts, which comply with the requirements of this Section, and as specified on the Contract Drawings.

Unless otherwise shown on the Contract Drawings lighting fixtures shall comply with the following requirements:

1. Housing

   a. Lighting fixtures shall be of rigid construction and built in accordance with NEMA WD6.

   b. Ferrous components shall be protected from corrosion by plating or finished with white baked enamel unless another color is shown on the Contract Drawings. All paint shall be spray-applied and baked at 350°F, for at least 20 minutes. Interior surfaces of all fluorescent fixtures shall be white enamel of minimum 87% reflectance.

   c. Exposed parts of the lighting fixture housing shall be free from spinning lines, ripples, or other visible marks and manufacturer's stickers.

   d. Outdoor lighting fixture housings shall be constructed of copper-free cast aluminum (copper content less than 0.4%, Alloy 360.4) or stainless steel. Housings shall be properly gasketed to be watertight. All hardware shall be stainless steel.

   e. Recessed lighting fixture housings shall be constructed of a minimum 20-gauge cold-rolled steel and painted with a white, baked enamel finish.

   f. Pendant and surface-mounted, continuous lighting fixture housings shall be constructed of extruded aluminum and treated with the finish specified on the Contract Drawings.

   g. Ballast compartment shall be so designed that ballast temperature shall not exceed the UL limit of 105°C at 40°C ambient temperature.

2. Optical System

   a. Reflectors

      (1) Unless otherwise shown on the Contract Drawings, fluorescent, parabolic louvers shall be constructed of non-iridescent, semi-specular aluminum with a minimum reflectance of 85%.

      (2) Diffuser reflectors shall be finished with high-reflectance, baked white enamel with a non-yellowing binder.

      (3) Clear reflector inserts for fluorescent lighting fixtures shall be fabricated of aluminum or steel backing with a silver film laminate which shall be guaranteed by the entity manufacturing the lighting fixtures against separation and peeling for a minimum of five years. Minimum reflectance shall be 92%.

      (4) The visible clear Alzak reflectors shall be of non-iridescent finish with a minimum reflectance of 90%.

   b. Lenses, Diffusers, and Shielding Devices

      (1) Lenses, diffusers, and shielding devices shall be properly and securely mounted within the lighting fixture housing. Lay-in lenses, diffusers, or shielding devices shall not be acceptable.

      (2) Glass lenses or diffusers shall be constructed of tempered, borosilicate glass.

(3) Plastic lenses or diffusers shall be white opal or clear, prismatic, 100% ultraviolet-stabilized acrylic or high-impact polycarbonate. Plastic lenses shall be installed with the smooth side out.

(4) The shielding and optical materials shall be tightly fitted with no loose parts and shall show no visible leaks of unintentional light.

3. Exit Signs

a. Furnish single and double face Exit Signs with hardware suitable for wall or ceiling mounting as shown on the Contract Drawings.

b. Exit Signs shall be guaranteed by the manufacturer for a minimum of five years.

c. Surface mounted Exit Signs shall be of die-cast aluminum construction with aluminum faceplates and invisible universal arrows and mounting knockouts for field adjustment. Finish of the housing and faceplates shall be as shown on the Contract Drawings. Exit Signs shall be single or double face, and shall be suitable for ceiling, back, or end mounting.

d. Edge-lit Exit Signs shall be of UV stabilized acrylic construction with inbeded, laminated legend and arrows.

e. Exit Signs shall be energized from either 120 VAC or 277 VAC. Exit Signs shall operate on Light Emitting Diode (LED) light sources and shall consume a maximum of six watts per Sign face.

f. Average luminance of the legend "EXIT" shall be no less than 15 cd/m^2 (5 Fl) with uniformity ratio (max/min) no greater than 3/1.

4. Emergency Battery Operated Lights

a. Emergency Battery Operated Lights specified herein shall be:

(1) Fluorescent Fixture with internal or external battery pack

(2) Battery Operated Exit Sign

(3) Incandescent Emergency Lighting Fixture

b. Emergency Battery Operated Lights shall automatically switch "ON" when normal or emergency power supply fails and provide a minimum of 90 minutes of reduced illumination.

c. The fluorescent batteries of fixtures used for both, normal and emergency lighting, shall be of the nickel-cadmium or the lead-calcium type and shall have sufficient electrical capacity to energize the connected lamps at a minimum of 50% of normal light output. The battery shall be guaranteed by the manufacturer for a minimum of five years.

d. The battery charger shall be the dual-rated type and shall have sufficient capacity to recharge the discharged battery to full charge within twelve hours, maximum.

e. Emergency Battery Operated Lights shall be equipped with a test switch and an LED lamp indicating AC power is on.

C. Lamps

1. General

Lamps shall comply with the requirements of the Energy Policy Act of 1992 or it's latest editions.

2. Fluorescent Lamps

Unless otherwise shown on the Contract Document, lamps shall comply with the following requirements:

a. Tubular Type

(1) Lamp tube diameter shall be T8, T10, or T12

(2) Lamps shall have triphosphor coating with a minimum Color Rendering Index (CRI) of 70

(3) Minimum average lamp life at 3 hours per start shall be 20,000 hours

(4) Minimum efficiency shall be 80 lm/W (lumens per Watt).

(5) Maximum lamp lumen depreciation at the end of rated life shall be 20%

b. High Output (HO) and Slimline Type

(1) Lamp tube diameter shall be T8 or T12

(2) Lamps shall have triphosphor coating with a minimum Color Rendering Index (CRI) of 70

(3) Minimum average lamp life at 3 hours per start shall be 12,000 hours

(4) Maximum lamp lumen depreciation at the end of rated life shall be 20%

c. Compact Fluorescent Lamps

(1) Minimum average lamp life at 3 hours per start shall be 10,000 hours

(2) Lamp shall have a triphosphor coating with a minimum Color Rendering Index (CRI) of 82

(3) Minimum efficiency shall be 65 lm/W

(4) Maximum lamp lumen depreciation at the end of rated life shall be 15%

3. Incandescent and Tungsten Halogen Lamps

Unless otherwise shown on the Contract Document, lamps shall comply with the following requirements:

a. Incandescent and tungsten halogen lamps shall have a minimum average lamp life of 2500 hours.

b. Incandescent reflector type lamps shall have beam patterns as shown on the Contract Drawings and conforming to ANSI C 78.379.

4. High Intensity Discharge Lamps

Unless otherwise shown on the Contract Documents, lamps shall comply with the following requirements:

a. High Pressure Sodium (HPS) Lamps

(1) Minimum average lamp life at 10 hours per start: 24,000 hours

(2) Minimum efficiency: 75 lm/W

(3) Maximum lamp lumen depreciation at the end of rated life: 20%

(4) Maximum color shift: ±250 degrees Kelvin

b. Metal Halide (MH) Lamps

(1) MH lamp fixtures shall be connected only to circuits that are turned off for at least 15 minutes a week. Use of MH lamps in uninterrupted 24-hour operation circuits is not permitted.

(2) Minimum average lamp life at 10 hours per start shall be 15,000 hours for lamp burning in a vertical position. For lamps burning in a horizontal position, as follows:

Lamps < 400 W:	10,000 hours
400 W lamps:	20,000 hours
1000 W lamps:	12,000 hours

1500 W lamps: 6,000 hours

(3) Minimum efficiency: 75 lm/W

(4) Maximum lamp lumen depreciation at the end of rated life: 30%

(5) Maximum color shift: ±250 degrees Kelvin.

(6) Minimum Color Rendering Index (CRI): 65

c. Mercury Vapor (MV) Lamps

Unless otherwise shown on the Contract Drawings, MV lamps shall not be permitted for general illumination purposes.

D. Ballasts

1. Fluorescent Lamp Ballasts

a. Fluorescent lamp ballasts shall comply with ANSI C 82.1 and shall be Class 'A' sound rated Class 'P' listed by ETL and UL.

b. Fluorescent lamp ballasts shall be certified for the appropriate for the application minimum starting temperature.

c. Unless otherwise shown on the Contract Drawings, fluorescent lamp ballasts for indoor applications shall be high-frequency, electronic type, suitable for operation in rapid start circuitry and comply with the following requirements:

(1) Minimum Power Factor: 0.950

(2) Total Harmonic Distortion: less than 20%

(3) Lamp Current Crest Factor: less than 1.7

(4) Lamp Current Frequency: greater than 20 kHz

(5) In-rush current: less than 20x normal current

d. Fluorescent lamp ballasts shall be wired and grounded in accordance with NFPA 70 and the manufacturer's written instructions.

2. High Intensity Discharge (HID) Ballasts

a. HID lamp ballasts shall comply with ANSI C 82.4, and shall be the high-power factor, constant wattage auto-transformer (CWA), or similar, type of automatic wattage regulation.

b. The power loss of HID lamp ballasts, as a percentage of lamp wattage, shall not exceed 20%.

c. HID lamp ballasts for indoor applications in public spaces shall be encased and potted for the purpose of noise reduction.

d. HID lamp ballasts shall be wired and grounded in accordance with NFPA 70 and the manufacturer's written instructions.

e. Remote HID lamp ballasts shall be installed in accordance the manufacturer's written instructions.

f. Unless otherwise noted on the Contract Drawings all HPS ballasts, which are not used in 24 hours operations, shall be furnished with automatic protective starters. An automatic protective starter shall apply pulses for no more than 15 minutes and then deactivate if a lamp arc cannot be initiated.

E. Fuses

Fuses and fuse assemblies shall be as shown on the Contract Drawings.

F. Lighting Control

1. Lighting Management System

a. The lighting management system shall automatically switch lights on and off according to a time clock schedule, amount of daylight present, and in accordance with the requirements of this section and as shown on the Contract Documents.

b. A factory-trained field service engineer shall be to functionally test each hardware and software component in lighting management system after installation, and to provide on-site training for Authority personnel. The minimum of 16 hours training session shall consist of the following parts:

(1) general description of the system and operational functions of it's components

(2) hands on training for each of the hardware components (performance, maintenance, repair, parts replacement)

(3) hands on software training (programming, operation, modem connection)

At least two representatives from the facility where the system is being installed, two representatives from the electrical maintenance group and two representatives from the Authority engineering department shall be present for the training.

Manufacturer shall provide a minimum of 6 complete operation manuals.

c. Remote Power Switching Panelboards

(1) The remote power switching lighting panelboards shall be mounted in electrical closets and shall comply with Section 16470 of these Specifications and as specified on the Contract Documents.

(2) The remote power switching panelboards shall consist of a microprocessor-based control module, interface module, control busses, remote-controlled breakers, and Class 2 barriers.

(3) The remote power switching panelboards shall meet or exceed the following capabilities:

(a.) Individual control for up to 42 remotely controllable circuit breakers.

(b.) Eight dry-contact inputs for connection to either 2-wire maintained or 3-wire momentary external control devices.

(c.) Zone creation and control of individual circuit breakers or zones.

(d.) Run/Halt/Hold/All-On operational modes.

(e.) Individual circuit breaker and zone manual override.

(f.) Circuit breaker status monitoring.

(g.) Security access codes.

(h.) Telephone override.

(i.) Diagnostic testing of memory, keyboard, screen, com ports, and circuit breaker.

(j.) Expansion port to connect additional inputs via expansion cabinet.

(k.) RS-232 port for connection to personal computer.

(l.) Non-violable EEPROM memory.

(4) All electronic modules and circuit breakers in the panelboards shall be mounted in the positions and control the loads as indicated on the panel wiring schedules indicated on the Contract Drawings.

(5) Emergency panelboards shall respond to the loss of normal power in the associated normal panel by automatically switching on all emergency circuits.

d. Addressable Relay Panels

(1) Addressable relays shall provide inputs and outputs directly compatible with the existing remote power switching panelboard system.

(2) Each remotely controlled relay panel shall be furnished with at least one manual on/off override.

(3) The addressable relay panels shall meet or exceed the following capabilities:

(a.) Protocol shall be based on a modified ANSI 3.28.

(b.) Run length without repeaters shall be 10,000 feet at 9,600 Baud, full duplex.

(c.) Up to 16 analog inputs and digital inputs. These inputs shall except directly, occupancy sensors and variable output ambient light sensors.

(d.) All information shall be stored internally in register locations and be readable/writeable from any device on the high-speed network.

(e.) Addressable in the range of up to 32 panels.

2. Photoelectric Control Devices

a. The location, number, size, and type of all ambient light sensors, timers, and occupancy sensors to be installed shall be as shown on the Contract Drawings.

b. The ambient light sensor shall have a cadmium sulphide, hermetically sealed photocell, shall be fully temperature-compensated, and shall provide for a time delay of at least 15 seconds to prevent false switching. The ambient light sensors shall be remotely mounted where shown on the Contract Drawings.

c. The ambient light sensor shall meet or exceed the following capabilities:

(1) There shall be different lighting sensors for different tasks (i.e. atrium, skylight and outdoor).

(2) Separately mounted resolution enhancement adjustment.

(3) The photoelectric device shall be a class 2, low voltage type.

(4) Output shall be directly proportional to light measured.

(5) Fully adjustable response in the range between 0 and 10,000 foot-candles with +/-1% accuracy at 21C.

(6) The housing shall be constructed from flame-retardant material, and meet UL984 HB standards.

(7) Outputs shall be 4-20mA or 0-10Volt.

(8) Power supplies shall be available in a range of voltages.

d. The time switch shall function to prevent lighting from being energized at pre-set periods each day. The time switch shall permit different "ON-OFF" settings for each day of the week, with provision for omitting selected days. The time switch shall have at least 4 inputs. Unit shall be capable of retaining memory for no less than 90 days. When permitted by the time switch, photoelectric controls shall operate to energize lighting whenever natural lighting falls below 2,5 lux (25 FC).

3. Occupancy sensors

a. The occupancy (motion) sensors shall be designed to control lighting automatically based on the presence or absence of people.

b. The ultrasonic occupancy sensors shall produce a low intensity, inaudible sound (above 22KHz) and detect changes in the acoustic waves caused by motion. The sensors shall not respond to audible sound. If the sensors detect motion, the internal or external relays shall close the contacts and turn on the connected lighting loads. If no motion occurs within a pre-set period of time, the lights shall be automatically turned off.

c. Ultrasonic detectors shall be precision crystal-controlled. Sensors shall not interfere with each other when two or more sensors are placed in the same room.

d. The passive infrared occupancy sensors shall maintain a detection when the person of average size and weight moves within a maximum distance of 8 inches at the speed of 12 inches per second.

e. The occupancy sensors shall be equipped with LED walk indicator, which shall be visible from any area in the room.

f. The occupancy sensors shall be furnished with an adjustable timer for delayed turn-off. The time delay shall be adjustable from 30 seconds to 15 minutes.

g. The occupancy sensors shall be furnished with adjustable sensitivity control. Although, sensitivity shall be high, false triggering by random noises or motions other than human movement shall not be permitted.

h. The occupancy sensors shall be furnished with manual override switch that will enable a bypass of the sensor in the event of failure.

i. The sensors shall be connected to power modules. The power module consumption shall not exceed 2VA in any mode of operation. The power modules shall combine a Class 2 (120V/277V) transformer and heavy duty relay with form A isolated contacts in a single housing. The relay shall be rated for 20A operation.

j. The sensors shall be suitable for ceiling-mounted installation and shall not protrude more than 1-1/2 inches from the ceiling surface.

k. All sensors or equipment supplied shall be accompanied by electronic circuit diagram, component layout, circuit description and installation instructions.

l. All devices shall have a minimum three-year factory warranty for materials and labor.

m. All sensors shall be properly masked and adjusted for required sensitivity and time delay. Coordinate adjustments with manufacturer.

4. Dimmers

a. Wallbox dimmers shall be of linear sliding type and shall be rated for operation with the specified connected load. Dimmer shall be designed to smoothly change light output of the lamps without visible flicker. Rotary type dimmers are not permitted.

b. Wallbox dimmers shall be equipped with built in on/off switch and preset control button.

c. Furnish an appropriate wallbox dimmer for each individual type of load:

(1) Incandescent

(2) Electronic low voltage

(3) Magnetic low voltage

(4) Fluorescent

d. Preset dimming control system shall be as shown on Contract Drawings and shall meet or exceed the following capabilities:

(1) System shall have four preset scenes and off for up to 8 control zones.

(2) System shall be mountable in a standard 2, 3 or 4 gang metal wallbox. Wallbox shall be as specified in Section 16135 of this Specification.

(3) One raise/lower switch with visual display shall be available for each zone.

(4) A temporary master raise/lower switch shall move all light levels up or down.

(5) System shall have smooth fade mode. Switching time between scenes shall be adjustable from 1 second to 90 minutes.

(6) A temporary zone override shall be provided.

(7) Multiple controls and remote wallstations shall be capable of activating each of the preset scenes and shall not interfere with each other.

G. Contactors

1. Contactors shall be of the single coil, electrically operated, mechanically held type. Positive locking shall be obtained without the use of hooks, latches, or semi-permanent magnets. Contactors shall be required to make, but not break, the operating coil current.

2. The contactor's main contacts shall be the double break, silver-to-silver type protected by arcing contacts. Contacts shall be self-aligning and renewable from the front of the panel.

3. The contactor's control connections shall be clearly marked "L" for line wire, "C" for closing wire, and "O" for opening wire. A manual operating lever shall be included with the contactor.

4. Each contactor shall be equipped with a control line fuse, a coverplate to conceal contacts, and one normally open auxiliary contact.

5. Unless otherwise shown on the Contract Drawings, contactors shall be mounted separately in a sheet steel, NEMA 12 enclosure. Grouped contactors shall be installed in a common sheet steel, NEMA 12 enclosure.

6. Unless otherwise shown on the Contract Drawings, relays for two-wire control shall be provided, where required, for the operation specified on the Contract Drawings.

PART 3. EXECUTION

3.01 EXAMINATION

A. Inspect all lighting fixtures, equipment, and accessories prior to installation. Replace any damaged items.

3.02 PREPARATION

A. The Contractor shall be responsible for field verification of dimensions and coordination of conduit entry and all other mounting conditions with the entity manufacturing lighting fixtures.

B. Unless otherwise shown on the Contract Drawings, all lighting outlets shall have lighting fixtures. In instances where a specific lighting fixture has not been assigned to a lighting outlet, furnish and install a complete lighting fixture of the type and wattage designated for outlets of similar function and/or type as directed by the Engineer.

C. Unless otherwise shown on the Contract Drawings, lighting fixtures and/or fixture outlet boxes shall be provided with hangers to adequately support the complete weight of the lighting fixture. The design of hangers and the method of fastening other than what is shown on the Contract Drawings, or herein specified, shall be submitted to the Engineer for approval.

3.03 INSTALLATION

A. Install all lighting equipment and accessories, as well as all lighting fixtures, complete with lamps, in the locations shown on the Contract Drawings in accordance with the manufacturer's written instructions. All lighting fixtures shall be properly secured to structural elements.

B. Lighting fixtures shall be carefully supported and aligned with necessary hangers, supporting members, and plaster frames for proper installation, all as shown in the Contract Drawings and the Specifications, and as approved by the Engineer. No rivets, springs, or other hardware shall be visible after installation.

C. Lighting fixtures shall be supported to satisfy seismic requirements described in applicable local codes.

D. All lighting fixtures shall be properly wired and connected to branch circuits, tested, and left ready for operation. Bond all lighting fixtures and metal accessories to the branch circuit-grounding conductor.

E. Where a continuous string of lighting fixture is specified to be installed, the lighting equipment shall be installed so as to produce a continuous, straight, unbroken band of light, free of visual imperfections, socket shadows, light gaps, etc.

F. All pendant-mounted lighting fixtures within the same room or area shall be installed plumb, and at a uniform height from the finished floor. Adjustment of a height shall be made during the installation. Unless otherwise shown on the Contract Drawings, stems and canopies shall be matched to the associated lighting fixtures.

G. Install recessed lighting fixtures to permit removal from below. Use accessories and firestopping materials to meet regulatory requirements for fire rating.

3.04 ADJUSTMENTS

A. Prior to final inspection, relamp all fixtures which have failed lamps, or lamps where visible color shift has occurred, and leave all lighting fixtures, equipment, and accessories in good, uniform operating condition. The Contractor shall replace any burned-out lamp during the first 100 days after the completion of the Contract.

B. Aim and adjust all lighting fixtures as shown on the Contract Drawings.

C. Adjust exit sign arrows as shown on the Contract Drawings.

D. Cleaning

1. Clean all components of the lighting system to remove conductive and deleterious materials.
2. Remove dirt and debris from all enclosures.
3. Clean finishes and touch up damage.

END OF SECTION

SECTION 16510

LIGHTING SYSTEMS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16510A01 For each lighting fixture type: Clearly illustrate assembly methods, detailed dimensions, mounting details, materials, finishes, electrical components, and light sources.

16510A02 For each ballast type: Submit manufacturer's data with ballast description, catalog number, lamp type, input voltage, in-rush current, line current, input wattage, ballast factor, power factor, crest factor, minimum starting temperature, total harmonic distortion and wiring diagram.

16510A05 Photoelectric Control Devices: Submit manufacturer's data for ambient light sensors, timers, infrared and ultrasonic occupance sensors.

END OF APPENDIX "A"

DIVISION 16

SECTION 16527

HIGH MAST FLOODLIGHT SYSTEMS

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for high mast floodlight systems.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	National Fire Protection Association (NFPA)
NFPA 70	National Electrical Code
NFPA 101	Life Safety Code
	American Association of State Highway and Transportation Officials (AASHTO)
AASHTO LTS-2	Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals
	American Society for Testing and Materials (ASTM)
ASTM A 36	Structural Steel
ASTM A 123	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 143	Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
ASTM A 153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 615	Deformed and Billet-Steel Bars for Concrete Reinforcement
ASTM A 572	High-Strength Low-Alloy Columbium-Vanadium Steel of Structural Quality
ASTM A 595	Steel Tubes, Low-Carbon, Tapered for Structural Use
	American Institute of Steel Construction (AISC)
AISC	Specification for the Design, Fabrication and Erection of Structural Steel for Buildings
	American Welding Society (AWS)
AWS D 1.1, D 1.5	Structural Welding Code, Steel

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. The high mast floodlight systems shall be furnished, supplied, installed, adjusted and tested in accordance with this Section and as specified on the Contract Drawings.

B. The high mast floodlight poles shall be designed in accordance with AASHTO LTS-2, the local Building Code and the provisions of the AISC Specifications. In case of conflict, the more stringent requirement shall govern. The poles shall be designed for vibration and fatigue using two million vibration cycles. All structural details shall be checked for fatigue resistance by applying governing fatigue loading, computing nominal stress ranges at the details and assuring that the stress ranges are less than the constant-amplitude fatigue limits for the particular details.

C. The design windload shall be the pressure of the wind based on a wind velocity of 90 m.p.h. (and shall include a 30 percent gust factor) on the pole with all appurtenances installed as shown on the Contract Drawings, including but not limited to lowering ring, luminaries, pole and base.

D. Physical properties of poles shall be such that horizontal linear displacement due to the transverse load application is not greater than 5% of the structure height or the limitations set by vibration or fatigue analysis.

E. Structural design calculations of floodlight poles assemblies, including anchor bolts, bases, and lowering devices shall be signed and sealed by a Professional Engineer licensed in the State where the installation will take place.

1.04 QUALITY ASSURANCE

A. Entities manufacturing high mast floodlight equipment, and components specified herein, and as shown on the Contract Drawings, shall have a minimum of five years of manufacturing experience and shall demonstrate prior experience on at least two projects involving complexities similar to those required under this Contract.

B. Electrical equipment for which there are a nationally recognized standards shall be safety tested and bear the conformance labeling of the third party inspection authority, such as Underwriters Laboratories Inc. (UL), Electrical Testing Laboratory (ETL), Factory Mutual, or approved equal, certifying that the electrical equipment is listed as suitable for the purpose specified and shown on the Contract Drawings.

C. Electrical equipment shall be manufactured and installed in compliance with applicable articles of NFPA 70, NFPA 101 and all local codes.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in the manufacturer's original, unopened, protective packaging. Wet or damp wrapping shall be removed, and disposed of, to prevent staining finish.

B. Store materials in manufacturer's original protective packaging in a manner to prevent soiling and physical damage, prior to installation.

C. Maintain protective covering until installation is complete and remove such coverings as part of final cleanup.

D. Handle in a manner to prevent damage to finished surfaces. Touch up any damage to finishes to match adjacent surfaces.

1.06 SPARE PARTS

A. Unless otherwise noted on the Contract Drawings, provide 10% (or minimum of one) spare winch assemblies.

B. Unless otherwise noted on the Contract Drawings, provide 10% (or minimum of 12) replacement lamps for each type of lamp installed.

C. Unless otherwise noted on the Contract Drawings, provide 5% (or minimum of 2) replacement ballasts for each type of ballast installed.

1.07 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

Subject to compliance with requirements of this Section, provide high mast floodlight systems of manufacturers listed on the Contract Drawings.

2.02 MATERIALS

Unless otherwise noted on the Contract Drawings, materials for high mast floodlight systems shall be as specified below:

A. Pole

Pole shaft shall consist of round and multi-sided tapered steel tubes. Pole sections over 12.5 inches in diameter shall be fabricated of ASTM A 572, Grade 65 material with minimum yield strength of Fy = 65ksi. Sections 12.5 inches and under in diameter shall be fabricated of ATSM A 595, Grade A steel modified to 55,000 psi minimum yield strength. Shaft shall be hot-dip galvanized after fabrication in accordance with ASTM A 123 and A 143.

B. Anchor Base Plate

Steel plate fabricated from hot rolled weldable, low carbon steel conforming to ASTM A 572, Grade 42 shall be circumferentially welded to the pole top and bottom. The material shall possess a minimum yield strength of Fy = 42 ksi. Base Plate shall be hot-dip galvanized after fabrication in accordance with ASTM A 123 and A 143.

C. Anchor Bolt Assemblies

Fabricated from low carbon high strength steel alloy conforming to ASTM A 615 possessing a minimum yield strength of Fy = 75 ksi. Each anchor bolt shall be provided with two (2) hex nuts and two (2) flat washers and two (2) leveling shims. The threaded end of each anchor bolt and each hex nut and washer shall be hot-dip galvanized in accordance with ASTM A 153 without hydrogen embrittlement.

D. Bracket Arms

Fabricated from 2" schedule 40 pipe shall conform to ASTM A 513.

E. Lighting Fixture Housings

Fabricated from copper-free aluminum Alloy 360.1 with 0.4% copper content.

2.03 CONSTRUCTION FEATURES

A. General

The locations, sizes and types of high mast floodlight pole assemblies are shown on the Contract Drawings.

B. Pole

1. Shaft shall be tapered steel tubing. All shaft steel shall be full gauge without laminations. All sections of the shaft shall have a uniform taper from top to bottom and shall be full length longitudinally welded. Weld shall be as per AASHTO LTS-2, AWS D1.1 & D1.5, whichever will govern. All welds shall be inspected by methods described in AASTO LTS-2. The Authority shall perform additional testing as directed by the Engineer.
2. The overall height dimension as shown on the Contract Drawings shall be achieved by a combination of shop welding and/or field telescoping of one section onto another.
3. Pole shaft shall be secured to the ground by base plate with anchor bolts.
4. All transverse welds and all base plate welds shall be 100 percent penetration. Longitudinal welds shall be 60 percent minimum penetration. The longitudinal weld in slip joint area shall be reinforced. Inspection shall consist of ultrasonic testing for all 100 percent penetration welds, visual and magnetic particle for all others.
5. Overall pole height shall not deviate from the specified height plus or minus 1 percent. Sweep and camber shall be maximum of 1/8 inch per 5 feet. Twist shall be a maximum of 10 degrees overall.
6. The handhole shall be located 6 inches above the base plate and shall be approximately 14 inches by 36 inches outside dimensions and shall have a suitable hinged door and quarter turn lock.
7. Welded splices or connections shall be in accordance with AWS D 1.1. In material where the yield point is increased by cold working or other physical means, the strength of the welds themselves shall be based upon the properties of the base metal prior to working.
8. A grounding lug shall be welded adjacent to the equipment handhole inside the pole, and shall be suitable for connection with #4/0 AWG bare copper cable as shown on the Contract Drawings.
9. Resistance of all joints in pole shall not exceed that of parent material.
10. Lightning rod assembly shall be bronze and mounted on top of pole. Rod shall be 2-inch diameter, lead coated solid copper and shall have a terminal as shown on the Contract Drawings.
11. Each anchor bolt shall be threaded as required, and have a 90 degree hook. Anchorage shall be based on the more stringent of AISC and AASHTO codes. Anchor bolts shall be provided with a full-size bolt circle template.
12. The foundation and anchorage system shall be designed for loads equal to, or greater than, the maximum loads that the pole is designed for. The geotechnical criteria shall be stated in order to determine the type of footing to be used (i.e. spread footing).

C. Lowering Device

1. Power Unit

   a. The power unit shall be a drill type tool with a heavy duty reversing motor with the stalled torque at least twice that required to operate the device. The motor shall drive the winch through the torque limiter coupling to limit the lifting force exerted on the cables. The torque limit shall be factory pre-set. There shall be a back-up shear pin designed to shear at torque level between 50% and 100% over the torque limiter setting. Provide five extra pins with each power unit. The motor shall be controlled by the switch connected by a 20-foot remote cord.

b. The motor shall be provided with a support frame that can be mechanically connected to the winch assembly.

c. The portable power unit shall be provided with a portable, enclosed and encapsulated transformer to step down the voltage from the value specified on the Contract Drawings to 120V to operate the power unit. The transformer shall be provided with carrying handle. All electrical connections shall be pre-wired outdoor type twist-lock caps and plugs.

d. Utilize the unit in the erection of the floodlight pole assemblies and upon completion of said work deliver the unit, in good operating condition, to a location designated by the Engineer.

e. Unless otherwise indicated on the Contract Drawings, provide one power unit per each ten poles installed.

2. Winch and Gear Reducer Assembly

a. The winch shall be designed for power operation. The winch shall have a strength at least five (5) times the lifted load with the number of layers of cable with which it will be used. The winch shall be supported from both ends and stainless steel keepers shall be provided to ensure the uncoiled cable will properly rewrap onto the drum.

b. The worm gear reducer shall have a minimum of 30 to 1 reduction ratio and include an internal drag brake on the worm shaft to prevent free spooling of the winch drum.

c. The drum shall be capable of winding 150 feet of cable and shall be factory pre-wound with stainless steel 7x19 aircraft cord of 1/4-inch diameter and sufficient length to maintain at least eight (8) complete wraps on the drum after the device has been lowered to its lowest position.

d. A disconnecting type clevis assembly shall be crimped on the end of the drive cable at the factory, and an adapter plate for connecting the reducer onto the drive mounting plate shall be provided with each reducer assembly.

e. The winch shall be welded to a removable mounting plate connected to the pole structure with four (4) stainless steel bolts and with welded bottom lip to release stress from the bolt connections.

f. All hardware shall be hot-dip galvanized according to ASTM A 153.

3. Transition Clevis Assembly

a. The transition clevis assembly shall be fabricated of A 36, quality steel and shall be hot-dipped galvanized.

b. A transition clevis assembly shall be used to properly attach winch cable to the three (3) hoisting cables and the main electrical power cord. To prevent the cables from untwisting while loaded, which would result in a reduction of tensile strength of the cable, the clevis shall not allow either the winch cable or any of the hoisting cables to independently rotate.

c. The underside of the transition plate shall contain three compression springs Type S54. The springs shall be internally supported by a galvanized eye-bolt assembly for connection to the main drive cable. Each spring loaded eye-bolt shall have its corresponding 7x19 stainless steel woven aircraft hoisting cable of 3/16" diameter attached to it by means of factory installed crimps.

4. Headframe Assembly

a. The headframe shall be attached to the pole by means of a steel slip fitter and secured by stainless steel screws. The assembly shall be made of a minimum A36 quality steel and hot-dip galvanized per ASTM A 123.

b. The headframe shall encompass six (6) hoisting cable sheaves with the minimum diameter of six (6) inches. The cable grooves shall be machined to eliminate any rough surface on which cable shall ride. Oil impregnated sintered bronze bushing shall be pressed into the steel sheave hub and shall ride on stainless steel shafts.

c. Sheaves shall be housed inside side plates with stainless steel cable keepers. Each sheave shall utilize a keeper bolt arrangement to prevent cables from jumping the sheave.

d. The headframe shall include three (3) symmetrically located latching devices. The latches shall contain no moving parts and shall remove all loading from the suspension and drive cables. The latches and hardware shall be A36 quality steel and shall be galvanized. Each latch shall be strong enough to support three (3) times the weight of the entire ring and the maximum number of luminaires.

e. Indicator flags shall turn automatically during locking process, providing a signal visible from the ground that the latch is securely locked.

f. The power cable shall ride over a roller assembly. The assembly shall consist of multiple rollers installed between two (2) vertical side plates. To prevent abrasion of the cable as it travels through the headframe, the rollers shall be made of resin. The rollers shall be located on a radius on both ends of the assembly to support power cable in at least a seven (7)-inch, bending radius. A keeper bar shall be positioned at both ends of the assembly to keep the cord in its track during pole erection and normal operation.

g. All suspension cables shall be pre-strung in the factory through the head assembly.

h. The entire headframe assembly shall be covered by the bird-proof, aluminum-free, cover hood. The hood shall fit the cable sheaves in such a manner as to prevent the cables from jumping the sheave. The hood shall be attached to the frame by means of stainless steel screws and self-locking nuts.

5. Luminaire Ring Assembly

a. The ring shall be made of a minimum seven (7)-gauge A36 quality steel channel and shall be hot-dip galvanized. The ring shall have welded to it a sufficient quantity of 2" diameter galvanized steel pipe tenons for attachment of the luminaires.

b. The luminaire tenon shall be pre-wired, with power cord running from the tenon to the junction box. The ring shall contain three stainless steel locating pins, each with a stainless steel sleeve.

c. The ring assembly shall be furnished with spring loaded iris guide arms or other centering device that will center the luminaire ring while ascending or descending the pole. The centering device shall be capable of keeping the ring concentric about the pole in winds up to 30 mph.

6. Wiring

a. Each ring shall be furnished with the necessary length of 4#10 Type "SO" electrical power cords. All cables shall be attached to the ring assembly at a NEMA Type IV weather-tight copper-free aluminum wiring compartment through watertight cable connectors. A factory prewired 600V terminal block shall be provided in the wiring chamber. A weather-tight twist-lock power inlet shall be provided on the chamber to allow the testing of the luminaires while in the lowered position.

b. A circuit breaker assembly shall be mounted to the winch plate to serve as disconnecting means for the lowering device. Prewired to the breaker assembly shall be a weather-tight twist-lock connector to alternately supply the power to the portable power unit and to the test inlet on the lowered luminaire ring.

c. Strain relief shall be provided at both ends of the main power cable with the use of the properly sized cable clamps. The hole in the headframe plate through which the power cable passes shall be dressed with a stainless steel bushing.

D. Luminaires

Each high mast floodlight pole shall be furnished with the luminaires appropriate for the floodlight application. Provide luminaires as specified on the Contract Drawings and in accordance with the requirements of Section 16510 "LIGHTING SYSTEMS".

E. Paint

Each pole shall be primed and painted in accordance with the requirements specified in the Section entitled "PAINTING".

PART 3. EXECUTION

3.01 INSTALLATION

A. Foundation

Foundations shall be as shown on the Contract Drawings. Concrete shall be in accordance with the Section entitled "CONCRETE".

B. Excavation and Backfill

Excavation and backfill for foundation shall be in accordance with the Section entitled "EXCAVATION, BACKFILLING AND FILLING".

C. Install anchoring hardware in accordance with the manufacturer's instructions and the specified anchor bolt template.

D. Dissimilar Metals

1. "Dissimilar metals" shall mean those metals which are incompatible with one another in the presence of moisture, as determined from their relative positions in the Electrochemical Series, or from test data.

2. Where dissimilar metals come in contact, paint the joint both inside and out with approved coating to exclude moisture from the joint, or provide a suitable insulating barrier separating the metals.

E. Assemblies

1. Assemble luminaires, furnished under the Section 16510 "LIGHTING SYSTEMS", in accordance with the manufacturer's instructions and as shown on the Contract Drawings. Provide and install any additional boxes, brackets, required for a complete installation.

2. Provide stainless steel safety tether for each luminaire. Connect safety tether to the luminaire and the ring assembly.

3.02 INSPECTION

Upon completion of the installation, the lighting fixtures and lighting equipment shall be in operating order and condition and wiring shall be neatly arranged and the finish free from defects. At the time of final inspection, all fixtures shall be fully lamped and be complete with the required lenses, reflectors, and other components necessary for the specified functioning of the fixtures. All fixtures and equipment shall be clean and free from dust or paint spots. Any reflectors, glassware, or other parts broken prior to the final inspection shall be replaced.

3.03 ADJUSTMENTS

Luminaires shall be carefully aimed in accordance with an approved computer-generated plot so as to provide a required footcandle distribution. Adjust floodlights during the hours of darkness under the supervision of the Engineer. Notify the Engineer at least 48 hours before the aiming.

END OF SECTION

SECTION 16527

HIGH MAST FLOODLIGHT SYSTEMS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16527A01 Shop Drawings

a. Manufacturer's established installation procedure manuals for each type of specified high mast floodlight pole, lowering device and lighting fixture.

b. For each high mast type: Clearly illustrate assembly methods, luminaire mounting hardware, detailed dimensions, anchor bolt size and templates, lowering device details, materials, finishes and electrical components.

c. For each ballast type: Submit manufacturer's data with ballast description, catalog number, lamp type, input voltage, input wattage, ballast factor, power factor, minimum starting temperature, operating temperature and wiring diagram.

d. Photoelectric Control Devices: Submit manufacturer's data for ambient light sensors and contactors.

Calculations

16527H01 For each high mast floodlight system type specified on the Contract Drawings submit calculations verifying that total weight and Effective Projected Area (EPA) of the selected high mast with accessories and appurtenances do not exceed manufacturers Maximum Recommended Total Load. Structural design calculations of floodlight poles assemblies, including anchor bolts, bases, and lowering devices shall be signed and sealed by a Professional Engineer licensed in the State where the installation will take place.If the splice design is based on the results of an independent outside entity, the complete test design shall be submitted.Test results of the welds.Results of vibration and fatigue analysis.Structural computation of lowering device.The design computations and drawings for any necessary dampers.Structural steel, reinforcing steel and concrete.

16527H02 Submit computer generated lighting calculations.

END OF APPENDIX "A"

DIVISION 16

SECTION 16550

ROADWAY LIGHTING

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for Roadway Lighting.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO LTS-2	Structural Support for Highway Signs, Luminaires, and Traffic Signals

American Society for Testing and Materials (ASTM)

ASTM A 153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM B 108	Aluminum - Alloy Permanent Mold Casting
ASTM B 117	Method of Salt Spray (Fog) Testing
ASTM B 136	Method for Measurement of Stain Resistance of Anodic Coatings on Aluminum
ASTM B 137	Method for Measurement of Weight of Coating on Anodically Coated Aluminum
ASTM B 221	Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
ASTM B 244	Method for Measurement of Thickness of Anodic Coatings on Aluminum and of Other Nonconductive Coatings on Nonmagnetic Basic Metals with Eddy-Current Instruments

Underwriters Laboratories (UL)

UL 57	Electric Lighting Fixtures
UL 1029	High-Intensity-Discharge Lamp Ballasts
UL 1572	High Intensity Discharge Lighting Fixtures

The Energy Policy Act of 1992

Lamp Efficiency Labeling and Standards

Illuminating Engineering Society of North America (IESNA)

ANSI/IES RP8-1983	American National Standard Practice for Roadway Lighting

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. The roadway lighting system shall provide safe and uniform illumination levels on roadway and parking lot pavements. The lighting levels shall be as specified or as produced by the lighting systems shown on the Contract Drawings. In no case the lighting levels shall be lower than recommended by the ANSI/IES RP8-1983 or it's latest editions.

B. The complete roadway lighting standard including shafts, luminaires, appurtenances and accessories shown on the Contract Drawings, including but not limited to: mast arms, traffic signals, pedestrian signals, fixed signs, arms, bases and anchor bolts shall be designed to support the weight of the equipment and withstand a maximum wind force of 90 mph (unless otherwise shown on the Contract Drawings) without sustaining permanent deformation, rupture or structural failure.

C. The roadway light standards and accessories shall be designed in accordance with AASHTO LTS-2. Maximum deflection shall be limited to 5 percent of shaft length under static load test.

D. Design calculations shall be certified by a Professional Engineer licensed in the State where the installation will take place.

E. Where a manufacturer's model number is shown on the Contract Drawings, it shall establish the standards of quality and performance, accessories, including the construction features, lighting and electrical performance, finish and other physical and technical properties of the equipment.

F. Roadway lighting fixtures shall be furnished with an optical assembly which complies with IESNA light distribution classification and as specified on the Contract Drawings.

G. Install and adjust roadway lighting as specified in this Section and on the Contract Drawings.

1.04 QUALITY ASSURANCE

Entities performing the Work of this Section shall have experience on at least two projects involving complexities similar to those required under this Contract.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened, protective packaging.

B. Materials shall be wrapped for protection during delivery, storage, and handling. Wet or damp wrapping shall be removed, and disposed of, to prevent staining shaft finish.

C. Store materials in original packaging in a manner to prevent soiling and physical damage, prior to installation.

D. Handle in a manner to prevent damage to finished surfaces.

E. Where possible, maintain protective coverings until installation is complete and remove such coverings as part of final cleanup.

1.06 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MATERIALS

Unless otherwise noted on the Contract Drawings, materials for roadway lighting standards and assemblies shall be as specified below, or approved equal:

A. Shafts, Mast Arms, Pole Caps - ASTM B 221, Aluminum alloy 6063 heat-treated to produce a T6 temper.

B. Anchor Bases (including Bolt Covers) and Transformer Bases - ASTM B 108, Aluminum alloy 356 heat-treated to produce a T6 temper.

C. Anchor Studs, Lockwashers, Flatwashers, Screws, Nuts, Bolts, and Hardware -Stainless Steel

D. Anchor Rods - Hot-rolled steel; galvanized in accordance with ASTM A 153 for thread exposure, plus 3 inches minimum toward "hook" end.

E. Anchor Couplings - Hot-rolled steel; galvanized in accordance with ASTM A 153.

F. Luminaire Housings - Low copper content (less than 0.4%) aluminum alloy 360.4 heat-treated to produce a T6 temper.

2.02 CONSTRUCTION FEATURES

A. General

1. Components and sizes (lengths and diameters) of roadway lighting standards and assemblies shall be as shown on the Contract Drawings.

2. Electrical equipment for which there is a nationally recognized standard shall be safety tested and bear the conformance labeling of the third party inspection authority, such as Underwriters Laboratories Inc. (UL), ETL, Factory Mutual, or approved equal, certifying that the lighting fixtures and electrical equipment are listed as suitable for the purpose specified and shown on the Contract Drawings.

B. Luminaires

1. General

a. Roadway luminaires described in this specifications are of three general types:

(1) Highway luminaires-pole mounted luminaires for open roadways.

(2) Underpass luminaires-ceiling or wall mounted luminaires for covered portions of roadways.

(3) Sign luminaires-sign mounted luminaires for traffic signs.

b. Supply and install roadway luminaires in accordance with Section 16510, this Section of specifications and lighting fixture descriptions and manufacturer's model number as shown on the Contract Drawings.

c. Unless otherwise noted on the Contract Drawings, roadway luminaires shall be constructed of a metal housing, optical assembly, and a lens door. All mounting hardware shall be constructed of corrosion resistant material.

d. Optical assembly shall consist of specular aluminum reflector and borosilicate glass refractor or flat lens. Polycarbonate, Acrylic or other plastic refractors and lenses are not permitted. Optical assembly shall be self-leveling and sealed with a breathing and filtering gasket to prevent entrance of airborne contaminates. Gasket shall be cemented full perimeter with no metallic clips or fasteners.

e. The hinge mounted lens door shall be fully gasketed and accessible for tool-less or single tool relamping.

f. Ballast shall be mounted on a removable tray and shall have quick disconnect electrical terminals for easy maintenance.

g. Unless otherwise noted on the Contract Drawings, roadway luminaires shall have an electrostatically deposited, thermally set, grey polyester powder coat finish.

h. There shall be optional factory prewired no-tool photoelectric control receptacle. Photocontrol receptacles shall be provided with a stop to prevent rotation beyond 350°.

i. The photometric light distribution of the roadway luminaires shall be classified by IESNA as a one of the following Types:

(1) Type I

(2) Type II (Type II four-way)

(3) Type III

(4) Type IV

(5) Type V

2. Highway luminaires:

a. Unless otherwise noted on the Contract Drawings, highway luminaires shall be a high-pressure Sodium (HPS) type with Type I, Type II or Type III photometric distribution.

b. Highway luminaires shall be furnished with cutoff, semi-cutoff or non-cutoff optics as specified on the Contract Drawings.

c. The highway luminaires shall be equipped with a latched and hinged power door for easy luminaire access.

d. The internal slipfitter shall be furnished with one-piece pipe clamp capable of adapting 1-1/4 through 2-inch pipe without rearrangement of clamp or bolts, and shall be adjustable at least $\pm$ 5° from horizontal.

3. Underpass luminaires:

a. Underpass luminaires shall be supplied for direct ceiling mounting, direct wall mounting, or for use with surface conduits and boxes. Mounting boxes shall comply with the requirements specified in Section 16135 of this specification.

b. Unless otherwise noted on the Contract Drawings ceiling mounted underpass luminaires shall be a HPS type with Type I or Type V photometric distribution.

4. Sign Lighting luminaires:

a. Unless otherwise noted on the Contract Drawings ceiling sign luminaires shall be a Metal Halide (MH) type with wide photometric distribution.

b. Sign luminaires shall be furnished with integral light shields to minimize back and side glare.

C. Lamps

1. A lamp shall be furnished for each lamp holder of each luminaire. Luminaires and lamps shall be of the type and wattage as shown on the Contract Drawings and as specified in this Section and in Section 16510 of these specifications.

2. Mercury Vapor lamps are not permitted for roadway lighting.

D. Ballasts

1. Unless otherwise noted on the Contract Documents ballasts shall be a Constant Wattage Auto transformer (CWA) type and shall comply with requirements of Section 16510 of these specifications.

2. HPS ballasts, which are not used in a 24-hour operation, shall be furnished with automatic protective starters. An automatic protective starter shall apply pulses for no more than 15 minutes and then deactivate if a lamp arc cannot be initiated.

E. Fuse Assemblies

Fuse assemblies shall be complete with 5 amperes, 600-volt fuses, with 18-inch long leads of No.10 Standard type XHHW or USE wire.

F. Shafts

1. Unless otherwise noted on the Contract Drawings, shaft shall be spun tapered, or octagonal tapered, seamless tubing. Shaft may be drilled to manufacturer's specification for mounting luminaires. Removable aluminum pole cap shall be provided for the top of each shaft.
2. Each shaft shall be furnished with a cable support hook mounted inside the top of the shaft.
3. Welding shall be performed on the shaft only at the anchor base. Field welding shall not be permitted.
4. Where design parameters will result in excessive vibration, shafts shall be provided with factory installed vibration dampeners. Vibration dampener size, location and mounting shall be in accordance with the manufacturer's recommendations, and as approved by the Engineer.

G. Mast Arms

The types and sizes of mast arms shall be as shown on the Contract Drawings.

H. Anchor Bases

Anchor bases shall be free from cracks, pits, and blow holes, and shall be provided with a grounding lug. The base shall be supplied with bolt covers and mounting hardware and shall have provision for anchoring to the transformer base.

I. Transformer Bases

1. Transformer bases shall be frangible type and shall be free from cracks, pits and blow holes. Transformer bases shall be breakaway approved and fatigue tested.
2. Each transformer base shall be sized in accordance with the manufacturer's specifications and by pole height, total weight and bolt circle.
3. All transformer bases shall be provided with internal lugs for mounting on anchorage and a tapped hole inside the base for mounting a ground stud.
4. The base shall be furnished with a suitably sized, lockable, hinged door.

J. Pole Foundations

Pole foundation details and concrete for the pole foundations shall be as shown on the Contract Drawings.

K. Finish

Unless otherwise shown on the Contract Drawings, shafts, mast arms and transformer bases shall be satin finished clear anodized. Anodic coatings shall comply with ASTM B 117, 0 136, 0 137, and 0 244.

L. Accessories

Hardware accessories: slip fitters, mounting plates, screws, nuts, washers, bolts and other hardware necessary for assembling the roadway lighting standards shall be provided. The exposed portion of studs, washers, hex nuts and other hardware shall be well greased.

M. Anchor Bolts

Anchor bolts, including anchor rods, anchor couplings, anchor studs, nuts, installation template and flatwashers and lockwashers, shall he furnished for each lighting standard.

PART 3. EXECUTION

3.01 INSTALLATION

A. Install concrete foundations, including conduits and anchor bolts, as shown on the Contract Drawings and in accordance with the manufacturer's anchor bolt template.

B. Install underground conduits as shown on the Contract Drawings and as specified in Section 16115 of this specification.

C. Install conduit bodies and mounting boxes for underpass luminaires as shown on the Contract Drawings and as specified in Section 16135 of this specifications.

D. Install roadway lighting standards, fixtures and appurtenances in accordance with the Contract Drawings, manufacturers' installation procedures and as specified herein.

E. Connect all equipment as required for proper operation and as shown on the Contract Drawings.

F. Set lighting standards plumb with variation off-true-vertical not to exceed 1/8-inch in ten feet. Vertical alignment shall be achieved by shimming, grouting or other approved means. Grout all bases after final alignment has been completed.

G. Set underpass and sign luminaires plumb with variations off-true-horizontal between two adjacent fixtures not to exceed 1/8-inch. Fixture mounting variations from a straight line between the first and the last fixture in a row shall not exceed 1/8-inch.

H. Requirements for mounting heights shall be as shown on the Contract Drawings.

3.02 FINISH REPAIR

All abraded or damaged anodized surfaces of roadway lighting standards, fixtures and appurtenances shall be repaired in a manner satisfactory to the Engineer.

END OF SECTION

SECTION 16550

LIGHTING SYSTEMS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16550A01 Shop Drawings

a. Manufacturer's established installation procedure manuals for each type of specified roadway lighting standard and fixture.

b. For each roadway lighting standard and fixture type: Clearly illustrate assembly methods, detailed dimensions, anchor bolt templates, mounting details, materials, finishes, electrical components, and light sources.

c. For each ballast type: Submit manufacturer's data with ballast description, catalog number, lamp type, input voltage, input wattage, ballast factor, power factor, minimum starting temperature, operating temperature and wiring diagram.

d. Photoelectric Control Devices: Submit manufacturer's data for ambient light sensors and contactors.

Calculations

16550H01 For each roadway lighting standard type specified on the Contract Documents submit calculations verifying that total weight and Effective Projected Area (EPA) of the selected lighting standard with accessories and appurtenances do not exceed manufacturers Maximum Recommended Total Load.

END OF APPENDIX "A"

DIVISION 16

SECTION 16670

LIGHTNING PROTECTION SYSTEM

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies the requirements for a complete lightning protection system.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	Lighting Protection Institute (LPI)
LPI 175	Lightning Protectors Installation Code
LPI 176	Material Standard
LPI 176	Inspection Guide
	National Fire Protection Association (NFPA)
NFPA 70	National Electrical Code
NFPA 780	Lightning Protection Code
NFPA 781	Lightning Protection Early Streamer Emission Air Terminals Code (Proposed)
	Underwriters Laboratories
UL 96	Lightning Protection Components
UL 96 A	Installation Requirements for Lightning Protection Systems

1.03 DESIGN REQUIREMENTS

A. Unless otherwise specified on the Contract Drawings or in this Section, the Lightning Protection System shall be manufactured, supplied, and installed in conformance with the requirements of all local codes, and the Publications referenced in Article 1.02 herein.

B. The Lightning Protection System shall be composed of all items of hardware, cables and grounding electrodes necessary to dissipate the lightning current into the mass of the earth. In general, the system shall consist of readily available listed components that fully comply with the requirements of this Section and the Contract Drawings.

C. The Lightning Protection system shall be designed to prevent damage to building structures and property, injury to occupants, and protection of electrical systems including electronic equipment.

D. The Lightning Protection system shall include but not be limited to the following:

1. The entire roof system, gutters, leaders ventilators, and all other metal appurtenances shall be made electrically continuous and shall be grounded to the grounding grid or in the case of structural steel frame construction directly to the building steel with approved fasteners at intervals averaging not more than 100 feet around the perimeter of the structure.
2. All metallic objects inside the building within 6 feet of the Lightning Protection System or metal connected to it shall be bonded to the system with approved fittings and conductors.
3. Air terminals shall be no more than 20 feet apart with the end terminals no more than 2 feet from the ends of the building.
4. Lightning protection conductors shall interconnect all metallic objects on the protected structure, and shall be installed to provide a two way path to ground from each air terminal, and shall be bonded to the steel framework at each roof beam and a minimum of every 60 feet along the ridge beam.
5. Down conductors shall be installed at all four (4) corners of the building, at columns near the center of the north and south building walls and at other locations as required by the referenced codes and good design. They shall be installed as directly as possible to ground.
6. The design of the Lightning Protection System, including the down conductors, shall be compatible with the architectural features of the building or structure, as approved by the Engineer.

1.04 QUALITY ASSURANCE

A. The Contractor shall engage the services of a UL certified lightning protection installer, who shall have designed and installed Lightning Protection Systems that have been in satisfactory use for not less than three years in a minimum of 20 installations for purposes similar to those intended herein.

B. The lightning protection system design and installation shall conform to the requirements of LPI 175, LPI 176, NFPA 70, NFPA 780, NFPA 781, UL 96, and UL 96 A.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened, protective packaging. Protective caps shall be removed immediately prior to installation of conduit.

B. Store materials in a clean, dry space and protect them from weather.

C. Handle in a manner to prevent damage to finished surfaces.

1.06 SUBMITTALS

See Appendix "A" for submittal requirements.

1.07 SPARE PARTS

A. The Contractor, or his authorized representative, shall confirm that there are a minimum of three (3) established agencies within the Port Authority District, which stock a full inventory of spare parts for the system supplied. In the event that there are not three (3) sources of supply, the contractor warrants that all system components will be made available by the Contractor for a period of ten (10) years from the date of acceptance of the system.

PART 2. PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with the requirements of this Section, provide a lightning protection system of one of the manufacturers specified on the Contract Drawings.

2.02 MATERIAL

A. General

1. All electrical materials and equipment, shall be labeled or listed by UL for use in Master Labeled Lightning Protection systems. Materials shall be sized in accordance with the materials requirements of NFPA 780 and UL 96A.
2. Generally all materials shall be copper, or copper-bronze (in locations where system components are mounted on aluminum surfaces, aluminum materials shall be used) as specified herein and of the size, weight and construction to suit the application shown on the Contract Drawings and shall be used in accordance with UL and LPI and NFPA code requirements, for class II structures and as per manufacturers recommendations.

B. Conductors

1. Conductors shall be sized in accordance with material requirements above. Down conductors shall be copper.

C. Connections, Splices, and Fasteners

1. Connectors, splicers, fasteners, and cable clamps shall be heavy-duty bronze, approved for lightning protection systems.
2. Bonding plates shall be heavy-duty bronze with a minimum bonding surface of 8 square inches.
3. Fittings for connections to metal tracks, gutters, ventilators, etc., shall be of an approved type and shall be made tight by compression under bolt heads or equivalent.
4. Screws, bolts, nuts, washers and nails shall be stainless steel. Galvanized or plated materials are not acceptable.

D. Roof Penetrations

1. The roof penetrations required for down conductors or for connections to structural steel framework shall be made using thru-roof assemblies.
2. Through the roof connectors shall be bronze, right-angle, thru-roof connectors with clamp type top cable connector, 4 inches square roof flashing plate, 1/2 inches diameter by 15 inches long threaded stem, hex nut and washer, and adjustable bottom cable clamp.
3. Roof flashing shall be compatible with the roofing system.

E. Air Terminals

1. The air terminals shall be as follows:
   a. Ridge Type
      (1) Air terminal shall be pointed, solid, round, heavy duty, bronze rod for concealed in place installation.
      (2) Air terminal shall be 1/2 inches in diameter with a 10-inch nickel tipped point and 15-inch long solid copper stem.

(3) Each air terminal shall be furnished with lead washers, a support bracket for attachment to the ridge member, and an adjustable thru-roof clamp type cable connector.

b. Parapet Type

(1) Pointed, solid, round, heavy duty, bronze rod with 5/8 inches inside threaded adapter for mounting on a point support.

(2) 1/2 inches in diameter with a nickel tipped point and a 24-inch long solid copper stem.

(3) Each terminal shall be furnished with an offset point support and a point extension.

(4) Each offset point support shall be bronze with a 5/8 inch outside thread.

(5) Each point extension shall be bronze, 3 inches long, with a 5/8 inches outside top thread and a 5/8 inches inside bottom thread.

F. Ground Terminations

1. The ground terminations shall be as follows:

a. 5/8" x 10'-0" (minimum) copper-clad rod.

b. Bronze clamp (connecting ground rod and down conductor) having at least 1-1/2" of contact between rod and conductor, or by an exothermic welded connection.

c. Conductors from the ground connections to the ground terminations shall be class II copper lightning conductors.

PART 3. EXECUTION

3.01 INSTALLATION

A. The installation shall be in accordance with LPI 175, LPI 76 and UL 96A.

B. The installation shall he completed by an experienced installer who is a certified Master Installer of the LPI or working under the direct supervision of an LPI manufacturer or his authorized LPI certified Master Installer representative.

C. Terminals shall be installed and all openings sealed in accordance with the Contract Drawings and manufacturers recommendations.

D. Connections to steel framework shall be with bonding plates as described above.

E. Conductors shall be held in place with approved fasteners. Spacing of fasteners shall not exceed 3-foot centers on both horizontal and vertical runs.

F. Approved connectors and splicers as described above shall be used for joining conductors. When attached to conductors they shall be sufficiently tight to withstand a tensile force of two hundred (200) pounds.

G. Down conductors shall be connected to building grounding system with approved fittings. Common grounding of all ground mediums entering the structure shall be ensured by interconnecting to the Lightning Protection System using main size conductors and fittings.

H. The offset point supports for the parapet air terminals shall be shimmed to clear the coping.

I. Conductors for the parapet air terminals shall interconnect all the terminals on the parapet and shall be fastened to the parapet with approved fasteners forming a closed loop around the building. Conductors shall be connected to the down conductors via the thru-roof connector described above.

J. Ground rods shall be located two feet below grade, preferably two feet from foundation walls.

K. Ground rods shall extend a minimum of ten feet vertically into the earth.

L. Grounded metal bodies located within the required bonding distance as determined by NFPA 780 shall be bonded to the Lightning Protection System using bonding connections and fittings.

3.02 COORDINATION

A. The Contractor shall insure a correct, neat and unobtrusive installation.

B. The Contractor shall insure a solid mechanical and electrical connection to the building ground system.

3.03 INSPECTION, TESTING, COMPLETION AND APPROVAL

A. The Contractor shall secure and deliver the LPI System certification to the Engineer upon completion of the installation.

B. The Contractor shall also submit copies of as-built shop drawings with LPI Forms 175A, B and C along with the LPI Certificate System Application.

C. Underwriters' Laboratories Master Label shall be furnished as evidence that the installation complies with the UL 96A requirements.

D. If protected structure is an addition to, or is attached to an existing structure the Contractor shall advise the Engineer of any additional work required on the existing Lightning Protection System or structure with current UL requirements.

END OF SECTION

SECTION 16670

LIGHTNING PROTECTION SYSTEM

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

16670A01 Shop Drawings –

1. Connection Diagrams
2. Layout drawing, including type, size and location of the following:
   a. All equipment
   b. Cable routing
   c. Ground rods
3. Any special equipment that must be manufactured or fabricated.

Catalog Cuts

16670B01 Catalog Cuts –

1. Wire and cable
2. Air terminals and other equipment
3. Supports, fasteners and hardware

END OF APPENDIX "A"

Appendix 1
PERMITS

New Jersey Natural Resources Conservation Program

HUDSON-ESSEX-PASSAIC SOIL CONSERVATION DISTRICT

15 BLOOMFIELD AVENUE
NORTH CALDWELL, NJ 07006
Telephone: (973) 364-0786
Fax: (973) 364-0784
information@hepscd.org
www.hepsoilnj.org

October 21, 2013

Mr. Marc Helman
Port Authority of NY & NJ
2 Gateway Center, 14 Fl.SW
Newark, NJ 07102

Re: **PANYNJ WO#22 Fence & Embankment Restoration**
Peripheral Ditch along NJTPK, Newark, NJ
Block: 5094 Lot: 1
HEPSCD 251 ID Code #213-E-4114, plan dated 10/2/13

Dear Sir/Madam:

The District has completed the review of the soil erosion and sediment control plan for the above referenced project and hereby reports that the plan meets the Standards for Soil Erosion and Sediment Control in New Jersey (N.J.A.C.290-1.1 et seq., promulgated pursuant to the New Jersey Soil Erosion and Sediment Control Act, N.J.S.A.4-24-39 et seq.). Accordingly, the plan is **certified** by the Hudson-Essex-Passaic Soil Conservation District subject to the following conditions:

- The District must be notified in writing 48 hours prior to the commencement of any construction activity.
- A copy of the certified plan must be kept on the job site at all times.
- The applicant or contractor must request a final inspection (once landscaping and final soil stabilization is complete) & obtain a Report of Compliance prior to seeking a temporary or permanent Certificate of Occupancy.
- The District must be provided with written notification of any conveyance of this project, subject property, or portions thereof, including individual residential lots if applicable. Said notice must provide the names, addresses, and telephone numbers of subsequent owners.
- The District must be informed of address and or telephone number changes of owners, agents responsible for site construction, and job supervisors.

Please be advised that the Soil Erosion and Sediment Control Act authorizes the issuance of stop construction orders and penalties of up to $3000 per day for violations of the certified plan or for failure to comply with the aforementioned requirements. Please be further advised that any conveyance of this project or portions thereof will transfer full responsibility for compliance with the certified plan to subsequent owners. Please contact the District if you require assistance implementing the certified soil erosion and sediment control plan. This certification is valid for **3-1/2 years** from the date of this letter and is limited to the controls specified in this plan. It is not authorization to engage in proposed land use unless such use has been previously approved by the municipality or other controlling agency.

Yours truly,

Carl Quazza
Chairman

Cc: Planner, Municipality, County

STATE DEPARTMENT OF AGRICULTURE, STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION
AND UNITED STATES NATURAL RESOURCES CONSERVATION SERVICE, COOPERATING
Printed on Recycled Paper

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Mail Code - 401-02B
Division of Water Quality
Bureau of Nonpoint Pollution Control
P.O. Box 420 – 401 E. State St.
Trenton, NJ 08625-0420
Tel: (609) 633-7021 / Fax: (609) 777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

BOB MARTIN
Commissioner

June 1, 2012

MARC HELMAN
PORT AUTH NY/NJ
2 GATEWAY CENTER - 14TH FLR SW
PERMITS & GOVERNMENT AFFAIRS
ENGINEERING DEPT
NEWARK, NJ 07102

Re: 5G3 -Construction Activity Stormwater (GP) NJ0088323
NJPDES: NJG0205541 PI ID #: 579471
NEWARK LIBERTY INTL REL BREWSTER RD/RUNWAY 11
Newark City, Essex County

SAMPLE

Dear Marc Helman:

Please find enclosed your Authorization to Discharge Stormwater under NJPDES General Permit NJ0088323 and a copy of that permit. All co-permittees will receive original Authorizations. One of these Authorization forms is requested to be LOCATED at the regulated construction site at all times and be AVAILABLE for inspection by any authorized representative of the New Jersey Department of Environmental Protection. If you have designated an agent, it is your responsibility to notify your agent about this General Permit Authorization and its requirements

Should any information about your project, i.e., mailing address, contact person, etc. change, please contact the Bureau for a Standard Change Form and a new authorization page will be developed and mailed to you. When all construction activity has ceased and the site is properly stabilized please notify the Bureau in writing that the project has been completed and authorization under the permit is no longer necessary.

The Department appreciates your efforts toward accomplishing the goal of providing cleaner water for our State and looks forward to working together with you in the future. If you have any questions please contact the Bureau.

Sincerely,

Ed Frankel

Ed Frankel, P.P., Section Chief
Bureau of Nonpoint Pollution Control

Enclosures:

Authorization to Discharge (ATD) Form
NJPDES General Permit No. NJ0088323
Annual Certification Form or available at www.state.nj.us/dep/dwq/pdf/5g3_annual_cert_form.pdf

c: HUDSON-ESSEX-PASSAIC Soil Conservation District
General Contractor (if applicable)

New Jersey Department of Environmental Protection
Mail Code - 401-02B
Bureau of Nonpoint Pollution Control
Division of Water Quality
PO Box 420 – 401 E State St
Trenton, NJ 08625-0420
Phone: (609) 633-7021
Fax: (609) 777-0432

AUTHORIZATION TO DISCHARGE
5G3 -Construction Activity Stormwater (GP)

Facility Name:
NEWARK LIBERTY INTL REL BREWSTER RD/RUNWAY 11

PI ID #: 579471

Facility Address:
NEAR NJ TPKE & E PORT ST
NEWARK, NJ 07114

NJPDES #: NJG0205541

251 ID#: 212-E-3809

Type of Activity: Stormwater Discharge General Permit Authorization New

Owner:
PORT AUTH NY/NJ
2 GATEWAY CENTER - 14TH FLR SW
PERMITS & GOVERNMENT AFFAIRS
ENGINEERING DEPT
NEWARK, NJ 07102

Operating Entity:
PORT AUTH NY/NJ
2 GATEWAY CENTER - 14TH FLR SW
PERMITS & GOVERNMENT AFFAIRS
ENGINEERING DEPT
NEWARK, NJ 07102

SAMPLE

Issuance Date:
06/01/2012

Effective Date of Authorization:
06/01/2012

Your Request for Authorization under NJPDES General Permit No. NJ0088323 has been approved by the New Jersey Department of Environmental Protection.

Ed Frankel

Date: 06/01/2012

Ed Frankel, P.P., Acting Bureau Chief
Bureau of Nonpoint Pollution Control
Division of Water Quality
New Jersey Department of Environmental Protection

PART I

NARRATIVE REQUIREMENTS

Construction Activity Stormwater (GP)

A. Authorization Under This Permit

1. Permit Area

a. This permit applies to all areas of the State of New Jersey.

2. Eligibility

a. Except as provided in 2.b. below, this permit may authorize all new and existing stormwater discharges associated with industrial activity and small construction activities as defined in N.J.A.C. 7:14A-1.2, and that are from the following facilities:

i. Construction activities including clearing, grading and excavation activities. In regard to landfills such construction activities are limited to:
- A landfill under construction which has not received any solid waste or hazardous waste as defined at N.J.A.C. 7:14A - 1.2; or
- A landfill that has been closed in compliance with N.J.A.C. 7:26-2A.9 (the Solid Waste rules) or N.J.A.C. 7:26G (the Hazardous Waste rules), the appropriate certifications have been submitted in accordance with N.J.A.C. 7:26 or N.J.A.C. 7:26G, and the landfill is not disrupted.
- A landfill other than those described above is deemed eligible when a written determination is made by the Department that the permit requirements are sufficient to control the construction activities.

b. The following stormwater discharges are not authorized by this permit:

i. Stormwater discharges subject to any of the following effluent guideline limitations for stormwater: cement manufacturing, materials storage piles (40 CFR 411, Subpart C); concentrated animal feeding operations (40 CFR 412); fertilizer manufacturing (40 CFR 418); petroleum refining (40 CFR 419); phosphate manufacturing (40 CFR 422); steam electric, coal pile runoff (40 CFR 423); mineral mining and processing (40 CFR 436); ore mining and dressing (40 CFR 440); asphalt emulsion (40 CFR 443 Subpart A); and landfills (40 CFR 445).

ii. Stormwater discharges from facilities with "sanitary landfills" as defined in N.J.A.C. 7:26-1.4 or "hazardous waste landfills" subject to N.J.A.C. 7:26G, unless the landfill meets the requirements of A.2.a.i above.

iii. Stormwater discharges from construction, other that single family home construction, that are not regulated under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., or that are not within the definition of "project" at N.J.S.A. 4:24-41g.

iv. Stormwater discharges that occur after the construction activities under 2.a.i, above, have been completed (see E.5 below). If the facility being constructed is in one or more of the categories identified in subparagraphs 1i through 1ix or subparagraph 1xi of the definition in N.J.A.C. 7:14A-1.2 of "stormwater discharge associated with industrial activity," then authorization for that stormwater discharge must be obtained under another NJPDES permit (such as NJPDES Permit No. NJ0088315, where applicable), even if authorization for the stormwater discharge from the construction activity has been obtained under this permit.)

SAMPLE

v. Stormwater discharges from projects or activities that conflict with an adopted Water Quality Management plan.

vi. Stormwater discharges from "major Highlands development" within the boundries of the "Preservation Area" of the "Highlands Region," designated by the Highlands Water Protection and Planning Act (Highlands Act), N.J.S.A.13:20-1 et seq., that does not have a "Highlands Preservation Area Approval" Highlands Applicability Determination issued by the Department that the proposed activity is exempt from the Highlands Act. (See definitions at H.3. below.)

3. **Other discharges are not authorized by this permit, even if such discharges are combined with stormwater discharges that are authorized by this permit.**

B. Requiring an Individual Permit or Other General Permit

1. **The Department may require any permittee authorized under this permit to apply for and obtain an individual DSW permit, or seek and obtain authorization under another general permit. Conversely, any permittee authorized under this permit may request to be excluded from authorization under this permit by applying to the Department for an individual DSW permit or for another general DSW permit. Revocation of existing permits under such circumstances is governed by N.J.A.C. 7:14A-6.13.**

2. **If, after receiving authorization under this permit, a facility is required by the Department to obtain another NJPDES DSW permit that would also cover the authorized stormwater discharge, then authorization under this permit shall remain in effect only until either:**

   a. The date such other permit becomes effective, or

   b. The date the application for such other permit (or request for authorization under another general permit) is denied. If such a facility fails to submit an application or request for authorization by the date specified by the Department, then the general permit authorization remains in effect only until that date.

C. Authorization

1. **In order to obtain authorization under this permit (except for automatic renewal of authorization under 5.a. below), a complete Request for Authorization (RFA) and the appropriate fee required under N.J.A.C. 7:14A-3.1(j) shall be submitted in accordance with the requirements of this permit.**

   a. Authorization becomes effective when the Department certifies the RFA (and when, in addition, the Pinelands Commission has made any determination required under 2. below).

2. **For new stormwater discharges commencing in the Pinelands Area (as defined by N.J.S.A. 13:18A-11) after November 2, 1992, authorization under this permit becomes effective only if, pursuant to N.J.S.A. 13:18A-15, the Pinelands Commission has determined that:**

   a. The Pinelands Commission will not review the facility based upon the issuance of a certification of the facility's soil erosion and sediment control plan issued by the soil conservation district or the State Soil Conservation Committee, or the approval of the facility's soil erosion and sediment control requirements issued by the municipality (whichever is applicable);

   b. The Pinelands Commission has reviewed and approved the facility following, if applicable, issuance of a certification of the facility's soil erosion and sediment control plan issued by the soil conservation district or the State Soil Conservation Committee, or the approval of the facility's soil erosion and sediment control requirements issued by the municipality (whichever is applicable); or

SAMPLE

c. The Pinelands Commission has, pursuant to N.J.A.C. 7:50-4.51 et seq., reviewed and approved the development application of the DOT.

3. **Authorizations under this general permit cease to be effective when any of the following occurs, whichever is earliest:**

a. When the State Soil Conservation Committee rejects (pursuant to N.J.S.A. 4:24-6.1 and N.J.A.C. 2:90) a decision by the soil conservation district to certify the facility's soil erosion and sediment control plan;

b. when the certification or municipal approval (under N.J.S.A. 4:28-48) of the facility's soil erosion and sediment control plan expires without being renewed or extended;

c. for single family home construction not within the definition of "project" at N.J.S.A. 4:24-41g 42 months after authorization becomes effective unless the authorization is renewed or extended by the Soil Conservation District that certified the RFA, or upon the activation date of the E-Permitting system, the Department; or

d. when the report of compliance is issued (see E.5.a. below), the final Certificate of Occupancy is received by the Soil Conservation District (see E.5.b. below), or the Department receives written Notification of Completion from the DOT (seeE.5.c. below), whichever is applicable.

4. **For a stormwater discharge authorized under this permit, the permittee is exempt from the provision in N.J.A.C. 7:14A-6.2(a)2 which declares that the discharge of any pollutant not specifically regulated in the NJPDES permit or listed and quantified in the NJPDES application shall constitute a violation of the permit.**

5. **Automatic Renewal of Authorization**

a. Authorization under this permit was automatically renewed when this permit was reissued, and will be automatically renewed if this permit is reissued in the future (so long as the discharge remains eligible). In either case, for any permittee who had or has authorization under this permit immediately prior to the effective date of the reissued permit, the most recently submitted RFA is also a timely and complete RFA under the reissued permit. (However, if the permittee is aware that any information in that most recently submitted RFA is no longer true, accurate, and complete, the permittee (except for DOT) shall provide the correct information to the soil conservation district, or upon the activation date of the E-Permitting system, the Department within 90 days after that effective date, if the permittee has not done so already.) The soil conservation district, or upon the activation date of the E-Permitting system, the Department shall provide a notice of renewed authorization to each such permittee (except for DOT).

b. A permittee whose authorization was renewed under a. above may request to be excluded from the reissued general permit in accordance with N.J.A.C. 7:14A-6.13(g), and may also request a stay of the application to that permittee of any conditions of the reissued permit in accordance with N.J.A.C. 7:14A-17.6.

D. Request For Authorization Requirements

1. **Deadline for Requesting Authorization for a New Discharge**

a. A RFA for a new stormwater discharge must be submitted prior to the commencement of the land disturbance that may result in that discharge.

2. **The Department may accept an RFA submitted after the foregoing deadlines; however, the discharger may still be held liable for any violations that occurred prior to the submission of the RFA.**

3. **Persons Requesting Authorization**

   a. A RFA shall be submitted by each person who is an operating entity for any part of the facility requiring a NJPDES permit for the stormwater discharge at the facility. When a facility is owned by one person but is currently operated by another person, the operating entity shall submit the RFA.

4. **Contents of the Request for Authorization**

   a. A completed RFA shall include all of the following information regarding the regulated facility, using the Department's E-Permitting system.

      i. The legal name and address of all known current owners and operating entities. The RFA shall also identify which of these persons is submitting the RFA.

      ii. The facility name and address.

      iii. A brief description of the facility and its current and proposed uses.

      iv. For stormwater discharges occurring in the Pinelands Area (as defined in N.J.S.A. 13:18A-11) prior to November 2, 1992, a Pinelands Commission "no call up" letter or public development approval.

      v. A RFA for stormwater discharges occurring in the "Preservation Area" of the "Highlands Region," designated by the Highlands Act, shall not be considered complete unless accompanied by a "Highlands Preservation Area Approval" issued by the Department or a "Highlands Applicability Dtermination" that the proposed activity is exempt from the Highlands Act and consistent with a Water Quality Management Plan (WQMP), or exempt from the Highlands Act and not addressed by a WQMP. (See definitions at H.3. below.)

      vi. The location of the project - State plane coordinates

      vii. Contact information for - fees/billing contact

      viii. The SCD certification code and 251 Identification code

      ix. Identification numbers of existing NJPDES permits

      x. Certification PIN

5. **Where to Submit**

   a. For projects that the New Jersey Department of Transportation (DOT) is constructing or proposes to construct, a completed, signed, and certified RFA shall be submitted by DOT to the Department at the address specified on the Department's RFA form, and the appropriate fee (except for authorization renewal under C.5.a.) shall be paid to the Department.

   b. For all other facilities, the RFA and associated payments to "Treasurer, State of New Jersey" shall be submitted to the Department

      i. The Department may, upon the request of the applicant, accept a paper application submitted to the location specified on the forms provided by the Department, at its discretion. All other forms and applications will be rejected.

      ii. Paper applications must be submitted 30 days prior to the commencement of land disturbance that may result in a discharge.

SAMPLE

6. **Certifying the Request for Authorization**

   a. For projects that the DOT is constructing or proposes to construct, the DOT shall certify the RFA if the requirements above have been satisfied, and if the DOT has certified the facility's plan for soil erosion and sediment control under N.J.S.A. 4:24-43.

   b. For other facilities the Department shall certify the RFA if the requirements above have been satisfied, and if:

      i. The soil conservation district has certified the facility's plan for soil erosion and sediment control under N.J.S.A. 4:24-43;

      ii. The State Soil Conservation Committee has certified the facility's plan for soil erosion and sediment control under N.J.S.A. 4:24-6.1 and N.J.S.A. 4:24-43;

      iii. The facility has been approved under a municipal ordinance for soil erosion and sediment control pursuant to N.J.S.A. 4:24-48; or

      iv. The facility is single family home construction that the Soil Conservation District determines in writing to be not within the definition of "project" at N.J.S.A. 4:24-41g.

   c. The Department shall grant or deny certification of the RFA within a period of thirty (30) days after the submission, to the Department, of a complete RFA. Failure of the Department to grant or deny certification within such time period shall constitute certification of the RFA.

7. **Additional Notification**

   a. Facilities that discharge stormwater associated with industrial activity through a large or medium municipal separate storm sewer system (systems serving a population of 100,000 or more) must also submit a copy of the RFA to the owner of and operating entity for that system.

   b. Persons requesting authorization shall also submit a copy of the RFA to each owner (if any) of the facility who did not submit the RFA.

E. Effluent Limitations, Inspection and Reporting Requirements

1. **Stormwater Pollution Prevention Plan (SPPP). Construction activity that may result in a stormwater discharge authorized by this permit shall be executed only in accordance with a SPPP that consists of the erosion and sediment control component described under a. below, and (where applicable) the construction site waste control component set forth in Attachment B. A copy of this SPPP shall be retained by the permittee for a period of at least five years after the completion of construction. This period may be extended by written request of the Department at any time (see N.J.A.C. 7:14A-6.6):**

   a. Erosion and sediment control - Land disturbances that may result in a stormwater discharge authorized by this permit shall be executed only in accordance with whichever of the following is applicable:

      i. A soil erosion and sediment control plan certified pursuant to N.J.S.A. 4:24-43;

      ii. Requirements for soil erosion and sediment control established in or pursuant to a municipal ordinance in accordance with N.J.S.A. 4:24-48; or

      iii. For single family home construction not within the definition of "project" at N.J.S.A. 4:24-41g, the minimum soil erosion and sediment control requirements established in Attachment C below.

b. At a minimum all soil erosion and sediment control plans shall be prepared in accordance with the guidance in the most recent version of "Standards for Soil Erosion and Sediment Control in New Jersey" and contain all of the information required in Appendix A2 of that document.

c. For purposes of this permit, the above mentioned soil erosion and sediment control plan or requirements constitute the erosion and sediment control component of the facility's SPPP (except for any provisions that are not relevant to the stormwater discharge authorized by this permit).

d. Construction Site Waste Control - The construction site waste control component of the SPPP consists of the requirements set forth in Attachment B. These requirements became operative on March 3, 2004 and apply only to construction activities that commence on or after March 3, 2004. Public projects that have gone out for bid or have been awarded a contract prior to March 3, 2004 are exempt from implementing the new requirements for construction site waste management. Construction activities that commenced prior to March 3, 2004 but did not obtain certification (or approval from exempt municipality) required under the Soil Erosion and Sediment Control Act are not exempt from the requirements in this section. Any other new construction activity for which an RFA is submitted on or after March 3, 2004 or which receive automatic renewal of authorization under this permit after March 3, 2004 also shall comply with these requirements.

2. **Land disturbances that may result in a stormwater discharge authorized by this permit shall not commence until authorization is effective under C.3. above.**

a. A copy of the authorization shall be posted onsite at all times until a notice of completion has been issued.

3. **Routine Inspections**

a. The permittee shall conduct and document weekly inspections of the areas of industrial activity or small construction activity to identify areas contributing to the stormwater discharge authorized by this permit and evaluate whether the stormwater pollution prevention plan (SPPP) identified under E.1. above, is being properly implemented and maintained, or whether additional measures are needed to implement the SPPP.

i. In the event that the industrial activities or small construction activities onsite are ceased or are anticipated to cease for a period of six (6) months or greater the permittee may seek a suspension of the routine inspection requirement of the permit or reduction in frequency to monthly with the written approval of the Soil Conservation District office overseeing the project on a form provided by the Department.

4. **Reports of Noncompliance**

a. All instances of noncompliance not reported under N.J.A.C. 7:14A-6.10 shall be reported to the Department annually by the permittee.

5. **Notification Of Completion**

a. The Soil Conservation District will provide the Department notification that a copy of the report of compliance was issued under N.J.A.C. 2:90-1 for completed construction activities, except single family home construction under b. below.

b. The builder of a single family home that is authorized under this permit, but not within the definition of "project" at N.J.S.A. 4:24-41g, shall send a copy of the final certification of occupancy to the Soil Conservation District. The Soil Conservation District will provide a copy of the final certificate of occupancy to the Department, which will serve as notification of completion.

SAMPLE

c. The DOT shall provide written notification to the Department when DOT certified projects are completed.

F. STANDARD CONDITIONS APPLICABLE TO THIS GENERAL PERMIT

1. **The permittee shall comply with all the conditions set forth in this permit and all the applicable requirements relevant to the permittee's discharge(s) that can be found in the Federal Clean Water Act and the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.). The permittee may be subject to penalties for any violations thereof.**

2. **The following conditions are incorporated by reference. The permittee is required to comply with the rules that were in effect as of the effective date of the final permit.**

   a. General Conditions

   b. Penalties for Violations - N.J.A.C. 7:14-8.1 et seq.

   c. Incorporation by Reference - N.J.A.C. 7:14A-2.3

   d. Toxic Pollutants - N.J.A.C. 7:14A-6.2(a)4i

   e. Duty to Comply - N.J.A.C. 7:14A-6.2(a)1 & 4

   f. Duty to Mitigate - N.J.A.C. 7:14A-6.2(a)5 & 11

   g. Inspection and Entry - N.J.A.C. 7:14A-2.11(e)

   h. Enforcement Action - N.J.A.C. 7:14A-2.9

   i. Duty to Reapply - N.J.A.C. 7:14A-4.2(e)1(i)

   j. Signatory Requirements for Applications and Reports - N.J.A.C. 7:14A-4.9

   k. Effect of Permit/Other Laws - N.J.A.C. 7:14A-6.2(a)6 & 7 & 2.9(C)

   l. Severability - N.J.A.C. 7:14A-2.2

   m. Administrative Continuation of Permits - N.J.A.C. 7:14A-2.8

   n. Permit Actions - N.J.A.C. 7:14A-2.7(c)

   o. Reopener Clause - N.J.A.C. 7:14A-6.2(a)10, 16.4(b) & 25.7(b)

   p. Permit Duration and Renewal - N.J.A.C. 7:14A-2.7(a) & (b)

   q. Consolidation of Permit Process - N.J.A.C. 7:14A-15.5

   r. Confidentiality - N.J.A.C. 7:14A-18.2 & 2.11(g)

   s. Fee Schedule - N.J.A.C. 7:14A-3.1

   t. UIC Corrective Action - N.J.A.C. 7:14A-8.4

   u. Additional Conditions Applicable to UIC Permits - N.J.A.C. 7:14A-8.9

   v. UIC Operating Criteria - N.J.A.C. 7:14A-8.16

SAMPLE

3. **Operation And Maintenance**

   a. Need to Halt or Reduce not a Defense - N.J.A.C. 7:14A-2.9(b)

   b. Proper Operation and Maintenance - N.J.A.C. 7:14A-6.12

4. **Monitoring And Records**

   a. Monitoring - N.J.A.C. 7:14A-6.5

   b. Recordkeeping - N.J.A.C. 7:14A-6.6

   c. Signatory Requirements for Monitoring Reports - N.J.A.C. 7:14A-6.9

5. **Reporting Requirements**

   a. Planned Changes - N.J.A.C. 7:14A-6.7

   b. Reporting of Monitoring Results - N.J.A.C. 7:14A-6.8

   c. Noncompliance Reporting - N.J.A.C. 7:14A-6.10 & 6.8(h)

   d. Hotline/Two Hour & Twenty-four Hour Reporting - N.J.A.C. 7:14A-6.10(c) & (d)

   e. Written Reporting - N.J.A.C. 7:14A-6.10(e) &(f) & 6.8(h)

   f. Duty to Provide Information - N.J.A.C. 7:14A-2.11, 6.2(a)14 & 18.1

   g. Compliance Schedules - N.J.A.C. 7:14A-6.4

   h. Transfer - N.J.A.C. 7:14A-6.2(a)8 & 16.2

   i. Additional Requriements for all Existing Manufacturing, Commercial, Mining, Siviculture, Mining, Silvicuture and Research Facilities - N.J.A.C. 7:14A-11.3

6. **Copies of the NJPDES rules may be purchased by contacting Lexis Nexis-Customer Service at (800)223-1940, or go to the Lexis Nexis bookstore on the internet at www.lexisnexis.com/bookstore.**

SAMPLE

G. SPECIAL CONDITIONS

1. **Other Laws**

   a. In accordance with N.J.A.C. 7:14A-6.2(a)7, this permit does not authorize any infringement of State or local law or regulations, including, but not limited to the Pinelands rules (N.J.A.C. 7:50), N.J.A.C. 7:1E (Department rules entitled "Discharges of Petroleum and other Hazardous Substances"), and all other Department rules. No discharge of hazardous substances (as defined in N.J.A.C. 7:1E-1.6) resulting from an onsite spill shall be deemed to be "pursuant to and in compliance with permit" within the meaning of the Spill Compensation and Control Act at N.J.S.A. 58:10-23.11c.

   b. Exemptions

      i. Operations and Maintenance Manual: In accordance with N.J.A.C. 7:14A-6.12(c), for a stormwater discharge authorized by this permit, the permittee is exempt from the requirement to prepare an operations and maintenance manual.

H. DEFINITIONS

1. **Unless otherwise stated herein the definitions set forth at N.J.A.C. 7:14A-1.2 are incorporated into this permit.**

2. **"Final certificate of occupancy" means a "certificate of occupancy", as defined at N.J.A.C. 5:23-1.4, that is not a temporary certificate of occupancy as described under N.J.A.C. 5:23-2.23(g).**

3. **The terms "Highlands Preservation Area Approval", "Highlands Region", "major Highlands development", and "Preservation Area" have the meanings set forth for those terms at N.J.A.C. 7:38-1.4. The term "Highlands Applicability Determination" refers to the applicability determination identified at N.J.A.C. 7:38-2.4.**

4. **"Separate storm sewer" means a conveyance or system of conveyances (including roads with drainage systems, streets, catch basins, gutters, ditches, man-made channels, or storm drains):**

   a. Designed or used for collecting or conveying stormwater;

   b. Which is not part of a "combined sewer system"; and

   c. Which is not part of a "Publicly Owned Treatment Works" (POTW).

5. **"Stormwater" means water resulting from precipitation (including rain and snow) that runs off the land's surface, is transmitted to the subsurface, or is captured by separate storm sewers or other sewerage or drainage facilities, or conveyed by snow removal equipment.**

I. ATTACHMENT A: RFA Certification

1. **Every Request for Authorization (RFA) shall include the following RFA certification.**

   a. "I certify under penalty of law that this Request for Authorization and all attached documents were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. As far as I know, none of the stormwater discharges for which this Request for Authorization is submitted are excluded from authorization by Section A.2. or A.3 of NJPDES Permit No. NJ0088323.

   b. I am aware that pursuant to the Water Pollution Control Act (see N.J.S.A. 58:10A-10f(2) and (3)), there are significant civil and criminal penalties for making a false statement, representation or certification in any application, record, or other document filed or required to be maintained under that Act, including fines and/or imprisonment."

2. **The RFA certification shall be signed as follows:**

   a. For a corporation, by a responsible corporate officer as described in N.J.A.C. 7:14A-4.9(a)1;

   b. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively;

   c. For a municipality, State, Federal or other public agency, by either a principal executive officer or ranking elected official; or

   d. For a corporation or other entity under a., b., or c., above, by a duly authorized representative, provided that the representative is authorized by a person described in a., b., or c., above;

SAMPLE

e. This authorization specifies either an individual or a position responsible for the overall operation of the regulated facility such as plant manager, operator of a well or well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company or public agency. A duly authorized representative may thus be either a named individual or any individual occupying a named position; and

i. The written authorization is attached to the RFA.

f. A separate RFA certification shall be signed, dated and submitted for each person submitting the RFA.

J. ATTACHMENT B: CONSTRUCTION SITE WASTE CONTROL COMPONENT OF THE STORMWATER POLLUTION PREVENTION PLAN (SPPP)

1. **The construction site waste control component of the SPPP consists of the requirements in 2., 3., and 4. below. These requirements become operative on March 3, 2004 and apply only to construction activities that commence on or after March 3, 2004. Public projects that have gone out for bid or have been awarded a contract prior to March 3, 2004 are exempt from implementing the new requirements for construction site waste management. Construction activities that commenced prior to March 3, 2004 but did not obtain certification (or approval from exempt municipality) required under the Soil Erosion and Sediment Control Act are not exempt from the requirements in this section. Any other new construction activity for which an RFA is submitted on or after March 3, 2004 or which receive automatic renewal of authorization under this permit after March 3, 2004 also shall comply with these requirements.**

2. **Material Management to Prevent or Reduce Waste - Any pesticides, fertilizers, fuels, lubricants, petroleum products, anti-freeze, paints and paint thinners, cleaning solvents and acids, detergents, chemical additives, and concrete curing compounds shall be stored in containers in a dry covered area. Manufacturers' recommended application rates, uses, and methods shall be strictly followed to the extent necessary to prevent or minimize the presence of waste from such materials in the stormwater discharge authorized by this permit. (The preceding sentence does not apply to any manufacturers' recommendations about fertilizer or other material that conflict with the erosion and sediment control component of the facility's SPPP.)**

3. **Waste Handling - The following requirements apply only to construction site waste that has the potential to be transported by the stormwater discharge authorized by this permit. The handling at the construction site of waste building material and rubble and other construction site wastes, including litter and hazardous and sanitary wastes, shall conform with the State Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., and its implementing rules at N.J.A.C. 7:26, 7:26A, and 7:26G; the New Jersey Pesticide Control Code at N.J.A.C. 7:30; the State litter statute (N.J.S.A. 13:1E-99.3); and OSHA requirements for sanitation at 29 C.F.R. 1926 (except where such conformance is not relevant to the stormwater discharge authorized by this permit). Construction sites shall have one or more designated waste collection areas onsite or adjacent to the site, and an adequate number of containers for waste. Waste shall be collected from such containers before they overflow, and spills at such containers shall be cleaned up immediately. Staged waste containers shall be maintained so as to prevent waste materials from overflowing, leaking, or lowing out of the container. Spills, leaks, and overflows, which do occur, shall be cleaned up immediately.**

   a. Construction site wastes include but are not limited to:

i. "Construction and demolition waste," as defined in N.J.A.C. 7:26-1.4 as follows: "waste building material and rubble resulting from construction, remodeling, repair, and demolition operations on houses, commercial buildings, pavements and other structures. The following materials may be found in construction and demolition waste: treated and untreated wood scrap; tree parts, tree stumps and brush; concrete, asphalt, bricks, blocks and other masonry; plaster and wallboard; roofing materials; corrugated cardboard and miscellaneous paper; ferrous and non-ferrous metal; non-asbestos building insulation; plastic scrap; dirt; carpets and padding; glass (window and door); and other miscellaneous materials; but shall not include other solid waste types."

ii. Any waste building material and rubble resulting from such operations that is hazardous for purposes of N.J.A.C. 7:26G (the Hazardous Waste rules).

iii. Discarded (including spilled) pesticides, fertilizers, fuels, lubricants, petroleum products, anti-freeze, paints and paint thinners, paint chips and sandblasting grits, cleaning solvents, acids for cleaning masonry surfaces, detergents, chemical additives used for soil stabilization (e.g., calcium chloride), and concrete curing compounds.

iv. Other "litter," as defined at N.J.S.A. 13:1E-215.d as follows: "any used or unconsumed substance or waste material which has been discarded whether made of aluminum, glass, plastic, rubber, paper, or other natural or synthetic material, or any combination thereof, including, but not limited to, any bottle, jar or can, or any top, cap or detachable tab of any bottle, jar or can, any unlighted cigarette, cigar, match or any flaming or glowing material or any garbage, trash, refuse, debris, rubbish, grass clippings or other lawn or garden waste, newspapers, magazines, glass, metal, plastic or paper containers or other packaging or construction material, but does not include the waste of the primary processes of mining or other extraction processes, logging, sawmilling, farming or manufacturing."

v. Sanitary sewage and septage.

vi. Contaminated soils encountered or discovered during earthmoving activities or during the cleanup of a leak or discharge of a hazardous substance.

b. Concrete Washout - Concrete washout onsite is prohibited outside designated areas. Washout activities include, but are not limited to, the washing of trucks, chutes, hoses, mixers, hoppers, and tools.

i. Designated washout areas shall be lined and bermed to prevent discharges to surface and ground water.

ii. Hardened concrete from the concrete washout shall be removed and properly disposed of.

iii. The concrete washout area shall be clearly designated with a sign indicating the areas uses.

c. Sanitary Sewage/Septage Disposal - Discharges of raw sanitary sewage or septage onsite are strictly prohibited. Adequate facilities with proper disposal shall be provided and maintained onsite or adjacent to the site for all workers and other sanitary needs.

4. Spills; Discharges of Hazardous Substances; Federally Reportable Releases.

a. Spill kits shall be available onsite or adjacent to the site for any materials that are listed in 2. above and used or applied onsite. All spills of such material shall be contained and cleaned up immediately. Cleaned up materials shall be properly disposed of.

SAMPLE

b. Discharges of hazardous substances (as defined in N.J.A.C. 7:1E-1.6) in construction site wastes are subject to the provisions of the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq., and of Department rules for Discharges of Petroleum and Other Hazardous Substances at N.J.A.C. 7:1E. No discharge of hazardous substances resulting from an onsite spill shall be deemed to be "pursuant to and in compliance with [this] permit" within the meaning of the Spill Compensation and Control Act at N.J.S.A. 58:10-23.11c.

c. Releases in excess of reportable quantities (RQ) established under 40 C.F.R. 110, 117, and 302 that occur within a 24-hr period must be reported to the National Response Center (800 424-8802).

K. ATTACHMENT C: INDIVIDUAL HOME CONSTRUCTION STABILIZATION PLAN, (IHCSP)

1. **The contents of the IHCSP outlined below establish minimum soil erosion and sediment controls that shall be implemented during construction of a single family home that is not within the definition of "project" at N.J.S.A. 4:24-41g. If site conditions exist in which one or more provisions below are not appropriate, the appropriate Soil Conservation District shall be contacted to obtain other acceptable methods, which shall be implemented in lieu of those provisions.**

2. **IHCSP Minimum Control Standards:**

   a. Site Perimeter Soil Erosion and Sediment Control

      i. All sediment barriers shall be installed in accordance with Standards for Soil Erosion and Sediment Control in New Jersey (Standards), July 1999, p. 25-1, prior to any grading or construction activities on the site and shall remain in place until the site is stabilized.

      ii. All sediment barriers shall be positioned to fully incorporate all construction activities with the exception of driveways and temporary access roads. In these circumstances, the sedimentcontrol devices shall be extended along the perimeter of all driveways and access roads.

      iii. All stockpiles, well drilling activities and septic system construction activities shall be incorporated within the confines of the sediment barriers. Additional sediment control devices may be required to control areas exhibiting high sediment loads.

      iv. The sediment barriers shall be inspected and maintained on a daily basis. Any failures, breaches, rips, etc. will be dealt with and corrected upon discovery.

      v. All soil washed, dropped, spilled, or tracked outside the property boundries or onto public right-of-ways will be removed immediately.

   b. Installation of Stone Driveway and Construction Entrance Stablization

      i. Installation of stone driveway and construction entrances shall be accomplished directly after the clearing of a lot.

      ii. The site of the permanent driveway and all constructionentrances shall be stoned with 1 1/2" - 2" stone immediately after initial site disturbance.

      iii. All soil washed, dropped, spilled, or tracked outside the limit of disturbance or onto public rights-of-way will be removed immediately.

   c. Stockpile Stabilization

SAMPLE

i. Stockpile and staging locations shall be placed within the area enclosed by the sediment control devices. Staging and stockpiling of materials outside of the construction perimeter will be subject to the same provisions of this plan.

ii. All soil stockpiles that are to be exposed for more than fourteen (14) days will be required to be temporarily seeded. If the season prevents the growth of temporary cover, then the surface will be mulched with straw or a similar substance at a rate of two (2) tons per acre.

iii. Additional sediment control devices may be required around stockpiles with heavy soil loads in their stormwater runoff.

d. Temporary Cover

i. A sub-base course will be applied immediately following rough grading and installation of improvements to stablize streets, roads, driveways, and parking areas. In areas where no utilities are present, the sub-base shall be installed within fiteen (15) days of the preliminary grading.

ii. Any disturbed area that will be exposed for more than a fourteen (14) day period, and not subject to construction, will immediately receive temporary seeding. If the season does permit the growthof temporary seeding. If the season does not permit the growth of temporary cover, the disturbed areas will be mulched with straw, or equivalent material at a rate of two (2) tons per acre, according to state standards.

iii. Immediately following initial disturbance or rough grading, all critical areas subject to erosion (I.e. steep slopes and embankments) will receive a temporary seeding in combination with straw mulch or a suitable equivalent, at a rate of two (2) tons per acre.

e. Final Seeding and Mulching/Permanent Vegetative Cover

i. Prior to seeding, the site shall be graded as needed and feasible to permit the use of conventional equipment for seedbed preparation. All grading should be done in accordance with Standards for Land Grading in Standards p. 4.7 through 4.13.

ii. Permanent vegetation to be seeded or sodded on all exposed areas within ten (10) days of final grading. Mulching is required on all seeding. When hydro-seeding, mulch shall be included in the tank when seeding.
- Mulch should be unrotted small grain straw, hay free of seeds, or salt hay. Mulch is to be applied at the rate of 1 1/2 to 2 tons per acre (70-90lbs/ 1,000sq. ft.), except that where a crimper is used instead of a liquid mulch-binder, the rate of application must be double the lower rate. Mulch chopper-blowers must NOT grind the material.
- The mulch shall be spread uniformly by hand or mechanically so that approximately 75-95% of the surface shall be uniformly covered. For uniform distribution of hand spread mulch, divide area into approximately 1,000sq. ft. sections and distribute 70-90lbs. within each section.
- Mulch anchoring shall be accomplished immediately after placement either by using peg and twine, mulch netting, use of a crimper or liquid mulch binders.

iii. Only approved seed mixtures shall be applied. (Approved mixtures can be obtained from Standards Table 4-2 or a mixture can be used which is recommended by the Cooperative Extension Service or Soil Conservation Service, which is approved by the Soil Conservation District.)

iv. After seeding, the soil shall be firmed with a corrugated roller to assure good seed-to-soil contact.

v. If soil moisture is deficient, the seed bed will be irrigated at a minimum of 1/4" of water, twice a day until vegetation is well established.

vi. At the time the site preparation for permanent vegetative stabilization is going to be accomplished, any soil that will not provide a suitable environment to support adequate vegetative ground cover, shall be removed or treated in such a way that it will permanently adjust the soil conditions and render it suitable for vegetative ground cover. If the removal or treatment of the soil will not provide suitable conditions, non-vegetative means of permanent ground stablization will have to be employed.

f. Standard for Managing High Acid Producing Soils

i. All soils having a pH of 4 or less or containing iron sulfides shall be covered with a minimum of twelve (12) inches of soil having a pH of 5 or more prior to seedbed preparation. The added soil shall be limed according to Standards p. 1-2.

ii. All stockpiles or wastepiles of soils having a pH of 4 or less or containing iron sulfides must have additional sediment control devices fully encircling them.

g. Dust Control

i. Dust control measures shall be applied to areas subject to dust blowing and movement where on- and off-site damage is likely without treatment. Consultation of local municipal ordinances regarding restrictions shall be performed prior to implementing dust suppression measures.

ii. Dust suppression on bare soil can be accomplished by any of the following methods:
- Tillage: Tillage shall be performed as a temporary emergency measure that is to be used before soil blowing starts.
- Sprinkling: Site is sprinkled with water until surface is wet. Where applicable, temporary vegetative cover shall be established or mulch shall be applied in accordance with Standards.
- Calcium Chloride application: Shall be in the form of loose, dry granules or flakes fine enough to feed through commonly used spreaders at a rate that will keep surface moist but not cause pollution or plant damage. Other practices shall be applied to slopes greater than 3:1.
- Stone: The surface may be covered with crushed stone or coarse gravel.
- Mulches.
- Vegetative covers.
- Spray on adhesives: Shall be applied on mineral soils (not on muck soils) and shall not be exposed to traffic. The following spray on adhesives are permitted for use as dust suppresants when applied according to the corresponding standards: 1) Anionic asphalt emulsion diluted with a 7:1 water dilution applied with a coarse spray nozzle at the concentration of 1,200 gallons per acre, 2) Latex emulsions diluted with a 12.5:1 water dilution and applied with a fine spray nozzle at the concentration of 235 gallons per acre, and 3) Resin in water diluted with a 4:1 water dilution and applied with a fine spray nozzle at the concentration of 300 gallons per acre.

h. Stabilization of steep slopes (I.e., slopes greater than 3:1)

i. Immediately following initial disturbance or rough grading, all critical areas subject to erosion (I.e. steep slopes and embankments) will receive a temporary seeding in combination with straw mulch or a suitable equivalent, at a rate of two (2) tons per acre, according to Standards

ii. Any steep slopes receiving pipeline installation will be backfilled and stabilized daily, as the installation continues.

i. Dewatering (There shall be no ponding of surface water for a period of greater than 72 hours, associated with dewatering activites)

ARCHIVE

i. Unfiltered dewatering is not permitted. All necessary precautions shall be taken during all dewatering operations to minimize sediment transfer. Any dewatering methods used must be in accordance with Standards.

ii. Water pumped from removable pump stationsand sump pits shall be discharged directly into a sediment basin or suitable filter area.
- The suction hose from the pump shall be placed inside the inner pipe to begin dewatering. The discharge hose shall be placed in a stabilized area downslope of unstabilized areas to prevent erosion.
- Sump Pits must be designed to the genral criteria outlined on detail 14-2 of the "Standards for Soil Erosion and Sediment Control in New Jersey".
- Sump Pits shall be perforated vertical standpipe which is wrapped with 1/2" hardware cloth and geotextile fabric and placed in the center of an excavated pit which is then backfilled with filter material consisting of anything from clean gravel (minimal fines) to ASTMC 33 stone(1 1/2" maximum diameter).

iii. Sediment Tanks and Sediment Control Bags are to be used on sites where excavations are deep, and space is limited and where direct discharge of sediment-laden water to stream and storm drain systems is to be avoided.
- Containers (tanks or bags) shall be located for ease of clean-out and disposal of the trapped sediment and to minimize interference with construction activities and pedestrian traffic. Bags shall not be placed directly into recieving waters.
- Sediment Control Bags must be located away from recieving waters and disposed of according to manufacturer's instructions.
- Sediment Control Tanks shall be sized accordingly: 1 cube foot of storage for each gallon per minute of pump discharge capacity. Tanks may be connected in series to increase effectiveness.

SAMPLE

SAMPLE

PAGE
581
NOT USED

PAGE
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NOT USED

General Decision Number: NJ140031 03/14/2014 NJ31

Superseded General Decision Number: NJ20130031

State: New Jersey

Construction Type: Building

County: Essex County in New Jersey.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Modification Number	Publication Date
0	01/03/2014
1	02/07/2014
2	03/14/2014

ASBE0032-008 09/19/2013

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR (Includes the application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems; also, the application of firestopping material to openings and penetrations in walls, floors, ceilings and curtain walls; also, all lead abatement)	$ 45.00	31.69

BRNJ0002-014 05/01/2013

	Rates	Fringes
BRICKLAYER (Including Caulking, Cleaning and Pointing)	$ 38.25	27.39

Work on high stacks: 22% per hour additional.

BRNJ0002-016 05/01/2013

	Rates	Fringes
MASON - STONE	$ 38.25	27.39

Work on high stacks: 22% per hour additional.

BRNJ0004-001 05/01/2013

	Rates	Fringes
CEMENT MASON	$ 38.25	27.39

BRNJ0007-022 07/01/2013

	Rates	Fringes
Tile finisher.....	$ 40.29	26.42
Tile setter.....	$ 51.05	29.56

Tile finisher:
Work grouting all epoxy: $10.00 additional per day.

CARP0006-009 11/01/2012

	Rates	Fringes
CARPENTER (Scaffold Builder).....	$ 41.49	56%

The first sixty feet at the regular rate, 10% per hour additional for each additional fifty feet thereafter.

CARP0006-010 11/01/2012

	Rates	Fringes
CARPENTER Including Acoustical Ceiling Installation, Drywall Hanging, Formwork, Batt and Blown Insulation...	$ 41.49	56%

CARP0029-008 11/01/2012

	Rates	Fringes
Soft floor layer.....	$ 41.49	56%

CARP0715-007 11/01/2012

	Rates	Fringes
Millwright.....	$ 42.28	56%

Work of erection and dismantling of elevators and towers, such as concrete conveyors and temporary material elevators, scaffolding or other structures to be used as scaffolding inside or outside of buildings: the first sixty feet at the regular rate, 10% per hour additional for each additional fifty feet thereafter.

ELEC0164-006 06/03/2013

	Rates	Fringes
ELECTRICIAN (Apartments over 4 units.).....	$ 48.99	62%
ELECTRICIAN (Including Low Voltage Wiring)		

Cable splicer	$ 48.99	62%
Electrician	$ 48.99	62%

Work on line voltage of 440 or 480 volts: 10% per hour additional.

Work from trusses, scaffolds, frames, ladders and poles, 40 ft. or more above the ground or floor (does not include work from a manlift): 20% per hour additional.

Work on radio towers, transmission towers and smokestacks: 21% per hour additional.

ELEV0001-003 03/17/2013

	Rates	Fringes
Elevator mechanic		
Work on the addition, replacement, refurbishing or relocation of control, drive, generating equipment, hoistway or pit equipment, including work involving a structural rise in the elevator shafts in an existing building and other elevator work in the machine room, hoistway or pit; Also, changes in design and appearance of basic escalator equipment	$ 45.14	27.455
All other work	$ 57.01	27.605

PAID HOLIDAYS:
New Year's Day, President's Day, Good Friday, Memorial Day, Fourth of July, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day, and Christmas Day.

PAID VACATION:

A worker who has worked less than 5 years: 4% of his or her hourly rate for all hours worked.

A worker who has worked 5 to 10 years: 6% of his or her hourly rate for all hours worked.

A worker who has worked 15 or more years: 8% of his or her hourly rate for all hours worked.

ENGI0825-020 07/01/2013

	Rates	Fringes
Power equipment operators:		

GROUP 1	$ 43.07	28.50
GROUP 2	$ 41.48	28.50
GROUP 3	$ 39.57	28.50
GROUP 4	$ 37.94	28.50
GROUP 5	$ 36.23	28.50

Hazardous waste removal work:
Work on a state or federally designated hazardous waste site, where the worker is in direct contact with hazardous material, and when personal protective equipment is required for respiratory, skin and eye protection: 20% per hour additional.

PAID HOLIDAYS:
New Year's Day, Washington's Birthday observed, Memorial Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided 1) that the worker works three of the preceding five work days before the holiday; or; the work day before the holiday and the work day after the holiday; and, 2) that the worker works the work day before and the work day after the holiday.

DEFINITION OF GROUPS:

GROUP 1:
Backhoe, Including Backhoe Track; Boom; Concrete Paving Machine; Crane (all types, including overhead and straddle traveling type); Drill (down-the-hole drill, rotary drill, self-propelled hydraulic drill, self-powered drill); Elevating Grader; Excavator; Front End Loader (5 cu. yd. and over); Piledriver (length of boom, including length of leads, shall determine premium rate applicable); Trencher

GROUP 2:
Backhoe Loader Combo; Concrete Pumper; Grader/Blade (Finish); Hoist; Hydraulic Crane, 10 Tons and under; Front End Loader (2 cu. yd. but less than 5 cu. yd.); Scraper; Side Boom

GROUP 3:
Asphalt Spreader; Bulldozer;Compressor(2 or 3) (in Battery) (within 100 ft.); Forklift; Front End Loader (1 cu. yd. and over but less than 2 cu. yd.); Lull; Mechanic; Paver, Asphalt; Roller, Blacktop; Tractor;

GROUP 4:
Bobcat/Skid Loader; Compressor (Single); Farm Tractor; Front End Loader (under 1 cu. yd.); Hydroseeder; Roller, Grade; Pump, Hydraulic

GROUP 5:
Oiler

IRON0011-012 08/01/2012

	Rates	Fringes

Ironworkers:
Reinforcing.....$ 40.74 39.40
Structural, Ornamental.....$ 43.54 39.40

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* LABO0008-001 05/01/2011

	Rates	Fringes
Asbestos Removal Laborer	$ 28.37	21.62

The removal, abatement, enclosure and decontamination of personal protective equipment, chemical protective clothing and machinery relating to asbestos and/or toxic and hazardous waste or materials which shall include but not necessarily be limited to: the erection, moving, servicing and dismantling of all enclosures, scaffolding and barricades; the operation of all tools and equipment normally used in the removal or abatement of asbestos and toxic or hazardous waste or materials; the labeling, bagging, cartoning, crating, or other packaging of materials for disposal; the clean-up of the worksite; and all other work incidental to the removal, abatement, encapsulation, enclosure, and decontamination of asbestos and toxic or hazardous waste or materials; and, in addition, all work tasks involved in the maintenance and operation of energy resource recovery plants (co-generation plants)

LABO0222-006 07/01/2012

	Rates	Fringes
LABORER		
MASON TENDER:		
Brick/Cement/Concrete	$ 29.85	23.07

LABO0222-009 07/01/2012

	Rates	Fringes
Laborers:		
Asphalt Shoveler, Asphalt Spreader, Common or General Laborer, Landscape Laborer, Pipelayer, Power Tool Operator and Screedman	$ 29.35	23.07

PAIN0711-018 05/01/2013

	Rates	Fringes
DRYWALL FINISHER/TAPER	$ 38.00	20.10

PAIN0711-019 11/01/2012

	Rates	Fringes

PAINTER (Brush & Roller).....$ 36.62 19.54
PAINTER (Spray).....$ 40.28 19.98

PAIN0711-021 05/01/2013

	Rates	Fringes
Glazier.....	$ 40.94	20.38

Work welding or using a cutting torch:
$1.00 per hour additional.

Work on a swing stage scaffold; on a pipe scaffold providing the working height of the platform is 30 ft. or above; and on motorized lifts provided that the height of the lift platform is above the second floor or above thirty feet: $1.00 per hour additional.

PLAS0029-003 05/01/2012

	Rates	Fringes
PLASTERER.....	$ 40.30	22.05

PLUM0024-014 05/01/2013

	Rates	Fringes
PLUMBER (Excluding HVAC Pipe Installation).....	$ 48.36	29.74

PLUM0475-014 05/01/2013

	Rates	Fringes
PIPEFITTER (Including HVAC Pipe Installation).....	$ 50.17	23.04

ROOF0004-011 06/01/2011

	Rates	Fringes
ROOFER (Shingles, Shake and Tile).....	$ 34.07	18.77

SFNJ0696-006 01/01/2014

	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers).....	$ 55.38	22.77

SHEE0025-005 09/18/2012

	Rates	Fringes
SHEET METAL WORKER (Including HVAC Duct Installation).....	$ 44.11	32.36

TEAM0408-002 11/01/2012

	Rates	Fringes
TRUCK DRIVER		
Dump Truck	$ 33.95	18.73+a
Off the Road Truck	$ 33.80	18.73+a

a. Employer contributes $1304.35 per month per worker for health and welfare.

Hazardous waste removal work, where the worker is in direct contact with hazardous material, and when personal protective equipment is required for respiratory, skin and eye protection: $3.00 per hour additional.

Hazardous waste removal work, where the worker is working in a hazardous waste site, in a zone requiring Level A personal protection for any of the workers: $3.00 per hour additional.

Hazardous waste removal work, where the worker is not working in a zone requiring Level A, B or C personal protection: $1.00 per hour additional.

PAID HOLIDAYS:
New Year's Day, President's Day, Decoration Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided that the worker has been assigned to work, or, "shapes", one day of the calendar week during which the holiday occurs.

SUNJ2004-007 01/02/2009

	Rates	Fringes
ROOFER, Excludes Shake & Shingle, and Tile Roofs	$ 30.21	15.25

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification

and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter

* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

General Decision Number: NJ140052 01/03/2014 NJ52

Superseded General Decision Number: NJ20130052

State: New Jersey

Construction Type: Heavy

County: Essex County in New Jersey.

HEAVY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/03/2014

* BRNJ0004-001 05/01/2013

	Rates	Fringes
CEMENT MASON	$ 38.25	27.39

CARP0006-009 11/01/2012

	Rates	Fringes
CARPENTER (Scaffold Builder)	$ 41.49	56%

The first sixty feet at the regular rate, 10% per hour additional for each additional fifty feet thereafter.

CARP0006-013 11/01/2012

	Rates	Fringes
CARPENTER (Including Form Work)	$ 41.49	56%

The first sixty feet at the regular rate, 10% per hour additional for each additional fifty feet thereafter.

CARP0715-007 11/01/2012

	Rates	Fringes
Millwright	$ 42.28	56%

Work of erection and dismantling of elevators and towers, such as concrete conveyors and temporary material elevators, scaffolding or other structures to be used as scaffolding inside or outside of buildings: the first sixty feet at the regular rate, 10% per hour additional for each additional fifty feet thereafter.

ELEC0164-008 06/03/2013

	Rates	Fringes

ELECTRICIAN

Cable splicer	$ 48.99	62%
Electrician	$ 48.99	62%

Work on line voltage of 440 or 480 volts: 10% per hour additional.

Work from trusses, scaffolds, frames, ladders and poles, 40 ft. or more above the ground or floor (does not include work from a manlift): 20% per hour additional.

Work on radio towers, transmission towers and smokestacks: 21% per hour additional.

ENGI0825-021 07/01/2013

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 43.07	28.50
GROUP 2	$ 41.48	28.50
GROUP 3	$ 39.57	28.50
GROUP 4	$ 37.94	28.50
GROUP 5	$ 36.23	28.50

Hazardous waste removal work:
Work on a state or federally designated hazardous waste site, where the worker is in direct contact with hazardous material, and when personal protective equipment is required for respiratory; skin and eye protection: 20% per hour additional.

PAID HOLIDAYS:
New Year's Day, Washington's Birthday observed, Memorial Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided 1) that the worker works three of the preceding five work days before the holiday; or, the work day before the holiday and the work day after the holiday; and, 2) that the worker works the work day before and the work day after the holiday.

DEFINITION OF GROUPS:

GROUP 1:
Backhoe, Including Backhoe Track; Boom; Concrete Paving Machine; Crane (all types, including overhead and straddle traveling type); Drill (down-the-hole drill, rotary drill, self-propelled hydraulic drill, self-powered drill); Elevating Grader; Excavator; Front End Loader (5 cu. yd. and over); Piledriver (length of boom, including length of leads, shall determine premium rate applicable)

GROUP 2:
Backhoe Loader Combo; Concrete Pumper; Grader/Blade (Finish); Hoist; Hydraulic Crane, 10 Tons and under; Front End Loader (2 cu. yd. but less than 5 cu. yd.); Scraper; Side

Boom

GROUP 3:
Asphalt Spreader; Bulldozer; Compressor(2 or 3) (in Battery) (within 100 ft.); Crusher; Forklift; Front End Loader (1 cu. yd. and over but less than 2 cu. yd.); Lull; Mechanic; Paver, Asphalt; Roller, Blacktop; Tractor;

GROUP 4:
Broom; Compressor (Single); Farm Tractor; Front End Loader (under 1 cu. yd.); Roller, Grade; Pump

GROUP 5:
Oiler

IRON0011-012 08/01/2012

	Rates	Fringes
Ironworkers:		
Reinforcing	$ 40.74	39.40
Structural, Ornamental	$ 43.54	39.40

LABO0172-009 09/01/2012

	Rates	Fringes
Laborers:		
Common or General Laborer; Landscape Laborer, Power Tool Operator	$ 33.20	22.40
Pipelayer	$ 33.90	22.40

Hazardous waste removal work:
Work on a state or federally designated hazardous waste site, where the worker is required to wear Level A, B or C personal protection: $3.00 per hour additional.

Work on a state or federally designated hazardous waste site, where the worker is not required to wear Level A, B, or C personal protection: $1.00 per hour additional.

PAID HOLIDAYS:
New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided that the worker works three days for the same employer within a period of ten working days consisting of five working days before and five working days after the day upon which the holiday falls or is observed.

LABO0222-013 07/01/2012

	Rates	Fringes
LABORER		
MASON TENDER:		

Cement/Concrete	$ 29.35	23.07

PAIN0711-023 05/01/2009

	Rates	Fringes
Painters:		
Work on bridges (Major Bridges Designed for Commercial Navigation)	$ 46.50	19.13

PAIN0711-024 11/01/2008

	Rates	Fringes
Painters:		
New Construction		
Brush and roller	$ 34.47	16.14
Spray	$ 37.92	16.14
Steel	$ 35.81	16.30
Repaint work, on projects on which no major alterations occur.		
Brush and roller	$ 26.67	13.80
Spray	$ 29.34	13.80
Steel	$ 27.74	13.93

PLUM0475-020 05/01/2013

	Rates	Fringes
PIPEFITTER	$ 50.17	23.04

TEAM0408-003 11/01/2012

	Rates	Fringes
TRUCK DRIVER		
Dump Truck	$ 33.95	18.73+a
Off the Road Truck, Flatbed Truck, Pickup Truck, Vacuum Truck	$ 33.80	18.73+a

a. Employer contributes $1304.35 per month per worker for health and welfare.

Hazardous waste removal work, where the worker is in direct contact with hazardous material, and when personal protective equipment is required for respiratory, skin and eye protection: $3.00 per hour additional.

Hazardous waste removal work, where the worker is working in a hazardous waste site, in a zone requiring Level A personal protection for any of the workers: $3.00 per hour additional.

Hazardous waste removal work, where the worker is not working in a zone requiring Level A, B or C personal protection: $1.00 per hour additional.

PAID HOLIDAYS:
New Year's Day, President's Day, Decoration Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided that the worker has been assigned to work, or, "shapes", one day of the calendar week during which the holiday occurs.

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

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U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage

payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

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U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

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END OF GENERAL DECISION

General Decision Number: NJ140002 01/03/2014 NJ2

Superseded General Decision Number: NJ20130002

State: New Jersey

Construction Type: Highway

Counties: Bergen, Essex, Hudson, Hunterdon, Middlesex, Morris, Passaic, Somerset, Sussex, Union and Warren Counties in New Jersey.

HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/03/2014

* BRNJ0002-005 05/01/2013

BERGEN, ESSEX AND HUDSON COUNTIES; HUNTERDON COUNTY (north and west of a line drawn from Clover Hill, through Reaville, through Flemington, through High Bridge, through Califon, through Fairmont, to Pottersville); MIDDLESEX COUNTY (Borough of Dunellen; Township of Edison (Town of Oak Tree only); Township of Piscataway (Town of New Market only); Borough of South Plainfield); MORRIS AND PASSAIC COUNTIES; SOMERSET COUNTY (north of a line drawn from the point where the Lamington River leaves the boundary line between Hunterdon and Somerset Counties; then, continuing along the Lamington River to where it becomes the North Branch of the Raritan River; then, continuing along the North Branch of the Raritan River to where it becomes Chambers Brook; then, continuing along Chambers Brook until it becomes the boundary line between the Townships of Bernards and Bridgewater; then, continuing along the boundary line between the Townships of Bernards and Bridgewater, until that boundary line intersects with Route 78; then, continuing along Route 78 until Route 78 intersects with Route 525; then, continuing along Route 525 until Route 525 intersects with the boundary line between the Townships of Bridgewater and Warren; then, continuing along the boundary line between the Townships of Bridgewater and Warren until that boundary line intersects with Route 22; then, following Route 22 until Route 22 intersects with Sebrings Mills Rd. (also known as King George Rd.); then, continuing south on Sebrings Mills Rd. until it goes over Green Brook, which is the Middlesex County line); SUSSEX, UNION AND WARREN COUNTIES:

	Rates	Fringes
Bricklayer.....	$ 38.25	27.39

Work 100 degrees F. and over:
to be paid at the rate of double time.

Work on high stacks:
22% per hour additional.

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* BRNJ0002-006 05/01/2013

HUNTERDON COUNTY (south and east of a line drawn from Clover Hill, through Reaville, through Flemington, through High Bridge, through Califon, through Fairmont, to Pottersville); MIDDLESEX COUNTY (does not include the Borough of Dunellen; Township of Edison (Town of Oak Tree); Township of Piscataway (Town of New Market); Borough of South Plainfield); SOMERSET COUNTY (south of a line drawn from the point where the Lamington River leaves the boundary line between Hunterdon and Somerset Counties; then, continuing along the Lamington River to where it becomes the North Branch of the Raritan River; then, continuing along the North Branch of the Raritan River to where it becomes Chambers Brook; then, continuing along Chambers Brook until it becomes the boundary line between the Townships of Bernards and Bridgewater; then, continuing along the boundary line between the Townships of ~~Bernards~~ and Bridgewater, until that boundary line intersects with Route 78; then, continuing along Route 78 until Route 78 intersects with Route 525; then, continuing along Route 525 until Route 525 intersects with the boundary line between the Townships of Bridgewater and Warren; then, continuing along the boundary line between the Townships of Bridgewater and Warren until that boundary line intersects with Route 22; then, continuing along Route 22 until Route 22 intersects with Sebrings Mills Rd. (also known as King George Rd.); then, continuing south along Sebrings Mills Rd. until it goes over Green Brook, which is the Middlesex County line):

	Rates	Fringes
Bricklayer.....	$ 38.25	27.39

Work 100 degrees F. and over:
to be paid at the rate of double time.

Work on high stacks:
22% per hour additional.

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* BRNJ0002-008 05/01/2013

BERGEN, ESSEX AND HUDSON COUNTIES; HUNTERDON COUNTY (north and west of a line drawn from Clover Hill, through Reaville, through Flemington, through High Bridge, through Califon, through Fairmont, to Pottersville); MIDDLESEX COUNTY (Borough of Dunellen; Township of Edison (Town of Oak Tree only); Township of Piscataway (Town of New Market only); Borough of South Plainfield); MORRIS AND PASSAIC COUNTIES; SOMERSET COUNTY (north of a line drawn from the point where the Lamington River leaves the boundary line between Hunterdon and Somerset Counties; then, continuing along the Lamington River to where it becomes the North Branch of the Raritan River; then, continuing along the North Branch of the Raritan River to where it becomes Chambers Brook; then, continuing along Chambers Brook until it becomes the boundary line between the Townships of Bernards and Bridgewater; then, continuing along the boundary line between the Townships of Bernards and Bridgewater, until that boundary line intersects with Route 78;

then, continuing along Route 78 until Route 78 intersects with Route 525; then, continuing along Route 525 until Route 525 intersects with the boundary line between the Townships of Bridgewater and Warren; then, continuing along the boundary line between the Townships of Bridgewater and Warren until that boundary line intersects with Route 22; then, continuing along Route 22 until Route 22 intersects with Sebrings Mills Rd. (also known as King George Rd.); then, continuing south on Sebrings Mills Rd. until it goes over Green Brook, which is the Middlesex County line); SUSSEX, UNION AND WARREN COUNTIES:

	Rates	Fringes
CEMENT MASON.....	$ 38.25	27.39

Cement mason:
Epoxy, acid and latex work: $.50 per hour additional.

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* BRNJ0002-009 05/01/2013

HUNTERDON COUNTY (south and east of a line drawn from Clover Hill, through Reaville, through Flemington, through High Bridge, through Califon, through Fairmont, to Pottersville); MIDDLESEX COUNTY (does not include the Borough of Dunellen; Township of Edison (Town of Oak Tree); Township of Piscataway (Town of New Market); Borough of South Plainfield); SOMERSET COUNTY (south of a line drawn from the point where the Lamington River leaves the boundary line between Hunterdon and Somerset Counties; then, continuing along the Lamington River to where it becomes the North Branch of the Raritan River; then, continuing along the North Branch of the Raritan River to where it becomes Chambers Brook; then, continuing along Chambers Brook until it becomes the boundary line between the Townships of Bernards and Bridgewater; then, continuing along the boundary line between the Townships of Bernards and Bridgewater, until that boundary line intersects with Route 78; then, continuing along Route 78 until Route 78 intersects with Route 525; then, continuing along Route 525 until Route 525 intersects with the boundary line between the Townships of Bridgewater and Warren; then, continuing along the boundary line between the Townships of Bridgewater and Warren until that boundary line intersects with Route 22; then, continuing along Route 22 until Route 22 intersects with Sebrings Mills Rd. (also known as King George Rd.); then, continuing south along Sebrings Mills Rd. until it goes over Green Brook, which is the Middlesex County line):

	Rates	Fringes
CEMENT MASON.....	$ 38.25	27.39

Cement mason:
Epoxy, acid and latex work: $.50 per hour additional.

CARP0006-008 11/01/2012

	Rates	Fringes
CARPENTER.....	$ 41.49	56%

CARP1456-002 05/01/2008

	Rates	Fringes
Piledriver		
Concrete form work.....	$ 37.00	27.02
All other work.....	$ 37.00	32.90

Work on land pile driving, while handling and working with creosote and creosote-impregnated products: $.25 per hour additional.

Work on hazardous/toxic/contaminated waste removal, on a hazardous/toxic/contaminated waste site, where the worker comes into contact with hazardous/toxic/contaminated waste material, and when A, B or C personal protective equipment is required and used for respiratory, skin or eye protection: 20% per hour additional.

ELEC0102-001 06/03/2013

HUNTERDON COUNTY (Townships of Alexandria and Bethlehem; Boroughs of Bloomsbury and Califon; Town of Clinton; Township of Clinton; Township of Delaware (west of a line following County Route 523 from the Delaware River north to the Raritan Township line); Township of East Amwell (east of State Hwy. 31); Township of Franklin; Boroughs of Frenchtown, Glen Gardner, Hampton and High Bridge; Townships of Holland and Kingwood; Borough of Lebanon; Township of Lebanon; Borough of Milford; Township of Raritan (east of State Hwy. 31 and north of County Route 523); Townships of Readington, Tewksbury and Union); MORRIS AND PASSAIC COUNTIES; SOMERSET COUNTY (does not include the Township of Franklin east of a line following Cedar Grove Lane from the Raritan River, in a southwesterly direction, to the Millstone Branch of the Pennsylvania Railroad; then, west along the railroad to the Delaware and Raritan Canal; then, south along the canal to the Middlesex County line; does not include the Township of Montgomery west and south of a line following U.S. Hwy. 206 (formerly State Hwy. 31) north from the Mercer County line to Harlingen Rd.; then, west along Harlingen Rd. and the Dutchtown-Zion road to the Hillsborough township line); SUSSEX, UNION AND WARREN COUNTIES:

	Rates	Fringes
Line construction:		
High-tension pipe-type		
cable installation:		
Cable splicer.....	$ 55.34	55%
Ground person.....	$ 30.19	55%
Groundman.....	$ 30.19	55%
Line technician;		
equipment operator; x-ray		

technician; equipment
repair person; equipment
service person; hole-
digging equipment
operator; truck with
winch or pole and steel
hand; truck without winch..$ 50.31 55%
Line technician-welder.....$ 52.83 55%
All other work:
Cable splicer.....$ 55.34 55%
Groundman.....$ 30.19 55%
Line technician;
equipment operator.....$ 50.31 55%
Line technician-welder.....$ 52.83 55%

Work with, or the removal of, asbestos materials: 112% times the journeyman rate.

ELEC0102-002 06/03/2013

HUNTERDON COUNTY (Townships of Alexandria and Bethlehem; Boroughs of Bloomsbury and Califon; Town of Clinton; Township of Clinton; Township of Delaware (west of a line following County Route 523 from the Delaware River north to the Raritan Township line); Township of East Amwell (east of State Hwy. 31); Township of Franklin; Boroughs of Frenchtown, Glen Gardner, Hampton and High Bridge; Townships of Holland and Kingwood; Borough of Lebanon; Township of Lebanon; Borough of Milford; Township of Raritan (east of State Hwy. 31 and north of County Route 523); Townships of Readington, Tewksbury and Union); MORRIS AND PASSAIC COUNTIES; SOMERSET COUNTY (does not include the Township of Franklin east of a line following Cedar Grove Lane from the Raritan River, in a southwesterly direction, to the Millstone Branch of the Pennsylvania Railroad; then, west along the railroad to the Delaware and Raritan Canal; then, south along the canal to the Middlesex County line; does not include the Township of Montgomery west and south of a line following U.S. Hwy. 206 (formerly State Hwy. 31) north from the Mercer County line to Harlingen Rd.; then, west along Harlingen Rd. and the Dutchtown-Zion road to the Hillsborough township line); SUSSEX, UNION AND WARREN COUNTIES:

	Rates	Fringes
Electricians:		
All other work:		
Cable Splicer.....	$ 55.17	55.5%
Electrician.....	$ 50.15	55.5%

Work forty ft. or more above the ground or protective rigging (does not apply to pole work, or to use of a manlift or high reach-type lift): 10% per hour additional.

Work with, or the removal of, asbestos materials: 112% times the journeyman rate.

ELEC0164-002 06/03/2013

BERGEN, ESSEX AND HUDSON COUNTIES:

	Rates	Fringes
Electricians:		
Electrician	$ 48.99	62%
All other work:		
Cable splicer	$ 48.99	62%

Work on line voltage of 440 or 480 volts: 10% per hour additional.

Work from trusses, scaffolds, frames, ladders and poles, 40 ft. or more above the ground or floor (does not include work from a manlift): 20% per hour additional.

Work on radio towers, transmission towers and smokestacks: 21% per hour additional.

ELEC0164-010 06/02/2008

BERGEN, ESSEX AND HUDSON COUNTIES:

	Rates	Fringes
Line construction:		
Cable splicer	$ 54.00	54%
Groundman (includes empty conduit installations on roadways)	$ 30.75	54%
Layout Man	$ 50.03	54%
Lineman; lineman-welder; x-ray technician; equipment repairman; equipment serviceman	$ 45.90	54%

Work on live wires of 440 or 480 volts: 10% per hour additional.

Work on radio towers, transmission towers and smokestacks: 21% per hour additional.

ELEC0269-010 10/01/2012

HUNTERDON COUNTY (Township of Delaware (east of a line following County Route 523 from the Delaware River north to the Raritan Township line); Township of East Amwell (west of State Hwy. 31); Borough of Flemington; City of Lambertville; Township of Raritan (west of State Hwy. 31 and south of County Route 523); Borough of Stockton; Township of West Amwell); SOMERSET COUNTY (Township of Montgomery (west and south of a line following U.S. Hwy. 206 (formerly State Hwy. 31) north from the Mercer County line to Harlingen Rd.; then, west along Harlingen Rd. and the Dutchtown-Zion road to the Hillsborough township line):

	Rates	Fringes
Electrician.....	$ 47.34	61.48% + .25

ELEC0269-013 10/01/2012

HUNTERDON COUNTY (Township of Delaware (east of a line following County Route 523 from the Delaware River north to the Raritan Township line); Township of East Amwell (west of State Hwy. 31); Borough of Flemington; City of Lambertville; Township of Raritan (west of State Hwy. 31 and south of County Route 523); Borough of Stockton; Township of West Amwell); SOMERSET COUNTY (Township of Montgomery (west and south of a line following U.S. Hwy. 206 (formerly State Hwy. 31) north from the Mercer County line to Harlingen Rd.; then, west along Harlingen Rd. and the Dutchtown-Zion road to the Hillsborough township line):

	Rates	Fringes
Line construction:		
Continuous pipe-type underground oil-filled transmission conduit installations:		
Ground person; truck with winch operator.....	$ 37.87	57.93%
Line technician; cable splicer; heavy equipment operator.....	$ 47.34	57.93%
All other work:		
Ground person; truck with winch operator.....	$ 37.87	57.93%
Line technician; cable splicer; heavy equipment operator.....	$ 47.34	57.93%

ELEC0456-001 06/03/2013

MIDDLESEX COUNTY; SOMERSET COUNTY (Township of Franklin (east of a line following Cedar Grove Lane from the Raritan River, in a southwesterly direction, to the Millstone Branch of the Pennsylvania Railroad; then, west along the railroad to the Delaware and Raritan Canal; then, south along the canal to the Middlesex County line)):

	Rates	Fringes
Electricians:		
Cable splicer.....	$ 50.48	66%
Electrician.....	$ 46.33	67.25%

Work on line voltage of 440 volts and over: 10% per hour additional.

Work from trusses, scaffolds and ladders 40 ft. or more from the ground or floor; or under air pressure; or over

conveyors or moving equipment or machinery: 10% per hour additional.

ELEC0456-002 06/03/2013

MIDDLESEX COUNTY; SOMERSET COUNTY (Township of Franklin (east of a line following Cedar Grove Lane from the Raritan River, in a southwesterly direction, to the Millstone Branch of the Pennsylvania Railroad; then, west along the railroad to the Delaware and Raritan Canal; then, south along the canal to the Middlesex County line)):

	Rates	Fringes
Line construction:		
Continuous pipe-type underground oil-filled transmission conduit installations:		
Cable splicer	$ 50.48	66%
Crane Operator	$ 50.48	66%
Groundman (when installing conduit on public roadways)	$ 26.80	66%
Groundman; winch operator	$ 43.88	66%
Line technician; x-ray technician; equipment repair person; equipment serviceperson; electrical installation worker; hole-digging equipment operator; truck operator with winch or pole; truck operator without winch	$ 44.67	66%
All other work:		
Cable splicer	$ 50.48	66%
Crane Operator	$ 50.48	66%
Groundman (when installing conduit on public roadways)	$ 26.80	66%
Groundman43.98; winch operator	$ 43.88	66%
Line technician	$ 46.33	67.25%

ENGI0825-004 07/01/2013

	Rates	Fringes
Power equipment operators:		
Steel erection:		
GROUP 1	$ 47.09	28.50
GROUP 2	$ 45.43	28.50
GROUP 3	$ 46.70	28.50
GROUP 4	$ 42.64	28.50
GROUP 5	$ 39.98	28.50
GROUP 6	$ 38.45	28.50
GROUP 7	$ 36.69	28.50

Hazardous waste removal work:
Work on a state or federally designated hazardous waste site, where the worker is in direct contact with hazardous material, and when personal protective equipment is required for respiratory, skin and eye protection: 20% per hour additional.

PAID HOLIDAYS:
New Year's Day, Washington's Birthday observed, Memorial Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided 1) that the worker works three of the preceding five work days before the holiday; or, the work day before the holiday and the work day after the holiday; and, 2) that the worker works the work day before and the work day after the holiday.

DEFINITION OF GROUPS:

GROUP 1:
Cranes (all cranes, land or floating with boom including jib, 140 ft. and over, above ground); derricks (all derricks, land, floating or Chicago boom type with boom including jib, 140 ft. and over, above ground)

GROUP 2:
Cranes (all cranes, land or floating with boom including jib, less than 140 ft. above ground); derricks (all derricks, land, floating or Chicago boom type with boom including jib, less than 140 ft. above ground)

GROUP 3:
Helicopter pilot

GROUP 4:
"A" frame; cherry picker (10 ton and under); hoist (all types of hoist, including steam, gas, diesel, electric, air, hydraulic, single and double drum, concrete, brick shaft caisson, or any other similar type of hoisting machine, portable or stationary, except Chicago boom type); jack (screw, air, hydraulic power-operated unit or console type (not hand jack or pile load test type); side boom; straddle carrier

GROUP 5:
Aerial platform used as a hoist; compressor, two or three in battery; directional boring machine; elevator or house car; concrete cleaning/decontamination machine operator, decontamination and remediation work only; conveyor and tugger hoist; firefighter; forklift; generator, two or three in battery; heavy equipment robotic operator/technician, decontamination and remediation work only; maintenance, utility person; master environmental maintenance technician, decontamination and remediation work only; rod bending machine (power); ultra high-pressure waterjet cutting tool system operator/maintenance technician, decontamination and remediation work only; vacuum blasting machine operator/maintenance technician,

decontamination and remediation work only; welding machine (gas or electric, two or three in battery, including diesel); captain, power boat; tug master, power boat; oiler, with either one compressor or one welding machine

GROUP 6:
Compressor, single; off-road back dump; welding machine (single, gas, diesel and electric converters of any type); welding system, multiple (rectifier, transformer type); generator, single

GROUP 7:
Oiler; deckhand

ENGI0825-009 07/01/2013

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 43.07	28.50
GROUP 2	$ 41.48	28.50
GROUP 3	$ 39.57	28.50
GROUP 4	$ 37.94	28.50
GROUP 5	$ 36.23	28.50
GROUP 6	$ 43.84	27.25

Hazardous waste removal work:
Work on a state or federally designated hazardous waste site, where the worker is in direct contact with hazardous material, and when personal protective equipment is required for respiratory, skin and eye protection: 20% per hour additional.

PAID HOLIDAYS:
New Year's Day, Washington's Birthday observed, Memorial Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided 1) that the worker works three of the preceding five work days before the holiday; or, the work day before the holiday and the work day after the holiday; and, 2) that the worker works the work day before and the work day after the holiday.

DEFINITION OF GROUPS:

GROUP 1:
Autograde - combination subgrader; base metal spreader and base trimmer (CMI and similar types); autograde placer - trimmer spreader combination (CMI and similar types); autograde slipform paver (CMI and similar types); backhoe; central power plant (all types); concrete paving machine; crane (all types, including overhead and straddle traveling type); crane, gantry; derrick (land, floating or Chicago boom type); drillmaster, quarrymaster (down-the-hole drill, rotary drill, self-propelled hydraulic drill, self-powered drill); dragline; elevating grader; front end loader (5 cu. yd. and over); gradall; grader, raygo; locomotive (large);

mucking machine; pavement and concrete breaker (superhammer and hoe ram); pile driver (length of boom, including length of leads, shall determine premium rate applicable); roadway surface grinder; scooper (loader and shovel); shovel; tree chopper with boom; trench machine (cable plow)

GROUP 2:

"A" frame/backhoe combination; boom attachment on loader (rate based on size of bucket, not applicable to pipehook); boring and drilling machine; brush chopper, shredder and tree shredder; carryall; concrete pump; concrete pumping system, pumpcrete and similar type; conveyor, 125 ft. and over; drill doctor, including dust collecting and maintenance work); front end loader (2 cu. yd. but less than 5 cu. yd.); grader (finish); groove cutting machine (ride-on type); heater planer; hoist (all types of hoist, shall also include steam, gas, diesel, electric, air, hydraulic, single and double drum, concrete, brick shaft caisson, snorkel roof, and/or any other similar type hoisting machine, portable or stationary, except Chicago boom type) (if hoist is "outside material tower hoist", long boom rate is to be applied); hydraulic crane, 10 tons and under; hydro-axe; hydro-blaster; jack (screw, air, hydraulic power-operated unit or console type (not hand jack or pile load test type); log skidder; pan; pavers (all) (concrete); plate and frame filter press; pumpcrete machine; squeezecrete; concrete pump (regardless of size); scraper; side boom; straddle carrier, Ross and similar type; whip hammer; winch truck (hoisting)

GROUP 3:

Asphalt curbing machine; asphalt plant engineer; asphalt spreader; autograde tube finishing and texturing machine (CMI and similar types); autograde curecrete machine (CMI and similar types); autograde curb trimmer and sidewalk, shoulder, slipform (CMI and similar types); bar bending machine (power); batcher; batching plant and crusher on site; belt conveyor system; boom-type skimmer machine; bridge deck finisher; bulldozers (all); car dumper (railroad); compressor and blower-type unit (used independently or mounted on dual-purpose truck, on jobsite or in conjunction with jobsite, in loading and unloading of concrete, cement, fly ash, instantcrete, or similar type materials); compressor (2 or 3) (in battery) (within 100 ft.); concrete cleaning/decontamination machine operator, when used for decontamination and remediation; concrete finishing machine; concrete saw and cutter (ride-on type); concrete spreader, hetzel, rexomatic and similar type; concrete vibrator; conveyor, under 125 ft.; crushing machine; directional boring machine; ditching machine, small (Ditchwitch, Vermeer or similar type); dope pot (mechanical with or without pump); dumpster; elevator; firefighter; forklift (Economobile, Lull and similar type of equipment); front end loader (1 cu. yd. and over but less than 2 cu. yd.); generator (2 or 3) (in battery) (within 100 ft.); giraffe grinder; grader and motor patrol; gunite machine (does not include nozzle); hammer, vibratory (in conjunction with generator); heavy equipment robotic operator/technician, when used for decontamination and remediation; hoist (roof, tugger, aerial platform hoist and

house cars); hopper; hopper door (power-operated); ladder (motorized); laddervator; locomotive, dinky type; maintenance, utility person; master environmental maintenance technician, when used for decontamination and remediation; mechanic; mixer (except paving mixer); pavement breaker, small, self-propelled ride-on type (also maintains compressor on hydraulic unit); pavement breaker, truck-mounted; pipe bending machine (power); pitch pump; plaster pump, regardless of size; posthole digger (post pounder and auger); rod bending machine (power); roller, blacktop; scale, power; seaman pulverizing mixer; shoulder widener; silo; skimmer machine (boom type); steel cutting machine, servicing and maintaining; tractor; captain, power boat; tug master, power boat; ultra high-pressure waterjet cutting tool system operator/maintenance technician, when used for decontamination and remediation; vacuum blasting machine operator/maintenance technician, when used for decontamination and remediation; vibrating plant (used in conjunction with unloading); welder and repair mechanic

GROUP 4:
Broom and sweeper; chipper; compressor (single); concrete spreader (small type); conveyor loader (does not include elevating grader); engine, large diesel (1620 H.P.) and staging pump; farm tractor; fertilizing equipment (operation and maintenance of); fine grade machine (small type); form line grader (small type); front end loader (under 1 cu. yd.); generator (single); grease, gas, fuel and oil supply truck; heater (Nelson or other type including propane, natural gas or flow-type unit); lights (portable generating light plant); mixer, concrete, small; mulching equipment (operation and maintenance of); off-road back dump; pump (4-in. suction and over, including submersible pump); pump (diesel engine and hydraulic) (immaterial of power); road finishing machine (small type); roller, grade, fill or stone base; seeding equipment (operation and maintenance of); sprinkler and water pump truck; steam jenny and boiler; stone spreader; tamping machine, vibrating ride-on; temporary heating plant (Nelson or other type, including propane, natural gas or flow-type unit); welding machine (gas, diesel, and/or electric converter of any type) (single, or two or three in a battery) (within 100 ft.); welding system, multiple (rectifier, transformer type); wellpoint system

GROUP 5:
Oiler; tire repair and maintenance

GROUP 6:
Helicopter pilot; helicopter engineer

IRON0011-002 08/01/2012

BERGEN, ESSEX, HUDSON AND HUNTERDON COUNTIES; MIDDLESEX COUNTY (north half); MORRIS AND PASSAIC COUNTIES; SOMERSET COUNTY (north half); SUSSEX AND UNION COUNTIES:

	Rates	Fringes

Ironworkers:
Reinforcing.....$ 40.74 39.40
Structural.....$ 43.54 39.40

IRON0036-003 07/01/2012

WARREN COUNTY

	Rates	Fringes
Ironworkers:.....	$ 34.05	24.00

IRON0068-004 07/01/2013

MIDDLESEX COUNTY (south half); SOMERSET COUNTY (south half):

	Rates	Fringes
Ironworker.....	$ 42.40	20.03

Hazardous waste removal work, on a state or federally designated hazardous waste site, where the worker is required to wear Level A, B or C personal protection: $3.00 per hour additional.

LABO0172-005 09/01/2012

	Rates	Fringes
Laborers:		
GROUP 1.....	$ 33.20	22.40
GROUP 2.....	$ 33.90	22.40
GROUP 3.....	$ 34.15	22.40
GROUP 4.....	$ 37.70	22.40

Hazardous waste removal work:
Work on a state or federally designated hazardous waste site, where the worker is required to wear Level A, B or C personal protection: $3.00 per hour additional.

Work on a state or federally designated hazardous waste site, where the worker is not required to wear Level A, B, or C personal protection: $1.00 per hour additional.

PAID HOLIDAYS:
New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided that the worker works three days for the same employer within a period of ten working days consisting of five working days before and five working days after the day upon which the holiday falls or is observed.

DEFINITION OF GROUPS:

GROUP 1:

Basic laborer; landscape laborer; railroad track laborer; utility meter installer; traffic director/flag person; salamander tender; pit person; dump person; asphalt laborer (only in Bergen, Essex, Hudson and Hunterdon Counties; Middlesex County (north of the Raritan River); Morris, Passaic, Somerset, Sussex, Union and Warren Counties); slurry seal laborer (only in Bergen, Essex, Hudson and Hunterdon Counties; Middlesex County (north of the Raritan River); Morris, Passaic, Somerset, Sussex, Union and Warren Counties); raker and tamper on cold patch work; wrapper and coater of pipe; waterproofing laborer; timber person; powder carrier; magazine tender; signal person; power buggy operator; tree cutter; and the operation of such other basic power tools used to perform work usually done manually by laborers

GROUP 2:
Pipelayer; laser person; conduit and duct line layer; jackhammer; chipping hammer; pavement breaker; concrete cutter; asphalt cutter; sheet hammer operator; sandblasting, acetylene cutting and burning; wagon drill operator; directional drill operator; hydraulic drill operator; drill master; core driller; traffic control coordinator; asphalt raker/lute person (only in Bergen, Essex, Hudson and Hunterdon Counties; Middlesex County (north of the Raritan River); Morris, Passaic, Somerset, Sussex, Union and Warren Counties); walk-behind saw cutter

GROUP 3:
Finisher; rammer; setter of brick or stone pavers; hardscaping; gunite nozzle person; stonecutter; form setter; manhole; catch basin and inlet builder; asphalt screedperson (only in Bergen, Essex, Hudson and Hunterdon Counties; Middlesex County (north of the Raritan River); Morris, Passaic, Somerset, Sussex, Union and Warren Counties)

GROUP 4:
Blaster

LABO0172-006 03/01/2011

MIDDLESEX COUNTY (south of the Raritan River):

	Rates	Fringes
Laborers:		
ASPHALT WORK:		
GROUP 1	$ 33.00	21.55
GROUP 2	$ 32.60	21.55
GROUP 3	$ 32.85	21.55
GROUP 4	$ 32.70	21.55
GROUP 5	$ 32.90	21.55

PAID HOLIDAYS:
New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided that the worker works three days for the same employer within a

period of ten working days, consisting of five working days before and five working days after the day upon which the holiday falls or is observed.

DEFINITION OF GROUPS:

GROUP 1:
Head raker

GROUP 2:
Painter, shoveler, roller person, kettle person, smother person, tamper

GROUP 3:
Raker, screed person, lute person

GROUP 4:
Milling controller

GROUP 5:
Traffic control coordinator

PAIN0711-009 05/01/2013

	Rates	Fringes
Painters:		
Work on bridges (all bridges that span major waterways, railroad bridges, bridges over canyons, overpasses)	$ 50.68	21.80

PAIN0711-014 05/01/2011

	Rates	Fringes
Painters:		
All other work:		
Brush and roller	$ 35.99	16.86
Spray	$ 38.91	17.19

PLAS0029-001 05/01/2012

BERGEN, ESSEX, HUDSON, MORRIS, PASSAIC, SUSSEX, UNION AND WARREN COUNTIES:

	Rates	Fringes
CEMENT MASON	$ 40.30	22.05

Cement masons:
Work on suspended staging, not supported from the ground: $.50 per hour additional.

PLAS0592-030 05/01/2013

HUNTERDON, MIDDLESEX, SOMERSET AND UNION COUNTIES:

	Rates	Fringes
Cement mason.....	$ 38.37	29.11

TEAM0408-001 11/01/2012

ESSEX, MORRIS, SUSSEX AND UNION COUNTIES:

	Rates	Fringes
Truck drivers:		
Group 1.....	$ 34.05	18.73+a
Group 2.....	$ 33.95	18.73+a
Group 3.....	$ 34.85	18.73+a
Group 4.....	$ 34.80	18.73+a

a. Employer contributes $1472.15 per month per worker for health and welfare.

Hazardous waste removal work, where the worker is in direct contact with hazardous material, and when personal protective equipment is required for respiratory, skin and eye protection: $3.00 per hour additional.

Hazardous waste removal work, where the worker is working in a hazardous waste site, in a zone requiring Level A personal protection for any of the workers: $3.00 per hour additional.

Hazardous waste removal work, where the worker is not working in a zone requiring Level A, B or C personal protection: $1.00 per hour additional.

PAID HOLIDAYS:
New Year's Day, President's Day, Decoration Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided that the worker has been assigned to work, or, "shapes", one day of the calendar week during which the holiday occurs.

DEFINITION OF GROUPS:

GROUP 1:
Winch trailer driver

GROUP 2:
Drivers of all Euclid-type vehicles: Euclid, International Harvester, Wabco, Caterpillar, Koehring, tractor and wagon; dumpster; bottom, rear and side dump; carry-all and scraper (not self-loading, loading over the top); water sprinkler trailer; water pull and similar types of vehicle; driver of tractor and trailer-type vehicles: flat, float, I-beam, low bed, water sprinkler, bituminous, transit mix, road oil, fuel, bottom dump hopper, rear dump, office, shanty, epoxy, asphalt, agitator mixer, mulching, stringing, seeding, fertilizing, pole, spread bituminous distributor, water

pull (entire unit), tractor trailer, reel trailer and similar types of vehicle

GROUP 3:
Driver on straight three-axle materials: truck and float

GROUP 4:
Truck driver; driver of the following types of vehicles: dump, flat, float, pick-up, container hauler, fuel, water sprinkler, road oil, stringer bead, hot pass, bus, dumpcrete, transit mixer, agitator mixer, half track, winch truck, side-o-matic, dynamite, powder, x-ray, welding, skid, jeep, station wagon, A-frame, dual purpose truck, truck with mechanical tailgate, asphalt distributor, batch truck, seeding, mulching, fertilizing, air compressor truck (in transit); parts chaser; escort; scissor; hi-lift; telescope; concrete breaker; gin pole; stone, sand, asphalt distributor and spreader; nipper; fuel truck (driver of fuel truck including handling of hose and nozzle - entire unit); team driver; vacuum or vac-all truck (entire unit); skid truck (debris container - entire unit); concrete mobile truck (entire unit); beltcrete truck; pumpcrete truck; line truck; reel truck; wrecker or tow truck; utility truck; tack truck; lift truuk; cardex person; drivers on the following types of vehicle: Broyhill coal tar epoxy truck, Littleford bituminous distributor, slurry seal truck or vehicle, thickol track master pick-up (swamp cat pick-up), bucket loader, dump truck and any rubber-tired tractor used in pulling and towing farm wagons and trailers of any description; on-site repair shop

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TEAM0469-001 05/01/2011

HUNTERDON, MIDDLESEX AND SOMERSET COUNTIES; UNION COUNTY (south of Wood Ave.); WARREN COUNTY:

	Rates	Fringes
Truck drivers:		
Group 1	$ 34.85	24.385
Group 2	$ 34.75	24.385
Group 3	$ 34.65	24.385
Group 4	$ 34.60	24.385

Hazardous waste removal work, where the worker is in direct contact with hazardous material, and when personal protective equipment is required for respiratory, skin and eye protection: $3.00 per hour additional.

Hazardous waste removal work, where the worker is working in a hazardous waste site, in a zone requiring Level A personal protection for any of the workers: $3.00 per hour additional.

Hazardous waste removal work, where the worker is not working in a zone requiring Level A, B or C personal protection: $1.00 per hour additional.

PAID HOLIDAYS:
New Year's Day, President's Day, Decoration Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided that the worker has been assigned to work, or, "shapes", one day of the calendar week during which the holiday falls.

DEFINITION OF GROUPS:

GROUP 1:
Winch trailer driver

GROUP 2:
Drivers of all Euclid-type vehicles: Euclid, International Harvester, Wabco, Caterpillar, Koehring, tractor and wagon; dumpster; bottom, rear and side dump; carry-all and scraper (not self-loading, loading over the top); water sprinkler trailer; water pull and similar types of vehicle; driver of tractor and trailer-type vehicles: flat, float, I-beam, low bed, water sprinkler, bituminous, transit mix, road oil, fuel, bottom dump hopper, rear dump, office, shanty, epoxy, asphalt, agitator mixer, mulching, stringing, seeding, fertilizing, pole, spread bituminous distributor, water pull (entire unit), tractor trailer, reel trailer and similar types of vehicle

GROUP 3:
Driver on straight three-axle materials: truck and float

GROUP 4:
Truck driver; driver of the following types of vehicles: dump, flat, float, pick-up, container hauler, fuel, water sprinkler, road oil, stringer bead, hot pass, bus, dumpcrete, transit mixer, agitator mixer, half track, winch truck, side-o-matic, dynamite, powder, x-ray, welding, skid, jeep, station wagon, A-frame, dual purpose truck, truck with mechanical tailgate, asphalt distributor, batch truck, seeding, mulching, fertilizing, air compressor truck (in transit); parts chaser; escort; scissor; hi-lift; telescope; concrete breaker; gin pole; stone, sand, asphalt distributor and spreader; nipper; fuel truck (driver of fuel truck including handling of hose and nozzle - entire unit); team driver; vacuum or vac-all truck (entire unit); skid truck (debris container - entire unit); concrete mobile truck (entire unit); beltcrete truck; pumpcrete truck; line truck; reel truck; wrecker or tow truck; utility truck; tack truck; lift truuk; cardex person; drivers on the following types of vehicle: Broyhill coal tar epoxy truck, Littleford bituminous distributor, slurry seal truck or vehicle, thiokol track master pick-up (swamp cat pick-up), bucket loader, dump truck and any rubber-tired tractor used in pulling and towing farm wagons and trailers of any description; on-site repair shop

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TEAM0560-001 11/01/2012

BERGEN, HUDSON AND PASSAIC COUNTIES:

	Rates	Fringes
Truck drivers:		
Group 1	$ 32.10	28.78
Group 2	$ 32.15	28.78
Group 3	$ 32.25	28.78
Group 4	$ 32.35	28.78

Hazardous waste removal work:

Work on a state or federally designated hazardous waste site, where the worker is in direct contact with hazardous material, and when personal protective equipment is required for respiratory, skin and eye protection: $3.00 per hour additional.

Work on a state or federally designated hazardous waste site, in a zone requiring Level A personal protection for any workers other than the truck driver: $3.00 per hour additional.

Work on a state or federally designated hazardous waste site, in a zone requiring Level B, C or D personal protection for any workers other than the truck driver: $1.00 per hour additional.

PAID HOLIDAYS:
New Year's Day, President's Day, Decoration Day, Independence Day, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day and Christmas Day; provided that the employee has been assigned to work, or, "shapes", one day of the calendar week during which the holiday occurs.

DEFINITION OF GROUPS:

GROUP 1:
Driver of the following types of vehicle: dump; flat; float; pick-up; container hauler; fuel; water sprinkler; road oil; stringer bead; hot pass; bus; dumpcrete; transit mixer; agitator mixer; half track; winch truck; side-o-matic; dynamite; powder; x-ray; welding; skid; jeep; station wagon; stringer; A-frame; dual-purpose truck; truck with mechanical tailgate; asphalt distributor; batch truck; seeding; mulching; fertilizing; air compressor truck (in transit); parts chaser; escort; scissor; hi-lift; telescope; concrete breaker; gin pole; stone, sand, asphalt distributor and spreader; nipper; fuel truck (driver of fuel truck including handling of hose and nozzle - entire unit); team driver; vacuum or vac-all trucks (entire unit); skid truck (debris container - entire unit); concrete mobile truck (entire unit); beltcrete truck; pumpcrete truck; line truck; reel truck; wrecker; tow truck; utility truck; tack truck; cardex person; driver on the following types of vehicle: Broyhill coal tar epoxy truck, Littleford bituminous distributor, slurry seal truck or vehicle, thiokol track master pick-up (swamp cat pick-up); bucket

loader dump truck and any rubber-tired tractor used in pulling and towing farm wagons and trailers of any description; on-site repair shop

GROUP 2:
Driver of 3-axle materials truck and float

GROUP 3:
Driver of all Euclid-type vehicles: Euclid; International Harvester; Wabco; Caterpillar; Koehring, tractor and wagon; dumpster; dump; bottom, rear and side dump; carry-all and scraper (not self-loading, loading over the top); water sprinkler trailer; water pull and similar types of vehicle; driver of tractor and trailer-type vehicle: flat, float, I-beam, low bed, water sprinkler, bituminous, transit mix, road oil, fuel, bottom dump hopper, rear dump, office, shanty, epoxy, asphalt, agitator mixer, mulching, stringing, seeding, fertilizing, pole, spread bituminous distributor, water pull (entire unit), tractor trailer, reel trailer, and similar types of vehicle

GROUP 4:
Winch trailer driver

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination.

The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.

Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

NOTIFICATION
OF
MINORITY BUSINESS ENTERPRISES
AND
WOMEN'S BUSINESS ENTERPRISES
ON-LINE DIRECTORY
AND
FORMS

The Port Authority has a long-standing practice of making its contract available to as many firms as possible and has taken affirmative steps to encourage Minority Business Enterprises (MBEs) and Women's Business Enterprises (WBEs) to seek business opportunities with it. The Port Authority's on-line Directory of Qualified MBE/WBEs lists the firms that are registered to assist Contractors in meeting and exceeding their Good Faith Goals.

The MBE/WBE Directory specifies the firms the Authority has determined to be (1) MBEs/WBEs and (2) experienced in performing work in the trades and contract dollar ranges indicated.

Contractors are provided with an interactive directory and the ability to view and print a current listing of M/WBE contractors. Information may be selected and sorted according to categories, state, dollar range, and type (MBE, WBE, DBE, and SBE).

To view the directory, type in www.panynj.gov/business-opportunities/mwsbe-search.cfm. For further information about MWBE Qualified Vendors, contact the Office of Business Diversity and Civil Rights at (212) 435-7802.

Updated 11/12

THE PORT AUTHORITY OF NY & NJ

Certification Application for the Minority and Women-owned
Business Enterprise Program

General Instructions:

- DO NOT LEAVE ANY SPACES BLANK ON THE APPLICATION - if a question is not applicable to your business insert "N/A" in the space provided for your answer
- For questions, call the Certification Helpline at (212) 435-7808 or E-mail certhelp@panynj.gov.
- Once you have completed the application, please return it and all required documentation to:

The Port Authority of NY & NJ
Office of Business Diversity and Civil Rights - Certification Unit
233 Park Avenue South, 4th floor
New York, NY 10003

SECTION I: MAIN BUSINESS INFORMATION

1a. Business Name

Legal name of business applying to be certified — Federal EIN or SSN

1b. D.B.A.

"Doing Business As"- Complete if entity does business under a name which is different from its legal name.

2a. Business Address (must represent a physical location; cannot be a Post Office Box)

Street Address — Suite / Apt / Room/ Unit/Floor

City — State — Zip/Zip+4 — County

2b. Business Mailing Address (complete only if different from the address given in Question 2a)

Street Address — Suite / Apt / Room/ Unit/Floor

City — State — Zip/Zip+4

3. Business Phone + Extension

4. Business Fax

5. Business E-mail Address

6. Business Website

7a. Business Owner/Title/Cell Phone

Schedule A

7b. Name/title of an authorized representative to contact during the application review process.

Mr./Miss/Mrs./Ms.	First Name	Last Name
Title	Phone /Ext.	E-Mail Address

8a. This business is applying for certification as ("X"all that apply):

- ☐ Minority-owned Business Enterprise (MBE)
- ☐ Women-owned Business Enterprise (WBE)
- ☐ Small Business Enterprise (Criteria listed on page 14)

9b. Is this a Veteran owned business? Yes_____ No_____

- ☐ Veteran Owned Business (VOB)
- ☐ Service Disabled Veteran Owned Business (SDVOB)

If "Yes", please provide a copy of the verification letter from the U.S. Department of Veteran Affairs, Center for Veterans Enterprise.

10. Are you currently bidding or negotiating a contract with the Port Authority or its tenants?

Yes_____ No_____

If "Yes", provide contract/purchase order number and contact information (name, phone number).

_____

11. Has your business ever applied for certification as an M/W/SBE, or a DBE (whether SBA 8(a), Transportation, or other) with another governmental agency, department, or authority?

Yes_____ No_____

If "Yes", provide the following:

Name of Governmental Entity	Entity Contact	Program (MBE, WBE, SBE, DBE)	Status (Pending, Certified, Decertified, Denied, On Appeal)	Date (mm/yy)

12. How did you first hear about the Port Authority's certification programs?
(please choose only one)

☐ Letter/Call/E-mail

☐ Port Authority website

☐ Event _____
Event name or sponsor / date

☐ Other _____
Specify

SECTION II: BUSINESS STRUCTURE/OWNERSHIP

13a. Business Structure

☐ Sole Proprietorship ☐ Limited Partnership (LP)

☐ Corporation (including S-Corp.) ☐ Limited Liability Partnership (LLP)

☐ General Partnership ☐ Limited Liability Company (LLC)

13b. When did you establish your business under its current structure? _____/_____/_____

13c. Did your business exist under a different type of business structure prior to the date its current structure?

Yes_____ No_____

If "Yes", explain the history of your business structure and provide a copy of the original documentation.

_____

_____

_____

13d. Has your Certificate of Incorporation, Business Certificate, or Certificate of Trade Name been amended?

Yes_____ No_____

If "Yes", identify each time your business document was amended, explain why and provide a copy of the amended document.

_____

_____

_____

13e. Method of Business Origination or Acquisition (check all applicable).

☐ Started New Business ☐ Secured franchise

☐ Bought Existing Business ☐ Secured Concession

☐ Merger or Consolidation ☐ Inherited Business

☐ Other _____

Date of origination or acquisition (if later, provide date of acquisition by current owner).

_____/_____/_____

For the questions in this section which refer to ethnic identification of owners, shareholders, officers, board members, and managers, please use the following group codes to identify the ethnicity of each individual where required. (See page 10, "Definitions of Group Codes").

01	Black	02c	Spanish	04	Native American
02a	Hispanic	03a	Asian-Pacific	05	White (Non-Minority)
02b	Portuguese	03b	Asian-Indian	06	Other

14. Please provide the following information for all person(s) with ownership interest in the business (all proprietors, partners, and members OR, in the case of a corporation, all shareholders).

Name (First and Last)	Position In Company	% Owned	Date Ownership Established (mm/yy)	Gender (M/F)	Ethnicity (see group code table)	US Citizen or Permanent Resident Alien (Y/N)

QUESTION 15 APPLIES ONLY TO CORPORATIONS. IF YOUR BUSINESS IS NOT A CORPORATION, SKIP TO QUESTION 16.

15a. If the business is a corporation, provide the following information for all shareholders identified in Question 14.

Name (First and Last)	Title	Number of Shares Owned	Unit Share Price Paid When Purchased

15b. Indicate the number of company shares in each of the following categories:

Common Authorized _____ Common Issued _____

Preferred Authorized _____ Preferred Issued _____

15c. Name and position of current Officers and/or Board of Directors.

Name (First and Last)	Position	Position Effective Date (mm/yy)	Gender (M/F)	Ethnicity (see group code table)

ALL APPLICANTS SHOULD RESUME COMPLETING THE APPLICATION HERE

16. Please identify the capital contributions to the business by each person identified in Question 14, including cash, equipment, property, and expertise

Name (First and Last)	Type of Contribution	Total Dollar Value	Date of Contribution (mm/yy)

17. If your business is owned in whole or in part by another business, please identify the entity and the percentage of ownership interest. Include venture capitalists and other similar investors.

Business Name	Percentage Owned	Date Ownership Established (mm/yy)

SECTION III: BUSINESS MANAGEMENT

18. Identify individuals responsible for managerial operations (state if owner or non-owner). Refer to "Definitions of Group Codes", page10.

Name & Title	Gender (M/F)	Group Code	Owner (Y/N)
a) Financial Decisions			
b) Estimating			
c) Preparing Bids			
d) Negotiating Bonding			
e) Marketing & Sales			
f) Hiring & Firing			
g) Supervising Field Operations			
h) Purchasing Equipment/Supplies			
i) Managing & Signing Payroll			
j) Negotiating Contracts			
k) Signatures for Business Accounts			

19 Do any principals, officers, employees and/or owners of the business have an affiliation, i.e. business interest or employment with any other business?

Yes_____ No_____ (If "Yes", complete the following):

Name (First and Last)	Email Address	Name and Address of Affiliated Business	Nature of Business	Nature of Affiliation

20. Number of Employees (if necessary, average over the past year)

Permanent		Temporary		Field	
Full-Time	_____	Full-Time	_____	Full-Time	_____
Part-Time	_____	Part-Time	_____	Part-Time	_____

SECTION IV: BUSINESS FINANCES

21. Does your business have a Line of Credit?

Yes_____ No_____ If "Yes", please provide:

_____

Bank Dollar Limit Name of Guarantor(s)

22. Please list all major current lenders to the company

Name of Lender	Amount of Loan	Terms of Repayment

23. Identify bank(s) where business accounts are maintained

Bank Name	Address	Contact Name	Contact Title	Type of Account

24. Please provide gross receipts (sales) for each of the last three fiscal years. (If in business for less than three years, complete as applicable)

Current Year _____ $_____

Last Year _____ $_____

Previous Year _____ $_____

SECTION V: BUSINESS OPERATIONS

25. Check the industry which best describes your PRIMARY line of business

- ☐ Construction-related
- ☐ Consultants
- ☐ Technical Service
- ☐ Other _____
- ☐ Professional Service
- ☐ Consumer Service
- ☐ Manufacturer/Supplier

Describe principal products/commodities sold, specialties or services offered:

_____

_____

_____

23. If a license, permit or certification (e.g. Master Electrical License, PE for engineers, CDL for truck drivers, etc.) is required to conduct your business, please identify the individual(s) holding the license, permit or certification and provide a copy.

Name of the Holder/Registrant	Type of License/ Permit/Certification	Issued by	Issue Date (mm/yy)	Exp. Date (mm/yy)

24. Is your business bonded? Yes_____ No_____

If "Yes", please provide:

Name of Agent/Broker	Surety Co.	Bonding Limit	
		Single $	Aggregate $

25. Is your business insured? Yes_____ No_____ If "Yes", please provide:

_____

Carrier Name $ Amount of Liability Insurance

26. Please list the major equipment or machinery your business owns.

Type	Depreciated $ Value	Acquisition Date (mm/yy)	Owned or Leased

27. List rented, leased or owned warehouse, plant and office facilities; submit copy of lease, deed or mortgage

Facility Type	Owner or Name of Lessor and/or rental agent	Amt of yearly payment

28. Does your business share office space, personnel or equipment with any other entity?

Yes_____ No_____

If "Yes", please provide:

Business Name	Phone	Personnel (X)	Office Space ("X")	Yard Space (X)	Equipment ("X")	Machinery (X)

DEFINITIONS OF GROUP CODES

(To be used for questions 11 and 12b, page four; question 15, page six; supporting documents number two, Page 11)

Group Code	Group Name	Group Definition
01	Black	Persons having origins from any of the black African racial groups not of Hispanic origin
02a	Hispanic	All persons of Mexican, Puerto Rican, Cuban, Caribbean Islands, Central or South American culture or origin, regardless of race
02b	Portuguese	Persons whose culture or origin is rooted in Portugal
02c	Spanish	Persons whose culture or origin is rooted in Spain
03a	Asian-Pacific	Persons having origins in any of the original peoples of the Far East, Southeast Asian or the Pacific Islands
03b	Asian-Indian	Persons having origins in any of the original peoples of the Indian subcontinent
04	Native American	Persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification
05	Non-Minority	Persons whose culture or origin is other than those defined above
06	Other	Persons other than those defined above

"Minority Business Enterprise" or "MBE" means a business entity which is owned and controlled by one or more members of one or more minority groups. "Women-owned Business Enterprise" or "WBE" means a business entity which is owned and controlled by one or more women.

"Owned and controlled" means a business entity which is at least 51 percent owned by one or more members of minority groups or women, or in the case of a publicly held corporation, at least 51 percent of the stock of which is owned by members of one or more minority groups or women; and whose management and daily business operations are controlled by one or more such individuals who are citizens or permanent resident aliens.

SUPPORTING DOCUMENTATION CHECKLIST

REQUIRED FOR ALL APPLICANTS Attach copies of the following documents, as applicable. Indicate documents submitted by checking appropriate boxes. The minimum documentation required for certification is listed below, but is not limited to this list. A representative may request additional documents during the application review, if warranted. **COPIES ONLY – NO ORIGINALS**

- ☐ 1. Résumés for all principals, partners, officers and/or key employees of the firm. Provide home address, telephone number, education, training, and employment with dates and specific duties with the company
- ☐ 2. Proof of ethnicity for each person with ownership interest (valid passport, ethnic birth certificate)*
- ☐ 3. Proof of U.S. Citizenship (valid U.S. passport, ethnic birth certificate, naturalization certificate)*
- ☐ 4. Proof of permanent resident alien status (valid permanent resident alien "green" card showing expiration date)*
- ☐ 5. Bank signature card, bank resolution or letter from bank identifying persons authorized to conduct transactions on each account
- ☐ 6. Lease agreement or proof of ownership (deed/mortgage) for business location(s)
- ☐ 7. Proof of any certification (including SBA 8(a)), decertification, or denial from another governmental agency, department, or authority
- ☐ 8. Copies of any licenses, permits and/or accreditations required for conducting business
- ☐ 9. Proof of sources of capitalization/investments (purchase receipts, any loan agreements)
- ☐ 10. Any employment agreements
- ☐ 11. All third party agreements including: equipment rental, purchase agreements, management service agreements, etc.
- ☐ 12. Vehicle registration(s) for any vehicle used for business purposes
- ☐ 13. Current financial statement (statement of cash flows, balance sheet, or profit and loss statement)
- ☐ 14. Most recent three years' business Federal, tax returns (all pages, all schedules); if in business less than three years prior two (2) years of personal tax returns (1040s) for each person with ownership interest, including all applicable W-2 forms and schedule.
- ☐ 15. Marketing data form.

Note:
*If you have one document that satisfies the requirements for numbers 2 – 4, submit only one copy.

REQUIRED FOR VETERAN OWNED BUSINESSES AND SDVOBs

- ☐ Provide a copy of the verification letter from the U.S. Department of Veteran Affairs, Center for Veterans Enterprise

REQUIRED FOR CONSTRUCTION/ARCHITECTRAL & ENGINEERING FIRMS

- ☐ Applicable licenses/permits

REQUIRED FOR CONSTRUCTION FIRMS

- ☐ Construction reference sheet (attached; references must be for jobs completed during the past three years) http://www.panynj.gov/business-opportunities/sd-become-certified.html

REQUIRED FOR ARCHITECTURAL & ENGINEERING FIRMS

- ☐ Architectural & Engineering Specialty Form (attached – check applicable specialties) http://www.panynj.gov/business-opportunities/sd-become-certified.html

Attach required documents and indicate documents submitted by checking appropriate boxes

REQUIRED FOR SOLE PROPRIETORSHIPS

☐ Copy of Business Trade Name or Certification Trade Name filed with County Clerk (If doing business under an assumed name)

REQUIRED FOR PARTNERSHIPS AND LLPs

☐ 1. Business Certificate including any amendments

☐ 2. Partnership Agreement

☐ 3. Buy out rights

REQUIRED FOR LIMITED LIABILITY COMPANIES (Check appropriate boxes below)

☐ 1. Certificate of formation and/or organization, including date approved by State

☐ 2. Operating and/or managing agreements

☐ 3. Franchise and/or third-party agreement

REQUIRED FOR CORPORATIONS

☐ 1. Articles of incorporation, including date approved by State

☐ 2. Corporation By-Laws

☐ 3. Minutes of first corporate organizational meeting and amendments

☐ 4. Copies of all issued stock certificates front and back, as well as next un-issued certificate

☐ 5. Copy of stock ledger

☐ 6. If applicable, furnish copies of agreements relating to:

a. stock options
b. shareholder agreements
c. shareholder voting rights
d. restriction on the disposal of stock loan agreements
e. facts pertaining to the value of shares
f. buy-out rights
g. restrictions on the control of the corporation

SMALL BUSINESS ENTERPRISE PROGRAM

To be eligible businesses must:

- Have a principal place of business in either New York or New Jersey.
- Have operated that specific type of business for at least three (3) years.
- Not exceed the average annualized gross revenue limitations cited below for the last three (3) fiscal years.

Average Annualized Gross Revenue Limitation and other Port Authority Pre-requisites by Procurement Category.

- **Construction - $14 million**
  The Port Authority's Engineering Department must also qualify construction firms. This requires the submittal of acceptable references for completed contracts. A minimum of three acceptable references is required for each construction specialty area.

- **Commodity - $7 million**
  Commodity firms eligible to participate are provided a five percent (5%) price preference in designated contracts solicited by the Port Authority's Procurement Division.

- **Janitorial Maintenance - $16.5 million**

- **Financial Services - $7 million**

CODE OF ETHICS CERTIFICATION

In signing and submitting the annexed Certification Application, each applicant and each person signing on behalf of any applicant certifies that they have not made any offers or agreements or given or agreed to give anything of value or taken any other action with respect to any employee or former employee of The Port Authority of New York and New Jersey or any of its subsidiaries (hereinafter referred to as the "Authority") or any immediate family member of either which would constitute a breach of ethical standards under the Code of Ethics and Financial Disclosure dated as of July 18, 1994 (a copy of which is available upon request to the Office of Business & Job Opportunity), nor do they have any knowledge of any act on the part of such employee or former employee relating either directly or indirectly to the applicant which constitutes a breach of the ethical standards set forth in said code.

> As used herein, "anything of value" shall include but not be limited to any (a) favors, such as meals, entertainment, transportation (other than that contemplated by an Authority contract), etc., which might tend to obligate the Authority employee to the Contractor and (b) gift, gratuity, money, goods, equipment, services, lodging, discounts not available to the general public, offers or promises of employment, loans or the cancellation thereof, preferential treatment or business opportunity. Such term shall not include compensation contemplated by any Authority contract.

The foregoing certification shall be deemed to have been made by the applicant as follows: If the applicant is a corporation, such certification shall be deemed to have been made not only with respect to the application itself, but also with respect to each director and officer, as well as, to the best of the certifier's knowledge and belief, each stockholder with an ownership interest in excess of 10%; if the applicant is a partnership, such certification shall be deemed to have been made not only with respect to the applicant itself, but also with respect to each partner. Moreover, the foregoing certification, if made by a corporate applicant, shall be deemed to have been authorized by the Board of Directors of the applicant, and such authorization shall be deemed to include the signing and submission of the bid and the inclusion therein of such certification as the act and deed of the corporation.

In any case where the applicant cannot make the foregoing certification, the applicant shall so state and shall furnish with the application, a signed statement that sets forth in detail the reasons thereof.

The foregoing certification or signed statement shall be deemed to have been made by the applicant with full knowledge that it would become part of the records of the Authority and that the Authority will rely on its truth and accuracy in granting certification.

Applicants are advised that knowingly providing a false certification or statement pursuant hereto may be the basis for prosecution for offering a false instrument for filing (see e.g., New York Penal Law, Section 175.30 et. Seq.). Applicants are also advised that the inability to make such certification will not, in and of itself disqualify an applicant, and that in each instance the Authority will evaluate the reasons therefore provided by the applicant.

ACKNOWLEDGEMENTS AND VERIFICATION

FIRST, this certification application form, the supporting documents, and any other information provided in support of the application is considered part of the application. Any false statements or misrepresentations in the application may result in the applicant's disqualification from certification as Minority and/or Woman-owned Business Enterprise (M/WBE) by The Port Authority of New York and New Jersey for him/herself and its subsidiaries, which are included in the term "Port Authority".

SECOND, the information contained herein is subject to the Port Authority's Freedom of Information policy amended in May 2008.

THIRD, the Port Authority may require further proof of eligibility for certification in addition to the information disclosed in this application and the applicant shall cooperate with the Port Authority in supplying the additional information. By completing this application, the applicant agrees to submit the additional proof required and acknowledges that the Port Authority may decide to deny the application if the additional proof is not submitted within 30 days after it is requested.

FOURTH, by filing this application, the applicant consents to examination of its books and records and interviews of its principals and employees by the Port Authority for the purpose of determining whether the applicant is, or continues to be, an eligible M/WBE. The applicant acknowledges that its certification may be denied if such examinations or interviews are refused or if the Port Authority determines, as a result of the examinations or interviews, that the applicant does not qualify for certification as a M/WBE.

FIFTH, by filing this application, the applicant consents to inquiries being directed by the Port Authority to the applicant's bonding companies, banking institutions, credit agencies, contractors, clients and other certifying agencies for the purpose of ascertaining the applicant's eligibility for certification. If the applicant fails to permit such inquiring to be made, such failure may be grounds for denying or revoking the applicant's certification.

SIXTH, the applicant agrees that it will advise the Port Authority of any change in the ownership or operational and managerial control of applicant's business after the certification application has been filed within 30 days of such change.

SEVENTH, certification is normally granted for a period of five (5) years. However, the Port Authority may require submission of a new application, additional information, examinations of the applicant's principals and employees at any time before the expiration of the five-year certification period. The applicant's failure to submit such material or to consent to such examinations and interviews will be grounds for revocation of certification.

EIGHTH, the filing of this application, its acceptance by the Port Authority, and any subsequent certification of the applicant by the Port Authority, is not intended to and does not create any procedural or substantive rights enforceable at law by the applicant against the Port Authority, its Commissioners, officers, agents or employees and any such certification is only intended to facilitate the identification of qualified and bona fide M/WBEs.

NINTH, the Code of Ethics certification attached hereto shall be considered part of this certification application and the applicant is advised to familiarize him/herself with the terms of the certification prior to submitting this application.

TENTH, in submitting this application the applicant and each person signing on behalf of the applicant certifies that, to the best of their knowledge and belief, the following statements are true and correct:

A) No individual who is current or former employee of the Port Authority or its subsidiaries (i.e., Port Authority Trans-Hudson Corporation (PATH), Newark Legal and Communications Center Urban Renewal Corporation) other than those individuals identified in the space immediately below (1) owns an interest in; or (2) has involvement in a relationship with the applicant firm (a) from or as a result of which the individual has received within the past year, or is entitled to receive in any future year, more than $1,000 or its equivalent; or (b) which has a market value in excess of $1,000. *(List here any such current or former Port Authority Employee (s))

_____

B) No individual who is a current or former employee of the Port Authority or its subsidiaries other than those individuals identified in the space immediately below (1) holds a position in the applicant firm such as an officer, director, trustee, partner, employee, or a position of management: or (2) acts as a consultant, agent or representative of the firm in any capacity. *(List here any current or former Port Authority Employee (s))

_____

*Included within the scope of this certification are the individuals identified by the applicant in response to questions 14, 15b and 18

Applicant _____ Date _____

Signature

VERIFICATION

STATE OF _____

COUNTY OF _____

(A) For Sole Proprietorships, Partnerships, and Limited Liability Partnerships

_____, being duly sworn, states that he or she is the owner of (or a Partner in) the entity making the foregoing application and that the statements and representations made in the application are true to his/her own knowledge.

_____ _____
Signature Date

(B) For Corporations and Limited Liability Companies

_____, being duly sworn, states that he/she is the
Name of Corporate Officer

_____ of _____,
Title of Corporate Officer Name of Corporation

the entity making the foregoing application, that he/she has read the application and knows its contents, that the statements and representations made in the application are true to his/her knowledge, and that the application is made at the direction of the Board of Directors of the Corporation.

Corporate Seal _____
Signature Date

Sworn to before me this _____ day of _____, 20_____

_____
Notary Public

Mail to: The Port Authority of New York and New Jersey
Office of Business Diversity and Civil Rights – Certification Unit
233 Park Avenue South, 4th Floor
New York, NY 10003

INFORMATION FOR DETERMINING JOINT VENTURE ELIGIBILITY

Return your submittal to:	*The Port Authority of New York and New Jersey* Office of Business Diversity and Civil Rights *233 Park Avenue South, 4th Floor* *New York, NY 10003*
Firms not currently certified should call (212) 435-7808 for information	

(Note: This form need not be completed if all joint venture firms are M/WBEs
The Joint Venture approval is valid through the duration of the Port Authority contract)

1. NAME OF JOINT VENTURE: _____

2. ADDRESS OF JOINT VENTURE: _____

_____

_____

3. TELEPHONE NUMBER (S) OF JOINT VENTURE: _____

_____

4. (A) IDENTIFY THE FIRMS WHICH COMPRISE THE JOINT VENTURE. (THE MINORITY OR WOMAN-OWNED BUSINESS ENTERPRISE PARTNER MUST COMPLETE A UNIFORM CERTIFICATION APPLICATION – SCHEDULE A):

_____

_____

(B) DESCRIBE THE ROLE OF THE M/WBE IN THE JOINT VENTURE:

_____

_____

_____

5. NATURE OF THE JOINT VENTURE'S BUSINESS: _____

_____

_____

6. PROVIDE A COPY OF THE JOINT VENTURE AGREEMENT.

Schedule B

7. WHAT IS THE CLAIMED PERCENTAGE OF MBE OR WBE OWNERSHIP? _____

8. OWNERSHIP OF JOINT VENTURE: (THIS NEED NOT BE FILLED IN IF DESCRIBED IN THE JOINT VENTURE AGREEMENT)

(A) PROFIT AND LOSS SHARING: _____

_____

(B) CAPITAL CONTRIBUTIONS, INCLUDING EQUIPMENT:

_____

_____

_____

(C) OTHER APPLICABLE OWNERSHIP INTERESTS:

_____

_____

_____

9. CONTROL OF AND PARTICIPATION IN THIS CONTRACT. IDENTIFY BY NAME, RACE, SEX AND "FIRM" THOSE INDIVIDUALS AND THEIR TITLES WHO ARE RESPONSIBLE FOR DAY-TO-DAY MANAGEMENT AND POLICY DECISION-MAKING, BUT NOT LIMITED TO, THOSE WITH PRIME RESPONSIBILITY FOR:

NAME & TITLE	SEX		GROUP CODE*	FIRM
FINANCIAL DECISIONS				
_____	☐M	☐F	_____	_____
_____	☐M	☐F	_____	_____
MANAGEMENT DECISIONS, SUCH AS:				
ESTIMATING				
_____	☐M	☐F	_____	_____
_____	☐M	☐F	_____	_____
MARKETING AND SALES				
_____	☐M	☐F	_____	_____
_____	☐M	☐F	_____	_____

Schedule B

HIRING AND FIRING OF MANAGEMENT PERSONNEL

_____ ☐M ☐F _____ _____

_____ ☐M ☐F _____ _____

PURCHASING OF MAJOR ITEMS OR SUPPLIES

_____ ☐M ☐F _____ _____

_____ ☐M ☐F _____ _____

SUPERVISION OF FIELD OPERATIONS

_____ ☐M ☐F _____ _____

_____ ☐M ☐F _____ _____

*GROUP CODE KEY

01 – BLACK	02A – HISPANIC	03A – ASIAN-PACIFIC	04 – NATIVE AMERICAN
	02B – PORTUGUESE	03B – ASIAN-INDIAN	05 – NON-MINORITY
	02C – SPANISH		06 - OTHER

Schedule B

Affidavit

"The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operation of the joint venture and the intended participation by each joint venturer in the undertaking. Further, the undersigned agree to provide to the grantee current and complete information and any proposed changes to the joint venture arrangement. The undersigned also agree to permit authorized representatives of the grantee or the Federal-funding agency to audit and examine the books, records and files of the joint venture, or those of each joint venturer relevant to the joint venture. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statement."

NAME OF FIRM	NAME OF FIRM
SIGNATURE	SIGNATURE
NAME	NAME
TITLE	TITLE
DATE	DATE

State of _____ County of _____

On this _____ day of _____, 20____, before me appeared (name) _____ to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

_____
Notary Public

State of _____ County of _____

On this _____ day of _____, 20____, before me appeared (name) _____ to me personally known, who being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

_____
Notary Public

Schedule B

CONSTRUCTION M/WBE PARTICIPATION PLAN

PA 3749/05-11

Office of Business Diversity and Civil Rights

PAGE _____ OF _____

NOTE: The Contractor is required to submit to the Engineering Dept. a MODIFIED PLAN for any changes to the original plan: i.e.; subcontractor, dollar amount or work performed.
If more than 1 page is used, complete totals on last page.

Contract Number: _____

Contract Description: _____

Contractor Name: _____

Mailing Address: _____

Contract Amount: _____

Telephone Number: _____

Contract Goals: MBE _____ WBE _____ DBE _____

Name, Address, Phone Number of PA Certified MBE/WBE/DBE subcontractor (including name of contact person)	Indicate MBE, WBE Or DBE	Description of Work, Services to be provided. Where applicable, specify, "supply" or "install or both "supply" and "install."	Anticipated date work will start and finish	*Approximate $ amount of M/W/DBE Subcontract	MBE/WBE/DBE % of Total Contract Amount
			TOTAL:		

Signature of Contractor: _____

Print Name: _____

Title: _____ Date _____

FOR OBDCR USE ONLY
Contract Goals: ☐ Approved ☐ Waived ☐ Rejected
Reviewed by: _____
OBDCR Business Development Representative
Print Name: _____ Date _____

Distribution: Original – OBDCR; Copy 2 – Engineer of Construction; Copy 3 – Contractor; Copy 4 – Line Department
*Please Note: supplies, equipment and material men are only credited 60% towards the M/W/DBE goal. Please adjust calculations accordingly.

Schedule C

CONSTRUCTION M/WBE PARTICIPATION PLAN - MODIFIED

PA 3749A (08-10)

Office of Business and Job Opportunity

PAGE _____ OF _____

Contract Number: _____

Contractor Name: _____

Mailing Address: _____

Telephone Number: _____

Contract Description: _____

Contract Amount: _____

Contract Goals: MBE _____ WBE _____ DBE _____

Name, Address, _Phone Number of PA Certified MBE/WBE/DBE subcontractor (including name of contact person)	Indicate MBE, WBE Or DBE	Description of Work, Services to be provided. Where applicable, specify "supply" or "install or both "supply" and "install."	Anticipated date work will start and finish	*Approximate $ amount of M/W/DBE Subcontract	MBE/WBE/DBE % of Total Contract Amount
			TOTAL:		

Signature of Contractor: _____

Print Name: _____

Title: _____ **Date** _____

FOR OBJO USE ONLY

Contract Goals: ☐ Approved ☐ Waived ☐ Rejected

Reviewed by: _____

OBJO Business Development Representative

Print Name: _____ Date _____

Distribution: Original – OBJO; Copy 2 – Engineer of Construction; Copy 3 – Contractor; Copy 4 – Line Department

*Please Note: supplies, equipment and material men are only credited 60% towards the M/W/DBE goal. Please adjust calculations accordingly.

Schedule C

INSTRUCTIONS

CONTRACTOR INSTRUCTIONS: Contractor is required to submit a MBE/WBE Participation Plan and/or best efforts documentation to the designee identified in the contract book within 7 days of contract award.

ENGINEER OF CONSTRUCTION INSTRUCTIONS: After a review of the submitted MBE/WBE Participation plan, forward to Office of Business and Job Opportunity via fax at (212) 435-7828 or PAD to 233PAS 4th Floor for review and approval. Approved/waived/rejected plan will be returned within 10 business days of receipt of this document. Engineer of Construction will advise vendor of the results of the MBE/WBE Participation Plan review.

STATEMENT OF PAYMENTS TO M/W/DBE SUBCONTRACTORS/LESSORS/SUPPLIERS

Contract No: _____ Period Reporting: _____ (Example: 10/1/93 - 10/31/93)

Contract Title: _____ Payment Appl #: _____

Contractor: _____ % Project Completed: _____

SUBCONTRACTOR'S NAME	(Indicate) MBE WBE DBE	ESTIMATED TOTAL SUBCONTRACT AMOUNT	AMOUNTS PAID (Column A) Prior Statement	(+ Column B) This Statement	(= Column C) Cumulative To-Date
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0

SUPPLIERS/LESSORS	(Indicate) MBE WBE DBE	TOTAL AMOUNT SUPPLIER AGREEMENT	AMOUNTS PAID (Amounts entered should reflect 100% NOT the 60% credit we receive by this office.) Prior Statement	This Statement	Cumulative To-Date
					$0
					$0
					$0
					$0
					$0
					$0

Date Prepared: _____

Prepared by: _____

Title: _____

Officer's Signature: _____

The Port Authority of NY & NJ
Resident Engineer's Office

Date Received: _____

Reviewed By: _____

Title: _____

Schedule D

FINAL

STATEMENT OF PAYMENT
TO M/W/DBE SUBCONTRACTORS/LESSORS/SUPPLIERS

Contract No:	Period Reporting: (Example: 10/1/98 - 10/31/98)
Contract Title:	Payment Appl #: & Final
Contractor:	% Project Completed: 100%

SUBCONTRACTOR'S NAME	(Indicate) MBE WBE DBE	TOTAL SUBCONTRACT AMOUNT	Column A AMOUNTS PAID & TO BE PAID Prior Statement	+ Column B This Statement	= Column C Cumulative To-Date
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0

SUPPLIERS/LESSORS	(Indicate) MBE WBE DBE	TOTAL AMOUNT SUPPLIER AGREEMENT	AMOUNTS PAID & TO BE PAID (Amounts entered should reflect 100% paid. The 60% credit will be handled by the office.) Prior Statement	This Statement	Cumulative To-Date
					$0
					$0
					$0
					$0
					$0
					$0

Date Prepared:	For The Port Authority of NY & NJ Resident Engineer's Office
Prepared by:	Date Received:
Title:	Reviewed By:
Officer's Signature:	Title:

Schedule D

THE PORT AUTHORITY OF NY & NJ

ANALYSIS OF BID

PROJECT **Overnight Aircraft Parking**

BID DATE

THIS IS NOT PART OF THE CONTRACT

SHEET

CONTRACTOR

CONTRACT NO. **EWR-154.226**

Unit No.	Descriptions [1]	Quantity	Unit [2]	Unit Price	Amount
1	**General Conditions** (incl. MOT)		LS		
2	**Civil / Sitework** (excluding Classified Work)	-	-	-	-
3	New RCP Storm Drainage (15", 18", 24")		LF		
4	Removal of Existing Asphalt Pavement		SF		
5	Removal of Existing Concrete Pavement		SF		
6	Removal of Existing Retaining Wall		LF		
7	Backfill for Pilecaps and Grade Beams Using Existing Soil to be Removed		CY		
8	Fencing		LF		
9	Misc. Removals, Utilities and Sitework		LS		
10	**Structural / Architectural**	-	-	-	-
11	Demolition of Building 14		CF		
12	Demolition of Building 14 Foundation		CY		
13	Demolition of Building 95		CF		
14	Demolition of Building 95 Foundation		CY		
15	Demolition of Building 332		CF		
16	Demolition of Building 332 Foundation		CY		
17	Material Salvage (credit)		LS		

THE PORT AUTHORITY OF NY & NJ

ANALYSIS OF BID

PROJECT **Overnight Aircraft Parking**

BID DATE

THIS IS NOT PART OF THE CONTRACT

SHEET

CONTRACTOR

CONTRACT NO. **EWR-154.226**

Unit No.	Descriptions [1]	Quantity	Unit [2]	Unit Price	Amount
18	**Mechanical - HVAC**	-	-	-	-
19	Removals at Building 14		LS		
20	Removals at Building 95		LS		
21	Removals at Building 332		LS		
22	**Plumbing**	-	-	-	-
23	Removals of Existing Piping and Associated Work at Building 340 North & South Water Rooms and Building 58 Pump Station		LS		
24	Firewatch		LS		
25	**Electrical**	-	-	-	-
26	Ductbank including Conduits/Wires, Concrete, Excavation and Fill, Type A-H		LF		
27	Fence Lighting		LF		
28	Vehicle Parking Lights, Type L		EA		
29	Misc. Electrical Work		LS		
30	**Electronics**	-	-	-	-
31	Removals at Building 14		LS		
32	Removals at Building 95		LS		
33	Removals at Building 332		LS		

THE PORT AUTHORITY OF NY & NJ

ANALYSIS OF BID

PROJECT **Overnight Aircraft Parking**

BID DATE

THIS IS NOT PART OF THE CONTRACT

SHEET

CONTRACTOR

CONTRACT NO. **EWR-154.226**

Unit No.	Descriptions [1]	Quantity	Unit [2]	Unit Price	Amount
34	**Environmental**	-	-	-	-
35	Disposal of Concrete, Waste Type ID 13C at Building 14		TON		
36	Misc. Removals at Building 14 including Universal Waste, Hydraulic Fluid System for Hangar Doors, etc.		LS		
37	Removals at Building 95 including Universal Waste and Misc. Waste		LS		
38	Removals at Building 332 including Universal Waste and misc. waste		LS		
	Total Lump Sum (Unclassified Work)				

1. Separate and list all items or operations of work included in your estimate in accordance with Specifications. When listing subcontracts, the prime contractor will have each subcontractor complete an analysis of bid form.
2. Unit of measure, i.e., SF, CY, Bbls, Pcs, Ea., etc.
3. Include all charges, such as moving on site, removal, rental, etc.
4. In case of conflict between information hereon (whether supplied by the Authority or the bidder) and the terms or prices contained or inserted in the Contract Booklet or Contract Drawings, said Booklet and Drawings shall control.
5. The Analysis of Bid is not part of the contract. No information hereon (whether supplied by the Authority or the bidder) and no information deduced from information hereon, including quantities of materials or work, shall be deemed to vary, alter or modify any provision of the Contract, including provisions therein as to compensation and performance. The unit prices contained hereon serve the sole purpose of informing Port Authority as to components of the bidder's price quoted in the Contract. The items of materials or work contained hereon shall not deemed to be an exhaustive list of the items of materials or work required by the Contract Drawings and Specifications in their present form.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

July 18, 2014

ADDENDUM NO. 1

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** – NEWARK LIBERTY INTERNATIONAL AIRPORT – OVERNIGHT AIRCRAFT PARKING

The following changes are hereby made in the Contract Documents for the subject Contract.

This communication should be physically annexed to back cover of the book and initialled by each bidder before submitting his bid.

In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialled.

CHANGES IN THE CONTRACT BOOKLET

Pages 377 - through 391	Delete these pages in their entireties and substitute therefore new page 377 which is attached hereto and made a part hereof.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

_____

SECTION 09910

PAINTING

APPENDIX "B"

PAINT SCHEDULE

A. Exterior

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
Steel Semi-Gloss	S-3S	Aluminum Epoxy Mastic	Carboline Carbomastic 15	Epoxy	Carboline Carboguard 890	Aliphatic Polyurethane Semi-Gloss	Carboline Carbothane 133 LH
			PPG PMC Amerlock 2 AL		PPG PMC Amercoat 385		PPG PMC Amercoat 450 HSG
			SW Epoxy Mastic Aluminum II		SW Macropoxy 646		SW Acrolon 218 HS

END OF APPENDIX "B"

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

July 18, 2014

ADDENDUM NO. 1

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** – NEWARK LIBERTY INTERNATIONAL AIRPORT – OVERNIGHT AIRCRAFT PARKING

The following changes are hereby made in the Contract Documents for the subject Contract.

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In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialled.

CHANGES IN THE CONTRACT BOOKLET

Pages 377 - through 391	Delete these pages in their entireties and substitute therefore new page 377 which is attached hereto and made a part hereof.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

08-27-14P03:16 RCVD

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

August 4, 2014

ADDENDUM NO. 2

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** – NEWARK LIBERTY INTERNATIONAL AIRPORT – OVERNIGHT AIRCRAFT PARKING

The following changes are hereby made in the Contract Documents for the subject Contract.

This communication should be physically annexed to back cover of the book and initialled by each bidder before submitting his bid.

In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialled.

CHANGES IN THE CONTRACT BOOKLET

Page 1 - In the second line of the first paragraph, change the day and date for receipt of Proposals to "Tuesday, August 12, 2014".

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

August 4, 2014

ADDENDUM NO. 2

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** – NEWARK LIBERTY INTERNATIONAL AIRPORT – OVERNIGHT AIRCRAFT PARKING

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In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialled.

CHANGES IN THE CONTRACT BOOKLET

Page 1 - In the second line of the first paragraph, change the day and date for receipt of Proposals to "Tuesday, August 12, 2014".

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

08-27-14P03:16 RCVD

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

August 8, 2014

ADDENDUM NO. 3

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** – NEWARK LIBERTY INTERNATIONAL AIRPORT – OVERNIGHT AIRCRAFT PARKING

The following changes are hereby made in the Contract Documents for the subject Contract.

This communication should be physically annexed to back cover of the book and initialled by each bidder before submitting his bid.

In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialled.

CHANGES IN THE CONTRACT BOOKLET

Page v - Before Section 02070 of Division 2 – SITEWORK, insert:

"02050 DEMOLITION AND DISPOSAL.....140A"

Page 1 - In the second line of the first paragraph, change the date for receipt of Proposals to "August 19, 2014" ADD #4 OVERRIDE

Page 140 - Following this page, insert new Section 02050 DEMOLITION AND DISPOSAL on pages 140A through 140G (7 pages), which are attached hereto and made a part hereof.

REVISED CONTRACT DRAWINGS

Drawings C201 and C202 have been revised as of August 5, 2014. Copies of these drawings are forwarded herewith. Destroy the drawings of these numbers now in your possession and substitute therefor the revised drawings.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

_____

08-27-14P03:16 RCVD

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

August 8, 2014

ADDENDUM NO. 3

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** – NEWARK LIBERTY INTERNATIONAL AIRPORT – OVERNIGHT AIRCRAFT PARKING

The following changes are hereby made in the Contract Documents for the subject Contract.

This communication should be physically annexed to back cover of the book and initialled by each bidder before submitting his bid.

In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialled.

CHANGES IN THE CONTRACT BOOKLET

Page v - Before Section 02070 of Division 2 – SITEWORK, insert:

"02050 DEMOLITION AND DISPOSAL.....140A"

Page 1 - In the second line of the first paragraph, change the date for receipt of Proposals to "August 19, 2014"

Page 140 - Following this page, insert new Section 02050 DEMOLITION AND DISPOSAL on pages 140A through 140G (7 pages), which are attached hereto and made a part hereof.

REVISED CONTRACT DRAWINGS

Drawings C201 and C202 have been revised as of August 5, 2014. Copies of these drawings are forwarded herewith. Destroy the drawings of these numbers now in your possession and substitute therefor the revised drawings.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

_____

DIVISION 2

SECTION 02050

DEMOLITION AND DISPOSAL

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for demolition and disposal.

B. Retained Items

Prior to demolition, carefully remove, store and protect materials and equipment, if any, shown on the Contract Drawings as "Retain - Deliver to Engineer".

C. Additionally, for Work in the City of New York, prior to demolition employ a certified exterminator and treat entire structure in accordance with governing health regulations for rodent and insect control, as if the Work were being performed for a private corporation.

1.02 DESIGN AND PERFORMANCE REQUIREMENTS

A. The Contractor assumes the risk of any loss due to theft, destruction or disappearance of, or damage to, the structures or portions thereof to be demolished, whether occurring before or after the submission of Proposals on this Contract, arising from any cause whatsoever excepting only affirmative, intentional acts of the Authority.

B. The Authority assumes no responsibility for guarding the structures to be demolished either before or after the Contractor is given access thereto, and does not guarantee that their condition will remain the same after the submission of Proposals as before. The Authority does not imply by this Section that the structures to be demolished are complete structures.

C. Storage or sale of items of salvable value to the Contractor is prohibited on the construction site.

D. Demolition using explosive, incendiary or wrecking ball methods is prohibited.

E. Provide water and wet down the structure(s) being demolished, as well as the sites adjacent to the structure(s) being demolished, to limit raising dust and dirt to lowest practical level. Provide water truck, water line or hydrant connection, and hoses for this purpose.

F. Do not use, or permit the use of, the structure(s) to be demolished for any purpose other than for actual demolition.

G. Do not traverse pavement with tracked vehicles or other equipment which may damage pavement.

H. Do not use heaters without prior approval of the Engineer. Installation of temporary heaters, if used, shall conform to American National Standards Institute (ANSI) A10.10 "Safety Requirements for Temporary and Portable Space Heating Devices and Equipment Used in the Construction Industry".

I. Condition of Adjacent Construction

1. Prior to starting demolition, make an inspection accompanied by the Engineer to determine physical condition of adjacent existing structure(s) or construction that is to remain.

2. During such inspection the Engineer and the Contractor shall mutually agree on existing damage to adjacent existing structure(s) or construction that is to remain, if any, and the Contractor shall subsequently prepare and submit to the Engineer a written description of such mutually agreed upon existing damage, including photographic documentation when requested by the Engineer.

J. Utility Services

1. Do not disrupt service to fire hydrants in any way without the written approval of the Engineer. If, with written approval of the Engineer, water service to any area is disrupted, make provisions to ensure adequate fire protection for such area.

2. At all times during the Work of this Section, maintain accessibility from street to all fire hydrants, traffic signals, power or light poles, mailboxes, and similar utility and public service items adjacent to the construction site.

3. Do not interrupt utilities serving occupied or used areas, except when authorized by the Engineer. Provide temporary services during such interruptions as approved by the Engineer.

4. Arrange in advance of demolition Work for disconnection or rerouting of utility line(s). Identify such capped, plugged, sealed or rerouted lines on a record drawing. Submit such drawing in accordance with 1.03 B.

1.03 SUBMITTALS

For Submittal Requirements, see Appendix "A".

PART 2. PRODUCTS

2.01 MATERIALS

A. Imported Fill

Soil materials to be delivered to the construction site by the Contractor, approved in accordance with 1.03 C, shall be as follows:

1. For basements, voids and sub-base, soil materials shall consist of stone, gravel, and sand, free from debris, trash, roots and other organic matter, with no particle size exceeding 2 inches in maximum dimension.

2. For tank filling, soil material shall be clean, well-graded sand.

B. Rubble Fill

Rubble fill shall be concrete, brick or other masonry materials resulting from demolition. Break fill material into pieces not exceeding 4 inches in their greatest dimension, with no flat or elongated pieces, with all protruding reinforcing cut or burned off, and with a sufficient percentage of smaller pieces to minimize voids. A flat piece is one having a ratio of width to thickness greater than five; an elongated piece is one having a ratio of length to width greater than five.

PART 3. EXECUTION

3.01 PREPARATION

A. Protection

1. Erect and maintain temporary window or opening covers, covered passageways, barricades or fences as required to ensure safe passage of persons around area of demolition.
2. Erect and maintain enclosed dust chutes as required for the disposal of materials, rubbish, and debris.
3. Erect and maintain dustproof partitions as required to prevent spread of dust, fumes or smoke to other occupied or used areas or structures.
4. Provide temporary interior and exterior shoring, bracing and/or support as required to ensure that movement or settlement of structures to be demolished is safely controlled and collapse is prevented. Ensure that movement, settlement, and/or damage to existing facilities does not occur.

B. Pollution Controls

1. Use water sprinkling, enclosed chutes and/or temporary enclosures to limit dust and dirt rising and scattering in the air. Conform to requirements of 1.02 E.
2. Filter sediment from runoff before it enters drainage systems or waterways using methods in accordance with 1.03 A.6.
3. Do not use water when it may create hazardous or objectionable conditions such as ice or flooding.
4. Pump out the contents of buried tanks shown on the Contract Drawings. Remove such pumped-out materials and dispose of them away from Authority property by safe means so as not to endanger the health of workers and the public.

C. Authority-Retained Items

1. Remove and handle carefully to avoid damage.
2. Prepare as shown on the Contract Drawings.
3. Deliver to a construction site location designated by the Engineer, unless otherwise shown on the Contract Drawings.

3.02 DEMOLITION

A. Conduct demolition operations and disposal of debris to ensure minimum interference with the use of, or access to, adjacent buildings or construction site areas. Do not unnecessarily obstruct sidewalks or street.

B. Before commencement of demolition remove all glass in windows, doors, skylights and fixtures.

C. Proceed with demolition in a systematic manner, from top of structure to ground. Complete upper demolition before disturbing lower supporting members.

D. Do not store any materials, rubbish, dirt, debris or waste of any sort resulting from the demolition operations on the floor of partially demolished structures, or adjacent construction site areas.

E. Demolish concrete and masonry in small sections. Lower heavy framing members carefully.

F. Where shown on the Contract Drawings, break and remove on grade and basement slabs.

G. Disposal of Demolished Materials

1. Unless otherwise shown on the Contract Drawings, dispose of debris, rubbish, and other materials resulting from demolition operations away from Authority property.

2. On Authority property, do not burn, bury or otherwise dispose of debris, rubbish or other materials resulting from demolition operations.

H. Contractor's Salvaged Materials

Except for items shown on the Contract Drawings as "Retained - Deliver to Engineer", other removed and salvaged materials not shown for reuse or as retained shall become the Contractor's property. Such materials shall be removed from Authority property at no additional cost to the Authority.

3.03 ADJUSTMENTS

A. Unless otherwise shown on the Contract Drawings, provide fill for below-grade areas and voids resulting from the Work of this Section as follows:

1. Fill to be placed one foot or more below grade or paving subgrade, or one foot or more away from foundation walls, edges of footings, or underground utility lines, may at the Contractor's option, be imported soil material or rubble fill as specified in 2.01.

2. Fill to be placed in the remaining one-foot void shall be approved imported soil material conforming to requirements of 2.01 A.1.

B. Place approved rubble fill material in horizontal layers not exceeding one foot in loose depth, with top layer consisting of the smallest size rubble available. Compact each layer of rubble fill with at least four passes of a ten-ton roller, of a type approved by the Engineer.

C. Place approved imported soil materials in horizontal layers not exceeding 6 inches in loose depth. Compact each layer at optimum moisture content of fill material to a density equal to original adjacent ground, unless otherwise directed by the Engineer.

D. Unless otherwise shown on the Contract Drawings, fill buried tanks with approved imported sand conforming to requirements of 2.01 A.2.

E. After placement and compaction of fill, grade surface to meet adjacent contours and to provide surface drainage.

F. Where and as shown on the Contract Drawings, provide for subsurface drainage through slabs on which fill is placed.

3.04 REPAIR

Promptly repair, to the satisfaction of the Engineer and at no cost to the Authority, damage caused to adjacent facilities by demolition and removal operations.

END OF SECTION

SECTION 02050

DEMOLITION AND DISPOSAL

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

Shop Drawings

02050A01 Submit in accordance with the requirements of "Shop Drawings, Catalog Cuts, and Samples", of Division 1 - GENERAL PROVISIONS, a record drawing indicating horizontal and vertical locations of disconnected, rerouted or capped utilities, or filled underground tanks. Reference all such items to visible permanent surface features.

Samples

02050C01 For imported fill material, submit to the Engineer of Materials, Engineering Materials Laboratory, Port Authority Technical Center, 241 Erie Street, Jersey City, NJ 07310-1397, one 25- pound, representative sample of such material proposed for use under this Section, subject to the following:
1. Not less than three weeks prior to delivery of imported fill material to the construction site, submit sample in clean sturdy container or bag which shall not permit loss of any material.
2. Clearly label sample with Contract number, title and location, material supplier's name and location and identification of fill material.
3. Do not deliver imported fill material to the construction site until the Engineer has checked and approved the sample of such material.

Certificates

02050E01 Certificates of severance of utility services from the respective utilities

Construction and Installation Procedures

02050G01 Description of proposed methods and operations of demolition, for review and approval by the Engineer;

02050G02 Description of sequence of demolition and disposal Work, for review and approval by the Engineer;

02050G03 Description of proposed method of filtering sediment from runoff, for review and approval

by the Engineer.

Inspection Reports

02050O01 Written inspection report described in 1.02 I.2.

END OF APPENDIX "A"

2783
updated OPro Drawing Log
8/18/14 /g

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

August 15, 2014

ADDENDUM NO. 4

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** – NEWARK LIBERTY INTERNATIONAL AIRPORT – OVERNIGHT AIRCRAFT PARKING

The following changes are hereby made in the Contract Documents for the subject Contract.

This communication should be physically annexed to back cover of the book and initialled by each bidder before submitting his bid.

In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialled.

CHANGES IN THE CONTRACT BOOKLET

Page i - Make the following changes:

A. In 9., delete "MINORITY AND WOMEN'S BUSINESS ENTERPRISES PROGRAM (MBE/WBE)" and insert "DBE Program".
B. After 18., add the following:
"18A. Buy American Certificate"

Page ii - After 46., add a new line as follows:
"46A. Minimum Wage Rates"

Page iii - Make the following changes:

A. After "64. NO ESTOPPEL OR WAIVER…", add the following new lines:
"CHAPTER VII – FEDERAL AVIATION ADMINISTRATION REQIREMENTS"
"64A. FEDERAL AVIATION ADMINISTRATION REQIREMENTS"……79A"
B. Change "CHAPTER VII – MISCELLANEOUS" to "CHAPTER VIII – MISCELLANEOUS."

Page iv - Make the following changes:

A. In 104., delete "ASBESTOS COST SUMMARY SUBMITTAL" and insert "Lead Cost Summary Submittal".

Page v - After Section 02070 of Division 2 – SITEWORK, insert:

"02075 PARTIAL REMOVALS.....150A"

After Section 02722 of Division 2 – SITEWORK, insert:

"02832 METALLIC –COATED STEEL CHAIN LINK FENCE AND GATES" .....257A"

Page vi - Make the following changes:

A. After Section 16670 of Division 16 – ELECTRICAL, insert:

"16720 FIRE ALARM SYSTEMS.....560A"

B. After Permits insert "Appendix A".
C. Delete "Notification of M/WBE On-line Directory and Forms" without substitution therefor.
D. Delete "Schedule A" and substitute therefor: "Appendix A1".
E. Delete "Schedule B" and substitute therefor: "Appendix A2".
F. Delete "Schedule C" and substitute therefor: "Appendix A3".
G. Delete "Schedule D" and substitute therefor: "Appendix B".
H. Before "Analysis of Bid" insert "49 CFR PART 23".

Page 1 - A. In the second line of the first paragraph, change the date and date for receipt of Proposals to "Thursday, August 21, 2014".

B. After the last paragraph in Clause 1, add the following two new paragraphs:

"The Port Authority of New York and New Jersey, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

In addition, this Contract is subject to the requirements of Part 26 of Title 49 of the Code of Federal Regulations and Part 60-4 of Title 41 of the Code of Federal Regulations, (Department of Labor) Construction Contractors, Affirmative Action Requirements. These documents are available online at http://www.gpoaccess.gov/cfr."

Page 3 - After paragraph E., add the following:

"F. A Certification of Nonsegregated Facilities filled in on the form attached hereto in Appendix A.

G. A DBE Goals Stat4e4ment filled in on the form attached hereto as Appendix A1.

H. A DBE Participation Plan and Affirmation Statement filled in on the form attached hereto as Appendix A2.

I. An information on Solicited firms form filled in on the form attached hereto as Appendix A3.

J. If the bidder cannot make the certification required by the clause of the "Information for Bidders" entitled "Buy American Certificate", submit the statement and listing required by such clause"

Page 4 - Delete paragraph A. in its entirety, and substitute therefor the following:

"A. A detailed list of all anticipated material suppliers and subcontractors and a detailed list of the plant and equipment which the bidder proposes to use, indicating which portions it already possesses.

Page 7 - Delete Clause 9 in its entirety and substitute therefor new Clause 9 as follows:

"9. DBE PROGRAM

This Contract is subject to the United States Department of Transportation regulations on Disadvantaged Business Enterprises (DBE's) contained in Part 26 of Title 49 of the Code of Federal Regulations. The following goal for DBE participation has been set for this Contract:

20 % for firms owned and controlled by socially and economically disadvantaged individuals[1] and certified as DBE's by the Authority. Eligible DBE firms are listed on the following Uniform Certification Programs (UCPs) websites:

New York UCP – http://www.nysucp.net/

New Jersey UCP – http://www.njucp.net/

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1 Individuals who are rebuttably presumed to be socially and economically disadvantaged include women, Blacks, Hispanics, Native Americans, Asian-Pacific Americans, and Asian-Indian Americans. A bidder may meet the DBE goal by using any combination of disadvantaged businesses.

By bidding on this Contract, the bidder assures the Authority that it will meet the foregoing goal and shall submit the DBE Goals Statement form (Appendix A1) with his Proposal. If the bidder determines he cannot make this assurance he may nevertheless submit a bid but in such event he shall note on the DBE Goals Statement form the percentage of DBE participation he anticipates, including documentation supporting the good faith efforts made to achieve the goals set forth in the Contract.

The bidder shall submit with his Proposal the DBE Participation Plan and Affirmation Statement (Appendix A2) for each DBE firm he intends to use on this Contract. The DBE Participation Plan and Affirmation Statement shall provide the name and address of each DBE firm, a description of the work to be performed, the dollar value of each DBE subcontract and the signature affirmation from each DBE firm participating in this Contract.

A bidder who fails to meet the DBE goal for this Contract and fails to demonstrate to the Authority that the bidder has made good faith efforts to meet same shall not be eligible to be awarded the Contract. The following are illustrative of good faith efforts:

A. Attendance at a pre-bid meeting, if any, scheduled by the Authority to inform DBEs of subcontracting opportunities under a given solicitation;

B. Advertisement in general circulation media, trade association publications, and minority-focused media for at least 20 days before bids or proposals are due. If 20 days are not available, publication for a shorter reasonable time is acceptable;

C. Written notification to DBEs that their interest in the Contract is solicited;

D. Efforts made to select portions of the work proposed to be performed by DBEs in order to increase the likelihood of achieving the stated goal;

E. Efforts to negotiate with DBEs for specific sub-bids including at a minimum;

   1.) The names, addresses, and telephone numbers of DBEs that were contacted;

   2.) A description of the information provided to DBEs regarding the plans and specifications for portions of the work to be performed; and

   3.) A statement of why additional agreements with DBEs were not reached;

F. Concerning each DBE, the bidder contacted but rejected as unqualified, and the reasons for the bidder's rejection;

G. Efforts made to assist the DBEs contacted that need assistance in obtaining bonding or insurance required by the bidder or Authority.

The bidder shall submit with his Proposal the completed Information on Solicited Firms form (Appendix A3) listing every firm that provided a quotation to the bidder for any subcontract to be performed under this Contract, whether or not the firms are DBE certified and whether or not the firms' quotes were included in the final Proposal.

Page 21 - After the last paragraph, add Clause 18A. as follows:

"18A. BUY AMERICAN CERTIFICATE

By submitting a bid on this Contract, the bidder certifies that more than 60% (by cost) of the steel and manufactured products for this Contract are produced in the United States (as defined in "Buy American - Steel and Manufactured Products For Construction Contracts" of the clause entitled "Federal Aviation Administration Requirements" of Chapter VII of the Contract) provided that components of unknown origin are considered to have been produced or manufactured outside the United States. A list of articles, materials, and supplies excepted from this provision is included in Chapter VII hereof.

If the bidder cannot make this certification, he shall submit with his bid a signed statement stating that he will not meet the Buy American requirements and shall list below all products which are not produced in the United States. Bidders are advised that failure to meet the Buy American provisions may require the Authority to reject that bidder's proposal.

PRODUCT	COUNTRY OF ORIGIN

It is the intent of the Contract that the products provided under this Contract comply with the Buy American provisions of this Contract. If the Contract documents inadvertently prohibit the bidder from making the above certification, the bidder shall notify by telephone or email the person listed in the clause entitled "Questions by Bidders". Such notification shall be made a minimum of five days prior to the date for receipt of Proposals.

In addition, where the Contract documents permit substitutions in accordance with the clause of Division 1 entitled "Substitution" and where items are specified in the Contract generically without being specifically identified, items that are not produced in the United States will not be approved if the effect of such approval will be a violation of the Buy American provisions by the Contractor."

Page 33 - After the last paragraph in Clause 21, add the following new paragraph:

"The Authority (including its Inspector General), the FAA, the Comptroller General of the United States, or any of their duly authorized representatives, shall have access to any books, documents, papers and records of the Contractor which are pertinent to the Contract for the purpose of making audit, examination, excerpts and transcriptions.

Page 65 - Delete the third paragraph on the page in its entirety with no substitution therefor.

Page 66 - Make the following changes:

A. After the last paragraph in Clause 46, add new Clause 46A. as follows:

"46A. MINIMUM WAGE RATES

At the direction of the Federal Aviation Administration, the attention of bidders is directed particularly to the Schedule of Minimum Wage Rates attached to the Contract and made a part hereof.

The minimum wage rates as established by the Secretary of Labor are subject to change at any time before the award of the Contract except that if the change is made within five days after the opening of bids and the award is made within thirty days after the bids are opened, or ninety days after the date of wage decisions, whichever is earlier, the change is not effective. Such a change is necessary in order to comply with a decision of the U. S. Department of Labor.

B. After the first paragraph on the page, insert the following:

"The Contractor and his subcontractors may be required to submit certified payrolls and labor compliance documentation electronically through the use of the electronic payroll reporting system specified below. If the Contractor is required to submit his payroll records electronically, then he does not have to submit the weekly payroll records as set forth above.

The LCPtracker Payroll Reporting system is web-based and accessed on the World Wide Web by a web browser. The Contractor and each of his subcontractors will be given a Log On identification and password to access the LCPtracker Payroll Reporting system in order to perform data entry of the weekly payroll information required above. The Contractor's payroll and accounting software might be capable of generating a 'comma delimited file' that will interface with the software."

Page 79 - After this page, insert Chapter VII pages 79A through 79U, (21 pages) inclusive, which are attached hereto and made a part hereof.

Page 80 - At the top of the page, change "Chapter VII" to "Chapter VIII".

Page 98 - After the last sentence of the first paragraph on the page add the following sentence:

"The FAA shall have the same rights as the Authority under this paragraph."

Page 150 - Following this page, insert new Section 02075 PARTIAL REMOVALS pages 150A through 150F (6 pages), which are attached hereto and made a part hereof.

Page 257 - Following this page, insert new Section 02832 METALLIC –COATED STEEL CHAIN LINK FENCE AND GATES on pages 257A through 257I (9 pages), which are attached hereto and made a part hereof.

Page 560 - Following this page, insert new Section 16720 FIRE ALARM SYSTEMS on pages 560A through 560N) (14 pages), which are attached hereto and made a part hereof

Page 561 - Delete "APPENDIX 1"

Pages 581 through and including 598

Delete these pages in their entireties and substitute therefor Appendix A on new pages 581 through 598 which are attached hereto and made a part hereof.

Pages 621 through and including 647

Delete these pages in their entireties and substitute therefor Appendix A1, Appendix A2, Appendix A3, and Appendix B on new pages 621 through and including 630 (10 pages) which are attached hereto and made a part hereof.

REVISED CONTRACT DRAWINGS

Dwg. C502 Revise the drawing as shown on Sketch No. SK-C502 which is attached hereto and made a part hereof.

Dwg. G104 Revise the drawing as shown on Sketch No. SK-G104 which is attached hereto and made a part hereof.

Dwg. G105 Revise the drawing as shown on Sketch No. SK-G105 which is attached hereto and made a part hereof.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

08-27-14P03:15 RCVD

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Drawing Log
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CHAPTER VII

FEDERAL AVIATION ADMINISTRATION REQUIREMENTS

64A. FEDERAL AVIATION ADMINISTRATION REQUIREMENTS

A. Airport Improvement Program (AIP) Project: The Work in this Contract is included in AIP Project No.[3] which is being undertaken and accomplished by the Port Authority of New York and New Jersey (Authority) in accordance with the terms and conditions of a grant agreement between the Authority and the United States, under the Airport and Airway Improvement Act of 1982 (AAIA) (P.L. 97-248, 49 U.S.C. 2201 et seq.) and Part 152 of the Federal Aviation Regulations (FAR) (14 CFR Part 152), pursuant to which the United States has agreed to pay a certain percentage of the costs of the project that are determined to be allowable project costs under that Act. The United States is not a party to this Contract and no reference in this Contract to the FAA or any representative thereof, or to any rights granted to the FAA or any representative thereof, or the United States, by the Contract, makes the United States a party to this Contract.

B. Consent to Assignment: The Contractor shall obtain the prior written consent of the Authority to any proposed assignment of any interest in or part of this Contract.

C. Veteran's Preference: In the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to veterans of the Vietnam era and disabled veterans. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

D. FAA Inspection and Review: The Contractor shall allow any authorized representative of the FAA to inspect and review any Work or materials used in the performance of this Contract.

E. Health and Safety Requirements: It is a condition of this Contract, and shall be made a condition of each subcontract entered into pursuant to this Contract, that the Contractor and any subcontractor shall not require any laborer or mechanic employed in the performance of the Contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety, as determined under Construction Safety and Health Standards Title 29 CFR Part 1926 and other occupational and health standards (29 CFR Part 1910) promulgated by the United States Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (CWHSSA).

F. Rights to Inventions - Materials: All rights to inventions and materials generated under this Contract are subject to regulations issued by the FAA and the recipient of the Federal grant under which this Contract is executed.

G. Disadvantaged Business Enterprises: It is the policy of the Department of Transportation (DOT) that disadvantaged business enterprises shall have the maximum opportunity to participate in the performance of this Contract.

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[3] This project number will be subsequently supplied.

1.) The Contractor agrees to ensure that disadvantaged business enterprises have the maximum opportunity to participate in the performance of subcontracts. In this regard the Contractor shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 to ensure that disadvantaged business enterprises have the maximum opportunity to compete for and perform subcontracts.

2.) The Contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted Contracts. Failure by the Contractor to carry out these requirements is a material breach of this Contract which may result in the termination of this Contract or such other remedy as the Authority deems appropriate.

3.) Subcontracts: The Contractor shall insert in all subcontracts the clause set forth in subparagraph 2 of this paragraph.

4.) The Contractor shall not terminate for convenience any DBE subcontractor listed on the Contractor's DBE Participation Plan (or an approved substitute DBE firm) and then perform the Work with its own forces or those of an affiliate without the prior written consent of the Engineer. When a DBE subcontractor is terminated or fails to complete the Work of the Contract, the Contractor shall make good faith efforts to find another DBE subcontractor to perform such subcontract Work.

5.) In the event that the Contractor does not comply with the requirements of 49 CFR 26.53, including, but not limited to, the requirement that the Contractor meet the DBE participation goal set forth in this Contract or, if the goal has not been met, demonstrate that good faith efforts were made to meet the goal, then the Authority may determine that the Contractor is not a responsible bidder and, as such, ineligible for award of future contracts.

H. Minimum Wages:

1.) All laborers and mechanics employed or working upon the site of the Work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents therefor) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1 (b) (2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to laborers and mechanics, subject to the provisions of subparagraph 4 below; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of Work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing Work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which Work is performed. The wage determination (including any additional classification and wage rates conformed under (b)(i)3. of this Section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the Work in a prominent and accessible place where it can easily be seen by the workers.

2.)

a. The Engineer shall be the designated ("contracting officer") for this Contract, pursuant to 29 CFR 5.2 (e), and shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the Contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

(i) Except with respect to helpers as defined in 29 CFR 5.2 (n) (4), the Work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(iv) With respect to helpers as defined in 29 CFR 5.2 (n) (4), such a classification prevails in the area in which the Work is performed.

b. If the Contractor and the laborers or mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

c. In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

d. The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs b.(ii) or (iii) of this paragraph, shall be paid to all workers performing Work in the classification under this Contract from the first day on which Work is performed in the classification.

3.) Whenever the minimum wage rate prescribed in the Contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly wage rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

4.) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

I. Withholding: The Federal Aviation Administration shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this Contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the Contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of work, all or part of the wages required by the Contract, the Federal Aviation Administration may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

J. Payrolls and Basic Records:

1.) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the Work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found, under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the cost anticipated or the actual costs incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage ratios prescribed in the applicable programs.

2.)

a. The Contractor shall submit weekly for each week in which any Contract Work is performed a copy of all payrolls to the Authority. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under subparagraph 5.5(a)(3)(i) of Regulations, 29 CFR Part 5. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

b. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the Contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be maintained under subparagraph 5.5(a)(3)(i) of Regulations, 29 CFR Part 5 and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice and trainee) employed on the Contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations 29 CFR Part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of Work performed, as specified in the applicable wage determination.

c. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (b)(ii)of this section.

d. The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

3.) The Contractor or subcontractor shall make the records required under paragraph (a) of this section available for inspection, copying or transcription by authorized representatives of the Department of Transportation, Federal Aviation Administration or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal Aviation Administration may, after written notice to the Contractor, the Authority, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

K. Apprentices, Trainees and Helpers:

1.) Apprentices: Apprentices will be permitted to Work at less than the predetermined rate for the Work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the United States Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of Work actually performed. In addition, any apprentice performing Work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the Work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeymans's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the Work performed until an acceptable program is approved.

2.) Trainees: Except as provided in 29 CFR 5.16, trainees will not be permitted to Work at less than the predetermined rate for the Work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification, by the United States Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of Work actually performed. In addition, any trainee performing Work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the Work performed until an acceptable program is approved.

3.) Equal Employment Opportunity: The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

4.) Helpers: Helpers will be permitted to work on a project if the helper classification is specified on an applicable wage determination or is approved pursuant to the conformance procedure set forth in 29 CFR 5.5(a) (1) (ii). The allowable ratio of helpers to journeymen employed by the Contractor or subcontractor on the job site shall not be greater than two helpers for every three journeymen (in other words, not more than 40 percent of the total number of journeymen and helpers in each contractor's or in each subcontractor's own work force employed on the job site). Any worker listed on a payroll at a helper wage rate, who is not a helper as defined in 29 CFR 2.5(n) (4), shall be paid not less than the applicable wage rate on the wage determination for classification of Work actually performed. In addition, any helper performing Work on the job site in excess of the ratio permitted shall be paid not less than the applicable journeyman's (or laborer's, where appropriate) wage rate on the wage determination for the Work actually performed.

L. Compliance With Copeland Act Requirements: The Contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this Contract.

M. Compliance With Davis-Bacon and Related Act Requirements: All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this Contract.

N. Disputes Concerning Labor Standards: Disputes arising out of the labor standards provisions of this Contract shall not be subject to the general disputes clause of this Contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts, 5, 6 and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

O. Certification of Eligibility:

1.) By entering into this Contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

2.) No part of this Contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

3.) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

4.) The Contractor shall submit an executed copy of the form on the next page, entitled "Contractor's Certification Of Eligibility", with his Proposal.

CONTRACTOR'S CERTIFICATION OF ELIGIBILITY

The Bidder certifies, by submission of this Proposal or acceptance of this Contract, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. It further agrees by submitting this bid that it will include this Clause without modification in all lower tier transactions, solicitations, bids, proposals, contracts, and subcontracts. Where the Bidder/Offeror/Contractor or any lower tier participant is unable to certify to this statement, it shall attach an explanation to this Solicitation/Proposal.

That, the information above is true and complete to the best of my knowledge.

_____

Name and Title (please print)

_____ _____

Signature Date

NOTE: The penalty for making false statements in offers is prescribed in 19 U.S.C. 1001

P. Contract Work Hours and Safety Standards Act: Note: As used in the following, the terms "laborers" and "mechanics" include watchmen and guards.

1.) Overtime Requirements: No Contractor or subcontractor contracting for any part of the Contract Work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any Work week in which he or she is employed on such Work to Work in excess of eight hours in any calendar day or in excess of 40 hours in such Work week unless such laborer or mechanic receives compensation at a rate not less than 1 1/2 times his basic rate of pay for all hours worked in excess of eight hours in any calendar day or in excess of 40 hours in such Work week, whichever is greater.

2.) Violation, Liability for Unpaid Wages, Liquidated Damages. In the event of any violation of the clause set forth in subparagraph 1 of the paragraph, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed, with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph 1 of this paragraph, in the sum of $10 for each calendar day on which such individual was required or permitted to Work in excess of eight hours or in excess of the standard work week of 40 hours without payment of the overtime wages required by the Clause set forth in subparagraph 1 of this paragraph.

3.) Withholding for Unpaid Wages and Liquidated Damages: The FAA shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of Work performed by the Contractor or subcontractor under any such Contract or any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph 2 of this paragraph.

4.) Subcontracts: The Contractor or subcontractor shall insert in any subcontracts the Clauses contained in 29 CFR 5.5(a) (1) through (10), the Clauses set forth in subparagraph 1 through 4 of this paragraph, a Clause requiring the subcontractors to include these Clauses in any lower tier subcontracts and also such other Clauses as the Federal Aviation Administration may by appropriate instructions require. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the Clauses set forth in subparagraphs 1 through 4 of this paragraph and the Clauses in 29 CFR 5.5.

Q. Contracts Subject only to Contract Work Hours and Safety Standards Act:

1.) The Contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the Contract for all laborers and mechanics, including guards and watchmen, working on the Contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid.

2.) The records to be maintained under paragraph 1 above shall be made available by the Contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the Department of Transportation, Federal Aviation Administration and the Department of Labor, and the Contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

R. Subcontracts: The Contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR Part 5.5(a) (1) through (10) and such other clauses as the Federal Aviation Administration may by appropriate instructions require, and also a Clause requiring the subcontractors to include these Clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by of any subcontractor or lower tier subcontractor with all the Contract Clauses in 29 CFR Part 5.5.

S. Contract Termination: Debarment: A Breach of Contract Clauses in 29 CFR 5.5 may be grounds for termination of the Contract, and for the debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.

T. During the performance of this Contract, the Contractor agrees as follows (This entire Clause shall be included in all federally funded construction contracts exceeding $10,000.):

1.) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, sex or national origin.

Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination, rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices (to be provided) setting forth the provisions of this Nondiscrimination Clause.

2.) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

3.) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice (to be provided) advising the said labor union or workers representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

4.) The Contractor will comply with all provisions of Executive Order 11246 of 24 September 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

5.) The Contractor will furnish all information and reports required by Executive Order 11246 of 24 September 1965, as amended, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the Comptroller General of the United States, Department of Transportation, FAA and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

6.) In the event of the Contractor's noncompliance with the nondiscrimination Clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be cancelled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further government contracts or Federally-assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of 24 September 1965, as amended, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of 24 September 1965, as amended, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

7.) The Contractor will include the portion of the sentence immediately preceding paragraph 1. and the provisions of Paragraphs 1 through 7 in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of 24 September 1965, as amended, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontractor or purchase order as the Federal Aviation Administration may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Federal Aviation Administration, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

U. Contractors and subcontractors may satisfy the requirements of Paragraph B of Section 204 of Executive Order 11246 of September 24, 1965, as amended by complying with any of the following:

1.) Stating in the Invitations for Bids that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin, or

2.) Including appropriate insignia in display or other advertising as prescribed by the Department of Labor, or

3.) Using a single advertisement grouped with other advertisements under a caption which clearly states that all employers in the group assure all qualified applicants will have equal consideration for employment without regard to race, color, religion, sex, or national origin, or

4.) Using the phrase "an equal opportunity employer" in a single advertisement in clearly distinguishable type.

V. The following notices are to be posted per paragraphs A and C of Section 204 of Executive Order 11246 of September 24, 1965, as amended:

EQUAL EMPLOYMENT OPPORTUNITY IS THE LAW - DISCRIMINATION IS PROHIBITED BY THE CIVIL RIGHTS ACT OF 1964 AND BY EXECUTIVE ORDER NO. 11246

Title VI of the Civil Rights Act of 1964 - Administered by:

THE EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

Prohibits discrimination because of Race, Color, Religion, Sex, or National Origin by Employers with 75 or more employees, by Labor Organizations with a hiring hall of 75 or more members, by Employment Agencies, and by Joint Labor-Management Committees for Apprenticeship or Training. After July 1, 1967, employees and labor organizations with 50 or more employees or members will be covered; after July 1, 1968, those with 25 or more will be covered.

ANY PERSON

Who believes he or she has been discriminated against

SHOULD CONTACT

THE EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

1800 G Street N.W. Washington, D.C. 20506

Executive Order No. 11246 - Administered by:

THE OFFICE OF FEDERAL CONTRACT COMPLIANCE

Prohibits discrimination because of Race, Color, Religion, Sex or National Origin, and requires affirmative action to ensure equality of opportunity in all aspects of employment.

By all Federal Government Contractors and Subcontractors, and by Contractors Performing Work Under a Federally Assisted Construction Contract, regardless of the number of employees in either case.

ANY PERSON

Who believes he or she has been discriminated against

SHOULD CONTACT

THE OFFICE OF FEDERAL CONTRACT COMPLIANCE

U.S. Department of Labor, Washington, D.C. 20210

W. This Contract (if the Contract price exceeds $100,000) and all Work performed thereunder is subject to the Clean Air Act and the Federal Water Pollution Control Act. Accordingly,

1.) The Contractor hereby represents that any facility to be used in the performance of this Contract or to benefit from this Contract is not listed on the Environmental Protection Agency (EPA) List of Violating Facilities.

2.) The Contractor agrees to comply with all the requirements of Section 306 of the Clean Air Act and Section 508 of the Clean Water Act, Executive Order 11738, Environmental Protection Agency Regulation (40 CFR Part 15) and all regulations issued thereunder.

3.) The Contractor agrees that as a condition for award of this Contract he will notify the Authority of the receipt of any communication from the EPA indicating that a facility to be utilized for performance of or benefit from this Contract is under consideration to be listed on the EPA List of Violating Facilities.

4.) The Contractor agrees that he will include or cause to be included in any subcontract under this Contract which exceeds $100,000 the criteria and requirements in these subparagraphs 1 through 4.

X. For all projects involving airport location, a major runway extension, or runway location:

1.) The Contractor hereby represents that said projects will be located, designed, constructed, and operated so as to comply with applicable air and water quality standards.

2.) The Contractor agrees that he will include or cause to be included in any subcontract under this Contract the requirements of subparagraph 1.

Y.

1.) The Contractor hereby represents that in the performance of this Contract, he will adhere to all state and local regulations concerning air and water pollution controls (unless contrary to Federal requirements), secure necessary permits and inspections, and conduct his operations so as to minimize affects on the surrounding environment, all to the same extent as if the Authority were a private corporation.

2.) The Contractor agrees that he will include or cause to be included in any subcontract under this Contract the requirements of subparagraph 1.

Z. During the performance of this Contract, the Contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

1.) Compliance with Regulations: The Contractor shall comply with the regulations relative to nondiscrimination in Federally-assisted programs of the Department of Transportation (hereinafter, "DOT") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations) which are herein incorporated by reference and made a part of this Contract.

2.) Nondiscrimination: The Contractor, with regard to the work performed by it during the Contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the Contract covers a program set forth in Appendix B of the Regulations.

3.) Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the Contractor for Work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this Contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

4.) Information and Reports: The Contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Authority or the Federal Aviation Administration to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information the Contractor shall so certify to the Authority or the Federal Aviation Administration as appropriate, and shall set forth what efforts it has made to obtain the information.

5.) Sanctions for Noncompliance: In the event of the Contractor's noncompliance with the nondiscrimination provisions of this Contract, the Authority shall impose such Contract sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:

a. withholding of payments to the Contractor under the Contract until the Contractor complies, and/or

b. cancellation, termination, or suspension of the Contract, in whole or in part.

6.) Incorporation of Provisions: The Contractor shall include the provisions paragraphs 1 through 5 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The Contractor shall take such action with respect to any subcontract or procurement as the Authority or the Federal Aviation Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that, in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Contractor may request the Authority to enter into such litigation to protect the interests of the Authority and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

7.) Breach of Contract Terms - Sanctions: Any violation or breach of the terms of the Contract on the part of the Contractor/subcontractor may result in the suspension or termination of this Contract or such other action which may be necessary to enforce the rights of the parties of this agreement.

AA. Certification - Foreign Trade Restrictions: The Contractor or Subcontractor, by submission of a bid and/or execution of this Contract, certifies that it:

1.) is not owned or controlled by one or more citizens or nationals of a foreign country included in the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR);

2.) has not knowingly entered into any contract or subcontract for this project with a contractor that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens or nationals of a foreign country on said list; and,

3.) has not procured any product nor subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.

Unless the restrictions of this Clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to a Contractor who is unable to certify to the above. Thereafter, if the Contractor knowingly procures or subcontracts for the supply of any product or service of a foreign country on the said list for use on the project, the Federal Aviation Administration may direct, through the Authority, cancellation of the Contract at no cost to the Government or the Authority.

Further, the Contractor agrees that, it will incorporate this provision for certification without modification in each contract and in all lower tier subcontracts. The Contractor may rely upon the certification of a prospective subcontractor unless it has knowledge that the certification is erroneous.

The Contractor shall provide immediate written notice to the Authority if the Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The subcontractor agrees to provide immediate written notice to the Contractor, if at any time it learns that its certification was erroneous by reason of changed circumstances.

This certification is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration may direct, through the Authority cancellation of the Contract or subcontract for default at no cost to the Government or the Authority.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a Contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

BB. Buy American - Steel And Manufactured Products Products For Construction Contracts

1.) The Aviation Safety and Capacity Extension Act of 1990 provides that preference be given to steel and manufactured products produced in the United States when funds are expended pursuant to a grant issued under the Airport Improvement Program. The following terms apply:

a. Steel and manufactured products. As used in this clause, steel and manufactured products include (1) steel produced in the United States or (2) a manufactured product produced in the United States, if the cost of its components mined, produced or manufactured in the United States exceeds 60 percent of the cost of all its components and final assembly has taken place in the United States. Components of foreign origin of the same class or kind as the products referred to in subparagraphs 2(a) or (b) shall be treated as domestic.

b. Components: As used in this clause, components means those articles, materials, and supplies incorporated directly into steel and manufactured products.

c. Cost of Components: This means the costs for production of the components, exclusive of final assembly labor costs.

2.) The Contractor agrees that more than 60% (by cost) of the steel and manufactured products to be used by the Contractor, subcontractors, materialmen, and suppliers in the performance of this Contract will be produced in the United States or will be otherwise exempt under one of the following:

a. that the U. S. Department of Transportation has determined, under the Aviation Safety and Capacity Expansion Act of 1990, that the products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality;

b. that the U. S. Department of Transportation has determined, under the Aviation Safety and Capacity Expansion Act of 1990, that domestic preference would be inconsistent with the public interest; or

c. that inclusion of domestic material will increase the cost of the Contract by more than 25 percent.

CC. List of Supplies/Materials that the U.S. Government Has Determined Are Not Produced In the United States In Sufficient and Reasonably Available Quantities And of Sufficient Quality (JAN 1991):

- Acetylene, black.
- Agar, bulk.
- Anise.
- Antimony, as metal or oxide
- Asbestos, amosite chrysolite, and crocidolite.
- Bananas.
- Bauxite.
- Beef, corned, canned.
- Beef Extract
- Bephenium Hydroxynapthoate.
- Bismuth.
- Books, trade, text technical, or scientific; newspapers; pamphlets; magazines; periodicals; printed briefs and films, not printed in the United States and for which domestics editions are not available.
- Brazil nuts, unroasted.
- Cadmium, ores and flue dust.
- Kaurigum.
- Lac.
- Leather, sheepskin, hair type.
- Lavender oil.
- Manganese.
- Menthol, natural bulk.
- Mica.
- Microprocessor chips (brought onto a construction site as separate units for incorporation into building systems during construction or repair and alteration of real property.)
- Nickel, primary, in ingots, pigs, shots, cathodes, or similar forms; nickel oxideand nickel salts.
- Nitroguanidine (also known as picrite).
- Nux vomica, crude.
- Oiticica oil.
- Olive oil.
- Pine needle oil.

- Calcium cyanamide.
- Capers.
- Cashew nuts
- Castor beans and castor oil.
- Chalk, English
- Chestnuts.
- Chicle.
- Chrome ore or chromite.
- Cinchona bark.
- Cobalt, in cathodes, rondelles, or other primary ore and metal forms
- Cocoa beans.
- Coconut and coconut meat, unsweetened, in shredded, desiccated or similarly prepared form.Coffee, raw or green bean.
- Colchicine alkaloid, raw.
- Copra.
- Cork, wood or bark and waste.
- Cover glass, microscope slide.
- Cryolite, natural.
- Dammar gum
- Diamonds, industrial, stones and abrasives.
- Emetine, bulk
- Ergot, crude.
- Erthrityl tetranitrate.
- Fair linen, altar.
- Fibers of the following types: types: abaca, abace, agave, coir, flax, jute, jute, burlaps, palmyra and sisal.
- Goat and kidskins.
- Platinum and related group metals, refined, as sponge, powder, ingots, or cast bars.
- Pyrethrum flowers.
- Quartz crystals.
- Quebracho.
- Quinidine.
- Quinine.
- Rabbit fur felt.
- Radium salts, source and special nuclear materials.
- Rosettes.
- Rubber, crude and latex.
- Rutile.
- Santonin, crude.
- Secretin.
- Shellac.Silk, raw and unmanufactured.
- Spare and replacement parts for equipment of foreign manufacture, and for which domestic parts are not available.
- Spices and herbs in bulk
- Sugars, raw.
- Swords and scabbards.
- Talc, block, steatite.
- Tantalum.
- Tapioca flour and cassava,
- Tartar, crude; tartaric acid and cream of tartar in bulk.
- Tea in bulk.
- Thread, metallic (gold).
- Thyme oil.
- Tin in bars, blocks, and pigs.

- Graphite, natural, crystal-line, crucible grade.
- Handsewing needles.
- Hemp yarn.
- Hog bristles for brushes.
- Hyoscine, bulk.
- Ipecac, root.
- Iodine, crude.
- Triprolidine hydrochloride.
- Tungsten.
- Vanilla beans.
- Venom, cobra.
- Wax, canauba.
- Woods; logs, veneer, and lumber of the following species: Alaskan yellow cedar, angelique, balsa, ekki, greenhart, lignum vitae, mahogany, and teak.
- Yarn, 50 Denier rayon.

Petroleum terms are used as follows:

"Crude oil" means crude petroleum, as it is produced at the wellhead, and liquids (under atmospheric conditions) that have been recovered from mixtures of hydrocarbons that existed in a vaporous phase in a reservoir and that are not natural gas products.

"Finished products" means any one or more of the following petroleum oils, or a mixture or combination of these oils, to be used without further processing except blending by mechanical means:

1.) "Asphalt" a solid or semi-solid cementitious material that (1) gradually liquefies when heated, (2) has bitumins as its predominating constituents, and (3) is obtained in refining crude oil.

2.) "Fuel Oil" a liquid or liquefiable petroleum product burned for lighting or for the generation of heat or power and derived directly or indirectly from crude oil, such as kerosene, range oil distillate fuel oils, gas oil, diesel fuel, topped crude oil, or residues.

3.) "Gasoline" - a refined petroleum distillate that, by its consumption, is suitable for use as a carburant in internal combustion engines.

4.) "Jet Fuel" - a refined petroleum distillate used to fuel jet propulsion engines.

5.) "Liquefied gases" - hydrocarbon gases recovered from natural gas or produced from petroleum refining and kept under pressure to maintain a liquid state at ambient temperatures.

6.) "Lubricating oil" - a refined petroleum distillate or specially treated petroleum residue used to lessen friction between surfaces.

7.) "Naptha" -a refined petroleum distillate falling with a distillation range overlapping the higher gasoline and the lower kerosenes.

8.) "Natural gas products" - liquids (under atmospheric conditions) including natural gasoline, that -

a. are recovered by a process of absorption, adsorption, compression, refrigeration, cycling, or a combination of these processes, from mixtures of hydrocarbons that existed in a vaporous phase in a reservoir, and

b. when recovered and without processing in a refinery: definitions of products contained in subdivision 2, 3, and 7 above.

9.) "Residual fuel oil" - a topped crude oil or viscous residuum that, as obtained in refining or after blending with other fuel oil, meets or is the equivalent of MILSPEC Mil F 859 for Navy Special Fuel Oil and any more viscous fuel oil, such as No. 5 or Bunker C.

"Unfinished oils" means one or more of the petroleum oils listed under "Finished products" above, or a mixture or combination of these oils, that are to be further processed other than by blending by mechanical means.

CHAPTER VIII

MISCELLANEOUS

65. SUBMISSION TO JURISDICTION

The Contractor hereby irrevocably submits himself to the jurisdiction of the Courts of the State of New York and to the jurisdiction of the Courts of the State of New Jersey in regard to any controversy arising out of, connected with, or in any way concerning the Proposal or this Contract. The Contractor agrees that service of process on the Contractor in relation to such jurisdiction may be made, at the option of the Authority, either by registered or certified mail addressed to the applicable office as provided for in the clause hereof entitled "Service of Notices on the Contractor", by registered or certified mail addressed to any office actually maintained by the Contractor or by actual personal delivery to the Contractor if the Contractor be an individual, to any partner if the Contractor be a partnership or to an officer, director or managing or general agent if the Contractor be a corporation.

Such service shall be deemed to be sufficient when jurisdiction would not lie because of the lack of basis to serve process in the manner otherwise provided by law. In any case, however, process may be served as stated above whether or not it might otherwise have been served in a different manner.

66. PROVISIONS OF LAW DEEMED INSERTED

Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included therein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

67. INVALID CLAUSES

If any provision of this Contract shall be such as to destroy its mutuality or to render it invalid or illegal, then, if it shall not appear to have been so material that without it the Contract would not have been made by the parties, it shall not be deemed to form part thereof but the balance of the Contract shall remain in full force and effect.

68. NON-LIABILITY OF THE AUTHORITY REPRESENTATIVES

Neither the Commissioners of the Authority nor any officer, agent, or employee thereof shall be charged personally by the Contractor with any liability or held liable to him under any term or provision of this Contract, or because of its execution or attempted execution, or because of any breach hereof.

69. SERVICE OF NOTICES ON THE CONTRACTOR

Whenever provision is made in this Contract for the giving of any notice to the Contractor, its deposit in any post office or post office box, enclosed in a postpaid wrapper addressed to the Contractor at his office, or its delivery to his office, shall be sufficient service thereof as of the date of such deposit or delivery, except to the extent, if any, otherwise provided in the clause entitled "Submission to Jurisdiction". Until further notice to the Authority the Contractor's office will be that stated in his Proposal. Notices may also be served personally upon the Contractor; or if a corporation, upon any officer, director, or managing or general agent; or if a partnership upon any partner.

82. WORKMANSHIP AND MATERIALS

Workmanship and materials shall in every respect be free from defects of any kind and shall be in accordance with the best modern practice and whenever the Contract Drawings, Specifications or directions of the Engineer admit of a doubt as to what is permissible or fail to note the quality of any construction the interpretation which calls for the best quality is to be followed. Workmanship shall conform to applicable Specifications, manufacturer's instructions and recommendations for installation of products for the applications shown on the Contract Drawings, all of which shall be subject to the provisions of the Section of Division 1 GENERAL PROVISIONS entitled "Inspections and Rejections". The FAA shall have the same rights as the Authority under this paragraph.

Materials and Equipment incorporated into the Work shall be new except as may be otherwise herein specifically required, and shall comply with make, size, type and quality specified, or as specifically approved in writing by the Chief Engineer in accordance with the Section of Division 1 GENERAL PROVISIONS entitled "Substitution".

Reference to standards of any society, institution, association, or governmental authority in the Specifications or on the Contract Drawings, whether specific or by implication, shall mean for such standards which are part of the building code in effect for Work of this Contract, the edition date published in such code; and such references which are not part of the building code, shall mean the latest edition date in effect at the time of opening of Proposals upon the present Contract unless specifically stated otherwise.

In addition, various paragraphs of these Specifications may contain references to certain standard or tentative specifications or requirements of various organizations. Unless otherwise stated, these references are to be construed as referring to the specifications and requirements in effect on the date set for opening Proposals upon the present Contract.

If required by the Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment to be employed by the Contractor in performing the Work. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the approved instructions of the applicable supplier except as otherwise provided in the Contract Drawings or Specifications.

In case of a discrepancy between a description or requirement in the Contract Drawings and Specifications for any material or equipment and a catalog number or other designation for the same material or equipment (even though stated to be acceptable), the description or requirements shall control.

All inventions, ideas, designs and methods contained in the Specifications and Contract Drawings in which the Authority has or may acquire patent, copyright or other property rights are hereby expressly reserved for the exclusive use of the Authority. The Specifications and Contract Drawings contain confidential information which is disclosed only to enable this Contract to be performed. Said Specifications and Drawings must not be used for any purpose detrimental to the interest of the Authority and must not be produced or copied in whole or in part or used for furnishing information to others without the written consent of the Authority, provided, however, that the Contractor may, when the performance of the Contract so requires, furnish said information to others for the purpose of engaging or informing subcontractors and materialmen.

P

DIVISION 2

SECTION 02075

PARTIAL REMOVALS

PART 1. GENERAL

1.01 SUMMARY

This Section requires the selective removal and subsequent offsite disposal of portions of the existing building as shown on the Contract Drawings and as required to accommodate new construction.

1.02 DESIGN AND PERFORMANCE REQUIREMENTS

A. The Authority assumes no responsibility for guarding the removal areas either before or after the Contractor is given access thereto, and does not guarantee that their condition will remain the same after the submission of Proposals as before.

B. Storage or sale of items of salvageable value to the Contractor is prohibited on the construction site.

C. Removal using explosive, incendiary or wrecking ball methods is prohibited.

D. Provide water and wet down the removal areas, as well as the sites adjacent to the portions of structure(s) being removed, to limit raising dust and dirt to lowest practical level. Provide water truck, water line or hydrant connection, and hoses for this purpose.

E. Do not traverse pavement with tracked vehicles or other equipment which may damage pavement.

F. Do not use heaters without prior approval of the Engineer. Installation of temporary heaters, if used, shall conform to American National Standards Institute (ANSI) A10.10 "Safety Requirements for Temporary and Portable Space Heating Devices and Equipment Used in the Construction Industry".

G. Condition of Adjacent Construction

1. Prior to starting removal work, make an inspection accompanied by the Engineer to determine physical condition of adjacent existing structure(s) or construction that is to remain.

2. During such inspection the Engineer and the Contractor shall mutually agree on existing damage to adjacent existing structure(s) or construction that is to remain, if any, and the Contractor shall subsequently prepare and submit to the Engineer a written description of such mutually agreed upon existing damage, including photographic documentation when requested by the Engineer.

H. Utility Services

1. Do not disrupt service to fire hydrants in any way without the prior written approval of the Engineer. If, with written approval of the Engineer, water service to any area is disrupted, make provisions to ensure adequate fire protection for such area.

2. At all times during the Work of this Section, maintain accessibility from street to all fire hydrants, traffic signals, power or light poles, mailboxes, and similar utility and public service items adjacent to the construction site.

3. Do not interrupt utilities serving occupied or used areas, except when authorized by the Engineer. Provide temporary services during such interruptions as approved by the Engineer.

4. Arrange with the Engineer in advance of removal Work for disconnection or rerouting of utility line(s). Identify such capped, plugged, sealed or rerouted lines on a record drawing. Submit such drawing in accordance with 1.03 B.

I. Occupancy: The Authority will occupy portions of the building immediately adjacent to areas of selective removals. Conduct selective removal Work in manner that will minimize need for disruption of the Authority's normal operations. Provide minimum of 72 hours advance notice to the Authority of removal activities that will affect the Authority's normal operations.

J. Flame Cutting: Do not use cutting torches for removal until Work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.

1.03 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. Imported Fill

Soil materials to be delivered to the construction site by the Contractor, approved in accordance with 1.03 C, shall be as follows:

1. For basements, voids and subbase, soil materials shall consist of stone, gravel and sand, free from debris, trash, roots and other organic matter, with no particle size exceeding 2 inches in maximum dimension.

B. Rubble Fill

Rubble fill shall be concrete, brick or other masonry materials resulting from removals. Break fill material into pieces not exceeding 4 inches in their greatest dimension, with no flat or elongated pieces, with all protruding reinforcing cut or burned off, and with a sufficient percentage of smaller pieces to minimize voids. A flat piece is one having a ratio of width to thickness greater than five; an elongated piece is one having a ratio of length to width greater than five.

PART 3. EXECUTION

3.01 PREPARATION

A. Protection

1. Erect and maintain temporary window or opening covers, covered passageways, barricades or fences as required to ensure safe passage of persons around area of removals.
2. Erect and maintain enclosed dust chutes as required for the disposal of materials, rubbish and debris.
3. Erect and maintain dustproof partitions as required to prevent spread of dust, fumes or smoke to occupied portions of the building and adjacent buildings. Where selective removals occurs immediately adjacent to occupied portions of the building, construct dust-proof partitions of minimum 4-inch studs, 1/2-inch fire-retardant plywood on both sides.
4. Provide weatherproof closures for exterior openings and for roof areas with exposed, unprotected edges resulting from removals Work.
5. Provide temporary interior and exterior shoring, bracing and/or support as required to ensure that movement or settlement of portions of structures to be removed is safely controlled and collapse is prevented. Ensure that movement, settlement, and damage to existing facilities does not occur.
6. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to the Engineer if shutdown of service is necessary during changeover.

B. Pollution Controls

1. Use water sprinkling, enclosed chutes and/or temporary enclosures to limit dust and dirt rising and scattering in the air. Conform to requirements of 1.02 D.
2. Filter sediment from runoff before it enters drainage systems or waterways using methods approved by the Engineer following submittal in accordance with 1.03 A.4.
3. Do not use water when it may create hazardous or objectionable conditions such as ice or flooding.

3.02 REMOVALS

A. Conduct selective removals Work and disposal of debris to ensure minimum interference with the use of, or access to, adjacent occupied areas, adjacent buildings or construction site areas. Do not unnecessarily obstruct sidewalks or street.

B. Remove all glass in windows, doors, skylights and fixtures before proceeding with other required removal Work.

C. Proceed with removals in a systematic manner, from top of structure to ground. Complete upper removals before disturbing lower supporting members.

D. Do not store any materials, rubbish, dirt, debris or waste of any sort resulting from removal Work on the floor of areas to remain or adjacent construction site areas.

E. Remove concrete and masonry in small sections. Lower heavy framing members carefully.

F. Where shown on the Contract Drawings, break and remove on grade and basement slabs.

G. Disposal of Removed Materials

1. Unless otherwise shown on the Contract Drawings, dispose of debris, rubbish, and other materials resulting from removal operations away from Authority property.

2. On Authority property, do not burn, bury or otherwise dispose of debris, rubbish or other materials resulting from removal operations.

H. Contractor's Salvaged Materials

Removed and salvaged materials not shown for reuse or as retained shall become the Contractor's property. Such materials shall be removed from Authority property at no additional cost to the Authority.

3.03 ADJUSTMENTS

A. Unless otherwise shown on the Contract Drawings, provide fill for below-grade areas and voids resulting from the Work of this Section as follows:

1. Fill to be placed one foot or more below grade or paving subgrade, or one foot or more away from foundation walls, edges of footings, or underground utility lines, may at the Contractor's option, be imported soil material or rubble fill as specified in 2.01.

2. Fill to be placed in the remaining one-foot voids shall be approved imported soil material conforming to requirements of 2.01 A.1.

B. Place approved rubble fill material in horizontal layers not exceeding one foot in loose depth, with top layer consisting of the smallest size rubble available. Compact each layer of rubble fill with at least four passes of a ten-ton roller, of a type approved by the Engineer.

C. Place approved imported soil materials in horizontal layers not exceeding 6 inches in loose depth. Compact each layer at optimum moisture content of fill material to a density equal to original adjacent ground, unless otherwise directed by the Engineer.

D. After placement and compaction of fill, grade surface to meet adjacent contours and to provide surface drainage.

3.04 REPAIR

Promptly repair, to the satisfaction of the Engineer and at no cost to the Authority, damage caused to adjacent construction by removal operations.

END OF SECTION

SECTION 02075

PARTIAL REMOVALS

APPENDIX "A"

SUBMITTALS

A. Submit the following to the Engineer prior to start of removal Work:

1. Description of proposed methods and operations of removal, for review and approval by the Engineer;
2. Description of sequence of removal and disposal Work, for review and approval by the Engineer;
3. Written inspection report described in 1.02 G.2; and
4. Description of proposed method of filtering sediment from runoff, for review and approval by the Engineer.

B. Submit in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS, a record drawing indicating horizontal and vertical locations of disconnected, rerouted or capped utilities. Reference all such items to visible permanent surface features.

C. For imported fill material, submit to the Engineer of Materials, Engineering Materials Laboratory, Port Authority Technical Center, 241 Erie Street, Jersey City, NJ 07310-1397, one 25- pound, representative sample of such material proposed for use under this Section, subject to the following:

1. Not less than three weeks prior to delivery of imported fill material to the construction site, submit sample in clean sturdy container or bag which shall not permit loss of any material.
2. Clearly label sample with Contract number, title and location, material supplier's name and location and identification of fill material.
3. Do not deliver imported fill material to the construction site until the Engineer has checked and approved the sample of such material.

END OF APPENDIX "A"

DIVISION 2

SECTION 02832

METALLIC-COATED STEEL CHAIN LINK FENCE AND GATES

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for aluminum-coated and zinc-coated steel chain link fence including the following:

1. Furnishing and installing new fencing;
2. Removal of existing fencing;
3. Relocation of existing fencing.

B. Definitions of terms related to chain link fencing shall be in accordance with ASTM F 552.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	American Concrete Institute (ACI)
ACI 318	Building Code Requirements for Structural Concrete.
	American Society for Testing and Materials (ASTM)
ASTM A 121	Specification for Metallic-Coated Carbon Steel Barbed Wire.
ASTM A 153	Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
ASTM A 392	Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
ASTM A 491	Specification for Aluminum-Coated Steel Chain-Link Fence Fabric.
ASTM A 817	Specification for Metallic-Coated Steel Wire for Chain-Link Fence Fabric and Marcelled Tension Wire.
ASTM A 824	Specification for Metallic-Coated Steel Marcelled Tension Wire for Use With Chain Link Fence.
ASTM B 117	Practice for Operating Salt Spray (Fog) Apparatus.
ASTM B 429	Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
ASTM F 552	Standard Terminology Relating to Chain Link Fencing.
ASTM F 567	Practice for Installation of Chain-Link Fence.
ASTM F 626	Specification for Fence Fittings.
ASTM F 900	Specification for Industrial and Commercial Swing Gates.
ASTM F 1043	Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.

ASTM F 1083	Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
ASTM F 1184	Specification for Industrial and Commercial Horizontal Slide Gates.
ASTM F 1345	Specification for Zinc - 5% Aluminum Mischmetal Alloy-Coated Steel Chain-Link Fence Fabric.

1.03 QUALITY ASSURANCE

Upon request arrange for the Engineer to inspect all fencing materials at the place of manufacture.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Arrange for fence fabric and accessories to be delivered to the construction site in packed cartons or firmly tied rolls.

B. Verify that each package is identified and bears the manufacturer's name.

C. Store fence fabric and accessories in a secure and dry area.

1.05 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

A. Sliding gates shall be one of the following with no substitutions permitted:

1. "Easy Track" by
   Boundary Fence and Railing Systems, Inc.
   Richmond Hill, NY 11418

2. "Internal Roller" by
   Anchor Fence/Master Halco Inc.
   Baltimore, MD 21224

3. "Fortress Gate" by
   Tymetal Corporation
   Clifton Park, NY 12065

2.02 MATERIALS

A. General

1. Chain link fence components shall be zinc-coated steel except as otherwise permitted herein for fabric, barbed wire and gate framing.

2. Take field measurements prior to preparation of Shop Drawings and fabrication.

3. Unless otherwise specified herein or shown on the Contract Drawings, materials, coatings and shapes shall be of uniform type and manufacture.

B. Fence Fabric

1. Unless otherwise shown on the Contract Drawings, comply with ASTM A 817 for 0.192-inch diameter, 2-inch mesh, wire fabric.

2. Type II, Class 2 Zinc-Coated (Galvanized) fabric shall comply with ASTM A 392.

3. Type I Aluminum-Coated (Aluminized) fabric shall comply with ASTM A 491.

4. Type III Zinc - 5% Aluminum - Mischmetal coated fabric shall comply with ASTM F 1345.

5. Fence fabric height shall be as shown on the Contract Drawings. For fabric height of 6 feet and over, top and bottom selvage shall be twisted and barbed, unless otherwise shown on the Contract Drawings. For fabric height of less than 6 feet, both top and bottom selvages shall be knuckled.

6. Apply clear acrylic sealer to selvage area after weaving.

C. Barbed Wire

1. Each line of barbed wire shall consist of two strands of No. 12 1/2 gage (0.099-inch diameter) wires twisted with 4-point No. 14 gage barbs spaced approximately 5 inches apart. The barbed wire shall conform to ASTM A 121, Class 3 (0.8 oz/sf) zinc-coated or ASTM A 121, Type II aluminum-coated steel barbed wire with aluminum alloy barbs.

2. Extension arms shall be 45 degrees, extended outward as shown on the Contract Drawings and slotted to support three lines (unless otherwise shown on the Contract Drawings) of barbed wire such that the outermost line is positioned approximately 12 inches horizontally from the fence line.

3. End and intermediate vertical members of gates shall be extended vertically 12 inches and shall be provided with the necessary clips to secure barbed wire.

D. Fence Framing

1. Steel posts and rails shall conform to ASTM F 1043 for Heavy Industrial Fence.

2. External and internal protective coatings shall conform to ASTM F 1043 for the fence framework material group furnished. Framework shall demonstrate the ability to withstand salt spray when tested in accordance with ASTM B 117 based on certified test results, as follows:

   a. Exterior: 1000 hours with maximum 5 percent red rust.

   b. Interior: 650 hours with maximum 5 percent red rust.

3. Zinc-coated (galvanized) round steel pipe shall conform to the applicable portions of ASTM F 1083, Standard Weight Pipe (Schedule 40) with a minimum yield strength of 25,000 psi.

4. Unless otherwise shown on the Contract Drawings, equivalent steel sections may be substituted for the sections shown on the Contract Drawings. Equivalent sections shall conform to ASTM F 1043 Group IC - Round Steel Pipe, Group II - Roll Formed Steel Shapes or Group III - Hot-rolled Shapes and shall have bending strengths at least equal to those of the sections shown as determined by ASTM F 1043.

5. Rail sleeves and connectors shall allow for expansion and contraction of the rail. Use sleeves of the same material as the rail having a minimum length of 6 inches, or provide rails swedged at one end for a minimum length of 3 inches for connecting into a continuous run. Furnish and install suitable fittings for securing rails to terminal posts.

E. Gates

1. General

a. Gate types, opening widths and directions of operation shall be as shown on the Contract Drawings.

b. Gates shall conform to the requirements specified for metallic-coated steel chain link fence except that aluminum alloy framing conforming to ASTM B 429 may be used.

c. Gates shall be designed for operation by one person.

d. Where shown on the Contract Drawings, gates shall be topped with three lines of barbed wire, meeting the requirements of 2.02 C.1.

2. Swing Gates

a. Swing gates shall be factory assembled and shall swing 180 degrees.

b. Swing gates shall conform to ASTM F 900 except that framing shall be assembled by welding at the corners. Use of corner fittings will not be permitted.

3. Sliding Gates

a. Sliding gates shall be factory-assembled by one of the manufacturers specified in this Section.

b. For overhead and cantilever sliding gates, the materials, manufacture and dimensions and weights of frame members and posts shall, at a minimum, meet the requirements of ASTM F 1184, Class 2 (internal rollers).

c. Rollers for overhead and cantilever sliding gates shall be equipped with ball bearings. Non-sealed ball bearings shall be provided with a grease fitting for periodic maintenance. Rollers shall be secured to post or frame without welding.

4. Cantilever Sliding Gates

a. The gate leaf frames and tracks shall be fabricated of aluminum conforming to ASTM B 429 alloy 6063-T6 or as required to meet the performance requirements of ASTM F 1184 and specified herein.

b. Frame members shall be minimum 2-inch square, 0.91 lb/ft aluminum tubing assembled by welding at all corners to form a rigid, one-piece unit. Fabric shall be securely stretched and held in the center of the tubing. All cantilever overhang frames shall have 3/8-inch brace rods. For gate leaf sizes 23 feet to 30 feet, an additional lateral support rail shall be welded adjacent to the top and bottom horizontal rails.

c. The single leaf opening size shall determine the minimum overhang as follows:

Opening	Overhang
Up to 10'-0"	6'-6"
10'-1" to 14'-0"	7'-6"
14'-1" to 22'-0"	10'-0"
22'-1" to 30'-0"	12'-0"

d. The track shall be a combined integral track and rail. The rail shall be an aluminum extrusion having a minimum total weight of 3.72 pounds per foot and designed to withstand a reaction load of 2000 pounds. The roller track assembly shall be designed for the same reaction load as the rail and shall consist of two swivel type zinc die cast trucks having four sealed-lubricant ball bearing wheels of a minimum 2-inch diameter by 9/16-inch width. Provide two side-rolling wheels to ensure alignment of truck in track for each gate leaf. Fasten trucks to post brackets by minimum 7/8-inch diameter, 1/2-inch shank ball bolts.

e. Provide galvanized steel guide wheel assemblies for each supporting post. Each assembly shall consist of two rubber wheels of minimum 4-inch diameter with oil-impregnated bearings. The assembly shall be attached to the post so that the bottom horizontal member will roll between the wheels and can be adjusted to maintain plumb gate frames and proper alignment.

F. Tension Wire: ASTM A 824, Type I or Type II.

G. Accessories and Fittings

1. Furnish all necessary fittings for installation of fence as a complete unit including, but not limited to, post and line caps, rail and brace ends, rail sleeves, tie wires and clips, tension and brace bands, tension bars, truss rods and barbed wire extension arms.

2. Fence fittings shall conform to ASTM F 626.

3. Ferrous accessories and fittings shall be zinc-coated at a minimum of 1.2 oz./sf. in accordance with ASTM A 153, unless otherwise specified herein.

4. Furnish malleable iron non-lift-off type hinges offset to permit 180 degree swing gate opening.

5. Furnish malleable iron forked type latch with padlock eye suitable for operation from both sides of gate.

6. Furnish 2-inch cylinder type padlock for each gate and provide 3 keys for each padlock.

7. Furnish gate stops for double gates consisting of a mushroom type flush plate with anchors capable of being set in concrete and designed to engage center drop rod or plunger.

8. Furnish keepers to hold the gate leaf in the fully open position until manually released.

9. Wire ties shall be of the same material and coating as the fabric.

H. Concrete

Concrete for post footings shall attain a minimum compressive strength of 3000 psi in 28 days and shall conform to the requirements of ACI 318 for mixing and placing.

PART 3. EXECUTION

3.01 PREPARATION

Prepare the grade and remove surface irregularities, if any, which may cause interference with the installation of chain link fence.

3.02 REMOVAL OF EXISTING FENCING

A. Where shown on the Contract Drawings, remove existing fence including fabric, gates, posts and other appurtenances. Cut post footings flush with the ground surface and grout resulting voids, unless otherwise shown on the Contract Drawings.

B. Fencing materials and debris resulting from removal operations shall be disposed of away from Authority property, unless otherwise shown on the Contract Drawings.

3.03 INSTALLATION

A. Comply with applicable provisions of ASTM F 567.

B. Install fence with all posts vertical and all components to the line and grade shown on the Contract Drawings.

C. Connect to existing fence at an existing terminal post or by installation of an end post. Subject to approval by the Engineer, an existing line post may be converted to a terminal post by installation of appropriate brace rails and brace rods.

D. The clear opening from end posts to buildings, fences and other structures shall not exceed 2 inches.

E. Excavate holes for posts to the diameter and spacing shown on the Contract Drawings without disturbing the underlying materials. Holes resulting from removal of existing post footings may be reused as approved by the Engineer.

F. Center and align posts. Place concrete around posts and vibrate or tamp for consolidation. Confirm vertical and top alignment of posts and make necessary corrections. Extend concrete footings 1 inch above grade and trowel to a crown to shed water. Unless otherwise approved by the Engineer, no materials shall be installed on the posts nor shall the posts be disturbed within 7 days after the individual post footing is completed.

G. For non-FAA contracts only, use of mechanical devices may be substituted for concrete in the setting of line posts, provided the Contractor can demonstrate to the satisfaction of the Engineer that such mechanical devices will develop a strength in the ground equal to or greater than that of concrete footings shown on the Contract Drawings.

H. Stretch chain link fabric taut and securely fasten to posts. Cut fabric and attach each span independently to terminal posts with tension bars and tension bands spaced a maximum of 15 inches apart. Fasten fabric to line posts with tie wires, bands or other method approved by the Engineer, spaced a maximum of 15 inches apart. Fasten top edge of fabric to top rail or top tension wire at intervals not exceeding 24 inches. Fasten bottom edge of fabric to bottom tension wire with wire ties at intervals not exceeding 24 inches. Join rolls of wire fabric by weaving a single strand into the end of the rolls to form a continuous mesh. Install the bottom of the fence fabric to within 2 inches of the finished ground or pavement surface. Grade where necessary to provide a neat appearance.

I. Install fabric on security side of fence.

J. Firmly seat barbed wire extension arms or caps on tops of posts.

K. Stretch barbed wire tightly to remove all sag; firmly install it in slots of extension arms and anchor it to the terminal extension arms.

L. Install fabric on gate frames with stretcher bars at vertical edges. Install fabric at top and bottom edges with stretcher hooks at not more than 15-inch intervals.

M. Install gates plumb, level and secure for full opening without interference. For double gates, install ground-set, mushroom type, flush plate in concrete. Adjust hardware for smooth operation and lubricate where necessary.

N. Install horizontal brace rails with diagonal truss rods and turnbuckles at all terminal posts.

3.04 RELOCATION OF EXISTING FENCING

A. Remove existing fabric where shown on the Contract Drawings for installation on new posts. Prevent damage to the fabric. Repair or replace any damaged fabric to the satisfaction of the Engineer at no additional cost to the Authority.

B. Remove and dispose of existing posts and accessories as specified in 3.02 B.

C. Furnish and install new posts, footings and accessories as specified in this Section.

D. Install the removed fabric as specified in 3.03.

3.05 ELECTRICAL GROUNDS

At each location where an electric transmission, distribution or power line passes over the fence, construct electrical ground conforming to the following requirements:

A. Construct electrical grounds per NESC-093E, Specification Section 16450 and NFPA 780.

B. Ground the fence directly beneath the point where a power line passes over the fence and additionally approximately every 20 feet for 250 feet on each side of the power line crossing and at corner posts.

C. Ground fences at both sides of gates or at other opening in the fence with flexible braided ground strap.

D. Bond across all gates and openings with a buried bonding jumper.

E. The ground shall be accomplished with a copper clad rod 10-feet (3000 cm) long and 3/4-inch (20 mm) in diameter driven vertically until the top is 6 inches (150 mm) below the ground surface. Use a 4/0 AWG bare stranded copper conductor for the ground grid and 1/0 AWG for connection to fence posts. For above ground connections use a double-bolt compression type connector and for below grade use exothermic welded connections.

F. The grounding loop shall have less than 5 ohms resistance to ground.

G. Bond each barbed wire strand to a grounded fence post or grounding conductor.

H. Ground the fence wire mesh fabric, unless it is held in place by a conductive tie-wraps or similar device.

I. Construct electrical grounds at other locations along the fence as shown on the Contract Drawings.

END OF SECTION

SECTION 02832

METALLIC-COATED STEEL CHAIN LINK FENCE AND GATES

APPENDIX "A"

SUBMITTALS

Submit shop drawings of chain link fence and gates in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS.

A. Submit manufacturer's certificates of compliance with all requirements for material types, coatings, etc. specified in this Section including but not limited to fabric, barbed wire, fence and gate framing, tension wire, fittings and accessories. Submit certification that rail and roller track assembly for sliding gates are designed for the specified reaction load.

B. Submit representative samples of fabric to the Chief of Materials Engineering, Port Authority Technical Center, 241 Erie Street, Jersey City, NJ 07310-1397.

C. Submit certified test results for:

1. Salt spray testing of framework.
2. Concrete compressive strength.

D. Submit methods, types of equipment and other information required by the Engineer to demonstrate equivalent strength of mechanical line post setting devices.

END OF APPENDIX "A"

DIVISION 16

SECTION 16720

FIRE ALARM SYSTEMS

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for Fire Alarm Systems.

1.02 REFERENCES

The following is a listing of publications referenced in this Section:

Building Officials and Code Administrators, Inc. (BOCA)

National Electrical Manufacturers Association Standards (NEMA)

National Fire Protection Association (NFPA)

NFPA 70	National Electrical Code.
NFPA 72	National Fire Alarm Code.
NFPA 90A	Installation of Air Conditioning and Ventilating Systems.
NFPA 13	Installation of Sprinkler Systems.
NFPA 92A	Smoke Control Systems.

Underwriters Laboratories, Inc. (UL)

UL 268	Smoke Detectors for Fire Protective Signaling Systems.
UL 1971	Notification Appliances for Fire Protective Signaling Systems.
UL 864	Control Units for Fire Protective Signaling Systems.

American National Standards Institute (ANSI)

ANSI 117.1	Elevator Operation.

Americans with Disabilities Act, PL 101-336 (ADA)

New York City Building Code NYCBC.

New York City Electrical Code NYCEC.

New York City Fire Prevention Code and Directives.

1.03 QUALITY ASSURANCE

A. Qualifications

1. The entity performing the Work of this Section shall have successfully completed at least three (3) installations for fire alarm system work of similar type, size and complexity, as the Fire Alarm System described in this Specification and the Contract Drawings. Said Installations shall have been in satisfactory operation for a period of not less than one (1) year, and shall have included at least one contract for the installation of a Fire Alarm System in an existing occupied building. The entity shall be licensed to perform this type of Work in the jurisdiction of said Work. Licensure shall be evidenced by a submission from the entity of the following: a copy of the entity's current license, business permit and certifications. The entity performing the Work of this Section shall be an authorized installer approved by the System manufacturer. Proof of such authorization shall be provided to the Engineer prior to the commencement of any Work.

2. System Manufacturer: The System manufacturer shall be one of established reputation and experience in the fire alarm industry. The manufacturer shall have been in business a minimum of five (5) years, show substantial involvement in the development and manufacture of systems similar to the one specified in this Contract and have a minimum of (3) three qualified factory authorized full line distributors and or branch offices within fifty (50) miles of the System location. The manufacturer shall also have an in-house technical support staff accessible to the Authority for technical assistance over the phone, offer detailed technical training courses both on site and at the manufacturer's facility, and be ISO-9001 certified.

3. System Vendor: If other than the System manufacturer, shall be an authorized distributor of the System manufacturer. The distribution agreement by the manufacturer to the vendor must be one that includes full authority to distribute, sell, certify, program and maintain the manufacturer's complete product line whether included in this project or not. Service only, or sales only, System vendors will not be considered as meeting these requirements. The System vendor shall also maintain an in-house engineering department capable and experienced in the preparation of drawings, sketches, calculations and submittals which are required as part of this Contract. The System vendor shall have successfully completed at least three installations, which have included fire alarm system work, of similar type, size and complexity as described in this Specification and the Contract Drawings. Said installations shall be in satisfactory operation for a period of not less than one year, and shall have included at least one contract for the installation of a fire alarm system in an existing occupied building. The System vendor shall also maintain an in-house technical service department staffed with at least three field technicians factory trained and certified by the manufacturer to install, operate, certify and maintain the system to be installed.

4. System Maintainer: For the maintenance of Fire Alarm System required in 3.05 herein, the System maintainer may also be the System manufacturer, the System vendor, or a vendor authorized and certified by the manufacturer to perform testing and maintenance services on the System installed under this Contract. The System maintainer shall maintain an in-house technical service department staffed with at least three (3) field technicians factory trained and certified by the manufacturer to install, operate, certify and maintain the system to be installed. The System maintainer shall be licensed and/or certified to perform fire alarm system maintenance, as required by the jurisdiction where the installed system is located. The System maintainer must maintain a 24 hr. Emergency Field Service Staff, an Inventory of Parts to support the installed system and shall respond at the installed system site within 4 hours of a call for service.

B. Codes and Standard Requirements

1. Conform to the requirements of NFPA 70, all applicable local codes and all other publications referenced in 1.02 herein.

2. All fire alarm equipment, materials, devices and assemblies used on this Contract shall be listed and/or labeled by Underwriter's Laboratories, Inc. (UL), and by other Local jurisdiction as required, for the specific purpose for which they are used. The Contractor shall not alter, install or modify such equipment in any way so as to alter or void the listing or label.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original unopened protective packaging.

B. Store materials in a clean, dry space and protect same from damage.

C. Handle in a manner to prevent damage. Damaged equipment shall be replaced.

D. Where possible protective coverings shall be installed to prevent equipment damage, and shall be remain in place until final testing and commissioning is completed.

E. Touch up damage to finishes to match adjacent surfaces, including recoating of galvanized or plated surfaces where damaged, cut or drilled.

1.05 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MANUFACTURERS

Subject to compliance with the requirements of this Section, including but not limited to 1.03 A, provide fire alarm systems of manufacturers as shown on the Contract Drawings.

2.02 GENERAL

A. The System shall consist of those components as shown on the Contract Drawings, including but not limited to Fire Alarm Control Panel(s), Annunciator(s), Initiating Devices, Notification Appliances, Auxiliary and Accessory Devices, Test and Programming software, firmware and hardware, and all wiring and wiring methods as shown on the Contract Drawings and as specified in this Section.

B. Provide a fully operational Code compliant system. Only current equipment manufactured within six (6) months of the installation date shall be utilized.

2.03 MATERIALS

A. Addressable Fire Alarm Systems

1. Addressable Fire Alarm Systems, where required on the Contract Drawings, shall provide discreet identification and status information of system modules and devices via an alphanumeric visual display and hardcopy printer. The system shall be microprocessor based and user software programmable.

2. Fire Alarm Control Panel(s)

   a. Fire Alarm Control Panel(s) shall be of the type shown on the Contract Drawings.

   b. Panel(s) shall have active zones/loops/circuits as required. The spare capacity for zones/loops/circuits shall be at least 20%, or as otherwise shown on the Contract Drawings. Initiating and notification circuit loading shall be limited to 80% of the maximum specified by the manufacturer for the design configuration, with the maximum to comply with code requirements or as specified in the Contract Documents, whichever is more stringent. In no case shall the circuits be loaded as to impede proper system operation.

   c. Panel(s) shall be of modular construction using only solid state components and modules. Panels(s) shall contain all of the necessary components and modules to provide a complete operational code and specification compliant system, including spare capacity, as called for in the Contract Drawings.

   d. All Panel Door(s) shall be painted except those as specified otherwise. All System controls shall reside behind a key locked steel door provided with viewing windows made of any material other than glass accepted as part of the product listings.

   e. The System shall be programmable via an IBM compatible laptop computer and manufacturer-supplied software. The System shall be fully field programmable utilizing the laptop computer via an onboard system programming port with the System fully powered and in operation. Shutdown of the System, loss of System operation, or removal of the System memory chips shall not be acceptable as part of the normal programming method. The System program shall be stored onboard utilizing non-volatile memory IC(s). Upon power up from complete shutdown, the System shall automatically reboot using the last stored program. Operator intervention or reprogramming shall not be required.

f. The System shall provide a text area for each addressable module or device, designated as a "Custom Message Field" which shall be reserved for the Authority's use. The "Custom Message Field" shall be capable of displaying any character of the English alphabet in both upper and lower case and any Arabic numeric digit. The character capacity of the "Custom Message Field" shall be as specified in the Contract Drawings.

g. The System shall incorporate an automatic "watchdog" feature that will reboot the System in any event where the operating system or processor halts. Operation of the watchdog feature shall be both visually displayed and printed at the time of occurrence.

h. The System power supply shall be provided with two (2) sources of energy. The primary supply shall be 120 VAC single phase commercial power. The secondary supply shall be either an emergency standby generator(s) qualified as an emergency power supply for fire alarm systems of the type specified in this Contract or emergency standby batteries of the size and capacity required to meet the standby requirements of the System specified in this Contract. The system power supply shall automatically transfer between the primary and secondary power and vice versa. The power supply shall be monitored for integrity as required by applicable codes, standards and listings for the intended use.

i. The Panel(s) shall be UL listed as a test instrument for the measurement of the sensitivity of connected intelligent ionization and photoelectric smoke detectors to comply with the testing requirements of NFPA 72.

The fire alarm control panel shall provide a display and a printed list of these sensitivity measurements as a permanent record of the required sensitivity testing.

The fire alarm control panel shall be programmed and the connected ionization and photoelectric light refracting smoke detectors shall be capable of self adjustment to compensate for the accumulation of contaminants that would change the detector sensitivity in either a more or less sensitive direction. The adjustment shall keep the relationship between the sensing chamber and the programmed alarm threshold voltage constant to prevent false indications of the failure to alarm in the presence of smoke.

The fire alarm control panel shall annunciate a trouble condition when any smoke detector approaches 80% of its alarm threshold due to gradual contamination, signaling the need for service and eliminating unwanted alarms. The trouble report shall annunciate the specific location of the smoke detector requiring service.

3. Initiating Devices - Pull Stations

Provide manual fire pull stations where indicated on the Contract Drawings. Stations shall be painted red. Where specified on the Contract Drawings the station shall also include either an integral white stripe or an accessory backing plate with white stripe. The white stripe shall be (1) one-inch wide and placed diagonally from top left to bottom right of the station. The stripe shall not obscure the stations operating instructions. The station shall be operable without the use of a special key or other device not part of the station, except in the case of resetting. The station shall be constructed of materials specified in the Contract Drawings. All stations shall be single action unless otherwise specified. The device shall be field programmable.

4. Initiating Devices - Open Area Detectors

Provide automatic detection devices where indicated on the Contract Drawings. All automatic detection devices shall be resettable from the control panel. Detectors shall include the use of a separate base assembly. The base assembly shall not include detection electronics which shall be housed in the detector. The detector shall be removable from the base assembly without the use of tools and without disturbing wiring connections. The device shall be field programmable.

5. Initiating Devices - Duct Detectors

a. Provide automatic detection devices where indicated on the Contract Drawings. All automatic detection devices shall be resettable from the control panel. Detectors shall include the use of a separate housing assembly. The housing assembly shall not include detection electronics that shall be housed in the detector. The housing assembly may contain an auxiliary local relay. The detector shall be removable from the housing assembly without the use of special tools and without disturbing wiring connections. The device shall be field programmable.

b. Detectors used in air duct applications shall be listed for this use. The air velocity ratings of the housing, sampling tubes or detector shall not be less than the air velocities expected to occur in the air handling system duct at the point of insertion. Duct Housings shall be installed to avoid undesirable flow restrictions and turbulence according to the manufacturer's installation instructions.

c. Duct detection devices shall have provisions for the use of a remote location indicator.

6. Initiating Devices - System Interfaces

a. Provide System interface modules where indicated on the Contract Drawings. System interfaces shall allow for the monitoring of conventional dry contact inputs to the System. The Interface shall supervise the dry contact inputs through use of an end of line device (EOL). EOL devices shall be placed across the contacts being monitored and not at the interface. The device shall be field programmable.

b. The System Interface Modules shall be available in the following versions:

Dual Input
Single input
Single Input and Single Form C Contact Output

7. Notification Appliances

a. Provide system notification appliances where indicated on the Contract Drawings. System notification appliances shall provide either audible, visual or combination audible and visual indication as indicated on the Contract Drawings. Notification appliance field wiring connection shall be accomplished using an integral terminal strip with screw & binding plate fasteners. Each appliance terminal position shall permit (2) single conductor # 14 stranded or solid wires to be attached without the use of wire loops, wire nuts, wire terminals or other methods other than a straight in connection. Appliances employing "pigtail" or "flying lead" field connections shall not be used.

Appliance source voltages shall be 24VDC for visuals, 24 VDC for coded and non-coded bells, and horns, and either 25VAC or 70.7VAC, based on system platform, for voice/tone speaker appliances. All appliances shall be UL Listed and UL Cross-listed for the Base System utilized. Appliances shall be red in color unless otherwise specified on the Contract Drawings.

b. The system notification appliances shall be available in the following versions:

(1) 4", 6", 10", 12" Motor or ElectroMechanically Operated Bells.

(2) 4", 6", 10", 12" Motor or ElectroMechanically Operated Bells with 15, 30, 15/75, 75, 110 Candela Strobe Lights.

(3) Single and Multitone Electronic Horns.

(4) Single and Multitone Electronic Horns with 15, 30, 15/75, 75, 110 Candela Strobes.

(5) Electronic Strobes, 15, 30, 15/75, 75, 110 Candela Outputs.

(6) Speakers, 25VAC or 70.7VAC MultiTap Wall and Ceiling-Mounted.

(7) Speakers, 25VAC or 70.7VAC MultiTap Wall-Mounted with 15, 30, 15/75, 75, 110 Candela Strobes.

(8) Accessory mounting plates, boxes, trim rings and guards.

B. Conventional Fire Alarm Systems

1. Conventional (Non-Addressable) Fire Alarm Systems, where required on the Contract Drawings, shall provide area or zone type identification of system devices. The visual display may consist of either an LED lamp display, an LED segmented display or a combination of both.

2. Fire Alarm Control Cabinet(s)

a. Fire Alarm Control Panel(s) shall be of the type shown on the Contract Drawings.

b. Panel(s) shall have active zones/loops/circuits as required. The spare capacity for zones/loops/circuits shall be at least 20%, or as otherwise shown on the Contract Drawings. Initiating and Notification Circuit loading shall be limited to 80% of the maximum specified by the manufacturer for the design configuration, with the maximum to comply with code requirements or as specified on the Contract Drawings whichever is more stringent. In no case, shall the circuits be loaded as to impede proper system operation.

c. Panel(s) shall be of modular construction of only solid state components and modules. Panels(s) shall contain all of the necessary components and modules to provide a complete operational code and specification compliant system, including spare capacity as called for in the Contract Drawings.

d. All panel door(s) shall be painted red, except those as specified otherwise. All System controls shall reside behind a key locked steel door provided with viewing windows made of any material other than glass accepted as part of the product listings.

e. The system power supply shall be provided with two (2) sources of energy. The primary supply shall be 110 VAC single-phase commercial power. The secondary shall be either an emergency standby generator(s) qualified as an emergency power supply for fire alarm systems of the type specified in this Contract or emergency standby batteries of the size and capacity required to meet the standby requirements of the System specified in this Contract. The System power supply shall automatically transfer between the primary and secondary power and vice versa. The power supply shall be monitored for integrity as required by applicable codes, standards and listings for the intended use.

3. Initiating Devices - Pull Stations

Provide manual fire pull stations where indicated on the Contract Drawings. Stations shall be painted red. Where specified on the Contract Drawings the station shall also include either an integral white stripe or an accessory backing plate with white stripe. The white stripe shall be (1) one inch wide and placed diagonally from top left to bottom right of the station. The stripe shall not obscure the stations operating instructions. The station shall be operable without the use of a special key or other device not part of the station, except in the case of resetting. The station shall be constructed of materials specified in the Contract Documents. All stations shall be single action unless otherwise specified.

4. Initiating Devices - Open Area Detectors

Provide automatic detection devices where indicated on the Contract Drawings. All automatic detection devices shall be resettable from the control panel. Detectors shall include the use of a separate base assembly. The base assembly shall not include detection electronics that shall be housed in the detector. The detector shall be removable from the base assembly without the use of tools and without disturbing wiring connections.

5. Initiating Devices - Duct Detectors

a. Provide automatic detection devices where indicated on the Contract Drawings. All automatic detection devices shall be resettable from the control panel. Detectors shall include the use of a separate housing assembly. The housing assembly shall not include detection electronics that shall be housed in the detector. The housing assembly may contain an auxiliary local relay. The detector shall be removable from the housing assembly without the use of special tools and without disturbing wiring connections.

b. Detectors used in Air Duct Applications shall be listed for this use. The air velocity ratings of the housing, sampling tubes or detector shall not be less than the air velocities expected to occur in the air handling system duct at the point of insertion. Duct housings shall be installed to avoid undesirable flow restrictions and turbulence according to the manufacturer's installation instructions.

c. Duct detection devices shall have provisions for the use of a remote location indicator.

6. Notification Appliances

a. Provide system notification appliances where indicated on the Contract Drawings. System notification appliances shall provide either audible, visual or combination audible and visual indication as indicated on the Contract Drawings. Notification appliance field wiring connection shall be accomplished using an integral terminal strip with screw and binding plate fasteners. Each appliance terminal position shall permit (2) single conductor # 14 stranded or solid wires to be attached without the use of wire loops, wire nuts, wire terminals or other methods other than a straight in connection. Appliances employing "pigtail" or "flying lead" field connections shall not be used.

Appliance source voltages shall be 24VDC for visuals, 24 VDC for coded and non-coded bells, and horns, and either 25VAC or 70.7VAC, based on system platform, for Voice/Tone Speaker appliances. All appliances shall be UL listed and UL cross-listed for the base System utilized. Appliances shall be red in color unless otherwise specified on the Contract Drawings.

b. The system notification appliances shall be available in the following versions:

(1) 4", 6", 10", 12" Motor or ElectroMechanically Operated Bells.

(2) 4", 6", 10", 12" Motor or ElectroMechanically Operated Bells with 15, 30, 15/75, 75, 110 Candela Strobe Lights.

(3) Single and Multitone Electronic Horns.

(4) Single and Multitone Electronic Horns with 15, 30, 15/75, 75, 110 Candela Strobes.

(5) Electronic Strobes, 15, 30, 15/75, 75, 110 Candela Outputs.

(6) Speakers, 25VAC or 70.7VAC MultiTap Wall and Ceiling Mounted.

(7) Speakers, 25VAC or 70.7VAC MultiTap Wall-Mounted with 15, 30, 15/75, 75, 110 Candela Strobes.

(8) Accessory mounting plates, boxes, trim rings and guards.

PART 3. EXECUTION

3.01 EXAMINATION

Inspect all system equipment and accessories prior to installation. Replace any damaged items.

3.02 PREPARATION

A. Field verify dimensions and coordination of conduit entry and all other mounting conditions with the entity manufacturing the equipment.

B. Arrange for the entity manufacturing the equipment to provide on-site technical supervision during installation and interconnection of the system equipment. Said supervision is to ensure the proper installation and operation of the System equipment, prior to the installed System beginning the final acceptance test.

C. After the System has been delivered, an on-site inspection will be made by the Engineer. If any equipment has been damaged or for any reason does not comply with the requirements of this Section, the Contractor shall be required to replace the equipment at no additional cost to the Authority, even though the equipment has been previously inspected, tested and approved for shipment. After such satisfactory replacement, the System shall be installed.

3.03 INSTALLATION

A. Install all materials in accordance with the codes and standards referenced in 1.02 and in accordance with the Specifications, Contract Drawings and approved plans, shop drawings and other submittals.

B. Air duct detectors shall be installed in air handling units downstream of filters and shall be provided with a pair of sampling tubes of the length recommended by the manufacturer, for proper sensitivity and operation.

C. Wiring

1. All fire alarm cables shall be type FPLP-UL (fire alarm approved cable), twisted pair #14 gauge (unless otherwise shown on the Contract Drawings), solid copper, 200° C, 600V, shielded (or unshielded as required), insulated conductors, with FEP insulation, and conductors colored black and red. All wiring, raceways, fittings, connectors and enclosures shall be UL Listed for the intended use. Conductor terminations shall be by methods as approved by the Engineer, and as indicated on the Contract Drawings.

2. All fire alarm control and power wiring shall be in hot-dipped galvanized steel (thick wall) conduit, or as specified on the Contract Drawings.

3. Wiring for device circuits, signaling circuits, and indicating appliance circuits shall be power-limited type. System wiring shall not be mixed in raceways with other wiring. Power-limited and non-power-limited circuits shall be run in separate raceways.

4. Minimum conduit size shall be provided as required by NFPA 70, or any other local codes, using the actual cross-sectional area of the wiring to be installed. Unless otherwise noted, minimum conduit size shall be 3/4".

5. All junction boxes, pull boxes, or other appurtenance which permits entry into the conduit system shall be painted red. Insulation or covering of wires and cables shall be factory color coded by use of color compounds. The color code shall be consistent throughout the performance of the work. Each pair of wires shall have a black and a red colored insulated conductor. Red shall be used for circuits with a positive (+) potential and black shall be used for circuits with a negative (-) potential.

6. All wires shall be identified with flame-retardant, low profile, labels as specified on the Contract Drawings.

D. Grounding

1. Install grounding bushings on all conduits penetrating fire alarm enclosures. Ground all equipment, wireways, enclosures and circuits as shown on the Contract Drawings. Measure, record and report shield/drain resistance utilizing an insulation resistance test meter. Submit a copy of the original test report to the Engineer for approval.

3.04 TRAINING

Operation and training for the system shall be a half-day seminar provided to Authority designated personnel through the means of practical demonstrations, technical literature and other related teaching procedures unless otherwise shown on the Contract Drawings. The training shall be conducted at the construction site.

3.05 MAINTENANCE

Furnish full preventive and remedial maintenance service for the fire alarm system, including all labor, parts, materials and supplies until the issuance of the Certificate of Final Completion. The Contractor shall respond to service calls by responding at the site within four hours of the call 24 hours a day, 7 days a week, including holidays.

3.06 FIELD TESTING

A. No system devices, modules, or other system electronics shall be connected to any circuit, prior to or during testing. Any equipment damaged due to testing shall be replaced by the Contractor at no additional cost to the Authority.

B. All wiring not supplied as part of the manufactured control panel shall be tested by the Contractor in accordance with the test criteria listed on the test reports specified in the Section entitled "Field Testing of Wiring". Prior to testing, field wiring shall not be connected to any equipment except external terminal blocks.

C. All testing prescribed by, and within, the test reports shall be accomplished in the presence of the Engineer only after all wiring work is completed. Conduit, condulet, pull box and junction box terminations shall be completed prior to testing. Once testing has been completed, the tested wiring shall not be disturbed. Any connection or wire that must be reworked shall be re-tested. Any conduit that has its contents modified in any way shall have all of its circuit conductors re-tested.

D. Test instruments (Meggers, Volt/Ohm Meters, etc.) used for testing as part of this Contract shall have been tested and calibrated within the last twelve (12) months and shall be evidenced by a certificate. A copy of the calibration certificate for each instrument used shall be submitted.

E. Field Wiring Test Reports shall be submitted, in duplicate, to the Engineer for approval. One copy shall be the original and one copy a photocopy. The reports shall be legibly handwritten. Typewritten reports will not be acceptable.

F. Field wiring will only be connected to the fire alarm equipment and devices once the test reports have been approved by the Engineer. Field wiring shall only be connected to the fire alarm panel(s) in the presence of a factory-trained technician acceptable to the System manufacturer and the Engineer, unless otherwise indicated on the Contract Drawings.

G. All fire alarm equipment, panels, detectors, signals etc. shall be fully pre-tested and shall have passed a 30-day operational test prior to presentation for final acceptance test. All Punch List items, defective or damaged equipment or backordered items shall be replaced, installed and or completed prior to the pre-test and final acceptance test. Upon satisfactory completion of the pre-test, the Engineer shall be notified in writing that the pre-test has been completed and that the system is in full conformance with the Contract Documents and ready for the final acceptance test.

H. The final acceptance test of the fire alarm system shall be performed by the System manufacturer's authorized technicians in the presence of the Engineer and shall consist of but shall not be limited to all fire alarm System panels, notification appliances, initiating devices, interface modules, off premise monitoring, and auxiliary functions. The Engineer will also witness the test. It shall be the sole responsibility of the System vendor to supply, and prepare any and all resources necessary to conduct and document the final acceptance test as prescribed by these Specifications, the Contract Drawings and NFPA 72.

END OF SECTION

SECTION 16720

FIRE ALARM SYSTEMS

APPENDIX "A"

SUBMITTALS

Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - GENERAL PROVISIONS:

A. Shop Drawings

1. Layout drawings with dimensioned locations and quantities of each device.
2. System riser drawings detailing system equipment location and type, and reference notation to each drawing.
3. Wiring and conduit details indicating numbered wires and terminals, and size and routing of each conduit and wire.
4. System calculations detailing system power requirements, battery standby calculations, voltage drops, resistance, and capacitance limits as set by the manufacturer and wiring size as set by the manufacturer.

B. Catalog Cuts and Installation Sheets

1. Manufacturer's current catalog cut and installation sheet for each product utilized in the System specified including:
   a. Fire Alarm wires.
   b. Speakers.
   c. Horns.
   d. Strobes.
   e. Strobe/horn units.
   f. Pull station.
   g. Power wiring.
   h. Warden telephones.
   i. Standpipe phone jacks.
   j. Air duct detectors.
   k. Heat smoke detectors.
   l. Supervisory switches.
   m. Conduits, fittings, boxes, terminal strip cabinets.
   n. Cutout switch.
   o. Relays.
   p. Interface modules.

q. Fire alarm command station.

r. Fire alarm control panel.

s. Computers and components.

t. Fire alarm accessory equipment.

u. Wire labeling system.

2. Copies of all UL listing documents, as provided by the manufacturer, for each product utilized in the System.

3. Copies of all NYC/MEA listing documents and resolutions (report of Material and Acceptance Test Division), as provided by the manufacturer, for each product utilized in the System.

a. System circuit test results.

b. Factory test reports.

C. Spare Parts

Submit a complete list of recommended spare parts, which shall include those spare parts required to be furnished in compliance with the requirements of this Section for approval by the Engineer.

D. Test Plans

Prepare and submit to the Engineer for approval a performance testing plan for the entire system a minimum of 30 days in advance of the earliest, approved, scheduled inspection and test date. The system shall be divided into the following stages:

1. Inspection upon arrival at the construction site.

2. On-site inspection and test immediately following the complete installation of the system to demonstrate compliance with the requirements of this Section.

3. A 30-day operational test commencing with the successful completion of the on-site inspection and test.

E. Training

Prior to the on-site inspection and test of the system, prepare and submit to the Engineer for approval a fire alarm system curricula, in accordance with the requirements of this Section.

END OF APPENDIX "A"

PERMITS

APPENDIX A
FEDERAL AVIATION ADMINISTRATION
AIRPORT IMPROVEMENT PROGRAM
NOTICES TO CONTRACTORS
REQUIRED SUBMISSIONS TO FAA
CERTIFICATION OF NONSEGREGATED FACILITIES
TITLE VI CIVIL RIGHTS ACT OF 1964 COMPLIANCE COMMITMENT
SCHEDULES OF MINIMUM WAGE RATES

I. NOTICE TO CONTRACTORS:

A. The successful bidder on this Contract (if the Contract price is $50,000 or more and the successful bidder has 50 or more employees) and each subcontractor (if the subcontract price is 50,000 or more and the subcontractor has 50 or more employees) shall, within 120 days from Contract commencement, develop and maintain a written affirmative action compliance program for each of its establishments.

B. The successful bidder shall submit to the Authority a Certification of Nonsegregated Facilities prior to award of the Contract (if the Contract price exceeds $10,000 and the Contract is not exempt from the provisions of the equal opportunity clause) and shall notify prospective subcontractors for supplies and construction Contracts of the requirement for such a certification (if the subcontract price exceeds $10,000 and the subcontract is not exempt from the provisions of the Equal Protection Clause). Samples of the certification and the notice to subcontractors are contained in this Appendix A.

II. REQUIRED SUBMISSIONS TO FAA.

A. Compliance Reports. Within 30 days after award of this Contract, the Contractor (if the Contract price is $50,000 or more and it has 50 or more employees) shall file a compliance report on Standard Form 100, Employee Information Report, EEO-1 (SF100) with the Joint Reporting committee if:

1.) The Contractor has not submitted a complete compliance report within 12 months preceding the date of award, and

2.) The Contractor is within the definition of "employer" in paragraph 2e(3) of the instructions included in SF 100.

B. The Contractor shall require the subcontractor on any first tier subcontracts, irrespective of dollar amount, to file SF 100 within 30 days after award of the subcontract if the above two conditions apply. SF 100 is normally furnished contractors annually, based on a mailing list currently maintained by the Joint Reporting Committee. In the event a contractor has not received the form, he may obtain it by writing to the following address:

Joint Reporting Committee
P.O. Box 2236

Norfolk, Virginia 20501

C. The Contractor shall after commencement of Contract work submit the monthly Utilization Report (CC 257) to the OFCCP regional office, at the appropriate address listed below, on or before the fifth working day of each month, reporting activity of the previous month. If no Work was accomplished, the form should be submitted stating that fact. A form is to be submitted for the last month of activity stating the Work has been completed.

For downstate New York and New Jersey:

Mr. Harold M. Busch District
Director, OFCCP/ESA U.S.
Department of Labor

26 Federal Plaza, Rm. 36-116

New York, N.Y. 10278

For Upstate New York:

Mr. Garland Sweeney

District Director, OFCCP/ESA
U.S. Department of Labor
Jackson Building, Rm. 609

220 Delaware Avenue

Buffalo, N.Y. 14202

III. NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATION ON NONSEGREGATED FACILITIES.

A. A Certification of Nonsegregated Facilities must be submitted prior to the award of a subcontract exceeding $10,000 which is not exempt from the provisions of the Equal Opportunity Clause.

B. Contractors receiving subcontract awards exceeding $10,000 which are not exempt from the provisions of the equal opportunity clause will be required to provide for the forwarding of this notice to prospective subcontractors for supplies and construction contracts where the subcontracts exceed $10,000 and are not exempt from the provisions of the Equal Opportunity Clause. NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C 1001.

IV. CERTIFICATION OF NONSEGREGATED FACILITIES.

All bidders will be required to submit with their bids a Certification of Nonsegregated Employee Facilities, including an agreement to get a similar certification from proposed subcontractors. These certifications will be required prior to award of the Contract.

The Contractor certifies that it does not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The Contractor certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The Contractor agrees that a breach of this Certification is a violation of the equal opportunity clause in this Contract. As used in this Certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or any other reason. The Contractor agrees that (except where it has obtained identical Certifications from proposed subcontractors for specific time periods) he will obtain identical Certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause, and that it will retain such Certifications in its files.

Certification - The information above is true and complete to the best of my knowledge and belief.

_____

Name and Title of Signer (Please Print)

_____

Signature

_____

Date

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

V. TITLE VI CIVIL RIGHTS ACT OF 1964 COMPLIANCE COMMITMENT

All bidders will be required to submit with their bids the Title VI Civil Rights Act of 1964 Compliance Commitment form, including an agreement to get similar compliance commitment from proposed subcontractors. This compliance commitment will be required prior to award of the Contract.

Reference: Contract Number and Title: _____

The _____(Company) having submitted a bid for the referenced Contract, advises that contingent upon award of the Contract to our company, we will comply with Title VI Civil Rights Act of 1964 by not discriminating on the basis of age, race, sex, color, national origin or disability in its hiring and employment practices, or in admission to, access to, or operation of its programs, services, and activities. We will forward a copy of our commitment to comply with Title VI Civil Rights Act of 1964 to all vendors and subcontractors utilized for the referenced Contract, as listed below and inform them of their obligation to comply.

Subcontractors:

1) Name:
   Work to be performed:
   Dollar Value:
   Address:
   Telephone:

2) Name:
   Work to be performed:
   Dollar Value:
   Address:
   Telephone:

3) Name:
   Work to be performed:
   Dollar Value:
   Address:
   Telephone:

_____

(SIGNATURE OF BIDDER)

DATE: _____

VI. SCHEDULES OF MINIMUM WAGE RATES

The following are the minimum wage rates required by the Secretary of Labor. The classification may be supplemented and the rates for each classification may be changed from time to time in accordance with the revised rates and classifications issued by the Secretary of Labor.

PAGES 586-598 NOT USED

APPENDIX A1

DBE GOALS STATEMENT

The undersigned Bidder has satisfied the requirements of the Contract in the following manner (Complete the appropriate spaces):

The Bidder is committed to meeting the DBE utilization goal set forth in this Contract.

or

The Bidder is unable to meet the DBE utilization goal set forth in this Contract, but is committed to a minimum of _____% DBE utilization on this Contract and submits the attached narrative and documentation demonstrating good faith efforts consistent with Appendix A of 49 CFR 26 to meet the DBE utilization goal set forth in this Contract. Attach as many pages as necessary to provide a full and complete narrative and supporting documentation of good faith efforts made. This narrative shall be submitted on company letterhead and signed.

It is the present intent of the Bidder to utilize the specific DBE firms identified in Appendix A2 in the performance of the Work of this Contract. If for any reason, one or more of the DBE firms identified in Appendix A2 are unable or unwilling to participate, the Bidder will make good faith efforts to replace the DBE firm with another DBE firm in accordance with the Information For Bidders clause entitled "DBE Program".

Bidder Name:

Federal Tax ID No.: _____

By: _____

Signature and Title

APPENDIX A2
THE PORT AUTHORITY OF NY & NJ – OFFICE OF BUSINESS DIVERSITY AND CIVIL RIGHTS
DBE PARTICIPATION PLAN AND AFFIRMATION STATEMENT

Instructions: Submit one DBE PARTICIPATION PLAN AND AFFIRMATION STATEMENT form for each DBE firm used on this Contract.

CONTRACT NUMBER AND TITLE: _____

BIDDER:
Name of Firm: _____

Address: _____ Telephone: _____

Email Address: _____

DBE:
Name of Firm: _____

Address: _____ Telephone: _____

Description of work to be performed by DBE: _____

_____

Calculation (supply only): _____

The Bidder is committed to utilizing the above-named DBE for the work described above. The estimated dollar value of this work is $_____ or ____% of the total contract amount of $_____. The anticipated start date is _____ and the anticipated completion date is _____.

AFFIRMATION

The above-named DBE affirms that it will perform the portion of the Contract for the estimated dollar value as stated above.

By: _____ Date: _____
Signature of DBE and Title

If the Bidder does not receive award of the Contract, any and all representations in this DBE Participation Plan and Affirmation Statement shall be null and void.

By: _____ Date: _____
Signature of Bidder and Title

FOR OBDCR USE ONLY

Contract Goals: ☐ Approved ☐ Rejected ☐ Preliminary Plan Approved
Reviewed By: _____
OBDCR Business Development Representative
Signature: _____ Date: _____

Please Note: Only 60% of the expenditure to a DBE material supplier will be counted toward the DBE goal. Please show calculation above. Example: $100,000 x 60% = $60,000 estimated DBE dollar value of work. Plan cannot be accepted without calculation.

APPENDIX A3

INFORMATION ON SOLICITED FIRMS

The bidder must complete this form for itself and for all firms which gave the bidder a quotation for any work planned to be subcontracted regardless of whether they are ultimately chosen to participate in the Contract. Provide the information required below for every firm that provided a bid or a quote for a subcontract – even if the bid or quote from the firm is not used in the preparation of the final Proposal.

Name of Firm	Address of Firm	Phone Number	Contact Person	Firm	Annual Gross Revenue Range	DBE Certified

Footnote: Annual Gross Revenue Ranges: Less than $500,000; $500,000 - $1 Million; $1 - $2 Million; $2 - $5 Million; Over $5 Million - Select the category that best identifies the annual gross revenue of the solicited firm.

APPENDIX B (NJ)
NOTICE TO CONTRACTORS
AFFIRMATIVE ACTION REQUIREMENTS
EQUAL EMPLOYMENT OPPORTUNITY

83. NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246, AS AMENDED).

The following is to be made a part of all solicitations for bids on all federally assisted construction contracts or subcontracts in excess of $10,000.00.

1.) The Offeror's or Bidders's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2.) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce on all construction work in the covered area, are as follows:

Goal for minority	Goal for female
participation is 17.3%	participation is 6.9%

In the event that during the performance of this Contract the Office of Federal Contract Compliance establishes different goals for Essex, Morris, Somerset and Union Counties in New Jersey the Contractor shall be deemed bound to such different goals and this Appendix shall be deemed amended to substitute such goals for the goals set forth above.

These goals are applicable to all of the Contractor's construction Work (whether or not it is Federal or Federally-assisted) performed in the covered area. If the Contractor performs construction Work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the Contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3 (a), and its efforts to meet the goals established for the geographical area where this Contract is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the Contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to Contractor or from. project to project, for the sole purpose of meeting the Contractor's goals, shall be a violation of the Contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3.) The Contractor shall provide written notification to the Director, OFCCP, within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under this Contract. The notification shall list: the name, address, and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and, the geographical area in which the subcontract is to be performed.

4.) As used in this notice and in this Contract, the "covered area" means Essex, Morris, Somerset and Union Counties in New Jersey.

5.) The Department of Labor has eliminated all imposed EEO plans and the Philadelphia Plan as a means of complying with Executive Order 11246. Hometown Plans can still be used; however, signatories are required to submit goals and timetables for the utilization of women to the Director, Office of Federal Contract Compliance Programs, Department of Labor, Washington, D.C.

84. STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246, AS AMENDED).

The following specifications are made a part of all federally assisted construction contracts or subcontracts over $10,000.00 AND included in all invitations for bids:

A. As used in these specifications:

1.) "Covered area" means Essex, Morris, Somerset and Union Counties in New Jersey.

2.) "Director" means Director, Office of Federal Contract Compliance Programs (OFCCP), United States Department of Labor, or any person to whom the Director delegates authority;

3.) "Employer identification number" means the Federal Social Security Number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;

4.) "Minority" includes:

a. Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

b. Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South America, or other Spanish culture or origin regardless of race);

c. Asian or Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast, Asia, the Indian Subcontinent, or the Pacific Islands); and

d. American Indian or Alaskan native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

B. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the Work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the notice above which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this Contract resulted.

C. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the plan area (including goals and timetables) shall be in accordance with that plan for those trades which have unions participating in the plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO Clause and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the plan goals and timetables.

D. The Contractor shall implement the specific affirmative action standards provided in paragraphs G.(1) through (16) of these Specifications. The goals set forth in this Contract are expressed as percentages of the total hours of employment and training of minority and female utilizations; the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction Work in a geographical area where they do not have a Federal or federally assisted construction contract shall apply to the minority and female goals established for the geographical area where the Work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any OFCCP office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

E. Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the Contractor has a collective bargaining agreement to refer either minorities or women shall excuse the Contractor's obligations under these Specifications, Executive Order 11246, as amended, or the regulations promulgated pursuant thereto.

F. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

G. The Contractor shall take specific affirmative actions to ensure Equal Employment Opportunity (EEO). The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:

1.) Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

2.) Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

3.) Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason, therefor, along with whatever additional actions the Contractor may have taken.

4.) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

5.) Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under G.(2) above.

6.) Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction Work is performed.

7.) Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with onsite supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job sites. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

8.) Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media,. and providing written notification to and discussing the Contractor's EEO policy with other Contractors and subcontractors with whom the Contractor does or anticipates doing business.

9.) Direct its recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students; and to minority and female. recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

10.) Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer, and vacation employment to minority and female youth both on the site and in other areas of the Contractor's workforce.

11.) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

12.) Conduct, at least annually, an inventory and evaluation, at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

13.) Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

14.) Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

15.) Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

16.) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

H. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (G.(1) through (16)). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar groups of which the Contractor is a member and participant, may be asserted as fulfilling any one of more of its obligations under G.(1) through (16) of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

I. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provided EEO and to take affirmative action for all minority groups, both male and female, and all women, both minority and nonminority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate number (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

J. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

K. The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246, as amended.

L. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination, and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

M. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph G of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

N. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors shall not be required to maintain separate records.

O. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

RECEIVED
AUG 18 2014
VRH CONSTRUCTION CORP

2783
Entered in OPro
8/19/14 / g

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

August 18, 2014

ADDENDUM NO. 5

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** – NEWARK LIBERTY INTERNATIONAL AIRPORT – OVERNIGHT AIRCRAFT PARKING

The following changes are hereby made in the Contract Documents for the subject Contract.

This communication should be physically annexed to back cover of the book and initialled by each bidder before submitting his bid.

In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialled.

CHANGES IN THE CONTRACT BOOKLET

Page iv - Make the following change:

In 110., delete "ACCESS TO CUSTOMS SECURITY AREAS" and insert "NOT USED".

Page 136 - Delete Clause 110 in it's entirety, and substitute therefor new Clause 110 as follows:

"110. NOT USED"

REVISED CONTRACT DRAWINGS

Dwg. C101 Revise the drawing as shown on Sketch No. SK-C101 which is attached hereto and made a part hereof.

Dwg. P103 Revise the drawing as shown on Sketch No. SK-P103 which is attached hereto and made a part hereof.

Dwg. P104 Revise the drawing as shown on Sketch No. SK-P104 which is attached hereto and made a part hereof.

Dwg. E201 Revise the drawing as shown on Sketch No. SK-E201 which is attached hereto and made a part hereof.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

Dwg. E201 Revise the drawing as shown on Sketch No. SK-E201 which is attached hereto and made a part hereof.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

_____

08-27-14P03:15 RCVD

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

August 20, 2014

ADDENDUM NO. 6

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** – NEWARK LIBERTY INTERNATIONAL AIRPORT – OVERNIGHT AIRCRAFT PARKING

The following changes are hereby made in the Contract Documents for the subject Contract.

This communication should be physically annexed to back cover of the book and initialled by each bidder before submitting his bid.

In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialled.

CHANGES IN THE CONTRACT BOOKLET

Page 1 - In the second line of the first paragraph, change the day and date for receipt of Proposals to "Wednesday August 27, 2014".

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

August 20, 2014

ADDENDUM NO. 6

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** – NEWARK LIBERTY INTERNATIONAL AIRPORT – OVERNIGHT AIRCRAFT PARKING

The following changes are hereby made in the Contract Documents for the subject Contract.

This communication should be physically annexed to back cover of the book and initialled by each bidder before submitting his bid.

In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialled.

CHANGES IN THE CONTRACT BOOKLET

Page 1 - In the second line of the first paragraph, change the day and date for receipt of Proposals to "Wednesday August 27, 2014".

08-27-14P03:15 RCVD

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER – 3rd FLOOR
NEWARK, NJ 07102

August 26, 2014

ADDENDUM NO. 7

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** - NEWARK LIBERTY INTERNATIONAL AIRPORT- OVERNIGHT AIRCRAFT PARKING

The following changes are hereby made in the Contract Documents for the subject Contract.

This communication should be physically annexed to back cover of the book and initialed by each bidder before submitting his bid.

In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialed.

CHANGES IN THE CONTRACT BOOKLET

Page iv - After 89, insert:

"89A. RECYCLING OF CONSTRUCTION DEBRIS MATERIAL .....104"

Page 73 - After the last sentence on the page insert the following:

"B. A policy of workers' compensation and employer's liability insurance fulfilling the Contractor's and the subcontractor's obligations under the applicable State Workers' Compensation Law for those employees of the Contractor and the subcontractors employed pursuant to this Contract in operations conducted at the site of the Work hereunder. Coverage under this policy may, as appropriate, include one or more of the following endorsements:

1.) Longshoremen and Harbor Workers' Compensation Act Coverage Endorsement. (Applies when performing work on or around navigable waters).

2.) Maritime Coverage Endorsement (Applies to masters or members of the crews of vessels, if vessels are used).

3.) Federal Employer's Liability Act Coverage Endorsement. (May apply to railroad related Work).

Determination in any instance as to the appropriateness of the included coverage described in B.1, 2 and 3 above will be made based upon information to be provided by the Contractor relating to the mode of performance of work to be done under the Contract.

The policy described in B above will not provide coverage for any workers' compensation for the Contractor and/or subcontractors who perform any asbestos Work. In such cases, the Contractor or subcontractors shall procure and maintain, at their own expense, the workers' compensation insurance in accordance with the requirements of law in the state(s) where the work will take place, along with employer's liability insurance (in limits of not less than $1million per occurrence)

Should the Contractor and/or subcontractors be required to procure the workers' compensation insurance, within ten days after the acceptance of its Proposal the Contractor shall deliver to the General Manager, Risk Financing, The Port Authority of NY & NJ, Treasury Department, 225 Park Avenue South, 12th Floor, New York, N.Y. 10003 (Attn: Contract Insurance Review), an original certificate, stating the Contract number, from the insurer. A duplicate certificate evidencing the above insurance shall also be delivered to the Engineer. With regard to insurance required to be procured by a subcontractor, the Contractor shall deliver the certificate described above at least ten days before the subcontractor commences Work.

The requirements for insurance procured by the Contractor or subcontractors shall not in any way be construed as a limitation on the nature or extent of the obligations of the Contractor or subcontractors."

Page 74 - At the top of the page, delete "B" and substitute therefor "C".

Page 76 - Make the following changes:

A. Delete 60. B in its entirety without substitution therefor.

B. Delete "C." and substitute therefor "B.".

Page 104 - Above 90. DIESEL-POWERED EQUIPMENT, insert the following:

"89A. RECYCLING OF CONSTRUCTION DEBRIS MATERIAL

The Contractor shall remove from Authority property all construction debris, demolition debris and other debris material generated from the performance of the Work of this Contract unless the material is deemed acceptable by the Engineer for on-site re-use or recycling in accordance with the technical requirements of this Contract and remains at the Work site. The Contractor shall transport to recycling facilities or re-use and recycle on-site for this Contract, as applicable, no less than 75% by weight of the following types of designated debris material, to the extent arising from the Work of this Contract:

Asphalt Concrete
Portland Cement Concrete
Steel
Excess Unrestricted Soil

During the process of removal of all such designated debris material from Authority property, the Contractor shall submit to the Engineer on a monthly basis a Designated Debris Material Assessment Summary indicating the actual types and quantities by weight of the designated debris material removed for this Contract up to that point in time. In addition, the Designated Debris Material Assessment Summary shall also include types and quantities by weight of designated debris material actually re-used or recycled on-site in this Contract or, if shown on the Contract Drawings, are stockpiled for future use by the Authority. The Designated Debris Material Assessment Summary shall be accompanied by written verification from recycling and landfill destinations identifying the originating Work site, quantity of material delivered and type of debris material for all designated debris material removed from the Work site.

Within 15 days of the acceptance of his Proposal, the Contractor shall submit to the Engineer for review the Contractor's Designated Debris Material Assessment Plan indicating the anticipated types and anticipated quantities by weight and the intended destinations for all such designated debris material to be removed from the Work site. The Designated Debris Material Assessment Plan shall also indicate anticipated types and anticipated quantities by weight of all such designated debris material to remain at the Work site for re-use or recycling in this Contract as applicable.

All removals shall be completed promptly upon the completion of construction under this Contract."

08-27-14P03:15 RCVD

CHANGES TO THE CONTRACT DRAWINGS

Dwg. G104 Revise the drawing as shown on Sketch No. SK- G104 dated 8/22/14 which is attached hereto and made a part hereof.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

_____

Asphalt Concrete
Portland Cement Concrete
Steel
Excess Unrestricted Soil

During the process of removal of all such designated debris material from Authority property, the Contractor shall submit to the Engineer on a monthly basis a Designated Debris Material Assessment Summary indicating the actual types and quantities by weight of the designated debris material removed for this Contract up to that point in time. In addition, the Designated Debris Material Assessment Summary shall also include types and quantities by weight of designated debris material actually re-used or recycled on-site in this Contract or, if shown on the Contract Drawings, are stockpiled for future use by the Authority. The Designated Debris Material Assessment Summary shall be accompanied by written verification from recycling and landfill destinations identifying the originating Work site, quantity of material delivered and type of debris material for all designated debris material removed from the Work site.

Within 15 days of the acceptance of his Proposal, the Contractor shall submit to the Engineer for review the Contractor's Designated Debris Material Assessment Plan indicating the anticipated types and anticipated quantities by weight and the intended destinations for all such designated debris material to be removed from the Work site. The Designated Debris Material Assessment Plan shall also indicate anticipated types and anticipated quantities by weight of all such designated debris material to remain at the Work site for re-use or recycling in this Contract as applicable.

All removals shall be completed promptly upon the completion of construction under this Contract."

CHANGES TO THE CONTRACT DRAWINGS

Dwg. G104 Revise the drawing as shown on Sketch No. SK- G104 dated 8/22/14 which is attached hereto and made a part hereof.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

_____

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER – 3rd FLOOR
NEWARK, NJ 07102

August 26, 2014

ADDENDUM NO. 8

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** - NEWARK LIBERTY INTERNATIONAL AIRPORT- OVERNIGHT AIRCRAFT PARKING

The following changes are hereby made in the Contract Documents for the subject Contract.

This communication should be physically annexed to back cover of the book and initialed by each bidder before submitting his bid.

In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialed.

08-27-14P03:15 RCVD

CHANGES TO THE CONTRACT DRAWINGS

Dwg. S101 Revise the drawing as shown on Sketch No. SK- S101 dated 8/22/14 which is attached hereto and made a part hereof.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
THREE GATEWAY CENTER – 3rd FLOOR
NEWARK, NJ 07102

August 26, 2014

ADDENDUM NO. 8

TO PROSPECTIVE BIDDERS ON CONTRACT **EWR-153.226** - NEWARK LIBERTY INTERNATIONAL AIRPORT- OVERNIGHT AIRCRAFT PARKING

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In case any bidder fails to conform to these instructions, his Proposal will nevertheless be construed as though this communication had been so physically annexed and initialed.

CHANGES TO THE CONTRACT DRAWINGS

Dwg. S101 Revise the drawing as shown on Sketch No. SK- S101 dated 8/22/14 which is attached hereto and made a part hereof.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

D. Inspection Report For Asbestos Containing Materials, Lead Containing Paint And Universal/Regulated Materials Performed At Hangar 14" ATC Associates, Revised December 21, 2012

Reference Documents For Contract EWR-153.226

ATC ASSOCIATES INC.

INSPECTION REPORT FOR ASBESTOS CONTAINING MATERIALS, LEAD CONTAINING PAINT AND UNIVERSAL/REGULATED MATERIAL

Performed at:

HANGAR 14
NEWARK LIBERTY INTERNATIONAL AIRPORT
NEWARK, NJ

Performed for:

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

Prepared by:

ATC ASSOCIATES INC.
104 EAST 25TH STREET
NEW YORK, NEW YORK 10010

ATC Project No: 15.14777-0556

November 19, 2012
Revised December 21, 2012

ATC ASSOCIATES INC.

104 East 25th Street
Tenth Floor
New York, NY 10010
Telephone: 212-353-82
Facsimile: 212-353-8306

November 19, 2012 *(Revised December 21, 2012)*

Robert Pruno P.E.
Chief Environmental Engineer
Environmental Engineering Division
Port Authority of New York & New Jersey
2 Gateway Center, 14th floor
Newark, NJ 07102

Subject: **Inspection Report for Asbestos Containing Materials, Lead Containing Paint and Universal/Regulated Material**

Re: **Hangar 14 – Newark Liberty International Airport, Newark, NJ**

Dear Mr. Pruno:

ATC Associates Inc. (ATC) has completed the joint inspection with Port Authority of New York and New Jersey (PANYNJ) inspectors for asbestos-containing materials (ACM), universal/regulated material inventory and lead-containing paint (LCP) for the referenced site. PANYNJ inspectors conducted asbestos and lead sampling from May 7, 2012 through June 29, 2012. ATC conducted laboratory analysis of suspect ACM samples using Environmental Protection Agency (EPA) Methods: EPA 600/M4 82-020 Environmental Laboratory Approved Program (ELAP) 198.1, 198.6 and 198.4. ATC conducted laboratory analysis of paint samples using Atomic Absorption Spectrometry Flame (AAS). ATC conducted visual observations, identification, marking of locations and quantification of suspect ACM and completed universal/regulated material inventory for the referenced site.

ATC reviewed the laboratory results of the samples collected by PANYNJ and incorporated in the attached report. This report presents our findings, assessments and recommendations. ACM and LCP laboratory results, chain of custodies provided by PANYNJ, ACM location drawings, universal/regulated material location drawings and cost estimates are provided in the Appendices.

ATC appreciates this opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further assistance to you, please contact us.

Sincerely,

Husam Zeidan
Technical Assistant

Gilbert Gedeon, P.E.
Operations Manager

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5.0 UNIVERSAL/REGULATED MATERIAL INVENTORY SCOPE AND FINDINGS 7
6.0 CONCLUSIONS AND RECOMMENDATIONS 9

APPENDICES

Appendix A: ACM Laboratory Results and Chain of Custodies by PANYNJ

Appendix B: LCP Laboratory Results and Chain of Custodies by PANYNJ

Appendix C: ACM Location Drawings

Appendix D: Universal/Regulated Material Location Drawings

Appendix E: Cost Estimates

1.0 BUILDING DESCRIPTION

Hangar 14 was built in 1956 constructed primarily of steel and concrete. It is a three-story structure with approximately 78,300 square feet. Hangar 14 was used as an aircraft hangar. It is currently unoccupied and scheduled for complete demolition.

2.0 ACM INSPECTION SCOPE

PANYNJ conducted an asbestos inspection of the building and collected samples of suspect ACM. The areas inspected included interior and exterior areas of the building. Intrusive/destructive sampling was performed during this inspection. The intent of this survey was to locate and identify all accessible ACM.

The materials inspected and sampled for ACM during the inspections were:

• 12"x12" Dark Gray Floor Tile & Mastic	1st Floor
• Gray Leveling Compound	1st Floor
• 12"x12" Light Gray Floor Tile & Mastic	1st Floor
• 9"x9" Gray Floor Tile & Mastic	1st Floor
• 8"x8" Ceramic Tile Grout	1st Floor
• 2"x2" Ceramic Tile Grout	1st Floor
• 4"x4" Ceramic Tile Grout	1st Floor
• 4"x4" Ceramic Tile Glue	1st Floor
• Cement Under 8"x8" Floor Tile	1st Floor
• Block Wall Mortar	1st Floor
• 4" Light Gray Cove Base & Mastic	1st Floor
• 1'x1' White Ceiling Tile & Glue	1st Floor
• 4" Black Cove Base & Mastic	1st Floor
• 2'x4' White Drop Ceiling Tile	1st Floor
• Sheetrock & Joint Compound	1st Floor
• 9"x9" Beige Floor Tile & Mastic	1st Floor
• Brown Linoleum & Mastic	1st Floor
• 6" Black Cove Base & Mastic	1st Floor
• White Wall Plaster	1st Floor
• Brown Wall Plaster	1st Floor
• Yellow Carpet Glue	1st Floor
• 12"x12" Tan Floor Tile & Mastic	1st Floor
• Paper Inside Metal Door	1st Floor
• 3" White Pipe Insulation	1st Floor
• 3" White Canvas Pipe Wrap	1st Floor
• 3" Gray Elbow	1st Floor
• 3" Pipe White Insulation	1st Floor
• 3" Brown Paper Layer on Pipe Insulation	1st Floor
• Black Non-Slip Shower Strip	1st Floor
• 4" Brown Paper Layer on Pipe Insulation	1st Floor

• 4" White Corrugated Paper Layer on Pipe Insulation	1st Floor
• 4" Gray Elbow	1st Floor
• 8" White Pipe Insulation	1st Floor
• 4" Gray Paper Layer on Pipe Insulation	1st Floor
• 16" Brown Paper Layer on Pipe Insulation	1st Floor
• 16" White Pipe Insulation	1st Floor
• 6" White Pipe Insulation	1st Floor
• 4" White Pipe Insulation	1st Floor
• White Heat Exchanger Insulation	1st Floor
• 2" White Pipe Insulation	1st Floor
• White Tank Insulation	1st Floor
• White Vibration Cloth from 2'x4' Duct	1st Floor
• 6" Brown Cove Base & Glue	1st Floor
• 12"x12" Dark Gray Floor Tile & Yellow Mastic	1st Floor
• White Window Caulking (Block Building A)	1st Floor
• White Wall Paint	1st Floor
• Gray Cinder Block Cement	1st Floor
• White Caulking on Metal Vent	1st Floor
• Black Rubber Expansion Joint	1st Floor
• Gray Transite Board	1st Floor
• Black Building Vapor Barrier	1st Floor
• White Cloth Wrap on Wire in Switch Box	1st Floor
• Black Circuit Board in Switch Box	1st Floor
• 10" White Pipe Insulation	1st Floor
• Gray Pipe Penetration Sealer	1st Floor
• Black Rubber Electrical Conduit Sealer	1st Floor
• White Debris	2nd Floor Room 220G
• Beige Debris	2nd Floor Room 220G
• Black Vibration Damper from HVAC Duct	2nd Floor Room 220G
• 6" Brown Cove Base & Glue	2nd Floor
• 6" Dark Brown Cove Base & Glue	2nd Floor
• 6" White Exterior Window Caulking	2nd Floor
• 3" Black Cove Base & Glue	2nd Floor
• 4" Black Cove Base & Glue	2nd Floor
• 3" Brown Cove Base & Glue	2nd Floor
• Bathroom 1" Floor Tile & Grout	2nd Floor
• Bathroom 4" Ceramic Floor Tile Grout	2nd Floor
• Yellow Wall Glue	2nd Floor
• Dry Wall	2nd Floor
• Joint Patching Compound	2nd Floor
• Cinder Block	2nd Floor
• Interior Door Insulation	2nd Floor
• Wall Paneling Glue	2nd Floor
• Brown Wall Plaster	2nd Floor

• 2'x2' White Ceiling Tile	2nd Floor
• Decorative Cinderblock	2nd Floor
• Fiberglass Ductwork Insulation Glue	2nd Floor
• 9"x9" Light Gray Floor Tile & Mastic	2nd Floor
• 9"x9" Dark Gray Floor Tile & Mastic	2nd Floor
• 6" Black Cove Base & Mastic	2nd Floor
• White Ceiling Plaster	2nd Floor
• Brown Ceiling Plaster	2nd Floor
• Light Blue Paper Layer on Wall	2nd Floor
• White Wall Plaster	2nd Floor
• Gray Wall Plaster	2nd Floor
• Yellow Carpet	2nd Floor
• Yellow Carpet Glue	2nd Floor
• 9"x9" Gray Floor Tile & Mastic	2nd Floor
• 9"x9" Beige Floor Tile & Mastic	2nd Floor
• 12"x12" Brown Floor Tile & Mastic	2nd Floor
• 12"x12" Light Brown Floor Tile & Mastic	2nd Floor
• 12"x12" Gray Floor Tile & Mastic	2nd Floor
• 9"x9" Green Floor Tile & Mastic	2nd Floor
• 12"x12" White Floor Tile & Mastic	2nd Floor
• 12"x12" White Ceiling Tile	2nd Floor
• Formica Countertop	2nd Floor
• 6" Gray Cove Base & Glue	2nd Floor
• White Window Caulking	2nd Floor
• White Window Glazing	2nd Floor
• Black Sealant	2nd Floor
• White Patching Window Glazing	2nd Floor
• 4" Gray Cove Base & Glue	2nd Floor
• Brown Glue	2nd Floor
• Beige Window Insulation	2nd Floor
• Black Window Insulation Glue	2nd Floor
• Brown Cardboard on Bathroom Stall Door	2nd Floor
• Brown Wall Mastic	2nd Floor
• Gray/White Built-up Roof Membrane – 1st Layer	Roof
• Gray Paper Built-up Roof – 2nd Layer	Roof
• Yellow Built-up Roof Insulation – 3rd Layer	Roof
• Black Tar Under Built-up Roof	Roof
• Gray Roof Flashing – 1st Layer	Roof
• Gray Roof Flashing – 2nd Layer	Roof
• Yellow Roof Flashing – 3rd Layer	Roof
• Black Roof Flashing – 4th Layer	Roof
• Black Exhaust Vent Caulking	Roof
• White Exhaust Vent Caulking	Roof
• Black Skylight Tar	Roof

- Black Tar on Fan Unit Supports — Roof
- Black Tar on Vent — Roof
- Black Drain Flashing — Roof
- Gray/White Built-up Roof Membrane – 1st Layer — Stair Bulkhead
- Gray Paper Built-up Roof – 2nd Layer — Stair Bulkhead
- Yellow Built-up Roof Insulation – 3rd Layer — Stair Bulkhead
- Black Tar Under Built-up Roof — Stair Bulkhead
- Gray Window Caulking — Stair Bulkhead
- Gray Door Caulking — Stair Bulkhead

3.0 ASBESTOS CONTAINING MATERIAL INSPECTION RESULTS

ATC has reviewed and incorporated the ACM sample results into this report under Appendix A.

Based upon visual inspection and analytical results of bulk samples collected by PANYNJ, **the following materials are confirmed to be asbestos-containing materials** (> 1%):

PANYNJ Sample Number(s)	Sampling Date	Material Location & Description	Asbestos Content	Approximate Quantity
80142, 80143	5/11/12	Exterior – White Window Caulking on 2nd Floor	1.3-1.9% Chrysotile	900 LF
80402-80404	5/25/12	Exterior South East Blockhouse – White Vent Caulking	2.5-2.9% Chrysotile	20 LF
80219, 80222, 80224	5/15/12	1st Floor – 9"x9" Gray Floor Tile and Mastic Under 12"x12" Light Gray Floor Tile and Mastic	2.1-24.9% Chrysotile	1,850 SF
80229	5/15/12	1st Floor – 2"x2" Ceramic Tile Grout	1.4% Chrysotile	240 SF
80270-80272	5/15/12	1st Floor – 9"x9" Beige Floor Tile	11.2-12.5% Chrysotile	40 SF
80354-80356	5/18/12	1st Floor Room 12 – White Heat Exchanger Insulation	15-20% Chrysotile 10% Amosite	40 SF
80363-80365	5/18/12	1st Floor Room 12 – White Tank Insulation	10-40% Chrysotile 10-15% Amosite	60 SF
80366-80368	5/18/12	1st Floor Room 12 – White Vibration Cloth on Duct	20% Chrysotile	5 SF
80306, 80307, 80317, 80324-80335, 80337, 80339, 80341-80353, 80357-80362, 80420, 80421	5/16/12 / 5/17/12 / 5/18/12 / 5/29/12	1st Floor – Pipe and Pipe Fitting Insulation	4-25% Chrysotile 8-15% Amosite	7,650 LF
		2nd Floor – Pipe and Pipe Fitting Insulation		850 LF

PANYNJ Sample Number(s)	Sampling Date	Material Location & Description	Asbestos Content	Approximate Quantity
80006-80011, 80015-80020, 80051, 80055, 80056, 80066, 80068	5/7/12 / 5/8/12	2nd Floor Office Area – 9"x9" Beige or Gray Floor Tile and Mastic	1.4-17.8% Chrysotile	2,000 SF
80043, 80046, 80047, 80049, 80050, 80053, 80054, 80070	5/8/12	2nd Floor Office Area – 9"x9" Beige or Gray Floor Tile and Mastic under Carpeting	1.6-10.9% Chrysotile	3,650 SF
80084	5/9/12	2nd Floor Room 203F – Mastic under Various 12"x12" Floor Tiles	10.7% Chrysotile	280 SF
80134-80136, 80138, 80140	5/9/12	2nd Floor Office Area – 6" Brown Cove Base and Mastic	1.6-14.3% Chrysotile	170 LF
80162-80164	5/11/12	2nd Floor Room 220H – 1"x1" Ceramic Floor Tile Grout	1.9-15.4% Chrysotile	60 SF
80183-80185	5/11/12	2nd Floor Office Area – Black Wall Panel Mastic	1.2-1.6% Chrysotile	120 LF
81051	6/20/12	Roof – Black Exhaust Vent Caulking	7.2% Chrysotile	150 LF
81056	6/20/12	Roof – Black Skylight Tar	1.5% Chrysotile	80 SF
81069	6/20/12	Roof – Black Roof Drain Flashing	4.1% Chrysotile	800 SF

PANYNJ submitted the bulk samples to ATC's laboratory for Polarized Light Microscopy (PLM) and Transmission Electron Microscopy (TEM) analysis, as applicable, utilizing EPA Method 600/M4-82-020 and ELAP Method 198.1, 198.4 and 198.6. ACM location drawings are included in Appendix C.

4.0 LEAD CONTAINING PAINT INSPECTION RESULTS

ATC reviewed and incorporated the LCP sample results into this report under Appendix B.

Although the Housing Urban Development (HUD) defines lead based paint as paint having a lead concentration equal to or above 0.5% by weight, the Occupational Safety and Health Administration (OSHA) considers any concentration of lead to be lead-containing as stipulated under OSHA Lead in Construction Standard, 1926.62. Therefore, based upon visual inspection and analytical results of paint chip samples collected by PANYNJ, the following samples were confirmed to be lead-containing:

PANYNJ Sample Number(s)	Sampling Date	Material Description & Location	Lead Content (% by weight)
6442 LP	5/22/12	Light grey paint chip sample collected from metal decking ceiling of stairwell penthouse.	0.01
6444 LP	5/22/12	Red/light grey paint chip sample collected from stairwell penthouse ceiling beam.	1.00
6445 LP	5/22/12	Red/light grey paint chip sample collected from stairwell penthouse ceiling beam.	0.15
6447 LP	5/22/12	Grey/beige paint chip sample collected from stairwell penthouse roof access door jam.	1.83
6448 LP	5/22/12	Beige/light grey paint chip sample collected from stairwell concrete-block wall, second landing.	0.02
6449 LP	5/22/12	Red/light grey paint chip sample collected from bottom of stairwell step, second landing.	3.46
6450 LP	5/22/12	Light grey paint chip sample collected from stairwell fire standpipe, third landing.	0.13
6451 LP	5/22/12	Red/light grey paint chip sample collected from catwalk access door jam, third landing.	0.86
6452 LP	5/22/12	Light grey paint chip sample collected from catwalk access door jam, third landing.	0.87
6453 LP	5/22/12	Red/light grey paint chip sample collected from handrail of stairwell, second landing.	0.04
6454 LP	5/22/12	Beige/light grey paint chip sample collected from stairwell concrete black wall, first landing.	1.22
6455 LP	5/22/12	Red/grey paint chip sample collected from stairwell stair beam below first landing.	0.01
6456 LP	5/22/12	Grey paint chip sample collected from handrail of stairwell below first landing.	2.28
6467 LP	5/25/12	Grey paint chip sample collected from door jam of Room 201B.	0.12
6470 LP	5/25/12	White paint chip sample collected from plaster ceiling in Room 220G.	0.03
6472 LP	5/25/12	Red/grey paint chip sample collected from door jam in Room 208.	0.07
6478 LP	5/25/12	White paint chip sample collected from cinderblock wall, block building.	0.01
6479 LP	5/25/12	Red/grey paint chip sample collected from roll-up gate frame, block building.	0.06
6480 LP	5/29/12	Light blue paint chip sample collected from south side roll-up door.	0.06
6481 LP	5/29/12	Yellow paint chip sample collected from bollard on south side of building, adjacent diesel generator	0.04
6482 LP	5/29/12	White paint chip sample collected from old diesel generator.	0.02
6483 LP	5/29/12	Yellow paint chip sample collected from roll-up door frame adjacent to Room 1B, outer coat.	3.62

PANYNJ Sample Number(s)	Sampling Date	Material Description & Location	Lead Content (% by weight)
6484 LP	5/29/12	Grey paint chip sample collected from roll-up door frame adjacent to Room 1B, middle coat.	0.32
6485 LP	5/29/12	Red paint chip sample collected from roll-up door frame adjacent to Room 1B, middle coat.	21.30
6486 LP	5/29/12	Red/grey paint chip sample collected from main hangar door, east side of building.	5.04

PANYNJ submitted the suspect paint chip samples to ATC's laboratory for analysis by Atomic Absorption Spectrometry (AAS) utilizing EPA Method 3050B Modified/7000B. As per PANYNJ, lead abatement is not anticipated for Hangar 14. However, incidental spot removal of lead paint may be needed during demolition. Thus, one lump sum cost is allocated for HASP as well as, removal and disposal of LCP resulting from incidental spot removal.

5.0 UNIVERSAL/REGULATED MATERIAL INVENTORY SCOPE AND FINDINGS

ATC conducted a visual inspection on May 17 and 25, 2012 to identify and document universal/regulated materials at the site in order to prepare an inventory of these materials for the planned demolition and renovation activities. Materials inspected included but not limited to fluorescent lamps, high intensity discharge (HID) lamps, ballasts, capacitors, mercury containing equipment, transformers, batteries, hydro fluorocarbons and miscellaneous oils and chemicals.

Based on the age of the building, it was assumed that lamp ballasts/capacitors contain Polychlorinated Biphenyls (PCBs) and/or di (2) ethylhexyl phthalate (DEHP). A tabulation of the inventory is summarized in the tables below. Drawings with the locations of the observed materials are attached in Appendix D.

Lighting Fixtures:

Bulb Type	Fixture height from floor (Ft.)	No. of Fixtures	No. of Bulbs	No. of Ballasts or Capacitors	Bulb Size (Length in Ft)
Fluorescent (Interior)	~6	1	1	1	1
Fluorescent (Interior)	~8-12	15	44	24	2
Fluorescent (Interior)	~8-12	381	1,056	581	4
Fluorescent (Interior)	~15-25	362	760	465	8
Compact Fluorescent (Interior)	~15	15	30	15	NA
HID	~25	44	44	44	NA

(Interior)					
HID (Exterior)	~12-22	33	33	33	NA
Neon Lights (Exterior)	~32-35	NA	NA	NA	NA
TOTALS	NA	**851**	**1,968**	**1,163**	NA

Miscellaneous Equipment:

Equipment Type	Location	Quantity	Notes
20 Gallon Drum	1st Floor, Room 11	1	Contains Lubricating Oil
AC Units (Ceiling-mounted)	1st Floor, Rooms 6 and 21B	2	Unknown Refrigerant type and amount
Mercury Thermostats	Throughout 1st and 2nd Floors	6	Mercury Containing
AC Units (Window Type)	Throughout 1st and 2nd Floors	11	9 total pounds of unknown Refrigerant
Batteries (Interior Emergency Lighting)	Throughout 1st and 2nd Floors	13	Battery type unknown, not accessible
Hydraulic Elevator Equipment	1st Floor, Room 10	NA	Various equipment associated with elevator, assumed to contain Hydraulic Fluid
55-Gallon Drums	1st Floor, Room 24	4	Contains miscellaneous chemicals/petroleum
Transformers	Throughout 1st and 2nd Floors	24	Assumed to contain PCBs
Propane Tank	1st Floor, Room 13A	1	Contains Nitrogen Gas
Refrigerator	1st Floor, Room 21B	1	Assumed to contain CFCs
Half-Size Refrigerator	2nd Floor, Room 210	1	Assumed to contain CFCs
Propane Tank	Exterior, North	1	Contains Liquefied Petroleum Gas

Tank	Exterior, South	1	Contains Diesel Fuel Oil
Hydraulic Fluid	Room 1	NA	Associated with Hangar Door Louver System, Unknown Amount
Water Coolers	1st Floor, Room 1	2	Assumed to contain CFCs
HVAC Units	Roof	2	Unknown Refrigerant type and amount
5-Gallon Bucket	2nd Floor, Room 224	1	Bridge & Deck Repair Compound
Paint	2nd Floor, Room 224	NA	10 Gallons
Cement Mix	2nd Floor, Room 224	NA	100 lbs
Tank	1st Floor, Room 23B	1	Appears to be Associated with Fire Suppression System, ~200 Gallon, Unknown Chemical

As per PANYNJ, there exists PCB soil and groundwater contamination at Hangar 14. The New Jersey Department of Environmental Protection (NJDEP) has granted No Further Action (NFA) in regards to groundwater as noted in the letter dated March 27, 2009. The PCB soil contamination is located at the location of former underground storage tanks "USTs". For more details and for the extent of PCB contamination, refer to "EWR- Hangar 14 Supplement Remedial Investigation Report" dated March 2009.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Various types of ACM and universal/regulated material have been identified in this report that may be impacted as part of the proposed demolition work at Hangar 14. The materials reported in Sections 3.0 and 5.0 of this report would require removal prior to demolition.

APPENDIX A

ACM LABORATORY RESULTS AND CHAIN OF CUSTODIES BY PANYNJ

Rec. No.	Vendor Billing No.

23921

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

E/F

Laboratory Destination:	~~EMSL~~ ATC
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 3

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #'S FROM	SAMPLE #'S TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
1	EWR- 80000	EWR- 80014	15	RELINQUISHED BY: [signature]	DATE TIME 5-8-12
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: [signature]	DATE: 5-8-12 TIME:	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY: [signature]	DATE: 5/8/12 TIME: 1615	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY: courier	DATE: 5-8-12 TIME: 5:05pm	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY: Rec. received [signature]	DATE: 5-8-12 TIME: 2130	The data report for the above samples
RELINQUISHED BY: Analyzed By: A. Bowlyer	DATE: TIME: 5-8-12	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME: 2220	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By:	DATE: TIME:	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY: ATC-T Fata	DATE: 5/8/12 TIME: 6:15P	15 PCM
RECEIVED AT THE LAB BY: Svetlana Abdullayeva	LAB NAME: ATC DATE: 5-8-12 TIME: 5:05pm	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

M

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The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

#23921 ✓

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2nd

Job No.:

Area Description Utility Room 220G

Date: 5/7/2012

SAMPLE NUMBER		SAMPLE DESCRIPTION
EWR- 80000		white fallout debris collected from the floor of room 220G in front of the entrance door
LAB No:		
EWR- 80001		white fallout debris collected from the floor of room 220G in front of the entrance door
LAB No:		
EWR- 80002		white fallout debris collected from the floor of room 220G in front of the entrance doort
LAB No:		
EWR- 80003		Beige fallout debris collected from the floor of room 220G in front of the entrance door
LAB No:		
EWR- 80004		Beige fallout debris collected from the floor of room 220G in front of the entrance door
LAB No:		
EWR- 80005		Beige fallout debris collected from the floor of room 220G in front of the entrance door
LAB No:		
EWR- 80006		Light Grey 9 x 9 Floor tile material collected from room 220G, three feet to the right of the entry door
LAB No:		
EWR- 80007		Light Grey 9 x 9 Floor tile material collected from room 220G, to the right of the entry door adjacent cove base
LAB No:		

Port Authority Inspector(s): D McCarthy

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of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23921

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2nd

Job No.:

Area Description Utility Room 220G

Date: 5/7/2012

SAMPLE NUMBER		SAMPLE DESCRIPTION
EWR- 80008		Light Grey 9 x 9 Floor tile material collected from room 220G, three feet to the right of the entry door, center of the room
LAB No:		
EWR- 80009		Dark Grey 9 x 9 Floor tile material collected from room 220G, two feet to the right of the entry door door, center of the room
LAB No:		
EWR- 80010		Dark Grey 9 x 9 Floor tile material collected from room 220G, center of the room adjacent the horizontal HVAC Duct
LAB No:		
EWR- 80011		Dark Grey 9 x 9 Floor tile material collected from room 220G, center of the room adjacent the verticle HVAC Duct
LAB No:		
EWR- 80012		Black fiberous vibration damper material collected from the vertical HVAC duct in room 220G
LAB No:		
EWR- 80013		Black fiberous vibration damper material collected from the vertical HVAC duct in room 220G
LAB No:		
EWR- 80014		Black fiberous vibration damper material collected from the Horizontal HVAC duct in room 220G
LAB No:		
EWR-		
LAB No:		

Port Authority Inspector(s): D. McCarthy

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: HANGER 14 2ND FLOOR UTILITY ROOM 220G

Sample Date : 5/7/2012
Date Received : 5/8/2012
Date Analyzed : 5/8/2012
ATC Batch # 23921
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80000 23921 -1	THE FLOOR OF ROOM 220G IN FRONT OF THE ENTRANCE DOOR	WHITE FALLOUT DEBRIS	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarik Fata		Color: WHITE		Comments:			
EWR-80001 23921 -2	THE FLOOR OF ROOM 220G IN FRONT OF THE ENTRANCE DOOR	WHITE FALLOUT DEBRIS	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarik Fata		Color: WHITE		Comments:			
EWR-80002 23921 -3	THE FLOOR OF ROOM 200G IN FRONT OF THE ENTRANCE DOOR	WHITE FALLOUT DEBRIS	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarik Fata		Color: WHITE		Comments:			
EWR-80003 23921 -4	THE FLOOR OF ROOM 220G IN FRONT OF THE ENTRANCE DOOR	BEIGE FALLOUT DEBRIS	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarik Fata		Color: WHITE		Comments:			
EWR-80004 23921 -5	THE FLOOR OF ROOM 220G IN FRONT OF THE ENTRANCE DOOR	BEIGE FALLOUT DEBRIS	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarik Fata		Color: WHITE		Comments:			
EWR-80005 23921 -6	THE FLOOR OF ROOM 200G IN FRONT OF THE ENTRANCE DOOR	BEIGE FALLOUT DEBRIS	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarik Fata		Color: WHITE		Comments:			
EWR-80006 23921 -7	ROOM 220G, THREE FEET TO THE RIGHT OF THE ENTRY DOOR	LIGHT GREY 9 X 9 FLOOR TILE MATERIAL	NOB-TEM			21.3% Organic 5.4% Residue 67.9% Carbonate	5.4% Chrysotile
Analyzed By: Tarik Fata		Color: GRAY Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 5.4 %

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80007 23921 -8	ROOM 220G, TO THE RIGHT OF THE ENTRY DOOR ADJACENT COVE BASE	LIGHT GREY 9 X 9 FLOOR TILE MATERIAL	NOB-PLM			20.2% Organic 15% Residue 54.8% Carbonate	10% Chrysotile
Analyzed By: Tarik Fata		Color: GRAY Second Analyst: Mohamed Fata		Comments: PLM inconclusive			Total Asbestos: 10 %
EWR-80008 23921 -9	ROOM 220G, THREE FEET TO THE RIGHT OF THE ENTRY DOOR, CENTER OF THE ROOM	LIGHT GREY 9 X 9 FLOOR TILE MATERIAL	NOB-PLM			20.4% Organic 29.3% Residue 40.5% Carbonate	9.8% Chrysotile
Analyzed By: Tarik Fata		Color: GRAY Second Analyst: Mohamed Fata		Comments: PLM inconclusive			Total Asbestos: 9.8 %
EWR-80009 23921 -10	ROOM 220G, TWO FEET TO THE RIGHT OF ENTRY DOOR, CENTER OF THE ROOM	DARK GREY 9 X 9 FLOOR TILE MATERIAL	NOB-TEM			23% Organic 6.1% Residue 68.3% Carbonate	2.6% Chrysotile
Analyzed By: Tarik Fata		Color: D. GRAY Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 2.6 %
EWR-80010 23921 -11	ROOM 220G, CENTER OF THE ROOM ADJACENT THE HORIZONTAL HVAC DUCT	DARK GREY 9 X 9 FLOOR TILE MATERIAL	NOB-TEM			23% Organic 6.5% Residue 66.2% Carbonate	4.3% Chrysotile
Analyzed By: Tarik Fata		Color: D. GRAY Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 4.3 %
EWR-80011 23921 -12	ROOM 220G, CENTER OF THE ROOM ADJACENT THE VERTICLE HVAC DUCT	DARK GREY 9 X 9 FLOOR TILE MATERIAL	NOB-TEM			24.1% Organic 12.8% Residue 50.4% Carbonate	12.7% Chrysotile
Analyzed By: Tarik Fata		Color: D. GRAY Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 12.7 %
EWR-80012 23921 -13	THE VERTICAL HVAC DUCT IN ROOM 220G	BLACK FIBEROUS VIBRATION DAMPER MATERIAL	NOB-TEM			39% Organic 53.2% Residue 7.8% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80013 23921 -14	THE VERTICAL HVAC DUCT IN ROOM 220G	BLACK FIBEROUS VIBRATION DAMPER MATERIAL	NOB-TEM			36.8% Organic 51.6% Residue 11.1% Carbonate	0.5% Chrysotile
Analyzed By: Tarik Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.5 %
EWR-80014 23921 -15	THE HORIZONTAL HVAC DUCT IN ROOM 220G	BLACK FIBEROUS VIBRATION DAMPER MATERIAL	NOB-TEM			36.7% Organic 48.7% Residue 14.6% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10679

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarik Fata
Analyst:

Mohamed Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

ATC 23936

Rec. No.	Vendor Billing No.

BATCH# 23936

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	~~EMSL~~ ATC
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 5

Sample Type - **LEAD** [ ] PAINT [ ] WIPE [-] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
	EWR- 80015	EWR- 80041	32	RELINQUISHED BY: Mark Laidford	DATE TIME 05-09-12 0730
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: Mark Laidford	DATE: 05-09-12 TIME: 0730	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY: Bersaw	DATE: 5/9/12 TIME: 1548	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY: Analyzed By: ATC-Tata	DATE: 5/9/12 TIME: 800pm	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY: Tom-ABMayer	DATE: 5/9/12 TIME:	If "was not" is checked above, indicate the actual turnaround. 2days
RELINQUISHED BY: Andy Courier	DATE: 5/9/12 TIME: 6:40 pm	Please Email Results to rcamplon@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: ATC Jie Ying Gao	LAB NAME: ATC DATE: 5/9/12 TIME: 6:40 pm	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2nd

Job No.: —

Area Description Utility Room 2204

Date: 05-07-12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80015	Black mastic like material collected from under light gray 9"x9" tile by entry door in room 2204
LAB No:	
EWR- 80016	Black mastic like material collected from under light gray 9"x9" tile in center of room
LAB No:	
EWR- 80017	Black mastic like material collected from under light gray 9"x9" tile at the north west side of room
LAB No:	
EWR- 80018	Black mastic like material collected from under dark gray 9"x9" tile in the center of room
LAB No:	
EWR- 80019	Black mastic like material collected from under dark gray 9"x9" tile at the south end of room
LAB No:	
EWR- 80020	Black mastic like material collected from under dark gray 9"x9" tile at the north end of room
LAB No:	
EWR- 80021	Black 6" cove base like material collected from wall at the west side
LAB No:	
EWR- 80022	Black 6" cove base like material collected from wall at the north side
LAB No:	

Port Authority Inspector(s): M. Lidford, C. Ajula

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2nd

Job No.: —

Area Description Utility Room 220 G

Date: 05-07-12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80023	Black 6" cove base like material collected from the wall of the south side
LAB No:	
EWR- 80024	Black mastic like material collected from under 6" cove base on the west side
LAB No:	
EWR- 80025	Black mastic like material collected from under 6" cove base on the north side
LAB No:	
EWR- 80026	Black mastic like material collected from under 6" cove base on the south side
LAB No:	
EWR- 80027	White cementitious like material collected from the Eastside of the ceiling
LAB No:	
EWR- 80028	White cementitious like material collected from the center of the ceiling
LAB No:	
EWR- 80029	White cementitious like material collected from the southside of the ceiling
LAB No:	
EWR- 80030	Brown cementitious like material collected from the Eastside of the ceiling
LAB No:	

Port Authority Inspector(s): M. Cailford, C. Ajaka

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Environmental Field Operations
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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2nd

Job No.:

Area Description Utility Room 220 G

Date: 05-07-12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80031	Brown cementitious like material collected from the center of the ceiling
LAB No:	
EWR- 80032	Brown cementitious like material collected from the south side of the ceiling
LAB No:	
EWR- 80033	Light blue paper like material collected from the right side of the wall
LAB No:	
EWR- 80034	Light blue paper like material collected from the middle of the wall
LAB No:	
EWR- 80035	Light blue paper like material collected from the left side of the wall
LAB No:	
EWR- 80036	White cementitious like material collected from the right side of the wall
LAB No:	
EWR- 80037	White cementitious like material collected from the left side of the wall
LAB No:	
EWR- 80038	White cementitious like material collected from the middle of the wall
LAB No:	

Port Authority Inspector(s): M. Laidford, C. Ajibu

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of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23936

5 of 5

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2nd

Job No.: —

Area Description Utility Room 220G

Date: 05-07-12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80039	Gray cementitious like material collected from under white cementitious right side of the wall
LAB No:	
EWR- 80040	Gray cementitious like material collected from under white cementitious left side of the wall
LAB No:	
EWR- 80041	Gray cementitious like material collected from under white cementitious middle of the wall
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): M. Laidford, C. Ajulu

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: HANGER 14 2ND FLOOR, UTILITY ROOM 2204

Sample Date : 5/7/2012
Date Received : 5/9/2012
Date Analyzed : 5/9/2012
ATC Batch # 23936
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80015	From under light gray 9" x 9" tile by entry door in room 220G	Black mastic like material	NOB-TEM			21.5% Organic 12.4% Residue 64.7% Carbonate	1.4% Chrysotile
23936 -1		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.4 %
EWR-80016	From under light gray 9" x 9" tile in center of room	Black mastic like material	NOB-TEM			21% Organic 8% Residue 62.9% Carbonate	8.1% Chrysotile
23936 -2		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 8.1 %
EWR-80017	From under light gray 9" x 9" tile at the north west side of room	Black mastic like material	NOB-TEM			22.5% Organic 7.4% Residue 65.1% Carbonate	5% Chrysotile
23936 -3		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 5 %
EWR-80018	From under light dark gray 9" x 9" tile in the center of room	Black mastic like material	NOB-TEM			26.7% Organic 16.2% Residue 53% Carbonate	4.1% Chrysotile
23936 -4		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 4.1 %
EWR-80019	From under light dark gray 9" x 9" tile at the south end of room	Black mastic like material	NOB-TEM			26.7% Organic 9.4% Residue 59.9% Carbonate	4% Chrysotile
23936 -5		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 4 %
EWR-80020	From under light dark gray 9" x 9" tile at the north end of room	Black mastic like material	NOB-TEM			27.4% Organic 9.8% Residue 56.3% Carbonate	6.5% Chrysotile
23936 -6		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 6.5 %
EWR-80021	From wall at the west side	Black 6" cove base like material	NOB-TEM			46.8% Organic 14.7% Residue 38.5% Carbonate	NONE DETECTED
23936 -7		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel: 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80022	From wall at the north side	Black 6" cove base like material	NOB-TEM			45.3% Organic 8% Residue 46.7% Carbonate	NONE DETECTED
23936 -8		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80023	From wall at the south side	Black 6" cove base like material	NOB-TEM			45% Organic 15.7% Residue 39.3% Carbonate	NONE DETECTED
23936 -9		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80024	From under 6" cove base on the west side	Black mastic like material	NOB-TEM			48.8% Organic 3.8% Residue 47.4% Carbonate	NONE DETECTED
23936 -10		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80025	From under 6" cove base on the north side	Black mastic like material	NOB-TEM			50.8% Organic 40.4% Residue 8.8% Carbonate	NONE DETECTED
23936 -11		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80026	From under 6" cove base on the south side	Black mastic like material	NOB-TEM			51.5% Organic 19.6% Residue 28.9% Carbonate	NONE DETECTED
23936 -12		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80027	From the eastside of the ceiling	White cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -13		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-80028	From the center of the ceiling	White cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -14		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-80029	From the south side of the ceiling	White cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -15		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-80030	From the east side of the ceiling	Brown cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -16		Color: Brown					
Analyzed By: Tarek Fata				Comments:			
EWR-80031	From the center of the ceiling	Brown cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -17		Color: Brown					
Analyzed By: Tarek Fata				Comments:			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80032	From the south side of the ceiling	Brown cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -18		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80033	From the right side of the wall	Light blue paper like material	NOB-TEM			92% Organic 1.3% Residue 6.7% Carbonate	NONE DETECTED
23936 -19		Color: Blue		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-80034	From the middle of the wall	Light blue paper like material	NOB-TEM			84.5% Organic 2.5% Residue 13% Carbonate	NONE DETECTED
23936 -20		Color: Blue		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-80035	From the left side of the wall	Light blue paper like material	NOB-TEM			92% Organic 2.2% Residue 5.8% Carbonate	NONE DETECTED
23936 -21		Color: Blue		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-80036	From the right side of the wall	White cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -22		Color: White		Comments:			
Analyzed By: Tarek Fata							
EWR-80037	From the left side of the wall	White cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -23		Color: White		Comments:			
Analyzed By: Tarek Fata							
EWR-80038	From the middle of the wall	White cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -24		Color: White		Comments:			
Analyzed By: Tarek Fata							
EWR-80039	From under white cementitious right side of the wall	Gray cementitions like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -25		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80040	From under white cementitious left side of the wall	Gray cementitions like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -26		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80041	From under white cementitious middle of the wall	Gray cementitions like material	PLM		100% Mineral Filler		NONE DETECTED
23936 -27		Color: Gray		Comments:			
Analyzed By: Tarek Fata							

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Mohamed Fata
Analyst:

Aleks Barengolts
Analyst:

Rec. No.	Vendor Billing No. BATCH 23924

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

E/C

Laboratory Destination:	EMSL
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 6

Sample Type - **LEAD** [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set)	
	EWR- 30042	EWR- 30080	39	RELINQUISHED BY:	DATE TIME 5/8/12 1510
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY	DATE TIME

RELINQUISHED BY: C. Pater	DATE: 5/8/12 TIME: 1510	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY: [signature]	DATE: 5/8/12 TIME: 16:15	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY: Courier	DATE: 5/8/12 TIME: 5:05 pm	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY: Rene. A Barajas	DATE: 5-8-12 TIME: 05:50	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY:	DATE: TIME:	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: Svetlana Abdukayeva	LAB NAME: ATC DATE: 5/8/12 TIME: 5:05 pm	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

Analyzed By: ATC - M.Fata - 5/8/12 - 23:59 39 NOB Plus 35 NOB TEM

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The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23924

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building: Hangar 14

Contract No.: EWR-151.120

Floor: 2nd

Job No.:

Area Description: Office Area

Date: 5/8/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80042	Room 220 C Yellow Carpet Glue Like Material
LAB No:	
EWR- 80043	Room 220 C Gray 9"x9" Floor Tile Like Material
LAB No:	
EWR- 80044	Room 220 C Mastic Like Beneath Gray 9"x9" Floor Tile Like Material
LAB No:	
EWR- 80045	Room 225 B Yellow Carpet Glue Like Material
LAB No:	
EWR- 80046	Room 225 B Gray 9"x9" Floor Tile Like Material
LAB No:	
EWR- 80047	Room 225 B Mastic Like Material Beneath Gray 9"x9" Floor Tile Like Material
LAB No:	
EWR- 80048	Room 226 Yellow Carpet Glue Backing Like Material
LAB No:	
EWR- 80049	Room 226 Gray 9"x9" Floor Tile Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Laidford

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9-98

23924

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR-151.120

Floor 2nd

Job No.:

Area Description Office Area

Date: 5/8/17

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80050	Room 226 Mastic Like Material Beneath Gray 9x9" Floor Tile Like Material
LAB No:	
EWR- 80051	Hallway at Entrance to Room 219A Beige 9x9" Floor Tile Like Material
LAB No:	
EWR- 80052	Hallway at Entrance to Room 219A Mastic Like Material Beneath Beige 9x9" Floor Tile
LAB No:	
EWR- 80053	Hallway at Entrance to Room 226 Beige 9x9" Floor Tile Like Material
LAB No:	
EWR- 80054	Hallway at Entrance to Room 226 Mastic Like Material Beneath 9x9" Floor Tile Like Material
LAB No:	
EWR- 80055	Hallway at Entrance to Room 217 Beige 9x9" Floor Tile Like Material
LAB No:	
EWR- 80056	Hallway at Entrance to Room 217 Mastic Like Material Beneath Beige 9x9" Floor Tile Like Material
LAB No:	
EWR- 80057	Room 214 Yellow Carpet Like Material
LAB No:	

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR-151.120

Floor 2nd

Job No.:

Area Description Office Area

Date: 5/8/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80058	Room 214 Brown 12x12 Floor Tile Like Material
LAB No:	
EWR- 80059	Room 214 Mastic Like Material Beneath Brown 12x12 Floor Tile Like Material
LAB No:	
EWR- 80060	Room 213 Yellow Carpet Glue Like Material
LAB No:	
EWR- 80061	Room 213 Brown 12x12 Floor Tile Like Material
LAB No:	
EWR- 80062	Room 213 Mastic Like Material Beneath Brown 12x12 Floor Tile Like Material
LAB No:	
EWR- 80063	Room 211 Yellow Carpet Glue Like Material
LAB No:	
EWR- 80064	Room 211 Brown 12x12 Floor Tile Like Material
LAB No:	
EWR- 80065	Room 211 Mastic Like Material Beneath Brown 12x12 Floor Tile
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Laidford

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: DOR-151.120

Floor 2nd

Job No.:

Area Description Office Area

Date: 5/8/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80066	Stairwell #1 Beige 9x9 Floor Tile Like Material
LAB No:	
EWR- 80067	Stairwell #1 Mastic Like Material Beneath Beige 9x9 Floor Tile Like Material
LAB No:	
EWR- 80068	Hallway at Entrance to Room 205 Beige 9x9 Floor Tile Like Material
LAB No:	
EWR- 80069	Hallway at Entrance to Room 205 Mastic Like Material Beneath Beige 9x9 Floor Tile Like Material
LAB No:	
EWR- 80070	Room 202-D Beige 9x9 Floor Tile Like Material
LAB No:	
EWR- 80071	Room 202-D Mastic Like Material Beneath Beige 9x9 Floor Tile Like Material
LAB No:	
EWR- 80072	Room 202-H Yellow Carpet Glue Like Material
LAB No:	
EWR-	
LAB No:	

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Environmental Field Operations
P.A.C.M Sampling Form

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hangar 14

Contract No.: EWR-151.120

Floor 2nd

Job No.:

Area Description Office Area

Date: 5/8/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80073	Room 202H Lt Brown 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80074	Room 202H Glue/ Mastic Like Material Beneath Light Brown 12x12 Floor Tile Like Material
LAB No:	
EWR- 80075	Room 202H Yellow Carpet Glue Like Material
LAB No:	
EWR- 80076	Room 202H Light Brown 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80077	Room 202H Mastic Like Material Beneath 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80078	Room 202H Yellow Carpet Glue Like Material
LAB No:	
EWR- 80079	Room 202H Light Brown 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80080	Room 202H Mastic Like Material Beneath Light Brown Floor Tile 12"x12"
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Laid Ford

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: HANGER 14 2ND FLOOR, OFFICE AREA

Sample Date : 5/8/2012
Date Received : 5/8/2012
Date Analyzed : 5/9/2012
ATC Batch # 23924
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80042	Room 220 C	Yellow carpet glue like material	NOB-TEM			57.8% Organic 28.5% Residue 13.7% Carbonate	NONE DETECTED
23924 -1		Color: YELLOW					
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80043	Room 220 C	Gray 9" x 9" floor tile like material	NOB-TEM			29.3% Organic 17.8% Residue 51.3% Carbonate	1.6% Chrysotile
23924 -2		Color: GRAY					
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.6 %
EWR-80044	Room 220 C	Mastic like beneath gray 9" x 9" floor tile like material	NOB-TEM			74.3% Organic 6.1% Residue 19.1% Carbonate	0.5% Chrysotile
23924 -3		Color: BLACK					
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.5 %
EWR-80045	Room 225 B	Yellow carpet glue like material	NOB-TEM			60.1% Organic 25.5% Residue 14.4% Carbonate	NONE DETECTED
23924 -4		Color: YELLOW					
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80046	Room 225 B	Gray 9" x 9" floor tile like material	NOB-TEM			36.9% Organic 14.4% Residue 47.1% Carbonate	1.6% Chrysotile
23924 -5		Color: GRAY					
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.6 %
EWR-80047	Room 225 B	Mastic like material beneath gray 9" x 9" floor tile like material	NOB-TEM			68.8% Organic 9.3% Residue 22.3% Carbonate	1.6% Chrysotile
23924 -6		Color: BLACK					
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.6 %
EWR-80048	Room 226	Yellow carpet glue booking like material	NOB-TEM			61.4% Organic 27.3% Residue 11.3% Carbonate	NONE DETECTED
23924 -7		Color: YELLOW					
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80049 23924 -8	Room 226	Gray 9" x 9" floor tile like material Color: GRAY	NOB-TEM			31.2% Organic 12.8% Residue 53.7% Carbonate	2.3% Chrysotile
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 2.3 %
EWR-80050 23924 -9	Room 226	Mastic like material beneath gray 9" x 9" floor tile like material Color: BLACK	NOB-TEM			76.6% Organic 3.8% Residue 18% Carbonate	1.6% Chrysotile
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.6 %
EWR-80051 23924 -10	Hallway at entrance to room 219 A	Beige 9" x 9" floor tile like material Color: BEIGE	NOB-PLM			42.4% Organic 17.9% Residue 21.9% Carbonate	17.8% Chrysotile
Analyzed By: Mohamed Fata				Comments: PLM inconclusive			Total Asbestos: 17.8 %
EWR-80052 23924 -11	Hallway at entrance to room 219 A	Mastic like material beneath beige 9" x 9" floor tile like material Color: BLACK	NOB-TEM			88.4% Organic 4.9% Residue 6.4% Carbonate	0.3% Chrysotile
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.3 %
EWR-80053 23924 -12	Hallway at entrance to room 226	Beige 9" x 9" floor tile like material Color: BEIGE	NOB-PLM			35.1% Organic 10.8% Residue 43.2% Carbonate	10.9% Chrysotile
Analyzed By: Mohamed Fata				Comments: PLM inconclusive			Total Asbestos: 10.9 %
EWR-80054 23924 -13	Hallway at entrance to room 226	Mastic like material beneath 9" x 9" floor tile like material Color: BLACK	NOB-TEM			78.3% Organic 4.9% Residue 15.1% Carbonate	1.7% Chrysotile
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.7 %
EWR-80055 23924 -14	Hallway at entrance to room 217	Beige 9" x 9" floor tile like material Color: BEIGE	NOB-PLM			33.2% Organic 14.2% Residue 43.2% Carbonate	9.4% Chrysotile
Analyzed By: Mohamed Fata				Comments: PLM inconclusive			Total Asbestos: 9.4 %
EWR-80056 23924 -15	Hallway at entrance to room 217	Mastic like material beneath beige 9" x 9" floor tile like material Color: BLACK	NOB-TEM			78.5% Organic 4.7% Residue 15.2% Carbonate	1.6% Chrysotile
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.6 %
EWR-80057 23924 -16	Room 214	Yellow carpet like material Color: YELLOW	NOB-TEM			57.1% Organic 24.2% Residue 18.7% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80058 23924 -17	Room 214	Brown 12 x 12 floor tile like material Color: BROWN	NOB-TEM			30.8% Organic 11.6% Residue 57.6% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80059 23924 -18	Room 214	Mastic like material beneath brown 12" x 12" floor tile like material	NOB-TEM			33.8% Organic 12.5% Residue 53.7% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts	Color: YELLOW	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80060 23924 -19	Room 213	Yellow carpet glue like material	NOB-TEM			54.2% Organic 16.8% Residue 29% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts	Color: YELLOW	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80061 23924 -20	Room 213	Brown 12 x 12 floor tile like material	NOB-TEM			33.2% Organic 16.7% Residue 50.1% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts	Color: BROWN	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80062 23924 -21	Room 213	Mastic like material beneath brown 12" x 12" floor tile like material	NOB-TEM			35.9% Organic 16% Residue 48.1% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts	Color: BLACK	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80063 23924 -22	Room 211	Yellow carpet glue like material	NOB-TEM			61% Organic 17.4% Residue 21.6% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts	Color: YELLOW	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80064 23924 -23	Room 211	Brown 12 x 12 floor tile like material	NOB-TEM			26.7% Organic 16.1% Residue 57.2% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts	Color: BROWN	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80065 23924 -24	Room 211	Mastic like material beneath brown 12" x 12" floor tile like material	NOB-TEM			25.4% Organic 13.4% Residue 61.2% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts	Color: BLACK	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80066 23924 -25	Staircase #1	Beige 9" x 9" floor tile like material	NOB-TEM			26.7% Organic 11.3% Residue 57.1% Carbonate	4.9% Chrysotile
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts	Color: BEIGE	Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 4.9 %**
EWR-80067 23924 -26	Staircase #1	Mastic like material beneath gray 9" x 9" floor tile like material	NOB-TEM			79.5% Organic 9.3% Residue 11.2% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts	Color: BLACK	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80068 23924 -27	Hallway at entrance to room 205	Beige 9" x 9" floor tile like material	NOB-PLM			32% Organic 12.4% Residue 43.1% Carbonate	12.5% Chrysotile
Analyzed By: Mohamed Fata			Color: BEIGE	Comments: PLM inconclusive			**Total Asbestos: 12.5 %**

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80069 23924 -28	Hallway at entrance to room 205	Mastic like material beneath beige 9" x 9" floor tile like material Color: BLACK	NOB-TEM			88.2% Organic 7.3% Residue 4.5% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80070 23924 -29	Room 202D	Beige 9" x 9" floor tile like material Color: BEIGE	NOB-TEM			35.8% Organic 9.5% Residue 51.5% Carbonate	3.2% Chrysotile
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 3.2 %
EWR-80071 23924 -30	Room 202D	Mastic like material beneath beige 9" x 9" floor tile like material Color: BLACK	NOB-TEM			87.9% Organic 5.3% Residue 6.8% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80072 23924 -31	Room 202H	Yellow carpet glue like material Color: YELLOW	NOB-TEM			59.8% Organic 20.6% Residue 19.6% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB PLM inconclusive			
EWR-80073 23924 -32	Room 202H	Light brown 12 x 12 floor tile like material Color: BROWN	NOB-TEM			23.9% Organic 1.2% Residue 74.9% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80074 23924 -33	Room 202H	Mastic like material beneath light brown 12" x 12" floor tile like material Color: BLACK	NOB-TEM			68.9% Organic 15.3% Residue 15.8% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80075 23924 -34	Room 202H	Yellow carpet glue like material Color: YELLOW	NOB-TEM			62.1% Organic 24% Residue 13.9% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80076 23924 -35	Room 202H	Light brown 12 x 12 floor tile like material Color: BROWN	NOB-TEM			23.1% Organic 2.2% Residue 74.7% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80077 23924 -36	Room 202H	Mastic like material beneath brown 12" x 12" floor tile like material Color: BLACK	NOB-TEM			64.8% Organic 14% Residue 21.2% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80078 23924 -37	Room 202H	Yellow carpet glue like material Color: YELLOW	NOB-TEM			56% Organic 24.7% Residue 19.3% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80079	Room 202H	Brown 12 x 12 floor tile like material	NOB-TEM			19.9% Organic 1.4% Residue 78.7% Carbonate	NONE DETECTED
23924 -38		Color: L-BROWN					
Analyzed By: Mohamed Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80080	Room 202H	Mastic like material beneath brown floor tile 12" x 12"	NOB-PLM			27.1% Organic 2.3% Residue 70.6% Carbonate	NONE DETECTED
23924 -39		Color: BLACK					
Analyzed By: Mohamed Fata				Comments: PLM inconclusive, NOB-PLM inconclusive, positive stop, see #			

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch #_____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Mohamed Fata MB for MFata
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Aleks Barengolts MB for ABaren
Analyst:

Rec. No.	Vendor Billing No. BATCH 23 740

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

E/F

Laboratory Destination:	~~EMSL~~ ATC
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 9

Sample Type - **LEAD** [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
1	EWR-80081	EWR-80141	61	RELINQUISHED BY: C. Pierce	DATE TIME 5/9/12 1530
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: C. Pierce	DATE: 5/9/12 TIME: 1530	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY: J Milnar	DATE: 5-10-12 TIME: 1530	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY: Courier	DATE: 5/10/12 TIME: 16:30	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
~~RECEIVED BY~~:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: ATC-Thala	DATE: 5/10/12 TIME: 700P	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
~~RECEIVED BY~~:	DATE: TIME:	
RECEIVED AT THE LAB BY: M Bonezzi	LAB NAME: ATC DATE: 5/10/12 TIME: 16:30	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

M

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9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23940

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor: 2

Job No.:

Area Description: office Area

Date: 5/9/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80081	Room 220 N Gray 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80082	Room 220 N Yellow Glue Like Material Beneath Gray 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80083	Room 203 F Gray 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80084	Room 203 F Yellow Glue Like Material Beneath Gray 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80085	Room 203 F Gray 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80086	Room 203 F Yellow Glue Like Material Beneath Gray 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80087	Room 203 F Green 9"x9" Floor Tile Like Material (Layer 2) Beneath Gray 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80088	Room 203 F Mastic Like Material Beneath Green 12"x12" Floor Tile Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Lindford

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23940

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description Office Area

Date: 5/9/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80089	Room 203 F Green 9"x9" Floor Tile Like Material (Layer 2) Beneath Gray 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80090	Room 203 F Mastic Like Material Beneath Green 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80091	Room 203 F Green 9"x9" Floor Tile Like Material (Layer 2) Beneath Gray 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80092	Room 203 F Mastic Like Material Beneath Green 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80093	Staircase #2 White 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80094	Staircase #2 Mastic Like Material White 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80095	Staircase #2 White 12"x12" Floor Tile Like Material
LAB No:	
EWR- 80096	Staircase #2 Mastic Like Material Beneath 12"x12" Floor Tile Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Lad Ecd

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Environmental Field Operations
P.A.C.M Sampling Form

2394-10

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description OCE Fire Area

Date: 5/9/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80097	Stairwell #7 White 12x12 Floor Tile Like Material
LAB No:	
EWR- 80098	Stairwell #7 mastic Like Material Beneath White 12x12 Floor Tile Like Material
LAB No:	
EWR- 80099	Room 220 N White 12x12 Ceiling Tile with Large Holes
LAB No:	
EWR- 80100	Room 220 N White 12x12 Ceiling Tile with Large Holes
LAB No:	
EWR- 80101	Room 220 N White 12x12 Ceiling Tile with Large Holes
LAB No:	
EWR- 80102	Room 220 N Formica Countertop Like Material
LAB No:	
EWR- 80103	Room 220 N Formica Countertop Like Material
LAB No:	
EWR- 80104	Room 220 N Formica Countertop Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Ledford

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Engineering Department
Environmental Field Operations
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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description Office Area

Date: 5/9/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80105	Room 220N Gray Vinyl Cove Base Like Material (6" High)
LAB No:	
EWR- 80106	Room 220N Glue Like Material Behind Gray Vinyl Cove Base Like Material (6" High)
LAB No:	
EWR- 80107	Room 220K Gray Vinyl Cove Base Like Material (6" High)
LAB No:	
EWR- 80108	Room 220K Glue Like Material Behind Gray Vinyl Cove Base Like Material (6" High)
LAB No:	
EWR- 80109	In Hall Adjacent to Room 226 Gray Vinyl Cove Base Like Material (6" High)
LAB No:	
EWR- 80110	In Hallway Adjacent to Room 226 Glue Like Material Behind Gray Vinyl Cove Base Like Material (6" High)
LAB No:	
EWR- 80111	Room 220N White Window Caulking Like Material
LAB No:	
EWR- 80112	Room 220N White Window Glazing Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Laidfed

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description Office Area

Date: 5/9/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80113	Room 210 Black Sealant Like Material
LAB No:	
EWR- 80114	Room 214 White Patching Window Glazing Like Material
LAB No:	
EWR- 80115	Room 214 White Patching Window Glazing Like Material
LAB No:	
EWR- 80116	Room 214 White Patching Window Glazing Like Material
LAB No:	
EWR- 80117	Room 214 White Glazing Like Material
LAB No:	
EWR- 80118	Room 203B White Window Glazing Like Material
LAB No:	
EWR- 80119	Room 214 Gray & Vinyl Cove Base Like Material
LAB No:	
EWR- 80120	Room 214 Yellow Glue Backing Like Material Behind Gray & Vinyl Cove Base Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Ledford

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Environmental Field Operations
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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description Office Area

Date: 5/9/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80121	Hallway Outside Room 212 Gray 4" Vinyl Cove Base Like Material
LAB No:	
EWR- 80122	Hallway Outside Room 212 Yellow Glue Backing Like Material Behind Gray 4" Vinyl Cove Base Like Material
LAB No:	
EWR- 80123	Room 210 Gray 4" Vinyl Cove Base Like Material
LAB No:	
EWR- 80124	Room 210 Yellow Glue Backing Like Material Behind Gray 4" Vinyl Cove Base Like Material
LAB No:	
EWR- 80125	Hallway Adj. to Room 210 Brown Glue Backing Like Material
LAB No:	
EWR- 80126	Hallway Adj to Room 210 Brown Glue Backing Like Material
LAB No:	
EWR- 80127	Hallway Adj Room 211 Brown Glue Backing Like Material
LAB No:	
EWR- 80128	Room 220 N Black Sealant Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M Laid-Ford

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Environmental Field Operations
P.A.C.M Sampling Form

23940

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building: Hanger 14

Contract No.: EWR 151.120

Floor: 2

Job No.:

Area Description: Office Area

Date: 5/9/02

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80129	Room 220N Black Sealant Like Material
LAB No:	
EWR- 80130	Hallway Adjacent to Room 206 A Brown 6" Cove Base Like Material
LAB No:	
EWR- 80131	Hallway Adjacent to Room 206 A Brown Glue Like Material Behind Brown 6" Cove Base Like Material
LAB No:	
EWR- 80132	Hallway Adjacent Room 205 Brown 6" Cove Base Like Material
LAB No:	
EWR- 80133	Hallway Adjacent Room 205 Brown Glue Like Material Behind Brown 6" Cove Base Like Material
LAB No:	
EWR- 80134	Hallway Adjacent Room 202 A Dark Brown 6" Cove Base Like Material
LAB No:	
EWR- 80135	Hallway Adjacent Room 202 A Black Glue Like Material Behind Brown 6" Cove Base Like Material
LAB No:	
EWR- 80136	Hallway Adjacent Room 202 A Dark Brown 6" Cove Base Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Laid Ford

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description Office Area

Date: 5/9/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80137	Hallway Adjacent to Room 202A Black Glue Like Material Behind Brown 6" Cove Base Like Material
LAB No:	
EWR- 80138	Hallway Adjacent to Room 202A Dark Brown 6" Cove Base Like Material
LAB No:	
EWR- 80139	Hallway Adjacent to Room 202A Black Glue Like Material Behind Brown 6" Cove Base Like Material
LAB No:	
EWR- 80140	Hallway Adjacent to Room 208 Brown 6" Cove Base Like Material
LAB No:	
EWR- 80141	Hallway Adjacent to Room 208 Brown Glue Like Material Behind Brown 6" Cove Base Like Material
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Laid Ford

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: HANGER 14 2ND FLOOR OFFICE AREA

Sample Date : 5/9/2012
Date Received : 5/10/2012
Date Analyzed : 5/10/2012
ATC Batch # 23940
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
80081	ROOM 220N	GRAY 12" X 12" FLOOR TILE LIKE MATERIAL	NOB-TEM			22.8% Organic 18% Residue 59.2% Carbonate	NONE DETECTED
23940 -1		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80082	ROOM 220N	YELLOW GLUE LIKE MATERIAL BENEATH GRAY 12" X 12" FLOOR TILE LIKE MATERIAL	NOB-TEM			29% Organic 14.5% Residue 56.5% Carbonate	Trace Chrysotile
23940 -2		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: TRACE**
EWR-80083	ROOM 203F	GRAY 12" X 12" FLOOR TILE LIKE MATERIAL	NOB-TEM			16% Organic 4.6% Residue 79.4% Carbonate	NONE DETECTED
23940 -3		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80084	ROOM 203F	YELLOW GLUE LIKE MATERIAL BENEATH GRAY 12" X 12" FLOOR TILE LIKE MATERIAL	NOB-TEM			31.6% Organic 16.2% Residue 41.5% Carbonate	10.7% Chrysotile
23940 -4		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 10.7 %**
EWR-80085	ROOM 203F	GRAY 12" X 12" FLOOR TILE LIKE MATERIAL	NOB-TEM			15.2% Organic 2.5% Residue 82.3% Carbonate	NONE DETECTED
23940 -5		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80086	ROOM 203F	YELLOW GLUE LIKE MATERIAL BENEATH GRAY 12" X 12" FLOOR TILE LIKE MATERIAL	NOB-TEM			22% Organic 2.5% Residue 75.5% Carbonate	NONE DETECTED
23940 -6		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80087	ROOM 203F	GREEN 9" X 9" FLOOR TILE LIKE MATERIAL (LAYER 2) BENEATH GRAY 12" X 12" FLOOR TILE LIKE MATERIAL	NOB-TEM			19.3% Organic 12% Residue 68.7% Carbonate	NONE DETECTED
23940 -7		Color: GREEN					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
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Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80088 23940 -8	ROOM 203F	MASTIC LIKE MATERIAL BENEATH GREEN 12" X 12" FLOOR TILE LIKE MATERIAL Color: YELLOW	NOB-TEM			23% Organic 18% Residue 59% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80089 23940 -9	ROOM 203F	GREEN 9" X 9" FLOOR TILE LIKE MATERIAL (LAYER 2) BENEATH GRAY 12" X 12" FLOOR TILE LIKE MATERIAL Color: GREEN	NOB-TEM			20.2% Organic 13% Residue 66.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80090 23940 -10	ROOM 203F	MASTIC LIKE MATERIAL BENEATH GREEN 12" X 12" FLOOR TILE LIKE MATERIAL Color: YELLOW	NOB-TEM			21.8% Organic 5.1% Residue 73.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80091 23940 -11	ROOM 203F	GREEN 9" X 9" FLOOR TILE LIKE MATERIAL (LAYER 2) BENEATH GRAY 12" X 12" FLOOR TILE LIKE MATERIAL Color: GREEN	NOB-TEM			20% Organic 10.9% Residue 69.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80092 23940 -12	ROOM 203F	MASTIC LIKE MATERIAL BENEATH GREEN 12" X 12" FLOOR TILE LIKE MATERIAL Color: YELLOW	NOB-TEM			21.2% Organic 8.4% Residue 70.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80093 23940 -13	STAIRCASE #2	WHITE 12" X 12" FLOOR TILE LIKE MATERIAL Color: GRAY	NOB-TEM			24.1% Organic 9.9% Residue 66% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80094 23940 -14	STAIRCASE #2	MASTIC LIKE MATERIAL WHITE 12" X 12" FLOOR TILE LIKE MATERIAL Color: BLACK	NOB-TEM			71.3% Organic 8.1% Residue 20.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80095 23940 -15	STAIRCASE #2	WHITE 12" X 12" FLOOR TILE LIKE MATERIAL Color: GRAY	NOB-TEM			27.5% Organic 6.7% Residue 65.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80096 23940 -16	STAIRCASE #2	MASTIC LIKE MATERIAL BENEATH 12" X 12" FLOOR TILE LIKE MATERIAL Color: BLACK	NOB-TEM			67.7% Organic 17% Residue 15.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80097 23940 -17	STAIRCASE #2	WHITE 12" X 12" FLOOR TILE LIKE MATERIAL Color: WHITE	NOB-TEM			24.2% Organic 14% Residue 61.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80098	STAIRCASE #2	MASTIC LIKE MATERIAL BENEATH WHITE 12" X 12" FLOOR TILE LIKE MATERIAL	NOB-TEM			71% Organic 22.4% Residue 6.4% Carbonate	0.2% Chrysotile
23940 -18		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.2 %
EWR-80099	ROOM 220N	WHITE 12" X 12" CEILING TILE WITH LARGE HOLES	NOB-TEM			17.1% Organic 75.2% Residue 7.7% Carbonate	NONE DETECTED
23940 -19		Color: WHITE					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80100	ROOM 220N	WHITE 12" X 12" CEILING TILES WITH LARGE HOLES	NOB-TEM			16.9% Organic 81.5% Residue 1.6% Carbonate	NONE DETECTED
23940 -20		Color: WHITE					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80101	ROOM 220N	WHITE 12" X 12" CEILING TILES WITH LARGE HOLES	NOB-TEM			15.2% Organic 73.1% Residue 11.7% Carbonate	NONE DETECTED
23940 -21		Color: WHITE					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80102	ROOM 220N	FORMICA COUNTERTOP LIKE MATERIAL	NOB-TEM			92.7% Organic 3.4% Residue 3.9% Carbonate	NONE DETECTED
23940 -22		Color: BROWN					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80103	ROOM 220N	FORMICA COUNTERTOP LIKE MATERIAL	NOB-TEM			95.4% Organic 1.8% Residue 2.8% Carbonate	NONE DETECTED
23940 -23		Color: BROWN					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80104	ROOM 220N	FORMICA COUNTERTOP LIKE MATERIAL	NOB-TEM			87.3% Organic 4.7% Residue 8% Carbonate	NONE DETECTED
23940 -24		Color: BROWN					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80105	ROOM 220N	GRAY VINYL COVE BASE LIKE MATERIAL (6" HIGH)	NOB-TEM			38.2% Organic 1.6% Residue 60.2% Carbonate	NONE DETECTED
23940 -25		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80106	ROOM 220N	GLUE LIKE MATERIAL BEHIND GRAY VINYL COVE BASE LIKE MATERIAL (6" HIGH)	NOB-TEM			44.1% Organic 2.7% Residue 53.2% Carbonate	NONE DETECTED
23940 -26		Color: TAN					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80107	ROOM 220K	GRAY VINYL COVE BASE LIKE MATERIAL (6" HIGH)	NOB-TEM			55% Organic 3.8% Residue 41.2% Carbonate	NONE DETECTED
23940 -27		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80108 23940 -28	ROOM 220K	GLUE LIKE MATERIAL BEHIND GRAY VINYL COVE BASE LIKE MATERIAL (6" HIGH) Color: TAN	NOB-TEM			44.8% Organic 3% Residue 52.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80109 23940 -29	IN HALL ADJACENT TO ROOM 226	GRAY VINYL COVE BASE LIKE MATERIAL (6" HIGH) Color: GRAY	NOB-TEM			40.1% Organic 1.8% Residue 58.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80110 23940 -30	IN HALLWAY ADJACENT TO ROOM 226	GLUE LIKE MATERIAL BEHIND GRAY VINYL COVE BASE LIKE MATERIAL (6" HIGH) Color: TAN	NOB-TEM			47.6% Organic 1.7% Residue 50.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80111 23940 -31	ROOM 220N	WHITE WINDOW CAULKING LIKE MATERIAL Color: WHITE	NOB-TEM			15.2% Organic 3.1% Residue 81.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80112 23940 -32	ROOM 220N	WHITE WINDOW GLAZING LIKE MATERIAL Color: WHITE	NOB-TEM			13.1% Organic 1.7% Residue 85.2% Carbonate	Trace Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: TRACE**
EWR-80113 23940 -33	ROOM 220N	BLACK SEALANT LIKE MATERIAL Color: BLACK	NOB-TEM			16.5% Organic 2.2% Residue 81.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80114 23940 -34	ROOM 214	WHITE PATCHING WINDOW GLAZING LIKE MATERIAL Color: WHITE	NOB-TEM			12% Organic 2% Residue 86% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80115 23940 -35	ROOM 214	WHITE PATCHING WINDOW GLAZING LIKE MATERIAL Color: WHITE	NOB-TEM			10.7% Organic 10.4% Residue 78.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80116 23940 -36	ROOM 214	WHITE PATCHING WINDOW GLAZING LIKE MATERIAL Color: WHITE	NOB-TEM			10.9% Organic 3.4% Residue 85.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80117 23940 -37	ROOM 214	WHITE GLAZING LIKE MATERIAL Color: WHITE	NOB-TEM			8.3% Organic 1.4% Residue 90.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80118 23940 -38	ROOM 203B	WHITE WINDOW GLAZING LIKE MATERIAL Color: WHITE	NOB-TEM			8.4% Organic 1.2% Residue 90.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80119 23940 -39	ROOM 214	GRAY 4" VINYL COVE BASE LIKE MATERIAL Color: GRAY	NOB-TEM			31% Organic 1.2% Residue 67.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80120 23940 -40	ROOM 214	YELLOW GLUE BACKING LIKE MATERIAL BEHIND GRAY 4" VINYL COVE BASE LIKE MATERIAL Color: YELLOW	NOB-TEM			30.8% Organic 4.1% Residue 65.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80121 23940 -41	HALLWAY OUTSIDE ROOM 212	GRAY 4" VINYL COVE BASE LIKE MATERIAL Color: GRAY	NOB-TEM			33.9% Organic 1.6% Residue 64.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80122 23940 -42	HALLWAY OUTSIDE ROOM 212	YELLOW GLUE BACKING LIKE MATERIAL BEHIND GRAY 4" VINYL COVE BASE LIKE MATERIAL Color: YELLOW	NOB-TEM			30.1% Organic 3% Residue 66.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80123 23940 -43	ROOM 210	GRAY 4" VINYL COVE BASE LIKE MATERIAL Color: GRAY	NOB-TEM			50.2% Organic 2.3% Residue 47.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80124 23940 -44	ROOM 210	YELLOW GLUE BACKING LIKE MATERIAL BEHIND GRAY 4" VINYL COVE BASE LIKE MATERIAL Color: YELLOW	NOB-TEM			50.9% Organic 1.5% Residue 47.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80125 23940 -45	HALLWAY ADJ. TO ROOM 210	BROWN GLUE BACKING LIKE MATERIAL Color: BROWN	NOB-TEM			39% Organic 2.1% Residue 58.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80126 23940 -46	HALLWAY ADJ. TO ROOM 210	BROWN GLUE BACKING LIKE MATERIAL Color: BROWN	NOB-TEM			39% Organic 2.8% Residue 58.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80127 23940 -47	HALLWAY ADJ. ROOM 211	BROWN GLUE BACKING LIKE MATERIAL Color: BROWN	NOB-TEM			37.9% Organic 5.3% Residue 56.5% Carbonate	0.3% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 0.3 %**

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80128 23940 -48	ROOM 220N	BLACK SEALANT LIKE MATERIAL Color: BLACK	NOB-TEM			12.8% Organic 12.9% Residue 73.6% Carbonate	0.7% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.7 %
EWR-80129 23940 -49	ROOM 220N	BLACK SEALANT LIKE MATERIAL Color: GRAY	NOB-TEM			12.1% Organic 16.2% Residue 71.7% Carbonate	Trace Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM Inconclusive, NOB-PLM Inconclusive			Total Asbestos: TRACE
EWR-80130 23940 -50	HALLWAY ADJACENT TO ROOM 206A	BROWN 6" COVE BASE LIKE MATERIAL Color: BROWN	NOB-TEM			35.2% Organic 36.7% Residue 28.1% Carbonate	Trace Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: TRACE
EWR-80131 23940 -51	HALLWAY ADJACENT TO ROOM 206A	BROWN GLUE LIKE MATERIAL BEHIND BROWN 6" COVE BASE LIKE MATERIAL Color: BROWN	NOB-TEM			54.2% Organic 30.5% Residue 15.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80132 23940 -52	HALLWAY ADJACENT ROOM 205	BROWN 6" COVE BASE LIKE MATERIAL Color: BROWN	NOB-TEM			33.3% Organic 22.3% Residue 44.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80133 23940 -53	HALLWAY ADJACENT ROOM 205	BROWN GLUE LIKE MATERIAL BEHIND BROWN 6" COVE BASE LIKE MATERIAL Color: BROWN	NOB-TEM			53.2% Organic 39.3% Residue 7.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80134 23940 -54	HALLWAY ADJACENT ROOM 202A	DARK BROWN 6" COVE BASE LIKE MATERIAL Color: BROWN	NOB-TEM			30.1% Organic 28.8% Residue 28.8% Carbonate	12.3% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 12.3 %
EWR-80135 23940 -55	HALLWAY ADJACENT ROOM 202A	BLACK GLUE LIKE MATERIAL BEHIND BROWN 6" COVE BASE LIKE MATERIAL Color: BLACK	NOB-TEM			46.9% Organic 6.5% Residue 45% Carbonate	1.6% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.6 %
EWR-80136 23940 -56	HALLWAY ADJACENT TO ROOM 202A	DARK BROWN 6" COVE BASE LIKE MATERIAL Color: BROWN	NOB-TEM			35.4% Organic 11.5% Residue 50.2% Carbonate	2.9% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 2.9 %
EWR-80137 23940 -57	HALLWAY ADJACENT ROOM 202A	BLACK GLUE LIKE MATERIAL BEHIND BROWN 6" COVE BASE LIKE MATERIAL Color: BLACK	NOB-TEM			45.5% Organic 2.2% Residue 51.5% Carbonate	0.8% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.8 %

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
80138 23940 -58	HALLWAY ADJACENT TO ROOM 202A	DARK BROWN 6" COVE BASE LIKE MATERIAL Color: BROWN	NOB-PLM			28.9% Organic 21.4% Residue 35.5% Carbonate	14.2% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Mohamed Fata		Comments: PLM inconclusive			Total Asbestos: 14.2 %
80139 23940 -59	HALLWAY ADJACENT TO ROOM 202A	BLACK GLUE LIKE MATERIAL BEHIND BROWN 6" COVE BASE LIKE MATERIAL Color: BLACK	NOB-TEM			47.1% Organic 5.7% Residue 46.6% Carbonate	0.6% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.6 %
80140 23940 -60	HALLWAY ADJACENT TO ROOM 208	BROWN 6" COVE BASE LIKE MATERIAL Color: BROWN	NOB-PLM			33.4% Organic 14.3% Residue 38% Carbonate	14.3% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Mohamed Fata		Comments: PLM inconclusive			Total Asbestos: 14.3 %
80141 23940 -61	HALLWAY ADJACENT TO ROOM 208	BROWN GLUE LIKE MATERIAL BEHIND BROWN 6" COVE BASE LIKE MATERIAL Color: BROWN	NOB-TEM			53.8% Organic 42.5% Residue 3.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Mohamed Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No. 23946

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	ATC EMSL
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 7

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [X] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
1	80142	80185	44	RELINQUISHED BY: C. Fuson	DATE TIME 5/11/12 1500
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: C. Fuson	DATE: 5/11/12 TIME: 1500	**FAX RESULTS to: (201) 595-4872**
RECEIVED BY:	DATE: TIME:	**ATTN:**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY: Courier	DATE: 5/11/12 TIME: 4:20 pm	was [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	was not [ ] received within the requested turnaround time
RELINQUISHED BY: Analyzed By: ATC TFata	DATE: 5/11/12 TIME: 7:00 p	If "was not" is checked above, indicate the actual turnaround.
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: Milena Bonezzi	LAB NAME: ATC DATE: 5/11/12 TIME: 4:20 pm	(Signature of R. E.'s Representative) **CHARGE CODE:** (Use a separate C-O-C for each Charge Code)

5/12/12 Milena

PA 3739
9-98

The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23946

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description Office Area

Date: 5/11/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80142	Exterior Window Caulking (White) Like Material
LAB No:	
EWR- 80143	Exterior Window Caulking (White) Like Material
LAB No:	
EWR- 80144	Room 209B Black 3" Cove Base Like Material
LAB No:	
EWR- 80145	Room 209B Brown Glue Backing Like Material Behind Black 3" Cove Base Like Material
LAB No:	
EWR- 80146	Room 209 A Black 3" Cove Base Like Material
LAB No:	
EWR- 80147	Room 209 A Brown Glue Backing Like Material Behind Black 3" Cove Base Like Material
LAB No:	
EWR- 80148	Room 209 C Black 3" Cove Base Like Material
LAB No:	
EWR- 80149	Room 209 C Brown Glue Backing Like Material Behind Black 3" Cove Base Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Laid Ford

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description 2nd fl. Office Area

Date: 5/11/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80150	Room 202A Black 4" Vinyl Cove Base Like Material at Entrance to Room 202C.
LAB No:	
EWR- 80151	Room 202A Yellow Glue Like Material Behind Black 4" Vinyl Cove Base Like Material.
LAB No:	
EWR- 80152	Room 202A at Ent. to Room 202H Black 4" Vinyl Cove Base Like Material
LAB No:	
EWR- 80153	Room 202A at Ent. to Room 202H Yellow Glue Like Material Behind Black 4" Vinyl Cove Base Like Material
LAB No:	
EWR- 80154	Room 202H Black 4" Vinyl Cove Base Like Material
LAB No:	
EWR- 80155	Room 202H Yellow Glue Like Material Behind Black 4" Vinyl Cove Base Like Material
LAB No:	
EWR- 80156	Room 202B Brown 3" Cove Base Like Material
LAB No:	
EWR- 80157	Room 202B Dark Brown Glue Like Material Behind Brown 3" Cove Base Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Laid Ford

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Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description Office Area

Date: 5/11/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80158	Room 202D Brown 3" Cove Base Like Material
LAB No:	
EWR- 80159	Room 202D Dark Brown Glue Like Material Behind Brown 3" Cove Base Like Material
LAB No:	
EWR- 80160	Room 202D Brown 3" Cove Base Like Material
LAB No:	
EWR- 80161	Room 202D Dark Brown Glue Like Material Behind Brown 3" Cove Base Like Material
LAB No:	
EWR- 80162	Room 220H Bathroom 1" Floor Tile Grout Like Material
LAB No:	
EWR- 80163	Room 220H Bathroom 1" Floor Tile Grout Like Material
LAB No:	
EWR- 80164	Room 220H Bathroom 1" Floor Tile Grout Like Material
LAB No:	
EWR- 80165	Room 220H Bathroom 4" Ceramic Wall Tile Grout Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Laidlaw

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description Offices Area

Date: 5/11/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80166	Room 270 H Bathroom 4" Ceramic Wall Tile Grout Like Material
LAB No:	
EWR- 80167	Room 270H Bathroom 4" Ceramic Wall Tile Grout Like Material
LAB No:	
EWR- 80168	Hall Adjacent to Room 270N Yellow Wall Glue Like Material
LAB No:	
EWR- 80169	Hall Adjacent to Room 270N Yellow Wall Glue Like Material
LAB No:	
EWR- 80170	Hall Adjacent to Room 270N Yellow Wall Glue Like Material
LAB No:	
EWR- 80171	Hall Across From Room 226 Dry Wall Like Material
LAB No:	
EWR- 80172	Hall Across From Room 226 Joint Patching Compound
LAB No:	
EWR- 80173	Hall Across From Room 213 Drywall Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Lutford

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Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description Office Area

Date: 5/11/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80174	Hall Across from Room 213 Joint Patching Compound
LAB No:	
EWR- 80175	Hallway At Entrance to Room 203D Drywall Like material
LAB No:	
EWR- 80176	Hallway At Entrance to Room 203D Joint Patching Like Compound.
LAB No:	
EWR- 80177	Hallway Next to Room 207 Entrance Cinder block Mortar
LAB No:	
EWR- 80178	Hallway next to Room 222 Entrance Cinder Block Mortar Like Material.
LAB No:	
EWR- 80179	Hallway Next to Entrance to Room 223 Cinder Block Mortar Like Material
LAB No:	
EWR- 80180	Room 213 Entrance Door Interior Door Insulation Like Material
LAB No:	
EWR- 80181	Room 203B Entrance Door Interior Door Insulation Like Material
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Guidford

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Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2

Job No.:

Area Description Office Area

Date: 5/11/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80182	Room 203 E Entrance Door Interior Door Insulation Like Material
LAB No:	
EWR- 80183	Room 202 B Wall Panelling Glue Backing Like Material
LAB No:	
EWR- 80184	Room 207 C Wall Panelling Glue Backing Like Material
LAB No:	
EWR- 80185	Room 207 D Wall Panelling Glue Backing Like Material
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): C. Pierce, M. Lindfield

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: HANGER 14/ FLOOR 2 / OFFICE AREA

Project # EWR 151.120

Sample Date : 5/11/2012
Date Received : 5/11/2012
Date Analyzed : 5/12/2012
ATC Batch # 23946 A
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80142	Exterior Window	Caulking (White) Like material	NOB-TEM			24.7% Organic 5.4% Residue 68.6% Carbonate	1.3% Chrysotile Trace% Anthophyllite
23946 A -1		Color: Brown					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.3 %
EWR-80143	Exterior Window	Caulking (White) Like material	NOB-TEM			22.4% Organic 7.6% Residue 68.1% Carbonate	1.9% Chrysotile Trace% Anthophyllite
23946 A -2		Color: Brown					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.9 %
EWR-80144	Room 209D	Black 3" cove base like material	NOB-TEM			40.7% Organic 1.5% Residue 57.7% Carbonate	0.1% Chrysotile
23946 A -3		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.1 %
EWR-80145	Room 209D	Brown Glue backing like material Behind Black 3" cove base like material	NOB-TEM			53.9% Organic 30.5% Residue 15.6% Carbonate	NONE DETECTED
23946 A -4		Color: Brown					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80146	Room 209A	Black 3" cove Base Like material	NOB-TEM			41.4% Organic 2% Residue 56.6% Carbonate	NONE DETECTED
23946 A -5		Color: Brown					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80147	Room 209A	Brown glue Backing Like material Behind black 3" Cove Base like material	NOB-TEM			42.8% Organic 4.7% Residue 52.5% Carbonate	NONE DETECTED
23946 A -6		Color: Brown					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80148	Room 209C	Black 3" cove Base like material	NOB-TEM			39% Organic 3.2% Residue 57.8% Carbonate	Trace Chrysotile Trace% Anthophyllite
23946 A -7		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: TRACE

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80149 23946 A -8	Room 209C	Brown Glue Backing like material behind black 3" cove base like material Color: Brown	NOB-TEM			48.8% Organic 25.8% Residue 25.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80150 23946 A -9	Room 202A	Black 4" Vinyl cove base like material At entrance to room 202C Color: Black	NOB-TEM			61.1% Organic 1.4% Residue 37.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80151 23946 A -10	Room 202A	Yellow glue like material Behind black 4" Vinyl cove Base like material Color: Yellow	NOB-TEM			64% Organic 15.5% Residue 20.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80152 23946 A -11	Room 202A at ent. To room 202H	Black 4" vinyl Cove Base like material Color: Black	NOB-TEM			61.7% Organic 4.2% Residue 34.1% Carbonate	Trace Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: TRACE**
EWR-80153 23946 A -12	Room 202A at ent. To room 202H	Yellow glue like material Behind black 4" Vinyl Cove Base like material Color: Yellow	NOB-TEM			71.1% Organic 18.4% Residue 10.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80154 23946 A -13	Room 202H	Black 4" Vinyl cove base Like material Color: Black	NOB-TEM			59.4% Organic 2.8% Residue 37.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80155 23946 A -14	Room 202H	Yellow glue like material behind black 4" Vinyl Cove base like material Color: Yellow	NOB-TEM			75% Organic 24.7% Residue 0.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80156 23946 A -15	Room 202B	Brown 3" Cove Base like material Color: Brown	NOB-TEM			34.8% Organic 24.6% Residue 40.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80157 23946 A -16	Room 202B	Dark Brown Glue like material behind Brown 3" Cove Base like material Color: Brown	NOB-TEM			51.7% Organic 45.8% Residue 2.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80158 23946 A -17	Room 202D	Brown 3" Cove Base like material Color: Brown	NOB-TEM			32.5% Organic 24.6% Residue 42.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80159 23946 A -18	Room 202D	Dark Brown glue like material behind Brown 3" cove base like material	NOB-TEM			51.8% Organic 43.4% Residue 4.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Brown Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80160 23946 A -19	Room 202D	Brown 3" Cove Base like material	NOB-TEM			36.2% Organic 34.2% Residue 29.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Brown Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80161 23946 A -20	Room 202D	Dark Brown Glue like material behind Brown 3" Cove base like material	NOB-TEM			52.1% Organic 36.4% Residue 11.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Brown Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80162 23946 A -21	Room 220H Bathroom	1" floor tile grout like material	NOB-TEM			51.5% Organic 17.5% Residue 29.1% Carbonate	1.9% Chrysotile
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 1.9 %**
EWR-80163 23946 A -22	Room 220H Bathroom	1" floor tile grout like material	NOB-TEM			45.3% Organic 23.1% Residue 16.2% Carbonate	15.4% Chrysotile
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 15.4 %**
EWR-80164 23946 A -23	Room 220H Bathroom	1" floor tile grout like material	NOB-TEM			25.3% Organic 35.5% Residue 35.2% Carbonate	4% Chrysotile
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 4 %**
EWR-80165 23946 A -24	Room 220H Bathroom	4" ceramic Wall tile Grout like material	NOB-TEM			5.9% Organic 7.6% Residue 86.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80166 23946 A -25	Room 220H Bathroom	4" ceramic Wall tile Grout like material	NOB-TEM			5% Organic 18.6% Residue 76.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80167 23946 A -26	Room 220H Bathroom	4" ceramic Wall tile Grout like material	NOB-TEM			5.4% Organic 5.4% Residue 89.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80168 23946 A -27	Hall adjacent to Room 220N	Yellow wall glue like material	NOB-TEM			32% Organic 15.2% Residue 52.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Yellow Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80169	Hall adjacent to Room 220N	Yellow wall glue like material	NOB-TEM			37.4% Organic 22.8% Residue 39.8% Carbonate	NONE DETECTED
23946 A -28		Color: Yellow					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM Inconclusive, NOB-PLM inconclusive			
EWR-80170	Hall adjacent to Room 220N	Yellow wall glue like material	NOB-TEM			28.8% Organic 15.7% Residue 55.5% Carbonate	Trace Chrysotile
23946 A -29		Color: Yellow					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM Inconclusive, NOB-PLM inconclusive			Total Asbestos: TRACE
EWR-80171	Hall Across From room 226	Drywall like material	PLM	20% Cellulose	80% Mineral Filler		NONE DETECTED
23946 A -30		Color: Gray					
Analyzed By: Tarek Fata				Comments:			
EWR-80172	Hall Across From room 226	Joint patching Compound	PLM		100% Mineral Filler		NONE DETECTED
23946 A -31		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-80173	Hall Across from Room 213	Drywall like material	PLM	15% Cellulose	85% Mineral Filler		NONE DETECTED
23946 A -32		Color: Gray					
Analyzed By: Tarek Fata				Comments:			
EWR-80174	Hall Across from Room 213	Joint patching Compound	PLM		100% Mineral Filler		NONE DETECTED
23946 A -33		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-80175	Hallway at entrance to room 203D	Drywall like material	PLM	2% FiberGlass	98% Mineral Filler		NONE DETECTED
23946 A -34		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-80176	Hallway at entrance to room 203D	Joint patching like compound	PLM		100% Mineral Filler		NONE DETECTED
23946 A -35		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-80177	Hallway next to Room 207 entrance	Cinder Block mortar	PLM		100% Mineral Filler		NONE DETECTED
23946 A -36		Color: Gray					
Analyzed By: Tarek Fata				Comments:			
EWR-80178	Hallway next to Room 227 entrance	Cinder Block mortar like material	PLM		100% Mineral Filler		NONE DETECTED
23946 A -37		Color: Gray					
Analyzed By: Tarek Fata				Comments:			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80179	Hallway next to entrance to room 223	Cinder Block mortar like material	PLM		100% Mineral Filler		NONE DETECTED
23946 A -38		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80180	Room 213	Entrance Door Interior Door insulation Like material	PLM	95% Cellulose	5% Mineral Filler		NONE DETECTED
23946 A -39		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80181	Room 203B	Entrance Door Interior Door insulation like material	PLM	94% Cellulose	6% Mineral Filler		NONE DETECTED
23946 A -40		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80182	Room 203E	Entrance Door Interior Door insulation like material	PLM	94% Cellulose	6% Mineral Filler		NONE DETECTED
23946 A -41		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80183	Room 202B	Wall Paneling glue Backing like material	NOB-TEM			62% Organic 10.8% Residue 26% Carbonate	1.2% Chrysotile
23946 A -42		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.2 %
EWR-80184	Room 202C	Wall Paneling glue Backing like material	NOB-TEM			68.8% Organic 14.4% Residue 15.2% Carbonate	1.6% Chrysotile
23946 A -43		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.6 %
EWR-80185	Room 202D	Wall Paneling glue Backing like material	NOB-TEM			64.6% Organic 7.4% Residue 26.7% Carbonate	1.3% Chrysotile
23946 A -44		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.3 %

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10679

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # 23946. Amendments: A. Amendment Dates: 5-12-12 Amended by: EN

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Amended Report to include Trace 0.0001-Anth. on Samples EWR-8014A, EWR-8043 and EWR-8014B

Tarek Fata
Analyst:

Mohamed Fata
Analyst:

Mark Peysakhov
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J. # ~~29956~~ 23956 JYG 5/14/12

ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	(ASBESTOS) - PCM / (PLM) / (TEM) /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

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Sample Type - **LEAD** [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours (X)	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
1	EWR- 80186	EWR- 80203	18	RELINQUISHED BY: [signature]	DATE TIME 5/14/12 1530
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: [signature]	DATE: 5/14/12 TIME: 1530	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY:	DATE: TIME:	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY: courier	DATE: 5-14-12 TIME: 4:30pm	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY: Receiving by TEM, Angela	DATE: TIME: 5/14/2012	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY: Pam, PB Surgery	DATE: TIME: 5/14/12 2:00	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY:	DATE: TIME:	**Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov**
RECEIVED BY: Analyzed By: ATC-Tata	DATE: 5/14/12 TIME: 6:00pm	
RECEIVED AT THE LAB BY: ATC Svetlana Abdullayeva	LAB NAME: ATC DATE: 5-14-12 TIME: 4:30pm	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2nd Floor

Job No.:

Area Description Entire Floor

Date: 5/14/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80186	White Coat Plaster Material Collected From Room 222B, Wall Plaster
LAB No:	
EWR- 80187	Brown Coat Plaster Material Collected From Room 222B, Wall Plaster
LAB No:	
EWR- 80188	White Coat Wall Plaster Material Collected From Room 220D
LAB No:	
EWR- 80189	Brown Coat Wall Plaster Material Collected From Room 220D
LAB No:	
EWR- 80190	White Coat Wall Plaster Material Collected From Room 205
LAB No:	
EWR- 80191	Brown Coat Wall Plaster Material Collected From Room 205
LAB No:	
EWR- 80192	Brown Coat Ceiling Plaster Material Collected From Hall outside Rm 215
LAB No:	
EWR- 80193	Brown Coat Ceiling Plaster Material Collected From Room 224
LAB No:	

Port Authority Inspector(s): Brian Dean, K. Levin

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9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2nd Floor

Job No.:

Area Description Entire Floor

Date: 5/14/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80186	White Coat Plaster Material Collected From Room 222B, Wall Plaster
LAB No:	
EWR- 80187	Brown Coat Plaster Material Collected From Room 222B, Wall Plaster
LAB No:	
EWR- 80188	White Coat Wall Plaster Material Collected From Room 220D
LAB No:	
EWR- 80189	Brown Coat Wall Plaster Material Collected From Room 220D
LAB No:	
EWR- 80190	White Coat Wall Plaster Material Collected From Room 205
LAB No:	
EWR- 80191	Brown Coat Wall Plaster Material Collected From Room 205
LAB No:	
EWR- 80192	Brown Coat Ceiling Plaster Material Collected From Hall outside Rm 215
LAB No:	
EWR- 80193	Brown Coat Ceiling Plaster Material Collected From Room 224
LAB No:	

Port Authority Inspector(s): Brian Dean, K. Levin

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9-98

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of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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23956

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2nd Floor

Job No.:

Area Description Entire Floor

Date: 5/14/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80194	Brown Coat Ceiling Plaster Material Collected From Room 223
LAB No:	
EWR- 80195	White 2'x2' Ceiling Tile Material Collected From Room 220J
LAB No:	
EWR- 80196	White 2'x2' Ceiling Tile Material Collected From Room 220J
LAB No:	
EWR- 80197	White 2'x2' Ceiling Tile material Collected From Room 220K
LAB No:	
EWR- 80198	Decorative Cinderblock Mortar Material Collected From Room 222K9
LAB No:	
EWR- 80199	Decorative Cinderblock Mortar Material Collected From Room 221
LAB No:	
EWR- 80200	Decorative Cinder-block Mortar Material Collected From Room 209B
LAB No:	
EWR- 80201	Fiberglass Ductwork Insulation Glue Dots Material Collected From Room 206A
LAB No:	

Port Authority Inspector(s): Brian Dean, K. Levin

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9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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23956

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, TAR

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2nd Floor

Job No.:

Area Description Entire Floor

Date: 5/14/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80202	Fiberglass Ductwork Insulation Glue Dots Collected From Room 206A
LAB No:	
EWR- 80203	Fiberglass Ductwork Insulation Glue Dots Collected From Room 206A
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s):

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872
Project: NEWARK INTERNATIONAL AIRPORT

Sample Date : 5/14/2012
Date Received : 5/14/2012
Date Analyzed : 5/14/2012
ATC Batch # 23956
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Location: HANGER 14 / 2ND FLOOR ENTIRE FLOOR
Project # EWR 151.120

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80186	From Room 222E, Wall Plaster	White coat Plaster material	PLM		100% Mineral Filler		NONE DETECTED
23956 -1		Color: White		Comments:			
Analyzed By: Tarek Fata							
EWR-80187	From Room 222E, wall Plaster	Brown coat Plaster material	PLM		100% Mineral Filler		NONE DETECTED
23956 -2		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80188	From room 220D	White coat wall plaster material	PLM		100% Mineral Filler		NONE DETECTED
23956 -3		Color: White		Comments:			
Analyzed By: Tarek Fata							
EWR-80189	From Room 220D	Brown coat wall plaster	PLM		100% Mineral Filler		NONE DETECTED
23956 -4		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80190	From Room 205	White coat wall plaster material	PLM		100% Mineral Filler		NONE DETECTED
23956 -5		Color: White		Comments:			
Analyzed By: Tarek Fata							
EWR-80191	From room 205	Brown Coat wall plaster material	PLM		100% Mineral Filler		NONE DETECTED
23956 -6		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80192	From Hall outside Room 215	Brown Coat Ceiling plaster material	PLM		100% Mineral Filler		NONE DETECTED
23956 -7		Color: Brown		Comments:			
Analyzed By: Tarek Fata							

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80193	From room 224	Brown Coat ceiling Plaster material	PLM		100% Mineral Filler		NONE DETECTED
23956 -8		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80194	From Room 223	Brown coat Ceiling plaster material	PLM	Trace% Cellulose	100% Mineral Filler		NONE DETECTED
23956 -9		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80195	From room 220J	White 2' x 2' ceiling tile material	NOB-TEM			21.3% Organic 66.4% Residue 12.3% Carbonate	NONE DETECTED
23956 -10		Color: White		Comments: PLM inconclusive, NOB-PLM Inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-80196	From room 220J	White 2' x 2' ceiling tile material	NOB-TEM			20.2% Organic 48.1% Residue 31.7% Carbonate	NONE DETECTED
23956 -11		Color: White		Comments: PLM inconclusive, NOB-PLM Inconclusive			
Analyzed By: Tarek Fata		Second Analyst: alex Barengolts					
EWR-80197	From room 220K	White 2' x 2' ceiling tile material	NOB-TEM			19.8% Organic 53.4% Residue 26.8% Carbonate	NONE DETECTED
23956 -12		Color: White		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: alex Barengolts					
EWR-80198	From room 222K9	Decorative cinderblock mortar material	PLM		100% Mineral Filler		NONE DETECTED
23956 -13		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80199	From room 221	Decorative cinderblock mortar material	PLM		100% Mineral Filler		NONE DETECTED
23956 -14		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80200	From room 209B	Decorative cinderblock mortar material	PLM		100% Mineral Filler		NONE DETECTED
23956 -15		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80201	From room 206A	Fiberglass Duct work Insulation glue Dots material	PLM	25% FiberGlass	75% Mineral Filler		NONE DETECTED
23956 -16		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80202	From room 206A	Fiberglass Ductwork Insulation Glue Dots	PLM	20% FiberGlass	80% Mineral Filler		NONE DETECTED
23956 -17		Color: Brown		Comments:			
Analyzed By: Tarek Fata							

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80203	From room 206A	Fiberglass Ductwork Insulation Glue Dots	PLM	25% FiberGlass	75% Mineral Filler		NONE DETECTED
23956 -18		Color: Brown		Comments:			

Analyzed By: Tarek Fata

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%, based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Milena Bonezzi M.Bonezzi
Approved by
Laboratory Director:

Aleks Barengolts
Analyst:

Rec. No.	Vendor Billing No. 23964

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL ATC
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

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Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		8						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
1	EWR- 80204	EWR- 80287	84	RELINQUISHED BY:	DATE TIME 5/15/12 1530
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY:	DATE: 5/15/12 TIME: 1530	FAX RESULTS to: (973) 961-6066
RECEIVED BY:	DATE: TIME:	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: 5/15/12 TIME: 2330	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY: Courier	DATE: 5/15/12 TIME: 5:00pm	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: ATC Thatch	DATE: 5/15/12 TIME: 8:00p	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: M Bonezzi	LAB NAME: ATC DATE: 5/15/12 TIME: 5:00 pm	(Signature of R. E.'s Representative) CHARGE CODE: CA44151120 (Use a separate C-O-C for each Charge Code)

M

FA 3719
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The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor: 1st Floor

Job No.:

Area Description: Entire Floor

Date: 5/14/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80204	[redacted] 12"x12" Floor Tile Material Collected [redacted] From Rm #26, Dark Grey Tile.
LAB No:	
EWR- 80205	Yellow Glue Material Collected From Under [redacted] 12"x12" Tile, Dark Grey Tile In Rm. #26
LAB No:	
EWR- 80206	Dark Grey 12"x12" Floor Tile Material Collected From Room #17
LAB No:	
EWR- 80207	Yellow Glue Material Collected From Under Dark Grey 12"x12" Tile In Room #17
LAB No:	
EWR- 80208	Dark Grey 12"x12" Floor Tile Material Collected From Room #17
LAB No:	
EWR- 80209	Yellow Glue Material Collected From Under Dark Grey 12"x12" Tile In Room #17
LAB No:	
EWR- 80210	Grey Leveling Compound Material Collected From Room #17
LAB No:	
EWR- 80211	Grey Leveling Compound Material Collected From Room #17
LAB No:	

Port Authority Inspector(s): B. Dean, K. Levin

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Environmental Field Operations
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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/15/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80212	Grey Leveling Compound Material Collected From Room #17
LAB No:	
EWR- 80213	Light Grey 12"x12" Floor Tile Material Collected From Room 13A
LAB No:	
EWR- 80214	Yellow Glue Material Collected From Under Light Grey 12"x12" Tile In Room 13A
LAB No:	
EWR- 80215	Light Grey 12"x12" Floor Tile Material Collected From Room [redacted] #15
LAB No:	
EWR- 80216	Yellow Glue Material Collected From Under Light Grey 12"x12" Tile In Room #15
LAB No:	
EWR- 80217	Light Grey 12"x12" Floor Tile Material Collected From Room #15
LAB No:	
EWR- 80218	Yellow Glue Material Collected From Under Light Grey 12"x12" Tile In Room #15
LAB No:	
EWR- 80219	Grey 9"x9" Floor Tile Material Under 12"x12" Tile Collected From Room #15
LAB No:	

Port Authority Inspector(s): B. Dean, K. Levin

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/15/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80220	Black Mastic Material Under 9"x9" Grey Tile Collected From Room #15
LAB No:	
EWR- 80221	Grey 9"x9" Floor Tile Material Collected From Room #15
LAB No:	
EWR- 80222	Black Mastic Material Under 9"x9" Grey Tile Collected From Room #15
LAB No:	
EWR- 80223	Grey 9"x9" Floor Tile Material Collected From Room #15
LAB No:	
EWR- 80224	Black Mastic Material Under 9"x9" Grey Tile Collected From Room #15
LAB No:	
EWR- 80225	8"x8" Ceramic Tile Grout Material Collected From Floor of Room #23A
LAB No:	
EWR- 80226	8"x8" Ceramic Tile Grout Material Collected From Floor of Room #23A
LAB No:	
EWR- 80227	8"x8" Ceramic Tile Grout Material Collected From Floor of Room #23A
LAB No:	

Port Authority Inspector(s): B. Dean, K. Leavin

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/15/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80228	2"x2" Ceramic Tile Grout Material Collected From Floor of Room #22
LAB No:	
EWR- 80229	2"x2" Ceramic Tile Grout Material Collected From Floor of Room #22
LAB No:	
EWR- 80230	2"x2" Ceramic Tile Grout Material Collected From Floor of Room #22
LAB No:	
EWR- 80231	4"x4" Ceramic Tile Grout Material Collected From Wall of Room #22
LAB No:	
EWR- 80232	4"x4" Ceramic Tile Grout Material Collected From Wall of Room #22
LAB No:	
EWR- 80233	4"x4" Ceramic Tile Grout Material Collected From Wall of Room #23C
LAB No:	
EWR- 80234	4"x4" Ceramic Tile Glue Material Collected From Wall of Room #22
LAB No:	
EWR- 80235	4"x4" Ceramic Tile Glue Material Collected From Wall of Room #23C
LAB No:	

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/15/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80236	4"x4" Ceramic Tile Glue Material Collected From Wall of Room # 23A
LAB No:	
EWR- 80237	Cement Material Under 8"x8" Floor Tile In Room # 23A
LAB No:	
EWR- 80238	Cement Material Under 8"x8" Floor Tile Collected From Room # 23A
LAB No:	
EWR- 80239	Cement Material Under 8"x8" Floor Tile Collected From Room # 23A
LAB No:	
EWR- 80240	Block Mortar Material Collected From Wall of Room 23A
LAB No:	
EWR- 80241	Block Mortar Material Collected From Wall of Room # 23C
LAB No:	
EWR- 80242	Block Mortar Material Collected From Wall of Room # 23C
LAB No:	
EWR- 80243	4" Light Gray Cove Base Moulding Material Collected From Room # 23A
LAB No:	

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Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/15/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80244	Mastic Material Behind 4" Cove Base Collected From Room # 23A, Yellow
LAB No:	
EWR- 80245	4" Light Grey Cove Base Moulding Material Collected From Room # 23A
LAB No:	
EWR- 80246	Mastic Material Behind 4" Cove Base Collected From Room # 23A, Yellow
LAB No:	
EWR- 80247	4" Light Grey Cove Base Moulding Material Collected From Room # 23A
LAB No:	
EWR- 80248	Mastic Material Behind 4" Cove Base Collected From Room # 23A, Yellow
LAB No:	
EWR- 80249	1'x1' White Spline Ceiling Tile Material Collected From Room # 26
LAB No:	
EWR- 80250	Glue Dots Material Under 1'x1' Spline Ceiling Collected From Room # 26
LAB No:	
EWR- 80251	4" Black Cove Base Moulding Material Collected From Room # 26
LAB No:	

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Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/15/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR-80252	Brown Mastic Material Behind 4" Black Cove Base Collected From Room #26
LAB No:	
EWR-80253	4" Black Cove Base Moulding Material Collected From Room #26
LAB No:	
EWR-80254	Brown Mastic Material Behind 4" Black Cove Base Moulding Collected From Room #26
LAB No:	
EWR-80255	1'x1' White Spline Ceiling Tile Material Collected From Room #26
LAB No:	
EWR-80256	Glue Dots Material Under 1'x1' Spline Ceiling Collected From Room #26
LAB No:	
EWR-80257	4" Black Cove Base Moulding Material Collected From Room #17
LAB No:	
EWR-80258	Brown Mastic Material Behind 4" Black Cove Base Collected From #17
LAB No:	
EWR-80259	1'x1' White Spline Ceiling Tile Material Collected From Room #17
LAB No:	

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Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/15/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80260	Glue Dots Material Under 1'x1' Spline Ceiling Collected From Room #17
LAB No:	
EWR- 80261	2'x4' White Drop Ceiling Tile Material Collected From Room 13A
LAB No:	
EWR- 80262	2'x4' White Drop Ceiling Tile Material Collected From Room 13A
LAB No:	
EWR- 80263	2'x4' White Drop Ceiling Tile Material Collected From Room 23A
LAB No:	
EWR- 80264	Sheetrock Material Collected From Room #13A
LAB No:	
EWR- 80265	Sheetrock Material Collected From Room #13A
LAB No:	
EWR- 80266	Sheetrock Material Collected From Room #23A
LAB No:	
EWR- 80267	Joint Compound Material Collected From Room 13A
LAB No:	

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/[redacted]/15/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR-80268	Joint Compound Material Collected From Room #19
LAB No:	
EWR-80269	Joint Compound Material Collected From Room #19
LAB No:	
EWR-80270	Beige 9"x9" Floor Tile Material Collected From Entrance To Room #2
LAB No:	
EWR-80271	Beige 9"x9" Floor Tile Material Collected From Entrance To Room #2
LAB No.	
EWR-80272	Beige 9"x9" Floor Tile Material Collected From Entrance To Room #2
LAB No:	
EWR-80273	Brown Linoleum Material Collected From Stairwell 1C
LAB No:	
EWR-80274	Glue Material Under Linoleum Collected From Stairwell 1C
LAB No:	
EWR-80275	Brown Linoleum Material Collected From Stairwell 1C
LAB No.	

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Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/15/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80276	Glue Material Under Linoleum Collected From Stairwell 1C
LAB No:	
EWR- 80277	Brown Linoleum Material Collected From Stairwell 1C
LAB No:	
EWR- 80278	Glue Material Under Linoleum Collected From Stairwell 1C
LAB No:	
EWR- 80279	Grey Leveling Compound Material Collected From Floor In Room #6
LAB No:	
EWR- 80280	Grey Leveling Compound Material Collected From Floor In Room #6
LAB No:	
EWR- 80281	Grey Leveling Compound Material Collected From Floor In Room #6
LAB No:	
EWR- 80282	Black 6" Cove Base Moulding Material Collected From Room #14A
LAB No:	
EWR- 80283	Yellow/Brown Mastic Material Under 6" Cove Base Collected From Room 14A
LAB No:	

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/15/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80284	Black 6" Cove Base Moulding Material Collected From Room # 14B
LAB No:	
EWR- 80285	Yellow/Brown Mastic Material Under 6" Cove Base Collected From Room # 14B
LAB No:	
EWR- 80286	Black 6" Cove Base Moulding Material Collected From Room # 14A
LAB No:	
EWR- 80287	Yellow/Brown Mastic Material Under 6" Cove Base Collected From Room 14A
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): B. Dean, K. Levin

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: HANGER 14 / 1ST FLOOR / ENTIRE FLOOR

Sample Date : 5/14/2012
Date Received : 5/15/2012
Date Analyzed : 5/15/2012
ATC Batch # 23964
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80204	From Room #26, Dark Grey tile	12" x 12" floor tile material	NOB-TEM			18% Organic 2.7% Residue 79.3% Carbonate	NONE DETECTED
23964 -1		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80205	Under 12" x 12" tile dark grey tile in Room #26	Yellow Glue Material	NOB-TEM			76.5% Organic 7.6% Residue 15.9% Carbonate	NONE DETECTED
23964 -2		Color: YELLOW					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80206	From Room #17	Dark Grey 12" x 12" floor tile material	NOB-TEM			17.2% Organic 2.5% Residue 80.3% Carbonate	NONE DETECTED
23964 -3		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80207	Under Dark Grey 12" x 12" tile in room #17	Yellow glue material	NOB-TEM			75% Organic 2.5% Residue 22.5% Carbonate	NONE DETECTED
23964 -4		Color: YELLOW					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80208	From room #17	Dark Grey 12" x 12" floor tile material	NOB-TEM			20.9% Organic 6% Residue 73.1% Carbonate	NONE DETECTED
23964 -5		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80209	Under Dark Grey 12" x 12" tile in room #17	Yellow glue material	NOB-TEM			79.4% Organic 4.3% Residue 16.3% Carbonate	NONE DETECTED
23964 -6		Color: YELLOW					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80210	From room #17	Grey leveling compound material	NOB-TEM			6% Organic 50.4% Residue 43.6% Carbonate	NONE DETECTED
23964 -7		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80211	From room #17	Grey leveling compound material	NOB-TEM			4.7% Organic 57.3% Residue 38% Carbonate	NONE DETECTED
23964 -8		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80212	From room #17	Grey leveling compound material	NOB-TEM			5.6% Organic 43.1% Residue 51.3% Carbonate	NONE DETECTED
23964 -9		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80213	From room #13A	Light Grey 12" x 12" floor tile material	NOB-TEM			16.5% Organic 3.8% Residue 79.7% Carbonate	NONE DETECTED
23964 -10		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80214	Under Light Grey 12" x 12" tile in room 13A	Yellow Glue material	NOB-TEM			67.6% Organic 7.8% Residue 24.6% Carbonate	NONE DETECTED
23964 -11		Color: YELLOW					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80215	From room #15	Light Grey 12" x 12" floor tile material	NOB-TEM			20.7% Organic 5.9% Residue 73.4% Carbonate	NONE DETECTED
23964 -12		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80216	Under Light Grey 12" x 12" tile in Room #15	Yellow glue material	NOB-TEM			64.9% Organic 4.5% Residue 30.6% Carbonate	NONE DETECTED
23964 -13		Color: YELLOW					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80217	From room #15	Light Grey 12" x 12" floor tile material	NOB-TEM			18% Organic 4.4% Residue 77.6% Carbonate	NONE DETECTED
23964 -14		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80218	Under light grey 12" x 12" tile in room #15	Yellow glue material	NOB-TEM			47.1% Organic 5.9% Residue 47% Carbonate	NONE DETECTED
23964 -15		Color: YELLOW					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80219	From Room #15	Grey 9" x 9" floor tile material under 12" x 12" tile	NOB-TEM			28.2% Organic 18.6% Residue 51.1% Carbonate	2.1% Chrysotile
23964 -16		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 2.1 %
EWR-80220	From room #16	Black mastic material under 9" x 9" grey tile	NOB-TEM			23.4% Organic 48% Residue 28.1% Carbonate	0.5% Chrysotile
23964 -17		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.5 %

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80221	From room #15	Grey 9" x 9" floor tile material	NOB-TEM			18.6% Organic 1.6% Residue 79.8% Carbonate	Trace Chrysotile
23964 -18		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: TRACE
EWR-80222	From room #15	Black mastic material under 9" x 9" Grey tile	NOB-TEM			73.6% Organic 5.2% Residue 19% Carbonate	2.2% Chrysotile
23964 -19		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 2.2 %
EWR-80223	From room #15	Grey 9" x 9" floor tile material	NOB-TEM			28.3% Organic 16% Residue 55.7% Carbonate	Trace Chrysotile
23964 -20		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: TRACE
EWR-80224	From room #15	Black mastic material under 9" x 9" grey tile	NOB-PLM			35% Organic 25% Residue 15.1% Carbonate	24.9% Chrysotile
23964 -21		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Mohamed Fata		Comments: PLM inconclusive			Total Asbestos: 24.9 %
EWR-80225	From floor of room #23A	8" x8" ceramic tile grout material	NOB-TEM			3.7% Organic 75.2% Residue 21.1% Carbonate	NONE DETECTED
23964 -22		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80226	From floor of room #23A	8" x8" ceramic tile grout material	NOB-TEM			6% Organic 43% Residue 51% Carbonate	NONE DETECTED
23964 -23		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80227	From floor of room #23A	8" x8" ceramic tile grout material	NOB-TEM			11% Organic 80.1% Residue 8.9% Carbonate	NONE DETECTED
23964 -24		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80228	From floor of Room #22	2" x 2" Ceramic tile grout material	NOB-TEM			73.5% Organic 4.3% Residue 21.7% Carbonate	0.5% Chrysotile
23964 -25		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.5 %
EWR-80229	From floor of Room #22	2" x 2" Ceramic tile grout material	NOB-TEM			78.6% Organic 9.7% Residue 10.3% Carbonate	1.4% Chrysotile
23964 -26		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.4 %
EWR-80230	From floor of Room #22	2" x 2" Ceramic tile grout material	NOB-TEM			84.9% Organic 2.7% Residue 12.4% Carbonate	NONE DETECTED
23964 -27		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80231	From Wall of room #22	4" x 4" ceramic tile grout material	NOB-TEM			7.9% Organic 37.6% Residue 54.5% Carbonate	NONE DETECTED
23964 -26		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive NOB-PLM inconclusive			
EWR-80232	From Wall of room #22	4" x 4" ceramic tile grout material	NOB-TEM			9.9% Organic 24.1% Residue 66% Carbonate	NONE DETECTED
23964 -29		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80233	From Wall of room #23C	4" x 4" ceramic tile grout material	NOB-TEM			4.9% Organic 26.1% Residue 69% Carbonate	NONE DETECTED
23964 -30		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80234	From Wall of room #22	4" x 4" ceramic tile glue material	NOB-TEM			31.2% Organic 3.2% Residue 65.6% Carbonate	NONE DETECTED
23964 -31		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80235	From Wall of room #23C	4" x 4" ceramic tile glue material	NOB-TEM			29.9% Organic 5.5% Residue 54.6% Carbonate	NONE DETECTED
23964 -32		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80236	From Wall of room #22A	4" x 4" ceramic tile glue material	NOB-TEM			30.2% Organic 1.5% Residue 68.3% Carbonate	NONE DETECTED
23964 -33		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80237	In room #23A	Cement material under 8" x 8" floor tile	NOB-TEM			9.2% Organic 63.4% Residue 27.4% Carbonate	NONE DETECTED
23964 -34		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80238	From room #23A	Cement material under 8" x 8" floor tile	NOB-TEM			9.8% Organic 30% Residue 60.2% Carbonate	NONE DETECTED
23964 -35		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80239	From room #23A	Cement material under 8" x 8" floor tile	PLM		100% Mineral Filler		
23964 -36		Color: GRAY					NONE DETECTED
Analyzed By: Tarik Fata				Comments:			
EWR-80240	From Wall of room #23A	Block mortar material	PLM		100% Mineral Filler		
23964 -37		Color: GRAY					NONE DETECTED
Analyzed By: Tarik Fata				Comments:			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80241	From Wall of room #23C	Block mortar material	PLM		100% Mineral Filler		
23964 -38							NONE DETECTED
Analyzed By: Tarik Fata		Color: GRAY		Comments:			
EWR-80242	From Wall of room #23C	Block mortar material	PLM		100% Mineral Filler		
23964 -39							NONE DETECTED
Analyzed By: Tarik Fata		Color: GRAY		Comments:			
EWR-80243	From room #23A	4" light Grey Cove Base moulding material	NOB-TEM			53.9% Organic 1.6% Residue 44.5% Carbonate	
23964 -40							NONE DETECTED
Analyzed By: Tarik Fata		Color: GRAY Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80244	From room #23A, yellow	Mastic material behind 4" cove base	NOB-TEM			67.3% Organic 21.2% Residue 11.5% Carbonate	
23964 -41							NONE DETECTED
Analyzed By: Tarik Fata		Color: YELLOW Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80245	From room #23A	4" Light Grey Cove Base moulding material	NOB-TEM			50% Organic 1.2% Residue 48.8% Carbonate	
23964 -42							NONE DETECTED
Analyzed By: Tarik Fata		Color: GRAY Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80246	From room #23A, Yellow	Mastic material behind 4" cove base	NOB-TEM			69% Organic 22.4% Residue 8.6% Carbonate	
23964 -43							NONE DETECTED
Analyzed By: Tarik Fata		Color: YELLOW Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80247	From room #23A	4" Light Grey cove base moulding material	NOB-TEM			51.7% Organic 1.4% Residue 46.9% Carbonate	
23964 -44							NONE DETECTED
Analyzed By: Tarik Fata		Color: GRAY Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80248	From room #23A, yellow	Mastic material behind 4" cove base	NOB-TEM			64.5% Organic 17.2% Residue 18.3% Carbonate	
23964 -45							NONE DETECTED
Analyzed By: Tarik Fata		Color: YELLOW Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80249	From room #25	1' x 1' white spline ceiling tile material	NOB-TEM			37.9% Organic 36.6% Residue 25.5% Carbonate	
23964 -46							NONE DETECTED
Analyzed By: Tarik Fata		Color: GRAY Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80250	From room #26	Glue dots material under 1' x 1' spline ceiling	NOB-TEM			55.8% Organic 37.1% Residue 7.1% Carbonate	
23964 -47							NONE DETECTED
Analyzed By: Tarik Fata		Color: BROWN Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80251	From room #26	4" black cove base moulding material	NOB-TEM			40.8% Organic 6.2% Residue 53% Carbonate	NONE DETECTED
23964 -48		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80252	From room #26	Brown mastic material behind 4" black cove base	NOB-TEM			44.9% Organic 30.1% Residue 25% Carbonate	NONE DETECTED
23964 -49		Color: BROWN					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80253	From room #26	4" black cove base moulding material	NOB-TEM			40.1% Organic 7.1% Residue 52.8% Carbonate	NONE DETECTED
23964 -50		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80254	From room #26	Brown mastic material behind 4" black cove base moulding	NOB-TEM			37.6% Organic 43.3% Residue 19.1% Carbonate	NONE DETECTED
23964 -51		Color: BROWN					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80255	From room #26	1' x 1' white spline ceiling tile material	NOB-TEM			21.3% Organic 32.1% Residue 46.6% Carbonate	NONE DETECTED
23964 -52		Color: WHITE					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80256	From room #26	Glue dots material under 1' x 1' spline ceiling	NOB-TEM			45.6% Organic 39.5% Residue 14.9% Carbonate	NONE DETECTED
23964 -53		Color: BROWN					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80257	From room #17	4" black cove base moulding material	NOB-TEM			60.1% Organic 2.2% Residue 37.7% Carbonate	NONE DETECTED
23964 -54		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80258	From room #17	Brown mastic material behind 4" black cove base	NOB-TEM			64.9% Organic 28% Residue 7.1% Carbonate	NONE DETECTED
23964 -55		Color: BROWN					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80259	From room #17	1' x 1' white spline ceiling tile material	NOB-TEM			16.1% Organic 26.3% Residue 57.6% Carbonate	NONE DETECTED
23964 -56		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80260	From room #17	Glue dots material under 1' x 1' spline ceiling	NOB-TEM			48% Organic 43.3% Residue 8.7% Carbonate	NONE DETECTED
23964 -57		Color: BROWN					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80261	From room #13A	2' x 4' white drop ceiling tile material	NOB-TEM			29.9% Organic 40.7% Residue 29.4% Carbonate	NONE DETECTED
23964 -58		Color: WHITE					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80262	From room #13A	2' x 4' white drop ceiling tile material	NOB-TEM			29.1% Organic 43.3% Residue 27.6% Carbonate	NONE DETECTED
23964 -59		Color: WHITE					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80263	From room #23A	2' x 4' white drop ceiling tile material	NOB-TEM			26.7% Organic 41.8% Residue 31.5% Carbonate	NONE DETECTED
23964 -60		Color: WHITE					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80264	From room #13A	Sheetrock material	PLM	5% Cellulose	95% Mineral Filler		NONE DETECTED
23964 -61		Color: GRAY					
Analyzed By: Tarik Fata				Comments:			
EWR-80265	From room #13A	Sheetrock material	PLM	7% Cellulose	93% Mineral Filler		NONE DETECTED
23964 -62		Color: GRAY					
Analyzed By: Tarik Fata				Comments:			
EWR-80266	From room #23A	Sheetrock material	PLM	4% Cellulose	96% Mineral Filler		NONE DETECTED
23964 -63		Color: GRAY					
Analyzed By: Tarik Fata				Comments:			
EWR-80267	From room #13A	Joint compound material	PLM		100% Mineral Filler		NONE DETECTED
23964 -64		Color: WHITE					
Analyzed By: Tarik Fata				Comments:			
EWR-80268	From room #19	Joint compound material	PLM		100% Mineral Filler		NONE DETECTED
23964 -65		Color: WHITE					
Analyzed By: Tarik Fata				Comments:			
EWR-80269	From room #19	Joint compound material	PLM		100% Mineral Filler		NONE DETECTED
23964 -66		Color: WHITE					
Analyzed By: Tarik Fata				Comments:			
EWR-80270	From entrance to room #2	Beige 9" x 9" floor tile material	NOB-PLM			24.8% Organic 18% Residue 45.2% Carbonate	12% Chrysotile
23964 -67		Color: BEIGE					
Analyzed By: Tarik Fata		Second Analyst: Mohamed Fata		Comments: PLM inconclusive			Total Asbestos: 12 %

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Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80271	From entrance to room #2	Beige 9" x 9" floor tile material	NOB-PLM			26% Organic 11.1% Residue 51.7% Carbonate	11.2% Chrysotile
23964 -68		Color: BEIGE					
Analyzed By: Tarik Fata		Second Analyst: Mohamed Fata		Comments: PLM inconclusive			Total Asbestos: 11.2 %
EWR-80272	From entrance to room #2	Beige 9" x 9" floor tile material	NOB-PLM			24% Organic 37.6% Residue 25.9% Carbonate	12.5% Chrysotile
23964 -69		Color: BEIGE					
Analyzed By: Tarik Fata		Second Analyst: Mohamed Fata		Comments: PLM inconclusive			Total Asbestos: 12.5 %
EWR-80273	From stairwell 1C	Brown linoleum material	NOB-TEM			27.4% Organic 12.7% Residue 59.9% Carbonate	NONE DETECTED
23964 -70		Color: BROWN					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80274	From stairwell 1C	Glue material under linoleum	NOB-TEM			50.3% Organic 37.5% Residue 12.2% Carbonate	NONE DETECTED
23964 -71		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80275	From stairwell 1C	Brown linoleum material	NOB-TEM			30.5% Organic 41.4% Residue 28.1% Carbonate	NONE DETECTED
23964 -72		Color: BROWN					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80276	From stairwell 1C	Glue material under linoleum	NOB-TEM			47.6% Organic 44.9% Residue 7.5% Carbonate	NONE DETECTED
23964 -73		Color: BROWN					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80277	From stairwell 1C	Brown linoleum material	NOB-TEM			36.8% Organic 40.2% Residue 23% Carbonate	Trace Chrysotile
23964 -74		Color: BROWN					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: TRACE
EWR-80278	From stairwell 1C	Glue material under linoleum	NOB-TEM			46.2% Organic 37.1% Residue 16.7% Carbonate	Trace Chrysotile
23964 -75		Color: BROWN					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: TRACE
EWR-80279	From floor in room #6	Grey leveling compound material	PLM		100% Mineral Filler		
23964 -76		Color: GRAY					NONE DETECTED
Analyzed By: Tarik Fata				Comments:			
EWR-80280	From floor in room #6	Grey leveling compound material	PLM		100% Mineral Filler		
23964 -77		Color: GRAY					NONE DETECTED
Analyzed By: Tarik Fata				Comments:			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80281	From floor in room #3	Grey leveling compound material	PLM		100% Mineral Filler		
23964 -78							NONE DETECTED
Analyzed By: Tarik Fata		Color: GRAY		Comments:			
EWR-80282	From room #14A	Black 6" cove base moulding material	NOB-TEM			35.1% Organic 21% Residue 43.9% Carbonate	NONE DETECTED
23964 -79							
Analyzed By: Tarik Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80283	From room #14A	Yellow/brown mastic material under 6" cove base	NOB-TEM			65% Organic 18.8% Residue 16.2% Carbonate	NONE DETECTED
23964 -80							
Analyzed By: Tarik Fata		Color: YELLOW Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80284	From room #14B	Black 6" cove base moulding material	NOB-TEM			44.3% Organic 1.8% Residue 53.9% Carbonate	NONE DETECTED
23964 -81							
Analyzed By: Tarik Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80285	From room #14B	Yellow/brown mastic material under 6" cove base	NOB-TEM			45.6% Organic 31.6% Residue 22.8% Carbonate	NONE DETECTED
23964 -82							
Analyzed By: Tarik Fata		Color: YELLOW Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80286	From room #14A	Black 6" cove base moulding material	NOB-TEM			42.8% Organic 1.5% Residue 55.7% Carbonate	NONE DETECTED
23964 -83							
Analyzed By: Tarik Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80287	From room #14A	Yellow/brown mastic material under 6" cove base	NOB-TEM			41.7% Organic 1.7% Residue 56.6% Carbonate	NONE DETECTED
23964 -84							
Analyzed By: Tarik Fata		Color: BROWN Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%, based on one asbestos point counter over 400 non empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10379

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch #_____. Amendments: ____. Amendment Dates: _____ Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarik Fata
Analyst:

Mohamed Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No. #23973

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	(ASBESTOS) - PCM / (PLM) / (TEM) /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 7

Sample Type - **LEAD** [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		(X)						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
1	EWR-80288	EWR-80329	42	RELINQUISHED BY: [signature]	DATE TIME 5/16/12 1530
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: [signature]	DATE: 5/16/12 TIME: 1530	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY:	DATE: TIME:	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY: Tom Brackjons	DATE: 5/16/12 TIME: 5:00	The data report for the above samples
RELINQUISHED BY: COURIER	DATE: 5/16/12 TIME: 5:05PM	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: ATC-TTuta	DATE: 5/16/12 TIME: 7:00P	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY: ATC-Grace Chan	DATE: 5/16/12 TIME: 5:25PM	42 PCM
RECEIVED AT THE LAB BY: GRACECHAN	LAB NAME: ATC DATE: 5/16/12 TIME: 5:05 PM	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

PA 3739
9-96

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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#23973

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/16/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR-80288	White Coat Plaster Material Collected From Wall of Room # 14A
LAB No:	
EWR-80289	Brown Coat Plaster Material Collected From Wall of Room # 14A
LAB No:	
EWR-80290	White Coat Plaster Material Collected From Wall of Room # 14A
LAB No:	
EWR-80291	Brown Coat Plaster Material Collected From Wall of Room # 14A
LAB No:	
EWR-80292	White Coat Plaster Material Collected From Wall of Room # 14B
LAB No:	
EWR-80293	Brown Coat Plaster Material Collected From Wall of Room # 14B
LAB No:	
EWR-80294	Yellow Carpet Glue Collected From Floor of Room # 14A
LAB No:	
EWR-80295	Yellow Carpet Glue Collected From Floor of Room # 14A
LAB No:	

Port Authority Inspector(s): B. Dean, K. Levin

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9-98

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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#23973

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/16/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80296	Yellow Carpet Glue Collected From Floor of Room #14A
LAB No:	
EWR- 80297	Tan 12"x12" Floor Tile Material Collected From Under Carpet In Room #14A
LAB No:	
EWR- 80298	Tan 12"x12" Floor Tile Material Collected From Under Carpet In Room #14A
LAB No:	
EWR- 80299	Tan 12"x12" Floor Tile Material Collected From Under Carpet In Room #14A
LAB No:	
EWR- 80300	Black Mastic Material Under 12"x12" Tan Tile Collected From Room #14A
LAB No:	
EWR- 80301	Black Mastic Material Under 12"x12" Tan Tile Collected From Room #14A
LAB No:	
EWR- 80302	Black Mastic Material Under 12"x12" Tan Tile Collected From Room #14A
LAB No:	
EWR- 80303	Paper Material Inside Metal Door To Room #17
LAB No:	

Port Authority Inspector(s): B. Dean, K. Levin

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Environmental Field Operations
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#23973

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/16/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80304	Paper Material Inside Metal Door To Room #17
LAB No:	
EWR- 80305	Paper Material Inside Metal Door To Room #14B
LAB No:	
EWR- 80306	3" Pipe Insulation, white Cementitious Material Collected From Room #15 Vertical Runs
LAB No:	
EWR- 80307	3" Pipe Insulation, white Cementitious Material Collected From Room #15 Vertical Runs
LAB No:	
EWR- 80308	White Canvas Pipe Wrap Over FG Insulation, 3" Pipe Vertical Run In Room #26
LAB No:	
EWR- 80309	White Canvas Pipe Wrap Over FG Insulation, 3" Pipe Vertical Run In Room #26
LAB No:	
EWR- 80310	White Canvas Pipe Wrap Over FG Insulation 3" Pipe Vertical Run In Room #26
LAB No:	
EWR- 80311	Gray Cementitious Elbow Material Collected From 3" Vertical Run In Room #26
LAB No:	

Port Authority Inspector(s): B. Dean, K. Levin

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/16/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80312	Grey Cementitious Elbow Material Collected From 3" Vertical Run In Room #26
LAB No:	
EWR- 80313	Grey Cementitious Elbow Material Collected From 3" Vertical Run In Room #26
LAB No:	
EWR- 80314	Brown Paper Insulation Material Collected From 3" Vertical Run In Room #26
LAB No:	
EWR- 80315	Brown Paper Insulation Material Collected From 3" Vertical Run In Room #26
LAB No:	
EWR- 80316	Brown Paper Insulation Material Collected From 3" Vertical Run In Room #26
LAB No:	
EWR- 80317	3" Pipe Insulation, White Cementitious Material Collected From Room #15 Vertical Runs
LAB No:	
EWR- 80318	Black Non-Slip Shower Strip Material Collected From Floor of Shower In Room #22
LAB No:	
EWR- 80319	Black Non-slip Shower Strip Material Collected From Floor of Shower In Room #22
LAB No:	

Port Authority Inspector(s): B. Dean, K. Levin

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/16/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80320	Black Non-Slip Shower Strip Material Collected From Floor of Shower In Room #22
LAB No:	
EWR- 80321	Brown Paper On 4" Pipe Insulation Inside Wall Material Collected From Room #22
LAB No:	
EWR- 80322	Brown Paper On 4" Pipe Insulation Material Inside Wall Collected From Room #22
LAB No:	
EWR- 80323	Brown Paper On 4" Pipe Insulation Material Inside Wall Collected From Room #22
LAB No:	
EWR- 80324	White Corrugated Paper Insulation Material On 4" Pipe Inside Wall of Room #22
LAB No:	
EWR- 80325	White Corrugated Paper Insulation Material On 4" Pipe Inside Wall of Room #22
LAB No:	
EWR- 80326	White Corrugated Paper Insulation Material On 4" Pipe Inside Wall of Room #22
LAB No:	
EWR- 80327	Grey Cementitious Elbow Material Collected From 4" Pipe Inside Wall of Room #22
LAB No:	

Port Authority Inspector(s): B Dean, K. Levin

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.:

Area Description Entire Floor

Date: 5/16/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80328	Grey Cementitious Elbow Material Collected From 4" Pipe Inside wall of Room #22
LAB No:	
EWR- 80329	Grey Cementitious Elbow Material Collected From 4" Pipe Inside wall of Room #22
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): B. Dean, K. Levin

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872
Project: NEWARK INTERNATIONAL AIRPORT

Sample Date : 5/16/2012
Date Received : 5/16/2012
Date Analyzed : 5/16/2012
ATC Batch # 23973
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Location: HANGER 14 / 1ST FLOOR / ENTIRE FLOOR
Project # EWR 151.120

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80288	From wall of room #14A	white Coat plaster material	PLM		100% Mineral Filler		
23973 -1		Color: White		Comments:			NONE DETECTED
Analyzed By: Tarek Fata							
EWR-80289	From wall of room #14a	Brown coat plaster material	PLM		100% Mineral Filler		
23973 -2		Color: Brown		Comments:			NONE DETECTED
Analyzed By: Tarek Fata							
EWR-80290	From Wall of room #14A	White Coat plaster material	PLM		100% Mineral Filler		
23973 -3		Color: White		Comments:			NONE DETECTED
Analyzed By: Tarek Fata							
EWR-80291	From Wall of Room #14B	Brown coat plaster material	PLM		100% Mineral Filler		
23973 -4		Color: Brown		Comments:			NONE DETECTED
Analyzed By: Tarek Fata							
EWR-80292	From Wall of Room #14B	White coat plaster material	PLM		100% Mineral Filler		
23973 -5		Color: White		Comments:			NONE DETECTED
Analyzed By: Tarek Fata							
EWR-80293	From Wall of Room #14B	Brown coat plaster material	PLM		100% Mineral Filler		
23973 -6		Color: Brown		Comments:			NONE DETECTED
Analyzed By: Tarek Fata							
EWR-80294	From floor of room #14A	Yellow carpet glue collected	NOB-TEM			53.3% Organic 23.6% Residue 23.1% Carbonate	
23973 -7		Color: Yellow					NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOS-PLM inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80295 23973 -8	From floor of room #14A	Yellow carpet glue collected	NOB-TEM			56.2% Organic 27.2% Residue 16.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts	Color: Yellow	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80296 23973 -9	From floor of room #14A	Yellow carpet glue collected	NOB-TEM			57.8% Organic 36.3% Residue 5.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts	Color: Yellow	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80297 23973 -10	From under Carpet in room #14A	Tan 12" x 12" floor tile material	NOB-TEM			26.8% Organic 4.9% Residue 68.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts	Color: Tan	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80298 23973 -11	From under Carpet in room #14A	Tan 12" x 12" floor tile material	NOB-TEM			24.4% Organic 2.5% Residue 72.8% Carbonate	0.3% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts	Color: Tan	Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 0.3 %**
EWR-80299 23973 -12	From under Carpet in room #14A	Tan 12" x 12" floor tile material	NOB-TEM			24.4% Organic 5.6% Residue 69.7% Carbonate	0.3% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts	Color: Tan	Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 0.3 %**
EWR-80300 23973 -13	Room #14A	Balck mastic material under 12" x 12" tan tile	NOB-TEM			54.8% Organic 5.8% Residue 39.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts	Color: Black	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80301 23973 -14	Room #14A	Balck mastic material under 12" x 12" tan tile	NOB-TEM			45.3% Organic 18.2% Residue 36.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts	Color: Black	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80302 23973 -15	Room #14A	Balck mastic material under 12" x 12" tan tile	NOB-TEM			55% Organic 8% Residue 37% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts	Color: Black	Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80303 23973 -16	Inside metal door to room #17	Paper material	PLM	87% Cellulose	13% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata			Color: Brown	Comments:			
EWR-80304 23973 -17	Inside metal door to room #17	Paper material	PLM	90% Cellulose	10% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata			Color: Brown	Comments:			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
80305	Inside metal door to room #14B	Paper material	PLM	92% Cellulose	8% Mineral Filler		NONE DETECTED
23973 -18		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
80306	From room #15 Vertical Runs	3" pipe insulation white Cementitious material	PLM		80% Mineral Filler		10% Chrysotile 10% Amosite
23973 -19		Color: White		Comments:			
Analyzed By: Tarek Fata							Total Asbestos: 20 %
80307	From room #15 Vertical Runs	3" pipe insulation white cementitious material	PLM		80% Mineral Filler		8% Chrysotile 12% Amosite
23973 -20		Color: White		Comments:			
Analyzed By: Tarek Fata							Total Asbestos: 20 %
80308	In room #26	White canvas pipe wrap over FG insulation, 3" pipe vertical run	PLM	94% Cellulose	6% Mineral Filler		NONE DETECTED
23973 -21		Color: White		Comments:			
Analyzed By: Tarek Fata							
EWR-80309	In room #26	White canvas pipe wrap over FG insulation, 3" pipe vertical run	PLM	90% Cellulose	10% Mineral Filler		NONE DETECTED
23973 -22		Color: White		Comments:			
EWR-80310	In room #26	White canvas pipe wrap over FG insulation, 3" pipe vertical run	PLM	75% Cellulose 20% FiberGlass	5% Mineral Filler		NONE DETECTED
23973 -23		Color: White		Comments:			
Analyzed By: Tarek Fata							
EWR-80311	From 3" vertical run in room #26	Grey cementitious elbow material	PLM	Trace% Cellulose 10% FiberGlass	90% Mineral Filler		NONE DETECTED
23973 -24		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80312	From 3" vertical run in room #26	Grey cementitious elbow material	PLM	Trace% Cellulose 15% FiberGlass	85% Mineral Filler		NONE DETECTED
23973 -25		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80313	From 3" vertical run in room #26	Grey cementitious elbow material	PLM	Trace% Cellulose 10% FiberGlass	90% Mineral Filler		NONE DETECTED
23973 -26		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80314	From 3" vertical run in room #26	Brown paper insulation material	PLM	80% Cellulose	20% Mineral Filler		NONE DETECTED
23973 -27		Color: Brown		Comments:			
Analyzed By: Tarek Fata							

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80315	From 3" vertical run in room #26	Brown paper insulation material	PLM	89% Cellulose	11% Mineral Filler		NONE DETECTED
23973 -28		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80316	From 3" vertical run in room #26	Brown paper insulation material	PLM	92% Cellulose	8% Mineral Filler		NONE DETECTED
23973 -29		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80317	From Room #15 Vertical Runs	3" pipe insulation, White cementitious material	PLM		80% Mineral Filler		12% Chrysotile 8% Amosite
23973 -30		Color: White		Comments:			
Analyzed By: Tarek Fata							**Total Asbestos: 20 %**
EWR-80318	From floor of shower in room #22	Black non-slip shower strip material	NOB-TEM			62.9% Organic 19.9% Residue 17.2% Carbonate	NONE DETECTED
23973 -31		Color: Black		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-80319	From floor of shower in room #22	Black non-slip shower strip material	NOB-TEM			66.1% Organic 13% Residue 20.9% Carbonate	NONE DETECTED
23973 -32		Color: Black		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-80320	From floor of shower in room #22	Black non-slip shower strip material	NOB-TEM			77% Organic 9.4% Residue 13.6% Carbonate	NONE DETECTED
23973 -33		Color: Black		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-80321	Inside wall from room #22	Brown paper on 4" pipe insulation material	PLM	90% Cellulose	10% Mineral Filler		NONE DETECTED
23973 -34		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80322	Inside wall from room #22	Brown paper on 4" pipe insulation material	PLM	88% Cellulose	12% Mineral Filler		NONE DETECTED
23973 -35		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80323	Inside wall from room #22	Brown paper on 4" pipe insulation material	PLM	92% Cellulose	8% Mineral Filler		NONE DETECTED
23973 -36		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80324	On 4" pipe inside wall of room #22	White corrugated paper insulation material	PLM	70% Cellulose	10% Mineral Filler		20% Chrysotile
23973 -37		Color: White		Comments:			
Analyzed By: Tarek Fata							**Total Asbestos: 20 %**

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80325	On 4" pipe inside wall of room #22	White corrugated paper insulation material	PLM	70% Cellulose	5% Mineral Filler		25% Chrysotile
23973 -38		Color: White		Comments:			Total Asbestos: 25 %
Analyzed By: Tarek Fata							
EWR-80326	On 4" pipe inside wall of room #22	White corrugated paper insulation material	PLM	75% Cellulose	5% Mineral Filler		20% Chrysotile
23973 -39		Color: White		Comments:			Total Asbestos: 20 %
Analyzed By: Tarek Fata							
EWR-80327	On 4" pipe inside wall of room #22	Grey cemetalicus elbow material	PLM		90% Mineral Filler		10% Chrysotile
23973 -40		Color: Gray		Comments:			Total Asbestos: 10 %
Analyzed By: Tarek Fata							
EWR-80328	On 4" pipe inside wall of room #22	Grey cemetalicus elbow material	PLM		85% Mineral Filler		15% Chrysotile
23973 -41		Color: Gray		Comments:			Total Asbestos: 15 %
Analyzed By: Tarek Fata							
EWR-80329	On 4" pipe inside wall of room #22	Gray cemetalicus elbow material	PLM		80% Mineral Filler		20% Chrysotile
23973 -42		Color: Gray		Comments:			Total Asbestos: 20 %
Analyzed By: Tarek Fata							

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

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8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Mohamed Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

BATCH 23983

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM (PLM) (TEM) /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 4

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
1	EWR- 30330	EWR- 30350	21	RELINQUISHED BY: K. Lewis	DATE TIME 05/17/2012 1530
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: K. Lewis	DATE: 05/17/2012 TIME: 1530	FAX RESULTS to: (973) 961-6066
RECEIVED BY: Bud 973	DATE: 5/17/12 TIME: 03:30 pm	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY: Courier	DATE: 5/17/12 TIME: 18:00	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: ATC Thach	DATE: 5/17/12 TIME: 740 PM	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: M Bonezzi	LAB NAME: ATC DATE: 5/17/12 TIME: 18:00	(Signature of R. E.'s Representative) CHARGE CODE: CA44151120 (Use a separate C-O-C for each Charge Code)

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23983

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.: N/A

Area Description Entire Floor

Date: 05/17/2012

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80330 LAB No:	White cementitious like material collected from 8" OD pipe insulation located on east side of Room 23B. (12' above the floor)
EWR- 80331 LAB No:	White cementitious like material collected from 8" OD pipe insulation located on west side of Room 23B. (12' above the floor)
EWR- 80332 LAB No:	White cementitious like material collected from 8" OD pipe insulation located at the center of Room 23B (12' above the floor)
EWR- 80333 LAB No:	Grey paper like material collected from 4" OD pipe insulation located on east side of Room 23B (12' above the floor)
EWR- 80334 LAB No:	Grey paper like material collected from 4" OD pipe insulation located on west side of Room 23B (12' above the floor)
EWR- 80335 LAB No:	Grey paper like material collected from 4" OD pipe insulation located at the center of Room 23B 12' above the floor level.
EWR- 80336 LAB No:	Brown paper like material collected from 16" OD pipe insulation located on west side of Room 23B 12' above floor level (1st layer)
EWR- 80337 LAB No:	White cementitious like material collected from 16" OD pipe insulation located on west side of Room 23B 12' above the floor (2nd layer).

Port Authority Inspector(s): K. Levin, C. Sofat

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23983

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT, [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.: N/A

Area Description Entire Floor

Date: 05/17/2012

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80338	Brown paper like material collected from 16"OD pipe insulation located at the center of Room 23B 12' above the floor level. (1st layer)
LAB No:	
EWR- 80339	White cementitious like material collected from 16"OD pipe insulation located at the center of Room 23B. 12' above the floor level (2nd layer)
LAB No:	
EWR- 80340	Brown paper like material collected from 16"OD pipe insulation located on east side of Room 23B 12' above the floor (1st layer)
LAB No:	
EWR- 80341	White cementitious like material collected from 16"OD pipe insulation located on east side of Room 23B. 12' above the floor (2nd layer)
LAB No:	
EWR- 80342	White cementitious material collected from 16"OD pipe fitting insulation located in Room 23B 12' above floor level
LAB No:	
EWR- 80343	White cementitious material collected from 16"OD pipe fitting insulation located in Room 23B 12' above floor level
LAB No:	
EWR- 80344	White cementitious material collected from 16"OD pipe fitting insulation located in Room 23B 12' above floor level.
LAB No:	
EWR- 80345	White cementitious like material collected from 6"OD pipe insulation located on west side of Room 12, 5' above the floor.
LAB No:	

Port Authority Inspector(s): K. Levin, C. Tofat

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9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23983

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT [redacted]

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st FLOOR

Job No.: N/A

Area Description ENTIRE FLOOR

Date: 05/17/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80346	white cementitious MATERIAL collected FROM 6" OD PIPE
LAB No:	INSULATION Located IN ROOM 12, 5' ABOVE FLOOR
	AT center
EWR- 80347	white cementitious MATERIAL collected FROM 6" OD
LAB No:	PIPE INSULATION Located IN ROOM 12, 8' ABOVE
	FLOOR AT west side.
EWR- 80348	white cementitious MATERIAL collected FROM 6" PIPE
LAB No:	FITTING INSULATION Located IN ROOM # 12, 10' ABOVE
	FLOOR
EWR- 80349	white cementitious MATERIAL collected FROM 6" PIPE
LAB No:	FITTING INSULATION Located IN ROOM # 12, 5' ABOVE
	FLOOR
EWR- 80350	white cementitious MATERIAL collected FROM 6" PIPE
LAB No:	FITTING INSULATION Located IN ROOM # 12, 11' ABOVE
	FLOOR
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): K. LEVIN, C. Sofat

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Sample Date : 5/17/2012
Date Received : 5/17/2012
Date Analyzed : 5/17/2012
ATC Batch # 23983
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Location: Building: Hanger 14, 1st Floor, Entire Floor

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80330 23983 -1	From 8" OD pipe insulation located on east side of room 23B (12' above the floor)	White cementitious like material Color: White	PLM		80% Mineral Filler		12% Chrysotile 8% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 20 %
EWR-80331 23983 -2	From 8" OD pipe insulation located on west side of room 23B (12' above the floor)	White cementitious like material Color: White	PLM		80% Mineral Filler		10% Chrysotile 10% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 20 %
EWR-80332 23983 -3	From 6" OD pipe insulation located on center side of room 23B (12' above the floor)	White cementitious like material Color: White	PLM		75% Mineral Filler		10% Chrysotile 15% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 25 %
EWR-80333 23983 -4	From 4" OD pipe insulation located on east side of room 23B (12' above the floor)	Grey Paper like material Color: Gray	PLM	85% Cellulose	10% Mineral Filler		5% Chrysotile
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 5 %
EWR-80334 23983 -5	From 4" OD pipe insulation located on west side of room 23B (12' above the floor)	Grey Paper like material Color: Gray	PLM	80% Cellulose	16% Mineral Filler		4% Chrysotile
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 4 %
EWR-80335 23983 -6	From 4" OD pipe insulation located on center side of room 23B (12' above the floor level)	Grey Paper like material Color: Gray	PLM	80% Cellulose	15% Mineral Filler		5% Chrysotile
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 5 %
EWR-80336 23983 -7	From 16" OD pipe insulation located on west side of room 23B (12' above the floor level) (1st layer)	Brown paper like material Color: Brown	PLM	95% Cellulose	5% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80337 23983 -8	From 16" OD pipe insulation located on west side of room 23B (12' above the floor level) (2nd layer)	White cementitious like material Color: White	PLM		75% Mineral Filler		15% Chrysotile 10% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 25 %
EWR-80338 23983 -9	From 16" OD pipe insulation located on center of room 23B (12' above the floor level) (1st layer)	Brown paper like material Color: Brown	PLM	96% Cellulose	4% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-80339 23983 -10	From 16" OD pipe insulation located on center of room 23B (12' above the floor level) (2nd layer)	White cementitious like material Color: White	PLM		80% Mineral Filler		10% Chrysotile 10% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 20 %
EWR-80340 23983 -11	From 16" OD pipe insulation located on east side of room 23B (12' above the floor level) (1st layer)	Brown paper like material Color: Brown	PLM	92% Cellulose	8% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-80341 23983 -12	From 16" OD pipe insulation located on east side of room 23B (12' above the floor level) (2nd layer)	White cementitious like material Color: White	PLM		80% Mineral Filler		10% Chrysotile 10% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 20 %
EWR-80342 23983 -13	From 16" OD pipe fitting insulation located in room 23B 12' above floor level	White cementitious material Color: White	PLM		75% Mineral Filler		15% Chrysotile 10% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 25 %
EWR-80343 23983 -14	From 16" OD pipe fitting insulation located in room 23B 12' above floor level	White cementitious material Color: White	PLM		75% Mineral Filler		10% Chrysotile 15% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 25 %
EWR-80344 23983 -15	From 16" OD pipe fitting insulation located in room 23B 12' above floor level	White cementitious material Color: White	PLM		75% Mineral Filler		15% Chrysotile 10% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 25 %
EWR-80345 23983 -16	From 6" OD pipe insulation located on west side of room 12, 5' above the floor	White cementitious like material Color: White	PLM		70% Mineral Filler		15% Chrysotile 15% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 30 %
EWR-80346 23983 17	From 6" OD pipe insulation located on west side of room 12, 5' above the floor at center	White cementitious material Color: White	PLM		80% Mineral Filler		10% Chrysotile 10% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 20 %

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80347 23983 -18	From 6" OD pipe insulation located in of room 12, 8' above the floor at west side	White cementitious material Color: White	PLM		70% Mineral Filler		15% Chrysotile 15% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 30 %
EWR-80348 23983 -19	From 6" pipe fitting insulation located in of room 12,10' above the floor	White cementitious material Color: White	PLM		75% Mineral Filler		15% Chrysotile 10% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 25 %
EWR-80349 23983 -20	From 6" pipe fitting insulation located in of room 12, 5' above floor	White cementitious material Color: White	PLM		80% Mineral Filler		10% Chrysotile 10% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 20 %
EWR-80350 23983 -21	From 6" pipe fitting insulation located in of room 12, 11' above floor	White cementitious material Color: White	PLM		75% Mineral Filler		15% Chrysotile 10% Amosite
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 25 %

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

23991 L

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

E/F

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / ~~PLM~~ / ~~TEM~~ /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 4

Sample Type - **LEAD** [ ] PAINT [ ] WIPE [1] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
1	EWR-80351	EWR-80374	24	RELINQUISHED BY: K. Levin	DATE TIME 05/18/2012 1500
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: K. Levin	DATE: 05/18/2012 TIME: 1500	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY:	DATE: TIME:	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY: Grace Chan	DATE: 5/18/12 TIME: 6:07 pm	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: ATC- T. Lin	DATE: 5/18/12 TIME: 8:30P	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	RY Plm
RECEIVED AT THE LAB BY: Grace Chan	LAB NAME: ATC DATE: 5/18/12 TIME: 6:007 pm	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

[illegible] as DEMO
[illegible] 5/18/12 10:00 AM

M

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23991 c

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st floor

Job No.: N/A

Area Description Entire Floor

Date: 05/18/2012

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80351	White cementitious like material collected from 4" OD pipe fitting insulation located
LAB No:	on south side of Room 12, 9' above floor level
EWR- 80352	White cementitious like material collected from 4" OD hot water pipe fitting insulation located on south
LAB No:	side of Room 12, 10' above the floor level.
EWR- 80353	White cementitious like material collected from 4" OD hot water pipe fitting insulation located at
LAB No:	the center of Room 12, 4' above the floor level
EWR- 80354	White cementitious like material collected from heat exchanger located along south wall of
LAB No:	Room 12. 8' above the floor level
EWR- 80355	White cementitious like material collected from heat exchanger insulation located along south
LAB No:	wall of Room 12. 8' above the floor level
EWR- 80356	White cementitious like material collected from heat exchanger insulation located along south wall
LAB No:	of Room 12, 8' above the floor level.
EWR- 80357	White cementitious like material collected from 2" OD city water pipe elbow insulation located
LAB No:	at the center of Room 12. 8' above the floor level
EWR- 80358	White cementitious like material collected from 2" OD city water pipe elbow insulation located
LAB No:	at the center of Room 12, 10' above the floor level

Port Authority Inspector(s): K. Levin, C. Jofat

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The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23991

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st Floor

Job No.: N/A

Area Description Entire Floor

Date: 05-18-12.

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80359	White cementitious like material collected from 2" pipe elbow locate in the center of room # 12
LAB No:	12' above floor -> city water pipe
EWR- 80360	white cementitious like material collected from 2" city water pipe insulation located at the center of room #
LAB No:	12, 8 FT above floor.
EWR- 80361	white cementitious like material collected from 2" city water pipe insulation located at center of room # 12
LAB No:	10 FT above floor
EWR- 80362	white cementitious like material collected from 2" city water pipe insulation located at center of room # 12
LAB No:	12 FT above floor.
EWR- 80363	white cementitious like material collected from tank insulation located along south wall in room # 12
LAB No:	10 FT above floor.
EWR- 80364	white cementitious like material collected from tank insulation located along south wall in room # 12
LAB No:	10 FT above floor
EWR- 80365	white cementitious material collected from tank insulation located along south wall in room # 12
LAB No:	10 FT above floor.
EWR- 80366	white vibration cloth like material collected from 2' x 4' duct located in room 12, 14 FT above
LAB No:	floor.

Port Authority Inspector(s): K. Levin, C. Sofat

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23991

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st floor

Job No.: N/A

Area Description Entire floor

Date: 05/18/2012

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80367	white vibration cloth like material collected from 2" x 4" Duct Located in ROOM 12, 14 FT ABOVE
LAB No:	Floor
EWR- 80368	white vibration cloth like material collected from 2" x 4" Duct Located in ROOM 12, 14 FT ABOVE
LAB No:	Floor.
EWR- 80369	Brown 6" cove base like material collected from Staircase # 1, Ground Level.
LAB No:	
EWR- 80370	Brown 6" cove base like material collected from staircase # 1, Ground Level.
LAB No:	
EWR- 80371	Brown 6" cove base like material collected from staircase # 1, Ground Level
LAB No:	
EWR- 80372	Light Brown Glue like material collected behind 6" cove base located in staircase # 1,
LAB No:	Ground Level.
EWR- 80373	Light Brown Glue like material collected behind 6" cove base located in staircase # 1
LAB No:	Ground Level.
EWR- 80374	Light Brown Glue like material collected behind 6" cove base located in staircase # 1
LAB No:	Ground Level.

Port Authority Inspector(s): K. Levin, C. Tofat

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Sample Date : 5/18/2012
Date Received : 5/18/2012
Date Analyzed : 5/18/2012
ATC Batch # 23991
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Location: HANGER 14 1ST FLOOR / ENTIRE FLOOR
Project # EWR 151.120

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80351 23991 -1	4" OD pipe fitting insulation located on south side of room 12, 9' above floor level	White cementitious like material Color: WHITE/GRAY	PLM		80% Mineral Filler		20% Chrysotile
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 20 %
EWR-80352 23991 -2	4" OD hot water pipe fitting insulation located on South side of Room 12, 10' above the floor level	White cementitious like material Color: WHITE/GRAY	PLM		75% Mineral Filler		25% Chrysotile
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 25 %
EWR-80353 23991 -3	4" OD hot water pipe fitting insulation located on center of Room 12, 10' above the floor level	White cementitious like material Color: WHITE	PLM		75% Mineral Filler		15% Chrysotile 10% Amosite
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 25 %
80354 23991 -4	Heat Exchanger located along south wall of room 12, 8' above the floor level	White cementitious like material Color: GRAY	PLM		80% Mineral Filler		20% Chrysotile
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 20 %
EWR-80355 23991 -5	Heat exchanger insulation located South wall of room 12, 8' above the floor level	White cementitious like material Color: WHITE	PLM		70% Mineral Filler		20% Chrysotile 10% Amosite
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 30 %
EWR-80356 23991 -6	Heat exchanger insulation located South wall of room 12, 8' above the floor level	White cementitious like material Color: WHITE	PLM		75% Mineral Filler		15% Chrysotile 10% Amosite
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 25 %
EWR-80357 23991 -7	2" OD city water pipe elbow insulation located at the center of room 12, 8' above the floor level	White cementitious like material Color: WHITE	PLM		80% Mineral Filler		10% Chrysotile 10% Amosite
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 20 %

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80358 23991 -8	2" OD city water pipe elbow insulation located at the center of Room 12, 10' above the floor level	White cementitious like material Color: WHITE	PLM		75% Mineral Filler		15% Chrysotile 10% Amosite
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 25 %
EWR-80359 23991 -9	2" OD pipe elbow locate in the center of room #12, 12' above floor - city water pipe	White cementitious like material Color: WHITE	PLM		70% Mineral Filler		10% Chrysotile 20% Amosite
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 30 %
EWR-80360 23991 -10	2" city water pipe insulation located at the center of room #12, 8 ft above floor	White cementitious like material Color: WHITE	PLM		75% Mineral Filler		10% Chrysotile 15% Amosite
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 25 %
EWR-80361 23991 -11	2" city water pipe insulation located at center of room #12 10 ft above floor	White cementitious like material Color: WHITE	PLM		80% Mineral Filler		10% Chrysotile 10% Amosite
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 20 %
EWR-80362 23991 -12	2" city water pipe insulation located at center of room #12 12 ft above floor	White cementitious like material Color: WHITE	PLM		75% Mineral Filler		15% Chrysotile 10% Amosite
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 25 %
EWR-80363 23991 -13	Tank insulation located along south wall in room #12, 10 ft above floor	White cementitious like material Color: GRAY	PLM		60% Mineral Filler		40% Chrysotile
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 40 %
EWR-80364 23991 -14	Tank insulation located along south wall in room #12, 10 ft above floor	White cementitious like material Color: WHITE	PLM		80% Mineral Filler		10% Chrysotile 10% Amosite
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 20 %
EWR-80365 23991 -15	Tank insulation located along South wall in room #12, 10 ft above floor	White cementitious like material Color: WHITE	PLM		75% Mineral Filler		10% Chrysotile 15% Amosite
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 25 %
EWR-80366 23991 -16	2' x 4' duct located in room 12, 14 ft above floor	White vibration cloth like material Color: GRAY	PLM	40% Cellulose	40% Mineral Filler		20% Chrysotile
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 20 %
EWR-80367 23991 -17	2' x 4' Duct located in room 12, 14 ft above floor	White vibration cloth like material Color: GRAY	PLM	50% Cellulose	30% Mineral Filler		20% Chrysotile
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 20 %

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Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80368 23991 -18	2' x 4' duct located in room 12, 14 ft above floor	White vibration cloth like material Color: GRAY	PLM	40% Cellulose	40% Mineral Filler		20% Chrysotile
Analyzed By: Tarik Fata				Comments:			Total Asbestos: 20 %
EWR-80369 23991 -19	Staircase #1, ground level	Brown 6" cove base like material Color: BROWN	NOB-TEM			31.3% Organic 29.8% Residue 38.9% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80370 23991 -20	Staircase #1, ground level	Brown 6" cove base like material Color: BROWN	NOB-TEM			30% Organic 30.9% Residue 39.1% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80371 23991 -21	Staircase #1, ground level	Brown 6" cove base like material Color: BROWN	NOB-TEM			30.9% Organic 29.8% Residue 39.3% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80372 23991 -22	Collected Behind 6" cove base located in staircase #1 Ground Level	Light brown glue like material Color: BROWN	NOB-TEM			54% Organic 38.8% Residue 7.2% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80373 23991 -23	Collected Behind 6" cove base located in staircase #1 Ground Level	Light brown glue like material Color: BROWN	NOB-TEM			52.6% Organic 33.5% Residue 13.9% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80374 23991 -24	Collected Behind 6" cove base located in staircase #1 Ground Level	Light brown glue like material Color: BROWN	NOB-TEM			52% Organic 36.9% Residue 11.1% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestus Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

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5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

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10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarik Fata
Analyst:

Mohamed Fata
Analyst:

Mark Peysakhov
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

23994

Laboratory Destination:	EMSL ATC
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 2

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other

Set	SAMPLE #' S FROM	SAMPLE #' S TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.) RELINQUISHED BY:	DATE TIME
1	EWR- 80375	EWR- 80380	6	K. Lewis	05/21/2012 15:00
	EWR-	EWR-			
	EWR-	EWR-			

RELINQUISHED BY: K. Lewis	DATE: 05/21/2012 TIME: 1530	FAX RESULTS to: (973) 961-6066
RECEIVED BY: Mancior Sanchez	DATE: 5-21-12 TIME: 4:00 pm	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY: Analyzed By: ATC Tala	DATE: 5/21/12 TIME: 5:40 P	If "was not" is checked above, indicate the actual turnaround. CPCM
RELINQUISHED BY: Courier	DATE: 05/21/12 TIME: 4:45 p.m	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY: Ken A Bellegos	DATE: 5/21/12 TIME: 2100	
RECEIVED AT THE LAB BY: D. Agent	LAB NAME: ATC DATE: 05/21/12 TIME: 4:45 p.m.	(Signature of R. E.'s Representative) CHARGE CODE: CA44151120 (Use a separate C-O-C for each Charge Code)

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

23994

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st floor

Job No.: N/A

Area Description ROOM 13B

Date: 05/21/2012

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80375	Dark grey floor tile like material collected from 12x12 floor tiles located
LAB No:	on west side of Room 13B
EWR- 80376	Yellow glue like material collected underneath 12x12 dark grey floor tiles located on west
LAB No:	side of ROOM 13B
EWR- 80377	Dark grey floor tile like material collected from 12x12 floor tiles located on east
LAB No:	side of Room 13B
EWR- 80378	Yellow glue like material collected underneath 12x12 dark grey floor tiles located on east
LAB No:	side of Room 13B
EWR- 80379	Dark grey floor tile like material collected from 12x12 floor tiles located at the center
LAB No:	of ROOM 13B
EWR- 80380	Yellow glue like material collected underneath 12x12 dark grey floor tiles located at
LAB No:	the center of ROOM 13B
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): K. Levin

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: HANGER 14 1ST FLOOR / ROOM 13B

Project # EWR 151.120

Sample Date : 5/21/2012
Date Received : 5/21/2012
Date Analyzed : 5/21/2012
ATC Batch # 23994
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80375 23994 -1	From 12 x 12 floor tiles located on west side of room 13B	Dark grey floor tile like material	NOB-TEM			17.4% Organic 3.3% Residue 79.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Alex Barengolts		Comments: PLM Inconclusive, NOB-PLM inconclusive			
EWR-80375 23994 -2	From underneath 12 x 12 dark gray floor tiles located on west side of room 13B	Yellow glue like material	NOB-TEM			66.9% Organic 9.3% Residue 23.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Yellow Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80377 23994 -3	From 12 x 12 floor tiles located on east side of room 13B	Dark grey floor tile like material	NOB-TEM			18.6% Organic 17.5% Residue 63.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80378 23994 -4	From underneath 12 x 12 dark gray floor tiles located on east side of room 13B	Yellow glue like material	NOB-TEM			80.2% Organic 9.6% Residue 10.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Yellow Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80379 23994 -5	From 12 x 12 floor tiles located at the center of room 13B	Dark grey floor tile like material	NOB-TEM			16.6% Organic 2% Residue 81.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80380 23994 -6	From underneath 12 x 12 dark gray floor tiles located at the center of room 13B	Yellow glue like material	NOB-TEM			64.5% Organic 16.5% Residue 19% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Yellow Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

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9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No	Vendor Billing No.

24016

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	(ASBESTOS - PCM / PLM / TEM)
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 3

Sample Type - **LEAD** [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
				X				

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
	EWR- 80381	EWR- 80392	12	RELINQUISHED BY: Mark Lindford	DATE TIME 05-24-12 1530
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY	DATE TIME
				RELINQUISHED BY	DATE TIME

RELINQUISHED BY: Mark Lindford	DATE: 05-24-12 TIME: 1530	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY: Marcon Davis	DATE: 5-24-12 TIME: 4pm	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY: [illegible]	DATE: 5/24/12 TIME: 2100	The data report for the above samples
RELINQUISHED BY: Courier	DATE: 5/24/12 TIME: 17:10	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By ATC Tech	DATE: 5/24/12 TIME: 545 P	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: Jie Ying Gao	LAB NAME: ATC DATE: 5/24/12 TIME: 17:10	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

PA 3739
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The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24016 2 of 3

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 2nd

Job No.: —

Area Description Offices

Date: 05-24-12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80381	Beige glue like material collected from the left side of insulation material over south west window in Room 209A
LAB No:	
EWR- 80382	Beige glue like material collected from the right side of insulation material over south west window in Room 209A
LAB No:	
EWR- 80383	Beige glue like material collected from the bottom of insulation material over south west window
LAB No:	
EWR- 80384	Black glue like material collected from the left side behind insulation material over south west window in Room 209A
LAB No:	
EWR- 80385	Black glue like material collected from the right side behind insulation material over south west window in Room 209A
LAB No:	
EWR- 80386	Black glue like material collected from the bottom behind insulation material over south west window in Room 209A
LAB No:	
EWR- 80387	Brown cardboard like material collected from the topside of stall door in restroom 208
LAB No:	
EWR- 80388	Brown cardboard like material collected from the bottom of stall door in restroom 208
LAB No:	

Port Authority Inspector(s): M. Hilford, Greg Urban

PA 3733
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24016 3 of 3

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building: Hanger 14

Contract No.: EWR 151.120

Floor: 2nd

Job No.: —

Area Description: Offices

Date: 05-24-12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80389	Brown cardboard like material collected from the middle of stall door in Restroom 208
LAB No:	
EWR- 80390	Brown mastic like material collected from wall adjacent to window on the left side in Room 203E
LAB No:	
EWR- 80391	Brown mastic like material collected from wall adjacent to window on the bottom in Room 203E
LAB No:	
EWR- 80392	Brown mastic like material collected from wall adjacent to window on the right side in Room 203E
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): M. Lindford, Greg Urban

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872
Project: NEWARK INTERNATIONAL AIRPORT

Sample Date : 5/24/2012
Date Received : 5/24/2012
Date Analyzed : 5/24/2012
ATC Batch # 24016
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Location: HANGER 14, 2nd Floor, Offices
Project # EWR 151.120

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80381 24016 -1	From the left side of insulation material over south west window in room 209 A	Beige glue like material	PLM				NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-80382 24016 -2	From the right side of insulation material over south west window in room 209 A	Beige glue like material	NOB-TEM			35.1% Organic 9% Residue 55.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Beige Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80383 24016 -3	From the bottom of insulation material over south west window in room 209 A	Beige glue like material	NOB-TEM			35.9% Organic 5.5% Residue 58.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Beige Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80384 24016 -4	From the left side behind insulation material over south west window in room 209 A	Black glue like material	NOB-TEM			86.3% Organic 12.9% Residue 0.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80385 24016 -5	From the right side behind insulation material over south west window in room 209 A	Black glue like material	NOB-TEM			57.7% Organic 33.7% Residue 8.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80386 24016 -6	From the bottom behind insulation material over south west window in room 209 A	Black glue like material	NOB-TEM			75.9% Organic 3.4% Residue 20.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80387 24016 -7	From the top side of stall door in restroom 208	Brown cardboard like material	PLM	88% Cellulose	12% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata		Color: Brown		Comments:			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80388	From the bottom side of stall door in restroom 208	Brown cardboard like material	PLM	90% Cellulose	10% Mineral Filler		NONE DETECTED
24016 -8		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80389	From the middle side of stall door in restroom 208	Brown cardboard like material	PLM	92% Cellulose	8% Mineral Filler		NONE DETECTED
24016 -9		Color: Brown		Comments:			
Analyzed By: Tarek Fata							
EWR-80390	From wall adjacent to window on the leftside in room 203E	Brown mastic like material	NOB-TEM			60.4% Organic 37.4% Residue 2.2% Carbonate	NONE DETECTED
24016 -10		Color: Brown		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-80391	From wall adjacent to window on the bottom in room 203E	Brown mastic like material	NOB-TEM			53.2% Organic 15.6% Residue 31.2% Carbonate	NONE DETECTED
24016 -11		Color: Brown		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-80392	From wall adjacent to window on the rightside in room 203E	Brown mastic like material	NOB-TEM			53.4% Organic 14.1% Residue 32.5% Carbonate	NONE DETECTED
24016 -12		Color: Brown		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

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12) PLM Letter is attached on this report.

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14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.
	24022

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL ATC
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 5

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
							X	

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
	EWR- 80393	EWR- 80419	27	RELINQUISHED BY: Mark Lindford	DATE TIME 05-25-12 1530
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: Mark Lindford	DATE: 05-25-12 TIME: 1530	FAX RESULTS to: (973) 961-6066
RECEIVED BY:	DATE: 5-25-12 TIME: 1535	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: 5.26.12 TIME: 2:00	The data report for the above samples
RELINQUISHED BY: Courier	DATE: 5/25/12 TIME: 5:01 pm	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: ATC - TFata	DATE: 5/25/12 TIME: 6:20 PM	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: Jie Ying Gao	LAB NAME: ATC DATE: 5/25/12 TIME: 5:01 pm	(Signature of R. E.'s Representative) CHARGE CODE: CA44151120 (Use a separate C-O-C for each Charge Code)

24 NOB PLM. 21 NOB TEM

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24022 2 of 5

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1ST

Job No.: ——

Area Description South EAST "Black Bldg A"

Date: 05-25-12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80393	white caulking like material collected from the right side of the window
LAB No:	
EWR- 80394	white caulking like material collected from the left side of the window
LAB No:	
EWR- 80395	white caulking like material collected from the top of the window
LAB No:	
EWR- 80396	white paint like material collected from the right side of the wall
LAB No:	
EWR- 80397	white paint like material collected from the left side of the wall
LAB No:	
EWR- 80398	white paint like material collected from the top of the wall
LAB No:	
EWR- 80399	Gray cementitious like material collected from between cinder block wall west
LAB No:	
EWR- 80400	Gray cementitious like material collected from between cinder block wall EAST
LAB No:	

Port Authority Inspector(s): M. Midford, G. Urban

PA 3729
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24022 30 of 5

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st

Job No.:

Area Description South East Dock Bldg A"

Date: 05-25-12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80401	Gray consistency like material collected from between cinder block wall north
LAB No:	
EWR- 80402	White caulk like material collected from exterior around metal vent East
LAB No:	
EWR- 80403	White caulk like material collected from exterior around metal vent Right Lower
LAB No:	
EWR- 80404	White caulk like material collected from exterior around metal vent West
LAB No:	
EWR- 80405	Black rubber like material collected from exterior At bottom of expansion joint
LAB No:	
EWR- 80406	Black rubber like material collected from exterior At top of expansion joint
LAB No:	
EWR- 80407	Black rubber like material collected from exterior At middle of expansion joint
LAB No:	
EWR- 80408	Gray transite like material collected from board affected to the east wall Right
LAB No:	

Port Authority Inspector(s): M. Laidford, G. Urban

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24022

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st

Job No.:

Area Description South East "Block Bldg. A"

Date: 05-25-12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80409	Gray transite like material collected from board attached to the east wall left
LAB No:	
EWR- 80410	Gray transite like material collected from board attached to the east wall top side
LAB No:	
EWR- 80411	Black vapor barrier like material collected from the exterior of building bottom right
LAB No:	
EWR- 80412	Black vapor barrier like material collected from the exterior of building bottom left
LAB No:	
EWR- 80413	Black vapor barrier like material collected from the exterior of building south east corner
LAB No:	
EWR- 80414	White cloth like wrap collected from around wire inside switch box for roll up gate left side
LAB No:	
EWR- 80415	White cloth like wrap collected from around wire inside switch box for roll up gate right side
LAB No:	
EWR- 80416	White cloth like wrap collected from around wire inside switch box for roll up gate bottom
LAB No:	

Port Authority Inspector(s): M. Hadford, G. Urbani

EA 3/09
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24022

5 of 5

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st

Job No.:

Area Description South end "Block Bldg. A"

Date: 05 25 12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80417	Black circuit board like material collected from left side of switch box
LAB No:	
EWR- 80418	Black circuit board like material collected from right side of switch box
LAB No:	
EWR- 80419	Black circuit board like material collected from light center of switch box
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): M. Lindford, G. Urbano

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: HANGER 14 / 1ST SOUTH EAST "BLOCK BLDG A"

Project # EWR 151.120

Sample Date : 5/25/2012
Date Received : 5/25/2012
Date Analyzed : 5/26/2012
ATC Batch # 24022
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80393	From the right side of the window	White caulking like material	NOB-TEM			7% Organic 1.8% Residue 90.9% Carbonate	0.3% Anthophyllite
24022 -1		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.3 %
EWR-80394	From the left side of the window	White caulking like material	NOB-TEM			7.4% Organic 2.8% Residue 89.7% Carbonate	0.1% Anthophyllite
24022 -2		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.1 %
EWR-80395	From the top of the window	White caulking like material	NOB-TEM			6.8% Organic 3.7% Residue 88.9% Carbonate	0.6% Anthophyllite
24022 -3		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.6 %
EWR-80396	From the Right side of the wall	White paint like material	NOB-TEM			27.8% Organic 37% Residue 35.2% Carbonate	NONE DETECTED
24022 -4		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80397	From the left side of the wall	White paint like material	NOB-TEM			14.2% Organic 40% Residue 45.8% Carbonate	NONE DETECTED
24022 -5		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80398	From the top of the wall	White paint like material	NOB-TEM			40% Organic 43.2% Residue 16.8% Carbonate	NONE DETECTED
24022 -6		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80399	Between cinder block wall West	Gray cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
24022 -7		Color: Gray					
Analyzed By: Tarek Fata				Comments:			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80400	Between cinder block wall West	Gray cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
24022 -8		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80401	Between cinder block wall North	Gray cementitious like material	PLM		100% Mineral Filler		NONE DETECTED
24022 -9		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80402	Exterior around metal vent East	White caulk like material	NOB-PLM			17.6% Organic 25.4% Residue 54.2% Carbonate	2.8% Chrysotile
24022 -10		Color: White					
Analyzed By: Tarek Fata		Second Analyst: George Htay		Comments: PLM inconclusive			Total Asbestos: 2.8 %
EWR-80403	Exterior around metal vent right lower	White caulk like material	NOB-PLM			21.4% Organic 26.1% Residue 49.6% Carbonate	2.9% Chrysotile
24022 -11		Color: White					
Analyzed By: Tarek Fata		Second Analyst: George Htay		Comments: PLM inconclusive			Total Asbestos: 2.9 %
EWR-80404	Exterior around metal vent West	White caulk like material	NOB-PLM			24.1% Organic 22.9% Residue 50.5% Carbonate	2.5% Chrysotile
24022 -12		Color: White					
Analyzed By: Tarek Fata		Second Analyst: George Htay		Comments: PLM inconclusive			Total Asbestos: 2.5 %
EWR-80405	Exterior at bottom of expansion joint	Black rubber like material	NOB-TEM			91% Organic 1.5% Residue 7.5% Carbonate	NONE DETECTED
24022 -13		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80406	Exterior at top of expansion joint	Black rubber like material	NOB-TEM			81% Organic 6% Residue 13% Carbonate	NONE DETECTED
24022 -14		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80407	Exterior at middle of expansion joint	Black rubber like material	NOB-TEM			90.1% Organic 2.4% Residue 7.5% Carbonate	NONE DETECTED
24022 -15		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80408	From board attached to the East wall right	Gray transite like material	NOB-TEM			58.5% Organic 31.1% Residue 10.4% Carbonate	NONE DETECTED
24022 -16		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80409	From board attached to the East wall Left	Gray transite like material	NOB-TEM			53.3% Organic 30.7% Residue 16% Carbonate	NONE DETECTED
24022 -17		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80410 24022 -18	From board attached to the East wall top side	Gray transite like material	NOB-TEM			61% Organic 33.3% Residue 5.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80411 24022 -19	From the exterior of building bottom right	Black vapor barrier like material	NOB-TEM			97.1% Organic 2% Residue 0.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80412 24022 -20	From the exterior of building bottom left	Black vapor barrier like material	NOB-TEM			96.8% Organic 1.9% Residue 1.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80413 24022 -21	From the exterior of building South East corner	Black vapor barrier like material	NOB-TEM			94.2% Organic 3.5% Residue 2.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80414 24022 -22	From around wire inside switch box for roll up Gate left side	White cloth like wrap collected	NOB-TEM			21.9% Organic 10.3% Residue 67.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: White Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80415 24022 -23	From around wire inside switch box for roll up Gate right side	White cloth like wrap collected	NOB-TEM			29.4% Organic 2.6% Residue 68% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: White Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80416 24022 -24	From around wire inside switch box for roll up Gate bottom	White cloth like wrap collected	NOB-TEM			27.7% Organic 2.5% Residue 69.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: White Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80417 24022 -25	From left side of switch box	Black circuit board like material	NOB-TEM			95.8% Organic 1.8% Residue 2.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80418 24022 -26	From right side of switch box	Black circuit board like material	NOB-TEM			95.1% Organic 1.8% Residue 3.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80419 24022 -27	From right center of switch box	Black circuit board like material	NOB-TEM			93.3% Organic 2.5% Residue 4.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%, based on one asbestos point counter over 400 non-empty points

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Milena Bonezzi M Bonezzi
Approved by
Laboratory Director:

George Hay
Analyst:

Aleks Barengolts
Analyst:

Rec. No.	Vendor Billing No.

BATCH 24027

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 2

Sample Type - **LEAD** [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
	EWR- 80420	EWR- 80424	5	RELINQUISHED BY: S. KHODORKOVSKY	DATE TIME 5/29/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S. KHODORKOVSKY	DATE: TIME: 5/29/12 15:30	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY:	DATE: TIME:	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Courier	DATE: TIME: 5/29/12 16:45	Please Email Results to rcamplon@panynj.gov and dmccarth@panynj.gov
RECEIVED BY: Analyzed By: ATC - T Feta	DATE: TIME: 5/29/12 6:00 PM	
RECEIVED AT THE LAB BY: Milena Bonezzi	LAB NAME: ATC DATE: 5/29/12 TIME: 16:45	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

PA 3732
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

BATCH 24027

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st fl

Job No.:

Area Description

Date: 05.29.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80420	White Pipe Insulation Material collected from 10" pipe located on west side 1st fl
LAB No:	adjacent to door 1B (steam hot)
EWR- 80421	White Pipe Insulation like Material collected from 8" pipe located on west side
LAB No:	1st fl adjacent to door 1B (cold)
EWR- 80422	Gray Pipe Penetration Sealer like material collected from exterior south wall
LAB No:	adjacent to door #1 & diesel generator
EWR- 80423	Gray Pipe Penetration Sealer like Material collected from exterior South wall
LAB No:	adjacent to door #1 & diesel generator
EWR- 80424	Gray Pipe Penetration Sealer like Material collected from exterior south wall
LAB No:	adjacent to door #1 & diesel generator
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. Khodorkovsky / V. Feldbluym

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872
Project: NEWARK INTERNATIONAL AIRPORT

Sample Date : 5/29/2012
Date Received : 5/29/2012
Date Analyzed : 5/29/2012
ATC Batch # 24027
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Location: HANGER 14 / 1ST SE
Project # EWR 151.120

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80420	10" pipe located on west side 1st fl adjacent to door 1B (steam hot)	White pipe insulation material	PLM		80% Mineral Filler		10% Chrysotile 10% Amosite
24027 -1		Color: White		Comments:			
Analyzed By: Tarek Fata							Total Asbestos: 20 %
EWR-80421	8" pipe located on west side 1st fl adjacent to door 1B (cold)	White pipe insulation material	PLM		80% Mineral Filler		12% Chrysotile 8% Amosite
24027 -2		Color: White		Comments:			
Analyzed By: Tarek Fata							Total Asbestos: 20 %
EWR-80422	Exterior south wall adjacent to door #1 and diesel generator	Gray pipe penetration sealer like material	PLM	Trace% Cellulose	100% Mineral Filler		NONE DETECTED
24027 -3		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80423	Exterior south wall adjacent to door #1 and diesel generator	Gray pipe penetration sealer like material	PLM	Trace% Cellulose	100% Mineral Filler		NONE DETECTED
24027 -4		Color: Gray		Comments:			
Analyzed By: Tarek Fata							
EWR-80424	Exterior south wall adjacent to door #1 and diesel generator	Gray pipe penetration sealer like material	PLM	Trace% Cellulose	100% Mineral Filler		NONE DETECTED
24027 -5		Color: Gray		Comments:			
Analyzed By: Tarek Fata							

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

				Non-Asbestos		NOB	Asbestos
Sample #	*Location*	*Type of Material*	*Method*	*% Fibrous*	*% Non-Fibrous*	*% Type*	*% Type*

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

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9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

24261

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM (PLM) TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 3

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)		
	EWR- 81071	EWR- 81076	6	RELINQUISHED BY: S. KHODORKOVSKY		DATE TIME 6/29/12 15:30
	EWR-	EWR-		RELINQUISHED BY:		DATE TIME
	EWR-	EWR-		RELINQUISHED BY:		DATE TIME
				RELINQUISHED BY:		DATE TIME
				RELINQUISHED BY:		DATE TIME
				RELINQUISHED BY:		DATE TIME

RELINQUISHED BY: S. KHODORKOVSKY	DATE: TIME: 6/29/12 15:30	FAX RESULTS to: (973) 961-6066
RECEIVED BY: J. Mawar	DATE: TIME: 7/2/12 15:39	ATTN: RALPH CAMPIONE
RELINQUISHED BY: Courier	DATE: TIME: 7/2/12 16:35	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY: [illegible]	DATE: TIME: 7/2/12 2:00	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY:	DATE: TIME:	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY: Analyzed By: Atc. Tlaton	DATE: TIME: 7-2-12 530P	
RECEIVED AT THE LAB BY: Jie Ying Gao	LAB NAME: ATC DATE: 7/2/12 TIME: 16:35	(Signature of R. E.'s Representative) CHARGE CODE: CA44151150 (Use a separate C-O-C for each Charge Code)

EA 1739
9-98

The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24261

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st fl.

Job No.:

Area Description Exterior

Date 06.29.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81071	black rubber/fiber electrical supply pipe sealer like material, collected on the south side exterior
LAB No:	
EWR- 81072	black rubber/fiber electrical supply pipe sealer like material, collected on the south side exterior
LAB No:	
EWR- 81073	black rubber/fiber electrical supply pipe sealer like material, collected on the south side exterior
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

PA 3732
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24261

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: C 44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor 1st fl

Job No.:

Area Description South East "Block Bldg A"

Date: 06.29.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81074	black rubberized door gasket like material, collected from the door to block bldg A
LAB No:	
EWR- 81075	black rubberized door gasket like material, collected from the door to block bldg A.
LAB No:	
EWR- 81076	black rubberized door gasket like material, collected from the door to block bldg A
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. Khodorkovsky / V. Feldblyum

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: Building: Hanger 14, Floor: 1st floor, Area: Exterior

Sample Date: 7/2/2012
Date Received: 7/2/2012
Date Analyzed: 7/2/2012
ATC Batch # 24261
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81071	On the south side exterior	Black rubber / fiber electrical supply pipe sealer like material	NOB-TEM			24.5% Organic 30.3% Residue 45.2% Carbonate	NONE DETECTED
24261 -1		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81072	On the south side exterior	Black rubber / fiber electrical supply pipe sealer like material	NOB-TEM			23.1% Organic 31% Residue 45.9% Carbonate	NONE DETECTED
24261 -2		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81073	On the south side exterior	Black rubber / fiber electrical supply pipe sealer like material	NOB-TEM			24.1% Organic 30.7% Residue 45.2% Carbonate	NONE DETECTED
24261 -3		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81074	The door to block bldg A	Black rubberized door gasket like material	NOB-TEM			91.7% Organic 1.4% Residue 6.9% Carbonate	NONE DETECTED
24261 -4		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81075	The door to block bldg A	Black rubberized door gasket like material	NOB-TEM			91.4% Organic 2.7% Residue 5.9% Carbonate	NONE DETECTED
24261 -5		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81076	The door to block bldg A	Black rubberized door gasket like material	NOB-TEM			92.1% Organic 1.7% Residue 6.2% Carbonate	NONE DETECTED
24261 -6		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual identify named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

24177

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 10

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	SAMPLE #' S TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
	EWR- 80991	EWR- 81056	66	RELINQUISHED BY: S. Khodorkovsky	DATE TIME 6/20/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S. KHODOREVSKY	DATE: TIME: 6/20/12 15:30	FAX RESULTS to: (973) 961-6066
RECEIVED BY: MANGAL Sanker	DATE: TIME: 6-20-12 15:30 pm	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY: Courier	DATE: 6/20/12 TIME: 6:25 pm	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: Alex Fetu	DATE: 6-20-12 TIME: 7:30 PM	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY: [illegible]	DATE: TIME: 6/20/12	68 PLM
RECEIVED AT THE LAB BY: Milena Bonezzi	LAB NAME: ATC DATE: 6/20/12 TIME: 5:15 PM	(Signature of R. E.'s Representative) CHARGE CODE: CA44151150 (Use a separate C-O-C for each Charge Code)

PA 3739
9-98

The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24177

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description Main ROOF

Date: 06.20.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80991	gray/white rubberized roof membrane like material collected on the roof, center top layer
LAB No:	
EWR- 80992	gray paper 2nd layer like material collected on the roof, center
LAB No:	
EWR- 80993	yellow foam insulation 3rd layer like material, collected on the roof, center
LAB No:	
EWR- 80994	black tar bottom layer ~~paper~~ like material, collected on the roof, center
LAB No:	
EWR- 80995	gray/white top layer rubberized roof membrane like material, collected on the roof, east side, center loc
LAB No:	
EWR- 80996	gray paper 2nd layer like material collected on the roof, eastside, center loc
LAB No:	
EWR- 80997	yellow foam insulation 3rd layer like material, collected on the roof eastside, center loc
LAB No:	
EWR- 80998	black tar paper bottom layer like material, collected on the roof, eastside, center loc
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Engineering Department
Environmental Field Operations
P.A.C.M. Sampling Form

24177

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description main roof

Date: 06.20.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80999	gray/white rubberized roof membrane top layer like material collected on the roof, east side, north loc
LAB No:	
EWR- 81000	gray paper 2nd layer like material collected on the roof, eastside, north loc
LAB No:	
EWR- 81001	yellow foam insulation 3rd layer like material collected on the roof, eastside, north loc
LAB No:	
EWR- 81002	black tar paper bottom layer like material collected on the roof, eastside north loc
LAB No:	
EWR- 81003	gray/white rubberized roof membrane top layer like material, collected on the roof, northside
LAB No:	
EWR- 81004	gray paper 2nd layer like material collected on the roof, northside
LAB No:	
EWR- 81005	yellow foam insulation 3rd layer like material, collected on the roof, northside
LAB No:	
EWR- 81006	black tar bottom layer like material collected on the roof, northside
LAB No:	

Port Authority inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Environmental Field Operations
P.A.C.M Sampling Form

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description main roof

Date: 06.20.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81007	gray/white rubberized roof membrane top layer like material collected on the roof, north west
LAB No:	
EWR- 81008	gray paper 2nd layer like material collected on the roof, north west
LAB No:	
EWR- 81009	yellow foam insulation 3rd layer, like material collected on the roof, north west
LAB No:	
EWR- 81010	black tar bottom layer like material collected on the roof, north west
LAB No:	
EWR- 81011	gray/white rubberized roof membrane top layer like material collected on the roof westside, north loc
LAB No:	
EWR- 81012	gray paper 2nd layer like material collected on the roof, westside, north loc
LAB No:	
EWR- 81013	yellow foam insulation 3rd layer like material, collected on the roof, westside, north loc
LAB No:	
EWR- 81014	black tar paper bottom layer like material collected on the roof, westside, north loc
LAB No:	

Port Authority Inspector(s): S. KHODOKOVSKY / V. Feldblyum

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2M177

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description main roof

Date: 06.20.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81015	gray/white rubberized roof membrane top layer like material collected on the roof, westside
LAB No:	
EWR- 81016	gray paper 2nd layer like material collected on the roof, westside
LAB No:	
EWR- 81017	yellow foam insulation 3rd layer like material collected on the roof westside
LAB No:	
EWR- 81018	black tar bottom layer like material collected on the roof westside
LAB No:	
EWR- 81019	gray/white rubberized roof membrane top layer like material collected on the roof, southwest
LAB No:	
EWR- 81020	gray paper 2nd layer like material collected on the roof, south west
LAB No:	~~yellow foam insulation 3rd layer~~
EWR- 81021	yellow foam insulation 3rd layer like material collected on the roof southwest
LAB No:	
EWR- 81022	black tar bottom layer like material collected on the roof southwest
LAB No:	

Port Authority Inspector(s): S. Khodorkovsky / V. Feldblyum

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2M177

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description main roof

Date: 06.20.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81023	gray/white rubberized roof membrane top layer like material collected on the roof, south side
LAB No:	
EWR- 81024	gray paper 2nd layer like material collected on the roof, southside
LAB No:	
EWR- 81025	yellow foam insulation 3rd layer like material collected on the roof, southside
LAB No:	
EWR- 81026	black tar bottom layer like material collected on the roof, southside
LAB No:	
EWR- 81027	gray/white rubberized roof membrane top layer like material collected on the roof southeast
LAB No:	
EWR- 81028	gray paper 2nd layer like material collected on the roof, south east
LAB No:	
EWR- 81029	yellow foam insulation 3rd layer like material, collected on the roof, southeast
LAB No:	
EWR- 81030	black tar bottom layer like material collected on the roof, south east
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Engineering Department
Environmental Field Operations
P.A.C.M. Sampling Form

24177

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description main roof

Date: 06 20.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81031	gray roof flashing top layer rubberized like material collected from the roof
LAB No:	north west
EWR- 81032	gray roof flashing 2nd layer paper like material collected from the roof,
LAB No:	northwest
EWR- 81033	yellow roof flashing 3rd layer foam like material collected from the roof,
LAB No:	north west
EWR- 81034	black roof flashing bottom layer tar like material collected from the roof
LAB No:	northwest
EWR- 81035	gray roof flashing top layer rubberized like material collected from the roof,
LAB No:	southwest
EWR- 81036	gray roof flashing 2nd layer paper like material collected from the roof
LAB No:	southwest
EWR- 81037	yellow roof flashing 3rd layer foam like material collected from the roof
LAB No:	southwest
EWR- 81038	black roof flashing bottom layer tar like material collected from the roof
LAB No:	southwest

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24177

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description main roof

Date: 06.20.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81039	gray roof flashing top layer rubberized like material collected from the roof
LAB No:	southside
EWR- 81040	gray roof flashing 2nd layer paper like material collected from the roof
LAB No:	southside
EWR- 81041	yellow roof flashing 3rd layer foam like material collected from the roof
LAB No:	southside
EWR- 81042	black roof flashing bottom layer tar like material collected from the roof
LAB No:	southside
EWR- 81043	gray roof flashing top layer rubberized like material collected from the roof.
LAB No:	eastside
EWR- 81044	gray roof flashing 2nd layer paper like material collected from the roof.
LAB No:	eastside
EWR- 81045	yellow roof flashing 3rd layer foam like material collected from the roof.
LAB No:	eastside
EWR- 81046	black roof flashing bottom layer tar like material collected from the roof
LAB No:	eastside

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24177

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description main roof

Date: 06.20.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81047	gray roof flashing top layer rubberized like material, collected from the roof,
LAB No:	northside
EWR- 81048	gray roof flashing 2nd layer paper like material, collected from the roof, northside
LAB No:	
EWR- 81049	yellow roof flashing 3rd layer foam like material, collected from the roof, northside
LAB No:	
EWR- 81050	black roof flashing bottom layer tar like material, collected from the roof
LAB No:	northside
EWR- 81051	black exhaust vent caulking like
LAB No:	material, collected from the roof, northside
EWR- 81052	white exhaust vent caulking like
LAB No:	material, collected from the roof, northside
EWR- 81053	black exhaust vent caulking like
LAB No:	material, collected from the roof, center
EWR- 81054	white exhaust vent caulking like
LAB No:	material, collected from the roof center

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24177

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description main roof

Date: 06.20.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81055	black skylight tar like material collected from the roof, westside
LAB No:	
EWR- 81056	black skylight tar like material collected from the roof, southside
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: Bldg: Hanger 14, Floor: Roof, Main roof

Sample Date : 6/20/2012
Date Received : 6/20/2012
Date Analyzed : 6/20/2012
ATC Batch # 24177
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80991	On the roof center top layer	Gray/White rubberized roof membrane like material	NOB-TEM			96.3% Organic 1.4% Residue 2.1% Carbonate	0.2% Chrysotile
24177 -1		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.2 %
EWR-80992	On the roof, center	Gray paper 2nd layer like material	NOB-TEM			75.4% Organic 4.9% Residue 19.7% Carbonate	Trace Chrysotile
24177 -2		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: TRACE
EWR-80993	On the roof, center	Yellow foam insulation 3rd layer like material	PLM		10% Mineral Filler 90% Foam		NONE DETECTED
24177 -3		Color: Yellow					
Analyzed By: Tarek Fata				Comments:			
EWR-80994	On the roof, center	Black tar bottom layer paper like material	NOB-TEM			97% Organic 2.7% Residue 0.3% Carbonate	NONE DETECTED
24177 -4		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80995	On the roof, east side, center loc	Gray/White top layer rubberized roof membrane like material	NOB-TEM			94.2% Organic 1.7% Residue 4.1% Carbonate	NONE DETECTED
24177 -5		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80996	On the roof, east side, center loc	Gray paper 2nd layer like material	NOB-TEM			76.9% Organic 13.7% Residue 9.4% Carbonate	NONE DETECTED
24177 -6		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80997	On the roof eastside, center loc	Yellow foam insulation 3rd layer like material	PLM		10% Mineral Filler 90% Foam		NONE DETECTED
24177 -7		Color: Yellow					
Analyzed By: Tarek Fata				Comments:			

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80998 24177 -8	On the roof, eastside, center loc	Black tar paper bottom layer like material Color: Black	NOB-TEM			95.1% Organic 2.9% Residue 2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80999 24177 -9	On the roof, eastside, north loc	Gray/White rubberized roof membrane top layer like material Color: Gray	NOB-TEM			94.1% Organic 1.8% Residue 4.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81000 24177 -10	On the roof, eastside, north loc	Gray paper 2nd layer like material Color: Gray	NOB-TEM			80.6% Organic 9.2% Residue 10.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81001 24177 -11	On the roof, eastside, north loc	Yellow foam insulation 3rd layer like material Color: Yellow	PLM		10% Mineral Filler 90% Foam		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-81002 24177 -12	On the roof, eastside, north loc	Black tar paper bottom layer like material Color: Black	NOB-TEM			96.3% Organic 1.4% Residue 2.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81003 24177 -13	On the roof, northside	Gray/white rubberized roof membrane top layer like material Color: Gray	NOB-TEM			94% Organic 1.6% Residue 4.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81004 24177 -14	On the roof, northside	Gray paper 2nd layer like material Color: Gray	NOB-TEM			82.1% Organic 14.8% Residue 3.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81005 24177 -15	On the roof, northside	Yellow foam insulation 3rd layer like material Color: Yellow	PLM		10% Mineral Filler 90% Foam		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-81006 24177 -16	On the roof, northside	Black tar bottom layer like material Color: Black	NOB-TEM			97.3% Organic 1.9% Residue 0.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81007 24177 -17	On the roof, north west	Gray/White rubberized roof membrane top layer like material Color: Gray	NOB-TEM			90% Organic 2.8% Residue 7.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81008	On the roof, north west	Gray paper 2nd layer like material	NOB-TEM			83.9% Organic 3.2% Residue 12.9% Carbonate	NONE DETECTED
24177 -18		Color: Gray		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81009	On the roof, north west	Yellow foam insulation 3rd layer like material	PLM		10% Mineral Filler		NONE DETECTED
24177 -19		Color: Yellow		Comments:	90% Foam		
Analyzed By: Tarek Fata							
EWR-81010	On the roof, north west	Black tar bottom layer like material	NOB-TEM			98% Organic 1.2% Residue 0.8% Carbonate	NONE DETECTED
24177 -20		Color: Black		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81011	On the roof, westside north loc	Gray/White rubberized roof membrane top layer like material	NOB-TEM			92.8% Organic 1.9% Residue 5.3% Carbonate	NONE DETECTED
24177 -21		Color: Gray		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81012	On the roof, westside north loc	Gray paper 2nd layer like material	NOB-TEM			77.3% Organic 15.6% Residue 7.1% Carbonate	NONE DETECTED
24177 -22		Color: Gray		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81013	On the roof, westside north loc	Yellow foam insulation 3rd layer like material	PLM		10% Mineral Filler		NONE DETECTED
24177 -23		Color: Yellow		Comments:	90% Foam		
Analyzed By: Tarek Fata							
EWR-81014	On the roof, westside north loc	Black tar paper bottom layer like material	NOB-TEM			95% Organic 2.5% Residue 2.5% Carbonate	NONE DETECTED
24177 -24		Color: Black		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81015	On the roof, westside	Gray/White rubberized roof membrane top layer like material	NOB-TEM			94.7% Organic 1.1% Residue 4.2% Carbonate	NONE DETECTED
24177 -25		Color: Gray		Comments: PLM inconclusive NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81016	On the roof, westside	Gray paper 2nd layer like material	NOB-TEM			86.1% Organic 11.7% Residue 2.2% Carbonate	NONE DETECTED
24177 -26		Color: Gray		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81017	On the roof, westside	Yellow foam insulation 3rd layer like material	PLM		10% Mineral Filler		NONE DETECTED
24177 -27		Color: Yellow		Comments:	90% Foam		
Analyzed By: Tarek Fata							

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81018	On the roof, westside	Black tar bottom layer like material	NOB-TEM			85.5% Organic 10.6% Residue 3.9% Carbonate	NONE DETECTED
24177 -28		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81019	On the roof, south west	Gray/white rubberized roof membrane	NOB-TEM			93.2% Organic 1.7% Residue 5.1% Carbonate	NONE DETECTED
24177 -29		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81020	On the roof, south west	Gray paper 2nd layer like material	NOB-TEM			85.1% Organic 4% Residue 10.9% Carbonate	NONE DETECTED
24177 -30		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81021	On the roof, south west	Yellow foam insulation 3rd layer like material	PLM		5% Mineral Filler		NONE DETECTED
24177 -31		Color: Yellow			95% Foam		
Analyzed By: Tarek Fata				Comments:			
EWR-81022	On the roof, south west	Black tar bottom layer like material	NOB-TEM			94.8% Organic 1.5% Residue 3.7% Carbonate	NONE DETECTED
24177 -32		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81023	On the roof, south west	Gray/white rubberized roof membrane top layer like material	NOB-TEM			93.3% Organic 3.3% Residue 3.4% Carbonate	NONE DETECTED
24177 -33		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81024	On the roof, south west	Gray paper 2nd layer like material	NOB-TEM			75% Organic 9.2% Residue 15.8% Carbonate	NONE DETECTED
24177 -34		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81025	On the roof, south side	Yellow foam insulation 3rd layer like material	PLM		10% Mineral Filler		NONE DETECTED
24177 -35		Color: Yellow			90% Foam		
Analyzed By: Tarek Fata				Comments:			
EWR-81026	On the roof, south side	Black tar bottom layer like material	NOB-TEM			97.9% Organic 1.7% Residue 0.4% Carbonate	NONE DETECTED
24177 -36		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81027	On the roof, southeast side	Gray/white rubberized roof memorane top layer like material	NOB-TEM			88.3% Organic 3.6% Residue 8.1% Carbonate	NONE DETECTED
24177 -37		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81028	On the roof, southeast side	Gray paper 2nd layer like material	NOB-TEM			63.5% Organic 2.1% Residue 34.4% Carbonate	NONE DETECTED
24177 -38		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81029	On the roof, southeast side	Yellow foam insulation 3rd layer like material	PLM		10% Mineral Filler		NONE DETECTED
24177 -39		Color: Yellow			90% Foam		
Analyzed By: Tarek Fata				Comments:			
EWR-81030	On the roof, southeast side	Black tar bottom layer like material	NOB-TEM			94.2% Organic 3% Residue 2.8% Carbonate	NONE DETECTED
24177 -40		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81031	From the roof, north west	Gray roof flashing top layer rubberized like material	NOB-TEM			93.9% Organic 1.5% Residue 4.6% Carbonate	NONE DETECTED
24177 -41		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81032	From the roof, north west	Gray roof flashing 2nd layer paper like material	NOB-TEM			83.8% Organic 9.7% Residue 6.5% Carbonate	NONE DETECTED
24177 -42		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81033	From the roof, north west	Yellow roof flashing 3rd layer foam like material	PLM		10% Mineral Filler		NONE DETECTED
24177 -43		Color: Yellow			90% Foam		
Analyzed By: Tarek Fata				Comments:			
EWR-81034	From the roof, north west	Black roof flashing bottom layer tar like material	NOB-TEM			93.9% Organic 1.8% Residue 4.3% Carbonate	NONE DETECTED
24177 -44		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81035	From the roof, south west	Gray roof flashing top layer rubberized like material	NOB-TEM			93.7% Organic 2.5% Residue 3.8% Carbonate	NONE DETECTED
24177 -45		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81036	From the roof, south west	Gray roof flashing 2nd layer paper like material	NOB-TEM			79.6% Organic 2% Residue 18.4% Carbonate	NONE DETECTED
24177 -46		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81037	From the roof, south west	Yellow roof flashing 3rd layer foam like material	PLM		5% Mineral Filler		NONE DETECTED
24177 -47		Color: Yellow			95% Foam		
Analyzed By: Tarek Fata				Comments:			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81038	From the roof, south west	Black roof flashing bottom layer tar like material	NOB-TEM			96.8% Organic 1.4% Residue 1.8% Carbonate	NONE DETECTED
24177 -48		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM Inconclusive			
EWR-81039	From the roof, south side	Gray roof flashing top layer rubberized like material	NOB-TEM			96.2% Organic 2.1% Residue 1.7% Carbonate	NONE DETECTED
24177 -49		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81040	From the roof, south side	Gray roof flashing 2nd layer paper like material	NOB-TEM			90.3% Organic 6.9% Residue 2.8% Carbonate	NONE DETECTED
24177 -50		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81041	From the roof, south side	Yellow roof flashing 3rd layer foam like material	PLM		10% Mineral Filler		NONE DETECTED
24177 -51		Color: Yellow			90% Foam		
Analyzed By: Tarek Fata				Comments:			
EWR-81042	From the roof, south side	Black roof flashing bottom layer tar like material	NOB-TEM			98.5% Organic 1.5% Residue	NONE DETECTED
24177 -52		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81043	From the roof, east side	Gray roof flashing top layer rubberized like material	NOB-TEM			95.1% Organic 1.3% Residue 3.6% Carbonate	NONE DETECTED
24177 -53		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81044	From the roof, east side	Gray roof flashing 2nd layer paper like material	NOB-TEM			94.7% Organic 3.5% Residue 1.8% Carbonate	NONE DETECTED
24177 -54		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81045	From the roof, east side	Yellow roof flashing 3rd layer foam like material	PLM		10% Mineral Filler		NONE DETECTED
24177 -55		Color: Yellow			90% Foam		
Analyzed By: Tarek Fata				Comments:			
EWR-81046	From the roof, east side	Black roof flashing bottom layer tar like material	NOB-TEM			96.3% Organic 3.1% Residue 0.6% Carbonate	NONE DETECTED
24177 -56		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81047	From the roof, north side	Gray roof flashing top layer rubberized like material	NOB-TEM			95% Organic 2.5% Residue 2.5% Carbonate	NONE DETECTED
24177 -57		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM Inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81048	From the roof, north side	Gray roof flashing 2nd layer paper like material	NOB-TEM			85.1% Organic 9.9% Residue 5% Carbonate	NONE DETECTED
24177 -58		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81049	From the roof, north side	Yellow roof flashing 3rd layer foam like material	PLM		10% Mineral Filler		NONE DETECTED
24177 -59		Color: Yellow			90% Foam		
Analyzed By: Tarek Fata				Comments:			
EWR-81050	From the roof, north side	Black roof flashing bottom layer tar like material	NOB-TEM			92.5% Organic 2.5% Residue 5% Carbonate	NONE DETECTED
24177 -60		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81051	From the roof, north side	Black exhaust vent caulking like material	NOB-TEM			72% Organic 10.7% Residue 10.1% Carbonate	7.2% Chrysotile
24177 -61		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 7.2 %**
EWR-81052	From the roof, north side	White exhaust vent caulking like material	NOB-TEM			50.5% Organic 1.1% Residue 48.2% Carbonate	0.1% Chrysotile
24177 -62		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 0.1 %**
EWR-81053	From the roof, center	Black exhaust vent caulking like material	NOB-TEM			50% Organic 1.7% Residue 48.1% Carbonate	0.2% Chrysotile
24177 -63		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 0.2 %**
EWR-81054	From the roof, center	White exhaust vent caulking like material	NOB-TEM			61.5% Organic 1.4% Residue 37.1% Carbonate	NONE DETECTED
24177 -64		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81055	From the roof, westside	Black skylight tar like material	NOB-TEM			93% Organic 1.9% Residue 5.1% Carbonate	NONE DETECTED
24177 -65		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81056	From the roof, southside	Black skylight tar like material	NOB-TEM			91.8% Organic 3.4% Residue 3.3% Carbonate	1.5% Chrysotile
24177 -66		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 1.5 %**

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

24175

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 3

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
	EWR- 81057	EWR- 81070	14	RELINQUISHED BY: S. KHODORKOVSKY	DATE TIME 6/20/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S. KHODORKOVSKY	DATE: 6/20/12 TIME: 15:30	FAX RESULTS to: (973) 961-6066
RECEIVED BY: Mancur Sanchez	DATE: 6-20-12 TIME: 15:30 Pm	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY: Courier	DATE: 6/20/12 TIME: 5:15 pm	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: 6/20/12 TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Atc-Tinta	DATE: 6-20-12 TIME: 8:00 pm	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: Milena Bonezzi	LAB NAME: ATC DATE: 6/20/12 TIME: 5:15	(Signature of R. E.'s Representative) CHARGE CODE: CA44151150 (Use a separate C-O-C for each Charge Code)

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24175

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description roof

Date: 06.20.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81065	black tar on fan unit supports like material collected on the roof,
LAB No:	northside
EWR- 81066	black tar on fan unit supports like material collected on the roof,
LAB No:	northside
EWR- 81067	black ~~[illegible]~~ tall vent tar like material collected on the roof, center
LAB No:	
EWR- 81068	black tall vent tar like material collected on the roof, center
LAB No:	
EWR- 81069	black drain flashing tar like material collected on the roof, eastside
LAB No:	
EWR- 81070	black drain flashing tar like material collected on the roof, westside
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

PA 3739
9-98

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of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24175

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building Hanger 14

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description Stair Bulk head

Date: 06.20.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81057	gray/white top layer rubberized roofing like material collected from stair bulk head roof
LAB No:	
EWR- 81058	gray 2nd layer paper like material collected from stair bulk head roof
LAB No:	
EWR- 81059	yellow 3rd layer foam like material collected from stair bulkhead roof
LAB No:	
EWR- 81060	black bottom layer tar like material collected from stair bulkhead roof
LAB No:	
EWR- 81061	gray window caulking like material collected from stair bulkhead, northside
LAB No:	
EWR- 81062	gray window caulking like material collected from stair bulkhead, southside
LAB No:	
EWR- 81063	gray door caulking like material collected from stair bulkhead, eastside
LAB No:	
EWR- 81064	gray door caulking like material collected from stair bulkhead, eastside
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V Feldblyum

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: HANGER 14 ROOF STAIR BULKHEAD

Sample Date : 6/20/2012
Date Received : 6/20/2012
Date Analyzed : 6/20/2012
ATC Batch # 24175
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	*Location*	*Type of Material*	*Method*	*Non-Asbestos % Fibrous*	*Non-Asbestos % Non-Fibrous*	*NOB % Type*	*Asbestos % Type*
EWR-81057 24175 -1	STAIR BULKHEAD ROOF	GRAY/WHITE TOP LAYER RUBBERIZED ROOFING LIKE MATERIAL	NOB-TEM			88.8% Organic 1.3% Residue 9.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81058 24175 -2	STAIR BULKHEAD ROOF	GRAY 2ND LAYER PAPER LIKE MATERIAL	NOB-TEM			85.1% Organic 11.3% Residue 3.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81059 24175 -3	STAIR BULKHEAD ROOF	YELLOW 3RD LAYER FOAM LIKE MATERIAL	PLM		10% Mineral Filler 90% foam		NONE DETECTED
Analyzed By: Tarek Fata		Color: Yellow		Comments:			
EWR-81060 24175 -4	STAIR BULKHEAD ROOF	BLACK BOTTOM LAYER TAR LIKE MATERIAL	NOB-TEM			37.5% Organic 20% Residue 42.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81061 24175 -5	STAIR BULKHEAD, NORTH SIDE	GRAY WINDOW CAULKING LIKE MATERIAL	NOB-TEM			7.1% Organic 1% Residue 91.2% Carbonate	0.7% Chrysotile
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 0.7 %**
EWR-81062 24175 -6	STAIR BULKHEAD, SOUTH SIDE	GRAY WINDOW CAULKING LIKE MATERIAL	NOB-TEM			9.9% Organic 1.3% Residue 88.3% Carbonate	0.5% Chrysotile
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 0.5 %**
EWR-81063 24175 -7	STAIR BULKHEAD, EAST SIDE	GRAY DOOR CAULKING LIKE MATERIAL	NOB-TEM			83.1% Organic 9.9% Residue 7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Gray Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81064	STAIR BULKHEAD, EAST SIDE	GRAY DOOR CAULKING LIKE MATERIAL	NOB-TEM			83.8% Organic 5.4% Residue 10.8% Carbonate	NONE DETECTED
24175 -8		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81065	ON THE ROOF, NORTH SIDE	BLACK TAR ON FAN UNIT SUPPORTS LIKE MATERIAL	NOB-TEM			82% Organic 9.8% Residue 8.2% Carbonate	NONE DETECTED
24175 -9		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81066	ON THE ROOF, NORTH SIDE	BLACK TAR ON FAN UNIT SUPPORTS LIKE MATERIAL	NOB-TEM			85.6% Organic 8.9% Residue 5.5% Carbonate	NONE DETECTED
24175 -10		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81067	ON THE ROOF, CENTER	BLACK TALL VENT TAR LIKE MATERIAL	NOB-TEM			83.4% Organic 9.7% Residue 6.9% Carbonate	NONE DETECTED
24175 -11		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81068	ON THE ROOF, CENTER	BLACK TALL VENT TAR LIKE MATERIAL	NOB-TEM			83.5% Organic 12% Residue 4.5% Carbonate	NONE DETECTED
24175 -12		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81069	ON THE ROOF, EAST SIDE	BLACK DRAIN FLASHING TAR LIKE MATERIAL	NOB-TEM			81.1% Organic 6.3% Residue 8.5% Carbonate	4.1% Chrysotile
24175 -13		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 4.1 %
EWR-81070	ON THE ROOF, WEST SIDE	BLACK DRAIN FLASHING TAR LIKE MATERIAL	NOB-TEM			94.4% Organic 2.1% Residue 3.5% Carbonate	Trace Chrysotile
24175 -14		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: TRACE

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Tel. 212-353-8280
Fax: 212-353-8306

				Non-Asbestos		NOB	Asbestos
Sample #	*Location*	*Type of Material*	*Method*	*% Fibrous*	*% Non-Fibrous*	*% Type*	*% Type*

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Aleks Barengolts
Analyst:

APPENDIX B

LCP LABORATORY RESULTS AND CHAIN OF CUSTODIES BY PANYNJ

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

#66422 #66423, #66424

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	(LEAD - SW846) NIOSH 7082 /

Page 1 of 4

Sample Type - (LEAD) [X] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #'S FROM	SAMPLE #'S TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
1	EWR-6442LP	EWR-6451LP	10	RELINQUISHED BY: Ralph	DATE TIME 5/22/12 1500
2	EWR-6452LP	EWR-6456LP	5	RELINQUISHED BY: Ralph	DATE TIME 5/22/12 1500
3	EWR-6457LP	EWR-6465LP	9	RELINQUISHED BY: Ralph	DATE TIME 5/22/12 1500
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY:	DATE: TIME:	FAX RESULTS to: (973) 961-6066
RECEIVED BY:	DATE: TIME:	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: courier	DATE: 05.22.12 TIME: 4pm	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: N Saiefar	LAB NAME: AR DATE: 05.22.12 TIME: 4pm	(Signature of R. E.'s Representative) CHARGE CODE: CA44151120 (Use a separate C-O-C for each Charge Code)

Analyzed By: AR N Saiefar 05.22.12 8pm

Port Authority of NY & NJ

66422

Environmental Field Operations
Lead Sampling Field Form

Charge Code: **CA44151.120** Contract: EWR-151.120

Job No. NA

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT Building: 14

Area Description: STAIRWELL S-2 Floor: Stairwell

Date: 5/22/2012 Quadrant:

Lead Inspector(s): R. CAMPIONE, T. TAYLOR

Sample Type : [X] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR-6442 LP	PANT SAMPLE COLLECTED FROM METAL DECKING CEILING OF STAIRWELL PENTHOUSE	LIGHT GREY	
EWR-6443 LP	PANT SAMPLE COLLECTED FROM METAL DECKING CEILING OF STAIRWELL PENTHOUSE	LIGHT GREY	
EWR-6444 LP	PANT SAMPLE COLLECTED FROM STAIRWELL PENTHOUSE CEILING BEAM	LIGHT GREY RED	
EWR-6445 LP	PANT SAMPLE COLLECTED FROM STAIRWELL PENTHOUSE CEILING BEAM	LIGHT GREY RED	
EWR-6446 LP	PANT SAMPLE COLLECTED FROM STAIRWELL PENTHOUSE ROOF ACCESS DOOR	GREY BEIGE	
EWR-6447 LP	PANT SAMPLE COLLECTED FROM STAIRWELL PENTHOUSE ROOF ACCESS DOOR JAM	GREY BEIGE	
EWR-6448 LP	PANT SAMPLE COLLECTED FROM STAIRWELL CONCRETE BLOCK WALL SECOND LANDING BELOW PENTHOUSE	LIGHT GREY BEIGE	
EWR-6449 LP	PANT SAMPLE COLLECTED FROM BOTTOM OF STAIRWELL STEP SECOND LANDING BELOW PENTHOUSE	LIGHT GREY RED	
EWR-6450 LP	PANT SAMPLE COLLECTED FROM STAIRWELL FIRE STAND PIPE THIRD LANDING FROM PENTHOUSE	LIGHT GREY	
EWR-6451 LP	PANT SAMPLE COLLECTED FROM CATWALK ACCESS DOOR JAM THIRD LANDING FROM PENTHOUSE	GREY LIGHT GREY RED	

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310

Fax: (201) 216-2158 **Phone:** (201) 216-2160

Project: NEWARK LIBERTY INTL AIRPORT

Location: STAIRWELL S-2 / FLOOR: STAIRWELL

Project # EWR-151.120

Sample Date: 5/22/2012
Date Received: 5/22/2012
Date Analyzed : 5/22/2012
Report Date: 5/22/2012
ATC Batch #: 66422
Total Samples: 10
Sample Media: Paint Chips by weight

PAINT SAMPLE ANALYSIS BY FLAME (AA)
METHOD EPA 3050B Modified/7000B

ANALYSIS RESULTS

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR-6442 LP 66422 -1	Paint sample collected from Metal decking ceiling of stairwell penthouse / Light Grey	0.01	0.01
EWR-6443 LP 66422 -2	Paint sample collected from Metal decking ceiling of stairwell penthouse / Light Grey	< 0.01	0.01
EWR-6444 LP 66422 -3	Paint sample collected from Stairwell Penthouse ceiling Beam / Light Grey Red	1.00	0.01
EWR-6445 LP 66422 -4	Paint sample collected from Stairwell Penthouse ceiling Beam / Light Grey Red	0.15	0.01
EWR-6446 LP 66422 -5	Paint sample collected from Stairwell penthouse Roof access Door / Grey Beige	< 0.01	0.01
EWR-6447 LP 66422 -6	Paint sample collected from Stairwell penthouse Roof access door jam / Grey Beige	1.83	0.01
EWR-6448 LP 66422 -7	Paint sample collected from Stairwell concrete block wall second landing below penthouse /	0.02	0.01
EWR-6449 LP 66422 -8	Paint sample collected from Bottom of stairwell step second landing below Penthouse / Ligh	3.46	0.01
EWR-6450 LP 66422 -9	Paint sample collected from Stairwell fire stand pipe third landing from penthouse / Light Gr	0.13	0.01
EWR-6451 LP 66422 -10	Paint sample collected from Catwalk access door jam third landing from penthouse / Grey L	0.86	0.01

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310
Fax: (201) 216-2158 **Phone:** (201) 216-2160
Project: NEWARK LIBERTY INTL AIRPORT

Location: STAIRWELL S-2 / FLOOR: STAIRWELL
Project # EWR-151.120

Sample Date: 5/22/2012
Date Received: 5/22/2012
Date Analyzed : 5/22/2012
Report Date: 5/22/2012
ATC Batch #: 66422
Total Samples: 10
Sample Media: Paint Chips by weight

PAINT SAMPLE ANALYSIS BY FLAME (AA)
METHOD EPA 3050B Modified/7000B

ANALYSIS RESULTS

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR-6442 LP *66422 -1*	Paint sample collected from Metal decking ceiling of stairwell penthouse / Light Grey	0.01	0.01
EWR-6443 LP *66422 -2*	Paint sample collected from Metal decking ceiling of stairwell penthouse / Light Grey	< 0.01	0.01
EWR-6444 LP *66422 -3*	Paint sample collected from Stairwell Penthouse ceiling Beam / Light Grey Red	1.00	0.01
EWR-6445 LP *66422 -4*	Paint sample collected from Stairwell Penthouse ceiling Beam / Light Grey Red	0.15	0.01
EWR-6446 LP *66422 -5*	Paint sample collected from Stairwell penthouse Roof access Door / Grey Beige	< 0.01	0.01
EWR-6447 LP *66422 6*	Paint sample collected from Stairwell penthouse Roof access door jam / Grey Beige	1.83	0.01
EWR-6448 LP *66422 -7*	Paint sample collected from Stairwell concrete block wall second landing below penthouse /	0.02	0.01
EWR-6449 LP *66422 -8*	Paint sample collected from Bottom of stairwell step second landing below Penthouse / Ligh	3.46	0.01
EWR-6450 LP *66422 -9*	Paint sample collected from Stairwell fire stand pipe third landing from penthouse / Light Gr	0.13	0.01
EWR-6451 LP *66422 -10*	Paint sample collected from Catwalk access door jam third landing from penthouse / Grey L	0.86	0.01

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New York, NY 10010
Tel: 212-353-8280
Fax: 212-353-8306

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)

NOTES:

1) THE REPORTING LIMIT (RL) IS 0.01%. The detection limit as reported is the reporting limit. The true detection limit is half the RL. RL is based on 0.010 mg/sample weight which is typically 0.1 gram.

2) HUD defines lead-based paint as paint having a lead concentration equal to or above 0.5% by weight. Results preceded by "<" are below the detectable levels by this analysis method.

3) Blank units are in µg

4) ATC Associates Inc. Laboratory is not responsible for sample collection. These results relate only to the items tested. This report shall not be reproduced, except in full, without written approval of the laboratory.

5) ATC is accredited by the New York State Department of Health Environmental Laboratory Approval Program (ELAP) and by the American Industrial Hygiene Association (AIHA-LAP, LLC) to perform analysis of lead in paint, dust wipes, air and soil samples. (ELAP #10879), (AIHA-LAP, LLC #100229).

6) Confidentiality Notice:
The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Unless otherwise indicated, no blank corrections were performed.

8) The condition of all samples was acceptable upon receipt.

9) Unless otherwise indicated all QC results were in control.

10) The data within this report is reliable to 3 significant figures.

11) The laboratory certifies that the test results meet all requirements of NELAC.

12) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

13) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

14) The uncertainty for these test results is available upon request.

Natalija Saizefarova N Saizefarova
Analyzed by:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Port Authority of NY & NJ

66423

Environmental Field Operations
Lead Sampling Field Form

Charge Code: CA44151.120 Contract: EWR-151.120

Job No. NA

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT Building: 14

Area Description: STAIRWELL S-2 Floor: Stairwell

Date: 5/22/2012 Quadrant:

Lead Inspector(s): R. CAMPIONE, T. TAYLOR

Sample Type : [X] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR-6452 LP	PANT SAMPLE COLLECTED FROM CATWALK ACCESS DOOR THIRD LANDING FROM PENTHOUSE	GREY LIGHT GREY	
EWR-6453 LP	PANT SAMPLE COLLECTED FROM HANDRAIL OF STAIRWELL SECOND FLOOR LANDING	GREY LIGHT GREY RED	
EWR-6454 LP	PANT SAMPLE COLLECTED FROM STAIRWELL CONCRETE BLOCK WALL FIRST LANDING	LIGHT GREY BEIGE	
EWR-6455 LP	PANT SAMPLE COLLECTED FROM STAIRWELL STAIR BEAM BELOW FIRST LANDING	GREY RED	
EWR-6456 LP	PANT SAMPLE COLLECTED FROM HANDRAIL OF STAIRWELL BELOW FIRST LANDING	GREY	

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104 E. 25th Street, 10th Floor
New York, NY 10010
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Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310
Fax: (201) 216-2158 **Phone:** (201) 216-2160
Project: NEWARK LIBERTY INTL AIRPORT

Location: STAIRWELL S-2 / FLOOR: STAIRWELL
Project # EWR-151.120

Sample Date: 5/22/2012
Date Received: 5/22/2012
Date Analyzed : 5/22/2012
Report Date: 5/22/2012
ATC Batch #: 66423
Total Samples: 5
Sample Media: Paint Chips by weight

PAINT SAMPLE ANALYSIS BY FLAME (AA)
METHOD EPA 3050B Modified/7000B

ANALYSIS RESULTS

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR-6452 LP 66423 -1	Paint sample collected from Catwalk access door third landing from penthouse / Grey Light	0.87	0.01
EWR-6453 LP 66423 -2	Paint sample collected from Handrail of stairwell second floor landing / Grey Light Grey Red	0.04	0.01
EWR-6454 LP 66423 -3	Paint sample collected from Stairwell concrete Block wall first landing / Light Grey Beige	1.22	0.01
EWR-6455 LP 66423 -4	Paint sample collected from Stairwell Stair beam below first Landing / Grey Red	0.01	0.01
EWR-6456 LP 66423 -5	Paint sample collected from Handrail of Stairwell Below First Landing / Grey	2.28	0.01

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SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)

NOTES:

1) **THE REPORTING LIMIT (RL) IS 0.01%. The detection limit as reported is the reporting limit. The true detection limit is half the RL.**
RL is based on 0.010 mg/sample weight which is typically 0.1 gram.

2) HUD defines lead-based paint as paint having a lead concentration equal to or above 0.5% by weight.
Results preceded by "<" are below the detectable levels by this analysis method.

3) Blank units are in µg

4) ATC Associates Inc. Laboratory is not responsible for sample collection. These results relate only to the items tested. This report shall not be reproduced, except in full, without written approval of the laboratory.

5) ATC is accredited by the New York State Department of Health Environmental Laboratory Approval Program (ELAP) and by the American Industrial Hygiene Association (AIHA-LAP, LLC) to perform analysis of lead in paint, dust wipes, air and soil samples. (ELAP #10879), (AIHA-LAP, LLC #100229).

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7) Unless otherwise indicated, no blank corrections were performed.

8) The condition of all samples was acceptable upon receipt.

9) Unless otherwise indicated all QC results were in control.

10) The data within this report is reliable to 3 significant figures.

11) The laboratory certifies that the test results meet all requirements of NELAC.

12) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

13) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

14) The uncertainty for these test results is available upon request.

Natalija Saizefarova NSaizefar
Analyzed by:

Milena Bonezzi M.Bonezzi
Approved by
Laboratory Director:

Port Authority of NY & NJ

Environmental Field Operations
Lead Sampling Field Form

66424

Charge Code: CA44151.120 Contract: EWR-151.120

Job No. NA

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT Building: 14

Area Description: EXPOSED STRUCTURAL BEAMS Floor: SECOND

Date: 5/22/2012 Quadrant:

Lead Inspector(s): R. CAMPIONE, T. TAYLOR

Sample Type : [X] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR-6457 LP	PANT SAMPLE COLLECTED FROM EXPOSED STRUCTURAL T BEAM IN ROOM 220n, COLUMN LINE 14C	LIGHT GREY RED	
EWR-6458 LP	PANT SAMPLE COLLECTED FROM EXPOSED STRUCTURAL T BEAM IN ROOM 220c, COLUMN LINE 14A	LIGHT GREY RED	
EWR-6459 LP	PANT SAMPLE COLLECTED FROM EXPOSED STRUCTURAL T BEAM IN ROOM 219e, COLUMN LINE 12C	BLUE RED	
EWR-6460 LP	PANT SAMPLE COLLECTED FROM EXPOSED STRUCTURAL L BEAM IN ROOM 219a, COLUMN LINE 11C	BLUE RED	
EWR-6461 LP	PANT SAMPLE COLLECTED FROM EXPOSED STRUCTURAL T BEAM IN ROOM 222a, COLUMN LINE 8C	LIGHT GREY RED	
EWR-6462 LP	PANT SAMPLE COLLECTED FROM EXPOSED STRUCTURAL T BEAM IN ROOM 223, COLUMN LINE 9C	LIGHT GREY RED	
EWR-6463 LP	PANT SAMPLE COLLECTED FROM EXPOSED STRUCTURAL L BEAM IN ROOM 209a, COLUMN LINE 5A	LIGHT GREY BEIGE RED	
EWR-6464 LP	PANT SAMPLE COLLECTED FROM EXPOSED STRUCTURAL T BEAM IN ROOM 203c, COLUMN LINE 1A	BEIGE, YELLOW GREEN, RED	
EWR-6465 LP	PANT SAMPLE COLLECTED FROM EXPOSED STRUCTURAL L BEAM IN ROOM 202d, COLUMN LINE 1C	BEIGE, YELLOW GREEN, RED	

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310
Fax: (201) 216-2158 **Phone:** (201) 216-2160
Project: NEWARK LIBERTY INTL AIRPORT

Location: EXPOSED STRUCTURAL BEAMS / FLOOR: SECOND
Project # EWR-151.120

Sample Date: 5/22/2012
Date Received: 5/22/2012
Date Analyzed : 5/22/2012
Report Date: 5/22/2012
ATC Batch #: 66424
Total Samples: 9
Sample Media: Paint Chips by weight

PAINT SAMPLE ANALYSIS BY FLAME (AA)
METHOD EPA 3050B Modified/7000B

ANALYSIS RESULTS

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR-6457 LP *66424 -1*	Paint sample collected from Exposed Structural T Beam in room 220n, column line 14C / Li	2.43	0.01
EWR-6458 LP *66424 -2*	Paint sample collected from Exposed Structural T Beam in room 220n, column line 14A / Li	2.15	0.01
EWR-6459 LP *66424 -3*	Paint sample collected from Exposed Structural T Beam in room 219e, column line 12C / Bl	35.46	0.01
EWR-6460 LP *66424 -4*	Paint sample collected from Exposed Structural L Beam in room 219a, Column Line 11C / b	27.87	0.01
EWR-6461 LP *66424 -5*	Paint sample collected from Exposed Structural T Beam in room 222a, column Line 8C / Lig	3.64	0.01
EWR-6462 LP *66424 -6*	Paint sample collected from Exposed Structural T Beam in room 223, column 9C / Light Gr	32.60	0.01
EWR-6463 LP *66424 -7*	Paint sample collected from Exposed Structural L Beam in room 209a, column line 5A / Lig	10.79	0.01
EWR-6464 LP *66424 -8*	Paint sample collected from Exposed Structural T Beam in room 203c, column line 1A / Bei	2.16	0.01
EWR-6465 LP *66424 -9*	Paint sample collected from Exposed Structural L Beam in room 202d, Column Line 1C / B	7.48	0.01

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)

NOTES:

1) **THE REPORTING LIMIT (RL) IS 0.01%. The detection limit as reported is the reporting limit. The true detection limit is half the RL.**
RL is based on 0.010 mg/sample weight which is typically 0.1 gram.

2) HUD defines lead-based paint as paint having a lead concentration equal to or above 0.5% by weight.
Results preceded by "<" are below the detectable levels by this analysis method.

3) Blank units are in µg

4) ATC Associates Inc. Laboratory is not responsible for sample collection. These results relate only to the items tested. This report shall not be reproduced, except in full, without written approval of the laboratory.

5) ATC is accredited by the New York State Department of Health Environmental Laboratory Approval Program (ELAP) and by the American Industrial Hygiene Association (AIHA-LAP, LLC) to perform analysis of lead in paint, dust wipes, air and soil samples. (ELAP #10879), (AIHA-LAP, LLC #100229).

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8) The condition of all samples was acceptable upon receipt.

9) Unless otherwise indicated all QC results were in control.

10) The data within this report is reliable to 3 significant figures.

11) The laboratory certifies that the test results meet all requirements of NELAC.

12) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

13) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

14) The uncertainty for these test results is available upon request.

Natalija Saizefarova N Saizefarova
Analyzed by:

Milena Bonezzi M Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

#66438

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	(LEAD - SW846) / NIOSH 7082 /

Page 1 of 3

Sample Type - **LEAD** [X] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
							X	

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
	EWR- 646618	EWR- 647618	11	RELINQUISHED BY: Mark Lindford	DATE TIME 05-25-12 1530
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: Mark Lindford	DATE: 05-25-12 TIME: 1530	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY:	DATE: 5-25-12 TIME: 3:36	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY: ATC, A. Amaya AA 5/25/12	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY:	DATE: TIME:	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: ATC Y. Mastichenko	LAB NAME: DATE: 05.25.12 TIME: 05:01 P.M.	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

Analyzed By: ATC; A. Amaya 5/26/12 10:30AM

#66438

Port Authority of NY & NJ

Environmental Field Operations
Lead Sampling Field Form

Charge Code: CA44151.120 Contract: EWR-151.120

Job No. NA

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT Building: 14

Area Description: Offices Floor: 2nd

Date: 05-25-12 Quadrant:

Lead Inspector(s): M. Hadford, G. Urban

Sample Type : [X] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR-6466LP	paint chip sample collected from cinder block by room 217	Beige	
EWR-6467LP	paint chip sample collected from door jamb at room 291b	Gray	
EWR-6468LP	paint chip sample collected from drywall in room 216	Beige	
EWR-6469LP	paint chip sample collected from plaster wall in room 220I	Light Blue	
EWR-6470LP	paint chip sample collected from plaster ceiling in room 220G	white	
EWR-6471LP	paint chip sample collected from cinder block by room 208	Beige	
EWR-6472LP	paint chip sample collected from door jamb at room 208	Gray/Red	
EWR-6473LP	paint chip sample collected from drywall in room 203D	Beige	
EWR-6474LP	paint chip sample collected from plaster wall by room 203A	Beige	
EWR-6475LP	paint chip sample collected from plaster ceiling in room 212	white	

3 of 3

Port Authority of NY & NJ

Environmental Field Operations
Lead Sampling Field Form

66438

Charge Code: CA44151.120 Contract: EWR-151.120

Job No. NA

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT Building: 14

Area Description: Offices Floor: 2nd

Date: 05-25-12 Quadrant:

Lead Inspector(s): M. Lockford, G. Urban

Sample Type : [X] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR-44762P	Paint chip sample collected from drywall in room 212	Pink	

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel: 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310
Fax: (201) 216-2158 **Phone:** (201) 216-2160
Project: NEWARK LIBERTY INTL AIRPORT

Location: Area Offices / Building:14 / Floor: 2nd
Project # EWR-151.120

Sample Date: 5/25/2012
Date Received: 5/25/2012
Date Analyzed : 5/26/2012
Report Date: 5/25/2012
ATC Batch #: 66438
Total Samples: 11
Sample Media: Paint Chips by weight

PAINT SAMPLE ANALYSIS BY FLAME (AA)
METHOD EPA 3050B Modified/7000B

ANALYSIS RESULTS

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR-6466 LP *66438 -1*	From cinder block by room 217 / Beige	< 0.01	0.01
EWR-6467 LP *66438 -2*	From door jamb of room 201b / Gray	0.12	0.01
EWR-6468 LP *66438 -3*	From dry wall in room 216 / Beige	< 0.01	0.01
EWR-6469 LP *66438 -4*	From plaster wall in room 220I / Light Blue	< 0.01	0.01
EWR-6470 LP *66438 -5*	From plaster ceiling in room 220G / White	0.03	0.01
EWR-6471 LP *66438 -6*	From cinder Block by room 208 / Beige	< 0.01	0.01
EWR-6472 LP *66438 -7*	From door jamb at room 208 / Gray / Red	0.07	0.01
EWR-6473 LP *66438 -8*	From dry wall in room 203D / Beige	< 0.01	0.01
EWR-6474 LP *66438 -9*	From Plaster wall by Room 203A / Beige	< 0.01	0.01
EWR-6475 LP *66438 -10*	From plaster ceiling in room 212 / white	< 0.01	0.01
EWR-6476 LP *66438 -11*	From drywall in room 212 / Pink	< 0.01	0.01

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)

NOTES:

1) **THE REPORTING LIMIT (RL) IS 0.01%. The detection limit as reported is the reporting limit. The true detection limit is half the RL.**
RL is based on 0.010 mg/sample weight which is typically 0.1 gram.

2) HUD defines lead-based paint as paint having a lead concentration equal to or above 0.5% by weight.
Results preceded by "<" are below the detectable levels by this analysis method.

3) Blank units are in µg

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10) The data within this report is reliable to 3 significant figures.

11) The laboratory certifies that the test results meet all requirements of NELAC.

12) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

13) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

14) The uncertainty for these test results is available upon request.

Adil Ansari
Analyzed by:

Milena Bonezzi M.Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

#66439

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 2

Sample Type - **LEAD** [X] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
							X	

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
	EWR- 6477LP	EWR- 6479LP	3	RELINQUISHED BY: Mark Lindford	DATE TIME 05-25-12 1530
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: Mark Lindford	DATE: 05-25-12 TIME: 1530	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY:	DATE: 5-25-12 TIME: 339	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY:	DATE: TIME:	**Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov**
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: ATC Y. Mashchenko	LAB NAME: DATE: 05.25.12. TIME: 05:01 P.M.	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

Analyzed By: ATC, A. Amgai 5/26/12 10:30AM

Port Authority of NY & NJ

Environmental Field Operations
Lead Sampling Field Form

66439

Charge Code: **CA44151.120** Contract: EWR-151.120

Job No. NA

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT Building: 14

Area Description: South East "Block Bldg A" Floor: 1st

Date: 05-25-12 Quadrant:

Lead Inspector(s): M. Hilford, G. Urban

Sample Type : [X] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR 64771P	paint chip sample collected from entry door to bldg.	Blue	
EWR 64781P	paint chip sample collected from inside block wall	white	
EWR 64791P	paint chip sample collected from frame of roll up gate	Gray/Red	

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310

Fax: (201) 216-2158 **Phone:** (201) 216-2160

Project: NEWARK LIBERTY INTL AIRPORT

Location: South East "Block Bldg A" / Bldg: 14 / floor: 1st

Project # EWR-151.120

Sample Date: 5/25/2012
Date Received: 5/25/2012
Date Analyzed : 5/26/2012
Report Date: 5/25/2012
ATC Batch #: 66439
Total Samples: 3
Sample Media: Paint Chips by weight

PAINT SAMPLE ANALYSIS BY FLAME (AA)
METHOD EPA 3050B Modified/7000B

ANALYSIS RESULTS

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR-6477 LP 66439 -1	From entry Door to Bldg / Blue	< 0.01	0.01
EWR-6478 LP 66439 -2	From cinder block wall / white	0.01	0.01
EWR-6479 LP 66439 -3	From frame of roll up Gate / Gray / Red	0.06	0.01

NOTES:

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12) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

13) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

14) The uncertainty for these test results is available upon request.

Adil Ansari
Analyzed by:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

66469

Laboratory Destination:	EMSL ATC
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	LEAD SW846 / NIOSH 7082 /

Page 1 of 2

Sample Type - LEAD [X] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
1	EWR- 6480-LP	EWR- 6486-LP	7	RELINQUISHED BY: [signature]	5-29-12
	EWR-	EWR-		RELINQUISHED BY:	
	EWR-	EWR-		RELINQUISHED BY:	
				RELINQUISHED BY:	
				RELINQUISHED BY:	
				RELINQUISHED BY:	

RELINQUISHED BY: [signature]	DATE: 5-29-12 TIME:	FAX RESULTS to: (973) 961-6066
RECEIVED BY:	DATE: TIME:	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: courier	DATE: 5.29.12 TIME: 5:-pm	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: [signature]	LAB NAME: AR DATE: 5.29.12 TIME: 5:-pm	(Signature of R. E.'s Representative) CHARGE CODE: CA44151120 (Use a separate C-O-C for each Charge Code)

Analyzed by: AR [signature] 05.29.12 7:40 pm

66464

Port Authority of NY & NJ

Environmental Field Operations
Lead Sampling Field Form

Charge Code: CA44151.120 Contract: EWR-151.120

Job No. NA

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT Building: 14

Area Description: MISC PAINTED ITEMS Floor: FIRST

Date: 5/29/2012 Quadrant:

Lead Inspector(s): D. MCCARTHY

Sample Type : [X] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR-6480 LP	PAINT SAMPLE COLLECTED FROM SOUTH SIDE ROLL UP DOOR ADJACENT ENTRY DOOR No. 1	LIGHT BLUE	
EWR-6481 LP	PAINT SAMPLE COLLECTED FROM BOLLARD ON THE SOUTH SIDE OF 14, ADJACENT DIESEL GENERATOR	YELLOW	
EWR-6482 LP	PAINT SAMPLE COLLECTED FROM OLD DEISEL GENERATOR	DEGRADED WHITE	
EWR-6483 LP	PAINT SAMPLE COLLECTED FROM ROLL UP DOOR FRAME ADJACENT FROM AREA 1-B, OUTER COATING	YELLOW	
EWR-6484 LP	PAINT SAMPLE COLLECTED FROM ROLL UP DOOR FRAME ADJACENT FROM AREA 1-B, MIDDLE COAT	RUBBERIZED GREY	
EWR-6485 LP	PAINT SAMPLE COLLECTED FROM ROLL UP DOOR FRAME ADJACENT FROM AREA 1-B, MIDDLE COAT	RED	
EWR-6486 LP	PAINT SAMPLE COLLECTED FROM MAIN HANGER DOOR EAST SIDE OF BUILDING 14	GREY RED	

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310

Fax: (201) 216-2158 **Phone:** (201) 216-2160

Project: NEWARK LIBERTY INTL AIRPORT

Location: Misc Painted Items / Bldg: 14 / floor: 1st

Project # EWR-151.120

Sample Date: 5/29/2012
Date Received: 5/29/2012
Date Analyzed : 5/29/2012
Report Date: 5/29/2012
ATC Batch #: 66464
Total Samples: 7
Sample Media: Paint Chips by weight

PAINT SAMPLE ANALYSIS BY FLAME (AA)
METHOD EPA 3050B Modified/7000B

ANALYSIS RESULTS

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR-6480 LP *66464 -1*	From south side roll up door adjacent entry door no.1 / light blue	0.06	0.01
EWR-6481 LP *66464 -2*	From bollard on the south side of 14, adjacent diesel generator / Yellow	0.04	0.01
EWR-6482 LP *66464 -3*	From old deisel generator / Degraded white	0.02	0.01
EWR-6483 LP *66464 -4*	From roll up door frame adjacent from area 1-B, outer coating / yellow	3.62	0.01
EWR-6484 LP *66464 -5*	From roll up door frame adjacent from area 1-B, middle coat	0.32	0.01
EWR-6485 LP *66464 -6*	From roll up door frame adjacent from area 1-B, middle coat / Red	21.30	0.01
EWR-6486 LP *66464 -7*	From main hanger door east side of building 14 / Grey red	5.04	0.01

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)

NOTES:

1) **THE REPORTING LIMIT (RL) IS 0.01%. The detection limit as reported is the reporting limit. The true detection limit is half the RL.**
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12) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

13) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

14) The uncertainty for these test results is available upon request.

Natalija Saizefarova
Analyzed by:

Milena Bonezzi H. Bonezzi
Approved by
Laboratory Director:

APPENDIX C

ACM LOCATION DRAWINGS

Sheet of

THE PORT AUTHORITY
OF NY & NJ

ATC ASSOCIATES

CLIENT DESIGN

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

NEWARK LIBERTY
INTERNATIONAL
AIRPORT

ENVIRONMENTAL

File

CORDON SURVEY OF
BUILDING 14

ACM LOCATION
FIRST FLOOR PLAN

Designed by Drawn by Checked by

Date 10/19/2012

Contract Number

Drawing Number N101

PDI PD-003

APPENDIX D

UNIVERSAL/REGULATED MATERIAL LOCATION DRAWINGS

APPENDIX E

COST ESTIMATES

Contract No.:		THE PORT AUTHORITY OF NY & NJ	Discipline:	Environmental	Sheet: 1 of 3
Charge Code:			Prepared by:	H. Zeidan	Date: 12/21/12
Project Mgr:		Summary of Cost Estimate	Checked by:	F. Pierre	Date: 12/21/12
Project Title:	Newark Liberty International Airport - Hangar 14				
Consultant Name:	ATC ASSOCIATES INC	Consultant Contact: Gilbert Gedeon			

Item #	Description	Method Of Abatement	Total $	Assumption / Basis
1	Asbestos Abatement Cost Estimate		$258,860	
2	Universal Waste Cost Estimate		$45,460	
	Subtotal		$304,319	
	Contingency of 20%		$60,864	
	Total Cost		$365,183	

THE PORT AUTHORITY

Contract No.
Charge Code.
Project Mgr
Project Title: Newark Liberty International Airport - Hangar 14
Consultant Name: ATC ASSOCIATES INC

Asbestos Abatement Cost Estimate

Consultant Contact, Gilbert Gedeon

Discipline: Environmental | Sheet: 2 of 3
Prepared by: B. Zandan | Date: 12/21/12
Checked by: F. Pierre | Date: 12/21/12

Item #	Description	Quantity	Unit	Unit Price $ Material	Unit Price $ Labor	Total $ Material	Total $ Labor	Total $	Assumption / Basis
1	Exterior - White Window Caulking on 2nd Floor	900	LF		15.00	-	13,500	13,500	
2	Exterior South East Blockhouse - White Vent Caulking	20	LF		15.00	-	300	300	
3	1st Floor - 9"x 9" Gray Floor Tiles & Mastic*	1,850	SF		5.00	-	9,250	9,250	
4	1st Floor - 2"x 2" Ceramic Tile Grout	240	SF		9.00	-	2,160	2,160	
5	1st Floor - 9"x 9" Beige Floor Tiles	40	SF		10.00	-	400	400	
6	1st Floor Room 12 - White Heat Exchanger Insulation	40	SF		18.00	-	720	720	
7	1st Floor Room 12 - White Tank Insulation	60	SF		18.00	-	1,080	1,080	
8	1st Floor Room 12 - White Vibration Cloth on Duct	5	SF		18.00	-	90	90	
9	1st Floor - Pipe & Pipe Fitting Insulation	7,650	LF		9.00	-	68,850	68,850	
10	2nd Floor - Pipe & Pipe Fitting Insulation**	850	LF		9.00	-	7,650	7,650	
11	2nd Floor - 9"x9" Beige or Gray Floor Tiles & Mastic	2,000	SF		5.00	-	10,000	10,000	
12	2nd Floor - 9"x9" Beige or Gray Floor Tiles & Mastic under Carpeting	3,650	SF		5.00	-	18,250	18,250	
13	2nd Floor Room 203F - Mastic under Various 12"x 12" Floor Tiles	280	SF		5.00	-	1,400	1,400	
14	2nd Floor - 6" Brown Cove Base & Mastic	170	LF		5.00	-	850	850	
15	2nd Floor Room 220H - 1"x 1" Ceramic Floor Tile Grout	60	SF		8.00	-	480	480	
16	2nd Floor - Black Wall Panel Mastic	120	LF		8.00	-	960	960	
17	Roof - Black Exhaust Vent Caulking	150	LF		8.00	-	1,200	1,200	
18	Roof - Black Skylight Tar	80	SF		8.00	-	640	640	
19	Roof - Black Roof Drain Flashing	800	SF		8.00	-	6,400	6,400	
20	2 Decon Units including cost of Maintenance	3	Lump Sum		2,500.00	-	7,500	7,500	
21	Scaffolding and Elevated Work Platform***	1	Lump Sum		20,000.00	-	20,000	20,000	
22	Waste Disposal - ACM	450	Cubic Yards		90.00	-	40,500	40,500	
23	Sub Total							212,180	
24	Incidental Spot Removal & Disposal of Lead Paint (10% of Subtotal)							21,218	
25	Equipment and Materials (12% of Subtotal)							25,462	
							Total Cost	258,860	

(*) This material is located underneath 12"x12" Light Gray Floor Tiles & Mastic.

(**) Pipe & Pipe Fitting Insulation in the plenum area above the 2nd floor, ~12-15' high.

(***) Scaffolding & Platform for removal of items 1 & 10.

THE PORT AUTHORITY OF NY & NJ

Contract No.:
Charge Code:
Project Mgr:
Project Title: Newark Liberty International Airport - Hangar 14
Consultant Name: ATC ASSOCIATES INC

Universal Waste Cost Estimate

Consultant Contact: Gilbert Gedeon

Discipline: Environmental Sheet: 3 of 3
Prepared by: H. Zeidan Date: 12/21/12
Checked by: F. Pierre Date: 12/21/12

Item #	Description	Quantity	Unit	Unit Price $ Material	Unit Price $ Labor	Total $ Material	Total $ Labor	Total $	Assumption / Basis
1	Mobilization and Demobilization	2.00	Per Day		$500.00		$1,000.00	$1,000.00	
2	Labor (5-Man Crew per Day)	40.00	Mandays		$500.00		$20,000.00	$20,000.00	
3	Equipment (Vehicle, lift, lights, generator, etc.)	10.00	Per Day	$750.00		$7,500.00		$7,500.00	
4	Packaging for Bulbs (851 fixtures)	1.00	LS	$750.00		$750.00		$750.00	
5	Fluorescent Bulb Disposal	0.24	LF	10393		$2,494.32		$2,494.32	
6	HID Disposal	1.50	Per HID	77		$115.50		$115.50	
7	Ballast Disposal (1,163 ballasts)	16.00	55 Gallon Drum	$500.00		$8,000.00		$8,000.00	
8	Miscellaneous Waste Disposal*	1.00	LS	$3,000.00		$3,000.00		$3,000.00	
9	Transportation	4.00	Per Trip	$650.00		$2,600.00		$2,600.00	
							Total Cost	45,459.82	

(*) Includes: Oils, AC Units, Batteries, Mercury Thermostats, Water Coolers, Transformers (PCB), Hydraulic Fluids, Refrigerators and Tank

E. Inspection Report For Asbestos Containing Materials, Lead Containing Paint And Universal/Regulated Materials Performed At Building 95" ATC Associates, Revised December 21, 2012

ATC ASSOCIATES INC.

INSPECTION REPORT FOR ASBESTOS CONTAINING MATERIALS, LEAD CONTAINING-PAINT AND UNIVERSAL/REGULATED MATERIAL

Performed at:

BUILDING 95
NEWARK LIBERTY INTERNATIONAL AIRPORT
NEWARK, NJ

Performed for:

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

Prepared by:

ATC ASSOCIATES INC.
104 EAST 25TH STREET
NEW YORK, NEW YORK 10010

ATC Project No: 15.14777-0556

November 19, 2012
Revised December 21, 2012

ATC ASSOCIATES INC.

104 East 25th Street
Tenth Floor
New York, NY 10010
Telephone: 212-353-82
Facsimile: 212-353-8306

November 19, 2012 *(Revised December 21, 2012)*

Robert Pruno P.E.
Chief Environmental Engineer
Environmental Engineering Division
Port Authority of New York & New Jersey
2 Gateway Center, 14th floor
Newark, NJ 07102

Subject: **Inspection Report for Asbestos Containing Materials, Lead Containing Paint and Universal/Regulated Material**

Re: **Building 95 – Newark Liberty International Airport, Newark, NJ**

Dear Mr. Pruno:

ATC Associates Inc. (ATC) has completed the joint inspection with Port Authority of New York and New Jersey (PANYNJ) inspectors for asbestos-containing materials (ACM), universal/regulated material inventory and lead-containing paint (LCP) for the referenced site. PANYNJ inspectors conducted asbestos and lead sampling from May 30, 2012 through June 19, 2012. ATC conducted laboratory analysis of suspect ACM samples using Environmental Protection Agency (EPA) Methods: EPA 600/M4 82-020 Environmental Laboratory Approved Program (ELAP) 198.1, 198.6 and 198.4. ATC conducted laboratory analysis of paint samples using Atomic Absorption Spectrometry Flame (AAS). ATC conducted visual observations, identification, marking of locations and quantification of suspect ACM and completed universal/regulated material inventory for the referenced site.

ATC reviewed the laboratory results of the samples collected by PANYNJ and incorporated in the attached report. This report presents our findings, assessments and recommendations. ACM and LCP laboratory results, chain of custodies provided by PANYNJ, ACM location drawings, universal/regulated material location drawings and cost estimates are provided in the Appendices.

ATC appreciates this opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further assistance to you, please contact us.

Sincerely,

Husam Zeidan
Technical Assistant

Gilbert Gedeon, P.E.
Operations Manager

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5.0 UNIVERSAL/REGULATED MATERIAL INVENTORY SCOPE AND FINDINGS 4
6.0 CONCLUSIONS AND RECOMMENDATIONS 6

APPENDICES

Appendix A: ACM Laboratory Results and Chain of Custodies by PANYNJ

Appendix B: LCP Laboratory Results and Chain of Custodies by PANYNJ

Appendix C: ACM Location Drawings

Appendix D: Universal/Regulated Material Location Drawings

Appendix E: Cost Estimates

1.0 BUILDING DESCRIPTION

Building 95 is approximately 68,270 square feet in size. It is a one-story structure constructed primarily of steel and concrete. Building 95 used to serve as a toll equipment office. It is currently unoccupied and is scheduled for complete demolition.

2.0 ASBESTOS CONTAINING MATERIAL INSPECTION SCOPE

PANYNJ conducted an asbestos inspection of the building and collected samples of suspect ACM. The areas inspected included interior and exterior areas of the building. Intrusive/destructive sampling was performed during this inspection. The intent of this survey was to locate and identify all accessible ACM.

The materials inspected and sampled for ACM during the inspections were:

• Black Expansion Joint	Exterior
• White Window Caulking	Exterior
• Black Gas Pipe Gasket	Exterior
• Gray Stair Asphalt	Exterior
• Black Buffer Gasket	Exterior Loading Dock
• White Wall Sealer	Exterior Loading Dock
• White Cement Sealer	Exterior Loading Dock
• Black Vapor Barrier	Exterior, North Side
• Black Cinderblock Sealer	Exterior, North Side
• Black Textured Material	Exterior Ramp
• White Caulking	Exterior Roll-up Doors
• Pipe Fitting Insulation	1st Floor
• Pipe Insulation	1st Floor
• Gray Cement Trowel on Material	1st Floor
• Beige Cove Base	1st Floor Offices
• White & Green Sheetrock	1st Floor Offices
• Beige, White & Green Wall Joint Compound	1st Floor Offices
• 12"x12" Gray Streaked Floor Tile & Mastic	1st Floor Offices
• 12"x12" Yellow Floor Tile & Black Mastic	1st Floor Offices
• 12"x12" Red Floor Tile & Black Mastic	1st Floor Offices
• 12"x12" Gray Floor Tile & Black Mastic	1st Floor Offices
• Gray Ceramic Tile Grout	1st Floor Bathroom
• 2'x2' Ceiling Tile	1st Floor, Room 3
• Carpet Mastic, Yellow	1st Floor, Room 5
• 12"x12" White Floor Tile & Brown Mastic	1st Floor, Room 6
• 12"x12" Off White Floor Tile & Brown Mastic	1st Floor, Room 6
• Green Cove Base	1st Floor, Room 19
• White Expansion Joint	1st Floor, Room 16A
• 9"x9" Gray Floor Tile & Brown Mastic	1st Floor, Room 20A
• Ceiling Pipe Joint Textured Paint, White	1st Floor, Room 20F

• Gray Expansion Joint	1st Floor, Room 20F
• Gray Cove Base	1st Floor, Room 21
• White Ceiling Sealer	1st Floor, Room 21
• Black Vibration Cloth	1st Floor, Room 23
• White Boiler Gasket Insulation	1st Floor, Room 23
• Gray Metal Hatch Sealer	1st Floor, Room 24A
• Clear Column Base Sealer	1st Floor, Room 24A
• Gray Column Base Cement	1st Floor, Room 24A
• Black Ceiling Tar	1st Floor, Room 24A
• 12"x12" Gray Linoleum	1st Floor, Room 30
• Black Cove Base	1st Floor, Room 32
• White Fiber Wall Panel & Yellow Mastic	1st Floor, Room 45
• Black & Gray Pipe Wrap	1st Floor, Room 45
• Built-up Roofing	Upper Roof
• Black Tar Paper	Upper Roof
• Black Metal Flashing	Upper Roof
• Gray Vent Pipe Sealer	Upper Roof
• Black Vent Pipe Tar	Upper Roof
• Bulkhead Flashing	Upper Roof
• Black Asphalt Stepping Pads	Upper Roof
• Black Tar Drain Flashing	Upper Roof
• Black Foam Pipe Insulation	Upper Roof
• Pitch Pocket Tar	Upper Roof
• Built-up Roofing	Main Roof (Without Gravel)
• Roof Drain Flashing	Main Roof (Without Gravel)
• Gray/Black Asphalt Stepping Pads	Main Roof (Without Gravel)
• Pitch Pocket Tar	Main Roof (Without Gravel)
• Gray Cinderblock Sealer	Main Roof (Without Gravel)
• Black Parapet Wall Flashing	Main Roof (Without Gravel)
• Gray Vent Pipe Sealer	Main Roof (Without Gravel)
• Black Vent Pipe Tar	Main Roof (Without Gravel)
• Built-up Roofing	Main Roof
• Black Parapet Wall Flashing	Main Roof
• Black HVAC Flashing	Main Roof
• Black HVAC Dampening Cloth	Main Roof
• Roof Tar Patch	Main Roof
• Gray Parapet Wall Mortar	Main Roof

3.0 ASBESTOS CONTAINING MATERIAL INSPECTION RESULTS

ATC has reviewed and incorporated the ACM sample results into this report under Appendix A.

Based upon visual inspection and analytical results of bulk samples collected by PANYNJ, **the following materials are confirmed to be asbestos-containing materials** (> 1%):

PANYNJ Sample Number(s)	Sampling Date	Material Location & Description	Asbestos Content	Approximate Quantity
80484, 80485, 80490-80492, 80495	5/31/12	1st Floor Rooms 30, 31, 32, 38, 39 & 13A – 12"x12" Gray and Red Floor Tiles & Mastic	1.4-2.1% Chrysotile	750 SF
80499-80502	5/31/12	1st Floor Room 20A – 9"x9" Gray Floor Tile & Mastic	1.9-22.7% Chrysotile	100 SF
80532-80537	6/1/12	1st Floor – Pipe Fitting Insulation	4-6% Chrysotile	60 LF
80935	6/19/12	Main Roof – Black Tar Drain Flashing	3.6% Chrysotile	210 SF
80901, 80902, 80908, 80952-80954	6/19/12	Main & Upper Roof – Black Vent Pipe Tar	3-6.6% Chrysotile	350 SF
80919-80921, 80948, 80966-80969, 80971, 80973, 80975	6/19/12	Main & Upper Roof – Black Parapet Wall Flashing	1.9-10.3% Chrysotile	3,350 SF
80976-80978	6/19/12	Main & Upper Roof – Black HVAC Unit Flashing	2.4-4.8% Chrysotile	1,550 SF
80913-80915	6/19/12	Upper Roof – Bulkhead Flashing	6-7.8% Chrysotile	450 SF

PANYNJ submitted the bulk samples to ATC's laboratory for Polarized Light Microscopy (PLM) and Transmission Electron Microscopy (TEM) analysis, as applicable, utilizing EPA Method 600/M4-82-020 and ELAP Method 198.1, 198.4 and 198.6. ACM location drawings are included in Appendix C.

4.0 LEAD CONTAINING PAINT INSPECTION RESULTS

ATC reviewed and incorporated the LCP sample results into this report under Appendix B.

Although the Housing Urban Development (HUD) defines lead based paint as paint having a lead concentration equal to or above 0.5% by weight, the Occupational Safety and Health Administration (OSHA) considers any concentration of lead to be lead-containing as stipulated under OSHA Lead in Construction Standard, 1926.62. Therefore, based upon visual inspection and analytical results of paint chip samples collected by PANYNJ, the following samples were confirmed to be lead-containing:

PANYNJ Sample Number(s)	Sampling Date	Material Description & Location	Lead Content (% by weight)
6498 LP	5/30/12	Orange paint chip sample collected from metal structural column in Room 24A.	1.10
6506 LP	6/4/12	Red paint chip sample collected from sink area mechanicals, near water meter.	0.01
6511 LP	6/4/12	Red/blue/grey paint chip sample collected from interior entry door in the boiler room.	0.44
6512 LP	6/4/12	Red paint chip sample collected from boiler #1.	0.15
6513 LP	6/4/12	Dark red paint chip sample collected from boiler #2.	0.05
6515 LP	6/4/12	Yellow paint chip sample collected from exterior truck dock area.	0.01
6516 LP	6/4/12	Blue/red paint chip sample collected from exterior window frame on the southern truck dock area.	1.39
6517 LP	6/4/12	Green paint chip sample collected from exterior water meter.	0.02
6518 LP	6/4/12	Green paint chip sample collected from individual truck dock.	0.40

PANYNJ submitted the suspect paint chip samples to ATC's laboratory for analysis by Atomic Absorption Spectrometry (AAS) utilizing EPA Method 3050B Modified/7000B. As per PANYNJ, lead abatement is not anticipated for Building 95. However, incidental spot removal of lead paint may be needed during demolition. Thus, one lump sum cost is allocated for HASP as well as, removal and disposal of LCP resulting from incidental spot removal.

5.0 UNIVERSAL/REGULATED MATERIAL INVENTORY SCOPE AND FINDINGS

ATC conducted a visual inspection on June 6, 11 and 20, 2012 to identify and document universal/regulated materials at the site in order to prepare an inventory of these materials for the planned demolition and renovation activities. Materials inspected included but not limited to fluorescent lamps, high intensity discharge (HID) lamps, ballasts, capacitors, mercury containing equipment, transformers, batteries, hydro fluorocarbons and miscellaneous oils and chemicals.

Based on the age of the building, it was assumed that lamp ballasts/capacitors contain Polychlorinated Biphenyls (PCBs) and/or di (2) ethylhexyl phthalate (DEHP). A tabulation of the inventory is summarized in the tables below. Drawings with the locations of the observed materials are attached in Appendix D.

Lighting Fixtures:

Bulb Type	Fixture height from floor (Ft.)	No. of Fixtures	No. of Bulbs	No. of Ballasts or Capacitors	Bulb Size (Length in Ft)
Fluorescent (Interior)	~8-10	25	50	25	2
Fluorescent (Interior)	~7-20	567	1,132	571	4
Fluorescent (Interior)	~7-15	34	65	68	8
Fluorescent (Insect Light Traps)	~5-15	6	12	6	4
HID (Interior)	~20-25	11	10	11	NA
HID (Exterior)	~14-20	44	44	44	NA
HID (Roof)	0	2	2	2	NA
TOTALS	NA	**689**	**1,315**	**727**	NA

Miscellaneous Equipment:

Equipment Type	Location	Quantity	Notes
AC Units	Rooms 42 & 43	2	Window type units, 90 ounces of Refrigerant (R) 22
Refrigerator	Room 16	1	Assumed to contain CFCs
Commercial Freezers	Room 24A	4	128 ounces of Refrigerant (R) 404A
Emergency Door Batteries	Throughout on Exit Doors	7	Batteries contain Mercury
Mercury Thermostats	Throughout the Building	22	Mercury Containing
Batteries (Interior Emergency Lighting)	Throughout the Building	68	Battery type unknown, not accessible
Rechargeable Battery	Room 5	1	Contains Lead

Water Cooler	Room 24A	1	Assumed to contain CFCs
Monitors	Rooms 14B & 14C	5	Computer monitors of various sizes
Motor Starters	Rooms 14B & 14C	25	Various types
Hydraulic Door/Gate Operator	Throughout the Building	17	Contains Hydraulic Oil, ~1/2 Gallon Each
Transformers	Exterior and Interior of Building	7	Dry-type Transformers
Water Softening Filtration Tanks	Room 27	2	300 Gallon Tanks, Unknown Chemicals
Fluorescent Bulbs	Room 23	6	4ft. bulbs on the floor
Fluorescent Bulbs	Room 22	160	40 8ft. bulbs in boxes; 120 4ft. bulbs in boxes
By-pass Feeder	Room 23	1	Unknown Chemical
AC Unit	Roof	21	1,050 pounds of Refrigerant (R) 22
AC Unit	Roof	16	With recovery tanks, 400 pounds of Refrigerants (R) 404A/22
Air Dryer	Room 50	1	12 ounces of Refrigerant (R) 134A

6.0 CONCLUSIONS AND RECOMMENDATIONS

Various types of ACM and universal/regulated material have been identified in this report that may be impacted as part of the proposed demolition work at Building 95. The materials reported in Sections 3.0 and 5.0 of this report would require removal prior to demolition.

APPENDIX A

ACM LABORATORY RESULTS AND CHAIN OF CUSTODIES BY PANYNJ

Rec. No.	Vendor Billing No.

24033

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 7

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	SAMPLE #' S TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
	EWR- 80425	EWR- 80471	47	RELINQUISHED BY: S. KHODORKOVSKY	DATE TIME 5/30/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S. KHODORKOVSKY	DATE: 5/30/12 TIME: 1530	FAX RESULTS to: (973) 961-6066
RECEIVED BY: N Sinyan	DATE: TIME: 330pm	ATTN: RALPH CAMPIONE
RELINQUISHED BY: Courier	DATE: 5/30/12 TIME: 17:45	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: 5.30.12 TIME: 22:00	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: ATC - TFata	DATE: 5/30/12 TIME: 6:40 PM	Please Email Results to rcamplon@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: Jie Ying Gao	LAB NAME: ATC DATE: 5/30/12 TIME: 17:45	(Signature of R. E.'s Representative) CHARGE CODE: CA44151120 (Use a separate C-O-C for each Charge Code)

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24033

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 5/30/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80425	12" x 12" white floor tile material taken in Rm 6, North side
LAB No:	
EWR- 80426	brown mastick like material taken in Rm 6, North side
LAB No:	
EWR- 80427	12" x 12" offwhite floor tile material taken in Rm 6, West side, patched area
LAB No:	
EWR- 80428	brown mastic (floor) like material taken in Rm 6, West side, patched area
LAB No:	
EWR- 80429	blue cove base material taken in Rm 6, West side
LAB No:	
EWR- 80430	beige cove base material taken in Rm 5, east side
LAB No:	
EWR- 80431	black cove base material taken in hallway adjacent to Rm 4
LAB No:	
EWR- 80432	12" x 12" off-white floor tile material taken in Rm 6, West side, patched area
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldbluym

PA 3038
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M. Sampling Form

24033

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 5/30/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80433	brown floor mastic like material taken in Rm 6, westside, patched area
LAB No:	
EWR- 80434	12" x 12" off-white floor material taken in Rm 6, westside, patched area
LAB No:	
EWR- 80435	brown floor mastic like material taken in Rm 6, westside, patched area
LAB No:	
EWR- 80436	24" x 24" droping ceiling tile material taken in Rm 3 (white color)
LAB No:	
EWR- 80437	24" x 24" drop-in ceiling tile material taken in Rm 3 (white color)
LAB No:	
EWR- 80438	24" x 24" drop-in ceiling tile material taken in Rm 3 (white color)
LAB No:	
EWR- 80439	drywall white material taken in Rm 6, westside
LAB No:	
EWR- 80440	green drywall material taken in Rm 3, westside
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldbluym

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24033

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 5/30/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80441	white drywall material taken in Rm 8, Eastside
LAB No:	
EWR- 80442	beige wall joint compound taken in Rm 5
LAB No:	
EWR- 80443	white wall joint compound taken in Rm 6
LAB No:	
EWR- 80444	green wall joint compound taken in Rm 3
LAB No:	
EWR- 80445	white wall sealer taken in Northwest corner loading dock #2
LAB No:	
EWR- 80446	white wall sealer taken in North west corner loading dock #2
LAB No:	
EWR- 80447	white wall sealer taken in north west corner loading dock #2
LAB No:	
EWR- 80448	white cement like sealer material taken in south side of loading dock #2, next to loading bay #12
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblum

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The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24033

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 5/30/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80449	white cement like sealer material taken in south side of loading dock #2
LAB No:	next to loading bay #12
EWR- 80450	white cement like sealer material taken in south side of loading dock #2
LAB No:	next to loading bay #12
EWR- 80451	grey cove base material taken in Rm 21, southside
LAB No:	
EWR- 80452	grey cove base material taken in Rm 21, southside
LAB No:	
EWR- 80453	grey cove base material taken in Rm 21, southside
LAB No:	
EWR- 80454	white ceiling sealer taken in Rm 21
LAB No:	
EWR- 80455	white ceiling sealer taken in Rm 21
LAB No:	
EWR- 80456	white ceiling sealer taken in Rm 21
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblum

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The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24033

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 5/30/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80457	12"x12" gray linoleum tile material in Room 30
LAB No:	
EWR- 80458	12"x12" gray linoleum tile material in Room 30
LAB No:	
EWR- 80459	12"x12" gray linoleum tile material in Room 30
LAB No:	
EWR- 80460	12"x12" gray streaked vinyl floor tile like material, taken in Rm 30
LAB No:	
EWR- 80461	floor tile mastic like material taken in Rm 30
LAB No:	
EWR- 80462	12"x12" gray streaked floor tile like material, taken in Rm 31, ~~taken~~ from top layer
LAB No:	
EWR- 80463	12"x12" gray streaked floor tile like material, taken in Rm 31, top layer
LAB No:	
EWR- 80464	floor tile mastic like material taken in Rm 31
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldbluym

PA 3/39
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24033

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 5/30/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80465	floor tile mastic like material taken in Rm 31
LAB No:	
EWR- 80466	12" x 12" yellow bottom layer floor tile material, taken in Rm 31
LAB No:	
EWR- 80467	12" x 12" yellow bottom layer floor tile material, taken in Rm 31
LAB No:	
EWR- 80468	12" x 12" yellow bottom layer floor tile material, taken in Rm 31
LAB No:	
EWR- 80469	black floor tile mastic like material taken in Rm 31, bottom layer
LAB No:	
EWR- 80470	black floor tile mastic like material taken in Rm 31, bottom layer
LAB No:	
EWR- 80471	black floor tile mastic like material taken in Rm 31, bottom layer
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblum

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel: 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: Building 95, Floor 1
Project # EWR 151.120

Sample Date : 5/30/2012
Date Received : 5/30/2012
Date Analyzed : 5/30/2012
ATC Batch # 24033
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80425	Taken in rm 6, north side	12" x 12" white floor tile material	NOB-TEM			17% Organic 2.5% Residue 80.5% Carbonate	NONE DETECTED
24033 -1		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80426	Taken in rm 6, north side	Brown mastic like material	NOB-TEM			47.5% Organic 16.4% Residue 36.1% Carbonate	NONE DETECTED
24033 -2		Color: Brown					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80427	Taken in rm 6, west side patched area	12" x 12" off white floor tile material	NOB-TEM			15.9% Organic 2.9% Residue 81.2% Carbonate	NONE DETECTED
24033 -3		Color: Off white					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80428	Taken in rm 6, west side patched area	Brown mastic (floor) like material	NOB-TEM			64% Organic 21.3% Residue 14.7% Carbonate	NONE DETECTED
24033 -4		Color: Brown					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80429	Taken in rm 6, west side	blue cove base material	NOB-TEM			38.5% Organic 1.3% Residue 60.2% Carbonate	NONE DETECTED
24033 -5		Color: Blue					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80430	Taken in rm 5, east side	beige cove base material	NOB-TEM			39.9% Organic 13.2% Residue 46.9% Carbonate	NONE DETECTED
24033 -6		Color: Beige					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80431	Taken in hallway adjacent to rm 4	black cove base material	NOB-TEM			38.4% Organic 2.6% Residue 59% Carbonate	NONE DETECTED
24033 -7		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
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Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80432	Taken in rm 6, west side, patched area	12" x 12" off white floor tile material	NOB-TEM			16.6% Organic 1.2% Residue 82.2% Carbonate	NONE DETECTED
24033 -8		Color: Off white					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80433	Taken in rm 6, west side, patched area	Brown floor mastic like material	NOB-TEM			78.4% Organic 10.5% Residue 11.1% Carbonate	NONE DETECTED
24033 -9		Color: Brown					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM Inconclusive, NOB-PLM inconclusive			
EWR-80434	Taken in rm 6, west side, patched area	12" x 12" off white floor tile material	NOB-TEM			17.1% Organic 2.6% Residue 80.3% Carbonate	NONE DETECTED
24033 -10		Color: Off white					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80435	Taken in rm 6, west side, patched area	Brown floor mastic like material	NOB-TEM			78.4% Organic 11.8% Residue 9.8% Carbonate	NONE DETECTED
24033 -11		Color: Brown					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80436	Taken in rm 3 (white color)	24" x 24" drop in ceiling tile material	NOB-TEM			27.5% Organic 29.4% Residue 43.1% Carbonate	NONE DETECTED
24033 -12		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM Inconclusive, NOB-PLM inconclusive			
EWR-80437	Taken in rm 3 (white color)	24" x 24" drop in ceiling tile material	NOB-TEM			30% Organic 27.7% Residue 42.3% Carbonate	NONE DETECTED
24033 -13		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80438	Taken in rm 3 (white color)	24" x 24" drop in ceiling tile material	NOB-TEM			29.4% Organic 26.2% Residue 44.4% Carbonate	NONE DETECTED
24033 -14		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80439	Taken in rm 6, west side	drywall white material	PLM	30% Cellulose	70% Mineral Filler		NONE DETECTED
24033 -15		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-80440	Taken in rm 3, west side	green drywall material	PLM	25% Cellulose	75% Mineral Filler		NONE DETECTED
24033 -16		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-80441	Taken in rm 8, east side	white drywall material	PLM	20% Cellulose	80% Mineral Filler		NONE DETECTED
24033 -17		Color: White					
Analyzed By: Tarek Fata				Comments:			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80442	Taken in rm 5	beige wall joint compound	NOB-TEM			14.7% Organic 9.1% Residue 76.2% Carbonate	NONE DETECTED
24033 -18		Color: Beige					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80443	Taken in rm 6	white wall joint compound	NOB-TEM			10.9% Organic 24.3% Residue 64.8% Carbonate	NONE DETECTED
24033 -19		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80444	Taken in rm 3	green wall joint compound	NOB-TEM			10.2% Organic 16.5% Residue 73.3% Carbonate	NONE DETECTED
24033 -20		Color: Green					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80445	Taken in north west corner loading dock #2	white wall sealer	NOB-TEM			64.1% Organic 4.2% Residue 31.7% Carbonate	NONE DETECTED
24033 -21		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80446	Taken in north west corner loading dock #2	white wall sealer	NOB-TEM			62.9% Organic 3% Residue 34.1% Carbonate	NONE DETECTED
24033 -22		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80447	Taken in north west corner loading dock #2	white wall sealer	NOB-TEM			60.2% Organic 4.4% Residue 35.4% Carbonate	NONE DETECTED
24033 -23		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80448	Taken in south side of loading dock #2, next to loading bay #12	white cement like sealer material	NOB-TEM			9% Organic 77% Residue 14% Carbonate	NONE DETECTED
24033 -24		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80449	Taken in south side of loading dock #2, next to loading bay #12	white cement like sealer material	NOB-TEM			16.1% Organic 46.5% Residue 37.4% Carbonate	NONE DETECTED
24033 -25		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80450	Taken in south side of loading dock #2, next to loading bay #12	white cement like sealer material	NOB-TEM			23.2% Organic 11.9% Residue 64.9% Carbonate	NONE DETECTED
24033 -26		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80451	Taken in rm 21,southside	grey cove base material	NOB-TEM			88.4% Organic 6.2% Residue 5.4% Carbonate	NONE DETECTED
24033 -27		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80452	Taken in rm 21,southside	grey cove base material	NOB-TEM			84% Organic 2.1% Residue 13.9% Carbonate	NONE DETECTED
24033 -28		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80453	Taken in rm 21,southside	grey cove base material	NOB-TEM			86.8% Organic 2.4% Residue 10.8% Carbonate	NONE DETECTED
24033 -29		Color: Grey					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80454	Taken in rm 21	white ceiling sealer	NOB-TEM			66.2% Organic 16.5% Residue 17.3% Carbonate	NONE DETECTED
24033 -30		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80455	Taken in rm 21	white ceiling sealer	NOB-TEM			56.8% Organic 9.9% Residue 33.3% Carbonate	NONE DETECTED
24033 -31		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80456	Taken in rm 21	white ceiling sealer	NOB-TEM			47.3% Organic 21.2% Residue 31.5% Carbonate	NONE DETECTED
24033 -32		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80457	In room 30	12" x 12" gray linoleum tile material	NOB-TEM			33% Organic 1.6% Residue 65.4% Carbonate	NONE DETECTED
24033 -33		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80458	In room 30	12" x 12" gray linoleum tile material	NOB-TEM			33.7% Organic 1.4% Residue 64.9% Carbonate	NONE DETECTED
24033 -34		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80459	In room 30	12" x 12" gray linoleum tile material	NOB-TEM			32.6% Organic 1.6% Residue 65.8% Carbonate	NONE DETECTED
24033 -35		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80460	Taken in room 30	12" x 12" gray streaked vinyl floor tile	NOB-TEM			17.3% Organic 5.2% Residue 77.5% Carbonate	NONE DETECTED
24033 -36		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80461	Taken in room 30	Floor tile mastic like material	NOB-TEM			38.4% Organic 3.9% Residue 57.7% Carbonate	NONE DETECTED
24033 -37		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80462	Taken in room 30, from top layer	12" x 12" gray streaked floor tile like material	NOB-TEM			17.8% Organic 2% Residue 80.2% Carbonate	NONE DETECTED
24033 -38		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80463	Taken in room 31, from top layer	12" x 12" gray streaked floor tile like material	NOB-TEM			18.2% Organic 1.2% Residue 80.6% Carbonate	NONE DETECTED
24033 -39		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80464	Taken in room 31	floor tile mastic like material	NOB-TEM			85% Organic 5% Residue 10% Carbonate	NONE DETECTED
24033 -40		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80465	Taken in room 31	floor tile mastic like material	NOB-TEM			58.6% Organic 2.5% Residue 38.9% Carbonate	NONE DETECTED
24033 -41		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80466	Taken in room 31	12" x 12" yellow bottom layer floor tile material	NOB-TEM			19.8% Organic 4.6% Residue 75.6% Carbonate	NONE DETECTED
24033 -42		Color: Yellow					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80467	Taken in room 31	12" x 12" yellow bottom layer floor tile material	NOB-TEM			18.5% Organic 9.8% Residue 71.7% Carbonate	NONE DETECTED
24033 -43		Color: Yellow					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80468	Taken in room 31	12" x 12" yellow bottom layer floor tile material	NOB-TEM			21.1% Organic 8.9% Residue 70% Carbonate	NONE DETECTED
24033 -44		Color: Yellow					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80469	Taken in room 31, bottom layer	black floor tile mastic like material	NOB-TEM			30.7% Organic 29.9% Residue 39.4% Carbonate	NONE DETECTED
24033 -45		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80470	Taken in room 31, bottom layer	black floor tile mastic like material	NOB-TEM			21.7% Organic 26.2% Residue 52.1% Carbonate	NONE DETECTED
24033 -46		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80471	Taken in room 31, bottom layer	black floor tile mastic like material	NOB-TEM			19.2% Organic 51.8% Residue 29% Carbonate	NONE DETECTED
24033 -47		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES.

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the Limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Materia (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____ Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Mohamed Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No. BATCH 24040 ✓

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

E/F

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 9

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #'S FROM	SAMPLE #'S TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
	EWR- 80472	EWR- 80528	57	RELINQUISHED BY: S KHODORKOVSKY	DATE TIME 05/31/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S. KHODORKOVSKY	DATE: 05/31/12 TIME: 15:30	FAX RESULTS to: (973) 961-6066 ✓
RECEIVED BY: Marcial Sonchez	DATE: 5/31/12 TIME: 15:30 pm	ATTN: RALPH CAMPIONE ✓
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY: Courier	DATE: 5/31/12 TIME: 4:48 PM	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: ATC-T Fata ✓	DATE: 5/31/12 TIME: 6:00 PM	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY: [illegible]	DATE: 5/31/12 TIME: 23:59	57 PLM
RECEIVED AT THE LAB BY: M Bonezzi	LAB NAME: ATC DATE: 5/31/12 TIME: 4:48 PM	(Signature of R. E.'s Representative) CHARGE CODE: CA44151120 (Use a separate C-O-C for each Charge Code)

M

PA 3739
9-96

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24040

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 05/31/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80472	black cove base material taken in Rm 32
LAB No:	
EWR- 80473	black cove base material taken in Rm 32
LAB No:	
EWR- 80474	black cove base material taken in Rm 32
LAB No:	
EWR- 80475	gray sealer like material taken in Rm 24A by floor metal hatch
LAB No:	
EWR- 80476	gray sealer like material taken in Rm 24A by floor metal hatch
LAB No:	
EWR- 80477	gray sealer like material taken in Rm 24A by floor metal hatch
LAB No:	
EWR- 80478	clear sealer like material taken from column base in Rm 24A
LAB No:	
EWR- 80479	clear sealer like material taken from column base in Rm 24A
LAB No:	

Port Authority Inspector(s): S. Khodorkovsky / V. Feldbluym

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The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24040

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 05/31/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80480	clear sealer like material taken from column base in Rm 24A
LAB No:	
EWR- 80481	gray cement like material taken from steel column base in Rm 24A
LAB No:	
EWR- 80482	gray cement like material taken from steel column base in Rm 24A
LAB No:	
EWR- 80483	gray cement like material taken from steel column base in Rm 24A
LAB No:	
EWR- 80484	12" x 12" red floor tile, taken in hallway by Rm 13A, bottom layer
LAB No:	
EWR- 80485	12" x 12" red floor tile, taken in hallway by Rm 13A, bottom layer
LAB No:	
EWR- 80486	12" x 12" red floor material, taken in hallway by Rm 13A, bottom layer
LAB No:	
EWR- 80487	black floor tile mastic like material taken in hallway by Rm 13A, bottom layer
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldbluym

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2 of 2

The Port Authority of New York & New Jersey

Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 05/31/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80488	black floor tile mastic like material taken in hallway by Rm 13A, bottom layer
LAB No:	
EWR- 80489	black floor tile mastic like material taken in hallway by Rm 13A, bottom layer
LAB No:	
EWR- 80490	12"x12" gray floor tile material taken in hallway by Rm 13A, 3rd layer (from top)
LAB No:	
EWR- 80491	12" x 12" gray floor tile material taken in hallway by Rm 13A, 3rd layer (from top)
LAB No:	
EWR- 80492	12" x 12" gray floor tile material taken in hallway by Rm 13A, 3rd layer (from top)
LAB No:	
EWR- 80493	black floor tile mastic like material taken in hallway by Rm 13A, between 3rd and 4th layer (from top)
LAB No:	
EWR- 80494	black floor tile mastic like material taken in hallway by Rm 13A, between 3rd and 4th layer (from top)
LAB No:	
EWR- 80495	black floor tile mastic like material taken in hallway by Rm 13A, between 3rd and 4th layer (from top)
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldbleyan

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of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 05/31/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80496	gray cement tile grout like material taken in bathroom 15A
LAB No:	
EWR- 80497	gray cement tile grout like material taken in bathroom 15A
LAB No:	
EWR- 80498	gray cement tile grout like material taken in bathroom 15A
LAB No:	
EWR- 80499	9" x 9" gray floor tile material taken in southeast corner of Rm 20A
LAB No:	
EWR- 80500	9" x 9" gray floor tile material taken in south east corner of Rm 20A
LAB No:	
EWR- 80501	9" x 9" gray floor tile material taken in south east corner of Rm 20A
LAB No:	
EWR- 80502	brown floor tile mastic like material taken in south east location of Rm 20A
LAB No:	
EWR- 80503	brown floor tile mastic like material taken in south east location of Rm 20A
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldbluym

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The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24040

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 05/31/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80504	brown floor tile mastic like material taken in southeast location of Rm 20A
LAB No:	
EWR- 80505	white textured paint coating like material taken from Rm 20F off ceiling pipe joint
LAB No:	
EWR- 80506	white textured paint coating like material taken from Rm 20F off ceiling pipe joint
LAB No:	
EWR- 80507	white textured paint coating like material taken from Rm 20F off ceiling pipe joint
LAB No:	
EWR- 80508	gray expansion joint filler like material taken from the floor in Rm 20F
LAB No:	
EWR- 80509	gray expansion joint filler like material taken from the floor in Rm 20F
LAB No:	
EWR- 80510	gray expansion joint filler like material taken from the floor in Rm 20F
LAB No:	
EWR- 80511	green cove base material taken in Rm 19
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldbluym

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 05/31/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80512	green cove base material taken in Rm 19
LAB No:	
EWR- 80513	green cove base material taken in Rm 19
LAB No:	
EWR- 80514	black tar like material taken from above the suspended ceiling in Rm 24A
LAB No:	
EWR- 80515	black tar like material taken from above the suspended ceiling in Rm 24A
LAB No:	
EWR- 80516	black tar like material taken from above the suspended ceiling in Rm 24A
LAB No:	
EWR- 80517	white fiber wall panel material collected from Rm 45, west wall
LAB No:	
EWR- 80518	white fiber wall panel material collected from Rm 45, west wall
LAB No:	
EWR- 80519	white fiber wall panel material collected from Rm 45, west wall
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblum

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Environmental Field Operations
P.A.C.M Sampling Form

2-40/5

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 05/31/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80520	yellow wall glue like material collected from under wall panel in Rm 45
LAB No:	South wall
EWR- 80521	yellow wall glue like material collected from under wall panel in Rm 45
LAB No:	South wall
EWR- 80522	yellow wall glue like material collected from under wall panel in Rm 45
LAB No:	South wall
EWR- 80523	black wrap like material (pipe wrap) collected from A/C unit in Rm 45
LAB No:	
EWR- 80524	black wrap like material (pipe wrap) collected from A/C unit in Rm 45
LAB No:	
EWR- 80525	black wrap like material (pipe wrap) collected from A/C unit in Rm 45
LAB No:	
EWR- 80526	gray wrap like material (pipe wrap) collected from A/C unit in Rm 45
LAB No:	
EWR- 80527	gray wrap like material (pipe wrap) collected from A/C unit in Rm 45
LAB No:	

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 05/31/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80528	gray wrap like material (pipe wrap) collected from A/C unit in Rm 45
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblum

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Sample Date: 5/31/2012
Date Received: 5/31/2012
Date Analyzed: 5/31/2012
ATC Batch # 24040
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Location: BUILDING: 95/ FLOOR: 1
Project # EWR 151.120

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80472	Taken in Rm 32	Black cove base material	NOB-TEM			36% Organic 10.9% Residue 53.1% Carbonate	NONE DETECTED
24040 -1		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80473	Taken in Rm 32	Black cove base material	NOB-TEM			37.1% Organic 22.9% Residue 40% Carbonate	NONE DETECTED
24040 -2		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80474	Taken in Rm 32	Black cove base material	NOB-TEM			37% Organic 1.2% Residue 61.8% Carbonate	NONE DETECTED
24040 -3		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80475	Taken in rm 24 A by floor metal hatch	Gray sealer like material	NOB-TEM			44.1% Organic 6% Residue 49.9% Carbonate	NONE DETECTED
24040 -4		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80476	Taken in rm 24 A by floor metal hatch	Gray sealer like material	NOB-TEM			42% Organic 4% Residue 54% Carbonate	NONE DETECTED
24040 -5		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80477	Taken in rm 24 A by floor metal hatch	Gray sealer like material	NOB-TEM			37.8% Organic 3.3% Residue 58.9% Carbonate	NONE DETECTED
24040 -6		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80478	Taken from column base in Rm 24A	Clear sealer like material	NOB-TEM			94.5% Organic 2.4% Residue 3.1% Carbonate	NONE DETECTED
24040 -7		Color: CLEAR					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80479 24040 -8	Taken from column base in Rm 24A	Clear sealer like material Color: CLEAR	NOB-TEM			95.4% Organic 2.4% Residue 2.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80480 24040 -9	Taken from column base in Rm 24A	Clear sealer like material Color: CLEAR	NOB-TEM			88.7% Organic 3.9% Residue 7.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80481 24040 -10	Taken from steel column base in Rm 24A	Gray cement like material Color: GRAY	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata							
EWR-80482 24040 -11	Taken from steel column base in Rm 24A	Gray cement like material Color: GRAY	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-80483 24040 -12	Taken from steel column base in Rm 24A	Gray cement like material Color: GRAY	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-80484 24040 -13	Taken in hallway by Rm 13A, bottom layer	12" x 12" red floor tile Color: RED	NOB-TEM			27.3% Organic 9.7% Residue 61.3% Carbonate	1.7% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.7 %
EWR-80485 24040 -14	Taken in hallway by Rm 13A, bottom layer	12" x 12" red floor tile Color: RED	NOB-TEM			25.7% Organic 5.4% Residue 67.5% Carbonate	1.4% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.4 %
EWR-80486 24040 -15	Taken in hallway by Rm 13A, bottom layer	12" x 12" red floor tile Color: RED	NOB-TEM			25.9% Organic 3.3% Residue 70.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80487 24040 -16	Taken in hallway by rm 13A, bottom layer	Black floor tile mastic like material Color: BLACK	NOB-TEM			27.4% Organic 24.9% Residue 47.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80488 24040 -17	Taken in hallway by rm 13A, bottom layer	Black floor tile mastic like material Color: BLACK	NOB-TEM			27.4% Organic 13% Residue 59.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80489	Taken in hallway by rm 13A, bottom layer	Black floor tile mastic like material	NOB-TEM			30.4% Organic 25.3% Residue 44.3% Carbonate	NONE DETECTED
24040 -18		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80490	Taken in hallway by Rm 13A, 3rd layer (From top)	12" x 12" Gray Floor tile material	NOB-TEM			25.9% Organic 18.5% Residue 53.5% Carbonate	2.1% Chrysotile
24040 -19		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 2.1 %
EWR-80491	Taken in hallway by Rm 13A, 3rd layer (From top)	12" x 12" Gray Floor tile material	NOB-TEM			23.9% Organic 11.8% Residue 62.2% Carbonate	2.1% Chrysotile
24040 -20		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 2.1 %
EWR-80492	Taken in hallway by Rm 13A, 3rd layer (From top)	12" x 12" Gray Floor tile material	NOB-TEM			25.7% Organic 22.7% Residue 50.1% Carbonate	1.5% Chrysotile
24040 -21		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.5 %
EWR-80493	Taken in hallway by Rm 13A, between 3rd and 4th layer (From top)	Black floor tile mastic like material	NOB-TEM			59.6% Organic 4.4% Residue 36% Carbonate	NONE DETECTED
24040 -22		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80494	Taken in hallway by Rm 13A, between 3rd and 4th layer (From top)	Black floor tile mastic like material	NOB-TEM			55.6% Organic 24.8% Residue 19.6% Carbonate	NONE DETECTED
24040 -23		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80495	Taken in hallway by Rm 13A, between 3rd and 4th layer (From top)	Black floor tile mastic like material	NOB-TEM			59.9% Organic 11% Residue 27.6% Carbonate	1.5% Chrysotile
24040 -24		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.5 %
EWR-80496	Taken in bathroom 15A	Gray cement tile grout like material	PLM	Trace% Cellulose	100% Mineral Filler		NONE DETECTED
24040 -25		Color: GRAY					
Analyzed By: Tarek Fata				Comments:			
EWR-80497	Taken in bathroom 15A	Gray cement tile grout like material	PLM	Trace% Cellulose	100% Mineral Filler		NONE DETECTED
24040 -26		Color: GRAY					
Analyzed By: Tarek Fata				Comments:			
EWR-80498	Taken in bathroom 15A	Gray cement tile grout like material	PLM	Trace% Cellulose	100% Mineral Filler		NONE DETECTED
24040 -27		Color: GRAY					
Analyzed By: Tarek Fata				Comments:			

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Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80499 24040 -28	Taken in South East corner of rm 20A	9" x 9" gray floor tile material	NOB-PLM			27% Organic 34.1% Residue 16.2% Carbonate	22.7% Chrysotile
Analyzed By: Tarek Fata		Color: GRAY Second Analyst: Mohamed Fata		Comments: PLM inconclusive			Total Asbestos: 22.7 %
EWR-80500 24040 -29	Taken in South East corner of Rm 20A	9" x 9" gray floor tile material	NOB-PLM			26.8% Organic 21.7% Residue 29.8% Carbonate	21.7% Chrysotile
Analyzed By: Tarek Fata		Color: GRAY Second Analyst: Mohamed Fata		Comments: PLM inconclusive			Total Asbestos: 21.7 %
EWR-80501 24040 -30	Taken in South East corner of Rm 20A	9" x 9" gray floor tile material	NOB-PLM			26.6% Organic 22% Residue 29.4% Carbonate	22% Chrysotile
Analyzed By: Tarek Fata		Color: GRAY Second Analyst: Mohamed Fata		Comments: PLM inconclusive			Total Asbestos: 22 %
EWR-80502 24040 -31	Taken in south East location of rm 20A	Brown floor tile mastic like material	NOB-TEM			69.8% Organic 7.4% Residue 20.9% Carbonate	1.9% Chrysotile
Analyzed By: Tarek Fata		Color: BROWN Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.9 %
EWR-80503 24040 -32	Taken in south East location of rm 20A	Brown floor tile mastic like material	NOB-TEM			61.9% Organic 4.8% Residue 33.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BROWN Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80504 24040 -33	Taken in south East location of rm 20A	Brown floor tile mastic like material	NOB-TEM			66% Organic 17% Residue 17% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BROWN Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80505 24040 -34	Taken from Rm 20F off Ceiling pipe joint	White textured paint coating like material	NOB-TEM			43.5% Organic 12.9% Residue 43.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: WHITE Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80506 24040 -35	Taken from Rm 20F off Ceiling pipe joint	White textured paint coating like material	NOB-TEM			49.7% Organic 14.1% Residue 36.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: WHITE Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80507 24040 -36	Taken from Rm 20F off Ceiling pipe joint	White textured paint coating like material	NOB-TEM			50.6% Organic 7.8% Residue 41.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: WHITE Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80508 24040 -37	Taken from the floor in rm 20F	Gray Expansion joint filler like material	NOB-TEM			63.3% Organic 1.9% Residue 34.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: GRAY Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80509	Taken from the floor in rm 20F	Gray Expansion joint filler like material	NOB-TEM			63.9% Organic 1.6% Residue 34.5% Carbonate	NONE DETECTED
24040 -38		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80510	Taken from the floor in rm 20F	Gray Expansion joint filler like material	NOB-TEM			61.3% Organic 1.7% Residue 37% Carbonate	NONE DETECTED
24040 -39		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80511	Taken in rm 19	Green Cove base material	NOB-TEM			38% Organic 1.3% Residue 60.7% Carbonate	NONE DETECTED
24040 -40		Color: GREEN					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80512	Taken in rm 19	Green Cove base material	NOB-TEM			37.2% Organic 1.3% Residue 61.5% Carbonate	NONE DETECTED
24040 -41		Color: GREEN					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80513	Taken in rm 19	Green Cove base material	NOB-TEM			37% Organic 1.4% Residue 61.6% Carbonate	NONE DETECTED
24040 -42		Color: GREEN					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80514	Taken from above the suspended ceiling in Rm 24A	Black tar like material	NOB-TEM			97.8% Organic 1.6% Residue 0.6% Carbonate	NONE DETECTED
24040 -43		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80515	Taken from above the suspended ceiling in Rm 24A	Black tar like material	NOB-TEM			91.9% Organic 1.6% Residue 6.5% Carbonate	NONE DETECTED
24040 -44		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80516	Taken from above the suspended ceiling in Rm 24A	Black tar like material	NOB-TEM			97.5% Organic 1.3% Residue 1.2% Carbonate	NONE DETECTED
24040 -45		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80517	Collected from Rm 45, West wall	White Fiber wall panel material	NOB-TEM			59.2% Organic 29.3% Residue 11.5% Carbonate	NONE DETECTED
24040 -46		Color: WHITE					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80518	Collected from Rm 45, West wall	White Fiber wall panel material	NOB-TEM			58.1% Organic 23.8% Residue 18.1% Carbonate	NONE DETECTED
24040 -47		Color: WHITE					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80519	Collected from Rm 45, West wall	White Fiber wall panel material	NOB-TEM			58.2% Organic 28.8% Residue 13% Carbonate	NONE DETECTED
24040 -48		Color: WHITE					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80520	Collected from under wall panel in Rm 45 south wall	Yellow wall glue like material	NOB-TEM			41.8% Organic 25% Residue 33.2% Carbonate	NONE DETECTED
24040 -49		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80521	Collected from under wall panel in Rm 45 south wall	Yellow wall glue like material	NOB-TEM			43.4% Organic 25.3% Residue 31.3% Carbonate	NONE DETECTED
24040 -50		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80522	Collected from under wall panel in Rm 45 south wall	Yellow wall glue like material	NOB-TEM			47.7% Organic 21.3% Residue 31% Carbonate	NONE DETECTED
24040 -51		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80523	Collected from A/C unit in Rm 45	Black Wrap like material (Pipe wrap)	NOB-TEM			60.8% Organic 3.9% Residue 35.3% Carbonate	NONE DETECTED
24040 -52		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80524	Collected from A/C unit in Rm 45	Black Wrap like material (Pipe wrap)	NOB-TEM			68.2% Organic 3.6% Residue 28.2% Carbonate	NONE DETECTED
24040 -53		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80525	Collected from A/C unit in Rm 45	Black Wrap like material (Pipe wrap)	NOB-TEM			66% Organic 4% Residue 30% Carbonate	NONE DETECTED
24040 -54		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80526	Collected from A/C unit in Rm 45	Gray wrap like material (Pipe wrap)	NOB-TEM			90.3% Organic 6.5% Residue 3.2% Carbonate	NONE DETECTED
24040 -55		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80527	Collected from A/C unit in Rm 45	Gray wrap like material (Pipe wrap)	NOB-TEM			88.6% Organic 5.7% Residue 5.7% Carbonate	NONE DETECTED
24040 -56		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80528	Collected from A/C unit in Rm 45	Gray wrap like material (Pipe wrap)	NOB-TEM			90.9% Organic 6.8% Residue 2.3% Carbonate	NONE DETECTED
24040 -57		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Mohamed Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

24051

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 7

Sample Type - **LEAD** [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
	EWR- 80529	EWR- 80570	42	RELINQUISHED BY: S. KHODORKOVSKY	6/1/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	
	EWR-	EWR-		RELINQUISHED BY:	
				RELINQUISHED BY:	
				RELINQUISHED BY:	
				RELINQUISHED BY:	

RELINQUISHED BY: S. KHODORKOVSKY	DATE: 6/1/12 TIME: 15:30	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY:	DATE: TIME:	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY: Courier	DATE: 6/1/12 TIME: 17:17	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: ATC-T Fata	DATE: 6-1-12 TIME: 7:00 PM	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: Jie Ying Gao	LAB NAME: ATC DATE: 6/1/12 TIME: 17:17	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

Received at ATC
6/2/12 00:20

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24051

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 06/01/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80529	white rubber expansion joint sealer like material taken in hallway 16A
LAB No:	
EWR- 80530	white rubber expansion joint sealer like material taken in hallway 16A
LAB No:	
EWR- 80531	white rubber expansion joint sealer like material taken in hallway 16A
LAB No:	
EWR- 80532	white insulation like material taken off the pipe elbow in Rm 45, westside above the drop ceiling
LAB No:	
EWR- 80533	white pipe insulation like material taken off the pipe elbow in Rm 45, westside above the drop ceiling
LAB No:	
EWR- 80534	white pipe insulation like material taken off the pipe elbow in Rm 45, westside above the drop ceiling
LAB No:	
EWR- 80535	white pipe insulation like material taken off T-joint, located above the drop ceiling in north west corner of Rm 24A by Rm 22
LAB No:	
EWR- 80536	white pipe insulation like material taken off T-joint, located above the drop ceiling in north west corner of Rm 24A by Rm 22
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V Feldbluym

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24051

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 06/01/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80537	white insulation like material taken off T-joint, located above the drop ceiling in north west corner of Rm 24A by Rm 22
LAB No:	
EWR- 80538	black vibration cloth material taken off duct in Rm 23 (boiler room), south side
LAB No:	
EWR- 80539	black vibration cloth material taken off duct in Rm 23 (boiler room), south side
LAB No:	
EWR- 80540	black vibration cloth material taken off duct in Rm 23 (boiler room); south side
LAB No:	
EWR- 80541	white insulation gasket like material taken from boiler #1 in Rm 23
LAB No:	
EWR- 80542	white gasket insulation like material taken from boiler #1 in Rm 23
LAB No:	
EWR- 80543	white gasket insulation like material taken from boiler #1 in Rm 23
LAB No:	
EWR- 80544	white gasket insulation cloth like material taken from boiler #2 in Rm 23
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldbluym

PA 3135
9-93

The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M. Sampling Form

24051

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building: 95

Contract No.: EWR-151.120

Floor: 1

Job No.:

Area Description:

Date: 06/01/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80545	white gasket insulation cloth like material taken from boiler #2 in Rm 23
LAB No:	
EWR- 80546	White gasket-insulation cloth like material taken from boiler #2 in Rm 23
LAB No:	
EWR- 80547	white pipe insulation like material taken off pipe elbow in Rm 23 westside
LAB No:	
EWR- 80548	white pipe insulation like material taken off pipe elbow in Rm 23, westside
LAB No:	
EWR- 80549	White pipe insulation like materials taken off pipe elbow in Rm 23, westside
LAB No:	
EWR- 80550	white sealer like material taken from outside bldg, north west side, under ventilation duct
LAB No:	
EWR- 80551	white sealer like material taken from outside bldg wall, north west side, under ventilation duct
LAB No:	
EWR- 80552	White sealer like material taken from outside bldg wall, north side, under ventilation duct
LAB No:	

Port Authority Inspector(s): S RHODORKOVSKY / V Feldbluym

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The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24051

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 06/01/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80553	black exterior vapor barrier material taken at the base of the bldg, north side
LAB No:	
EWR- 80554	black exterior-vapor barrier material taken at the base of the bldg, north side
LAB No:	
EWR- 80555	black exterior vapor barrier material taken at the base of the bldg, north side
LAB No:	
EWR- 80556	gray rubber insulation like material taken from ventilation louver, north side
LAB No:	
EWR- 80557	gray rubber insulation like material taken from ventilation louver, north side
LAB No:	
EWR- 80558	gray rubber insulation like material taken from ventilation louver, north side
LAB No:	
EWR- 80559	gray cement trowel on like material taken at the base of stairs at exit #5
LAB No:	
EWR- 80560	gray cement trowel on like material taken at the base of stairs at exit #5
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblum

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 06/01/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80561	gray cement trowel on like material taken at the base of stairs at exit #5
LAB No:	
EWR- 80562	black expansion joint filler like material taken at the base of the Bay 7, loading dock #37
LAB No:	
EWR- 80563	black expansion joint filler like material taken at the base of the Bay 7, loading dock #37
LAB No:	
EWR- 80564	black expansion joint filler like material taken at the base of the Bay 7, loading dock #37
LAB No:	
EWR- 80565	black rubberized like material taken from laminated dock bumper at Bay 7 loading dock #37
LAB No:	
EWR- 80566	black rubberized like material taken from laminated dock bumper at Bay 7 loading dock #37
LAB No:	
EWR- 80567	black rubberized like material taken from laminated dock bumper at Bay 7 loading Dock #37
LAB No:	
EWR- 80568	black rubber like material taken from molded Dock bumper at Bay 7 loading DOCK #37
LAB No:	

Port Authority Inspector(s): S. KHODOKOVSKY / V. Feldbluym

PA 3739
9-96

The Port Authority of New York & New Jersey

Engineering Department
Environmental Field Operations
F.A.C.M Sampling Form

24051

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 06/01/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80569	black rubber like material taken from molded dock bumper at Bay 7
LAB No:	loading dock #37
EWR- 80570	black rubber-like material taken from molded dock bumper at Bay 7
LAB No:	loading dock #37
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldbluym

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872
Project: NEWARK INTERNATIONAL AIRPORT

Sample Date : 6/1/2012
Date Received : 6/1/2012
Date Analyzed : 6/2/2012
ATC Batch # 24051
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Location: BUILDING 95 / FLOOR 1
Project # EWR 151.120

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80529	Taken in hallway 16A	White rubber expansion joint sealer like material	NOB-TEM			68.1% Organic 1.3% Residue 30.6% Carbonate	NONE DETECTED
24051 -1		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80530	Taken in hallway 16A	White rubber expansion joint sealer like material	NOB-TEM			67.1% Organic 1.3% Residue 31.6% Carbonate	NONE DETECTED
24051 -2		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80531	Taken in hallway 16A	White rubber expansion joint sealer like material	NOB-TEM			68.2% Organic 1.9% Residue 29.9% Carbonate	NONE DETECTED
24051 -3		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80532	Taken off the pipe elbow in rm 45, West side above the drop ceiling	White insulation like material	PLM	10% Cellulose	86% Mineral Filler		4% Chrysotile
24051 -4		Color: White					
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 4 %
EWR-80533	Taken off the pipe elbow in Rm 45, West side above the drop ceiling	White insulation like material	PLM	10% Cellulose	85% Mineral Filler		5% Chrysotile
24051 -5		Color: White					
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 5 %
EWR-80534	Taken off the pipe elbow in Rm 45 West side above the drop ceiling	White insulation like material	PLM	11% Cellulose	85% Mineral Filler		4% Chrysotile
24051 -6		Color: White					
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 4 %
EWR-80535	Taken off T-joint, located above the drop ceiling North West corner of rm 24A by rm 22	White insulation like material	PLM	6% Cellulose	88% Mineral Filler		6% Chrysotile
24051 -7		Color: White					
Analyzed By: Tarek Fata				Comments:			Total Asbestos: 6 %

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80536	Taken off T-joint, located above the drop ceiling North West corner of rm 24A by rm 22	White insulation like material	PLM	6% Cellulose	90% Mineral Filler		4% Chrysotile
24051 -8		Color: White		Comments:			Total Asbestos: 4 %
Analyzed By: Tarek Fata							
EWR-80537	Taken off T-joint, located above the drop ceiling North West corner of rm 24A by rm 22	White insulation like material	PLM	5% Cellulose	90% Mineral Filler		5% Chrysotile
24051 -9		Color: White		Comments:			Total Asbestos: 5 %
Analyzed By: Tarek Fata							
EWR-80538	Taken off duct in rm 23 (Boiler room) South side	Black Vibration Cloth material	NOB-TEM			75.1% Organic 1.4% Residue 23.5% Carbonate	NONE DETECTED
24051 -10		Color: Black		Comments: PLM Inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov					
EWR-80539	Taken off duct in rm 23 (Boiler room) South side	Black Vibration Cloth material	NOB-TEM			66.7% Organic 3.2% Residue 30.1% Carbonate	NONE DETECTED
24051 -11		Color: Black		Comments: PLM Inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov					
EWR-80540	Taken off duct in rm 23 (Boiler room) South side	Black Vibration Cloth material	NOB-TEM			74.5% Organic 2.6% Residue 22.9% Carbonate	NONE DETECTED
24051 -12		Color: Black		Comments: PLM Inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov					
EWR-80541	Taken from boiler #1 in rm 23	White insulation gasket like material	NOB-TEM			23.4% Organic 29.9% Residue 46.7% Carbonate	NONE DETECTED
24051 -13		Color: White		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov					
EWR-80542	Taken from boiler #1 in rm 23	White gasket insulation like material	NOB-TEM			23.4% Organic 30.2% Residue 46.4% Carbonate	NONE DETECTED
24051 -14		Color: White		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov					
EWR-80543	Taken from boiler #1 in rm 23	White gasket insulation like material	NOB-TEM			23.3% Organic 30.4% Residue 46.3% Carbonate	NONE DETECTED
24051 -15		Color: White		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov					
EWR-80544	Taken from boiler #2 in rm 23	White gasket insulation cloth like material	NOB-TEM			24.3% Organic 45.5% Residue 30.2% Carbonate	NONE DETECTED
24051 -16		Color: White		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov					
EWR-80545	Taken from boiler #2 in rm 23	White gasket insulation cloth like material	NOB-TEM			24.7% Organic 37% Residue 38.3% Carbonate	NONE DETECTED
24051 -17		Color: White		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov					

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80546 24051 -18	Taken from boiler #2 in rm 23	White gasket insulation cloth like material	NOB-TEM			25.8% Organic 16.1% Residue 58.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: White Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80547 24051 -19	Taken off pipe elbow in rm 23, West side	White pipe insulation like material	PLM	10% Cellulose 20% FiberGlass	70% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata		Color: White		Comments:			
EWR-80548 24051 -20	Taken off pipe elbow in rm 23, West side	White pipe insulation like material	PLM	15% Cellulose 25% FiberGlass	60% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata		Color: White		Comments:			
EWR-80549 24051 -21	Taken off pipe elbow in rm 23, West side	White pipe insulation like material	PLM	15% Cellulose 20% FiberGlass	65% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata		Color: White		Comments:			
EWR-80550 24051 -22	Taken from outside Bldg, North West side, under ventilation Duct	White sealer like material	NOB-TEM			29.1% Organic 50.9% Residue 20% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: White Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80551 24051 -23	Taken from outside bldg wall, North West side under ventilation duct	White sealer like material	NOB-TEM			27.2% Organic 1.7% Residue 71.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: White Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80552 24051 -24	Taken from outside bldg wall, North West side under ventilation duct	White sealer like material	NOB-TEM			25.9% Organic 3.5% Residue 70.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: White Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80553 24051 -25	Taken at the base of the bldg North side	Black Exterior vapor barrier material	NOB-TEM			46.2% Organic 44.7% Residue 9.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80554 24051 -26	Taken at the base of the bldg North side	Black Exterior vapor barrier material	NOB-TEM			40.8% Organic 38.4% Residue 20.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80555 24051 -27	Taken at the base of the bldg North side	Black Exterior vapor barrier material	NOB-TEM			53.5% Organic 25.1% Residue 21.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: Black Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80556	Taken from ventilation lower, North side	Gray rubber insulation like material	NOB-TEM			58.1% Organic 12.8% Residue 29.1% Carbonate	NONE DETECTED
24051 -28		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80557	Taken from ventilation lower, North side	Gray rubber insulation like material	NOB-TEM			42.9% Organic 14.3% Residue 42.8% Carbonate	NONE DETECTED
24051 -29		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM Inconclusive, NOB-PLM inconclusive			
EWR-80558	Taken from ventilation lower, North side	Gray rubber insulation like material	NOB-TEM			57.6% Organic 30.9% Residue 11.5% Carbonate	NONE DETECTED
24051 -30		Color: Gray					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80559	Taken at the base of stairs at exit #5	Gray cement trowel on like material	PLM		100% Mineral Filler		NONE DETECTED
24051 -31		Color: Gray					
Analyzed By: Tarek Fata				Comments:			
EWR-80560	Taken at the base of stairs at exit #5	Gray cement trowel on like material	PLM		100% Mineral Filler		NONE DETECTED
24051 -32		Color: Gray					
Analyzed By: Tarek Fata				Comments:			
EWR-80561	Taken at the base of stairs at exit #5	Gray cement trowel on like material	PLM		100% Mineral Filler		NONE DETECTED
24051 -33		Color: Gray					
Analyzed By: Tarek Fata				Comments:			
EWR-80562	Taken at the base of the Bay 7, loading dock #37	Black expansion joint filler like material	NOB-TEM			86.8% Organic 1.6% Residue 11.6% Carbonate	NONE DETECTED
24051 -34		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80563	Taken at the base of the Bay 7, loading dock #37	Black expansion joint filler like material	NOB-TEM			82.9% Organic 1.5% Residue 15.6% Carbonate	NONE DETECTED
24051 -35		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80564	Taken at the base of the Bay 7, loading dock #37	Black expansion joint filler like material	NOB-TEM			84.2% Organic 2.1% Residue 13.7% Carbonate	NONE DETECTED
24051 -36		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80565	Taken from laminated dock bumper at Bay 7 loading dock #37	Black rubbersized like material	NOB-TEM			95.1% Organic 1.6% Residue 3.3% Carbonate	NONE DETECTED
24051 -37		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

ATC ASSOCIATES INC

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80566 24051 -38	Taken from laminated dock bumper at Bay 7 loading dock #37	Black rubbersized like material Color: Black	NOB-TEM			95% Organic 1.5% Residue 3.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80567 24051 -39	Taken from laminated dock bumper at Bay 7 loading dock #37	Black rubbersized like material Color: Black	NOB-TEM			93.2% Organic 2.1% Residue 4.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80568 24051 -40	Taken from molded dock bumper at Bay 7 loading Dock #37	Black rubber like material Color: Black	NOB-TEM			88.4% Organic 1.3% Residue 10.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80569 24051 -41	Taken from molded dock bumper at Bay 7 loading dock #37	Black rubber like material Color: Black	NOB-TEM			94.6% Organic 1.3% Residue 4.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80570 24051 -42	Taken from molded dock bumper at Bay 7 loading dock #37	Black rubber like material Color: Black	NOB-TEM			93.8% Organic 1.3% Residue 4.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Mohamed Fata
Analyst:

Mark Peysakhov
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J. # 24072

ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

EHF

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 4

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
	EWR- 80571	EWR- 80594	24	RELINQUISHED BY: S. KHODORKOVSKY	DATE TIME 06/05/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S. KHODORKOVSKY	DATE: 06/05/12 TIME: 15:30	FAX RESULTS to: (973) 961-6066
RECEIVED BY: ESAT 90	DATE: 6-5-12 TIME: 1620	ATTN: RALPH CAMPIONE
RELINQUISHED BY: Courier	DATE: 6/5/12 TIME: 17:20	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY: Tom Arbowgast	DATE: 6/5/12 TIME: 2:30	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: ATC- T Fata	DATE: 6-5-12 TIME: 6:30 PM	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: Jie Ying Gao	LAB NAME: ATC DATE: 6/5/12 TIME: 17:20	(Signature of R. E.'s Representative) CHARGE CODE: CA44151120 (Use a separate C-O-C for each Charge Code)

M

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24072

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 06/05/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80571	white window caulking like material collected from outside Rm 31, South wall
LAB No:	
EWR- 80572	white window caulking like material collected from outside Rm 31, South wall
LAB No:	
EWR- 80573	white window caulking like material collected from outside Rm 31, South wall
LAB No:	
EWR- 80574	black rubberized gasket like material collected from outside gas line pipe
LAB No:	east side of the bldg
EWR- 80575	black rubberized gasket like material collected from outside gas line pipe
LAB No:	eastside of the bldg
EWR- 80576	black rubberized gasket like material collected from outside gas line pipe
LAB No:	eastside of the bldg
EWR- 80577	1 gray asphalt & stair thread like material collected on stairs outside exit from Rm 46
LAB No:	
EWR- 80578	gray asphalt stair thread like material collected on stairs outside exit from Rm 46
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldbluym

PA-3732
9.98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24072

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 06/05/12

SAMPLE NUMBER		SAMPLE DESCRIPTION
EWR- 80579	LAB No:	gray asphalt stair tread like material collected on stairs outside exit from bldg 96
EWR- 80580	LAB No:	white rubberized caulking like material collected next to rollup gates of Rm 50
EWR- 80581	LAB No:	white rubberized caulking like material collected next to rollup gates of Rm 50
EWR- 80582	LAB No:	White rubberized caulking like material collected next to roll-up gates of Rm 50
EWR- 80583	LAB No:	black rubberized sealer like material collected from metal skirt under cinder block on north side of the bldg
EWR- 80584	LAB No:	black rubberized sealer like material collected from metal skirt under cinder block on north side of the bldg
EWR- 80585	LAB No:	black rubberized sealer like material collected from metal skirt under cinder block on north side of the bldg
EWR- 80586	LAB No:	black rubberized sealer like material collected from expansion joint on west side of the bldg

Port Authority Inspector(s): S. Khodorkovsky / V. Feldblyum

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9-98

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24072

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 06/05/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80587	black rubberized expansion joint sealer like material collected on west side of the bldg
LAB No:	
EWR- 80588	black rubberized expansion joint sealer like material collected on west side of the bldg
LAB No:	
EWR- 80589	black textured material (like) collected from ramp located outside Rm 16
LAB No:	
EWR- 80590	black textured like material collected from ramp located outside Rm 16
LAB No:	
EWR- 80591	black textured like material collected from ramp located outside Rm 16
LAB No:	
EWR- 80592	black textured expansion joint sealer like material collected from the floor in Rm 50
LAB No:	
EWR- 80593	black textured expansion joint sealer like material collected from the floor in Rm 50
LAB No:	
EWR- 80594	black textured expansion joint sealer like material collected from the floor in Rm 50
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: BUILDING 95 / FLOOR 1

Project # EWR 151.120

Sample Date : 6/5/2012

Date Received : 6/5/2012

Date Analyzed : 6/5/2012

ATC Batch # 24072

Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80571	From outside Rm 31 South wall	White window caulking like material	NOB-TEM			23.2% Organic 33.3% Residue 43.5% Carbonate	NONE DETECTED
24072 -1		Color: WHITE					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80572	From outside Rm 31 South wall	White window caulking like material	NOB-TEM			24.9% Organic 45.8% Residue 29.3% Carbonate	NONE DETECTED
24072 -2		Color: WHITE					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80572	From outside Rm 31 South wall	White window caulking like material	NOB-TEM			25.7% Organic 56.1% Residue 18.2% Carbonate	NONE DETECTED
24072 -3		Color: WHITE					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80574	From outside gas line pipe east side of the Bldg	Black rubberized gasket like material	NOB-TEM			66.7% Organic 16.7% Residue 16.6% Carbonate	NONE DETECTED
24072 -4		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80575	From outside gas line pipe east side of the Bldg	Black rubberized gasket like material	NOB-TEM			65.8% Organic 9.4% Residue 24.8% Carbonate	NONE DETECTED
24072 -5		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments PLM inconclusive, NOB-PLM inconclusive			
EWR-80576	From outside gas line pipe east side of the Bldg	Black rubberized gasket like material	NOB-TEM			63.3% Organic 23.3% Residue 13.4% Carbonate	NONE DETECTED
24072 -6		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80577	On stairs outside exit from Rm 46	Gray asphalt & stair thread like material	NOB-TEM			15.6% Organic 61% Residue 23.4% Carbonate	NONE DETECTED
24072 -7		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80578	On stairs outside exit from Rm 46	Gray asphalt & stair thread like material	NOB-TEM			15.7% Organic 55.6% Residue 28.7% Carbonate	NONE DETECTED
24072 -8		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80579	On stairs outside exit from Rm 46	Gray asphalt & stair thread like material	NOB-TEM			5.5% Organic 51.2% Residue 43.3% Carbonate	NONE DETECTED
24072 -9		Color: GRAY					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80580	Next to rollup gates of Rm 50	White rubberized caulking like material	NOB-TEM			32.7% Organic 4% Residue 63.3% Carbonate	NONE DETECTED
24072 -10		Color: WHITE					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80581	Next to rollup gates of Rm 50	White rubberized caulking like material	NOB-TEM			31.4% Organic 1.3% Residue 67.3% Carbonate	NONE DETECTED
24072 -11		Color: WHITE					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80582	Next to rollup gates of Rm 50	White rubberized caulking like material	NOB-TEM			33.8% Organic 2.2% Residue 64% Carbonate	NONE DETECTED
24072 -12		Color: WHITE					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80583	From metal skirt under cinder block on north side of the bldg	Black rubberized sealer like material	NOB-TEM			68% Organic 3.2% Residue 28.8% Carbonate	NONE DETECTED
24072 -13		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80584	From metal skirt under cinder block on north side of the bldg	Black rubberized sealer like material	NOB-TEM			50% Organic 7.4% Residue 42.6% Carbonate	NONE DETECTED
24072 -14		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80585	From metal skirt under cinder block on north side of the bldg	Black rubberized sealer like material	NOB-TEM			22.7% Organic 2.9% Residue 74.4% Carbonate	NONE DETECTED
24072 -15		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80586	From expansion joint on west side of the bldg	Black rubberized sealer like material	NOB-TEM			62.1% Organic 2.2% Residue 35.7% Carbonate	NONE DETECTED
24072 -16		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80587	On west side of the bldg	Black rubberized expansion joint sealer like material	NOB-TEM			67.1% Organic 1.1% Residue 31.8% Carbonate	NONE DETECTED
24072 -17		Color: BLACK					
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80588 24072 -18	On west side of the bldg	Black rubberized expansion joint sealer like material Color: BLACK	NOB-TEM			49.1% Organic 25.5% Residue 25.4% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80589 24072 -19	From ramp located outside Rm 16	Black textured material (like) Color: BLACK	NOB-TEM			82.3% Organic 8.3% Residue 9.4% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80590 24072 -20	From ramp located outside Rm 16	Black textured like material Color: BLACK	NOB-TEM			84.5% Organic 9% Residue 6.5% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80591 24072 -21	From ramp located outside Rm 16	Black textured like material Color: BLACK	NOB-TEM			84.5% Organic 6.8% Residue 6.7% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80592 24072 -22	From the floor in Rm 50	Black textured expansion joint sealer like material Color: BLACK	NOB-TEM			95.4% Organic 1.8% Residue 2.8% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80593 24072 -23	From the floor in Rm 50	Black textured expansion joint sealer like material Color: BLACK	NOB-TEM			96.7% Organic 1.7% Residue 1.6% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80594 24072 -24	From the floor in Rm 50	Black textured expansion joint sealer like material Color: BLACK	NOB-TEM			54.9% Organic 17.3% Residue 27.8% Carbonate	NONE DETECTED
Analyzed By: Tarik Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

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2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

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9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarik Fata
Analyst:

Mohamed Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

24076

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 2

Sample Type - LEAD [ ] PAINT [ ] WIPE [1] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
	EWR- 80625	EWR- 80626	2	RELINQUISHED BY: S. RHODOBROVSKY	DATE TIME 06/06/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S RHODOBROVSKY	DATE: TIME: 06/06/12 15:30	FAX RESULTS to: (973) 961-6066
RECEIVED BY:	DATE: TIME:	ATTN: RALPH CAMPIONE
RELINQUISHED BY: Courier	DATE: 6/6/12 TIME: 16:55	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY: Dave Hussey	DATE: TIME: 6/6/12 2330	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed by: ATC- Tech	DATE: 6-6-12 TIME: 6:40pm	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: Jie Ying Gao	LAB NAME: ATC DATE: 6/6/12 TIME: 16:55	(Signature of R. E.'s Representative) CHARGE CODE: CA44151120 (Use a separate C-O-C for each Charge Code)

PA 3739
9-90

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24076

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151120

Building 95

Contract No.: EWR-151.120

Floor 1

Job No.:

Area Description

Date: 06.06.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80625	yellowish carpet glue like material collected from under carpet in Rm 5
LAB No:	
EWR- 80626	yellowish carpet-glue like material collected from under carpet in Rm 5
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S KHODORKOVSKY / V. Feldblyum

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310

Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: Building 95, Floor 1,

Sample Date : 6/6/2012

Date Received : 6/6/2012

Date Analyzed : 6/6/2012

ATC Batch # 24076

Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80625	From under carpet in room 5	Yellowish carpet glue like material	NOB-TEM			56.9% Organic 42% Residue 1.1% Carbonate	NONE DETECTED
24076 -1		Color: Yellow					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80626	From under carpet in room 5	Yellowish carpet glue like material	NOB-TEM			42.2% Organic 14.4% Residue 43.4% Carbonate	NONE DETECTED
24076 -2		Color: Yellow					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101167-0 and by NY State FLAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Mohamed Fata
Analyst:

Aleks Barengolts
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

GLC

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

24165

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 11

Sample Type - LEAD - [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
	EWR- 80885	EWR- 80954	70	RELINQUISHED BY: S KHODOROVSKY	DATE TIME 6/19/12 1530
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S KHODOROVSKY	DATE: 6/19/12 TIME: 1530	FAX RESULTS to: (973) 961-6066
RECEIVED BY:	DATE: TIME: 6-12-350	ATTN: RALPH CAMPIONE
RELINQUISHED BY: Courier	DATE: 6/19/12 TIME: 16:40	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: 6/19/12 TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME: 0330	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By: ATC-Tuba	DATE: 6-19-12 TIME: 9:00 PM	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	To Plan
RECEIVED AT THE LAB BY: Jie Ying Gao	LAB NAME: ATC DATE: 6/19/12 TIME: 16:40	(Signature of R. E.'s Representative) CHARGE CODE: CA44151150 (Use a separate C-O-C for each Charge Code)

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The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24165

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description upper roof

Date: 06.19.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80885	black tar paper upper layer like material collected from the upper roof, center
LAB No:	
EWR- 80886	gray perolite 2nd layer like material collected from the upper roof, center
LAB No:	
EWR- 80887	yellow foam like material 3rd layer, collected from the upper roof, center
LAB No:	
EWR- 80888	black tar bottom layer like material, collected from the upper roof, center
LAB No:	
EWR- 80889	black tar paper top layer like material collected from the upper roof, eastside
LAB No:	
EWR- 80890	gray perolite 2nd layer like material collected from the upper roof, eastside
LAB No:	
EWR- 80891	yellow foam like material 3rd layer, collected from the upper roof, eastside
LAB No:	
EWR- 80892	black tar paper top layer like material, collected from the upper roof, westside
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description upper roof

Date: 06.19.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80893	gray perlite insulation 2nd layer like material collected from the upper roof, westside
LAB No:	
EWR- 80894	yellow foam 3rd layer like material collected from the upper roof, westside
LAB No:	
EWR- 80895	black epdm upper flashing like material collected from the upper roof, westside
LAB No:	
EWR- 80896	yellow glue behind epdm upper flashing collected from the upper roof, westside
LAB No:	
EWR- 80897	black tar paper like material collected from the upper roof, westside, lower flashing
LAB No:	
EWR- 80898	black metal flashing sealer, collected from the upper roof, westside
LAB No:	
EWR- 80899	gray metal vent sealer like material collected from the upper roof, westside, metal vent pipe skirt
LAB No:	
EWR- 80900	gray metal vent sealer like material collected from the upper roof, westside metal vent pipe skirt
LAB No:	

Port Authority Inspector(s): S Khodorkovsky / V Feldblyum

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description upper roof

Date: 06.19.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80901	black tar like material collected from the metal vent pipe base, on the upper roof, westside
LAB No:	
EWR- 80902	black tar like material collected from the metal vent pipe base, on the upper roof, westside
LAB No:	
EWR- 80903	black epdm like material collected from upper flashing, on the upper roof, northside
LAB No:	
EWR- 80904	yellow glue like material collected behind epdm upper flashing, on the upper roof northside
LAB No:	
EWR- 80905	black tar paper like material collected from the lower flashing, upper roof, northside
LAB No:	
EWR- 80906	black metal flashing sealer, collected from the upper roof, northside
LAB No:	
EWR- 80907	gray sealer like material collected from the metal vent pipe start, on the upper roof, northwest
LAB No:	
EWR- 80908	black tar paper like material collected from the metal vent pipe base, on the upper roof, northwest
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description upper roof

Date: 06.19.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80909	black epdm like material collected from upper flashing, on the upper roof eastside
LAB No:	
EWR- 80910	yellow glue like material collected behind epdm upper flashing, on the upper roof eastside
LAB No:	
EWR- 80911	black tar paper like material collected from the lower flashing, on the upper roof eastside
LAB No:	
EWR- 80912	black metal flashing sealer like material collected from the upper roof, eastside
LAB No:	
EWR- 80913	black tar paper like material collected from bulkhead flashing, on the upper roof, north west
LAB No:	
EWR- 80914	black tar paper like material, collected from bulkhead flashing, on the upper roof, north west
LAB No:	
EWR- 80915	black tar paper like material, collected from bulkhead flashing, on the upper roof, westside
LAB No:	
EWR- 80916	black asphalt stepping pads like material, collected on the upper roof, westside
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description upper roof

Date: 06 19 12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80917	black asphalt stepping pads like material collected on the upper roof, center
LAB No:	
EWR- 80918	black asphalt stepping pads like material, collected on the upper roof, northwest
LAB No:	
EWR- 80919	black tar parapet wall drain caulking like material, collected on the upper roof westside
LAB No:	
EWR- 80920	black tar parapet wall drain caulking like material, collected on the upper roof northside
LAB No:	
EWR- 80921	black tar parapet wall drain caulking like material, collected on the upper roof northside
LAB No:	
EWR- 80922	black foam pipe insulation like material collected from HVAC unit, upper roof northside
LAB No:	
EWR- 80923	black foam pipe insulation like material collected from HVAC unit, upper roof, northside
LAB No:	
EWR- 80924	black foam pipe insulation like material collected from HVAC unit upper roof, southside
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V Feldblyum

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Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description upper roof

Date: 06.19.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80925	black tar pitch pocket filler like material collected from upper roof,
LAB No:	northside
EWR- 80926	black tar pitch pocket filler like material collected from upper roof
LAB No:	southside
EWR- 80927	black tar pitch pocket filler like material collected from upper roof,
LAB No:	southside
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description lower roof, ungravel, main

Date: 06.19.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80928	black tar top layer like material collected from ungravel main roof center
LAB No:	
EWR- 80929	yellow fiber bottom layer like material collected from ungravel lower main roof center
LAB No:	
EWR- 80930	black tar top layer like material collected from ungravel main roof, eastside
LAB No:	
EWR- 80931	yellow fiber bottom layer like material collected from ungravel lower main roof, eastside
LAB No:	
EWR- 80932	black tar top layer like material collected from ungravel main roof westside
LAB No:	
EWR- 80933	~~Bl~~ yellow fiber bottom layer like material collected from ungravel main roof, westside.
LAB No:	
EWR- 80934	black tar drain flashing like material collected from ungravel main roof westside
LAB No:	
EWR- 80935	black tar drain flashing like material collected from ungravel main roof center
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building: 95

Contract No.: EWR-151.120

Floor: Roof

Job No.:

Area Description: ungravel main roof

Date: 06/19/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80936	black tar drain flashing like material collected from ungravel main roof
LAB No:	eastside
EWR- 80937	gray asphalt stepping pads like material collected from ungravel main
LAB No:	roof, westside
EWR- 80938	gray asphalt stepping pads like material collected from ungravel main
LAB No:	roof, center
EWR- 80939	gray asphalt stepping pads like material collected from ungravel main roof,
LAB No:	eastside
EWR- 80940	black pitch pocket filler collected by
	gas line pipe, from ungravel main roof
LAB No:	center
EWR- 80941	black pitch pocket filler collected by
	gas line pipe, from ungravel main roof
LAB No:	eastside
EWR- 80942	black pitch pocket filler collected by
	gas line pipe, from ungravel main roof
LAB No:	eastside
EWR- 80943	gray sealer like material collected
	between cinder block wall and parapet
LAB No:	metal flashing, eastside

Port Authority Inspector(s): S. Khodorkovsky / V. Feldbeyum

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Environmental Field Operations
P.A.C.M Sampling Form

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description ungravel main roof

Date: 06 19 12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80944	gray sealer like material collected between cinder block wall and parapet metal flashing center
LAB No:	
EWR- 80945	gray sealer like material collected between cinder block wall and parapet metal flashing westside
LAB No:	
EWR- 80946	gray/black sealer like material collected from parapet metal jacket, eastside of ungravel main roof
LAB No:	
EWR- 80947	gray/black sealer like material collected from parapet metal jacket, eastside of ungravel main Roof
LAB No:	
EWR- 80948	gray/black sealer like material collected from parapet metal jacket, eastside of ungravel main Roof
LAB No:	
EWR- 80949	gray sealer like material collected from the metal vent pipe skirt, on ungravel main roof center
LAB No:	
EWR- 80950	gray sealer like material collected from the metal vent pipe skirt, on ungravel main roof center
LAB No:	
EWR- 80951	gray sealer like material, collected from the metal vent pipe skirt, on ungravel main roof center
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Environmental Field Operations
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Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building: 95

Contract No.: EWR-151.120

Floor: Roof

Job No.:

Area Description: ungravel main roof

Date: 06.19.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80952	black tar like material collected from the metal vent pipe base, on the ungravel main roof, center
LAB No:	
EWR- 80953	black tar like material collected from the metal vent pipe base, on the ungravel main roof, center
LAB No:	
EWR- 80954	black tar like material collected from the metal vent pipe base, on the ungravel main roof, center
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8289
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Sample Date : 6/19/2012
Date Received : 6/19/2012
Date Analyzed : 6/19/2011
ATC Batch # 24165
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Location: BUILDING 95 ROOF / UPPER ROOF / LOWER ROOF / UNGRAVEL MAIN ROOF

Project # EWR-151.120

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80885	THE UPPER ROOF, CENTER	BLACK TAR PAPER UPPER LAYER LIKE MATERIAL	NOB-TEM			92.1% Organic 7.9% Residue	NONE DETECTED
24165 -1		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80886	THE UPPER ROOF, CENTER	GRAY PERLITE 2ND LAYER LIKE MATERIAL	PLM	20% Cellulose 10% FiberGlass	70% Mineral Filler		NONE DETECTED
24165 -2		Color: GRAY					
Analyzed By: Tarek Fata				Comments:			
EWR-80887	THE UPPER ROOF, CENTER	YELLOW FOAM LIKE MATERIAL 3RD LAYER	PLM	10% Cellulose	90% Foam		NONE DETECTED
24165 -3		Color: YELLOW					
Analyzed By: Tarek Fata				Comments:			
EWR-80888	THE UPPER ROOF, CENTER	BLACK TAR BOTTOM LAYER LIKE MATERIAL	NOB-TEM			92.6% Organic 6.7% Residue 0.7% Carbonate	NONE DETECTED
24165 -4		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80889	THE UPPER ROOF, EAST SIDE	BLACK TAR PAPER TOP LAYER LIKE MATERIAL	NOB-TEM			86.7% Organic 8.2% Residue 5.1% Carbonate	NONE DETECTED
24165 -5		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80890	THE UPPER ROOF, EAST SIDE	GRAY PERLITE 2ND LAYER LIKE MATERIAL	PLM	10% Cellulose 10% FiberGlass	80% Mineral Filler		NONE DETECTED
24165 -6		Color: GRAY					
Analyzed By: Tarek Fata				Comments:			
EWR-80891	THE UPPER ROOF, EAST SIDE	YELLOW FOAM LIKE MATERIAL 3RD LAYER	PLM		10% Mineral Filler		NONE DETECTED
24165 -7		Color: YELLOW			90% Foam		
Analyzed By: Tarek Fata				Comments:			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel: 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80892 24165 -8	THE UPPER ROOF, WEST SIDE	BLACK TAR PAPER TOP LAYER LIKE MATERIAL Color: BLACK	NOB-TEM			93.9% Organic 4.2% Residue 1.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80893 24165 -9	THE UPPER ROOF WEST SIDE	GRAY PERLITE INSULATION 2ND LAYER LIKE MATERIAL Color: GRAY	PLM	10% Cellulose 10% FiberGlass	80% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-80894 24165 -10	THE UPPER ROOF, WEST SIDE	YELLOW FOAM 3RD LAYER LIKE MATERIAL Color: YELLOW	PLM		10% Mineral Filler 90% Foam		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-80895 24165 -11	THE UPPER ROOF, WEST SIDE	BLACK EPDM UPPER FLASHING LIKE MATERIAL Color: BLACK	NOB-TEM			80.3% Organic 17% Residue 2.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80896 24165 -12	THE UPPER ROOF, WEST SIDE	YELLOW GLUE BEHIND EPDM UPPER FLASHING Color: YELLOW	NOB-TEM			81.3% Organic 5.3% Residue 13.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80897 24165 -13	THE UPPER ROOF, WEST SIDE, LOWER FLASHING	BLACK TAR PAPER LIKE MATERIAL Color: BLACK	NOB-TEM			95.3% Organic 4% Residue 0.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80898 24165 -14	THE UPPER ROOF, WEST SIDE	BLACK METAL FLASHING SEALER Color: BLACK	NOB-TEM			45.2% Organic 14.3% Residue 40.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80899 24165 -15	THE UPPER ROOF, WEST SIDE, METAL VENT PIPE SKIRT	GRAY METAL VENT SEALER LIKE MATERIAL Color: GRAY	NOB-TEM			62.3% Organic 31.3% Residue 6.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80900 24165 -16	THE UPPER ROOF, WEST SIDE METAL VENT PIPE SKIRT	GRAY METAL VENT SEALER LIKE MATERIAL Color: GRAY	NOB-TEM			59.1% Organic 35.2% Residue 5.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80901 24165 -17	THE METAL VENT PIPE BASE ON THE UPPER ROOF, WEST SIDE	BLACK TAR LIKE MATERIAL Color: BLACK	NOB-TEM			75.8% Organic 15.5% Residue 2.1% Carbonate	6.6% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 6.6 %**

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80902 24165 -18	THE METAL VENT PIPE BASE, ON THE UPPER ROOF, WEST SIDE	BLACK TAR LIKE MATERIAL Color: BLACK	NOB-TEM			74% Organic 12.4% Residue 8.3% Carbonate	5.3% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 5.3 %
EWR-80903 24165 -19	UPPER FLASHING, ON THE UPPER ROOF, NORTH SIDE	BLACK EPDM LIKE MATERIAL Color: BLACK	NOB-TEM			73.8% Organic 20.4% Residue 5.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80904 24165 -20	BEHIND EPDM UPPER FLASHING, ON THE UPPER ROOF NORTH SIDE	YELLOW GLUE LIKE MATERIAL Color: YELLOW	NOB-TEM			89.3% Organic 3.4% Residue 7.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80905 24165 -21	THE LOWER FLASHING, UPPER ROOF, NORTH SIDE	BLACK TAR PAPER LIKE MATERIAL Color: BLACK	NOB-TEM			61.2% Organic 13.5% Residue 25.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM Inconclusive, NOB-PLM inconclusive			
EWR-80906 24165 -22	THE UPPER ROOF, NORTH SIDE	BLACK METAL FLASHING SEALER Color: BLACK	NOB-TEM			44.1% Organic 11.2% Residue 44.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80907 24165 -23	THE METAL VENT PIPE SKIRT, ON THE UPPER ROOF, NORTH WEST	GRAY SEALER LIKE MATERIAL Color: GRAY	NOB-TEM			64.1% Organic 27.5% Residue 8.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80908 24165 -24	THE METAL VENT PIPE BASE, ON THE UPPER ROOF, NORTH WEST	BLACK TAR PAPER LIKE MATERIAL Color: BLACK	NOB-TEM			70.6% Organic 14.1% Residue 9.2% Carbonate	6.1% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 6.1 %
EWR-80909 24165 -25	UPPER FLASHING, ON THE UPPER ROOF EAST SIDE	BLACK EPDM LIKE MATERIAL Color: BLACK	NOB-TEM			93.9% Organic 1.6% Residue 4.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80910 24165 -26	BEHIND EPDM UPPER FLASHING, ON THE UPPER ROOF, EAST SIDE	YELLOW GLUE LIKE MATERIAL Color: YELLOW	NOB-TEM			90.1% Organic 7% Residue 2.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80911 24165 -27	THE LOWER FLASHING, ON THE UPPER ROOF, EAST SIDE	BLACK TAR PAPER LIKE MATERIAL Color: BLACK	NOB-TEM			66.7% Organic 5.6% Residue 27.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM Inconclusive, NOB-PLM Inconclusive			

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Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80912 24165 -28	THE UPPER ROOF, EAST SIDE	BLACK METAL FLASHING SEALER LIKE MATERIAL	NOB-TEM			40.7% Organic 10.6% Residue 48.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80913 24165 -29	BULKHEAD FLASHING, ON THE UPPER ROOF, NORTH WEST	BLACK TAR PAPER LIKE MATERIAL	NOB-TEM			72.7% Organic 18.1% Residue 1.4% Carbonate	7.8% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 7.8 %**
EWR-80914 24165 -30	BULKHEAD FLASHING, ON THE UPPER ROOF, NORTH WEST	BLACK TAR PAPER LIKE MATERIAL	NOB-TEM			77.1% Organic 13.9% Residue 3% Carbonate	6% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 6 %**
EWR-80915 24165 -31	BULKHEAD FLASHING, ON THE UPPER ROOF, WEST SIDE	BLACK TAR PAPER LIKE MATERIAL	NOB-TEM			75.1% Organic 12.9% Residue 5% Carbonate	7% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 7 %**
EWR-80916 24165 -32	ON THE UPPER ROOF, WEST SIDE	BLACK ASPHALT STEPPING PADS LIKE MATERIAL	NOB-TEM			63.6% Organic 15.3% Residue 21.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80917 24165 -33	ON THE UPPER ROOF, CENTER	BLACK ASPHALT STEPPING PADS LIKE MATERIAL	NOB-TEM			71.9% Organic 16.6% Residue 11.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80918 24165 -34	ON THE UPPER ROOF, NORTH WEST	BLACK ASPHALT STEPPING PADS LIKE MATERIAL	NOB-TEM			72.7% Organic 13.1% Residue 14.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80919 24165 -35	ON THE UPPER ROOF, WEST SIDE	BLACK TAR PARAPET WALL DRAIN CAULKING LIKE MATERIAL	NOB-TEM			73.3% Organic 11.6% Residue 11.3% Carbonate	3.8% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 3.8 %**
EWR-80920 24165 -36	ON THE UPPER ROOF, NORTH SIDE	BLACK TAR PARAPET WALL DRAIN CAULKING LIKE MATERIAL	NOB-TEM			75.3% Organic 11.5% Residue 8.3% Carbonate	4.9% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 4.9 %**
EWR-80921 24165 -37	ON THE UPPER ROOF, NORTH SIDE	BLACK TAR PARAPET WALL DRAIN CAULKING LIKE MATERIAL	NOB-TEM			75.2% Organic 12.1% Residue 6.1% Carbonate	6.6% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 6.6 %**

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New York, NY 10010
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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80922 24165 -38	HVAC UNIT, UPPER ROOF, NORTH SIDE	BLACK FOAM PIPE INSULATION LIKE MATERIAL Color: BLACK	NOB-TEM			64.1% Organic 13.5% Residue 22.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80923 24165 -39	HVAC UNIT, UPPER ROOF, NORTH SIDE	BLACK FOAM PIPE INSULATION LIKE MATERIAL Color: BLACK	NOB-TEM			63.8% Organic 7.1% Residue 29.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80924 24165 -40	HVAC UNIT, UPPER ROOF, SOUTH SIDE	BLACK FOAM PIPE INSULATION LIKE MATERIAL Color: BLACK	NOB-TEM			65.1% Organic 10.8% Residue 24.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80925 24165 -41	UPPER ROOF, NORTH SIDE	BLACK TAR PITCH POCKET FILLER LIKE MATERIAL Color: BLACK	NOB-TEM			72.9% Organic 9.1% Residue 18% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80926 24165 -42	UPPER ROOF, SOUTH SIDE	BLACK TAR PITCH POCKET FILLER LIKE MATERIAL Color: BLACK	NOB-TEM			74.8% Organic 9% Residue 16.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80927 24165 -43	UPPER ROOF, SOUTH SIDE	BLACK TAR PITCH POCKET FILLER LIKE MATERIAL Color: BLACK	NOB-TEM			75.4% Organic 10.3% Residue 14.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80928 24165 -44	UNGRAVEL MAIN ROOF, CENTER	BLACK TAR TOP LAYER LIKE MATERIAL Color: BLACK	NOB-TEM			90.5% Organic 2.7% Residue 6.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80929 24165 -45	UNGRAVEL LOWER MAIN ROOF, CENTER	YELLOW FIBER BOTTOM LAYER LIKE MATERIAL Color: YELLOW	PLM	80% FiberGlass	20% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-80930 24165 -46	UNGRAVEL MAIN ROOF, EAST SIDE	BLACK TAR TOP LAYER LIKE MATERIAL Color: BLACK	NOB-TEM			85.7% Organic 9.5% Residue 4.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80931 24165 -47	UNGRAVEL LOWER MAIN ROOF, EAST SIDE	YELLOW FIBER BOTTOM LAYER LIKE MATERIAL Color: YELLOW	PLM	75% FiberGlass	25% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80932 24165 -48	UNGRAVEL MAIN ROOF, WEST SIDE	BLACK TAR TOP LAYER LIKE MATERIAL	NOB-TEM			88% Organic 8.1% Residue 3.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80933 24165 -49	UNGRAVEL MAIN ROOF, WEST SIDE	YELLOW FIBER BOTTOM LAYER LIKE MATERIAL	PLM	70% FiberGlass	30% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata		Color: YELLOW		Comments:			
EWR-80934 24165 -50	UNGRAVEL MAIN ROOF, WEST SIDE	BLACK TAR DRAIN FLASHING LIKE MATERIAL	NOB-TEM			74% Organic 5.3% Residue 20.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80935 24165 -51	UNGRAVEL MAIN ROOF, CENTER	BLACK TAR DRAIN FLASHING LIKE MATERIAL	NOB-TEM			79% Organic 14.2% Residue 3.2% Carbonate	3.6% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 3.6 %
EWR-80936 24165 -52	UNGRAVEL MAIN ROOF, EAST SIDE	BLACK TAR DRAIN FLASHING LIKE MATERIAL	NOB-TEM			76.1% Organic 5.8% Residue 18.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80937 24165 -53	UNGRAVEL MAIN ROOF, WEST SIDE	GRAY/BLACK ASPHALT STEPPING PADS LIKE MATERIAL	NOB-TEM			62.4% Organic 6.1% Residue 31.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80938 24165 -54	UNGRAVEL MAIN ROOF, CENTER	GRAY/BLACK ASPHALT STEPPING PADS LIKE MATERIAL	NOB-TEM			69.4% Organic 15.8% Residue 14.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80939 24165 -55	UNGRAVEL MAIN ROOF, EAST SIDE	GRAY/BLACK ASPHALT STEPPING PADS LIKE MATERIAL	NOB-TEM			57% Organic 13.1% Residue 29.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80940 24165 -56	BY GAS LINE PIPE, FROM UNGRAVEL MAIN ROOF, CENTER	BLACK PITCH POCKET FILLER	NOB-TEM			76.4% Organic 9.3% Residue 14.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80941 24165 -57	BY GAS LINE PIPE, FROM UNGRAVEL MAIN ROOF, EAST SIDE	BLACK PITCH POCKET FILLER	NOB-TEM			77.8% Organic 6.2% Residue 16% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
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Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80942 24165 -58	BY GAS LINE PIPE, FROM UNGRAVEL MAIN ROOF, EAST SIDE	BLACK PITCH POCKET FILLER Color: BLACK	NOB-TEM			76.6% Organic 9.7% Residue 13.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80943 24165 -59	BETWEEN CINDER BLOCK WALL AND PARAPET METAL FLASHING, EAST SIDE	GRAY SEALER LIKE MATERIAL Color: GRAY	NOB-TEM			72.7% Organic 4.1% Residue 23.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80944 24165 -60	BETWEEN CINDER BLOCK WALL AND PARAPET METAL FLASHING CENTER	GRAY SEALER LIKE MATERIAL Color: GRAY	NOB-TEM			70% Organic 11.1% Residue 18.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80945 24165 -61	BETWEEN CINDER BLOCK WALL AND PARAPET METAL FLASHING WEST SIDE	GRAY SEALER LIKE MATERIAL Color: GRAY	NOB-TEM			70.8% Organic 7.5% Residue 20.9% Carbonate	0.8% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.8 %
EWR-80946 24165 -62	PARAPET METAL JACKET, EAST SIDE OF UNGRAVEL MAIN ROOF	GRAY/BLACK SEALER LIKE MATERIAL Color: BLACK	NOB-TEM			48.9% Organic 2.5% Residue 48.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80947 24165 -63	PARAPET METAL JACKET, EAST SIDE OF UNGRAVEL MAIN ROOF	GARY/BLACK SEALER LIKE MATERIAL Color: BLACK	NOB-TEM			48.8% Organic 2.3% Residue 48.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80948 24165 -64	PARAPET METAL JACKET, EAST SIDE OF UNGRAVEL MAIN ROOF	GRAY/BLACK SEALER LIKE MATERIAL Color: BLACK	NOB-TEM			50.9% Organic 4.4% Residue 42.8% Carbonate	1.9% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 1.9 %
EWR-80949 24165 -65	THE METAL VENT PIPE SKIRT, ON UNGRAVEL MAIN ROOF, CENTER	GRAY SEALER LIKE MATERIAL Color: GRAY	NOB-TEM			62.1% Organic 37.9% Residue	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80950 24165 -66	THE METAL VENT PIPE SKIRT, ON UNGRAVEL MAIN ROOF, CENTER	GRAY SEALER LIKE MATERIAL Color: GRAY	NOB-TEM			55.8% Organic 30.3% Residue 13.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80951 24165 -67	THE METAL VENT PIPE SKIRT, ON UNGRAVEL MAIN ROOF, CENTER	GRAY SEALER LIKE MATERIAL Color: GRAY	NOB-TEM			52.8% Organic 3.3% Residue 43.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8220
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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80952 24165 -68	THE METAL VENT PIPE BASE, ON THE UNGRAVEL MAIN ROOF, CENTER	BLACK TAR LIKE MATERIAL Color: BLACK	NOB-TEM			78.2% Organic 14.2% Residue 1.5% Carbonate	6.1% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 6.1 %
EWR-80953 24165 -69	THE METAL VENT PIPE BASE, ON THE UNGRAVEL MAIN ROOF, CENTER	BLACK TAR LIKE MATERIAL Color: BLACK	NOB-TEM			75.9% Organic 13% Residue 5.5% Carbonate	5.6% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 5.6 %
EWR-80954 24165 -70	THE METAL VENT PIPE BASE, ON THE UNGRAVEL MAIN ROOF, CENTER	BLACK TAR LIKE MATERIAL Color: BLACK	NOB-TEM			76.3% Organic 7% Residue 13.7% Carbonate	3% Chrysotile
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 3 %

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Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10979

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ___, Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Tarek Fata
Analyst:

Aleks Barengolts
Analyst:

Rec. No.	ATC 24161	Vendor Billing No. E\C

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

#24161

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 6

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
	EWR- 20955	EWR- 20990	36	RELINQUISHED BY: S KHODORKOVSKY	DATE TIME 6/19/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S KHODORKOVSKY	DATE: TIME: 6/19/12 15:30	FAX RESULTS to: (973) 961-6066
RECEIVED BY: R Nichard	DATE: TIME: 6/19/12	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME: 3 50	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for ths above samples
RELINQUISHED BY: Courier	DATE: 6/19/12 TIME: 16:40	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY: Rec. D Bongiovi	DATE: TIME: 6/19/12	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By Atc T Tuke	DATE: 6-19-12 TIME: 5:30Pm	Please Email Results to rcamplon@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: Jie Ying Gao	LAB NAME: ATC DATE: 6/19/12 TIME: 16:40	(Signature of R. E.'s Representative) CHARGE CODE: CA44151150 (Use a separate C-O-C for each Charge Code)

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PA 3739
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The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

ATC 24161 24161

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description main roof

Date: 6/19/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80955	black tar top layer ~~like~~ membrane like material collected on the main roof
LAB No:	center
EWR- 80956	yellow fiber insulation 2nd layer like material collected on the main roof
LAB No:	center
EWR- 80957	black tar bottom layer vapor barrier like material collected on the main roof, center
LAB No:	
EWR- 80958	black tar top layer roof membrane like material collected on the main roof,
LAB No:	eastside
EWR- 80959	yellow fiber insulation 2nd layer like material collected on the main roof,
LAB No:	westside
EWR- 80960	black tar bottom layer vapor barrier like material collected on the main roof
LAB No:	westside
EWR- 80961	black tar top layer roof membrane like material collected on the main roof,
LAB No:	southside
EWR- 80962	yellow fiber insulation 2nd layer like material collected on the main roof
LAB No:	southside

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

PA 2299
9-98

The Port Authority
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Engineering Department
Environmental Field Operations
P.A.C.M. Sampling Form

2416!

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description main roof

Date: 06/19/12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80963	black tar bottom layer vapor barrier like material collected on the main roof southside
LAB No:	
EWR- 80964	black tar flashing like material collected on the main roof southside
LAB No:	
EWR- 80965	black metal joint sealer collected from the flashing on the main roof southside
LAB No:	
EWR- 80966	black tar flashing like material collected on the main roof southside
LAB No:	
EWR- 80967	black metal joint sealer collected from the flashing on the main roof southside
LAB No:	
EWR- 80968	black tar flashing like material collected on the main roof southside
LAB No:	
EWR- 80969	black metal joint sealer collected from the flashing on the main roof southside
LAB No:	
EWR- 80970	black parapet flashing like material collected from parapet wall on main roof eastside
LAB No:	

Port Authority Inspector(s): S. Khodorkovsky / V. Eeldblyum

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description: main roof

Date: 06.19.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80971	black tar parapet flashing like material collected on main roof, eastside
LAB No:	
EWR- 80972	black parapet flashing like material collected on main roof, eastside
LAB No:	
EWR- 80973	black tar parapet flashing like material collected on main roof, eastside
LAB No:	
EWR- 80974	black parapet flashing like material collected on main roof, eastside
LAB No:	
EWR- 80975	black tar parapet flashing like material collected on main roof, eastside
LAB No:	
EWR- 80976	black tar HVAC flashing at base like material collected on the main roof, southside
LAB No:	
EWR- 80977	black tar HVAC flashing at base, like material collected on the main roof southside
LAB No:	
EWR- 80978	black tar HVAC flashing at base like material collected on the main roof southside
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24161

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description main roof

Date: 06.14.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80979	black tar HVAC on unit like material collected on the main roof, south side
LAB No:	
EWR- 80980	black tar HVAC on unit like material collected on the main roof, west side
LAB No:	
EWR- 80981	black tar HVAC on unit like material collected on the main roof, north side
LAB No:	
EWR- 80982	black HVAC vibration dampening cloth like material collected on the main roof, east
LAB No:	
EWR- 80983	black HVAC vibration dampening cloth like material collected on the main roof
LAB No:	west side
EWR- 80984	black HVAC vibration dampening cloth like material collected on the main roof
LAB No:	east side
EWR- 80985	black tar roof patch like material collected on the main roof, east side
LAB No:	
EWR- 80986	black tar roof patch like material collected on the main roof, ~~east side~~
LAB No:	west side

Port Authority Inspector(s): S. Khodorkovsky / V. Feldblyum

PA 3739
9 98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24161

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 95

Contract No.: EWR-151.120

Floor Roof

Job No.:

Area Description main roof

Date: 06.19.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 80987	black tar roof patch like material collected on the main roof, southside
LAB No:	
EWR- 80988	gray parapet wall mortar like material collected on the main roof eastside
LAB No:	
EWR- 80989	gray parapet wall mortar like material collected on the main roof northside
LAB No:	
EWR- 80990	gray parapet wall mortar like material collected on the main roof westside
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872
Project: NEWARK INTERNATIONAL AIRPORT

Sample Date : 6/19/2012
Date Received : 6/19/2012
Date Analyzed : 6/19/2012
ATC Batch # 24161
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Location: Building 95 / Roof / Main Roof
Project # EWR-151.120

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80955	On the main roof Center	Black Tar top layer membrane like material	NOB-TEM			91% Organic 6.4% Residue 2.6% Carbonate	NONE DETECTED
24161 -1		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80956	On the main roof Center	Yellow Fiber insulation 2nd layer like material	PLM	85% FiberGlass	15% Mineral Filler		NONE DETECTED
24161 -2		Color: YELLOW					
Analyzed By: Tarek Fata				Comments:			
EWR-80957	On the main roof, Center	Black tar bottom layer vapor barrier like material	NOB-TEM			95.8% Organic 1.2% Residue 3% Carbonate	NONE DETECTED
24161 -3		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80958	On the main roof, West side	Black Tar top layer roof membrane like material	NOB-TEM			70.5% Organic 6% Residue 23.5% Carbonate	NONE DETECTED
24161 -4		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80959	On the main roof, West side	Yellow fiber insulation 2nd layer like material	PLM	30% Cellulose 20% FiberGlass	50% Mineral Filler		NONE DETECTED
24161 -5		Color: YELLOW					
Analyzed By: Tarek Fata				Comments:			
EWR-80960	On the main roof West side	Black Tar bottom layer vapor barrier like material	NOB-TEM			94.8% Organic 1.5% Residue 3.7% Carbonate	NONE DETECTED
24161 -6		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80961	On the main roof, South side	Black tar top layer roof membrane like material	NOB-TEM			84.9% Organic 14.7% Residue 0.4% Carbonate	NONE DETECTED
24161 -7		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80962 24161 -8	On the main roof South side	Yellow fiber insulation 2nd layer like material	PLM	90% FiberGlass	10% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata		Color: YELLOW		Comments:			
EWR-80963 24161 -9	On the main roof, South side	Black tar bottom layer vapor barrier like material	NOB-TEM			85.4% Organic 7.8% Residue 6.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80964 24161 -10	On the main roof South side	Black tar flashing like material	NOB-TEM			57.7% Organic 26.6% Residue 15.7% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80965 24161 -11	From the flashing on the main roof South side	Black metal joint sealer	NOB-TEM			63.2% Organic 11.5% Residue 25.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80966 24161 -12	On the main roof South side	Black tar flashing like material	NOB-TEM			59.2% Organic 20.7% Residue 11.2% Carbonate	8.9% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 8.9 %**
EWR-80967 24161 -13	From the flashing on the main roof South side	Black metal joint sealer	NOB-TEM			71.1% Organic 7.6% Residue 18% Carbonate	3.3% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 3.3 %**
EWR-80968 24161 -14	On the main roof south side	Black tar sealer	NOB-TEM			59.7% Organic 24% Residue 6% Carbonate	10.3% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 10.3 %**
EWR-80969 24161 -15	From the flashing on the main roof South side	Black metal joint sealer	NOB-TEM			66% Organic 6.2% Residue 25.1% Carbonate	2.7% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 2.7 %**
EWR-80970 24161 -16	From parapet wall on main roof East side	Black parapet flashing like material	NOB-TEM			73.4% Organic 3.1% Residue 22.7% Carbonate	0.8% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 0.8 %**
EWR-80971 24161 -17	On main roof East side	Black tar parapet flashing like material	NOB-TEM			58.2% Organic 18% Residue 16.1% Carbonate	7.7% Chrysotile
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			**Total Asbestos: 7.7 %**

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80972	On main roof East side	Black parapet flashing like material	NOB-TEM			73.5% Organic 4.3% Residue 21.7% Carbonate	0.5% Chrysotile
24161 -18							
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.5 %
EWR-80973	On main roof East side	Black parapet flashing like materia	NOB-TEM			46% Organic 22.9% Residue 21.3% Carbonate	9.8% Chrysotile
24161 -19							
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 9.8 %
EWR-80974	On main roof East side	Black parapet flashing like material	NOB-TEM			70.6% Organic 4.4% Residue 24.2% Carbonate	0.8% Chrysotile
24161 -20							
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 0.8 %
EWR-80975	On main roof East side	Black tar parapet flashing like material	NOB-TEM			57.6% Organic 14.2% Residue 22.1% Carbonate	6.1% Chrysotile
24161 -21							
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 6.1 %
EWR-80976	On the main roof South side	Black tar HVAC flashing at base, like material	NOB-TEM			74.9% Organic 13.8% Residue 7.9% Carbonate	3.4% Chrysotile
24161 -22							
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 3.4 %
EWR-80977	On the main roof, south side	Black tar HVAC flashing at base, like material	NOB-TEM			70.1% Organic 14.4% Residue 10.7% Carbonate	4.8% Chrysotile
24161 -23							
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 4.8 %
EWR-80978	On the main roof, south side	Black tar HVAC flashing at base, like material	NOB-TEM			74.5% Organic 9.4% Residue 13.7% Carbonate	2.4% Chrysotile
24161 -24							
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: 2.4 %
EWR-80979	On the main roof, south side	Black tar HVAC on unit like material	NOB-TEM			79.2% Organic 6.7% Residue 14.1% Carbonate	NONE DETECTED
24161 -25							
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80980	On the main roof, West side	Black tar HVAC on unit like material	NOB-TEM			73.3% Organic 9.9% Residue 16.8% Carbonate	NONE DETECTED
24161 -26							
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80981	On the main roof North side	Black tar HVAC on unit like material	NOB-TEM			74.9% Organic 11.2% Residue 13.9% Carbonate	NONE DETECTED
24161 -27							
Analyzed By: Tarek Fata		Color: BLACK Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-80982	On the main roof Center	Black HVAC vibration Dampening Cloth like material	NOB-TEM			84.2% Organic 2% Residue 13.8% Carbonate	Trace Chrysotile
24161 -28		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			Total Asbestos: TRACE
EWR-80983	On the main roof West side	Black HVAC vibration Dampening Cloth like material	NOB-TEM			91.4% Organic 1.7% Residue 6.9% Carbonate	NONE DETECTED
24161 -29		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80984	On the main roof East side	Black HVAC vibration Dampening Cloth like material	NOB-TEM			88.8% Organic 1.7% Residue 9.5% Carbonate	NONE DETECTED
24161 -30		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80985	On the main roof East side	Black tar roof patch like material	NOB-TEM			87.5% Organic 6.5% Residue 6% Carbonate	NONE DETECTED
24161 -31		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80986	On the main roof West side	Black tar roof patch like material	NOB-TEM			82.5% Organic 1.7% Residue 15.8% Carbonate	NONE DETECTED
24161 -32		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80987	On the main roof, south side	Black tar Roof patch like material	NOB-TEM			53.6% Organic 11.3% Residue 35.1% Carbonate	NONE DETECTED
24161 -33		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-80988	On the main roof East side	Gray parapet wall mortar like material	PLM		100% Mineral Filler		NONE DETECTED
24161 -34		Color: GRAY					
Analyzed By: Tarek Fata				Comments:			
EWR-80989	On the main roof North side	Gray parapet wall mortar like material	PLM		100% Mineral Filler		NONE DETECTED
24161 -35		Color: GRAY					
Analyzed By: Tarek Fata				Comments:			
EWR-80990	On the main roof West side	Gray parapet wall mortar like material	PLM		100% Mineral Filler		NONE DETECTED
24161 -36		Color: GRAY					
Analyzed By: Tarek Fata				Comments:			

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%, based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request

5) Accredited by NVLAP #101167-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC

11) Supplement to test report batch # _____, Amendments: ____, Amendment Dates: _____, Amended by:

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Tarek Fata
Analyst:

Aleks Barengolts
Analyst:

APPENDIX B

LCP LABORATORY RESULTS AND CHAIN OF CUSTODIES BY PANYNJ

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

66487

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	(LEAD) - SW846 / NIOSH 7082 /

Page 1 of 3

Sample Type - **LEAD** [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	SAMPLE #' S TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
1	EWR- 6487 LP	EWR- 6501 LP	15	RELINQUISHED BY: [signature]	DATE TIME 5-31-12
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: [signature]	DATE: 5-31-12 TIME:	**FAX RESULTS to: (973) 961-6066**
RECEIVED BY: Manual Sanchez	DATE: 5-31-12 TIME: 15:30 pm	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY: Courier	DATE: 5/31/12 TIME: 4:48 PM	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY:	DATE: TIME:	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: M Bonez	LAB NAME: ATC DATE: 5/31/12 TIME: 4:48 PM	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151120** (Use a separate C-O-C for each Charge Code)

Analyzed by: AC Nanjeffer 5/31/12 8 pm

Port Authority of NY & NJ

66487

Environmental Field Operations
Lead Sampling Field Form

Charge Code: CA44151120 Contract: EWR-151.120

Job No. NA

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT Building: 95

Area Description: INTERIOR - VARIOUS Floor: 1

Date: 5/30/2012 Quadrant:

Lead Inspector(s): D. McCarthy

Sample Type : [X] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR 6487 LP	PAINT CHIP SAMPLE COLLECTED FROM ROOM 5 DOOR FRAME	BEIGE	
EWR 6488 LP	PAINT CHIP SAMPLE COLLECTED FROM ROOM 5 ENTRY DOOR	LIGHT BLUE	
EWR 6489 LP	PAINT CHIP SAMPLE COLLECTED FROM WALL BOARD IN ROOM 6	WHITE	
EWR 6490 LP	PAINT CHIP SAMPLE COLLECTED FROM WALL BOARD IN ROOM 8	LIGHT BLUE	
EWR 6491 LP	PAINT CHIP SAMPLE COLLECTED FROM ENTRY DOOR TO ROOM 3	GREEN / BLUE	
EWR 6492 LP	PAINT CHIP SAMPLE COLLECTED FROM NORTH WALL, WALL BOARD	GREEN	
EWR 6493 LP	PAINT CHIP SAMPLE COLLECTED FROM SPLINE OF ENTRY DOOR TODOCK AREA 2	DARK GREY	
EWR 6494 LP	PAINT CHIP SAMPLE COLLECTED FROM DOUBLE FORKLIFT DOOR FRAME TO DOCK AREA 2	DARK BLUE / GREY	
EWR 6495 LP	PAINT CHIP SAMPLE COLLECTED FROM PERIMETER CINDERBLOCK WALL OF DOCK AREA 2	LIGHT BEIGE	
EWR 6496 LP	PAINT CHIP SAMPLE COLLECTED FROM DOCK AREA 2 STRUCTUAL BEAM	YELLOW	

Port Authority of NY & NJ

Environmental Field Operations
Lead Sampling Field Form

66487

Charge Code: CA44151120 Contract: EWR-151.120

Job No. NA

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT Building: 95

Area Description: INTERIOR - VARIOUS Floor: 1

Date: 5/30/2012 Quadrant:

Lead Inspector(s): D. McCarthy

Sample Type : [X] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR 6497 LP	PAINT CHIP SAMPLE COLLECTED FROM THE FLOOR OF ROOM 21	DARK GREY	
EWR 6498 LP	PAINT CHIP SAMPLE COLLECTED FROM STRUCTUAL COLUMN IN AREA 24A	DARK BLUE/ GREY/ ORANGE	
EWR 6499 LP	PAINT CHIP SAMPLE COLLECTED FROM DUCT VENT REGISTER ON THE CEILING IN AREA 24A	DARK BLUE / SILVER	
EWR 6500 LP	PAINT CHIP SAMPLE COLLECTED FROM MENS LOCKERROOM FLOOR	GREY TEXTURE	
EWR 6501 LP	PAINT CHIP SAMPLE COLLECTED FROM BLOCK WALL EXPANSION JOINT ADJACENT THE CAFETERIA DOOR	WHITE	
EWR	PAINT CHIP SAMPLE COLLECTED FROM		
EWR	PAINT CHIP SAMPLE COLLECTED FROM		
EWR	PAINT CHIP SAMPLE COLLECTED FROM		
EWR	PAINT CHIP SAMPLE COLLECTED FROM		
EWR	PAINT CHIP SAMPLE COLLECTED FROM		

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310
Fax: (201) 216-2158 **Phone:** (201) 216-2160
Project: NEWARK LIBERTY INTL AIRPORT

Location: INTERIOR - VARIOUS / BUILDING #95, FLOOR #1
Project # EWR-151.120

Sample Date: 5/30/2012
Date Received: 5/31/2012
Date Analyzed : 5/31/2012
Report Date: 5/31/2012
ATC Batch #: 66487
Total Samples: 15
Sample Media: Paint Chips by weight

PAINT SAMPLE ANALYSIS BY FLAME (AA)
METHOD EPA 3050B Modified/7000B

ANALYSIS RESULTS

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR 6487 LP *66487 -1*	Room 5 door frame / Beige	< 0.01	0.01
EWR 6488 LP *65487 -2*	Room 5 entry door / Light blue	< 0.01	0.01
EWR 6489LP *66487 -3*	Wall board in room 6 / White	< 0.01	0.01
EWR 6490 LP *66487 -4*	Wall board in room 8 / Light blue	< 0.01	0.01
EWR 6491 LP *66487 -5*	Entry door to room 3 / Green / Blue	< 0.01	0.01
EWR 6492 LP *66487 -6*	North wall, wall board / Green	< 0.01	0.01
EWR 6493 LP *66487 -7*	Spline of entry door todock area 2 / Dark grey	< 0.01	0.01
EWR 6494 LP *66487 -8*	Double forklift door frame to dock area 2 / Dark Blue / Grey	< 0.01	0.01
EWR 6495 LP *66487 -9*	Perimeter cinderblock wallof dock area 2 / Light beige	< 0.01	0.01
EWR 6496 LP *66487 -10*	Dock area 2 structual beam / Yellow	< 0.01	0.01
EWR 6497 LP *66487 -11*	The floor of room 21 / Dark grey	< 0.01	0.01
EWR 6498 LP *66487 -12*	Structual column in area 24A / Dark blue / Grey / Orange	1.10	0.01
EWR 6499 LP *66487 -13*	Duct vent register on the ceiling in area 24A / Dark blue / silver	< 0.01	0.01
EWR 6500 LP *66487 -14*	Mens lockerroom floor / Grey texture	< 0.01	0.01
EWR 6501 LP *66487 -15*	Block wall expansion joint adjacent the cafeteria door / White	< 0.01	0.01

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)

NOTES:

1) **THE REPORTING LIMIT (RL) IS 0.01%. The detection limit as reported is the reporting limit.** The true detection limit is half the RL. RL is based on 0.010 mg/sample weight which is typically 0.1 gram.

2) HUD defines lead-based paint as paint having a lead concentration equal to or above 0.5% by weight. Results preceded by "<" are below the detectable levels by this analysis method.

3) Blank units are in µg

4) ATC Associates Inc. Laboratory is not responsible for sample collection. These results relate only to the items tested. This report shall not be reproduced, except in full, without written approval of the laboratory.

5) ATC is accredited by the New York State Department of Health Environmental Laboratory Approval Program (ELAP) and by the American Industrial Hygiene Association (AIHA-LAP, LLC) to perform analysis of lead in paint, dust wipes, air and soil samples. (ELAP #10878), (AIHA-LAP, LLC #100329).

6) Confidentiality Notice:
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7) Unless otherwise indicated, no blank corrections were performed.

8) The condition of all samples was acceptable upon receipt.

9) Unless otherwise indicated all QC results were in control.

10) The data within this report is reliable to 3 significant figures.

11) The laboratory certifies that the test results meet all requirements of NELAC.

12) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

13) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

14) The uncertainty for these test results is available upon request.

Natalija Saizefarova
Analyzed by:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J. 66534

ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION

CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	(LEAD) / SW846 / NIOSH 7082 /

Page 1 of 3

Sample Type - LEAD [X] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE # S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	DATE TIME
1	EWR- 6502 LP	EWR- 6519 LP	18	RELINQUISHED BY: Dan McCarth	6-6-12
	EWR-	EWR-		RELINQUISHED BY:	
	EWR-	EWR-		RELINQUISHED BY:	
				RELINQUISHED BY:	
				RELINQUISHED BY:	
				RELINQUISHED BY:	

RELINQUISHED BY: Dan McCarth	DATE: TIME: 6-6-12	FAX RESULTS to: (973) 961-6066
RECEIVED BY:	DATE: TIME:	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnarcund time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnarcund.
RELINQUISHED BY: courier	DATE: TIME: 06.06.12 5pm	Please Email Results to rcampion@panynj.gov and drmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: N Fairfax	LAB NAME: AR DATE: 06.06.12 TIME: 5pm	(Signature of R. E.'s Representative) CHARGE CODE: CA44151120 (Use a separate C-O-C for each Charge Code)

Analyzed By: AR N Fairfax 06.06.12 9pm

66534

Port Authority of NY & NJ

Environmental Field Operations
Lead Sampling Field Form

Charge Code: CA44151120 Contract: EWR-151.120

Job No. NA

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT Building: 95

Area Description: INTERIOR - VARIOUS Floor: 1

Date: 6/4/2012 Quadrant:

Lead Inspector(s): D. McCarthy

Sample Type : [X] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR 6502 LP	PAINT CHIP SAMPLE COLLECTED FROM THE MAIN ENTRY VESTABULE DOOR NO. 2	BLUE / LT BLUE	
EWR 6503 LP	PAINT CHIP SAMPLE COLLECTED FROM THE MAIN ENTRY VESTABULE DOOR NO. 1, DOOR FRAME	BLUE/ YELLOW / LT BLUE	
EWR 6504 LP	PAINT CHIP SAMPLE COLLECTED FROM FLOOR OF AREA 20A	RED	
EWR 6505 LP	PAINT CHIP SAMPLE COLLECTED FROM FLOOR STRIPE OF AREA 20A	YELLOW / SILVER	
EWR 6506 LP	PAINT CHIP SAMPLE COLLECTED FROM SINK AREA MECHANICALS, ADJACENT WATER METER	RED	
EWR 6507 LP	PAINT CHIP SAMPLE COLLECTED FROM RAISED CONCRETE PLATFORM OF THE SINK AREA MECHANICALS, BELOW THE WATER METER	YELLOW	
EWR 6508 LP	PAINT CHIP SAMPLE COLLECTED FROM ROLL UP DOOR FRAME IN AREA 20A	BLUE	
EWR 6509 LP	PAINT CHIP SAMPLE COLLECTED FROM REFRIGERATOR DOOR ADJACENT THE SINK AREA	WHITE	
EWR 6510 LP	PAINT CHIP SAMPLE COLLECTED FROM THE BUMP RAILING NEAR SINK AREA	BLUE / WHITE / RED	
EWR 6511 LP	PAINT CHIP SAMPLE COLLECTED FROM INTERIOR ENTRY DOOR TO THE BOILER ROOM	RED / BLUE / GREY	

Port Authority of NY & NJ

66534

Environmental Field Operations
Lead Sampling Field Form

Charge Code: CA44151120 Contract: EWR-151.120

Job No. NA

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT Building: 95

Area Description: INTERIOR / EXTERIOR - VARIOUS Floor: 1

Date: 6/5/2012 Quadrant:

Lead Inspector(s): D. McCarthy

Sample Type : [X] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR 6512 LP	PAINT CHIP SAMPLE COLLECTED FROM BOILER ROOM, ROOM 23, BOILER NO. 1	RED	
EWR 6513 LP	PAINT CHIP SAMPLE COLLECTED FROM BOILER ROOM, ROOM 23, BOILER NO. 2	DARK RED	
EWR 6514 LP	PAINT CHIP SAMPLE COLLECTED FROM BUILDING 95 EXTERIOR FOUNDATION WALL NORTH FACE OF BUILDING	WHITE / BROWN	
EWR 6515 LP	PAINT CHIP SAMPLE COLLECTED FROM BUILDING 95 EXTERIOR TRUCK DOCK AREA	YELLOW	
EWR 6516 LP	PAINT CHIP SAMPLE COLLECTED FROM EXTERIOR WINDOW FRAME ON THE SOUTHERN TRUCK DOCK	BLUE / RED	
EWR 6517 LP	PAINT CHIP SAMPLE COLLECTED FROM THE EXTERIOR WATER METER OF BUILDING 95	GREEN	
EWR 6518 LP	PAINT CHIP SAMPLE COLLECTED FROM INDIVIDUAL TRUCK DOCK OF BUILDING 95	GREEN	
EWR 6519 LP	PAINT CHIP SAMPLE COLLECTED FROM AN EXTERIOR STAIRCASE OF BUILDING 95 ADJACENT THE BOILER ROOM EXTERNAL DOOR	BLUE	
EWR	PAINT CHIP SAMPLE COLLECTED FROM		
EWR	PAINT CHIP SAMPLE COLLECTED FROM		

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310

Fax: (201) 216-2158 **Phone:** (201) 216-2160

Project: NEWARK LIBERTY INTL AIRPORT

Location: INTERIOR - VARIOUS / BUILDING #95, FLOOR #1

Project # EWR-151.120

Sample Date: 6/4/2012
Date Received: 6/6/2012
Date Analyzed : 6/6/2012
Report Date: 6/6/2012
ATC Batch #: 66534
Total Samples: 18
Sample Media: Paint Chips by weight

PAINT SAMPLE ANALYSIS BY FLAME (AA)
METHOD EPA 3050B Modified/7000B

ANALYSIS RESULTS

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR 6502 LP 66534 -1	From the main entry vestabule door no. 2, blue/ lt blue	< 0.01	0.01
EWR 6503 LP 66534 -2	From the main entry vestuble door no. 1, door frame, blue / yellow / lt blue	< 0.01	0.01
EWR 6504 LP 66534 -3	From floor of area 20A, Red	< 0.01	0.01
EWR 6505 LP 66534 -4	From floor stripe of area 20A, yellow /silver	< 0.01	0.01
EWR 6506 LP 66534 5	From sink are mechanicals, adjacent water meter, red	0.01	0.01
EWR 6507 LP 66534 -6	From raised concrete platform of the sink area mechanicals, below the water meter, yellow	< 0.01	0.01
EWR 6508 LP 66534 -7	From roll up door frame in area 20A, blue	< 0.01	0.01
EWR 6509 LP 66534 -8	From refrigerator door adjacent the sink area, white	< 0.01	0.01
EWR 6510 LP 66534 -9	From the bump railing near sink area, blue/ white/ red	< 0.01	0.01
EWR 6511 LP 66534 -10	From interior entry door to the boiler room, red/blue/grey	0.44	0.01
EWR 6512 LP 66534 -11	From boiler room, room 23, boiler no.1, red	0.15	0.01
EWR 6513 LP 66534 -12	From boiler room, room 23, boiler no. 2, dark red	0.05	0.01
EWR 6514 LP 66534 -13	From building 95 exterior foundation wall north face of building, white/ brown	< 0.01	0.01
EWR 6515 LP 66534 -14	From buildign 95 exterior truck dock area, yellow	0.01	0.01
EWR 6516 LP 66534 -15	From exterior window frame on the southern truck dock, blue / red	1.39	0.01
EWR 6517 LP 66534 -16	From exterior water meter of building 95, green	0.02	0.01

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR 6518 LP 66534 -17	From individual truck dock of building 95, green	0.40	0.01
EWR 6519 LP 66534 -18	From an exterior staircase of building 95 adjacent the boiler room external door, blue	< 0.01	0.01

NOTES:

1) **THE REPORTING LIMIT (RL) IS 0.01%. The detection limit as reported is the reporting limit. The true detection limit is half the RL.**
RL is based on 0.010 mg/sample weight which is typically 0.1 gram.

2) HUD defines lead-based paint as paint having a lead concentration equal to or above 0.5% by weight.
Results preceded by "<" are below the detectable levels by this analysis method.

3) Blank units are in µg

4) ATC Associates Inc. Laboratory is not responsible for sample collection. These results relate only to the items tested. This report shall not be reproduced, except in full, without written approval of the laboratory.

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12) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

13) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

14) The uncertainty for these test results is available upon request.

Natalija Saizefarova
Analyzed by:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

APPENDIX C

ACM LOCATION DRAWINGS

APPENDIX D

UNIVERSAL/REGULATED MATERIAL LOCATION DRAWINGS

APPENDIX E

COST ESTIMATES

Contract No.:		**THE PORT AUTHORITY OF NY & NJ**	Discipline:	Environmental	Sheet: 1 of 3
Charge Code:			Prepared by:	H. Zeidan	Date: 12/21/12
Project Mgr		**Summary of Cost Estimate**	Checked by:	F. Pierre	Date: 12/21/12
Project Title:	Newark Liberty International Airport - Building 95				
Consultant Name:	ATC ASSOCIATES INC	Consultant Contact: Gilbert Gedeon			

Item #	Description	Method Of Abatement	Total $	Assumption / Basis
1	Asbestos Abatement Cost Estimate		$81,547	
2	Universal Waste Cost Estimate		$38,681	
	Subtotal		$120,228	
	Contingency of 20%		$24,046	
	Total Cost		$144,273	

THE PORT AUTHORITY OF NY & NJ

Contract No.:
Charge Code:
Project Mgr:
Project Title: Newark Liberty International Airport - Building 95
Consultant Name: ATC ASSOCIATES INC

Asbestos Abatement Cost Estimate

Consultant Contact: Gilbert Gedeon

Discipline: Environmental
Prepared by: H. Zeidan
Checked by: F. Pierre

Sheet: 2 of 3
Date: 12/21/12
Date: 12/21/12

Item #	Description	Quantity	Unit	Unit Price $		Total $		Total $	Assumption / Basis
				Material	Labor	Material	Labor		
1	1st Floor - 12"x 12" Gray and Red Floor Tiles & Mastic	750	SF		5.00	-	3,750	3,750	
2	1st Floor Room 20A - 9"x 9" Gray Floor Tiles & Mastic	100	SF		5.00	-	500	500	
3	1st Floor - Pipe Fitting Insulation	60	LF		25.00	-	1,500	1,500	
4	Main Roof - Black Tar Drain Flashing	210	SF		6.00	-	1,260	1,260	
5	Main & Upper Roof - Black Vent Pipe Tar	350	SF		6.00	-	2,100	2,100	
6	Main & Upper Roof - Black Parapet Wall Flashing	3,350	SF		6.00	-	20,100	20,100	
7	Main & Upper Roof - Black HVAC Unit Flashing	1,550	SF		6.00	-	9,300	9,300	
8	Upper Roof - Bulkhead Flashing	450	SF		6.00	-	2,700	2,700	
9	2 Decon Units including cost of Maintenance	2	Lump Sum		2,500.00	-	5,000	5,000	
10	Waste Disposal - ACM	200	Cubic Yards		90.00	-	18,000	18,000	
11	Sub Total							64,210	
12	Incidental Spot Removal & Disposal of Lead Paint (15% of Subtotal)							9,632	
13	Equipment and Materials (12% of Subtotal)							7,705	
							Total Cost	**81,547**	

THE PORT AUTHORITY

Contract No:
Charge Code:
Project Mgr:
Project Title: Newark Liberty International Airport - Building 95
Consultant Name: ATC ASSOCIATES INC

Universal Waste Cost Estimate

Consultant Contact: Gilbert Gedeon

Discipline: Environmental | Sheet: 3 of 3
Prepared by: H. Zeidan | Date: 12/21/12
Checked by: F. Pierre | Date: 12/21/12

Item #	Description	Quantity	Unit	Unit Price $ Material	Unit Price $ Labor	Total $ Material	Total $ Labor	Total $	Assumption / Basis
1	Mobilization and Demobilization	2.00	Per Day		$500.00		$1,000.00	$1,000.00	
2	Labor (4-Man Crew per Day)	32.00	Mandays		$500.00		$16,000.00	$16,000.00	
3	Equipment (Vehicle, HIL lights, generator, etc.)	10.00	Per Day	$750.00		$7,500.00		$7,500.00	
4	Packaging for Bulbs (689 fixtures)	1.00	LS	$750.00		$750.00		$750.00	
5	Fluorescent Bulb Disposal	6.23	LF	$196		$1,217.04		$1,217.04	
6	HID Disposal	1.50	Per HID	$6		$84.00		$84.00	
7	Ballast Disposal (72 ballasts)	10.00	55 Gallon Drum	$500.00		$5,000.00		$5,000.00	
8	Miscellaneous Waste Disposal*	1.00	LS	$4,500.00		$4,500.00		$4,500.00	
9	Transportation	4.00	Per Trip	$650.00		$2,600.00		$2,600.00	
							Total Cost	38,681.04	

(*) Includes: AC Units, Refrigerator, Commercial Freezers, Batteries, Mercury Thermostats, Water Cooler, Transformers (PCB), Hydraulic Fluids and Tanks

F. Inspection Report For Asbestos Containing Materials, Lead Containing Paint And Universal/Regulated Materials Performed At Building 332" ATC Associates, Revised December 21, 2012

ATC ASSOCIATES INC.

INSPECTION REPORT FOR ASBESTOS CONTAINING MATERIALS, LEAD CONTAINING PAINT AND UNIVERSAL/REGULATED MATERIAL

Performed at:

BUILDING 332
NEWARK LIBERTY INTERNATIONAL AIRPORT
NEWARK, NJ

Performed for:

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

Prepared by:

ATC ASSOCIATES INC.
104 EAST 25TH STREET
NEW YORK, NEW YORK 10010

ATC Project No: 15.14777-0561

November 19, 2012
Revised December 21, 2012

ATC ASSOCIATES INC.

104 East 25th Street
Tenth Floor
New York, NY 10010
Telephone: 212-353-82
Facsimile: 212-353-8306

November 19, 2012 *(Revised December 21, 2012)*

Robert Pruno P.E.
Chief Environmental Engineer
Environmental Engineering Division
Port Authority of New York & New Jersey
2 Gateway Center, 14th floor
Newark, NJ 07102

Subject: **Inspection Report for Asbestos Containing Materials, Lead Containing Paint and Universal/Regulated Material**

Re: **Building 332 – Newark Liberty International Airport, Newark, NJ**

Dear Mr. Pruno:

ATC Associates Inc. (ATC) has completed the joint inspection with Port Authority of New York and New Jersey (PANYNJ) inspectors for asbestos-containing materials (ACM), universal/regulated material inventory and lead-containing paint (LCP) for the referenced site. PANYNJ inspectors conducted asbestos and lead sampling from August 14, 2012 through October 24, 2012. ATC conducted laboratory analysis of suspect ACM samples using Environmental Protection Agency (EPA) Methods: EPA 600/M4 82-020 Environmental Laboratory Approved Program (ELAP) 198.1, 198.6 and 198.4. ATC conducted laboratory analysis of paint samples using Atomic Absorption Spectrometry Flame (AAS). ATC conducted visual observations, identification, marking of locations and quantification of suspect ACM and completed universal/regulated material inventory for the referenced site.

ATC reviewed the laboratory results of the samples collected by PANYNJ and incorporated in the attached report. This report presents our findings, assessments and recommendations. ACM and LCP laboratory results, chain of custodies provided by PANYNJ, ACM location drawings, universal/regulated material location drawings and cost estimates are provided in the Appendices.

ATC appreciates this opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further assistance to you, please contact us.

Sincerely,

Husam Zeidan
Technical Assistant

Gilbert Gedeon, P.E.
Operations Manager

TABLE OF CONTENTS

Page

1.0 BUILDING DESCRIPTION 1
2.0 ASBESTOS CONTAINING MATERIAL INSPECTION SCOPE 1
3.0 ASBESTOS CONTAINING MATERIAL INSPECTION RESULTS 2
4.0 LEAD CONTAINING PAINT INSPECTION RESULTS 2
5.0 UNIVERSAL/REGULATED MATERIAL INVENTORY SCOPE AND FINDINGS 3
6.0 CONCLUSIONS AND RECOMMENDATIONS 4

APPENDICES

Appendix A: ACM Laboratory Results and Chain of Custodies by PANYNJ

Appendix B: LCP Laboratory Results and Chain of Custodies by PANYNJ

Appendix C: ACM Location Drawings

Appendix D: Universal/Regulated Material Location Drawings

Appendix E: Cost Estimates

1.0 BUILDING DESCRIPTION

Building 332 was built in 2001 and is approximately 46,400 square feet in size. It is a one-story structure with a mezzanine constructed primarily of steel and concrete. Building 332 serves as a mail processing facility. It is currently occupied and is scheduled for complete demolition.

2.0 ACM INSPECTION SCOPE

PANYNJ conducted a limited asbestos inspection of the building and collected samples of suspect ACM. The areas inspected included only accessible areas of the building interior and exterior. Intrusive/destructive sampling was not performed during this inspection as the building is occupied. The intent of this survey was to locate and identify all accessible ACM.

The materials inspected and sampled for ACM during the inspections were:

• Black Expansion Joint	Exterior, Loading Area
• White Expansion Joint	Exterior, Loading Area
• Gray Foam Expansion Joint	Exterior, Loading Area
• Gray Cement Patch	Exterior, Loading Area
• White Wall Joint Compound	1st Floor
• White Cinderblock Mortar	1st Floor
• White Concrete Material	1st Floor
• Door Buffer Gasket, Black	1st Floor Freezers
• White Door Sealant	1st Floor Freezers
• Yellow Foam Wall Insulation	1st Floor Freezers
• Black Foam 2.5" Pipe Insulation	1st Floor Freezers
• Carpet Mastic, Yellow	2nd Floor Offices
• Beige Wall Panel & Mastic	2nd Floor Offices
• Gray Streaked Floor Linoleum	2nd Floor Offices
• Green Floor Linoleum	2nd Floor Offices
• Light Gray Cove Base & Yellow Mastic	2nd Floor Offices
• White Gypsum Board	2nd Floor Offices
• White Gypsum Board Joint Compound	2nd Floor Offices
• White 2'x2' Ceiling Tile	2nd Floor Offices
• Black Window Gasket	2nd Floor Offices
• Black Interior Window Sealer	2nd Floor Offices
• Ceiling Penetration Sealer, Red	2nd Floor Offices, Room 211
• Black Door Gasket	2nd Floor Offices
• Built-up Roofing	East & West Lower Roofs
• Roof Drain Flashing	East & West Lower Roofs
• Pipe Penetration Tar	East & West Lower Roofs
• Gray Parapet Joint Sealer	East & West Lower Roofs
• Generator Exhaust Pipe Coating, Black	West Lower Roof

3.0 ASBESTOS CONTAINING MATERIAL INSPECTION RESULTS

ATC has reviewed and incorporated the ACM sample results into this report under Appendix A.

Based upon visual inspection and analytical results of bulk samples collected by PANYNJ, **materials sampled do not contain asbestos.**

The following suspect materials were not sampled by PANYNJ due to building occupancy and; therefore, are assumed to be asbestos containing:

Material Location & Description	Approximate Quantity
1st Floor Fire Doors (12 Doors) – Fire Door Insulation	360 SF

The canvas roof (~45,000 SF) was not sampled as requested by PANYNJ.

PANYNJ submitted the bulk samples to ATC's laboratory for Polarized Light Microscopy (PLM) and Transmission Electron Microscopy (TEM) analysis, as applicable, utilizing EPA Method 600/M4-82-020 and ELAP Method 198.1, 198.4 and 198.6. ACM location drawings are included in Appendix C.

4.0 LEAD CONTAINING PAINT INSPECTION RESULTS

ATC reviewed and incorporated the LCP sample results into this report under Appendix B.

Although the Housing Urban Development (HUD) defines lead based paint as paint having a lead concentration equal to or above 0.5% by weight, the Occupational Safety and Health Administration (OSHA) considers any concentration of lead to be lead-containing as stipulated under OSHA Lead in Construction Standard, 1926.62. Therefore, based upon visual inspection and analytical results of paint chip samples collected by PANYNJ, the following samples were confirmed to be lead-containing:

PANYNJ Sample Number(s)	Sampling Date	Material Description & Location	Lead Content (% by weight)
6646 LP	10/24/12	Yellow paint chip sample collected from bump frame of truck dock door column base.	0.09
6655 LP	10/24/12	White paint chip sample collected from structural steel column at Truck Bay 5.	0.02

PANYNJ submitted the suspect paint chip samples to ATC's laboratory for analysis by Atomic Absorption Spectrometry (AAS) utilizing EPA Method 3050B Modified/7000B. As per PANYNJ, lead abatement is not anticipated for Building 332. However, incidental spot removal of lead paint may be needed during demolition. Thus, one lump sum cost is allocated for HASP as well as, removal and disposal of LCP resulting from incidental spot removal.

5.0 UNIVERSAL/REGULATED MATERIAL INVENTORY SCOPE AND FINDINGS

ATC conducted a visual inspection on September 17, 2012 to identify and document universal/regulated materials at the site in order to prepare an inventory of these materials for the planned demolition and renovation activities. Materials inspected included but not limited to fluorescent lamps, high intensity discharge (HID) lamps, ballasts, capacitors, mercury containing equipment, transformers, batteries, hydro fluorocarbons and miscellaneous oils and chemicals.

ATC assumed that lamp ballasts/capacitors contain Polychlorinated Biphenyls (PCBs) and/or di (2) ethylhexyl phthalate (DEHP). Transformers observed with degraded/missing labels were assumed to contain PCBs. A tabulation of the inventory is summarized in the tables below. Drawings with the locations of the observed materials are attached in Appendix D.

Lighting Fixtures:

Bulb Type	Fixture height from floor (Ft.)	No. of Fixtures	No. of Bulbs	No. of Ballasts/Capacitors	Bulb Length
Fluorescent (Guard Booth)	~7	1	2	1	1'
Fluorescent (Interior)	~10-12	53	159	53	2'
Fluorescent (Interior)	~8-12	136	269	136	4'
Fluorescent (Interior)	~8-30	66	264	132	6'
U-Shaped Fluorescent (Interior)	~7-15	78	156	78	2'
Compact Fluorescent	~7-10	20	40	20	6"
Fluorescent (Boxed – Room 213)	NA	0	80	0	2'
HID (Exterior)	~8-15	31	31	31	NA
HID (Roof)	~1-10	6	6	6	NA
TOTALS	NA	**390**	**1,005**	**456**	NA

Miscellaneous Equipment:

Equipment Type	Location	Quantity	Notes
AC Units (Wall Mounted)	Security Booths in Warehouse Area	2	Refrigerant type and amount unknown
AC Units (Roof Mounted)	Roof of Freezer Rooms 126 & 124	4	8 pounds of Refrigerant (R) 22
Batteries (Interior Emergency Lighting)	Throughout the Building, Two in Guard Booth	~27	Battery type unknown, not accessible
Water Coolers	Throughout the Building	7	Assumed to contain CFCs
Refrigerator	1st Floor, Room 122	1	Assumed to contain CFCs
Diesel Fuel	1st Floor Generator Room	1	Unknown Amount
Car Batteries	1st Floor Generator Room	2	Assumed to be Lead-Acid
Diesel Tank	1st Floor Generator Room	1	160 Gallons
Hydraulic Door/Gate Operator	Throughout the Building	37	Contains Hydraulic Oil, ~1/2 Gallon Each
Transformers	Throughout the Building	10	Dry-Type Transformer
AC Unit	Roof	1	3 pounds 10 ounces of Refrigerant (R) 22
AC Units	Roof	3	16 capacitors; 153 pounds of Refrigerant (R) 22

6.0 CONCLUSIONS AND RECOMMENDATIONS

Various types of ACM and universal/regulated material have been identified in this report that may be impacted as part of the proposed demolition work at Building 332. The materials reported in Sections 3.0 and 5.0 of this report would require removal prior to demolition.

APPENDIX A

ACM LABORATORY RESULTS AND CHAIN OF CUSTODIES BY PANYNJ

Rec. No.	Vendor Billing No.
	BATCH 24574

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 7

Sample Type - LEAD [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE # S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.) RELINQUISHED BY:	DATE TIME
	EWR- 81217	EWR- 81258	42	S. KHODORKOVSKY	08/14/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S. KHODORKOVSKY	DATE: TIME: 8/14/12 15:30	FAX RESULTS to: (973) 622-7222
RECEIVED BY: Miguel Sanchez	DATE: TIME: 8/14/12 16:00 pm	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY: Analyzed By: ATC - T Feiter	DATE: 8/14/12 TIME: 730P	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: COURIER	DATE: 8/14/12 TIME: 4:55 PM	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY: Tom Abramyan	DATE: TIME: 8/14/12	28:20
RECEIVED AT THE LAB BY: M BONCZZI	LAB NAME: ATC DATE: 8/14/12 TIME: 4:55 PM	(Signature of R. E.'s Representative) CHARGE CODE: CA44151150 (Use a separate C-O-C for each Charge Code)

M

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24574

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 332

Contract No.: EWR 151.120

Floor 2nd fl, offices

Job No.:

Area Description Demolition Survey

Date: 08.14.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81217	yellow carpet glue like material collected in Rm 203
LAB No:	
EWR- 81218	yellow carpet glue like material collected in Rm 208
LAB No:	
EWR- 81219	yellow carpet glue like material collected in Rm 204
LAB No:	
EWR- 81220	streaked beige wall panel like material collected in hallway 202, north wall
LAB No:	
EWR- 81221	yellow wall panel glue like material collected in hallway 202, north wall
LAB No:	
EWR- 81222	gray streaked textured linoleum like material collected in hallway 202, along north wall from the floor
LAB No:	
EWR- 81223	streaked beige wall panel like material collected by Rm 218
LAB No:	
EWR- 81224	yellow wall panel glue like material collected by entrance to Rm 218
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Floor 2nd fl, offices

Job No.:

Area Description Demolition Survey

Date: 08.14.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81225	gray streaked textured linoleum like material collected by entrance to Rm 217
LAB No:	
EWR- 81226	streaked beige wall panel like material collected in Rm 213, by kitchen
LAB No:	
EWR- 81227	yellow wall panel glue like material collected in Rm 213, by kitchen
LAB No:	
EWR- 81228	gray streaked textured linoleum like material collected in Rm 213, by kitchen
LAB No:	
EWR- 81229	green floor linoleum like material collected in Rm 213, east side
LAB No:	
EWR- 81230	green floor linoleum like material collected in Rm 214, southside
LAB No:	
EWR- 81231	green floor linoleum like material collected in Rm 219, eastside
LAB No:	
EWR- 81232	~~[illegible]~~ light gray cove base like material collected in Rm 203, south wall
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Building 332

Contract No.: EWR 151.120

Floor 2nd fl, offices

Job No.:

Area Description Demolition Survey

Date: 08-14-12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81233	yellow cove base glue like material collected in Rm 203, south wall
LAB No:	
EWR- 81234	light gray cove base like material collected in Rm 207, from the wall adjacent to Rm 208
LAB No:	
EWR- 81235	yellow cove base glue like material collected in Rm 207, from the wall adjacent to Rm 208
LAB No:	
EWR- 81236	light gray cove base like material collected in Rm 204, south wall
LAB No:	
EWR- 81237	yellow cove base glue like material collected in Rm 204, south wall
LAB No:	
EWR- 81238	white gypsum board like material collected by Rm 207
LAB No:	
EWR- 81239	white gypsum board joint compound like material collected by Rm 207
LAB No:	
EWR- 81240	white gypsum board like material collected in hallway 202, south wall
LAB No:	

Port Authority Inspector(s): S. Khodorkovsky / V. Feldblyum

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 332

Contract No.: EWR 151.120

Floor 2nd fl. offices

Job No.:

Area Description Demolition Survey

Date: 08.14.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81241	white gypsum board joint compound like material collected in hallway 202, South wall
LAB No:	
EWR- 81242	White gypsum board like material collected in hallway by Rm 214
LAB No:	
EWR- 81243	white gypsum board joint compound like material collected in hallway by Rm 214
LAB No:	
EWR- 81244	White 2'x2' ceiling tile material collected by Rm 214, Hallway
LAB No:	
EWR- 81245	White 2'x2' ceiling tile material collected in Rm 213
LAB No:	
EWR- 81246	White 2'x2' ceiling tile material collected in Rm
LAB No:	
EWR- 81247	black rubberized window gasket like material collected in Rm 213, east side
LAB No:	
EWR- 81248	black rubberized outside window gasket like material collected in Rm 203 northside
LAB No:	

Port Authority Inspector(s): S. KHODOZKOVSKY / V. Feldblyum

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Building 332

Contract No.: EWR 151.120

Floor 2nd fl, offices

Job No.:

Area Description Demolition Survey

Date: 08.14.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81249	black rubberized outside window gasket like material collected in Rm 221, west side
LAB No:	
EWR- 81250	black indoor window sealer like material collected in hallway ~~by~~ 202
LAB No:	
EWR- 81251	black indoor window sealer like material collected in hallway 202
LAB No:	
EWR- 81252	black in door window sealer like material collected between Rms 215 & 214
LAB No:	
EWR- 81253	red ~~for~~ ceiling penetration sealer like material collected in Rm 211
LAB No:	
EWR- 81254	red ceiling penetration sealer like material collected in Rm 211
LAB No:	
EWR- 81255	red ceiling penetration sealer like material collected in Rm 211
LAB No:	
EWR- 81256	black rubberized door casing gasket like material collected by entrance to Rm 203
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Job No.:

Area Description Demolition Survey

Date: 08.14.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81257	black rubberized door casing gasket like material collected by entrance to Rm 207
LAB No:	
EWR- 81258	black rubberized door casing gasket like material collected by entrance to Rm 209
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Sample Date : 8/14/2012
Date Received : 8/14/2012
Date Analyzed : 8/14/2012
ATC Batch # 24574
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Location: BUILDING: 332 / 2ND FLOOR OFFICES / DEMOLITION SURVEY
Project # EWR.151.120

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81217	In Room 203	Yellow carpet glue like material	NOB-TEM			32.7% Organic 44.8% Residue 22.5% Carbonate	NONE DETECTED
24574 -1		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81218	In room 208	Yellow carpet glue like material	NOB-TEM			29.6% Organic 31.6% Residue 38.8% Carbonate	NONE DETECTED
24574 -2		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81219	In room 204	Yellow carpet glue like material	NOB-TEM			34.2% Organic 36.8% Residue 29% Carbonate	NONE DETECTED
24574 -3		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81220	In hallway 202, North wall	Streaked beige wall panel like material	NOB-TEM			74.3% Organic 2.2% Residue 23.5% Carbonate	NONE DETECTED
24574 -4		Color: BEIGE					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81221	In hallway 202, North wall	Yellow wall panel glue like material	NOB-TEM			54.2% Organic 15% Residue 30.8% Carbonate	NONE DETECTED
24574 -5		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81222	In hallway 202, along North wall from the floor	Gray streaked texture linoleum like material	NOB-TEM			30.8% Organic 14.2% Residue 55% Carbonate	NONE DETECTED
24574 -6		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81223	By room 218	Streaked beige wall panel like material	NOB-TEM			69.3% Organic 2.2% Residue 28.5% Carbonate	NONE DETECTED
24574 -7		Color: BEIGE					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81224	By entrance to Rm 218	Yellow wall panel glue like material	NOB-TEM			49.9% Organic 24.7% Residue 25.4% Carbonate	NONE DETECTED
24574 -8		Color: YELLOW		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81225	By entrance to rm 218	Gray streaked textured linoleum like material	NOB-TEM			21.2% Organic 52.2% Residue 26.6% Carbonate	NONE DETECTED
24574 -9		Color: GRAY		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81226	In Rm 213, by kitchen	Streaked beige wall panel like material	NOB-TEM			68% Organic 2.5% Residue 29.5% Carbonate	NONE DETECTED
24574 -10		Color: BEIGE		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81227	In rm 213, by kitchen	Yellow wall panel glue like material	NOB-TEM			57.9% Organic 39.3% Residue 2.8% Carbonate	NONE DETECTED
24574 -11		Color: YELLOW		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81228	In rm 213, by kitchen	Gray streaked textured linoleum like material	NOB-TEM			20.5% Organic 38.7% Residue 40.8% Carbonate	NONE DETECTED
24574 -12		Color: GRAY		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81229	In Rm 213, East side	Green floor linoleum like material	NOB-TEM			25% Organic 60.7% Residue 14.3% Carbonate	NONE DETECTED
24574 -13		Color: GREEN		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81230	In rm 214, South side	Green floor linoleum like material	NOB-TEM			22.8% Organic 58.5% Residue 18.7% Carbonate	NONE DETECTED
24574 -14		Color: GREEN		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81231	In Rm 219, East side	Green floor linoleum like material	NOB-TEM			19.4% Organic 56.6% Residue 24% Carbonate	NONE DETECTED
24574 -15		Color: GREEN		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81232	In rm 203, South wall	Light Gray base like material	NOB-TEM			37.7% Organic 47.3% Residue 15% Carbonate	NONE DETECTED
24574 -16		Color: GRAY		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					
EWR-81233	In rm 203, South wall	Yellow cove base glue like material	NOB-TEM			24.5% Organic 12.7% Residue 62.8% Carbonate	NONE DETECTED
24574 -17		Color: YELLOW		Comments: PLM inconclusive, NOB-PLM inconclusive			
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts					

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81234	In Rm 207, from the wall adjacent to Rm 208	Light gray cove base like material	NOB-TEM			36.5% Organic 18.8% Residue 44.7% Carbonate	NONE DETECTED
24574 -18		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81235	In Rm 207, from the wall adjacent to rm 208	Yellow cove base glue like material	NOB-TEM			31.2% Organic 18.4% Residue 50.4% Carbonate	NONE DETECTED
24574 -19		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81236	In rm 204, South wall	Light Gray cove base like material	NOB-TEM			36.7% Organic 22% Residue 41.3% Carbonate	NONE DETECTED
24574 -20		Color: GRAY					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81237	In rm 204, South wall	Yellow cove base glue like material	NOB-TEM			27.5% Organic 19.7% Residue 52.8% Carbonate	NONE DETECTED
24574 -21		Color: YELLOW					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81238	By rm 207	White gypsum board like material	PLM	20% Cellulose	80% Mineral Filler		NONE DETECTED
24574 -22		Color: WHITE					
Analyzed By: Tarek Fata							
EWR-81239	By rm 207	White gypsum board joint compound like material	PLM	15% Cellulose	85% Mineral Filler		NONE DETECTED
24574 -23		Color: WHITE					
Analyzed By: Tarek Fata				Comments:			
EWR-81240	In hallway 202, South wall	White gypsum board like material	PLM	13% Cellulose	87% Mineral Filler		NONE DETECTED
24574 -24		Color: WHITE					
Analyzed By: Tarek Fata				Comments:			
EWR-81241	In Hallway 202, South wall	White gypsum board joint compound	PLM		100% Mineral Filler		NONE DETECTED
24574 -25		Color: WHITE					
Analyzed By: Tarek Fata				Comments:			
EWR-81242	In hallway By rm 214	White gypsum board like material	PLM	15% Cellulose	85% Mineral Filler		NONE DETECTED
24574 -26		Color: WHITE					
Analyzed By: Tarek Fata				Comments:			
EWR-81243	In hallway by rm 214	White gypsum board joint compound	PLM		100% Mineral Filler		NONE DETECTED
24574 -27		Color: WHITE					
Analyzed By: Tarek Fata				Comments:			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81244	By Rm 214, hallway	White 2' x 2' ceiling tile material	NOB-TEM			19.2% Organic 29.6% Residue 51.2% Carbonate	NONE DETECTED
24574 -28		Color: WHITE					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81245	In rm 213	White 2' x 2' ceiling tile material	NOB-TEM			17% Organic 67.3% Residue 15.7% Carbonate	NONE DETECTED
24574 -29		Color: WHITE					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81246	In Rm 213	White 2' x 2' ceiling tile material	NOB-TEM			13.7% Organic 68.9% Residue 17.4% Carbonate	NONE DETECTED
24574 -30		Color: WHITE					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81247	In Rm 213, East side	Black rubberized window gasket like material	NOB-TEM			79.8% Organic 5.8% Residue 14.4% Carbonate	NONE DETECTED
24574 -31		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81248	In rm 203 North side	Black rubbersized outside winodw gasket like material	NOB-TEM			77.4% Organic 13.7% Residue 8.9% Carbonate	NONE DETECTED
24574 -32		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81249	In rm 221 West side	Black rubbersized outside winodw gasket like material	NOB-TEM			78.5% Organic 3% Residue 18.5% Carbonate	NONE DETECTED
24574 -33		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81250	In hallway by 202	Black indoor window sealer like material	NOB-TEM			64.5% Organic 19.8% Residue 15.7% Carbonate	NONE DETECTED
24574 -34		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81251	In hallway by 202	Black indoor window sealer like material	NOB-TEM			68.1% Organic 12.2% Residue 19.7% Carbonate	NONE DETECTED
24574 -35		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81252	Between Rm 215 & 214	Black indoor window sealer like material	NOB-TEM			66.6% Organic 19.9% Residue 13.5% Carbonate	NONE DETECTED
24574 -36		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81253	Collected in rm 211	Red ceiling penetration sealer like material	NOB-TEM			59.4% Organic 20% Residue 20.6% Carbonate	NONE DETECTED
24574 -37		Color: RED					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81254	In rm 211	Red ceiling penetration sealer like material	NOB-TEM			63.1% Organic 17.8% Residue 19.1% Carbonate	NONE DETECTED
24574 -38		Color: RED					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81255	In rm 211	Red ceiling penetration sealer like material	NOB-TEM			59.4% Organic 15.8% Residue 24.8% Carbonate	NONE DETECTED
24574 -39		Color: RED					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81256	By entrance to rm 203	Black rubberized door casting gasket like material	NOB-TEM			43.4% Organic 33.3% Residue 23.3% Carbonate	NONE DETECTED
24574 -40		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81257	By entrance to Rm 207	Black rubberized door casting gasket like material	NOB-TEM			35.5% Organic 49.7% Residue 14.8% Carbonate	NONE DETECTED
24574 -41		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81258	By entrance to rm 209	Black rubberized door casing gasket like material	NOB-TEM			36.3% Organic 17.1% Residue 46.6% Carbonate	NONE DETECTED
24574 -42		Color: BLACK					
Analyzed By: Tarek Fata		Second Analyst: Alex Barengolts		Comments: PLM inconclusive, NOB-PLM inconclusive			

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				Non-Asbestos		NOB	Asbestos
Sample #	*Location*	*Type of Material*	*Method*	*% Fibrous*	*% Non-Fibrous*	*% Type*	*% Type*

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ___. Amendment Dates: _____. Amended by: _____.

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata

Analyst:

Milena Bonezzi M. Bonezzi

Approved by
Laboratory Director:

Tarek Fata

Analyst:

Aleks Barengolts

Analyst:

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

24610

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 6

Sample Type - LEAD [ ] PAINT [ ] WIPE [-]- SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE # S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
	EWR- 81298	EWR- 81330	33	RELINQUISHED BY: S. KHODORKOVSKY	DATE TIME 8/17/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S. KHODORKOVSKY	DATE: TIME: 8/17/12 15:30	FAX RESULTS to: (973) 622-7222
RECEIVED BY:	DATE: TIME:	ATTN: RALPH CAMPIONE
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME: 8/17/12	The data report for the above samples
RELINQUISHED BY: Courier	DATE: TIME: 8/17/12 20:30	was [ ] received within the requested turnaround time was not [ ] received within the requested turnarcund time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Analyzed By ATC TFata	DATE: TIME: 8/17/12 940pm	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
~~RECEIVED BY:~~ [illegible]	DATE: TIME: 8/18/12 10:45	
RECEIVED AT THE LAB BY: Jieying Gao	LAB NAME: ATC DATE: 8/17/12 TIME: 20:30	(Signature of R. E.'s Representative) CHARGE CODE: CA44151150 (Use a separate C-O-C for each Charge Code)

21 NOB Plm
21 NOB TEM

PA 3739
9-98

The Port Authority
of New York & New Jersey
Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24610

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 332

Contract No.: EWR 151.120

Floor

Job No.:

Area Description Demolition Survey

Date: 08.17.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81298	white wall ~~column~~ joint compound like material collected at 1st fl bay area west side at column D1
LAB No:	
EWR- 81299	white wall joint compound like material collected at 1st fl bay area
LAB No:	
EWR- 81300	white wall joint compound like material collected at 1st fl bay area
LAB No:	
EWR- 81301	white cinder block mortar like material collected inside electrical room #129 east wall
LAB No:	
EWR- 81302	white cinder block mortar like material collected inside electrical room #129 west wall
LAB No:	
EWR- 81303	white cinder block mortar like material collected from the wall at 1st fl bay area between Rms 129 & 130
LAB No:	
EWR- 81304	black expansion joint like material collected at 1st fl bay area, loading ~~area~~ area adjacent to column K1
LAB No:	
EWR- 81305	black expansion joint like material collected at 1st fl bay area, loading area adjacent to column K3
LAB No:	

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

24610

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 332

Contract No.: EWR 151.120

Floor 1

Job No.:

Area Description Demolition Survey

Date: 08.17.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81306	black expansion joint like material collected at 1st fl bay area, loading area
LAB No:	adjacent to column K5
EWR- 81307	gray patch cement like material collected at 1st fl bay area, outside
LAB No:	loading area adjacent to column K1
EWR- 81308	gray patch cement like material collected at 1st fl bay area, outside
LAB No:	loading area adjacent to column K1
EWR- 81309	gray patch cement like material collected at 1st fl bay area, outside
LAB No:	loading area adjacent to column K3
EWR- 81310	white expansion joint like material between steel beam and cinder block at
LAB No:	1st fl bay area, loading area adjacent to K1
EWR- 81311	white expansion joint like material between steel beam and cinder block, collected
LAB No:	at 1st fl bay area, loading area adjacent to K3
EWR- 81312	white expansion joint like material between steel beam and cinder block, collected
LAB No:	at 1st fl bay area, loading area adjacent to K5
EWR- 81313	gray foam expansion joint like material between steel beam and cinder block, 2nd layer
LAB No:	collected at 1st fl bay area, loading area adjacent to K1

Port Authority Inspector(s): S. Khodorkovsky / V. Feldblyum

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Engineering Department
Environmental Field Operations
P.A.C.M. Sampling Form

24610

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 332

Contract No.: EWR 151.120

Floor 1

Job No.:

Area Description Demolition Survey

Date: 08.17.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81314	gray foam expansion joint like material between steel beam and cinder block, 2nd layer collected at 1st fl loading area adjacent to K3
LAB No:	
EWR- 81315	gray foam expansion joint like material between steel beam and cinder block, 2nd layer collected at 1st fl loading area adjacent to K5
LAB No:	
EWR- 81316	black rubberized cooling unit door weather strip like material collected at 1st fl cooling
LAB No:	room #126, west door R1
EWR- 81317	black rubberized cooling unit door weather strip like material collected at 1st fl
LAB No:	cooling room #126, east door R3
EWR- 81318	black rubberized cooling unit door weather strip like material collected at 1st fl
LAB No:	cooling room #124, central door R5
EWR- 81319	white rubberized door sealant like material collected at 1st fl cooling room
LAB No:	#126, door # R1
EWR- 81320	white rubberized door sealant like material collected at 1st fl cooling room
LAB No:	#126, door # R2
EWR- 81321	white rubberized door sealant like material collected at 1st fl cooling room
LAB No:	#124, door # R4

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Engineering Department
Environmental Field Operations
P.A.C.M. Sampling Form

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Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 332

Contract No.: EWR 151.120

Floor 1

Job No.:

Area Description Demolition Survey

Date: 08.17.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81322	yellow foam cooling unit wall insulation like material collected from cooling unit
LAB No:	# 124, 1st fl bay area
EWR- 81323	yellow foam cooling unit wall insulation like material collected from cooling unit
LAB No:	# 124, 1st fl bay area
EWR- 81324	yellow foam cooling unit wall insulation like material collected from cooling unit
LAB No:	# 124, 1st fl bay area
EWR- 81325	white concrete like material collected from east wall at 1st fl, bay area
LAB No:	
EWR- 81326	white concrete like material collected from east wall at 1st fl, bay area
LAB No:	
EWR- 81327	white concrete like material collected from east wall at 1st fl, bay area
LAB No:	
EWR- 81328	black foam 2.5" pipe insulation like material collected at the top of cooling unit #124,
LAB No:	at 1st fl, bay area
EWR- 81329	black foam 2.5" pipe insulation like material collected at the top of cooling unit #124
LAB No:	at 1st fl, bay area

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

PA 3739
9-98

The Port Authority of New York & New Jersey

Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

Facility: NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building: 332

Contract No.: EWR 151.120

Floor:

Job No.:

Area Description: Demolition Survey

Date: 08.17.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81330	black foam 2.5" OD pipe insulation like material collected at the top of cooling unit # 124, at 1st fl bay area
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. Khodorkovsky / V. Feldblyum

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: BUILDING 332 1ST FLOOR DEMOLITION SURVEY

Sample Date : 8/17/2012
Date Received : 8/17/2012
Date Analyzed : 8/18/2012
ATC Batch # 24610
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81298	AT 1ST FLOOR BAY AREA, WEST SIDE AT COLUMN D1	WHITE WALL JOINT COMPOUND LIKE MATERIAL	NOB-TEM			33.1% Organic 1.1% Residue 65.8% Carbonate	NONE DETECTED
24610 -1		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81299	AT 1ST FLOOR BAY AREA	WHITE WALL JOINT COMPOUND LIKE MATERIAL	NOB-TEM			32.9% Organic 1.3% Residue 65.8% Carbonate	NONE DETECTED
24610 -2		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81300	AT 1ST FLOOR BAY AREA	WHITE WALL JOINT COMPOUND LIKE MATERIAL	NOB-TEM			28.5% Organic 1.1% Residue 70.4% Carbonate	NONE DETECTED
24610 -3		Color: White					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81301	INSIDE ELECTRICAL ROOM #129, EAST WALL	WHITE CINDER BLOCK MORTAR LIKE MATERIAL	PLM		100% Mineral Filler		NONE DETECTED
24610 -4		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-81302	INSIDE ELECTRICAL ROOM #129, WEST WALL	WHITE CINDER BLOCK MORTAR LIKE MATERIAL	PLM		100% Mineral Filler		NONE DETECTED
24610 -5		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-81303	WALL AT 1ST FLOOR BAY AREA BETWEEN ROOMS 129 & 130	WHITE CINDER BLOCK MORTAR LIKE MATERIAL	PLM		100% Mineral Filler		NONE DETECTED
24610 -6		Color: White					
Analyzed By: Tarek Fata				Comments:			
EWR-81304	AT 1ST FLOOR BAY AREA, LOADING AREA ADJACENT TO COLUMN K1	BLACK EXPANSION JOINT LIKE MATERIAL	NOB-TEM			40.2% Organic 12.4% Residue 47.4% Carbonate	NONE DETECTED
24610 -7		Color: Black					
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81305 24610 -6	AT 1ST FLOOR BAY AREA, LOADING AREA ADJACENT TO COLUMN K3	BLACK EXPANSION JOINT LIKE MATERIAL Color: Black	NOB-TEM			42% Organic 14.7% Residue 43.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81306 24610 -9	AT 1ST FLOOR BAY AREA, LOADING AREA ADJACENT TO COLUMN K5	BLACK EXPANSION JOINT LIKE MATERIAL Color: Black	NOB-TEM			42.5% Organic 10.7% Residue 46.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81307 24610 -10	AT 1ST FLOOR BAY AREA, OUTSIDE LOADING AREA ADJACENT TO COLUMN K1	GRAY PATCH CEMENT LIKE MATERIAL Color: Gray	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-81308 24610 -11	AT 1ST FLOOR BAY AREA, OUTSIDE LOADING AREA ADJACENT TO COLUMN K1	GRAY PATCH CEMENT LIKE MATERIAL Color: Gray	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-81309 24610 -12	AT 1ST FLOOR BAY AREA, OUTSIDE LOADING AREA ADJACENT TO COLUMN K3	GRAY PATCH CEMENT LIKE MATERIAL Color: Gray	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-81310 24610 -13	BETWEEN STEEL BEAM AND CINDER BLOCK AT 1ST FL BAY AREA, LOADING AREA ADJ TO K1	WHITE EXPANSION JOINT LIKE MATERIAL Color: White	NOB-TEM			56.7% Organic 1.1% Residue 42.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81311 24610 -14	BETWEEN STEEL BEAM AND CINDER BLOCK AT 1ST FL BAY AREA, LOADING AREA ADJ TO K3	WHITE EXPANSION JOINT LIKE MATERIAL Color: White	NOB-TEM			58.7% Organic 1.2% Residue 40.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81312 24610 -15	BETWEEN STEEL BEAM AND CINDER BLOCK AT 1ST FL BAY AREA, LOADING AREA ADJ TO K5	WHITE EXPANSION JOINT LIKE MATERIAL Color: White	NOB-TEM			52.5% Organic 1.3% Residue 46.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81313 24610 -16	BETWEEN STEEL BEAM & CINDER BLOCK 2ND LAYER AT 1ST FL BAY AREA, LOADING AREA ADJ TO K1	GRAY FOAM EXPANSION JOINT LIKE MATERIAL Color: Gray	NOB-TEM			76.7% Organic 1.7% Residue 21.6% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81314 24610 -17	BETWEEN STEEL BEAM & CINDER BLOCK 2ND LAYER AT 1ST FL BAY AREA, LOADING AREA ADJ TO K3	GRAY FOAM EXPANSION JOINT LIKE MATERIAL Color: Gray	NOB-TEM			54.4% Organic 6.7% Residue 38.9% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81315 24610 -18	BETWEEN STEEL BEAM & CINDER BLOCK 2ND LAYER AT 1ST FL BAY AREA, LOADING AREA ADJ TO K5	GRAY FOAM EXPANSION JOINT LIKE MATERIAL Color: Gray	NOB-TEM			65.2% Organic 2.6% Residue 32.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81316 24610 -19	AT 1ST FLOOR LOADING ROOM #126, WEST DOOR R1	BLACK RUBBERIZED COOLING UNIT DOOR WEATHER STRIP LIKE MATERIAL Color: Black	NOB-TEM			54.8% Organic 15.8% Residue 29.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81317 24610 -20	AT 1ST FLOOR LOADING ROOM #126, EAST DOOR R3	BLACK RUBBERIZED COOLING UNIT DOOR WEATHER STRIP LIKE MATERIAL Color: Black	NOB-TEM			52.6% Organic 15.3% Residue 32.1% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81318 24610 -21	AT 1ST FLOOR LOADING ROOM #124, CENTRAL DOOR R5	BLACK RUBBERIZED COOLING UNIT DOOR WEATHER STRIP LIKE MATERIAL Color: Black	NOB-TEM			57.7% Organic 11.5% Residue 30.8% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81319 24610 -22	AT 1ST FLOOR COOLING ROOM #126, DOOR #R1	WHITE RUBBERIZED DOOR SEALANT LIKE MATERIAL Color: White	NOB-TEM			47% Organic 28.5% Residue 24.5% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81320 24610 -23	AT 1ST FLOOR COOLING ROOM #126, DOOR #R2	WHITE RUBBERIZED DOOR SEALANT LIKE MATERIAL Color: White	NOB-TEM			47.3% Organic 31.3% Residue 21.4% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81321 24610 -24	AT 1ST FLOOR COOLING ROOM #124, DOOR #R4	WHITE RUBBERIZED DOOR SEALANT LIKE MATERIAL Color: White	NOB-TEM			50.5% Organic 25.2% Residue 24.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81322 24610 -25	COOLING UNIT #124, 1ST FLOOR BAY AREA	YELLOW FOAM COOLING UNIT WALL INSULATION LIKE MATERIAL Color: Yellow	PLM	10% Cellulose	90% foam		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-81323 24610 -26	COOLING UNIT #124, 1ST FLOOR BAY AREA	YELLOW FOAM COOLING UNIT WALL INSULATION LIKE MATERIAL Color: Yellow	PLM	5% Cellulose	95% foam		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-81324 24610 -27	COOLING UNIT #124, 1ST FLOOR BAY AREA	YELLOW FOAM COOLING UNIT WALL INSULATION LIKE MATERIAL Color: Yellow	PLM	5% Cellulose	95% foam		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			

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Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81325 24610 -28	EAST WALL AT 1ST FLOOR, BAY AREA	WHITE CONCRETE LIKE MATERIAL Color: White	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-81326 24610 -29	EAST WALL AT 1ST FLOOR, BAY AREA	WHITE CONCRETE LIKE MATERIAL Color: White	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-81327 24610 -30	EAST WALL AT 1ST FLOOR, BAY AREA	WHITE CONCRETE LIKE MATERIAL Color: White	PLM		100% Mineral Filler		NONE DETECTED
Analyzed By: Tarek Fata				Comments:			
EWR-81328 24610 -31	AT THE TOP OF COOLING UNIT #124, AT 1ST FLOOR, BAY AREA	BLACK FOAM 2.5" PIPE INSULATION LIKE MATERIAL Color: Black	NOB-TEM			66.7% Organic 4.3% Residue 29% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81329 24610 -32	AT THE TOP OF COOLING UNIT #124 AT 1ST FLOOR, BAY AREA	BLACK FOAM 2.5" PIPE INSULATION LIKE MATERIAL Color: Black	NOB-TEM			67.7% Organic 3.1% Residue 29.2% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81330 24610 -33	AT THE TOP OF COOLING UNIT #124, AT 1ST FLOOR, BAY AREA	BLACK FOAM 2.5" OD PIPE INSULATION LIKE MATERIAL Color: Black	NOB-TEM			67.9% Organic 4.8% Residue 27.3% Carbonate	NONE DETECTED
Analyzed By: Tarek Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

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Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10879

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Tarek Fata
Analyst:

Mohamed Fata
Analyst:

Mark Peysakhov
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

24611

Laboratory Destination:	EMSL (ATC)
Parameter / Protocol:	ASBESTOS - PCM / (PLM) TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 7

Sample Type - **LEAD** [ ] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
		X						

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
	EWR- 81331	EWR- 81375	45	RELINQUISHED BY: S. KHODORKOVSKY	DATE TIME 8/17/12 15:30
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: S. KHODORKOVSKY	DATE: 8/17/12 TIME: 15:30	**FAX RESULTS to: (973) 622-7222**
RECEIVED BY:	DATE: TIME:	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: 8/17/12 TIME:	The data report for the above samples
RELINQUISHED BY: Courier	DATE: 8/17/12 TIME: 20:30	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY:	DATE: TIME:	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: Jie Ying Gao	LAB NAME: ATC DATE: 8/17/12 TIME: 20:30	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151150** (Use a separate C-O-C for each Charge Code)

Analyzed by: ATC. M. Fata 8/17/12 23:59 45 PLM

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P.A.C.M Sampling Form

24611

Facility NEWARK LIBERTY INTERNATIONAL AIRPORT

Charge Code: CA44151150

Building 332

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description Demolition Survey

Date: 08.17.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81331	black rubber 1st layer roofing like material collected at east lower roof,
LAB No:	west loc.
EWR- 81332	gray paper 2nd layer roofing like material collected at east lower roof,
LAB No:	west loc.
EWR- 81333	yellow foam 3rd layer roofing like material collected at east lower roof,
LAB No:	west loc
EWR- 81334	clear plastic bottom layer vapor barrier like material collected at east lower roof
LAB No:	west loc.
EWR- 81335	black rubber 1st layer roofing like material collected at east lower roof
LAB No:	central loc.
EWR- 81336	gray paper 2nd layer roofing like material collected at east lower roof, central loc
LAB No:	
EWR- 81337	yellow foam 3rd layer roofing like material collected at east lower roof,
LAB No:	central loc.
EWR- 81338	clear plastic bottom layer vapor barrier like material collected at east lower roof
LAB No:	central loc

Port Authority Inspector(s): S. KHODORKOVSKY / V. Feldblyum

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Engineering Department
Environmental Field Operations
P.A.C.M Sampling Form

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Building 332

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description Demolition Survey

Date: 08 17 12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81339	black rubber 1st layer roofing like material collected at east lower roof, east loc
LAB No:	
EWR- 81340	gray paper 2nd layer roofing like material collected at east lower roof, east loc
LAB No:	
EWR- 81341	yellow foam 3rd layer roofing like material collected at east lower roof, east loc
LAB No:	
EWR- 81342	clear plastic bottom layer vapor barrier like material collected at east lower roof, east loc
LAB No:	
EWR- 81343	black tar drain caulking like material collected from east lower roof, west loc
LAB No:	
EWR- 81344	black tar drain caulking like material collected from east lower roof, [redacted] central loc
LAB No:	
EWR- 81345	black tar drain caulking like material collected from east lower roof, [redacted] east loc
LAB No:	
EWR- 81346	black tar pipe penetration coating like material collected from east lower roof, [redacted]
LAB No:	

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Date: 08 17 12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81347	black tar pipe penetration coating like material collected from east lower roof,
LAB No:	[redacted]
EWR- 81348	black tar pipe penetration coating like material collected from east lower roof
LAB No:	[redacted]
EWR- 81349	gray metal parapet joint caulk sealer like material collected from east lower roof north loc
LAB No:	
EWR- 81350	gray metal parapet joint caulk sealer like material collected from east lower roof east side loc
LAB No:	
EWR- 81351	gray metal parapet joint caulk sealer like material collected from [redacted] east lower roof south side loc
LAB No:	
EWR- 81352	black rubber 1st layer roofing like material collected at west lower roof, east loc
LAB No:	
EWR- 81353	gray paper 2nd layer roofing like material collected from west lower roof, [redacted] east loc
LAB No:	
EWR- 81354	yellow foam 3rd layer roofing like material collected from west lower roof, east loc
LAB No:	

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Floor Roof

Job No.:

Area Description Demolition Survey

Date: 08.17.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81355	clear plastic bottom layer vapor barrier like material collected at west lower roof, east loc
LAB No:	
EWR- 81356	black rubber 1st layer roofing like material collected from west lower roof, central loc
LAB No:	
EWR- 81357	gray paper 2nd layer roofing like material collected from west lower roof, central loc
LAB No:	
EWR- 81358	yellow foam 3rd layer roofing like material collected from west lower roof, central loc
LAB No:	
EWR- 81359	clear plastic bottom layer vapor barrier like material collected from west lower roof central loc
LAB No:	
EWR- 81360	black rubber 1st layer roofing like material collected from west lower roof, west loc
LAB No:	
EWR- 81361	gray paper 2nd layer roofing like material collected from west lower roof, west loc
LAB No:	
EWR- 81362	yellow foam 3rd layer roofing like material collected from west lower roof, west loc
LAB No:	

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Floor Roof

Job No.:

Area Description Demolition Survey

Date: 08.17.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81363	clear plastic bottom layer vapor barrier like material collected from west lower roof west loc
LAB No:	
EWR- 81364	black tar drain caulking like material collected from west lower roof, east loc
LAB No:	
EWR- 81365	black tar drain caulking like material collected from west lower roof, west loc
LAB No:	
EWR- 81366	black tar drain caulking like material collected from west lower roof, west loc
LAB No:	
EWR- 81367	black tar pipe penetration coating like material collected from west lower roof,
LAB No:	
EWR- 81368	black tar pipe penetration coating like material collected from west lower roof,
LAB No:	
EWR- 81369	black tar pipe penetration coating like material collected from west lower roof,
LAB No:	
EWR- 81370	gray metal parapet joint caulk sealer like material collected from west lower roof, north side loc
LAB No:	

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Building 332

Contract No.: EWR 151.120

Floor Roof

Job No.:

Area Description Demolition Survey

Date: 08.17.12

SAMPLE NUMBER	SAMPLE DESCRIPTION
EWR- 81371	Gray metal parapet joint caulk sealer like material collected from west lower roof
LAB No:	westside loc.
EWR- 81372	Gray metal parapet joint caulk sealer like material collected from west lower
LAB No:	roof: southside loc
EWR- 81373	black generator exhaust pipe coating like
LAB No:	material collected from west lower roof
EWR- 81374	black generator exhaust pipe coating like
LAB No:	material collected from west lower roof
EWR- 81375	black generator exhaust pipe coating like
LAB No:	material collected from west lower roof
EWR-	
LAB No:	
EWR-	
LAB No:	
EWR-	
LAB No:	

Port Authority Inspector(s): S. Khodorkovsky / V. Feldblyum

ATC ASSOCIATES INC
104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY , NJ 07310
Fax: (201) 595-4872

Project: NEWARK INTERNATIONAL AIRPORT

Location: BUILDING 332 ROOF DEMOLITION SURVEY

Sample Date : 8/17/2012
Date Received : 8/17/2012
Date Analyzed : 8/18/2012
ATC Batch # 24611
Methods: EPA 600/M4-82-020
ELAP 198.1, 198.6 and 198.4

Bulk Asbestos Analysis Results

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81331	AT EAST LOWER ROOF, WEST LOC.	BLACK RUBBER 1ST LAYER ROOFING LIKE MATERIAL	NOB-TEM			86.2% Organic 5.3% Residue 8.5% Carbonate	NONE DETECTED
24611 -1		Color: Black					
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81332	AT EAST LOWER ROOF, WEST LOC.	GRAY PAPER 2ND LAYER ROOFING LIKE MATERIAL	NOB-TEM			87.5% Organic 5.7% Residue 6.8% Carbonate	NONE DETECTED
24611 -2		Color: Gray					
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81333	AT EAST LOWER ROOF, WEST LOC.	YELLOW FOAM 3RD LAYER ROOFING LIKE MATERIAL	NOB-TEM			86.2% Organic 2.1% Residue 11.7% Carbonate	NONE DETECTED
24611 -3		Color: Yellow					
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM Inconclusive, NOB-PLM Inconclusive			
EWR-81334	AT EAST LOWER ROOF WEST LOC.	CLEAR PLASTIC BOTTOM LAYER VAPOR BARRIER LIKE MATERIAL	NOB-TEM			88.4% Organic 7.2% Residue 4.4% Carbonate	NONE DETECTED
24611 -4		Color: Clear & black					
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81335	AT EAST LOWER ROOF CENTRAL LOC.	BLACK RUBBER 1ST LAYER ROOFING LIKE MATERIAL	NOB-TEM			87.8% Organic 4.8% Residue 7.4% Carbonate	NONE DETECTED
24611 -5		Color: Black					
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM Inconclusive			
EWR-81336	AT EAST LOWER ROOF, CENTRAL LOC.	GRAY PAPER 2ND LAYER ROOFING LIKE MATERIAL	NOB-TEM			89.4% Organic 4.3% Residue 6.3% Carbonate	NONE DETECTED
24611 -6		Color: Gray					
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81337	AT EAST LOWER ROOF, CENTRAL LOC.	YELLOW FOAM 3RD LAYER ROOFING LIKE MATERIAL	PLM	Trace% Cellulose	10% Mineral Filler		NONE DETECTED
24611 -7		Color: Yellow			90% Foam		
Analyzed By: Mohamed Fata				Comments:			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81338 24611 -8	AT EAST LOWER ROOF CENTRAL LOC.	CLEAR PLASTIC BOTTOM LAYER VAPOR BARRIER LIKE MATERIAL Color: Clear & Black	NOB-TEM			71.2% Organic 24.2% Residue 4.6% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81339 24611 -9	AT EAST LOWER ROOF, EAST LOC.	BLACK RUBBER 1ST LAYER ROOFING LIKE MATERIAL Color: Black	NOB-TEM			89% Organic 4.8% Residue 6.2% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81340 24611 -10	AT EAST LOWER ROOF, EAST LOC.	GRAY PAPER 2ND LAYER ROOFING LIKE MATERIAL Color: Gray	NOB-TEM			69% Organic 6.2% Residue 24.8% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81341 24611 -11	AT EAST LOWER ROOF, EAST LOC.	YELLOW FOAM 3RD LAYER ROOFING LIKE MATERIAL Color: Yellow	PLM	Trace% Cellulose	10% Mineral Filler 90% Foam		NONE DETECTED
Analyzed By: Mohamed Fata				Comments:			
EWR-81342 24611 -12	AT EAST LOWER ROOF, EAST LOC.	CLEAR PLASTIC BOTTOM LAYER VAPOR BARRIER LIKE MATERIAL Color: Clear	NOB-TEM			94.8% Organic 2.6% Residue 2.6% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81343 24611 -13	EAST LOWER ROOF, WEST LOC.	BLACK TAR DRAIN CAULKING LIKE MATERIAL Color: Black	NOB-TEM			35.2% Organic 13.5% Residue 51.3% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81344 24611 -14	EAST LOWER ROOF, CENTRAL LOC.	BLACK TAR DRAIN CAULKING LIKE MATERIAL. Color: Black	NOB-TEM			34% Organic 12.3% Residue 53.7% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive NOB-PLM inconclusive			
EWR-81345 24611 -15	EAST LOWER ROOF, EAST LOC.	BLACK TAR DRAIN CAULKING LIKE MATERIAL Color: Black	NOB-TEM			33.2% Organic 17.1% Residue 49.7% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81346 24611 -16	EAST LOWER ROOF	BLACK TAR PIPE PENETRATION COATING LIKE MATERIAL Color: Black	NOB-TEM			55.9% Organic 6.7% Residue 37.4% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81347 24611 -17	EAST LOWER ROOF	BLACK TAR PIPE PENETRATION COATING LIKE MATERIAL Color: Black	NOB-TEM			55.8% Organic 9.4% Residue 34.8% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
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Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81348 24611 -18	EAST LOWER ROOF	BLACK TAR PIPE PENETRATION COATING LIKE MATERIAL Color: Black	NOB-TEM			55.2% Organic 3.6% Residue 41.2% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81349 24611 -19	EAST LOWER ROOF, NORTH LOC.	GRAY METAL PARAPET JOINT CAULK SEALER LIKE MATERIAL Color: Gray	NOB-TEM			63.1% Organic 3.8% Residue 33.1% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81350 24611 -20	EAST LOWER ROOF, EAST SIDE LOC.	GRAY METAL PARAPET JOINT CAULK SEALER LIKE MATERIAL Color: Gray	NOB-TEM			62.7% Organic 3.3% Residue 34% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81351 24611 -21	EAST LOWER ROOF, SOUTH SIDE LOC.	GRAY METAL PARAPET JOINT CAULK SEALER LIKE MATERIAL Color: Gray	NOB-TEM			62.7% Organic 5.4% Residue 31.9% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81352 24611 -22	WEST LOWER ROOF, EAST LOC.	BLACK RUBBER 1ST LAYER ROOFING LIKE MATERIAL Color: Black	NOB-TEM			88.7% Organic 1.4% Residue 9.9% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81353 24611 -23	WEST LOWER ROOF, EAST LOC.	GRAY PAPER 2ND LAYER ROOFING LIKE MATERIAL Color: Gray	NOB-TEM			85.4% Organic 3.4% Residue 11.2% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81354 24611 -24	WEST LOWER ROOF, EAST LOC.	YELLOW FOAM 3RD LAYER ROOFING LIKE MATERIAL Color: Yellow	PLM	Trace% Cellulose	10% Mineral Filler Trace% Organic Binders 90% Foam		NONE DETECTED
Analyzed By: Mohamed Fata				Comments:			
EWR-81355 24611 -25	AT WEST LOWER ROOF, EAST LOC.	CLEAR PLASTIC BOTTOM LAYER VAPOR BARRIER LIKE MATERIAL Color: Clear	NOB-TEM			78.9% Organic 8.8% Residue 12.3% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81356 24611 -26	WEST LOWER ROOF, CENTRAL LOC.	BLACK RUBBER 1ST LAYER ROOFING LIKE MATERIAL Color: Black	NOB-TEM			88.7% Organic 2.5% Residue 8.8% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81357 24611 -27	WEST LOWER ROOF, CENTRAL LOC.	GRAY PAPER 2ND LAYER ROOFING LIKE MATERIAL Color: Gray	NOB-TEM			90.6% Organic 3.8% Residue 5.6% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

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New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81358 24611 -28	WEST LOWER ROOF, CENTRAL LOC.	YELLOW FOAM 3RD LAYER ROOFING LIKE MATERIAL Color: Yellow	PLM	5% Cellulose	15% Mineral Filler 80% Foam		NONE DETECTED
Analyzed By: Mohamed Fata				Comments:			
EWR-81359 24611 -29	WEST LOWER ROOF, CENTRAL LOC.	CLEAR PLASTIC BOTTOM LAYER VAPOR BARRIER LIKE MATERIAL Color: Clear	NOB-TEM			84% Organic 2.7% Residue 13.3% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB PLM inconclusive			
EWR-81360 24611 -30	WEST LOWER ROOF, WEST LOC.	BLACK RUBBER 1ST LAYER ROOFING LIKE MATERIAL Color: Black	NOB-TEM			87.3% Organic 6.8% Residue 5.9% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive NOB-PLM inconclusive			
EWR-81361 24611 -31	WEST LOWER ROOF, WEST LOC.	GRAY PAPER 2ND LAYER ROOFING LIKE MATERIAL Color: Gray	NOB-TEM			88.7% Organic 3.4% Residue 7.9% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81362 24611 -32	WEST LOWER ROOF, WEST LOC.	YELLOW FOAM 3RD LAYER ROOFING LIKE MATERIAL Color: Yellow	PLM	Trace% Cellulose	10% Mineral Filler 90% Foam		NONE DETECTED
Analyzed By: Mohamed Fata				Comments:			
EWR-81363 24611 -33	WEST LOWER ROOF, WEST LOC.	CLEAR PLASTIC BOTTOM LAYER VAPOR BARRIER LIKE MATERIAL Color: Clear	NOB-TEM			90.2% Organic 2.4% Residue 7.4% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81364 24611 -34	WEST LOWER ROOF, EAST LOC.	BLACK TAR DRAIN CAULKING LIKE MATERIAL Color: Black	NOB-TEM			36.2% Organic 10.4% Residue 53.4% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81365 24611 -35	WEST LOWER ROOF, WEST LOC.	BLACK TAR DRAIN CAULKING LIKE MATERIAL Color: Black	NOB-TEM			89.6% Organic 2.2% Residue 8.2% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81366 24611 -36	WEST LOWER ROOF, WEST LOC.	BLACK TAR DRAIN CAULKING LIKE MATERIAL Color: Black	NOB-TEM			90.5% Organic 1.6% Residue 7.9% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments PLM inconclusive, NOB-PLM inconclusive			
EWR-81367 24611 -37	WEST LOWER ROOF	BLACK TAR PIPE PENETRATION COATING LIKE MATERIAL Color: Black	NOB-TEM			54.1% Organic 9.6% Residue 36.3% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Sample #	Location	Type of Material	Method	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	NOB % Type	Asbestos % Type
EWR-81368 24611 -38	WEST LOWER ROOF	BLACK TAR PIPE PENETRATION COATING LIKE MATERIAL Color: Black	NOB-TEM			50.6% Organic 6.1% Residue 43.3% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81369 24611 -39	WEST LOWER ROOF	BLACK TAR PIPE PENETRATION COATING LIKE MATERIAL Color: Black	NOB-TEM			54.3% Organic 6.2% Residue 39.5% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81370 24611 -40	WEST LOWER ROOF, NORTH SIDE LOC.	GRAY METAL PARAPET JOINT CAULK SEALER LIKE MATERIAL Color: Gray	NOB-TEM			64.4% Organic 4.2% Residue 31.4% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81371 24611 -41	WEST LOWER ROOF, WEST SIDE LOC.	GRAY METAL PARAPET JOINT CAULK SEALER LIKE MATERIAL Color: Gray	NOB-TEM			64% Organic 1.3% Residue 34.7% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81372 24611 -42	WEST LOWER ROOF, SOUTH SIDE LOC.	GRAY METAL PARAPET JOINT CAULK SEALER LIKE MATERIAL Color: Gray	NOB-TEM			63% Organic 3.1% Residue 33.9% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81373 24611 -43	WEST LOWER ROOF	BLACK GENERATOR EXHAUST PIPE COATING LIKE MATERIAL Color: Black	NOB-TEM			51.6% Organic 15.5% Residue 32.9% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81374 24611 -44	WEST LOWER ROOF	BLACK GENERATOR EXHAUST PIPE COATING LIKE MATERIAL Color: Black	NOB-TEM			63.2% Organic 17.5% Residue 19.3% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			
EWR-81375 24611 -45	WEST LOWER ROOF	BLACK GENERATOR EXHAUST PIPE COATING LIKE MATERIAL Color: Black	NOB-TEM			57.7% Organic 15.4% Residue 26.9% Carbonate	NONE DETECTED
Analyzed By: Mohamed Fata		Second Analyst: Mark Peysakhov		Comments: PLM inconclusive, NOB-PLM inconclusive			

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104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

				Non-Asbestos		NOB	Asbestos
Sample #	*Location*	*Type of Material*	*Method*	*% Fibrous*	*% Non-Fibrous*	*% Type*	*% Type*

NOTES:

1) The Limit of Detection is the same as the Reporting Limit for these results.

2) The Reporting Limit (RL) is the Limit of Quantitation. For point counts the limit of quantitation of 0.25%; based on one asbestos point counter over 400 non-empty points.

3) Asbestos Containing Material (ACM) Definition: > 1% asbestos by weight is considered an ACM

4) Disclaimer: The laboratory is not responsible for sample collection. Please refer to enclosed letter. This report may not be reproduced, except in full, without written approval by ATC Associates Inc. This report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. This report relates only to the samples reported above as described in the chain of custody. Quality control data is available upon request.

5) Accredited by NVLAP #101187-0 and by NY State ELAP #10979

6) Confidentiality Notice: The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Liability Notice: ATC Associates Inc. and its personnel shall not be liable for any misinformation provided to us by the client regarding these samples. This report relates only to samples submitted and analyzed.

8) When the results display more than three digits, only the first three are significant. The data within this report is reliable to 3 significant figures.

9) The condition of all samples was acceptable upon receipt.

10) The laboratory certifies that the test results meet all requirements of NELAC.

11) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

12) PLM Letter is attached on this report.

13) TRACE = LESS THAN LIMIT OF QUANTITATION (<0.25%)

14) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

15) The uncertainty for these test results is available upon request.

Mohamed Fata
Analyst:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Mark Peysakhov
Analyst:

APPENDIX B

LCP LABORATORY RESULTS AND CHAIN OF CUSTODIES BY PANYNJ

Rec. No.	Vendor Billing No.

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPARTMENT, CONSTRUCTION MANAGEMENT DIVISION
CHAIN OF CUSTODY REPORT

Laboratory Destination:	EMSL ATC
Parameter / Protocol:	ASBESTOS - PCM / PLM / TEM /
Parameter / Protocol:	LEAD - SW846 / NIOSH 7082 /

Page 1 of 3

Sample Type - LEAD [X] PAINT [ ] WIPE [ ] SOIL [ ] WATER [ ] OTHER _____

TURNAROUND (CHECK ONE)	1 Hour	4 Hours	8 Hours	12 Hours	24 Hours	48 Hours	72 Hours	Other
				X				

Set	SAMPLE #' S FROM	TO	#	SAMPLER'S SIGNATURE (A signature is required for each set.)	
1	EWR- 6646 LP	EWR- 6663 LP	18	RELINQUISHED BY: [signature]	DATE TIME 10-24-12 16:00
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
	EWR-	EWR-		RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME
				RELINQUISHED BY:	DATE TIME

RELINQUISHED BY: [signature]	DATE: 10-24-12 TIME: 16:00	**FAX RESULTS to: (973) 622-7222**
RECEIVED BY:	DATE: TIME:	**ATTN: RALPH CAMPIONE**
RELINQUISHED BY:	DATE: TIME:	Vendor, DO NOT MARK OR WRITE IN THIS SPACE Reseved for Port Authority use.
RECEIVED BY:	DATE: TIME:	The data report for the above samples
RELINQUISHED BY:	DATE: TIME:	was [ ] received within the requested turnaround time was not [ ] received within the requested turnaround time
RECEIVED BY:	DATE: TIME:	If "was not" is checked above, indicate the actual turnaround.
RELINQUISHED BY: Courier	DATE: 10/24/12 TIME: 22:30	Please Email Results to rcampion@panynj.gov and dmccarth@panynj.gov
RECEIVED BY:	DATE: TIME:	
RECEIVED AT THE LAB BY: [signature]	LAB NAME: ATC LAB DATE: 10/24/12 TIME: 22:30	(Signature of R. E.'s Representative) **CHARGE CODE: CA44151150** (Use a separate C-O-C for each Charge Code)

[illegible] 10/25/12 [illegible]

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

Client: THE PORT AUTHORITY OF NY & NJ
241 ERIE STREET, ROOM 234
JERSEY CITY, NJ 07310
Fax: (201) 216-2158 **Phone:** (201) 216-2160
Project: NEWARK LIBERTY INTL AIRPORT

Location: Bldg. 332 / 1 Floor / Various Interior/Exterior
Project # N/A

Sample Date: 10/24/2012
Date Received: 10/25/2012
Date Analyzed : 10/25/2012
Report Date: 10/25/2012
ATC Batch #: 67520
Total Samples: 18
Sample Media: Paint Chips by weight

PAINT SAMPLE ANALYSIS BY FLAME (AA)
METHOD EPA 3050B Modified/7000B

ANALYSIS RESULTS

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR 6646-LP 67520 -1	Yellow paint chip sample collected from the bump frame of the truck dock door column base	0.09	0.01
EWR 6647-LP 67520 -2	Yl. paint chip sample collected from the bump frame of the truck dock door col. base bollard	< 0.01	0.01
EWR 6648-LP 67520 -3	Blue paint chip sample collected from the exterior truck dock door frame bay 1	< 0.01	0.01
EWR 6649-LP 67520 -4	Blue paint chip sample collected from the exterior truck dock door frame bay 4	< 0.01	0.01
EWR 6650-LP 67520 -5	Light gray paint chip sample collected from the door frame of the valve room	< 0.01	0.01
EWR 6651-LP 67520 -6	Light gray paint chip sample collected from the door of the valve room	< 0.01	0.01
EWR 6652-LP 67520 -7	Dark gray paint chip sample collected from the floor entrance to the valve room	< 0.01	0.01
EWR 6653-LP 67520 -8	Dark gray paint chip sample collected from the floor at the cargo receiving station	< 0.01	0.01
EWR 6654-LP 67520 -9	White paitn chip sample collected from the structural steel column at truck bay 2	< 0.01	0.01
EWR 6655-LP 67520 -10	White paitn chip sample collected from the structural steel column at truck bay 5	0.02	0.01
EWR 6656-LP 67520 -11	Black paint chip sample collected from the truck dock rollup door frame bay 1	< 0.01	0.01
EWR 6657-LP 67520 -12	Black paint chip sample collected from the truck dock rollup door frame bay 4	< 0.01	0.01
EWR 6658-LP 67520 -13	Dark gray paint chip sample collected from the entrance door to the break area	< 0.01	0.01
EWR 6659-LP 67520 -14	Dark gray paint chip sample collected from the window frame of the break area	< 0.01	0.01
EWR 6660-LP 67520 -15	Red paint chip sample collected from the fire system stand pipe	< 0.01	0.01
EWR 6661-LP 67520 -16	Red paint chip sample collected from the fire system stand pipe	< 0.01	0.01

ATC ASSOCIATES INC

104 E. 25th Street, 10th Floor
New York, NY 10010
Tel. 212-353-8280
Fax: 212-353-8306

SAMPLE ID	SAMPLE DESCRIPTION	LEAD CONCENTRATION (% by weight)	DETECTION LIMIT (% by weight)
EWR 6662-LP 67520 -17	Blue/yellow paint chip sample collected from exterior structural steel in the front of 332	< 0.01	0.01
EWR 6663-LP 67520 18	Blue/yellow paint chip sample collected from exterior structural steel in the front of 332	< 0.01	0.01

NOTES:

1) **THE REPORTING LIMIT (RL) IS 0.01%. The detection limit as reported is the reporting limit. The true detection limit is half the RL.**
RL is based on 0.010 mg/sample weight which is typically 0.1 gram.

2) HUD defines lead-based paint as paint having a lead concentration equal to or above 0.5% by weight.
Results preceded by "<" are below the detectable levels by this analysis method.

3) Blank units are in µg

4) ATC Associates Inc. Laboratory is not responsible for sample collection. These results relate only to the items tested. This report shall not be reproduced, except in full, without written approval of the laboratory.

5) ATC is accredited by the New York State Department of Health Environmental Laboratory Approval Program (ELAP) and by the American Industrial Hygiene Association (AIHA-LAP, LLC) to perform analysis of lead in paint, dust wipes, air and soil samples. (ELAP #10879), (AIHA-LAP, LLC #100229).

6) Confidentiality Notice:
The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above.

7) Unless otherwise indicated, no blank corrections were performed.

8) The condition of all samples was acceptable upon receipt

9) Unless otherwise indicated all QC results were in control.

10) The data within this report is reliable to 3 significant figures.

11) The laboratory certifies that the test results meet all requirements of NELAC.

12) Supplement to test report batch # _____. Amendments: ____. Amendment Dates: _____. Amended by: _____

13) ATC certifies that this report is an accurate and authentic report of the results obtained from the laboratory analysis

14) The uncertainty for these test results is available upon request.

Inna Livshiz
Analyzed by:

Milena Bonezzi M. Bonezzi
Approved by
Laboratory Director:

Port Authority of NY & NJ

67520

Environmental Field Operations
Lead Sampling Field Form

Charge Code: CA44151150 **Contract:** EWR 151.120

Job No.

Facility: Newark Liberty International Airport **Building:** 332

Area Description: VARIOUS INTERIOR/EXTERIOR **Floor:** 1

Date: 10-24-12 **Quadrant:**

Lead Inspector(s): D. McCarthy, T.Taylor

Sample Type: [x] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR 6646-LP	Yellow paint chip sample collected from the bump frame of the truck dock door column base	yellow	
EWR 6647-LP	Yellow paint chip sample collected from the bump frame of the truck dock door column base bollard	yellow	
EWR 6648-LP	Blue paint chip sample collected from the exterior truck dock door frame bay 1	Blue	
EWR 6649-LP	Blue paint chip sample collected from the exterior truck dock door frame bay 4	Blue	
EWR 6650-LP	Light Grey paint chip sample collected from the door frame of the valve room	Light Grey	
EWR 6651-LP	Light Grey paint chip sample collected from the door of the valve room	Light Grey	
EWR 6652-LP	Dark Grey paint chip sample collected from the floor entrance to the valve room	Dark Grey	
EWR 6653-LP	Dark Grey paint chip sample collected from the floor at the cargo receiving station	Dark Grey	
EWR 6654-LP	White paint chip sample collected from the structural steel column at truck bay 2	White	
EWR 6655-LP	White paint chip sample collected from the structural steel column at truck bay 5	White	

Port Authority of NY & NJ

Environmental Field Operations
Lead Sampling Field Form

Charge Code: CA44151150 Contract: EWR 151.120

Job No. _____

Facility: Newark Liberty International Airport Building: 332

Area Description: VARIOUS INTERIOR/EXTERIOR Floor: 1

Date: 10-24-12 Quadrant: _____

Lead Inspector(s): D. McCarthy, T.Taylor

Sample Type: [x] Paint [ ] Wipe [ ] Soil [ ] Water [ ] Other

Sample No.	Sample Description	Paint Color	Results
EWR 6656-LP	Black paint chip sample collected from the truck dock rollup door frame bay 1	Black	
EWR 6657-LP	Black paint chip sample collected from the truck dock rollup door frame bay 4	Black	
EWR 6658-LP	Dark Grey paint chip sample collected from the entrance door to the break area	Dark Grey	
EWR 6659-LP	Dark Grey paint chip sample collected from the window frame of the break area	Dark Grey	
EWR 6660-LP	Red paint chip sample collected from the fire system stand pipe	Red	
EWR 6661-LP	Red paint chip sample collected from the fire system stand pipe	Red	
EWR 6662-LP	Blue/yellow paint chip sample collected from exterior structural steel in the front of 332	Blue/ yellow	
EWR 6663-LP	Blue/yellow paint chip sample collected from exterior structural steel in the front of 332	Blue/ yellow	

APPENDIX C

ACM LOCATION DRAWINGS

APPENDIX D

UNIVERSAL/REGULATED MATERIAL LOCATION DRAWINGS

APPENDIX E

COST ESTIMATES

Contract No		**THE PORT AUTHORITY** OF NEW YORK & NEW JERSEY	Discipline:	Environmental	Sheet: 1 of 3
Charge Code			Prepared by:	H. Zeidan	Date: 12/21/12
Project Mgr		**Summary of Cost Estimate**	Checked by:	F. Pierre	Date 12/21/12
Project Title	**Newark Liberty International Airport - Building 332**				
Consultant Name	ATC ASSOCIATES INC.	Consultant Contact: Gilbert Gedeon			

Item #	Description	Method Of Abatement	Total $	Assumption / Basis
1	Asbestos Abatement Cost Estimate		$13,566	
2	Universal Waste Cost Estimate		$37,439	
	Subtotal		$51,005	
	Contingency of 20%		$10,201	
	Total Cost		$61,206	

THE PORT AUTHORITY OF NY & NJ

Asbestos Abatement Cost Estimate

Contract No.:		Discipline: Environmental	Sheet: 2 of 3
Charge Code:		Prepared by: H. Zeidan	Date: 12/21/12
Project Mgr:		Checked by: F. Pierre	Date: 12/21/12
Project Title:	Newark Liberty International Airport - Building 332		
Consultant Name:	ATC ASSOCIATES INC	Consultant Contact: Gilbert Gedeon	

Item #	Description	Quantity	Unit	Unit Price $		Total $		Total $	Assumption / Basis
				Material	Labor	Material	Labor		
1	1st Floor Fire Doors (12 Doors) - Fire Door Insulation	360	SF		15.00	-	5,400	5,400	
2	2 Decon Units including cost of Maimenance	2	Lump Sum		2,500.00	-	5,000	5,000	
3	Waste Disposal - ACM	8	Cubic Yards		90.00	-	720	720	
4	Sub Total							11,120	
5	Incidental Spot Removal & Disposal of Lead Paint (10% of Subtotal)							1,112	
6	Equipment and Materials (12% of Subtotal)							1,334	
							Total Cost	13,566	

THE PORT AUTHORITY

Contract No.:
Charge Code:
Project Mgr:
Project Title: Newark Liberty International Airport - Building 332
Consultant Name: ATC ASSOCIATES INC

Universal Waste Cost Estimate

Consultant Contact: Gilbert Gedeon

Discipline: Environmental | Sheet: 3 of 3
Prepared by: H. Zeidan | Date: 12/21/12
Checked by: F. Pierre | Date: 12/22/12

Item #	Description	Quantity	Unit	Unit Price $ Material	Unit Price $ Labor	Total $ Material	Total $ Labor	Total $	Assumption / Basis
1	Mobilization and Demobilization	2.00	Per Day		$500.00		$1,000.00	$1,000.00	
2	Labor (4-Man Crew per Day)	40.00	Mandays		$500.00		$20,000.00	$20,000.00	
3	Equipment (Vehicle, lift, lights, generator, etc.)	10.00	Per Day	$750.00		$7,500.00		$7,500.00	
4	Packaging for Bulbs (350 fixtures)	1.00	LS	$750.00		$750.00		$750.00	
5	Fluorescent Bulb Disposal	0.24	LF	3472		$833.28		$833.28	
6	HID Disposal	1.50	Per HID	37		$55.50		$55.50	
7	Ballast Disposal (456 ballasts)	7.00	55 Gallon Drum	$500.00		$3,500.00		$3,500.00	
8	Miscellaneous Waste Disposal*	1.00	LS	$2,500.00		$2,500.00		$2,500.00	
9	Transportation	2.00	Per Trip	$650.00		$1,300.00		$1,300.00	
							Total Cost	**37,438.78**	

(*) Includes: AC Units, Batteries, Mercury Thermostats, Water Coolers, Refrigerator, Diesel Fuel, Transformers and Hydraulic Fluids

G.

USEPA PCB TRANSFORMER REGISTRATION SERIAL#67769

USEPA	United States Environmental Protection Agency Washington, DC 20460	Form Approved OMB No. 2070-0159

PCB TRANSFORMER REGISTRATION

Return To:	For Official Use Only
Fibers & Organics Branch (7404) Office of Pollution Prevention & Toxics U.S. Environmental Protection Agency 401 M Street, S.W. Washington, DC 20460	

1. Company Name	Address	Contact Name & Phone #
United Airlines Inc.	P.O. Box 66100 Chicago IL 60666	Steven Sulgit (650)634-7209

2. a. Location of PCB Transformer(s) - Location #1	2. a. Location of PCB Transformer(s) - Location #2
SEE ATTACHED SHEET	SEE ATTACHED SHEET
b. No. of Transformers and wt. (kg):	b. No. of Transformers and wt. (kg):
c. Any transformers containing flammable dielectric fluid: Yes or No	c. Any transformers containing flammable dielectric fluid: Yes or No
2. a. Location of PCB Transformer(s) - Location #3	2. a. Location of PCB Transformer(s) - Location #4
SEE ATTACHED SHEET	SEE ATTACHED SHEET
b. No. of Transformers and wt. (kg):	b. No. of Transformers and wt. (kg):
c. Any transformers containing flammable dielectric fluid: Yes or No	c. Any transformers containing flammable dielectric fluid: Yes or No

7. Certification

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate, and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as a company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate, and complete.

Signature	Name and Official Title (Type or Print)	Date Signed
Steven F. Sulgit	Steven F. Sulgit Sen. Staff	11/24/98

Paperwork Reduction Act Notice

The annual public reporting burden for this collection of information is estimated to average 2 hours per response. This estimate includes time for reading instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to: Director, OPPE Regulatory Information Division, U.S. Environmental Protection Agency (mail code 2137), 401 M Street, S.W., Washington, D.C. 20460. Include the OMB number identified above in any correspondence. Do not send the completed form to this address. The actual information or form should be submitted in accordance with the instructions accompanying the form, or as specified in the corresponding regulations.

EPA Form 7720-12 (9/98)

UNITED AIRLINES

Maintenance Operations

This information is being submitted to your office under the requirements of 40CFR – Section 761.30a, in compliance with the recently established National Registry of Transformers containing Polychlorinated Biphenyl used as a dielectric fluid. The listed transformers are currently active and registered with the local fire agencies within their respective locations.

Company Name:	United Airlines Inc.
Company Address:	P.O. Box 66100 Chicago IL 60666
Contact Name for this Registration:	Steven F. Sulgit Senior Staff Representative – Corporate Environmental Safety
Address:	Bldg. 74 – 3 SFOSY San Francisco International Airport San Francisco CA 94128
Telephone:	(650 634-7209 (650) 634-7211
E-Mail	Steve.Sulgit@UAL.COM

Transformer Location:	United Airlines – Newark Intl. Airport Hangar # 14 Brewster Road Newark Int. Airport Newark NJ 07114
Contact Name:	Bruce Bartels Manager of Building Services
Phone:	(973) 961-5027
One Transformer	Manufactured by UPTEGRAFF CO. Scottsdale AZ 1957
Weight of Transformer	1000 KGS, 275 Gallons of dielectric fluid, ASKAREL.
Serial #	67769

Oct 14 02 01:43p b111 zak at uai 973 961-5068 p.4

[redacted]

THE PORT AUTHORITY OF NY & NJ

4 WORLD TRADE CENTER
NEW YORK, NY 10006
Phone: (212) 435-5720

TRANSMITTAL
No. C012

PROJECT: EWR - Overnight Aircraft Parking
DATE: 2/13/2015
TO: VRH Construction Corp.
320 Grand Avenue

Englewood, NY 07631

Contract No. EWR-153-226

[redacted]

ATTN: **Gabriela Lachapel**

WE ARE SENDING:	STATUS LEGEND:		SUBMITTED FOR:
☑ Shop Drawings	Approved (APP)	Closed (CLO)	☐ Approval
☑ Letter	Approved as Corrected (AAC)	For Record Only (FRO)	☑ Your Use
☑ Prints	Approved as Noted - Resubmit (ANR)	Incomplete (INC)	☐ As Requested
☐ Change Order	Not Approved (NA)	New Item (NEW)	☐ Review and Comment
☐ Plans	No Exceptions Taken (NET)	No Action Taken (NACT)	
☐ Samples	Reviewed With No Comments (RWNC)	Superseded (SUPS)	
☐ Specifications	Reviewed With Comments - Resubmit (RWC)	UnSubmitted (UNS)	
☑ Other: Made from Submittal 012 ✓	**SENT VIA:** UPS		
	Tracking Number: 1ZV027832595090419		

PACKAGE	SUBMITTAL	DWG. #	REV.	COPIES	DATE	DESCRIPTION	STATUS
02050	02050G0001		R000	3	2/13/2015	Demolition Plans by Bertin Engineering & National	NA

( ) Please make necessary corrections as noted, if any. Place approval form on original of each approved drawing or cut, insert date of approval within same and return _____ prints each. IT IS REQUESTEDTHAT THESE PRINTS BE RETURNED TO US WITHIN 5 DAYS.

( ) The Contract required that the Contractor shall furnish to the engineer one set of drawings, all clearly revised, completed and brought up-to-date showing all of the permanent equipment, materials and construction as actually used.

Your earliest attention to these items would be greatly appreciated so as to avoid delay in the progress of the job.

Prepared By: **Donald Branche**
Contract Manager Specialist

RECEIVED
FEB 20 2015
EWR-Senior Resident Engineer
Engineering/Construction

CC: Joseph Chu, Catherine Nigro, Caesar Johnson
file w/Atts., VRH Construction Corp. Trans 012

Dewberry

TRANSMITTAL

Date:	2/11/2015	Project #:	EWR 153.226/DEI Job No. 50057649
Project Name:	Newark Airport RON Parking & Demo 14, 95, 332 EWR 153.226		
Reference:	**R012**		

To: Mr.Donald Branche
The Port Authority of NY & NJ
4 World Trade Center, 20th Floor
PANYNJ - New York, NY
Phone: 212 435 5720
CC:

We transmit:	The following:	For:
	☒ Shop Drawings	☒ Your Review, etc
As requested by:	As approved by:	As submitted for approval by:
Donald Branche		

Copies:	Package:	Rev	Description:
5	02050G0001	R000	Demolition Plans

Comments:

Marked "NOT APPROVED". **Building Review and Demolition Sequencing and Demolition Procedure Comments**

1. Building demolition sequence is not complete. Example, page 8 of 14, paragraph 3.b) states "Cut and pull down the columns....". No indication of equipment being used, pick points, loads, outriggers. "Lowering the roof as the columns are pulled away from the building:" is not descriptive. Provide sketches, estimated loads, and demonstrate that the building maintains its integrity relative to wind loads as the lateral supports are removed. Similar comments for all buildings.
2. On page 5 of 15 mid paragraph states "The roof structure would be sheared from the outside or above the structure for it to drop down on the floor slab." This is not an acceptable procedure. Spec Section 02050 states "Provide temporary interior and exterior shoring bracing and/or support as required to ensure that movement or settlement of structures to be demolished is safely controlled and collapse is prevented."
3. Demonstrate building is stable during demolition.
4. All glass gets removed before building is demolished.

Submittal should be only **Building Review and Demolition Sequencing and Demolition Procedure Comments; HASP items belong in other submittals.**

Signed: RMElsener
Robert Elsener
646-434-2833

VRH Construction Corp.

320 Grand Ave.
Englewood, NJ 07631

Phone: 201-871-4422
Fax: 201-871-6727

SUBMITTAL NO. 02050-G0001
PACKAGE NO: 02050

TITLE: Demolition Plan
PROJECT: PANYNJ-EWR-153.226/NJ
DRAWING:
STATUS: 3
BIC: PANYNJ

REQUIRED START: 1/16/2015
REQUIRED FINISH: 1/28/2015
DAYS HELD: 0
DAYS ELAPSED: 0
DAYS OVERDUE: -13

RECEIVED FROM		SENT TO		RETURNED BY		FORWARDED TO	
CATANZAR	VC	PANYNJ	CN	PANYNJ	CN	CATANZAR	VC

Revision No.	Description / Remarks	Received	Sent	Returned	Forwarded	Status	Sepias	Prints	Drawing Date	Held	Elapsed
000	Bertin Engineering & National Bulb	1/15/2015	1/15/2015			3	0	0		0	0

This submittal has been reviewed by VRH, checked and approved for compliance with the contract documents.

☐ APPROVED
☐ APPROVED AS CORRECTED
☒ NOT APPROVED
☐ REVIEWED WITH NO COMMENTS
☐ REVIEWED WITH COMMENTS
☐ OTHER

Approval is only for conformance with the design concept of the project and compliance with the information given in the Contract documents. The contractor is responsible for confirming and correlating all dimensions at the job site. The contractor is responsible to the fabrication processes and techniques of construction and coordination of the work of all trades.

Date: 2/11/2015 BY: Rel Elsewer
DEMBERRY ENGINEERING
TITLE: ENGINEER

Building Review and Demolition Sequencing
And Demolition Procedure Comments

1. Building demolition sequence is not complete. Example, page 8 of 14, paragraph 3.b) states "Cut and pull down the columns....". No indication of equipment being used, pick points, loads, outriggers. "Lowering the roof as the columns are pulled away from the building:" is not descriptive. Provide sketches, estimated loads, and demonstrate that the building maintains its integrity relative to wind loads as the lateral supports are removed. Similar comments for all buildings.

2. On page 5 of 15 mid paragraph states "The roof structure would be sheared from the outside or above the structure for it to drop down on the floor slab." This is not an acceptable procedure. Spec Section 02050 states "Provide temporary interior and exterior shoring bracing and/or support as required to ensure that movement or settlement of structures to be demolished is safely controlled and collapse is prevented."

3. Demonstrate building is stable during demolition.

4. All glass gets removed before building is demolished.

Submitted

02050-G0001_AerialPersonnelLifts -	HASP
02050-G0001_BuildingReview&DemoSequencing -	Not Approved
02050-G0001_DemolitionProcedure -	Not Approved
02050-G0001_EmployeeHASPManual-ConfinedSpaceEntry -	HASP
02050-G0001_EmployeeHASPManual-Forklift -	HASP
02050-G0001_FallProtection -	HASP
02050-G0001_HandTools -	HASP
02050-G0001_HazardAnalysisWorkPlanPolicy -	HASP
02050-G0001_LadderSafetyGuidelines -	HASP
02050-G0001_Lead -	02094/HASP
02050-G0001_SafetyGuideline -	HASP
02050-G0001_WorkManagementPlan-BulbRecycling -	02081/HASP

BERTIN
ENGINEERING

66 GLEN AVENUE
GLEN ROCK, NJ07452
P 201.670.6688
F 201.670.9788
www.bertinengineering.com

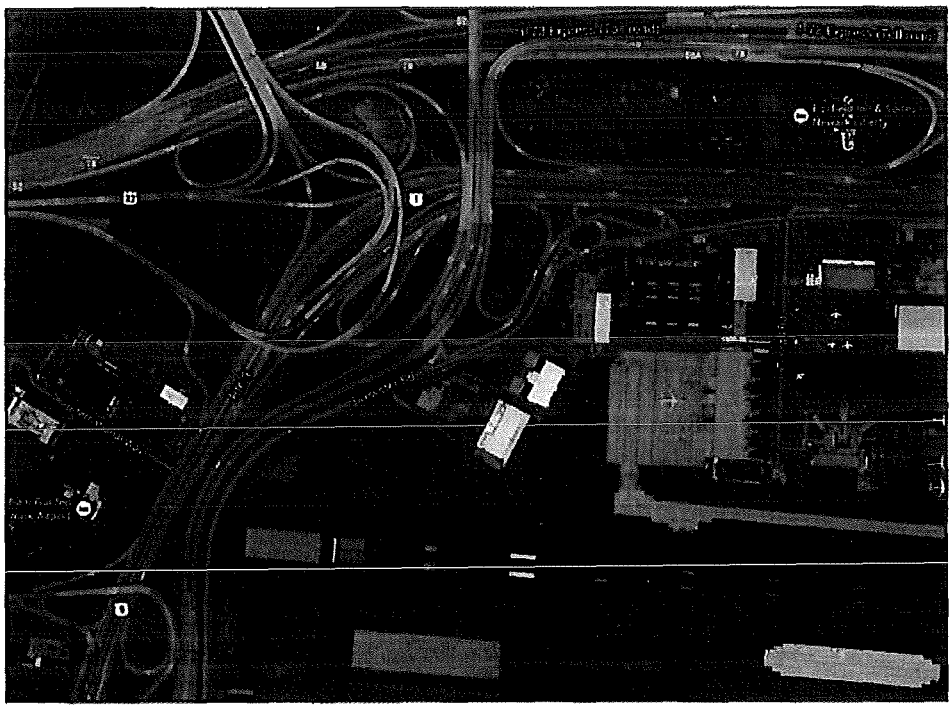
BUILIING REVIEW AND DEMOLITION SEQUENCING REPORT

BUILDINGS 95, 332 & 14
BREWSTER ROAD
NEWARK LIBERTY INTERNATIONAL AIRPORT
NEWARK, NJ

BEA 14-328
(Ref.: Contract # EWR-153.226)

JANUARY 8, 2015
(Revised - January 12, 2015)

PREPARED FOR: CATCO Demolition Services
10 Gregory Drive
Montville, New Jersey 07045



PREPARED BY: Jasvinder Arjani, RA

REVIEWED BY: Calisto Bertin, P.E
N.J. Lic. # 28845

VRH CONSTRUCTION CORP.

Submittal Date: 1/15/15
Contract: EWR-153.226
Transmittal #: 0012
Submittal #: 02050-G0001
Description: Demolition Plans
Revision # 000
This submittal has been reviewed by VRH, checked & approved for compliance with contract documents

BUILDIING REVIEW AND DEMOLITION SEQUENCING REPORT
Buildings 95, 332 & 14
Brewster Road
Newark Liberty International Airport
Newark, NJ

BE 14-328

CONTENTS

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INTRODUCTION

Bertin Engineering (BE) has been retained by CATCO Demolition Services (CATCO), a sub-contractor to VRH Construction Corporation (VRH), to prepare a limited demolition plan for buildings 95, 332 and 14 on Brewster Road at Newark Liberty International Airport, Newark, NJ. CATCO is responsible to demolish the building shell, as enumerated in Contract # EWR-153.226, dated September 12, 2014.

An initial site visit was conducted on December 15, 2014 by Jasvinder Arjani, Vinny Luongo and J Dawson Gray of Bertin Engineering to observe the general conditions of the buildings. There was no exploratory or destructive probing performed and it should be assumed that not all possible elements of the structure have been viewed and reported on.

CATCO has provided BE with copies of reference documents that are listed below, some of which have been prepared by Catanzaro & Sons Enterprises (CSE), the parent company of CATCO. Documents listed are copies and are not official signed and/or sealed documents.

1. Partial drawing document set for the three buildings they received from Port Authority of New Jersey through VRH.
2. Site Specific Safety Program prepared by VRH and copy of the cover letter confirming CATCO has reviewed the site specific safety program.
3. Procedure for operating, maintaining, and controlling Forklifts (Powered Industrial Trucks) in a safe manner, prepared by CSE
4. Procedure for operating, maintaining, and controlling Aerial Personnel Lifts in a safe manner, prepared by CSE
5. Benzene safety guidelines prepared by CSE
6. Confined space policy prepared by CSE
7. Demolition document template prepared by CSE
8. H2S Safety guideline prepared by CSE
9. Job hazard analysis/safe work plan policy prepared by CSE
10. Ladder safety guideline prepared by CSE
11. Lead safety guideline prepared by CSE
12. Tool safety and inspection plan prepared by CSE

PROPERTY DESCRIPTION

The three buildings to be demolished are Building # 14, Building # 332 and Building # 95 on Brewster Road. All three buildings are vacant and will remain unoccupied until they are removed.

Building # 14 is a hanger for overnight aircraft parking with a two story office portion; Building #95 is a storage and food handling building with remains of large walk-in coolers; and Building 332 is a cargo storage building with a two story office component.

The subject property is part of the Newark Liberty International Airport Overnight Aircraft Parking on Brewster Road, Newark, New Jersey.

The drawings provided include a Location Plan, drawing G106 for the Newark Liberty International Airport Overnight Aircraft Parking. The buildings to be demolished are located in the north portion of the lot, north of a runways and close to the access ramps for Highways 1&9, 21, 22, 78 and NJ Turnpike.

The property is fairly flat and is mostly paved. Except for the loading dock pits, there are no retaining walls or major grade changes near the three buildings. There are utilities around the building but the plans do not indicate any public utilities under the building or within the footprint.

The three buildings to be demolished are not close to a residential neighborhood or public building. There are no structures immediately next to these three buildings however, the buildings are close to the runway and access to other overnight parking/paved areas.

DEMOLITION PROCEDURES

Prior to starting demolition on any of the building, CATCO will confirm that the following pre-demolition measures, to be done by others, are put in place:

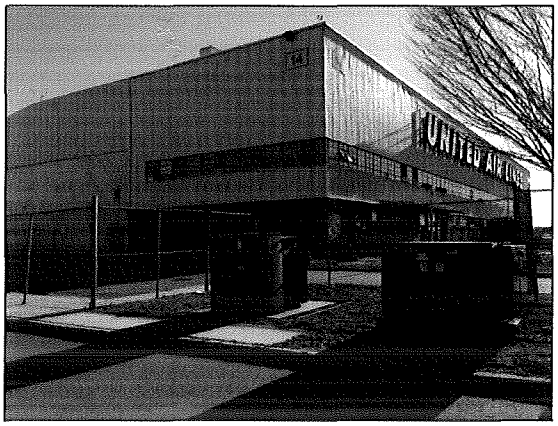
1. Removal of hazardous substances
2. Disconnection of all utilities and cutting and capping of pipes as required
3. Baiting
4. Fire control measures
5. Erosion control measures
6. Traffic Control devices
7. Barriers
8. Staging areas for equipment and debris
9. Mobilize (4) hydraulic excavators ranging from 75,000 lbs. – 100,000 lbs, equipped with specialty demolition attachments- grapples/shears; (1) wheel loader 54,000 lbs – (2) bobcat skid steers; and (1) 160,000 lb excavator with 3rd member shear.
10. Set up portable dust control units to constantly mist the demolition areas. *Dustboss db60;*

BE does not anticipate the use of temporary supports such as scaffolding and shoring as the building demolition is planned to be done from the outside by shearing the perimeter columns close to the base and gently pulling them outside and lowering the structure to the ground. Since the floor is a structural slab on piles, care shall be taken to not overload the floor slab with concentrated equipment loads or material stacking. The roof structure would be sheared from the outside or above the structure for it to drop down on the floor slab. Once the structure is down on the slab the sorting and stacking of the debris will be done from the outside moving in to remove all building components.

At no time will any personnel go into the area of demolition before it is cleared. Implosion methods and wrecking balls will not be used at this location.

Dust control measures will be implemented throughout the duration of the demolition operation.

BUILDING # 14



Building # 14 has a footprint of approximately 61,300 square feet. Being an aircraft hangar, it has a high roof with 2 sets of large rolling doors for aircraft access. There is also a two-story office on the side facing Brewster Road.

The figure below is a reduced copy of the Building 14 Plan drawing S101.

The roof trusses span from grid line A to grid line C (over the 2-story portion), and grid line C to grid line H (over the hanger portion). Grid line 1 and 14 are end walls. Hanger doors are installed along grid line H and large truss girders are provided along grid line H to allow for these wide openings.

[redacted]

Foundation & Footing:

Building # 14 structure is built over pile foundation and does not have a basement. The foundation system includes piles, pile caps and grade beams, and has a structural floor

slab. There are two sets of trenches in the floor, a service pit and an elevator pit. The trench covers are metal grates.

Visual observations of the floor slab indicate it is in good condition, with no signs of movement or cracks.

All foundation and floor structures will remain in place after the structure above is demolished, in a broom clean condition.

Columns:

Typical column bays are 20' to 25' wide with long span structure along gridline H where the 303.5' length is divided into 3 spans. The columns are steel and encased in masonry. They are either designed as composite structures or the masonry cover provides fire rating and/or protection from moving vehicles and aircraft, however there is insufficient information to confirm either. The masonry cover appears to be in good condition, with no signs of damage or cracks.

Cross bracing of the structure is provide in certain bays along grid line A, C, and H, as well as in the two end walls. Plans also indicate certain temporary bracings in the two story portion that were removed once the floor slab was placed.

The steel structure towards the air side is designed to support the framing for hanger doors. There are miscellaneous steel structures in the space to support pipes/equipment.

Girders and Roof Framing:

The girders used for the floor construction are steel beams that support the second floor reinforced concrete slab, roof framing between columns and equipment. The girder along grid line H is a deep truss structure for long span and supports roof trusses and hanger doors.

The roof consists of steel trusses with corrugated steel sheet metal roofing. The trusses also support mechanical equipment and pipes. In the two-story section between grid lines A and C, steel joists have been provided between the trusses to support second floor ceiling. These trusses are connected with bracing at the bottom chord and sheet metal at the top for lateral stability. Where visible they are in fairly good condition.

Walls:

The observed exterior and interior walls are built out of concrete masonry units. The walls along column lines appear to be non-bearing, the stair and elevator enclosures are probably load bearing. Bearing walls will be confirmed during the early stages of demolition, when the ceilings are removed. Only the non-bearing interior walls will be removed before the demolition of the main structure begins.

The walls appear for the most part to be in good condition. However there are some step cracks in the block walls along grid line C. The contractor/supervisor will call the engineer to access the wall damage if it is of concern when exposed.

Demolition of Building # 14

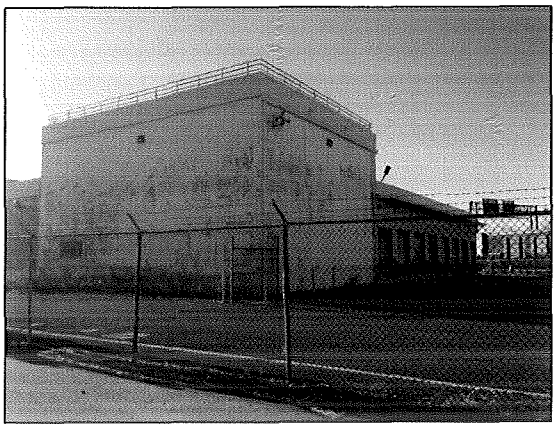
The 2-story portion of the building contains sufficient lateral support from the partition walls to remain stable during demolition if there is no cross bracing found on removal of loose furniture and equipment. The hanger portion of the building contains cross bracing along grid line H between lines 5 and 10.

The demolition of Building #14 will proceed as follows:

1. Use handheld tools for removal of all movable and loose non-structural installations, including mechanical equipment, ceilings, furniture, partition walls, toilet fixtures, light fixtures and window glass.
2. Use small skid-steer loaders and small excavators equipped with variety of hydraulic attachments to demolish interior non-bearing walls, equipment platforms and supports and ceiling support structure that will include breakers for concrete. Retain the stairways and elevator enclosures for lateral stability.
3. Use specialized mechanized equipment and tools to remove the structure. The intent is to employ high reach excavators equipped with tools for crushing concrete and for shearing steel. The demolition will be carried out from the end walls moving inside and will follow the below sequence:
   a) Remove the end wall along grid line 1, between grid lines C and H;
   b) Cut and pull down the columns along grid line 1, between grid line D and H (inclusive), lowering the roof as the columns are pulled away from the building;
   c) Cut and clear the roof structure within grid lines C, H, 1 and 5, removing all material down to the concrete floor, but leaving the column at H-5.
   d) Cut the remaining columns along grid line 1 (between lines A and C), pulling them away from the structure and allow the roof to be lowered in the process.
   e) Cut and remove all material to the floor; then proceed to grid lines 2 through 5 in the same manner, leaving the columns in grid line 5.
   f) Repeat the process from grid line 14 and work toward grid line 10.
   g) Cut and remove the remaining portion of hanger between lines 5 and 10 as described above; and
   h) Cut and remove the remaining 2-story portion of the building.

Alternatively, the hanger portion can be removed prior to the 2-story portion, but not the reverse. Since the floor is a structural slab on piles, care shall be taken to not overload the floor slab with concentrated equipment loads or material stacking.

BUILDING # 95:



At the time of the site visit, there was no power to Building # 95, thereby limiting visual observations. Only 3 drawings were made available for the building. The footprint of the building is approximately 54,000 square feet, is 1 story with varying roof heights. There are many overhead doors.

The figure below is a reduced copy of the Building # 95 Plan, drawing S103.

[redacted]

Foundation & Footing:

Building # 95 structure is built over pile foundation and does not have a basement. The foundation system includes piles and pile caps. It is unclear, based on the information provided whether the floor is a 2-way or 1-way structural slab with grade beams.

All foundation and floor structures will remain in place after the structure above is demolished, in a broom clean condition.

Columns:

The bays vary in width and the plans do not provide bay dimensions. The columns are steel construction, but their condition could not be determined due to the limited visibility within the building.

Girders and Roof Framing:

The girders used for roof construction are steel beams that support steel joist roof framing and corrugated steel sheet metal roofing. It could not be determined if these steel structure is tied to the wall for lateral stability or the walls are independent of the structure.

Walls:

The exterior and some of the interior walls observed where built out of concrete masonry unit. It does not appear if any of the walls are load bearing, but that could not be determined during the site visit. All insulated metal panel walls are not load bearing.

The walls where observed appear to be in fair condition; however there are some step cracks in the block walls.

Demolition of Building # 95

Because of limited visibility at the time of survey and incomplete set of drawings, location of lateral bracing would have to be confirmed before demolition. In absence of steel bracing, the masonry exterior walls shall be retained for lateral bracing and shall be removed along with the steel structure demolition.

The demolition of Building #95 will proceed as follows:

1. Use handheld tools for removal of all movable and loose non-structural installations, including mechanical equipment, ceilings, furniture, partition walls, toilet fixtures, light fixtures and window glass.
2. Use small skid-steer loaders and small excavators equipped with variety of hydraulic attachments to demolish interior non-bearing walls, equipment platforms and supports and ceiling support structure that will include breakers for concrete.
3. Use specialized mechanized equipment and tools to remove the structure. The intent is to employ high reach excavators equipped with tools for crushing

concrete and for shearing steel. Based on observed roof framing between grid line A0, A3, 5A and 6A it is assumed roof joists bear on numbered grid lines and are installed parallel to lettered grid lines. The demolition will be carried out from the end walls, which based on above assumption would be grid line 0, moving inside and will follow the below sequence:

a) Remove the end wall along grid line 0;

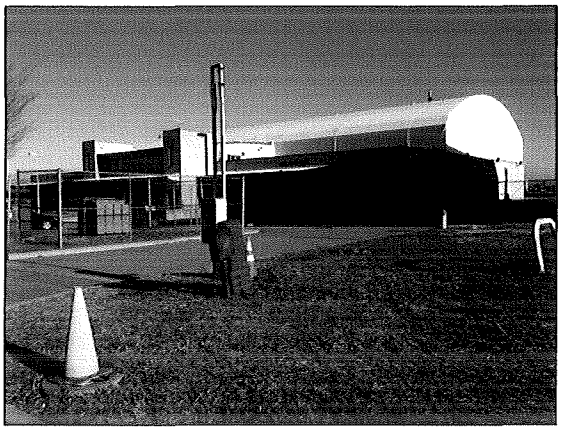
b) Cut and pull down the columns along grid line 0 and 1, lowering the roof as the columns are pulled away from the building up to grid line 2;

c) Cut and clear the roof structure up to grid line 2, removing all material down to the concrete floor, but leaving the column at grid line 2.

d) Proceed to grid line 2 in the same manner, and repeat the process working towards grid line 9 and to the opposite end;

Since the floor is a structural slab on piles, care shall be taken to not overload the floor slab with concentrated equipment loads or material stacking.

BUILDING # 332:



Building # 332 has a footprint of approximately 47,000 square feet. It is a high roof structure for use as cargo storage on one side, and has a two story office with loading docks on the side facing Brewster Road.

The high roof portion is a translucent fabric structure with pre-engineered factory manufactured steel framing. Although the building will be demolished, it appears that it could be disassembled and relocated to another location.

Below is a reduced copy of the Building 332 Plan drawing S105.

[redacted]

Foundation & Footing:

Building # 332 structure is built over pile foundation and does not have a basement. The foundation system includes piles, pile caps and grade beams, and has a structural floor slab. There are loading-dock levelers in the slab along grid line C. There is also an elevator pit.

The floor slab where appears to be in good condition and showed no signs of movement or cracks.

Columns:

The building has two parts. The two story office portion is steel construction with typical bays that are 25' wide along the long side of the building and is 40' single span structure. The steel columns are encased in concrete at the bottom to protect them from moving equipment. Knee braces have been used in the direction of the span for lateral stability.

The fabric structure steel is a single span truss design with a vertical side wall. The trusses are provided at 50-foot spacing, and span 130 feet. Space truss headers have been provided between trusses at mid-point along the vertical side wall. Wind bracing cables have been provided for lateral stability at in the end spans in the roof framing and the second bay from either end walls in the vertical walls.

Girders and Roof Framing:

The girders used for the floor construction are steel beams that support the second floor reinforced concrete slab and equipment. There is cantilevered steel structure at the second level to provide a canopy over the loading docks, and one toward the fabric structure to provide for an observation office over the cargo storage area.

The roof construction on the 2-story portion is out of steel trusses with corrugated steel sheet metal roofing. The trusses support mechanical equipment and pipes as well. Further details are not available on roof framing.

The roof trusses span from grid line A to grid line D and pre-engineered frame from grid line D to grid line F. Grid lines 1 and 15 are end walls.

Walls:

The exterior and interior walls where observed are constructed of concrete masonry units. The exterior and interior walls along column lines seem to be non-bearing. The stair and elevator enclosures are of masonry construction and could be load-bearing, which will be determined during the early stages of demolition.

Demolition of Building # 332

The 2-story portion of the building contains sufficient lateral support from the partition walls, second floor and stair and elevator enclosures to remain stable during demolition. The pre-engineered fabric structure contains cross bracing in the roof and walls at the ends and header truss along the side walls.
The demolition of Building #332 will proceed as follows:

1. Use handheld tools for removal of all movable and loose non-structural installations, including mechanical equipment, ceilings, furniture, partition walls, toilet fixtures, light fixtures and window glass.
2. Use small skid-steer loaders and small excavators equipped with variety of hydraulic attachments to demolish interior non-bearing walls, equipment platforms and supports and ceiling support structure that will include breakers for concrete. Retain the stairways and elevator enclosures for lateral stability.
3. Use specialized mechanized equipment and tools to remove the structure. The intent is to employ high reach excavators equipped with tools for crushing concrete and for shearing steel. The demolition will be carried out from the end walls moving inside and will follow the below sequence:
   a) Remove the fabric structure first. Start the demolition from either one of the end walls and maintain the wind bracings at the opposite end. Start demolition from either grid line 1 or grid line 15 and not both ends.
   b) Cut the frames above concrete barrier and pull down the frames along grid line 1, between grid line D and F, lowering the roof as the columns are pulled away from the building. Columns for the two-story structure along grid line D shall remain while the fabric structure is removed;
   c) Cut and clear the structure within grid lines D, F, 1 and the column line following grid line 1, removing all material down to the concrete floor.
   d) Proceed to the next frame line and repeat the process working towards grid line 5 and to the opposite end (grid line 15);
   e) Cut and clear the fabric structure removing all material down to the concrete floor.
   f) Start two story structure demolition by removing the end wall along grid line 1;
   g) Cut and pull down the columns along grid line 1, lowering the roof as the columns are pulled away from the building;
   h) Cut and clear the roof structure within grid lines A, D, 1 and the column line following grid line 1
   i) Cut and remove all material to the floor; then proceed to the next grid line the same manner, leaving the columns in grid line 5.
   j) Repeat the process from grid line 15 and work toward grid line 11.
   k) Cut and remove the remaining 2-story portion of the building.

A qualified supervisor will monitor the demolition at all times and will inform engineer of any deviations from the description and demolition plan and of any unsafe situations that need immediate attention. Since the floor is a structural slab on piles, care shall be taken to not overload the floor slab with concentrated equipment loads or material stacking.

1.0 Policy

Forklifts (powered industrial trucks) shall be operated, maintained, and controlled in a safe manner.

This policy covers minimum performance standards applicable to all CSE Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To define the procedures and standards that apply to the care, control, maintenance, inspection, and operation of forklifts (powered industrial trucks).

3.0 Scope

CSE Associates work sites, i.e., **CSE** offices, client job sites, etc. requiring the use of forklifts (powered industrial trucks).

4.0 Definitions

Forklift means a mobile, power-propelled truck used to carry, push, pull, lift, stack, or tier materials. Powered industrial trucks (forklifts) are also commonly known as pallet trucks, rider trucks, fork trucks, or lift trucks.

5.0 Requirements

5.1 Training

Only trained and authorized persons are permitted to operate a forklift. No employees are allowed to operate a forklift without the proper training. The Branch Safety Officer or designee will administer the forklift operator certification program and maintain training records.

Training shall occur prior to employee operation of any **CSE** forklift, and at least every three years thereafter unless observed performance by the operator dictates the need for more frequent retraining. A training guide is included in Appendix 19-1. The following requirements shall be met to become a "Qualified Forklift Operator":

- Complete the educational requirement as stated above and described in detail on Appendix 19-1.

- Perform the demonstrated capability requirement satisfactorily. Each trainee, who satisfactorily completes the qualifications as outlined above, shall be issued a written document as evidence of being a Qualified Forklift Operator.

5.2 Inspection and Maintenance

Prior to placing a forklift truck into service, the truck operator shall inspect their vehicle and document this inspection on the **CSE** Associates Forklift Inspection Form (reference Appendix 19-2). This inspection is not necessary on days when the forklift will not be placed into service.

It is the responsibility of the department manager to submit the inspection checklists to the Safety Officer on a weekly basis. The Branch Safety Officer shall keep the last 30 days of inspection checklists for each forklift on file for review.

Any noted condition that affects the safe operation of the lift truck shall be reported to the operator's supervisor for corrective action and shall keep the lift truck from being operated until the unsafe condition is corrected.

Forklifts that are defective, in need of repair or are unsafe shall be tagged "Danger - Do Not Operate." and taken out of service until restored to safe operating condition.

A maintenance log shall be maintained for each forklift to determine when required maintenance is due. Only qualified personnel shall perform maintenance and repair. Maintenance records for each forklift shall be kept on file by the assigned department manager.

5.3 General Safe Operating Rules

The following safe operating rules apply to **CSE** Associates employees who operate a forklift. Violations of safe operating rules can and will result in retraining and/or disciplinary action.

- Only **CSE** employees trained as per the requirements of this manual section and authorized by the department manager shall be allowed to operate forklifts

- **CSE** forklifts shall not be loaned or rented to others for use.
- Stunt driving and horseplay shall not be permitted.
- Forklifts shall be equipped with seat belts and utilized by the operator when in use.
- Personnel are not permitted to ride on forklifts except in designated seats that are part of the equipment design.
- Forklifts shall be equipped with a portable fire extinguisher.
- Under travel conditions, the forklift shall be operated at a speed that will permit it to be brought to a stop in a safe manner.
- Traffic regulations shall be observed, including authorized work site speed limits. A safe distance shall be maintained approximately three forklift lengths from the forklift truck ahead.
- The driver shall be required to slow down and sound the horn at cross aisles and other areas where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.
- The driver shall be required to look in the direction of, and keep a clear view of the path of travel.
- Forklifts shall have a functional horn and back-up alarm with a distinctive sound, loud enough to be heard clearly above ether local background noises. There are other scenarios where a flashing yellow/amber light would be installed. An Addendum referencing any requirements of such lights shall be added to this manual section.
- Copies of the manufacturer's operating instructions for each type of forklift shall be readily available for review by operators and supervisory personnel.
- Lift trucks, stackers, etc., shall have the rated capacity clearly posted on the vehicle so as to be clearly visible to the operator. When the manufacturer provides auxiliary removable counterweights, corresponding alternate rated capacities also shall be clearly shown on the vehicle. These ratings shall not be exceeded.

- No modifications or additions, which affect the capacity or safe operation of the equipment, shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

- Steering or spinner knobs shall not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering hand wheel to spin. The steering knob shall be mounted within the periphery of the wheel.

- Forklifts shall have the manufacturer's nameplate showing its weight with attachments, lifting capacity, lift height maximum and other pertinent data. Nameplates or markings shall be maintained in a legible condition and remain in place.

- Railroad tracks shall be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.

- Grades shall be ascended or descended slowly.

- When ascending or descending grades in excess of 10 percent, loaded forklifts shall be driven with the load upgrade.

- Unloaded forklifts should be operated on all grades with the load engaging means downgrade.

- On grades, the load and load engaging means shall be tilted back if applicable and raised only as far as necessary tee clear the road surface.

- No person shall be allowed to stand or pass under the elevated portion of any forklift, whether loaded or empty.

- There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.

- Arms or legs are prohibited from being placed between the uprights of the mast or outside the running lines of the forklift.

- When a forklift is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set.

- Wheels shall be blocked if parked on an incline.

- A safe distance shall be maintained from the edge of ramps or platforms while on any elevated dock, or platform, or freight car. Forklifts shall not be used for opening or closing freight doors.

- Brakes shall be set and wheel blocks shall be in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semi-trailer during loading or unloading when the trailer is not coupled to a tractor. Prior to forklift entry, the flooring and frames of trucks, trailers and railroad cars shall be checked for breaks and weakness before they are driven into and to determine if it will bare the intended weight of the forklift and intended load.

- Dock board or bridge plates shall be properly secured before they are driven over. Dock board or bridge plates shall be driven over carefully and slowly and their rated capacity never exceeded. Portable dock boards shall be secured in position, by being anchored or equipped with devices that will prevent their slipping.

- An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material. etc. representative of the job application, but not to withstand the impact of a falling capacity load.

- Additional counter weighting of forklifts shall not be allowed unless approved by the manufacturer.

- Employees shall not jump off a forklift.

- Forklift operators shall yield to pedestrians.

- Loads carried shall be secured on the forks to prevent upset / overturn.

5.4 Refueling and Battery Changing/Charging

Refueling and battery charging operations shall be performed only in designated areas. Open flames, smoking, sparks or electric arcs shall be eliminated from refueling and battery changing/charging areas.

Forklifts shall be shut-off, properly positioned and brakes applied before attempting to refuel or change/charge battery. Proper PPE including eye and face protection and gloves will be worn when handling cylinders and/or batteries. Refer to Personal Protective Equipment section (25).

6.0 REFERENCES

OSHA 29 CFR 1910. 178 (Powered Industrial Trucks)

OSHA 29 CFR 1926.602 (c) (Lifting and Hauling Equipment)

1.0 Policy

Aerial personnel lifts shall be operated, maintained, and controlled in a safe manner.

2.0 Purpose

To define the procedures and standards that apply to the care, control, maintenance, inspection, and operation of aerial personnel lifts.

3.0 Scope

Applies to all work sites, i.e., offices, client job sites, etc., requiring the use of aerial personnel lifts.

4.0 Definitions

Aerial personnel lift means any vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel. These include extensible boom platforms, aerial ladders, articulating boom platforms, vertical towers, and a combination of any of the above. Also for the purposes of this Policy, powered work platforms and scissor lifts shall be considered as aerial personnel lifts.

Articulating boom platform means an aerial personnel lift with two or more hinged boom sections.

Extension boom platform means an aerial personnel lift (except ladders) with a telescopic or extension boom. Telescopic derricks with personnel platform attachments shall be considered to be extension boom platforms when used with a personnel platform.

Insulated aerial device means aerial personnel lift designed for work on energized lines and apparatus.

Platform means any personnel-carrying device (basket or bucket) that is a component of an aerial personnel lift.

Vertical tower means Aerial personnel lift designed to elevate a platform in a substantially vertical axis.

5.0 Requirements

5.1 General

Equipment that is not designed for use as a personnel lift shall not be used as a personnel lift (e.g., front end loader buckets, backhoe buckets and cranes).

Only trained personnel who have been designated by their supervisor are authorized to operate aerial personnel lifts. Aerial lifts shall be inspected before use (see form at the end of this policy).

Lift controls shall be tested prior to use to determine that such controls are in safe working condition.

Review and follow electrical safety requirements for use of aerial personnel lifts.

Review and follow fall protection requirements for aerial personnel lifts as found in the Fall Protection Program. Personnel should not be permitted to stand on the rails of aerial devices. A body harness shall be worn and a lanyard appropriately attached.

Personnel shall not be permitted to use an aerial personnel lift as a means of access. In the event that there are no other means of access, specific procedures including rationale (feasibly), duration, evacuation, fall protection, etc. shall be developed and reviewed with affected employees prior to implementation.

Large or excessive amounts of material, excluding tools, shall not be transported in an aerial personnel lift. Other material lifts would be necessary for such activities.

Load limits specified by the manufacturer shall not be exceeded.

Aerial personnel lifts that can operate horizontally shall set brakes and outriggers, when used, be positioned on pads or a solid surface, and chock wheels before using on an incline.

5.2 Boom and Ladder Lift Units

Before ladder trucks and tower trucks are moved from site to site, the aerial ladders shall be secured in the lower traveling position by the locking device above the truck cab, and the manually operated device at the base of the ladder, or by other equally effective means (e.g., cradles which prevent rotation of the ladder in combination with positive acting linear actuators).

An aerial lift truck may not be moved when the boom is elevated in a working position with personnel in the basket, except for equipment that is specifically designed for this type of operation.

Articulating boom and extendible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

The insulated aerial devices shall not be altered in any manner that might reduce its insulating value. The insulated boom of a lift shall be regularly maintained and certified to ensure the continued insulating properties.

Before moving an aerial lift for travel, the boom(s) shall be inspected to see that it is properly cradled and outriggers are in stowed position.

Modifications

Aerial lifts may be "field modified" for uses other than those intended by The manufacturer, provided the modification has been certified in writing by the Manufacturer, or by any other equivalent entity, such as a nationally recognized Testing laboratory, to be in conformity with all applicable provision of ANSI A92.2 - 1969 and this section, and to be at least as safe as the equipment was before modification

6.0 References

OSHA CFR 29 1926.453, .952(b), and .955(e)(12)

DAILY AERIAL LIFT SCISSOR LIFT INSPECTION

Type Equipment: _____ **Unit No.** _____

Location: _____ **Job No.** _____

Inspected by: _____ **Date** _____

Indicate by initialing "Yes" if item checked is adequate is operational, and safe. Initial "No" to indicate repair or other action is required. Use NA to indicate "Not applicable".

	Yes	No	NA
a. Fuel level (applicable for engine drive only)			
b. Engine oil level (applicable for engine drive only)			
c. Hydraulic system level, visible leaks			
d. Battery, water level, condition, state of charge			
e. Tires, proper inflation, damage			
f. Platform structure, cleanliness, physical condition			
g. Instruction placards, in place and legible			
h. Eye wash bottle, fire extinguisher (if applicable)			
i. Test the tilt alarm (if applicable)			
From the ground control station (Do all applicable portions):			
a. Raise and lower platform/boom			
b. Raise platform/boom and lower with auxiliary power			
c. Raise platform/boom and lower with manual bleed valves			
d. Telescope out and in			
e. Swing platform right and left			
From the platform control station:			
a. Fasten safety harness			
b. Telescope out and in			
c. Raise and lower platform/boom			
d. Swing right and left			
e. Extend and level outriggers (if applicable)			
f. Drive machine forward and reverse, right and left			
g. Raise platform/boom and descend with auxiliary power			

Note defects found must be repaired prior to equipment use. On completion of inspection, retain this form with the equipment till the end of the workday. Then turn in to immediate supervision for filing.

_____

_____

_____

_____ _____
Signature of Person Completing Repairs Date Repaired

This safety guideline is intended to provide suitable information to all **CSE** employees regarding the potential toxic effects of Benzene so that adequate measures can be taken to limit exposures through controls in the workplace.

Authorized Personnel:

Name of Employee	Date Last Trained

I. GENERAL

Of all the hydrocarbons, Benzene poses the most serious long-term threat. Exposure over time, to even low levels of Benzene can cause leukemia, blood changes and aplastic anemia.

II. CHARACTERISTICS

Benzene is a colorless to light-yellow liquid with a pleasant sweet odor.

- Formula (C_6H_6)
- CAS No.: 71-43-2

Benzene is a flammable liquid that can accumulate static electricity. Benzene vapors are heavier that air and may travel to a source of ignition and flash back. The vapors are readily dispersed by wind movement and/or air currents. Liquid benzene tends to float on water and may travel to a source of ignition and spread fire. Benzene is highly reactive with no oxidizing materials.

III. USES:

Benzene is a component of gasoline, both in the manufacturing process and found naturally in crude oil; Benzene is also used as a feed stock for chemical manufacturing.

IV. HEALTH EFFECTS:

WARNING
Benzene is a cancer-causing agent in humans. All contact should be reduced to the lowest possible level. The above exposure limits are for air levels only. Skin contact may also cause overexposure.

Benzene is one of the most hazardous of all petroleum products because of its adverse health hazards and high flammability.

The following adverse health affects are important to remember where there may be a potential exposure to Benzene:

a) **Acute:** At high concentrations (1000 PPM) Benzene has an acute effect on the central nervous systems causing headaches, dizziness, drowsiness, unconsciousness, and possible death.

   Acute exposure can also cause breathlessness, irritability, and giddiness.

b) **Chronic:** Benzene has the chronic exposure effect on bone marrow (aplastic anemia leukemia).

   Chronic exposure can also cause convulsions, liver damage, heart damage, blood diseases (aplastic anemia), and cancer (leukemia). These symptoms can take months or years to surface and can develop without physical or visible indications.

c) Repeated skin contact leads to irritant contact dermatitis (rash); as with any petroleum solvent (which Benzene is also classified as), it will leach the natural oils out of the skin. Direct contact with the skin can cause erythema and/or blistering.

d) Benzene is irritating to eyes and mucous membranes.

e) Flammable/dangerous fire risk: benzene has a very low flash point making it dangerous to have any open flame, spark or source of ignition when vapors are present.

f) Explosive limits in air 1.5 to 8% by volume: benzene is highly flammable at low levels of vapor quantity in air.

VIII. PERSONAL PROTECTIVE MEASURES

CSE employees are not permitted to work in areas where there may be a potential for Benzene exposure. It is the responsibility of the Contracting Company's Project Manager and the on-site supervisor/foreman to see that any jobsite that may expose employees to Benzene is not manned with personnel until it is proven that it is safe to work within the acceptable OSHA limits without personal protective equipment.

XI. SPECIAL REQUIREMENTS

If it is necessary to perform any work where the exposure to Benzene is about the OSHA acceptable limits, then **CSE** must implement a comprehensive OSHA mandated special safety policy and procedure that includes special elements of exposure monitoring, formal medical program, special personal protective equipment, and much more.

X. TRAINING

All employees will be provided awareness training in this program in order to be familiar with the potential hazards and proper safe work procedures to follow if exposed to this health hazard.

1.0 Policy

Systems shall be utilized to ensure the safety of employees who are required to enter confined spaces. Only those CSE employees who have received specifically required training and certification on confined space entry shall be allowed to enter and/or attend a confined space. This program will be reviewed annually by the Corporate Director of Health and Safety, and revised as necessary.

This policy covers minimum performance standards applicable to all CSE Associates employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

2.0 Purpose

To set forth procedures for the safe entry to confined spaces.

3.0 Scope

Applies to all **CSE** Associates work sites, i.e., **CSE** offices, client job sites, etc., involving confined space entry.

4.0 Definitions

Attendant means an individual stationed outside permitted confined spaces that monitors the authorized entrants and who performs all attendants' assigned duties.

Authorized Entrant means an individual who is authorized to enter a confined space.

Blanking or blinding means an absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Confined space means a space that is large enough and so configured that an individual can enter and perform assigned work; has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and is not designed for continuous occupancy. A permit required confined space has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere

- Contains a material that has the potential for engulfing an entrant
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross- section
- Contains any other recognized serious safety or health hazard

Confined Space Permit means a written or printed document that allows persons to enter into a permitted confined space.

Double block and bleed means the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permitted confined space that could endanger entrants.

Engulfment means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry supervisor means the person responsible for determining if acceptable entry conditions are present at a permitted confined space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section. An entry supervisor may also be acting as an attendant.

Hazardous atmosphere means an atmosphere that may expose persons to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness.

Line breaking means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Permit-required confined space program (permit space program) means the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

Permit system means a written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

Prohibited condition means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Oxygen deficient atmosphere means an atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen enriched atmosphere means an atmosphere containing more than 23.5 percent oxygen by volume.

Rescue service means the personnel designated to rescue employees from permit spaces.

Retrieval system means the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Testing means the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

5.0 Requirements

5.1 General

Employees shall be informed of identified permit required confined spaces for the work site as they are identified.

Only authorized personnel may be permitted to enter a permit required confined space.

The Confined Space Pre-Job Assessment Form (Appendix 10-1) must be completed (in addition to the Site Safety Plan requirements) for each potential confined space identified where entry is planned. Refer to **Definitions 4.0** - Confined Space.

Danger signs or other equivalent means shall be used to warn of existing confined spaces that are accessible by employees and others. The wording shall be " DANGER-PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" or other equivalent language.

Required safety equipment shall be at the confined space work area, in working order, and instruments calibrated.

5.2 Initial Evaluation of Confined Spaces

Confined spaces shall be considered as permit required confined spaces until a competent person conducts an initial evaluation of the work site to identify permit required confined spaces. This evaluation shall be recorded on the Confined Space Pre-Job Assessment Form (Appendix 10-1). Confined spaces shall be classified as follows:

- Non Hazardous
- Hazardous due to work task
- Hazardous due to internal condition

If the work site contains permit required confined spaces, danger signs stating "DANGER - CONFINED SPACE - ENTER BY PERMIT ONLY" or equivalent shall be posted to inform employees of the existence and location of the spaces. Bilingual signs shall be posted as necessary.

5.3 Reclassification or Canceling of Permit Required Spaces

Permit required confined spaces shall be reclassified as non-permit spaces under the following circumstances:

- The space has no actual or potential atmospheric hazards and if hazards within the space are eliminated without entry into the space
- If testing and inspection during entry demonstrates that the hazards within the space have been eliminated and remain eliminated
- If the permit required confined space is to be reclassified as a non permit space, the basis for determining that hazards have been eliminated shall be documented on Appendix 10-2.

- If a hazard returns, personnel shall evacuate the space and the space shall be reevaluated

- If new hazards are identified that are not part of the original permit, personnel shall immediately evacuate the space and the confined space shall be re-evaluated

- Cancelled permits shall be kept on file for a period of at least 12 months and reviewed to determine problems encountered.

5.4 Confined Space Entry Form

The responsible supervisor shall ensure that a Confined Space Entry Form (reference Appendix 10-3) is completed prior to the entry of any permit required confined space. Completion of this form involves the following activities:

- Assessing hazards
- Atmospheric testing
- Identification of qualified entrants
- Identification of attendant(s).
- Identification of entry supervisor
- Establishment of Rescue method and Rescue Service
- De-energizing systems
- Cleaning of confined spaces
- Types of equipment required
- Hazards that may be generated through work activities
- Communication methods
- Entrants are qualified

Confined Space Permits are valid for the work period or work shift and become void and shall be reissued when:

- There is an unplanned interruption in the work process
- The surrounding conditions change that introduce a new hazard
- Personnel leave the space to perform other work
- The work space is left unattended
- The work period (normal time a person or crew is scheduled to work during that day) ends
- When new crew assumes the work assignments of the existing work crew

Permits are not void during any single work period when crewmembers are added to the existing crew or when crewmembers are replaced on a planned rotational basis and the provisions of the permit are met including training and instructions.

Permits become void when the scope of work exceeds the definition of work defined on the permit, and when work is required to be completed that is not covered by the permit.

Confined Space Permits shall be posted at the confined space work area until the work is completed. At the conclusion of work, the permit shall be returned to the issuer (i.e. Entry Supervisor, client, etc.).

Completed confined space permits shall be kept for a minimum of 12 months and until a review of the confined space permit program is completed.

5.5 Atmospheric Testing

Atmospheric conditions of a confined space shall be tested with calibrated equipment prior to entry of personnel and as identified by the Initial Evaluation of Confined Spaces (5.2 of this section). Atmospheric testing shall be completed as indicated below and recorded on the Entry Permit:

- Oxygen content shall be tested. The acceptable range is 19.5 to 23.5 percent

- Test for combustible gas and vapors. Acceptable range is 0 to 10 percent of the Lower Flammable Limit (or Lower Explosive Limit). Record readings on the Entry Permit

- Check for toxic gases and airborne combustibles (i.e. dusts) as identified by the initial determination of confined spaces (5.2 of this section). Safe operating levels can be determined from the Permissible Exposure Level (PEL) as listed in OSHA 29 CFR 1910.1000, applicable Material Safety Data Sheets (MSDSs) or as provided by the client

- Entrants and/or attendants may request additional monitoring at any time

See testing equipment requirements under the Industrial Hygiene section (23) of this manual.

5.6 Pre Entry (occurring prior to entry)

Only those persons receiving specifically required training and certification on confined space entry shall be allowed to enter and/or attend a confined space. This training shall be documented at orientation (see Orientation Checklists - Appendix 7-5) and at the required pre-job meeting (see Confined Space Pre-Job Assessment Form – Appendix 10-1) defining the specific requirements of the confined space being entered. Annual refresher training shall be conducted for all applicable **CSE** personnel to include emergency rescue drills.

Persons who enter confined space, Attendant(s), and Entry Supervisor shall receive the following minimum instructions concerning the confined space:

- How to recognize symptoms of the specific potential hazards of the confined space
- The consequences of exposure to potential hazards
- When to evacuate the confined space
- Adhering to instruction of the Attendant
- Evacuating when alarms sound
- How communications will be maintained
- What to do if an exposure occurs or there is a release of a substance
- Shutting off tools during an emergency

Sources of energy or contaminants shall be controlled, such as:

- Electrical energy
- Pressurized systems such as pipelines and vessels are isolated through double blocking, blinding, bleeding, and depressurization
- Extreme heat and extreme cold conditions

Pre-entry atmospheric testing shall be completed (5.5 of this section).

The method of ventilating the confined space shall be established (5.7 of this section).

The approved tools shall be identified and staged at or near the entry point of the confined space. Tools, electrical tools and lighting systems shall be approved for use in confined spaces as identified by the Initial Evaluation of confined spaces (5.2 of this section).

Depending upon the Pre-Job Assessment (see Appendix 10-1), lighting and electrical equipment may be either low voltage (50V or less), or conventional 120V portable lamps and tools if powered by approved ground-fault circuit interrupter devices and the work is not an electrically hazardous location. Pneumatic equipment may be used instead of electrical equipment.

Required rescue procedures and rescue equipment that shall be staged at the confined space (refer to section 5.9).

The safe methods to enter, exit, and escape for personnel (including rescue personnel during retrieval) working in a permit-required confined space shall be developed during the job planning phase, specified on, and included, as needed, on the entry permit.

Personnel have been issued required personal protective equipment (PPE).

Persons who enter confined spaces shall be logged using the Confined Space Pre-Job Assessment Form (Appendix 10-1).

5.7 Ventilation of Confined Spaces

Powered ventilation shall occur before entry into permit-required confined space and continue until after the employees have left the space. Layout of ventilation equipment will be made in such a manner that the air is being sent throughout the entire confined space. Forced air ventilation shall come from a clean source and may not increase hazards.

Air hoses with diffusers may not be used to provide forced ventilation.

Air sampling shall be conducted prior to personnel entry to assure the safety of the space and periodic air sampling shall be continued thereafter in the space when forced ventilation is used.

Forced ventilation may be used to:

- To remove contaminants created by work activities such as welding
- As a method of maintaining controlling the ambient temperature of a confined space when the rise in temperature is cause by atmospheric conditions.

Ventilation shall occur only by forcing air into a confined space. If it is necessary to exhaust hazardous gases, such as those produced when welding, the air being forced into the confined space shall be increased by at least the amount that is being exhausted out of the space.

5.8 Performance of Work

The confined space attendant shall remain at the entry point of the confined space while personnel are inside any permit required confined space.

The confined space attendant shall ensure that only authorized personnel enter the confined space.

Confined space attendants shall not perform any other work activities except that they may also serve as the attending supervisor.

Confined space attendants shall only monitor a single confined space, unless entry points to subsequent confined space(s) are immediately adjacent and are under the direct control of the attendant.

If an emergency or other unplanned event takes place during the course of work the Confined Space Work Permit is void.

The Attendant and Entry Supervisor have the authority to discontinue work activities at any time.

Compressed gas cylinders other than a self-contained breathing apparatus should not be taken into a confined space.

The hoses of gas cutting and welding tools shall be inspected for leaks prior to taking them into any confined space.

Scaffolds constructed inside confined spaces shall conform to the provisions of the Scaffold policy section (28) of this manual.

Persons who enter confined spaces shall comply with the provisions of this standard and the confined space permit. This includes:

- Supervisors
- Inspectors
- Surveyors
- Observers
- Scaffold Builders
- Engineers
- Vendors
- Contractors, subcontractors, and other employers

Sources of ignition (e.g., flame. arc, or spark) shall not be permitted in any confined space until tests have ensured that the percentage of combustible/flammable gas or vapor is not more than zero (0) % of the Lower Explosive Limit (LEL).

5.9 Emergencies

5.9.1 Emergency Notification

It is the responsibility of the Entry Supervisor and/or the Entry Attendant to immediately notify the senior **CSE** employee on the worksite of a potential emergency by radio or cell phone. The senior **CSE** employee will assess the situation and contact emergency response personnel if applicable.

Only those individuals trained and certified in confined space entry procedures on the worksite may assist in emergency rescue operations.

5.9.2 First Aid / Medical Services

Refer to the requirements in First Aid section (20) for specific worksite requirements.

5.9.3 Rescue / Retrieval Systems

To facilitate emergency rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a confined space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.

The entry supervisor, prior to the initial entry of personnel into a confined space, shall ensure the rescue equipment and retrieval system is functioning properly.

Retrieval systems shall meet the following requirements to the greatest extent possible.

- Each authorized entrant shall use a full body harness with a retrieval lifeline attached at the center of the entrant's back near shoulder level, or above the entrant's head or safety coveralls with built-in harness, with a retrieval lifeline attached at the near shoulder level of the entrant's back, or above the entrant's head

- Wristlets may be used in lieu of the full body harness if the entry supervisor can demonstrate that the use of a full body harness is not feasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative

- The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the confined space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type confined spaces more than 5 feet deep

- The safety harness shall be of the type that permits easy rescue of personnel from the confined space during emergency conditions and may be either the harness type that suspends a person in an upright position or the wrist type rescue harness. (A hoisting device or other effective means for lifting personnel from confined spaces is preferred)

- Lifelines shall have a minimum breaking strength of 5,400 pounds

5.10 Completion of Work

When the work is completed in a confined space the following, as a minimum shall be completed:

- Tools, equipment and materials shall be removed

- The space shall be inspected to ensure no personnel are inadvertently left in the confined space according to the Energy Control section (14) of this manual

- The area surrounding the confined space shall be clean of materials, equipment, scraps, and debris

- The supervisor responsible for the confined space work shall inspect the work location to ensure cleanup of materials, tools, and other items is complete

- (Lockout) locks are removed only when work is completed

6.0 References

OSHA 29 CFR 1910.146

CATANZARO & SONS ENTERPRISE/CSE

DEMOLITION

Procedures:

Before the start of every demolition job, CSE shall take a number of steps to safeguard the health and safety of workers at the job site. These preparatory operations involve the overall planning of the demolition job, including the methods to be used to bring the structure down, the equipment necessary to do the job, and the measures to be taken to perform the work safely. Planning for a demolition job is as important as actually doing the work. Therefore, a competent person experienced in all phases of the demolition work to be performed shall perform all planning work.

Engineering Survey:

Prior to starting all demolition operations, OSHA Standard 1926.850(a) requires that a competent person will conduct an engineering survey of the structure. The purpose of this survey is to determine the condition of the framing, floors, and walls so that measures can be taken, if necessary, to prevent the premature collapse of any portion of the structure. When indicated as advisable, any adjacent structure(s) or improvements shall also be similarly checked. CSE will maintain a written copy of this survey. Photographing existing damage in neighboring structures will also take place by the competent person designated.

The engineering survey provides CSE with the opportunity to evaluate the job in its entirety. CSE shall plan for the wrecking of the structure, the equipment to do the work, manpower requirements, and the protection of the public. The safety of all workers on the job site will be a prime consideration. During the preparation of the engineering survey, CSE shall plan for potential hazards such as fires, cave-ins, and injuries. If the structure to be demolished has been damaged by fire, flood, explosion, or some other cause, appropriate measures, including bracing and shoring of walls and floors, shall be taken to protect workers and any adjacent structures. It shall also be determined if any type of hazardous chemicals, gases, explosives, flammable material, or similar dangerous substances have been used or stored on the site. If the nature of a substance cannot be easily determined, samples shall be taken and analyzed by a qualified person prior to demolition.

Utility Location:

One of the most important elements of the pre-job planning is the location of all utility services. All electric, gas, water, steam, sewer, and other services lines shall be shut off, capped, or otherwise controlled, at or outside the building before demolition work is started. In each case, any utility company that is involved shall be notified in advance, and its approval or services, if necessary, shall be obtained.

If it is necessary to maintain any power, water, or other utilities during demolition, such lines shall be temporarily relocated as necessary and/or protected. The location of all overhead power sources shall also be determined, as they can prove especially hazardous during any machine demolition. All workers shall be informed of the location of any existing or relocated utility service. The telephone numbers of the local police, ambulance, and fire departments shall be available at each job site. This information can prove useful to the job supervisor in the event of any traffic problems, such as the movement of equipment to or from the job site.

Medical Services and First Aid:

Prior to starting work, provisions shall be made for prompt medical attention in case of serious injury. The nearest hospital, infirmary, clinic, or physician shall be located as part of the engineering survey. The job supervisor shall be provided with instructions for the most direct route to these facilities. Proper equipment for prompt transportation of an injured worker, as well as a communication system to contact any necessary ambulance service, will be available at the job site. The telephone numbers of the hospitals, physicians, or ambulances shall be conspicuously posted.

A properly stocked first aid kit as determined by an occupational physician, will be available at the job site. The first aid kit shall contain approved supplies in a weatherproof container with individual sealed packages for each type of item. It shall also include rubber gloves to prevent the transfer of infectious diseases. Provisions shall also be made to provide for quick drenching or flushing of the eyes should any person be working around corrosive materials. Eye flushing will be done with water containing no additives. The contents of the kit shall be checked before being sent out on each job and at least weekly to ensure the expended items are replaced.

Fire Prevention and Protection:

A **"fire plan"** shall be set up prior to beginning a demolition job. This plan shall outline the assignments of key personnel in the event of a fire and provide an evacuation plan for workers on the site. ***Common sense*** shall be the general rule in all fire prevention planning:

Preparatory Operations:

When employees are required to work within a structure to be demolished which has been damaged by fire, flood, explosion, or other cause, the walls or floor shall be shored or braced.

All electric, gas, water, steam, sewer, and other service lines shall be shut off, capped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company that is involved shall be notified in advance.

If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary, and protected.

It shall also be determined if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in any pipes, tanks, or other equipment on the property. When the presence of any such substances is apparent or suspected, testing and purging shall be performed and the hazard eliminated before demolition is started.

Where a hazard exists from fragmentation of glass, such hazards shall be removed.

Where a hazard exists to employees falling through wall openings, the opening shall be protected to a height of approximately 42 inches.

When debris is dropped through holes in the floor without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than 42 inches high and not less than 6 feet back from the projected edge of the opening above. Signs, warning of the hazard of falling materials, shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

All floor openings, not used as material drops, shall be covered over with material substantial enough to support the weight of any load that may be imposed. Such material shall be properly secured to prevent its accidental movement.

Except for the cutting of holes in floors for chutes, holes through which to drop materials, preparation of storage space, and similar necessary preparatory work, the demolition of exterior walls and floor construction shall begin at the top of the structure and proceed downward. Each story of exterior wall and floor construction shall be removed and dropped into the storage space before commencing the removal of exterior walls and floors in the story next below.

Employee entrances to multi-story structures being demolished shall be completely protected by sidewalk sheds or canopies, or both, providing protection from the face of the building for a minimum of 8 feet. All such canopies shall be at least 2 feet wider than the building entrances or openings (1 foot wider on each side thereof), and shall be capable of sustaining a load of 150 pounds per square foot.

During the planning stage of the job, all safety equipment needs shall be determined. The required number and type of respirators, lifelines, warning signs, safety nets, special face and eye protection, hearing protection, and other worker protection

In the absence of an infirmary, clinic, hospital, or physician that is reasonably accessible in terms of time and distance to the work site, a person who has a valid certificate in first aid training shall be available at the work site to render first aid.

A comprehensive first aid plan is necessary for any confined space entry.

Pre-Demolition Considerations:

- All potential sources of ignition shall be evaluated and the necessary corrective measures taken.
- When storing debris or combustible material inside a structure, such storage shall not obstruct or adversely affect the means of exit.
- Electrical wiring and equipment for providing light, heat, or power should be installed by a competent person and inspected regularly.
- Electrical wiring and equipment for providing light, heat, or power shall be installed by a competent person and inspected regularly.
- A suitable location at the job site shall be designated and provided with plans, emergency information, and equipment, as needed.
- Access for heavy fire-fighting equipment shall be provided on the immediate job site at the start of the job and well maintained until the job is completed.
- Equipment powered by an internal combustion engine shall be located so that the exhausts discharge away from combustible materials and away from workers.
- When the exhausts are piped outside the building, clearance of at least six inches shall be maintained between such piping and combustible material.
- Free access from the street to fire hydrants and to outside connections for standpipes, sprinklers, or other fire extinguishing equipment, whether permanent or temporary, should be provided and maintained at all times.
- All internal combustion equipment shall be shut down prior to refueling. Fuel for this equipment shall be stored in a safe location.
- Pedestrian walkways should not be so constructed as to impede access to hydrants.
- Sufficient fire fighting equipment shall be located near any flammable or combustible liquid storage area.
- Only approved containers and portable tanks shall be used for the storage and handling of flammable combustible liquids.
- No material or construction should interfere with access to hydrants, Siamese connections, or fire-extinguishing equipment
- A temporary or permanent water supply of volume, duration, and pressure sufficient to operate the fire-fighting equipment properly shall be made available.
- Standpipes with outlets should be provided on large multistory buildings to provide for fire protection on upper levels. If the, water pressure is insufficient, a pump shall also be provided.
- Heating devices shall be situated so they are not likely to overturn and shall be installed in accordance with their listing, including clearance to combustible material or equipment
- Temporary heating equipment, when utilized, shall be maintained by competent personnel.

Pre-Demolition Considerations: (continued)

- An ample number of fully charged portable fire extinguishers should be provided throughout the operation. All motor driven mobile equipment shall be equipped with an approved fire extinguisher.
- Roadways between and around combustible storage piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment, or other materials
- Smoking shall be prohibited at or in the vicinity of hazardous operations or materials. Where smoking is permitted, safe receptacles shall be provided for smoking materials.
- An alarm system, e.g., telephone system, siren, two-way radio, etc. shall be established in such a way that employees on the site and the local fire department can be alerted in case of an emergency.. The alarm code and reporting instructions shall be conspicuously posted and the alarm system shall be serviceable at the job site during the demolition. Fire cutoffs shall be retained in the buildings undergoing alterations or demolition until operations necessitate their removal.

Procedures:

Stairs, Passageways, and Ladders:

- Only those stairways, passageways, and ladders, designated as means of access to the structure of a building, shall be used. Other access ways shall be entirely closed at all times.
- All stairs, passageways, ladders and incidental equipment thereto, which are covered by this section, shall be periodically inspected and maintained in a clean safe condition.
- In a multistory building, when a stairwell is being used, it shall be properly illuminated by either natural or artificial means, and completely and substantially covered over at a point not less than two floors below the floor on which work is being performed, and access to the floor where the work is in progress shall be through a properly lighted, protected, and separate passageway.

Chutes:

- No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected.
- All materials chutes, or sections thereof, at an angle of more than 45° from the horizontal, shall be entirely enclosed, except for openings equipped with closures at or about floor level for the insertion of materials. The openings shall not exceed 48 inches in height measured along the wall of the chute. At all stories below the top floor, such openings shall be kept closed when not in use.

Chutes: (continued)

- A substantial gate shall be installed in each chute at or near the discharge end. A competent employee shall be assigned to control the operation of the gate, and the backing and loading of trucks.
- When operations are not in progress, the area surrounding the discharge end of a chute shall be securely closed off.
- Any chute opening, into which workmen dump debris, shall be protected by a substantial guardrail approximately 42 inches above the floor or other surface on which the men stand to dump the material. Any space between the chute and the edge of openings in the floors through which it passes shall be solidly covered over.
- Where the material is dumped from mechanical equipment or wheelbarrows, a securely attached toeboard or bumper, not less than 4 inches thick and 6 inches high, shall be provided at each chute opening.
- Chutes shall be designed and constructed of such strength as to eliminate failure due to impact of materials or debris loaded therein.

Removal of Materials through Floor Openings:

Any openings cut in a floor for the disposal of materials shall be no larger in size than 25 percent of the aggregate of the total floor area, unless the lateral supports of the removed flooring remain in place. Floors weakened or otherwise made unsafe by demolition operations shall be shored to carry safely the intended imposed load from demolition operations.

Removal of Walls, Masonry Sections and Chimneys:

- Masonry walls, or other sections of masonry, shall not be permitted to fall upon the floors of the building in such masses as to exceed the safe carrying capacities of the floors.
- No wall section, which is more than one story in height, shall be permitted to stand alone without lateral bracing, unless such wall was originally designed and constructed to stand without such lateral support, and is in a condition safe enough to be self-supporting. All walls shall be left in a stable condition at the end of each shift.
- Employees shall not be permitted to work on the top of a wall when weather conditions constitute a hazard.
- Structural or load-supporting members on any floor shall not be cut or removed until all stories above such a floor have been demolished and removed. This provision shall not prohibit the cutting of floor beams for the disposal of materials or for the installation of equipment, provided that the requirements of §§1926.853 and 1926.855 are met.

Removal of Walls, Masonry Sections and Chimneys: (continued)

- Floor openings within 10 feet of any wall being demolished shall be planked solid, except when employees are kept out of the area below.
- In buildings of "skeleton-steel" construction, the steel framing may be left in place during the demolition of masonry. Where this is done, all steel beams, girders, and similar structural supports shall be cleared of all loose material as the masonry demolition progresses downward.
- Walkways or ladders shall be provided to enable employees to safely reach or leave any scaffold or wall.
- Walls, which serve as retaining walls to support earth or adjoining structures, shall not be demolished until such earth has been properly braced or adjoining structures have been properly underpinned.
- Walls, which are to serve as retaining walls against which debris will be piled, shall not be so used unless capable of safely supporting the imposed load.

Manual Removal of Floors:

- Openings cut in a floor shall extend the full span of the arch between supports.
- Before demolishing any floor arch, debris and other material shall be removed from such arch and other adjacent floor area. Planks not less than 2 inches by 10 inches in cross section, full size undressed, shall be provided for, and shall be used by employees to stand on while breaking down floor arches between beams. Such planks shall be so located as to provide a safe support for the workmen shall the arch between the beams collapse. The open space between planks shall not exceed 16 inches.
- Safe walkways, not less than 18 inches wide, formed of planks not less than 2 inches thick if wood, or of equivalent strength if metal, shall be provided and used by workmen when necessary to enable them to reach any point without walking upon exposed beams.
- Stringers of ample strength shall be installed to support the flooring planks, and the ends of such stringers shall be supported by floor beams or girders, and not by floor arches alone.
- Planks shall be laid together over solid bearings with the ends overlapping at least 1 foot.
- When floor arches are being removed, employees shall not be allowed in the area directly underneath, and such an area shall be barricaded to prevent access to it.
- Demolition of floor arches shall not be started until they, and the surrounding floor area for a distance of 20 feet, have been cleared of debris and any other unnecessary materials.

Removal of Walls, Floors, and Material with Equipment:

- Mechanical equipment shall not be used on floors or working surfaces unless such floors or surfaces are of sufficient strength to support the imposed load.
- Floor openings shall have curbs or stop-logs to prevent equipment from running over the edge.

Storage:

- The storage of waste material and debris on any floor shall not exceed the allowable floor loads.
- In buildings having wooden floor construction, the flooring boards may be removed from not more than one floor above grade to provide storage space for debris, provided falling material is not permitted to endanger the stability of the structure.
- When wood floor beams serve to brace interior walls or freestanding exterior walls, such beams shall be left in place until other equivalent support can be installed to replace them.
- Floor arches, to an elevation of not more than 25 feet above grade, may be removed to provide storage area for debris: Provided, That such removal does not endanger the stability of the structure.
- Storage space into which material is dumped shall be blocked off, except for openings necessary for the removal of material. Such openings shall be kept closed at all times when material is not being removed.

Removal of Steel Construction:

- When floor arches have been removed, planking in accordance with 1926.855(b) shall be provided for the workers engaged in razing the steel framing.
- Cranes, derricks, and other hoisting equipment used shall meet the requirements specified in other chapters of this Program.
- Steel construction shall be dismantled column length by column length, and tier by tier (columns may be in two-story lengths).
- Any structural member being dismembered shall not be overstressed.

Mechanical Demolition:

- No workers shall be permitted in any area, which can be adversely affected by demolition operations, when balling or clamming is being performed. Only those workers necessary for the performance of the operations shall be permitted in this area at any other time.
- The crane boom and loadline shall be as short as possible.

Mechanical Demolition: (continued)

- The weight of the demolition ball shall not exceed 50 percent of the crane's rated load, based on the length of the boom and the maximum angle of operation at which the demolition ball will be used, or it shall not exceed 25 percent of the nominal breaking strength of the line by which it is suspended, whichever results in a lesser value.
- The ball shall be attached to the loadline with a swivel-type connection to prevent twisting of the loadline, and shall be attached by positive means in such manner that the weight cannot become accidentally disconnected.
- When pulling over walls or portions thereof, all steel members affected shall have been previously cut free.
- All roof cornices or other such ornamental stonework shall be removed prior to pulling walls over.
- During demolition, continuing inspections by a competent person shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, or walls, or loosened material. No employee shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means.

SPECIAL STRUCTURES DEMOLITION

SAFE WORK PRACTICES WHEN DEMOLISHING A CHIMNEY, STACK, SILO, OR COOLING TOWER

INSPECTION AND PLANNING:

When preparing to demolish any chimney, stack, silo, or cooling tower, the first step will be a careful, detailed inspection of the structure by an experienced person. If possible, architectural/engineering drawings shall be consulted. Particular attention shall be paid to the condition of the chimney or stack. Workers shall be on the lookout for any structural defects such as weak or acid-laden mortar joints, and any cracks or openings. The interior brickwork in some sections of industrial chimney shafts can be extremely weak. If the stack has been banded with steel straps, these bands shall be removed only as the work progresses from the top down. Sectioning of the chimney by water, etc. shall be considered.

SAFE WORK PRACTICE:

When hand demolition is required, it shall be carried out from a working platform.

- Experienced personnel will install a self-supporting tubular scaffold, suspended platform, or knee-braced scaffolding around the chimney.
- Particular attention shall be paid to the design, support, and tie-in (braces) of the scaffold.

SAFE WORK PRACTICES: (continued)

- A competent person shall be present at all times during the erection of the scaffold.
- It is essential that there be adequate working clearance between the chimney and the work platform.
- Access to the top of the scaffold shall be provided by means of portable walkways.
- The platforms shall be decked solid and the area from the work platform to wall bridged with a minimum of two-inch thick lumber.
- A top rail 42 inches above the platform, with a midrail covered with canvas or mesh, shall be installed around the perimeter of the platform to prevent injury to workers below. Debris netting may be installed below the platform.
- Excess canvas or plywood attachments can form a wind-sail that could collapse the scaffold.
- When working on the work platform, all personnel shall wear hard hats, long-sleeve shirts, eye and face protection, such as goggles and face shields, respirators, and safety belts, as required.
- Care shall be taken to assign the proper number of workers to the task.
- Too many people on a small work platform can lead to accidents.

An alternative to the erection of a self-supporting tubular steel scaffold to "climb" the structure with a creeping bracket scaffold. Careful inspection of the masonry and a decision as to the safety of this alternative will be made by a competent person. It is essential that the masonry of the chimney be in good enough condition to support the bracket scaffold.

The area around the chimney shall be roped off or barricaded and secured with appropriate warning signs posted. No unauthorized entry shall be permitted to this area. It is also good practice to keep a worker, i.e., a supervisor, operating engineer, another worker, or a "safety person," on the ground with a form of communication to the workers above.

Special attention shall be paid to weather conditions when working on a chimney. No work shall be done during inclement weather such as during lightning or high wind situations. The work site shall be wet down, as needed, to control dust.

DEBRIS CLEARANCE:

If debris is dropped inside the shaft, it can be removed through an opening in the chimney at grade level.

- The opening at grade will be kept relatively small in order not to weaken the structure.
- If a larger opening is desired, a professional engineer shall be consulted.

DEBRIS CLEARANCE: (continued)

- When removing debris by hand, an overhead canopy of adequate strength shall be provided.
- If machines are used for removal of debris, proper overhead protection for the operator shall be used.
- Excessive debris shall not be allowed to accumulate inside or outside the shaft of the chimney as the excess weight of the debris can impose pressure on the wall of the structure and might cause the shaft to collapse.
- The foreman shall determine when debris is to be removed, halt all demolition during debris removal, and make sure the area is clear of cleanup workers before continuing demolition.

DEMOLITION BY DELIBERATE COLLAPSE:

Another method of demolishing a chimney or stack is by deliberate collapse. Deliberate collapse requires extensive planning and experienced personnel, and shall be used only when conditions are favorable.

There will be a clear space for the fall of the structure of at least 45^0 on each side of the intended fall line and 1½ times the total height of the chimney. Considerable vibration may be set up when the chimney falls, so there should be no sewers or underground services on the line of the fall. Lookouts must be posted on the site and warning signals must be arranged. The public and other workers at the job site must be kept well back from the fall area.

The use of explosives is one way of setting off deliberate collapse. **This type of demolition shall be undertaken only by qualified persons.** The entire work area shall be cleared of nonessential personnel before any explosives are placed. Though the use of explosives is a convenient method of bringing down a chimney or stack, there is a considerable amount of vibration produced, and caution shall be taken if there is any likelihood of damage.

DEMOLITION OF PRESTRESSED CONCRETE STRUCTURES:

The different forms of construction used in a number of more or less conventional structures built during the last few decades will give rise to a variety of problems when the time comes for them to be demolished. Prestressed concrete structures fall in this general category. The most important aspect of demolishing a prestressed concrete structure takes place during the engineering survey. During the survey, a qualified person shall determine if the structure to be demolished contains any prestressed members.

It is the responsibility of CSE to inform all workers on the demolition job site of the presence of prestressed concrete members within the structure. CSE shall also instruct them in the safe work practice that will be followed to safely perform the demolition. Workers shall be informed of the hazards of deviating from the prescribed procedures and the importance of following their supervisor's instruction.

Categories of Prestressed Construction

There are four main categories of prestressed members. The category or categories shall be determined before attempting demolition, bearing in mind that any presetressed structure may contain elements of more than one category.

Category 1- Members are prestressed before the application of the superimposed loads, and all cables or tendons are fully bonded in the concrete or grouted within ducts.

Category 2- Like Category 1, but the tendons are left ungrouted. This type of construction can sometimes be recognized from the access points that may have been provided for inspection of the cables and anchors. More recently, unbonded tendons have been used in the construction of beams, slabs, and other members; these tendons are protected by grease and surrounded by plastic sheathing, instead of the usual metal duct.

Category 3- Members are prestressed progressively as building construction proceeds and the dead load increases, using bonded tendons as in Category 1.

Category 4 Like Category 3, but using unbonded tendons as in Category 2.

Examples of construction using members of Categories 3 or 4 are relatively rare. However, they may be found, for example, in the podium of a tall building or some types of bridges. They require particular care in demolition.

PRETENSIONED MEMBERS:

These usually do not have any end anchors, the wires being embedded or bonded within the length of the member. Simple pretensioned beams and slabs of spans up to about 7 meters (23 feet) can be demolished in a manner similar to ordinary reinforced concrete. Pretensioned beams and slabs may be lifted and lowered to the ground as complete units after the removal of any composite concrete covering to tops and ends of the units. To facilitate breaking up, the members shall be turned on their sides. Lifting from the structure shall generally be done from points near the ends of the units or from lifting point positions. Reuse of lifting eyes, if in good condition, is recommended whenever possible. When units are too large to be removed, consideration shall be given to temporary supporting arrangements.

PRECAST UNITS STRESSED SEPARATELY FROM THE MAIN FRAMES OF THE STRUCTURE, WITH END ANCHORS AND GROUTED AND UNGROUTED DUCTS:

Before breaking up, units of this type shall be lowered to the ground, if possible. It is advisable to seek the counsel of a professional engineer before carrying out this work, especially where there are ungrouted tendons. In general, this is true because grouting is not always 100% efficient. After lowering the units can be turned on their side with the ends up on blocks after any composite concrete is removed. This may suffice to break the unit and release the prestress; if not, a sand bag screen, timbers, or a blast mat as a screen shall be erected around the ends and demolition commenced, taking care to clear the area of any personnel. It shall be borne in mind that the end blocks may be heavily reinforced and difficult to break up.

MONOLITHIC STRUCTURES:

The advice of the professional engineer experienced in prestressed work shall be sought before any attempt is made to expose the tendons or anchorages of structures in which two or more members have been stressed together. It will usually be necessary for temporary supports to be provided so the tendons and the anchorage can be cautiously exposed. In these circumstances it is essential that indiscriminate attempts to expose and de-stress the tendons and anchorages not be made.

PROGRESSIVELY PRESTRESSED STRUCTURES:

In the case of progressively prestressed structures, it is essential to obtain the advice of a professional engineer, and to demolish the structure in strict accordance with the engineer's method of demolition. The stored energy in this type of structure is large. In some cases, the inherent properties of the stressed section may delay failure for some time, but the presence of these large prestressing forces may cause sudden and complete collapse with little warning.

SAFE WORK PRACTICES WHEN WORKING IN CONFINED SPACES:

CSE often comes in contact with confined spaces when demolishing structure at industrial sites. These confined spaces can be generally categorized in two major groups: those with open tops and a depth that restricts the natural movement of air, and enclosed spaces with very limited openings for entry. Examples of these spaces include storage tanks, vessels, degreasers, pits vaults, casing, and silos. The hazards encountered when entering and working in confined spaces are capable of causing bodily injury, illness, and death. Accidents occur among workers because of failure to recognize that a confined space is a potential hazard. It shall therefore be considered that the most unfavorable situation exists in every case and that the danger of explosion, poisoning, and asphyxiation will be present at the onset of entry.

SAFE BLASTING PROCEDURES

GENERAL SAFE WORK PRACTICES

For information only, CSE – does not work with explosives/blasting

BLASTING SURVEY AND SITE PREPARATION:

Prior to the blasting of any structure or portion thereof, a complete written survey will be made by a qualified person of all adjacent improvements and underground utilities. When there is a possibility of excessive vibration due to blasting operations, seismic or vibration tests shall be taken to determine proper safety limits to prevent damage to adjacent or nearby buildings, utilities, or other property.

The preparation of a structure for demolition by explosives may require the removal of structural columns, beams or other building components. This work shall be directed by a structural engineer or a competent person qualified to direct the removal of these structural elements. Extreme caution will be taken during this preparatory work to prevent the weakening and premature collapse of the structure.

The use of explosives to demolish smokestacks, silos, cooling towers, or similar structures shall be permitted only if there is a minimum of 90^0 of open space extended for at least 150% of the height of the structure or if the explosives specialist can demonstrate consistent previous performance with tighter constraints at the site.

FIRE PRECAUTIONS:

The presence of fire near explosives presents a severe danger. Every effort shall be made to ensure that fires or sparks do not occur near explosive materials. Smoking, matches, firearms, open flame lamps, and other fires, flame, or heat-producing devices will be prohibited in or near explosive magazines or in areas where explosives are being handled, transported, or used. In fact, persons working near explosives shall not even carry matches, lighters, or other sources of sparks or flame. Open fires or flames shall be prohibited within 100 feet of any explosive materials. In the event of a fire which is in imminent danger of contact with explosives, all employees will be removed to a safe area.

Electrical detonators can be inadvertently triggered by stray RF (radio frequency) signals from two-way radios. RF signal sources shall be restricted from or near to the demolition site, if electrical detonators are used.

PERSONNEL SELECTION:

A blaster is a competent person who uses explosives. A blaster will be qualified by reason of training, knowledge, or experience in the field of transporting, storing, handling, and using explosives. In addition, the blaster shall have a working knowledge of state and local regulations that pertain to explosives. Training courses are often available from manufacturers of explosives and blasting safety manuals are offered by the Institute of Makers of Explosives (IME) as well as other organizations.

Blasters shall be required to furnish satisfactory evidence of competency in handling explosives and in safely performing the type of blasting required. A competent person shall always be in charge of explosives and shall be held responsible for enforcing all recommended safety precautions in connection with them.

TRANSPORTATION OF EXPLOSIVES

VEHICLE SAFETY:

Vehicles used for transporting explosives shall be strong enough to carry the load without difficulty, and shall be in good mechanical condition. All vehicles used for the transportation of explosives shall have tight floors, and any exposed spark-producing metal on the inside of the body shall be covered with wood or some other non-sparking material.

Vehicles or conveyances transporting explosives shall only be driven by, and shall be under the supervision of, a licensed driver familiar with the local, state, and Federal regulations governing the transportation of explosives. No passengers shall be allowed in any vehicle transporting explosives.

Explosives, blasting agents, and blasting supplies shall not be transported with other materials or cargoes. Blasting caps shall not be transported with other materials or cargoes.

Blasting caps shall not be transported in the same vehicle with other explosives. If an open-bodied truck is used, the entire load shall be completely covered with a fire and water-resistant tarpaulin to protect it from the elements. Vehicles carrying explosives shall not be loaded beyond the manufacturer's safe capacity rating, and in no case shall the explosives be piled higher than the closed sides and ends of the body.

Every motor vehicle or conveyance used for transporting explosives shall be marked or placarded with warning signs required by OSHA and the DOT.

Each vehicle used for transportation of explosives shall be equipped minimally with at least 10 pound rated serviceable ABC fire extinguisher. All drivers shall be trained in the use of the extinguishers on their vehicle.

In transporting explosives, congested traffic and high density population areas shall be avoided, where possible, and no unnecessary stops shall be made. Vehicles carrying explosives, blasting agents, or blasting supplies shall not be taken inside a garage or shop for repairs or servicing. No motor vehicle transporting explosives shall be left unattended.

STORAGE OF EXPLOSIVES

INVENTORY HANDLING AND SAFE HANDLING:

All explosives will be accounted for at all times and all not being used will be kept in a locked magazine. A complete detailed inventory of all explosives received and placed in, removed from, and returned to the magazine shall be maintained at all times. Appropriate authorities will be notified of any loss, theft, or unauthorized entry into a magazine.

Manufacturers' instructions for the safe handling and storage of explosives are ordinarily enclosed in each case of explosives. The specifics of storage and handling are best referred to these instructions and the aforementioned IME manuals. They shall be carefully followed. Packages of explosives shall not be handled roughly. Sparking metal tools shall not be used to open wooden cases. Metallic slitters may be used for opening fiberboard cases, provided the metallic slitter does not come in contact with the metallic fasteners of the case.

The oldest stock shall always be used first to minimize the chance of deterioration from long storage. Loose explosives or broken, defective, or leaking packages can be hazardous and shall be segregated and properly disposed of in accordance with the specific instructions of the manufacturer. If the explosives are in good condition it may be advisable to repack them. In this case, the explosives supplier shall be contacted. Explosives cases shall not be opened or explosives packed or repacked while in a magazine

STORAGE CONDITIONS:

Providing a dry, well ventilated place for the storage of taken to make sure mats and other protection do not disturb the explosives is one of the most important and effective safety measures. Exposure to weather damages most kinds of explosives, especially dynamite and caps. Every precaution shall be taken to keep them dry and relatively cool. Dampness or excess humidity may be the cause of misfires resulting in injury or loss of life. Explosives shall be stored in properly constructed fire and bullet-resistant structures, located according to the IME American Table of Distances and kept locked at all times except when opened for use by an authorized person. Explosives shall not be left, kept, or stored where children, unauthorized persons, or animals have access to them, nor shall they be stored in or near a residence.

Detonators shall be stored in a separate magazine located according to the IME American Table of Distances.

DETONATORS SHALL NEVER BE STORES IN THE SAME MAGAZINE WITH ANY OTHER KIND OF EXPLOSIVE

Ideally, arrangements shall be made whereby the supplier delivers the explosives to the job site in quantities which will be used up during the workday. An alternative would be for the supplier to return to pick up unused quantities of explosives. If it is necessary for the Company to store his explosives, he shall be familiar with all local requirements for such storage.

PROPER USE OF EXPLOSIVES:

Blasting operations shall be conducted between sunup and sundown, whenever possible. Adequate signs shall be sounded to alert to the hazard presented by blasting. Blasting mats or other containment shall be used where there is danger of rocks or other debris being thrown into the air or where there are buildings or transportation systems nearby. Care shall be taken to make sure mats and other protections do not disturb the connections to electrical blasting caps.

Radio, television, and radar transmitters create fields of electrical energy that can, under exceptional circumstances, detonate electric blasting caps. Certain precautions will be taken to prevent accidental discharge of electric blasting caps from current induced by radar, radio transmitters, lightning, adjacent power lines, dust storms, or other sources of extraneous or static electricity.

These precautions shall include:

- Ensuring that mobile radio transmitters on the job site which are less than 100 feet away from electric blasting caps, in other than original containers, shall be de-energized and effectively locked;
- The prominent display of adequate signs, warning against the use of mobile radio transmitters, on all roads within 1,000 feet of the blasting operations;
- Maintaining the minimum distances recommended by the IMES between the nearest transmitter and electric blasting caps;
- The suspension of all blasting operations and removal of persons from the blasting area during the approach and progress of an electric storm.
- After loading is completed, there shall be as little delay as possible before firing. Each blast shall be fired under the direct supervision of the blaster, who shall inspect all connections before firing and who shall personally see that all persons are in the clear before giving the order to fire. Standard signals, which indicate that a blast is about to be fired and a later all clear signal have been adopted. It is important that everyone working in the area be familiar with these signals and that they be strictly obeyed.

PROCEDURES AFTER BLASTING

INSPECTION AFTER THE BLAST:

Immediately after the blast has been fired, the firing line shall be disconnected from the blasting machine and short-circuited. Where power switches are used, they shall be locked open or in the off position. Sufficient time shall be allowed for dust, smoke, and fumes to leave the blasted area before returning to the spot.

An inspection of the area and the surrounding rubble shall be made by the blaster to determine if all charges have been exploded before employees are allowed to return to the operation. All wires shall be traced and the search for unexploded cartridges made by the blaster.

DISPOSAL OF EXPLOSIVES:

Explosives, blasting agents, and blasting supplies that are obviously deteriorated or damaged shall not be used, they shall be properly disposed of. Explosives distributors will usually take back old stock. Local fire marshals or representatives of the United States Bureau of Mines may also arrange for its disposal. Under no circumstances shall any explosives be abandoned.

Wood, paper, fiber, or other materials that have contained high explosives shall not be used again for any purpose, but shall be destroyed by burning. These materials shall not be burned in a stove, fireplace, or other confined space. Rather, they shall be burned at an isolated outdoor location, at a safe distance from thoroughfares, magazines, and other structures. It is important to check that the containers are entirely empty before burning. During burning, the area shall be adequately protected from intruders and all persons kept at least 100 feet from the fire.

This safety guideline is intended to provide suitable information to all **CSE** employees regarding the potential toxic effects of H_2S so that adequate measures can be taken to limit exposures through controls in the workplace.

Authorized Personnel:

Name of Employee	Date Last Trained

I. GENERAL

Hydrogen sulfide is ever present in all refineries. In addition it is generated in many industrial processes as a by-product and also during the decomposition of organic matter containing sulfur.

Hydrogen sulfide (H_2S) is a colorless gas that at low concentrations has the odor of rotten eggs. At high concentrations, it kills your sense of smell.

- Formula H_2S
- CAS No.: 7783-06-04

H_2S is a highly flammable and extremely toxic gas that can form an explosive mixture with air over a wide area.

II. CHARACTERISTICS OF HYDROGEN SULFIDE

When ignition occurs, the combustion produces irritants and toxic gases, including sulfur dioxide (SO_2). SO_2 has an irritating effect on the eyes and lungs and can be fatal at concentrations about 100PPM.

H_2S is heavier than air, has a tendency to settle in low-laying areas, and is readily dispersed by wind movements or currents.

H_2S attacks most metals, especially in the presence of water, forming sulfides that are usually insoluble precipitates. It is also very corrosive to plastics and tissue.

H_2S dissolves in water forming a weak acid (hydro sulfurous acid).

H_2S will be released when in water when agitated making it a dangerous hidden hazard.

III. HEALTH EFFECTS:

The following information outlines the symptoms of hydrogen sulfide at specific concentrations.

10 PPM (0.001% H_2S)

- Obvious and unpleasant odor.
- Burning eye irritation.
- Permissible exposure limit is eight hours.

200 PPM (0.02% H_2S)

- Kills smell quickly.
- Stings eyes and throat.
- Respiratory irritation.
- Death after one to two hours of exposure.

500 PPM (0.05% H_2S)

- Dizziness. Breathing ceases within a few minutes.
- Requires prompt artificial respiration.
- Loss of muscle control, making self-rescue impossible.

1000 PPM (0.10% H_2S)

- Unconsciousness at once, followed by death within minutes.

IV. EXPOSURE WARNING

H_2S CAN PARALYZE THE SENSE OF SMELL. DO NOT USE THE SENSE OF SMELL TO DETECT H_2S.

V. H_2S DETECTION AND ALARM SYSTEMS

In most refineries emergency employee alarms are installed to meet the regulatory standards. The alarms provide warning for the necessary emergency action according

to the site emergency action plan and provide time for employees to safely escape from the workplace or the immediate area.

Systems are also used on drilling locations, offshore platforms and produce H_2S, and some plants. It is not readily used on land production leases. Signs are and should be posted stating the presence of poison gas and urging caution.

VI. WARNING CONDITIONS

There are three conditions that you must be aware of when working around H_2S. The following information identifies the level of danger and alarms associated with each condition.

Condition Green

- Possible Danger
- No Alarms

Condition Yellow

- Moderate Danger
- H_2S to 50 PPM
- Intermittent Audible Alarm and Yellow Flashing Light

Condition Red

- Extreme Danger
- H_2S at 50 PPM or Above
- Continuous Audible Alarm and a Red Flashing Light

VII. HYDROGEN SULFIDE DETECTION DEVICES

Fixed H_2S detection devices (monitor and indicator) are designed to detect H_2S concentrations in air and established TWA (time weighted average) (10 PPM) and STEL (15 PPM).

The alarm should be capable of being perceived above the ambient noise or light levels in the affected area. The alarm should be distinctive and recognizable as a sign to evacuate the area and to start emergency status emergency procedures.

VIII. PERSONAL MONITORS

Personal monitors are also available in many types. They are also designed with the employee's safety in mind. Familiarize yourself with the equipment available at your current work assignment.

IX. PLANT MONITORS

Plant monitors are available in many types and are designed with the employee's safety in mind. Familiarize yourself with the equipment available at your current work assignment.

In order to respond effectively in an emergency situation, every individual at the site should know their specific responsibilities. Whether or not an individual has an assigned duty, each individual should know what to do in the even of an emergency.

X. EVACUATION

Follow these procedures in the even of a hydrogen sulfide release that requires evacuation:

- Hold your breath and quickly leave the area containing H_2S. Do not inhale.
- Move quickly to the upwind "Safe Breathing Area" to receive instructions.
- Always be conscious of the wind and constantly monitor wind direction. Wind socks and streamers show which direction the wind is blowing so that you can determine the proper safe breathing area.

XI. SCBA ESCAPE

- When in an area, on some client's premises, which has required you to be trained to use or wear an escape respirator such as an SCBA, put on your SCBA and help anyone who appears to be affected by the gas.
- Before taking off your make, ensure that the air you will breathe is safe.
- Always be conscious of the wind and constantly monitor wind direction. Wind socks and streamers show which direction the wind is blowing so that you can determine the proper safe breathing area.

XII. EMERGENCY RESCUE AND FIRST AID

WARNING

To prevent risk and injury to other personnel, re-entry into an area of unknown concentration of H_2S will require the use of self-contained breathing equipment and backup personnel.

- Wear a full rescue unit (minimum 30-minute breathing apparatus) before attempting a rescue.

- Remove the victim immediately to fresh air.
- If breathing, maintain the victim at rest and administer respiration immediately.
- If the victim is not breathing, start artificial respiration immediately.
- Call an ambulance and get the victim medical treatment.
- Keep the victim lying down with a blanket or coat under the shoulders to keep airway passage open. Conserve the victim's body heat and do not leave the victim unattended.
- If the eyes are affected by H_2S, wash them thoroughly with clear water. For slight eye irritation, cold compresses are helpful.
- A victim should not return to work until authorized to do so by a physician, even if the victim has had minor exposure and has not completely lost consciousness.

XIII. PPE (PERSONAL PROTECTIVE EQUIPMENT)

Depending on the exposure i.e., the amount of gas in the air and the type of work, employees will be required to wear different levels of PPE. Examples of protection include:

- When the exposure level is near or above 10 PPM, you will be required to wear self contained fresh air gear.
- Wear chemical goggles or a face shield when eye contact with this material is possible.
- Avoid skin contact. Wear proper clothing such as impervious gloves, long sleeves, apron, and boots.

XIV. VENTILATION (INDOOR)

Use adequate general and local exhaust ventilation to keep atmospheric vapor concentrations below the occupational exposure limits.

XV. EYEWASH AND SHOWERS

Safety showers and eyewash stations must be available in the vicinity of a potential exposure to the material. Familiarize yourself with the location of these facilities before starting the job.

XVI. TRAINING

All employees will be provided awareness training in this program in order to be familiar with the potential hazards and proper safe work procedures to follow if exposed to this health hazard. The training will be provided prior to working in any job with potential exposure to H_2S operations.

The purpose of hydrogen sulfide training is to familiarize employees with the governmental regulations affecting H_2S operations. Employees will learn the necessary skills to recognize, detect, and use the proper safety equipment in the event of an H_2S incident.

PURPOSE:

The purpose of the Hazard Analysis is to provide a method for a supervisor and his/her crew to inspect an upcoming job, identify potential hazards related to that job, and to arrive at agreement on the development of a Safe Work Plan for completing their assignment.

POLICY:

Once the client/owner has issued a permit, it is each CSE employee's responsibility to ensure that the Safe Work Plan for the work he/she is about to do is properly developed. After receiving a valid work permit from the client/owner and before starting a job, each crew shall review the permit requirements and perform a thorough Hazard Analysis. The Hazard Analysis process serves as CSE's Safe Work Plan. As such, by completing the process and signing on the back of the form, employees are indicating that they are prepared to accomplish the assigned task efficiently and safely.

In the event conditions change, the Hazard Analysis Form must be updated. Potential hazards, including those specific to the task and those general to the work area, must be discussed and a plan formulated to eliminate or minimize identified hazards. Each person on the crew must understand his/her role relating to the tasks at hand. When a new worker is assigned to a job in progress, the Hazard Analysis must be reviewed with this person and he/she must sign the form before beginning work.

PROCEDURE:

1. Once the client/owner work permit has been issued, the assigned crew shall conduct a thorough Hazard Analysis session at the job site, which includes, but is not limited to:
   a) Walking the job and reviewing all elements of the assignment. The supervisor shall identify all equipment that is to be worked on.
   b) Identifying existing and/or potential hazards and take appropriate action to eliminate or minimize identified hazards; reaching agreement on the safest plan to complete the assigned task. Each person on the crew must thoroughly understand their role in the upcoming tasks.
   c) Evaluating PPE requirements and upgrading permit required PPE or providing additional PPE whenever necessary to provide maximum level of employee protection.
   d) Ensuring that all workers know and are properly trained for their assignment(s).
   e) Posting the completed form(s) along with the work permit in a conspicuous place in the work area. In the event it is not possible to post the form(s), they shall be kept readily available at the job site. The forms shall be kept in a manner that protects them from weather damage.
2. Whenever possible the supervisor shall be involved in the Hazard Analysis Session. However, there are times when this is not possible. Should the supervisor find that he/she will not be available, he/she shall assign a competent person to lead the session. As soon as practical following the beginning of a job, the supervisor shall review all Hazard Analysis Forms of crews assigned to him/her and sign the back of the form in the section provided.

GENERAL INSTRUCTIONS:

- Print and make sure the form is legible/readable. The only place you do not print required information is when you place your signature on the back of the form.
- Involve the entire crew in the process. The more eyes and experience used to identify hazards, the better.
- Whenever possible, the completed Hazard Analysis should be reviewed for proper completion and signed by the designated lead person, foreman, supervisor or Safety dept. representative **before** the work is started. If this is not possible, the form should be reviewed as soon as practical.
- When the form (s) is completed, it must be posted & readily available at the job site.

Front of Hazard Analysis Form–

Description of job – The first step of hazard analysis is to accurately describe the work to be performed. This will provide the basis for the rest of the process. At the top of the form, provide a brief, but specific description of the job you will perform.

Date and Time – Enter the date the work will be performed and the time you started the Hazard Analysis process.

Location – Enter the name of the facility where the work will be performed. For example:

Equilon – LARC or *Tosco – Rodeo*

Supervisor – Enter the name of the immediate foreman or supervisor.

Client Contact – Enter the name of the client contact person for that job.

Crew – Clearly **print** the name(s) of each person that will be working on the job. This may include non-CSE employees, such as other contractors or client personnel working with you.

Unit – Enter the name of the unit where the work will be performed. For example:

DCU or *#2 Alky*

Equipment – Enter the number or name of the equipment you will be working on. Be as specific as possible. Make sure that you are preparing to work on the right equipment. If there is no number or name for the equipment, enter the number or name of the equipment it is connected to. For example:

E-2370 or *Tank (Tk) 700* or *Drain line from tk 1501*

Product – Enter the name of the product or material that is present or that was present when the equipment/line was in service. In addition, if the equipment/line was flushed or cleaned before the work is performed, indicate that on the form.

Permit Numbers – Enter the number from the client permit(s) in the appropriate section. Some jobs may have multiple permits.

Location of – (Enter the location of the nearest):

Telephone – This is the telephone that would be used to report an emergency (*i.e. – operators shack).* If there is no telephone in the immediate area, indicate how you would report an emergency (*i.e. – radio, cell phone).*

Emergency Phone No.(s) – Enter the phone number(s)/radio channel(s) for reporting emergencies at that location

Fire Extinguisher – Enter the location of the nearest portable fire extinguisher. Be sure to check the extinguisher and verify that it is fully charged, is operational, and has been inspected within the past year. Report any extinguisher that appears to be inoperable, damaged, discharged or in need of service.

Eyewash/Safety Shower – Enter the location of the nearest eyewash/safety shower. If it is alarmed, check with the unit operator before activating. If it is not connected to an alarm system, verify that it is operational by activating the control lever/device, until the water flows clear. Once the system is flushed be sure to replace the protective caps on the eyewash applicators.

Yes, No, N/A Questions – Each one of these questions requires an answer. Carefully consider each question and how it will affect or apply to the work being performed. If the question doesn't apply to the job, mark it "N/A" (Not applicable). Each question is important.

Back of Hazard Analysis form –

Fall Protection – Answer the first question in this section. If you check "No", then you can move on to the next section. If you check "Yes", then you must complete the entire Fall Protection section. Make sure that workers are properly trained in the use of fall protection equipment.

Scaffold User Inspection – Answer the first question of this section. If you check "No" then you can move on to the next section. If you check "Yes", then you must conduct a thorough inspection of the staging prior to use and complete the entire Scaffold User Inspection section.

If the scaffold is yellow-tagged, identify the hazard(s) that require the yellow tag (*i.e. – hole in deck, missing guardrail, restricted access*).

Job Steps – Briefly outline or list the steps necessary to safely complete the job from start to finish. For example:

Inspect/Prepare job site, obtain permit, complete Hazard Analysis form and review with crew, obtain/inspect tools and PPE, perform job, cleanup, return tools.

Existing Hazards – List hazards that are present at the job site. These will primarily be existing physical hazards. For example:

Elevated work, uneven surfaces, confined space, high noise levels, pinch points, conflicting work above/below, weather conditions.

Potential Hazards – List hazardous conditions that may be created/exposed while doing the work. For example:
Hot Pipes, product release, exposure to hazardous material(s), sparks/slag, heavy lifting, explosive atmosphere.

Action Taken To Eliminate or Minimize Hazards – List what you are going to do to eliminate or control each of the identified hazards.

Crew/Employee Signatures – Now that you have filled in the blanks and answered the questions, review the Hazard Analysis form with all crewmembers and any other contractor client personnel working on the job. When each crew member understands the hazards present, is properly trained for their assigned task and understands how to complete the work safely, they must sign their name in the same numbered space as they printed their name on the front of the form. Do not sign if you don't understand or aren't properly trained.

Hazard Analysis session lead by – The supervisor or foreman or lead person that conducts the Hazard Analysis review with all crew members and checks the form for proper completion must print and sign their name and indicate the date and time the review was held.

Now you can start the job! Remember, the form is complete, but **the process continues**. Always remain alert for changing conditions. The Hazard Analysis form must be modified/updated if conditions change or new hazards are found. Any modifications must be communicated with all crewmembers. *Remember to review the Hazard Analysis with any new crewmembers that are added while the job is in progress. Their name(s) and signature(s) must also be added to the Hazard Analysis form.

Post all completed forms in a conspicuous and readily available location.

(COMPANY NAME HERE)

HAZARD ANALYSIS/SAFE WORK PLAN – GENERAL WORK

THIS CREW IS TO PERFORM THE FOLLOWING:

DATE TIME	LOCATION	LOCATION OF:	PPE ✓ Check Applicable
SUPERVISOR	CLIENT CONTACT	Telephone Emergency Phone No. (s)?	❑ MINIMUM Hard Hat, Safety Glasses with Side Shields, Goggles, Ear Plugs, Gloves, Fire Retardant Coveralls, Work Boots
CREW: (Print name below and sign in the same numbered space on the back of this sheet.			
☐ ☐	UNIT		
☐ ☐	EQUIPMENT	Fire Extinguisher	ADDITIONAL ALWAYS provide maximum level of worker protection
☐ ☐	What product is/was in equipment?	Eyewash/Safety Shower	❑ Vibration Dampening Gloves
☐ ☐			❑ Knee Pads
☐ ☐	All permit numbers must be listed below.	Evacuation Area Primary:	❑ Face Shield
☐ ☐	HOT WORK #		❑ Ear Muffs ❑ Safety Harness & Lanyard
☐ ☐	COLD WORK #	Secondary:	❑ Supplied Air ❑ Half Face Respirator
☐ ☐	UNIT ENTRY #		❑ Full Face Respirator ❑ Acid Gear
☐ ☐	CONFINED SPACE #	IF IN DOUBT,?? STOP AND ASK!!	❑ Rain Suit ❑ Rubber Gloves ❑ Rubber Boots
☐ ☐	OTHER #		❑ Other

Crew PSM trained?	YES	NO	N/A	Motorized equipment inspected?	YES	NO	N/A
Crew properly trained for job?	YES	NO	N/A	Operator(s) trained? Operator(s) on approved list?	YES	NO	N/A
Entire crew knows emergency evacuation procedure?	YES	NO	N/A	Rigging (slings, ropes, wire ropes, come-alongs, chain hoists) inspected and found safe?	YES	NO	N/A
Actions taken to prevent worker exposure to Hazardous Material?	YES	NO	N/A	Equipment blocked, de-pressured and drained?	YES	NO	N/A
Crew knows potential hazards?	YES	NO	N/A	Equipment locked/tagged out?	YES	NO	N/A
Crew knows location of MSDS?	YES	NO	N/A	GFCI's/low voltage lighting used?	YES	NO	N/A
Entire crew familiar with safety manual?	YES	NO	N/A	Crew knows hand signals?	YES	NO	N/A
Weather presents a problem?	YES	NO	N/A	Crew aware of pinch points?	YES	NO	N/A
Conflicting jobs in area?	YES	NO	N/A	Tools/equipment inspected and found safe?	YES	NO	N/A
Barricades installed as needed & tagged?	YES	NO	N/A	Tool holders available for use with knocker wrench?	YES	NO	N/A
Work area clean, orderly & safe?	YES	NO	N/A	Equipment blinded?	YES	NO	N/A
Hoses and cords out of walkways?	YES	NO	N/A	Correct type of blinds & gaskets for job?	YES	NO	N/A
Drains properly covered?	YES	NO	N/A	Is work in confined space?	YES	NO	N/A
Work area clear of flammable hazards?	YES	NO	N/A				

PURPOSE:

The Ladder Safety Policy is intended to provide employees with safe guidelines for the use of portable ladders, while complying with applicable OSHA and other Regulatory Compliance Standards. This policy is designed to meet or exceed ANSI requirements.

POLICY:

Except where either permanent or temporary stairways or suitable ramps or runways are provided, employees are to only use manufactured portable ladders that are labeled as being designed and manufactured in accordance with the provisions of the American National Standards Institute. Under no circumstances are portable ladders to be used unless conditions are considered safe, secure and in compliance with OSHA and company procedures and safe work practices.

PROCEDURES:

1. The use of ladders with broken or missing rungs or steps, broken or split side rails, or other faulty or defective construction is prohibited. All rungs, cleats, and steps will be parallel, level and uniformly spaced when the ladder is being used. All ladders will be inspected prior to use by a competent person. When ladders with such defects are discovered they must be immediately removed from service and tagged as such.
2. Employees will face the ladder and will not carry material or tools in their hands while ascending or descending.
3. Ladders will not be loaded beyond the maximum intended load for which they were built or beyond the manufacturer's rated capacity.
4. All ladders shall be placed on secure footing, and the area around the top and bottom will be kept clear of work materials, tools and debris.
5. Planks will not be used on the top step of stepladders.
6. Portable ladders will be placed and used at a pitch that places the horizontal distance, from the top support to the foot of the ladder, at about one-quarter of the working length of the ladder. Ladders will not be used in a horizontal position as a platform, runway or scaffold.
7. Ladders shall not be placed in front of doors, unless door is blocked open, and/or a barricade or guard is provided.
8. Ladders shall not be placed on scaffold, boxes, boards, barrels, or other unstable bases.
9. Ladders shall not be spliced together.
10. Employees will not stand on the topcap or the step below the topcap of a stepladder.
11. Any ladder splashed with caustic or acid shall not be used until thoroughly cleaned and inspected for possible corrosive damage.
12. There shall be ample clearance and clear access at the top and bottom of portable ladders.
13. Portable rung ladders shall only be used with the metal supports on the under side.

14. No ladder shall be used to gain access to a roof unless it extends at least 3 feet above the point of highest support with the building. Side rails must extend not less than 36" above any landing. When this is not practical, grab rails will be provided to facilitate employee movement to and from the point of access.
15. Portable metal ladders will not be used for electrical work or where they may contact electrical conductors.
16. All ladders shall be equipped with non-slip bases when a hazard of slipping exists.
17. All ladders will be tied off on top, blocked or otherwise secured to prevent movement before work is performed from them.
18. All ladders must have a minimum width of 12 inches. All ladders must have a distance of 12" between rungs.
19. The company prefers not to use or issue chain ladders, however if a client provides or mandates chain ladder usage, a thorough pre-use inspection of the ladder(s) must be performed. When there is a need for this type of ladder, wire rope ladders are preferred.
20. Stepladders shall not exceed 20 feet in length.
21. Extension ladders shall be equipped with positive stops.
22. Ladders shall be maintained in good condition.
23. Only one employee is to work on or climb a ladder at the same time.
24. All work done from a ladder shall be within an individual's normal reach and with no overextending allowed.
25. All work done from a ladder that exposes a worker to a fall potential of 6 feet or more requires the worker to wear a harness and be tied off per the Fall Protection Policy. Employees are not permitted to stand or work off of the top three rungs or cleats of a ladder unless there are members of the structure that provide a firm handhold, or the employee is protected by personal fall protection

PLAN YOUR WORK, AND THEN WORK YOUR PLAN SAFELY!!!

FALL PROTECTION

Is work being performed at an unprotected elevated area where workers may be exposed to a fall of 6 feet or more? Note: Client/Owner or working conditions may require fall protection at lower elevations. If yes, complete the following information.				Yes	No
Have workers that require fall protection been provided with a full body harness, appropriate lanyard(s) with shock absorbing device and boom strap (if needed)?	Yes	No	Is static line required? If yes, has it been inspected by a competent person prior to use?	Yes Yes	No No
Have all workers completed fall protection training?	Yes	No	Are adequate anchor points present?	Yes	No
Has all fall protection equipment been inspected prior to use and found to be in safe condition?				Yes	No
List any other fall protection equipment required:					

SCAFFOLD USER INSPECTION: Does job require use of scaffold? YES ☐ NO ☐ If yes, complete the section below.

Inspect the following items before using *(Check box when found safe for use)* ☑

Top and mid rails in place	☐	Bars and clamps tight and secure	☐
Toe boards and falling object protection in place and secure	☐	Ladders in place and secure	☐
Weather conditions do not present a hazard	☐	Holes in decks adequately covered	☐
Planks in safe condition and secured	☐	Free of slipping and/or tripping hazard	☐
Personnel barriers installed on hot lines/equipment	☐	Scaffolding properly tagged	☐
Free of overhead hazards	☐	*Enter Maximum Load Allowed* *(Heavy Duty Formula is Square Feet x 75 PSF = Max Capacity in pounds)*	
List any hazards:			

Steps of Task (List steps necessary to completed the task)	**Potential Hazards** Evaluate hazards associated with Tools being used, Methods employed to accomplish task, Materials required to complete task, and Working Environment/Conditions	**Controls** (Identify preventative measures to be used to control each identified hazard)	PSM standards require employees to be trained on the hazards associated with each task. Do not sign this form unless you have been trained and understand the potential hazards associated with this task. If you have not been trained, do not understand or feel you can not complete this job safely, speak to your supervisor before starting work.
			Sign your name:
			1
			2
			3
			4
			5
			6
			7
			8
			9
			10

Hazard Analysis session lead by: *(circle one)* *Supervisor* *Lead Person* *Other*

Print Name: Signature: Date: Time:

Reviewed By: *(circle one)* *Supervisor* *Safety* *Other*

Print Name: Signature: Date: Time:

This safety guideline is intended to provide suitable information to all **CSE** employees regarding the potential effects of Lead and where lead may be found so that adequate measures can be taken to limit exposures through controls in the workplace.

Authorized Personnel:

Name of Employee	Date Last Trained

I. GENERAL

The objective of this guideline is to prevent absorption of harmful quantities of lead. The guideline is intended to protect employees from the immediate toxic effects of lead and from the serious toxic effects that may not become apparent until years of exposure have passed.

II. CHARACTERISTICS & WHERE IT CAN BE FOUND

To understand why lead is so hazardous, it is important to know what it is, the hazardous effects on people, and which materials do or may contain lead. Once this is understood, employees will gain a respect for the safety guidelines set forth in this policy.

What Is It?

Pure lead (Pb) is a heavy metal and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.

Where Can It Be Found?
Lead can be found in:
- Old glossy paints used on walls and pipe.
- Building and roof metal support frames.

Report to the Contracting Company's Project Manager anytime you suspect lead-containing materials that may not have been disclosed:
- Cracked or pealing paint,
- Visible paint dust, grindings, or shavings.

III. HEALTH EFFECTS:

I. **Ways in which lead enters your body.**
Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). When lead is scattered in the air it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed.

Hazards encountered with lead occur when:
- Inhaling lead as a dust, fume or mist.
- Ingesting lead through food, cigarettes, and chewing tobacco when handled with contaminated hands.

Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume or mist it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up, which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion.

A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood system, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.

II. **Effects of overexposure to lead -(1) Short-term (acute) overexposure**.
Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter

of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short-term dose of lead can lead to acute encephalopathy. Short-term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead and chronic effects, which take longer to acquire. Lead adversely affects numerous body systems and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

(2) Long-term (chronic) overexposure.

Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain.

Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy.

Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible.

Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to

have birth defects, mental retardation, or behavioral disorders or to die during the first year of childhood.

Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigue as a result of decreased oxygen-carrying capacity in the blood.

IV. PROCEDURES:

1.1. Permissible Exposure Limit (PEL)
The current Cal/OSHA lead standard is 50 µg/m^3 as an 8-hour Time Weighted Average (TWA). The standard as it applies to construction is unique in that it groups tasks ***presumed*** to create employee exposures above the PEL of 50 µg/m^3 as an 8-hour TWA, as follows:

LEAD-RELATED CONSTRUCTION TASKS AND THEIR 8-HOUR TWA EXPOSURE LEVELS

> 50 to 500 µg/m^3	**> 500 µg/m^3 to 2,500 µg/m^3**	**> 2,500 µg/m^3**
Manual demolition	Using lead-containing mortar	Abrasive blasting
Dry manual scraping	Lead burning	Welding
Dry manual sanding	Rivet busting	Torch cutting
Heat gun use	Power tool cleaning without dust detection systems	Torch burning
Power tool cleaning with dust collection systems	Cleanup of dry expendable abrasive blasting jobs	
Spray painting with lead paint	Abrasive blasting enclosure movement and removal	

1.2. Action Level
The standard also establishes an action level of 30 micrograms per cubic meter of air (30 µg/m^3), time-weighted average, based on an 8-hour workday. The action level initiates several requirements of the standard, such as exposure monitoring, medical surveillance, and training and education.

1.3. Evaluation Process
The Contracting Company's Project Manager will provide **CSE** employees with results of any evaluation processes and a listing of lead containing material. The Contracting Company will provide all precautions and render the area safe for IPM employees before work begins.

1.4. Medical Surveillance –

If it is found that **CSE** employees have been exposed to lead levels above the Cal/OSHA PEL, they will be placed into a medical surveillance program. The medical surveillance program is part of the Cal/OSHA standard's comprehensive approach to the prevention of lead-related disease. Its purpose is to supplement the main thrust of the standard, which is aimed at minimizing airborne concentrations of lead and sources of ingestion. Only medical surveillance can determine if the other provisions of the standard have effectively protected you as an individual. Compliance with the standard's provisions will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers:

- Who have high body burdens of lead acquired over past years,
- Who have additional uncontrolled sources of non-occupational lead exposure,
- Who exhibit unusual variations in lead absorption rates, or
- Who have specific non-work related medical conditions that could be aggravated by lead exposure (e.g., renal disease, anemia).

In addition, control systems may fail, or hygiene and respirator programs may be inadequate. Periodic medical surveillance of individual workers will help detect those failures. Medical surveillance will also be important to protect your reproductive ability regardless of whether you are a man or woman.

V. SAFETY MEASURES:

CSE employees are not permitted to work in areas where there may be a potential for Lead exposure. If it is necessary to perform any work where the exposure to Lead is about the Cal/OSHA acceptable limits, then **CSE** must implement a comprehensive mandated safety policy and procedure that includes special elements of exposure monitoring, formal medical program, special personal protective equipment, and much more.

Below are listed possible work controls and practices:

1. WELDING, BURNING, AND TORCH CUTTING.

Welding and cutting activities that potentially involve exposure to lead can occur as part of a number of construction projects such as highway/railroad bridge rehabilitation (including elevated mass-transit lines), demolition, and indoor and outdoor industrial facility maintenance and renovation. Lead exposures are generated when a piece of lead-based painted steel is heated to its melting point either by an oxyacetylene torch or an arc welder. In this situation, lead becomes airborne as a volatilized component of the coating.

The amount of time a worker may spend actually welding or cutting can vary from only a few minutes up to a full shift. In addition, the coating being worked on may consist of several layers of lead-based paint, each of which could contain as much as 50% lead. Taken together, these factors suggest that a worker's exposure to

airborne lead during welding or cutting activities can vary widely and may be exceedingly high. Lead burning, a process by which virgin or alloyed lead is melted with a torch or otherwise fused to another lead object, is typically performed in maintenance operations on electrostatic precipitators or during the installation of lead shot, bricks, or sheets in the walls or floors of health-care x-ray units or industrial sites. Lead health hazards in this operation, as in welding and torch cutting, are from lead that is superheated and released into the worker's breathing zone in the form of a fume.

- Engineering Controls. The engineering controls that can be used, depending on feasibility, are:
  - ⇒ Local exhaust ventilation (LEV) that has a flanged hood and is equipped with HEPA filtration may be appropriate where the use of LEV does not create safety hazards. Use of a flexible duct system requires that the welder be instructed to keep the duct close to the emission source and to ensure the duct is not twisted or bent.
  - ⇒ A fume-extractor gun that removes fumes from the point of generation is an alternative to an exhaust hood for gas-shielded arc-welding processes. Such extraction systems can reduce breathing zone concentrations by 70% or more. These systems require that the gun and shielding gas flow rates be carefully balanced to maintain weld quality and still provide good exhaust flow.
  - ⇒ A longer cutting torch can be used in some situations to increase the distance from the lead source to the worker's breathing zone.
  - ⇒ Hydraulic shears can sometimes be used to mechanically cut steel that is coated with lead based-paint. The use of this method is limited by the ability of the shears to reach the cutting area.
  - ⇒ Whenever possible, pneumatic air tools should be used to remove rivets in lieu of burning and torch cutting.

- Work Practice Controls. The following work practice controls will help to reduce worker exposures to lead during welding, burning, and torch cutting:
  - ⇒ Strip back all lead-based paint for a distance of at least 4 inches in all directions from the area of heat application. Chemical stripping, vacuum-shrouded hand tools, vacuum blasting, or other suitable method may be used. However, in enclosed spaces, strip back or protect the workers with air-line respirators.
  - ⇒ Ensure that workers avoid the smoke plume by standing to the side or upwind of the cutting torch whenever the configuration of the job permits.
  - ⇒ Prohibit burning to remove lead-based paint. Paint should be removed using other methods, such as chemical stripping, power tools (e.g. needle guns) with vacuum attachments, etc.

2. MANUAL SCRAPING AND SANDING OF LEAD-BASED PAINTS.
   Hand scraping of lead-based paints involves the use of a hand-held scraping tool to remove paint from coated surfaces. The health hazards in this activity are caused by the lead dust and paint chips produced in the scraping process. Hand sanding can

also produce excessive dust. These activities are typically performed during residential and commercial/institutional lead abatement projects.

- Engineering and Work Practice Controls. Controls that employers can implement to protect workers performing scraping and sanding of lead-based paints are:
  - ⇒ Use of wet-sanding and wet-scraping methods in conjunction with HEPA vacuuming or HEPA mechanical ventilation. Wet methods include misting of peeling paint with water before scraping, and sanding and misting of debris prior to sweeping or vacuuming.
  - ⇒ Use of shrouded power tools with HEPA vacuum attachments. The shroud must be kept flush with the surface.
  - ⇒ Use of techniques with known low exposure potential, such as encapsulation and removal or replacement instead of hand scraping and hand sanding.

VI. REGULATED AREAS:

The Contracting Company will ensure a work plan is designed and implemented that will:

- ✓ Eliminate lead dust or fumes from exposing both work personnel and building occupants.
- ✓ Ensure that unauthorized persons cannot access the area.
- ✓ Use of signage - warning signs shall be provided and displayed at each regulated area, and is posted at all approaches to regulated areas.

VII. TRAINING:

All employees will be provided awareness training in this program in order to be familiar with the potential hazards and proper safe work procedures to follow if exposed to this health hazard.

Training and information will be provided for all employees exposed to lead at or above the action level, or who may suffer skin or eye irritation from lead. The training will inform exposed employees of:

- Specific hazards associated with their work environment,
- Protective measures which can be taken,
- Danger of lead to their bodies (including their reproductive systems), and
- Their rights under the standard.

PURPOSE:

There are various types of tools and equipment used in the workplace for many different purposes. Examples include, but are not limited to, portable hand tools, power tools, pneumatic tools, and powder-actuated tools.

The purpose of this policy is to provide employees with appropriate knowledge relating to the care and use of tools and equipment and to protect employees from hazards associated with improper use of tools and equipment and defective and poorly maintained tools and equipment.

POLICY:

Only trained and/or experienced employees may use/operate tools or equipment. Tools and equipment shall not be modified and they are to be used only for their designed purpose. It shall be the responsibility of the employee to inspect tools and equipment prior to use and to use all tools and equipment in a safe manner. Employees observed abusing, altering, modifying or misusing tools or equipment shall be subject to disciplinary action. Employees shall wear all appropriate personal protective equipment while using tools and equipment. Additionally if a tool or piece of equipment is found to be defective, the tool/equipment shall be red-tagged, taken out of service until it can be replaced or repaired by a qualified person.

It shall be the responsibility Project Manager or Site Superintendent to designate a competent person who will be assigned to be responsible for testing/inspecting and repairing all tools and equipment. All periodic inspections, maintenance and repairs of tools or equipment shall be documented.

To promote safety and efficiency, the following procedures shall be followed:

PROCEDURE:

1. **General Tool Safety**

   Many serious injuries have resulted from the improper use of tools and equipment. Many of these injuries could have been prevented if the following rules were followed:

   Inspection and Maintenance

   All tools shall be identified and inventoried either individually or by group.

   All tools in the inventory shall have a documented inspection at least once every six months. In addition to these periodic documented inspections all tools shall be inspected prior to issue and upon return by the tool room attendants and prior to each use by the user.

   All tools will be kept in good working condition with no modifications.

   All periodic inspections and all maintenance & repairs shall be documented. Completed forms shall be kept in a binder in the tool room or tool trailer for one year. The binder shall contain a copy of the inspection checklist for the type for tools and/or equipment being inspected.

- **Selection**

  Use the right tool for the task instead of trying to make the wrong one fit.

- **Use**

  Keep control of yourself, the tool, and the job. When applying force with a tool, remember that it may slip, break, or just suddenly do its job. Watch your hands and your balance (body mechanics) to avoid injury.

  Vibration Absorbing Gloves are to be made available to workers using pneumatic impact guns or other vibrating equipment. These gloves are required PPE for worker's operating heavy vibrating tools (i.e. jack hammers, 90 guns, impact guns etc.). The use of these gloves are designed to dampen vibration, dissipate impact and absorb shock, they can assist in the prevention of cumulative trauma injury often associated with operating this type of equipment. They only work if you use them.

  Select the right protective equipment for the task and use it properly.

  Do not use tools and equipment that you have not been trained to use.

- **Care**

  Take proper care of your tools and equipment. Keep them stored where they will not get damaged and will not present a hazard.

  Check your tools and equipment prior to use for defects, wear, or damage. Immediately remove from service and tag any defective tools. Damaged tools shall be turned into the tool room for repair or replacement.

- **Supervision**

  Supervisors shall be responsible for ensuring that employees are trained before using a specific tool. Watch your employees at work. Ask them about their immediate assignment and take an interest in finding the safest way to do the job. Then follow up to insure that the tools and equipment in your area are being used safely.

2. Hand Tool Safety

Hand tools shall only be used for the purpose for which they are intended.

All appropriate PPE will be worn while using hand tools.

Wrenches, including adjustable, pipe and socket shall not be used when jaws are sprung to the point of slippage.

Pipe wrench parts (i.e., jaws) are not to be removed and used for anything other than the manufactured use.

The use of snipes and cheater bars or double wrenching to gain leverage **is prohibited.**

Always use tool holder while using hammer and knocker wrenches.

Hand tools shall be tagged and removed from service if any of the following defects are present:

- Impact tools, such as hammers, flange wedges chisels, drift pins, pin bars and knocker wrenches with visible signs of mushrooming, cracking or bending.

- Wooden handle tools, such as hammers, picks, shovels, and brooms with visible sign of cracking, loosening or splintering of the handle.
- Wrenches, such as adjustable, combo and pipe with visible signs of bending, cracking, defective handles or other defects that impair their strength.

3. Electrical Power Tool Safety

All appropriate PPE will be worn while using power tools.

Be sure that the proper permit has been obtained prior to use of electrical power tools.

GFCI's are to be used with all portable electric equipment. GFCI's are to be inspected and tested prior to each use.

Do not connect electrical power unless the operating switch is turned off.

Employee shall avoid loose fitting clothing when operating power tools.

The power source on tools shall be physically disconnected prior to attempting any repairs or attachment replacement.

Protective guards on power tools **shall not** be removed, altered or modified. All guarding will meet the requirements set forth by ANSI B15.1 1926.300 (c)

Trigger/switch locks on power tools are prohibited.

All electrical tools and power cords must be inspected per the Electrical Equipment Safety and Inspection Policy.

Electrical tools and power cords must display the current inspection color code for the current inspection period to it being placed in service.

Electrical tools **shall not** be hoisted or carried by their power cords.

Cords are tripping hazards. Route them so as to minimize interference in walkways. Overhead is preferred.

Electrical power tools shall be tagged and removed from service if any of the following defects are present:

- Electrical power tool cord does not have current inspection color code.
- Power cord is frayed, cut or damaged. The use of electrical tape to cover damage to cords **is prohibited**.
- Defective or faulty on/off switches.
- Loose or defective components

4. Air Power Tool Safety

All hoses exceeding 1/2" inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.

Chicago fittings shall be pinned.

Attachments on air tools shall be secured by retainer pins and rings.

Do not connect air unless the operating switch is turned off.

Do not disconnect tool until air supply is shut off and air pressure is bled off.

Air power tools **shall not** be hoisted or carried by their hoses.

Hoses are tripping hazards. Route them so as to minimize interference in walkways. Overhead is preferred.

Air power tools shall be tagged and removed from service if any of the following defects are present:

- Air power tools, such as air power grinders, impact wrenches, German hacksaws with visible signs of deformities in the body of the tool, improperly functioning actuator, bent or deformed blades, or any signs of obvious damage to the air supply line fittings.
- Hoses must be visually inspected for cracking, signs of aging, worn or damaged connecting fittings, or any other obvious deformities, such as blistering or bulges.

5. Powder Actuated Tool Safety

Only employees who have received an approved training course and license for the particular tool to be used may operate powder-actuated tools.

Toolroom personnel shall not issue powder-actuated tools unless the person requesting the tool can provide a current license for that tool.

Powder-actuated tools shall be tested prior to use to ensure all safeties are functioning.

The fastener **shall not** be loaded until ready for the shot. The tool **shall not** be left unattended unless it is unloaded.

Never point either an empty or loaded tool at any person.

Keep both hands and feet clear of the open-end of the barrel.

In the event of a misfire, the operator shall hold the tool firmly against the work surface for a period of 30 seconds and then follow manufacturer's instructions.

Personnel, other than the operator of the tool, must stay clear of the area where the tool is being used.

Operators of powder-actuated tools shall wear goggles for eye protection while operating these tools.

A sign at least 8 x 10 inches, using boldface type no less than 1 inch in height, shall be posted within 50 feet of the area where the tool is being used. The sign shall bear the following wording:

CAUTION
POWDER-ACTUATED TOOL IN USE

Powder-actuated tools shall be tagged and removed from service if any of the following defects are present:

- Tool has visible signs of worn or damaged parts.
- Missing or malfunctioning parts or accessories.
- Missing operator's instruction manual or missing power load and fastener chart.
- Tool misfires more than one time during use.

6. Abrasive Wheel Machinery

Abrasive wheels shall be used only on machines provided with safety guards as defined:

- The safety guard shall be mounted so as to maintain proper alignment with the wheel, and the strength of the fastenings shall exceed the strength of the guard.
- Grinding machines shall be equipped with flanges
- Abrasive wheel machinery guards shall meet the design specifications of the American National Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels, ANSI B7.1-1970, which is incorporated by reference as specified in Sec. 1910.6.

National Bulb Recycling Corp

January 9, 2015

VRH Construction Corp.
15 Brewster Road
Signature building
Newark Liberty International Airport
Newark, NJ 07114

WORK MANAGEMENT PLAN-Universal Waste
EWR-153.226Bldgs. 14 - 95 - 332
General demolition environmental notes:

As in accordance with New Jersey's Small Quantity Handler (SMQH) Universal Waste Removal Rules: Fluorescent Lamps and thermostats will be packaged in containment boxes each day and will be removed from the jobsite via SMQH Vehicle and sent to the Certified Recycling Plant (ALR-see attached permits and licenses).

Exit signs, batteries and ballasts will be properly contained in universal waste containers and put in the on site waste container along with the fixtures to be transported to SIM's Metal Management, 1 Linden Avenue East, Jersey City, NJ 07305.

A Universal Waste Manifest will be issued daily. Certifications of Proper Recycling will be issued when the recycling process is complete.

Joseph N. Puro, CRP
National Bulb Recycling Corp.
Office: 732-455-8380
Cell: 201-962-67555

Encl: ALR Permits & Licenses (6 pages)

New York State Department of Environmental Conservation
Facility DEC ID : 3135600248

A 1 of 6

NOTICE OF INSPECTION RESULTS

Date : 06/08/2012

Owner : DAVID J GREEN
P O BOX 1550
WATERBURY, CT 06721

Facility : AMERICAN LAMP RECYCLING
26 INDUSTRIAL WAY
WAPPINGERS FALLS, NY 12590

Contact : ROBERT JUDKINS, JR
AMERICAN LAMP RECYCLING
26 INDUSTRIAL WAY
WAPPINGERS FALLS, NY 12590
(845) 896-0058

Compliance Status Determined On : 05/31/2012 1:30 PM

Compliance Status Determined By : JEFFREY C LAWYER
NYS DEC
21 SOUTH PUTT CORNERS ROAD
NEW PALTZ, NY 12561-1696

Basis for Determination : Routine Inspection

Comments :

The facility has an Air Registration for a machine which crushes fluorescent and high intensity discharge lamps and separates the materials into powder, glass, and metal. The emissions generated are controlled by HEPA and carbon filters, and vented to the outside. The machine is referred to as a USA Lights Model 2000. It is operated in an enclosed area under negative pressure, and was in operation at the time of the inspection.

Mercury is the pollutant of concern, and mercury compounds are a listed hazardous air pollutant in 6NYCRR Part 200 and the federal Clean Air Act. Potential and actual mercury emissions (with emission control) from the stack have been calculated to be less than one pound per year. Mercury levels are monitored inside the building on a daily basis to ensure levels are safe.

The differential pressure across the HEPA filters is monitored, and the filters are replaced when the pressure reaches a maximum setpoint. Filter replacement is typically every 6 months. Replacement of the carbon filters is based on processing time and occurs approximately every 5000 hours. This replacement is better than manufacturer (Calgon) recommendations. A meter in the processing room tracks hours of operation, and the hours are recorded daily.

Recordkeeping at the facility is well maintained. This includes when the HEPA and carbon filters are replaced. This information is kept on the computer and can be shown on the hazardous waste manifests. HEPA filters were last replaced on 1/18/2012, and the carbon filters were last replaced on 3/14/2012.

Part 200.7 requires that emission control devices must be kept in proper working condition. The monitoring and recordkeeping associated with the HEPA and carbon filters demonstrates compliance with this requirement.

The company plans to move to Marlboro. A registration application will be submitted to the Department for the new location.

Inspection Details :

A 2-16

This Facility has been inspected for the following requirements, issued permits and active consent orders. Detailed descriptions of Emission Units, Emission Points, Processes and Emission Sources can be found in the listed permits.

Regulation Determinations (No Violations observed at the time of this Inspection):

Regulation : 6 NYCRR 200.7
FACILITY LEVEL

Regulation : 6 NYCRR 201-4.1 (a)
FACILITY LEVEL

A 3 of 6

New York State Department of Environmental Conservation

Registration ID: 3-5136-00133/00001 **Facility DEC ID:** 3-5136-00133

AIR FACILITY REGISTRATION CERTIFICATE
in accordance with 6 NYCRR Subpart 201-4

Registration Issued to: DAVID J GREEN
P O BOX 1550
WATERBURY,CT 06721

Contact: DAVID J GREEN
P O BOX 1550
WATERBURY,CT 06721

Facility: AMERICAN LAMP RECYCLING
55 RIVERVIEW DR
MARLBORO,NY 12542

Description:
Fluorescent and HID lamp dismantling and component separation unit with an enclosed machine. Emissions are reduced by HEPA and carbon filters. Phosphor powder, HEPA filters, and activated carbon are sent to mercury retorting facilities for final recovery of mercury.

Total Number of Emission Points: 1 **Cap By Rule:** No

Authorized Activity By Standard Industrial Classification Code:
4953 - REFUSE SYSTEMS
5093 - SCRAP AND WASTE MATERIALS

Registration Effective Date: 07/16/2012 **Registration Expiration Date:** (Not Applicable)

List of Regulations in Application:

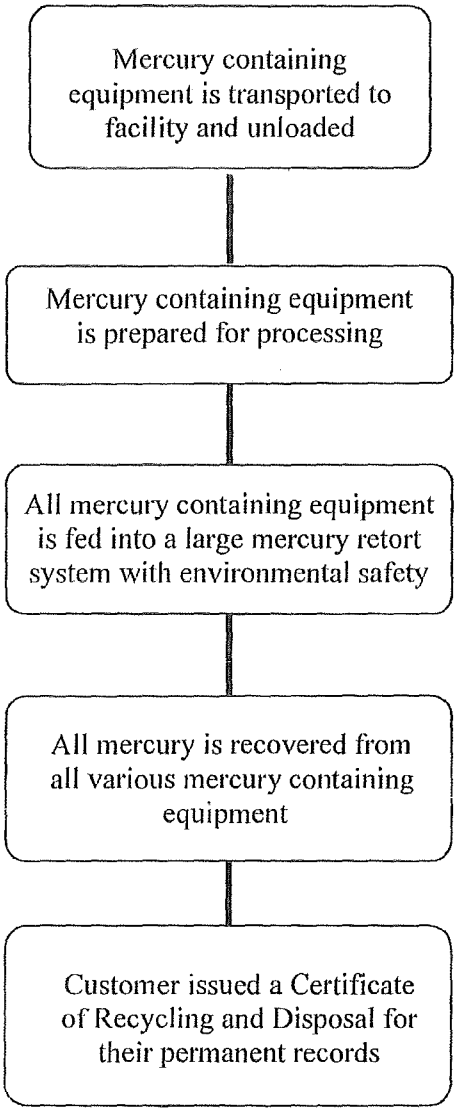
6 NYCRR Part 201	Permits and Certificates
6 NYCRR Part 212	General Process Emission Sources

KENNETH R GRZYB
REGION 3 AIR POLLUTION CONTROL ENGINEER
NYSDEC REGION 3
21 S PUTT CORNERS RD
NEW PALTZ,NY 12561

This registrant is required to operate this facility in accordance with all air pollution control applicable Federal and State laws and regulations. Failure to comply with these laws and regulations is a violation of the ECL and the registrant is subject to fines and/or penalties as provided by the ECL. If ownership of this facility changes, the registrant is required to notify the Department at the address shown above using the appropriate forms and procedures within 30 days after the transfer takes place. The present registrant will continue to be responsible for all fees and penalties until the Department has been notified of any change in ownership.

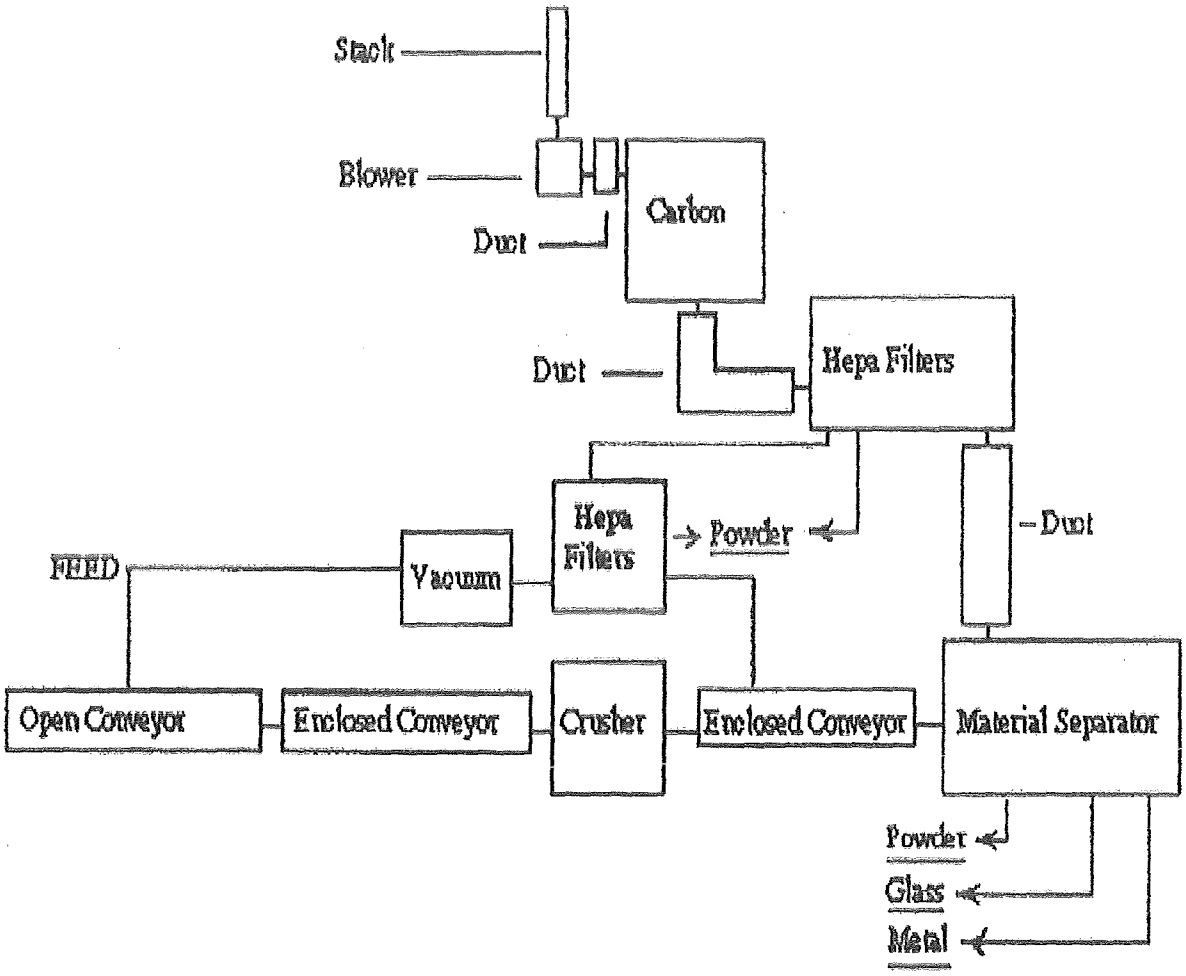
A-4 of 6

MERCURY RECYCLING PROCESS



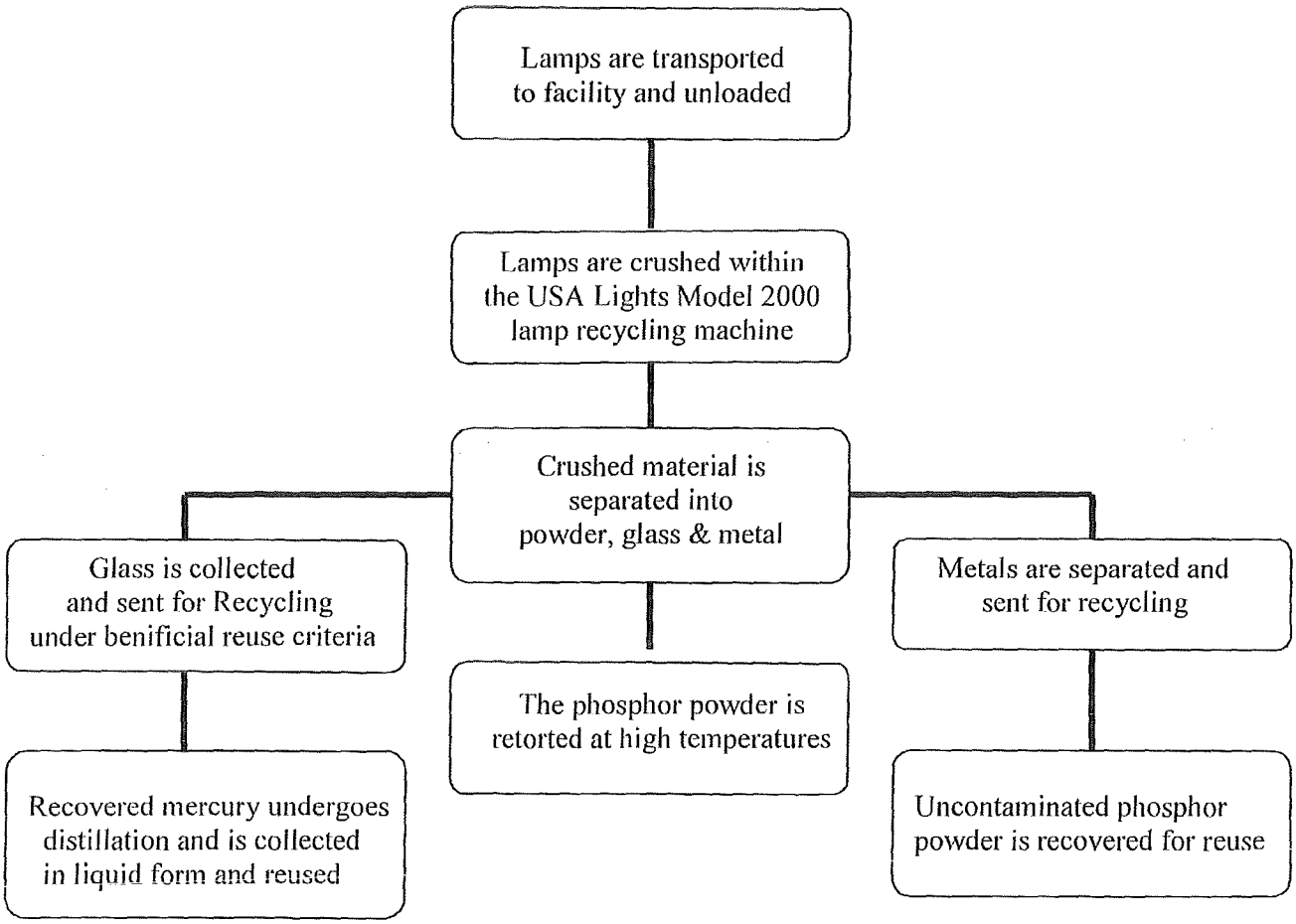
A 5 of 6

American Lamp Recycling, LLC.
"Model 2000"
Lamp Recycling Flow Chart



A 648

LAMP RECYCLING PROCESS



THE PORT AUTHORITY OF NY & N[redacted]

4 WORLD TRADE CENTER
NEW YORK, NY 10006
Phone: (212) 435-5720

[redacted]

TRANSMITTAL

No. C047

[redacted]

PROJECT: EWR - Overnight Aircraft Parking

DATE: 4/1/2015

TO: VRH Construction Corp.
320 Grand Avenue

Englewood, NY 07631

Contract No: EWR-153.226

ATTN: **Gabriela Lachapel**

WE ARE SENDING:	STATUS LEGEND:		SUBMITTED FOR:
☑ Shop Drawings	Approved (APP)	Closed (CLO)	☐ Approval
☑ Letter	Approved as Corrected (AAC)	For Record Only (FRO)	☑ Your Use
☑ Prints	Approved as Noted - Resubmit (ANR)	Incomplete (INC)	☐ As Requested
☐ Change Order	Not Approved (NA)	New Item (NEW)	☐ Review and Comment
☐ Plans	No Exceptions Taken (NET)	No Action Taken (NACT)	
☐ Samples	Reviewed With No Comments (RWNC)	Superseded (SUPS)	
☐ Specifications	Reviewed With Comments - Resubmit (RWC)	UnSubmitted (UNS)	
☑ Other: Made from Submittal CTS 047 ✓	**SENT VIA:** UPS		
	Tracking Number: 1ZV027832598887983		

PACKAGE	SUBMITTAL	DWG. #	REV.	COPIES	DATE	DESCRIPTION	STATUS
02050	02050G0001		R001	3	4/1/2015	Methods & operations of demolition By Bertin Eng	APP

( ) Please make necessary corrections as noted, if any. Place approval form on original of each approved drawing or cut, insert date of approval within same and return _____ prints each. IT IS REQUESTEDTHAT THESE PRINTS BE RETURNED TO US WITHIN 5 DAYS.

( ) The Contract required that the Contractor shall furnish to the engineer one set of drawings, all clearly revised, completed and brought up-to-date showing all of the permanent equipment, materials and construction as actually used.

Your earliest attention to these items would be greatly appreciated so as to avoid delay in the progress of the job.

Prepared By: **Donald Branche**
Contract Manager Specialist

RECEIVED
APR 17 2015
EWR-Senior Resident Engineer
Engineering/Construction Bldg 80

CC: Catherine Nigro,Joseph Chu,Caesar Johnson
FILE W/ATT., VRH Construction Corp. Trans: 047

VRH Construction Corp.

320 Grand Ave.
Englewood, NJ 07631

Phone: 201-871-4422
Fax: 201-871-6727

SUBMITTAL NO. 02050-G0001
PACKAGE NO: 02050

TITLE: Demolition Plan
PROJECT: PANYNJ-EWR-153.226/NJ
DRAWING:
STATUS: 3
BIC: PANYNJ

REQUIRED START: 3/25/2015
REQUIRED FINISH: 4/8/2015
DAYS HELD: 0
DAYS ELAPSED: 68
DAYS OVERDUE: -15

RECEIVED FROM	SENT TO	RETURNED BY	FORWARDED TO
CATANZAR VC	PANYNJ CN	PANYNJ CN	CATANZAR VC

Revision No.	Description / Remarks	Received	Sent	Returned	Forwarded	Status	Sepias	Prints	Drawing Date	Held	Elapsed
000	Bertin Engineering & National Bulb	1/15/2015	1/15/2015	2/19/2015	2/19/2015	7	0	0		0	35
001	Bertin Engineering	3/24/2015	3/24/2015			3	0	0		0	0

This submittal has been reviewed by VRH, checked and approved for compliance with the contract documents.

LETTER OF TRANSMITTAL

VRH AVIATION CONSTRUCTION SPECIALISTS

Action Key

1 For your records and/or use
2 For price quotation
3 For approval
4 Approved/Reviewed
5 Approved as noted: Re-submission not required
6 Approved as corrected: Revise and re-submit
7 Rejected: Re-submit per contract documents
8 Incomplete

To	Catanzaro & Sons Enterprises	Transmittal No.	00078
	10 Gregory Drive	Job No.	2783
		Project	PANYNJ-EWR-153.226/NJ
	Montville, NJ 07045		Overnight Aircraft Prkg.
Attention	Veronica Catanzaro		
Phone No.	973-263-0370 Fax 973-263-8587		

We are sending you herewith the following: ☐ Drawings ☐ Shop Drawings ☐ Samples ☐ Specifications ☒ Other:

Via: ☒ Attached ☐ Separate Cover Via _____

Quantity	Drawing/Submittal No.	Description	Action
1	02050-G0001	Title: Demolition Plan Desc: Bertin Engineering	4

Remarks:

cc:

Signed GLachapel

By Gabriela S. Lachapel

Date 4/2/2015

320 Grand Avenue
Englewood, NJ
07631-4355

Phone
201.871.4422

Fax/Executive
201.871.6727

Fax/Estimating
201.871.0705

Fax/Accounting
201.871.1927

BERTIN ENGINEERING

JOB BE-14-328
SHEET NO. 1 OF
CALCULATED BY JG DATE 3/23/15
CHECKED BY EB DATE
SCALE

BUILDING REVIEW & DEMOLITION SEQUENCING REPORT
BUILDINGS 95 & 332
BREWSTER ROAD, NEWARK LIBERTY AIRPORT, NEWARK, NJ

CAPACITY CHECKS FOR EQUIPMENT

- BUILDING 332 "RUBB" STRUCTURE ROOF TRUSS

USE 50#/LF BY MANUFACTURER (3/20/15 e-mail)
ADD 15% FOR ATTACHED LATERAL BRACING
50 + .15(50) × 130' SPAN = 7,475 lbs SAY 7.5^k
TRY 470G LC w 16'-1" ARM
MIN. CAPACITY = 14.4^k
GRAPPLE ATTACH = 5^k
9.4^k
− 7.5
1.9^k REMAINING OK

- BUILDING 332 ROOF TRUSS "T2"

TOP CHORD WT5 × 22.5 × 60' = 1,350 lbs.
BTM CHORD WT5 × 9.5 × 60' = 570 lbs.
VERTICALS TS4 × 3 × 1/4"
10.5 × 35'± = 368 lbs.

DIAGS 2L's 3 × 3 × 1/4"
9.8 × 65'± = 637 lbs.

LATERALS WT5 × 13 × 8.33' × 2 = 217 lbs.

ROOF 20GA, 3" TYPE 'N' DECK
SAY 9 lbs./LF × 8.33 × 60' = 4,500 lbs
7,642 lbs.

BERTIN ENGINEERING

66 GLEN AVENUE
GLEN ROCK, NJ07452
P 201.670.6688
F 201.670.9788
www.bertinengineering.com

BUILDING REVIEW AND DEMOLITION SEQUENCING REPORT

BUILDINGS 95 & 332
BREWSTER ROAD
NEWARK LIBERTY INTERNATIONAL AIRPORT
NEWARK, NJ

BEA 14-328
(Ref.: Contract # EWR-153.226)

JANUARY 8, 2015
(Revised - January 12, 2015)
(Revised – March 24, 2015)

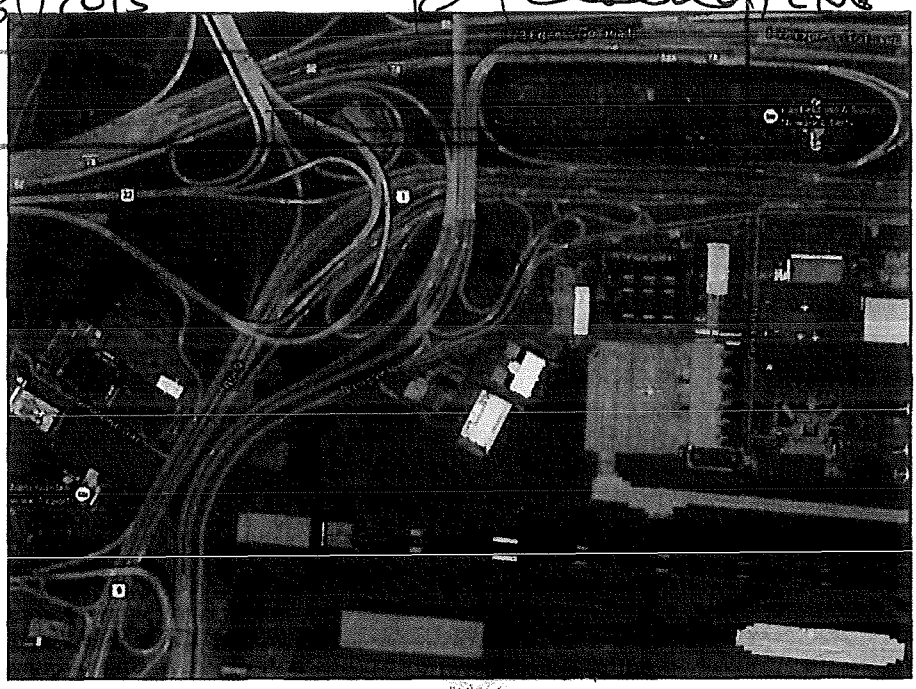
[X] APPROVED
[ ] APPROVED AS CORRECTED
[ ] NOT APPROVED
[ ] REVIEWED WITH COMMENTS
[ ] REVIEWED WITH COMMENTS
[ ] OTHER

Approval is only for conformance with the design concept of the project and compliance with the information given in the Contract documents. Contractor is responsible for conforming and correlating all dimensions at the job site for operations that pertain to the fabrication, erection or in techniques of construction and for coordination of the work of all trades.

DEWBERRY ENGINEERS INC.

Date: 3/31/2015

PREPARED FOR: CATCO Demolition Services
10 Gregory Drive
Montville, New Jersey 07045



PREPARED BY: Jasvinder Ajani, RA
John G. Yakimik, P.E.

REVIEWED BY: Calisto Bertin, P.E.
N.J. Lic. # 28845

Submittal Date: 3/24/15
Contract: EWR-153.226
Transmittal #: 0047
Submittal #: 02050-G0001
Description: Demolition Plan
Revision # 001

This submittal has been reviewed by VRH, checked & approved for compliance with contract documents

BUILDIING REVIEW AND DEMOLITION SEQUENCING REPORT
Buildings 95 & 332
Brewster Road
Newark Liberty International Airport
Newark, NJ

BE 14-328

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INTRODUCTION

Bertin Engineering (BE) has been retained by CATCO Demolition Services (CATCO), a sub-contractor to VRH Construction Corporation (VRH), to prepare a limited demolition plan for Buildings 95, 332 and 14 on Brewster Road at Newark Liberty International Airport, Newark, NJ. CATCO is responsible to demolish the building superstructures, as enumerated in Contract # EWR-153.226, dated September 12, 2014. This report addresses the demolition of Buildings 95 and 332. A separate report addresses the demolition of Building 14.

An initial site visit was conducted on December 15, 2014 by Jasvinder Arjani, Vinny Luongo and J Dawson Gray of Bertin Engineering to observe the general conditions of the buildings. There was no exploratory or destructive probing performed and it should be understood that not all possible elements of the structure have been viewed and reported on.

CATCO has provided BE with copies of reference documents that are listed below, some of which have been prepared by Catanzaro & Sons Enterprises (CSE), the parent company of CATCO. Documents listed are copies and are not official signed and/or sealed documents.

1. Partial drawing document set for the three buildings they received from the Port Authority of New Jersey through VRH;
2. Site Specific Safety Program prepared by VRH and copy of the cover letter confirming CATCO has reviewed the site specific safety program;
3. Procedure for operating, maintaining, and controlling Forklifts (Powered Industrial Trucks) in a safe manner, prepared by CSE;
4. Procedure for operating, maintaining, and controlling Aerial Personnel Lifts in a safe manner, prepared by CSE;
5. Benzene safety guidelines prepared by CSE;
6. Confined space policy prepared by CSE;
7. Demolition document template prepared by CSE;
8. H2S Safety guideline prepared by CSE;
9. Job hazard analysis/safe work plan policy prepared by CSE;
10. Ladder safety guideline prepared by CSE;
11. Lead safety guideline prepared by CSE;
12. Tool safety and inspection plan prepared by CSE;
13. Specifications for John Deere 350G-LC, 470G-LC and 250G-LC hydraulic excavators, and;
14. "RITCHIE Specs" for Case SR200 skid steer loader

PROPERTY DESCRIPTION

Two of the three buildings to be demolished are Building 332 and Building 95 on Brewster Road. Both buildings are vacant and will remain unoccupied until they are removed.

Building 95 is a storage and food handling structure with remains of large walk-in coolers. Building 332 is a cargo storage structure with a two story office component.

The subject property is part of the Newark Liberty International Airport Overnight Aircraft Parking on Brewster Road, Newark, New Jersey.

The drawings provided include a Location Plan, Drawing G106, for the Newark Liberty International Airport Overnight Aircraft Parking. The buildings to be demolished are located in the north portion of the lot, north of runways and close to the access ramps for Highways 1&9, 21, 22, 78 and the NJ Turnpike.

The property is fairly flat and is mostly paved. Except for the loading dock pits, there are no retaining walls or major grade changes near the three buildings. There are utilities around the building but the plans do not indicate any public utilities under the building or within the footprint.

The buildings to be demolished are not close to a residential neighborhood or public buildings. There are no structures immediately next to these three buildings. However, the buildings are close to the runway and access to other overnight parking/paved areas.

DEMOLITION PROCEDURES

Prior to starting demolition on any of the buildings, CATCO will confirm that the following pre-demolition measures, some to be accomplished by others, are put in place:

1. Removal of hazardous substances;
2. Disconnection of all utilities and cutting and capping of pipes as required;
3. Baiting;
4. Fire control measures;
5. Erosion control measures;
6. Traffic Control devices;
7. Barriers;
8. Staging areas for equipment and debris
9. Mobilizing (3) hydraulic excavators ranging from 58,000 lbs. – 109,000 lbs., equipped with specialty demolition attachments such as jackhammers, grapples and shears; (1) wheel loader 54,000 lbs. and (2) "bobcat" skid steer vehicles.
10. Set up portable dust control units to constantly mist the demolition areas. *Dustboss db60;*

BE does not anticipate the extensive use of temporary supports such as scaffolding and shoring. The building demolitions are planned to be accomplished utilizing hydraulic excavators positioned safely around the exterior of the building or its structural remains. Demolition would proceed systematically from the roof of the structures to the floors at grade by removing dead load generally opposite the sequence the buildings were constructed.

Concrete and masonry units would be removed by utilizing excavators with jackhammering equipment and buckets.

Structural steel members such as joists, beams and columns would be sheared systematically and individually by excavators with shears, close to the connections while simultaneously being grappled by the excavator with the highest capacity, the John Deere 470G LC. The sheared members would be lowered in a controlled manner by the 470G LC. The common, one to two story grid framing of Buildings 95 and 332, exclusive of the truss portion of Building 332, are ideal for this simple method of building demolition. All members to be grappled for removal are within the minimum loading capacity and reach of the John Deere 470G LC.

Loading checks were performed through attached calculations on members which were determined to be the heaviest picks based on the plans available. Other calculations to determine the effects of wind or the demolition itself to determine if the remaining structure would be stabile are not necessary at this time since the grid-type structure will retain its integrity if the structure is dismembered in the sequences outlined in this report.

The sequences reflect a demolition process opposite to the order the buildings were constructed to systematically reduce dead load and maintain stability throughout the demolition process.

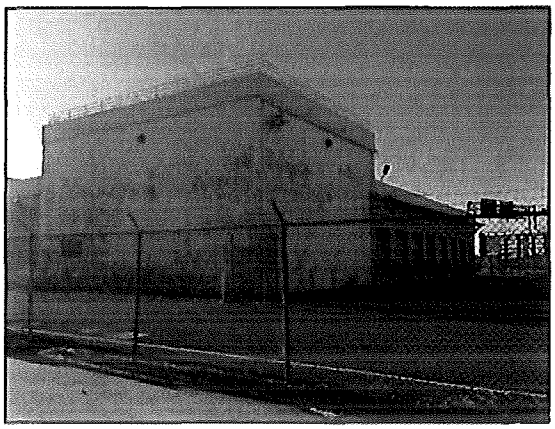
Since the floors are structural slabs on piles, care shall be taken to only load the floor slab with demolished materials that were directly over the slab area. Concentrated loads due to material piling will not be permitted.

Once each grid portion of the structure is down on the slab, the sorting of the debris will be accomplished from the outside moving in to remove all building components and to achieve the reach necessary for the excavators performing the demolition.

At no time will any personnel enter the area of demolition before it is cleared. Implosion methods or wrecking balls will not be used at these locations.

Dust control measures will be implemented throughout the duration of the demolition operation.

This office will perform periodic site observations during the demolition to monitor compliance with these procedures.



BUILDING 95:

At the time of the site visit, there was no power to Building 95, thereby limiting visual observations. Only 3 non-descript drawings were made available for the building. The footprint of the building is approximately 54,000 square feet and is 1 story with varying roof heights. There are numerous overhead doors.

The figure below is a reduced copy of the Building # 95 Framing Plan, Drawing S103.

[redacted]

Foundation & Footing:

The Building 95 structure is understood to be built over a pile foundation and does not have a basement. The foundation system includes piles and pile caps. It is unclear, based on the information provided, whether the floor is a 2-way or 1-way structural slab with grade beams.

All foundation and floor structures will remain in place after the structure above is demolished, in a broom clean condition.

Columns:

The bays vary slightly in width and depth. The plans do not provide bay dimensions. The columns are steel construction, but their condition could not be determined due to the limited visibility within the building.

Girders and Roof Framing:

The girders used for roof construction are steel beams that support steel joist roof framing and corrugated steel sheet metal roofing. It could not be determined if the steel structure is tied to the wall for lateral stability or the walls are independent of the structure.

Walls:

The exterior and some of the interior walls observed where built out of concrete masonry units. It does not appear that the walls are load bearing. All insulated metal panel walls are not load bearing.

The walls that were observed appear to be in fair condition; however there are some step cracks in the block walls.

Demolition of Building 95

Because of limited visibility at the time of survey and severely incomplete drawings, the location of lateral bracing, if any, would have to be confirmed when the first grid section of the building is demolished. In absence of steel bracing, the masonry exterior walls shall be retained for lateral bracing and shall be removed along with each structural grid box demolition.

The demolition of Building 95 will therefore proceed as follows:

1. Use handheld tools for removal of all movable and loose non-structural installations, including mechanical equipment, ceilings, furniture, partition walls, plumbing fixtures, light fixtures and window glass. **Window glass must be removed first.**
2. Use Case SR200 skid-steer loaders equipped with hydraulic attachments to demolish interior non-bearing walls and equipment platforms and supports.

3. Use John Deere 250G LC, 350G LC and 470G LC excavators with arm lengths as marked on enclosures and hydraulic attachments to remove the superstructure. Use the 470G LC for all lowering of structural members. The intent is to employ these long reach excavators equipped with tools for crushing concrete, shearing steel and grappling members to dismantle grid sections of the building from a safe distance without massive collapse.

   Based on observed roof framing between grid line A0, A3, 5A and 6A, it is understood that roof joists bear on numbered grid lines and are installed parallel to lettered grid lines. The demolition will be carried out from the end walls, which based on the above understanding would be grid line 0, moving inward and following this sequence:

   a) Remove the end wall along grid line 0 while searching for any lateral or cross bracing which may affect stability. If found, this office will be notified for evaluation prior to any further demolition of the structure;

   b) Using the equipment listed above, shear beams and joists between columns H and G working from grid line 0 and 1 toward grid line 2, allowing the roof and joists to be lowered or removed by the 470G LC excavator only within the grid box bounded by column lines 0/1, 2,H and G;

   c) Proceed to the grid box to the right/east and shear beams and joists between columns G and F1/F working from grid line 0 and 1 toward grid line 2, allowing the roof and joists to be lowered or removed by the 470G LC excavator only within the grid box bounded by the column lines.

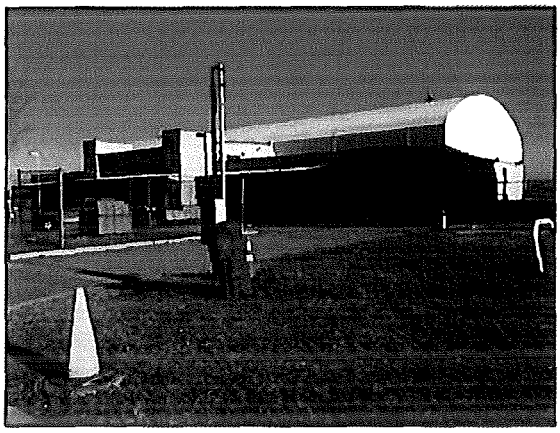
   d) Cut and remove column(s) at G-0/1 and beam G-0/1 to G-2.

   e) Cut and clear the roof structure moving toward the right/east in the sequence described from 3b. through 3d., up to grid line 2, removing all material down to the concrete floor, but leaving the columns at grid line 2.

   f) Proceed to the grid section bounded by column lines 2 and 3 in the same manner as described from 3b. to 3e. Repeat the process working towards grid line 9 and to the opposite end;

Since the floor is a structural slab on piles, care shall be taken to not overload the floor slab with concentrated equipment loads or material stacking.

BUILDING 332:



Building 332 has a footprint of approximately 47,000 square feet. It is a high roof structure for use as cargo storage on one side, and has a two story office with loading docks on the side facing Brewster Road.

The high roof portion is a translucent fabric structure with pre-engineered factory-manufactured steel framing. Although the high roof portion of the building will be demolished, it appears that it could be disassembled and relocated to another location, if need be.

Below is a reduced copy of the Building 332 Plan Drawing S105.

[redacted]

Foundation & Footing:

The Building 332 superstructure is built over a pile foundation and does not have a basement. The foundation system includes piles, pile caps and grade beams, and has a structural floor slab. There are loading-dock levelers in the slab along grid line C. There is also an elevator pit.

The floor slab, where visible, appears to be in good condition and showed no signs of movement or cracks.

Columns:

The two story office portion is steel construction with typical column–supported grid bays that are generally 25' wide along the east elevation of the building and 40' long. The steel columns are encased in concrete at the bottom to protect them from moving equipment. Knee braces have been used in the direction of the span for lateral stability.

The fabric structure steel is a single span rigid frame truss design. The trusses are provided at 50-foot spacing, and span 130 feet. Space truss transvers headers have been provided between trusses at mid-height along the supporting side walls. Wind bracing cables have been provided for lateral stability in the end spans of the roof framing and the first interior spans of the wall framing.

Girders and Roof Framing:

The girders used for the floor construction are steel beams that support the second floor reinforced concrete slab and equipment. There are two cantilevered steel portions at the second level, one to provide a canopy over the loading docks, and one toward the fabric structure to provide for an observation office over the cargo storage area.

The roof construction on the 2-story portion consists of simply-supported steel trusses with corrugated steel sheet metal roofing. The trusses also support mechanical equipment and appurtenances.

The roof trusses span from grid line A to grid line D. The pre-engineered frame spans from grid line D to grid line F. Grid lines 1 and 15 are end walls.

Walls:

The exterior and interior walls that were visible are constructed of concrete masonry units. The exterior and interior walls along column lines are understood to be non-bearing. The stair and elevator enclosures are of masonry construction and are probably load-bearing. The load carrying capabilities of walls will be determined carefully during the early stages of demolition when architectural coverings and equipment will be removed.

Demolition of Building 332

The 2-story portion of the building contains sufficient lateral support from the partition walls, second floor and stair and elevator enclosures to remain stable during demolition if this section is removed one grid section or box at a time. The pre-engineered fabric

structure contains cross bracing in the roof and walls at the ends and a header truss along the side walls.

The demolition of Building 332 will proceed as follows:

1. Use handheld tools for removal of all movable and loose non-structural installations, including mechanical equipment, ceilings, furniture, partition walls, plumbing fixtures, light fixtures and window glass. **Window glass must be removed first.**
2. Use Case SR200 skid-steer loaders equipped with hydraulic attachments to demolish interior non-bearing walls and equipment platforms and supports. Retain the stairway and elevator shaft walls for lateral stability and primary support.
3. Use John Deere 250G LC, 350G LC and 470G LC excavators with arm lengths as marked on enclosures and hydraulic attachments to remove the superstructure. Use the 470G LC for all lowering of structural members. The intent is to employ these long reach excavators equipped with tools for crushing concrete, shearing steel and grappling members to dismantle grid sections of the building from a safe distance without massive collapse. Generally, the demolition will be accomplished from the fabric roof structure to the grid framing portion and as outlined below:

   a) Remove all fabric associated with the roof and walls of the pre-engineered structure within grid box D,F,1,15 during a period of low wind velocities to prevent any unanticipated effects of wind uplift.

   b) Remove the structural rigid frames associated with the pre-engineered structure within grid box D,F,1,15 starting at grid line 1 and proceeding toward grid line 15, while maintaining the support trusses and wind bracings at the opposite end. **Do not** remove structural rigid frames or wind bracings simultaneously from both ends.

   c) Cut each truss rigid frame at one support end only, above the concrete tilt-up wall panels and space truss headers one rigid frame truss at a time while holding the truss frame at the cut end with the 470G LC excavator. Lower each truss rigid frame in a controlled manner by simultaneously cutting lateral and transverse bracing only spanning to the adjacent rigid frame. Maintain connections at the opposite end of the truss until the truss is stable on the floor slab. The 350G LC shall assist with grappling and lowering the truss. Columns for the two-story structure along grid line D shall remain while the fabric structure rigid frame trusses are removed;

   d) Cut and remove the debris associated each rigid frame removal before proceeding to the next adjacent frame.

   e) Proceed to the next adjacent frame line and repeat the process in 3c. and 3d. working towards grid line 15;

   f) Once all truss rigid frames are cut and removed above the concrete tilt-up wall panels and space truss headers, all structural members below and

including the space truss headers may now be removed. Columns for the two-story structure along grid line D shall remain at this time.

g) Remove concrete tilt-up wall panels by jack-hammering in place or removing panels no greater than 10 ft. wide with the 470G LC excavator only, to maintain excavator capacities.

h) Begin the demolition of the remaining single story structure that exists within grid lines C,D,1,5 and C,D,11,15. Remove the end wall along grid line C between grid lines 1 and 5/6;

i) Using the equipment listed above, shear beams and joists between columns 1 and 2 working form grid line C toward grid line D, allowing the roof to be lowered or removed by the excavators only within the grid box bounded by column lines 1,2,C and D. Maintain the girder along grid line D;

j) Proceed to the adjacent grid box and shear beams between columns 2 and 3 from grid line C toward grid line D, allowing the roof to be lowered or removed by the excavators only within the grid box bounded by column lines 2,3,C and D;

k) Remove all remaining columns and girders in the preceding two grid box sections.

l) Proceed toward grid line 5/6 or, the two story portion of the structure in the sequence outlined in 3h through 3j. and stop at grid line 5/6.

m) Repeat the process outlined in 3g through 3k from grid line 15 toward grid line 11.

n) Begin the demolition of the 2-story portion of the building within grid lines A,D,5,11 by starting with the removal of the roof trusses. Remove the roof trusses one at a time by cutting the roof area between trusses and then cutting the truss at one support end only while holding the truss frame at the cut end with the 470G LC excavator only. Lower each truss in a controlled manner by simultaneously cutting lateral and transverse bracing only spanning to the adjacent truss and then cut the opposite end of the truss at the support once the truss has been stabilized on the floor slab. The 350G LC excavator may be used to assist with lowering the truss. Maintain girders along grid lines B and D throughout truss removal.

o) Cut and remove all remaining second story beams and girders and columns above the second story elevation. The structural stairwell and elevator shall remain at this time.

p) Remove the remaining structure, except for the two structural stairwells by working from grid line B toward grid line D similar to the sequence described by 3h through 3k. The W27 x 84 girder between column lines 7 and 9 must be temporarily supported by shoring at its connection with the W27 x 94 girder during this process.

q) Demolish the remaining structural stairwell and elevator enclosures.

A qualified supervisor will monitor the demolition at all times and will inform the engineer of any deviations from the description and demolition plan and of any unsafe situations that need immediate attention. Since the floor is a structural slab on piles, care shall be taken to not overload the floor slab with concentrated equipment loads or material stacking.

THE PORT AUTHORITY [redacted]

TRANSMITTAL

No. 0062

PROJECT: EWR - Overnight [redacted] **DATE:** 6/18/2015

TO: VRH Construction Corp.
320 Grand Avenue

Englewood, NJ 07631-4355

Contract No: EWR-153.226

ATTN: **Gabriela Lachapel**

WE ARE SENDING:	STATUS LEGEND:		SUBMITTED FOR:
☑ Shop Drawings	Approved (APP)	Closed (CLO)	☐ Approval
☐ Letter	Approved as Corrected (AAC)	For Record Only (FRO)	☑ Your Use
☐ Prints	Approved as Noted - Resubmit (ANR)	Incomplete (INC)	☐ As Requested
☐ Change Order	Not Approved (NA)	New Item (NEW)	☐ Review and Comment
☐ Plans	No Exceptions Taken (NET)	No Action Taken (NACT)	
☐ Samples	Reviewed With No Comments (RWNC)	Superseded (SUPS)	
☐ Specifications	Reviewed With Comments - Resubmit (RWC)	UnSubmitted (UNS)	
☑ Other: Made from CTS 62	**SENT VIA:** UPS		
	Tracking Number: 1ZV027830196644748		

PACKAGE	SUBMITTAL	DWG. #	REV.	COPIES	DATE	DESCRIPTION	STATUS
02050	02050G0001		R002	2	6/18/2015	Demolition Plan (Building 14)	AAC

( ) Please make necessary corrections as noted, if any. Place approval form on original of each approved drawing or cut, insert date of approval within same and return _____ prints each. IT IS REQUESTEDTHAT THESE PRINTS BE RETURNED TO US WITHIN 5 DAYS.

( ) The Contract required that the Contractor shall furnish to the engineer one set of drawings, all clearly revised, completed and brought up-to-date showing all of the permanent equipment, materials and construction as actually used.

Your earliest attention to these items would be greatly appreciated so as to avoid delay in the progress of the job.

Prepared By: **Jose L. Perez**
Contract Manager Specialist

PLEASE SUBMIT ALL SUBMITTALS TO : **LesLynn Harding**

RECEIVED
JUN 22 2015

VRH Construction Corp.

320 Grand Ave.
Englewood, NJ 07631

Phone: 201-871-4422
Fax: 201-871-6727

SUBMITTAL NO. 02050-G0001
PACKAGE NO: 02050

TITLE: Demolition Plan
PROJECT: PANYNJ-EWR-153.226/NJ
DRAWING:
STATUS: 3
BIC: PANYNJ

REQUIRED START: 5/27/2015
REQUIRED FINISH: 6/10/2015
DAYS HELD: 0
DAYS ELAPSED: 131
DAYS OVERDUE: -15

RECEIVED FROM		SENT TO		RETURNED BY		FORWARDED TO	
CATANZAR	VC	PANYNJ	CN	PANYNJ	CN	CATANZAR	VC

Revision No.	Description / Remarks	Received	Sent	Returned	Forwarded	Status	Sepias	Prints	Drawing Date	Held	Elapsed
000	Bertin Engineering & National Bulb	1/15/2015	1/15/2015	2/19/2015	2/19/2015	7	0	0		0	35
001	Building 95 & 332	3/24/2015	3/24/2015	4/2/2015	4/2/2015	4	0	0		-54	9
002	Building 14	5/26/2015	5/26/2015			3	0	0		0	0

This submittal has been reviewed by VRH, checked and approved for compliance with the contract documents.

BERTIN
ENGINEERING

66 GLEN AVENUE
GLEN ROCK, NJ07452
P 201.670.6688
F 201.670.9788
www.bertinengineering.com

☐ APPROVED

☒ APPROVED AS CORRECTED
SEE NOTE P.12

☐ NOT APPROVED

☐ REVISE AND RESUBMIT NO COMMENTS

☐ REVIEWED WITH COMMENTS

☐ OTHER

Approval is only for conformance with the design concept of the project and compliance with the information given in the Contract documents. Contractor is responsible for conforming and correlating all dimensions at the job site for operations that pertain to the fabrication process or to techniques of construction and for coordination of the work of all trades.

DEWBERRY ENGINEERS INC.

Date: 6/16/2015 BY: RM Eisenen

TITLE: DIRECTOR

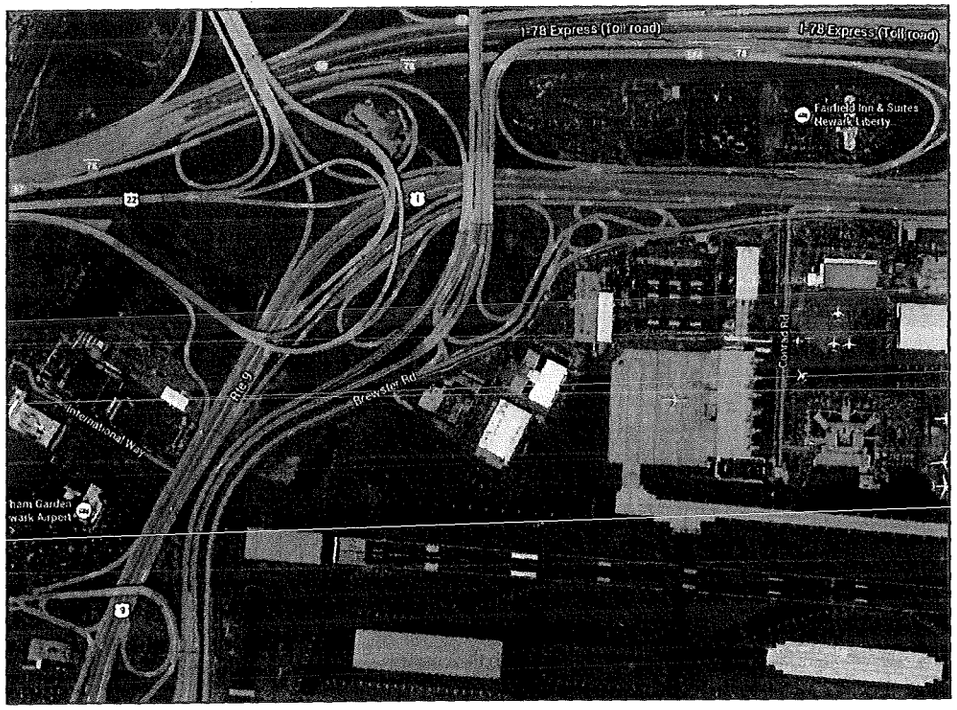
BUILDING REVIEW AND DEMOLITION SEQUENCING REPORT

BUILDING 14
BREWSTER ROAD
NEWARK LIBERTY INTERNATIONAL AIRPORT
NEWARK, NJ

BEA 14-328
(Ref.: Contract # EWR-153.226)

JANUARY 8, 2015
(Revised - January 12, 2015)
(Revised - May 22, 2015)

PREPARED FOR: CATCO Demolition Services
10 Gregory Drive
Montville, New Jersey 07045



PREPARED BY: Jasvinder Arjani
John G. Yakimik, PE

REVIEWED BY: Calisto Bertin, P.E.,
N.J. Lic. #28845

Date: 05.27.15 Contract No.: EWR-153.22(
Project: Overnight Aircraft Parking
Transmittal No.: 0062

BUILDING REVIEW AND DEMOLITION SEQUENCING REPORT
Building 14
Brewster Road
Newark Liberty International Airport
Newark, NJ

BE 14-328

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INTRODUCTION

Bertin Engineering (BE) has been retained by CATCO Demolition Services (CATCO), a sub-contractor to VRH Construction Corporation (VRH), to prepare a limited demolition plan for Buildings 95, 332 and 14 on Brewster Road at Newark Liberty International Airport, Newark, NJ. CATCO is responsible to demolish the building superstructures, as enumerated in Contract # EWR-153.226, dated September 12, 2014. This report addresses the demolition of Building 14. A separate report addressed the demolition of Buildings 95 and 332.

An initial site visit was conducted on December 15, 2014 by Jasvinder Arjani, Vinny Luongo and J Dawson Gray of Bertin Engineering to observe the general conditions of the buildings. There was no exploratory or destructive probing performed and it should be understood that not all possible elements of the structure have been viewed and reported on.

CATCO has provided BE with copies of reference documents that are listed below, some of which have been prepared by Catanzaro & Sons Enterprises (CSE), the parent company of CATCO. Documents listed are copies and are not official signed and/or sealed documents.

1. Partial drawing document set for the three buildings they received from the Port Authority of New Jersey through VRH;
2. Site Specific Safety Program prepared by VRH and copy of the cover letter confirming CATCO has reviewed the site specific safety program;
3. Procedure for operating, maintaining, and controlling Forklifts (Powered Industrial Trucks) in a safe manner, prepared by CSE;
4. Procedure for operating, maintaining, and controlling Aerial Personnel Lifts in a safe manner, prepared by CSE;
5. Benzene safety guidelines prepared by CSE;
6. Confined space policy prepared by CSE;
7. Demolition document template prepared by CSE;
8. H2S Safety guideline prepared by CSE;
9. Job hazard analysis/safe work plan policy prepared by CSE;
10. Ladder safety guideline prepared by CSE;
11. Lead safety guideline prepared by CSE;
12. Tool safety and inspection plan prepared by CSE, and;
13. Specifications for John Deere 250G-LC, 350G-LC, 450D-LC and 650G-LC hydraulic excavators and Case SR200 skid steer loader.

PROPERTY DESCRIPTION

One of the three buildings to be demolished is Building 14 on Brewster Road. The building is vacant and will remain unoccupied until it is removed. The building is a former aircraft hangar with a two story office component.

The subject property is part of the Newark Liberty International Airport Overnight Aircraft Parking project on Brewster Road, Newark, New Jersey.

The drawings provided include a Contract Set for the project and available original construction drawings of the buildings. The buildings to be demolished are located in the north portion of the complex, north of runways and close to the access ramps for Highways 1&9, 21, 22, 78 and the NJ Turnpike.

The property is fairly flat and is mostly paved. Except for the loading dock pits, there are no retaining walls or major grade changes near the building. There are various utilities surrounding the building. The plans do not indicate any utilities under the building footprint.

The building to be demolished is not in close proximity to a residential neighborhood or other public buildings. There are two structures in the process of being demolished immediately adjacent to Building 14 as part of this project. Building 14 is in close proximity to the north runway and associated taxiways.

DEMOLITION PROCEDURES

Prior to starting demolition on any of the buildings, CATCO will confirm that the following pre-demolition measures, some to be accomplished by others, are put in place:

1. Removal of hazardous substances;
2. Disconnection of all utilities and cutting and capping of pipes as required;
3. Baiting;
4. Fire control measures;
5. Erosion control measures;
6. Traffic control devices;
7. Barriers;
8. Staging areas for equipment and debris;
9. Mobilizing (4) hydraulic excavators ranging from 55,000 lbs. – 152,000 lbs., equipped with specialty demolition attachments such as jackhammers, grapples and shears; (1) wheel loader 54,000 lbs. and (2) "bobcat" skid steer vehicles;
10. Portable dust control units to constantly mist the demolition areas. *Dustboss db60,* and;
11. Portable dust control through water tank truck(s) to wet down ground beneath and surrounding the controlled collapse of superstructure steel only.

BE does not anticipate the extensive use of temporary supports such as scaffolding and shoring. The building demolitions are planned to be accomplished utilizing hydraulic excavators positioned safely around the exterior of the building or its structural remains. Demolition would proceed systematically from the roof line of the structure to the floor at grade by removing dead load generally opposite the sequence the buildings were constructed. Superstructure steel and required sway bracing would remain in place during the removals. Superstructure steel would them be prepared for a controlled collapse as detailed below.

Concrete, concrete encasement and masonry units would be removed by utilizing excavators with jackhammering equipment and buckets.

Structural steel members such as trusses, joists, beams, columns, diagonal bracing and the second floor concrete floor of the office area would be removed through a controlled collapse. According to available plans, specifically, Drawing No. 204 of Contract No. NA-380.003, the office area second floor concrete slab is required to remain in place for stability of the in-place structural steel. The controlled collapse would be accomplished by making a series of cuts in the flanges of columns near the base along Column Line "C". The John Deere 650D-LC, 450D-LC, 350G-LC and JD250G-LC excavators would then pull cables wrapped around columns in Column Line "C". The pull would be toward the northwest, perpendicular to Column Line "C" and away from runways, active

roadways and taxiways. The force of the pull would cause column webs along Column Line "C" to yield and bend, thereby making the column and thus the entire superstructure and roof "kneel" in a measured fall with roof trusses remaining generally intact and landing as such on the ground. CATCO performs this method of large building demolition safely on a regular basis with complete success. The method is arguably safer than cutting and picking the truss apart from the constructed higher elevation. See www.catcodemo.com or on Facebook for videos and photos of this method. A list of controlled collapse building demolitions performed by CATCO includes the following:

- 192 Bloomfield Ave., Bloomfield, NJ – 3 story, steel frame commercial building. Former Hartz Mountain building. Front of building directly on Bloomfield Avenue;
- 2- 150 foot height water towers for Tilcon, NY Riverdale, NJ and Mt. Hope, NJ;
- Assorted mining and steel structures, maximum 125 foot height;
- US Gypsum Factory, Clark, NJ – 230 foot high steel and brick smokestack;
- BASF Factory, South Kearny, NJ – 12 story, heavily reinforced steel frame structure;
- Essex County Hospital, Belleville, NJ – 250 foot high steel and brick smokestack;
- Drew Chemical Company, Boonton, NJ – 3, 5 story steel and brick industrial buildings with direct frontage on Division Street and Woonton Avenue;
- Fieldstone Developers, North Bergen, NJ – 4 story steel and brick industrial buildings with direct frontage on Kennedy Boulevard, and;
- D.R. Mon Group, West New York, NJ 3 and 4 story steel and brick industrial buildings with direct frontage on Washington Avenue;

Calculations to determine the effects of wind or the demolition itself to determine if the remaining superstructure would be stabile are not necessary if the structure is dismembered in the sequences outlined in this report. The sequences reflect a demolition process opposite to the order the building was constructed to systematically reduce dead load and maintain stability throughout the demolition process.

Once each portion of the building, exclusive of superstructure steel, is down on the slab, the sorting of the debris will be accomplished from the outside moving in to remove all building components. This method is necessary to achieve the reach necessary for the excavators performing the demolition.

At no time will any unauthorized personnel enter the area of demolition before it is cleared. Implosion methods or wrecking balls will not be used.

Dust control measures will be implemented throughout the duration of the demolition operation. A more intensive dust control measure will be implemented immediately prior to the controlled collapse of the superstructure by flooding the grade slab and the surrounding area with water.

This office will perform periodic site observations during the demolition to monitor compliance with these procedures.

BUILDING 14

Building 14 has a footprint of approximately 61,300 square feet. Being an aircraft hangar, it has a high cantilevered roof with 2 sets of large rolling doors for aircraft access. There is also a two-story office on the side facing Brewster Road.

The figure below is a reduced copy of the Building 14 Plan Drawing S101.

From visual observations, and available plans, it is understood that the roof trusses span from Column Line "A" through Column Line "C" continuously to Column Line "H", apparently as a cantilever over the aircraft storage area. Column Line 1 and 14 are end walls. Hanger doors are installed along Column Line H and large truss girders were observed along Column Line H to allow for these wide openings.

[redacted]

Foundation & Footing:

The Building 14 superstructure is built over a pile foundation and does not have a basement. The foundation system includes piles, pile caps and grade beams, and has a structural floor slab.

Visual observations of the floor slab indicate it is in good condition, with no signs of movement or cracks.

Columns:

Column lines, supporting the cantilevered trusses are typically 20 feet from centerline to centerline, except for 2 interior column lines spaced at 40 feet. According to available plans, the columns are steel and are encased in concrete or masonry. The masonry or concrete encasement cover appears to be in good condition, with no signs of damage or cracks.

Visual evidence of cross bracing for the superstructure is provided throughout the structure. Limited available plans also indicate certain temporary bracings in the two story portion that were removed once the concrete floor slab was placed.

The steel structure toward the air side is designed to support the framing for the hanger doors. There are miscellaneous secondary steel supports within the trusses which support mechanical equipment.

Girders and Roof Framing:

The girders used for the floor construction are steel beams that support the second floor reinforced concrete slab, roof framing between columns and equipment. The girder along Column Line "H" is a deep truss structure for long spans that appears to aid in the support of the cantilevered roof trusses and hanger doors.

The roof consists of steel trusses with corrugated steel sheet metal roofing. The trusses also support mechanical equipment. In the two-story section between Column Lines "A" and "C", steel joists have been provided between the trusses to support the second floor ceiling. These trusses are connected with bracing at the bottom chord and sheet metal at the top for lateral stability. Where visible, they are in fairly good condition.

Walls:

The observed exterior and interior walls are built out of concrete masonry units. The walls along column lines appear to be non-bearing, the stair and elevator enclosures are probably load bearing. Bearing walls will be confirmed during the early stages of demolition, when the ceilings are removed.

The walls appear to be in good condition. However there are some step cracks in the block walls along Column Line "C". The contractor/supervisor shall contact the Engineer to access the wall damage if it is of concern when exposed.

Demolition of Building 14

The 2-story portion of the building appears to contain sufficient lateral support from the cross bracing and second floor slab concrete and framing steel to remain stable during masonry demolition. The hanger portion of the building contains cross bracing along Column Lines 1 and 14, the exterior lines.

The demolition of Building 14 will proceed as follows:

1. Use handheld tools for removal of all movable and loose non-structural installations, including mechanical equipment, ceilings, furniture, partition walls, plumbing fixtures, light fixtures and window glass. **Window glass must be removed first.**
2. Use Case SR200 skid-steer loaders equipped with hydraulic attachments to demolish interior non-bearing walls, equipment platforms and supports.
3. Use John Deere 250G LC, and 350G LC and tools to remove remaining masonry and concrete components of the superstructure, except for the second floor slab which, according to available plans is required for lateral stability. Any steel cross bracing found during this phase must remain intact and undamaged. Additionally, all structural steel must remain intact and undamaged during this phase.
4. At the conclusion of the previous phase, all structural steel, cross bracing and the second floor concrete slab of the superstructure are all that shall remain to limit the amount of dust which may be produced during the controlled collapse of the remaining superstructure and to maintain stability. All debris shall be removed from the entire ground floor slab before proceeding with this phase.

Perform a controlled collapse of the remaining superstructure by:

a) Cordoning a safe distance from the building and prohibiting all unauthorized personnel from the area;

b) Coordinating with Newark Airport Operations regarding parked aircraft in close proximity;

c) Positioning the John Deere 650D-LC, 450D-LC, 250G-LC and 350G-LC excavators at locations roughly one and a half times the height of the structure away from the building with steel cables attached to the excavators and wrapped around columns within Column Line "C". Columns are to be matched with excavators as follows:

   a. 250G-LC with C1, C2, C3 & C4;

   b. 650D-LC with C5, C6 and C7;

   c. 450D-LC with C8, C9 and C10, and;

   d. 350G-LC with C11, C12, C13 and C14

d) Flood the entire ground floor of the structure and the surrounding area with water via tank trucks and hoses to control the impending dust;

e) Pull cables tight with little slack ensuring that they engage each wrapped column equally;

f) Cut flanges in accordance with attached Sketch SK-1. All webs shall remain intact.

g) Signal "all clear" once all personnel have left the cordoned area.

h) Excavators will then tension the cables in a slow, steady manner to a tension not to exceed 50% of the cables' capacities;

i) Monitor superstructure via survey equipment for movement;

j) Clear collapsed material using the 250G LC and 350G LC with shear cutters and grapples.

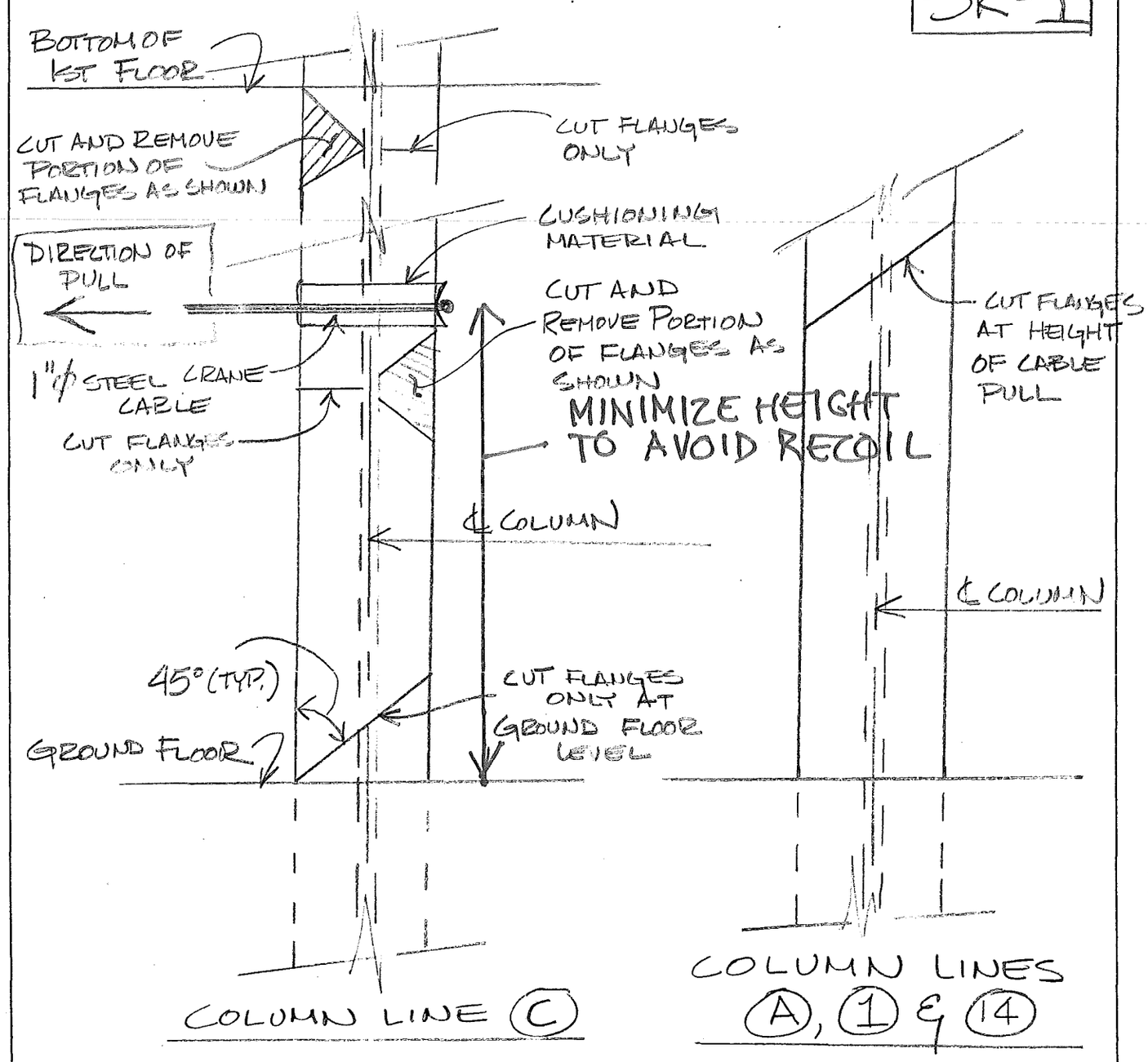
A qualified supervisor will monitor the demolition at all times and will inform the Engineer of any deviations from the description and demolition plan and of any unsafe situations that need immediate attention.

BERTIN ENGINEERING

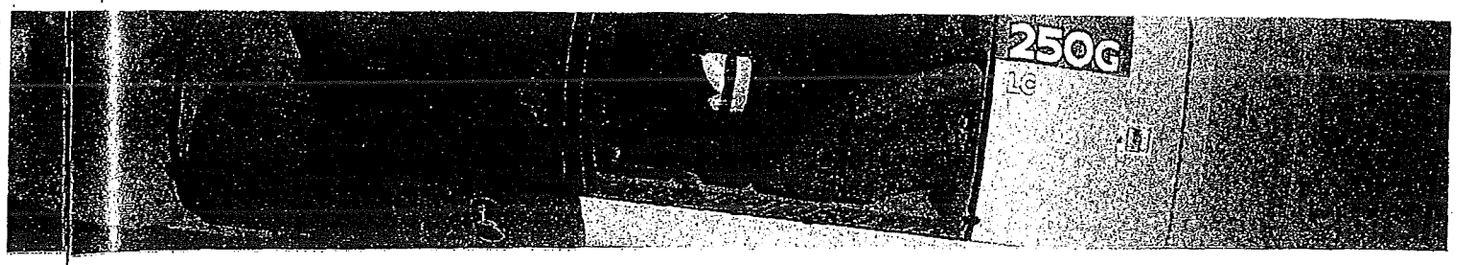
SHEET NO. 1 OF
CALCULATED BY CG DATE 5/20/15
CHECKED BY CB DATE
SCALE

BUILDING REVIEW & DEMOLITION SEQUENCING REPORT
BUILDING 14
BREWSTER ROAD, NEWARK LIBERTY AIRPORT
NEWARK, NJ

SK-1



ELEVATION



Ground Pressure	250G LC
700-mm (28 in.) Triple Semi-Grouser Shoes	41.8 kPa (6.06 psi)
800-mm (32 in.) Triple Semi-Grouser Shoes	37.0 kPa (5.37 psi)
Swing Mechanism	
Speed	13.5 rpm
Torque	74 376 Nm (54,857 lb.-ft.)
Serviceability	
Refill Capacities	
Fuel Tank	500 L (132 gal.)
Cooling System	23 L (6 gal.)
Engine Oil with Filter	19.5 L (5.2 gal.)
Hydraulic Tank	147.6 L (39 gal.)
Hydraulic System	240 L (63 gal.)
Swing Drive	7 L (7.5 qt.)
Gearbox	
Propel (each)	6.2 L (6.5 qt.)
Pump Drive	1.1 L (1.2 qt.)

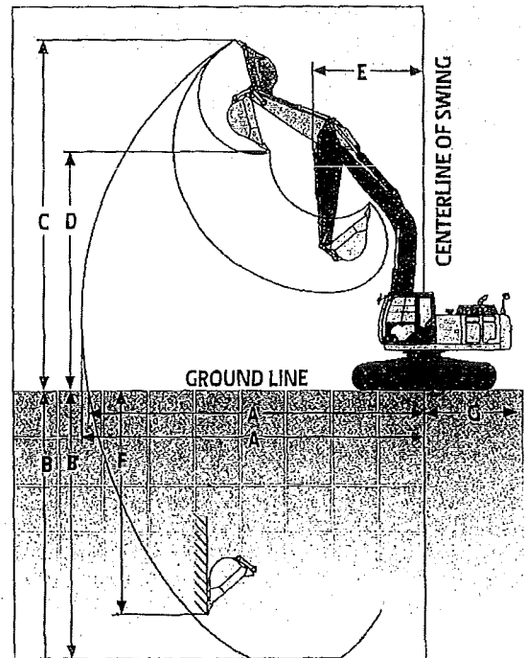
Operating Weights

With full fuel tank; 79-kg (175 lb.) operator; 1.06-m³ (1.38 cu. yd.), 1065-mm (42 in.), 997-kg (2,197 lb.) bucket; 3.61-m (11 ft. 10 in.) arm; 5112-kg (11,270 lb.) counterweight; and 800-mm (32 in.) triple semi-grouser shoes

Operating Weight	25 281 kg (55,736 lb.)
Component Weights	
Undercarriage with Triple Semi-Grouser Shoes	
700 mm (28 in.)	8467 kg (18,667 lb.)
800 mm (32 in.)	8752 kg (19,294 lb.)
One-Piece Boom (with arm cylinder)	2210 kg (4,872 lb.)
Arm with Bucket Cylinder and Linkage	
2.96 m (9 ft. 9 in.)	1296 kg (2,858 lb.)
3.61 m (11 ft. 10 in.)	1396 kg (3,078 lb.)
Boom-Lift Cylinders (2), Total Weight	434 kg (958 lb.)
1.06-m³ (1.38 cu. yd.), 1065-mm (42 in.) Heavy-Duty Plate-Lip Bucket	997 kg (2,197 lb.)
Counterweight, Standard	5112 kg (11,270 lb.)

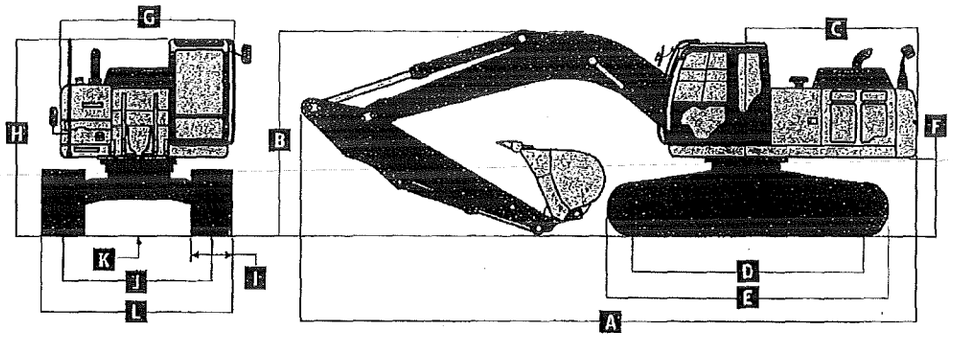
Operating Dimensions

	Arm Length	*2.96 m (9 ft. 9 in.)*	*3.61 m (11 ft. 10 in.)*
	Arm Digging Force		
	SAE	129.1 kN (29,021 lb.)	112.2 kN (25,220 lb.)
	ISO	131.0 kN (29,450 lb.)	114.0 kN (25,628 lb.)
	Bucket Digging Force		
	SAE	175.9 kN (39,552 lb.)	175.9 kN (39,552 lb.)
	ISO	189.0 kN (42,489 lb.)	189.0 kN (42,489 lb.)
	Lifting Capacity Over Front at Ground Level 6.1-m (20 ft.) Reach (with power boost)	8455 kg (18,639 lb.)	8381 kg (18,478 lb.)
A	Maximum Reach	10.29 m (33 ft. 9 in.)	10.91 m (35 ft. 10 in.)
A'	Maximum Reach at Ground Level	10.11 m (33 ft. 2 in.)	10.75 m (35 ft. 3 in.)
B	Maximum Digging Depth	6.96 m (22 ft. 10 in.)	7.61 m (25 ft. 0 in.)
B'	Maximum Digging Depth at 2.44-m (8 ft. 0 in.) Flat Bottom	6.75 m (22 ft. 2 in.)	7.44 m (24 ft. 5 in.)
C	Maximum Cutting Height	10.16 m (33 ft. 4 in.)	10.56 m (34 ft. 8 in.)
D	Maximum Dumping Height	7.20 m (23 ft. 7 in.)	7.58 m (24 ft. 10 in.)
E	Minimum Swing Radius	3.44 m (11 ft. 3 in.)	3.43 m (11 ft. 3 in.)
F	Maximum Vertical Wall	6.03 m (19 ft. 9 in.)	6.74 m (22 ft. 1 in.)
G	Tail-Swing Radius	3.14 m (10 ft. 4 in.)	3.14 m (10 ft. 4 in.)



Machine Dimensions — 250G LC

A	Overall Length	
	2.96 m (9 ft. 9 in.)	10.35 m (34 ft. 0 in.)
	3.61 m (11 ft. 10 in.)	10.41 m (34 ft. 2 in.)
B	Overall Height	
	2.96 m (9 ft. 9 in.)	3.07 m (10 ft. 1 in.)
	3.61 m (11 ft. 10 in.)	3.14 m (10 ft. 4 in.)
C	Rear-End Length/Swing Radius	3.14 m (10 ft. 4 in.)
D	Distance Between Idler/Sprocket Centerline	3.84 m (12 ft. 7 in.)
E	Undercarriage Length	4.64 m (15 ft. 3 in.)
F	Counterweight Clearance	1.09 m (3 ft. 7 in.)
G	Upperstructure Width	2.89 m (9 ft. 6 in.)
H	Cab Height	3.01 m (9 ft. 11 in.)
I	Track Width with Triple Semi-Grouser Shoes	700 mm (28 in.) / 800 mm (32 in.)
J	Gauge Width	2.59 m (8 ft. 6 in.)
K	Ground Clearance	0.46 m (18 in.)
L	Overall Width with Triple Semi-Grouser Shoes	
	700 mm (28 in.)	3.29 m (10 ft. 10 in.)
	800 mm (32 in.)	3.39 m (11 ft. 3 in.)



Lift Capacities

Boldface type indicates hydraulically limited capacity; lightface type indicates stability-limited capacities, in kg (lb.). Ratings at bucket lift hook; machine equipped with 871-kg (1,920 lb.) bucket; standard gauge; and situated on firm, uniform supporting surface. Total load includes weight of cables, hook, etc. Figures do not exceed 87 percent of hydraulic capacities or 75 percent of weight needed to tip machine. All lift capacities are based on ISO 10567.

Load Point Height	1.5 m (5 ft.)		3.0 m (10 ft.)		4.5 m (15 ft.)		6.0 m (20 ft.)		7.5 m (25 ft.)		9.0 m (30 ft.)	
Horizontal Distance from Centerline of Rotation	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side
With 2.96-m (9 ft. 9 in.) arm and 700-mm (28 in.) shoes												
6.0 m (20 ft.)							5126 (11,207)	5126 (11,207)				
4.5 m (15 ft.)					7138 (15,343)	7138 (15,343)	5939 (12,881)	5939 (12,881)	5358 (11,712)	4155 (8,903)		
3.0 m (10 ft.)					9529 (20,456)	9253 (19,947)	7053 (15,254)	5839 (12,571)	5900 (12,831)	4012 (8,610)		
1.5 m (5 ft.)					11 578 (24,945)	8596 (18,513)	8135 (17,591)	5515 (11,872)	6109 (13,128)	3852 (8,276)		
Ground Line					12 543 (27,129)	8277 (17,798)	8576 (18,423)	5295 (11,393)	5973 (12,839)	3728 (8,013)		
–1.5 m (–5 ft.)			8446 (19,259)	8446 (19,259)	12 551 (27,188)	8201 (17,622)	8471 (18,196)	5203 (11,192)	5919 (12,733)	3679 (7,916)		
–3.0 m (–10 ft.)	9964 (22,420)	9964 (22,420)	14 599 (33,304)	14 599 (33,304)	11 732 (25,372)	8282 (17,803)	8509 (18,290)	5237 (11,275)				
–4.5 m (–15 ft.)			13 748 (29,522)	13 748 (29,522)	9758 (20,866)	8530 (18,366)						
With 3.61-m (11 ft. 10 in.) arm and 700-mm (28 in.) shoes												
6.0 m (20 ft.)							4380 (9,584)	4380 (9,584)	4073 (8,643)	4073 (8,643)		
4.5 m (15 ft.)							5228 (11,347)	5228 (11,347)	4823 (10,535)	4236 (9,080)		
3.0 m (10 ft.)					8377 (17,995)	8377 (17,995)	6404 (13,856)	5954 (12,814)	5440 (11,830)	4066 (8,728)	3825 (7,436)	2875 (6,140)
1.5 m (5 ft.)					10 707 (23,066)	8785 (18,917)	7613 (16,465)	5589 (12,027)	6104 (13,196)	3877 (8,327)	4493 (8,810)	2792 (5,971)
Ground Line			4492 (10,371)	4492 (10,371)	12 136 (26,233)	8327 (17,907)	8537 (18,478)	5314 (11,431)	5970 (12,828)	3720 (7,992)	4417 (8,130)	2721 (5,829)
–1.5 m (–5 ft.)	4381 (9,836)	4381 (9,836)	7698 (17,525)	7698 (17,525)	12 576 (27,229)	8149 (17,510)	8438 (18,120)	5167 (11,111)	5872 (12,622)	3631 (7,804)		
–3.0 m (–10 ft.)	8049 (18,103)	8049 (18,103)	12 146 (27,656)	12 146 (27,656)	12 165 (26,317)	8158 (17,531)	8413 (18,073)	5145 (11,070)	5876 (12,649)	3635 (7,828)		
–4.5 m (–15 ft.)	12 636 (28,581)	12 636 (28,581)	15 638 (33,670)	15 638 (33,670)	10 774 (23,160)	8328 (17,916)	7773 (16,579)	5263 (11,351)				

Lift Capacities *(continued)* 250G LC

Boldface type indicates hydraulically limited capacity; lightface type indicates stability-limited capacities, in kg (lb.). Ratings at bucket lift hook; machine equipped with 871-kg (1,920 lb.) bucket; standard gauge; and situated on firm, uniform supporting surface. Total load includes weight of cables, hook, etc. Figures do not exceed 87 percent of hydraulic capacities or 75 percent of weight needed to tip machine. All lift capacities are based on ISO 10567.

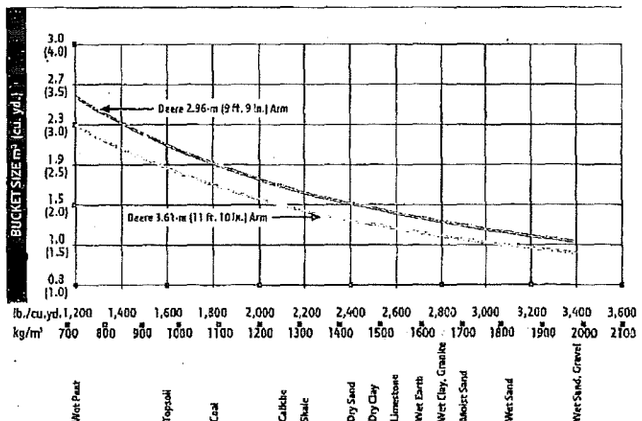
Load Point Height	1.5 m (5 ft.)		3.0 m (10 ft.)		4.5 m (15 ft.)		6.0 m (20 ft.)		7.5 m (25 ft.)		9.0 m (30 ft.)	
Horizontal Distance from Centerline of Rotation	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side
With 2.96-m (9 ft. 9 in.) arm and 800-mm (32 in.) shoes												
6.0 m (20 ft.)							5126 (11,207)	5126 (11,207)				
4.5 m (15 ft.)					7138 (15,343)	7138 (15,343)	5939 (12,881)	5939 (12,881)	5358 (11,712)	4203 (9,007)		
3.0 m (10 ft.)					9529 (20,456)	9347 (20,149)	7053 (15,254)	5902 (12,708)	5900 (12,831)	4059 (8,714)		
1.5 m (5 ft.)					11 578 (24,945)	8690 (18,716)	8135 (17,591)	5578 (12,009)	6182 (13,286)	3900 (8,380)		
Ground Line					12 543 (27,129)	8371 (18,001)	8676 (18,639)	5358 (11,530)	6046 (12,998)	3776 (8,116)		
–1.5 m (–5 ft.)			8446 (19,259)	8446 (19,259)	12 551 (27,188)	8295 (17,825)	8571 (18,413)	5266 (11,329)	5993 (12,891)	3727 (8,019)		
–3.0 m (–10 ft.)	9964 (22,420)	9964 (22,420)	14 599 (33,304)	14 599 (33,304)	11 732 (25,372)	8376 (18,005)	8588 (18,506)	5300 (11,412)				
–4.5 m (–15 ft.)			13 748 (29,522)	13 748 (29,522)	9758 (20,866)	8624 (18,568)						
With 3.61-m (11 ft. 10 in.) arm and 800-mm (32 in.) shoes												
6.0 m (20 ft.)							4380 (9,584)	4380 (9,584)	4073 (8,643)	4073 (8,643)		
4.5 m (15 ft.)							5228 (11,347)	5228 (11,347)	4823 (10,535)	4284 (9,184)		
3.0 m (10 ft.)					8377 (17,995)	8377 (17,995)	6404 (13,856)	6018 (12,951)	5440 (11,830)	4114 (8,831)	3825 (7,436)	2914 (6,223)
1.5 m (5 ft.)					10 707 (23,066)	8879 (19,119)	7613 (16,465)	5652 (12,164)	6104 (13,251)	3925 (8,431)	4503 (8,810)	2830 (6,055)
Ground Line			4492 (10,371)	4492 (10,371)	12 136 (26,233)	8421 (18,109)	8537 (18,478)	5378 (11,568)	6043 (12,986)	3768 (8,095)	4438 (8,130)	2759 (5,912)
–1.5 m (–5 ft.)	4381 (9836)	4381 (9836)	7698 (17,525)	7698 (17,525)	12 576 (27,229)	8243 (17,712)	8538 (18,336)	5230 (11,248)	5945 (12,780)	3679 (7,907)		
–3.0 m (–10 ft.)	8049 (18,103)	8049 (18,103)	12 146 (27,656)	12 146 (27,656)	12 165 (26,317)	8252 (17,734)	8513 (18,290)	5209 (11,207)	5950 (12,807)	3683 (7,932)		
–4.5 m (–15 ft.)	12 636 (25,581)	12 636 (25,581)	15 638 (33,670)	15 638 (33,670)	10 774 (23,160)	8422 (18,118)	7773 (16,579)	5327 (11,488)				

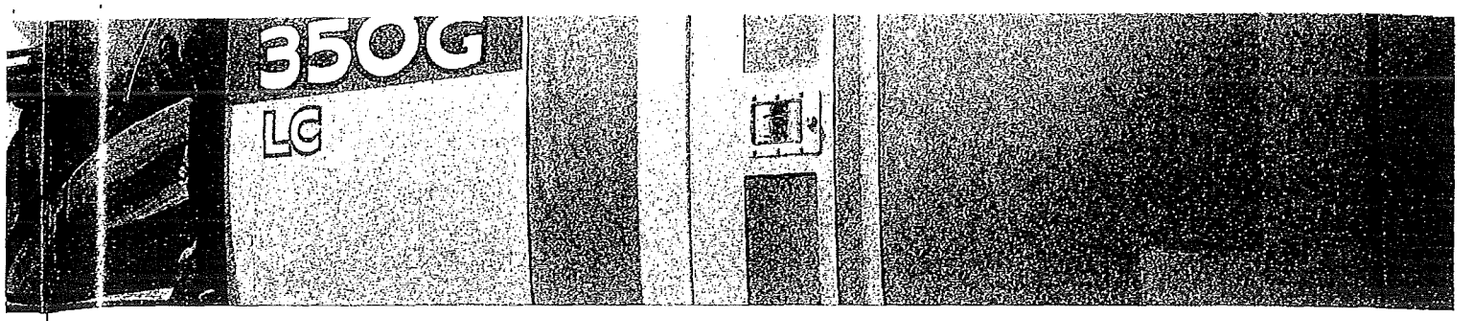
Buckets

A full line of buckets is offered to meet a wide variety of applications. Digging forces are with power boost. Tooth selection includes the John Deere Fanggs™ Standard, Tiger, Twin Tiger, Abrasion panel, or Flare tooth. Replaceable cutting edges and a variety of teeth are available through John Deere Parts. Optional side cutters add 150 mm (6 in.) to bucket widths. Capacities are SAE heaped ratings.

Type Bucket	Bucket Width		Bucket Capacity		Bucket Weight		Bucket Dig Force		Arm Dig Force 2.96 m (9 ft. 9 in.)		Arm Dig Force 3.61 m (11 ft. 10 in.)		Bucket Tip Radius		Number of Teeth
	mm	in.	m³	cu. yd.	kg	lb.	kN	lb.	kN	lb.	kN	lb.	mm	in.	
Heavy Duty	1067	42	1.06	1.4	997	2,197	176.0	39,558	129.1	29,021	112.2	25,220	1435	56.5	5
Heavy Duty	1219	48	1.22	1.6	1071	2,361	176.0	39,558	129.1	29,021	112.2	25,220	1435	56.5	6
Heavy Duty	1372	54	1.39	1.8	1138	2,509	176.0	39,558	129.1	29,021	112.2	25,220	1435	56.5	6
Heavy Duty High Capacity	610	24	0.70	0.9	801	1,767	167.4	37,636	124.7	28,044	108.9	24,477	1588	62.5	3
Heavy Duty High Capacity	760	30	0.92	1.2	913	2,012	167.4	37,636	124.7	28,044	108.9	24,477	1588	62.5	4
Heavy Duty High Capacity	914	36	1.13	1.5	968	2,135	167.4	37,636	124.7	28,044	108.9	24,477	1588	62.5	4
Heavy Duty High Capacity	1065	42	1.34	1.7	1035	2,281	167.4	37,636	124.7	28,044	108.9	24,477	1588	62.5	5
Heavy Duty High Capacity	1220	48	1.55	2.0	1137	2,507	167.4	37,636	124.7	28,044	108.9	24,477	1588	62.5	6
Ditching	1525	60	3.00	3.9	709	1,563	211.4	47,534	136.6	30,705	117.8	26,485	1194	47.0	0

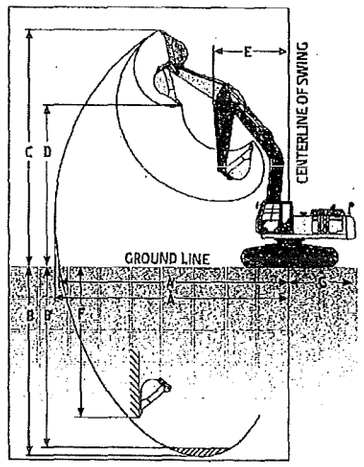
Bucket Selection Guide*





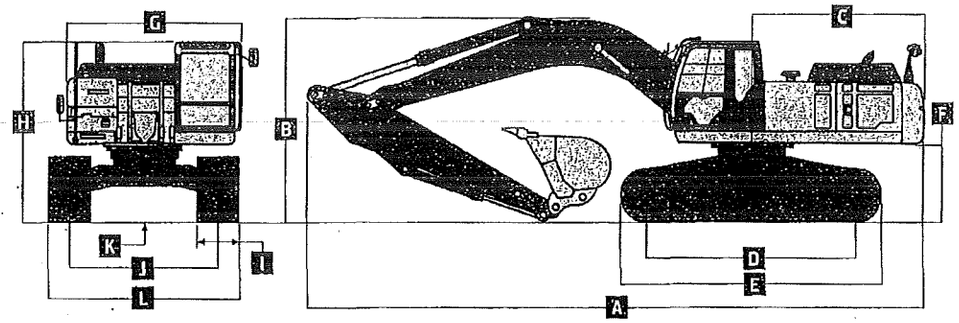
Ground Pressure	**350G LC**
800-mm (32 in.) Triple Semi-Grouser Shoes	52.8 kPa (7.66 psi)
Swing Mechanism	
Speed	10.7 rpm
Torque	120 000 Nm (88,507 lb.-ft.)
Serviceability	
Refill Capacities	
Fuel Tank	628 L (166 gal.)
Cooling System	39.7 L (10.5 gal.)
Engine Oil with Filter	27 L (7.2 gal.)
Hydraulic Tank	193 L (51 gal.)
Hydraulic System	290 L (77 gal.)
Swing Drive	11.8 L (12.5 qt.)
Gearbox	
Propel (each)	8.5 L (9.0 qt.)
Pump Drive	1.1 L (1.2 qt.)
Operating Weights	
With full fuel tank; 79-kg (175 lb.) operator; 1.76-m³ (2.3 cu. yd.), 1370-mm (54 in.), 1160-kg (2,557 lb.) bucket; 4.0-m (13 ft. 1 in.) arm; 6928-kg (15,274 lb.) counterweight; and 800-mm (32 in.) triple semi-grouser shoes	
Operating Weight	34 726 kg (76,557 lb.)
Component Weights	
Undercarriage with 800-mm (32 in.) Triple Semi-Grouser Shoes	12 710 kg (28,020 lb.)
One-Piece Boom (with arm cylinder)	3031 kg (6,682 lb.)
Arm with Bucket Cylinder and Linkage	
2.66 m (8 ft. 9 in.)	1649 kg (3,635 lb.)
3.2 m (10 ft. 6 in.)	1758 kg (3,876 lb.)
4.0 m (13 ft. 1 in.)	1898 kg (4,184 lb.)
Boom-Lift Cylinders (2), Total Weight	624 kg (1,376 lb.)
1.76-m³ (2.3 cu. yd.), 1370-mm (54 in.) Heavy-Duty Bucket	1160 kg (2,557 lb.)
Counterweight, Standard	6928 kg (15,274 lb.)

	Operating Dimensions			
	Arm Length	*2.66 m (8 ft. 9 in.)*	*3.2 m (10 ft. 6 in.)*	*4.0 m (13 ft. 1 in.)*
	Arm Digging Force			
	SAE	204.2 kN (45,914 lb.)	177.6 kN (39,930 lb.)	152.6 kN (34,314 lb.)
	ISO	222.0 kN (49,908 lb.)	185.0 kN (41,590 lb.)	159.0 kN (35,745 lb.)
	Bucket Digging Force			
	SAE	225.2 kN (50,628 lb.)	225.2 kN (50,628 lb.)	225.2 kN (50,628 lb.)
	ISO	246.0 kN (55,303 lb.)	246.0 kN (55,303 lb.)	246.0 kN (55,303 lb.)
	Lifting Capacity Over Front at Ground Level 6.1-m (20 ft.) Reach (with power boost)	12 790 kg (28,197 lb.)	12 800 kg (28,219 lb.)	12 851 kg (28,331 lb.)
A	Maximum Reach	10.57 m (34 ft. 8 in.)	11.10 m (36 ft. 5 in.)	11.86 m (38 ft. 11 in.)
A'	Maximum Reach at Ground Level	10.36 m (34 ft. 0 in.)	10.89 m (35 ft. 9 in.)	11.67 m (38 ft. 3 in.)
B	Maximum Digging Depth	6.84 m (22 ft. 5 in.)	7.38 m (24 ft. 3 in.)	8.18 m (26 ft. 10 in.)
B'	Maximum Digging Depth at 2.44-m (8 ft. 0 in.) Flat Bottom	6.64 m (21 ft. 9 in.)	7.21 m (23 ft. 8 in.)	8.04 m (26 ft. 5 in.)
C	Maximum Cutting Height	9.99 m (32 ft. 9 in.)	10.36 m (34 ft. 0 in.)	10.75 m (35 ft. 3 in.)
D	Maximum Dumping Height	6.94 m (22 ft. 9 in.)	7.24 m (23 ft. 9 in.)	7.63 m (25 ft. 0 in.)
E	Minimum Swing Radius	4.61 m (15 ft. 1 in.)	4.46 m (14 ft. 8 in.)	4.47 m (14 ft. 8 in.)
F	Maximum Vertical Wall	5.51 m (18 ft. 1 in.)	6.42 m (21 ft. 1 in.)	7.27 m (23 ft. 10 in.)
G	Tail-Swing Radius	3.60 m (11 ft. 10 in.)	3.60 m (11 ft. 10 in.)	3.60 m (11 ft. 10 in.)



Machine Dimensions

		350G LC
A	Overall Length	
	2.66 m (8 ft. 9 in.)	11.33 m (37 ft. 2 in.)
	3.2 m (10 ft. 6 in.)	11.20 m (36 ft. 9 in.)
	4.0 m (13 ft. 1 in.)	11.29 m (37 ft. 1 in.)
B	Overall Height	
	2.66 m (8 ft. 9 in.)	3.47 m (11 ft. 5 in.)
	3.2 m (10 ft. 6 in.)	3.27 m (10 ft. 9 in.)
	4.0 m (13 ft. 1 in.)	3.60 m (11 ft. 10 in.)
C	Rear-End Length/Swing Radius	3.60 m (11 ft. 10 in.)
D	Distance Between Idler/Sprocket Centerline	4.05 m (13 ft. 3 in.)
E	Undercarriage Length	4.94 m (16 ft. 2 in.)
F	Counterweight Clearance	1.18 m (3 ft. 10 in.)
G	Upperstructure Width	2.99 m (9 ft. 10 in.)
H	Cab Height	3.14 m (10 ft. 4 in.)
I	Track Width with Triple Semi-Grouser Shoes	800 mm (32 in.)
J	Gauge Width	2.59 m (8 ft. 6 in.)
K	Ground Clearance	0.50 m (20 in.)
L	Overall Width with Triple Semi-Grouser Shoes	
	600 mm (24 in.)	3.19 m (10 ft. 6 in.)
	800 mm (32 in.)	3.39 m (11 ft. 2 in.)



Lift Capacities

Boldface type indicates hydraulically limited capacity; lightface type indicates stability-limited capacities, in kg (lb.). Ratings at bucket lift hook; machine equipped with 1160-kg (2,557 lb.) bucket and 800-mm (32 in.) shoes; standard gauge; and situated on firm, uniform supporting surface. Total load includes weight of cables, hook, etc. Figures do not exceed 87 percent of hydraulic capacities or 75 percent of weight needed to tip machine. All lift capacities are based on ISO 10567.

Load Point Height	1.5 m (5 ft.)		3.0 m (10 ft.)		4.5 m (15 ft.)		6.0 m (20 ft.)		7.5 m (25 ft.)		9.0 m (30 ft.)	
Horizontal Distance from Centerline of Rotation	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side
With 2.66-m (8 ft. 9 in.) arm												
6.0 m (20 ft.)							9496 (20,636)	9213 (19,803)	8705 (19,093)	6162 (13,179)		
4.5 m (15 ft.)					14 206 (30,447)	14 021 (30,255)	10 894 (23,562)	8801 (18,960)	9279 (20,190)	6021 (12,922)		
3.0 m (10 ft.)					17 742 (38,067)	12 827 (27,693)	12 506 (27,011)	8285 (17,857)	9573 (20,571)	5798 (12,462)		
1.5 m (5 ft.)							13 399 (28,794)	7868 (16,949)	9319 (20,037)	5570 (11,982)		
Ground Line					18 814 (42,867)	11 932 (25,647)	13 127 (28,197)	7634 (16,432)	9155 (19,685)	5423 (11,666)		
–1.5 m (–5 ft.)			12 495 (28,545)	12 495 (28,545)	18 754 (40,705)	11 959 (25,693)	13 059 (28,045)	7575 (16,301)	9117 (19,617)	5389 (11,605)		
–3.0 m (–10 ft.)			21 868 (47,544)	21 868 (47,544)	16 665 (36,066)	12 147 (26,109)	12 606 (27,142)	7679 (16,540)				
–4.5 m (–15 ft.)			16 500 (35,354)	16 500 (35,354)	12 776 (27,209)	12 551 (27,027)						
With 3.2-m (10 ft. 6 in.) arm												
6.0 m (20 ft.)									8008 (17,528)	6249 (13,381)		
4.5 m (15 ft.)							10 108 (21,858)	8940 (19,242)	8700 (18,923)	6077 (13,042)		
3.0 m (10 ft.)					16 457 (35,331)	13 179 (28,428)	11 834 (25,561)	8402 (18,102)	9604 (20,664)	5832 (12,529)	7003 (15,009)	4180 (8,936)
1.5 m (5 ft.)					19 033 (41,053)	12 300 (26,492)	13 321 (28,796)	7933 (17,084)	9338 (20,070)	5579 (11,995)	6882 (14,768)	4069 (8,714)
Ground Line					19 818 (42,912)	11 930 (25,649)	13 140 (28,219)	7635 (16,430)	9132 (19,628)	5395 (11,598)	6794 (14,592)	3988 (8,553)
–1.5 m (–5 ft.)			11 956 (27,138)	11 956 (27,138)	19 291 (41,824)	11 864 (25,490)	13 002 (27,916)	7516 (16,168)	9042 (19,442)	5314 (11,431)		
–3.0 m (–10 ft.)	14 280 (32,048)	14 280 (32,048)	19 673 (44,674)	19 673 (44,674)	17 649 (38,194)	11 988 (25,762)	13 051 (28,032)	7558 (16,269)	9105 (19,608)	5371 (11,580)		
–4.5 m (–15 ft.)			19 521	19 521	14 491	12 307	10 645	7794				

Lift Capacities *(continued)* 350G LC

Boldface type indicates hydraulically limited capacity; lightface type indicates stability-limited capacities, in kg (lb.). Ratings at bucket lift hook; machine equipped with 1160-kg (2,557 lb.) bucket and 800-mm (32 in.) shoes; standard gauge; and situated on firm, uniform supporting surface. Total load includes weight of cables, hook, etc. Figures do not exceed 87 percent of hydraulic capacities or 75 percent of weight needed to tip machine. All lift capacities are based on ISO 10567.

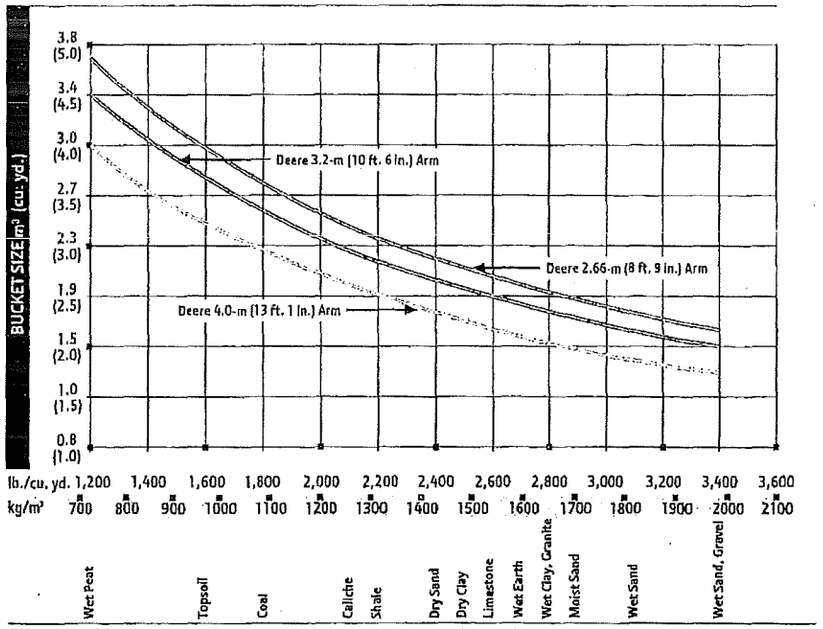
Load Point Height	1.5 m (5 ft.)		3.0 m (10 ft.)		4.5 m (15 ft.)		6.0 m (20 ft.)		7.5 m (25 ft.)		9.0 m (30 ft.)	
Horizontal Distance from Centerline of Rotation	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side
With 4.0-m (13 ft. 1 in.) arm												
6.0 m (20 ft.)									7015 (15,348)	6409 (13,734)	5727 (11,021)	4442 (9,453)
4.5 m (15 ft.)									7813 (16,997)	6203 (13,312)	7212 (15,462)	4370 (9,335)
3.0 m (10 ft.)					14 409 (30,952)	13 717 (29,563)	10 708 (23,138)	8612 (18,543)	8838 (19,174)	5923 (12,721)	7070 (15,160)	4234 (9,058)
1.5 m (5 ft.)					17 673 (38,094)	12 624 (27,185)	12 469 (26,955)	8065 (17,362)	9401 (20,198)	5626 (12,090)	6904 (14,815)	4082 (8,741)
Ground Line			6735 (15,416)	6735 (15,416)	19 386 (41,927)	12 004 (25,812)	13 195 (28,331)	7669 (16,500)	9133 (19,623)	5386 (11,573)	6766 (14,526)	3955 (8,476)
–1.5 m (–5 ft.)	6807 (15,227)	6807 (15,227)	10 880 (24,662)	10 880 (24,662)	19 638 (42,536)	11 769 (25,286)	12 949 (27,797)	7458 (16,037)	8974 (19,285)	5244 (11,269)	6692 (14,301)	3887 (8,342)
–3.0 m (–10 ft.)	11 398 (25,572)	11 398 (25,572)	16 291 (36,941)	16 291 (36,941)	18 694 (40,455)	11 779 (25,307)	12 899 (27,693)	7414 (15,947)	8945 (19,236)	5218 (11,226)		
–4.5 m (–15 ft.)	16 873 (38,021)	16 873 (38,021)	23 293 (50,183)	23 293 (50,183)	16 436 (35,373)	11 987 (25,775)	12 165 (26,067)	7536 (16,233)	8817 (18,456)	5356 (11,576)		
–6.0 m (–20 ft.)			16 669 (35,135)	16 669 (35,135)	12 038 (25,239)	12 038 (25,239)						

Buckets

A full line of buckets is offered to meet a wide variety of applications. Digging forces are with power boost. Tooth selection includes the John Deere Fanggs™ Standard, Tiger, Twin Tiger, Abrasion panel, or Flare tooth. Replaceable cutting edges and a variety of teeth are available through John Deere Parts. Optional side cutters add 150 mm (6 in.) to bucket widths. Capacities are SAE heaped ratings.

Type Bucket	Bucket Width		Bucket Capacity		Bucket Weight		Bucket Dig Force		Arm Dig Force 2.66 m (8 ft. 9 in.)		Arm Dig Force 3.2 m (10 ft. 6 in.)		Arm Dig Force 4.0 m (13 ft. 1 in.)		Bucket Tip Radius		Number of Teeth
	mm	in.	m³	cu. yd.	kg	lb.	kN	lb.	kN	lb.	kN	lb.	kN	lb.	mm	in.	
Heavy Duty	914	36	1.13	1.5	971	2,140	225.2	496	204.2	450	177.6	392	152.6	337	1600	63.0	4
Heavy Duty	1067	42	1.34	1.7	1003	2,212	225.2	496	204.2	450	177.6	392	152.6	337	1600	63.0	5
Heavy Duty	1219	48	1.55	2.0	1055	2,326	225.2	496	204.2	450	177.6	392	152.6	337	1600	63.0	6
Heavy Duty	1372	54	1.76	2.3	1161	2,559	225.2	496	204.2	450	177.6	392	152.6	337	1600	63.0	6
Heavy Duty High Capacity	760	30	0.96	1.3	1142	2,518	204.2	450	196.6	433	171.7	379	148.3	327	1765	69.5	4
Heavy Duty High Capacity	915	36	1.19	1.6	1263	2,783	204.2	450	196.6	433	171.7	379	148.3	327	1765	69.5	4
Heavy Duty High Capacity	1065	42	1.41	1.8	1416	3,123	204.2	450	196.6	433	171.7	379	148.3	327	1765	69.5	5
Heavy Duty High Capacity	1220	48	1.64	2.1	1506	3,321	204.2	450	196.6	433	171.7	379	148.3	327	1765	69.5	6
Heavy Duty High Capacity	1372	54	1.87	2.4	1617	3,565	204.2	450	196.6	433	171.7	379	148.3	327	1765	69.5	6

Bucket Selection Guide*



*Contact your John Deere dealer for optimum bucket and attachment selections. These recommendations are for general conditions and average use. Does not include optional equipment such as thumbs or couplers. Larger buckets may be possible when using light materials, for flat and level operations, less compacted materials, and volume loading applications such as mass-excavation applications in ideal conditions. Smaller buckets are recommended for adverse conditions such as off-level applications, rocks, and uneven surfaces. Bucket capacity indicated is SAE heaped.

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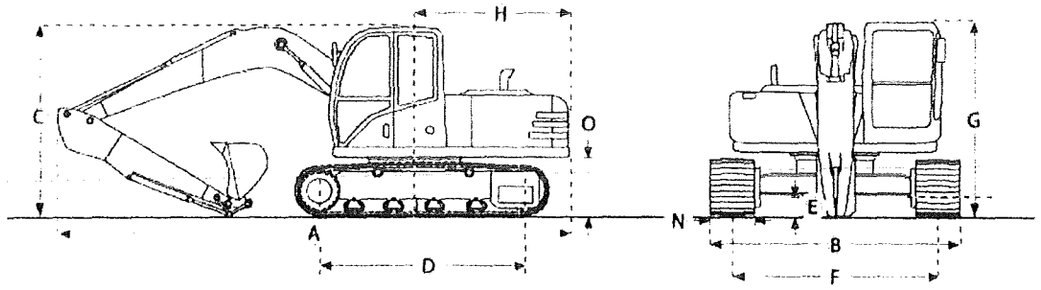
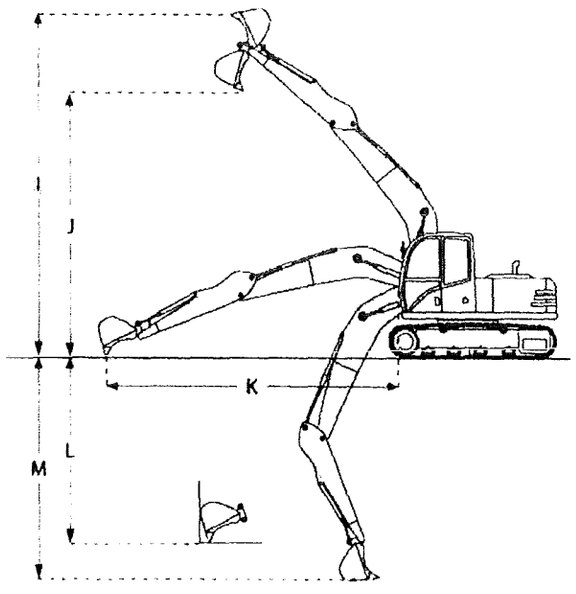


Selected Dimensions

Boom/Stick Option	Boom/Stick Option (HEX) 1	
A. SHIPPING LENGTH OF UNIT	39 ft in	11880 mm
C. SHIPPING HEIGHT OF UNIT	11.8 ft in	3600 mm
I. MAX CUTTING HEIGHT	33.7 ft in	10262.6 mm
J. MAX LOADING HEIGHT	23 ft in	7010.4 mm
K. MAX REACH ALONG GROUND	36.8 ft in	11201.4 mm
L. MAX VERTICAL WALL DIGGING DEPTH	15.7 ft in	4776.2 mm
M. MAX DIGGING DEPTH	23.9 ft in	7290.8 mm
Dimensions		
B. WIDTH TO OUTSIDE OF TRACKS	11.9 ft in	3640 mm
D. LENGTH OF TRACK ON GROUND	14.7 ft in	4470 mm
E. GROUND CLEARANCE	2.4 ft in	735 mm
G. HEIGHT TO TOP OF CAB	10.8 ft in	3280 mm
H. TAIL SWING RADIUS	11.4 ft in	3470 mm
O. COUNTERWEIGHT CLEARANCE	4.4 ft in	1350 mm
Undercarriage		
F. TRACK GAUGE	9.5 ft in	2890 mm
N. SHOE SIZE	30 in	750 mm



Specification

Engine		
MAKE	John Deere	
MODEL	6101 A	
NET POWER	285 hp	212.5 kw
POWER MEASURED @	2000 rpm	
DISPLACEMENT	619 cu in	10.1 L
TORQUE MEASURED @	1300 rpm	
MAX TORQUE	955 lb ft	1294.8 Nm
ASPIRATION	Turbocharger	
NUMBER OF CYLINDERS	6	
Operational		
OPERATING WEIGHT	97680 lb	44306.9 kg

FUEL CAPACITY	160 gal	605.7 L
COOLING SYSTEM FLUID CAPACITY	10 gal	38 L
HYDRAUILC SYSTEM FLUID CAPACITY	137 gal	518.6 L
ENGINE OIL CAPACITY	9 gal	34 L
SWING DRIVE FLUID CAPACITY	1.5 gal	5.7 L
OPERATING VOLTAGE	24 V	
ALTERNATOR SUPPLIED AMPERAGE	45 amps	
HYDRAULIC SYSTEM RELIEF VALVE PRESSURE	4270 psi	29440.6 kPa
HYDRAULIC PUMP FLOW CAPACITY	95 gal/min	359.6 L/min
Swing Mechanism		
SWING SPEED	9 rpm	
SWING TORQUE	107004 lb ft	145077.9 Nm
Undercarriage		
NUMBER OF SHOES PER SIDE	53	
SHOE SIZE	30 in	750 mm
NUMBER OF CARRIER ROLLERS PER SIDE	3	
NUMBER OF TRACK ROLLERS PER SIDE	9	
GROUND PRESSURE	8.7 psi	59.9 kPa
MAX TRAVEL SPEED	3.4 mph	5.5 km/h
DRAWBAR PULL	79590 lb	354 kN
TRACK GAUGE	9.5 ft in	2890 mm
Buckets		
REFERENCE BUCKET CAPACITY	2.4 yd3	1 9 m3
Boom/Stick Option (HEX) 1		
BOOM/STICK OPTION (HEX) 1	Arm Length 9ft. 6in.(2.9m)	
SHIPPING HEIGHT OF UNIT	11.8 ft in	3600 mm
SHIPPING LENGTH OF UNIT	39 ft in	11880 mm
MAX DIGGING DEPTH	23.9 ft in	7290.8 mm
MAX REACH ALONG GROUND	36.8 ft in	11201.4 mm
MAX CUTTING HEIGHT	33.7 ft in	10262.6 mm
MAX LOADING HEIGHT	23 ft in	7010.4 mm
MAX VERTICAL WALL DIGGING DEPTH	15.7 ft in	4776.2 mm
Boom/Stick Option (HEX) 2		
BOOM/STICK OPTION (HEX) 2	Arm Length 11ft. 2in. (3.4m)	
SHIPPING HEIGHT OF UNIT	11.4 ft in	3480 mm
SHIPPING LENGTH OF UNIT	38.7 ft in	11790 mm
MAX DIGGING DEPTH	25.5 ft in	7772.4 mm
MAX REACH ALONG GROUND	38.8 ft in	11811 mm
MAX CUTTING HEIGHT	36.3 ft in	11073.4 mm
MAX LOADING HEIGHT	25.2 ft in	7671.8 mm
MAX VERTICAL WALL DIGGING DEPTH	21.1 ft in	6425.2 mm
Boom/Stick Option (HEX) 3		
BOOM/STICK OPTION (HEX) 3	Arm Length 12ft. 10in. (3.9m)	
SHIPPING HEIGHT OF UNIT	11.4 ft in	3480 mm
SHIPPING LENGTH OF UNIT	38.7 ft in	11790 mm
MAX DIGGING DEPTH	27.1 ft in	8254 mm
MAX REACH ALONG GROUND	40.3 ft in	12268.2 mm
MAX CUTTING HEIGHT	36.7 ft in	11177 mm
MAX LOADING HEIGHT	25.5 ft in	7772.4 mm
MAX VERTICAL WALL DIGGING DEPTH	23.1 ft in	7034 8 mm
Boom/Stick Option (HEX) 4		
BOOM/STICK OPTION (HEX) 4	Arm Length 16ft. 1in. (4.9m)	
SHIPPING HEIGHT OF UNIT	15.3 ft in	4660 mm
SHIPPING LENGTH OF UNIT	38.4 ft in	11700 mm
MAX DIGGING DEPTH	29.9 ft in	9119.6 mm
MAX REACH ALONG GROUND	43.3 ft in	13182.6 mm
MAX CUTTING HEIGHT	38.9 ft in	11862.8 mm
MAX LOADING HEIGHT	28.8 ft in	8763 mm
MAX VERTICAL WALL DIG DEPTH	27.8 ft in	8458.2 mm
Dimensions		
WIDTH TO OUTSIDE OF TRACKS	11.9 ft in	3640 mm
HEIGHT TO TOP OF CAB	10.8 ft in	3280 mm
GROUND CLEARANCE	2.4 ft in	735 mm
COUNTERWEIGHT CLEARANCE	4.4 ft in	1350 mm
TAIL SWING RADIUS	11.4 ft in	3470 mm
LENGTH OF TRACK ON GROUND	14.7 ft in	4470 mm

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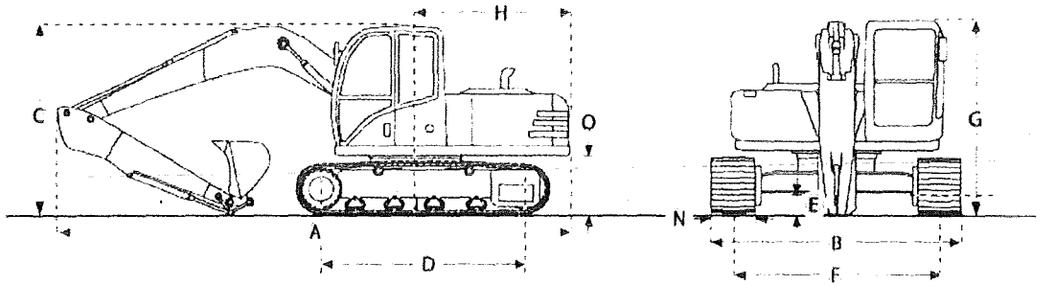
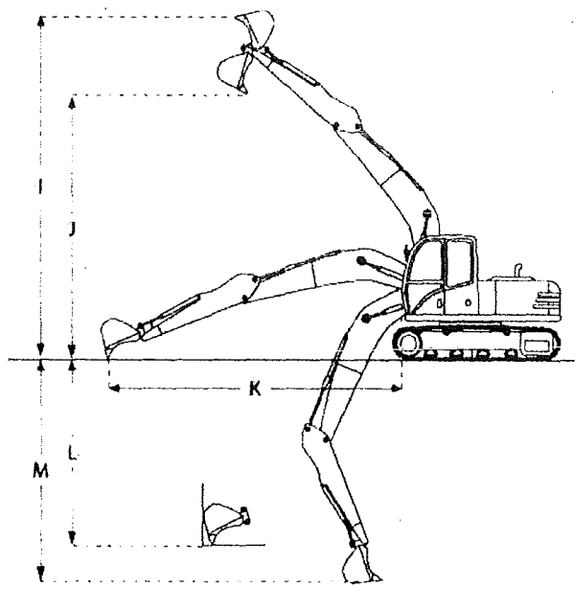


Selected Dimensions

Boom/Stick Option	Boom/Stick Option (HEX) 1	
A. SHIPPING LENGTH OF UNIT	43.3 ft in	13210 mm
C. SHIPPING HEIGHT OF UNIT	14.7 ft in	4470 mm
I. MAX CUTTING HEIGHT	39.1 ft in	11910 mm
J. MAX LOADING HEIGHT	26.4 ft in	8050 mm
K. MAX REACH ALONG GROUND	42.7 ft in	13000 mm
L. MAX VERTICAL WALL DIGGING DEPTH	24.3 ft in	7390 mm
M. MAX DIGGING DEPTH	28 ft in	8530 mm
Dimensions		
B. WIDTH TO OUTSIDE OF TRACKS	13.8 ft in	4190 mm
D. LENGTH OF TRACK ON GROUND	15.1 ft in	4600 mm
E. GROUND CLEARANCE	2.8 ft in	860 mm
G. HEIGHT TO TOP OF CAB	11.3 ft in	3450 mm
H. TAIL SWING RADIUS	12.2 ft in	3710 mm
O. COUNTERWEIGHT CLEARANCE	5 ft in	1520 mm
Undercarriage		
F. TRACK GAUGE	10.8 ft in	3300 mm
N. SHOE SIZE	36 in	900 mm



Specification

Engine		
MAKE	Isuzu	
MODEL	AH-6WG1XYSA-02	
NET POWER	463 hp	345 kw
POWER MEASURED @	1800 rpm	
DISPLACEMENT	957 cu in	15.7 L
ASPIRATION	Turbocharged w/ charge cooler	
NUMBER OF CYLINDERS	6	
Operational		
OPERATING WEIGHT	152190 lb	69033 kg
FUEL CAPACITY	238 gal	901 L
COOLING SYSTEM FLUID CAPACITY	14.7 gal	55.8 L

HYDRAUILC SYSTEM FLUID CAPACITY	190.2 gal	720 L
ENGINE OIL CAPACITY	13.6 gal	51.5 L
SWING DRIVE FLUID CAPACITY	4.8 gal	18 L
OPERATING VOLTAGE	24 V	
ALTERNATOR SUPPLIED AMPERAGE	50 amps	
HYDRAULIC SYSTEM RELIEF VALVE PRESSURE	4975 psi	34300 kPa
HYDRAULIC PUMP FLOW CAPACITY	120 gal/min	456 L/min
Swing Mechanism		
SWING SPEED	9.5 rpm	
SWING TORQUE	142839 lb ft	193804 Nm
Undercarriage		
NUMBER OF SHOES PER SIDE	47	
SHOE SIZE	36 in	900 mm
NUMBER OF CARRIER ROLLERS PER SIDE	3	
NUMBER OF TRACK ROLLERS PER SIDE	8	
GROUND PRESSURE	10.1 psi	69.6 kPa
MAX TRAVEL SPEED	3 mph	4.9 km/h
DRAWBAR PULL	101666 lb	452.2 kN
TRACK GAUGE	10.8 ft in	3300 mm
Buckets		
REFERENCE BUCKET CAPACITY	4 yd3	3.1 m3
MINIMUM BUCKET CAPACITY	2.4 yd3	1.8 m3
MAXIMUM BUCKET CAPACITY	5.8 yd3	4.4 m3
Boom/Stick Option (HEX) 1		
BOOM/STICK OPTION (HEX) 1	25ft. 7in. 7.8m Boom w/ 11ft. 10in. 3.6m Arm	
SHIPPING HEIGHT OF UNIT	14.7 ft in	4470 mm
SHIPPING LENGTH OF UNIT	43.3 ft in	13210 mm
MAX DIGGING DEPTH	28 ft in	8530 mm
MAX REACH ALONG GROUND	42.7 ft in	13000 mm
MAX CUTTING HEIGHT	39.1 ft in	11910 mm
MAX LOADING HEIGHT	26.4 ft in	8050 mm
MAX VERTICAL WALL DIGGING DEPTH	24.3 ft in	7390 mm
Boom/Stick Option (HEX) 2		
BOOM/STICK OPTION (HEX) 2	25ft. 7in. 7.8m Boom w/ 13ft.9in. 4.2m Arm	
SHIPPING HEIGHT OF UNIT	16.3 ft in	4980 mm
SHIPPING LENGTH OF UNIT	43.3 ft in	13210 mm
MAX DIGGING DEPTH	30 ft in	9140 mm
MAX REACH ALONG GROUND	44.7 ft in	13610 mm
MAX CUTTING HEIGHT	40.2 ft in	12240 mm
MAX LOADING HEIGHT	27.3 ft in	8330 mm
MAX VERTICAL WALL DIGGING DEPTH	26.8 ft in	8180 mm
Boom/Stick Option (HEX) 3		
BOOM/STICK OPTION (HEX) 3	25ft. 7in. 7.8m Boom w/ 17ft.5in. 5.3m Arm	
SHIPPING HEIGHT OF UNIT	17.3 ft in	5280 mm
SHIPPING LENGTH OF UNIT	42.8 ft in	13060 mm
MAX DIGGING DEPTH	32.9 ft in	10030 mm
MAX REACH ALONG GROUND	47.6 ft in	14500 mm
MAX CUTTING HEIGHT	41.5 ft in	12650 mm
MAX LOADING HEIGHT	30.1 ft in	9170 mm
MAX VERTICAL WALL DIGGING DEPTH	31.3 ft in	9530 mm
Boom/Stick Option (HEX) 4		
BOOM/STICK OPTION (HEX) 4	22ft. 4in. 6.8m Mass Excavating Boom w/ 9ft. 6in. 2.9m Arm	
SHIPPING HEIGHT OF UNIT	16.3 ft in	4950 mm
SHIPPING LENGTH OF UNIT	40.3 ft in	12270 mm
MAX DIGGING DEPTH	23.3 ft in	7110 mm
MAX REACH ALONG GROUND	37.8 ft in	11510 mm
MAX CUTTING HEIGHT	36.8 ft in	11200 mm
MAX LOADING HEIGHT	24.1 ft in	7340 mm
MAX VERTICAL WALL DIG DEPTH	17.3 ft in	5280 mm
Dimensions		
WIDTH TO OUTSIDE OF TRACKS	13.8 ft in	4190 mm
HEIGHT TO TOP OF CAB	11.3 ft in	3450 mm
GROUND CLEARANCE	2.8 ft in	860 mm
COUNTERWEIGHT CLEARANCE	5 ft in	1520 mm
TAIL SWING RADIUS	12.2 ft in	3710 mm
LENGTH OF TRACK ON GROUND	15.1 ft in	4600 mm

© 2007-2014 RitchieSpecs Equipment Specifications Ritchie Bros. Auctioneers
OEM specifications are provided for base units. Actual equipment might vary with options.

RITCHIE Specs

Everything and Equipment

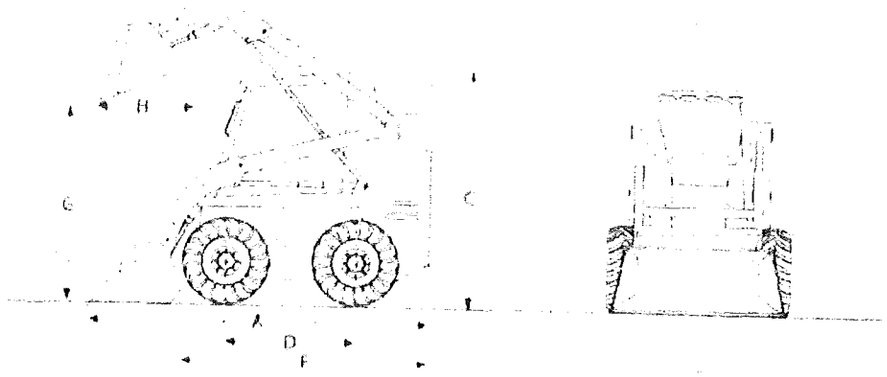
Current number of specifications

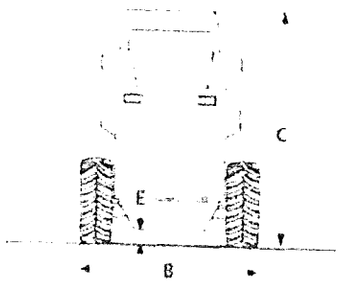
CASE SR200 SKID STEER LOADER

Print specification

Looking to purchase this item?

Need to sell equipment?





Dimensions

LENGTH WITH BUCKET	10 ft 8 in	3300 mm
WIDTH OVER TIRES	5 ft 3 in	1610 mm
HEIGHT TO TOP OF CAB	6 ft 6 in	2000 mm
WHEELBASE	3 ft 7 in	1110 mm
GROUND CLEARANCE	8 in	203.2 mm
DUMP OVER REACH AT MAX LIFT AND DUMP	8 ft 9 in	2670 mm
REACH AT MAX LIFT AND DUMP	8 ft 2 in	2500 mm
DUMP HEIGHT AT MAX LIFT AND DUMP	20.3 in	515.6 mm

Engine

MAKE	Case	
MODEL	4327 (MJ)	
GROSS POWER	74 hp	55.2 kW
NET POWER	70 hp	52.2 kW
POWER MEASURED @	2500 rpm	
DISPLACEMENT	195 cu in	3.2 L
TORQUE MEASURED @	1400 rpm	
MAX TORQUE	203.0 lb ft	275.2 Nm
NUMBER OF CYLINDERS	4	
ASPIRATION	Turbocharged	

Operational

OPERATIONAL WEIGHT	6900 lb	3129.8 kg
FUEL CAPACITY	20 gal	75.7 L
ENGINE OIL FLUID CAPACITY	2.6 gal	10 L
HYDRAULIC SYSTEM FLUID CAPACITY	5.3 gal	20 L
GEAR BOX FLUID CAPACITY (EACH SIDE)	1.8 gal	6.7 L
OPERATING SPEED	7.2 mph	11.6 km/h
MAX SPEED	11.9 mph	19.2 km/h
LINE SIZE	10 x 12.5	
OPERATING VOLTAGE	12 V	
ALTERNATOR SUPPLIED AMPERAGE	95 amps	

Loader

RATED OPERATING CAPACITY	2050 lb	929.7 kg
FULL LOAD	4000 lb	1814.4 kg

BUCKET CAPACITY	0.56 yd3	0.43 m3
BUCKET WIDTH	66 in	1676.4 mm
Hydraulic		
PUMP TYPE	Gear	
PUMP FLOW CAPACITY	8.2 gal/min	31 L/min
RELIEF VALVE PRESSURE	3000 psi	20684.3 kPa
Dimensions		
LENGTH WITH BUCKET	10.8 ft in	3300 mm
LENGTH W/O BUCKET	8.3 ft in	2670 mm
WIDTH OVER TIRES	5.3 ft in	1630 mm
HEIGHT TO TOP OF CAB	6.9 ft in	2000 mm
CLEARANCE AT MAX LIFT AND DUMP	8.2 ft in	2500 mm
WHEELBASE	3.7 ft in	1130 mm
GROUND CLEARANCE	8 in	203.2 mm
REACH AT MAX LIFT AND DUMP	20.3 in	515.6 mm
TURNING RADIUS FROM CENTER - MACHINE REAR	62.9 in	1597.7 mm
TURNING RADIUS FROM CENTER - INC. BUCKET	79.9 in	2029.5 mm

VRH Construction Corp.

320 Grand Ave.
Englewood, NJ 07631

Phone: 201-871-4422
Fax: 201-871-6727

SUBMITTAL
NO. 02050-G0001
PACKAGE NO: 02050

TITLE: Demolition Plan
PROJECT: PANYNJ-EWR-153.226/NJ
DRAWING:
STATUS: 3
BIC: PANYNJ

REQUIRED START: 5/27/2015
REQUIRED FINISH: 6/10/2015
DAYS HELD: 0
DAYS ELAPSED: 131
DAYS OVERDUE: -15

RECEIVED FROM		SENT TO		RETURNED BY		FORWARDED TO	
CATANZAR	VC	PANYNJ	CN	PANYNJ	CN	CATANZAR	VC

Revision No.	Description / Remarks	Received	Sent	Returned	Forwarded	Status	Sepias	Prints	Drawing Date	Held	Elapsed
000	Bertin Engineering & National Bulb	1/15/2015	1/15/2015	2/19/2015	2/19/2015	7	0	0		0	35
001	Building 95 & 332	3/24/2015	3/24/2015	4/2/2015	4/2/2015	4	0	0		-54	9
002	Building 14	5/26/2015	5/26/2015			3	0	0		0	0

This submittal has been reviewed by VRH, checked and approved for compliance with the contract documents.

BERTIN ENGINEERING

66 GLEN AVENUE
GLEN ROCK, NJ07452
P 201.670.6688
F 201.670.9788
www.bertinengineering.com

☐ APPROVED

☒ APPROVED AS CORRECTED
SEE NOTE P.12

☐ NOT APPROVED

☐ REVIEWED WITH COMMENTS

☐ OTHER

Approval is only for conformance with the design concept of the project and compliance with the information given in the Contract documents. Contractor is responsible for conforming and correlating all dimensions at the job site for operations that pertain to the fabrication process or to techniques of construction and for coordination of the work of all trades.

DEWBERRY ENGINEERS INC.

Date: 6/16/2015 BY: RM Essner

TITLE: Engineer

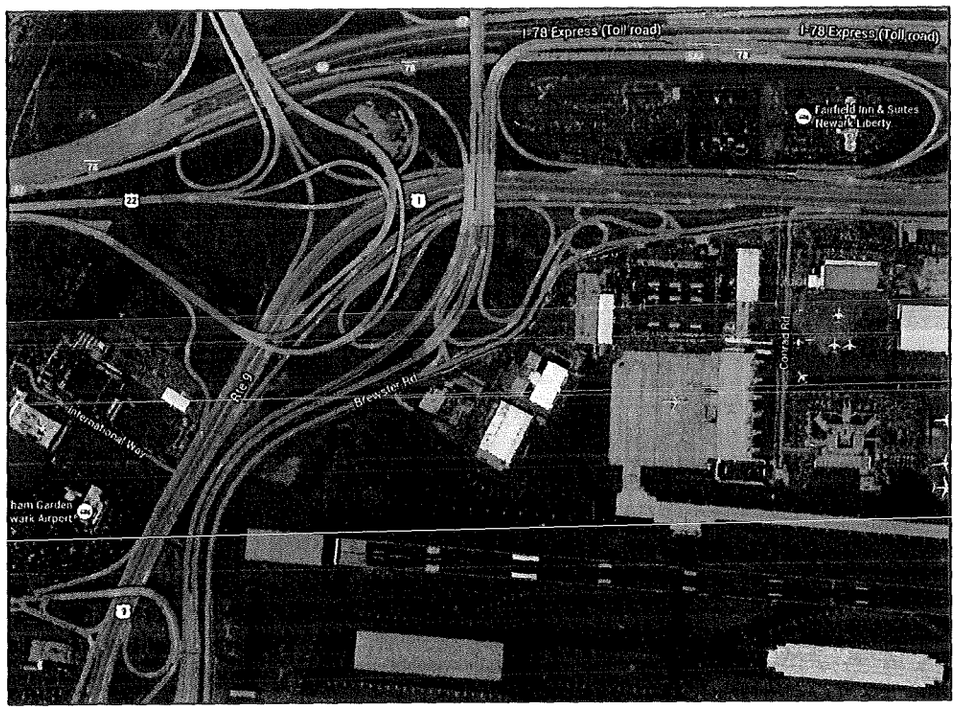
BUILDING REVIEW AND DEMOLITION SEQUENCING REPORT

BUILDING 14
BREWSTER ROAD
NEWARK LIBERTY INTERNATIONAL AIRPORT
NEWARK, NJ

BEA 14-328
(Ref.: Contract # EWR-153.226)

JANUARY 8, 2015
(Revised - January 12, 2015)
(Revised - May 22, 2015)

PREPARED FOR: CATCO Demolition Services
10 Gregory Drive
Montville, New Jersey 07045



PREPARED BY: Jasvinder Arjani
John G. Krakimik, PE

REVIEWED BY: Calisto Bertin, P.E.,
N.J. Lic. #28845

Date: 05.27.15 Contract No.: EWR-153.226
Project: Overnight Aircraft Parking
Transmittal No.: 0062

BUILDING REVIEW AND DEMOLITION SEQUENCING REPORT
Building 14
Brewster Road
Newark Liberty International Airport
Newark, NJ

BE 14-328

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INTRODUCTION

Bertin Engineering (BE) has been retained by CATCO Demolition Services (CATCO), a sub-contractor to VRH Construction Corporation (VRH), to prepare a limited demolition plan for Buildings 95, 332 and 14 on Brewster Road at Newark Liberty International Airport, Newark, NJ. CATCO is responsible to demolish the building superstructures, as enumerated in Contract # EWR-153.226, dated September 12, 2014. This report addresses the demolition of Building 14. A separate report addressed the demolition of Buildings 95 and 332.

An initial site visit was conducted on December 15, 2014 by Jasvinder Arjani, Vinny Luongo and J Dawson Gray of Bertin Engineering to observe the general conditions of the buildings. There was no exploratory or destructive probing performed and it should be understood that not all possible elements of the structure have been viewed and reported on.

CATCO has provided BE with copies of reference documents that are listed below, some of which have been prepared by Catanzaro & Sons Enterprises (CSE), the parent company of CATCO. Documents listed are copies and are not official signed and/or sealed documents.

1. Partial drawing document set for the three buildings they received from the Port Authority of New Jersey through VRH;
2. Site Specific Safety Program prepared by VRH and copy of the cover letter confirming CATCO has reviewed the site specific safety program;
3. Procedure for operating, maintaining, and controlling Forklifts (Powered Industrial Trucks) in a safe manner, prepared by CSE;
4. Procedure for operating, maintaining, and controlling Aerial Personnel Lifts in a safe manner, prepared by CSE;
5. Benzene safety guidelines prepared by CSE;
6. Confined space policy prepared by CSE;
7. Demolition document template prepared by CSE;
8. H2S Safety guideline prepared by CSE;
9. Job hazard analysis/safe work plan policy prepared by CSE;
10. Ladder safety guideline prepared by CSE;
11. Lead safety guideline prepared by CSE;
12. Tool safety and inspection plan prepared by CSE, and;
13. Specifications for John Deere 250G-LC, 350G-LC, 450D-LC and 650G-LC hydraulic excavators and Case SR200 skid steer loader.

PROPERTY DESCRIPTION

One of the three buildings to be demolished is Building 14 on Brewster Road. The building is vacant and will remain unoccupied until it is removed. The building is a former aircraft hangar with a two story office component.

The subject property is part of the Newark Liberty International Airport Overnight Aircraft Parking project on Brewster Road, Newark, New Jersey.

The drawings provided include a Contract Set for the project and available original construction drawings of the buildings. The buildings to be demolished are located in the north portion of the complex, north of runways and close to the access ramps for Highways 1&9, 21, 22, 78 and the NJ Turnpike.

The property is fairly flat and is mostly paved. Except for the loading dock pits, there are no retaining walls or major grade changes near the building. There are various utilities surrounding the building. The plans do not indicate any utilities under the building footprint.

The building to be demolished is not in close proximity to a residential neighborhood or other public buildings. There are two structures in the process of being demolished immediately adjacent to Building 14 as part of this project. Building 14 is in close proximity to the north runway and associated taxiways.

DEMOLITION PROCEDURES

Prior to starting demolition on any of the buildings, CATCO will confirm that the following pre-demolition measures, some to be accomplished by others, are put in place:

1. Removal of hazardous substances;
2. Disconnection of all utilities and cutting and capping of pipes as required;
3. Baiting;
4. Fire control measures;
5. Erosion control measures;
6. Traffic control devices;
7. Barriers;
8. Staging areas for equipment and debris;
9. Mobilizing (4) hydraulic excavators ranging from 55,000 lbs. – 152,000 lbs., equipped with specialty demolition attachments such as jackhammers, grapples and shears; (1) wheel loader 54,000 lbs. and (2) "bobcat" skid steer vehicles;
10. Portable dust control units to constantly mist the demolition areas. *Dustboss db60,* and;
11. Portable dust control through water tank truck(s) to wet down ground beneath and surrounding the controlled collapse of superstructure steel only.

BE does not anticipate the extensive use of temporary supports such as scaffolding and shoring. The building demolitions are planned to be accomplished utilizing hydraulic excavators positioned safely around the exterior of the building or its structural remains. Demolition would proceed systematically from the roof line of the structure to the floor at grade by removing dead load generally opposite the sequence the buildings were constructed. Superstructure steel and required sway bracing would remain in place during the removals. Superstructure steel would them be prepared for a controlled collapse as detailed below.

Concrete, concrete encasement and masonry units would be removed by utilizing excavators with jackhammering equipment and buckets.

Structural steel members such as trusses, joists, beams, columns, diagonal bracing and the second floor concrete floor of the office area would be removed through a controlled collapse. According to available plans, specifically, Drawing No. 204 of Contract No. NA-380.003, the office area second floor concrete slab is required to remain in place for stability of the in-place structural steel. The controlled collapse would be accomplished by making a series of cuts in the flanges of columns near the base along Column Line "C". The John Deere 650D-LC, 450D-LC, 350G-LC and JD250G-LC excavators would then pull cables wrapped around columns in Column Line "C". The pull would be toward the northwest, perpendicular to Column Line "C" and away from runways, active

roadways and taxiways. The force of the pull would cause column webs along Column Line "C" to yield and bend, thereby making the column and thus the entire superstructure and roof "kneel" in a measured fall with roof trusses remaining generally intact and landing as such on the ground. CATCO performs this method of large building demolition safely on a regular basis with complete success. The method is arguably safer than cutting and picking the truss apart from the constructed higher elevation. See www.catcodemo.com or on Facebook for videos and photos of this method. A list of controlled collapse building demolitions performed by CATCO includes the following:

- 192 Bloomfield Ave., Bloomfield, NJ – 3 story, steel frame commercial building. Former Hartz Mountain building. Front of building directly on Bloomfield Avenue;
- 2- 150 foot height water towers for Tilcon, NY Riverdale, NJ and Mt. Hope, NJ;
- Assorted mining and steel structures, maximum 125 foot height;
- US Gypsum Factory, Clark, NJ – 230 foot high steel and brick smokestack;
- BASF Factory, South Kearny, NJ – 12 story, heavily reinforced steel frame structure;
- Essex County Hospital, Belleville, NJ – 250 foot high steel and brick smokestack;
- Drew Chemical Company, Boonton, NJ – 3, 5 story steel and brick industrial buildings with direct frontage on Division Street and Woonton Avenue;
- Fieldstone Developers, North Bergen, NJ – 4 story steel and brick industrial buildings with direct frontage on Kennedy Boulevard, and;
- D.R. Mon Group, West New York, NJ 3 and 4 story steel and brick industrial buildings with direct frontage on Washington Avenue;

Calculations to determine the effects of wind or the demolition itself to determine if the remaining superstructure would be stabile are not necessary if the structure is dismembered in the sequences outlined in this report. The sequences reflect a demolition process opposite to the order the building was constructed to systematically reduce dead load and maintain stability throughout the demolition process.

Once each portion of the building, exclusive of superstructure steel, is down on the slab, the sorting of the debris will be accomplished from the outside moving in to remove all building components. This method is necessary to achieve the reach necessary for the excavators performing the demolition.

At no time will any unauthorized personnel enter the area of demolition before it is cleared. Implosion methods or wrecking balls will not be used.

Dust control measures will be implemented throughout the duration of the demolition operation. A more intensive dust control measure will be implemented immediately prior to the controlled collapse of the superstructure by flooding the grade slab and the surrounding area with water.

This office will perform periodic site observations during the demolition to monitor compliance with these procedures.

BUILDING 14

Building 14 has a footprint of approximately 61,300 square feet. Being an aircraft hangar, it has a high cantilevered roof with 2 sets of large rolling doors for aircraft access. There is also a two-story office on the side facing Brewster Road.

The figure below is a reduced copy of the Building 14 Plan Drawing S101.

From visual observations, and available plans, it is understood that the roof trusses span from Column Line "A" through Column Line "C" continuously to Column Line "H", apparently as a cantilever over the aircraft storage area. Column Line 1 and 14 are end walls. Hanger doors are installed along Column Line H and large truss girders were observed along Column Line H to allow for these wide openings.

[redacted]

Foundation & Footing:

The Building 14 superstructure is built over a pile foundation and does not have a basement. The foundation system includes piles, pile caps and grade beams, and has a structural floor slab.

Visual observations of the floor slab indicate it is in good condition, with no signs of movement or cracks.

Columns:

Column lines, supporting the cantilevered trusses are typically 20 feet from centerline to centerline, except for 2 interior column lines spaced at 40 feet. According to available plans, the columns are steel and are encased in concrete or masonry. The masonry or concrete encasement cover appears to be in good condition, with no signs of damage or cracks.

Visual evidence of cross bracing for the superstructure is provided throughout the structure. Limited available plans also indicate certain temporary bracings in the two story portion that were removed once the concrete floor slab was placed.

The steel structure toward the air side is designed to support the framing for the hanger doors. There are miscellaneous secondary steel supports within the trusses which support mechanical equipment.

Girders and Roof Framing:

The girders used for the floor construction are steel beams that support the second floor reinforced concrete slab, roof framing between columns and equipment. The girder along Column Line "H" is a deep truss structure for long spans that appears to aid in the support of the cantilevered roof trusses and hanger doors.

The roof consists of steel trusses with corrugated steel sheet metal roofing. The trusses also support mechanical equipment. In the two-story section between Column Lines "A" and "C", steel joists have been provided between the trusses to support the second floor ceiling. These trusses are connected with bracing at the bottom chord and sheet metal at the top for lateral stability. Where visible, they are in fairly good condition.

Walls:

The observed exterior and interior walls are built out of concrete masonry units. The walls along column lines appear to be non-bearing, the stair and elevator enclosures are probably load bearing. Bearing walls will be confirmed during the early stages of demolition, when the ceilings are removed.

The walls appear to be in good condition. However there are some step cracks in the block walls along Column Line "C". The contractor/supervisor shall contact the Engineer to access the wall damage if it is of concern when exposed.

Demolition of Building 14

The 2-story portion of the building appears to contain sufficient lateral support from the cross bracing and second floor slab concrete and framing steel to remain stable during masonry demolition. The hanger portion of the building contains cross bracing along Column Lines 1 and 14, the exterior lines.

The demolition of Building 14 will proceed as follows:

1. Use handheld tools for removal of all movable and loose non-structural installations, including mechanical equipment, ceilings, furniture, partition walls, plumbing fixtures, light fixtures and window glass. **Window glass must be removed first.**
2. Use Case SR200 skid-steer loaders equipped with hydraulic attachments to demolish interior non-bearing walls, equipment platforms and supports.
3. Use John Deere 250G LC, and 350G LC and tools to remove remaining masonry and concrete components of the superstructure, except for the second floor slab which, according to available plans is required for lateral stability. Any steel cross bracing found during this phase must remain intact and undamaged. Additionally, all structural steel must remain intact and undamaged during this phase.
4. At the conclusion of the previous phase, all structural steel, cross bracing and the second floor concrete slab of the superstructure are all that shall remain to limit the amount of dust which may be produced during the controlled collapse of the remaining superstructure and to maintain stability. All debris shall be removed from the entire ground floor slab before proceeding with this phase.

   Perform a controlled collapse of the remaining superstructure by:

   a) Cordoning a safe distance from the building and prohibiting all unauthorized personnel from the area;
   b) Coordinating with Newark Airport Operations regarding parked aircraft in close proximity;
   c) Positioning the John Deere 650D-LC, 450D-LC, 250G-LC and 350G-LC excavators at locations roughly one and a half times the height of the structure away from the building with steel cables attached to the excavators and wrapped around columns within Column Line "C". Columns are to be matched with excavators as follows:
      a. 250G-LC with C1, C2, C3 & C4;
      b. 650D-LC with C5, C6 and C7;
      c. 450D-LC with C8, C9 and C10, and;
      d. 350G-LC with C11, C12, C13 and C14
   d) Flood the entire ground floor of the structure and the surrounding area with water via tank trucks and hoses to control the impending dust;

e) Pull cables tight with little slack ensuring that they engage each wrapped column equally;

f) Cut flanges in accordance with attached Sketch SK-1. All webs shall remain intact.

g) Signal "all clear" once all personnel have left the cordoned area.

h) Excavators will then tension the cables in a slow, steady manner to a tension not to exceed 50% of the cables' capacities;

i) Monitor superstructure via survey equipment for movement;

j) Clear collapsed material using the 250G LC and 350G LC with shear cutters and grapples.

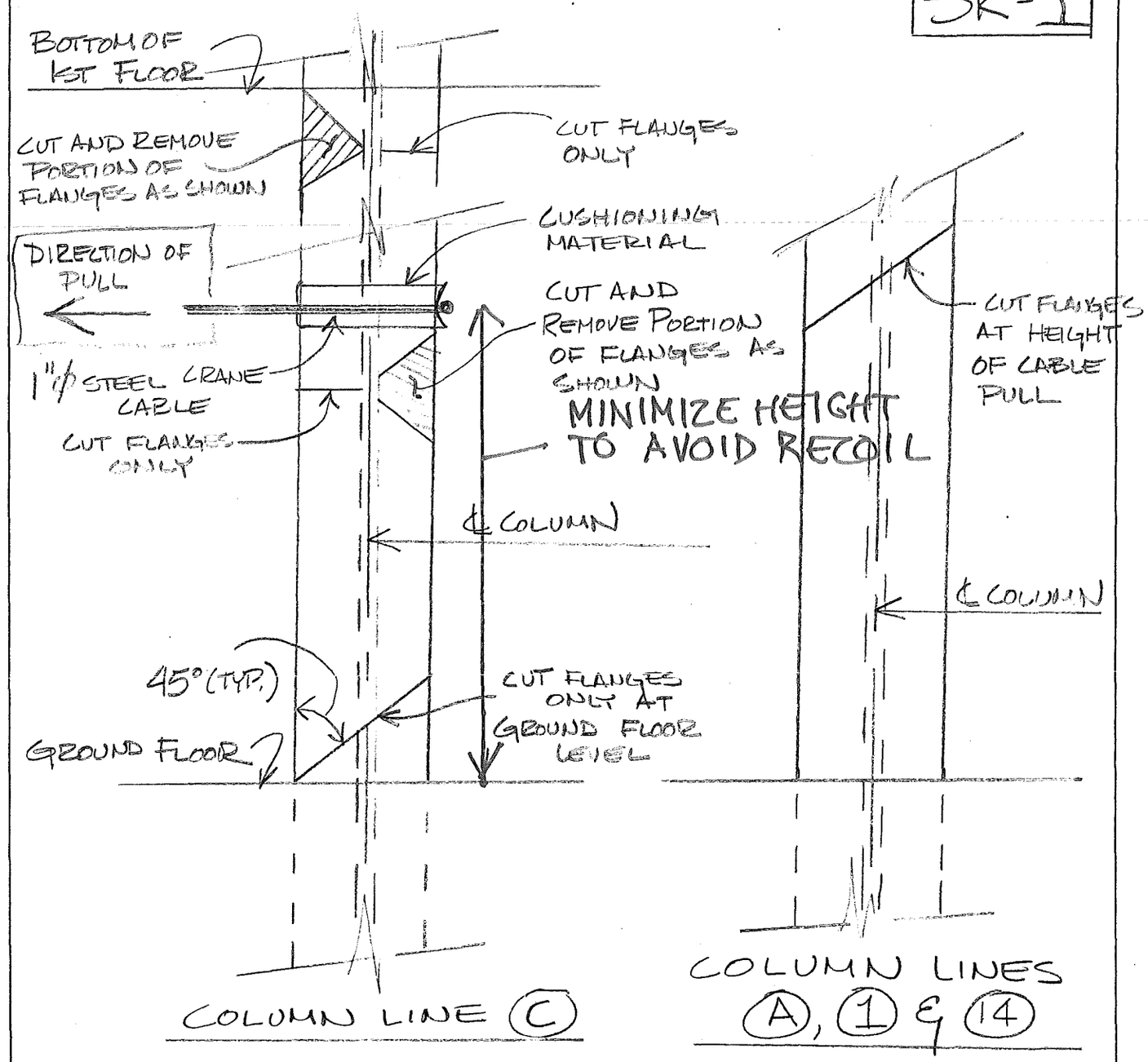
A qualified supervisor will monitor the demolition at all times and will inform the Engineer of any deviations from the description and demolition plan and of any unsafe situations that need immediate attention.

BERTIN ENGINEERING

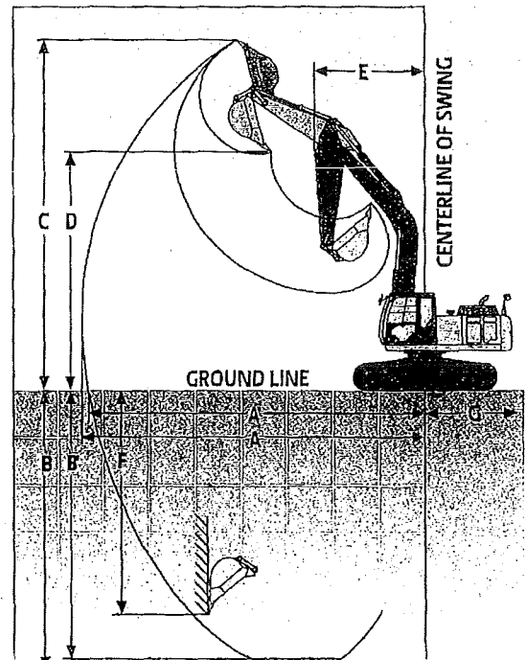
SHEET NO. 1 OF
CALCULATED BY CY DATE 5/20/15
CHECKED BY CB DATE
SCALE

BUILDING REVIEW & DEMOLITION SEQUENCING REPORT
BUILDING 14
BREWSTER ROAD, NEWARK LIBERTY AIRPORT
NEWARK, NJ

SK-1

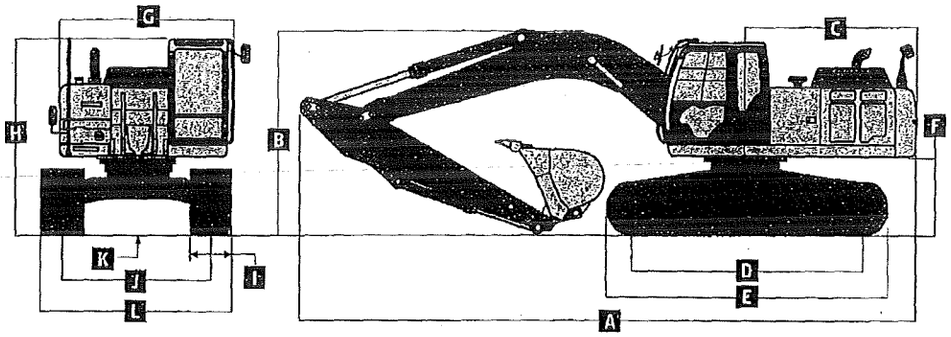


Ground Pressure	250G LC	
700-mm (28 in.) Triple Semi-Grouser Shoes	41.8 kPa (6.06 psi)	
800-mm (32 in.) Triple Semi-Grouser Shoes	37.0 kPa (5.37 psi)	
Swing Mechanism		
Speed	13.5 rpm	
Torque	74 376 Nm (54,857 lb.-ft.)	
Serviceability		
Refill Capacities		
Fuel Tank	500 L (132 gal.)	
Cooling System	23 L (6 gal.)	
Engine Oil with Filter	19.5 L (5.2 gal.)	
Hydraulic Tank	147.6 L (39 gal.)	
Hydraulic System	240 L (63 gal.)	
Swing Drive	7 L (7.5 qt.)	
Gearbox		
Propel (each)	6.2 L (6.5 qt.)	
Pump Drive	1.1 L (1.2 qt.)	
Operating Weights		
With full fuel tank; 79-kg (175 lb.) operator; 1.06-m³ (1.38 cu. yd.), 1065-mm (42 in.), 997-kg (2,197 lb.) bucket; 3.61-m (11 ft. 10 in.) arm; 5112-kg (11,270 lb.) counterweight; and 800-mm (32 in.) triple semi-grouser shoes		
Operating Weight	25 281 kg (55,736 lb.)	
Component Weights		
Undercarriage with Triple Semi-Grouser Shoes		
700 mm (28 in.)	8467 kg (18,667 lb.)	
800 mm (32 in.)	8752 kg (19,294 lb.)	
One-Piece Boom (with arm cylinder)	2210 kg (4,872 lb.)	
Arm with Bucket Cylinder and Linkage		
2.96 m (9 ft. 9 in.)	1296 kg (2,858 lb.)	
3.61 m (11 ft. 10 in.)	1396 kg (3,078 lb.)	
Boom-Lift Cylinders (2), Total Weight	434 kg (958 lb.)	
1.06-m³ (1.38 cu. yd.), 1065-mm (42 in.) Heavy-Duty Plate-Lip Bucket	997 kg (2,197 lb.)	
Counterweight, Standard	5112 kg (11,270 lb.)	
Operating Dimensions		
Arm Length	*2.96 m (9 ft. 9 in.)*	*3.61 m (11 ft. 10 in.)*
Arm Digging Force		
SAE	129.1 kN (29,021 lb.)	112.2 kN (25,220 lb.)
ISO	131.0 kN (29,450 lb.)	114.0 kN (25,628 lb.)
Bucket Digging Force		
SAE	175.9 kN (39,552 lb.)	175.9 kN (39,552 lb.)
ISO	189.0 kN (42,489 lb.)	189.0 kN (42,489 lb.)
Lifting Capacity Over Front at Ground Level 6.1-m (20 ft.) Reach (with power boost)	8455 kg (18,639 lb.)	8381 kg (18,478 lb.)
A Maximum Reach	10.29 m (33 ft. 9 in.)	10.91 m (35 ft. 10 in.)
A' Maximum Reach at Ground Level	10.11 m (33 ft. 2 in.)	10.75 m (35 ft. 3 in.)
B Maximum Digging Depth	6.96 m (22 ft. 10 in.)	7.61 m (25 ft. 0 in.)
B' Maximum Digging Depth at 2.44-m (8 ft. 0 in.) Flat Bottom	6.75 m (22 ft. 2 in.)	7.44 m (24 ft. 5 in.)
C Maximum Cutting Height	10.16 m (33 ft. 4 in.)	10.56 m (34 ft. 8 in.)
D Maximum Dumping Height	7.20 m (23 ft. 7 in.)	7.58 m (24 ft. 10 in.)
E Minimum Swing Radius	3.44 m (11 ft. 3 in.)	3.43 m (11 ft. 3 in.)
F Maximum Vertical Wall	6.03 m (19 ft. 9 in.)	6.74 m (22 ft. 1 in.)
G Tail-Swing Radius	3.14 m (10 ft. 4 in.)	3.14 m (10 ft. 4 in.)



Machine Dimensions — 250G LC

A	Overall Length	
	2.96 m (9 ft. 9 in.)	10.35 m (34 ft. 0 in.)
	3.61 m (11 ft. 10 in.)	10.41 m (34 ft. 2 in.)
B	Overall Height	
	2.96 m (9 ft. 9 in.)	3.07 m (10 ft. 1 in.)
	3.61 m (11 ft. 10 in.)	3.14 m (10 ft. 4 in.)
C	Rear-End Length/Swing Radius	3.14 m (10 ft. 4 in.)
D	Distance Between Idler/Sprocket Centerline	3.84 m (12 ft. 7 in.)
E	Undercarriage Length	4.64 m (15 ft. 3 in.)
F	Counterweight Clearance	1.09 m (3 ft. 7 in.)
G	Upperstructure Width	2.89 m (9 ft. 6 in.)
H	Cab Height	3.01 m (9 ft. 11 in.)
I	Track Width with Triple Semi-Grouser Shoes	700 mm (28 in.) / 800 mm (32 in.)
J	Gauge Width	2.59 m (8 ft. 6 in.)
K	Ground Clearance	0.46 m (18 in.)
L	Overall Width with Triple Semi-Grouser Shoes	
	700 mm (28 in.)	3.29 m (10 ft. 10 in.)
	800 mm (32 in.)	3.39 m (11 ft. 3 in.)



Lift Capacities

Boldface type indicates hydraulically limited capacity; lightface type indicates stability-limited capacities, in kg (lb.). Ratings at bucket lift hook; machine equipped with 871-kg (1,920 lb.) bucket; standard gauge; and situated on firm, uniform supporting surface. Total load includes weight of cables, hook, etc. Figures do not exceed 87 percent of hydraulic capacities or 75 percent of weight needed to tip machine. All lift capacities are based on ISO 10567.

Load Point Height	1.5 m (5 ft.)		3.0 m (10 ft.)		4.5 m (15 ft.)		6.0 m (20 ft.)		7.5 m (25 ft.)		9.0 m (30 ft.)	
Horizontal Distance from Centerline of Rotation	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side
With 2.96-m (9 ft. 9 in.) arm and 700-mm (28 in.) shoes												
6.0 m (20 ft.)							5126 (11,207)	5126 (11,207)				
4.5 m (15 ft.)					7138 (15,343)	7138 (15,343)	5939 (12,881)	5939 (12,881)	5358 (11,712)	4155 (8,903)		
3.0 m (10 ft.)					9529 (20,456)	9253 (19,947)	7053 (15,254)	5839 (12,571)	5900 (12,831)	4012 (8,610)		
1.5 m (5 ft.)					11 578 (24,945)	8596 (18,513)	8135 (17,591)	5515 (11,872)	6109 (13,128)	3852 (8,276)		
Ground Line					12 543 (27,129)	8277 (17,798)	8576 (18,423)	5295 (11,393)	5973 (12,839)	3728 (8,013)		
–1.5 m (–5 ft.)			8446 (19,259)	8446 (19,259)	12 551 (27,188)	8201 (17,622)	8471 (18,196)	5203 (11,192)	5919 (12,733)	3679 (7,916)		
–3.0 m (–10 ft.)	9964 (22,420)	9964 (22,420)	14 599 (33,304)	14 599 (33,304)	11 732 (25,372)	8282 (17,803)	8509 (18,290)	5237 (11,275)				
–4.5 m (–15 ft.)			13 748 (29,522)	13 748 (29,522)	9758 (20,866)	8530 (18,366)						
With 3.61-m (11 ft. 10 in.) arm and 700-mm (28 in.) shoes												
6.0 m (20 ft.)							4380 (9,584)	4380 (9,584)	4073 (8,643)	4073 (8,643)		
4.5 m (15 ft.)							5228 (11,347)	5228 (11,347)	4823 (10,535)	4236 (9,080)		
3.0 m (10 ft.)					8377 (17,995)	8377 (17,995)	6404 (13,856)	5954 (12,814)	5440 (11,830)	4066 (8,728)	3825 (7,436)	2875 (6,140)
1.5 m (5 ft.)					10 707 (23,066)	8785 (18,917)	7613 (16,465)	5589 (12,027)	6104 (13,196)	3877 (8,327)	4493 (8,810)	2792 (5,971)
Ground Line			4492 (10,371)	4492 (10,371)	12 136 (26,233)	8327 (17,907)	8537 (18,478)	5314 (11,431)	5970 (12,828)	3720 (7,992)	4417 (8,130)	2721 (5,829)
–1.5 m (–5 ft.)	4381 (9,836)	4381 (9,836)	7698 (17,525)	7698 (17,525)	12 576 (27,229)	8149 (17,510)	8438 (18,120)	5167 (11,111)	5872 (12,622)	3631 (7,804)		
–3.0 m (–10 ft.)	8049 (18,103)	8049 (18,103)	12 146 (27,656)	12 146 (27,656)	12 165 (26,317)	8158 (17,531)	8413 (18,073)	5145 (11,070)	5876 (12,649)	3635 (7,828)		
–4.5 m (–15 ft.)	12 636 (28,581)	12 636 (28,581)	15 638 (33,670)	15 638 (33,670)	10 774 (23,160)	8328 (17,916)	7773 (16,579)	5263 (11,351)				

Lift Capacities *(continued)* 250G LC

Boldface type indicates hydraulically limited capacity; lightface type indicates stability-limited capacities, in kg (lb.). Ratings at bucket lift hook; machine equipped with 871-kg (1,920 lb.) bucket; standard gauge; and situated on firm, uniform supporting surface. Total load includes weight of cables, hook, etc. Figures do not exceed 87 percent of hydraulic capacities or 75 percent of weight needed to tip machine. All lift capacities are based on ISO 10567.

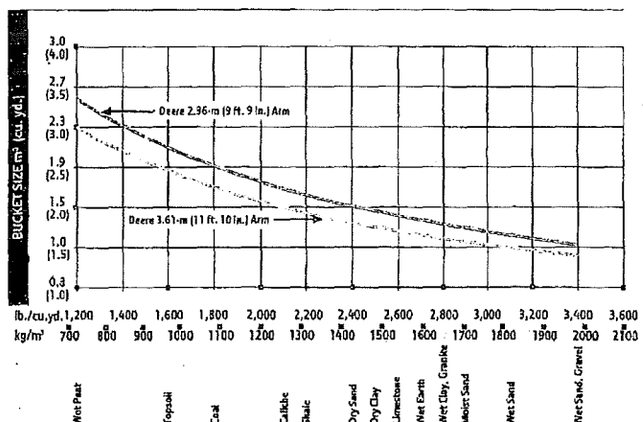
Load Point Height	1.5 m (5 ft.)		3.0 m (10 ft.)		4.5 m (15 ft.)		6.0 m (20 ft.)		7.5 m (25 ft.)		9.0 m (30 ft.)	
Horizontal Distance from Centerline of Rotation	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side
With 2.96-m (9 ft. 9 in.) arm and 800-mm (32 in.) shoes												
6.0 m (20 ft.)							5126 (11,207)	5126 (11,207)				
4.5 m (15 ft.)					7138 (15,343)	7138 (15,343)	5939 (12,881)	5939 (12,881)	5358 (11,712)	4203 (9,007)		
3.0 m (10 ft.)					9529 (20,456)	9347 (20,149)	7053 (15,254)	5902 (12,708)	5900 (12,831)	4059 (8,714)		
1.5 m (5 ft.)					11 578 (24,945)	8690 (18,716)	8135 (17,591)	5578 (12,009)	6182 (13,286)	3900 (8,380)		
Ground Line					12 543 (27,129)	8371 (18,001)	8676 (18,639)	5358 (11,530)	6046 (12,998)	3776 (8,116)		
–1.5 m (–5 ft.)			8446 (19,259)	8446 (19,259)	12 551 (27,188)	8295 (17,825)	8571 (18,413)	5266 (11,329)	5993 (12,891)	3727 (8,019)		
–3.0 m (–10 ft.)	9964 (22,420)	9964 (22,420)	14 599 (33,304)	14 599 (33,304)	11 732 (25,372)	8376 (18,005)	8588 (18,506)	5300 (11,412)				
–4.5 m (–15 ft.)			13 748 (29,522)	13 748 (29,522)	9758 (20,866)	8624 (18,568)						
With 3.61-m (11 ft. 10 in.) arm and 800-mm (32 in.) shoes												
6.0 m (20 ft.)							4380 (9,584)	4380 (9,584)	4073 (8,643)	4073 (8,643)		
4.5 m (15 ft.)							5228 (11,347)	5228 (11,347)	4823 (10,535)	4284 (9,184)		
3.0 m (10 ft.)					8377 (17,995)	8377 (17,995)	6404 (13,856)	6018 (12,951)	5440 (11,830)	4114 (8,831)	3825 (7,436)	2914 (6,223)
1.5 m (5 ft.)					10 707 (23,066)	8879 (19,119)	7613 (16,465)	5652 (12,164)	6104 (13,251)	3925 (8,431)	4503 (8,810)	2830 (6,055)
Ground Line			4492 (10,371)	4492 (10,371)	12 136 (26,233)	8421 (18,109)	8537 (18,478)	5378 (11,568)	6043 (12,986)	3768 (8,095)	4438 (8,130)	2759 (5,912)
–1.5 m (–5 ft.)	4381 (9836)	4381 (9836)	7698 (17,525)	7698 (17,525)	12 576 (27,229)	8243 (17,712)	8538 (18,336)	5230 (11,248)	5945 (12,780)	3679 (7,907)		
–3.0 m (–10 ft.)	8049 (18,103)	8049 (18,103)	12 146 (27,656)	12 146 (27,656)	12 165 (26,317)	8252 (17,734)	8513 (18,290)	5209 (11,207)	5950 (12,807)	3683 (7,932)		
–4.5 m (–15 ft.)	12 636 (25,581)	12 636 (25,581)	15 638 (33,670)	15 638 (33,670)	10 774 (23,160)	8422 (18,118)	7773 (16,579)	5327 (11,488)				

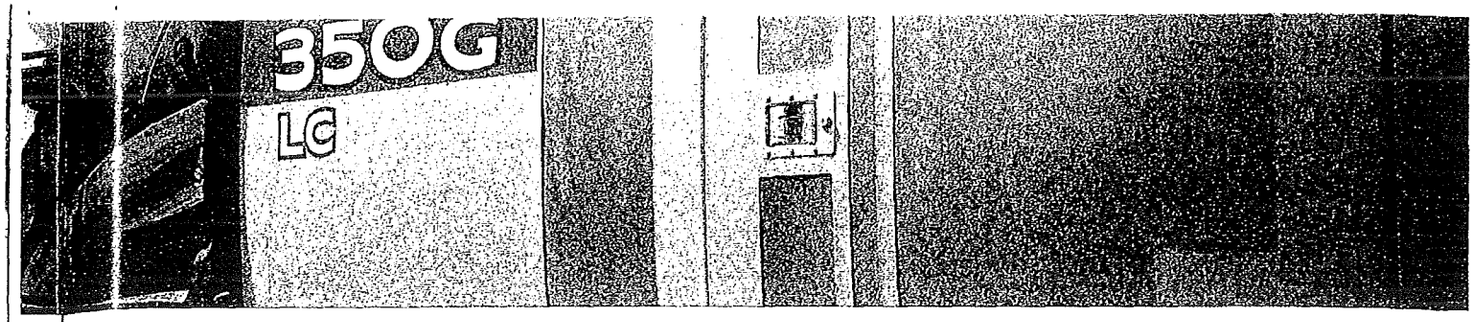
Buckets

A full line of buckets is offered to meet a wide variety of applications. Digging forces are with power boost. Tooth selection includes the John Deere Fanggs™ Standard, Tiger, Twin Tiger, Abrasion panel, or Flare tooth. Replaceable cutting edges and a variety of teeth are available through John Deere Parts. Optional side cutters add 150 mm (6 in.) to bucket widths. Capacities are SAE heaped ratings.

Type Bucket	Bucket Width		Bucket Capacity		Bucket Weight		Bucket Dig Force		Arm Dig Force 2.96 m (9 ft. 9 in.)		Arm Dig Force 3.61 m (11 ft. 10 in.)		Bucket Tip Radius		Number of Teeth
	mm	in.	m³	cu. yd.	kg	lb.	kN	lb.	kN	lb.	kN	lb.	mm	in.	
Heavy Duty	1067	42	1.06	1.4	997	2,197	176.0	39,558	129.1	29,021	112.2	25,220	1435	56.5	5
Heavy Duty	1219	48	1.22	1.6	1071	2,361	176.0	39,558	129.1	29,021	112.2	25,220	1435	56.5	6
Heavy Duty	1372	54	1.39	1.8	1138	2,509	176.0	39,558	129.1	29,021	112.2	25,220	1435	56.5	6
Heavy Duty High Capacity	610	24	0.70	0.9	801	1,767	167.4	37,636	124.7	28,044	108.9	24,477	1588	62.5	3
Heavy Duty High Capacity	760	30	0.92	1.2	913	2,012	167.4	37,636	124.7	28,044	108.9	24,477	1588	62.5	4
Heavy Duty High Capacity	914	36	1.13	1.5	968	2,135	167.4	37,636	124.7	28,044	108.9	24,477	1588	62.5	4
Heavy Duty High Capacity	1065	42	1.34	1.7	1035	2,281	167.4	37,636	124.7	28,044	108.9	24,477	1588	62.5	5
Heavy Duty High Capacity	1220	48	1.55	2.0	1137	2,507	167.4	37,636	124.7	28,044	108.9	24,477	1588	62.5	6
Ditching	1525	60	3.00	3.9	709	1,563	211.4	47,534	136.6	30,705	117.8	26,485	1194	47.0	0

Bucket Selection Guide*

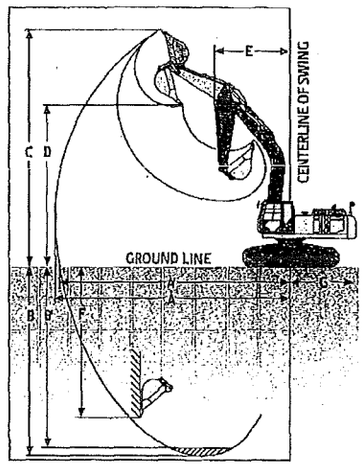




Ground Pressure	**350G LC**
800-mm (32 in.) Triple Semi-Grouser Shoes	52.8 kPa (7.66 psi)
Swing Mechanism	
Speed	10.7 rpm
Torque	120 000 Nm (88,507 lb.-ft.)
Serviceability	
Refill Capacities	
Fuel Tank	628 L (166 gal.)
Cooling System	39.7 L (10.5 gal.)
Engine Oil with Filter	27 L (7.2 gal.)
Hydraulic Tank	193 L (51 gal.)
Hydraulic System	290 L (77 gal.)
Swing Drive	11.8 L (12.5 qt.)
Gearbox	
Propel (each)	8.5 L (9.0 qt.)
Pump Drive	1.1 L (1.2 qt.)
Operating Weights	
With full fuel tank; 79-kg (175 lb.) operator; 1.76-m³ (2.3 cu. yd.), 1370-mm (54 in.), 1160-kg (2,557 lb.) bucket; 4.0-m (13 ft. 1 in.) arm; 6928-kg (15,274 lb.) counterweight; and 800-mm (32 in.) triple semi-grouser shoes	
Operating Weight	34 726 kg (76,557 lb.)
Component Weights	
Undercarriage with 800-mm (32 in.) Triple Semi-Grouser Shoes	12 710 kg (28,020 lb.)
One-Piece Boom (with arm cylinder)	3031 kg (6,682 lb.)
Arm with Bucket Cylinder and Linkage	
2.66 m (8 ft. 9 in.)	1649 kg (3,635 lb.)
3.2 m (10 ft. 6 in.)	1758 kg (3,876 lb.)
4.0 m (13 ft. 1 in.)	1898 kg (4,184 lb.)
Boom-Lift Cylinders (2), Total Weight	624 kg (1,376 lb.)
1.76-m³ (2.3 cu. yd.), 1370-mm (54 in.) Heavy-Duty Bucket	1160 kg (2,557 lb.)
Counterweight, Standard	6928 kg (15,274 lb.)

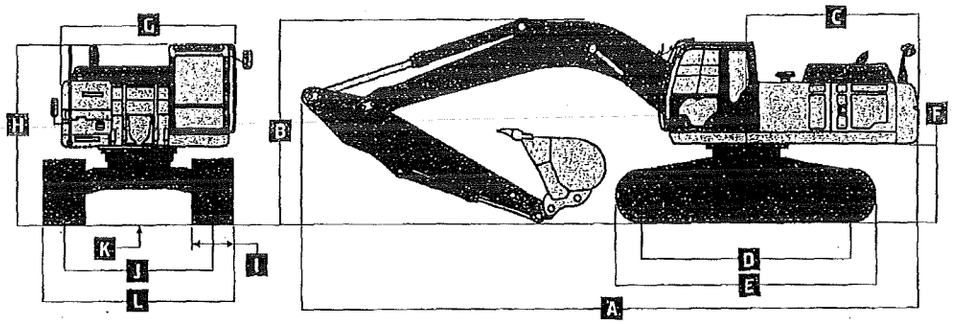
Operating Dimensions

	Arm Length	*2.66 m (8 ft. 9 in.)*	*3.2 m (10 ft. 6 in.)*	*4.0 m (13 ft. 1 in.)*
	Arm Digging Force			
	SAE	204.2 kN (45,914 lb.)	177.6 kN (39,930 lb.)	152.6 kN (34,314 lb.)
	ISO	222.0 kN (49,908 lb.)	185.0 kN (41,590 lb.)	159.0 kN (35,745 lb.)
	Bucket Digging Force			
	SAE	225.2 kN (50,628 lb.)	225.2 kN (50,628 lb.)	225.2 kN (50,628 lb.)
	ISO	246.0 kN (55,303 lb.)	246.0 kN (55,303 lb.)	246.0 kN (55,303 lb.)
	Lifting Capacity Over Front at Ground Level 6.1-m (20 ft.) Reach (with power boost)	12 790 kg (28,197 lb.)	12 800 kg (28,219 lb.)	12 851 kg (28,331 lb.)
A	Maximum Reach	10.57 m (34 ft. 8 in.)	11.10 m (36 ft. 5 in.)	11.86 m (38 ft. 11 in.)
A'	Maximum Reach at Ground Level	10.36 m (34 ft. 0 in.)	10.89 m (35 ft. 9 in.)	11.67 m (38 ft. 3 in.)
B	Maximum Digging Depth	6.84 m (22 ft. 5 in.)	7.38 m (24 ft. 3 in.)	8.18 m (26 ft. 10 in.)
B'	Maximum Digging Depth at 2.44-m (8 ft. 0 in.) Flat Bottom	6.64 m (21 ft. 9 in.)	7.21 m (23 ft. 8 in.)	8.04 m (26 ft. 5 in.)
C	Maximum Cutting Height	9.99 m (32 ft. 9 in.)	10.36 m (34 ft. 0 in.)	10.75 m (35 ft. 3 in.)
D	Maximum Dumping Height	6.94 m (22 ft. 9 in.)	7.24 m (23 ft. 9 in.)	7.63 m (25 ft. 0 in.)
E	Minimum Swing Radius	4.61 m (15 ft. 1 in.)	4.46 m (14 ft. 8 in.)	4.47 m (14 ft. 8 in.)
F	Maximum Vertical Wall	5.51 m (18 ft. 1 in.)	6.42 m (21 ft. 1 in.)	7.27 m (23 ft. 10 in.)
G	Tail-Swing Radius	3.60 m (11 ft. 10 in.)	3.60 m (11 ft. 10 in.)	3.60 m (11 ft. 10 in.)



Machine Dimensions

		350G LC
A	Overall Length	
	2.66 m (8 ft. 9 in.)	11.33 m (37 ft. 2 in.)
	3.2 m (10 ft. 6 in.)	11.20 m (36 ft. 9 in.)
	4.0 m (13 ft. 1 in.)	11.29 m (37 ft. 1 in.)
B	Overall Height	
	2.66 m (8 ft. 9 in.)	3.47 m (11 ft. 5 in.)
	3.2 m (10 ft. 6 in.)	3.27 m (10 ft. 9 in.)
	4.0 m (13 ft. 1 in.)	3.60 m (11 ft. 10 in.)
C	Rear-End Length/Swing Radius	3.60 m (11 ft. 10 in.)
D	Distance Between Idler/Sprocket Centerline	4.05 m (13 ft. 3 in.)
E	Undercarriage Length	4.94 m (16 ft. 2 in.)
F	Counterweight Clearance	1.18 m (3 ft. 10 in.)
G	Upperstructure Width	2.99 m (9 ft. 10 in.)
H	Cab Height	3.14 m (10 ft. 4 in.)
I	Track Width with Triple Semi-Grouser Shoes	800 mm (32 in.)
J	Gauge Width	2.59 m (8 ft. 6 in.)
K	Ground Clearance	0.50 m (20 in.)
L	Overall Width with Triple Semi-Grouser Shoes	
	600 mm (24 in.)	3.19 m (10 ft. 6 in.)
	800 mm (32 in.)	3.39 m (11 ft. 2 in.)



Lift Capacities

Boldface type indicates hydraulically limited capacity; lightface type indicates stability-limited capacities, in kg (lb.). Ratings at bucket lift hook; machine equipped with 1160-kg (2,557 lb.) bucket and 800-mm (32 in.) shoes; standard gauge; and situated on firm, uniform supporting surface. Total load includes weight of cables, hook, etc. Figures do not exceed 87 percent of hydraulic capacities or 75 percent of weight needed to tip machine. All lift capacities are based on ISO 10567.

Load Point Height	1.5 m (5 ft.)		3.0 m (10 ft.)		4.5 m (15 ft.)		6.0 m (20 ft.)		7.5 m (25 ft.)		9.0 m (30 ft.)	
Horizontal Distance From Centerline of Rotation	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side
With 2.66-m (8 ft. 9 in.) arm												
6.0 m (20 ft.)							9496 (20,636)	9213 (19,803)	8705 (19,093)	6162 (13,179)		
4.5 m (15 ft.)					14 206 (30,447)	14 021 (30,255)	10 894 (23,562)	8801 (18,960)	9279 (20,190)	6021 (12,922)		
3.0 m (10 ft.)					17 742 (38,067)	12 827 (27,693)	12 506 (27,011)	8285 (17,857)	9573 (20,571)	5798 (12,462)		
1.5 m (5 ft.)							13 399 (28,794)	7868 (16,949)	9319 (20,037)	5570 (11,982)		
Ground Line					18 814 (42,867)	11 932 (25,647)	13 127 (28,197)	7634 (16,432)	9155 (19,685)	5423 (11,666)		
–1.5 m (–5 ft.)			12 495 (28,545)	12 495 (28,545)	18 754 (40,705)	11 959 (25,693)	13 059 (28,045)	7575 (16,301)	9117 (19,617)	5389 (11,605)		
–3.0 m (–10 ft.)			21 868 (47,544)	21 868 (47,544)	16 665 (36,066)	12 147 (26,109)	12 606 (27,142)	7679 (16,540)				
–4.5 m (–15 ft.)			16 500 (35,354)	16 500 (35,354)	12 776 (27,209)	12 551 (27,027)						
With 3.2-m (10 ft. 6 in.) arm												
6.0 m (20 ft.)									8008 (17,528)	6249 (13,381)		
4.5 m (15 ft.)							10 108 (21,858)	8940 (19,242)	8700 (18,923)	6077 (13,042)		
3.0 m (10 ft.)					16 457 (35,331)	13 179 (28,428)	11 834 (25,561)	8402 (18,102)	9604 (20,664)	5832 (12,529)	7003 (15,009)	4180 (8,936)
1.5 m (5 ft.)					19 033 (41,053)	12 300 (26,492)	13 321 (28,796)	7933 (17,084)	9338 (20,070)	5579 (11,995)	6882 (14,768)	4069 (8,714)
Ground Line					19 818 (42,912)	11 930 (25,649)	13 140 (28,219)	7635 (16,430)	9132 (19,628)	5395 (11,598)	6794 (14,592)	3988 (8,553)
–1.5 m (–5 ft.)			11 956 (27,138)	11 956 (27,138)	19 291 (41,824)	11 864 (25,490)	13 002 (27,916)	7516 (16,168)	9042 (19,442)	5314 (11,431)		
–3.0 m (–10 ft.)	14 280 (32,048)	14 280 (32,048)	19 673 (44,674)	19 673 (44,674)	17 649 (38,194)	11 988 (25,762)	13 051 (28,032)	7558 (16,269)	9105 (19,608)	5371 (11,580)		

Lift Capacities *(continued)* 350G LC

Boldface type indicates hydraulically limited capacity; lightface type indicates stability-limited capacities, in kg (lb.). Ratings at bucket lift hook; machine equipped with 1160-kg (2,557 lb.) bucket and 800-mm (32 in.) shoes; standard gauge; and situated on firm, uniform supporting surface. Total load includes weight of cables, hook, etc. Figures do not exceed 87 percent of hydraulic capacities or 75 percent of weight needed to tip machine. All lift capacities are based on ISO 10567.

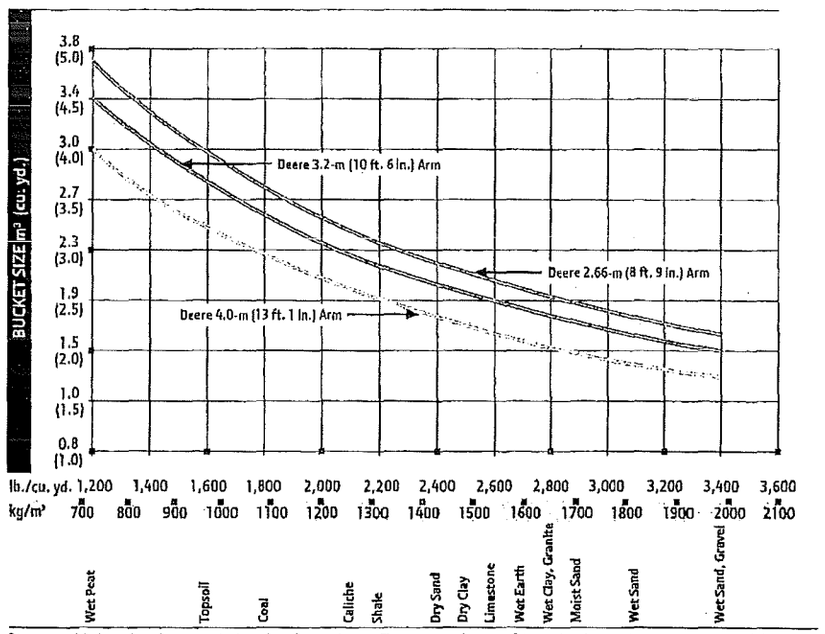
Load Point Height	1.5 m (5 ft.)		3.0 m (10 ft.)		4.5 m (15 ft.)		6.0 m (20 ft.)		7.5 m (25 ft.)		9.0 m (30 ft.)	
Horizontal Distance from Centerline of Rotation	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side	Over Front	Over Side
With 4.0-m (13 ft. 1 in.) arm												
6.0 m (20 ft.)									7015 (15,348)	6409 (13,734)	5727 (11,021)	4442 (9,453)
4.5 m (15 ft.)									7813 (16,997)	6203 (13,312)	7212 (15,462)	4370 (9,335)
3.0 m (10 ft.)					14 409 (30,952)	13 717 (29,563)	10 708 (23,138)	8612 (18,543)	8838 (19,174)	5923 (12,721)	7070 (15,160)	4234 (9,058)
1.5 m (5 ft.)					17 673 (38,094)	12 624 (27,185)	12 469 (26,955)	8065 (17,362)	9401 (20,198)	5626 (12,090)	6904 (14,815)	4082 (8,741)
Ground Line			6735 (15,416)	6735 (15,416)	19 386 (41,927)	12 004 (25,812)	13 195 (28,331)	7669 (16,500)	9133 (19,623)	5386 (11,573)	6766 (14,526)	3955 (8,476)
–1.5 m (–5 ft.)	6807 (15,227)	6807 (15,227)	10 880 (24,662)	10 880 (24,662)	19 638 (42,536)	11 769 (25,286)	12 949 (27,797)	7458 (16,037)	8974 (19,285)	5244 (11,269)	6692 (14,381)	3887 (8,342)
–3.0 m (–10 ft.)	11 398 (25,572)	11 398 (25,572)	16 291 (36,941)	16 291 (36,941)	18 694 (40,455)	11 779 (25,307)	12 899 (27,693)	7414 (15,947)	8945 (19,236)	5218 (11,226)		
–4.5 m (–15 ft.)	16 873 (38,021)	16 873 (38,021)	23 293 (50,183)	23 293 (50,183)	16 436 (35,373)	11 987 (25,775)	12 165 (26,067)	7536 (16,233)	8817 (18,456)	5356 (11,576)		
–6.0 m (–20 ft.)			16 669 (35,135)	16 669 (35,135)	12 038 (25,239)	12 038 (25,239)						

Buckets

A full line of buckets is offered to meet a wide variety of applications. Digging forces are with power boost. Tooth selection includes the John Deere Fanggs™ Standard, Tiger, Twin Tiger, Abrasion panel, or Flare tooth. Replaceable cutting edges and a variety of teeth are available through John Deere Parts. Optional side cutters add 150 mm (6 in.) to bucket widths. Capacities are SAE heaped ratings.

Type Bucket	Bucket Width		Bucket Capacity		Bucket Weight		Bucket Dig Force		Arm Dig Force 2.66 m (8 ft. 9 in.)		Arm Dig Force 3.2 m (10 ft. 6 in.)		Arm Dig Force 4.0 m (13 ft. 1 in.)		Bucket Tip Radius		Number of Teeth
	mm	in.	m³	cu. yd.	kg	lb.	kN	lb.	kN	lb.	kN	lb.	kN	lb.	mm	in.	
Heavy Duty	914	36	1.13	1.5	971	2,140	225.2	496	204.2	450	177.6	392	152.6	337	1600	63.0	4
Heavy Duty	1067	42	1.34	1.7	1003	2,212	225.2	496	204.2	450	177.6	392	152.6	337	1600	63.0	5
Heavy Duty	1219	48	1.55	2.0	1055	2,326	225.2	496	204.2	450	177.6	392	152.6	337	1600	63.0	6
Heavy Duty	1372	54	1.76	2.3	1161	2,559	225.2	496	204.2	450	177.6	392	152.6	337	1600	63.0	6
Heavy Duty High Capacity	760	30	0.96	1.3	1142	2,518	204.2	450	196.6	433	171.7	379	148.3	327	1765	69.5	4
Heavy Duty High Capacity	915	36	1.19	1.6	1263	2,783	204.2	450	196.6	433	171.7	379	148.3	327	1765	69.5	4
Heavy Duty High Capacity	1065	42	1.41	1.8	1416	3,123	204.2	450	196.6	433	171.7	379	148.3	327	1765	69.5	5
Heavy Duty High Capacity	1220	48	1.64	2.1	1506	3,321	204.2	450	196.6	433	171.7	379	148.3	327	1765	69.5	6
Heavy Duty High Capacity	1372	54	1.87	2.4	1617	3,565	204.2	450	196.6	433	171.7	379	148.3	327	1765	69.5	6

Bucket Selection Guide*



*Contact your John Deere dealer for optimum bucket and attachment selections. These recommendations are for general conditions and average use. Does not include optional equipment such as thumbs or couplers. Larger buckets may be possible when using light materials, for flat and level operations, less compacted materials, and volume loading applications such as mass-excavation applications in ideal conditions. Smaller buckets are recommended for adverse conditions such as off-level applications, rocks, and uneven surfaces. Bucket capacity indicated is SAE heaped.

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JOHN DEERE 450 LC HYDRAULIC EXCAVATOR

450 D EXCAVATOR

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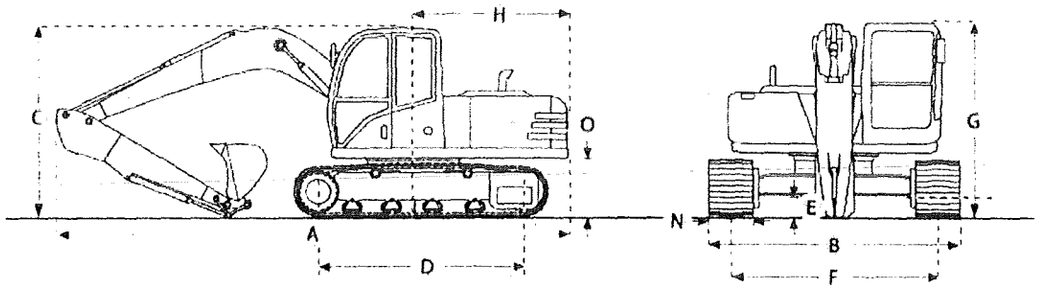
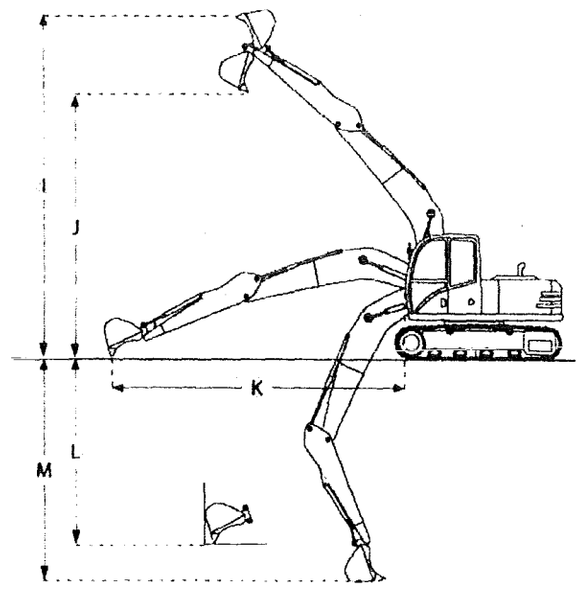


Selected Dimensions

Boom/Stick Option	Boom/Stick Option (HEX) 1	
A. SHIPPING LENGTH OF UNIT	39 ft in	11880 mm
C. SHIPPING HEIGHT OF UNIT	11.8 ft in	3600 mm
I. MAX CUTTING HEIGHT	33.7 ft in	10262.6 mm
J. MAX LOADING HEIGHT	23 ft in	7010.4 mm
K. MAX REACH ALONG GROUND	36.8 ft in	11201.4 mm
L. MAX VERTICAL WALL DIGGING DEPTH	15.7 ft in	4776.2 mm
M. MAX DIGGING DEPTH	23.9 ft in	7290.8 mm
Dimensions		
B. WIDTH TO OUTSIDE OF TRACKS	11.9 ft in	3640 mm
D. LENGTH OF TRACK ON GROUND	14.7 ft in	4470 mm
E. GROUND CLEARANCE	2.4 ft in	735 mm
G. HEIGHT TO TOP OF CAB	10.8 ft in	3280 mm
H. TAIL SWING RADIUS	11.4 ft in	3470 mm
O. COUNTERWEIGHT CLEARANCE	4.4 ft in	1350 mm
Undercarriage		
F. TRACK GAUGE	9.5 ft in	2890 mm
N. SHOE SIZE	30 in	750 mm



Specification

Engine		
MAKE	John Deere	
MODEL	6101 A	
NET POWER	285 hp	212.5 kw
POWER MEASURED @	2000 rpm	
DISPLACEMENT	619 cu in	10.1 L
TORQUE MEASURED @	1300 rpm	
MAX TORQUE	955 lb ft	1294.8 Nm
ASPIRATION	Turbocharger	
NUMBER OF CYLINDERS	6	
Operational		
OPERATING WEIGHT	97680 lb	44306.9 kg

FUEL CAPACITY	160 gal	605.7 L
COOLING SYSTEM FLUID CAPACITY	10 gal	38 L
HYDRAUILC SYSTEM FLUID CAPACITY	137 gal	518.6 L
ENGINE OIL CAPACITY	9 gal	34 L
SWING DRIVE FLUID CAPACITY	1.5 gal	5.7 L
OPERATING VOLTAGE	24 V	
ALTERNATOR SUPPLIED AMPERAGE	45 amps	
HYDRAULIC SYSTEM RELIEF VALVE PRESSURE	4270 psi	29440.6 kPa
HYDRAULIC PUMP FLOW CAPACITY	95 gal/min	359.6 L/min
Swing Mechanism		
SWING SPEED	9 rpm	
SWING TORQUE	107004 lb ft	145077.9 Nm
Undercarriage		
NUMBER OF SHOES PER SIDE	53	
SHOE SIZE	30 in	750 mm
NUMBER OF CARRIER ROLLERS PER SIDE	3	
NUMBER OF TRACK ROLLERS PER SIDE	9	
GROUND PRESSURE	8.7 psi	59.9 kPa
MAX TRAVEL SPEED	3.4 mph	5.5 km/h
DRAWBAR PULL	79590 lb	354 kN
TRACK GAUGE	9.5 ft in	2890 mm
Buckets		
REFERENCE BUCKET CAPACITY	2.4 yd3	1.9 m3
Boom/Stick Option (HEX) 1		
BOOM/STICK OPTION (HEX) 1	Arm Length 9ft. 6in.(2.9m)	
SHIPPING HEIGHT OF UNIT	11.8 ft in	3600 mm
SHIPPING LENGTH OF UNIT	39 ft in	11880 mm
MAX DIGGING DEPTH	23.9 ft in	7290.8 mm
MAX REACH ALONG GROUND	36.8 ft in	11201.4 mm
MAX CUTTING HEIGHT	33.7 ft in	10262.6 mm
MAX LOADING HEIGHT	23 ft in	7010.4 mm
MAX VERTICAL WALL DIGGING DEPTH	15.7 ft in	4776.2 mm
Boom/Stick Option (HEX) 2		
BOOM/STICK OPTION (HEX) 2	Arm Length 11ft. 2in. (3.4m)	
SHIPPING HEIGHT OF UNIT	11.4 ft in	3480 mm
SHIPPING LENGTH OF UNIT	38.7 ft in	11790 mm
MAX DIGGING DEPTH	25.5 ft in	7772.4 mm
MAX REACH ALONG GROUND	38.8 ft in	11811 mm
MAX CUTTING HEIGHT	36.3 ft in	11073.4 mm
MAX LOADING HEIGHT	25.2 ft in	7671.8 mm
MAX VERTICAL WALL DIGGING DEPTH	21.1 ft in	6425.2 mm
Boom/Stick Option (HEX) 3		
BOOM/STICK OPTION (HEX) 3	Arm Length 12ft. 10in.(3.9m)	
SHIPPING HEIGHT OF UNIT	11.4 ft in	3480 mm
SHIPPING LENGTH OF UNIT	38.7 ft in	11790 mm
MAX DIGGING DEPTH	27.1 ft in	8254 mm
MAX REACH ALONG GROUND	40.3 ft in	12268.2 mm
MAX CUTTING HEIGHT	36.7 ft in	11177 mm
MAX LOADING HEIGHT	25.5 ft in	7772.4 mm
MAX VERTICAL WALL DIGGING DEPTH	23.1 ft in	7034.8 mm
Boom/Stick Option (HEX) 4		
BOOM/STICK OPTION (HEX) 4	Arm Length 16ft. 1in. (4.9m)	
SHIPPING HEIGHT OF UNIT	15.3 ft in	4660 mm
SHIPPING LENGTH OF UNIT	38.4 ft in	11700 mm
MAX DIGGING DEPTH	29.9 ft in	9119.6 mm
MAX REACH ALONG GROUND	43.3 ft in	13182.6 mm
MAX CUTTING HEIGHT	38.9 ft in	11862.8 mm
MAX LOADING HEIGHT	28.8 ft in	8763 mm
MAX VERTICAL WALL DIG DEPTH	27.8 ft in	8458.2 mm
Dimensions		
WIDTH TO OUTSIDE OF TRACKS	11.9 ft in	3640 mm
HEIGHT TO TOP OF CAB	10.8 ft in	3280 mm
GROUND CLEARANCE	2.4 ft in	735 mm
COUNTERWEIGHT CLEARANCE	4.4 ft in	1350 mm
TAIL SWING RADIUS	11.4 ft in	3470 mm
LENGTH OF TRACK ON GROUND	14.7 ft in	4470 mm

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JOHN DEERE 650D LC HYDRAULIC EXCAVATOR

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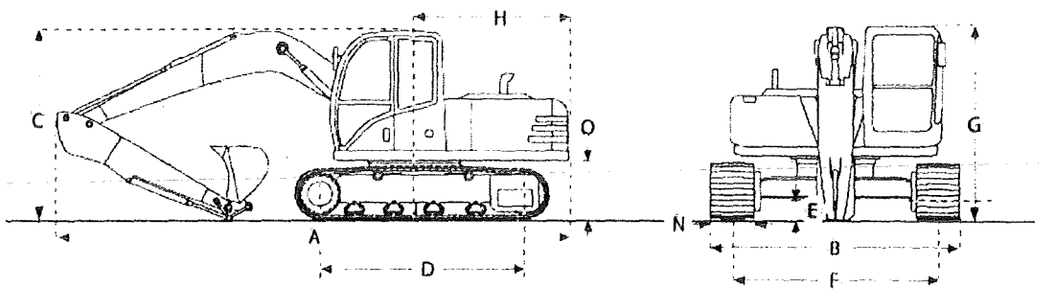
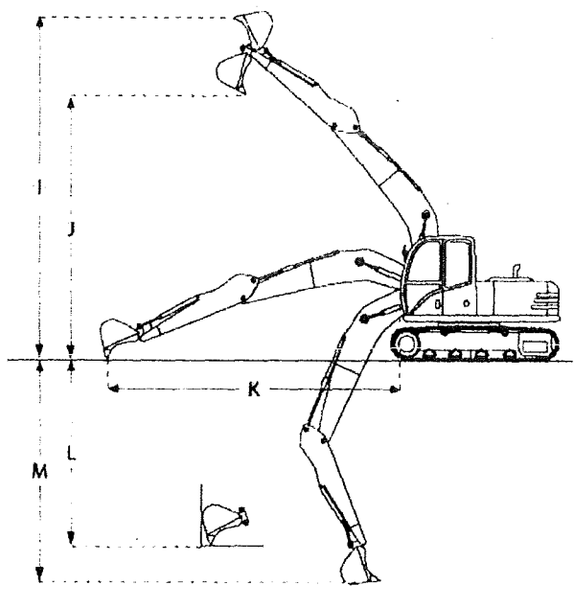


Selected Dimensions

Boom/Stick Option	Boom/Stick Option (HEX) 1	
A. SHIPPING LENGTH OF UNIT	43.3 ft in	13210 mm
C. SHIPPING HEIGHT OF UNIT	14.7 ft in	4470 mm
I. MAX CUTTING HEIGHT	39.1 ft in	11910 mm
J. MAX LOADING HEIGHT	26.4 ft in	8050 mm
K. MAX REACH ALONG GROUND	42.7 ft in	13000 mm
L. MAX VERTICAL WALL DIGGING DEPTH	24.3 ft in	7390 mm
M. MAX DIGGING DEPTH	28 ft in	8530 mm
Dimensions		
B. WIDTH TO OUTSIDE OF TRACKS	13.8 ft in	4190 mm
D. LENGTH OF TRACK ON GROUND	15.1 ft in	4600 mm
E. GROUND CLEARANCE	2.8 ft in	860 mm
G. HEIGHT TO TOP OF CAB	11.3 ft in	3450 mm
H. TAIL SWING RADIUS	12.2 ft in	3710 mm
O. COUNTERWEIGHT CLEARANCE	5 ft in	1520 mm
Undercarriage		
F. TRACK GAUGE	10.8 ft in	3300 mm
N. SHOE SIZE	36 in	900 mm



Specification

Engine		
MAKE	Isuzu	
MODEL	AH-6WG1XYSA-02	
NET POWER	463 hp	345 kw
POWER MEASURED @	1800 rpm	
DISPLACEMENT	957 cu in	15.7 L
ASPIRATION	Turbocharged w/ charge cooler	
NUMBER OF CYLINDERS	6	
Operational		
OPERATING WEIGHT	152190 lb	69033 kg
FUEL CAPACITY	238 gal	901 L
COOLING SYSTEM FLUID CAPACITY	14.7 gal	55.8 L

HYDRAUILC SYSTEM FLUID CAPACITY	190.2 gal	720 L
ENGINE OIL CAPACITY	13.6 gal	51.5 L
SWING DRIVE FLUID CAPACITY	4.8 gal	18 L
OPERATING VOLTAGE	24 V	
ALTERNATOR SUPPLIED AMPERAGE	50 amps	
HYDRAULIC SYSTEM RELIEF VALVE PRESSURE	4975 psi	34300 kPa
HYDRAULIC PUMP FLOW CAPACITY	120 gal/min	456 L/min
Swing Mechanism		
SWING SPEED	9.5 rpm	
SWING TORQUE	142839 lb ft	193804 Nm
Undercarriage		
NUMBER OF SHOES PER SIDE	47	
SHOE SIZE	36 in	900 mm
NUMBER OF CARRIER ROLLERS PER SIDE	3	
NUMBER OF TRACK ROLLERS PER SIDE	8	
GROUND PRESSURE	10.1 psi	69.6 kPa
MAX TRAVEL SPEED	3 mph	4.9 km/h
DRAWBAR PULL	101666 lb	452.2 kN
TRACK GAUGE	10.8 ft in	3300 mm
Buckets		
REFERENCE BUCKET CAPACITY	4 yd3	3.1 m3
MINIMUM BUCKET CAPACITY	2.4 yd3	1.8 m3
MAXIMUM BUCKET CAPACITY	5.8 yd3	4.4 m3
Boom/Stick Option (HEX) 1		
BOOM/STICK OPTION (HEX) 1	25ft.7in. 7.8m Boom w/ 11ft. 10in. 3.6m Arm	
SHIPPING HEIGHT OF UNIT	14.7 ft in	4470 mm
SHIPPING LENGTH OF UNIT	43.3 ft in	13210 mm
MAX DIGGING DEPTH	28 ft in	8530 mm
MAX REACH ALONG GROUND	42.7 ft in	13000 mm
MAX CUTTING HEIGHT	39.1 ft in	11910 mm
MAX LOADING HEIGHT	26.4 ft in	8050 mm
MAX VERTICAL WALL DIGGING DEPTH	24.3 ft in	7390 mm
Boom/Stick Option (HEX) 2		
BOOM/STICK OPTION (HEX) 2	25ft. 7in. 7.8m Boom w/ 13ft.9in. 4.2m Arm	
SHIPPING HEIGHT OF UNIT	16.3 ft in	4980 mm
SHIPPING LENGTH OF UNIT	43.3 ft in	13210 mm
MAX DIGGING DEPTH	30 ft in	9140 mm
MAX REACH ALONG GROUND	44.7 ft in	13610 mm
MAX CUTTING HEIGHT	40.2 ft in	12240 mm
MAX LOADING HEIGHT	27.3 ft in	8330 mm
MAX VERTICAL WALL DIGGING DEPTH	26.8 ft in	8180 mm
Boom/Stick Option (HEX) 3		
BOOM/STICK OPTION (HEX) 3	25ft. 7in. 7.8m Boom w/ 17ft.5in. 5.3m Arm	
SHIPPING HEIGHT OF UNIT	17.3 ft in	5280 mm
SHIPPING LENGTH OF UNIT	42.8 ft in	13060 mm
MAX DIGGING DEPTH	32.9 ft in	10030 mm
MAX REACH ALONG GROUND	47.6 ft in	14500 mm
MAX CUTTING HEIGHT	41.5 ft in	12650 mm
MAX LOADING HEIGHT	30.1 ft in	9170 mm
MAX VERTICAL WALL DIGGING DEPTH	31.3 ft in	9530 mm
Boom/Stick Option (HEX) 4		
BOOM/STICK OPTION (HEX) 4	22ft. 4in. 6.8m Mass Excavating Boom w/ 9ft. 6in. 2.9m Arm	
SHIPPING HEIGHT OF UNIT	16.3 ft in	4950 mm
SHIPPING LENGTH OF UNIT	40.3 ft in	12270 mm
MAX DIGGING DEPTH	23.3 ft in	7110 mm
MAX REACH ALONG GROUND	37.8 ft in	11510 mm
MAX CUTTING HEIGHT	36.8 ft in	11200 mm
MAX LOADING HEIGHT	24.1 ft in	7340 mm
MAX VERTICAL WALL DIG DEPTH	17.3 ft in	5280 mm
Dimensions		
WIDTH TO OUTSIDE OF TRACKS	13.8 ft in	4190 mm
HEIGHT TO TOP OF CAB	11.3 ft in	3450 mm
GROUND CLEARANCE	2.8 ft in	860 mm
COUNTERWEIGHT CLEARANCE	5 ft in	1520 mm
TAIL SWING RADIUS	12.2 ft in	3710 mm
LENGTH OF TRACK ON GROUND	15.1 ft in	4600 mm

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CASE SR200 SKID STEER LOADER

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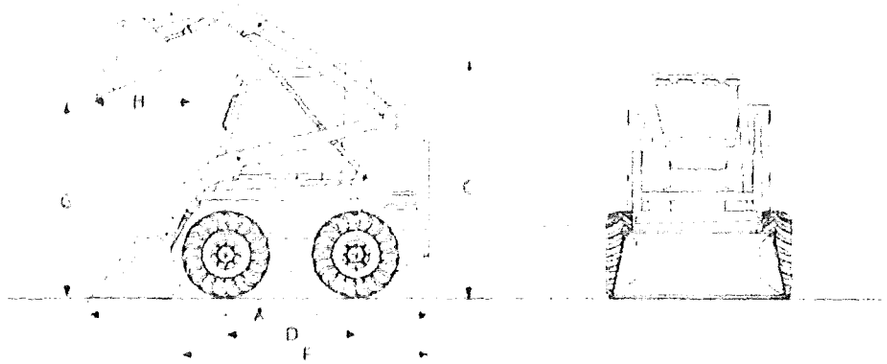

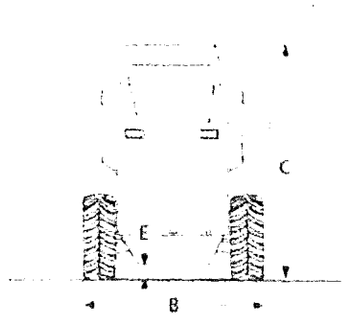

Dimensions

A - LENGTH WITH BUCKET	10 8 ft in	3300 mm
B - WIDTH OVER TIRE	5 3 ft in	1630 mm
C - HEIGHT TO TOP OF CAB	6 6 ft in	2000 mm
D - WHEELBASE	3 7 ft in	1130 mm
E - GROUND CLEARANCE	8 in	203 2 mm
F - LENGTH WITHOUT BUCKET	8 8 ft in	2670 mm
G - CLEARANCE AT MAX LIFT AND DUMP	8 2 ft in	2500 mm
H - REACH AT MAX LIFT AND DUMP	20 3 in	515 6 mm

Engine

MAKE	Case	
MODEL	432TMJ	
GROSS POWER	74 hp	55 2 kW
NET POWER	70 hp	52 2 kW
POWER MEASURED @	2500 rpm	
DISPLACEMENT	195 cu in	3 2 L
TORQUE MEASURED @	1400 rpm	
MAX TORQUE	203 lb ft	275 2 Nm
NUMBER OF CYLINDERS	4	
ASPIRATION	Turbocharged	

Operational

OPERATIONAL WEIGHT	6900 lb	3129 8 kg
FUEL CAPACITY	20 gal	75 7 L
ENGINE OIL FILL CAPACITY	2 6 gal	10 L
HYDRAULIC SYSTEM FILL CAPACITY	5 3 gal	20 L
CHAIN BOX FLUID CAPACITY - EACH SIDE	1 8 gal	6 7 L
OPERATING SPEED	7 2 mph	11 6 km/h
MAX SPEED	11 9 mph	19 2 km/h
TIRE SIZE	10 x 12 5	
OPERATING VOLTAGE	12 V	
ALTERNATOR OUTPUT AMPERAGE	95 amps	

Loader

OPERATING LOAD RATING	2050 lb	930 2 kg
TIPPING LOAD	4000 lb	1814 4 kg

BUCKET CAPACITY	0.56 yd3	0.43 m3
BUCKET WIDTH	66 in	1676.4 mm
Hydraulic		
PUMP TYPE	Gear	
PUMP FLOW CAPACITY	8.2 gal/min	31 L/min
RELIEF VALVE PRESSURE	3000 psi	20684.3 kPa
Dimensions		
LENGTH WITH BUCKET	10.8 ft in	3300 mm
LENGTH W/O BUCKET	8.8 ft in	2670 mm
WIDTH OVER TIRES	5.3 ft in	1630 mm
HEIGHT TO TOP OF CAB	6.6 ft in	2000 mm
CLEARANCE AT MAX LIFT AND DUMP	8.2 ft in	2500 mm
WHEELBASE	3.7 ft in	1130 mm
GROUND CLEARANCE	8 in	203.2 mm
REACH AT MAX LIFT AND DUMP	20.3 in	515.6 mm
TURNING RADIUS FROM CENTER MACHINE REAR	62.9 in	1597.7 mm
TURNING RADIUS FROM CENTER INC. BUCKET	79.9 in	2029.5 mm

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