FOI #15165

Torres Rojas, Genara

From: DMorris@tectonicengineering.com
Sent: Wednesday, August 06, 2014 10:50 AM
To: Duffy, Daniel; American, Heavyn-Leigh
Cc: Torres Rojas, Genara; Van Duyne, Sheree
Subject: Freedom of Information Online Request Form

Information:

First Name: David
Last Name: Morris
Company: Tectonic Engineering
Mailing Address 1: 160 Pehle Avenue, Suite 306
Mailing Address 2:
City: Saddle Brook
State: NJ
Zip Code: 07663
Email Address: DMorris@tectonicengineering.com
Phone: 2018430403
Required copies of the records: Yes

List of specific record(s):
Request for records related to the bid documents submitted by Railroad Construction Company for the Hackensack River Bridge Project - Contract No. PAT-924.103. This request was previously sent in on May 10,2013 with the reference number 13971.

THE PORT AUTHORITY OF NY & NJ

FOI Administrator

October 1, 2014

Mr. David Morris
Tectonic Engineering
160 Pehle Avenue, Suite 306
Saddle Brook, NJ 07663

Re: Freedom of Information Reference No. 15165

Dear Mr. Morris:

This is in response to your August 6, 2014 request, which has been processed under the Port Authority's Freedom of Information Code (the "Code") for copies of records related to the bid documents submitted by Railroad Construction Company for the Hackensack River Bridge Project - Contract No. PAT-924.103.

Material responsive to your request and available under the Code can be found on the Port Authority's website at http://www.panynj.gov/corporate-information/foi/15165-C.pdf. Paper copies of the available records are available upon request.

Certain portions of the responsive material are exempt from disclosure pursuant to exemptions (1) and (4) of the Code.

Please refer to the above FOI reference number in any future correspondence relating to your request.

Very truly yours,

Daniel D. Duffy
FOI Administrator

225 Park Avenue South, 17th Floor
New York, NY 10003
T: 212 435 3642 F: 212 435 7555

CONFORMED

THE PORT AUTHORITY OF NY & NJ

Lillian D. Valenti
Director, Procurement

August 1, 2013

VIA FACSIMILE AND UPS NEXT DAY AIR

Railroad Construction Company, Inc.
75-77 Grove Street
Paterson, NJ 07503

SUBJECT: THE PORT AUTHORITY TRANS-HUDSON CORPORATION – HACKENSACK RIVER BRIDGE – DECK AND RAIL REPLACEMENT– CONTRACT PAT-924.103
PURCHASE ORDER UPAT924103

Gentlemen:

The Port Authority Trans-Hudson Corporation (PATH) hereby accepts your proposal on the subject Contract.

PATH 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 PATH 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.

Very truly yours,

PORT AUTHORITY TRANS-HUDSON
CORPORATION

BY _____
Director of Procurement

THE PORT AUTHORITY OF NY & NJ

Lillian D. Valenti
Director, Procurement

August 1, 2013

VIA FACSIMILE AND UPS NEXT DAY AIR

Railroad Construction Company, Inc.
75-77 Grove Street
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Very truly yours,

PORT AUTHORITY TRANS-HUDSON
CORPORATION

BY _____
Director of Procurement

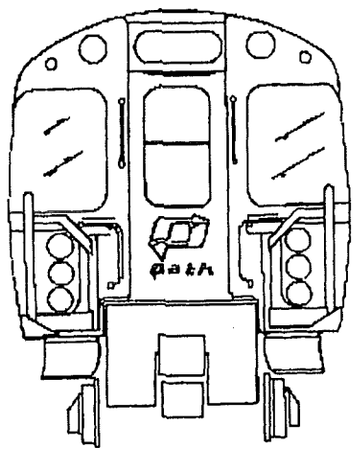
2 Montgomery Street, 3rd Floor
Jersey City, NJ 07302

Railroad Construction Company, Inc. (1)

PORT AUTHORITY
TRANS-HUDSON CORPORATION

CR02923103

#
D.H.



PATH

HACKENSACK RIVER BRIDGE – DECK AND RAIL REPLACEMENT

CONTRACT PAT-924.103

MARCH 2013

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

PORT AUTHORITY
TRANS-HUDSON CORPORATION

DIRECTORS

David Samson, Chairman
Richard H. Bagger
H. Sidney Holmes III
Jeffrey H. Lynford
Jeffrey A. Moerdler
Raymond M. Pocino
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William Baroni, Jr., Vice President
Stephen B. Kingsberry, Acting Director
Robert E. VanEtten, Inspector General

Peter J. Zipf, P.E.
Chief Engineer
The Port Authority of New York and New Jersey

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PORT AUTHORITY TRANS-HUDSON CORPORATION

Sealed proposals for the following contract will be received by The Port Authority of New York and New Jersey in the office of the Director of Procurement, Attn: Bid Custodian, Two Montgomery Street, 3rd Floor, Jersey City, NJ 07302, until 2:30 P.M. on the date indicated where the proposals will then be publicly opened and read in the Bid Room.

Contract documents may be seen at the Contract Desk on the 3rd Floor, 3 Gateway Center, Newark, NJ and may be obtained upon receipt of a non-refundable payment of $100.00 per set. Only company checks or money orders payable to the order of The Port Authority of New York and New Jersey will be accepted. If checks or money orders for documents are mailed, they should be addressed to The Port Authority of New York and New Jersey, Contract Desk, 3rd Floor, 3 Gateway Center, Newark, NJ 07102. For availability of contract documents, go to http://www.panynj.gov/business-opportunities/bid-proposal-advertisements.html Questions by prospective bidders concerning the contract should be directed only to the person whose name and phone number is listed.

A VALID PHOTO ID IS REQUIRED TO GAIN ACCESS INTO EITHER BUILDING.

Contract PAT-924.103 – Port Authority Trans-Hudson Corporation – Hackensack River Bridge-Deck and Rail Replacement. Estimate Range: $5M – $10M. Bids Due Thursday, March 28, 2013. The work under this contract consists generally of the replacement of deck timbers, running rail, emergency rail, head blocks, miter rails, expansion rails, contact rail and appurtenances; replacement of damaged concrete ties and removal of all temporary wooden ties and related Work on PATH Tracks G and H at the Hackensack River Bridge and the vicinity thereof in Jersey City, New Jersey. For questions, call Jessamma Vatakencherry at (201) 395-3453 or email – jvataken@panynj.gov.

New York, MONDAY, March 11, 2013

RAILROAD CONSTRUCTION COMPANY, INC.

INFORMATION FOR BIDDERS

Friday, April 12, 2013 (Add #3)
~~April 11, 2013 (Add. #1)~~

1. FORM AND SUBMISSION OF PROPOSALS

The Port Authority Trans Hudson Corporation, hereinafter called "PATH", invites Proposals in the annexed form. Proposals will be received until 2:30 P.M. on ~~Thursday, March 28, 2013 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 PATH, 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. See Attached

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; See Attached

A certified check, payable to the order of The Port Authority Trans Hudson Corporation, 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. RAILROAD CONSTRUCTION COMPANY, INC.

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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.

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. See Attached

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. See Attached

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. See Attached.

RAILROAD CONSTRUCTION COMPANY, INC.

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

Banking Institution: Wells Fargo Bank
Address: 190 River Road, 2nd Floor
Summit, NJ 07901
Bank Representative: Robert Bogosian
Telephone Number: (908) 598-3867

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.

Exemption (1)
Federal Employer Identification No.

006802300
Dun and Bradstreet No.

Other Credit Service

Account No.

D. The Form of Contract bound herewith, with the bidder's Lump Sum inserted in the clause thereof entitled "General Agreement". The amount must be given both in figures and in writing and, in case of discrepancy, the writing shall control. 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.

RAILROAD CONSTRUCTION COMPANY, INC.

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 PATH 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 PATH to determine the Contractor'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 Contractor 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, PATH 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, PATH 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, PATH 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 PATH who is at present the Authority's Director of Procurement. No other act of PATH, its Directors, officers, agents, or employees shall constitute acceptance of a Proposal. Such notice will state whether or not PATH 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 PATH 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 PATH to accept a Proposal within ninety (90) days after the opening of Proposals; and no other act of PATH, its Directors, officers, agents or employees shall constitute rejection of a Proposal, including any counter offer or other act of PATH, its Directors, officers, agents or employees.

PATH 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 PATH terminates the Contract, PATH 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 PATH will return all certified checks deposited by bidders, except those deposited by three bidders to be selected by PATH, which will be returned within three days after one Proposal is accepted by PATH; or if a Performance and Payment Bond is required, within three days after a satisfactory Performance and Payment Bond is furnished to PATH; 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. 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.

To ensure meaningful participation of MBEs and WBEs on this Contract, PATH 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 subcontractorsin 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 PATH 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 PATH or the Regional Alliance of Small Contractors such as the Loaned Executive Assistance Program (L.E.A.P.).

Subsequent to acceptance by PATH 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 PATH 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, PATH 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 PATH and the individuals furnishing consultant advice of all liability and responsibility in connection therewith.

PATH has compiled and made available on-line an MBE/WBE Directory which specifies the firms PATH has determined to be (1) MBEs/WBEs and (2) experienced in performing work in the trades and contract dollar ranges indicated in the Directory. PATH 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 PATH to determine whether the firm is in fact an MBE/WBE and technically competent to perform portions of the Work.

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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.

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

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".

9. 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 Mourad Rahman , at (201) 216-6523.

10. QUESTIONS BY BIDDERS

Questions by prospective bidders concerning the Contract may be addressed to Jessamma Vatakencherry, at (201) 395-3453 or email at jvataken@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 Jessamma Vatakencherry nor any other employee or representative of PATH 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 PATH, its Directors, 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.

11. 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 PATH 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 PATH hereunder as provided in the clauses of the Form of Contract entitled "Monthly Advances" and "Final Payment" or at any other time.

12. 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 PATH 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 PATH and that PATH will rely on its truth and accuracy in awarding this Contract. In the event that PATH 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, PATH 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 PATH ". 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 PATH 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.

13. 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 PATH 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 PATH and that PATH will rely on its truth and accuracy in awarding this Contract. In the event that PATH 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, PATH 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 PATH ".

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 PATH 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.

14. 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 PATH 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.

15. 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.

16. 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 PATH ". 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.).

PROPOSAL

To The Port Authority Trans Hudson Corporation:

The undersigned[3] Railroad Construction Company, Inc.
A Corporation organized under the laws of the State of New Jersey.

(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 price inserted by the undersigned in the clause of the Form of Contract entitled "General Agreement".

This offer shall be irrevocable for ninety (90) days after the date on which The Port Authority Trans Hudson Corporation 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 PATH 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 PATH, its Directors, 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 PATH without liability of any kind except as may arise under letters patent of the undersigned, if any.

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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]:

75-77 Grove Street
Paterson, N.J. 07503

The telephone number of the bidder is: (973) 684-0362

The fax number of the bidder is: (973) 684-1355

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

RAILROAD CONSTRUCTION COMPANY, INC.

4 Insert office address.

SIGNATURE AND CERTIFICATE OF AUTHORITY[5]

Dated, April 11, 2013

(Signature of individual or name of corporation or partnership) Railroad Construction Company, Inc.

(Signature of agent, partner or corporate officer)

By[6,7] Joseph Vacca Vice-President

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

Home/ Exemption (1)
Office: 715-717 Grove St. Paterson NJ 07503

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)

Mary Speck
Mary Speck, Secretary

2013 APR 12 PM 2:45
PROCUREMENT
(MAIL CENTER)

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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.).

ACKNOWLEDGMENT[8]

ACKNOWLEDGMENT OF BIDDER, IF A CORPORATION

State of New Jersey

SS:

County of Passaic

On this 11th day of April, 2013 before me personally came and appeared Joseph Vaccaro, to me known, who, being by me duly sworn, did depose and say that he resides at Exemption (1) that he is the Vice-President of Railroad Construction Company Inc., 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)

LUZ Y. CARRILLO-SARMIENTO
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires on July 31, 2013

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 and who executed the foregoing instrument and he acknowledged to me that he executed the same.

(Notary Seal)

(Notary Signature)

2013 APR 12 PM 2:45
PROCUREMENT
(MAIL CENTER)

---

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.

Railroad Construction Company, Inc.

Contractors - Engineers

75-77 Grove Street • Paterson, NJ 07503

Est. 1926

Phone 973-684-0362 • Fax 973-684-1355

April 10, 2013

The Port Authority of New York & New Jersey
Two Montgomery Street, 3rd Floor
Jersey City, N.J. 07302

Attn: Bid Custodian

Re: PATH - Hackensack River Bridge -
Deck & Rail Replacement
Contract No. PAT-924.103

To Whom It May Concern:

The following is a list of names and addresses of officers of *Railroad Construction Company, Inc.*:

Alfonso Daloisio, Jr.
President -

Eugene A. Sullivan, Jr.
Vice-President -

Joseph Vaccaro
Vice-President -

Lauren A. Elsaesser
Vice-President/Treasurer -

Peter Fleming
Vice-President -

Gregory Fallon
Vice-President -

Mary Speck
Secretary -

Exemption (1)

Should you need any further information, please do not hesitate to contact us.

Very truly yours,
Railroad Construction Company, Inc.

Joseph Vaccaro
Vice-President

2013 APR 12 PM 2:46
(MAIL CENTER)

JV:lc

RAILROAD CONSTRUCTION COMPANY, INC.

CONTRACT PAT-924.103

STATEMENT ACCOMPANYING PROPOSAL[9]

Names and Residences of Officers, If Bidder is a Corporation

Name	Title	Residence[10]
See Attached.		

Names and Residences of Partners, If Bidder is a Partnership

Name	General or Limited Partner	Residence[11]

Bidder's Residence, If an Individual[12]

---

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]
RAILROAD CONSTRUCTION COMPANY, INC., a corporation organized under the laws of the state of New Jersey,
75-77 Grove Street, Paterson, NJ 07503
as principal(s), and[14]
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
1400 American Lane, Schaumburg, IL 60196
as surety are hereby held and firmly bound unto The Port Authority Trans Hudson Corporation (herein called "PATH") in the penal sum of Eight Hundred Thousand Dollars ($800,000), 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 22nd day of March, 2013

The condition of the above obligation is such that whereas the above named principal(s) has submitted to PATH 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 PAT-924.103, "PATH - Hackensack River Bridge – Deck and Rail Replacement"; now therefore:

A. If said Proposal shall not be accepted, or

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

C. If said Proposal shall be accepted and PATH requires the principal(s) to furnish a Performance and Payment Bond and either the principal(s) furnishes a Performance and Payment Bond satisfactory to PATH in accordance with the requirements of said Proposal or PATH 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 PATH may receive or accept such Proposal or within which the principal(s) may furnish a Performance and Payment Bond or by any waiver by PATH 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.

RAILROAD CONSTRUCTION COMPANY, INC.

Principal[15]

(Seal)

By[16]

Joseph Vaccaro, Vice-President

FIDELITY AND DEPOSIT COMPANY OF MARYLAND

Surety

(Seal)

By[17]

Vivian Carti, 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 Passaic

On this 22nd day of March, 2013 before me personally came and appeared Joseph Vaccaro, to me known, who being by me duly sworn, did depose and say that he resides at Exemption (1) that he is the Vice-President of Railroad Construction Company, Inc., 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)

LUZ Y. CARRILLO-SARMIENTO
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires on July 31, 2013

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

---

[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.

ACKNOWLEDGEMENT OF SURETY

STATE OF NEW YORK)

CITY OF NEW YORK) SS:

COUNTY OF NEW YORK)

On this **22nd Day** of **March,** in the year **2013**, before me personally came to me known, who, being by me duly sworn, did depose and say that **Vivian Carti** he/she resides in New York, NY that he/she is the **Attorney-in-Fact** of **Fidelity and Deposit Company of Maryland** the corporation described in and which executed the above instrument; and that he/she signed his/her name thereto by order of the Board of Directors of said Corporation.

Notary Public or Commissioner of Deeds

KELLY O'MALLEY
NOTARY PUBLIC-STATE OF NEW YORK
No. 01OM6267190
My Commission Expires August 13, 2016

2013 APR 12 PM 2:46
(MAIL CENTER)

SURETY DISCLOSURE STATEMENT AND CERTIFICATION
pursuant to N.J.S.A. 2A:44-143

(for use when surety(ies) have a certificate from U.S. Secretary of the Treasury in accordance with 31 U.S.C.§9305)

Fidelity and Deposit Company of Maryland ,

surety on the attached bond, hereby certifies the following:

(1) The surety meets the applicable capital and surplus requirements of R.S.17:17-6 or R.S.17:17-7 as of the surety's most current annual filing with the New Jersey Department of Insurance.

(2) The capital and surplus, as determined in accordance with the applicable laws of this State, of the surety participating in the issuance of the attached bond is in the following amounts as of the calendar year ended December 31, 2011 which amounts have been certified on a Certification by PricewaterhouseCoopers, LLP and are included in the Annual Statement on file with the New Jersey Department of Insurance, 20 West State Street CN-325, Trenton, New Jersey 08625-0325.

Fidelity and Deposit Company of Maryland , $194,791,087

With respect to each surety participating in the issuance of the attached bond that has received from the United States Secretary of the Treasury a certificate of authority pursuant to 31 U.S.C. §9305, the underwriting limitation established therein on July 1, 2011 is as follows:

Fidelity and Deposit Company of Maryland , $16,970,000

The amount of the bond to which the statement and certification is attached is $800,000.00.

(1) If, by virtue of one or more contracts of reinsurance, the amount of the bond indicated under item (4) above exceeds the total underwriting limitation of all sureties on the bond as set forth in item (3) above, then for each such contract of reinsurance:

(a) The name and address of each such insurer under that contract and the amount of the reinsurer's participation in the contract is as follows:

and;

(b) Each surety that is party to any such contract of reinsurance certifies that each insurer listed under item (5)(a) satisfies the credit for reinsurance requirement established under P.L. 1993, c.243(C.17:51B-1 et seq.) and any applicable regulations in effect as of the date on which the bond to which this statement and certification is attached shall have been filed with the appropriate public agency.

CERTIFICATE

I, Frank E. Martin., as Vice President for Fidelity and Deposit, a corporation domiciled in Maryland, DO HEREBY CERTIFY that, to the best of my knowledge, the foregoing statements made by me are true, and ACKNOWLEDGE that, if any of those statements made by me are false, this bond is VOIDABLE.

Frank E. Martin Jr.

Frank E. Martin, Jr., Vice President

Dated: 3/22/2013
Effective: April 13, 2012

ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **GEOFFREY DELISIO, Vice President,** in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Vivian CARTI, Debra A. DEMING, Cynthia FARRELL, Thomas RHATIGAN, Sandra DIAZ, Jessica IANNOTTA, Sonia ROGERS, Valorie SPATES and Evangelina L. DOMINICK, all of New York, New York, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings,** and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland.. and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V. Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 25th day of June, A.D. 2012.

ATTEST:

ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND

By: _____
Assistant Secretary
Eric D. Barnes

_____
Vice President
Geoffrey Delisio

State of Maryland
City of Baltimore

On this 25th day of June, A.D. 2012, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **GEOFFREY DELISIO, Vice President, and ERIC D. BARNES, Assistant Secretary,** of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposeth and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

_____
Maria D. Adamski, Notary Public
My Commission Expires: July 8, 2015

FIDELITY AND DEPOSIT COMPANY
OF MARYLAND
600 Red Brook Blvd., Suite 600, Owings Mills, MD 21117

Statement of Financial Condition
As Of December 31, 2011

ASSETS

Bonds	$ 167,477,539
Stocks	23,576,974
Cash and Short Term Investments	235,580
Reinsurance Recoverable	12,886,175
Other Accounts Receivable	39,980,988
TOTAL ADMITTED ASSETS	$ 244,157,256

LIABILITIES, SURPLUS AND OTHER FUNDS

Reserve for Taxes and Expenses		$ 127,987
Ceded Reinsurance Premiums Payable		48,215,682
Securities Lending Collateral Liability		1,022,500
TOTAL LIABILITIES		$ 49,366,169
Capital Stock, Paid Up	$ 5,000,000	
Surplus	189,791,087	
Surplus as regards Policyholders		194,791,087
TOTAL		$ 244,157,256

Securities carried at $59,049,993 in the above statement are deposited as required by law.

Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of December 31, 2011 market quotations for all bonds and stocks owned, the Company's total admitted assets would be $253,778,028 and surplus as regards policyholders $204,411,859.

I, DENNIS F. KERRIGAN, Corporate Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2011.

Corporate Secretary

State of Illinois
City of Schaumburg } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Illinois, in the City of Schaumburg, this 15th day of March, 2012.

Notary Public

OFFICIAL SEAL
DARRYL JOINER
Notary Public - State of Illinois
My Commission Expires May 3, 2014

See Attached.

CONTRACT PAT-924.103

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 Trans Hudson Corporation (herein called "PATH") in the penal sum of Eight Hundred Thousand Dollars ($800,000), 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 PATH 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 PAT-924.103, "PATH - Hackensack River Bridge – Deck and Rail Replacement", now therefore:

A. If said Proposal shall not be accepted, or

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

C. If said Proposal shall be accepted and PATH requires the principal(s) to furnish a Performance and Payment Bond and either the principal(s) furnishes a Performance and Payment Bond satisfactory to PATH in accordance with the requirements of said Proposal or PATH 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 PATH may receive or accept such Proposal or within which the principal(s) may furnish a Performance and Payment Bond or by any waiver by PATH 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

---

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

17. 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, PATH'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 PATH Tracks G and H at the Hackensack River Bridge and the vicinity thereof in Jersey City, New Jersey.

"Work" shall mean all structures, equipment, plant, labor, materials (including materials and equipment, if any, furnished by PATH) and other facilities and all other things necessary or proper for or incidental to performing the replacement of deck timbers, running rail, emergency rail, head blocks, miter rails, expansion rails, contact rail and appurtenances; replacement of damaged concrete ties and removal of all temporary wooden ties and related Work on PATH Tracks G and H at the Hackensack River Bridge and the vicinity thereof in Jersey City, New Jersey; 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).

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

"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.

"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.

"Assistant Chief Engineer for Construction" shall mean the Assistant Chief Engineer for 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 PATH) to be constructed, installed or left by the Contractor at or about the construction site (or elsewhere in the possession of PATH) 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.

"Lump Sum" shall mean the amount stipulated in the clause hereof entitled "General Agreement".

"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.

"Authority" or "Port Authority" shall mean The Port Authority of New York and New Jersey which is acting as agent for PATH for the purposes of this Contract.

18. GENERAL AGREEMENT

The Contractor agrees to perform the replacement of deck timbers, running rail, emergency rail, head blocks, miter rails, expansion rails, contact rail and appurtenances; replacement of damaged concrete ties and removal of all temporary wooden ties and related Work on PATH Tracks G and H at the Hackensack River Bridge and the vicinity thereof in Jersey City, New Jersey 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.

PATH agrees to pay to the Contractor and the Contractor agrees to accept from PATH, in full consideration for the performance by the Contractor of his duties and obligations under this Contract and the whole thereof, a compensation of:

Three Million Eight Hundred Eighty Seven Thousand Seven Hundred Thirty Four Dollars
Zero Cents
($ 3,887,734.00)[19]

(throughout this Contract called the "Lump Sum"), and such compensation only, subject only to the express provisions of this Contract specifically setting forth actual, defined additions to or deductions from such compensation.

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 PATH, or 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.

RAILROAD CONSTRUCTION COMPANY, INC.

---

[19] For sales tax exemptions, see clause entitled "Exemptions from New Jersey Sales and Use Taxes".

19. PATH ACCESS TO RECORDS

PATH 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 PATH 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 PATH; 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 PATH 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 PATH has notified the Contractor in writing of a pending claim by PATH 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 PATH, 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 PATH a right of access to records and documents is intended to impair or affect any right of access to records and documents which PATH would have in the absence of such provision.

20. 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]."[20] 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/.

PATH is an organization of the type described in subsection (a)(1) of section 9 of the Sales and Use Tax Act.[21]

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.

RAILROAD CONSTRUCTION COMPANY, INC.

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

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

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 PATH 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. PATH is afforded the opportunity before any payment of tax is made, to contest said claim in the manner and to the extent that PATH may choose and to settle or satisfy said claim, and such attorney as PATH 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 PATH and its designated attorney in contesting said claim, and has or have furnished promptly to PATH 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 PATH elects to contest any such claim, it will bear the expense of such contest.

21. PERFORMANCE AND PAYMENT BOND

If PATH 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 Lump Sum and such bond shall be signed by one or more sureties[22] satisfactory to PATH. 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, PATH may give notice to one or more bidders to advise PATH as to the names of their proposed sureties. Within forty-eight hours thereafter each bidder so notified shall so advise PATH. 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 PATH not to require a bond.

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22 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 PATH 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.

If PATH elects to require the Contractor to furnish a bond, he shall deliver such bond to PATH 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 PATH 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 PATH.

PATH 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 PATH 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 PATH. Inasmuch as the damages to PATH 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 Lump Sum 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 PATH; and

C. The sum of $500 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.

In the recovery of the damages above specified, PATH 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 PATH under this numbered clause, PATH 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, PATH shall pay to the Contractor by check the amount provided in this numbered clause.

If at any time PATH shall be or become dissatisfied with any surety or sureties then upon any bond furnished in accordance with the requirements of PATH, or if for any other reason such bond shall cease to be adequate security to PATH, the Contractor shall, within five days after notice from PATH 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 PATH to constitute adequate security.

CHAPTER II

ADJUSTMENTS AND PAYMENTS

22. ADJUSTMENTS OF LUMP SUM

If any 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.

23. COMPENSATION FOR EXTRA WORK

The Chief Engineer shall have authority to agree in writing with the Contractor on behalf of PATH 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) vacation allowances and union dues and assessments which the employer actually pays pursuant to contractual obligation upon the basis of such wages, and (b) taxes actually paid by the employer pursuant to law upon the basis of such wages. "Employees" as used above means only the employees of one employer.

"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 PATH 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 showing the name and number of each workman employed on such Work, the number of hours which he is employed thereon, the character of his duties, and the wages to be paid to him, (b) a memorandum showing the 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 claimed therefor. Such memoranda and time slips are for the purpose of enabling the Engineer to determine the amounts to be paid by PATH under this numbered clause; and accordingly, they shall constitute a condition precedent to such payment and the failure of the Contractor or his subcontractors 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 Contractor's compensation for Extra Work shall be subject to audit review by PATH. The Engineer will notify the Contractor that an audit review will be conducted no later than 90 days from the date 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 PATH. If the Contractor disagrees in whole or in part with the audit findings, the Contractor shall notify PATH of such disagreement in writing within 30 days of receipt of said audit findings or PATH 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.

24. 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 its 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 its 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 its 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 its employees pursuant to the terms of its 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 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.

25. 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 "PATH 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) taxes actually paid by the employer pursuant to law upon the basis of such salaries and wages, and (b) 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.

26. 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 PATH the approximate amount of Work performed and compensation earned by the Contractor up to that time showing separately:

A. The amount of 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 Work performed (other than Extra Work) bears to the Work performed and to be performed (other than Extra Work).

B. 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, PATH shall, within fifteen days after the receipt of each such monthly 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 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, PATH 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 PATH 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 PATH 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 PATH as such are set forth in the clause hereof entitled "Withholding of Payments".

27. 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.

28. 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 PATH and to the Contractor the total compensation earned by the Contractor.

If so required, the Contractor shall thereupon (i) certify to PATH 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 PATH 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), PATH 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 PATH 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 PATH 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 PATH 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.

29. WITHHOLDING OF PAYMENTS

If (1) the Contractor fails to perform any of his obligations under this Contract or any other agreement between PATH and the Contractor (including his obligation to PATH 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 PATH) or (2) any claim (just or unjust) which arises out of or in connection with this Contract or any other agreement between PATH and the Contractor is made against PATH or (3) any subcontractor under this Contract or any other agreement between PATH 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 PATH and the Contractor or if in the opinion of the Chief Engineer any of the aforesaid contingencies is likely to arise, then PATH 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 PATH 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 PATH does not intend to exercise its right with respect to such contingency. Neither the above provisions for rights of PATH to withhold and apply monies nor any exercise or attempted exercise of, or omission to exercise, such rights by PATH 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 PATH 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, PATH 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 PATH, 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 PATH an amount equal to PATH's cost of any investigation conducted by or on behalf of PATH, 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 PATH, PATH may deduct from any amount payable to the Contractor by PATH, under the Contract or under any other open contract between the Contractor and PATH, 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 PATH, PATH 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

30. TIME FOR COMPLETION AND DAMAGES FOR DELAY

The Contractor shall complete the performance of all Work under this Contract within 360 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 PATH that the Performance and Payment Bond furnished by him is satisfactory;

B. The date of receipt by him of notice from PATH that the insurance procured by him in accordance with the clause hereof entitled "Insurance Procured by Contractor" is satisfactory, as evidenced by the certificate(s) 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 PATH 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 PATH 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 PATH 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 Five Hundred Dollars ($500) per calendar day.

31. 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 PATH 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 PATH, and since, with sufficient opportunity, PATH 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.

32. 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 PATH 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 PATH 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 PATH 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 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 PATH 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 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.

33. DELAYS TO CONTRACTOR

As between the Contractor and PATH, 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 PATH, 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, PATH 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 PATH 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 PATH as to the time of such performance and the delay of PATH in fulfilling such requirement shall not result in liability of any kind on the part of PATH 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.

34. 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 PATH's own ability to perform it, either directly or through others, PATH 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 PATH. In the event of such cancellation, no allowance shall be made for anticipated profits.

CHAPTER IV

CONDUCT OF CONTRACT

35. 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 PATH, 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.

If at any time it shall be, from the viewpoint of PATH, impracticable or undesirable in the judgment of the Chief Engineer to proceed with or continue the performance of the Contract or any part thereof, whether or not for reasons beyond the control of PATH, 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 PATH impracticable or undesirable in the judgment of the Chief Engineer to proceed with or continue the performance of the Contract or any part thereof whether or not for reasons beyond the control of PATH, 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.

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 Assistant Chief Engineer for 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 Assistant Chief Engineer for 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 PATH 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.

36. 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.

37. NOTICE REQUIREMENTS

No claim against PATH 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 PATH 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 PATH.

The above referred to notices and information are required whether or not PATH is aware of the existence of any circumstances which might constitute a basis for a claim and whether or not PATH 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 PATH representative above designated to receive it may not be sufficient to come to the attention of the representative of PATH 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.

38. EQUAL EMPLOYMENT OPPORTUNITY

In order to conform with the policy of PATH 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 PATH 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 PATH, and said Division and Director shall have a right of action against the Contractor to effectuate the intent of this clause.

39. 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 PATH every two weeks a report indicating the number of workers employed at the construction site as of the lst 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 PATH 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 PATH 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 PATH 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 PATH, and said Attorney General shall have a direct right of action against the Contractor to effectuate the intent of this clause.

40. 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 clause entitled "Equal Employment Opportunity", including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered by PATH. 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, PATH 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).

41. 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 PATH; 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. PATH 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 "PATH 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 PATH (on forms furnished by PATH) of all his payroll records and those of each of his subcontractors as PATH 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 PATH (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 Engineer may at any time request the Contractor to prepare a daily report on PATH 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.

42. 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, Assistant Chief Engineer for 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 Assistant Chief Engineer for 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 PATH 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.

43. 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.

44. TITLE TO MATERIALS

All materials to become part of the permanent construction shall be and become the property of PATH 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 PATH 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 PATH.

45. 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 PATH shall be void and of no effect as to PATH, 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 PATH 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 PATH, 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 PATH or the Engineer shall create any rights in favor of such subcontractor and against PATH; and as between PATH 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.

46. 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.

47. 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 PATH for other purposes, the Engineer may render to PATH 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 PATH 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 PATH shall not operate to release the Contractor or his sureties from any obligations under or upon this Contract or the Performance and Payment Bond.

48. 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 PATH 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 PATH 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 PATH 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.

49. 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 PATH 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 PATH shall not operate to release the Contractor or his sureties from any obligations under or upon this Contract or the Performance and Payment Bond.

50. 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 PATH, 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 PATH of duties involving transactions with the Contractor on behalf of PATH, 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 PATH 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

51. 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 Director, 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 PATH, its Directors, 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 PATH as to the feasibility of performance of this Contract or any part thereof. Moreover, PATH 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 PATH 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 PATH's consent to enter into this Contract and that without such provisions, PATH would not have entered into this Contract.

52. 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 PATH, 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 PATH 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 PATH;

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 PATH 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 PATH 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 PATH 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 PATH 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 PATH 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 PATH, governmental nature of PATH or the provisions of any statutes respecting suits against PATH , 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 PATH, 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 PATH is named, including a direct right of action against the Contractor to enforce the foregoing indemnity, except, however, that PATH 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.

53. 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".

54. INSURANCE PROCURED BY PATH

In order to reduce the cost of this Contract, PATH 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 PATH, with current coverage limits of $50 million per occurrence for bodily injury and property damage liability.

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.) Longshore 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, including employer's liability insurance (in limits of not less than $1 million per occurrence).

Should the Contractor and/or subcontractors be required to procure the workers' compensation insurance, within ten days after the acceptance of his 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.

C. 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 Contractor's and subcontractors' machinery, tools, and equipment and property of a similar nature, including forms, shoring, scaffolding, temporary structures, rental property/equipment 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, B and C 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 policies under A above are 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, B and C above.

PATH 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, B and C 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 PATH and PATH 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 PATH 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, PATH 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 PATH 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 PATH 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 PATH, its Directors, 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.

PATH 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 PATH all such returned premiums, dividends and credits and the subcontractors shall be deemed to have assigned to PATH 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 PATH's right to such returned premiums, dividends and credits.

Notwithstanding any payment by PATH of any insurance premiums, PATH 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 PATH in all matters relating to the aforementioned insurance and shall comply with all requirements of all insurance policies procured by PATH. 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.

55. 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.) Combined single limit for bodily injury and property damage liability - $ 5 million per each accident.

2.) Hazardous/contaminated waste transportation insurance shall be provided by any Contractor or subcontractor hauling hazardous/contaminated waste with a limit of $5 million each occurrence.

B. Environmental Liability Insurance:

The Contractor shall procure and maintain in force an Environmental Liability Insurance Policy covering the Contractor's pollution legal liability, including cleanup, with limits not less than $5 million per occurrence for bodily injury and property damage tailored to the specific exposures as they relate to the Work of this Contract. The policy will be in effect commencing on or about the date of PATH's acceptance of the Contractor's Proposal.

Such policy and any certificate of insurance submitted hereunder in relation to such policy shall (I) be expressly endorsed for each PATH facility under this Contract and each transfer location, travel route and material disposition location selected by the Contractor, (II) state that claims disputes and coverage shall be litigated in United States courts having jurisdiction, and not be limited to arbitration, and (III) acknowledge the Contractor's disclosure to the insurance carrier that the material may be considered a hazardous substance/waste under applicable law including, but not limited to, RCRA and/or CERCLA and/or the Toxic Substance Control Act (TSCA). It should be noted that the substances may be considered "hazardous" under CERCLA, but not necessarily "hazardous" under RCRA and that such materials if RCRA "hazardous" would require a manifest and disposal certificate under RCRA at a Subtitle C hazardous waste disposal facility. A copy of this Contract, including all schedules and documents attached hereto, shall be provided to the insurance carrier.

The Port Authority of New York and New Jersey and its related entities shall be named as an additional insured in the liability policy or policies and evidenced by the certificate(s) of insurance set forth above. The liability policy(ies) and the certificate(s) of insurance shall show coverage for cross-liability/severability of interests as provided under the standard ISO "separation of insureds" condition.

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 PATH.

Such policy(ies) and certificate(s) of insurance shall contain an additional endorsement providing that "the insurance carrier shall not, without obtaining express advance permission from the General Counsel to PATH, raise any defense involving in any way the jurisdiction of the Tribunal over the person of PATH, the immunity of PATH, its Directors, officers, agents or employees, the governmental nature of PATH or the provisions of any statutes respecting suits against PATH".

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 PATH as to form or substance, or if the carrier issuing any such certificate or policy shall be or become unsatisfactory to PATH, the Contractor shall promptly obtain a new and satisfactory certificate and policy. Upon request of the General Manager, Risk Financing, the Contractor shall furnish PATH 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 PATH 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

56. RIGHTS AND REMEDIES OF PATH

PATH 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 PATH 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 PATH 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 PATH shall not be deemed to limit any other rights or remedies which PATH would have in the absence of such enumeration; and no exercise by PATH 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.

57. 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 PATH, the Contractor expressly agrees that no default, act or omission of PATH 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.

58. 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 PATH.

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 PATH as agent for the Contractor, credit to PATH the cost thereof, and credit to the Contractor the compensation earned thereby; and the difference between them shall be payable by the Contractor to PATH, or vice versa as the case may be. If such difference is in its favor, PATH 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 PATH 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.

59. NO ESTOPPEL OR WAIVER

PATH 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 PATH, 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 PATH 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 PATH, the Engineer, or any officer, agent or employee of PATH, nor any permission or direction to continue with the performance of Work, nor any performance by PATH of any of the Contractor's duties or obligations, nor any aid lent to the Contractor by PATH in his performance of such duties or obligations, nor any other thing done or omitted to be done by PATH, its Directors , 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 PATH 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 PATH may be entitled because of such breach. Moreover, no waiver by PATH of any breach of this Contract shall be deemed to be a waiver of any other or any subsequent breach.

CHAPTER VII

MISCELLANEOUS

60. 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 PATH, 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.

61. 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.

62. 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.

63. NON-LIABILITY OF PATH REPRESENTATIVES

Neither the Directors of PATH 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.

64. 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 PATH 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.

65. 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 PATH 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.

66. 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[23] Contractor and surety company (or companies), as principal and surety (or sureties), respectively,

Contractor	Surety

23 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 Trans Hudson Corporation (herein called "PATH") 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 PATH, a copy of which is hereby made a part of this bond as though herein set forth in full and which is designated Contract PAT-924.103 - "PATH - Hackensack River Bridge - Deck and Rail Replacement", and

WHEREAS, PATH 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 PATH 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 PATH 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 PATH.

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 PATH 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 [24] _____

_____
Surety

By[25] _____

APPROVED AS TO ACCEPTABILITY OF SURETIES:

_____
Credit Manager

_____ 20

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

[25] 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

67. CONSTRUCTION REQUIRED BY THE SPECIFICATIONS

These Specifications relate generally to performing the replacement of deck timbers, running rail, emergency rail, head blocks, miter rails, expansion rails, contact rail and appurtenances; replacement of damaged concrete ties and removal of all temporary wooden ties and related Work on PATH Tracks G and H at the Hackensack River Bridge and the vicinity thereof in Jersey City, New Jersey.

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 PATH 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.

68. 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. G004 and designated "Area ~~Available~~ For Contractor's Use". The approximate size of the Area for Contractor's Use is (Add #2) 1500 square feet and is located directly below the work site. (Add #3) 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.

69. CONSTRUCTION SITE SECURITY REQUIREMENTS

The Port Authority Trans Hudson Corporation operates facilities and systems at which terrorism or other criminal acts may have a significant impact on life safety and key infrastructures. PATH 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 PATH. 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 PATH. 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 PATH. 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.) PATH may provide for construction site access control, inspection and monitoring by security guards retained by PATH. 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 PATH, 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 PATH. Further, the Contractor, subcontractors or materialmen may be required to be monitored by security personnel designated by PATH 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 PATH, which will be in effect on the date that Work commences. The description of high security areas may be changed at any time by PATH during the duration of this Contract. The Contractor shall notify PATH 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 PATH and the escorting and monitoring of workmen and materialmen hereunder.

PATH 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.

70. MATERIALS FURNISHED BY THE AUTHORITY

PATH will furnish to the Contractor for installation by him in the permanent construction the following materials:

1	1 EA	115# RE Rail as CWR 150-ft lengths
2	1 EA	115# RE Rail as CWR 160-ft lengths
3	3 EA	115# RE Rail as CWR 175-ft lengths
4	1 EA	115# RE Rail as CWR 180-ft lengths
5	2 EA	115# RE Rail as CWR 200-ft lengths
6	1 EA	115# RE Rail as CWR 225-ft lengths
7	1 EA	115# RE Rail as CWR 240-ft lengths
8	6 EA	115# RE Rail as CWR 300-ft lengths
9	67 EA.	Rocla Fast Clip Concrete ties (115# rail)
10	2 Pair	Expansion Joints, with 13' Movement Rail
11	4 Pair	Promex 115# Miter Rail
12	100 EA	Composite Contact Rail, 39-foot rails (3900 ft total)
13	12 EA	End Approaches for Composite Contact Rail
14	112 EA	Joint Bars for Composite Contact Rail
15	230 EA	Type 02 Contact Rail Insulators
16	200 EA	Coverboard Assembly for Contact rail, Complete (20-ft lengths) (4000-ft)
17	6 EA	Contact Rail Anchor Assembly for Composite Contact Rail

It is presently expected but not guaranteed that the foregoing materials will be furnished to the Contractor by the times required for their installation.

PATH 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.

70. MATERIALS FURNISHED BY THE AUTHORITY

PATH will furnish to the Contractor for installation by him in the permanent construction the following materials:

1	1 EA	115# RE Rail as CWR 150-ft lengths
2	1 EA	115# RE Rail as CWR 160-ft lengths
3	3 EA	115# RE Rail as CWR 175-ft lengths
4	1 EA	115# RE Rail as CWR 180-ft lengths
5	2 EA	115# RE Rail as CWR 200-ft lengths
6	1 EA	115# RE Rail as CWR 225-ft lengths
7	1 EA	115# RE Rail as CWR 240-ft lengths
8	6 EA	115# RE Rail as CWR 300-ft lengths
9	67 EA.	Rocla Fast Clip Concrete ties (115# rail)
10	2 Pair	Expansion Joints, with 13' Movement Rail
11	4 Pair	Promex 115# Miter Rail
12	100 EA	Composite Contact Rail, 39-foot rails (3900 ft total)
13	12 EA	End Approaches for Composite Contact Rail
14	112 EA	Joint Bars for Composite Contact Rail
15	230 EA	Type 02 Contact Rail Insulators
16	200 EA	Coverboard Assembly for Contact rail, Complete (20-ft lengths) (4000-ft)
17	6 EA	Contact Rail Anchor Assembly for Composite Contact Rail
18	1350 EA	Dapped Timbers
19	2660 EA	Spacing Blocks
20	32 EA	Headblock Timbers
21	8 EA	Skewed Blocks
22	20 EA	Ties for the Embedded Track on the Approaches
23	16 EA	Skewed Ties

It is presently expected but not guaranteed that the foregoing materials will be furnished to the Contractor by the times required for their installation.

Materials furnished to the Contractor shall be examined by him at the time they are furnished to him, and if there is any shortage, damage or other defect, the Contractor shall at that time bring it specifically in writing to the attention of the Engineer. Any shortage, damage or defect so brought to the Engineer's attention and acknowledged by him will be corrected by PATH. If no shortage, damage or other defect is so brought to the attention of and acknowledged by the Engineer at the time said materials are furnished to the Contractor, the materials shall thereafter conclusively be deemed to have been satisfactory in all respects, provided that if the Contractor demonstrates to the satisfaction of the Engineer that there was a shortage, damage or defect at the time the materials were furnished to the Contractor and that such fact could not reasonably have been ascertained at that time, then the shortage, damage or defect will be corrected by PATH.

From the date the foregoing materials are furnished to the Contractor they shall form part of the materials included in the risks assumed by the Contractor as provided in subparagraph A of the clause of the Form of Contract entitled "Risks Assumed by the Contractor".

All materials or portions thereof in excess of those actually required in the permanent construction and which in the opinion of the Engineer may be suitable for use by PATH shall be returned to PATH at a location at the construction site designated by the Engineer upon the completion of the Work or when there is no longer any need for this material, whichever may first occur.

The Contractor at his own expense, shall furnish all materials required by the Contract Drawings and Specifications with the exception of those materials expressly provided to be furnished to the Contractor by PATH in accordance with this numbered Section.

71. 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 routine maintenance and facility 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 PATH and the public and as may be directed by the Engineer.

72. 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.

73. 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.

74. CONTRACT DRAWINGS

The Contract Drawings which accompany and form a part of these Specifications bear the general title "Port Authority Trans Hudson Corporation - PATH - Hackensack River Bridge - Deck and Rail Replacement - Contract PAT-924.103" and are separately numbered and entitled as follows:

G001	TITLE SHEET	General
G002	LEGEND, ABBREVIATIONS AND INDEX OF DRAWINGS	General
G003	GENERAL NOTES	General
G004	GENERAL PLAN	General
C001	BRIDGE TIE NOTES	Civil
C002	RUNNING RAIL AND TIMBER LAYOUT PLAN SHEET 1 OF 3	Civil
C003	RUNNING RAIL AND TIMBER LAYOUT PLAN SHEET 2 OF 3	Civil
C004	RUNNING RAIL AND TIMBER LAYOUT PLAN SHEET 3 OF 3	Civil
C005	ALIGNMENT PLAN SHEET 1 OF 2	Civil
C006	ALIGNMENT PLAN SHEET 2 OF 2	Civil
C007	ALIGNMENT AND CURVE DATA	Civil
C008	WESTBOUND TRACK G PROFILE 1 OF 2	Civil
C009	WESTBOUND TRACK G PROFILE 2 OF 2	Civil
C010	EASTBOUND TRACK H PROFILE 1 OF 2	Civil
C011	EASTBOUND TRACK H PROFILE 2 OF 2	Civil
C012	TRACK G SPECIAL TRACKWORK LAYOUTS	Civil
C013	TRACK H SPECIAL TRACKWORK LAYOUTS	Civil
C014	EXISTING TYPICAL CROSS SECTION, DETAILS AND BRIDGE DECK PLAN	Civil
C015	TYPICAL CROSS SECTION AND VIADUCT SECTION	Civil
C016	TIE CONNECTION DETAILS	Civil
C017	HANDRAIL DETAILS	Civil
C018	EMBEDDED TIE DETAILS	Civil
C019	TOWER SPAN HEAD BLOCK ANCHORAGE	Civil
C020	LIFT SPAN HEAD BLOCK ANCHORAGE	Civil
C021	SKEWED TIE BOLTS	Civil

C022	TRACK G EMERGENCY RAIL	Civil
C023	TRACK H EMERGENCY RAIL	Civil
C024	MANGANESE SLIDING JOINT INSTALLATION DETAILS	Civil
C025	TIE PLATE FOR PANDROL FASTENER	Civil
C026	SCREW SPIKE DETAIL	Civil
C102	TRACK G TIE LAYOUT - 1	Civil
C103	TRACK G TIE LAYOUT - 2	Civil
C104	TRACK G TIE LAYOUT - 3	Civil
C105	TRACK G TIE LAYOUT - 4	Civil
C106	TRACK G TIE LAYOUT - 5	Civil
C107	TRACK H TIE LAYOUT - 1	Civil
C108	TRACK H TIE LAYOUT - 2	Civil
C109	TRACK H TIE LAYOUT - 3	Civil
C110	TRACK H TIE LAYOUT - 4	Civil
C111	TRACK H TIE LAYOUT - 5	Civil
S001	STEEL BRACKET LAYOUT	Structural
S002	STEEL BRACKET DETAILS - 1	Structural
S003	STEEL BRACKET DETAILS - 2	Structural
S004	COUNTERWEIGHT LOCATION AND NOTES	Structural
S005	COPUNTERWEIGHT DETAILS	Structural
S006	HEAD BLOCK CONNECTION DETAIL	Structural
E001	CONTACT RAIL LAYOUT 1 OF 2	Electrical
E002	CONTACT RAIL LAYOUT 2 OF 2	Electrical
E003	CONTACT RAIL DETAILS	Electrical
E004	MISCELLANEOUS ELECTRICAL DETAILS	Electrical
C300	SUPPLEMENTAL INSTALLATION REQUIREMENTS 1 OF 6	
C301	SUPPLEMENTAL INSTALLATION REQUIREMENTS 2 OF 6	
C302	SUPPLEMENTAL INSTALLATION REQUIREMENTS 3 OF 6	
C303	SUPPLEMENTAL INSTALLATION REQUIREMENTS 4 OF 6	
C304	SUPPLEMENTAL INSTALLATION REQUIREMENTS 5 OF 6	

C305 SUPPLEMENTAL INSTALLATION REQUIREMENTS 6 OF 6

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.

75. REFERENCE DRAWINGS

The following drawings, called Reference Drawings, were not prepared by PATH 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 PATH. Said drawings bear the general title "Port Authority Trans-Hudson Corporation Purchase of Timbers Hackensack River Bridge" and are separately numbered and entitled as follows:

G100	TITLE SHEET
G101	LEGEND, ABBREVIATIONS, NOTES, AND INDEX
C102	TRACK G TIE LAYOUT - 1
C103	TRACK G TIE LAYOUT - 2
C104	TRACK G TIE LAYOUT - 3
C105	TRACK G TIE LAYOUT - 4
C106	TRACK G TIE LAYOUT - 5
C107	TRACK H TIE LAYOUT - 1
C108	TRACK H TIE LAYOUT - 2
C109	TRACK H TIE LAYOUT - 3
C110	TRACK H TIE LAYOUT - 4
C111	TRACK H TIE LAYOUT - 5
C112	SKEWED BLOCK DETAILS TRACK G
C113	SKEWED BLOCK DETAILS TRACK H
C114	HEAD BLOCK TRACK G
C115	HEAD BLOCK TRACK H
C116	HEAD BLOCK DETAILS
C117	TIE FABRICATION DETAILS - 1

C118	TIE FABRICATION DETAILS - 2
C119	SKEWED TIE DETAILS TRACK G
C120	SKEWED TIE DETAILS TRACK H
C121	TIE DIMENSIONS TRACK G SHEET 1 OF 7
C122	TIE DIMENSIONS TRACK G SHEET 2 OF 7
C123	TIE DIMENSIONS TRACK G SHEET 3 OF 7
C124	TIE DIMENSIONS TRACK G SHEET 4 OF 7
C125	TIE DIMENSIONS TRACK G SHEET 5 OF 7
C126	TIE DIMENSIONS TRACK G SHEET 6 OF 7
C127	TIE DIMENSIONS TRACK G SHEET 7 OF 7
C128	TIE DIMENSIONS TRACK H SHEET 1 OF 7
C129	TIE DIMENSIONS TRACK H SHEET 2 OF 7
C130	TIE DIMENSIONS TRACK H SHEET 3 OF 7
C131	TIE DIMENSIONS TRACK H SHEET 4 OF 7
C132	TIE DIMENSIONS TRACK H SHEET 5 OF 7
C133	TIE DIMENSIONS TRACK H SHEET 6 OF 7
C134	TIE DIMENSIONS TRACK H SHEET 7 OF 7

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.

76. 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 Port 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 PATH shall become the property of PATH. PATH 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.

77. 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 PATH 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.

78. 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 PATH has or may acquire patent, copyright or other property rights are hereby expressly reserved for the exclusive use of PATH. 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 PATH and must not be produced or copied in whole or in part or used for furnishing information to others without the written consent of PATH, 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, PATH 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 PATH. Promptly upon request by PATH, the Contractor shall furnish or obtain from the appropriate person a form of license satisfactory to PATH, but as between the Contractor and PATH the license herein provided for shall nevertheless arise for the benefit of PATH 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 PATH to its successors, immediate or otherwise, in the operation or ownership of any real or personal property now or hereafter owned or operated by PATH, 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 PATH 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 PATH 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 PATH 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 PATH. If PATH 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 PATH against patent, copyright or other intellectual property right claims, PATH 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 PATH or to take such steps as may be necessary to ensure compliance by PATH with such injunction, all to the satisfaction of PATH and all without cost or expense to PATH.

79. 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.

80. 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 PATH and may be rejected at any time by the Engineer if incorrect, improper or otherwise unsatisfactory in his opinion.

81. 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 PATH 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.

82. 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 PATH 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.

83. 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".

84. ACCIDENTS AND FIRST AID PROVISIONS

The Contractor shall promptly report in writing to the Engineer and to PATH 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 PATH.

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 PATH, giving full details of the claim.

85. 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.

86. 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.

87. 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.

88. 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.

89. LAWS AND ORDINANCES

In order to effectuate the policy of PATH, 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 PATH, 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 any variance in his own name without first obtaining the approval of PATH.

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.

90. U.S. COAST GUARD SECURITY REQUIREMENTS

The Contractor is advised that in conjunction with Port Security Provisions for the Port of New York and New Jersey a 25 yard security or exclusionary area has been established by the United States Coast Guard around all bridges, piers and other facilities on the waterfront in the Greater New York/New Jersey area. No person or vessel may enter these security areas without the approval of the Coast Guard Captain of the Port and Vessel Traffic Service Activities New York as well as the Commander, First Coast Guard District Bridge Branch.

All requests to enter into these security zones shall be made in writing to Captain of the Port of New York not less than 30 days prior to the intended date of entry into the zone. Requests must be submitted to the U.S. Coast Guard Waterways Oversight Branch at Commanding Officer, U.S. Coast Guard Activities New York (WOB), 212 Coast Guard Drive, Staten Island, NY 10305; (718) 354-4193 or 4355 and must contain a complete list of all personnel that will enter into the security zones, complete vessel information and, if appropriate, a copy of Coast Guard Bridge Branch construction approval.

The following information is required:

A. Employee's name, social security number and date of birth.

B. Contractor's supervisor name and telephone number.

C. Name, type, size of barge/vessel/boat.

D. Contract start and end dates, working hours and days.

After background checks of all personnel have been completed, Coast Guard Captain of the Port will issue a letter specifying personnel and vessels authorized to enter the security zone.

After initial written approval for entry has been received, the Contractor shall notify the Coast Guard (Vessel Traffic Service 718-354-4088) daily prior to entering and upon securing for the day or leaving the site.

If additional, or changes in existing personnel, are required said information identified above shall be transmitted as above, as early as possible, but not less than 96 hours in advance of the expected change.

Failure to comply with the above Security Zone Requirements and Conditions is punishable under Federal Law by arrest, prosecution, and or civil penalties.

91. 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.

92. 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.

93. 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.

94. 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.

95. 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. PATH 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.

96. 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.

97. WARRANTIES

The Specifications may provide for certain warranties of portions of the permanent construction. These warranties are intended for the greater assurance of PATH and not as a substitute for rights which PATH 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 PATH by any manufacturer shall be deemed to be a limitation upon any rights which PATH would have, either expressed or implied, in the absence of such guarantees or warranties.

98. REQUIREMENTS FOR CRANES AND DERRICKS

During the performance of Work at the construction site, the use by the Contractor or his subcontractors of power-operated equipment that can hoist, lower and horizontally move a suspended load as specified in Federal Register Part II, Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1926 Cranes and Derricks in Construction; Final Rule (OSHA), shall be subject to the approval of the Engineer in accordance with this Section.

A. General requirements

1.) Cranes shall be operated by certified and licensed crane operators. A certified and licensed crane operator shall receive and maintain the following:

a. Certificate from the National Commission for the Certification of Crane Operators (NCCCO), or other crane operator certification program found by the New Jersey Department of Labor Crane Operators License Advisory Board to offer an equivalent testing and certification program.

b. Crane license issued by the Office of Safety Compliance, certified in one of the following:

(i) "Lattice boom truck crane" or "LBT" shall mean a crane consisting of a superstructure mounted on an automotive truck as a base and a means of travel.

(ii) "Lattice boom crawler crane" or "LBC" shall mean a crane consisting of a superstructure mounted on a base with crawler treads as a means of travel.

(iii) "Small telescoping boom crane" or "TSS" shall mean a crane with extendable and retractable boom mounted on an automotive truck as a base and a means of travel and with a manufacturer's load rating of less than 17.5 tons.

(iv) "Large telescoping boom crane" or "TLL" shall mean a crane with extendable and retractable boom mounted on an automotive truck as a base and a means of travel and with a manufacturer's load rating of 17.5 tons or more.

c. Medical certificate that meets the requirements of the American Society of Mechanical Engineers Safety Standard B30.5-2007.

2.) Determinations will be made in writing by the Engineer on whether cranes and other such equipment meeting OSHA 1926.1400 Scope section (c) entitled "*Exclusions*" shall be exempt from the requirements herein. Such determinations shall in no way relieve the Contractor from conformance with all applicable requirements of this Section and governing codes.

B. For each crane, submit the following to the Engineer prior to delivery of the crane to the construction site:

1.) Equipment Owner Identification and Equipment User Identification.

2.) Drawings clearly indicating location of each crane or derrick, all pertinent features of the site, and supporting platforms and structures.

3.) Name of competent person as outlined in Federal Register Part II, Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1926 Cranes and Derricks in Construction: Final Rule (OSHA).

4.) Monthly and annual crane inspection reports. Attached to such records of inspection shall be a written designation naming the competent person identified in B. 3.) above, signed by the owner or lessee of the crane.

5.) High wind (50 MPH and over) emergency plan.

6.) Name of qualified person as defined in Federal Register Part II, Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1926 Cranes and Derricks in Construction; Final Rule (OSHA). Any OSHA requirement requesting certification by a Professional Engineer shall be fulfilled by a Professional Engineer licensed to practice in the State of New Jersey.

Upon the review and acceptance in writing by the Engineer of all of the above submissions, the Contractor will be permitted to deliver, place and/or assemble the crane at the construction site. Coordinate all such deliveries, placements and/or assemblies with the Engineer.

C. Requirements for cranes upon delivery to the construction site:

1.) Submit a valid certificate of competence to operate a crane and classifications for the operator to the Engineer.

2.) Submit rigger's qualifications to the Engineer.

D. Requirements for inspection and operation of cranes at the construction site:

1.) Crane ropes shall be inspected on a daily and monthly basis and copies of the monthly inspection reports shall be stored in the crane cab.

2.) Should the monthly or yearly inspection expire while the crane or derrick is located at the construction site, the Contractor shall ensure that the owner of the crane or derrick performs the monthly and /or annual inspection. Submit proof of the inspection to the Engineer.

3.) Pre-lift meetings shall be held in accordance with Federal Register Part II, Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1926 Cranes and Derricks in Construction; Final Rule (OSHA). Submit pre-lift meeting minutes to the Engineer.

E. The estimated review time for all crane and derrick submissions to the Engineer is five (5) business days. If the Contractor has not received any reply by the fourth day of the review, contact the Engineer.

F. If any governing agency issues a letter of deficiency to the Authority or stop work order to the Contractor while the crane or derrick is located at the construction site, the Contractor shall cooperate fully with the governing agency to ensure that all acceptable corrective actions will be taken immediately. Keep the Engineer advised during the performance of all remedial Work.

G. Cranes or derricks performing an emergency use pursuant to an order or direction issued by the Engineer shall be exempt from the submission requirements herein except for the requirements specified in B. 4.) and C. 1.) above.

99. 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.

100. 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 PATH 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.

101. 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 Contractor's 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".

EXEMPTION (4)

DRAWINGS OF NON-PUBLIC AREAS

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[26] 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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[26] 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)

2.) Area (building, floor or area)

3.) Trade/CSI code (concrete, steel, etc as required)

4.) Location (3rd Fl, etc)

5.) Phase of Work, if applicable

6.) Change Order work, if applicable

7.) 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		

102. 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 PATH 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.

103. PATH OPERATIONS AND CONDITIONS

A. Construction Site Conditions:

1.) Schedule and perform the Work in the sequence shown on the Contract Drawings, if any, in such a manner as not to delay, endanger, or interfere with PATH operations. To the extent feasible the scheduled sequence, if any, and the times of the Contractor's operations, once approved, will be adhered to and operations of PATH and others will be scheduled so as to cause the least interference with the Contractor's operations. However, should the Engineer deem that any portion of the area in which the Contractor is working is required by PATH, the Contractor will be required to suspend operations and remove personnel, and obstructing plant, equipment and materials from such areas, within 1/2 hour of notice to suspend operations and stand by, if necessary, until directed by the Engineer to resume operations in such areas.

2.) Should the Contractor be specifically directed to suspend operations as provided in A.1, and if solely because of such direction and not due to fault of the Contractor, 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.

3.) To enable the Contractor to plan Work of the Contract, and to enable PATH to plan train service operations, maintenance operations, and operations of others, prepare and submit for approval in accordance with "Coordination" hereof, prior to any work, a schedule of outages required. PATH on a monthly basis, prepares a report of all work scheduled for the next month, this must be submitted at least 3 week prior to the start of the month when the work is to be scheduled. Once on the monthly schedule, then a weekly schedule of operations for Work of the Contract is to be submitted.

4.) 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.

5.) Take all precautions necessary for protection of persons and property during dust or fragment generating operations, concrete mixing or placing, painting or other operations which may stain, soil or damage property, or injure persons. Provide and erect waterproof, fire-resistant, UL labeled tarpaulins with flame spread rating of 15 or less or other protective enclosures as approved by the Engineer.

6.) The Contractor, employees of the Contractor, subcontractors, materialmen or other persons over whom the Contractor has control (hereinafter in this Section "Contractors's Personnel") shall conform to the following:

a. Do not park any vehicles, including construction vehicles, company vehicles or personal vehicles within any area of PATH property without prior approval of the Engineer, and no representation is made that parking, if approved, will be available throughout the Work of the Contract.

b. Do not enter upon PATH right-of-way unless PATH flaggers if required and Employee in Charge (EIC) assigned to the Contractor are present.

c. Do not permit material, equipment or other objects to lie within or project into the PATH right-of-way.

d. Provide sound suppression devices on gasoline and diesel powered construction equipment and pneumatic tools as required to maintain noise exposure below the limits specified in the Code of Federal Regulations (CFR) 29 CFR 1926 Occupational Safety and Health Regulations for Construction (OSHA). Maintain such sound suppression devices in proper operating condition throughout the time of their use and make adjustments and repair as required to maintain noise within exposure levels stipulated in 29 CFR 1926.52, Table D-2.

e. Do not store combustible products or flammable materials at areas of Work.

7.) Restrict smoking to areas designated by the Engineer for this purpose.

8.) At all times while performing Work, require workers to wear reflective safety vests, hard hats and boots with non-slip type soles. Reflective safety vests shall have a visible reflective surface of not less than 100 square inches on front and back.

9.) Do not burn or bury debris of any type on PATH property, or wash waste materials down sewers or into waterways.

10.) In the event of damage to or disruption of existing construction, the Contractor shall repair, replace or reinstall such construction to the satisfaction of the Engineer. Should the Contractor fail to perform such repair or replacement, PATH reserves the right to perform such Work and deduct from the Contractor's compensation an amount representing the cost of such Work, as determined by the Engineer.

11.) In addition to the requirements of the Section of Division 1 GENERAL PROVISIONS entitled "Safety Provisions", provide and maintain at areas of Work, two "Pyrene 95-P20M" extinguishers as manufactured by RC Industries, Inc., Linden, N.J., or approved equal UL rated 20A-80BC 20 pound dry chemical multi-purpose fire extinguishers.

B. Construction Site Conditions in Tunnels and Stations:

1.) The use of propane heaters and gasoline or diesel powered construction equipment within tunnels or at underground stations is prohibited.

2.) Use of liquids having a flashpoint below 73 degrees F and boiling point below 100 degrees F is prohibited, unless specifically approved by the Engineer.

3.) Provide and operate air moving equipment when fume generating operations are in progress. During such operations provide air monitoring and test for toxicity (PPM), oxygen deficiency and combustible gas (% LEL).

4.) Work will be permitted in only one tunnel at any one time unless otherwise shown on the Contract Drawings or specifically approved by the Engineer.

C. Access To Areas of Work:

1.) Work of this Contract is at areas that are accessible by road. Transportation for personnel, material and equipment delivery, and debris removal shall be via road transportation provided by the Contractor.

2.) Contractor shall be required to submit plans for temporary stairs from the street level to the top of the PATH Hack viaduct for both the G and H track.

3.) Contractor to submit plans for use of cranes required to lift material from street level to track level for both tracks G and H.

D. Material and Equipment Delivery and Removal:

1.) Contractor may pickup material supplied by PATH at the PATH C Yard near the intersection of Academy Street and Mill, Jersey City, New Jersey by truck to be transported to the staging area at Hackensack River Bridge.

2.) Due to the limited space available at the PATH C or D Yard, operations, during performance of this Contract, shall comply with the following:

a. No storage of material or equipment is permitted in either PATH C or D Yards.

b. Promptly remove material supplied by PATH from PATH C Yard.

c. Contractor storage area shall be near the Hack Bridge viaduct, no wood material may be stored under the viaduct.

E. PATH Rail Transportation:

1.) If PATH will not supply any work trains for the Contractor's use, all track equipment must be supplied by the Contractor.

2.) Under no circumstances will the Contractor be permitted to use PATH passenger trains for transporting material or equipment of any kind in connection with performance of the Work.

3.) The Contractor's personnel shall not use PATH passenger trains for transportation in connection with performance of the Work, unless specifically approved in advance by the Engineer and such use, if granted, shall be subject to the limitations and conditions imposed by the Engineer for such transportation.

4.) Make arrangements for PATH Rail Transportation in accordance with "Coordination" hereof.

F. Contractor's Rail Transportation:

1.) In lieu of utilizing PATH rail transportation, the Contractor will provide at his expense, Hi-Rail equipment or other suitable rail equipment for use on PATH tracks subject to the provisions stipulated herein.

a. All rail equipment must be inspected by PATH prior to use on the PATH system.

2.) In addition to the requirements herein, the times and conditions of Hi-Rail equipment operation shall be the same as those stipulated for PATH work trains.

3.) Access to PATH tracks for placement and removal of Hi-Rail equipment is available only at the following locations:

a. The New Jersey Transit grade crossing on the PATH eastbound track, Harrison, New Jersey.

b. The New Jersey Transit bridge grade crossing on the PATH westbound track, Kearny, New Jersey.

4.) The services of a PATH pilot are required at all times of operation of Hi-Rail or other railroad equipment on PATH tracks. Such pilot will be provided at no cost to the Contractor. Make arrangements for a PATH pilot in accordance with "Coordination" hereof.

5.) When not in active use in connection with performance of the Work, all Hi-Rail equipment must be remove from the PATH property

G. PATH Flagger Service:

1.) PATH will provide flaggers without charge to the Contractor and their use is required for the following operations in connection with performance of the Work:

a. Work within or closer than 25 feet to the right-of way.

b. Work that requires crossing or obstruction of tracks.

c. Use of PATH rail transportation or Contractor's rail transportation

d. Work that in any way interferes with or interrupts PATH train service operations

e. Work which, in the sole discretion of the Engineer, requires flaggers for safety purposes.

2.) Make arrangements for PATH flagger service in accordance with "Coordination" hereof.

H. Traction Power and Existing Utilities:

1.) The Contractor's attention is called to the fact that there will be high voltage electric lines and rails for PATH traction power at or adjacent to the areas of Work and no representation is made that such lines and rails will be de-energized during performance of the Work of the Contract. The Contractor shall take all necessary precautions to protect his personnel and others affected by his operations from injury from such high voltage electric lines and rails. Such lines and rails will remain energized for PATH operations except where shut-off is approved by the Engineer.

2.) Maintain operation of existing utility services such as compressed air, water, sewers, electricity, ventilation or fire protection and PATH surveillance cameras, signal and communication systems during performance of Work of the Contract, except as absolutely necessary for cutoff, cutover or other change of the affected systems, as approved by the Engineer. Coordinate with the Engineer prior to interrupting or otherwise affecting any operating system, utility or service.

3.) Shut-off and turn-on of traction power or existing utility, signal or communication service will be performed by others without cost to the Contractor.

4.) PATH will not provide any compressed air, electric or lighting, Contractor is required to supply at no additional cost to PATH.

5.) Notify the Engineer of such shut-off or turn-on requirements in accordance with "Coordination" hereof.

I. Coordination:

1.) The progress schedule required under the Section of Division 1 GENERAL PROVISIONS entitled "Progress Schedule and Analysis of Bid" shall contain, but not be limited to, the following items:

a. Description of operations, location of Work in tunnels, and station closings, if any

b. Start and completion dates of each operation

c. Dates of material pickup from C or D Yard

d. Dates and times of Work that:

(i) Require closing of PATH stations or tunnels

(ii) Require crossing or obstruction of tracks

(iii) Is within or closer than 25 feet to right-of-way

(iv) Interferes with or interrupts PATH train service operations

(v) Require use of Contractor's Hi-rail equipment, if any.

2.) Submit written notification to the Engineer not later than 4:00 P.M. Monday of the week preceding each day that the following services are required:

a. PATH rail transportation service

b. Services of PATH pilot for Contractor's rail transportation

c. PATH flagger services

d. Work to be performed within PATH tunnels

3.) Written notification shall include, but not be limited to, the following items:

a. For PATH rail transportation service:

(i) The dates and locations of areas of Work

(ii) Whether or not flatcar will be required to remain in position as storage platform at areas of Work; and if so, locations of such areas

(iii) Number of Contractor's personnel to be transported

b. For services of PATH pilot:

(i) The dates, times and locations of Hi-rail equipment delivery to PATH track access points.

(ii) The dates, times and locations of areas of Work destinations of Hi-rail equipment.

(iii) Whether or not Hi-rail equipment will be positioned at areas of Work as a storage platform; and if so, locations of such areas.

c. For PATH flagger services:

(i) The dates, times and locations of area of Work

(ii) Description of operations to be performed at areas of Work

4.) Where shut-off services of PATH traction power or other utility or service are permitted, notify the Engineer not less than 3 work days prior to the anticipated need for such services. Each notification shall be written and shall include:

a. The dates, times and locations of areas of Work involved.

b. Description of what utility or service shut-off or turn on is required.

c. Duration of shut-off times.

J. Coordination Rescheduling or Cancellation:

1.) When the Contractor obtains approval under "Coordination" hereof for the use of PATH services, Work in PATH tunnels, or the closing of a PATH station for a particular day or days, and should the Contractor thereafter require a rescheduling or cancellation of such services for the approved days, submit written notification of such rescheduling or cancellation to the Engineer not less than 48 hours in advance of each day for which approval was given. Failure by the Contractor to provide such notification of rescheduling or cancellation shall result in deduction by PATH of the following amounts from the Contractor's compensation:

a. For PATH rail transportation: $1600 for each prior approved 6-hour tour or part thereof.

b. For PATH pilot: $50 for each prior approved hour or part thereof.

c. For PATH flagger services: $50 per flag person for each prior approved hour or part thereof.

d. For PATH shut-off or turn-on of traction power or other utility or service: $200 for each shut-off or turn-on previously approved.

e. For PATH station closing: $2000 per day.

2.) PATH On-Track Safety Program

PATH requires that all Contractor personnel who may enter the track area at any time be certified by successfully completing the "PATH ON-TRACK SAFETY PROGRAM", in compliance with the Rules and Regulations set forth in Federal Railroad Administration (FRA) Regulation 49 CFR Part 214, Subpart C, entitled "RAILROAD WORKER PROTECTION". Contractor personnel not certified under this program will not be permitted to enter the PATH track area. On a monthly basis, PATH will provide a four hour certification class at no cost to the Contractor which includes a certification test for supervisory staff representing the Contractor. The Contractor's supervisory staff will then be required to train and certify all additional Contractor personnel that may be performing Work of the Contract. A letter certifying that the listed Contractor personnel have been trained on the "PATH ON-TRACK SAFETY PROGRAM" and, that they fully understand and will comply will all requirements of FRA rules, shall be filed with PATH's Safety Supervisor at One PATH Plaza, Jersey City, NJ 07306, Sixth floor, within 48 hours of such training. Only the persons specified in such letter will be permitted to enter the track area.

K. 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 Work and shall take such precautions as will accomplish such end, without undue interference with the public or the operations of PATH.

104. HOURS OF WORK AND CONSTRUCTION STAGING

A. Hours of Work

1.) Subject to all requirements stated elsewhere herein, the Work of this Contract shall be performed in accordance with Construction Staging in B. and during the following hours of Work.

a. Pick up material supplied by PATH at PATH C or D Yard only between the hours of 8:00 AM and 4:00 PM, each day, Monday through Friday.

b. Load and unload material at the Viaduct area of the Hackensack River Bridge only between the hours of 8:00 AM and 4:00 PM, each day, Monday through Friday.

c. Perform Work that requires crossing or obstruction of tracks within 25 feet of right-of-way, or in any way interferes with or interrupts PATH train operations between the hours of 1:00 AM and 5:00 AM, each day, Monday through Friday and between the hours of 1:00 AM Saturday and 12:01 AM Monday.

2.) Work of this Contract is to be performed on an operating railroad, therefore, PATH does not guarantee that PATH rail transportation will be available precisely at the beginning and end of each specified time period. Arrival times of PATH rail transportation will vary as stipulated herein.

3.) The Contractor shall submit to the Engineer, at least one week in advance, his scheduled hours of Work for each week.

4.) Do not perform Work at the construction site outside of these time periods or on a Federal legal holiday or a holiday of the State(s) in which the Work is being performed, unless otherwise permitted by the Engineer.

B. Construction Staging

1.) For construction staging refer to Track Construction Sequence Notes on Contract Drawing G003.

EXEMPTION (4)

DRAWINGS OF NON-PUBLIC AREAS

DIVISION 2

SECTION 02094

WORKER AND ENVIRONMENTAL PROTECTION FOR LEAD-CONTAINING PAINT REMOVAL

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for:

1. The installation and use of containment systems for the removal of paint coatings containing lead and other toxic metals in accordance with the Society for Protective Coatings (SSPC) Technology Guide 6 and associated Containment Class Tables A, W, P, and C..
2. The protection of Contractor workers, the public, and the environment from exposure to harmful levels of lead that may be present in the paint being removed.
3. Ensuring that all waste is collected, handled, stored, transported, and disposed of in accordance with applicable regulations.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

A. Code of Federal Regulations (CFR)

1. 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response
2. 29 CFR 1910.134 Respiratory Protection
3. 29 CFR 1926 Occupational Safety and Health Regulations for Construction
4. 29 CFR 1926.51 Sanitation
5. 29 CFR 1926.62 Lead
6. 40 CFR 50 National Primary and Secondary Ambient Air Quality Standards
7. 40 CFR 261-264 Hazardous Waste Standards
8. 40 CFR 265.13 General Waste Analysis
9. 40 CFR 268 Land Disposal Restrictions
10. 49 CFR 171-179 Transportation Regulations

B. New York Code of Rules and Regulations (NYCRR)

1. Title 6, Chapter III, 364-373 Hazardous Waste Management Regulations

C. New Jersey Administrative Code (NJAC)

1. NJAC, Title 8, Chapter 62 - New Jersey Department of Health, Standards for Lead Certification
2. NJAC, Title 5, Chapter 17 - New Jersey Lead Hazard Evaluation Abatement Code
3. NJAC, Title 7, Chapter 18 - Regulations Governing the Certification of Laboratories and Environmental Measurements

D. The Society for Protective Coatings (SSPC)

1. SSCP Guide 6 - Guide for Containing Surface Preparation Debris Generated During Paint Removal Operations
2. SSPC Guide 7 - Guide for Disposal of Lead-Contaminated Surface Preparation Debris

1.03 REGULATORY REQUIREMENTS

A. Comply with the requirements of this section as though the Authority were a private corporation. Comply with the requirements of all applicable Federal, State, and City laws, codes, and regulations, including, but not limited to the regulations of the:

1. United States Environmental Protection Agency (USEPA);
2. Occupational Safety and Health Administration (OSHA);
3. New York State Department of Environmental Conservation (NYSDEC);
4. New York State Department of Health (NYSDOH); and
5. New York State Department of Labor (NYSDOL).
6. New Jersey Department of Environmental Protection (NJDEP);
7. New Jersey Department of Health and Senior Services (NJDHSS);
8. New Jersey Department of Labor (NJDOL);

B. Comply with all applicable regulations even if the regulation is not specifically referenced herein. If a Federal, State, or City regulation is more restrictive than the requirements of this Section, follow the more restrictive requirements.

1.04 QUALIFICATIONS AND EXPERIENCE

A. Laboratory Qualifications/Occupational Physician

1. Verify that the analytical laboratories performing metals analysis on air, water, soil and solid waste, are accredited by The American Industrial Hygiene Association (AIHA), and has successfully participated (previous 12 months at a minimum) in the AIHA ELPAT program and PAT program. NJDEP specific certifications must include NELAC or N.J.A.C. 7:18 (as amended November 22, 2006) Regulations Governing the Certification of Laboratories and Environmental Measurements.
2. Verify that the laboratory conducting the worker blood analyses is approved by OSHA, and NYSDOH, as applicable.
3. Verify the certifications of the Occupational Physician.

B. Competent Person/Supervisor. Employ one who:

1. Has a minimum of two years industrial painting field experience, with a minimum of ninety days field supervisory or management experience in paint removal projects.
2. Has proof of completion of 29 CFR 1926.62 Lead in Construction training.
3. Has proof of 29 CFR 1910.120 (initial or refresher) HAZWOP Supervisor training within the last 12 months.
4. Has proof of training under RCRA, per 40 CFR 265.16
5. For Work in New York, has proof of completion of Society for Protective Coatings (SSPC) Competent Person for Deleading of Industrial Structures (SSPC C-3) course or equivalent. Certification must be maintained throughout the duration of the Contract.

6. For work in New Jersey, has proof of completion of the New Jersey Lead Abatement Supervisor Program for Commercial Buildings and Super Structures, N.J.A.C. 5.17-2.1. Certification must be maintained throughout the duration of the Contract.

C. Workers. Confirm that:

1. All workers have proof of completion of 29 CFR 1926.62 Lead in Construction training.

1.05 SUBMITTALS

See Appendix "A" for submittal requirements

PART 2. PRODUCTS

2.01 PERSONAL PROTECTIVE MATERIALS AND MONITORING EQUIPMENT

A. Monitoring and Testing Equipment

1. Supply the instrumentation needed for monitoring worker and area exposures.
2. Supply all equipment needed for the operation of all instrumentation and monitors (e.g., generators, batteries, power cords, fuel, etc.).

B. Personal Protective Equipment and Hygiene Facilities

1. Provide all personal protective equipment (PPE) needed for Contractor's workers and for up to 4 Authority representatives at each shift.
2. Repair or replace PPE as required to assure that it continues to provide its intended purpose.

C. Containment Materials

1. Supply all equipment and materials needed to contain debris in accordance with the provisions of this Section. This may include ground covers, rigging, scaffolding, planking, containment materials, dust collection and ventilation equipment and HEPA vacuums.

PART 3. EXECUTION

3.01 WORKER PROTECTION CRITERIA FOR LEAD

A. Competent Person - confirm that daily inspections of the work area will be made by a competent person.

B. Written Compliance Program (WCP) – Prepare a WCP in accordance with 29 CFR 1926.62 (e)(2)(i). Maintain a copy of the WCP at the construction site for review by all employees and interested parties.

C. Engineering and Work Practice Controls – Implement engineering and work practice controls, including administrative controls, to reduce and maintain employee exposure to lead below the PEL.

D. Exposure Monitoring/Initial Assessment – Collect representative personal air samples in accordance with 29 CFR 1926.62 (d)(1)(iii). Protect workers during initial exposure assessment in accordance with 29 CFR 1926.62 (d)(2)(i). If historical data will be used in accordance with 29 CFR 1926.62 (d)(3)(iii), provide prior to start of work for evaluation by the Engineer.

E. Respiratory Protection- Implement a Respiratory Protection Program in accordance with 29 CFR 1910.134. Proper selection, use, maintenance and inspection of respirators is required. Provide medical clearance and fit tests for respirator users.

F. Protective Clothing and Equipment - Furnish clean protective clothing and equipment in accordance with 29 CFR 1926.62 (g) and ensure they are used by all employees whose exposures exceed the PEL. Furnish closed containers for items to be cleaned, such as work shoes and facemasks. If the clothing is disposable, label the containers as clothing contaminated with lead, if applicable. Apply hazardous waste labels to drums containing PPE. If testing dictates that these materials are non-RCRA hazardous, re-label drums as non-hazardous and provide testing records supporting this determination to the Engineer.

G. Housekeeping – In accordance with 29 CFR 1926.62 (h), clean accumulations of dust or debris containing lead daily and conduct all cleaning with HEPA (High Efficiency Particulate Air)-filtered vacuums. Containerize the debris for proper disposal. Apply hazardous waste labels to drums containing dust and debris. If testing dictates that these materials are non-RCRA hazardous, re-label drums as non-hazardous and provide testing records supporting this determination to the Engineer.

H. Personal Hygiene Facilities and Equipment/Decontamination Zone – In accordance with 29 CFR 1926.62 (i), provide clean change areas, showers, lavatory, eating facilities, and hand washing facilities as necessary for workers who may be exposed to lead at or above the OSHA PEL.

I. Medical Surveillance and Medical Removal Protection – In accordance with 29 CFR 1926.62 (j) and (k), perform initial and periodic blood sampling and analysis for lead and zinc protoporphyrin (ZPP) when an employee is exposed to lead at or above the OSHA Action Level of 30 ug/m3. Provide the Engineer with blood analysis results.

J. Employee Training and Information - In accordance with 29 CFR 1926.62 (l), provide initial and annual refresher site specific training for all employees who may be exposed to lead at or above the OSHA Action Level.

K. Signs and Restricted Zones - In accordance with 29 CFR 1926.62 (m), establish restricted zones around areas or activities that might generate airborne emissions of lead in excess of the OSHA Action Level and post caution signs around each restricted zone.

L. Record keeping - In accordance with 29 CFR 1926.62 (n), retain all records related to training, medical examinations, blood analysis, exposure monitoring, respirator fit testing, inspections by a competent person, and other related documentation.

M. Visible Assessments - Conduct daily assessments of visible emissions and releases to the air, soil, water, and sediment, as applicable. Undertake all necessary corrective action to control emissions.

3.02 AMBIENT AIR MONITORING FOR LEAD

A. High Volume Ambient Air Monitoring

1. The Engineer will undertake high volume ambient air monitoring during paint removal and clean-up activities to confirm that emissions do not exceed the EPA National Primary and Secondary Ambient Air Quality Standards (NAAQS), or specific New York or New Jersey regulations.
2. Total suspended particulate (TSP-lead) will be analyzed in accordance with 40 CFR 50 Appendix G.

3. The number and location of monitors will be determined by the Engineer, taking into consideration proximity to homes, businesses, and the general surroundings. Monitor siting and operation will be performed in accordance with the guidance provided in Methods A1 and A2 of SSPC publication 95-06, Project Design.

4. The Contractor will be advised if such monitoring will be performed and will be provided with verbal background and ongoing results. Written results will be provided if requested by the Contractor.

5. Take corrective actions as directed by the Engineer when air monitoring results exceed the established 8-hour period concentrations.

6. Regardless of the ambient air monitoring results, ensure at all times that no visible emissions occur.

3.03 ON-SITE MANAGEMENT, TRANSPORTATION, AND DISPOSAL OF PAINT DEBRIS, WASTEWATER, AND ANY OTHER WASTE GENERATED FROM THE WORK.

A. General

1. Contractor is responsible for the collection, handling, storage, transportation and disposal of all hazardous wastes generated from this Work. The Authority will provide the EPA identification number for lead waste disposal for permitting purposes.

2. The Contractor is responsible for the collection, handling, transportation, and disposal of all solvent wastes generated from this Work. The Contractor shall acquire their own EPA identification number for the disposal of solvent wastes.

3. The Contractor is responsible for the collection, handling, transportation, and disposal of all non-hazardous municipal/construction waste and waste water generated from this Work.

4. Recover all waste products generated during the paint removal Work, including but not limited to rags, tape, disposable coveralls, filters, and sediments.

5. Store waste only at locations designated by the Engineer. Inventory and transport hazardous waste to the designated 90-day central accumulation storage area at the end of each working day, at a minimum.

6. Obtain hazardous waste generation reports and pay for fees/taxes imposed by the States.

B. Items Provided by the Contractor

1. Hazardous Waste - Provide DOT-approved containers of the appropriate size and type for the hazardous waste generated, including but not limited to, paint chips, protective clothing, and the interior lining of the containment. Use containers that are resistant to rust and corrosion, (painted if constructed of steel), that have tight fitting lids or covers, and which are water resistant and leak proof.

2. Municipal/Construction Waste - Provide all containers for non-hazardous municipal/construction waste. Use containers that are free of loose debris when brought to the construction site.

3. Spent Solvents - Provide all DOT-approved containers for spent solvents. Do not mix spent solvents with paint debris, water or other lead contaminated waste.

C. Waste Sampling, Testing, and Classification

1. Sampling: Collect and have analyzed, representative samples of each waste stream generated by the Work. Collect the samples under the observation of the Engineer.

2. Testing

a. Solid Waste: Direct the laboratory to test the solid waste in accordance with 40 CFR 261, Appendix II, Method 1311, Toxicity Characteristic Leaching Procedure (TCLP), to determine if it is hazardous. (Equal to or greater than 5 mg/L)[1]

b. Waste water - Test the waste water for Total metals (As, Cd, Cr, Cu, Pb, Hg, Mo, Ni, Zn), hexavalent chromium, pH, suspended solids, oil and grease, BOD, temperature, total cyanide, TPH, and other analytical parameters required for disposal characterization or by the disposal facility.

3. Laboratory Report

a. Include the following minimum information in each report : Identity of the RCRA listed waste streams and identity of the waste stream(s) analyzed, the number of samples collected and tested, dates of sampling and testing, laboratory test procedures utilized, the names and signatures of the individuals collecting the samples and analyzing the laboratory tests, interpretation of the test results, and final determination.

b. Include copies of the chain-of-custody forms in the documentation of hazardous waste and non-hazardous waste streams.

D. Waste Handling, Packaging, and Storage

1. Comply with 40 CFR 262 for the on-site handling, packaging, and storage of all waste generated by the Work.

2. All paint debris shall be vacuumed and collected in DOT-approved 55-gallon drums at the end of each Work period. Paint debris shall include paint chips and dust and shall not include any other construction debris, trash or chemical solvents. All disposable protective clothing and interior lining of the containment system shall be collected in DOT-approved drums at the end of each Work period.

3. At the Work areas, store waste in locations designated by the Engineer. Do not place hazardous waste on unprotected grounds (e.g. cover the ground with impervious tarping). Locate in a secure area with signs around the perimeter, and shield adequately to prevent dispersion of the waste by wind or water.

4. Properly transport all non-hazardous waste municipal/construction waste from the Work areas to the designated storage area. Verify that the waste is completely covered during transportation.

5. Maintain all drums in good operating condition with all lids and closing mechanisms intact and operational to prevent escape of debris by winds, spilling of contents, or access by unauthorized personnel.

6. Store non-hazardous waste separately from hazardous waste. Do not mix hazardous waste with non-hazardous waste. Do not mix different types of hazardous waste unless specifically approved by the Engineer.

7. Verify that all waste is transported to the appropriate recycling or disposal facility within 60 days after waste is first placed into the container.

8. Train all personnel in the proper handling of hazardous waste at the Work site in accordance with 29 CFR 1910.120, including the procedures to follow in the event of a release or spill, required notifications, and methods of clean-up. Maintain all training records on-site.

E. Labeling of Containers

1. Immediately label all containers of waste and paint debris to identify the contents. Label containers of paint debris as "LEAD PAINT WASTE, CONTAINS LEAD". Include the Contract Number and locations. Provide similar labels on containers of other waste, wastewater and debris.

2. After the TCLP test results are received, or after determination of hazardous waste status based on RCRA list at 40 CFR 261, Subpart D, immediately apply hazardous waste labels, if the waste tests hazardous. Label each container of hazardous waste in accordance with 40 CFR 262, and 49 CFR 171-179.

F. Waste Transportation and Disposal (with the Exception of Waste Water)

1. Hazardous Waste

a. Prepare the hazardous waste manifest for each shipment and provide to the Engineer for review and signature.

b. Arrange for the transportation of all hazardous waste by a licensed transporter in accordance with 40 CFR 263, 49 CFR 171-179, and 6 NYCRR 364.

c. Hazardous Paint Waste (TCLP results which indicate that lead concentrations or equal to or greater than 5 mg/L) shall be treated and stabilized to TCLP levels below 0.75 mg/L prior to disposal.

d. Provide a certification for each manifested shipment that the waste was accepted by the recycling or disposal facility, and properly treated and disposed. Comply with all of the manifesting, certification, and reporting requirements for hazardous waste in accordance with 40 CFR 262, 40 CFR 268, and 6 NYCRR 372, including certificates of final disposal for each shipment.

2. Non-Hazardous, Municipal, and Construction Waste

a. Properly transport, and dispose of all non-hazardous, municipal and construction waste.

b. Verify that waste is completely covered during transport.

c. If lead or hazardous substances were detected during the laboratory testing, notify the disposal facility that such metals or materials are present in the waste.

d. For non-hazardous lead waste with TCLP results which indicate lead concentrations between 1 mg/L and 5 mg/L, the waste shall be treated and stabilized to TCLP levels below 0.75 mg/L prior to disposal.

e. Comply with additional City and local regulations as applicable.

G. Waste Water Handling and Disposal

1. Provide containers for the collection and retention of all waste water including but not limited to the water used for steam cleaning, hygiene purposes, decontamination and cleanup activities. Filter visible paint chips and particulate from the waste water prior to placing it into the containers. Make disposal arrangement with the local publicly owned treatment works (POTW), sanitation company, or other appropriate permitted facility.

H. Cleaning of Haul Routes - Clean waste transportation haul routes upon completion of operation at end of each hauling.

END OF SECTION

DIVISION 2

SECTION 02462

REPLACEMENT OF TRACKWORK AND BRIDGE TIES

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for the rehabilitation of trackwork on PATH's Hackensack Bridge including but not limited to the removal and installation of rail, ties, miter rails and shoes, expansion joints, contact rail, walkway and handrails, and related items.

1.02 REFERENCE STANDARDS

A. The following is a listing of the publications referenced in this Section:

1. American Railway Engineering and Maintenance of Way Association (AREMA) Manual for Railway Engineering
2. In AREMA publications, the words "railway", "railroad", "railway company", or words of like import shall be understood to mean PATH.

1.03 QUALITY ASSURANCE

A. All Work shall be performed in accordance with all applicable recommended practices in the AREMA Manual for Railway Engineering and the AREMA Portfolio of Track Plans, and as modified in this Section.

1.04 DRAWING REQUIREMENTS

A. Drawings, details, and sketches for shop drawings and catalog cuts shall be dimensioned in the Imperial System and angles shall be dimensioned in degrees, minutes, and seconds of arc.

1.05 MANUFACTURER'S CERTIFICATIONS

A. Products shall be certified as to their compliance with the requirement of this Section. Manufacturer's certifications for each product to be installed in the Work shall be submitted to the Engineer.

B. Annotated shop drawings, annotated catalog cuts, letters of certification, or a combination of the aforementioned will be acceptable formats for manufacturer's certifications.

1.06 SUBMITTALS

See Appendix "A" for submittals requirements.

1.07 DELIVERY, STORAGE AND HANDLING

A. Exercise care to avoid bending, scraping, and overstressing rails or steelwork. Block with wood, or otherwise protect, projecting parts likely to be bent or damaged.

B. Ship small parts. such as tie plates, rail clips, spikes, lags, shims, bolts, nuts, washers, small plates, and anchors, in boxes, crates, barrels, or shipping pallets.

C. Load, transport, unload and store all materials in such a manner that the material is kept clean and free from damage. Store material above ground on platforms, skids, or other supports, and cover and protect it from corrosion or deterioration.

D. Coordinate transportation and delivery of all materials for proper timing of installation and avoidance of any interruptions of PATH operations.

PART 2. PRODUCTS

2.01 MATERIALS

A. Track Bolts, Nuts, and Washers: Track bolts and nuts shall be new, manufactured and tested and of proper design for the rail and joint bars used and shall conform to the AREMA Manual, Chapter 4, Part 3, Section 3.5 "Specification for Heat-Treated Carbon-Steel Track Bolts and Carbon-Steel Nuts". Bolts shall be 1 inch diameter, 5 ½ inches long with 2 ¼ inch thread and oval neck for 115RE rail and 1 1/8 inch diameter, 5 ½ inches long with 2 ½ inch thread and oval neck for 140RE rail.

B. Spring Washers: Spring washers shall be new, manufactured and tested and of proper design for the rail and joint bars used and shall conform to the AREMA Manual, Chapter 4, Part 3, Section 3.6 "Specifications for Spring Washers".

C. Screw Spikes: Screw spikes for Pandrol tie plates shall be 15/16 inch diameter, hot forged, as manufactured by Pandrol and meet ASTM A-66 specifications.

D. Tie Plates: Tie Plates shall be Pandrol rolled steel plates and approved design for 5 ½" rail base in accordance with the Contract Drawings.

E. Rail Clips: Rail clips shall be Pandrol e2055 and shall provide for a clamping force of 5,500 lbs. with a nominal toe load of 2,750 lbs. at a working deflection of 7/16 inch.

F. ZLR Rail Fastenerss: At indications shown on the Contract Drawings, the ZLR rail clips shall be 'PR' 633 series clip and a PANDROL cast toe plate "TOE-13519".

G. Steel Cut Spikes: Track spikes shall be new 5/8" by 6 inches long under the head and conform to the AREMA Manual, Chapter 5, Part 2, Section 2.1 "Specification for Soft Steel Track Spikes".

H. Joint Bars and Compromise Bars: Joint bars and compromise bars shall be new, head free design, manufactured and tested in accordance with the AREMA Manual, Chapter 4, Part 3, Section 3.4, "Specifications for Quenched Carbon-Steel Joint Bars, Microalloyed Joint Bars, and Forged Compromise Joint Bars" and their design shall conform to the Contract Drawings. Joint bars required for the permanent installation of the emergency guard rails shall be of fit and good condition and suitable to join the emergency guard rail.

I. Steel Rails: Bolted running rail may be used on an interim or temporary basis before final installation of the 115RE CWR. Interim rail may be new PATH provided 115RE or the existing 140RE rail. If Contractor chooses to supply his own rail, the rail shall be relay 115RE or 140RE rails in accordance with AREMA grade Class 1 or better.

J. Hook Bolts: Hook bolts for the open deck bridge section shall be 3/4" diameter with a minimum 3" thread "Sealtite Hook Bolts" as manufactured by the Lewis Bolt & Nut Company, LaJunta, CO, or approved equal. Length is to be as shown on the Contract Drawings. Nuts and washers shall be of an integral design as manufactured by the Lewis Bolt & Nut Company, LaJunta, CO, or approved equal.

K. Rail Acceptance for Welding:

1. Prior to acceptance of the rail from PATH, all new rail shall be visually inspected by the Contractor with any variations and unacceptable tolerances reported and submitted to the Engineer.

2. Submittals: In accordance with the special Provisions, submit the following.

a. Electric Flash-Butt Welds (Pressure welding)

(1) Prior to pressure welding of rail, submit to the Engineer for his review and approval a list of all equipment and calibration methods, method of rail end alignment, method of rail straightening, and a schedule of lengths of rail strings to be fabricated. Location of all pressure welded strings in finished track shall be designated by eastbound and westbound track, stations at ends of rail string and right or left rail as determined by facing in the direction of increasing engineering station. If any strings are to be cut in the field, the schedule shall indicate the locations of the proposed cuts.

(2) The Contractor shall fill out and submit to the Engineer a weld report for each weld giving the following information: weld location number, date of weld, Contractor's name, welder's name, welder's consecutive weld number, rail temperature, and Contractor's supervisor shall indicate his approval of the weld on the weld report

(3) Submit to the Engineer for review and approval, details of equipment and procedure proposed for straightening of welds if required.

b. Thermite Welds

(1) Provide self-tapping, thermite weld type as manufactured by Boutet, Orgo-Thermite, Calorite or approved equal. Obtain approval from the Engineer for the weld kit to be used.

(2) The Contractor shall fill out and submit to the Engineer a weld report for each weld giving the following information: name of supplier of weld kit, date or lot number of welding kit, weld location number, date of weld, Contractor's name, welder's name, welder's consecutive weld number, rail temperature, and Contractor's supervisor shall indicate his approval of the weld on the weld report.

(3) Thermite Welding Quality - Check rail for end straightness before for welding. Straightedge both ends and tops of all rails using a 36 inch long metal straight edge and a metal taper gauge. Check quality of gas used for thermite welding to insure even temperatures are maintained during pre-heating. If oxy-propane is used, a constant blue flame should be visible when propane gas is ignited at 14 psi pressure and oxygen gas at 35 psi pressure.

(4) Welder Qualification and Weld Testing - Rail welding shall be done under the direct supervision of a welding foreman who has been qualified by test sample welding using the thermite rail welding process. Should the approved foreman of the welding crew be replaced during the Work, the new foreman and welding crew shall be re-qualified. Qualification testing shall consist of performing two sample welds using the equipment, procedures, and setup proposed for production welding

3. Inspection and Tests: The Contractor shall provide, at his expense, a PATH approved, independent testing agency to provide weld tests.

a. Provide ultrasonic testing of all welds in accordance with AREMA Specifications Chapter 4, Part 2, Section 2.1.8, Ultrasonic Testing.

b. All welds giving indication of fault by ultrasonic inspection or failing to comply with the misalignment tolerances, or rejected by Engineer for any reason, shall be saw cut out a minimum of 12 inches on either side of the rejected element, and the joint or joints immediately rewelded, and reinspected to approval, at no additional cost to PATH.

c. The Contractor shall provide an ultrsonic inspection of each weld. The Contractor shall fill out an inspection report for the welds and shall submit the report to the Engineer. The inspection report shall give the following information: weld location, date of inspection, name of company performing inspection, inspector's name, and result of inspection

L. Insulated Rail Joints: Insulated rail joints shall be the Toughcoat Insulated Rail Joint as manufactured by the Allegheny Rail Products Division of L.B. Foster. Insulated joints shall conform to 115RE rail and to PATH's standard rail drilling pattern unless otherwise shown on the Contract Drawings. Each complete joint set shall be individually packed into "kits", and marked for identification. A complete joint set shall have all components necessary to install an insulated joint complete, including bars, end posts, bolts, washers, nuts, and backing plates.

M. Shims: Steel shims shall be used to adjust the elevation of the rail at temporary transitions where new ties meet existing ties at the end of each outage. Steel shims shall be manufactured to the size and shape for insertion under an 115RE rail base to a thickness of 1/8 inch from hot-rolled plate steel. Steel shims shall be sheared or cut by a suitable method to obtain the required configuration. All edges which are sheared, punched or cut during manufacture shall be ground to remove sharp edges. Circular holes shall be drilled, punched or cut at right angles to the shim surfaces.

N. Stone Ballast: Stone ballast shall meet the requirements as specified in Specification Section 02466.

O. Walkway:

1. Walkway grating that is determined to be replaced will be as shown on the Contract Drawings and is to be galvanized steel and shall be pressure locked rectangular design, type B, as manufactured by:

IKG Industries – HARSCO
1514 South Sheldon Road
Channelview, TX 77530

or approved equal.

2. The main bars are to be 1 ¼" x 3/16" spaced at 1 3/16" center-to-center. Cross bars are to be 5/16" square, flush top and spaced at 4" center-to-center. Main bars and cross bars are to be slotted at their intersections so as not to remove excessive material from the load sustaining members. Main bars to be "dovetail" slotted and have their slots solidly filled by the cross bars. All ends are to be banded.

P. Grating Fasteners:

1. Grating fasteners shall be galvanized steel GG-1B as manufactured by:

Grating Fasteners, Inc.
P.O. Box 6438
New Orleans, LA 70174

or approved equal.

Q. Handrail and Support Posts: Handrails and support posts shall be ½" diameter steel posts as indicated on the Contract Drawings.

R. Head Bonds: All rail joints shall have rail head bonds applied. Rail bonds shall be new 9 ¾" - 4/0 Erico Part #SBS24884 or approved equal.

PART 3. EXECUTION

3.01 MAINTENANCE OF RAILROAD OPERATONS

A. The ability of PATH to provide and maintain its revenue train operations over the Hackensack Bridge with double track operations, or with single track operations during specified periods of time when one of the PATH tracks is scheduled to be out of service, is of the utmost importance.

B. PATH will schedule track outages for PATH tracks on the Hackensack Bridge for specified periods of time. Only one of the PATH tracks will be out of service during any single period of time.

3.02 CUTTING AND REMOVAL

A. Perform all cutting and removal as shown on the Contract Drawings. Work shall be performed in accordance with methods approved by the Engineer.

B. Do not cut or remove more than is necessary to accommodate the new construction or alteration.

C. Maintain the integrity of all construction at all times.

D. Protect finished surfaces at all times and repair or replace, if damaged, to match existing construction to the satisfaction of the Engineer.

E. Do not allow removed materials and debris to accumulate at the site; remove them daily. All areas adjacent to, and leading to and from the site, shall be kept free of removed materials and debris.

3.03 CONSTRUCTION EOUIPMENT

A. The Contractor shall prepare a list of on-track construction equipment that will be used for the Contract. Submit to the Engineer for approval this list together with catalog cuts of the on-track construction equipment.

B. Construction equipment shall be capable of operating in contact rail territory.

C. Construction equipment shall be capable of operating on a 5.5% grade in inclement weather with any required trailing load, and shall be equipped with power brakes in operating condition.

D. Construction equipment shall be capable of shunting track signal circuits.

E. The Engineer reserves the right to inspect the proposed construction equipment prior to its assignment to this Contract.

3.04 LINES AND GRADES FOR TRACKWORK

A. During the progress of the work, the Engineer will provide suitable points, marks or benchmarks at such intervals as the Engineer deems necessary.

B. From the points, marks or benches given by the Engineer and from the data shown on the Contract Drawings showing the alignment and grades, the Contractor shall provide all field lines and grades necessary for the construction.

C. The Engineer shall have the right at any time to determine the correctness or completeness of the field lines and grades given by the Contractor, and any imperfect or erroneous construction resulting from errors in the lines or grades given by the Contractor shall be corrected or shall be replaced by construction which is strictly in accordance with the Contract Drawings.

D. The Engineer may draw the Contractor's attention to errors or omissions in construction lines or grades, but no omission on the part of the Engineer to point out such errors or omissions shall give the Contractor any right or claim against PATH or shall in any way relieve the Contractor of his obligations according to the terms of the Contract.

3.05 CONTRACTOR'S WORK PLAN AND SCHEDULE

A. The Contractor shall prepare and submit to the Engineer for approval a proposed Site Specific Work Plan (SSWP) and Schedule showing the specific construction activities during each work period for operations under this Contract.

B. This plan shall show the specific amount and production of the Work and the location of that Work that he plans to complete during each work period. This plan shall also show the number of workers and units of construction equipment assigned to each work period.

C. This schedule shall show the specific time that the Contractor plans to obtain the track for his operations and the time that he plans to complete his operations for each work period.

D. The Contractor's Work Plan and Schedule shall show whether or not his operations during each specific work period will affect the resumption of rail operations at the conclusion of the outage with the requirements of Paragraphs 3.07, and 3.08 of this Section.

E. The Contractor's Work Plan and Schedule shall also show the start and end of the periods of standby status which are required in accordance with Paragraphs 3.07, 3.08 and 3.09 of this Section.

F. The Contractor Work Plan shall also include a welded string and interim bolted joint layout showing the rail lengths, location of insulated joints, final closure welds or permanent bolted joints for each the rail.

3.06 OPERATION OF REVENUE TEST TRAIN

A. In all cases of new track or contact rail construction, or where existing track or contact rail has been modified or reconstructed with revised alignment or profile, the Engineer will require the operation of one or more revenue test trains prior to his placing the track into service. Test trains will operate both in the normal and the reverse directions of traffic.

B. Revenue test trains will consist of standard PATH revenue rolling stock and will be operated at PATH's expense. The Contractor shall make available his qualified representative to accompany the Engineer in observing the passing of the revenue test train over the trackwork.

C. The Contractor shall have his work crew and his construction equipment available on standby status in accordance with Paragraphs 3.07, and 3.08 of this Section. In the event the Engineer determines from the test train operation that a deficiency exists in the track installation, the Contractor shall be available to correct these difficulties in a prompt and timely manner.

D. The test train operation shall verify to the satisfaction of the Engineer that the track has safe and good riding characteristics prior to placing the track into service.

E. The test train operation shall verify to the satisfaction of the Engineer that all car clearances of the test train on the trackwork are adequate, proper, and safe. The car clearances which will be checked include horizontal, vertical, and contact rail clearances, and clearances to adjacent tracks. The Engineer will check these clearances prior to placing the track into service.

F. Any deficiencies or hazardous or unsafe conditions in the track and contact rail for train operations at the design speed shall be corrected by the Contractor. Where such deficiencies or hazardous or unsafe conditions are due to the Contractor's failure to follow the specifications, the Contract Drawings, or the Engineer's directions, the Contractor shall make the corrections at his own expense.

G. Satisfying these requirements of this Paragraph 3.06 shall not release the Contractor from meeting the requirements of Paragraph 3.13 of this Section.

3.07 WORK ON THE BRIDGE AFFECTING THE LIFT SPAN

A. Work performed on the lift span, and any work performed on the tower spans that may affect the lift span, including work on expansion joints, miter rails and shoes, or headblock panels, will be deemed as work on bridge affecting the lift span.

B. Work performed on the bridge which does not affect the physical condition of the trackwork associated with the lift span, and which does not affect PATH's ability to operate the lift span during the Contractor's operations, will be deemed as work on bridge not affecting the lift span. C. The Contractor shall complete his operations on the bridge no later than the time(s) and date(s) indicated in the Contract Documents so that the track(s) and the lift span can be readied for service. Upon completion of his operations on the bridge, the Contractor shall maintain standby status for a period of five (5) hours while PATH readies the track(s) and the lift span for service. Contractor's standby status shall include his making available his work crew and construction equipment used in the work period just completed. The Contractor shall render assistance as required and as directed by the Engineer including, but not limited to, the actions specified below:

1. Trouble-shoot and resolve any problems resulting from the Contractor's operations that prevent the track(s) and the lift span from being available for service.
2. Render assistance, at the direction of the Engineer, to resolve any problems that prevent the track(s) and the lift span from being available for service. The Contractor will be compensated for rendering assistance where the problems requiring such assistance were not the result of the Contractor's operations in accordance with the provisions of the clause of the Form of Contract entitled "Compensation for Extra Work".

C. PATH will perform any lifting and lowering of the lift span, including testing its operation, by lifting the span to the fully open position and then lowering it to the fully closed position.

D. PATH will operate the revenue test train in accordance with Paragraph 3.06 of this Section.

E. The Contractor shall obtain the approval of the Engineer, after the bridge is ready for normal operations, to release his work crew and construction equipment from the bridge at the end of each period of standby status.

3.08 CONTRACTOR'S STANDBY STATUS

A. The Contractor shall have his work crew and construction equipment ready at the bridge on a standby status in accordance with Paragraphs 3.07 and 3.08 of this Section.

B. The starting and ending times of each period of standby status shall be in accordance with the Contractor's Work Plan and Schedule as approved by the Engineer.

C. In the event that the Contractor completes his operations in a work period earlier than the approved completion time, he shall still be ready on standby status during the approved period of time as required by sub-paragraph B, above.

D. Where a period of standby status is required, it will be deemed to be a part of the approved work period.

E. The Contractor shall obtain the approval of the Engineer, after the bridge is ready for normal operations, to release his work crew and construction equipment from the bridge at the end of each period of standby status.

3.09 TREATMENT OF EXISTING SIGNAL EOUIPMENT

A. The Contractor shall use every precaution to ensure that the signal equipment is not damaged during the performance of the Contract, and shall repair or replace such damaged equipment.

B. PATH shall remove and reinstall the signal equipment to its original condition. The Contractor shall provide prior notification to the Engineer so that this work can be scheduled. The Contractor shall render support to railroad signal forces in accordance with the Contract Drawings.

3.10 INSTALLATION OF MITER RAILS

A. The Contractor shall locate and place each replacement miter rail shoe assembly on the new headblock panels at the locations indicated on the Contract Drawings.

B. Miter rail and shoe assembly shall be installed in accordance with the manufacturer's instructions, in accordance with the Contract Drawings, and as directed by the Engineer.

C. Before permanent installation, all components of the miter rail system shall be placed loosely fitted in their final location to demonstrate that the horizontal and vertical alignments are adequate to properly operate the track and lift bridge. Final adjustment of miter rails shall be coordinated with PATH to ensure proper operation and adjustment of the track locking mechanism.

D. Miter rails shall be adjusted to provide an exact fit without being forced into position.

E. Miter rail and shoe assemblies are designed to provide a six (6) inch clearance between opposite faces of Shoe A and Shoe B. Where possible, shoes shall be positioned flush with the outer edge of the headblock panel with no portion of the miter rail shoe extending beyond the outer surface of the headblock timber. Where the gap between headblock panels exceeds six (6) inches, miter rail and shoes shall be positioned so that each shoe shall overhang its headblock panel by an equal distance. At the East Lift Tower, clearance between Shoe A and Shoe B shall be adjusted for bridge steel temperature in accordance with the Contract Drawings.

F. After the loose installation has been approved by the Engineer the miter rail shall be securely fastened to the shoe and adjoining trackwork

G. Miter rail shoes shall then be permanently fastened to the headblock assemblies using 6" long screw spikes.

3.11 INSTALLATION OF EXPANSION JOINTS

A. Locate and place expansion joints as indicated on Contract Drawings, according to the manufacturer's installation instructions and as directed by the Engineer.

B. Bolt expansion joints to adjacent trackwork with joint bars as described in Paragraph 3.17 of this Section.

C. Fasten expansion joints to timber ties with screw spikes, using two spikes per tie (one gage, one field) for every tie in contact with each base casting.

3.12 INSTALLATION OF TRACKWORK

A. Alignment, Grade and Surface: The tracks shall be installed true to the lines and grades indicated on the Contract Drawings and surfaced for good riding of revenue trains. Applicable surveying instruments shall be used in establishing alignment. An approved track level in conjunction with applicable surveying instruments shall be used for surfacing all tracks.

B. Track Gage: The standard gage for construction of all tracks, measured perpendicular to the track (radially on curves) between opposite points on the gage surface of the rail in a plane 5/8" below top of rail is 4 feet 8 1/2 inches.

C. Line Rail: The outer or high rail on curves and the rail furthest from the contact rail on tangents shall be used as the line rail. The line rail shall be used whenever any work involving horizontal alignment is performed. All horizontal alignment measurements and sightings shall be referenced to the gage line of the line rail.

D. Grade Rail: When surfacing or raising track, one rail, which shall be the inner rail on curves and usually the line rail on tangents, shall be selected as the grade rail. This rail shall be first brought to proper profile. The opposite rail is then brought to its proper elevation by use of a level board. The profile shall be taken as the line of the base of rail at the center of the track. Adjustment in vertical and horizontal alignment shall be made to remove irregularities from track profile. Base of rail shall be taken at the intersection of the plane at gage.

E. Quality of Final Track Alignment: Vertical and horizontal track alignments shall be measured and verified by the Contractor.

F. Track Shift: The extent of the rail replacement shall be as shown on the Contract Drawings. After each segment of a Work Period has been completed, the Contractor shall make all adjustment to the rail run-offs immediately beyond said segment as required to ensure against any sudden changes in rail elevation.

G. Track Construction Tolerances: Track construction tolerances shall be within the limits outlined in the following table. The tolerances given in this table are not cumulative.

TRACK CONSTRUCTION TOLERANCES

Cross Level and Super-Elevation	
Deviation of Cross Level and Super-Elevation	+1/8"
Track Gauge	
Deviation of Track Gage	+0" to -1/16"
Vertical Track Alignment:	
Variation in 31' Chords	±1/4"
Deviations in 31' Chords from Theoretical	±1/8"

Horizontal Track Alignment:	
Variation in 31' Chords	±1/4"
Deviations in 31' Chords from Theoretical	±1/8"

3.13 TRACK AND CONTACT RAIL GAUGES

A. Aldon Co.'s No. PG-2 steel pipe track gauge or approved equal, shall be used to set the gage of the track.

B. Approved contact rail gauge shall be used for the gauging of the contact rail.

C. The gauges shall be plainly marked to show the gage for which they are intended.

D. Geismar Model RCA track gauge, or approved equal, shall be used to verify the gauge of the track.

E. Gauges will be inspected frequently by the Engineer in the presence of the Contractor in order to make sure that the proper gauge is being used at all times.

F. The same gages shall be used through the course of the Work.

3.14 GAUGE RAIL

A. Gauge shall be changed by suitable adjustments of the rail opposite the line rail. In general, the gage rail is the inner rail on curves and the rail closest to the contact rail on tangents.

3.15 RAIL INSTALLATION OPERATIONS

A. Handling:

1. Rails must be carefully handled. In the construction of track, care must be taken to prevent bumping of rail. In the process of laying, lifting or surfacing, particular care must be taken to prevent the bending of the rails by the use of construction trains or otherwise. The rails shall be skidded off the cars or other conveyances by a method approved by the Engineer and shall in no case be dropped from vehicles. Care must be taken that they do not strike other rails.
2. Strings of rail shall not be dragged upon tops of ties or on ballast. Strings shall be pulled upon suitable rail rollers approved by the Engineer.
3. Lengths of rail or strings of rail shall not be stored within the gage of any track. Rails shall not be stored on the bridge.

B. Field Cutting:

1. Special length rails necessary to complete the work shall be cut in the field. They shall be sawed square across the rail, a variation of more than 1/32 of an inch will not be accepted. Burrs shall be removed and ends made smooth. Use of special length rails less than 15'- 0" long will not be permitted.

C. Special lengths of rail cut in the field, as specified above, shall be drilled by the Contractor for joint bars. Holes shall be spaced as shown in accordance with AREMA Chapter 4, Section 3.3 "Rail Drillings, Bar Punchings, and Bolts" and shall be free from burrs and shall be cylindrical, not conical. Holes in rails shall be drilled and not punched. After drilling, bolt holes shall be brushed out and inspected. A smooth edge shall be provided around the entire circumference to the hole. Burning of rails will not be permitted.

D. Bonding: After installing rail and before restoring service on the line, the Contractor will install new rail bonds on each new or reinstalled running rail bolted joint. Rail bonds shall be welded to the railhead and applied in accordance with the manufacturer's instructions. The Contractor shall submit the proposed method for bond installation to the Engineer for approval. Installation shall be in a manner as to prevent fore or spilling of materials into the river.

E. Rail Anchorage Record: A record shall be provided by the Contractor in a producible form acceptable to the Engineer. Rail anchorage record shall contain at least the following data for each continuous welded rail (CWR) during rail clip installation and at readjustment of anchoring temperature where required:

1. Date and time.
2. Track number and rail (north/south).
3. Location by station.
4. Weather, air and rail temperature at base of rail, and temperature of bridge steel.
5. Type of fastener.
6. Length of rail being anchored.

F. Placement Procedures:

1. Rails shall be placed base down, parallel with track, avoiding excessive bending or damage, using suitable mechanical equipment. Care shall be taken to avoid placing rails near any other installation that could be susceptible to damage.
2. In advance of the anchoring, an approved rail thermometer shall be used to ascertain rail temperature. Thermometer shall be placed on web or the base of the rail where it will be shaded from the sun's rays and left long enough to record the rail temperature accurately. The Engineer will ensure that temperature is checked frequently. All rail thermometers shall be checked for accuracy.
3. Except as otherwise provided, rails shall be laid so that the welded joints of one line of rails are staggered approximately opposite the quarter points of rails in the other line.
4. Rail temperature of CWR shall be between 85 degrees F and 105 degrees F at the time of anchoring.
5. When the rail temperature is lower than the 85 degrees F, a rail heating device approved by the Engineer shall be used to adjust the CWR. In so doing, rail shall be adjusted and anchored for a neutral rail temperature range of between 85 degrees F and 105 degrees F. When CWR temperature is above the specified range for neutral temperature, rail shall be cooled by applying water until rail temperature is within acceptable range.
6. Any reference to anchoring of running rail in this Specification shall include fastening of the rail with a Pandrol Rail Fastening System.

G. Adjustment by Natural Temperature Change

1. When it is necessary to adjust CWR already in track, the required increase or decrease may be found by taking the difference between measured and recorded rail temperatures at each string of CWR and calculating amount of adjustment, as shown below.

2. The number of inches by which a CWR shall be increased or decreased to adjust its length for a temperature higher or lower than that at which it was anchored or adjusted may be calculated by taking the difference between the two temperatures, multiplying that difference in degrees Fahrenheit by the length of the CWR in feet, and then multiplying the product by 0.000078.

   a. For example, to adjust the length of a 500 ft. CWR, fastened at a rail temperature of 40 degrees, to correspond to the length of this rail at a temperature of 85 degrees, subtract 40 from 85 to obtain a difference of 45 degrees and multiply as follows:

   45 x 500 x 0.000078 = 1.75 inches.

Rail Temperature	Inches of Increase
0°	3.32
10°	2.93
20°	2.54
30°	2.15
40°	1.76
50°	1.37
60°	0.98
70°	0.59
80°	0.20
85°	0

H. The Contractor shall submit a welded string layout to the Engineer for approval prior to welding of rail. The layout shall show the rail lengths, location of insulated joints, Special Trackwork (expansion joints and miter rails), and final in-track location for each string.

I. The Contractor shall submit a layout of interim bolted rails to the Engineer for approval. The layout shall show the rail lengths, location of insulated joints, and the Special Trackwork.

J. Interim bolted running rails shall he installed using new 115-RE rails in accordance with this Specification. Furnish and install joint bars and standard track bolts in the interim bolted running rail of the design shown on the Contract Drawings.

K. All work will be performed before replacing the existing 3rd rail. Once all timbers and new CWR installed, contractor to install new 84C contact rail.

L. PATH shall have first claim to any used material, if we say anything is to be released, such as the 140# rail, the contractor must give PATH a credit for this material

M. Upon completion of the Work, the Contractor shall deliver to the Engineer at PATH's Harrison C Yard in Harrison, NJ, the following items:

1. The interim bolted running rail except for salvaged rail to be used as emergency rail.
2. Standard bolted joints used for the interim bolted running rail.

3.16 JOINT BARS AND BOLTS

A. Conventional joint bar assemblies, where required, shall be bolted to the track rail as indicated on the Contract Drawings. Spring washers for bolts are required at all rail joints. Nuts shall be tightened with an approved automatic tightener or track wrench. The heads of the bolts shall be tight against the joint bar before tightening the nuts.

B. New compromise joints shall be used to adequately connect 115-RE rail to rail of other sections and provide a smooth rail surface over the top of the joint. Correct compromise bars shall be used as determined by the weight of rail, section of rail and if the joint is designated right-hand, left-hand or no-hand. Joint bars shall be free from any cracks or breaks after installation. Any defective bars shall be removed and replaced before work will be accepted. Compromise joints and their installation shall conform to AREMA recommended practices.

C. The distance between rail ends at bolted joints shall be gauged according to the Contract Documents. The opening between the ends of 39 foot rails for various temperatures shall be as follows:

Rail End Openings
For Open Area Tracks (Interim Bolted Rails)

(Temperature in Degrees Fahrenheit)	
Below 6°	5/16"
From 6° to 25°	1/4"
From 26° to 45°	3/16"
From 46° to 65°	1/8"
From 66° to 85°	1/16"
Above 85°	0"

Observation shall be made of actual temperature at points where rails are to placed.

D. Joint gauges (metal shims) shall be furnished by the Contractor and shall be used for spacing rails at the joints. These gauges shall be removed as soon as the joint bar bolts are tightened and the rail securely anchored.

3.17 INSTALLATION OF TIES

A. Handling: All ties shall be carefully handled. Throwing ties or other timbers from cars or other conveyances will not be allowed. No picks, shovels, spike mauls or other tools shall be used for pulling or "bucking" ties.

B. Drilling: All ties shall be accurately drilled from and normal to the top surface, which is the widest face farthest from the pith of the tree, whether or not the pith is present in the piece. The finished holes shall be circular and the sizes and locations of all holes shall be as approved by the Engineer. All unused holes shall be plugged with "Creosote" treated hardwood tie plugs. Coordinate this Work with PATH to ensure that interference with signal equipment does not result.

1. Only the required holes shall be drilled in replacement ties. If the Contractor drills additional unused holes in any replacement tie, he shall replace that tie with a new replacement tie at no cost to PATH.

C. Placing: The top surface of all ties shall be in a plane which is parallel to the plane across the top surface of the rails.

D. Every long tie shall be anchored to the lift span to control lateral, vertical and longitudinal movement. Ties shall be anchored to bridge stringers using hook bolts and nuts as shown on the Contract Drawings. Hook bolts shall not come in contact with the running rail tie plates under any circumstances.

E. Although consideration was given in the design of each tie, the Contractor is advised that field dapping of some ties may be necessary to ensure a satisfactory tie installation. Field dapping of ties at existing impedance bond locations shall be done in the field as approved by the Engineer.

F. Damaged ties shall be replaced in kind or as directed by the Engineer.

G. All ties on the track(s) included those embedded in concrete shall be replaced, as shown on the Contract Drawings.

H. Upon completion of the daily tie replacement the Contractor shall install the tie spacing bars. Tie spacing bars shall be fastened to each open deck tie with a new screw spike. Joints in the tie spacing bars shall be butted on the tie center line and staggered. Both bars shall not end on the same tie unless at the end of the span. Prior to fastening spacing bars, the Contractor shall pre-drill suitable holes in the timbers.

I. Tie spacing bars shall be replaced on the tracks where shown on the Contract Drawings. Tie spacing bars shall be installed outside the gage of each track, and at other locations, is shown on the Contract Drawings, to maintain the tie spacing. Ties shall be spaced as indicated on the Contract Drawings.

J. Removal of Existing Ties: Existing bridge timbers should be prepared appropriately so they are not rejected for disposal. Remove steel and metal (tie plates, spikes, end plates, bars etc...) from the used wood ties and timbers at the work site before loading for transportation to the temporary disposal staging areas and final disposal facility. All ties and timbers are to be transported to an approved off-site permitted commercial or industrial incineration facility. Contractor to submit transportation an dandling manifests, and certification of receipt and disposal of the ties from the incineration facility.

3.18 CONTACT RAIL AND PROTECTION BOARD ASSEMBLIES

A. Work on contact rail, replacement of protection boards, and protection board brackets shall be as shown on the Contract Drawings. Contact rail work will not begin until all timbers and new running rail is installed.

B. The contact rail shall be installed to proper alignment and grade, resting evenly and uniformly on all insulators. When the contact rail does not properly rest on the insulators, the Contractor shall furnish and install between the insulators and caps, suitable shims of a type approved by the Engineer, provided this condition cannot be otherwise corrected.

C. When, in order to obtain the prescribed height of contact rail relative to running rail, it is necessary to raise the insulator assembly, a treated exterior grade plywood shim 7-3/4 inches by 11 inches of suitable thickness shall be installed on the top of tie, beneath both the contact rail insulator and the protection board bracket, and the shims previously mentioned may be omitted.

D. The contact rail is made of comparatively soft metal requiring special care in handling to avoid denting, bending and twisting during installation. Only rails free from imperfections shall be installed in the work. On curves, the rail shall be bent, to conform to the exact radius of the curve, by means of an approved rail bender. Necessary cuts shall be made by sawing and shall be straight and at right angles to the longitudinal axis of the rail. Unnecessary cuts shall be avoided.

E. Provide gaps in the contact rail at locations shown on the Contract Drawings.

F. End and Side Approaches: The ends of contact rail sections shall be terminated with end approaches. The end approaches shall be of the proper length as shown on the Contract Drawings. They shall be assembled, ground, fitted and connected to the contact rail, so as to ensure a smooth running surface.

G. No contact rail less than 25 feet in length shall be used unless otherwise shown on the Contract Drawings or specifically authorized by the Engineer.

H. Contact Rail Joints: Lengths of contact rail shall be joined together by welding together the ends of abutting contact rails by means of a combination weld and bond installed by the "Caldweld" process as made by Erico Products, Inc., Cleveland, OH 44139. No substitutions will be permitted. Use the manufacturer's recommended equipment and materials, according to the contact rail weight and section to be spliced. Contractor shall employ at the work at least one employee, either a supervisor or a workman, who is qualified to make contact rail welds by the "Cadweld" process and who is certified by the manufacturer. Follow the manufacturer's instructions and recommendations.

I. Contact Rail Weld Testing: Test each weld with the mechanical test and with the electrical test, according to the manufacturer's instructions. Failure of either test by a contact rail weld shall indicate a defective joint and shall be cause for rejection of that weld. Defective joints shall not be permitted to remain in the work, and, to this end only skilled labor shall be employed for the welding of the contact rails. The Engineer reserves the right to make any tests which, in his opinion, may be necessary to locate any defective material or poor workmanship. Replace all defective welding and bonding which may be found during the progress of the Work under this Contract.

J. Installation of contact rail fiberglass protection board: Installation shall include supporting adjustable brackets, splice plates, drive lags, bolts, and other appurtenances. Contact rail protection board brackets shall be placed on the ties supporting the contact rail insulators and the ties shall be drilled in the field by the Contractor, Brackets supporting protection boards shall be installed at each insulator but in no case shall be installed at each insulator but in no case shall be at greater than 10-foot intervals. The Contractor shall assemble the adjustable brackets with the proper adjustment so as to give correct relationship of protection board to contact rail ash shown on the Contract Drawings. Contact rail protection board brackets shall be gauged accurately before installation and the protection boards shall be set to proper alignment and elevation. Care shall be exercised to maintain the minimum clearance between the top of the contact rail and the underside of the protection board. The use of shims or wedges under protection board brackets solely will not be allowed. In all cases, protection boards shall be of sufficient length to be supported by not less than 2 brackets. On curves, the protection board shall be cut into short lengths so as to conform as closely as possible to the arc of the curve and where necessary, additional special brackets shall be installed. Special care shall be taken in installing brackets on curves, so that such clearances as the Engineer may direct, will be provided.

K. Splicing of Protection Boards: All standard splices in the protection board shall be installed as shown on the Contract Drawings. Care shall be taken to locate and install all protection board splices no more than 24 inches form a bracket but not closer than 15 inches. The ends of all protection boards shall be properly squared. Expansion gaps between the ends of the boards shall not be less than 1/16 inch nor more than 1/4 inch unless otherwise directed by the Engineer. The splices shall be located immediately in front of the brackets, rather than immediately behind the brackets, when facing the direction of train travel. The direction of train travel will be as shown on the Contract Drawings. All holes in the protection board shall be 1/2-inch in diameter and shall be drilled straight and perpendicular to the surface. Re-drilling, enlarging or burning holes will not be permitted. All holes required for bolts of supporting brackets shall be drilled in the field after the brackets are in position.

L. Overhang of Protection Boards: The end of the protection boards shall overhang the end-approaches 6 inches. The distance between the extreme end of the overhang of the protection board and the centerline of the nearest bracket shall not exceed 36 inches. The end of the board shall be suitably beveled on the underside so as to deflect the shoe downward if it should strike the same. Protection board shall be continuous over expansion gaps in contact rail.

3.19 TIE PLATES

A. Pandrol tie plates shall be used under running rails on all ties except where otherwise specified. Tie plates shall be placed with the shoulder tight against the outside base of rail so as to ensure a full bearing of all the assembled parts.

3.20 STEEL SHIMS

A. Steel shims as shown on the Contract Drawings shall be utilized to adjust for any discrepancy which may develop between adjacent timbers. Only one shim shall be used under any tie plate unless otherwise directed by the Engineer. Steel shims shall be placed on top of the tie.

3.21 PLACEMENT OF EMERGENCY GUARD RAILS

A. PATH will supply relay or fit 115RE rail for use as emergency guard rail.

B. The better face of the rail head on the replacement emergency rail shall be placed so it will face the gage side of the running rail.

C. Emergency guard rail joints shall be fastened utilizing Contractor furnished joint bars . All emergency rail joints shall be fully bolted with six track bolts.

D. Emergency rail shall be fastened directly to the ties using new standard rail cut spikes driven into every third timber. Pre-drill 9/16 inch diameter hole prior to driving spikes.

E. The emergency rail run on the lift span shall be of 115 RE section. The flared end sections located near the miter rails of the emergency rail runs shall be of 115 RE section utilizing relay rail furnished by PATH.

F. Rail sections of the north and south emergency guard rails shall be the same.

G. The lengthening of the emergency guard rail runs to meet the requirements of the permanent installation shall be accomplished with additional rails of 115 RE section.

3.22 STONE BALLAST

A. Install ballast in accordance with Section 3.04 of Specifictaion Section 02466..

3.23 MISMATCHED TRANSITION JOINTS

A. Where worn rail is replaced by new rail and the resulting temporary transition joint has a mismatch on either top or gage side of the railhead then corrective measures shall be taken prior to placing the track in service. Corrective methods and procedures shall be subject to the approval of the Engineer.

3.24 FINAL TRACK INSPECTION

A. Final surface, alignment, cross level, and superelevation and inspection shall be in accordance with Article 3.09 of Specification Section 02466

3.25 FIELD FITTINGS

A. Wherever it is necessary to do cutting and fitting in the field, all Work in connection therewith shall be carefully and accurately done so as not to damage the material and to insure a smooth riding and safe track.

3.26 TEMPORARY REMOVALS AND REINSTALLATION

A. The Contractor shall disconnect sufficient lengths of the existing adjacent handrails to facilitate the headblock, tie, and grating replacement operations. He shall suspend or remove such lengths as required during his work operations, and shall temporarily reconnect them or install the new handrail completely by the end of each work period.

B. The Contractor shall properly support the negative return cable on the bridge deck at all times during construction. Contractor shall submit method of support to the Engineer for approval.

C. Contractor to remove and reinstall negative return cables at the miter rail locations. Contractor shall submit method of support to the Engineer for approval.

3.27 INSTALLATION OF HANDRAIL AND WALKWAY

A. The Contractor shall remove and reinstall all exiting handrails, post supports attached to the walkway, and walkway.

B. If the existing handrail and walkways are not serviceable, the Contractor is to furnish and erect new handrail, post support system and walkway as indicated on the contract drawings. Contractor shall submit a detailed erection plan to the Engineer for approval. The Contractor will be reimbursed for this work at the "Net Cost" for 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 Contract providing compensation for Extra Work.

C. Contractor will temporarily support any cable, conduit, or utility that is attached to the handrails or support posts in a safe manner as approved by the Engineer. Contractor to reinstall all cable, conduit, or utility that is to be fastened or supported by the handrail or support posts with new fasteners.

D. Contractor is advised that all existing cable, conduit, or utility attached to or supported by the handrail or support posts is not shown on the contract drawings and is to be verified by the Contractor and indicated on his erection plan as specified above.

E. The Contractor shall remove and reinstall the existing walkway or install the new walkway grating as work progresses. The walkway grating shall be fastened to each bearing tie with galvanized steel dome head screws as shown on the Contract Drawings.

F. The Contractor is advised that some modifications to the walkway grating may be required for a proper, acceptable installation. Modifications include cutting and welding of the grating. Any grating damaged, bent, or that does not fit the new ties shall be replaced at no additional cost to PATH.

END OF SECTION

SECTION 02462

REPLACEMENT OF TRACKWORK AND BRIDGE TIES

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

02462A01 Submit for approval shop drawings of dimensions and weights of equipment and materials, as required by 1.06.

Catalog Cuts

02462B01 Submit for approval catalog cuts of welding materials and welding procedures to the Engineer, as required by 2.01 L.2

02462B02 Submit for approval the list of on-track construction equipment with catalog cuts, as required by 3.03.

Samples

02462C01 Submit to the Manager, Materials Engineering Division samples of stone ballast, as required by 2.01 Q.

Certificates

02462E01 Submit manufacturer's certifications for each product to be used in the Work, as required by1.05 .

Manufacturer Test Reports

02462F01 Submit to the Manager, Materials Engineering Division all certified test reports for chemical, physical, and electrical tests required by Part 2 of this Section.

Construction and Installation Procedures

02462G01 Submit for approval the method to remove, support, and reinstall cables, conduit, and utility as required by 3.26 B.

02462G02 Submit for approval the erection procedure for the new handrail, post support system and

walkway as required by 3.27 B.

Schedules

02462J01 Submit for approval the proposed Work Plan and Schedule, as required by 3.05.

Inspection Reports

02462O01 Submit to the Engineer weld inspection reports, as required by 2.01 L.3,

Information

02462S01 Where the title "Manager, Materials, Engineering Division" is used, it shall be understood to mean Manager, Materials Engineering Division, Port Authority Technical Center, 241 Erie Street, Jersey City, New Jersey 07310-1397.

Detail Contract Drawings

02462W01 Submit for approval layout for welded rail strings, as required by 3.15 H.

02462W02 Submit for approval layout for interim bolted rails, as required by 3.15 I.

END OF APPENDIX "A"

DIVISION 2

SECTION 02466

BALLAST, SURFACE AND ALIGN TRACK

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for the rehabilitation of trackwork on PATH's Hackensack Bridge including but not limited to the realignment of track on the east and west bridge approaches, furnishing and supplying ballast and surfacing and aligning the track to its final alignment location as indicated on the contract drawings.

B. This Section includes:

1. Ballast Operations
2. Surfacing and Lining Track

1.02 REFERENCE STANDARDS

A. The following is a listing of the publications referenced in this Section:

1. American Railway Engineering and Maintenance of Way Association (AREMA) Manual for Railway Engineering
2. In AREMA publications, the words "railway", "railroad", "railway company", or words of like import shall be understood to mean PATH.

1.03 QUALITY ASSURANCE

A. All Work shall be performed in accordance with all applicable recommended practices in the AREMA Manual for Railway Engineering and the AREMA Portfolio of Track Plans, and as modified in this Section.

1.04 MANUFACTURER'S CERTIFICATIONS

A. Products shall be certified as to their compliance with the requirement of this Section. Manufacturer's certifications for each product to be installed in the Work shall be submitted to the Engineer.

B. Annotated shop drawings, annotated catalog cuts, letters of certification, or a combination of the aforementioned will be acceptable formats for manufacturer's certifications.

1.05 SUBMITTALS

See Appendix "A" for submittals requirements.

1.06 DELIVERY, STORAGE AND HANDLING

A. Load, transport, unload and store all materials in such a manner that the material is kept clean and free from damage.

B. Coordinate transportation and delivery of all materials for proper timing of installation and avoidance of any interruptions of PATH operations.

PART 2. PRODUCTS

2.01 BALLAST

A. Material

1. Stone Ballast: Stone ballast shall meet the requirements for traprock or for granite in accordance with the AREMA Manual for Railroad Engineering, Chapter 1, Roadway and Ballast, Section 2.2 through Section 2.8 inclusive
2. Ballast shall be of AREMA gradation no. 4 and from quarries which are approved by the Engineer as containing material of the desired quality in accordance with the Specifications.
3. Gravel, limestone, dolomite, slag, cinders, or clinkers will not be acceptable for ballast.

B. Cleaning

1. Ballast should be clean and free from sand, dirt, rubbish or any substance which would foul or damage the ballast. When the rock is of such a nature that when crushed and screened it is not free from dust, it shall be scrubbed in an approved scrubbing machine at the quarry.

C. Ballast Sample

1. Submit to the Engineer for approval the name and location of the stone quarry, the type of stone proposed for use and two (2) seventy five pound bags of stone ballast samples tagged with the name of the quarry, type of stone, and the Contract Name and Number.
2. Submit ballast samples directly to the Manager, Materials Engineering Division.
3. Do not deliver ballast from any source until the Engineer has approved the sample from that source.

D. Inspection

1. The Engineer may inspect ballast at its source or at delivery and test the material for conformance to the Specification.
2. If at any time during ballast placement the source of ballast is changed, sample testing and approval must be performed in conformance with article 2.01.C above.
3. Each load of ballast material shall be delivered with the manufacturer's certification and a copy of the weight ticket which is to be furnished to the Engineer.

E. Ballast Job-Site Testing

1. Periodically during the progress of the track work, the Engineer will test samples of the ballast from in-place locations designated by the Engineer to insure a uniform quality of ballast.
2. If ballast does not conform to the requirements as contained in this Specification, the Engineer will notify the Contractor to stop further unloading of the ballast until the deformity or fault has been corrected and will dispose of all defective ballast without cost to the Authority.
3. The Engineer reserves the right to reject any load of ballast arriving at the work site that does not conform to this specification. The load shall be disposed of without cost to the Authority.

PART 3. EXECUTION

3.01 GENERAL

A. Site Preparation

1. Prior to distributing stone ballast, the Contractor shall pick up track materials, other scrap and debris within 20 feet from centerline of track.
2. Materials identified by the Engineer as salvage shall be loaded and transported to the location shown on the Contract Drawings and stockpiled.
3. Scrap metals, other scrap and debris shall become the property of the Contractor and disposed of off the Authority's property.
4. Scrap ties and other timber shall be picked-up, removed from the Authority's property, and disposed of in a lawful manner.
5. Burning or burying ties, timber and debris on Authority property is forbidden.

B. Surfacing and Lining Track: All main tracks on the east and west approaches to the bridge as shown on the Contract Drawings, shall be surfaced and lined.

1. The high or outer rail on curves and the rail furthest from the contact rail on tangents shall be used as the line rail. The line rail shall be used whenever any work involving horizontal alignment is performed. All horizontal alignment measurements and sightings shall be referenced to the gage line of the line rail.
2. When surfacing or raising track, one rail, which shall be the inner rail on curves and the line rail on tangents, shall be selected as the grade rail. This rail shall be first brought to proper profile. The opposite rail is then brought to its proper elevation by use of a level board.
3. The Contractor shall make the necessary adjustments to the track in order to establish the alignment and profile shown on Contract Drawings.

C. Quality of Final Track Alignment: Track alignment, profile, and track geometry shall be measured and verified by the Contractor to the satisfaction of the Engineer. Measurement of alignment profile and track geometry will also be subject to verification by the Engineer. Any deviations above the allowable shall be corrected by the Contractor.

D. Lines and Grades for Trackwork

1. During the progress of the work, the Engineer will provide suitable points, marks or benches at such intervals as the Engineer deems necessary.
2. From the points, marks or benches given by the Engineer and from the data shown on the Contract Drawings showing the alignment and grades, the Contractor shall provide all field lines and grades necessary for the construction.
3. The Engineer shall have the right at any time to determine the correctness or completeness of the field lines and grades given by the Contractor, and any imperfect or erroneous construction resulting from errors in the lines or grades given by the Contractor shall be corrected or shall be replaced by construction which is strictly in accordance with the Contract Drawings.

4. The Engineer may draw the Contractor's attention to errors or omissions in construction lines or grades, but no omission on the part of the Engineer to point out such errors or omissions shall give the Contractor any right or claim against PATH or shall in any way relieve the Contractor of his obligations according to the terms of the Contract.

E. Tolerances

1. The final established surface and alignment of all tracks including crosslevel, superelevation, and vertical and horizontal alignment shall be as shown on the Contract Drawings and shall be within the tolerances specified below:

a. Cross Level:

(1) Deviation from design at any point ± 1/8 inch

(2) Maximum variation in 31' chord ± 1/8 inch

b. Horizontal Track Alignment:

(1) Deviation from design ± 1/8 inch.

(2) Maximum variation in 31' chord ± 1/4 inch

c. Vertical Track Profile:

(1) Deviation from design + ½ inch / -1 /4 inch

(2) Maximum variation in 31' chord ± 1/4 inch.

F. The runoff at the end of a raise into a hold point in track, such as an open deck bridge, overhead bridges, etc. shall not exceed 1/4 inch in 62 feet of track unless otherwise approved by the Engineer. No sharp crests, humps, sags or dips in track shall be permitted.

G. Curves shall be superelevated as indicated on the Contract Drawings.

3.02 TAMPING, SURFACING AND LINING OPERATIONS

A. The Contractor shall tamp ballast with 16 tool, squeeze-vibratory type, and power tamping equipment. Control of power tamper shall ensure maximum uniform compaction of ballast uniformly along the track. The Engineer shall approve tamping variables, including rate of advance, number of passes, number of insertions per tie, length and number of blades, and frequency of vibration. Tamping tools shall be replaced when wear of the working surface is more than 30% of its original surface area. Procedures and equipment shall be as approved by the Engineer.

B. Tamping and lining equipment, ballast regulator, ballast compactor, and other on track equipment proposed for use shall conform to the AREMA Plate C diagram..

C. Track raises during surfacing shall be limited to two (2) inches per each tamping and compacting cycle.

D. After surfacing track and before returning track to revenue service, the welded rail that was surfaced shall be adjusted for thermal expansion and properly fastened and anchored according to article 3.16 of Specification Section 02462.

E. Every tie in the track shall be tamped from a point 15 inches inside each rail on both sides of the ties to the end of the ties. Contact rail ties shall be tamped under the insulator area to the satisfaction of the Engineer to prevent settlement of the third rail. Tamping shall not be permitted at the center of the ties but this area shall be filled with ballast to conform to the typical section as indicated in the contract drawings. All ties that are pulled loose during surfacing operations shall be lifted, spike pulled, spike holes plugged, tie re-spiked, and re-tamped to provide firm bearing against the rail.

F. For each tie, tamp simultaneously inside and outside both running rails on both sides of tie. Tamping in snow covered or frozen ballast will not be permitted.

G. All crossties shall be tamped tightly to provide good bearing against base of rail, after track and turnout is raised to true surface. Down ties shall be brought up to base of rail and machine tamped. The resultant surface and alignment shall be of uniform and smooth quality.

H. Immediately following each surfacing lift, and prior to any train operation, cribs and shoulders shall be compacted by a machine specifically designed for this purpose. Crib and shoulder compaction machine shall be as approved and as specified in 3.04 of this Section.

I. The Contractor shall ensure upon completion of each day's surfacing and lining operations that all Pandrol Clips, newly applied or existing, shall be properly seated to exert proper toe load and anchoring force. Clips and or anchors not meeting this requirement shall be removed and reapplied to the proper position.

J. During tamping operations, extreme caution shall be exercised in order to prevent damage to train-stop tripper arms, snowmelter elements, track circuit bootleg boxes, impedance bond leads, and cable and air lines. Rail bonds and other wayside equipment damaged by the Contractor shall be replaced at the Contractor's expense. Replacement bonds shall be of the same number and type of those they replace. They shall be installed per manufacturer specifications.

3.03 BALLAST OPERATIONS

A. Ballast shall be unloaded only in amount required for track raise specified and for ballast section restoration.

B. Contractor shall use a ballast regulator machine to distribute stone ballast in sufficient quantity for tamping track and for restoring ballast sections.

1. Ballast section shoulders, sub-ballast, and ballast slopes shall be shaped to conform to the section as indicated in the Contract Drawings.

2. Contractor's attention is drawn to the track appurtenances in place on the track: care shall be taken to avoid damage to this equipment during distribution of ballast by ballast regulator and from ballast cars.

C. Contractor shall avoid pulling sod, vegetation, and other foreign material onto track structure or shoulders for purpose of tamping or dressing ballast section. Any sod, vegetation, or foreign matter inadvertently pulled in shall be removed by the Contractor prior to tamping.

D. Deliver ballast at a rate no faster than can be satisfactorily incorporated into the work to maintain a proper interval of operations and to permit proper inspection by the Engineer.

E. To the extent practicable, unload ballast in position for use with a minimum of redistributing and dressing.

F. Final surfacing and aligning of track shall be accomplished over the entire project limits.

G. Final track raise shall be the raise necessary to bring the track to the profile shown on Contract Drawings and to the tolerances specified in 3.01.E of this Section.

H. During the final track raise line track to the final alignment as shown on the Contract Drawings. Track liner employed shall be a fully automatic model capable of determining existing curve data, computing new values for optimum curve value, and lining track to the new values without disturbing track surface. Machine shall be capable of producing a tape or graph showing existing and proposed values and this tape shall be reviewed and approved by the Engineer prior to final lining.

I. Concurrent with the final surfacing and aligning of track, consolidate cribs and shoulders and dress ballast. Use approved ballast regulating machine to shape ballast section as indicated in the Contract Drawings.

J. Compact ballast shoulders and cribs, after each surfacing raise, using a track machine specifically designed for that purpose which will compact cribs and shoulders continuously by applying a combination of pressure and vibration.

1. Cribs and shoulders on contact rail side shall be filled with ballast, shaped to proper section using hand tools, and compacted using a portable vibrating compactor.

2. Upon completion of the compacting top of ballast shall be no more than one inch below top of crosstie.

3.04 CONTRACTOR'S WORK PLAN AND SCHEDULE

A. The Contractor shall prepare and submit to the Engineer for approval a proposed Site Specific Work Plan (SSWP) and Schedule showing the specific construction activities during each work period for operations under this Contract.

B. This plan shall show the specific amount and production of the Work and the location of that Work that he plans to complete during each work period. This plan shall also show the number of workers and units of construction equipment assigned to each work period.

C. This schedule shall show the specific time that the Contractor plans to obtain the track for his operations and the time that he plans to complete his operations for each work period.

D. The Contractor's Work Plan and Schedule shall also show the start and end of the periods of standby status which are required in accordance with Paragraphs 3.07 of this Section.

3.05 OPERATION OF REVENUE TEST TRAIN

A. In all cases of new track or contact rail construction, or where existing track or contact rail has been modified or reconstructed with revised alignment or profile, the Engineer will require the operation of one or more revenue test trains prior to his placing the track into service. Test trains will operate both in the normal and the reverse directions of traffic.

B. Revenue test trains will consist of standard PATH revenue rolling stock and will be operated at PATH's expense. The Contractor shall make available his qualified representative to accompany the Engineer in observing the passing of the revenue test train over the trackwork.

C. The Contractor shall have his work crew and his construction equipment available on standby status in accordance with Paragraph 3.07 of this Section. In the event the Engineer determines from the test train operation that a deficiency exists in the track installation, the Contractor shall be available to correct these difficulties in a prompt and timely manner.

D. The test train operation shall verify to the satisfaction of the Engineer that the track has safe and good riding characteristics prior to placing the track into service.

E. The test train operation shall verify to the satisfaction of the Engineer that all car clearances of the test train on the trackwork are adequate, proper, and safe. The car clearances which will be checked include horizontal, vertical, and contact rail clearances, clearances to adjacent tracks, and lateral clearances and elevation of test train with relation to employee loading platforms. The Engineer will check these clearances prior to placing the track into service.

F. Any deficiencies or hazardous or unsafe conditions in the track and contact rail for train operations at the design speed shall be corrected by the Contractor. Where such deficiencies or hazardous or unsafe conditions are due to the Contractor's failure to follow the specifications, the Contract Drawings, or the Engineer's directions, the Contractor shall make the corrections at his own expense.

3.06 CONTRACTOR'S STANDBY STATUS

A. The Contractor shall have his work crew and construction equipment ready at the bridge on a standby status in accordance with this section and Paragraphs 3.07 and 3.08 of Section 02462.

B. The starting and ending times of each period of standby status shall be in accordance with the Contractor's Work Plan and Schedule as approved by the Engineer.

C. In the event that the Contractor completes his operations in a work period earlier than the approved completion time, he shall still be ready on standby status during the approved period of time as required by sub-paragraph B, above.

D. Where a period of standby status is required, it will be deemed to be a part of the approved work period.

E. The Contractor shall obtain the approval of the Engineer, after the bridge is ready for normal operations, to release his work crew and construction equipment from the bridge at the end of each period of standby status.

3.07 TREATMENT OF EXISTING SIGNAL EOUIPMENT

A. The Contractor shall use every precaution to ensure that the signal equipment is not damaged during the performance of the Contract, and shall repair or replace such damaged equipment.

B. PATH shall remove and reinstall the signal equipment to its original condition. The Contractor shall provide prior notification to the Engineer so that this work can be scheduled. The Contractor shall render support to railroad signal forces in accordance with the Contract Drawings.

3.08 FINAL TRACK INSPECTION

A. Final surface, alignment, cross level, and superelevation shall be within the tolerances specified. In order to determine acceptability of finished track, the Contractor together with the Engineer shall make a final inspection to establish that track construction is within specified tolerances.

B. Final inspection shall include testing by a Contractor supplied track geometry test car capable of testing cross level, left and right rail profiles, track alignment, twist, warp and superelevation. Test car will be capable of measuring the parameters specified above with sufficient accuracy to establish that track construction is within the specified tolerances.

C. Correct track deviations, as disclosed by the inspection described above, which excedd tolerances specified herein, at no additional cost to the Authority.

D. Contractor shall participate in any retesting required as a result of corrections to the work, at no additional cost to the Authority.

E. The Contractor shall notify the Engineer 15 days in advance for requesting any track inspection.

F. Three (3) months after all Work is complete, Contractor shall re-tamp the track and readjust all surface and line conditions to meet the requirements shown on the Contract Drawings.

END OF SECTION

SECTION 02466

BALLAST, SURFACE AND ALIGN TRACK

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

02466A01 Submit for approval shop drawings of dimensions and weights of equipment and materials, as required by 1.04.

Samples

02466C01 Submit to the Manager, Materials Engineering Division samples of stone ballast, as required by 2.01 C.

Product Data

02466D01 Submit name and location of proposed ballast supplier.

02466D02 Submit the type and specifications of equipment to be used in placing, compacting, regulating and tamping ballast and aligning track. 1. All on-track equipment used by the Contractor shall be designed to clear contact rail, protection boards and contact rail appurtenances.

Certificates

02466E01 Submit manufacturer's certifications for each product to be used in the Work, as required by 1.05.

Manufacturer Test Reports

02466F01 Submit to the Manager, Materials Engineering Division all certified test reports for chemical, physical, and electrical tests required by Part 2 of this Section.

Construction and Installation Procedures

02466G01 Submit the proposed method of handling ballast.

Information

02466S01 Where the title "Manager, Materials, Engineering Division" is used, it shall be understood to mean Manager, Materials Engineering Division, Port Authority Technical Center, 241 Erie Street, Jersey City, New Jersey 07310-1397.

02466S02 Submittals shall be made in accordance with the requirements of "Shop Drawings, Catalog Cuts and Samples" of Division 1 - General Provisions.

END OF APPENDIX "A"

DIVISION 3

SECTION 03100

CONCRETE FORMWORK

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for cast-in-place concrete formwork.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Concrete Institute (ACI)

ACI 347	Guide to Formwork for Concrete
ACI 117	Standard Specifications for Tolerances for Concrete Construction and Materials
ACI 318	Building Code Requirements for Reinforced Concrete

American Society for Testing and Materials (ASTM)

ASTM D 1751	Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-Extruding and Resilient Bituminous Types)

National Forest Products Association (NFPA)

National Design Specifications for Wood Construction

West Coast Lumber Inspection Bureau

American Plywood Association (APA)

Douglas Fir Plywood Association (DFPA)

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. Design calculations shall be prepared by a Professional Engineer licensed in the State where the Work is to be performed. Design calculations shall be made available to the Engineer to facilitate inspection.

B. For wood products furnished for the Work of this Section, the Contractor shall comply with the applicable provisions of "National Design Specifications for Wood Construction" of the National Forest Products Association (NFPA).

C. For all other products furnished for the Work of this section, the contractor shall comply with the reference standards of the local building code.

D. Shop Drawings

1. All formwork and shoring shop drawings shall be signed and sealed by a Professional Engineer licensed in the State where the Work is to be performed. Shop drawings shall be made available to the Engineer to facilitate inspection.

2. Shop drawings shall indicate:

a. Pertinent dimensions, openings, methods of construction, types of connections, materials, joint arrangement and details, ties and shores, location of framing, studding and bracing, and temporary supports;

b. Means of leakage prevention for concrete exposed to view in the finished construction;

c. Sequence and timing of erection and stripping, assumed compressive strength at time of stripping, height of lift and height of drop during placement;

d. Vertical, horizontal and special loads in accordance with "Loads" of ACI 347 (Section 2.2) and camber diagrams, if applicable;

e. Notes to formwork erector showing size and location of conduits and pipes embedded in concrete according to ACI 318 (Section 6.3).

1.04 SUBMITTALS

For Submittals - see Appendix "A".

PART 2. PRODUCTS

2.01 MATERIALS

A. Earth Forms

Use only for footings where shown on the Contract Drawings.

B. Lumber Forms

Use for edge forms and unexposed finish concrete. Boards shall be 6 inches or 8 inches in width, shiplapped or tongue and groove, "Standard" Grade Douglas Fir, conforming to the "Standard Grading and Dressing Rules No. 17", of the West Coast Lumber Inspection Bureau. Boards shall be four sides surfaced.

C. Plywood Forms

Use for exposed finish concrete. Forms shall conform to U.S. Product Standard PA 1-66. Each panel shall carry the grade trademark of the American Plywood Association along with the Douglas Fir Plywood Association (DFPA) Quality stamp and shall be full size (4-foot x 8-foot) panels.

1. Plywood for surfaces to receive membrane waterproofing shall be a minimum of 5/8 inch thick and shall be "B-B Plyform Class 1 Exterior" grade.

2. Plywood where "Smooth Finish" is required, as shown on the Contract Drawings, shall be "HD Overlay Plyform Class 1 Exterior" grade, a minimum of 3/4 inch thick.

D. Prefabricated Forms

Prefabricated forms shall be as listed below and where shown on the Contract Drawings:

1. Pan Type Void Forms

   Removable steel or reinforced plastic of sizes and profiles required to produce completed Work shown.

2. Tubular Column Type

   Metal, fiberglass-reinforced plastic, or spirally wound laminated fiber materials; inside surface treated with release agent; of sizes required to produce completed Work shown.

E. Steel Forms

Sheet steel, suitably reinforced and designed for the particular use shown on the Contract Drawings.

F. Form Liners

Smooth, durable, grainless and non-staining hardboard, unless otherwise shown on the Contract Drawings.

G. Framing, Studding, and Bracing

Stud or No. 3 Structural Light Framing grade.

H. Form Ties and Spreaders

Standard, non-corrosive metal form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face. No wire ties, wood spreaders or through bolts will be permitted.

I. Form Anchors and Hangers

Anchors and hangers used for exposed concrete shall not leave exposed metal at surface. Hangers supporting forms from structural steel shall be symmetrically arranged on supporting members to minimize twisting or rotation of member. Penetration of structural steel members will not be permitted.

J. Form Coating Agent

Provide one of the following unless otherwise shown on the Contract Drawings:

1. "Arcal-80"; Arcal Chemical Corporation
2. "Synthex"; Industrial Synthetics Company
3. "Nox-Crete Form Coating"; Nox-Crete Company

K. Vapor Retarder

Where shown on the Contract Drawings, 8 mil thick poly-ethylene sheet

L. Bituminous Joint Filler: ASTM D 1751

PART 3. EXECUTION

3.01 PREPARATION

A. Earth Forms

Trench earth forms neatly and accurately and at least 2 inches wider than footing widths shown on the Contract Drawings, unless otherwise indicated. Construct wood edge strips at top of each side of trench to secure reinforcing and prevent trench from sloughing. Form sides of footings where earth sloughs. Earth forms shall be tamped firm and cleaned of all debris and loose material before depositing concrete.

B. Formwork – General

Sloped surfaces steeper than 1.5 horizontal to 1 vertical should be provided with a top form to hold the shape of the concrete during placement, unless it can be demonstrated to the engineer that top forms can be omitted. Construct forms to the correct shape and dimensions, mortar tight, of sufficient strength, and so braced and tied together that the movement of men, equipment, materials or the placing and vibrating of the concrete shall not throw them out of line or position. Forms shall be strong enough to maintain their shape under all imposed loads. Camber where necessary to assure level finished soffits unless otherwise shown on the Contract Drawings. Carefully verify the horizontal and vertical positions of forms and correct all inaccuracies to the satisfaction of the Engineer before placing concrete in any form. Complete all wedging and bracing before placing concrete.

C. Forms for "Smooth Finish" Concrete

Use steel, plywood or lined board forms. Plywood and form liners shall be clean, smooth, uniform in size and free from damaged edges and holes. Form lining shall have close-fitting square joints between separate sheets and shall not be sprung into place. Sheets of form liners and plywood shall be full size wherever possible and joints shall be taped to prevent protrusions in concrete. Use special care in forming and stripping wood forms to protect corners and edges. All horizontal joints shall be level and continuous. Wood forms shall be kept wet at all times until stripping.

D. Forms for Surfaces to Receive Membrane Waterproofing

Use plywood or steel forms. After erection of forms, tape form joints to prevent protrusions in concrete.

E. Framing, Studding and Bracing

Space studs at 16 inches on center maximum for boards and 12 inches on center maximum for plywood. Framing, bracing, centering and supporting members shall be of ample size and strength to carry safely, without deflection, all dead and live loads to which forms may be subjected, and shall be spaced sufficiently close to prevent any bulging or sagging of forms. Soffits of all beam forms shall be constructed of material a minimum of two inches thick. Concrete out of line, level or plumb will be cause for rejection by the Engineer of the whole Work affected. Distribute bracing loads over base area on which bracing is erected. When placed on ground, protect against undermining, settlement or accidental impact.

3.02 INSTALLATION

A. Tolerances

Formwork shall be constructed so that concrete surfaces shall be within construction tolerances specified in "Standard Specifications for Tolerance for Concrete Construction and Materials" of ACI 117. Tolerances not met will be corrected to the satisfaction of the Engineer at no cost to the Authority.

B. Chamfered Corners

As shown on the Contract Drawings, provide moldings in forms for all chamfering required. Moldings shall be 45-degree right triangles in profile, of size required, milled from wood free from visible defects.

C. Forms Ties

Form ties shall be of sufficient strength and used in sufficient quantities to prevent spreading of the forms. Place ties at least one inch away from the finished surface of the concrete. Leave inner rods in concrete when forms are stripped. Space all form ties to be equidistant, and symmetrical and lined up both vertically and horizontally unless otherwise shown on the Contract Drawings.

D. Cleanouts and Access Panels

Provide removable cleanout sections or access panels at the bottoms of all forms to permit inspection and effective cleaning of loose dirt, debris, and waste material. Clean all forms and surfaces against which concrete is to be placed of all chips, sawdust, and other debris and thoroughly blow out with compressed air just before concrete is placed.

E. Arrangement

Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.

F. Construction Joints

Provide a surfaced pouring strip where construction joints intersect exposed surfaces to provide a straight line at joints. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage. Construction joints shall show no overlapping of concrete and shall, as closely as possible, present the same appearance as butted plywood joints. Joints in a continuous line shall be straight, true, and sharp.

G. Embedded Items

Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, waterstops and other features. No wood or uncoated aluminum shall be embedded in concrete. Obtain any required information pertaining to embedded items to be furnished for the Work specified in other Sections. Securely anchor all embedded items in correct location and alignment prior to placing concrete. Conduits and pipes, including those made of coated aluminum, must meet the requirements of ACI 318 (Section 6.3). Approved coatings for aluminum shall be as follows unless otherwise shown on the Contract Drawings:

1. Conlux

   Primer - Bond Plex 46 or 66 (water borne urethane)
   Topcoat - Epolon Multi-Mil 39 (epoxy polyamide)

2. Sherwin Williams

   Topcoat - Heavy Duty Epoxy B67/B60B3 (epoxy polyamide)
   Note: self-priming

3. Benjamin Moore

   Primer - Epoxy Rust Inhibitive Primer (epoxy polyamide)
   Topcoat - Epoxy Enamel (epoxy polyamide)

H. Openings for Items Passing Through Concrete

Frame openings in concrete where shown on the Contract Drawings. Establish exact locations, sizes, and other conditions required for openings and attachment of Work specified under other Sections. Coordinate all Work of this nature in order that there shall be no unnecessary cutting and patching of concrete. Perform any cutting and repairing of concrete required as a result of failure to provide for such openings at no cost to the Authority.

I. Screeds

Set screeds and establish levels for tops of concrete slabs and levels for finish on slabs. Slope slabs to drain where required or as shown on the Contract Drawings. Before depositing concrete, remove all debris from the space to be occupied by the concrete and thoroughly wet all forms. Remove freestanding water.

J. Screed Supports

For concrete over waterproof membranes and vapor barrier membranes, use screed supports of a cradle, pad or base type which shall not puncture the membrane. Staking through the membrane will not be permitted.

K. Shores and Falsework

Provide shores and falsework of adequate strength to protect persons and adjacent structures. Falsework and supports shall be adequate in size and strength to resist the loads imposed upon them without deformation, deflection, or settlement. All members must be straight and true without twists or bends. Use wedges in pairs or jacks where required to bring forms, shoring, or falsework for beams, girders, slabs, and other parts of the structure to the necessary elevations and uniform bearing before placing concrete. Do not use single wedges. Vertical and lateral loads shall be carried to ground by the formwork system or by bracing. Where shores rest on ground, provide adequate mud sills or other bases. Construct forms to permit their removal without disturbing the original shoring. Ensure that there is no movement of shores, braces or other supports during placement of concrete.

L. Reuse and Coating of Forms

Thoroughly clean forms and reapply form coating before each reuse. For exposed Work, do not reuse any form which cannot be reconditioned to "like new" condition. Discard forms considered unsatisfactory by the Engineer. Apply form coating to all forms in accordance with the manufacturer's specifications, except where "Scored Finish" is required as shown on the Contract Drawings. Do not coat forms for concrete that is to receive a "Scored Finish". Apply form coatings before placing reinforcing steel.

M. Inspection

Notify the Engineer after placement of reinforcing steel in the forms, but prior to placing any concrete, so that his inspection may be made.

3.03 REMOVAL OF FORMS AND SHORES

A. The forms and supporting shoring shall not be removed until the members have acquired sufficient strength to support their weight and the loads superimposed thereon safely and until the time and sequence of removal have been approved by the Engineer. Formwork shall be removed without damage to the concrete, in a sequence that does not allow the members to be subject to impact or loading eccentricities. Any repair required as a result of damage to the concrete shall be made to the satisfaction of the Engineer at no cost to the Authority.

B. Except when otherwise approved by the Engineer, or when minimum attained concrete strengths are specified on the Contract Drawings, forms shall be left in place for not less than the total number of days as specified in ACI 347.

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

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

03100A01 From work and shoring shop drawings for areas accessible to the public and/or concrete exposed to view in the finished construction shall be submitted to the Engineer (as indicated in Section 1.03 D) at least 21 days prior to ordering any material or constructing any formwork.

03100A02 Provide a layout of all embedded items, including electrical and telephoneconduit and lumbing and drainage pipes, at least 15 days prior to concrete placement.

Catalog Cuts

03100B01 Material certifications, brand names and test results (where required) for all formwork materials. Submit at least 35 days prior to concrete placement.

Samples

03100C01 From ties and spreaders with manufacturer's specifications, submit at least 21 days prior to ordering any material.

03100C02 Tapes for form joints with manufacturer's literature;

03100C03 Water stops and premolded expansion joint filler;

03100C04 From liners with manufacturer's specifications, submit at least 21 days prior to ordering any material;

03100C05 From coating agent with manufacturer's literature

END OF APPENDIX "A"

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 D1.4.

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.

03200A02 All proposed changes to the size, spacing or arrangement of the reinforcing steel shown on the Contract Drawings shall be clearly flagged as such on the shop drawings.

Catalog Cuts

03200B01 Catalog cuts for chair, spacers, hangers

03200B02 Spec, Data Sheets for mechanical Splices

03200B03 Spec, Data sheets for repair coatings

Certificates

03200E01 Certification from the applicator of epoxy that the epoxy-coated reinforcing bars meet the requirements of ASTM A 775 (AASHTO M284).

03200E02 Test results and certification from the galvanizer that the weight, application and testing of zinc coating conforms with specifications and ASTM A 767.

Manufacturer Test Reports

03200F01 Certified mill test reports for all concrete reinforcement.

END OF APPENDIX "A"

DIVISION 3

SECTION 03302

PORTLAND CEMENT CONCRETE, SHORT 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 and curing.

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.

American Concrete Institute (ACI)

ACI 211	Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
ACI 301	Specifications for Structural Concrete for Buildings.
ACI 304R	Guide for Measuring, Mixing, Transporting and Placing Concrete.
ACI 305R	Hot Weather Concreting.
ACI 306R	Cold Weather Concreting.
ACI 308	Standard Practice for Curing Concrete.
ACI 318	Building Code Requirements for Structural Concrete.

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 94	Specification for Ready-Mixed Concrete.
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 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 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 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 494	Specification for Chemical Admixtures for Concrete.
ASTM C 618	Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in 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 1315	Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
ASTM D 1751	Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
ASTM D 1752	Specification for 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 5199	Test Method for Measuring the Nominal Thickness of Geosynthetics.

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 Specification for Road and Bridge Construction.

1.03 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements

1. Cold weather concrete construction shall conform to ACI 306R.
2. 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 heated to maintain 50 deg F as approved by the Engineer.
3. Reinforcement, forms and soils with which concrete will be in contact shall be 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. Do not place concrete for pavements, overlays, bridge decks or ramps when the ambient temperature exceeds 90 deg F or when the rate of evaporation exceeds 0.2 lbs/ft2/hr, in accordance with ACI 305R, Figure 2.1.5. Schedule Work so that concrete can be placed during the coolest part of the day (late afternoon or at night).

3. If the concrete temperature reaches 92 deg F as measured in accordance with ASTM C 1064, it will be rejected.

1.04 QUALITY CONTROL

A. Maintain a level of Quality Control sufficient to consistently achieve the end result performance properties specified herein. In addition:

1. Submit the approved mix proportions. Forward to the Engineer all delivery tickets, which shall carry an automated, time-date stamp and shall indicate the batch weights of all batching constituents.

2. Ensure that all plant mixing equipment and trucks are calibrated and approved by either the New Jersey or New York State Department of Transportation.

3. Ensure that all personnel performing concrete testing are, at a minimum, certified ACI Level I Concrete Laboratory Testing Technicians or Grade I Concrete Field Testing Technicians, as appropriate.

1.05 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 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; conforming to Type III where early strength gain is required and permitted; or to other standards specified on the Contract Drawings.

B. Fly Ash: Conforming to ASTM C 311 and ASTM C 618, Class F or Class C, except the maximum loss on ignition shall be less than 4%.

C. Slag: Conforming to ASTM C 989, Grade 100 or 120.

D. Aggregates: Fine and coarse aggregates shall conform to ASTM C 33.

E. Water: Conforming to AASHTO T 26. Shall be clean and potable for both mixing and curing concrete.

F. Air Entraining Agent: Conforming to ASTM C 260.

G. 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 to the Engineer; dosage charts shall state the effects of concrete temperatures from 50 deg F to 90 deg F. 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.

H. Curing Materials

1. Liquid Membrane Forming 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. Or an approved equal meeting the requirements specified in 2.02 H.2.
2. Liquid Membrane Forming Curing Compound: Conforming to ASTM C 1315 and to the following:
   a. For horizontal exterior applications, curing membranes are restricted to ASTM C 309 Type 2, Class B materials.
   b. For other exterior applications ASTM C 309 Type 1 D, Class B membranes are acceptable.
   c. For interior applications only, ASTM C 309 Type 1, Class B membranes are acceptable.
   d. 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.
   e. 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.
   f. 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.

   b. Or an approved equal conforming to the requirements specified in 2.02 H.5.

I. Evaporation Retardant: 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.

J. Expansion Joints (Except For Bridge Decks), Contraction Joints and Waterstops:

1. Waterstops shall be of types and sizes shown on the Contract Drawings.

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 produce design performance criteria in accordance with the Contract Documents, with a degree of excess as determined by Chapter 5 of ACI 318, and to meet all of the applicable performance criteria as specified in the Contract Documents. 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. Verify that the independent testing laboratory used to develop the mix proportions and to perform testing has AASHTO Accreditation for all test methods required to be performed and for development of the required mix. Ensure that the technical staff preparing the mix proportions and performing the associated testing is certified by ACI for all the tests being performed. Submit to the Engineer proof of certifications prior to the start of development of the mix proportion and testing. The mix shall include copies of test reports, including test dates, and a complete list of materials, including type, brand and source. The mix proportion shall also conform to the following:

1. Substitute either fly ash or slag at the minimum rate of 15% by weight of cement. The maximum rates of substitution shall be 30% for fly ash and 40% for slag. Fly ash and slag substitution up to 50% in the same mix may be permitted upon approval by the Engineer.

2. Compute water to cement ratio by dividing the weight of all the water in the mix including that from admixtures and aggregates, plus added water, by the total weight of cementitious material computed by adding the total weight of cement plus fly ash, or slag. In order to meet the specified water to cement ratio, account for admixtures which increase the water to cement ratio by 0.01 or greater.

3. Do not add High Range Water Reducer to the concrete mix at the plant. Deliver High Range Water Reducer to the construction site in a tank fixed to the truck in such a way that the tank discharges directly into the mixing drum, or add High Range Water Reducer 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. If used, 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 to 90 deg F. If re-dosing occurs, use the re-dosing chart but do not under any circumstances allow the total dosage to exceed the maximum dosage recommended by the manufacturer. Mix the load in the truck for a minimum of an additional 5 minutes prior to releasing the load.

4. The percentage of air in the mix shall fall within the range as outlined in the table shown in 2.04 A.2 entitled "Air Content Target Range for Freshly Mixed Concrete". Determine air content by testing in accordance with ASTM C 231 for normal and heavyweight concrete mixes or ASTM C 173 for lightweight concrete.

2.04 QUALITY ACCEPTANCE LIMITS

A. Develop mixes to meet the following performance criteria Quality Acceptance Limits unless otherwise noted on the Contract Drawings:

1. Compressive Strength (ASTM C 39): The design compressive strength at 28 days as shown on the Contract Drawings.

2. Air Content (ASTM C 138, ASTM C 173 or ASTM C 231): The minimum and the maximum limits shall be as specified in the table below:

AIR CONTENT TARGET RANGE FOR FRESHLY MIXED CONCRETE

MAXIMUM SIZE AGGREGATE (SIZE #)	AIR CONTENT		
	Min.		Max.
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%

Note: For a specified compressive strength greater than 5000 psi, the minimum and maximum air content, as indicated above, shall both be reduced by 1.0%. For all concrete applications not exposed to freeze-thaw cycling or deicing chemicals, no air entrainment is required.

B. For concrete where riding surface tolerances are required, as shown on the Contract Drawings, meet the following requirements:

1. Surface smoothness deviations shall not exceed 1/8 inch in 10 feet. Correct any deficiencies as specified in 3.07 C.

2. Vertical deviation from the grade shown on the Contract Drawings shall not exceed plus or minus 0.04 foot at any point.

C. Specified concrete finishes, as shown on the Contract Drawings, shall conform to the requirements set forth in 3.03 D.2. Correct deficiencies as specified in 3.07 D.

PART 3. EXECUTION

3.01 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 shall be restricted to (1) a calibrated mobile mixer, or (2) a transit mixer that is loaded at the construction site with bulk bags of 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. Plants and truck mixers shall conform to ASTM C 94 and shall be either New Jersey or New York State Department of Transportation inspected and approved. Make documentation of such conformance available to the Engineer at all times.

   a. Routinely inspect mixers and immediately repair or withdraw from use mixers that are found to be mechanically unsatisfactory.

2. The Engineer may permit one re-tempering of the concrete subject to the following:

   a. The addition of water to the concrete mix at the construction site will not be permitted for mix proportions with a water to cement ratio of 0.40 or less. For all other mixes, water may be added, but the total amount of water may not exceed the approved mix proportion water to cement ratio.

   b. High range water reducer re-dosing shall conform to the manufacturer's approved re-dosage 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. Concrete that is re-mixed or re-tempered after it has partially hardened or has attained its initial set will be rejected.

   d. The Engineer reserves the right to reject concrete that has not been placed within 90 minutes from the time the cement had first contact with water, or if the concrete temperature reaches 92 deg F as measured in accordance with ASTM C 1064.

3.02 PRE-PLACEMENT FIELD REQUIREMENTS

A. Prior to any construction site delivery of concrete, furnish, deliver and maintain insulated curing boxes of sufficient size and strength to contain all the cylinder specimens 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. When the ambient 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. Locate the boxes where directed by the Engineer. Protect the boxes from vibration and other disturbances during specimen curing.

B. Pump Concrete

1. Grout used to prime the pump line shall not be included in the placement. Make provisions for the disposal of the grout at the end of the pump line outside Authority property and at no cost to the Authority. Placement shall not begin until concrete is visible at the end of the pump line.

2. Permit 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 not be limited to, pumping scheme, pump description, line diameter, line length and the number of turns and line offsets.

C. Preparation for Placing Concrete

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 Section 03200 entitled "Concrete Reinforcement". The repair crew shall be available at the time of examination.

4. Check all locking devices for formwork to ensure that they are in place and properly secured.

5. For preparation of surfaces to receive concrete, conform to 3.03 and the Contract Drawings for all procedures, equipment limitations and requirements to be performed prior to placing concrete.

6. Provide vent holes (1/4-inch diameter, minimum) in edge angles and embedded plates at joints where vibrating alone will not ensure elimination of voids. Submit to the Engineer for review shop drawings of all vent hole locations and procedures for placement of concrete at joints.

7. Make provisions for the concrete to pass through the reinforcing steel without segregating during placement.

3.03 APPLICATION

A. Bonding New Concrete to Existing Concrete

Where new concrete will be placed against existing concrete surfaces:

1. Before starting concrete placement, abrasive blast or shot blast existing concrete surfaces. Abrasive blasting shall conform to Section 02574 entitled "Abrasive Blasting of Pavements".

2. Thoroughly clean existing concrete surfaces of dust, concrete particles and other debris to the satisfaction of the Engineer.

3. Immediately prior to placing concrete, moisten existing concrete with water. Remove puddles of standing water.

4. Broom a thin layer of material from the leading edge of the concrete being placed into the wetted surfaces. Do not allow broomed material to dry before covering it with additional material as required for final grade.

B. Placing Concrete

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 rapidly to prevent formation of cold joints.

6. Use equipment and methods for placing that will permit rapid placement of fresh concrete of the required consistency and preclude segregation.

7. The method and equipment used to transfer concrete from mixer to forms will be subject to prior approval by the Engineer.

8. Subject to the foregoing requirements, convey concrete by approved means to its final position.

9. 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. 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.

10. Avoid 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.

11. Place concrete so as to require as little re-handling as possible.

12. Deposit concrete as near to joints as possible without disturbing them.

13. Thoroughly consolidate concrete.

14. Screed and float concrete for riding surfaces as it is placed and use an approved evaporation retardant or fog spray.

C. Concrete Placing and Finishing Equipment for Slab and other Riding Surfaces

1. For slab or overlays less than 8 inches thick, vibrating surface pans or screeds will be allowed.

2. Manual tools, such as bull floats, trowels, brooms and other similar hand tools are acceptable.

D. Consolidation and Finishing

1. Slabs and other Riding Surfaces

   a. Machine finishing shall conform to NJDOT's *Standard Specifications for Road and Bridge Construction*, Subsection 1005.02, 03 and 04.

   b. Finishing at and adjacent to joints shall conform to NJDOT's *Standard Specifications for Road and Bridge Construction*, Subsection 405.03.02 Item C.

   c. Strike off and screed concrete as soon as it is placed. Use an approved portable screed.

   d. After the concrete has been struck off and consolidated, further finish it by means of a longitudinal float. After floating, any excess water and laitance in excess of 1/8-inch thick shall be removed and disposed of outside of Authority property.

   e. While the concrete is still in a workable condition, immediately fill, strike off, consolidate and refinish any depressions with freshly mixed concrete. Cut down and refinish high areas.

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 (after screeding and floating) by the use of a steel trowel to produce a dense, smooth, even surface suitable for painting or the application of floor covering. Do not start troweling 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 and all 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 layer in accordance with the recommendations of the manufacturer of the abrasive concrete. Give the surface a wood float finish. Round the sides and edges of pavement slabs with an approved edging tool to the minimum radius obtainable, all 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. Rinse or wash burlap as often as necessary to prevent the presence of hardened particles and consequent scarring of the concrete.

g. Fill stair treads and platforms of steel stairs 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 3 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 achieved as follows:

(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's *Standard Specifications for Road and Bridge Construction*, 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.

3. Removal of Forms

Removal of forms shall be subject to the following:

a. Remove forms in accordance with the requirements of Section 03100 entitled "Concrete Formwork".

b. After removal of forms, patch areas of concrete which in the opinion of the Engineer show excessive honeycomb by cutting out defective areas and keying and refilling them with a mortar of cement and sand in the same proportions as in the approved concrete mix design.

c. After forms are removed, cure sides of slabs greater than 12 inches in thickness in accordance with 3.04.

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. Finish exposed mortar surfaces smooth and even with a wood float, except that surfaces exposed to view in the finished structure shall be finished with a steel trowel to match adjacent surfaces. Promptly remove all fins and other surface irregularities by chipping, grinding or other methods approved by the Engineer to achieve a uniform finish. Where no specific surface finish for formed concrete surfaces is shown on the Contract Drawings, no further finishing will be required.

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 the 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, until it has attained 4,000 psi. 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 provisions of ACI 306R Table 3.1 during the first 24 hours after removal of protection.

2. Allow all concrete to attain 4,000 psi compressive strength or the specified design compressive strength, whichever is lower, before being exposed to freeze-thaw cycles.

3. Choice of curing material and method shall be as approved by the Engineer.

B. 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 by placing a curing membrane on the surface. Use one of the curing materials listed in 2.02 H, which may be supplemented by initially using an evaporation retardant listed in 2.02 I, as long as wet curing is not required, subject to the following:

a. Burlap polyethylene sheet or cotton mats, if used, shall be lapped at edges and ends at least 1 foot and shall have all ends and edges taped to adjacent sheets or surfaces to completely seal areas to be cured. Secure in a sufficient manner that will not allow the film, the sheets or the securing mechanism to be removed by wind forces, resulting in fresh concrete exposure without protection. Presoak burlap for 24 hours prior to use in conformance with AASHTO M 182.

b. 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 and 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.

2. Recoat areas subjected to heavy rainfall within 3 hours after rain.

3. 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.

4. 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.

3.05 JOINTS

A. Construction Joints

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. Avoid lips and other irregularities between adjoining sections of concrete. Secure forms tightly against previously placed concrete.

B. Expansion and Contraction Joints

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. Blow out loose matter with filtered compressed air.

2. Install joint sealant to finish flush with concrete surface, except where otherwise shown on the Contract Drawings.

C. Saw Cut Control Joints

1. Saw cut each control joint at a point in the curing cycle when a thumb print can not be made on the surface and as soon as the concrete can support the weight of the saw and the operator without marring the surface or disturbing the final finish. At a minimum, perform these two checks every hour until the control joints can be cut. Unless otherwise shown on the Contract Drawings, saw cut depth shall be a minimum of 10% of the slab thickness or one inch whichever is greater. Saw shall produce a cut that does not ravel or damage the concrete. If approved for use, a liquid membrane forming curing compound must be applied prior to cutting. In general, cut control joints for standard concrete within 6 to 8 hours of concrete placement, and within 2 to 4 hours for very high early strength concrete. However, the timing of cuts shall ultimately depend on the mix proportion and the ambient temperature.

3.06 QUALITY ASSURANCE TESTING, SAMPLING AND INSPECTIONS

A. During mixing and placing of concrete the Engineer will perform Quality Assurance testing on samples taken from the end of the line or at the point of discharge in accordance with ASTM C 172. The Engineer will take samples of concrete from each Work period based on random sampling procedures described in ASTM D 3665.

1. The Engineer may perform the following quality assurance tests: slump, air content, compressive strength, unit weight, temperature and water to cement ratio. If any of these tests indicate results out of tolerance with those specified herein, or on the Contract Drawings, or as given in the approved mix proportion, the concrete may be rejected.

a. Compressive Strength: A minimum of six cylinders will be made for each 50 cubic yards or a portion thereof in accordance with ASTM C 31 and tested in accordance with ASTM C 39 at the time requirements specified in the Contract.

b. Slump Test: Performed during placement in accordance with ASTM C143. The Engineer will perform one test for each set of test specimens.

c. Unit Weight: The plastic unit weight of concrete will be determined in accordance with ASTM C 138. The Engineer will perform one test for each set of test specimens.

d. Air Content Test: Performed during placement in accordance with ASTM C 138, ASTM C 231 or ASTM C 173. The Engineer will perform one test for each set of specimens.

B. 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.

1. Provide representative samples, in the quantities requested by the Engineer, of all concrete ingredients, including cement, fly ash, slag, fine and coarse aggregate, admixtures, evaporation retardant and liquid membrane forming curing compound during any day of production when the Engineer requests a sample. Take such samples in the presence of the Engineer at the point of storage, at either the concrete producer's plant or the construction site that will be used for the Work of this Contract. For cement, fly ash and slag samples, either use a sampling port on the silo, drop material in a loader bucket between loads or take samples from the boot using a "Sample Thief" during loading.

3.07 CORRECTION OF DEFICIENCIES

A. Concrete that is found not to meet the requirements of 3.07 A.1, 3.07 A.2, 3.07 A.3 or 3.07 B will be considered deficient. Repair deficient concrete as specified in 3.07 C or in accordance with Engineer's directions at no additional cost to the Authority.

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 specified compressive strength is 5000 psi or more, no individual compressive strength test result shall be below the specified compressive strength by more than 0.10 of the specified strength.

3. If either or both of the requirements specified in 3.07 A.1 and 2 are not met, investigate the in-place compressive strength in accordance with ACI 318, Section 5.6.5 at no additional cost to the Authority. If the average of the compressive strength test results of the cores is less than 85% of the specified compressive strength or if the compressive strength of a single core is less than 75% of the specified compressive strength the concrete shall be considered deficient. At the Engineer's direction, either remove and replace concrete or accept a 50% reduction in payment for the in-place cost of the concrete.

B. Cracking Deficiency: Concrete slabs or structures that exhibit any cracks prior to opening to vehicular operations or loading will be considered deficient. At Engineer's direction either remove and replace deficient concrete or seal cracks in accordance with Section 03734 entitled "Concrete Crack Repair".

C. Diamond Grinding and Partial Depth Removal

1. Cured riding surfaces that do not meet the smoothness or finished grade requirements set forth in 1.04 B shall be corrected, to obtain the specified smoothness deviation, as follows:

   a. High spots between 1/8 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 1/8 inch and 1/2 inch 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 other approved means and by constructing an overlay in conformance with this Section.

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.

D. If concrete finishes do not meet specifications, re-finish or remove as directed by the Engineer, at no additional cost to the Authority.

END OF SECTION

SECTION 03302

PORTLAND CEMENT CONCRETE, SHORT FORM

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

03302A01 Shop Drawings of forms and test pour details at least 15 calendar days before the test.

03302A02 Shop Drawings for number, location and details of contraction, control, expansion and construction joints at least 15 days prior to concrete placement.

Catalog Cuts

03302B01 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.

03302B02 At least 35 calendar days prior to concrete placement, the following: Brand name and chemical composition of form oil or release agents, evaporation retardant and liquid membrane curing compounds.

03302B03 Surface Preparation Plan for surfaces on which concrete will be placed.

03302B04 Type, number and method of application of concrete vibrators.

03302B05 Method of concrete placement and consolidation adjacent to joint assemblies and embedded hardware.5

03302B06 Control Joint Location Plan.

03302B07 Method of curing and curing and materials.

Samples

03302C01 Cement, stone, sand, fly ash, slag, admixtures, evaporation retardant, curing compound. Furnish these to the Engineer in whatever quantities he may require. This applies to all mix

proportions, including changes to an approved mix proportion.

03302C02 List of materials for Work of this Section.

Product Data

03302D01 Concrete Mix Proportion: Appendix "B," "Concrete Materials and Mix Proportion Data" at least 35 calendar days prior to concrete placement in accordance with 2.03 A. To substantiate the mix proportion, submit all data and field results in accordance with 2.03 A.

03302D02 Concrete Mix Proportion: Written request to the Engineer for approval if a change in the weights of fine and coarse aggregate and cement is required in the approved mix proportion.

Certificates

03302E01 At least 35 calendar days prior to concrete placement, the following: Material certifications, source, brand name and test results (where required) of cement, fine and coarse aggregate, fly ash, slag and concrete admixtures following guidelines of Appendix "B".

03302E02 At least 35 calendar days prior to concrete placement, the following: Certification that admixtures conform to the requirements of 2.02.F & G. 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.

03302E03 At the request of the Engineer, submit cement, fly ash and/or slag Mill Certifications at any time.

Construction and Installation Procedures

03302G01 At least 35 calendar days prior to concrete placement, the following: Cold and Hot Weather Concreting Plans to the Engineer in accordance with 1.03 of the Specification. Materials and methods for protecting concrete from freezing.

03302G02 At least 35 calendar days prior to concrete placement, the following: Pumping Procedure Plan, including, at a minimum, the pumping scheme, pump description, line diameter, line length, and the number of turns and line offsets.

03302G03 At least 35 calendar days prior to concrete placement, the following: Method and sequence (timing) of adding concrete admixtures, high range water reducers, non chloride accelerators.

03302G04 At least 35 calendar days prior to concrete placement, the following: Mixing and placement procedures and methods, as well as catalog cuts of equipment for installation. For hand

mixes, submit the methods of proportioning, mixing (including minimum time requirements), transferring, and placing the concrete.

03302G05 At least 35 calendar days prior to concrete placement, the following: Curing Procedure Plan in accordance with 3.04 A, including the method and materials for curing.

03302G06 At least 35 calendar days prior to concrete placement, the following: Materials and procedures for filling cracks and patching honeycombs and/or spalls.

Qualifications

03302K01 Concrete Mix Proportion: ACI Level I or II Laboratory Testing Technician and Grade I Concrete Field Testing Technician certification for all personnel performing concrete testing.

03302K02 Concrete Mix Proportions: AASHTO accreditation for all testing to be performed by the independent laboratory in the formulation and testing of mix proportion.

Quality Assurance-Quality Control

03302L01 Daily copy of batch records in accordance with 1.04.A.1.a.

END OF APPENDIX "A"

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 3

SECTION 03730

CONCRETE SPALL REPAIRS

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for the repair of deteriorated or delaminated concrete on horizontal, vertical or overhead surfaces, by means of concrete spall repair materials.

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 T-277	Rapid Determination of the Chloride Permeability of Concrete.

American Concrete Institute (ACI)

ACI 503R-30	Pullout Strength Test. Appendix A
ACI 546.lR-80	Guide for Repair of Concrete Bridge Structures.

American Society for Testing and Materials (ASTM)

ASTM A 185	Steel Welded Wire Fabric, Plain for Concrete Reinforcement.
ASTM A 615	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
ASTM C 39	Compressive Strength of Cylindrical Concrete Specimens.
ASTM C 78	Flexural Strength (Modulus of Rupture)
ASTM C 109	Compressive Strength. Modified
ASTM C 157	Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
ASTM C 403	Time of setting of Concrete Mixtures by Penetration Resistance.
ASTM C 666	Rapid Freeze/Thaw Durability, Procedure A.
ASTM C 928	Specification for Packaged, Dry, Rapid Hardening Cementitious Materials for Concrete Repairs.

Steel Structures Painting Council (SSPC)

1.03 PERFORMANCE REQUIREMENTS

Concrete spall repair materials shall be certified by an independent testing laboratory for compliance with the following minimum requirements:

A. Concrete Spall Repair Material for Vertical or Overhead Applications.

1. Bond Strength

The concrete spall repair material shall be tested as follows:

a. A test panel, 2 ft. long X 1 ft. wide X 3 inches deep, shall be installed in an overhead position.

b. A total thickness of 2 1/2 inches of the concrete spall repair material shall be applied in two lifts within the overhead test panel.

c. After a 28-day dry-curing period, specimens shall be sawcut or cored into the overhead test panel, penetrating a minimum of 1/2 inch into the substrate. Each specimen shall be tested in direct pull out tension to attain a minimum bond strength of 25 psi. Acceptable specimen configurations shall be 3-inch or 4-inch diameter cores, or square specimens sawcut with a 4 inch side.

2. Length Change

The concrete spall repair material shall attain a shrinkage value no greater than – 0.15% after 28 days in air; and an expansion value no greater than 0.15% after 28 days in water. Preparation and testing of specimens shall be performed in accordance with the test method specified in ASTM C-157, except that shrinkage or expansion observations shall be recorded at the times specified in ASTM C-928.

3. Compressive Strength

The concrete spall repair material shall be tested in accordance with ASTM C-109 Modified, and shall attain minimum compressive strengths of 1000 psi in 24 hours, and 4000 psi in 28 days.

4. Flexural Strength

The concrete spall repair material shall be tested in accordance with ASTM C-78, and shall attain a minimum flexural strength of 600 psi in 28 days.

5. Time of Set

To determine the workability of the concrete spall repair material, its initial and final set times shall be tested in accordance with ASTM C-403.

6. Durability

The concrete spall repair material shall be tested in accordance with ASTM C-666, Method A. The test specimens shall have less than 10% weight loss after 300 cycles of testing, and the Relative Dynamic Modulus of Elasticity (R.D.M.E.) shall be no less than 75% of the original value.

7. Permeability

The concrete spall repair material shall be tested in accordance with AASHTO T-277, "Rapid Determination of Chloride Permeability of Concrete", to yield a permeability value of less than 1000 Coulombs.

B. Concrete Spall Repair Material for Horizontal Applications

1. Bond Strength

The concrete spall repair material shall be wet-cured for 28 days and tested in accordance with ACI-503R-Appendix A. The concrete spall repair material bond strength for roadways, bridge decks and other vehicular load carrying concrete surfaces shall be a minimum of 200 psi. For other concrete surfaces not subjected to vehicular traffic the bond strength shall be no less than 100 psi.

2. Length Change

The concrete spall repair material shall be tested in accordance with ASTM C-157, except that it shall attain a shrinkage value no greater than –0.10% after 28 days in air; and an expansion value no greater than 0.10% after 28 days in water.

3. Compressive Strength

Compressive strength testing for neat pastes shall be performed in accordance with ASTM C-109. Materials extended with No. 8 aggregate, shall be tested in accordance with ASTM C-39. Test cylinders shall be a minimum of 3 inches in diameter. The minimum compressive strength shall be 2000 psi in 6 hours or 3000 psi in 24 hours, unless otherwise shown on the Contract Drawings.

4. Flexural Strength

The concrete spall repair material shall be tested in accordance with ASTM C-78, and shall attain a minimum flexural strength of 600 psi in 28 days.

5. Time of Set

The initial set time and final set time of the concrete spall repair material shall be determined in accordance with ASTM C 403.

6. Durability

The concrete spall repair material shall be tested in accordance with ASTM C-666, Method A. The test specimens shall have less than 10% weight loss after 300 cycles of testing, and the Relative Dynamic Modulus of Elasticity (R.D.M.E.) shall be no less than 75% of the original value. This requirement will not apply at locations where freeze-thaw cycles do not occur or for temporary patching.

7. Permeability

The concrete spall repair material shall be tested in accordance with AASHTO T-277, "Rapid Determination of Chloride Permeability of Concrete", to yield a permeability value of less than 1000 Coulombs. This requirement will not apply to indoor applications.

1.04 ENVIRONMENTAL REQUIREMENTS

A. All work in this section shall be performed in accordance with the environmental requirements specified by the manufacturer of each concrete spall repair material, unless otherwise indicated herein or on the Contract Drawings. In case of conflict the more stringent requirements shall apply.

B. Cold Weather Requirements

1. Do not mix or place the concrete spall repair material when the ambient temperature is below 45 degrees Fahrenheit, or when conditions indicate that the temperature will fall below 45 degrees Fahrenheit within 72 hours, unless special mixing and placement procedures are approved by the Engineer.

2. Take all necessary precautions to insure that the temperature of the concrete spall repair material, as placed, is a minimum of 50 degrees Fahrenheit.

1.05 QUALITY ASSURANCE

A. The Contractor shall submit to the Chief of Materials Engineering, Materials Engineering Unit, Port Authority Technical Center, 241 Erie Street, Jersey City, NJ 07310-1397 for approval, with a copy to the Engineer, the name of a qualified representative of the concrete spall repair material manufacturer, who will be responsible for the following:

1. Provide technical information regarding proper methods of mixing and placing the concrete spall repair material.

2. Be present during the initial mixing and placing of the concrete spall repair material.

3. Be available for technical consultation when concrete spall repair material mixing or application problems arise.

4. Provide certification that the mixing, surface preparation, placement, finishing and curing procedure used during the initial placement were in compliance with the manufacturer's recommendations.

B. The Contractor shall furnish all labor, materials and equipment required to assist the Engineer in performing inspection and testing of the applied concrete spall repair materials. The Contractor shall make scaffolding and other equipment available as necessary to permit access to all repaired areas.

C. The Contractor shall install a test patch for the Engineer's inspection and approval, a minimum of 48 hours prior to proceeding with any concrete spall repair work shown on the contract drawings. The test patch location will be designated by the Engineer.

D. The Engineer may inspect all concrete spall repair materials and application procedures at any time for compliance with the Specifications.

E. The Engineer may take and test samples of each lot of the concrete spall repair materials delivered to the work site.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials in the manufacturers sealed original 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 it as required to protect it from the elements.

1.07 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. The concrete spall repair material(s) are specified on the Contract Drawings. Concrete spall repair material(s) submitted for approval, shall be accompanied by a certification indicating compliance with the requirements of Paragraph 1.03A or 1.03 B of this Specification, as applicable, and shall be submitted in accordance with the requirements of "Workmanship and Materials" of Division 1 -GENERAL PROVISIONS.

B. Stone aggregate shall be ASTM C-33, Size No. 8.

C. Reinforcing Bars shall be ASTM A-615, Grade 60.

D. Welded Wire Fabric shall be ASTM A-185.

E. Abrasive Blast Material shall be "Black Beauty", as manufactured by Reed Minerals, a Division of Harsco Corporation, South Kearny, NJ or approved equal.

2.02 EQUIPMENT

Abrasive Blast Equipment shall be as manufactured by the following, or an approved equal.

A. "Clemco" by Clementina, Oakland, CA.

B. "Pauli and Griffin" by Pauli Griffin, Vacaville, CA.

C. "Sandstorm" by Bowen Tools, Inc., Houston, TX.

PART 3. EXECUTION

3.01 SURFACE PREPARATION

A. The type and extent of deteriorated or delaminated concrete to be repaired shall be as shown on the Contract Drawings.

B. Square off the concrete area to be repaired with a 1/2-inch sawcut, and shall remove all loose, deteriorated and delaminated concrete by means of pneumatic or mechanical chipping tools.

C. Removal of loose, deteriorated and delaminated concrete, efflorescence and incrustation on concrete surfaces by means of pneumatic or mechanical chipping tools shall be done as follows:

1. Pneumatic hammers heavier than nominal 30-pound class shall not be used.

2. Pneumatic hammers or mechanical chipping tools shall be operated at an angle not to exceed 45 degrees relative to the surface of the area being repaired.

3. The Contractor shall remove deteriorated concrete to a sound surface for a depth not less than 1/4 inch nor more than 3/4 inch beyond the deteriorated layer of concrete, except as noted in 3.01 F.

4. All concrete surfaces to be repaired shall be cleaned of dirt, dust, laitance and other contaminants by abrasive blasting to yield a dry and sound concrete surface. Such work shall be performed within the same work period that the installation of the concrete spall repair material takes place.

D. The Contractor shall not use power tools to remove concrete adhered to exposed reinforcing steel. Removal of concrete, rust and/or corrosion adhered to exposed rebars shall be performed by abrasive blasting to a SSPC-SP6 surface finish.

E. The Contractor shall not damage or debond reinforcing steel, or shatter concrete beyond the area to be repaired.

F. If concrete removal has exposed more than half of the perimeter of a reinforcing bar, the rebar shall be completely exposed to clear the remaining concrete by a minimum of 1/2 inch. The Contractor shall not pry up or displace rebars to accomplish this clearance.

G. Corroded reinforcing bars, which exhibit 25% loss of cross section area, or more after cleaning, shall be repaired in accordance with the Reinforcing Bar Repair Detail shown on the Contract Drawings. Payment for such work shall be at the Net Cost thereof.

3.02 REPAIR MATERIAL INSTALLATION

A. After preparing the concrete surface to be repaired in accordance with the requirements of 3.01, and immediately prior to priming, such concrete surface shall be moistened with clean water without leaving any standing water. The moist condition will not be required, if the concrete spall repair material manufacturer specifically recommends that the surface area to be repaired not be moistened.

B. The concrete surface to be repaired shall be primed by scrubbing a slurry mix of the concrete spall repair material into the substrate using a mason's brush. The slurry shall be mixed in accordance with the manufacturer's recommendations, and its application shall be immediately followed by the installation of the approved concrete spall repair material.

C. The concrete spall repair material shall be mixed, handled and placed in strict conformance with the manufacturer's instructions, and the surface shall be finished as shown on the Contract Drawings, to match the existing concrete surface.

D. Horizontal concrete repair areas greater than 3/4 inch in depth shall have the concrete spall repair material extended with size No. 8 stone aggregate in accordance with the manufacturer's recommendations, or as approved by the Engineer.

E. All concrete spall repairs shall be cured using either an approved wet curing procedure, or a water-based curing membrane. If a wet curing procedure is selected and approved, such procedure shall be maintained for the duration of the curing.

PART 4. PAYMENT

4.01 NET COST WORK

The Contractor will be compensated for the work specified in 3.01 G at the "Net Cost" for 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 Contract providing compensation for Extra Work. Performance of such Net Cost Work shall be subject to all provisions of the Contract relating to performance for Extra Work. Compensation for said Net Cost Work shall not be charged against the total amount of compensation authorized for Extra Work.

END OF SECTION

SECTION 03730

CONCRETE SPALL REPAIRS

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

03730A01 As per Division 1, "Shop Drawings, Catalog Cuts and Samples."

Catalog Cuts

03730B01 As per Division 1, "Shop Drawings, Catalog Cuts and Samples."

03730B02 Submit to the Chief of Materials Engineering, Materials Engineering Unit, Port Authority Technical Center, 241 Erie Street, Jersey City, NJ 07310-1397, with a copy to the Engineer, a list of the concrete spall repair materials to be used in the performance of the Contract Work. Each concrete spall repair material shall be selected from the products specified on the Contract Drawings, and shall be properly identified for the type of concrete spall repair intended.

Samples

03730C01 As per Division 1 "Shop Drawings, Catalog Cuts and Samples".

Certificates

03730E01 Submit to the Chief of Materials Engineering a certification with a copy to the Engineer indicating compliance with the performance requirements outlined in Section 1.03. This certification shall include test results conducted within the last two years.

Construction and Installation Procedures

03730G01 The manufacturer's instruction for handling, storage, mixing and placing each of the concrete spall repair materials.

Quality Assurance-Quality Control

03730L01 Submit to the Chief of Materials Engineering certification with a copy to the Engineer on Quality Assurance Procedures outlined in Section 1.05.

DIVISION 3

SECTION 03734

CONCRETE CRACK REPAIR

PART 1. GENERAL

1.01 SUMMARY

This Section specifies the requirements for the repair of concrete cracks by the following methods:

A. Routing and Sealing.

B. Pressure Injection.

C. Gravity Application.

D. Membrane Surface Sealing.

E. Penetrating Surface Sealing.

1.02 PERFORMANCE AND ENVIRONMENTAL REQUIREMENTS

A. General

1. All work under this Section shall be performed in strict accordance with the environmental requirements and instruction provided by the manufacturer of the specified product.

2. All repair materials shall be installed within the range of ambient temperatures and humidity and within the range of surface temperatures and moisture of concrete surface specified by the manufacturer of the repair material.

3. Furnish all labor, materials and equipment required to assist the Engineer in performing inspection and testing. Make scaffolding and other equipment available as necessary to permit access to all portions of the installation.

B. Penetrating Surface Sealing

1. Penetrating Surface Sealer shall not be applied to surface when the wind is in excess of 10 mph.

2. The penetrating surface sealing materials shall not be installed if rain is forecast within 12 hours of application and if rain or water cleaning has occurred within 12 hours of application.

1.03 QUALITY ASSURANCE

A. General

1. The entity performing the Work under this Section shall have a minimum of five years experience and shall have successfully completed at least two projects within the past three years involving quantities and complexities equal to those required under this Section.

2. The Contractor shall obtain a letter signed by a duly authorized representative for the manufacturer of each repair material stating that the entity performing the repair of concrete cracks by any of the methods in Section 1.01 shown on the Contract Drawings has equipment appropriate for the tasks and the training and experience to properly perform the work under this Section.

3. Initially, at locations determined by the Engineer, the Contractor shall perform one test repair installation for each of the methods in 1.01 shown on the Contract Drawings to demonstrate his ability in performing the Work in strict compliance with the requirements of this section and to the satisfaction of both the Engineer and the manufacturer's representative, as per 1.03 A.5. The Contractor shall submit the plan for each test to the Engineer for approval. The sample test installation shall be performed in the same manner as proposed for production Work. The production Work shall be performed after approval of the test installation(s).

4. Where results from test repair installations or from 1.03 B.1 and 1.03 C.1 are found to be unacceptable, the Contractor shall propose a method for correcting all unacceptable Work, correct the Work to the satisfaction of the Engineer and take those measures necessary to assure that all subsequent repair Work will be acceptable, all at no additional cost to the Authority. Measures shall include any or all of the following: modification of equipment, changing repair materials, or employment of more competent personnel.

5. The Contractor shall arrange for the presence of a duly authorized representative of the manufacturer of the repair material, during the first two days performance of the concrete crack repair Work, who shall ensure that the Contractor's work force has the appropriate equipment, training, and experience to properly perform the Work in strict accordance with the manufacturer's specifications and instructions. As ordered by the Engineer, the duly authorized representative may be present beyond the first two days of the Work. The payment of the additional days shall be paid at the net cost, thereof, provided that cause for additional days are not due to Contractor's poor performance.

6. All materials and equipment including extra (backup) equipment shall be at the work site and shown to be in proper calibration and working order to the satisfaction of the Engineer, before commencing with crack repairs.

B. Pressure Injection

1. In repairs involving pressure injection of cracks, the Engineer will take core samples of two inches in diameter along the path of the injected crack for examination and testing. The number of core samples per each length of crack, longer than 20 feet long, shall be that yielded by dividing the entire length of the crack by 20 feet and rounding to the nearest whole number. The minimum number of core samples per each length of crack, shorter than 20 feet long, shall be one. For acceptance the cores shall show evidence that at least 90 percent of the depth of the cracks have been filled by the injected resin, unless noted otherwise on the Contract Drawings. Core holes shall be patched by the Contractor in an approved method and finished to match the adjacent surfaces to the satisfaction of the Engineer. The Engineer may take additional cores for testing, if and when he deems necessary.

C. Penetrating Surface Sealing

1. In repairs involving the method of Penetrating Surface Sealing, the Engineer will take core samples of two inches in diameter, one core for every 500 square feet of surface repaired. For acceptance the cores shall show evidence of 0.1 inch minimum surface penetration and 85% reduction in Water absorption, per ASTM C 642 entitled "Test Method for Specific Gravity Absorption and Voids in Hardened Concrete". Core holes shall be patched by the Contractor in an approved method and finished to match adjacent surfaces to the satisfaction of the Engineer.

1.04 DELIVERY STORAGE, AND HANDLING

A. Deliver all materials in the manufacturers sealed original containers bearing the manufacturer's name and product identification, and batch or lot number clearly identified, in a manner to prevent damage by breakage, water or moisture.

B. Store all repair material on platforms and cover it as required to protect it from the elements.

C. All materials shall be used during their manufacturer's recommended shelf life, but not after one year from the date of manufacture.

D. The Engineer will sample all materials on site and test them for conformance to manufacturer's specifications, at least once during the work.

1.05 SUBMITTALS

For submittals see Appendix "A".

PART 2. PRODUCTS

2.01 MATERIALS

A. General

1. The method(s) of concrete crack repair are shown on the Contract Drawings. For each repair method, the Contractor shall select and use a corresponding product from Appendix "B", List of Approved Products. No substitution(s) will be allowed.

2. All crack repair material components shall be supplied by the same manufacturer.

3. Solvents used for cleaning shall be approved by the product's manufacturer and shall be non-chlorinated.

B. Pressure Injection

1. Injection material components shall be completely reactive with each other and shall not be thinned.

2.02 ACCESSORIES

A. Pressure Injection

1. The equipment to be used for pressure injection shall be in strict accordance with the injection material manufacturer's instructions.

2. The pressure injection equipment shall be capable of achieving pumping pressures consistent with the recommendations of the product's manufacturer and of mixing reactive components of injection material at a constant volume ration within a tolerance of 5 percent.

3. Pressure pot systems and hand-held caulking guns, or grease guns, will not be permitted as pressure injection equipment, unless otherwise approved by the Engineer.

4. Injection ports shall be either surface mounted or set in drilled holes as shown on the Contract Drawings. Where drilled holes are called for, holes shall be drilled using drills fitted with a hollow drill bit, swivel chuck, and vacuum to insure that port holes are free of pulverized concrete powder. Rotary hammer drills shall not be used.

PART 3. EXECUTION

3.01 EXAMINATION

Prior to commencing with the Work, the cracks to be repaired shall be thoroughly examined and the complete path mapped on the exterior concrete surface.

3.02 PREPARATION

A. General

1. All loose concrete material in the vicinity of the crack shall be removed and the crack path shall be cleaned of dirt, laitance and other contaminants in accordance with the surface preparation in the manufacturer's specifications. In addition, where shown on the Contract Drawings, clean the surface and the cracks by solvent cleaning, washing and/or flushing.

2. Concrete surfaces and routed cracks which are designated to be sealed shall be cleaned by abrasive blasting and then by air blowing in order to remove substances which may interfere with adhesion of the sealer materials.

3. The Contractor shall coordinate cleaning, vacuuming, wetting, drying and surface preparation. Vacuum the concrete surfaces and all cracks after cleaning to remove all residue, dirt, sand and grit.

4. Protect adjacent existing finished surfaces from damage or marring of finishes as approved by the Engineer.

5. All residue and debris resulting from the Contractor's Work shall be placed in labeled containers supplied by the Contractor and shall be removed from the site and properly disposed of by the Contractor.

B. Pressure Injection

1. On concrete crack repairs performed by the method of pressure injection, locate entry ports along the path of the crack at each end and at intermediate locations spaced in accordance with the recommendations of the manufacturer of the material or as otherwise shown on the Contract Drawings.

2. Where ports are set in drilled holes, sites for round injection ports shall be drilled to a hole diameter and depth sufficient to assure a snug fit of the port. The drill hole shall be deep enough to allow a small reservoir below the bottom of the port that shall be set into the hole a minimum of one-half inch below the surface. All dust shall be thoroughly removed after the drilling operation.

3. Pressure injection ports and the entire path of the crack shall be sealed with the crack surface sealer material. The surface sealer material shall be allowed to cure in accordance with the manufacturer's recommendations prior to commencing with pressure injection.

C. Gravity Application

1. For crack repairs using low viscosity materials applied by the gravity application, the Contractor shall provide a continuous dam along both sides of the crack using silica sand or other approved means to confine the fluid repair material above the cracks for a height of 1/4 inch, unless otherwise shown on the Contract Drawings. While the repair material is tacky, remove the silica sand dams and any excess repair material residue by a spatula or similar tool. Removal of any excess residue by grinding will not be permitted. The final floor surface shall be finished flush with no ridges.

3.03 APPLICATION

A. General

1. The Contractor shall be required to have present, a manufacturer's technical representative, as per 1.03 A.5, to ascertain that each different type of repair is being performed correctly and successfully.

B. Pressure Injection

1. The reactive components of the repair material shall be mixed at a constant ratio in accordance with the manufacturer's recommendations just prior to injection.

2. Prior to commencing with the pressure injection, the equipment shall be activated and approximately eight ounces of mixed injection material shall be deposited into a container to insure that the equipment is working properly.

3. The pressure injection of the repair material shall begin at the entry port at the lowest elevation. Injection shall continue at the first port until the material begins to flow out of the port at the next highest elevation. If the injection process forces water out of the port, the injection shall continue until the material flows from the higher port. The first port shall then be plugged or sealed and pressure injection started at the second port until the material flows again from the next highest port. This sequence shall be repeated until the entire set of ports in the crack or void have flowed with the material and have been sealed.

4. When the repair material supply in the injection equipment is about to be exhausted, it shall be replenished without discontinuity of flow or change in mixing ratio.

5. In the event of leakage from the sealed crack surface, the injection process will be stopped until the leak is sealed. Any work stoppage of more than fifteen minutes will require cleaning of the mixing chamber and other equipment with mixed repair material.

6. Injection pressure shall be adjusted to avoid excessive stress build-up in the concrete and further propagation of the cracks. Pressure shall be increased gradually until the resin flows from the adjacent port.

7. After the pressure injection is complete, allow the repair material to cure fully in accordance with the manufacturer's recommendations. Drill out and/or remove ports and surface sealer and finish the surface to be flush with and to match with the adjacent existing finish. A power grinder shall be used to finish the surface unless otherwise shown on the Contract Drawings.

C. Penetrating Surface Sealing

1. Horizontal surfaces repaired by the method of Penetrating Surface Sealing shall be thoroughly soaked with the sealer and the application shall continue till the surface ponds for a minimum period of five seconds, for alcohol-based sealers. On the vertical surfaces, the application shall continue until the sealers run six inches past the point of application after thoroughly soaking the entire surface. All surface sealers shall be placed in two complete applications.

D. Gravity Application

1. For gravity feed of cracks allow the repair material to run into the crack then reapply. Repeat up to three applications or until the material remains flush with the floor surface.

PART 4. PAYMENT

4.01 NET COST WORK

The Contractor will be reimbursed for the work specified in 1.03 A.5 at the "Net Cost" for 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 Contract entitled "Compensation for Extra Work". Performance of such Net Cost Work shall be as directed by the Engineer and 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.

END OF SECTION

SECTION 03734

CONCRETE CRACK REPAIR

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

03734B01 Catalog Cuts for equipment used for installation of repair materials

03734B02 List of all materials to be used for crack repairs, including complete manufacturer's certification and recommendations including execution and application procedures for the repair materials to be used in each of the repair method of Section 1.01, in accordance with Appendix "B".

Samples

03734C01 The Contractor's plan for sample test for the Engineer's approval in accordance with 1.03 A.3.

Certificates

03734E01 Letter from the manufacturer in accordance with 1.03 A.2.

Construction and Installation Procedures

03734G01 Method of patching core holes, including proposed materials, as required in 1.03 B.1, 1.03 C.1, and method of finishing the concrete surface as required in 3.03 B.7.

Qualifications

03734K01 Evidence of the experience of the entity performing the Work as required in 1.03 A.1 including the names and addresses of previous clients to be used as references.

03734K02 The qualifications and experience of personnel who constitute the work force performing the Work, defined in 1.03 A.5, to the satisfaction of the Engineer.

03734K03 The names, qualifications and experience of the duly authorized representatives of the manufacturers who will be present during the crack repair Work, in accordance with 1.03 A.5.

SECTION 03734

CONCRETE CRACK REPAIR

APPENDIX "B"

LIST OF APPROVED PRODUCTS

A. For repairs of concrete cracks with width between 0.25 to 0.50 inches by the method of Routing and Sealing.

1. The following products shall be used for crack repairs on other than overhead and vertical surfaces:

Brand Name	High/Low Modulus	Manufacturer
Sikadur 35 (epoxy)	High	Sika Corp.
Flexolith LV (epoxy)	Low	TAMMS Industries
Aquaseal LV (epoxy)	Low	TAMMS Industries
Euco 352	Low	Euclid Chemical Co.
Sure-Anchor Epoxy J-50	High	Dayton Superior

2. The following products shall be used for crack repairs on overhead and vertical surfaces:

Brand Name	High/Low Modulus	Manufacturer
Sikadur 23	Low	Sika Corp.
J-50	High	Dayton Superior
Flexolith Gel	Low	TAMMS Industries
Sikadur 31	High	Sika Corp.

B. For repairs of concrete cracks by the method of Pressure Injection or by Gravity Application which shall be as shown on the Contract Drawings.

1. The following products shall be used for concrete crack width between 0.005 to 0.030 inches.

Brand Name	High/Low Modulus	Manufacturer
SikaPronto-19 (HMWM) (Note: Not to be injected)	High	Sika Corp.
Sealate T-70/MX-30 (HMWM)	Low	Transpo Industries, Inc.
Concrete Protector & Restorer (5742) (HMWM)	Low	3M Company

Legend: (MMA) Methyl Methacrylate

(HMWM) High Molecular Weight Methacrylate

Note: The surface sealer materials shall be compatible with the injection materials listed above and shall be supplied by the same manufacturer as approved by the Engineer.

2. The following products shall be used for concrete crack width between .015 to 0.25 inches.

Brand Name	High/Low Modulus	Manufacturer
Sikadur 52 (epoxy)	High	Sika Corp.
Sure-Inject 56 (epoxy)	High	Dayton Superior
Euco Sure Injection Resin (epoxy)	High	Euclid Chemical Co.
Dural 335 (epoxy)	High	TAMMS Industries
Flexolith LV	Low	TAMMS Industries
Aquaseal LV (epoxy)	Low	TAMMS Industries
Euco 352 LV (epoxy)	Low	Euclid Chemical Co.

Note: The surface sealer materials shall be compatible with the injection materials listed above and shall be supplied by the same manufacturer as approved by the Engineer.

C. For repairs of concrete cracks by the method of Membrane Surface Sealing.

Brand Name	Manufacturer
Sealate T-70/MX-30 (HMWM)	Transpo Industries, Inc.
Concrete Protector & Restorer (5742)	3M Company

D. For repairs of concrete cracks by the method of Penetrating Surface Sealing.

Brand Name	Carrier/ Solvent	Solids %	Manufacturer/Location
Aridox 40*	Alcohol	40	Anti Hydro International Inc., Newark NJ
Chem-Trete BSM 40	Alcohol	40	Huls America, Piscataway NJ
Chem-Trete BSM 40 VOC	Alcohol	55	Huls America, Piscataway NJ
Dynasylan BH-N*	Alcohol	100	Huls America, Piscataway NJ
Isoflex 618	Alcohol	40	Harry S. Peterson, Inc., Berea OH
Klereseal 940-S*	Alcohol	40	Pecora Corp., Harleysville PA

Masterseal SL 40*	Alcohol	40	Master Buildings, Inc., Streetsboro OH
Sil-Act ATS 42*	Alcohol	40	Advanced Chemical Technologies, Oklahoma City OK
Weather Worker S-100 (J-29A*)	Alcohol	100	Dayton Superior, Pine Plains NY
Enviroseal 40*	Alcohol	40	Harris Specialty Chemicals, Inc., Jacksonville FL

*The manufacturer certifies that this material complies with the volatile organic compound (VOC) requirement as set forth in the NYS Department of Environmental Conservation's regulation, 6NYCRR, Part 205, "Architectural Surface Coatings". Only Compliant Materials shall be used in NYC and the counties of Nassau, Suffolk, Westchester and Rockland.

END OF APPENDIX "B"

DIVISION 5

SECTION 05120

STRUCTURAL STEEL

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for structural steel.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Association of State Highway and Transportation Officials (AASHTO)

Standard Specifications for Highway Bridges

American Institute of Steel Construction (AISC)

Code of Standard Practice for Steel Buildings and Bridges:
Sections 2; 6; 8; and 10, only (except that all references to the responsibility of the Owner and the Engineer will not apply.)
Specifications for Structural Steel Buildings
Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts
Quality Certification Program

American Society for Non-destructive Testing (ASNT)

SNT-TC-1A	Recommended Practice

American Welding Society (AWS)

D 1.1	Structural Welding Code, Steel
D 1.5	AASHTO/AWS Bridge Welding Code
QC1	Certification of Welding Inspectors

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. Connection Design and Detailing

1. Complete details shall be shown on the shop drawings. For all Work, other than structural steel for bridges, the Contractor shall complete the design of connections for any portion of the structures not shown on the Contract Drawings or indicated in the Specifications.

2. For bridges, the design of connections for any portion of the structures not shown on the Contract Drawings or specified in the Specifications will be provided by the Engineer.

3. Design and detailing for any alternative connections proposed by the Contractor and accepted by the Engineer shall be prepared by the Contractor. All connection design and detailing prepared by the Contractor shall be performed under the supervision of a Professional Engineer licensed in the state where the steel is to be installed. The calculations and shop drawings shall also bear the signature and seal of a Professional Engineer licensed in the state where the steel is to be installed.

4. In the case of conflict between the requirements of this Contract and the Codes and Standards contained in the AASHTO or AISC publications referenced in 1.02, the requirements of this Contract shall govern.

B. Shop Drawings

1. The shop drawings shall contain all dimensional and geometric information. Materials shall not be ordered, fabricated, or delivered to the construction site before the shop drawings have been approved.

2. Prior to review of the shop drawings by the Engineer, such shop drawings shall have been reviewed and approved by the Contractor and shall be stamped to indicate this by the Contractor. Such approval by the Contractor shall constitute the Contractor's representation that the Contractor has verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and has reviewed or coordinated each shop drawing with other shop drawings and samples and with the requirements of the Work and the Contract Drawings and Specifications.

3. Shop drawings shall include layouts and details showing the type of steel for each member, sizes of members, connections, cuts, copes, cope reinforcing, bolts, welds and other pertinent data. Provisions for the connection of any other work shall be indicated on the shop drawings.

4. All welds shall be indicated by standard welding symbols as defined by AWS. Shop drawings shall show the size, length, and type of each weld.

5. Job standards for all typical connections for beams and girders, column splices, moment connections and wind bracing details shall be prepared by or under the supervision of a Professional Engineer, licensed in the state where the steel is to be installed and shall have the signature and seal of the Professional Engineer.

6. Shop drawings shall be submitted in complete packages so that individual parts and the assembled unit may be reviewed together. Index sheets shall be furnished with all beam, girder and column details at the same time the details are submitted for review.

7. The review of shop drawings by the Engineer shall not in any way relieve the Contractor from the responsibility for the adequacy of the design of the connections and all required detailing, the responsibility for the proper fitting of the Work in strict conformance with the Contractor requirements and from the necessity of furnishing material and workmanship required by Contract Drawings and Specifications in addition to that indicated on the shop drawings

8. The Contractor shall supply a complete set of stamped, approved drawings to the Authority Quality Assurance representative at the fabrication shop prior to the commencement of any fabrication.

C. Erection Drawings

1. The erection drawings shall include plans showing exact locations of base and bearing plates, and/or bolts and other embedded items. All field-bolted connections, not specifically shown on shop drawings, shall be shown on erection drawings.

1.04 QUALITY CONTROL

A. Requirements

1. The entity performing the Work of this Section shall have a minimum of three years experience in structural steel work involving complexities similar to those required under this Contract and shall employ labor and supervisory personnel experienced in this type of Work.

2. When the total quantity of steel furnished under this contract exceeds 10 tons, the fabrication shop shall be certified under the AISC certification program as Category Sbd for conventional steel building structures or Sbr for simple steel bridges, unless a higher category is shown on the Contract Drawings. A list of certified fabrication shops for each Category can be found on the following website:

   www.aisc.org/Template.cfm?Section=Find_an_AISC_Certified_Company&Template=/MemberDirectory/MemberDirectoryQCSearch.cfm

3. The Contractor's Quality Control Plan shall be submitted to the Engineer for review and approval. The Engineer may elect to inspect the fabrication shop to verify that the fabrication is performed in accordance with contract documents and that the shop is operated in accordance with the Quality Control Plan. At a minimum, the Quality Control Plan for fabrication shall address all the items listed in Appendix A, Part C.

B. The Contractor shall qualify welding processes and welding operators in accordance with the applicable AWS Welding Code and shall provide certification that welders to be employed in the Work have satisfactorily passed AWS qualification tests.

C. The Contractor shall maintain a Quality Control Program for both fabrication and erection of structural steel to assure that all installations conform to the requirements of the Contract Drawings and Specifications. The Quality Control Program shall conform to the AISC Code of Standard Practice for Steel Buildings and Bridges, as well as the requirements in this Section for both shop and field inspection and testing. The Contractor shall employ non-destructive testing personnel that meet ASNT SNT-TC-1A Level II qualifications and an AWS Certified Welding Inspector (CWI).

For bridge work where "Fracture Critical Members" are shown on the Contract Drawings, the contractor shall satisfy the requirements of the Fracture Control Plan as defined in the current AASHTO/AWS D1.5 Bridge Welding Code, including the Charpy Impact notch toughness requirements for Zone 2.

D. High Strength Bolts

1. Each shipment shall be accompanied by a mill certification report that shows mill test results for the included production lots. The Engineer reserves the right to sample and test bolts from any shipment.
2. Bolts may be sampled by the Engineer on site and tested by the Authority for wedge tensile and Rockwell hardness requirements in accordance with the appropriate American Society for Testing and Materials (ASTM) specifications. If any samples do not meet the test requirements, then the corresponding lot of bolts shall be rejected for use. Any bolts already installed from a failed lot or heat number shall be removed and replaced at no additional cost to the Authority.
3. Sampling shall be performed using the "shipping lot method" in which the ASTM specified number of bolts shall be taken from each shipment of the same nominal bolt size and length. Bolt containers shall be clearly marked with the manufacturer's name, the production lot number, and the heat number of steel. After sampling, as indicated in 1.04 D.2., the containers shall be so labeled in a manner approved by the Engineer.
4. All bolts used for bridge construction and all galvanized bolts shall also meet the requirements for rotational capacity testing as specified in the appropriate AASHTO/ASTM specification (e.g. ASTM A325, ASTM A490, AASHTO Section 11.5.6.4.2).

E. In addition to performing field inspection, the Contractor shall inspect structural steel at the fabricating shop.

F. Welds shall be inspected and tested at the fabricating shop by the Contractor in accordance with AWS D1.1 (AWS D 1.5 for bridge members) and as follows:

1. All welds shall be visually inspected by an AWS Certified Welding Inspector (CWI).
2. All full penetration welds shall be non-destructively tested for 100 percent of the weld length by radiographic or ultrasonic methods, as approved by the Engineer, unless otherwise noted.

3. Areas of suspected defects found visually in partial penetration and fillet welds shall be non-destructively tested by magnetic particle or dye penetrant methods, as approved by the Engineer. However, for bridge members, test a minimum of 10 percent of the length of all partial penetration and fillet welds in accordance with AWS D1.5. If, in the opinion of the Engineer, the test results disclose unacceptable welds, then the percentage of welds required to be tested may be increased, as deemed necessary by the Engineer, up to 100%, without additional compensation.

G. The Contractor shall have sole responsibility for coordinating the Work and notifying the Engineer in a timely manner to assure that all testing and inspection procedures required by the Engineer are properly provided.

H. The Authority will perform Quality Assurance testing to ensure quality workmanship. Inspection and testing will include, but not be limited to, visual inspections, ultrasonic, radiographic, magnetic particle or dye penetrant testing of the welding and cutting performed in the fabrication shop and in the field. The percentage and extent of testing will be no less than 25% of that required of the Contractor. The Contractor shall notify the Engineer and the Authority Materials Engineering Division 15 days prior to the start of fabrication.

I. The Contractor shall supply equipment and personnel, at no additional cost to the Authority, to assist in moving members as necessary for adequate access to properly perform Quality Assurance inspections and testing by the Authority. Coupons of material may also be requested and shall be cut in the presence of the Engineer at no additional cost to the Authority. The Contractor shall also provide a desk and adequate workspace for the Authority shop inspector. Access to the use of telephones, fax machines and copy machines shall be provided at all times.

1.05 SHIPPING

A. All material that has been inspected and accepted by the Authority's Quality Assurance shop inspector will be stamped with the initials "PA" and a number near its piece mark. A stamped shipment report will also be provided and shall accompany each shipment. Any material that is shipped to the jobsite that is not stamped or included on the shipment report and noted as "Accepted" on said shipment report shall immediately be rejected by the Engineer and shall not be permitted to be unloaded at the jobsite. Application of the inspector's stamp does not imply that the material will not be rejected by the Authority if subsequently found to be damaged or defective.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the construction site at appropriate intervals so as to ensure uninterrupted progress of Work.

B. Material shall be stored in an area designated or approved by the Engineer. Structural steel shall be drained properly. Adequate shoring and protection shall be provided to prevent distortion and other damage. Structural steel shall be stored on timber and not on mud or cinders, and otherwise handled so as not to damage shop paint. All sections which are to be placed in ground storage shall be readily accessible for inspection.

1.07 SUBMITTALS

A. See Appendix "A" for submittals requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. Structural Steel

1. Structural steel shall mean structural steel as defined in Section 2 - Classification of Materials of the AISC "Code of Standard Practice for Steel Buildings and Bridges". Structural steel shall conform to types shown on the Contract Drawings. The types are indicated by the ASTM or AASHTO designation for each. Each type shall conform to all of the requirements of the indicated ASTM or AASHTO specifications.

B. High Strength Bolts

1. High strength bolts, nuts and washers shall be of the types shown on the Contract Drawings. Joints using high strength bolts shall conform to the provisions of the AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts". In the case of bridge Work, conform to AASHTO Standard Specifications for Highway Bridges, Division II, Section 11.5.6.

C. Anchor Bolts

1. Anchor bolts shall conform to ASTM type shown on the Contract Drawings and shall be the regular hexagon-bolt type.

D. Welding Electrodes: Comply with AWS D1.1 (D1.5 for bridge members).

E. Grout: In accordance with Section 03602 of the specifications entitled Grout (Non-Metallic).

F. Paint: In accordance with Section 09910 of the specifications entitled Painting.

2.02 FABRICATION

A. Fabrication shall not begin without approvals for the following:

1. Shop Drawings
2. Quality Control Plan
3. Welding Procedure Specifications
4. Procedure Qualification Records (if applicable)
5. Welder Qualifications
6. Mill Test Reports
7. Quality Control personnel, including an AWS Certified Welding Inspector (CWI), and non-destructive testing personnel that meet ASNT SNT-TC-1A Level II qualifications.

B. Any fabrication performed without prior approval of these items shall not be accepted. In addition, a copy of all signed approvals, including the supporting documentation, shall be in the possession of the fabrication shop prior to the commencement of fabrication and shall be made available to the Authority's Quality Assurance inspector at all times.

C. Fabricate and assemble structural assemblies in shop to greatest extent possible. Provide camber and fabricate items of structural steel in accordance with the standards and specifications referenced herein and as indicated on shop drawings approved by the Engineer.

D. Properly mark and match-mark materials for field assembly. Fabricate for a delivery sequence, which will expedite erection and minimize field handling of materials.

E. Where finishing is required, complete assembly, including welding of units, before the start of finishing operations. Provide finish surfaces of members, exposed in final structure, free of markings, burrs, and other defects.

F. For bridge members the following shall be in accordance with Division II, Section 11 of the AASHTO Standard Specifications for Highway Bridges:

1. Workmanship, methods, standards, and accuracy of fabrication.
2. Fitting, cutting, drilling, punching, reaming, bending, curving, finishing, straightening, and cambering of steel.
3. Preparation, shop assembly, fitting and correction for misfits of connections.

2.03 SHOP PAINTING

A. Shop paint structural steel, except those members or portions of members to be embedded in concrete or mortar. Paint embedded steel which is partially exposed on exposed portions and initial 2 inches of embedded areas only.

1. For high strength bolted surfaces with friction type connections, paint with an approved slip critical zinc rich coating.

B. Unless otherwise shown on the Contract Drawings, do not paint:

1. surfaces which are to be welded;

2. surfaces which are scheduled to receive sprayed-on fireproofing;

3. surfaces of exposed, corrosion-resistant, high-strength, low-alloy steel members.

C. Apply an additional coat of paint to surfaces which are inaccessible after assembly or erection. Change color of additional coat to distinguish it from first. Where shop painting is required, paint erection marks on painted surfaces.

D. Type of paint and surface preparations, if any, shall be as shown on the Contract Drawings, or as specified in Section 09910 of the Contract specifications entitled "Painting".

E. Notify the Authority Materials Engineering Division 10 days in advance of painting so arrangements can be made to inspect surface preparation prior to coating. In addition to inspecting surface preparation and coating the Authority will also perform tests to confirm blast profile, dry film thickness and adhesion. Samples of coatings may be selected for testing by the Engineer.

PART 3. EXECUTION

3.01 PREPARATION

A. Work Under Other Sections

1. Examine all Work prepared under other Sections of these Specifications to incorporate the Work of this Section and ensure any defects affecting installation are corrected. Prior to commencement of the Work under this Section, verify the dimensions and coordinate the structural steel Work with Work under other Sections.

B. Anchor Bolts

1. The Contractor shall ascertain by accurate survey the location, alignment and elevation of the anchor bolts embedded in the concrete under other Sections, at least 21 working days prior to the start of the structural steel erection. Any discrepancy between the Contract Drawings and Specifications and the as-built conditions shall be corrected, as approved by the Engineer, prior to the start of steel erection.

3.02 ERECTION

A. Workmanship

1. All Work shall be erected plumb, square and true to lines and levels in strict accordance with Contract requirements and within tolerances of the AISC "Code of Standard Practice for Steel Buildings and Bridges" and in the case of bridges in accordance with AASHTO Specifications.

B. Temporary Shoring and Bracing

1. Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.

C. Temporary Planking

1. Provide temporary planking and working platforms as necessary to effectively complete Work.

D. Field Assembly

1. Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment. Level and plumb individual members of structure within specified AISC tolerances or more stringent tolerances when shown on the Contract Drawings. Establish required leveling and plumbing measurements at mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature of structure when completed and in service.

E. Touch-up Painting

1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting in accordance with Section 09910 of the Contract specifications entitled "Painting".

F. Bolting with high strength bolts shall conform with AISC Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts, or in the case of bridge work, AASHTO Standard Specifications for Highway Bridges, Division II, Section 11.5.6.

G. Grouting shall be performed in accordance with section 03602 of the specifications entitled Grout (Non-Metallic).

3.03 FIELD TESTS

A. The Contractor shall perform inspections of the following items in accordance with the Codes and Standards contained in the AASHTO or AISC publications referenced in 1.02: connections; proper tensioning of bolts (the Contractor shall furnish an approved calibrated torque wrench and assign two workers to assist the Engineer.); levels, plumbness and alignment of the framing; and field painting.

B. Field welding shall be inspected and tested by the Contractor in accordance with 1.04.F and the Contractor's Quality Control Plan for erection.

C. The Authority will perform Quality Assurance testing for field connections and welds in accordance with 1.04 H. The Contractor shall supply equipment and personnel needed to allow access for said testing, at no additional cost to the Authority.

END OF SECTION

SECTION 05120

STRUCTURAL 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

05120A01 As per Division 1, "Shop Drawings, Catalog Cuts and Samples."

05120A02 Design and Detailing as per 1.03 A. prior to submitting job standards.

05120A03 Job standards as per 1.03 B.5. prior to submitting detailed shop drawings

05120A04 Prior to the commencement of fabrication, approval of shop drawings for all structural steel as per 1.03 B.

05120A05 Erection drawings as per 1.03 C.

Catalog Cuts

05120B01 per Division 1, "Shop Drawings, Catalog Cuts and Samples."

05120B02 Catalog cuts and manufacturer's literature on paint and grout specified under this section

05120B03 Prior to commencing with fabrication of steel, certified copies of all mill reports covering the chemical and physical properties of all steel used in this Contract shall be submitted. Such certification shall be obtained from the mills producing the steel and shall certify that the steel meets the minimum requirements as to physical properties, inspection, marking, and tests for structural steel as defined by the American Society for Testing and Materials (ASTM) or in the case of bridges, AASHTO, for the type of steel shown on the Contract Drawings.

05120B04 Prior to commencing fabrication, mill certificates for high strength bolts as described in 1.04 D.1

05120B05 For bridge steel, submit results of Charpy Impact notch toughness tests showing suitability for use in zone 2 as defined in AASHTO prior to commencing fabrication.

05120B06 Inspection and test results from fabrication shop as per 1.04 F within five calendar days of inspections and tests.

05120B07 Inspection and test results from field tests as per 3.03 within five calendar days of inspections and tests.

05120B08 Prior to commencing with fabrication of steel, welder qualifications and welding procedure specifications in accordance with 1.04 B.

Certificates

05120E01 A copy of AISC certification for the fabrication shop indicating the required Category as specified

05120E02 Organizational chart indicating specific names and titles of personnel clearly identifying the reporting structure of personnel and the qualifications of the individuals responsible for implementing the program.

05120E03 Material traceability, indicating the procedure used to identify each individual piece mark and its components that can be traced to a specific heat number on mill test reports.

05120E04 A procedure for handling nonconformance issues, including a sample worksheet for recording nonconformance issues. Include the name and title of the person responsible for final acceptance.

05120E06 The certifications and qualifications for an AWS Certified Welding Inspector (CWI), Non-Destructive testing personnel qualified to ASNT SNT-TC-1A Level II requirements, and their respective employers. Include samples of inspection and testing forms to be used for the work of this Contract.

05120E07 A detailed schedule for the duration of fabrication at each shop. The schedule shall show, at a minimum, the start and end dates for ordering material, cutting material, fabricating material, painting material, and shipping material. If the schedule changes, a revised schedule shall be submitted For Information Only.

05120E08 A brief statement that explains the amount of steel, in tons, the shop is fabricating and the application(s) the fabrication is intended

05120E09 Copy of the Fracture Control Plan as per 1.04 C, if applicable.

05120E10 Name and location of shop that will perform painting work along with the shop's Quality Control Plan in accordance with Section 09910 entitled "Painting".

05120E11 Notification, in writing, 15 days prior to commencing fabrication of structural steel.

05120E12 Notification, in writing, 15 days prior to commencing with surface preparation and painting.

05120E13 Notification, in writing, 15 days prior to commencing field welding operations.

Calculations

05120H01 Calculations for connection design and detailing shall accompany submittal A.2. in this appendix.

05120H02 Computations for job standards shall accompany submittal A.3. in this appendix

END OF APPENDIX "A"

DIVISION 5

SECTION 05130

WALKWAY EXTENSION

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for the removal and reinstallation of the three existing walkway extensions as designated on the plans.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Association of State Highway and Transportation Officials (AASHTO)

Standard Specifications for Highway Bridges

American Institute of Steel Construction (AISC)

Code of Standard Practice for Steel Buildings and Bridges:
Sections 2; 6; 8; and 10, only (except that all references to the responsibility of the Owner and the Engineer will not apply.)
Specifications for Structural Steel Buildings
Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts
Quality Certification Program

American Society for Non-destructive Testing (ASNT)

SNT-TC-1A Recommended Practice

American Welding Society (AWS)

D 1.1	Structural Welding Code, Steel
D 1.5	AASHTO/AWS Bridge Welding Code
QC1	Certification of Welding Inspectors

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. General

1. The Contractor is to design and install walkway extensions at the locations shown on the contract drawings. These walkway extensions are to approximately match the dimensions of the existing walkway extensions. They are to be designed to fit around the new bridge timbers. The existing steel grating and handrail are to be removed and reinstalled as directed by the Engineer.

2. The grating for the existing walkway extensions are supported on steel angles. One end of the angles is lagged into the adjacent bridge timbers. The other ends are supported on angles that are welded to the bottom truss chord. The existing support system is to be completely removed and replaced with a new system designed by the Contractor. The welds where the posts supporting the walkway extensions connect to the bottom truss chords are to be ground smooth.

3. The grating for the new walkway extensions are to be supported on steel I-beams. One end of the I-beam is to be supported on the top of the outside stringer. The new I-beams are to be placed between the new bridge timbers and the tie spacing blocks are to be removed at these locations. The I-beams may be wide flange sections, American standard beams or built up sections from welded plates.

4. Provisions for avoiding interference with the existing rivets in the top flanges of the existing stringers are to be included in the Contractor's design.

5. The outside of the I-beams are to be supported on steel members such as I-beams, angles, channels, which are bolted to the existing truss chord. Use existing rivet holes for lattice bar connections and replace the lattice bars that are disturbed. Welding to the bottom chord is prohibited.

B. Design

1. The walkway is to be designed to withstand the combination of the following loads, whichever causes the highest stress:

   a. Uniform live load of 85 psf.

   b. Two point loads of 500 pounds each, a minimum of 3 feet apart

   c. Live load on the handrail in accordance with AREMA Chapter 15, Article 8.5.3

C. Connection Design and Detailing

1. Complete details shall be shown on the shop drawings. For all Work the Contractor shall complete the design of connections for any portion of the structures not shown on the Contract Drawings or indicated in the Specifications.

2. Design and detailing for any alternative connections proposed by the Contractor and accepted by the Engineer shall be prepared by the Contractor. All connection design and detailing prepared by the Contractor shall be performed under the supervision of a Professional Engineer licensed in the State of New Jersey. The calculations and shop drawings shall also bear the signature and seal of a Professional Engineer licensed in the State of New Jersey.

3. In the case of conflict between the requirements of this Contract and the Codes and Standards contained in the AASHTO or AISC publications referenced in 1.02, the requirements of this Contract shall govern.

D. Shop Drawings

1. The shop drawings shall contain all dimensional and geometric information. Materials shall not be ordered, fabricated, or delivered to the construction site before the shop drawings have been approved.
2. Prior to review of the shop drawings by the Engineer, such shop drawings shall have been reviewed and approved by the Contractor and shall be stamped to indicate this by the Contractor. Such approval by the Contractor shall constitute the Contractor's representation that the Contractor has verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and has reviewed or coordinated each shop drawing with other shop drawings and samples and with the requirements of the Work and the Contract Drawings and Specifications.
3. Shop drawings shall include layouts and details showing the type of steel for each member, sizes of members, connections, cuts, copes, cope reinforcing, bolts, welds and other pertinent data. Provisions for the connection of any other work shall be indicated on the shop drawings.
4. All welds shall be indicated by standard welding symbols as defined by AWS. Shop drawings shall show the size, length, and type of each weld.
5. Job standards for all typical connections for beams and girders, column splices, moment connections and wind bracing details shall be prepared by or under the supervision of a Professional Engineer, licensed in the state where the steel is to be installed and shall have the signature and seal of the Professional Engineer.
6. Shop drawings shall be submitted in complete packages so that individual parts and the assembled unit may be reviewed together. Index sheets shall be furnished with all beam, girder and column details at the same time the details are submitted for review.
7. The review of shop drawings by the Engineer shall not in any way relieve the Contractor from the responsibility for the adequacy of the design of the connections and all required detailing, the responsibility for the proper fitting of the Work in strict conformance with the Contractor requirements and from the necessity of furnishing material and workmanship required by Contract Drawings and Specifications in addition to that indicated on the shop drawings.
8. The Contractor shall supply a complete set of stamped, approved drawings to the Authority Quality Assurance representative at the fabrication shop prior to the commencement of any fabrication.

E. Erection Drawings

1. Submit the following information:
   a. Dimensions and location of each existing walkway extension.
   b. Dimensions and location of each new walkway extension.
   c. Shop drawings of each of the members.
   d. Calculations.

e. Removal procedures for the existing walkway extensions.

f. Installation procedures for the new walkway extensions.

2. The erection drawings shall include plans showing exact locations of base and bearing plates, and/or bolts and other embedded items. All field-bolted connections, not specifically shown on shop drawings, shall be shown on erection drawings.

1.04 QUALITY CONTROL

A. Requirements

1. The entity performing the Work of this Section shall have a minimum of three years experience in structural steel work involving complexities similar to those required under this Contract and shall employ labor and supervisory personnel experienced in this type of Work.

2. When the total quantity of steel furnished under this contract exceeds 10 tons, the fabrication shop shall be certified under the AISC certification program as Category Sbd for conventional steel building structures or Sbr for simple steel bridges, unless a higher category is shown on the Contract Drawings. A list of certified fabrication shops for each Category can be found on the following website:

www.aisc.org/Template.cfm?Section=Find_an_AISC_Certified_Company&Template=/MemberDirectory/MemberDirectoryQCSearch.cfm

3. The Contractor's Quality Control Plan shall be submitted to the Engineer for review and approval. The Engineer may elect to inspect the fabrication shop to verify that the fabrication is performed in accordance with contract documents and that the shop is operated in accordance with the Quality Control Plan. At a minimum, the Quality Control Plan for fabrication shall address all the items listed in Appendix A, Part C.

B. The Contractor shall qualify welding processes and welding operators in accordance with the applicable AWS Welding Code and shall provide certification that welders to be employed in the Work have satisfactorily passed AWS qualification tests.

C. The Contractor shall maintain a Quality Control Program for both fabrication and erection of structural steel to assure that all installations conform to the requirements of the Contract Drawings and Specifications. The Quality Control Program shall conform to the AISC Code of Standard Practice for Steel Buildings and Bridges, as well as the requirements in this Section for both shop and field inspection and testing. The Contractor shall employ non-destructive testing personnel that meet ASNT SNT-TC-1A Level II qualifications and an AWS Certified Welding Inspector (CWI).

For bridge work where "Fracture Critical Members" are shown on the Contract Drawings, the contractor shall satisfy the requirements of the Fracture Control Plan as defined in the current AASHTO/AWS D1.5 Bridge Welding Code, including the Charpy Impact notch toughness requirements for Zone 2.

D. High Strength Bolts

1. Each shipment shall be accompanied by a mill certification report that shows mill test results for the included production lots. The Engineer reserves the right to sample and test bolts from any shipment.

2. Bolts may be sampled by the Engineer on site and tested by the Authority for wedge tensile and Rockwell hardness requirements in accordance with the appropriate American Society for Testing and Materials (ASTM) specifications. If any samples do not meet the test requirements, then the corresponding lot of bolts shall be rejected for use. Any bolts already installed from a failed lot or heat number shall be removed and replaced at no additional cost to the Authority.

3. Sampling shall be performed using the "shipping lot method" in which the ASTM specified number of bolts shall be taken from each shipment of the same nominal bolt size and length. Bolt containers shall be clearly marked with the manufacturer's name, the production lot number, and the heat number of steel. After sampling, as indicated in 1.04 D.2., the containers shall be so labeled in a manner approved by the Engineer.

4. All bolts used for bridge construction and all galvanized bolts shall also meet the requirements for rotational capacity testing as specified in the appropriate AASHTO/ASTM specification (e.g. ASTM A325, ASTM A490, AASHTO Section 11.5.6.4.2).

E. In addition to performing field inspection, the Contractor shall inspect structural steel at the fabricating shop.

F. Welds shall be inspected and tested at the fabricating shop by the Contractor in accordance with AWS D1.1 (AWS D 1.5 for bridge members) and as follows:

1. All welds shall be visually inspected by an AWS Certified Welding Inspector (CWI).

2. All full penetration welds shall be non-destructively tested for 100 percent of the weld length by radiographic or ultrasonic methods, as approved by the Engineer, unless otherwise noted.

3. Areas of suspected defects found visually in partial penetration and fillet welds shall be non-destructively tested by magnetic particle or dye penetrant methods, as approved by the Engineer. However, for bridge members, test a minimum of 10 percent of the length of all partial penetration and fillet welds in accordance with AWS D1.5. If, in the opinion of the Engineer, the test results disclose unacceptable welds, then the percentage of welds required to be tested may be increased, as deemed necessary by the Engineer, up to 100%, without additional compensation.

G. The Contractor shall have sole responsibility for coordinating the Work and notifying the Engineer in a timely manner to assure that all testing and inspection procedures required by the Engineer are properly provided.

H. The Authority will perform Quality Assurance testing to ensure quality workmanship. Inspection and testing will include, but not be limited to, visual inspections, ultrasonic, radiographic, magnetic particle or dye penetrant testing of the welding and cutting performed in the fabrication shop and in the field. The percentage and extent of testing will be no less than 25% of that required of the Contractor. The Contractor shall notify the Engineer and the Authority Materials Engineering Division 15 days prior to the start of fabrication.

I. The Contractor shall supply equipment and personnel, at no additional cost to the Authority, to assist in moving members as necessary for adequate access to properly perform Quality Assurance inspections and testing by the Authority. Coupons of material may also be requested and shall be cut in the presence of the Engineer at no additional cost to the Authority. The Contractor shall also provide a desk and adequate workspace for the Authority shop inspector. Access to the use of telephones, fax machines and copy machines shall be provided at all times.

1.05 SHIPPING

A. All material that has been inspected and accepted by the Authority's Quality Assurance shop inspector will be stamped with the initials "PA" and a number near its piece mark. A stamped shipment report will also be provided and shall accompany each shipment. Any material that is shipped to the jobsite that is not stamped or included on the shipment report and noted as "Accepted" on said shipment report shall immediately be rejected by the Engineer and shall not be permitted to be unloaded at the jobsite. Application of the inspector's stamp does not imply that the material will not be rejected by the Authority if subsequently found to be damaged or defective.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the construction site at appropriate intervals so as to ensure uninterrupted progress of Work.

B. Material shall be stored in an area designated or approved by the Engineer. Structural steel shall be drained properly. Adequate shoring and protection shall be provided to prevent distortion and other damage. Structural steel shall be stored on timber and not on mud or cinders, and otherwise handled so as not to damage shop paint. All sections which are to be placed in ground storage shall be readily accessible for inspection.

1.07 SUBMITTALS

See Appendix "A" for submittals requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. Structural Steel

1. Structural steel shall mean structural steel as defined in Section 2 - Classification of Materials of the AISC "Code of Standard Practice for Steel Buildings and Bridges". Structural steel shall conform to types shown on the Contract Drawings. The types are indicated by the ASTM or AASHTO designation for each. Each type shall conform to all of the requirements of the indicated ASTM or AASHTO specifications.

B. High Strength Bolts

1. High strength bolts, nuts and washers shall be of the types shown on the Contract Drawings. Joints using high strength bolts shall conform to the provisions of the AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts". In the case of bridge Work, conform to AASHTO Standard Specifications for Highway Bridges, Division II, Section 11.5.6.

C. Anchor Bolts

1. Anchor bolts shall conform to ASTM type shown on the Contract Drawings and shall be the regular hexagon-bolt type.

D. Welding Electrodes: Comply with AWS D1.1 (D1.5 for bridge members).

E. Paint: In accordance with Section 09910 of the specifications entitled Painting.

2.02 FABRICATION

A. Fabrication shall not begin without approvals for the following:

1. Shop Drawings
2. Quality Control Plan
3. Welding Procedure Specifications
4. Procedure Qualification Records (if applicable)
5. Welder Qualifications
6. Mill Test Reports
7. Quality Control personnel, including an AWS Certified Welding Inspector (CWI), and non-destructive testing personnel that meet ASNT SNT-TC-1A Level II qualifications.

Any fabrication performed without prior approval of these items shall not be accepted. In addition, a copy of all signed approvals, including the supporting documentation, shall be in the possession of the fabrication shop prior to the commencement of fabrication and shall be made available to the Authority's Quality Assurance inspector at all times.

B. Fabricate and assemble structural assemblies in shop to greatest extent possible. Provide camber and fabricate items of structural steel in accordance with the standards and specifications referenced herein and as indicated on shop drawings approved by the Engineer.

C. Properly mark and match-mark materials for field assembly. Fabricate for a delivery sequence, which will expedite erection and minimize field handling of materials.

D. Where finishing is required, complete assembly, including welding of units, before the start of finishing operations. Provide finish surfaces of members, exposed in final structure, free of markings, burrs, and other defects.

E. For bridge members the following shall be in accordance with Division II, Section 11 of the AASHTO Standard Specifications for Highway Bridges:

1. Workmanship, methods, standards, and accuracy of fabrication.
2. Fitting, cutting, drilling, punching, reaming, bending, curving, finishing, straightening, and cambering of steel.
3. Preparation, shop assembly, fitting and correction for misfits of connections.

2.03 SHOP PAINTING

A. Shop paint structural steel. For high strength bolted surfaces with friction type connections, paint with an approved slip critical zinc rich coating.

B. Unless otherwise shown on the Contract Drawings, do not paint:

1. Surfaces which are to be welded;
2. Surfaces which are scheduled to receive sprayed-on fireproofing;
3. Surfaces of exposed, corrosion-resistant, high-strength, low-alloy steel members.

C. Apply an additional coat of paint to surfaces which are inaccessible after assembly or erection. Change color of additional coat to distinguish it from first. Where shop painting is required, paint erection marks on painted surfaces.

D. Type of paint and surface preparations, if any, shall be as shown on the Contract Drawings, or as specified in Section 09910 of the Contract specifications entitled "Painting".

E. Notify the Authority Materials Engineering Division 10 days in advance of painting so arrangements can be made to inspect surface preparation prior to coating. In addition to inspecting surface preparation and coating the Authority will also perform tests to confirm blast profile, dry film thickness and adhesion. Samples of coatings may be selected for testing by the Engineer.

PART 3. EXECUTION

3.01 PREPARATION

A. Work Under Other Sections

1. Examine all Work prepared under other Sections of these Specifications to incorporate the Work of this Section and ensure any defects affecting installation are corrected. Prior to commencement of the Work under this Section, verify the dimensions and coordinate the structural steel Work with Work under other Sections.

B. Anchor Bolts

1. The Contractor shall ascertain by accurate survey the location, alignment and elevation of the anchor bolts embedded in the concrete under other Sections, at least 21 working days prior to the start of the structural steel erection. Any discrepancy between the Contract Drawings and Specifications and the as-built conditions shall be corrected, as approved by the Engineer, prior to the start of steel erection.

3.02 ERECTION

A. Workmanship

1. All Work shall be erected plumb, square and true to lines and levels in strict accordance with Contract requirements and within tolerances of the AISC "Code of Standard Practice for Steel Buildings and Bridges" and in the case of bridges in accordance with AASHTO Specifications.

B. Temporary Shoring and Bracing

1. Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.

C. Temporary Planking

1. Provide temporary planking and working platforms as necessary to effectively complete Work.

D. Field Assembly

1. Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment. Level and plumb individual members of structure within specified AISC tolerances or more stringent tolerances when shown on the Contract Drawings. Establish required leveling and plumbing measurements at mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature of structure when completed and in service.

E. Touch-up Painting

1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting in accordance with Section 09910 of the Contract specifications entitled "Painting".

F. Bolting with high strength bolts shall conform with AISC Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts, or in the case of bridge work, AASHTO Standard Specifications for Highway Bridges, Division II, Section 11.5.6.

G. Grouting shall be performed in accordance with section 03602 of the specifications entitled Grout (Non-Metallic).

3.03 FIELD TESTS

A. The Contractor shall perform inspections of the following items in accordance with the Codes and Standards contained in the AASHTO or AISC publications referenced in 1.02: connections; proper tensioning of bolts (the Contractor shall furnish an approved calibrated torque wrench and assign two workers to assist the Engineer.); levels, plumbness and alignment of the framing; and field painting.

B. Field welding shall be inspected and tested by the Contractor in accordance with 1.04.F and the Contractor's Quality Control Plan for erection.

C. The Authority will perform Quality Assurance testing for field connections and welds in accordance with 1.04 H. The Contractor shall supply equipment and personnel needed to allow access for said testing, at no additional cost to the Authority.

END OF SECTION

SECTION 05130

WALKWAY EXTENSION

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

05130A01 As per Division 1, "Shop Drawings, Catalog Cuts and Samples."

05130A02 Design and Detailing as per 1.03 C. prior to submitting job standards.

05130A03 Job standards as per 1.03 D.5. prior to submitting detailed shop drawings

05130A04 Prior to the commencement of fabrication, approval of shop drawings for all structural steel as per 1.03 D.

05130A05 Erection drawings as per 1.03 E.

Catalog Cuts

05130B01 per Division 1, "Shop Drawings, Catalog Cuts and Samples."

05130B02 Catalog cuts and manufacturer's literature on paint and grout specified under this section

05130B03 Prior to commencing with fabrication of steel, certified copies of all mill reports covering the chemical and physical properties of all steel used in this Contract shall be submitted. Such certification shall be obtained from the mills producing the steel and shall certify that the steel meets the minimum requirements as to physical properties, inspection, marking, and tests for structural steel as defined by the American Society for Testing and Materials (ASTM) or in the case of bridges, AASHTO, for the type of steel shown on the Contract Drawings.

05130B04 Prior to commencing fabrication, mill certificates for high strength bolts as described in 1.04 D.1

05130B05 For bridge steel, submit results of Charpy Impact notch toughness tests showing suitability for use in zone 2 as defined in AASHTO prior to commencing fabrication.

05130B06 Inspection and test results from fabrication shop as per 1.04 F within five calendar days of inspections and tests.

05130B07 Inspection and test results from field tests as per 3.03 within five calendar days of inspections and tests.

05130B08 Prior to commencing with fabrication of steel, welder qualifications and welding procedure specifications in accordance with 1.04 B.

Certificates

05130E01 A copy of AISC certification for the fabrication shop indicating the required Category as specified

05130E02 Organizational chart indicating specific names and titles of personnel clearly identifying the reporting structure of personnel and the qualifications of the individuals responsible for implementing the program.

05130E03 Material traceability, indicating the procedure used to identify each individual piece mark and its components that can be traced to a specific heat number on mill test reports.

05130E04 A procedure for handling nonconformance issues, including a sample worksheet for recording nonconformance issues. Include the name and title of the person responsible for final acceptance.

05130E06 The certifications and qualifications for an AWS Certified Welding Inspector (CWI), Non-Destructive testing personnel qualified to ASNT SNT-TC-1A Level II requirements, and their respective employers. Include samples of inspection and testing forms to be used for the work of this Contract.

05130E07 A detailed schedule for the duration of fabrication at each shop. The schedule shall show, at a minimum, the start and end dates for ordering material, cutting material, fabricating material, painting material, and shipping material. If the schedule changes, a revised schedule shall be submitted For Information Only.

05130E08 A brief statement that explains the amount of steel, in tons, the shop is fabricating and the application(s) the fabrication is intended

05130E09 Copy of the Fracture Control Plan as per 1.04 C, if applicable.

05130E10 Name and location of shop that will perform painting work along with the shop's Quality Control Plan in accordance with Section 09910 entitled "Painting".

05130E11 Notification, in writing, 15 days prior to commencing fabrication of structural steel.

05130E12 Notification, in writing, 15 days prior to commencing with surface preparation and painting.

05130E13 Notification, in writing, 15 days prior to commencing field welding operations.

Calculations

05130H01 Calculations for connection design and detailing shall accompany submittal A.2. in this appendix.

05130H02 Computations for job standards shall accompany submittal A.3. in this appendix

END OF APPENDIX "A"

DIVISION 5

SECTION 05523

STEEL PIPE AND TUBE RAILINGS

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for steel pipe and tube handrails and railings.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	American Institute of Steel Construction, Inc. (AISC)
AISC 335	Specification for Structural Steel Buildings – Allowable Stress Design and Plastic Design with Commentary.
	American Society for Testing and Materials (ASTM)
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 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 780	Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
ASTM B 633	Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
ASTM C 1107	Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
	American Welding Society, Inc. (AWS)
AWS D1.1	Structural Welding Code – Steel.
	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 1	Surface Preparation Specification No. 1 – Solvent Cleaning.

SSPC-SP 3	Surface Preparation Specification No. 3 – Power Tool Cleaning.
SSPC-SP 7	Surface Preparation Specification No. 7 – Brush-Off Blast Cleaning.
SSPC-SP 10	Surface Preparation Specification No. 10 – Near-White Blast Cleaning.

1.03 DESIGN AND PERFORMANCE REQUIREMENTS

A. Structural Performance

1. Handrails and railings shall be capable of resisting structural loads in accordance with AREMA Chapter 15, Section 8.5.3.1.

2. When installed, handrail and railing assemblies shall be capable of withstanding required gravity loads and structural loads, applicable to the specific location or use, without exceeding the allowable design working stress of the materials involved, including anchors and connections.

3. Thermal Movements: Allow for thermal movements of handrails and railings resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

a. Temperature Change (Range): 120 degrees F, ambient; 180 degrees F, material surfaces.

B. Corrosion Control: Prevent galvanic action and other forms of corrosion by isolating metals and other materials from direct contact with incompatible materials.

1.04 QUALITY ASSURANCE

A. Where required by Appendix "A", submit structural calculations for handrails and railings. Determine allowable design working stresses of handrail and railing materials based on AISC 335.

B. Engineer Qualifications

A professional engineer who is legally qualified to practice in the jurisdiction where the Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for design of handrails and railings indicated for this Project in material, design and installation.

C. Welding Standards

Comply with applicable provisions of AWS D1.1 *Structural Welding Code – Steel.*

1. Each welder shall have satisfactorily passed AWS qualification tests for welding processes involved and shall be currently AWS certified.

D. Single Source Responsibility

Obtain each type of handrail and railing through one source from a single manufacturer.

E. Field Measurements

Verify handrail and railing dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.05 DELIVERY, STORAGE, AND HANDLING

Protect material from damage including, but not limited to, scratches, nicks, dents and gouges during delivery, storage, assembly and installation.

1.06 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MATERIALS

A. General

Metal surfaces shall be free from pitting, seam marks, roller marks, stains, discolorations and other imperfections where exposed to view on finished units.

B. Steel and Iron

Furnish steel and iron in the form shown on the Contract Drawings complying with the following requirements:

1. Steel Pipe: ASTM A 53.
   a. Type and Weight Class: Type F or Type S, Grade A, Schedule 40 (standard weight), unless another grade and weight are required by structural loads.
   b. Finish: Black finish or hot-dip galvanized, as shown on the Contract Drawings.
2. Steel Tubing: Cold-formed, ASTM A 500; or hot-rolled, ASTM A 501; black finish or hot-dip galvanized, as shown on the Contract Drawings.
3. Steel Plates, Shapes and Bars: ASTM A 36.
4. Castings: Gray iron, ASTM A 48, Class 30 or malleable iron, ASTM A 47, grade as recommended by fabricator for use shown on the Contract Drawings.

C. Brackets, Flanges and Fittings

Cast or formed metal of same type of material and finish as supported handrails and railings, unless otherwise shown on the Contract Drawings.

D. Welding Electrodes and Filler Metal

Type and alloy of filler metal and electrodes as recommended by producer of metal to be welded and as required for color match, strength and compatibility in fabricated items.

E. Fasteners

1. Use zinc-plated fasteners complying with ASTM B 633, Class Fe/Zn 25 (Service Condition 4–very severe). Do not use metals that are corrosive or incompatible with materials joined. Furnish concealed fasteners for interconnection of handrail and railing components and for their attachment to other Work.

2. Fasteners for Anchoring Handrails and Railings to Other Construction: Type, grade and class required to produce connections suitable for anchoring handrails and railings to other types of construction shown on the Contract Drawings and capable of withstanding design loads.

F. Anchors and Inserts

Type, size and material recommended by the railing manufacturer for type of loading and installation condition shown on Contract Drawings. Use stainless steel or hot-dip galvanized anchors and inserts for exterior locations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts as required, to be set into concrete or masonry.

G. 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.

H. Nonmetallic Grout

Pre-mixed, factory-packaged, nonshrink, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Furnish grout of grade specifically recommended by the manufacturer for interior or exterior applications.

I. Erosion Resistant Anchoring Cement

Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at the construction site to create pourable anchoring, patching and grouting compound. Formulation shall be resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and shall be recommended by manufacturer for exterior use.

2.02 FABRICATION

A. General

Fabricate handrails and railings to dimensions and details shown on the Contract Drawings. Furnish handrail and railing members in sizes and profiles shown on Contract Drawings, with supporting posts and brackets of size and spacing shown, but not less than required to support the design loadings required by 1.03 A.

1. 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. Shear and punch metals cleanly and accurately. Remove burrs and ease exposed edges to a radius of approximately 1/32 inch. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
3. Cut, reinforce, drill and tap components to receive anchorage, finish hardware and similar items.
4. Close exposed ends of handrail and railing members with prefabricated end fittings.
5. Fabricate wall returns at ends of wall-mounted handrails. Close ends of returns. Furnish railing extensions at bottom and top of stairs as shown on the Contract Drawings.
6. Form bends by using prefabricated elbow fittings and radius bends, as applicable, of radii shown on the Contract Drawings, except where configuration shown requires bending of railing members.
7. Fabricate connections that will be exposed to weather in a manner to exclude water. Where water may accumulate, provide weepholes.

B. Welded Connections

Fabricate handrails and railings with welded connections, unless otherwise shown on the Contract Drawings. Cope components at perpendicular and skew connections to provide close fit or use fittings designed for this purpose. Weld connections continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blend so no roughness shows after finishing and so welded surface matches contours of adjoining surfaces.

C. Nonwelded Connections

Where railings are shown on the Contract Drawings to be adhesively or mechanically attached:

1. Fabricate handrails and railings to accommodate interconnection of members using railing manufacturer's standard concealed mechanical fasteners and fittings.

2. Assemble members and fittings to produce flush, smooth and rigid hairline joints.

3. Splice joints for field connection shall use epoxy structural adhesive where such procedure represents manufacturer's standard splicing method.

D. Toe Boards

Incorporate toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details shown on the Contract Drawings or, if not shown, fabricate toe boards 4 inches high. Use manufacturer's standard toe board material.

E. Brackets, Flanges, Fittings and Anchors

1. Use manufacturer's standard wall brackets, flanges, miscellaneous fittings and anchors for interconnection of handrail and railing members to other Work. Furnish inserts and other anchorage devices as shown on the Contract Drawings and as required to provide support. Coordinate anchorage types with supporting structure.

2. For railing posts set in concrete, furnish minimum 6 inch long galvanized steel sleeves, matching shape and configuration of railing posts and with outside dimensions not less than 1/2 inch greater than outside dimensions of post. Weld galvanized steel plate closures to bottoms of sleeves. Plate closures shall be 1 inch greater in length and width than outside dimensions of sleeves.

a. Touch-up galvanized surfaces damaged by welding or abrasion by applying galvanizing repair paint to comply with ASTM A 780.

F. Galvanizing

1. Hot-dip galvanize railings shown on the Contract Drawings to be galvanized. Comply with applicable standards:

a. Iron and steel products made from rolled, pressed and forged steel shapes, castings, plates, bars and strips: ASTM A 123.

b. Iron and steel hardware: ASTM A 153.

2. Furnish galvanized fittings, brackets, fasteners, sleeves and other ferrous components for use with galvanized handrails and railings.

3. Fill vent and drain holes that will be exposed in finished Work, except those intended to remain as weep holes, by plugging with zinc and filing off smooth.

2.03 SHOP PAINTING

A. Galvanized Steel

Preparation for Shop Priming: After galvanizing, thoroughly clean handrails and railings of grease, dirt, oil, flux and other foreign matter and treat with zinc phosphate process. Apply primer within 12 hours of galvanizing or, if this can not be achieved, submit to the Engineer for approval, additional surface preparation measures to be performed, including but not limited to SSPC-SP 7.

B. Uncoated Steel

Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed handrails and railings:

1. Exteriors (SSPC Zone 1B): SSPC-SP 10.
2. Interiors (SSPC Zone 1A): SSPC-SP 1 and SSPC-SP 3.

C. Apply shop primer to prepared surfaces of handrail and railing components, unless otherwise shown on Contract Drawings. Comply with requirements in SSPC-PA 1 for shop painting. Primer is not required on surfaces to be embedded in concrete or masonry.

D. Apply additional paint coats as specified in Division 9 Section on painting.

E. Stripe paint edges, corners, crevices, bolts and welds.

PART 3. EXECUTION

3.01 PREPARATION

Coordinate setting drawings, diagrams, templates, instructions and directions for installation of anchorages, such as sleeves, inserts, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction specified in other Sections. Coordinate delivery of such items to the construction site in time for installation.

3.02 INSTALLATION

A. General

1. Fit exposed connections accurately together to form tight, hairline joints.
2. Perform cutting, drilling and fitting required for installation of handrails and railings. Set Work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.
3. Do not weld, cut or abrade surfaces of handrails and railing components which have been coated or finished after fabrication and are intended for field connection by mechanical means without further cutting or fitting.
4. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
5. Align rails so variations from level for horizontal members and from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
6. Adjust handrails and railings prior to anchoring to ensure matching alignment at abutting joints. Space posts at interval shown on the Contract Drawings or, if not shown, as required by design loadings.

B. Anchoring Posts

1. Anchor posts in concrete using steel sleeves preset and anchored into the concrete, unless other methods are shown on the Contract Drawings. After posts have been inserted into sleeves, solidly fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with grout manufacturer's directions.

2. Leave anchorage joint exposed, unless otherwise shown on the Contract Drawings. Wipe off excess grout and leave 1/8 inch build-up, sloped away from post. For installation exposed to exterior or to flow of water, seal grout to comply with grout manufacturer's directions.

3. Anchor posts to metal surfaces with manufacturer's standard fittings designed for this purpose.

C. Railing Connections

1. Use fully welded joints for permanently connecting railing components, unless otherwise shown on the Contract Drawings. Comply with requirements in 2.02 B for welded connections whether welding is performed in the shop or in the field.

2. Where railings are shown on the Contract Drawings to be mechanically or adhesively attached, use mechanical or adhesive joints for permanently connecting railing components. Prevent damage to railing members and fittings while making connections. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of handrails and railings.

D. Expansion Joints

Install expansion joints at locations shown on the Contract Drawings, but not farther apart than required to accommodate thermal movement. Furnish slip-joint internal sleeve extending 2 inches beyond joint on either side. Fasten internal sleeve securely to one side and locate joint within 6 inches of post.

E. Anchoring Railing Ends

1. Anchor railing ends into concrete or masonry with manufacturer's standard fittings designed for this purpose.

2. Anchor railing ends to metal surfaces with manufacturer's standard fittings using concealed fasteners.

F. Attachment of Handrails to Walls

1. Secure handrails to walls with manufacturer's standard wall brackets and end fittings.

2. For concrete and solid masonry, use drilled-in expansion shields for concealed bolts.

3. For hollow masonry anchorage, use toggle bolts with square heads.

3.03 ADJUSTING

A. At the construction site, repair finishes of handrails and railings damaged as a result of the Contractor's operations or furnish and install new railings. Remove handrails and railings whose finish cannot be repaired at the construction site and either return them to the fabrication shop, restore the finishes and reinstall, or furnish and install new handrails and railings. All such remedial Work shall be performed to the satisfaction of the Engineer and at no cost to the Authority.

B. 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.

3.04 PROTECTION

Protect finishes of handrails and railings from damage during installation and other Work of the Contract by use of temporary protective coverings approved by the railing manufacturer. Remove protective covering when other Work of the Contract is completed or when directed by the Engineer.

END OF SECTION

SECTION 05523

STEEL PIPE AND TUBE RAILINGS

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

05523A01 Drawings for fabrication and erection of handrails and railings, showing sizes, shapes and layout of all railing components. Include plans, elevations and details of fittings, connections, and anchorages to other Work. Furnish templates for anchors and bolts to be installed under other Sections.

Samples

05523C01 Samples for each type of finish shown on the Contract Drawings. Prepare samples on metal of same gauge and alloy to be used in Work. Where normal color and texture variations are to be expected, samples shall show limits of such variations. Include 6-inch long samples of distinctly different railing members including handrails, toprails, posts, rail coverings, and any appurtenances thereto, if any. Include samples of fittings and brackets.

Product Data

05523D01 Manufacturer's product specifications and instructions for products and processes used in the fabrication, assembly and installation of handrails and railings, including finishes and grout.

Calculations

05523H01 Professional Engineer: Demonstrate capabilities and experience. Include list of completed projects with project names, addressees, names of architects and owners.

Qualifications

05523K01 Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

05523K02 Welder: Evidence of current AWS certification.

DIVISION 5

SECTION 05530

GRATINGS

PART 1. GENERAL

1.01 SUMMARY

A. This Section specifies requirements for the following grating types and accessories, where shown on the Contract Drawings:

1. Metal bar gratings.
2. Expanded metal gratings.
3. Formed metal plank gratings.
4. Extruded aluminum plank gratings.
5. Metal frames and supports for gratings.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	American Architectural Manufacturers Association (AAMA)
AAMA 611	Specification for Anodized Architectural Aluminum.
	American Society of Mechanical Engineers (ASME)
ASME B18.21.1	Lock Washers (Inch Series).
ASME B18.22.1	Plain Washers.
	American Society for Testing and Materials (ASTM)
ASTM A 36	Specification for Carbon Structural Steel.
ASTM A 123	Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
ASTM A 276	Specification for Stainless Steel Bars and Shapes.
ASTM A 307	Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
ASTM A 510	Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel.
ASTM A 563	Specification for Carbon and Alloy Steel Nuts.
ASTM A 653	Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
ASTM A 666	Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
ASTM A 780	Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

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 209	Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
ASTM B 221	Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
ASTM B 316	Specification for Aluminum and Aluminum-Alloy Rivet and Cold-Heading Wire and Rods.
ASTM B 633	Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
ASTM D 1187	Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metals.
ASTM E 488	Test Method for Strength of Anchors in Concrete and Masonry Elements.
ASTM F 593	Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
ASTM F 594	Specification for Stainless Steel Nuts.
ASTM F 1267	Specification for Metal, Expanded, Steel.
	American Welding Society, Inc. (AWS)
AWS D1.1	Structural Welding Code – Steel.
AWS D1.2	Structural Welding Code – Aluminum.
AWS D1.3	Structural Welding Code – Sheet Steel.
AWS D1.6	Structural Welding Code – Stainless Steel.
	National Association of Architectural Metal Manufacturers (NAAMM)
NAAMM MBG 531	Metal Bar Grating Manual for Steel, Stainless Steel, and Aluminum Gratings and Stair Treads.
NAAMM MBG 532	Heavy-Duty Metal Bar Grating Manual for Structural Carbon Steel and Stainless Steel.
AMP 500-505	Metal Finishes Manual for Architectural and Metal Products.
	The Society for Protective Coatings (SSPC)
SSPC-Paint 12	Paint Specification No. 12 – Cold Applied Asphalt Mastic (Extra Thick Film).
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. Gratings shall be capable of resisting structural loads in accordance with AREMA Chapter 15, Section 8.5.3.2 Gratings shall also comply with applicable portions of OSHA. If OSHA is more stringent, it shall apply.

B. Gratings shall be capable of withstanding required gravity loads and structural loads, applicable to the specific grating use, without exceeding the allowable design working stress of the materials involved, including anchors and connections.

1.04 QUALITY ASSURANCE

A. When required by Appendix "A" of this Section, submit structural calculations for gratings, 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

A firm experienced in producing gratings similar to those shown on the Contract Drawings for Work of this Contract, with a record of successful in-service performance and sufficient production capacity to produce required units.

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. Engineering services are defined as those performed for installations of gratings that are similar in material, design and extent to those shown on the Contract Drawings for Work of this Contract.

D. Metal Bar Grating Standards

Comply with requirements of applicable portions of NAAMM MBG 531 and NAAMM MBG 532.

E. Welding Standards

Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and if pertinent, has undergone recertification. Qualify procedures and personnel according to the following as applicable:

1. AWS D1.1 Structural Welding Code – Steel.
2. AWS D1.2 Structural Welding Code – Aluminum.
3. AWS D1.3 Structural Welding Code – Sheet Steel.
4. AWS D1.6 Structural Welding Code – Stainless Steel.

F. Field Measurements

Where gratings are shown on the Contract Drawings to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate 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 MANUFACTURERS

A. Subject to compliance with requirements, furnish and install products by one of the following:

1. Metal Bar Gratings

   Alabama Metal Industries Corp. (AMICO), Birmingham, AL
   All American Grating, Inc., Pittsburgh, PA
   Barnett/Bates Corp., Joliet, IL
   Fisher & Ludlow (Div. of Harris Steel Ltd.), Plymouth, MI
   IKG Borden, Paramus, NJ
   Ohio Gratings, Inc., Canton, OH
   Tru-Weld Grating, Inc., Wexford, PA

2. Expanded Metal Gratings

   Alabama Metal Industries Corp. (AMICO), Birmingham, AL
   All American Grating, Inc., Pittsburgh, PA
   Fisher & Ludlow (Div. of Harris Steel Ltd.), Plymouth, MI

3. Formed Metal Plank Gratings

   Alabama Metal Industries Corp. (AMICO), Birmingham, AL
   Fisher & Ludlow (Div. of Harris Steel Ltd.), Plymouth, MI
   GS Metals Corp., Pinckneyville, IL
   IKG Borden, Paramus, NJ
   Morton Manufacturing Co., Libertyville, IL
   Unistrut Corp., Wayne, MI

4. Extruded Aluminum Plank Gratings

   AMICO-Klemp Corp., Birmingham, AL
   IKG Borden, Paramus, NJ
   Ohio Gratings, Inc., Canton, OH

2.02 MATERIALS

A. Steel

1. Steel Plates, Shapes, and Bars: ASTM A 36.
2. Steel Wire Rod for Grating Crossbars: ASTM A 510.
3. Uncoated Steel Sheet: ASTM A 1011, Commercial Steel, Type B.
4. Galvanized Steel Sheet: ASTM A 653, structural quality, Grade 33, with G90 coating.
5. Expanded Metal, Carbon Steel: ASTM F 1267, Type Regular or Flattened as shown on the Contract Drawings, Class 1 (uncoated sheet per ASTM A 1011, CS Type B).
6. Expanded Metal, Galvanized: ASTM F 1267, Type Regular or Flattened as shown on the Contract Drawings, Class 2 (hot-dip zinc-coated), Grade A (1.5 oz. per sq. ft. minimum coating thickness).

B. Stainless Steel

1. Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304.
2. Bars and Shapes: ASTM A 276, Type 304.
3. Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 316.
4. Bars and Shapes: ASTM A 276, Type 316.
5. Expanded Metal: ASTM F 1267, Type Regular or Flattened as shown on the Contract Drawings, Class 3.
6. For stainless steel units fabricated by welding, if any, use low-carbon type stainless steel.

C. Aluminum

1. Extruded Bars and Shapes: ASTM B 221, alloys as follows:
   a. For bearing bars of gratings and shapes: 6061-T6 or 6063-T6.
   b. For grating crossbars: 6061-T1.
2. Aluminum Sheet: ASTM B 209, alloy 5052-H32.

D. Fasteners

1. General: Type 304 or 316 stainless steel fasteners for exterior use and fasteners complying with ASTM B 633, 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. Fasteners for Stainless Steel Gratings: Type 304 or 316 stainless steel.
3. Fasteners for Aluminum Gratings: Type 304 or 316 stainless steel.
4. Bolts and Nuts: Regular hexagon-head bolts, carbon steel, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and flat washers where shown.
5. Lock Washers: Helical, spring type, carbon steel, ASME B18.21.1.
6. Plain Washers: Round, carbon steel, ASME B18.22.1.
7. 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 to comply with ASTM B 633, Class Fe/Zn 8.
   b. Exterior Locations: Stainless steel bolts complying with ASTM F 593, Alloy Group 1 or 2 and nuts complying with ASTM F 594.

E. Paint

1. Shop Primer for Steel

   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 mastic complying with SSPC-Paint 12 except containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

2.03 FABRICATION, GENERAL

Form gratings from materials of type, size, thickness and shapes shown on the Contract Drawings, but not less than that needed to support design loading.

A. Fabricate grating sections in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Shear and punch metals cleanly and accurately. Remove burrs. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise shown on the Contract Drawings.

C. Fit exposed connections accurately together to form hairline joints.

D. Welding: Comply with AWS recommendations and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.

E. Provide for anchorage of type shown on the Contract Drawings; coordinate with supporting structure. Fabricate and space anchoring devices to secure gratings, frames and supports rigidly in place and to support design loading.

F. Toe Plates, if any: Fabricate to fit grating units and weld to units in shop, unless otherwise shown on the Contract Drawings.

1. Height: Extend toe plates minimum of 4 inches above the top surface of the grating, unless otherwise shown on the Contract Drawings.

2.04 CONSTRUCTION FEATURES

A. Provide cutouts in grating sections for penetrations in sizes and at locations shown on the Contract Drawings. Cut openings neatly and accurately to size. Arrange cutouts to permit grating removal without disturbing items penetrating gratings where removable grating section is shown on the Contract Drawings.

B. Metal Bar Gratings

1. Fabricate bar grating by one of the following methods as shown on the Contract Drawings:

a. Welded (steel or stainless steel).

b. Press-Locked (steel, aluminum or stainless steel).

c. Swage-Locked (aluminum or stainless steel).

d. Riveted (steel, aluminum or stainless steel).

2. Fabricate gratings with cross bars and bearings bars in material, type, sizes and spacings shown on the Contract Drawings, but not less than that required to comply with structural performance requirements.

3. Edge-band openings in grating that interrupt 4 or more bearing bars with bars of the same size and material as bearing bars.

4. Fabricate removable grating sections, if any, with banding bars attached by welding to entire perimeter of each removable section. Include anchors and fasteners of type shown on the Contract Drawings or, if not shown, as recommended by manufacturer for attaching to supports.

5. Traffic Surface for Steel and Stainless Steel Bar Gratings

Plain, serrated, knurled or an applied abrasive finish consisting of aluminum oxide (corundum) aggregate in an epoxy-resin adhesive, as shown on the Contract Drawings.

6. Traffic Surface for Aluminum Bar Gratings

Plain, grooved or an applied abrasive finish consisting of aluminum-oxide aggregate in an epoxy-resin adhesive, as shown on the Contract Drawings.

7. Finish

a. Steel: Hot-dip galvanize exterior steel bar gratings after fabrication; shop prime paint interior steel bar gratings, unless otherwise shown on the Contract Drawings.

b. Aluminum: Mill finish, as fabricated, unless otherwise shown on the Contract Drawings.

c. Stainless Steel: Mill finish, as fabricated, unless otherwise shown on the Contract Drawings.

C. Expanded Metal Gratings

1. Furnish expanded metal gratings in material, finish, type, size, thickness and weight shown on the Contract Drawings or, if not shown, as recommended by manufacturer for applications shown and as needed to support design loads.

2. Edge-band openings with bars of thickness not less than overall grating thickness at contact points.

3. Where gratings are pierced by pipes, ducts and structural members, cut openings and weld a strap collar not less than 1/8 inch thick to the cut ends. Divide panels into sections only to the extent required for installation where grating platforms and runways are to be placed around previously installed pipe, ducts and structural members.

D. Formed Metal Plank Gratings

1. Furnish formed metal plank gratings in type, size, thickness, material and finish shown on the Contract Drawings or, if not shown, as recommended by manufacturer for applications shown and as needed to support design loads.

2. Type: C-shaped channel rolled from heavy sheet metal, punched in serrated diamond shape to produce raised slip-resistant surface and drainage holes.

3. Material: As follows and as shown on the Contract Drawings:

   a. Steel: 0.1046 inch thick (12 gage), ASTM A 653, G90 pre-galvanized.

   b. Aluminum: 0.100 inch thick, mill finish, unless otherwise shown.

4. Edge-band openings with metal sheet or bars having a thickness not less than grating material.

5. Where gratings are pierced by pipes, ducts and structural members, cut openings and weld a minimum 1/8 inch thick strap collar to the cut ends. Divide panels into sections only to the extent required for installation where grating platforms and runways are to be placed around previously installed pipe, ducts and structural members.

6. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

   "Diamond-Grip", Alabama Metal Industries Corp. (AMICO), Birmingham, AL
   "Grip Span", Fisher & Ludlow (Div. of Harris Steel Ltd.), Plymouth, MI
   "Grip Strut", GS Metals Corp., Pinckneyville, IL
   "Deck Span", IKG Borden, Paramus, NJ
   "Grip-Trac", Morton Manufacturing Co., Libertyville, IL
   "United Interlock", Unistrut Corp., Wayne, MI

E. Extruded Aluminum Plank Gratings

1. Furnish extruded aluminum plank gratings in type, size and finish shown on the Contract Drawings or, if not shown, as recommended by manufacturer for applications shown and as needed to support design loads.

2. Type: Extruded aluminum planks approximately 6 inches wide with multiple flanges approximately 1.2 inches o.c., acting as bearing bars connected by a web that serves as a walking surface. Top surface shall have raised ribs to increase slip resistance.

3. Depth: 2 inches, unless otherwise shown on the Contract Drawings.

4. Perforations: Rectangular, 19/32 by 3 inches, with adjacent rows staggered, unless otherwise shown on the Contract Drawings.

5. Finish: Mill, as fabricated, unless otherwise shown.

F. Grating Frames and Supports

1. Steel Frames and Supports: Fabricate from steel shapes, plates and bars of same basic metal and finish as grating, unless otherwise shown. Fabricate of welded construction to sizes, shapes and profiles shown on the Contract Drawings and as necessary to receive gratings. Miter and weld connections for perimeter angle frames. Cut, drill and tap units to receive anchorage, hardware and similar items.

2. Aluminum Frames: Fabricate frames for extruded aluminum gratings from extruded aluminum shapes of same basic material and finish as grating, to sizes, shapes and profiles shown on the Contract Drawings and as necessary to receive gratings. Miter and weld connections. Cut, drill and tap units to receive anchorage, hardware and similar items.

3. Equip units with integrally welded anchors for casting into concrete or building into masonry.

   a. Space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches wide by 1/4 inch thick by 8 inches long, unless otherwise shown on the Contract Drawings.

4. Galvanize steel frames and supports in the following locations:

   a. Exterior.

   b. Interior, where shown on the Contract Drawings.

2.05 SHOP FINISHING

A. Galvanized Steel

For items indicated to be galvanized, apply zinc coating by the hot-dip process complying with ASTM A 123. Minimum coating weight shall be 1.8 oz. per sq. ft. of coated surface. Where gratings, frames and supports are shown to be painted after galvanizing, prime and finish paint in accordance with Division 9 Section on Painting.

B. Painted Uncoated Steel

1. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed items:

   a. Exteriors (SSPC Zone 1B): SSPC-SP 6.

   b. Interiors (SSPC Zone 1A): SSPC-SP 3.

2. Shop Priming: Apply shop primer to prepared, uncoated surfaces of gratings, frames and supports, except those to be embedded in concrete or masonry, unless otherwise shown on the Contract Drawings. Comply with SSPC-PA 1 for shop painting.

3. Finish Painting: Finish paint shop primed surfaces of gratings, frames and supports in accordance with Division 9 Section on Painting.

C. Finishes

1. Comply with NAAMM's *Metal Finishes Manual for Architectural and Metal Products* for recommendations for applying and designating finishes.

2. Finish aluminum and stainless steel gratings, frames and supports after assembly.

3. Aluminum Finish: Class I clear anodic; AA M12-C22-A41 (0.7 mil or thicker), complying with AAMA 611 for gratings, supports and frames where shown on the Contract Drawings.

4. Stainless Steel Finish: Mill, unless other finish is shown on the Contract Drawings.

PART 3. EXECUTION

3.01 PREPARATION

Coordinate installation of anchorages for gratings, grating frames and supports. Furnish setting drawings, templates and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to construction site in time for installation.

3.02 INSTALLATION

A. General

1. Fastening to In-Place Construction: Install anchorage devices and fasteners where necessary for securing gratings to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts and other connectors.
2. Cutting, Fitting, and Placement: Perform cutting, drilling and fitting required for installing gratings. Set units accurately in location, alignment and elevation measured from established lines and levels and free from rack.
3. Provide temporary bracing or anchors in formwork for items that are to be built into concrete or masonry.
4. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
5. Field attach toe plates which could not be factory welded by field welding, unless otherwise shown on the Contract Drawings.
6. Field Welding: Comply with the following:
   a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   b. Obtain fusion without undercut or overlap.
   c. Remove welding flux immediately.
   d. Do not weld, cut or abrade the surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
7. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood or dissimilar metals with a heavy coat of bituminous paint.

B. Installing Metal Bar Gratings

1. General: Install gratings to comply with recommendations of referenced metal bar grating standards that apply to grating types and bar sizes shown on the Contract Drawings, including installation clearances, minimum bearing dimensions at supports and standard anchoring details.
2. Install gratings with cross bars on top side.
3. Do not notch bearing bars at supports to maintain elevation.

4. Attach removable units to supporting members with type and size of clips and fasteners shown on the Contract Drawings or, if not shown, as recommended by grating manufacturer for type of installation conditions shown.

5. Attach nonremovable units to supporting members by welding where both materials are the same; otherwise, fasten by bolting as indicated above.

C. Installing Expanded Metal Gratings

1. General: Comply with manufacturer's written instructions for installing gratings.

2. Place units with straight edge of bond up and with the long direction of diamond-shaped openings (LWD) parallel to direction of span.

3. Attach removable units to supporting members by bolting at 6 inch intervals.

4. Attach nonremovable units to supporting members by welding, unless otherwise shown on the Contract Drawings. Space welds at 6 inch intervals.

5. Attach aluminum units to steel supporting members by bolting at 6 inch intervals.

6. Butt edges parallel to long direction of diamond-shaped openings and weld at every second bond point. Place individual grating sections so diamonds of one piece are aligned with diamonds of adjacent sections.

D. Installing Metal Plank Gratings

1. General: Comply with manufacturer's written instructions for installing gratings. Use manufacturer's standard anchor clips and hold-down devices for bolted connections.

2. Attach removable units to supporting members by bolting at every point of contact.

3. Attach nonremovable units to supporting members by welding, unless otherwise shown on the Contract Drawings. Comply with manufacturer's written instructions for size and spacing of welds.

4. Attach aluminum units to steel supporting members by bolting at side channels at every point of contact and by bolting intermediate planks at each end on alternate sides. Bolt adjacent planks together at midspan.

3.03 ADJUSTING AND CLEANING

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 the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop painted surfaces. Apply by brush or spray in a minimum dry film thickness of 2.0 mils.

2. Galvanized Surfaces: Clean field welds, bolted connections and abraded areas. Repair galvanizing to comply with ASTM A 780. Apply by brush or spray in a minimum dry film thickness of 3 mils.

END OF SECTION

SECTION 05530

GRATINGS

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

05530A01 Shop Drawings: Show fabrication and installation details for gratings. Include plans, elevations, sections, and details of connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other Sections. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation, where required.

Product Data

05530D01 Formed-metal plank gratings.

05530D02 Extruded-aluminum plank gratings.

05530D03 Clips and anchorage devices for gratings.

05530D04 Paint products.

Certificates

05530E01 Mill Certificates: Signed by manufacturers of stainless-steel sheet certifying that products furnished comply with requirements.

05530E02 Welding Certificates: Copies of certificates for welding procedures and personnel.

Qualifications

05530K01 Qualification Data: For firms and persons specified in Article 1.04 "Quality Assurance" to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

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:

Samples

09910C01 On a 12 inch x 12 inch hard board ormetal panels, two samples of each paint and coating material, with texture to simulate actual conditions if requested by the engineer. If more than one application method is to be used, submit two samples of each paint and coating material for each application method.

09910C02 Identify each sample as to manufacturer, color name and number, location and application.

09910C03 Submit in color(s) shown on the Contract Drawings or if not shown in color(s) as selected by the Engineer from manufacturer's color chart

09910C04 On actual wood surfaces, two 4 inch x 8 inch samples of each natural and stained wood material. Identify each sample as to manufacturer and location application

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

09910D02 Submit to the Engineer one copy of U.S. Department of Labor Material Safety Sheets (MSDS) for hazardous chemicals utilized during the Work of this Section.

Qualifications

09910K01 Provide the company name and qualifications or experience.

09910K02 Submit Instructor"s qualification and training records for blasters and painters as required by 1.04 C 1. b if requested by the engineer.

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.

Inspection Reports

09910O01 Submit copy of daily log reports, as required by 3.03 B.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
Steel	Gloss	S-1G*	Organic Zinc Rich	Carboline Carbozinc 859	Epoxy	Carboline Carboguard 888	Aliphatic Polyurethane Gloss	Carboline Carbothane 134 HG
				PPG PMC Amercoat 68 HS		PPG PMC Amercoat 399		PPG PMC Amercoat 450 H
				SW Zinc Clad III HS		SW Macropoxy 646		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	Epoxy	Carboline Carboguard 893	Aliphatic Polyurethane Gloss	Carboline Carbothane 134 HG
				PPG PMC Dimetcote 9 HS		PPG PMC Amercoat 385		PPG PMC Amercoat 450 H
				Sherwin-Williams Zinc Clad II		Sherwin Williams Macropoxy 646		Sherwin-Williams Acrolon 218HS B65-600

Surface	System Designation	Primer	Manufacturer's Product	2nd Coat	Manufacturer's Product	Top Coat	Manufacturer's Product
B. 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

END OF APPENDIX "B"

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:

Shop Drawings

16000A06 Working drawings for the installation sequence of medium voltage cables, and other systems where shown on the Contract Drawings, including the reel designations for each leg of the installation. Drawings shall include the calculations for pulling tensions and sidewall pressure of all cable pulls, including identification of manhole locations with splices and manholes that will be "pulled-through" without splicing. Calculations shall be certified and sealed by a Professional Engineer licensed in the State in which the Work is to be performed.

Catalog Cuts

16000B01 Conduit, and fittings.

16000B02 Wire and cable.

16000B03 Wiring devices.

16000B04 Multi-outlet assemblies.

16000B05 "Standard" outlet and junction boxes.

16000B06 Medium voltage cable, splicing and termination kits.

16000B07 Lightning arresters.

16000B08 Capacitors.

16000B09 Panel boards and cabinets.

16000B10 General purpose transformers.

16000B11 Circuit breakers.

16000B12 Lighting fixtures.

16000B13 Pulling devices and end seals.

16000B14 Special pull and junction boxes.

16000B15 Supporting devices.

Product Data

16000D01 Nameplate designations.

Calculations

16000H01 Calculations where required by the Specifications or the Contract Drawings.

Manuals, Warrantees/Guarantees

16000I01 Operation and maintenance manuals, where required by the Specifications or the Contract Drawings.

Qualifications

16000K01 Training, , experience and work history for certified splicers and welders.

Record Documents

16000M01 One set of Shop Drawings revised, completed and brought up to date showing the permanent construction as actually made, in accordance with "Shop Drawings, Catalog Cuts and Samples" of Division 1, and showing the exact location of all equipment and conduit runs, as actually installed.

Inspection Reports

16000O01 A final copy of the records and certified test reports for all tests, to the Engineer for review, for not less than the following:
Primary cable and terminators insulation testing.

16000O02 A final copy of the records and certified test reports for all tests, to the Engineer for review, for not less than the following:
Insulation testing of 600V (nominal) cables rated 100 amperes (#3 AWG) and above.

16000O03 A final copy of the records and certified test reports for all tests, to the Engineer for review, for not less than the following:
Ground resistance test of each service ground.

16000O04 A final copy of the records and certified test reports for all tests, to the Engineer for review, for not less than the following:
Ground fault circuit breaker and receptacle testing.

16000O05 A final copy of the records and certified test reports for all tests, to the Engineer for review, for not less than the following:
Setting of all adjustable overcurrent devices.

16000O06 A final copy of the records and certified test reports for all tests, to the Engineer for review, for not less than the following and Setting or size of all overload elements installed, indicating the following:
1. Motor designation.
2. Nameplate horsepower, full load current, voltage and phases.
3. Operating current and voltage.
4. Overload element size or setting.

16000O07 A final copy of the records and certified test reports for all tests, to the Engineer for review, for not less than the following:
Emergency power distribution equipment and system test results.

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.

16110B02 Surface Metal Raceway and Accessories.

16110B03 Underfloor Raceway and Accessories.

16110B04 Wireways and Auxiliary Gutters.

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 cnsistently 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

WIRES, 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

Manufacturer Test Reports

16120F01 Submit certified shop test reports for wires and cables.

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 16122

CABLES, SPLICES, TERMINATIONS (D.C. TRACTION POWER CABLE)

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for cables, splices, terminations and appurtenances for D.C. traction cables.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

	American Society for Testing and Materials (ASTM)
ASTM E 662	Test Method for Specific Optical Density of Smoke Generated by Solid Materials
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 189	Lead-Coated and Lead-Alloy Coated Soft Copper Wire for Electrical Purposes
ASTM D 1373	Medium-Voltage Rubber Insulating Tape
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
	Federal Specifications (FS)
FS HH I 553	Insulation Tape, Electrical (Rubber, Natural and Synthetic)
	Insulated Cable Engineers Association (ICEA)
ICEA S 68 516	Ethylene-Propylene-Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
	Institute of Electrical and Electronics Engineers (IEEE)
IEEE 48	High Voltage AC Cable Terminators, Test Procedure and Requirements
IEEE 383	Type Test of Class 1E Electric Cables, Field Splices and Connections for Nuclear Power Generating Stations.
IEEE 404	Standard for type Test of Cable Joints for Use with Extruded Dielectic

	Cable Rated 5,000 through 46,000 Volts, and Cable Joints for Use with Laminated Dielectic Cable Rated 2,500 through 500,000 Volts
IEEE 837	Standard for Qualifying Permanent Connections Used in Substation Grounding
	Military Specifications (MIL)
MIL-C-24643	Cable and Cord, Electrical Low Smoke for Shipboard Use.
	National Fire Protection Association (NFPA)
NFPA 70	National Electrical Code
NFPA 130	Standard for Fixed Guideway Transit Systems
NFPA 258	Standard Research Method for Determining Smoke Generation of Solid Materials
	Naval Engineer Standards (NES)
NES 713	Determination of the Toxicity Index of the Products of Combustion for Small Specimens of Material
	Underwriters Laboratories Inc. (UL)
UL 44	Rubber-Insulated Wires and Cables
UL 467	Grounding and Bonding Equipment
UL 510	Insulating Tape
UL 1685	Standards for Safety Vertical Tray Fire Propagation and Smoke Release Test for Electrical and Optical Fiber Cables
UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords.

1.03 QUALITY ASSURANCE

A. The manufacturer shall have a minimum of three (3) years experience in manufacturing cable of the type and size described herein and the Contractor shall have the manufacturer provide a list of installations and contracts for which he has produced such materials.

B. 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.

C. Cables that have been manufactured more than two years prior to installation shall not be used in the Work of this Section.

D. 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 this Work of this Section.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store material in a clean, dry space and protect from weather.

B. Unless otherwise shown on the Contract Drawings, cables shall be provided with factory fitted pulling devices and end caps to prevent the entrance of moisture into the cable.

C. Cable real sizes shall be limited to the maximum dimensions shown on the Contract Drawings.

1.05 SUBMITTALS

See Appendix "A" for submittal requirements.

PART 2. PRODUCTS

2.01 MANUFACTURER

List of acceptable manufacturers is shown on Contract Drawings.

2.02 CABLES

A. General

1. Locations, types, sizes and numbers of cables are shown on the Contract Drawings.
2. 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 or lead alloy coated or lead alloy coated), or ASTM B 3 (uncoated).
3. Unless otherwise shown on the Contract Drawings, cable jackets 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 criteria according to the test method of UL 1685.
   b. The halogen content of the 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 2.0 according to the test method of NES 713.
   d. The cable jackets shall comply with ICEA T-33-665 for smoke generation.
   e. The acid gas content of cable jackets shall not exceed a maximum of 2.0 percent according to the test method of MIL-C-24643.
   f. The cable insulation materials shall pass the smoke generation test in accordance with ASTM E 662. 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 Non-Flaming Avg. Ds (4 minutes)	100
Non Flaming Avg. Dm (20 minutes)	350

g. 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 Non-Flaming Avg. Ds (4 minutes)	50
Non Flaming Avg. Dm (20 minutes)	250

4. Pulling Devices and End Seals

a. Unless otherwise shown on the Contract Drawings, cables shall be provided with factory fitted pulling devices and end caps to be used shall be submitted to the Engineer for approval.

b. For pulling tensions up to 1000 pounds per grip, basket grips may be utilized.

c. All cables shall be end-sealed, at both ends of each length, with a heat-shrinkable cap to prevent the entrance of moisture.

5. Identification

a. The following information shall be durably printed on the jacket surface and repeated at intervals not exceeding 24 inches:

Manufacturer's Name
Manufacturing Plant No.
No. of Conductors
Size of Conductors
Insulation Material and thickness
Jacket Material LS-Non-Hal/No acid
2000 volts (rated voltage)
DC Traction Power Cable
Sequential Footage
Date of Manufacture
UL Listing (where applicable)

b. Each reel shall carry a tag identifying the manufacturer, cable type, size, voltage, and length of cable on reel.

B. Jacketed, Single Conductor D.C. Traction Power Cable

1. Voltage ratings shall be for 2,000 volts D.C. continuously, rated for 90 degree C operations, and capable of withstanding frequent spikes of 3,000 volts as is typical to occur in an electrical railroad system.

2. General Construction

a. Copper conductor, (bare, lead or tin coated,) Class B or Class C stranded as shown on the Contract Drawings in accordance with ASTM B 8 and ASTM B 33.

b. An opaque separating tape shall be applied over the conductor that shall prevent migration of the insulation into the conductors, so as to aid in stripping for terminating.

c. The insulation shall be ethylene propylene rubber concentricity extruded over the screen. The insulation thickness shall be 0.140 inches and the thickness at any point shall not be less than 90 percent of that value. The insulation shall otherwise conform to ICEA S 68-516. The insulation shall conform to Type II of these standards. The cable shall conform to the requirements of ASTM D 2802.

d. A cross-linked polyolifin jacket of 95 mils average thickness, with a minimum at any point of not less than 90 percent of that value, shall be extruded over the insulated conductor.

3. Maximum outer diameter shall be as shown on the Contract Drawings.

C. Cable Splicing, Terminating and Arcproofing Materials

1. 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.

2. 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 cable itself.

3. Splicing materials shall conform to the following:

a. Connectors shall be as follows:

(1) Uninsulated split sleeve solder connectors shall be high conductivity, corrosion-resistant type.

(2) Uninsulated solderless, comparison connectors shall be conductivity cooper or bronze, corrosion resistant type.

(3) Uninsulated solderless bolted connectors shall be high conductivity cooper or bronze, corrosion-resistant type.

(4) Welded type connectors.

b. Terminals

(1) Uninsulated solder terminals shall be high conductivity, corrosion resistant type.

(2) Uninsulated solderless compression terminals shall be high conductivity, corrosion-resistant type.

(3) Uninsulated solderless, bolted terminals shall be high conductivity cooper or bronze, corrosion-resistant type.

c. Shrinkable Tubing

(1) Heat shrinkable tubing shall be irradiated modified polyolifin.

(2) Cold shrinkable tubing.

d. Tapes and Sealers

(1) Vinyl Tape - Flame-retardant, cold and weather-resistant, 3/4 inch and 1 1/2 inch 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; 3/4 inch and wider (1, 1 1/2, 2 inches) as shown on the Contract Drawings or approved by the Engineer, conforming to ASTM D 1373 and 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.

e. Solder

(1) Solder used on solder type connectors or terminals shall be 50 Tin/50 Lead.

(2) Flux used when soldering conductor connectors shall be of a non-corrosive and non-acid type.

f. Arcproofing Material

(1) Fire resistant tape shall be Scotch (3M) No. 77, or approved equal.

(2) Glass, cloth binding tape shall be Scotch (3M) No. 69, or approved equal.

g. Special splicing materials and methods shall be as shown on the Contract Drawings.

h. Cable Tags - Stainless steel metal tags, No. 28 gauge and 3/4-inch wide, embossed with letters and numbers 5/16-inch high, fastened to the cable at both ends of tags with 1/16-inch diameter monel wire or stainless steel cable tags.

2.03 TESTS

A. Shop Tests

1. Unless otherwise shown on the Contract Drawings, regular AC and DC dielectri-withstand and insulation-resistance tests shall be performed for all cable in accordance with ICEA S68 516. Both tests shall be performed with cable submerged in a tank of water.

2. Flame tests for cables shall be performed in accordance with IEEE 383.

3. Smoke generation tests for cables shall be performed in accordance with ASTM E662.

4. Halogen content test shall be performed in accordance with MIL C 24643.

5. Toxicity index test shall be performed in accordance with NES 713.

6. The flame, smoke generation, halogen content and toxicity index tests shall be performed per cable production run as long as the same batch of compound is being used. A minimum of two (2) tests shall be performed for each. Test samples as chosen by the Engineer.

7. The test results shall be certified and submitted to the Engineer for each reel of cable.

8. Factory inspection and witnessing of tests by the Engineer shall be required for all cables furnished under this Contract. The Engineer reserves the right to revise the shop test schedule, 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.

9. The cost of the shop tests shall be borne by the Contractor.

B. Independent Laboratory Tests

1. If required by contract drawing the following tests shall be performed in conformance with AEIC or ICEA standards:

a. Regular AC and DC dielectric-withstand and insulation resistance.

b. Dissection and dimensional analysis.

c. Microscopic examination for voids, contaminants and protrusions.

d. Hot creep test to determine sate of cure of insulation.

e. Any other additional test that the Authority may require in order to assure the quality of the cable.

2. In the event that the cable does not conform and is rejected by the Authority, the cost of the independent lab test shall borne by the Contractor.

3. The independent laboratory, selected by the Authority, will provide the Authority and manufacturer with all test results in writing within 14 days after receiving test cable specimens.

PART 3. EXECUTION

3.01 PREPARATION

A. Prior to pulling cables, clean raceway systems of all foreign matter and perform all operations necessary so as not to cause damage to cables while pulling.

B. Prior to pulling cables into underground conduit systems, place a feeding tube approved by the Engineer at the entrance end of such systems.

3.02 INSTALLATION

A. Cable Installation

1. General

a. Keep cables dry at all times.

b. Seal cable ends with watertight end seals if splicing or terminating does not follow at once.

c. Before splicing or terminating cables, make a thorough inspection to determine that water has not entered the cables or that the 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.

B. Splices and Terminations

1. General

a. Unless otherwise noted herein or on the Contract Drawings, or where the Contractor submits pulling tension and sidewall pressure calculations and they are approved by the Engineer, all D.C. traction power cable shall be spliced in each chamber or manhole through which they pass. Sufficient slack shall be provided for several resplicings.

b. Any splicing or terminating methods other than those required by this Section, for which the components are in accordance with the requirements of this Section, shall be submitted to the Engineer for approval.

2. Insulated Wires and Cables

a. Splices and terminations shall be completed by workmen trained and experienced in the type of cable and the voltage class specified in this Section, with not less than 3 years experience in this type of work.

b. Where required by the Engineer, sample splices shall be demonstrated to the Engineer by each splicer performing the Work of this Section. The sample shall be provided to the Engineer after completion of the demonstration.

c. Splices shall conform to IEEE 404 and shall:

(1) meet the full electrical and physical integrity of the cable construction, including voltage rating, ampacity, and type of waterproofing;

(2) conform to the cable manufacturer's requirements and recommendations.

C. Arcproofing

1. All D.C. traction power cables in splice chambers or manholes or other points of access including equipment shall be arcproofed.

2. Arcproofing that has been disturbed for any reason, shall be reinstalled as soon as possible after the disturbance.

3. Arcproofing shall be installed as follows:

a. Cables shall be grouped by circuit and arcproofing applied over the group of 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 wrapped with opposing-lays.

c. Arcproofing shall be extended into the conduit opening or end bell of the raceway entering a splice chamber, manhole, junction box or other points of access.

d. Arcproofing tape shall be 1-1/2 inches wide where the diameter of the individual cable, or the circumscribed circle for the circuit group, is less than 1-3/4 inches. For larger diameters, the tape shall be 3 inches wide.

e. Arcproofing shall be performed by trained workers with 3 years of experience in this type of work.

D. Identification of Cables

1. Each cable shall be identified by its circuit in all junction boxes, manholes, splice chambers or other points of access, and at all termination points.

2. The circuit designations shall be as shown on the Contract Drawings. Tags shall be attached to 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. Cables that are arcproofed shall be identified outside the applied arcproofing.

5. Cable tags shall be stainless steel metal tags, gauge and 3/4-inch wide, embossed with letters and numbers 5/16-inch high, fastened to the cable at both ends of tags with 1/16-inch diameter monel metal wire or stainless cables ties.

3.03 FIELD TESTS

A. A copy of all test reports, together with an outline of the test method used, shall be given to the Engineer. If, in the opinion of the Engineer, and tests do not meet the requirements of good practice or codes, the Contractor shall promptly replaced, at his own expense, the material or equipment involved or by other approved means review his work so that subsequent tests will indicate acceptable standards.

B. Should the foregoing tests reveal any defects, Contractor shall promptly correct such defects and rerun the tests until the entire installation is satisfactory to the Engineer in all aspects.

END OF SECTION

SECTION 16122

CABLES, SPLICES, TERMINATIONS (D.C. TRACTION POWER CABLE)

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

16122A01 Working drawings shall be submitted for the calculations installation sequence. Drawings shall include pulling tensions and sidewall pressure calculations of all cable pulls, including identification of manhole locations with splices and manholes which will be "pulled through" without splicing.

Catalog Cuts

16122B01 Catalog Cuts shall be provided for the following but not limited to:
1. D.C. traction power cable(s)
2. Connectors and terminators
3. Splices
4. Pulling devices and end seals
5. DC Power Cable Pothead

Manufacturer Test Reports

16122F01 Submit certified shop test reports for cable.

Record Documents

16122M01 Submit field test results of cables, including "Megger" readings with the method used.

END OF APPENDIX "A"

General Decision Number: NJ120047 06/29/2012 NJ47

Superseded General Decision Number: NJ20100052

State: New Jersey

Construction Type: Heavy

County: Bergen County in New Jersey.

HEAVY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/06/2012
1	02/17/2012
2	04/20/2012
3	05/25/2012
4	06/29/2012

* BRNJ0002-017 05/01/2012

	Rates	Fringes
BRICKLAYER	$ 36.95	25.37

Work on high stacks: 22% per hour additional.

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* BRNJ0004-001 05/01/2012

	Rates	Fringes
CEMENT MASON	$ 36.95	25.37

CARP0006-013 05/01/2012

	Rates	Fringes
CARPENTER (Including Form Work)	$ 41.28	55%

The first sixty feet at the regular rate, 10% per hour additional for each additional fifty feet thereafter.

CARP0715-007 05/01/2012

	Rates	Fringes
Millwright	$ 42.07	55%

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.

CARP1456-013 05/01/2008

	Rates	Fringes
CARPENTER (Dock Builder)		
Concrete form work	$ 37.00	27.02
All other work	$ 37.00	32.90

Work on land pile driving, floating marine construction and the construction of wharves, 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.

ELEC0164-007 06/02/2008

	Rates	Fringes
ELECTRICIAN		
Cable splicer	$ 54.00	54%
Electrician	$ 47.37	54%

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 07/01/2010

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 41.02	25.75
GROUP 2	$ 39.43	25.75
GROUP 3	$ 37.52	25.75
GROUP 4	$ 35.89	25.75
GROUP 5	$ 34.18	25.75

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 01/01/2012

	Rates	Fringes
Ironworkers:		
Reinforcing	$ 36.04	39.10
Structural, Ornamental	$ 38.84	39.10

LABO0172-008 03/01/2011

	Rates	Fringes
Laborers:		
Landsacpe Laborer, Power Tool Operator	$ 32.20	21.55

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 05/01/2009

	Rates	Fringes
LABORER		
MASON TENDER:		
Cement/Concrete	$ 28.55	19.42

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

SUNJ2004-023 01/02/2009

	Rates	Fringes

LABORER: Common or General.....$ 25.93 9.44

LABORER: Pipelayer.....$ 24.05 13.67

TEAM0560-003 05/01/2011

	Rates	Fringes
TRUCK DRIVER		
Dump Truck; Flatbed Truck...	$ 32.00	27.48
Off the Road Truck; Pickup Truck.....	$ 31.85	27.48

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.

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 rate.

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 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: NJ120052 06/29/2012 NJ52

Superseded General Decision Number: NJ20100057

State: New Jersey

Construction Type: Heavy

County: Essex County in New Jersey.

HEAVY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/06/2012
1	02/17/2012
2	04/20/2012
3	05/25/2012
4	06/29/2012

* BRNJ0004-001 05/01/2012

	Rates	Fringes
CEMENT MASON	$ 36.95	25.37

CARP0006-009 05/01/2012

	Rates	Fringes
CARPENTER (Scaffold Builder)	$ 41.28	55%

The first sixty feet at the regular rate, 10% per hour additional for each additional fifty feet thereafter.

CARP0006-013 05/01/2012

	Rates	Fringes
CARPENTER (Including Form Work)	$ 41.28	55%

The first sixty feet at the regular rate, 10% per hour additional for each additional fifty feet thereafter.

CARP0715-007 05/01/2012

	Rates	Fringes
Millwright	$ 42.07	55%

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 06/02/2008

	Rates	Fringes
ELECTRICIAN		
Cable splicer	$ 54.00	54%
Electrician	$ 47.37	54%

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 07/01/2010

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 41.02	25.75
GROUP 2	$ 39.43	25.75
GROUP 3	$ 37.52	25.75
GROUP 4	$ 35.89	25.75
GROUP 5	$ 34.18	25.75

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 01/01/2012

	Rates	Fringes
Ironworkers:		
Reinforcing	$ 36.04	39.10
Structural, Ornamental	$ 38.84	39.10

LABO0172-009 03/01/2011

	Rates	Fringes
Laborers:		
Common or General Laborer; Landscape Laborer, Power Tool Operator	$ 32.20	21.55
Pipelayer	$ 32.90	21.55

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 05/01/2009

	Rates	Fringes
LABORER		
MASON TENDER:		
Cement/Concrete	$ 28.55	19.42

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 05/01/2011

	Rates	Fringes
PIPEFITTER	$ 48.94	25.30

TEAM0408-003 05/01/2011

	Rates	Fringes
TRUCK DRIVER		
Dump Truck	$ 33.70	17.36+a
Off the Road Truck, Flatbed Truck, Pickup Truck, Vacuum Truck	$ 33.55	17.36+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 rate.

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 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: NJ130054 01/04/2013 NJ54

Superseded General Decision Number: NJ20120054

State: New Jersey

Construction Type: Heavy

County: Hudson County in New Jersey.

HEAVY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/04/2013

BRNJ0002-018 05/01/2012

	Rates	Fringes
BRICKLAYER	$ 36.95	25.37

Work on high stacks: 22% per hour additional.

BRNJ0004-001 05/01/2012

	Rates	Fringes
CEMENT MASON	$ 36.95	25.37

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* 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.

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* 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.

CARP1456-013 05/01/2008

	Rates	Fringes
CARPENTER (Dock Builder)		

Concrete form work	$ 37.00	27.02
All other work	$ 37.00	32.90

Work on land pile driving, floating marine construction and the construction of wharves, 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.

ELEC0164-008 06/04/2012

	Rates	Fringes
ELECTRICIAN		
Cable splicer	$ 47.69	62%
Electrician	$ 47.69	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 07/01/2012

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 42.02	27.25
GROUP 2	$ 40.43	27.25
GROUP 3	$ 38.52	27.25
GROUP 4	$ 36.89	27.25
GROUP 5	$ 35.18	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:
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 01/01/2012

	Rates	Fringes
Ironworkers:		
Reinforcing	$ 36.04	39.10
Structural, Ornamental	$ 38.84	39.10

LABO0172-008 03/01/2011

	Rates	Fringes
Laborers:		
Landsacpe Laborer, Power Tool Operator	$ 32.20	21.55

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.

LAB00222-013 05/01/2009

	Rates	Fringes
LABORER		
MASON TENDER:		
Cement/Concrete	$ 28.55	19.42

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

SUNJ2004-030 01/02/2009

	Rates	Fringes
LABORER: Common or General	$ 28.82	8.46
LABORER: Pipelayer	$ 24.05	13.67

TEAM0560-003 05/01/2011

	Rates	Fringes
TRUCK DRIVER		
Dump Truck; Flatbed Truck	$ 32.00	27.48
Off the Road Truck; Pickup Truck	$ 31.85	27.48

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.

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:

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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: NJ120057 06/29/2012 NJ57

Superseded General Decision Number: NJ20100062

State: New Jersey

Construction Type: Heavy

County: Middlesex County in New Jersey.

HEAVY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/06/2012
1	04/20/2012
2	05/18/2012
3	05/25/2012
4	06/29/2012

* BRNJ0004-001 05/01/2012

	Rates	Fringes
CEMENT MASON	$ 36.95	25.37

CARP0006-014 05/01/2012

	Rates	Fringes
CARPENTER	$ 41.28	55%

The first sixty feet at the regular rate, 10% per hour additional for each additional fifty feet thereafter.

CARP0715-007 05/01/2012

	Rates	Fringes
Millwright	$ 42.07	55%

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.

CARP1456-013 05/01/2008

	Rates	Fringes
CARPENTER (Dock Builder)		
Concrete form work	$ 37.00	27.02
All other work	$ 37.00	32.90

Work on land pile driving, floating marine construction and the construction of wharves, 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.

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* ELEC0456-010 06/04/2012

	Rates	Fringes
ELECTRICIAN		
Cable splicer	$ 50.48	66%
Electrician	$ 45.50	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.

ENGI0825-021 07/01/2010

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 41.02	25.75
GROUP 2	$ 39.43	25.75

GROUP 3.....	$ 37.52	25.75
GROUP 4.....	$ 35.89	25.75
GROUP 5.....	$ 34.18	25.75

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

IRON0011-011 01/01/2012

MIDDLESEX COUNTY (Northern Half of County)

	Rates	Fringes
Ironworkers:		
Reinforcing	$ 36.04	39.10
Structural, Ornamental, Rigger	$ 38.84	39.10

IRON0068-016 07/01/2011

MIDDLESEX COUNTY (Southern Half of County)

	Rates	Fringes
Ironworker		
Reinforcing	$ 32.35	18.78
Structural, Ornamental, Rigger	$ 34.35	18.78

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.

LABO0172-009 03/01/2011

	Rates	Fringes
Laborers:		
Common or General Laborer; Landscape Laborer, Power Tool Operator	$ 32.20	21.55
Pipelayer	$ 32.90	21.55

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 05/01/2009

	Rates	Fringes
LABORER		
MASON TENDER:		
Cement/Concrete.....	$ 28.55	19.42

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

PLUM0009-028 09/01/2011

MIDDLESEX COUNTY (does not include the Boroughs of Dunellen and Middlesex; Township of Piscataway; Borough of South Plainfield)

	Rates	Fringes
PIPEFITTER	$ 42.38	30.80
Service and Repair	$ 33.28	18.03
PLUMBER	$ 43.53	26.65
Service and Repair	$ 33.28	18.03

PLUM0024-021 05/01/2011

MIDDLESEX COUNTY (Boroughs of Dunellen and Middlesex; Township of Piscataway; Borough of South Plainfield)

	Rates	Fringes
PLUMBER	$ 46.31	28.09

PLUM0475-021 05/01/2011

MIDDLESEX COUNTY (Boroughs of Dunellen and Middlesex; Township of Piscataway; Borough of South Plainfield)

	Rates	Fringes
PIPEFITTER	$ 48.94	25.30

TEAM0469-008 05/01/2008

	Rates	Fringes
Truck drivers:		

Dump Truck; Flatbed Truck...	$ 33.00	19.185
Off the Road Truck; Pickup Truck.....	$ 32.85	19.185

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 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.

VACATION PAY CREDIT:
Workers working or receiving pay for 80 days within a year receive one week paid vacation (48 hours); 125 days receive two weeks paid vacation (96 hours); 145 days receive 15 days paid vacation (120 hours); 15 years seniority and 145 days receive 4 weeks paid vacation (160 hours).

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 rate.

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 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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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:

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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: NJ120065 06/29/2012 NJ65

Superseded General Decision Number: NJ20100070

State: New Jersey

Construction Type: Heavy

County: Union County in New Jersey.

HEAVY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/06/2012
1	02/17/2012
2	04/20/2012
3	05/25/2012
4	06/29/2012

* BRNJ0004-001 05/01/2012

	Rates	Fringes
CEMENT MASON	$ 36.95	25.37

CARP0006-009 05/01/2012

	Rates	Fringes
CARPENTER (Scaffold Builder)	$ 41.28	55%

The first sixty feet at the regular rate, 10% per hour additional for each additional fifty feet thereafter.

CARP0006-013 05/01/2012

	Rates	Fringes
CARPENTER (Including Form Work)	$ 41.28	55%

The first sixty feet at the regular rate, 10% per hour additional for each additional fifty feet thereafter.

CARP0715-007 05/01/2012

	Rates	Fringes
Millwright	$ 42.07	55%

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.

ELEC0102-026 09/05/2011

	Rates	Fringes
ELECTRICIAN		
Cable Splicer	$ 52.55	55.5%
Electrician	$ 47.77	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: 114% times the journeyman rate.

ENGI0825-021 07/01/2010

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 41.02	25.75
GROUP 2	$ 39.43	25.75
GROUP 3	$ 37.52	25.75
GROUP 4	$ 35.89	25.75
GROUP 5	$ 34.18	25.75

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 01/01/2012

	Rates	Fringes

Ironworkers:		
Reinforcing	$ 36.04	39.10
Structural, Ornamental	$ 38.84	39.10

LAB00172-007 03/01/2011

	Rates	Fringes
Laborers:		
Landsacpe Laborer, Power Tool Operator	$ 32.20	21.55
Pipelayer	$ 32.90	21.55

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.

LAB00222-013 05/01/2009

	Rates	Fringes
LABORER		
MASON TENDER:		
Cement/Concrete	$ 28.55	19.42

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 05/01/2011

	Rates	Fringes
PIPEFITTER.....	$ 48.94	25.30

SUNJ2004-041 01/02/2009

	Rates	Fringes
LABORER: Common or General.....	$ 26.73	13.67

TEAM0408-003 05/01/2011

	Rates	Fringes
TRUCK DRIVER		
Dump Truck.....	$ 33.70	17.36+a
Off the Road Truck, Flatbed Truck, Pickup Truck, Vacuum Truck.....	$ 33.55	17.36+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.

TEAM0469-009 05/01/2008

Union County (South of Wood Ave.)

	Rates	Fringes
Truck drivers:		
Dump Truck	$ 33.00	19.185
Off the Road Truck, Flatbed Truck, Pickup Truck, Vacuum Truck	$ 32.85	19.185

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 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.

VACATION PAY CREDIT:
Workers working or receiving pay for 80 days within a year receive one week paid vacation (48 hours); 125 days receive two weeks paid vacation (96 hours); 145 days receive 15 days paid vacation (120 hours); 15 years seniority and 145 days receive 4 weeks paid vacation (160 hours).

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 rate.

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 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: NJ130002 01/04/2013 NJ2

Superseded General Decision Number: NJ20120002

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	01/04/2013

BRNJ0002-005 05/01/2012

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	$ 36.95	25.37

Work 100 degrees F. and over:
to be paid at the rate of double time.

Work on high stacks:

22% per hour additional.

BRNJ0002-006 05/01/2012

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	$ 36.95	25.37

Work 100 degrees F. and over:
to be paid at the rate of double time.

Work on high stacks:
22% per hour additional.

BRNJ0002-008 05/01/2012

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	$ 36.95	25.37

Cement mason:
Epoxy, acid and latex work: $.50 per hour additional.

BRNJ0002-009 05/01/2012

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	$ 36.95	25.37

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.

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* ELEC0102-001 06/03/2012

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	$ 53.99	55%
Ground person	$ 26.496	51%
Groundman	$ 29.45	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	$ 49.08	55%
Line technician-welder	$ 51.53	55%
Lineman; 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	$ 47.12	54%
All other work:		
Cable splicer	$ 53.99	55%
Ground person	$ 26.496	51%
Groundman	$ 29.45	55%
Line technician; equipment operator	$ 44.16	51%
Line technician-welder	$ 51.53	55%
Lineman; equipment operator	$ 49.08	55%

Work with, or the removal of, asbestos materials: 114% times the journeyman rate.

ELEC0102-002 06/04/2012

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	$ 53.99	55.0%
Electrician	$ 48.93	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: 114% times the journeyman rate.

ELEC0164-002 06/04/2012

BERGEN, ESSEX AND HUDSON COUNTIES:

	Rates	Fringes
Electricians:		
Electrician	$ 47.69	62%
All other work:		
Cable splicer	$ 47.69	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 10/01/2006

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	$ 35.58	47.3%
Line technician; cable splicer; heavy equipment operator	$ 44.48	47.3%
All other work:		
Ground person; truck with winch operator	$ 35.58	47.3%
Line technician; cable		

splicer; heavy equipment operator	$ 44.48	47.3%

ELEC0456-001 06/04/2012

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	$ 45.50	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 06/04/2012

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	$ 45.50	67.25%

ENGI0825-004 07/01/2012

	Rates	Fringes
Power equipment operators:		
Steel erection:		
GROUP 1	$ 46.04	27.25
GROUP 2	$ 44.38	27.25
GROUP 3	$ 44.65	27.25
GROUP 4	$ 40.59	27.25
GROUP 5	$ 38.93	27.25
GROUP 6	$ 37.40	27.25
GROUP 7	$ 35.64	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:
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 07/01/2012

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 42.02	27.25
GROUP 2	$ 40.43	27.25
GROUP 3	$ 38.52	27.25
GROUP 4	$ 36.89	27.25
GROUP 5	$ 35.18	27.25
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 01/01/2012

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	$ 36.04	39.10
Structural	$ 38.84	39.10

IRON0036-003 07/01/2009

WARREN COUNTY

	Rates	Fringes
Ironworkers:	$ 34.05	22.42

IRON0068-004 07/01/2011

MIDDLESEX COUNTY (south half); SOMERSET COUNTY (south half):

	Rates	Fringes
Ironworker	$ 34.35	18.78

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 03/01/2011

	Rates	Fringes
Laborers:		
GROUP 1	$ 32.20	21.55
GROUP 2	$ 32.90	21.55
GROUP 3	$ 33.15	21.55
GROUP 4	$ 36.70	21.55

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 05/01/2012

	Rates	Fringes
Painters:		
Work on bridges (all bridges that span major waterways, railroad bridges, bridges over canyons, overpasses)	$ 49.78	21.25

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 05/01/2010

BERGEN, ESSEX, HUDSON, MORRIS, PASSAIC, SUSSEX, UNION AND WARREN COUNTIES:

	Rates	Fringes
CEMENT MASON	$ 40.00	21.75

Cement masons:
Work on suspended staging, not supported from the ground:
$.50 per hour additional.

PLAS0592-030 05/01/2012

HUNTERDON, MIDDLESEX, SOMERSET AND UNION COUNTIES:

	Rates	Fringes
Cement mason	$ 38.37	28.56

TEAM0408-001 05/01/2011

ESSEX, MORRIS, SUSSEX AND UNION COUNTIES:

	Rates	Fringes
Truck drivers:		
Group 1	$ 33.80	17.36+a
Group 2	$ 33.70	17.36+a

Group 3.....	$ 33.60	17.36+a
Group 4.....	$ 33.55	17.36+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, 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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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 05/01/2011

BERGEN, HUDSON AND PASSAIC COUNTIES:

	Rates	Fringes
Truck drivers:		
Group 1	$ 31.85	27.48
Group 2	$ 31.90	27.48
Group 3	$ 32.00	27.48
Group 4	$ 32.10	27.48

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.

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.

Revised 12/17/2008

THE PORT AUTHORITY OF NY & NJ

Certification Application for the Minority and Women-owned Business Enterprise Program

PLEASE PRINT OR TYPE CLEARLY

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
- Whenever the space is insufficient to answer the questions completely, attach additional sheets as necessary. Use the question number to identify any answer continued on an additional sheet
- For questions, call the Certification Helpline at 212-435-7808 or E-mail objocert@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 & Job Opportunity - Certification Unit
233 Park Avenue South, 4th floor
New York, NY 10003

SECTION I: MAIN COMPANY INFORMATION

1. Business Name

Legal name of company applying to be certified

2. D.B.A.

"Doing Business As"- Complete if company does business under a name which is different from its legal name.

3. Business Address (must represent a physical location; cannot be a Post Office Box)

Street Address — Suite / Apt / Room/ Unit

City — State — Zip/Zip+4

County

4. Business Mailing Address (complete only if different from the address given in Question 3)

Street Address — Suite / Apt / Room/ Unit

City — State — Zip/Zip+4

5. Business Phone ( ) ---

5a. Business Fax ( ) ---

6. Business Website

7. Your E-mail Address

7a. Your Cell Phone Number ( )

8. Federal EIN or SSN

Schedule A

9. 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

10. This company is applying for certification as ("X"all that apply)

Minority-owned Business Enterprise (MBE) ☐

Women-owned Business Enterprise (WBE) ☐

Refer to page _____ of the Application Guidelines to determine the appropriate designation for your company.

11. Are you currently involved in the bidding process or other contract/purchase order negotiations with the Port Authority or Port Authority tenants?

Yes_____ No_____

If "Yes", identify the department within the Port Authority and/or name of tenant and contact name

12. Has your company 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 details

Name of Governmental Entity	Program (MBE, WBE, SBE, DBE)	Status (Pending, Certified, Decertified, Denied, Rejected, Revoked, On Appeal)	Date (mm/yy)

13. How did you first hear about The Port Authority of NY & NJ's M/W/DBE Certification program(s)? (please choose only one)

Letter/Call/E-mail ☐

Port Authority Web site ☐

Event ☐ _____

Please specify name or sponsor of event and date

Other ☐ _____

Please specify what and when

SECTION II: COMPANY OWNERSHIP

14. Business Structure

Sole Proprietorship	☐	Partnership (including LLP)	☐
Limited Liability Company (LLC)	☐	Corporation (including S-Corp.)	☐

15. Date company was established _____/_____/_____

16. Has the business existed under a different type of business structure prior to the Date Established indicated in question? 16

Yes_____ No_____

If "Yes", please provide copy of original Business Certificate

17. Has your Certificate of Incorporation, Business Certificate, or Certificate of Trade Name been amended?

Yes_____ No_____

If "Yes", please provide copy of amended Business Certificate

18. 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	☐	_____	

19. Date of origination (or acquisition, if later) _____/_____/_____

For the remaining questions in Section II which ask for 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.

01	Black	02c	Spanish	04	Native American
02a	Hispanic	03a	Asian-Pacific	05	White (Non-Minority)
02b	Portuguese	03b	Asian-Indian	06	Other

20. Please provide the following information for all person(s) with ownership interest in the company (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)

*** QUESTIONS 22-24 APPLY ONLY TO CORPORATIONS. *** *** IF YOUR COMPANY IS NOT A CORPORATION, SKIP TO QUESTION 25 ***

21. If the company is a corporation, please provide the following information for all shareholders identified in Question 21

Name (First and Last)	Position In Company	Number of Shares Owned	Unit Share Price Paid When Purchased

22. State the number of company shares in each of the following

Common Authorized _____ Common Issued _____

Preferred Authorized _____ Preferred Issued _____

23. 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 **

24. Please identify the capital contributions to the company by each person identified in Question 21, including cash, equipment, property, and expertise

Name (First and Last)	Type of Contribution	Total Dollar Value	Date of Contribution (mm/yy)

25. If your company is owned in whole or in part by another company, please identify the company and the percentage of ownership interest. Include venture capitalists and other similar investors

Company Name	Percentage Owned	Date Ownership Established (mm/yy)

SECTION III: COMPANY MANAGEMENT

26. Identify individuals responsible for managerial operations (*state if owner or non-owner*). Refer to group code definitions on prior page.

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			

27. Do any principals, officers, employees and/or owners of the firm have an affiliation, i.e. business interest or employment with any other firm?

Yes_____ No_____ (If "Yes", complete the following)

Name (First and Last)	Name and Address of Affiliated Firm	Nature of Business	Nature of Affiliation

28. 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: COMPANY FINANCES

29. Does your company have a Line of Credit?

Yes_____ No_____ If "Yes", please provide details:

_____

Bank Dollar Limit Name of Guarantor(s)

30. Please list all major current lenders to the company

Name of Lender	Amount of Loan	Terms of Repayment

31. Identify bank(s) where company accounts are maintained

Bank Name	Address	Contact Name	Contact Title	Type of Account

32. 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: COMPANY OPERATIONS

33. Check the industry which best describes your PRIMARY line of business

- ☐ Construction-related
- ☐ Consultants
- ☐ Consumer Service
- ☐ Manufacturer/Supplier
- ☐ Professional Service
- ☐ Purchasing
- ☐ Technical Service
- ☐ Other _____

34. If a license, permit or certification (e.g. Master Electrical License, PE for engineers, CDL for truck drivers, etc.) is required to conduct any part of your company's 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)

35. Is your company bonded? Yes_____ No_____

If "Yes", please provide detail:

Name of Agent/Broker	Surety Co.	Bonding Limit	
		Single $	Aggregate $

36. Is your company insured? Yes_____ No_____ If "Yes", please provide detail:

_____ _____

Carrier Name $ Amount of Liability Insurance

37. Please list the company's major equipment or machinery

Type	Depreciated $ Value	Acquisition Date (mm/yy)	Owned or Leased

38. 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

39. Does your company share office space, personnel or equipment with any other company?

Yes_____ No_____

If "Yes", please provide details.

Company Name	Phone	Personnel (X)	Office Space ("X")	Yard Space (X)	Equipment ("X")	Machinery (X)

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 as reflected in the resolution adopted by the Committee on Operations of the Port Authority on August 13, 1992.

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.

EIGHT, 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 4, 4a, 8d, 9, 10, 10a, 17, 18, 19, 24 and 25.

ELEVENTH, the criteria for certification by the Port Authority as a Small Business Enterprise are outlined in the documentation entitled "Small Business Enterprise Program (SBE) Administered by The Port Authority of New York and New Jersey" which accompanies this application. If the applicant believes that he/she is eligible for SBE certification, he/she may request that this application also be treated as an SBE certification application by signing below. If signature is provided, all acknowledgments and provisions of this M/WBE certification shall also apply.

Applicant _____ Date _____

VERIFICATION

STATE OF _____)

SS:

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 & Job Opportunity – Certification Unit
233 Park Avenue South, 4th Floor
New York, NY 10003

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 Regional and Economic Development /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.

Supporting Documentation Checklist

REQUIRED FOR ALL APPLICANTS Attach copies of the following documents, as applicable. Indicate documents submitted by checking appropriate boxes. PLEASE PROVIDE COPIES OF SUPPORTING DOCUMENTS ONLY - NOT THE ORIGINALS. 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 process, if warranted.

- ☐ 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, State and City tax returns (all pages, all schedules); Prior two (2) years of personal tax returns (1040's) for each person with ownership interest, including all applicable W-2 forms and schedules if in business less than three years

If you have one document that satisfies the requirements for numbers 2 – 4, submit only one copy.

REQUIRED FOR A SOLE PROPRIETORSHIP

☐ Copy of Business Trade Name or Certification Trade Name filed with County Clerk (If doing business under an assumed name)

REQUIRED FOR A PARTNERSHIP AND JOINT VENTURE PARTNERSHIP

Attach copies of the following: (Indicate documents submitted by checking appropriate boxes)

☐ 1. Business Certificate

☐ 2. Partnership Agreement

REQUIRED FOR A LIMITED LIABILITY COMPANY (Check appropriate boxes below)

☐ 1. Sole Proprietorship

☐ 2. Corporation

☐ 3. Partnership Agreement

Attach required documents and indicate documents submitted by checking appropriate boxes

☐ 1. Certificate of formation and/or organization

☐ 2. Operating and/or managing agreements

☐ 3. Franchise and/or third-party agreement

REQUIRED FOR A CORPORATION

Attach documents of the following: (Indicate documents submitted by checking appropriate boxes)

☐ 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
ADMINISTERED BY
THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

The Small Business Enterprise Programs are designed to promote New York and New Jersey businesses and to provide them with the advantage of competing against firms of like size and expertise in a limited competitive environment. In order to be eligible to participate in opportunities set-aside for the programs, the Port Authority must certify a firm as a Small Business Enterprise. To be eligible for certification, firms at a minimum:

- Must have a principal place of business in either New York or New Jersey.
- Must have operated that specific type of business for at least three (3) years.
- Must 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.

- **Architectural & Engineering (A&E) - $4.5 million**
  - ***Landscape Architectural Services - $7 million***
  - ***Marine Engineering & Naval Architecture - $18.5 million***

  In addition to adhering to maximum gross revenues Thresholds, A&E firms must also have minimum average annual revenues of more than $100,000 over the last three (3) fiscal years.

- **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**

- **Unarmed Guard Service - $18.5 million**

- **Financial Services - $7 million**

INFORMATION FOR DETERMINING JOINT VENTURE ELIGIBILITY

Return your submittal to:	*The Port Authority of NY & NJ* *Office of Business and Job Opportunity* *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/W/DBEs*
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 OR DISADVANTAGED BUSINESS ENTERPRISE PARTNER MUST COMPLET A UNIFORM CERTIFICATION APPLICATION – SCHEDULE A)

_____

_____

(B) DESCRIBE THE ROLE OF THE M/W/DBE 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 OF DBE 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	_____	_____

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

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

-4-

THE PORT AUTHORITY OF NY & NJ

Office of Business and Job Opportunity

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: _____

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

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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 after the opening of the Proposals for this Contract.

ENGINEER OF CONSTRUCTION INSTRUCTIONS: After the review of the submitted MBE/WBE Participation plan, forward to the Office of Business and Job Opportunity via fax at (212) 435-7828 or PAD to 233 PAS 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.

PA 3749 A/ 5-07

THE PORT AUTHORITY OF NY & NJ
Office of Business and Job Opportunity

CONSTRUCTION
MBE/WBE/DBE PARTICIPATION PLAN
MODIFIED

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

STATEMENT OF PAYMENTS TO M/W/DBE SUBCONTRACTORS/LESSORS/SUPPLIERS

Contract No: _____ Period Reporting: _____ (Example: 10/1/98 - 10/31/98)

Contract Title: _____ Payment Appl #: _____

Contractor: _____ % Project Completed: _____

SUBCONTRACTOR'S NAME	(Indicate) MBE WBE DBE	ESTIMATED TOTAL SUBCONTRACT AMOUNT	Column A + Column B = Column C AMOUNTS PAID Prior Statement	This Statement	Cumulative To-Date
					$0
					$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% paid. The 80% credit will be handled by the 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

SUPPLIERS/LESSORS	(Indicate) MBE WBE DBE	TOTAL AMOUNT SUPPLIER AGREEMENT	AMOUNTS PAID & TO BE PAID (Amounts entered should reflect 100% paid. The 40% credit will be handled by the prime.) Prior Statement	This Statement	Cumulative To-Date
					$0
					$0
					$0
					$0
					$0
					$0

Date Prepared: _____

Prepared by: _____

Title: _____

Officer's Signature: _____

Port Authority of NY & NJ
Resident Engineer's Office

Date Received: _____

Reviewed By: _____

Title: _____

Schedule D

ANALYSIS OF BID

THE PORT AUTHORITY OF NY & NJ

PROJECT **Hackensack River Bridge Deck and Rail Replacement**

BID DATE April 11, 2013

THIS IS NOT PART OF THE CONTRACT

SHEET 1 OF 2.

CONTRACTOR Railroad Construction Company, Inc.

CONTRACT NO. PAT-924.103

Unit No.	Descriptions [1]	Quantity	Unit [2]	Unit Price	Amount
1	GENERAL CONDITIONS (including construction layout & survey)	1	LS	—	$706,400 -
2	REMOVE & DISPOSE EXISTING TIMBERS	1	~~EA~~ LS	—	421,850 -
3	CONSTRUCT NEW BRIDGE TRACKWORK (Tracks G & H; including painting of top flanges of stringers that support the rail ties)	1	~~EF~~ LS	—	1,358,046 -
4	BALLAST, SURFACE, ALIGN TRACK	1	~~EF~~ LS	—	160,992 -
5	SAFETY NETTING & PROTECTION	1	LS	—	255,700 -
6	CONCRETE FOR EMBEDDED TIE REPLACEMENT	1	~~EA~~ LS	—	86,000 -
7	PLATFORM & WALKWAY EXTENSIONS	1	~~EA~~ LS	—	32,400 -
8	FINAL TRACK INSPECTION & PUNCH LIST	1	LS	—	10,200 -
9	REMOVE & RE-INSTALL WALKWAY GRATING	1	~~SF~~ LS	—	218,400 -
10	REMOVE & RE-INSTALL HANDRAILS (including removal of existing paint and repainting, and removal & re-installation of utilities affected)	1	~~EF~~ LS	—	321,786 -
11	REMOVE & RE-INSTALL PASSENGER PLATFORM - TRACK H	1	LS	—	3,375 -

ANALYSIS OF BID

THE PORT AUTHORITY OF NY & NJ

PROJECT **Hackensack River Bridge Deck and Rail Replacement**

BID DATE April 11, 2013

THIS IS NOT PART OF THE CONTRACT

SHEET 2 OF 2

CONTRACTOR Railroad Construction Company Inc.

CONTRACT NO. PAT-924.103

Unit No.	Descriptions [1]	Quantity	Unit [2]	Unit Price	Amount
12	REMOVE REFUGE BAYS	1	~~EA~~ LS	—	$22,200 -
13	INSTALL COUNTERWEIGHT TRAYS & WEIGHTS	1	~~EA~~ LS	—	188,000 -
14	REMOVE, SUPPORT & RE-INTSALL CABLES ON TIMBERS	1	LS	—	65,200 -
15	REPLACE CONCRETE TIES	1	~~EA~~ LS	—	37,185 -
	Total Lump Sum				$3,887,734.00

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 TRANS-HUDSON CORPORTATION
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

April 10, 2013

ADDENDUM NO. 3

TO PROSPECTIVE BIDDERS ON CONTRACT **PAT-924.103 – PATH** – HACKENSACK RIVER BRIDGE – **DECK AND RAIL REPLACEMENT**

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 "Friday, April 12, 2013"

Page 84 - At the end of the last line of the first paragraph of 68. Available Property insert:

"The approximate size of the Area for Contractor's Use is 1500 square feet and is located directly below the Work site."

Pate 125 - After the end of 103.D.2.), insert:

"3.) All equipment shall clear the inside of the kinematic envelope by a minimum of 2" as shown in Contract PAT-120.007 PA-4 Cars Dwg. No. 2P395305-1041-C entitled "Carbody Kinematic Envelope" on Page 130A.

Page 130 - Following this page, insert pages 130A and 130B which are attached hereto and made a part hereof.

CHANGES IN THE CONTRACT DRAWINGS

Dwg. #G003 Make the following changes: A

A. At the end of General Note 17 on the drawing insert the following:

"Refer to page 130B in the Contract Book for the PATH Equipment Clearance Diagram."

B. After General Note 25 add the following:

"26. PATH will remove the contact rail heaters prior the start of Work and will replace the contact rail heaters after the Work is complete."

THE PORT AUTHORITY TRANS-HUDSON CORPORATION

Peter J. Zipf, P.E.
Chief Engineer

INITIALLED BY THE BIDDER:

Joseph Vacsaro, Vice-President

RAILROAD CONSTRUCTION COMPANY, INC.

PORT AUTHORITY TRANS-HUDSON CORPORATION
THREE GATEWAY CENTER - 3rd FLOOR
NEWARK, NJ 07102

March 25, 2013

ADDENDUM NO. 1

TO PROSPECTIVE BIDDERS ON CONTRACT **PAT-924.103 – PATH** – HACKENSACK RIVER BRIDGE – DECK AND RAIL REPLACEMENT

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 BOOK

Page 1 - In the second line of the first paragraph, change the date for receipt of Proposals to "Thursday, April 11, 2013".

PORT AUTHORITY TRANS-HUDSON CORPORATION

Peter J. Zipf, P.E.
Chief Engineer
The Port Authority of New York and New Jersey

INITIALLED BY THE BIDDER:

Joseph Vaccaro, Vice-President

RAILROAD CONSTRUCTION COMPANY, INC.