Torres Rojas, Genara FOI #14596

From: Klein, Melissa [mailto:mklein@nypost.com]
Sent: Thursday, January 23, 2014 2:52 PM
To: Van Duyne, Sheree
Subject: FOI request

First Name: Melissa
Last Name: Klein
Company: NY Post
Mailing Address 1: 1211 Avenue of the Americas
Mailing Address 2:
City: New York
State: NY
Zip Code: 10036
Email Address: mklein@nypost.com
Phone: 212-930-5774
Required copies of the records: Yes

List of specific record(s):
Any communication, electronic or otherwise, between Anthony Sartor and the Port Authority for the time period between Sept. 1, 2013 and Jan. 15, 2014, regarding the use of cranes at the PAs South Waterfront at Hoboken development. Also, any communication, electronic or otherwise, between any party and the Port Authority regarding the use of cranes at the South Waterfront at Hoboken development.

Thank you,

Melissa Klein
Reporter
New York Post
mklein@nypost.com
212-930-5774

THE PORT AUTHORITY OF NY & NJ

FOI Administrator

September 22, 2014

Ms. Melissa Klein
NY Post
1211 Avenue of the Americas
New York, NY 10036

Re: Freedom of Information Reference No. 14596

Dear Ms. Klein:

This is in response to your January 21, 2014 request, which has been processed under the Port Authority's Freedom of Information Code (the "Code", copy attached) for any communication, electronic or otherwise, regarding the use of cranes at the Port Authority's South Waterfront at Hoboken development from 9/1/13 to 1/15/14 between (1) Anthony Sartor and the Port Authority and (2) the Port Authority and any other party.

Material responsive to Number (1) of your request is exempt from disclosure pursuant to Exemption (5) of the Code.

Notwithstanding the overly broad nature of Number (2) of your request, a search has been conducted by staff familiar with this matter, and materials responsive and available under the Code can be found on the Port Authority's website at http://www.panynj.gov/corporate-information/foi/14596-O.pdf. Certain portions of these materials are exempt from disclosure pursuant to Exemptions (1), (4) and (5) of the Code. Paper copies of the available records are available upon request.

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

Very truly yours,

Daniel D. Duffy
FOI Administrator

Attachment

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

Lynch-Jacobs, Maureen

From: Pierre Gonzalez [pgonzalez@hisassoc.com]
Sent: Wednesday, November 06, 2013 6:27 PM
To: Lynch-Jacobs, Maureen
Cc: Mike Schiavoni; Tom Kanzler; Lawrence Shapiro
Subject: RE: Hoboken

Maureen,

As always we'll be glad to assist you in any way we can. Please see my answers below in red and do not hesitate to call if you want to discuss.
As expressed previously, it is my honest opinion that the TG-1900T equipped with Federated Cranes winch pack is the best choice for this project.

Best regards,
Pierre

Pierre GONZALEZ,
Project Engineer

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel: (516) 791-2600
Fax: (516) 791-5425

From: Lynch-Jacobs, Maureen [mailto:mjacobs@panynj.gov]
Sent: Wednesday, November 06, 2013 2:44 PM
To: 'Pierre Gonzalez'; 'msfederated@aol.com'
Subject: FW: Hoboken

Pierre/Mike,
I have questions concerning the Hoboken project, and now have authorization from the Chief Engineer's office and the PA law department to talk to you to resolve some of these items quickly.
Thanks,
Maureen

EXEMPTION 5

EXEMPTION 5

EXEMPTION 5

EXEMPTION 5

EXEMPTION 5

EXEMPTION 5

EXEMPTION 5

From: Manring, Noah D. [mailto:manringn@missouri.edu]
Sent: Thursday, October 17, 2013 9:27 AM
To: Keane, Jim
Cc: Lynch-Jacobs, Maureen; 'tbond@haagengineering.com'
Subject: RE: TG-1900 Hoboken

Dear Jim:

Pierre Gonzalez's email below is good and helpful. Based upon the new information provided in that email, I would feel comfortable approving the use of the "modified TG-1900" crane at the New Jersey site. Key points brought out in the email are ...

1. "The braking static capacity is approximately 150% the line pull capacity." This is the first time I've heard (or been able to read) anything about the braking capacity for this crane. It appears that the engineers have done a great deal of work to ensure a proper braking capacity and have even modified the winch pack with extra brakes "similar to the arrangement of Favco".

2. "The loads lifted on the Hoboken project will be around 15,000 lbf (with one occurrence at 20,000 lbf) which is well below the rated line pull of the original TG-1900." If the braking capacity is 150% of 58,000 lbf, then the braking capacity is 87,000 lbf and only 20,000 lbf will be lifted. This means that the brakes are able to hold 4X the load that will be lifted at this job site. This seems like a good margin of safety to me.

The rest of Gonzalez's email is very reasonable and offers an objective analysis of the situation. I get the impression that these engineers are doing a good job and are mindful of public safety. Let me know if I can be of any other service.

Sincerely, Noah

Noah D. Manring
Glen A. Barton Professor
Interim Associate Dean for Research
College of Engineering, University of Missouri
Columbia, MO 65211
573-882-0693
ManringN@missouri.edu

From: Keane, Jim [mailto:jkeane@panynj.gov]
Sent: Wednesday, October 16, 2013 3:17 PM
To: 'tbond@haagengineering.com'; Manring, Noah D.
Cc: Lynch-Jacobs, Maureen; Keane, Jim
Subject: Fw: TG-1900 Hoboken
Importance: High

Your comments on the attached please...

Sent from Jim Keane's BlackBerry Wireless Handheld
The Port Authority of NY and NJ - Look what we're doing
)0+ Years of Investing in the Region
www.panynj.gov
www.wtcprogress.com
www.panynj.gov/bayonnebridge
Office - 201-216-2821
Facsimile - 201-216-2225
Mobile - 973-417-4236

From: Pierre Gonzalez [mailto:pgonzalez@hisassoc.com]
Sent: Wednesday, October 16, 2013 04:09 PM
To: Lynch-Jacobs, Maureen
Cc: Keane, Jim; Lawrence Shapiro <lkshapiro@hisassoc.com>
Subject: TG-1900 Hoboken

Maureen,

Following our discussion from yesterday, please find below and in attachment the following information regarding the Favco M760D and TG-1900:

- Favco M760D: disc-brakes installed on each motor (4 motors total for the M760D). As stated by the manufacturer: "brakes are holding brakes only, with a minimum static capacity of 2.0 times motor torque" (see attached). Since there is one disc-brake per motor the braking static capacity is twice the line pull capacity. One potential issue with the arrangement is that the disc-brake is installed between the motor and gearbox/drive pinion: if any of the element mounted after the disc-brake (gearbox, spline or pinion) fails or is compromised (as it happened for the crane at 57th street), then the disc-brake of that motor becomes completely inoperant.
- TG-1900: holding band-brakes installed at opposite end of the shaft from motor (if the motor is compromised the band brake can still be applied at the other end of the drive shaft – as it happened at WTC#4). There are 2 brakes or 3 brakes (latest FMC design) for 4 motors. Each brake has a static capacity of approximately 3 times the torque from one motor, so overall the braking static capacity is approximately 150% the line pull capacity. One potential issue with the TG arrangement is that the band brakes are more "exposed" to the environment (as opposed as disk brakes in a confined housing/carter) and require more maintenance (check for foreign matter between band and brake drum) and proper alignment. As per the user's manual the band brakes have to be checked every 50 hours.

In both the Favco and TG-1900 (as in almost all other cranes), the brakes are designed and intended as static holding brakes only. The "dynamic braking" or control of the rate of descent of the lifted load is primarily achieved by the hydraulic system: normal braking of operational functions is accomplished by the hydraulic motors when the oil flow through the motors is reduced, and the static brakes are applied when the oil flow is stopped.

The static brakes of both the Favco and TG-1900 can be applied in emergency situation and used as "dynamic" brakes but that is not their primary intent - nor should it be considered as a "fail safe device". In such an event the case could be made that the disc brakes offer a better braking ability, mainly because the disc brakes are less dependent on the adjustment to engage and on the maintenance to guarantee their efficiency (the risk of inclusion of foreign matter in the brake affecting adversely the coefficient of friction is more limited for the disc brakes). The heating of the disc brakes is also somewhat more limited since they are placed in a housing filled with oil (wet brakes). On the other hand as pointed previously the TG-1900 brakes can always be applied since they are mounted on the other end of the drive shaft – which is not the case with the Favco's arrangement if a failure occurs on the drive shaft after the brake.

Candy Ricci

: Charles J. Messina
ubject: RE: SJP - Exhibit C

From: Pierre Gonzalez [mailto:pgonzalez@hisassoc.com]
Sent: Wednesday, October 16, 2013 4:09 PM
To: Maureen Lynch-Jacobs (mjacobs@panynj.gov)
Cc: Jim Keane (jkeane@panynj.gov); Lawrence Shapiro (lkshapiro@hisassoc.com)
Subject: TG-1900 Hoboken
Importance: High

Maureen,

Following our discussion from yesterday, please find below and in attachment the following information regarding the Favco M760D and TG-1900:

- Favco M760D: disc-brakes installed on each motor (4 motors total for the M760D). As stated by the manufacturer: "brakes are holding brakes only, with a minimum static capacity of 2.0 times motor torque" (see attached). Since there is one disc-brake per motor the braking static capacity is twice the line pull capacity. One potential issue with the arrangement is that the disc-brake is installed between the motor and gearbox/drive pinion: if any of the element mounted after the disc-brake (gearbox, spline or pinion) fails or is compromised (as it happened for the crane at 57th street), then the disc-brake of that motor becomes completely inoperant.

TG-1900: holding band-brakes installed at opposite end of the shaft from motor (if the motor is compromised the band brake can still be applied at the other end of the drive shaft – as it happened at WTC#4). There are 2 brakes or 3 brakes (latest FMC design) for 4 motors. Each brake has a static capacity of approximately 3 times the torque from one motor, so overall the braking static capacity is approximately 150% the line pull capacity. One potential issue with the TG arrangement is that the band brakes are more "exposed" to the environment (as opposed as disk brakes in a confined housing/carter) and require more maintenance (check for foreign matter between band and brake drum) and proper alignment. As per the user's manual the band brakes have to be checked every 50 hours.

In both the Favco and TG-1900 (as in almost all other cranes), the brakes are designed and intended as static holding brakes only. The "dynamic braking" or control of the rate of descent of the lifted load is primarily achieved by the hydraulic system: normal braking of operational functions is accomplished by the hydraulic motors when the oil flow through the motors is reduced, and the static brakes are applied when the oil flow is stopped.

The static brakes of both the Favco and TG-1900 can be applied in emergency situation and used as "dynamic" brakes but that is not their primary intent - nor should it be considered as a "fail safe device". In such an event the case could be made that the disc brakes offer a better braking ability, mainly because the disc brakes are less dependent on the adjustment to engage and on the maintenance to guarantee their efficiency (the risk of inclusion of foreign matter in the brake affecting adversely the coefficient of friction is more limited for the disc brakes). The heating of the disc brakes is also somewhat more limited since they are placed in a housing filled with oil (wet brakes). On the other hand as pointed previously the TG-1900 brakes can always be applied since ıey are mounted on the other end of the drive shaft – which is not the case with the Favco's arrangement if a failure occurs on the drive shaft after the brake.

The concern that the TG-1900 band brakes would not engage due to improper adjustment and/or maintenance is one reason (amongst others) why a new/modified winch-pack was designed for the TG-1900 by Federated Cranes (Tom Kanzler and Mike Schiavoni) . The new winch pack has two axial/variable displacement hydraulic otors, each with a disc-brake and planetary gearbox (similar to the arrangement of Favco). The motors are installed on each side of the drum and the torque is transferred directly to the drum shaft (thus alleviating the risk of failure in the transmission at the pinion/spline as happened for the crane at 57th street). The braking capacity is approximately rated to 150%-160% of the line pull (58,000lbs same as original winch for the TG-1900).

The loads lifted on the Hoboken project will be around 15,000lbs (with one occurrence at 20,000lbs) which is well below the rated line pull of the original TG-1900 and its braking capacity (150% of line pull). It is therefore our professional opinion that the TG-1900 with the original winch pack designed by FMC will be more than apt and adequate to perform the work required when maintained and operated properly.

In our view the new winch pack designed by Federated Cranes offers superior performance and braking capacity (disc brakes technology requiring less maintenance to work at peak efficiency) than the original winch pack. The new winch pack was designed in accordance to the current crane codes and design standards and is a proven system (as noted by Peter Stroh). The case could also be made that a modified TG-1900 equipped with this new winch is a different equipment altogether than the original TG-1900 targeted by NYC DOB cease use order (which in any case does not apply in Hoboken).

As engineers placing the safety of the public and workers first and foremost in the list of our preoccupations, it is our professional opinion that using a modified TG-1900 with a new winch would certainly represent the best outcome for this particular project – especially since using another crane (hammerhead) or a combination of several cranes (M760 + mobile cranes) would likely represent an increase of risk from the logistical and tructural standpoints and would not guarantee a reduction of risk from the mechanical standpoint.

As always, please do not hesitate to call me if you wish to discuss further, and thank you for your consideration in this matter.

Best regards,
Pierre

Pierre GONZALEZ,
Project Engineer
[cid:image003.jpg@01CB9BB8.4A349980]
303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel: (516) 791-2600
Fax: (516) 791-5425

Candy Ricci

om: Doug Allen <dallen@sjpproperties.com>
Sent: Thursday, October 10, 2013 3:49 PM
To: Francis J. Giantomasi; Charles J. Messina
Subject: FW: Hoboken Project - TG 1900 Tower Crane

Importance: High

Frank:
This is the Stroh Engineering report sent to me from Federated cranes as a result of our meetings with the PANYNJ technical team with information provided by the SJP team to the PANYNJ and at Maureen's request to Stroh Engineering. The report seems to affirm the positions we took in our meeting and subsequent correspondence.

Appreciatively,

Douglas Allen
EVP, PreConstruction and Planning
SJP Properties
379 Interpace Parkway
Parsippany, NJ 07054
(973) 257-3001 – Telephone
(973) 714-7797 - Mobile

From: Doug Allen
Sent: Thursday, October 10, 2013 3:47 PM
To: 'Del Tufo, Gerard'
Subject: FW: Hoboken Project - TG 1900 Tower Crane
Importance: High

Jerry:
Below please see Stroh Engineering report on cranes regarding our Hoboken site as submitted to the Port Authority.

Appreciatively,

Douglas Allen
EVP, PreConstruction and Planning
SJP Properties
379 Interpace Parkway
Parsippany, NJ 07054
(973) 257-3001 – Telephone
(973) 714-7797 - Mobile

From: Larry [mailto:Larry@ajmcnulty.com]
Sent: Thursday, October 10, 2013 3:08 PM
To: Doug Allen
Subject: FW: Hoboken Project - TG 1900 Tower Crane

Doug,

I thought you might want to see the report (below) prepared by Peter Stroh, P.E., concerning the TG 1900 tower ane. The report was solicited by Maureen Lynch-Jacobs of the Port Authority. I would hope this report will finally clear the air as to any issues regarding use of this crane on your Hoboken job.

Larry Weiss

Cranes, Inc.

Tel 718-784-1776

From: Lawrence K. Shapiro P.E. [mailto:lkshapiro@hisassoc.com]
Sent: Thursday, October 10, 2013 9:19 AM
To: 'Larry'
Cc: 'John Kelly'
Subject: FW: Hoboken

From: Peter Stroh [mailto:Peter@strohengineering.com]
Sent: Wednesday, October 09, 2013 5:08 PM
To: Larry Shapiro
Subject: FW: Hoboken

Larry,

Here is my response to Maureen.

Peter J. Stroh, P.E.

'resident

Stroh Engineering Services, P.C.

41 Robert Street

Babylon, New York 11702 U.S.A.

P - 631-669-7531

F - 631-669-6369

M - 631-553-0077

From: Peter Stroh
Sent: Wednesday, October 09, 2013 5:06 PM
To: 'Lynch-Jacobs, Maureen'
Subject: RE: Hoboken

Good Afternoon Maureen,

I looked over the information you sent me. Since a tower crane is to be used on the job, I assume mobile cranes on the streets will not be allowed, so I did not look at mobile cranes as an option. I did not find another luffing boom tower crane that will match the capabilities of the TG 1900 called out that is in its class. This TG 1900 has a special long reach boom that will accommodate the project requirements. The only luffing boom tower rane (non TG crane) that I know of that will make the reach is a Favco 1280. The 1280 is really too large for the project and I don't think there are any available and the current crane foundation would not work, so it is not a choice I would recommend. I looked at horizontal jib (hammerhead) cranes and I found that the Liebherr 630 will reach and have about the same capacity as the TG 1900 as speced out. However, I looked at Google Earth and it appears that the building south of the crane location is approximately 195' high to the cooling tower, so that the crane jib for the Liebherr would most likely not clear the building's mechanical equipment when the crane weathervanes. The European tower cranes tend to deflect much more than the TG cranes and Favco cranes, as the towers are built lighter and are not as rigid. With a long horizontal jib and a high freestanding height the jib tip could deflect down in the range of several feet.

I never saw any official notice stating that the TG cranes are not allowed to be used in New York City, but I have heard that they have been banned unofficially. I assume this ban stems from the incident at WTC Tower 4. While the TG cranes have had a long life, this in and of itself does not automatically determine that they are no longer capable of safe operation. Maintenance is the most important factor in determining the life of a crane. The better the maintenance, the longer the life. As far as structural capabilities are concerned, inspection and testing should adequately prove the integrity of the structure. If the crane is owned or serviced by Federated Equipment, they may be able to use the crane with the custom hoist pack that they designed and built for the TG cranes. I believe they built several of these hoist packs around 2004 ~ 2005. I know two of them were used at the Time Warner Building at Columbus Circle. Since these hoist packs were designed and built to the crane codes at the time, they are basically up to current design standards and have been used in NYC up until the ban on the cranes, so they are a proven system. I would also recommend that if the crane is to be used, new main load line and boom hoist rope be installed. I also note that the building is not that high, so that the hoisting height is relatively low for this crane. I also see that the sidewalks and curb lanes are closed around the jobsite, which will add to the public safety.

If the use of the TG 1900 will not be allowed, than you have several options:

1. Use two tower cranes on the project to meet the lifting requirements. This is not an option I would recommend, since the current crane position would not be able to be utilized. Two new foundations would need to be designed and built (remobilization of the foundation/piling equipment, etc.) two crane erections and dismantling, impacting the community, not to mention the additional expense.

2. Use one tower crane in the current position and erect the remaining portion of the building with mobile cranes from Sinatra Drive and River Street. Fairly large mobile cranes will need to be used and they may not fit into the current sidewalk and lane closings.

3. Use mobile cranes from inside the site to erect the steel and work out toward Second Street. Complete the steel erection from Second Street. Use mobile cranes on Second St., Sinatra Drive and River Street to erect the precast. This will delay the completion of the job, as the erection with mobile cranes is slower than the erection with a tower crane. The impact to the community will be more, as the mobile cranes will need to work on the streets and be assembled and dismantled on the streets. There is a basement in the building, so a platform would need to be designed and built for the crane, or a suitable ramp to provide access. A ramp is probably not practical, as most of the cranes would not be able to negotiate this type of ramp when assembled. A platform would be very expensive and delay the job as it needs to be built, as well as the additional crane to build the platform.

From a risk management prospective, the single tower crane makes the most sense. Put the crane up (one street closing to erect), erect the building (shorter erection time with tower crane and tower crane designed for a storm condition, mobile cranes need to be boomed down to the ground for winds over 50 mph), dismantle crane (one street closing). The mobile cranes will need to be moved around the site. I understand your reservations about the use of the TG 1900 crane for this site, but it is my opinion that the banning of the TG cranes was not fully vetted out. There was an existing bias to ban the cranes and the opportunity was too good to pass up. It is my recommendation that the TG 1900 crane be allowed to be used at this site. Inspections are a must and maintenance must be performed and documented. Please feel free to contact me with any questions or comments.

Peter J. Stroh, P.E.

President

Stroh Engineering Services, P.C.

1 Robert Street

Babylon, New York 11702 U.S.A.

P - 631-669-7531

F - 631-669-6369

M - 631-553-0077

-----Original Message-----
From: Lynch-Jacobs, Maureen [mailto:mjacobs@panynj.gov]
Sent: Saturday, October 05, 2013 1:30 PM
To: Peter Stroh
Subject: Hoboken

Peter,

A contractor has submitted a crane plan using a TG 1900 in Hoboken. They are out of service in NYC, so I can't allow it. If I send drawings on Monday, can look for alternate solutions. This is another rush.

Thanks

Maureen

---

ent from my BlackBerry Wireless Handheld

NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT

AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE

RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY,

PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY

PRINTOUTS.

TG-1900 jib capacities

Boom length	Jib length	Load radius Ft.	Load radius m	Boom angle Degrees	Jib offset 15° 2-part load hoist line Pounds	2-part load hoist line kilograms	1-part load hoist line Pounds	1-part load hoist line kilograms
170' (51.82 m)	30' (9.14 m)	160	48.77	40.4	17,100	7 757	14,700	6 668
		170	51.82	35.5	16,500	7 484	↕	↕
		180	54.86	29.9	16,000	7 258	↕	↕
		190	57.91	22.9	15,700	7 122	14,700	6 668
	50' (15.24 m)	60	18.29	78.2	20,400	9 253	14,700	6 668
		70	21.34	75.5	18,500	8 392	↕	↕
		80	24.38	72.7	17,000	7 711	↕	↕
		90	27.43	69.9	15,700	7 122	↕	↕
		100	30.48	67.0	14,600	6 623	↕	↕
		110	33.53	64.1	13,600	6 169	14,700	6 668
		120	36.58	61.0	12,800	5 806	13,900	6 305
		130	39.62	57.9	12,000	5 443	13,000	5 897
		140	42.67	54.6	11,400	5 171	12,300	5 579
		150	45.72	51.2	10,900	4 944	11,700	5 307
		160	48.77	47.6	10,400	4 717	11,100	5 035
		170	51.82	43.7	10,000	4 536	10,700	4 854
		180	54.86	39.5	9,600	4 355	10,200	4 627
		190	57.91	34.8	9,300	4 218	9,900	4 491
		200	60.96	29.5	9,100	4 128	9,600	4 355
		210	64.01	22.8	8,900	4 037	9,400	4 264
	70' (21.34 m)	60	18.29	80.4	14,400	6 532	14,600	6 623
		70	21.34	77.9	13,100	5 942	14,400	6 532
		80	24.38	75.4	11,900	5 398	13,100	5 942
		90	27 43	72.9	11,000	4 990	12,000	5 443
		100	30.48	70.3	10,100	4 581	11,100	5 035
		110	33.53	67.6	9,400	4 264	10,300	4 672
		120	36.58	64.9	8,800	3 992	9,600	4 355
		130	39.62	62.1	8,300	3 765	9,000	4 082
		140	42.67	59.2	7,800	3 538	8,400	3 810
		150	45.72	56.3	7,400	3 357	8,000	3 629
		160	48.77	53.2	7,000	3 175	7,600	3 447
		170	51.82	49.9	6,700	3 039	7,200	3 266
		180	54.86	46.5	6,400	2 903	6,900	3 130
		190	57.91	42.8	6,100	2 767	6,600	2 994
		200	60.96	38.7	5,900	2 676	6,300	2 858
		210	64.01	34.3	5,700	2 586	6,100	2 767
		220	67.06	29.1	5,600	2 540	5,900	2 676
		230	70.10	22.6	5,500	2 495	5,800	2 631
180' (54.86 m)	30' (9.14 m)	50	15.24	79.0	29,400	13 336	14,700	6 668
		60	18.29	76.2	29,400	13 336	↕	↕
		70	21.34	73.4	29,400	13 336	↕	↕
		80	24.38	70.5	28,200	12 792	↕	↕
		90	27.43	67.5	26,000	11 793	↕	↕
		100	30.48	64.5	24,200	10 977	↕	↕
		110	33.53	61.3	22,700	10 297	↕	↕
		120	36.58	58.1	21,400	9 707	↕	↕
		130	39.62	54.8	20,200	9 163	↕	↕
		140	42.67	51.2	19,200	8 709	↕	↕
		150	45.72	47.5	18,300	8 301	↕	↕
		160	48.77	43.6	17,600	7 983	↕	↕
		170	51.82	39.3	16,900	7 666	↕	↕
		180	54.86	34.5	16,400	7 439	↕	↕
		190	57.91	29.1	15,900	7 212	↕	↕
		200	60.96	22.3	14,600	6 623	14,700	6 668
	50' (15.24 m)	60	18.29	78.7	20,800	9 435	14,600	6 623
		70	21.34	76.1	18,900	8 573	↕	↕
		80	24.38	73.5	17,400	7 893	↕	↕
		90	27.43	70.8	16,000	7 258	14,600	6 623

Boom length	Jib length	Load radius Ft.	Load radius m	Boom angle Degrees	Jib offset 15° 2-part load hoist line Pounds	2-part load hoist line kilograms	1-part load hoist line Pounds	1-part load hoist line kilograms
180' (54.86 m)	50' (15.24 m)	100	30.48	68.1	14,900	6 759	14,600	6 623
		110	33.53	65.3	14,000	6 350	14,600	6 623
		120	36.58	62.4	13,100	5 942	14,300	6 486
		130	39.62	59.5	12,400	5 625	13,400	6 078
		140	42.67	56.4	11,700	5 307	12,700	5 761
		150	45.72	53.3	11,200	5 080	12,000	5 443
		160	48.77	49.9	10,700	4 854	11,500	5 216
		170	51.82	46.4	10,200	4 627	11,000	4 990
		180	54.86	42.6	9,800	4 445	10,500	4 763
		190	57.91	38.5	9,500	4 309	10,200	4 627
		200	60.96	34.0	9,200	4 173	9,800	4 445
		210	64.01	28.7	9,000	4 082	9,600	4 355
		220	67.06	22.2	8,900	4 037	9,400	4 264
	70' (21.34 m)	60	18.29	80.8	14,600	6 623	14,600	6 623
		70	21.34	78.4	13,300	6 033	14,600	6 623
		80	24.38	76.0	12,200	5 534	13,300	6 033
		90	27.43	73.6	11,200	5 080	12,300	5 579
		100	30.48	71.1	10,400	4 717	11,300	5 126
		110	33.53	68.6	9,700	4 400	10,500	4 763
		120	36.58	66.0	9,000	4 082	9,800	4 445
		130	39.62	63.4	8,500	3 856	9,200	4 173
		140	42.67	60.7	8,000	3 629	8,700	3 946
		150	45.72	57.9	7,600	3 447	8,200	3 720
		160	48.77	55.0	7,200	3 266	7,800	3 538
		170	51.82	51.9	6,900	3 130	7,400	3 357
		180	54.86	48.8	6,600	2 994	7,100	3 221
		190	57.91	45.4	6,300	2 858	6,800	3 084
		200	60.96	41.8	6,100	2 767	6,500	2 948
		210	64.01	37.9	5,900	2 676	6,300	2 858
		220	67.06	33.5	5,700	2 586	6,100	2 767
		230	70.10	28.4	5,600	2 540	5,900	2 676
		240	73.15	22.1	5,500	2 495	5,800	2 631
190' (57.91 m)	30' (9.14 m)	50	15.24	79.6	29,400	13 336	14,700	6 668
		60	18.29	76.9	29,400	13 336	↕	↕
		70	21.34	74.2	29,400	13 336	↕	↕
		80	24.38	71.4	28,900	13 109	↕	↕
		90	27 43	68.6	26,800	12 156	↕	↕
		100	30.48	65.7	24,900	11 294	↕	↕
		110	33.53	62.8	23,400	10 614	↕	↕
		120	36.58	59.7	22,000	9 979	↕	↕
		130	39.62	56.6	20,800	9 435	↕	↕
		140	42.67	53.4	19,800	8 981	↕	↕
		150	45.72	49.9	18,900	8 573	↕	↕
		160	48.77	46.3	18,100	8 210	↕	↕
		170	51.82	42.5	17,400	7 893	↕	↕
		180	54.86	38.3	16,800	7 620	↕	↕
		190	57.91	33.7	16,300	7 394	↕	↕
		200	60.96	28.3	14,800	6 713	↕	↕
		210	64.01	21.8	11,500	5 216	14,700	6 668
	50' (15.24 m)	60	18.29	79.2	21,100	9 571	14,600	6 623
		70	21.34	76.7	19,300	8 754	↕	↕
		80	24.38	74.2	17,700	8 029	↕	↕
		90	27.43	71.7	16,400	7 438	↕	↕
		100	30.48	69.1	15,300	6 940	↕	↕
		110	33.53	66.4	14,300	6 486	↕	↕
		120	36.58	63.7	13,500	6 124	14,600	6 623
		130	39.62	60.9	12,700	5 761	13,800	6 260
		140	42.67	58.1	12,000	5 443	13,100	5 942

(continued)

Refer to Notes page 5.

FMC

FMC Corporation

Cable Crane & Excavator Division
1201 Sixth Street Southwest
P.O. Box 2108
Cedar Rapids Iowa 52406

Link-Belt® cranes & excavators
manufactured in: Cedar Rapids Iowa
Lexington & Bowling Green Kentucky
Ontario Canada • Milan Italy
Queretaro Mexico & Nagoya Japan (under license)

Hydraulic system

Swing, boomhoist, main load and auxiliary load hoist drums — all hydraulically operated. Hydraulic power is supplied by reversible flow, variable displacement, piston-type pumps, flange mounted to gear reduction unit, which is mounted on output shaft of engine. Hydraulic pumps are connected through a closed loop hydraulic circuit to radial piston hydraulic motors which power operating functions. Normal braking of operational functions accomplished by hydraulic motors when oil flow through motors is reduced by movement of control lever toward neutral position.

Engine Specifications	GM 12V-71T
Number of cylinders	12
Bore and stroke — inches — *(mm)*	4¼ x 5 *(108 x 127)*
Piston displacement — cu. in. — *(cm³)*	852 *(13 964)*
High idle r.p.m.	2 050
Horsepower @ full load speed — — *(W)* Peak torque — ft. lbs. — *(J)*	493 *(367 630)* 1450 @ 1850 r.p.m. *(1966)*
Electrical system Batteries	24-volt 2 - 12-volt

Sump tank

Fabricated steel, non-pressurized; baffled for strength and deaeration. Mounted above power unit. Return line filter mounted on internal side of tank, and charge filter mounted in pressurized line between suction pump and charge pumps mounted to power unit. Capacity — 120 gallons *(454.25 L)*.

Principal Operating Functions —

Control system

Air controls; control levers for various functions mounted convenient to operator; "dead man" type controls return to "zero speed, brake on" position if released.

Main load hoist drum

Grooved, 54" *(1.37 m)* root diameter; mounted on anti-friction bearings on non-turning shaft. Drum driven through spur gear reduction by four two-speed, high torque, radial piston hydraulic motors. Infinitely variable rope drum speed control in three speed ranges — low, medium, and high — is standard.

Low Speed — Hydraulic motors each set to run at 90 cu. in. *(1 475.10 cm³)* displacement per revolution.

Medium Speed — Two hydraulic motors each set to run at 25 cu. in. *(409.75 cm³)*, and two hydraulic motors set to run at 90 cu. in. *(1 475.10 cm³)* displacement per revolution.

High Speed — Hydraulic motors each set to run at 25 cu. in. *(409.75 cm³)* displacement per revolution.

Optional main load hoist drum — Available is an optional main hoist drum for greater wire rope capacities.

Auxiliary load hoist drum — Optional. Smooth, 18" *(0.46 m)* root diameter, 33⅛" *(0.84 m)* wide between flanges; mounted on anti-friction bearings on non-turning shaft. Drum driven through spur gear reduction by one 2-speed, high torque, radial piston hydraulic motor. Infinitely variable speed control in two speed ranges — low and high — is standard.

Low speed — Hydraulic motor set to run at 90 cu. in. *(1 475.10 cm³)* displacement per revolution.

High speed — Hydraulic motor set to run at 45 cu. in. *(737.55 cm³)* displacement per revolution.

Drum brakes

External contracting band holding brakes; spring applied, air released. Brake drums involute splined to hydraulic motor counter-shafts at opposite end of shafts from motors. Brakes spring applied when control lever is moved to "brake on" position; air released when control lever is moved to neutral position — at which time hydraulic motor is blocked hydraulically to restrain load.

Load indicating and overload warning system — Equipped with a load-moment device for measuring the load and the load radius. Incorporated with this device is an overload warning system which warns the operator when an overload condition exists and inhibits certain functions of the machine.

SJPPROPERTIES

October 2, 2013

VIA Email/FedEx Overnight
Mr. Jerry Del Tufo
Assistant Director
Port Authority of NY & NJ
225 Park Avenue South
19th Floor
New York, NY 10003

Re: WCC III Hoboken, NJ

Dear Mr. Del Tufo:

In furtherance of our September 24, 2013 meeting last week, on-site inspection by the PANYNJ on September 25, 2013, and our written submission transmitted to you on September 25, 2013 sent in order to resolve the PANYNJ's expressed concerns about utilization of the TG 1900 crane in connection with the above referenced project ("Project"), enclosed is additional documentation that the PANYNJ recently requested in connection with the Project. It is my understanding that Pavarini McGovern, our Construction Manager, forwarded this information to the Port Authority at 9:00am today.

Please do not hesitate to contact me to discuss further or if you have any questions. We look forward to hearing from you.

Very truly yours,

Douglas Allen
EVP, Construction
SJP Properties

DA:dy

MORRIS CORPORATE CENTER IV
379 INTERPACE PARKWAY, BUILDING C, PARSIPPANY, NJ 07054 (973) 257-3001 (973) 402-0073
www.sjpproperties.com

HOWARD I. SHAPIRO
& ASSOCIATES
CONSULTING ENGINEERS, P.C.
A continuing tradition of engineering service - since 1946

303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel (516) 791-2600
Fax (516) 791-5425
www.HISAssoc.com

September 25, 2013

Waterfront Corporate Center III JV LLC
Morris Corporate Center IV
379 Interpace Parkway
Parsippany, NJ 07054
Attn: Mr. Douglas Allen

Ref.: Hoboken Waterfront Corporate Center Block B
Proposed of TG1900 Tower Crane

Dear Mr. Allen:

I write in response to reservations expressed by PASNYNJ about the proposed use of the TG1900 tower crane.

The TG1900 was selected, after an extensive study, because it fit the site constraints and lifting requirements of the project. No other lifting solution could meet those needs. The particular demands are driven by the dense mid-rise urban setting, constraints on use of adjoining streets and the necessity to set relatively heavy precast panels at long reaches.

After PA reservations were expressed, alternate solutions were studied and all found to be problematic:

- Favco M760 –This diesel-hydraulic luffing tower crane has ample lifting capacity, but its 226 foot boom would not reach the rear corners of the site as needed to set all of the steel and precast panels. Restrictions imposed by the city of Hoboken proscribe the deployment of mobile cranes on the adjoining streets to erect the back portion of the building.
- Electric luffing tower cranes –there are no machines available in the US market that have sufficient capacity.
- Electric hammerhead cranes –the Liebherr 630 EC-H20 is available and has the physical capabilities to serve the project, but its 267 ft. boom would sweep within four feet of the windows of the W Hotel, and both boom and counterjib would overswing multiple occupied buildings.

Lawrence K. Shapiro, PE *Cell (917) 721-8290* *LKShapiro@hisassoc.com*

In considering concerns about the TG1900 expressed by the PA, none would apply to the operation at the Hoboken site. The incident involving this crane at WTC4 was caused by hydraulic oil contaminated by water that entered through the climbing system. The Hoboken crane will not require a climbing mechanism, as it will be erected and dismantled at full height. There will be no opportunity for outside contaminants to penetrate the closed-loop hydraulic system.

The Manring report, commissioned by the PA following this incident, noted that that the hoist winch of the TG1900 relies on four hydraulic motors to lift its full capacity of 57,600 lbs. If a motor would fail, the winch capacity would be reduced. He proposed that the reliability of the crane could be enhanced by limiting the lift capacity to 30,000 lbs. All of the lifting at the Hoboken project is far below the 30,000 lb. Manring recommendation. The heaviest precast or steel lifts are no more than 15,000 lbs. The hoist motors would, therefore, benefit from both redundancy and very low load demand. The same could be said for the brakes.

Moreover, the overall project demand on the crane is moderate, considering the total number of lift cycles, intensity (The crane will operate single shift, six days per week.) and the moderate lifting heights. In comparison to the robust capabilities of the crane, its mechanical and hydraulic systems will see light service.

As the Manring report attributed the WTC4 incident to maintenance-related deficiencies, this project can be further insulated from such problems by carrying out a vigorous inspection and preventative maintenance program. The program could include third party inspections, frequent oil sampling and program review by qualified engineers.

If further information or study is required, please feel free to contact me.

Regards,

Lawrence K. Shapiro, P.E.

Lynch-Jacobs, Maureen

From: Tsao, Chi Wing
Sent: Tuesday, November 26, 2013 1:37 PM
To: 'Pierre Gonzalez'; Lynch-Jacobs, Maureen
Cc: MDePaul@pavmcgovern.com; lkshapiro@hisassoc.com; Lizzo, John
Subject: RE: Hoboken

Pierre,

Thank you very much for the additional information.

Since the crane is off centered, there is going to be eccentricity and the vertical force seen by the piles due to crane's weight W should be different for maximum (47.9 kips per your email dated 11/18) and minimum cases. Using the minimum value should put some of the piles in tension. Please verify.

Separately, I reviewed the Geotechnical report prepared by Mueser Rutledge. The report did not address the tensile and lateral capacity of the piles. The submitted documents also did not confirm the piles for the tower crane were subjected to the same installation requirements as the piles for the building. Mueser Rutledge or the EOR for the crane foundation should review and approve the pile loadings and layout prepared by Howard I. Shapiro and provide supporting documents/calculations to confirm the lateral and tensile capacity of the piles.

Please also confirm the size of pile actually installed. The drawings prepared by Howard I. Shapiro shown 12-3/4"ϕ min. while the pile driving record indicated 11-7/8"ϕ pile. The pile capacities shown on S-001 is for 12-3/4"ϕ pile.

Rick

From: Tsao, Chi Wing
Sent: Wednesday, November 20, 2013 1:58 PM
To: 'Pierre Gonzalez'
Cc: ASokolowski@pavmcgovern.com; Lizzo, John; lkshapiro@hisassoc.com; mike@weirwelding.com; sryan@hisassoc.com; Lynch-Jacobs, Maureen; MDePaul@pavmcgovern.com
Subject: RE: Hoboken

Pierre,
I believed the value for the vertical force due to gravity (weight of tower crane or 47.9 kips) should be different for minimum case.
I agree with the maximum downward reaction of 210 kips and the submitted calculations seems to show the minimum downward reaction is -14.33 kips (uplift). I want to be certain the piles and the pile connection to cap are designed for the tensile load.
Rick

From: Pierre Gonzalez [mailto:pgonzalez@hisassoc.com]
Sent: Tuesday, November 19, 2013 4:29 PM
To: Tsao, Chi Wing
Cc: ASokolowski@pavmcgovern.com; Lizzo, John; lkshapiro@hisassoc.com; mike@weirwelding.com; sryan@hisassoc.com; Lynch-Jacobs, Maureen; MDePaul@pavmcgovern.com
Subject: RE: Hoboken

Rick,

No problem, I'm glad I could clarify.

The piles are always under compression and will see no uplift as the overturning moment is not large enough to overtake the combined weight of the crane + the footing: for out-of-service, the maximum force seen by a pile due to the moment is +/-97.38K (downward or uplift) when the boom is parallel to a diagonal of the footing. The vertical force due to gravity is 63.82K + 47.9K = 111.72K. As such the maximum downward reaction is 111.72K + 97.38K = 209.1K and the minimum downward reaction is 111.72K – 97.38K = 14.34K (no uplift).

Sincerely,
Pierre

Pierre GONZALEZ,
Project Engineer

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel: (516) 791-2600
Fax: (516) 791-5425

From: Tsao, Chi Wing [mailto:ctsao@panynj.gov]
Sent: Tuesday, November 19, 2013 10:43 AM
To: 'pgonzalez@hisassoc.com'
Cc: 'ASokolowski@pavmcgovern.com'; Lizzo, John; 'lkshapiro@hisassoc.com'; 'mike@weirwelding.com'; 'sryan@hisassoc.com'; Lynch-Jacobs, Maureen; 'MDePaul@pavmcgovern.com'
Subject: RE: Hoboken

Pierre,
Thank you for the clarification. I would like to confirm the minimum downward force for out of service condition is **minus** 14.34 kips (pile in tension/uplift).
Rick

From: MDePaul@pavmcgovern.com [mailto:MDePaul@pavmcgovern.com]
Sent: Monday, November 18, 2013 2:03 PM
To: Lynch-Jacobs, Maureen
Cc: 'ASokolowski@pavmcgovern.com'; Tsao, Chi Wing; Lizzo, John; 'lkshapiro@hisassoc.com'; 'mike@weirwelding.com'; 'pgonzalez@hisassoc.com'; 'sryan@hisassoc.com'
Subject: Re: Hoboken

Maureen

I am working on the other info as we speak

Marc DePaul
Project Executive
Pavarini McGovern LLC
770 Broadway - 10th Floor
New York, NY 10003
Office # 212-907-0900
Cell #646-483-7721

From:	"Lynch-Jacobs, Maureen" <mjacobs@panynj.gov>
To:	"'pgonzalez@hisassoc.com'" <pgonzalez@hisassoc.com>, "Tsao, Chi Wing" <ctsao@panynj.gov>, "Lizzo, John" <jlizzo@panynj.gov>,
Cc:	"'MDePaul@pavmcgovern.com'" <MDePaul@pavmcgovern.com>, "'ASokolowski@pavmcgovern.com'" <ASokolowski@pavmcgovern.com>, "'mike@weirwelding.com'" <mike@weirwelding.com>, "'lkshapiro@hisassoc.com'" <lkshapiro@hisassoc.com>, "'sryan@hisassoc.com'" <sryan@hisassoc.com>
Date:	11/18/2013 01:59 PM
Subject:	Re: Hoboken

Thank you for all your help

Sent from my BlackBerry Wireless Handheld

From: Pierre Gonzalez [mailto:pgonzalez@hisassoc.com]
Sent: Monday, November 18, 2013 01:34 PM
To: Lynch-Jacobs, Maureen; Tsao, Chi Wing; Lizzo, John
Cc: Marc DePaul <MDePaul@pavmcgovern.com>; Allen Sokolowski <ASokolowski@pavmcgovern.com>; Mike Diffley <mike@weirwelding.com>; Lawrence Shapiro <lkshapiro@hisassoc.com>; Steve Ryan <sryan@hisassoc.com>
Subject: RE: Hoboken

Maureen, Rick, John

Items 1.1, 1.2, 1.3, 1.6 and 1.7 relates to the pile design/detailing/installation/testing and would be better answered by the geotechnical engineer and/or foundation contractor (we used the pile capacity information which was given to us for the crane's footing design but we did not perform nor are we responsible for the pile design).

Regarding the other items:

- 1.4: sheet 3 of the drawings submitted show a group of 3 piles at each corner of the footing (total of 12 piles for the footing). The sketch in the calculation just identify a group of pile (instead of showing the 3 piles).
- 1.5: for out of service conditions (governing case), the overturning moment at the base of the crane is 11,320.95K-ft, the vertical load is 439.56K and the horizontal load is 84.62K (page 2 of calculations). As listed on page 3, the vertical load seen by the piles due to the moment M will be 97.38K (upward or downward), the vertical load seen by the piles due to the footing's weight G will be 63.82K (downward) and the vertical load seen by the piles due to the crane's weight W will be 47.9K (downward). This results in a maximum downward force of 209.1K, no uplift (minimum downward force of 14.34K) and maximum lateral load of 7.05K per pile (neglecting any friction between the underside of the footing and the subsurface soil).
- 1.5: for in-service conditions the overturning moment at the base of the crane is considerably less (6,992.59K-ft as shown on page 16) so this case does not control. The minimum vertical load is 439.56K and the horizontal load is 9.81K (page 15-16 of calculations). The vertical load seen by the piles due to the moment M would be 58.35K (upward or downward), the vertical load seen by the piles due to the footing's weight G will be 63.82K (downward) and the vertical load seen by the piles due to the crane's weight W will be 47.9K (downward). This results in a maximum downward force of 170.1K and no uplift (minimum downward force of 53.37K)

Please do not hesitate to contact us if you have further comment or question.

Best regards,
Pierre

Pierre GONZALEZ,
Project Engineer
HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.

303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel: (516) 791-2600
Fax: (516) 791-5425

From: Lynch-Jacobs, Maureen [mailto:mjacobs@panynj.gov]
Sent: Friday, November 15, 2013 10:35 AM
To: 'pgonzalez@hisassoc.com'
Subject: Fw: Hoboken

Pierre,
Do you have this information? Or should I go to the client?

Sent from my BlackBerry Wireless Handheld

EXEMPTION 5

From: Pierre Gonzalez [mailto:pgonzalez@hisassoc.com]
Sent: Friday, November 08, 2013 4:34 PM
To: Lynch-Jacobs, Maureen
Cc: Lawrence Shapiro; Steve Ryan
Subject: RE: Hoboken

Maureen,

Please see in attachment.

Best regards,
Pierre

Pierre GONZALEZ,
Project Engineer
HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel: (516) 791-2600
Fax: (516) 791-5425

From: Lynch-Jacobs, Maureen [mailto:mjacobs@panynj.gov]
Sent: Friday, November 08, 2013 4:20 PM
To: 'Pierre Gonzalez'
Subject: Hoboken

Pierre,
Can you send the calculations for the concrete pad? I need to send them to Geotechnical and I can't pull them out of the package. I moved and cannot scan them. The PA is closed Monday, so there is no rush.
Maureen

NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY, PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY PRINTOUTS.

NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY, PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY PRINTOUTS.

NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY, PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY

EXEMPTION 5

From: Anthony Bond [mailto:tbond@haagglobal.com]
Sent: Thursday, October 17, 2013 9:00 AM
To: Keane, Jim; 'manringn@missouri.edu'
Cc: Lynch-Jacobs, Maureen
Subject: RE: TG-1900 Hoboken

The hydraulic motor controls the load, so the following statement is accurate, "control of the rate of descent of the lifted load is primarily achieved by the hydraulic system: normal braking of operational functions is accomplished by the hydraulic motors when the oil flow through the motors is reduced"

Regardless of the "static brake" intent by the manufacturer, the reality is that when the pressure for motor operation is reduced by bringing the winch lever back to the center position (or falls to zero due to failure) the disc brakes are applied. This is reflected in their statement below, disc brakes "applied in emergency situation and used as "dynamic" brakes but that is not their primary intent".

The key statement, which is most important and addressed in my previous letter response, is this one: "The new winch pack has two axial/variable displacement hydraulic motors, each with a disc-brake and planetary gearbox (similar to the arrangement of Favco). The motors are installed on each side of the drum and the torque is transferred directly to the drum shaft (thus alleviating the risk of failure in the transmission at the pinion/spline as happened for the crane at 57th street)."

The modified arrangement designed by Federated Cranes offers redundancy within the braking system for this crane that the incident cranes did not have. I agree with their statement that, "the new winch pack designed by Federated Cranes offers superior performance and braking capacity (disc brakes technology requiring less maintenance to work at peak efficiency) than the original winch pack."

Ensure that band-brakes, if they are not already installed for this crane, are also utilized on these winches; this offers another level of redundancy for the braking system, which is common within the industry.

Thanks,

Tony.

From: Keane, Jim [mailto:jkeane@panynj.gov]
Sent: Wednesday, October 16, 2013 3:17 PM
To: Anthony Bond; 'manringn@missouri.edu'
Cc: Lynch-Jacobs, Maureen; Keane, Jim
Subject: Fw: TG-1900 Hoboken
Importance: High

Your comments on the attached please...

Sent from Jim Keane's BlackBerry Wireless Handheld
The Port Authority of NY and NJ - Look what we're doing
90+ Years of Investing in the Region
www.panynj.gov
vww.wtcprogress.com
www.panynj.gov/bayonnebridge
Office - 201-216-2821
Facsimile - 201-216-2225
Mobile - 973-417-4236

From: Pierre Gonzalez [mailto:pgonzalez@hisassoc.com]
Sent: Wednesday, October 16, 2013 04:09 PM
To: Lynch-Jacobs, Maureen
Cc: Keane, Jim; Lawrence Shapiro <lkshapiro@hisassoc.com>
Subject: TG-1900 Hoboken

Maureen,

Following our discussion from yesterday, please find below and in attachment the following information regarding the Favco M760D and TG-1900:

- Favco M760D: disc-brakes installed on each motor (4 motors total for the M760D). As stated by the manufacturer: "brakes are holding brakes only, with a minimum static capacity of 2.0 times motor torque" (see attached). Since there is one disc-brake per motor the braking static capacity is twice the line pull capacity. One potential issue with the arrangement is that the disc-brake is installed between the motor and gearbox/drive pinion: if any of the element mounted after the disc-brake (gearbox, spline or pinion) fails or is compromised (as it happened for the crane at 57th street), then the disc-brake of that motor becomes completely inoperant.
- TG-1900: holding band-brakes installed at opposite end of the shaft from motor (if the motor is compromised the band brake can still be applied at the other end of the drive shaft – as it happened at WTC#4). There are 2 brakes or 3 brakes (latest FMC design) for 4 motors. Each brake has a static capacity of approximately 3 times the torque from one motor, so overall the braking static capacity is approximately 150% the line pull capacity. One potential issue with the TG arrangement is that the band brakes are more "exposed" to the environment (as opposed as disk brakes in a confined housing/carter) and require more maintenance (check for foreign matter between band and brake drum) and proper alignment. As per the user's manual the band brakes have to be checked every 50 hours.

In both the Favco and TG-1900 (as in almost all other cranes), the brakes are designed and intended as static holding brakes only. The "dynamic braking" or control of the rate of descent of the lifted load is primarily achieved by the hydraulic system: normal braking of operational functions is accomplished by the hydraulic motors when the oil flow through the motors is reduced, and the static brakes are applied when the oil flow is stopped.

The static brakes of both the Favco and TG-1900 can be applied in emergency situation and used as "dynamic" brakes but that is not their primary intent - nor should it be considered as a "fail safe device". In such an event the case could be made that the disc brakes offer a better braking ability, mainly because the disc brakes are less dependent on the adjustment to engage and on the maintenance to guarantee their efficiency (the risk of inclusion of foreign matter in the brake affecting adversely the coefficient of friction is more limited for the disc brakes). The heating of the disc brakes is also somewhat more limited since they are placed in a housing filled with oil (wet brakes). On the other hand as pointed previously the TG-1900 brakes can always be applied since they are mounted on the other end of the drive shaft – which is not the case with the Favco's arrangement if a failure occurs on the drive shaft after the brake.

The concern that the TG-1900 band brakes would not engage due to improper adjustment and/or maintenance is one reason (amongst others) why a new/modified winch-pack was designed for the TG-1900 by Federated Cranes (Tom Kanzler and Mike Schiavoni) . The new winch pack has two axial/variable displacement hydraulic motors, each with a disc-brake and planetary gearbox (similar to the arrangement of Favco). The motors are installed on each side of the drum and the torque is transferred directly to the drum shaft (thus alleviating the risk of failure in the transmission at the pinion/spline as happened for the crane at 57th street). The braking capacity is approximately rated to 150%-160% of the line pull (58,000lbs same as original winch for the TG-1900).

The loads lifted on the Hoboken project will be around 15,000lbs (with one occurrence at 20,000lbs) which is well below the rated line pull of the original TG-1900 and its braking capacity (150% of line pull). It is therefore our professional opinion that the TG-1900 with the original winch pack designed by FMC will be more than apt and adequate to perform the work required when maintained and operated properly.

In our view the new winch pack designed by Federated Cranes offers superior performance and braking capacity (disc brakes technology requiring less maintenance to work at peak efficiency) than the original winch pack. The new winch pack was designed in accordance to the current crane codes and design standards and is a proven system (as noted by Peter Stroh). The case could also be made that a modified TG-1900 equipped with this new winch is a different equipment altogether than the original TG-1900 targeted by NYC DOB cease use order (which in any case does not apply in Hoboken).

As engineers placing the safety of the public and workers first and foremost in the list of our preoccupations, it is our professional opinion that using a modified TG-1900 with a new winch would certainly represent the best outcome for this particular project – especially since using another crane (hammerhead) or a combination of several cranes (M760 + mobile cranes) would likely represent an increase of risk from the logistical and structural standpoints and would not guarantee a reduction of risk from the mechanical standpoint.

As always, please do not hesitate to call me if you wish to discuss further, and thank you for your consideration in this matter.

Best regards,
Pierre

Pierre GONZALEZ,
Project Engineer

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel: (516) 791-2600
Fax: (516) 791-5425

NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY, PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY PRINTOUTS.

Tower sections are electrically welded construction and are braced for maximum torsional bending strength. Connections are made by high tensile steel bolts at each corner, developing the full strength of each corner. The tower sections have included a platform and ladders to provide access to the machinery deck.

The counterweights consist of heavy steel plate sections, which are supported on the rear of the machinery deck.

The cabin is ergonomically designed to provide maximum efficiency of operation for all weather and site conditions. All windows are of safety glass structure with side windows slide opening to provide adequate ventilation. All motion controls come readily to hand. The cabin seat is fully adjustable to provide optimum comfort. It is also equipped with lifting armrest and headrest. Excellent visibility is provided for the operator with full length front window shaped to allow full vision when looking down without leaving the seat. The cabin is also equipped with an air conditioner.

Power for all motions is supplied by a turbo-charged diesel engine through which a gearbox drives the four axial piston variable displacement pumps. All pumps are connected in closed loop or hydrostatic transmission system to variable displacement motors for hoist and luff motion, a fixed displacement axial piston motor for the slew motion and variable displacement motors for the fly hoist motion (if applicable).

Motors drive through multi-disc brakes and two or three stages (depending on motion) planetary gearboxes, the pinions, which mesh with the individual drum gears or the internal slew ring gear.

Brakes are holding brakes only, with a minimum static capacity of 2.0 times motor torque.

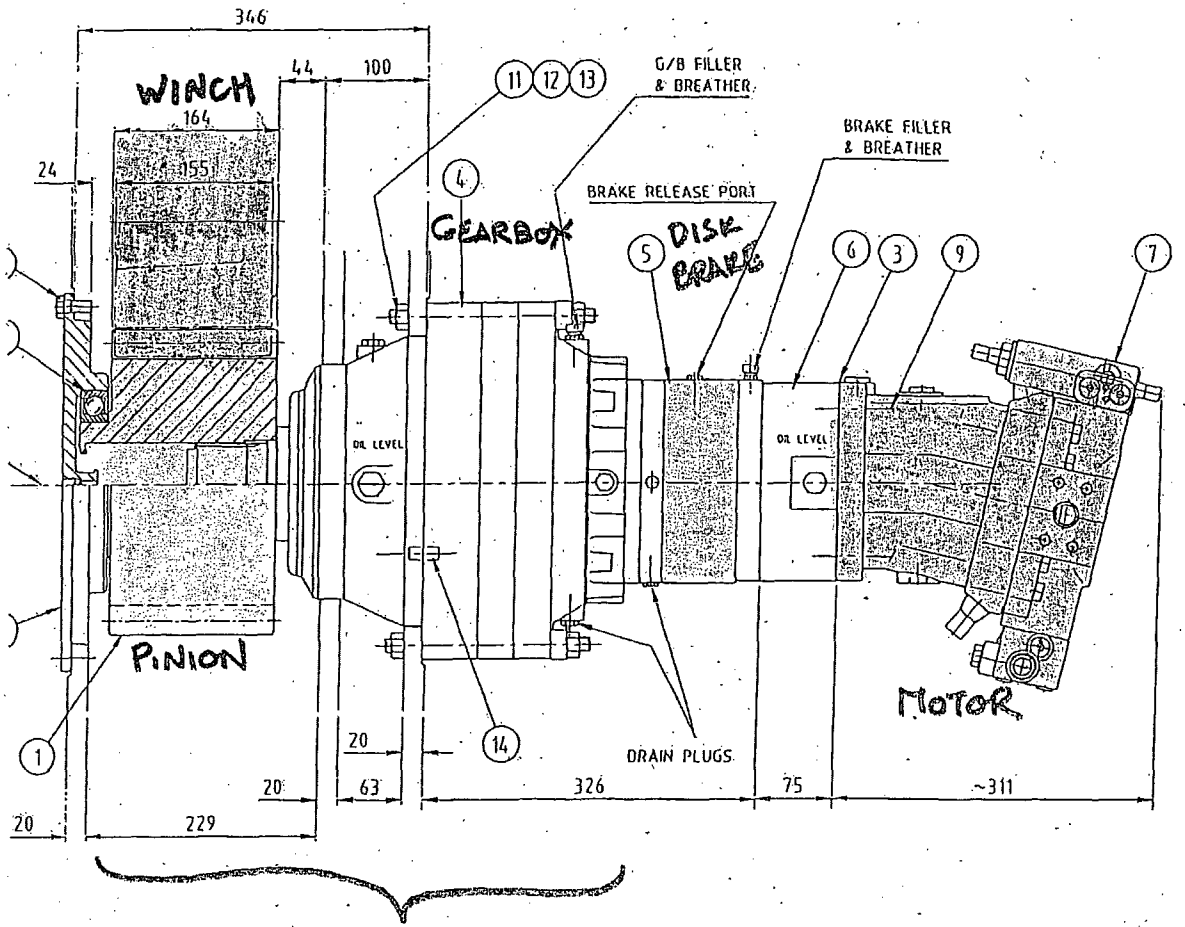
All operating controls for the crane movements are by sensitive 'dead man' type hydraulic pressure related controls. These incorporate the brake control as the brakes are automatically applied when the control lever is in the central position. The control valves give stepless control to each crane motion with all motion speeds selected to give optimum safety in control under any load condition.

The engine and crane safety system is powered by the 12 or 24V (volts) engine alternator.

The key that operates the ignition switch is to be kept remote from the crane during shutdown, preventing either unauthorized usage or starting of engine.

Where necessary, all electrics are wired so that automatic shutdown of engine, functions or switching into a safe mode of operation.

The following sections give the specification of the crane, as well as other relevant information such as the performance charts and hoisting diagrams.



IF ANY OF THESE ELEMENTS FAIL THEN THE BRAKE (AND MOTOR) ARE COMPLETELY INEFFECTIVE.

ATTENTION: MAINTENANCE PERSONNEL

USE ONLY OIL AS NOMINATED IN CRANE MANUAL, SECTION 4 TO FILL GEARBOX, BRAKE AND MOTOR.

DO NOT OVERFILL GEARBOX OR BRAKE.

Material List

Cat.	Item	Code	Qty	Description	Reference	
	1	REF	1	DRIVE PINION		
	2	REF	1	BEARING HOUSING		
	3	REF	1	MOTOR GASKET		
	4	GBX	1	GEARBOX 20:2:1		
	5	REF	1	BRAKE	0537303791	
	6	ADP	1	MOTOR ADAPTOR		
	7	MTR	REF	HYDRAULIC MOTOR	consult FFC	
	8	BR	1	BEARING (120/180/28)		
	9	HEX	4	M16 x 60	GRADE 8.8	
	10	HEX	4	M12 x 30	GR. 4.6 GALV.	
	11	TB	12	THREADED BAR M14 x 200.	GRADE 8.8	
	12	W	12	WASHER		
	13	HEX	12	NUT M14	GRADE 8	
	14	SPN	3	BISSELL PIN Ø 12 x 30	ZINC PLATED	

NOTES

1. MATERIAL LIST IS FOR ONE (1) DRIVE ONLY
   REFER TO WINCH ASSEMBLY FOR NUMBER OFF REQUIRED.
2. FULLY CLEAN MATING SURFACE OF GEARBOX AND WINCH AND THEN APPLY "LOCTITE 277" TO PROVIDE FRICTION JOINT.
3. U.O.N. ALL BOLTS TIGHTENED TO DWG. A3-9900.214

** TO BE ORDERED WITH SHAFT SEAL REMOVED AND A LEVEL PLUG ON THE SHAFT CENTERLINE

Checked	Date	Revision	ECN	Name	Issue
	2.02.01	ORIGINAL ISSUE	-	L.Z.	A

FAVELLE FAVCO — Favelle Favco Cranes Pty. Ltd. A.C.N. 067 562 449
A subsidiary of Hutchison Engineering (U) BHD

Project: 760-515-32-12 — First Used On S/No. 1043

Title: DRUM DRIVE ASSEMBLY - HOIST — Activity No. 230

Drawn	Checked	Date Drawn	Sheet	Weight	U/Film	Issue
L.Zubic	AM	2.02.01	1 of 1	295 kg	-	A

Approved	Scale	Drawing Number
BM	1:5	A3-2390.237M

DO NOT SCALE FROM DRAWING
IF IN DOUBT ASK FFC PTY LTD ENGINEERING DEPT.

© THIS DRAWING REMAINS THE PROPERTY OF FAVELLE FAVCO CRANES PTY LTD. AND MUST NOT BE USED OR COPIED WITHOUT WRITTEN PERMISSION.

EXEMPTION 5

From: Manring, Noah D. [mailto:manringn@missouri.edu]
Sent: Thursday, October 17, 2013 9:27 AM
To: Keane, Jim
Cc: Lynch-Jacobs, Maureen; 'tbond@haagengineering.com'
Subject: RE: TG-1900 Hoboken

Dear Jim:

Pierre Gonzalez's email below is good and helpful. Based upon the new information provided in that email, I would feel comfortable approving the use of the "modified TG-1900" crane at the New Jersey site. Key points brought out in the email are ...

1. "The braking static capacity is approximately 150% the line pull capacity." This is the first time I've heard (or been able to read) anything about the braking capacity for this crane. It appears that the engineers have done a great deal of work to ensure a proper braking capacity and have even modified the winch pack with extra brakes "similar to the arrangement of Favco".

2. "The loads lifted on the Hoboken project will be around 15,000 lbf (with one occurrence at 20,000 lbf) which is well below the rated line pull of the original TG-1900." If the braking capacity is 150% of 58,000 lbf, then the braking capacity is 87,000 lbf and only 20,000 lbf will be lifted. This means that the brakes are able to hold 4X the load that will be lifted at this job site. This seems like a good margin of safety to me.

The rest of Gonzalez's email is very reasonable and offers an objective analysis of the situation. I get the impression that these engineers are doing a good job and are mindful of public safety. Let me know if I can be of any other service.

Sincerely, Noah

Noah D. Manring
Glen A. Barton Professor
Interim Associate Dean for Research
College of Engineering, University of Missouri
Columbia, MO 65211
573-882-0693
ManringN@missouri.edu

From: Keane, Jim [mailto:jkeane@panynj.gov]
Sent: Wednesday, October 16, 2013 3:17 PM
To: 'tbond@haagengineering.com'; Manring, Noah D.
Cc: Lynch-Jacobs, Maureen; Keane, Jim
Subject: Fw: TG-1900 Hoboken
Importance: High

NYC Buildings

Robert D. LiMandri
Commissioner

Faisal Muhammed, P.E.
Executive Director
Cranes & Derricks Division

280 Broadway, 5th Floor
New York, NY 10007
Nyc.gov/buildings

+1 212 393 2348 tel
+1 212 566 5871 fax

CEASE USE ORDER

June 7th, 2013

Lawrence Weiss
Cranes, Inc.
53-20 44 Street
Maspeth, NY 11378

Re: CD# 2230, 1851 and 1850

To Mr. Weiss:

Following an investigation of two tower cranes similar to CD# 2230, 1851 and 1850 that were involved in recent accidents at the World Trade Center, DOB has determined that the hydraulic system design of the TG and STD series of tower cranes, which does not include a fail-safe mechanism for the hydraulic motors, was a contributing factor in both incidents.

As you are aware, the above-referenced cranes are already unauthorized to work in NYC due to its expired certificate of operation. In light of the foregoing, you are hereby ordered to cease use of the tower cranes referenced above pursuant to Section 28-207.5 of the Administrative Code of the City of New York ("Code").

Furthermore, DOB intends to revoke registrations for all TG and STD series tower cranes pursuant to Code Section 28-105.10. Separate notice of such proposed revocations will follow.

Very truly yours,

Faisal Muhammed, P.E.
Executive Director

cc: Michael Alacha, Assistant Commissioner, Engineering & Emergency Ops.

EXEMPTION 5

From: Manring, Noah D. [mailto:manringn@missouri.edu]
Sent: Thursday, October 17, 2013 9:27 AM
To: Keane, Jim
Cc: Lynch-Jacobs, Maureen; 'tbond@haagengineering.com'
Subject: RE: TG-1900 Hoboken

Dear Jim:

Pierre Gonzalez's email below is good and helpful. Based upon the new information provided in that email, I would feel comfortable approving the use of the "modified TG-1900" crane at the New Jersey site. Key points brought out in the email are ...

1. "The braking static capacity is approximately 150% the line pull capacity." This is the first time I've heard (or been able to read) anything about the braking capacity for this crane. It appears that the engineers have done a great deal of work to ensure a proper braking capacity and have even modified the winch pack with extra brakes "similar to the arrangement of Favco".

2. "The loads lifted on the Hoboken project will be around 15,000 lbf (with one occurrence at 20,000 lbf) which is well below the rated line pull of the original TG-1900." If the braking capacity is 150% of 58,000 lbf, then the braking capacity is 87,000 lbf and only 20,000 lbf will be lifted. This means that the brakes are able to hold 4X the load that will be lifted at this job site. This seems like a good margin of safety to me.

The rest of Gonzalez's email is very reasonable and offers an objective analysis of the situation. I get the impression that these engineers are doing a good job and are mindful of public safety. Let me know if I can be of any other service.

Sincerely, Noah

Noah D. Manring
Glen A. Barton Professor
Interim Associate Dean for Research
College of Engineering, University of Missouri
Columbia, MO 65211
573-882-0693
ManringN@missouri.edu

From: Keane, Jim [mailto:jkeane@panynj.gov]
Sent: Wednesday, October 16, 2013 3:17 PM
To: 'tbond@haagengineering.com'; Manring, Noah D.
Cc: Lynch-Jacobs, Maureen; Keane, Jim
Subject: Fw: TG-1900 Hoboken
Importance: High

Lynch-Jacobs, Maureen

From: Anthony Bond [tbond@haagglobal.com]
Sent: Thursday, October 17, 2013 9:00 AM
To: Keane, Jim; 'manringn@missouri.edu'
Cc: Lynch-Jacobs, Maureen
Subject: RE: TG-1900 Hoboken

The hydraulic motor controls the load, so the following statement is accurate, "control of the rate of descent of the lifted load is primarily achieved by the hydraulic system: normal braking of operational functions is accomplished by the hydraulic motors when the oil flow through the motors is reduced"

Regardless of the "static brake" intent by the manufacturer, the reality is that when the pressure for motor operation is reduced by bringing the winch lever back to the center position (or falls to zero due to failure) the disc brakes are applied. This is reflected in their statement below, disc brakes "applied in emergency situation and used as "dynamic" brakes but that is not their primary intent".

The key statement, which is most important and addressed in my previous letter response, is this one: "The new winch pack has two axial/variable displacement hydraulic motors, each with a disc-brake and planetary gearbox (similar to the arrangement of Favco). The motors are installed on each side of the drum and the torque is transferred directly to the drum shaft (thus alleviating the risk of failure in the transmission at the pinion/spline as happened for the crane at 57th street)."

The modified arrangement designed by Federated Cranes offers redundancy within the braking system for this crane that the incident cranes did not have. I agree with their statement that, "the new winch pack designed by Federated Cranes offers superior performance and braking capacity (disc brakes technology requiring less maintenance to work at peak efficiency) than the original winch pack."

Ensure that band-brakes, if they are not already installed for this crane, are also utilized on these winches; this offers another level of redundancy for the braking system, which is common within the industry.

Thanks,

Tony.

From: Keane, Jim [mailto:jkeane@panynj.gov]
Sent: Wednesday, October 16, 2013 3:17 PM
To: Anthony Bond; 'manringn@missouri.edu'
Cc: Lynch-Jacobs, Maureen; Keane, Jim
Subject: Fw: TG-1900 Hoboken
Importance: High

Your comments on the attached please...

Sent from Jim Keane's BlackBerry Wireless Handheld
The Port Authority of NY and NJ - Look what we're doing
90+ Years of Investing in the Region
www.panynj.gov
www.wtcprogress.com
www.panynj.gov/bayonnebridge
Office - 201-216-2821

available and the current crane foundation would not work, so it is not a choice I would recommend. I looked at horizontal jib (hammerhead) cranes and I found that the Liebherr 630 will reach and have about the same capacity as the TG 1900 as speced out. However, I looked at Google Earth and it appears that the building south of the crane location is approximately 195' high to the cooling tower, so that the crane jib for the Liebherr would most likely not clear the building's mechanical equipment when the crane weathervanes. The European tower cranes tend to deflect much more than the TG cranes and Favco cranes, as the towers are built lighter and are not as rigid. With a long horizontal jib and a high freestanding height the jib tip could deflect down in the range of several feet.

I never saw any official notice stating that the TG cranes are not allowed to be used in New York City, but I have heard that they have been banned unofficially. I assume this ban stems from the incident at WTC Tower 4. While the TG cranes have had a long life, this in and of itself does not automatically determine that they are no longer capable of safe operation. Maintenance is the most important factor in determining the life of a crane. The better the maintenance, the longer the life. As far as structural capabilities are concerned, inspection and testing should adequately prove the integrity of the structure. If the crane is owned or serviced by Federated Equipment, they may be able to use the crane with the custom hoist pack that they designed and built for the TG cranes. I believe they built several of these hoist packs around 2004 ~ 2005. I know two of them were used at the Time Warner Building at Columbus Circle. Since these hoist packs were designed and built to the crane codes at the time, they are basically up to current design standards and have been used in NYC up until the ban on the cranes, so they are a proven system. I would also recommend that if the crane is to be used, new main load line and boom hoist rope be installed. I also note that the building is not that high, so that the hoisting height is relatively low for this crane. I also see that the sidewalks and curb lanes are closed around the jobsite, which will add to the public safety.

If the use of the TG 1900 will not be allowed, than you have several options:

1. Use two tower cranes on the project to meet the lifting requirements. This is not an option I would recommend, since the current crane position would not be able to be utilized. Two new foundations would need to be designed and built (remobilization of the foundation/piling equipment, etc.) two crane erections and dismantling, impacting the community, not to mention the additional expense.
2. Use one tower crane in the current position and erect the remaining portion of the building with mobile cranes from Sinatra Drive and River Street. Fairly large mobile cranes will need to be used and they may not fit into the current sidewalk and lane closings.
3. Use mobile cranes from inside the site to erect the steel and work out toward Second Street. Complete the steel erection from Second Street. Use mobile cranes on Second St., Sinatra Drive and River Street to erect the precast. This will delay the completion of the job, as the erection with mobile cranes is slower than the erection with a tower crane. The impact to the community will be more, as the mobile cranes will need to work on the streets and be assembled and dismantled on the streets. There is a basement in the building, so a platform would need to be designed and built for the crane, or a suitable ramp to provide access. A ramp is probably not practical, as most of the cranes would not be able to negotiate this type of ramp when assembled. A platform would be very expensive and delay the job as it needs to be built, as well as the additional crane to build the platform.

From a risk management prospective, the single tower crane makes the most sense. Put the crane up (one street closing to erect), erect the building (shorter erection time with tower crane and tower crane designed for a storm condition, mobile cranes need to be boomed down to the ground for winds over 50 mph), dismantle crane (one street closing). The mobile cranes will need to be moved around the site. I understand your reservations about the use of the TG 1900 crane for this site, but it is my opinion that the banning of the TG cranes was not fully vetted out. There was an existing bias to ban the cranes and the opportunity was too good to pass up. It is my recommendation that the TG 1900 crane be allowed to be used at this site. Inspections are a must and maintenance must be performed and documented. Please feel free to contact me with any questions or comments.

Peter J. Stroh, P.E.

The loads lifted on the Hoboken project will be around 15,000lbs (with one occurrence at 20,000lbs) which is well below the rated line pull of the original TG-1900 and its braking capacity (150% of line pull). It is therefore our professional opinion that the TG-1900 with the original winch pack designed by FMC will be more than apt and adequate to perform the work required when maintained and operated properly.

In our view the new winch pack designed by Federated Cranes offers superior performance and braking capacity (disc brakes technology requiring less maintenance to work at peak efficiency) than the original winch pack. The new winch pack was designed in accordance to the current crane codes and design standards and is a proven system (as noted by Peter Stroh). The case could also be made that a modified TG-1900 equipped with this new winch is a different equipment altogether than the original TG-1900 targeted by NYC DOB cease use order (which in any case does not apply in Hoboken).

As engineers placing the safety of the public and workers first and foremost in the list of our preoccupations, it is our professional opinion that using a modified TG-1900 with a new winch would certainly represent the best outcome for this particular project – especially since using another crane (hammerhead) or a combination of several cranes (M760 + mobile cranes) would likely represent an increase of risk from the logistical and structural standpoints and would not guarantee a reduction of risk from the mechanical standpoint.

As always, please do not hesitate to call me if you wish to discuss further, and thank you for your consideration in this matter.

Best regards,
Pierre

Pierre GONZALEZ,
Project Engineer

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel: (516) 791-2600
Fax: (516) 791-5425

NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY, PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY PRINTOUTS.

EXEMPTION 5

From: Peter Stroh [mailto:Peter@strohengineering.com]
Sent: Wednesday, October 09, 2013 05:06 PM
To: Lynch-Jacobs, Maureen
Subject: RE: Hoboken

Good Afternoon Maureen,

I looked over the information you sent me. Since a tower crane is to be used on the job, I assume mobile cranes on the streets will not be allowed, so I did not look at mobile cranes as an option. I did not find another luffing boom tower crane that will match the capabilities of the TG 1900 called out that is in its class. This TG 1900 has a special long reach boom that will accommodate the project requirements. The only luffing boom tower crane (non TG crane) that I know of that will make the reach is a Favco 1280. The 1280 is really too large for the project and I don't think there are any

available and the current crane foundation would not work, so it is not a choice I would recommend. I looked at horizontal jib (hammerhead) cranes and I found that the Liebherr 630 will reach and have about the same capacity as the TG 1900 as speced out. However, I looked at Google Earth and it appears that the building south of the crane location is approximately 195' high to the cooling tower, so that the crane jib for the Liebherr would most likely not clear the building's mechanical equipment when the crane weathervanes. The European tower cranes tend to deflect much more than the TG cranes and Favco cranes, as the towers are built lighter and are not as rigid. With a long horizontal jib and a high freestanding height the jib tip could deflect down in the range of several feet.

I never saw any official notice stating that the TG cranes are not allowed to be used in New York City, but I have heard that they have been banned unofficially. I assume this ban stems from the incident at WTC Tower 4. While the TG cranes have had a long life, this in and of itself does not automatically determine that they are no longer capable of safe operation. Maintenance is the most important factor in determining the life of a crane. The better the maintenance, the longer the life. As far as structural capabilities are concerned, inspection and testing should adequately prove the integrity of the structure. If the crane is owned or serviced by Federated Equipment, they may be able to use the crane with the custom hoist pack that they designed and built for the TG cranes. I believe they built several of these hoist packs around 2004 ~ 2005. I know two of them were used at the Time Warner Building at Columbus Circle. Since these hoist packs were designed and built to the crane codes at the time, they are basically up to current design standards and have been used in NYC up until the ban on the cranes, so they are a proven system. I would also recommend that if the crane is to be used, new main load line and boom hoist rope be installed. I also note that the building is not that high, so that the hoisting height is relatively low for this crane. I also see that the sidewalks and curb lanes are closed around the jobsite, which will add to the public safety.

If the use of the TG 1900 will not be allowed, than you have several options:

1. Use two tower cranes on the project to meet the lifting requirements. This is not an option I would recommend, since the current crane position would not be able to be utilized. Two new foundations would need to be designed and built (remobilization of the foundation/piling equipment, etc.) two crane erections and dismantling, impacting the community, not to mention the additional expense.
2. Use one tower crane in the current position and erect the remaining portion of the building with mobile cranes from Sinatra Drive and River Street. Fairly large mobile cranes will need to be used and they may not fit into the current sidewalk and lane closings.
3. Use mobile cranes from inside the site to erect the steel and work out toward Second Street. Complete the steel erection from Second Street. Use mobile cranes on Second St., Sinatra Drive and River Street to erect the precast. This will delay the completion of the job, as the erection with mobile cranes is slower than the erection with a tower crane. The impact to the community will be more, as the mobile cranes will need to work on the streets and be assembled and dismantled on the streets. There is a basement in the building, so a platform would need to be designed and built for the crane, or a suitable ramp to provide access. A ramp is probably not practical, as most of the cranes would not be able to negotiate this type of ramp when assembled. A platform would be very expensive and delay the job as it needs to be built, as well as the additional crane to build the platform.

From a risk management prospective, the single tower crane makes the most sense. Put the crane up (one street closing to erect), erect the building (shorter erection time with tower crane and tower crane designed for a storm condition, mobile cranes need to be boomed down to the ground for winds over 50 mph), dismantle crane (one street closing). The mobile cranes will need to be moved around the site. I understand your reservations about the use of the TG 1900 crane for this site, but it is my opinion that the banning of the TG cranes was not fully vetted out. There was an existing bias to ban the cranes and the opportunity was too good to pass up. It is my recommendation that the TG 1900 crane be allowed to be used at this site. Inspections are a must and maintenance must be performed and documented. Please feel free to contact me with any questions or comments.

Peter J. Stroh, P.E.

President
Stroh Engineering Services, P.C.
41 Robert Street
Babylon, New York 11702 U.S.A.
P - 631-669-7531
F - 631-669-6369
M - 631-553-0077
-----Original Message-----
From: Lynch-Jacobs, Maureen [mailto:mjacobs@panynj.gov]
Sent: Saturday, October 05, 2013 1:30 PM
To: Peter Stroh
Subject: Hoboken

Peter,
A contractor has submitted a crane plan using a TG 1900 in Hoboken. They are out of service in NYC, so I can't allow it. If I send drawings on Monday, can look for alternate solutions. This is another rush.
Thanks
Maureen

Sent from my BlackBerry Wireless Handheld

NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT

AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE

RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY,

PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY

PRINTOUTS.

Facsimile - 201-216-2225
Mobile - 973-417-4236

From: Pierre Gonzalez [mailto:pgonzalez@hisassoc.com]
Sent: Wednesday, October 16, 2013 04:09 PM
To: Lynch-Jacobs, Maureen
Cc: Keane, Jim; Lawrence Shapiro <lkshapiro@hisassoc.com>
Subject: TG-1900 Hoboken

Maureen,

Following our discussion from yesterday, please find below and in attachment the following information regarding the Favco M760D and TG-1900:

- Favco M760D: disc-brakes installed on each motor (4 motors total for the M760D). As stated by the manufacturer: "brakes are holding brakes only, with a minimum static capacity of 2.0 times motor torque" (see attached). Since there is one disc-brake per motor the braking static capacity is twice the line pull capacity. One potential issue with the arrangement is that the disc-brake is installed between the motor and gearbox/drive pinion: if any of the element mounted after the disc-brake (gearbox, spline or pinion) fails or is compromised (as it happened for the crane at 57th street), then the disc-brake of that motor becomes completely inoperant.
- TG-1900: holding band-brakes installed at opposite end of the shaft from motor (if the motor is compromised the band brake can still be applied at the other end of the drive shaft – as it happened at WTC#4). There are 2 brakes or 3 brakes (latest FMC design) for 4 motors. Each brake has a static capacity of approximately 3 times the torque from one motor, so overall the braking static capacity is approximately 150% the line pull capacity. One potential issue with the TG arrangement is that the band brakes are more "exposed" to the environment (as opposed as disk brakes in a confined housing/carter) and require more maintenance (check for foreign matter between band and brake drum) and proper alignment. As per the user's manual the band brakes have to be checked every 50 hours.

In both the Favco and TG-1900 (as in almost all other cranes), the brakes are designed and intended as static holding brakes only. The "dynamic braking" or control of the rate of descent of the lifted load is primarily achieved by the hydraulic system: normal braking of operational functions is accomplished by the hydraulic motors when the oil flow through the motors is reduced, and the static brakes are applied when the oil flow is stopped.

The static brakes of both the Favco and TG-1900 can be applied in emergency situation and used as "dynamic" brakes but that is not their primary intent - nor should it be considered as a "fail safe device". In such an event the case could be made that the disc brakes offer a better braking ability, mainly because the disc brakes are less dependent on the adjustment to engage and on the maintenance to guarantee their efficency (the risk of inclusion of foreign matter in the brake affecting adversely the coefficient of friction is more limited for the disc brakes). The heating of the disc brakes is also somewhat more limited since they are placed in a housing filled with oil (wet brakes). On the other hand as pointed previously the TG-1900 brakes can always be applied since they are mounted on the other end of the drive shaft – which is not the case with the Favco's arrangement if a failure occurs on the drive shaft after the brake.

The concern that the TG-1900 band brakes would not engage due to inproper adjustment and/or maintenance is one reason (amongst others) why a new/modified winch-pack was designed for the TG-1900 by Federated Cranes (Tom Kanzler and Mike Schiavoni) . The new winch pack has two axial/varialle displacement hydraulic motors, each with a disc-brake and planetary gearbox (similar to the arrangement of Favco). The motors are installed on each side of the drum and the torque is transferred directly to the drum shaft (thus alleviating the risk of failure in the transmission at the pinion/spline as happened for the crane at 57th street). The braking capacity is approximately rated to 150%-160% of the line pull (58,000lbs same as original winch for the TG-1900).

Dawn Yannelli

From:	Michael.Romano@pavmcgovern.com
Sent:	Wednesday, October 02, 2013 9:08 AM
To:	Lynch-Jacobs, Maureen; Lizzo, John; Sloan, Stewart; Keane, Jim; Caban, Wally; Stickelman, Timothy; Del Tufo, Gerard; McKee, Robert; McAuley, Joseph; Francois, Michael B.
Cc:	MDePaul@pavmcgovern.com; Doug Allen; ASokolowski@pavmcgovern.com
Subject:	Waterfront Corporate Center Hoboken - SJP / PMG Additional Information Response
Attachments:	DA 100213 Port Authority TG 1900 info PA further info.doc; Additional Info Package 100213.pdf

All,

Please find the attached response letter and supporting documents to the additional Port Authority questions and comments.

(See attached file: DA 100213 Port Authority TG 1900 info PA further info.doc)(See attached file: Additional Info Package 100213.pdf)

Thank you

Michael Romano, LEED AP
Project Manager
Pavarini McGovern / Structuretone
Waterfront Corporate Center - Field Office
5 Marine View Plaza
2nd Floor, Suite 201
Hoboken, NJ 07030
(201) 222-6263 Phone
(201) 222-8092 Fax
(347) 219-0894 Cell

CORNELL & COMPANY

September 30, 2013

Federated Crane Company, LLC.
1640 New Market Avenue
South Plainfield, NJ 07080

Re: **Service Qualifications**

To Whom It May Concern:

Cornell & Company, Inc. owns the manufacturing rights to the TG series (formerly FMC LinkBelt) of Tower Gantry Cranes. In addition, Cornell owns and operates a Rental Fleet of TG Cranes.

In all of these capacities, we have a well-established business relationship with Mr. Mike Schiavone. He functions as a distributor for our cranes and crane products. Mike is a qualified Tower Crane Erector and Service Mechanic. We employ him on a regular basis and recommend him to our clients.

Upon receipt and review, please call with questions or comments.

Wishing you every continued success,

CORNELL & COMPANY, INC.

DG/kmf

Donald Garrahan
Equipment Manager

DG/kmf

P.O. BOX 007 • WOODBURY, NJ 08096
TELEPHONE 856-742-1000 • FACSIMILE 856-755-0150
www.cornellcranecontrol.com

"A Certified W.B.E. Firm and Equal Opportunity Employer"

Federated Crane Co., L.L.C.
1640 New Market Ave. S. Plainfield, NJ 08854
Phone: (917) 797 – 3441
Fax: (732) 356-0381

CRANE HISTORY
CD-1850
FMC LINK-BELT TG-1900
S/N 76H3-107C

2-4-2012 TO 7-30-2012	550 WEST 45th STREET, NEW YORK, NEW YORK REPLACMENT WINCH
6-27-2010 TO 8-1-2011	4-10 EAST 102nd, NEW YORK, NEW YORK REPLACMENT WINCH
3-21-2010 TO 7-12-2008	3701 JEROME AVE., BRONX, NEW YORK STANDARD WINCH
5-28-2004 TO 6-2-2003	71 SOUTH WACKER, CHICAGO IL. STANDARD WINCH
5-17-2003 TO 6-26-2002	731 LEXINGTON AVE. NEW YORK, NEW YORK STANDARD WINCH
7-24-2001 TO 12-1-2000	56th & BROADWAY NEW YORK, NEW YORK STANDARD WINCH
2-15-2000 TO 7-28-1999	383 MADISON AVE NEW YORK, NEW YORK STANDARD WINCH

ALL OTHER TIMES CD-1850 WAS IS FEDERATED CRANES YARD AT 1640 NEW MARKET AVE. SOUTH PLAINFIELD, NEW JERSEY

SJPPROPERTIES

October 2, 2013

VIA Email/FedEx Overnight
Mr. Jerry Del Tufo
Assistant Director
Port Authority of NY & NJ
225 Park Avenue South
19th Floor
New York, NY 10003

Re: WCC III Hoboken, NJ

Dear Mr. Del Tufo:

In furtherance of our September 24, 2013 meeting last week, on-site inspection by the PANYNJ on September 25, 2013, and our written submission transmitted to you on September 25, 2013 sent in order to resolve the PANYNJ's expressed concerns about utilization of the TG 1900 crane in connection with the above referenced project ("Project"), enclosed is additional documentation that the PANYNJ recently requested in connection with the Project. It is my understanding that Pavarini McGovern, our Construction Manager, forwarded this information to the Port Authority at 9:00am today.

Please do not hesitate to contact me to discuss further or if you have any questions. We look forward to hearing from you.

Very truly yours,

Douglas Allen
EVP, Construction
SJP Properties

DA:dy

MORRIS CORPORATE CENTER IV
379 INTERPACE PARKWAY, BUILDING C, PARSIPPANY, NJ 07054 (973) 257-3001 (973) 402-0073
www.sjpproperties.com

PAVARINI McGOVERN
Higher Standards In Construction

Waterfront Corporate Center - Block B - Hoboken

Submittal

Contractor:	Crisdel Group	Submittal #:	02000-036
Date Received:	4/3/2013	Submission #:	1
Date Sent:	4/3/2013		
Date Returned:		Specification:	
		Section:	
Item:	Crane Pad Reinforcing Dwg	Page:	
		Paragrahph:	
	Howard I Shapiro & Assoc Dwg		
	Option # 2	Dwg #:	Howard I Shapiro & Assoc Dwg
Manufacture:	JM AHLE CO, INC		

The undersigned has reviewed this submittal and it is in accordance with the contract documents.

Michael Romano

PAVARINI McGOVERN
Higher Standards in Construction

770 Broadway 10th Floor
New York, NY 10003
P212-807-0900 F 212-807-0901

T R A N S M I T T A L

To: Brian Jasopersad - HLW
Leon Bolleu - HLW
Shop Dwg Dept @ HLW
Shira Kinzbrunner - GACE
Brad Kiefer - GACE
Jan Cemark - MRCE

Date: 4/3/2013

Re: Waterfront Corp Center - Submittals

Job No.: 51000009

We are sending via:		The Following Items:		Sent For the Following Reasons:	
	By Hand	X	Shop Dwgs	X	For Approval
	Fedex.		O & M Manuals		For Information & use
X	FTP site		Samples		As requested
	Fax		Drawings		Signature
X	E-Mail		Specifications		Quotation
	Pick Up		Photostats		Review and Comments
			Product Data		Resubmit
			Calculations		

Copies	Number	Dated	Due Date	Sub	Description
1	02000-036			Crisdel	Crane Pad reinforcing shop dwg

Remarks:

Here are the steps for accessing the Esteban FTP site if you don't have it:

Address: ftp://ftp2.esteban.com
Username: ejp-hobokenblockb
Password: hobokensjp
File: PMG / Submittals / Issued to consultants / Crisdel

Accepted by:_____

cc

Sent By: Michael Romano

PAVARINI McGOVERN
Higher Standards in Construction

770 Broadway 10th Floor
New York, NY 10003
P212-907-0900 F 212-907-0901

T R A N S M I T T A L

To: Brian Jasopersad - HLW
Leon Bolleu - HLW
Shop Dwg Dept @ HLW
Shira Kinzbrunner - GACE
Brad Kiefer - GACE
Jan Cemark - MRCE

Date: 4/3/2013

Re: Waterfront Corp Center - Submittals

Job No.: 51000009

We are sending via:		The Following Items:		Sent For the Following Reasons:	
	By Hand	X	Shop Dwgs	X	For Approval
	Fedex.		O & M Manuals		For Information & use
X	FTP site		Samples		As requested
	Fax		Drawings		Signature
X	E-Mail		Specifications		Quotation
	Pick Up		Photostats		Review and Comments
			Product Data		Resubmit
			Calculations		

Copies	Number	Dated	Due Date	Sub	Description
1	02000-036			Crisdel	Crane Pad reinforcing shop dwg

Remarks:

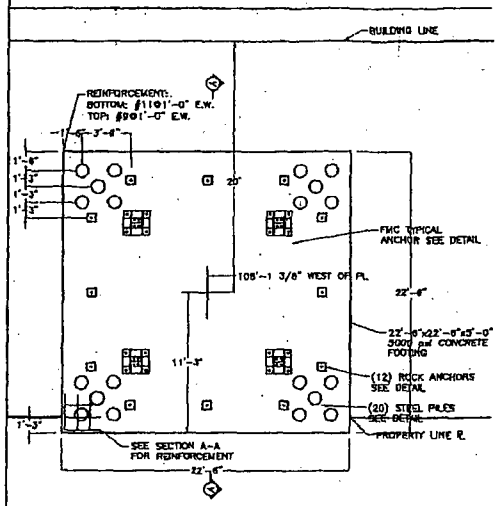
Here are the steps for accessing the Esteban FTP site if you don't have it:

Address: ftp://ftp2.esteban.com
Username: sjp-hobokenblockb
Password: hobokensjp
File: PMG / Submittals / Issued to consultants / Crisdel

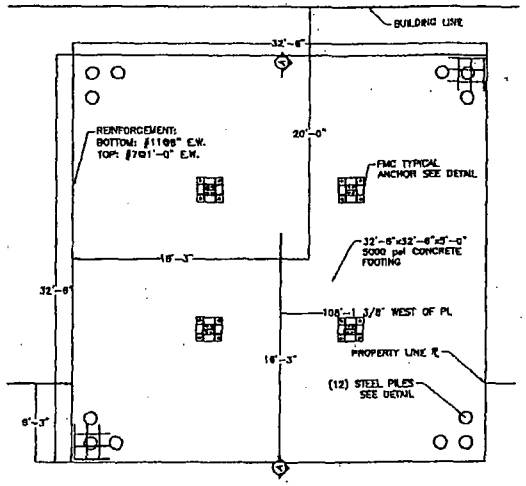
Accepted by:_____

CC

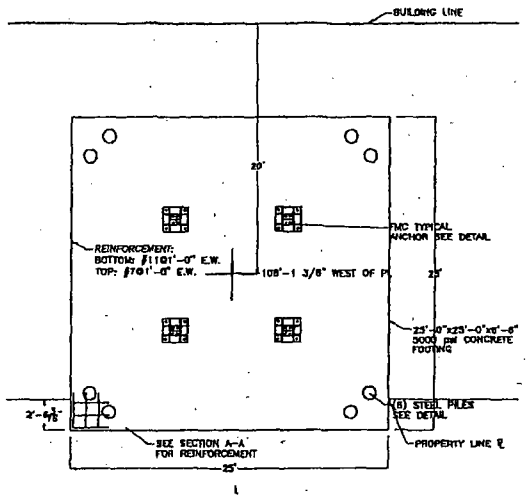
Sent By: *Michael Romano*



OPTION 1:TG2300 BASE WITH ROCK ANCHORS

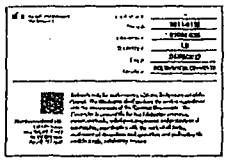


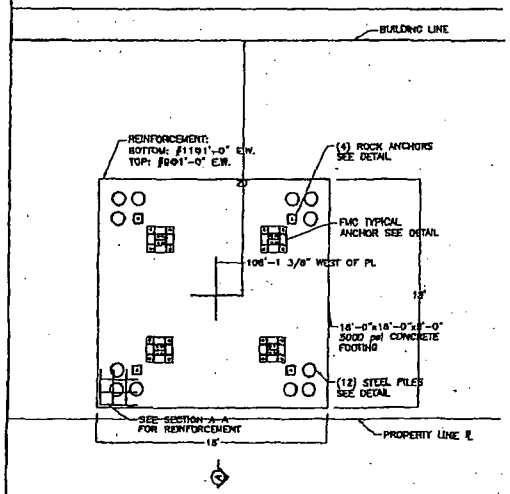
OPTION 2:TG2300 BASE WITHOUT ROCK ANCHORS



OPTION 3:TG1900 BASE WITHOUT ROCK ANCHORS WITH ONE TIE-IN

OPTION 3a:
27'-6"x27'-6"x5'-0" SLAB REINFORCEMENT IS SAME





OPTION 4:TG1900 BASE WITH ROCK ANCHORS WITH ONE TIE-IN

RECEIVED
04/03/2013
GACE consulting engineers pc

GACE consulting engineers pc

SUBMITTED FOR RECORD ONLY.

PLEASE RE-SUBMIT SIGNED AND SEALED COPY FOR RECORD.

PRELIMINARY PLAN

TOWER CRANE #1

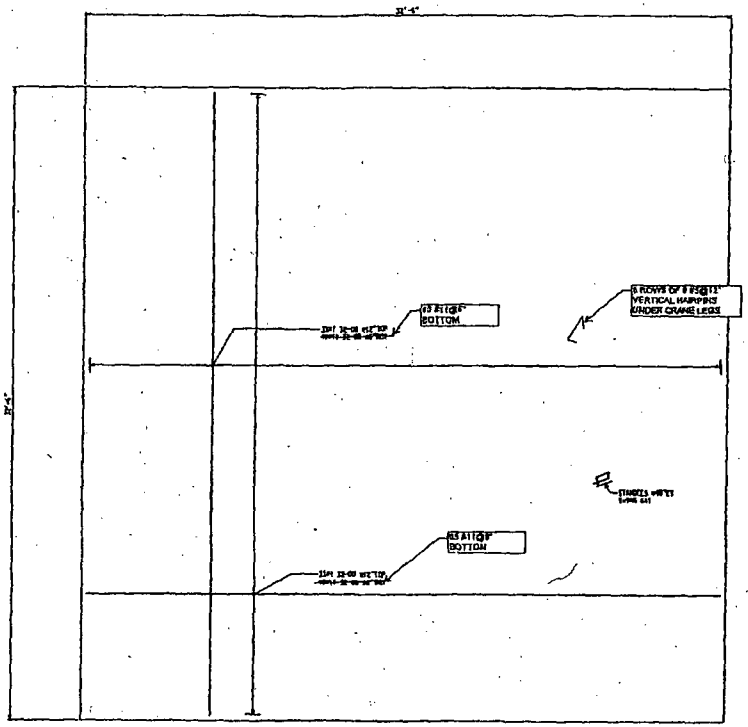
FMC TG-1900 230' BOOM
CD #2167 OR #2961

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 MERRICK ROAD, SUITE 400, LYNBROOK, N.Y. 11563
TEL. (516) 791-2600 FAX (516) 791-5595

TC CRANE INSTALLATION FOR Property Redevelopment

PROPOSED MIXED BUILDING AT Hempstead South Shopping Center Redevelopment, NJ

DATE: 03-01-13
SCALE: AS NOTED
DRAWN BY: JCE
JOB: 9-0-0-0-0-0
FILE NUMBER:
SHEET 1 OF 1 SHEETS



TOWER CRANE FOUNDATION PLAN

SUBMITTED FOR RECORD ONLY.

TO BE REVIEWED BY CRANE FOUNDATION ENGINEER.

RECEIVED 04/02/13 GACE

JM AHLE CO., INC.

FOUNDATION PLAN

R1

A continuing tradition of engineering service - since 1946

HOWARD I. SHAPIRO & ASSOCIATES

Consulting Engineers, P.C.

303 Merrick Road (Suite 400), Lynbrook, NY 11563

Howard I. Shapiro, P.E. (1932-2007) Jay P. Shapiro, P.E. Lawrence K. Shapiro, P.E. James Scheld, P.E. Heng Mun Loke, P.E. Valentin Ciocoi, P.E.

PORT AUTHORITY OF NEW YORK AND NEW JERSEY
225 PARK AVENUE SOUTH
NEW YORK, NY 10003

October 30, 2013

ATTN: Ms. Maureen Lynch-Jacobs

RE: Waterfront Corporate Center Project in Hoboken
TG-1900T Tower Crane at

Dear Ms. Lynch-Jacobs,

The engineering design of the installation and use (in-service and out-of-service) of a TG-1900T tower crane at the aforementioned site has been previously prepared and submitted by our office.

For the project, the TG-1900 crane (originally designed by FMC-Linkbelt) will be equipped with modified equipment constituting of:

- 240' long boom, originally designed by Jake's crane and endorsed by Cornell (present owner of the TG series cranes manufacturing rights). Please note that this configuration has been previously used in such jurisdiction as NYC, where the TG-1900 with the modified boom (known as TG-1900T) has been previously approved for use by NYC DOB division of Cranes & Derricks (please see load chart in attachment). As it happens, our office prepared the prototype approval for the crane to be used with the 240' boom and we can attest that **the crane in this configuration will be acceptable and adequate for the project presently considered**
- Replacement winch pack designed and manufactured by Federated Crane LLC. Please note that the replacement winch has been previously used before in such jurisdiction as NYC. As noted in his letter to NYC DOB division of Cranes & Derricks, Thomas Kanzler, PE states that the modified equipment does not alter the original FMC envelope because component weights and force vectors are the same as the original equipment while the dynamic loading is more constrained. As such, **the crane equipped with the modified equipment is structurally acceptable and adequate for the project presently considered** (questions pertaining to the mechanical performance of the modified equipment shall be directed to Federated Crane, LLC)
- The crane will be supported on (2) 40' long FMC TG-2300B tower sections, (1) 13'-7½" long FMC TG-2300/TG-1900 transition frame and (7) 13'-7½" long FMC TG-1900 tower sections. This combination uses original equipment for the TG-1900 tower crane and is permissible, as shown in Fig. 2-2 of section 2 of the crane operator's manual (please see attached).

We have performed design calculations to check the crane's support (tower legs and foundation) in this configuration and found **that this would be structurally adequate for this project as per relevant codes and applicable standards (ASCE 7-05, ASME B30.3 & 37-02, OSHA).**

Please do not hesitate to contact us if you have any question or comment

Very truly yours,

Lawrence K. Shapiro, P.E.

Tel: (516)791-2600 Fax: (516)791-5425

NYC Buildings

Robert D. LiMandri
Commissioner

Faisal Muhammed, P.E.
Executive Director
Cranes & Derricks Division

280 Broadway, 5th Floor
New York, NY 10007
Nyc.gov/buildings

+1 212 393 2348 tel
+1 212 566 5871 fax

CEASE USE ORDER

June 7th, 2013

Lawrence Weiss
Cranes, Inc.
53-20 44 Street
Maspeth, NY 11378

Re: CD# 2230, 1851 and 1850

To Mr. Weiss:

Following an investigation of two tower cranes similar to CD# 2230, 1851 and 1850 that were involved in recent accidents at the World Trade Center, DOB has determined that the hydraulic system design of the TG and STD series of tower cranes, which does not include a fail-safe mechanism for the hydraulic motors, was a contributing factor in both incidents.

As you are aware, the above-referenced cranes are already unauthorized to work in NYC due to its expired certificate of operation. In light of the foregoing, you are hereby ordered to cease use of the tower cranes referenced above pursuant to Section 28-207.5 of the Administrative Code of the City of New York ("Code").

Furthermore, DOB intends to revoke registrations for all TG and STD series tower cranes pursuant to Code Section 28-105.10. Separate notice of such proposed revocations will follow.

Very truly yours,

Faisal Muhammed, P.E.
Executive Director

cc: Michael Alacha, Assistant Commissioner, Engineering & Emergency Ops.

From: Doug Allen [mailto:dallen@sjpproperties.com]
Sent: Thursday, September 19, 2013 06:24 PM
To: McKee, Robert
Cc: Francois, Michael B.; Del Tufo, Gerard; McAuley, Joseph
Subject: Re: Tower crane rejection

Thank you

Bob,
The logistics was a long studied issue with the City of Hoboken and the Port Authority. Our initial logistics plan located a crawler Crane on the Head House area along Sinatra Drive, thus requiring the closure of Sinatra.

Almost 18 months ago in response to Hoboken concerns, we proposed a crane within the site on the second street frontage, that would allow Sinatra to remain open. The plan,as prepared by Howard Shapiro Associates, provided for the use of the TG1900 tower crane with the associated logistics. This plan was circulated to all, and reviewed in an open meeting with the City and Port Authority knowledge. As a result of comments and formal meetings the plan was finalized and submitted to all.This plan dated october 10, 2012 then became the Site mobilization and logistics plan for the project, and referenced at numerous Preconstruction meetings, including the Port Authority meeting.

The Lease and Developement Agreement between the City of Hoboken, the Port Authority of NYNJ and the Waterfront Corporate Center III JV LLC dated December 4, 2012 includes Exhibit O, as the Mobilization Plan as prepared by Howard Shapiro and Associates Consulting Engineers PC for Pavarini McGovern dated October 10, 2012. The reference to utilizing theTG 1900 tower Crane is specified within exhibit O of the Lease.

We have coordinated all the planning such as the distances and foundation requirements and purchase of steel and erection around this plan.

The last submission to the Port Authority was in response to your request for additional information, the complete booklet of inspections and design was submitted. It took longer than we anticipated and required further Engineering to satisfy the requirements you outlined for us.

This is a critical issue as we are coordinating with the City for the crane installation enabling the start of steel erection which is essential for the Pearson schedule.

We are available for any additional clarification required.

Sincerely

Doug

Sent from my iPhone

On Sep 19, 2013, at 3:43 PM, "McKee, Robert" <rmckee@panynj.gov> wrote:

> Doug,
>
> I am working with our General Manager of Inspection & Safety on the crane issue to see if there is a way to utilize the subject crane with some additional criteria (limiting of load, etc.) and will advise. As you may be aware the TG 1900 crane demonstrated design flaw problems in NYC at the WTC site a little while ago. Lastly, as you may recall I have been requesting that you submit the required TAA crane documentation since this past June for

review by our crane experts, it is unfortunate that this documentation was submitted only recently. As always we will do whatever we can do to try to assist SJP in this project.
>
> Bob
>
> -----Original Message-----
> From: Doug Allen [mailto:dallen@sjpproperties.com]
> Sent: Thursday, September 19, 2013 1:13 PM
> To: Francois, Michael B.; McKee, Robert; McAuley, Joseph
> Subject: Fwd: Tower crane rejection
>
> The crane package submitted as requested was the same equipment we documented on the logistics plan over the past two years and in the December agreement
>
> This is the most critical element to build. When the crane came off Sinatra and logistics identified a tower crane this is the equipment referenced.
>
> This cannot be changed all the base plates are in the piles to support.
>
> This is the same equipment being used on a Newark twenty four story building
>
> Please get back to me on this urgent matter
>
> Doug
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> From: <MDePaul@pavmcgovern.com<mailto:MDePaul@pavmcgovern.com>>
> Date: September 19, 2013, 12:58:30 PM EDT
> To: Doug Doug Allen <dallen@sjpproperties.com<mailto:dallen@sjpproperties.com>>
> Subject: Tower crane rejection
>
> Doug
>
> See below
>
>
> Maureen"<mjacobs@panynj.gov><mailto:mjacobs@panynj.gov>
> Date: Thu, 19 Sep 2013 12:08:02 -0400
> To: 'Lawrence K. Shapiro P.E.'<LKShapiro@hisassoc.com><mailto:LKShapiro@hisassoc.com>
> Subject: hoboken
>
> Larry,
> I received a submittal today for a tower crane using the 1900. We will not be able to use the 1900 on our sites. I will send an official rejection shortly.
> Thanks
> Maureen
>
>
>
>
> NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT
>
> AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE
>

GENOVA
BURNS
GIANTOMASI
WEBSTER
ATTORNEYS-AT-LAW

Genova Burns Giantomasi Webster LLC
494 Broad Street, Newark, NJ 07102
Tel: 973.533.0777 Fax: 973.533.1112
Web: www.genovaburns.com

Newark, NJ | New York, NY | Camden, NJ | Red Bank, NJ | Philadelphia, PA | Jersey City, NJ

Francis J. Giantomasi, Esq.
Partner
Member of NJ and NY Bars
fgiantomasi@genovaburns.com
Direct: 973-535-7103

October 18, 2013

VIA UPS OVERNIGHT DELIVERY
Peter J. Zipf
Chief Engineer
Port Authority of New York and New Jersey
225 Park Avenue South
New York, New York 10003

Timothy Stickelman, Esq.
Deputy General Counsel
Port Authority of New York and New Jersey
225 Park Avenue South
New York, New York 10003

Re: TG-1900 Tower Crane at Waterfront Corporate Center Project in Hoboken

Dear Messrs. Zipf and Stickelman:

This firm represents SJP Properties and the Waterfront Corporate Center III JV LLC ("WCC") with respect to the development of the Waterfront Corporate Center ("Project") pursuant to a December 2012 Lease and Development Agreement ("Agreement") entered into by WCC with the City of Hoboken ("Hoboken") and the Port Authority of New York and New Jersey ("Port Authority"). We write to provide further information regarding the use of the specific TG-1900 tower crane for the Project ("Hoboken TG-1900").

As you are aware, the Port Authority specifically approved the utilization of the Hoboken TG-1900 after a series of meetings, which approval was formalized in the mobilization and logistics plan and made a part of the Agreement. (Attached as Exhibit A is Exh. O to the Agreement, which specifically references and depicts the Hoboken TG-1900.) Despite its prior approval, the Port Authority has now indicated that it may not allow use of the Hoboken TG-1900 for the Project because a TG-1900 tower crane was involved in an incident at the World Trade Center ("WTC") in New York City ("NYC") nearly two years ago, well before the Port Authority approved the use of the Hoboken TG-1900.

Use of the Hoboken TG-1900 is critical to the construction of the Project, and in an effort to ease the Port Authority's concerns regarding the Hoboken TG-1900, WCC, SJP

Properties and its construction manager for the Project, Pavarini McGovern (collectively, "SJP"), have provided extensive information and documentation evidencing how and why the Hoboken TG-1900 is significantly different from the WTC crane, as well as how SJP's anticipated use of the crane for the Project is vastly different from the WTC crane's use at the WTC project.[1] SJP has also proposed enhanced safeguards to address any reservations concerning use of the Hoboken TG-1900.[2] Additionally, SJP has provided expert reports, including a report from Peter J. Stroh, P.E. (the Port Authority's own expert) – who concludes that the TG-1900 is the most ideal and safest crane for the Project, having found that alternative crane types would present considerable drawbacks from the standpoint of logistics and risk management. Indeed, the Port Authority's expert, Mr. Stroh, in recommending use of the Hoboken TG-1900, opined that it is the safest crane for the Project. Notwithstanding the fact that most of this information has already been provided to the Port Authority, we understand that there remains some confusion as to how the WTC crane and the Hoboken TG-1900 differ and why any risk of an incident, similar to that which occurred at the WTC, is nonexistent.

We are confident that the following explanation will clarify any concerns or misunderstanding the Port Authority may still have regarding SJP's utilization of the Hoboken TG-1900.

A. THE HOBOKEN TG-1900 VASTLY DIFFERS FROM THE WTC CRANE WITH RESPECT TO USE AND EQUIPMENT

1. The Hoboken TG-1900 will include a winch pack that provides superior performance and braking capacity compared to the WTC crane.

Unlike the WTC crane, the Hoboken TG-1900 will include a new/modified winch pack that starkly distinguishes it from the WTC crane and reduces the risk of transmission failure.[3] In particular, because the winch pack provides the crane with two axial/variable displacement hydraulic motors, each with a disc-brake and planetary gearbox, any risk of failure in the

[1] Attached as Exhibit B is much of this correspondence.

[2] SJP and its agents participated in meetings on September 25, 2013 and October 15, 2013 with the Port Authority to discuss these issues.

[3] Attached as Exhibit C is Pierre Gonzalez's written analysis of the Hoboken TG-1900 new/modified winch pack, which was sent to Maureen Lynch-Jacobs and Jim Keane of the PANYNJ on October 16, 2013.

transmission at the pinion/spline is alleviated. (Id.) As such, the Hoboken TG-1900 has markedly superior performance and braking capacity to the WTC crane, making it significantly safer, more reliable, and effectively reducing the risk of transmission failure.

2. Unlike the WTC crane, the Hoboken TG-1900 does not, and will not, require a climbing section mechanism.

Improper maintenance was the determinant cause of failure of the WTC crane. Specifically, a significantly high level of contaminants and extremely high level of water concentrations were found in the WTC crane's hydraulic system.[4] The hydraulic oil was, as a result, contaminated by the water which entered into the crane's climbing system during a "jump." (Id. and Exh. B.)

The Hoboken TG-1900, unlike the WTC crane, does not, and will not require a climbing mechanism. (Id.) Rather, the Hoboken TG-1900 will be erected and dismantled at full height. (Id.) Because the Hoboken TG-1900 does not requires a climbing mechanism, there will be no opportunity for outside contaminants to penetrate its closed-loop hydraulic system. (Id.) Thus, it is impossible for the specific cause of the problem with the WTC crane to occur with the Hoboken TG-1900. (Id.)

3. Unlike the WTC crane, the Hoboken TG-1900 will perform light service, operate a single shift, and lift well below the suggested capacity recommended by the WTC investigative report.

The overall project demand of the Hoboken TG-1900, in comparison to the WTC crane, will be extremely moderate, considering the total number of lift cycles and intensity. (Id.) The Hoboken TG-1900 will only operate a single shift (8 hours), six times per day, while the WTC crane operated 16 hours per day, which is approximately +/-50 lifts of steel and/or 15 lifts of pre-cast panels per day.

Further, the Hoboken TG-1900 will perform relatively light service in comparison to the heavy lifts performed by the WTC crane. (Id.) Specifically, the heaviest loads lifted at the Project will be approximately 15,000lbs, with one exception requiring a 20,000lb lift. (Id.) This is nearly one-third of the load capacity of the TG-1900 (57,600lbs) and half of the maximum load capacity suggested by the WTC investigative Manring report commissioned by

[4] Attached as Exhibit D is an expert report prepared by Lawrence K. Shapiro, P.E.

the Port Authority. (See Exhs. B-D.) In addition, the average weight for the steel lifts at the Project is 2,000lbs and the precast panel lifts at the Project is 6,000lbs, which the WTC crane lifts well exceeded. (Id.) The lifting heights and the amount of uninterrupted time during which the motors have to run to lift the load from the street to the crane's cab level, moreover, will be significantly less for the Hoboken TG-1900 – the WTC crane was approximately 860' above street level when the incident occurred, so by comparison the motors had to run for a duration approximately four times longer than what they will at Hoboken for a load to get from the street to the crane's cab level.

4. There are no feasible alternatives to the Hoboken TG-1900 for the Project.

In a good faith effort to accommodate the Port Authority's concerns, and at the request of the Port Authority, SJP has worked diligently to find alternative cranes for the Project. After studying multiple alternative cranes, it has become clear that there are no workable alternatives to the Hoboken TG-1900. By letter dated September 25, 2013, expert crane consultant, Larry Shapiro, P.E., advised that alternative solutions were studied and found to be problematic for the following reasons:

- *Favco M760 Crane* – The boom would not reach the rear corners of the site as needed to set all of the steel cast and precast panels, and it would require two additional hydraulic or crawler street cranes for the Project. This option would also require crane tie-backs to the building, in lieu of free-standing, which is not presently designed in the building steel or approved by the Port Authority.
- *Electric luffing-tower cranes* – There are no machines available in the US market that have sufficient capacity.
- *Electric hammerhead cranes* – The booms would sweep approximately 4 feet from the W Hotel, and swing over multiple occupied buildings and a public park; it would also require a temporary generator that would run for the duration of crane operation.

(See Exhs. A, B, and E.) Further, the use of alternative cranes would have substantial impacts upon the community and the construction site, including:

- Closure of River Street and Sinatra Drive, both major thoroughfares in Hoboken, for 24 hours a day for 8 to 10 months, with no vehicular access to those streets during that period;
- No pedestrian traffic would be possible on the portions of the streets closed for construction during this time;

- In order to accommodate different cranes, new base and foundation structures would likely need to be constructed to properly distribute the weight in an effort to avoid damaging underground utilities, which would necessarily include remobilization of the foundation/piling equipment and further disruption of street and pedestrian traffic.[5]

(Id.) Verifying SJP's findings that no acceptable alternatives to the Hoboken TG-1900 exist, the Port Authority's crane expert, Mr. Stroh, recommended that the Port Authority allow the utilization of the Hoboken TG-1900 for the Project.[6] Mr. Stroh advised that he evaluated alternatives and found none as effective, let alone better, than the Hoboken TG-1900 for the Project. (Id.) He further stated that there is nothing inherently unsafe about the Hoboken TG-1900 and that proper maintenance is the most important factor for crane safety. (Id.) Mr. Stroh concluded that it makes the most sense, from a risk management perspective, to utilize the Hoboken TG-1900 for the Project. (Id.)

5. All experts agree that the Hoboken TG-1900 should be used for the Project.

As described by crane expert Pierre Gonzalez and noted by expert Peter Stroh, the new/modified winch pack was designed "in accordance to the current crane codes and design standards and is a proven system," offering "superior performance and brake capacity," making the Hoboken TG-1900 "different equipment altogether than the original TG-1900." (See, id. and Exh E.) Gonzalez further recommends in his report that "[a]s engineers placing the safety of the public and workers first and foremost in the list of our preoccupations, it is our professional opinion that *using a modified TG-1900 with a new winch would certainly represent the best outcome for this particular project – especially since using another crane (hammerhead) or a combination of several cranes (M760 + mobile cranes) would likely represent an increase of risk from the logistical and structural standpoints.*" (Exh. C; emphasis added.)

Moreover, Gonzalez further notes that even if the Hoboken TG-1900 was used without the new/modified winch pack, it would still differ from the WTC crane because its intended use is different. For instance, the heaviest loads lifted for the Project will be around 15,000lbs

[5] It is important to note that the Port Authority did not ever reject the use of the Hoboken TG-1900; rather, it specifically approved it and SJP has completed the construction of the foundations necessary to support the Hoboken TG-1900 – construction which was specifically approved by the Port Authority.

[6] A copy of Mr. Stroh's findings are attached as Exhibit E.

(with one occurrence at 20,000lbs), which is well below the rated line pull of the original TG-1900 and its braking capacity (150% of line pull). (Id.) Therefore, the TG-1900 – even without the new/modified winch pack (which SJP intends on using) – would still be "more than apt and adequate to perform the work required..." (Id.)

In short, all of the crane experts agree that the Hoboken TG-1900 is the only workable option considering the crane requirements of the Project. Other cranes either cannot meet the Project requirements and/or present real and substantial site-specific risks, as opposed to hypothetical concerns based upon a singular incident with a different crane being used to hoist far greater loads on an entirely different project. (See Exhs. B-E.)

B. SJP'S ADDITIONAL SAFEGUARDS TO SATISFY THE PORT AUTHORITY'S CONCERNS EXPRESSED AT THE SEPTEMBER 25 AND OCTOBER 15 MEETINGS

1. SJP offers several enhanced safety measures to ensure safe use of the TG-1900.

Since no suitable alternative cranes were found by either SJP or the Port Authority's experts, SJP has proposed taking several steps to further safeguard use of the Hoboken TG-1900 for the Project. Such enhanced measures include:

- Additional hydraulic oil testing – once per month;
- Regular third-party inspections of the TG-1900, at intervals acceptable to the Port Authority;
- Additional rope inspections;
- Installation of new boom hoist cable;
- Strict adherence to crane safety protocol and proactive maintenance;
- Utilization of a qualified rigger for larger size picks;
- Monthly unannounced spot inspections by the Port Authority;
- Utilization of a black box load moment system;
- Certificates of manufacturer approval of the wire rope, history of motors on the crane, and the replacement parts and maintenance work (all of which have already been submitted to the Port Authority);

- Permitting the Port Authority to approve test protocol for mechanical systems at the time of crane erection;
- Following the heightened NYC DOB Cranes and Derricks load test standard criteria; and
- Submitting a CD-7 with the mobile crane applications once the Hoboken TG-1900 is approved; since the TG 1900 will not climb, the CD-7 will be filed for the erection and dismantling.

(Exh. B.) All of these proposed enhanced safeguards are in line with Mr. Stroh's finding that maintenance is the key to crane safety. (Id. and Exh. E.) Should Mr. Stroh or the Port Authority recommend any further reasonable maintenance measures, SJP would comply with those as well.

In addition to maintenance, SJP has proposed limiting the use of the Hoboken TG-1900 under certain weather conditions. In particular, SJP proposes the following measures to address wind-related concerns:

- For 50+mph winds, the Hoboken TG-1900 shall be taken out of service and the tower bolts shall be checked so that the crane will be free to weathervane;
- Weathervaning will be accomplished with a boom angle as low as possible and, as a result, the crane will offer less resistance for the wind from the rear of the crane;
- Both the tower and footing can accommodate a higher boom angle for the weathervaning procedure in the case where larger horizontal and vertical clearances with the adjacent structure would be desired;
- All manufacturer requirements and specifications for weathervaning and service conditions shall be followed.

(Exh. B.) These enhanced safety measures, combined with a much lesser demand required of the Hoboken TG-1900 for the Project (in comparison to the WTC crane), provides further safety protection and should fully alleviate any remaining concerns.

2. SJP is willing to provide specific indemnification in connection with the Hoboken TG-1900 even though the Agreement already provides sufficient indemnification.

The Agreement, under Article 12, among other sections, provides that the Port Authority shall be indemnified against liability in connection with the Project. As such, any concerns with respect to potential Port Authority liability caused by use of the Hoboken TG-1900 are baseless. On the other hand, if the Port Authority prohibits the Hoboken TG-1900, in breach of the Agreement, it would not receive the benefit of such indemnity with respect to an alternative crane as those indemnification provisions would not extend to such a circumstance.

Nonetheless, SJP offers to secure an additional credit of indemnity in an amount acceptable to the Port Authority in order to make it absolutely clear and certain that SJP would fully indemnify the Port Authority against any liability arising from the use of the Hoboken TG-1900 during the Project.

C. SJP HAS COMPLIED WITH ALL APPLICABLE WORKPLACE SAFETY REQUIREMENTS

The Project has and will continue to fully comply with all applicable laws and regulations governing workplace safety, including those provided under the Occupational Safety and Health Act ("OSHA") and American National Standards Institute ("ANSI"). Further, SJP has complied with all additional safety standards set forth in the Agreement. With respect to the Hoboken TG-1900, no applicable law or regulation prohibits its use for the Project.

CONCLUSION

While SJP understands that the Port Authority is concerned that an incident will occur similar to the WTC accident, it is impossible that a similar incident can occur at the Project considering the Hoboken TG-1900's anticipated use on the Project and its equipment (including the new/modified winch pack), as well as SJP's agreement to provide additional safety measures and inspections.

We trust the above information and exhibits clarify all of the Port Authority's concerns with respect to utilization of the Hoboken TG-1900. Because there exists no legitimate factual

or legal basis for the Port Authority to prohibit the use of the Hoboken TG-1900 – in addition to the fact that there are no feasible alternatives – the Port Authority's prior approval of the Hoboken TG-1900 cannot be withdrawn. Indeed, use of the Hoboken TG-1900 is fully consistent with the Port Authority's prior approvals, and constitutes the basis on which the Project was planned; any continued insistence by the Port Authority that utilization of the Hoboken TG-1900 crane is forbidden will have a devastating impact on the Project and its prospective tenants. Considering SJP will have no alternative but to seek relief from the Port Authority from all resulting costs, we believe that careful consideration of the many points raised in this letter is warranted and will ultimately obviate the Port Authority's concerns so the Project can proceed as originally approved and agreed by all parties to the Agreement.

We look forward to hearing from you and moving forward with the Project.

Very truly yours,

GENOVA BURNS GIANTOMASI WEBSTER LLC

FRANCIS J. GIANTOMASI

FJG/KBE/CJM

CC: Angelo J. Genova, Esq.

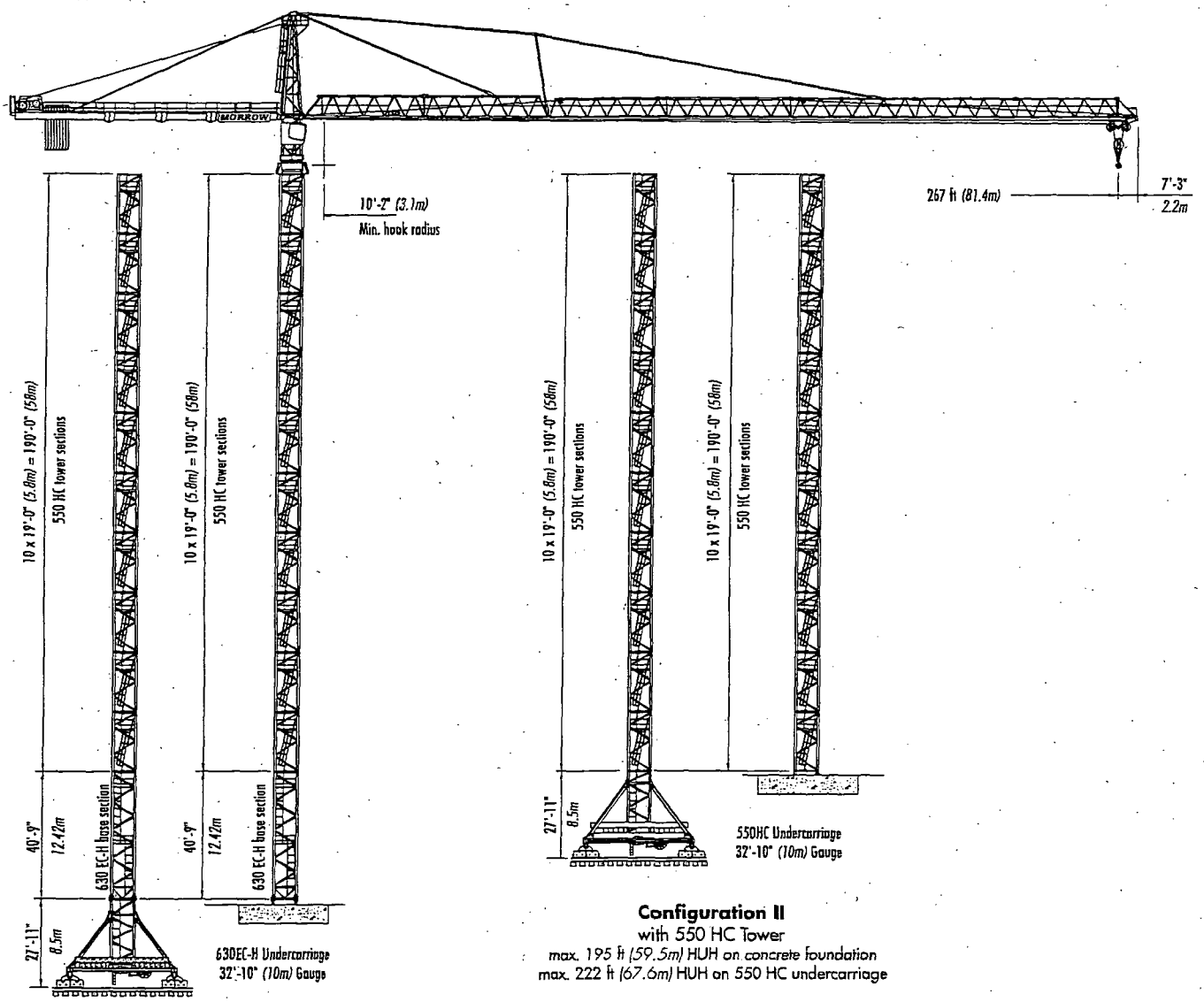
From: Lynch-Jacobs, Maureen [mailto:mjacobs@panynj.gov]
Sent: Wednesday, October 30, 2013 10:26 AM
To: 'dallen@sjpproperties.com'
Cc: Stickelman, Timothy; Starace, Jim; Francis J. Giantomasi
Subject: FW: hoboken

Mr. Douglas Allen,
As requested in a discussion between Tim Stickelman and Frank Giantomasi, please find attached the information of a possible alternate raised in the last paragraph of the PANYNJ letter date 10-28-13. I have included the owner's contact information. If you would like to discuss this option, we can set up a conference call.
Thanks
Maureen Lynch
9733322185

NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY, PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY PRINTOUTS.

LIEBHERR 630 EC-H 20 Litronic®

TOWER CRANE



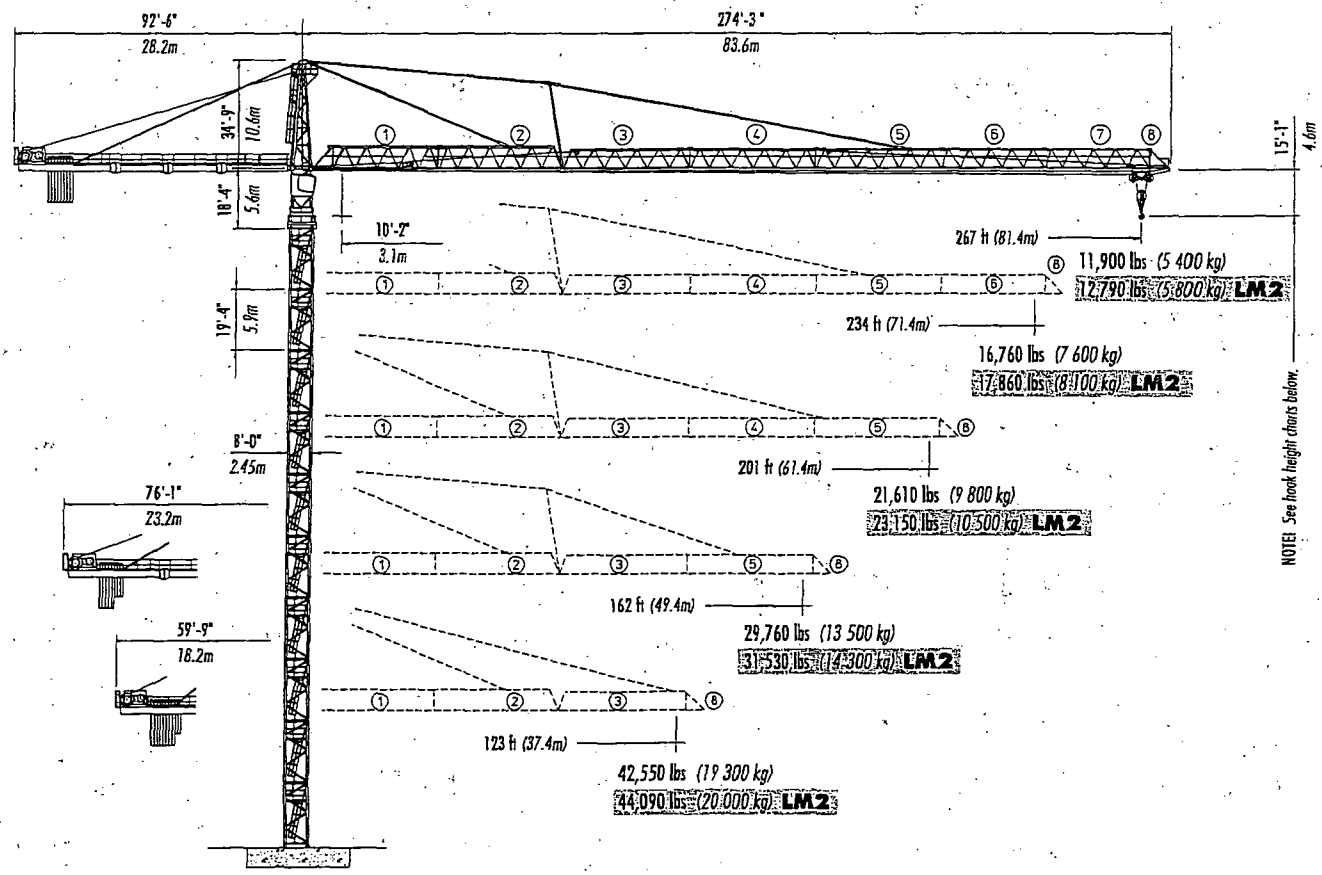
Configuration I
with 550 HC/630 EC-H Tower
max. 235 ft (71.7m) HUH on concrete foundation
max. 262 ft (80m) HUH on 630 EC-H undercarriage

Configuration II
with 550 HC Tower
max. 195 ft (59.5m) HUH on concrete foundation
max. 222 ft (67.6m) HUH on 550 HC undercarriage

FREESTANDING
travelling and stationary

Morrow Equipment

LIEBHERR 630 EC-H 20 Litronic®



FREESTANDING
with 550 HC Tower Sections
on concrete slab

Hook Heights

No. of Tower Elements	Tower Configuration I	Hook Height Concrete Foundation ft	Hook Height Concrete Foundation m	Hook Height 10m Undercarriage ft	Hook Height 10m Undercarriage m
1	630ECH BTS	45	13.7	72	22
2	550HC TS	64	19.5	91	27.8
3	550HC TS	83	25.3	110	33.6
4	550HC TS	102	31.1	129	39.4
5	550HC TS	121	36.9	148	45.2
6	550HC TS	140	42.7	167	51
7	550HC TS	159	48.5	186	56.8
8	550HC TS	178	54.3	205	62.6
9	550HC TS	197	60.1	224	68.4
10	550HC TS	216	65.9	243	74.2
11 [1]	550HC TS	235	71.7	262	80

No. of Tower Sections	Tower Configuration II	Hook Height Concrete Foundation ft	Hook Height Concrete Foundation m	Hook Height 10m Undercarriage ft	Hook Height 10m Undercarriage m
1	550HC TS	24	7.2	51	15.4
2	550HC TS	43	13.1	70	21.2
3	550HC TS	62	18.9	89	27
4	550HC TS	81	24.7	108	32.8
5	550HC TS	100	30.5	127	38.6
6	550HC TS	119	36.3	146	44.4
7	550HC TS	138	42.1	165	50.2
8	550HC TS	157	47.9	184	56
9	550HC TS	176	53.7	203	61.8
10 [1]	550HC TS	195	59.5	222	67.6

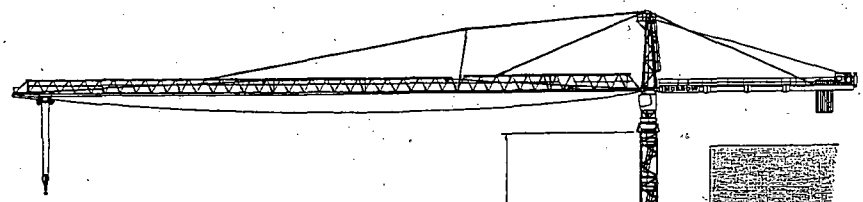
[1] *Lower top climbing unit to base of crane prior to operating at maximum hook height.*

NOTE! *Contact Morrow for specific information regarding alternate tower configurations, special jib assemblies, alternate foundation details, dimensions, reaction forces and slab opening requirements.*

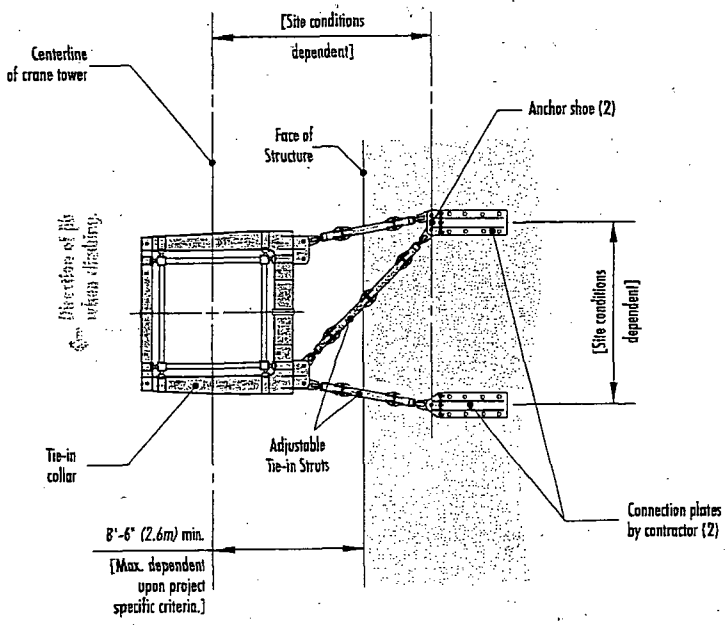
Please consult 630 EC-H 20 Litronic Operations Manual before erecting, operating, servicing or dismantling crane.

LIEBHERR 630 EC-H 20 Litronic®

Consult Operations Manual before erecting, operating, servicing or dismantling crane.

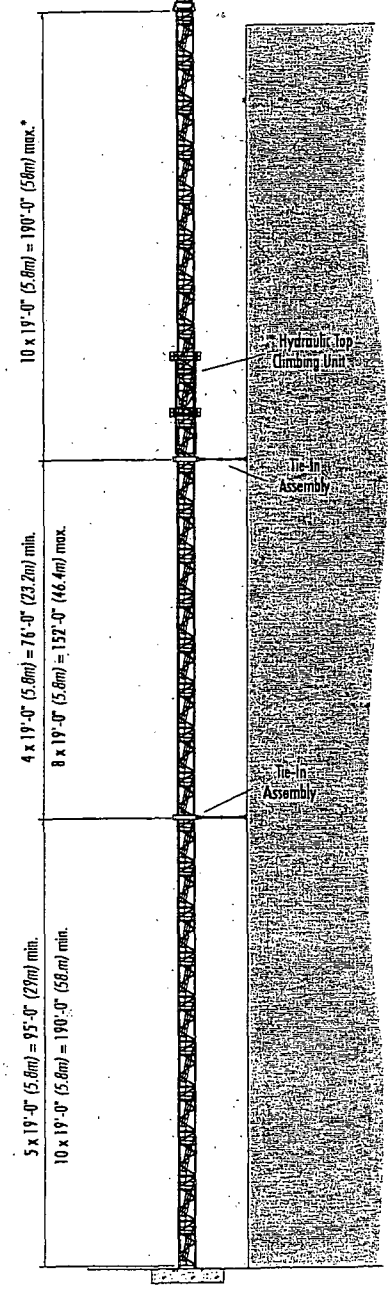


*** NOTE!** *Lower the top climbing unit to the uppermost tie-in prior to operating crane at maximum hook height.*



TIE-IN ASSEMBLY
Plan view

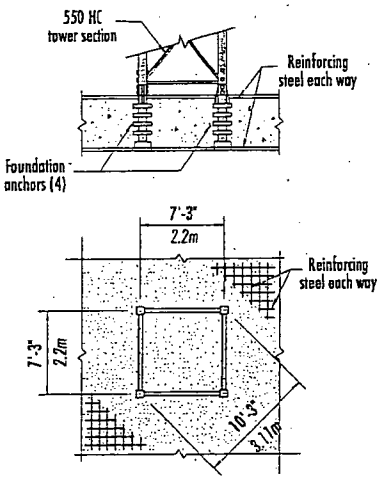
NOTE! *The tie-in assembly shown above is an example of a typical installation. Please note, however, that factors determining the installation of tie-in assemblies may vary due to project specific requirements.*



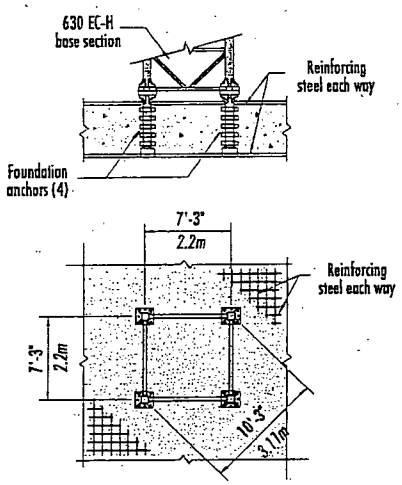
TOP CLIMBING
with 550 HC Tower Sections
Tied to structure

Morrow Equipment Co., L.L.C.

LIEBHERR 630 EC-H 20 Litronic®



with 550 HC Tower Section
on concrete slab



with 630 EC-H Base Section
on concrete slab

2-Part Line	Hook Radius	Jib tip Radius	Maximum Capacity – Radius	ft / m	10 / 3.1	49 / 15	66 / 20	82 / 25	98 / 30	123 / 37.4	148 / 45	162 / 49.4	180 / 55	201 / 61.4	213 / 65	234 / 71.4	246 / 75	267 / 81.4
	267 ft / 81.4m	274'-3" / 83.6m	44,090 lbs – 88 ft / 20 000 kg – 26.73m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	39,040 / 17 710	30,750 / 13 950	24,980 / 11 330	22,400 / 10 160	19,710 / 8 940	17,220 / 7 810	16,030 / 7 270	14,200 / 6 440	13,290 / 6 030	11,900 / 5 400
	234 ft / 71.4m	241'-6" / 73.6m	44,090 lbs – 100 ft / 20 000 kg – 30.54m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	35,540 / 16 120	28,970 / 13 140	26,060 / 11 820	23,020 / 10 440	20,170 / 9 150	18,830 / 8 540	16,760 / 7 600		
	201 ft / 61.4m	208'-8" / 63.6m	44,090 lbs – 106 ft / 20 000 kg – 32.28m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	37,830 / 17 160	30,890 / 14 010	27,820 / 12 620	24,580 / 11 150	21,610 / 9 800				
	162 ft / 49.4m	169'-4" / 51.6m	44,090 lbs – 113 ft / 20 000 kg – 34.41m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	40,370 / 18 310	33,030 / 14 980	29,760 / 13 500						
	123 ft / 37.4m	129'-11" / 39.6m	44,090 lbs – 119 ft / 20 000 kg – 36.16m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	42,550 / 19 300								

LM1

2-Part Line																		
	267 ft / 81.4m	274'-3" / 83.6m	44,090 lbs – 93 ft / 20 000 kg – 28.22m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	41,360 / 18 760	32,630 / 14 800	26,540 / 12 040	23,830 / 10 810	21,010 / 9 530	18,390 / 8 340	17,130 / 7 770	15,210 / 6 900	14,260 / 6 470	12,790 / 5 800
	234 ft / 71.4m	241'-6" / 73.6m	44,090 lbs – 106 ft / 20 000 kg – 32.19m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	37,590 / 17 050	30,690 / 13 920	27,650 / 12 540	24,430 / 11 080	21,450 / 9 730	20,040 / 9 090	17,860 / 8 100		
	201 ft / 61.4m	208'-8" / 63.6m	44,090 lbs – 113 ft / 20 000 kg – 34.37m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	40,300 / 18 280	32,980 / 14 960	29,720 / 13 480	26,300 / 11 930	23,150 / 10 500				
	162 ft / 49.4m	169'-4" / 51.6m	44,090 lbs – 119 ft / 20 000 kg – 36.26m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	42,660 / 19 350	34,940 / 15 850	31,530 / 14 300						
	123 ft / 37.4m	129'-11" / 39.6m	44,090 lbs – 123 ft / 20 000 kg – 37.4m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000								

LM2

IMPORTANT! *Litronic® cranes are equipped with Liebherr's state of the art PLC system that provides precise monitoring, control and coordination of all crane functions. This feature also permits a load increase of up to 10% as illustrated in the heavy lift mode (**LM2**) chart above. Heavy lift mode is permitted only when wind speed is less than 31 mph (50 kph). Contact Morrow for more information regarding the many features of the 630 EC-H 20 Litronic tower crane.*

Drive Information

Hoist Speed and Capacity

Hoist Unit WiW 300 VZ 401	2-Part Line					LM1
147 hp (110 kW) FC hoist unit *Variable frequency drive (VFD)* *3-speed electromagnetic gear shifting*	**Speed**	**Capacity**		**Line Speed**	**Capacity**		**Line Speed**
	1	up to 44,090 lbs up to 21,605 lbs	@ @	89 fpm 157 fpm	*up to 20 000 kg* *up to 9 800 kg*	@ @	*27 m/min* *48 m/min*
	2	up to 25,355 lbs up to 11,245 lbs	@ @	151 fpm 266 fpm	*up to 11 500 kg* *up to 5 100 kg*	@ @	*46 m/min* *81 m/min*
6L-237	3	up to 14,110 lbs up to 4,850 lbs	@ @	253 fpm 459 fpm	*up to 6 400 kg* *up to 2 200 kg*	@ @	*77 m/min* *140 m/min*

IMPORTANT! *Capacities and line speeds indicated will vary depending on the amount of hoist wire rope installed. This crane model may be equipped with a hoist unit other than that specified in the data shown above. To verify, check serial number and refer to 630 EC-H 20 Litronic Operation Manual for additional information.*

Motor Information

Drive Unit	Horsepower	Kilowatts	Speed	
Trolley (FC)	14.7 hp	*11 kW*	0 – 223 fpm	*0 – 68 m/min*
Swing (fluid coupling)	2 x 14.2 hp	*2 x 10.6 kW*	0.6 rpm	
Traveling (fluid coupling)	4 x 10 hp	*4 x 7.5 kW*	82 fpm	*25.0 m/min*

Power Requirements

Static: 480 V — 3-phase — 60 Hz — 200 Amp. service — 125 kVA

Travelling: 480 V — 3-phase — 60 Hz — 250 Amp. service — 156 kVA

Specifications subject to change without notice. For other configurations and specifications, contact Morrow Equipment.

LIEBHERR 630 EC-H 20 Litronic®

Description	Dimensions L x W x H	Weight	Description	Dimensions L x W x H	Weight
Tower Top [1]	34'-3" x 5'-11" x 7'-3" 10.44m x 1.8m x 2.2m	15,540 lbs 7 050 kg	Jib Butt Section ① #611	40'-5" x 6'-6" x 7'-10" 12.31m x 1.99m x 2.38m	14,770 lbs 6 700 kg
Slewing Assembly (Complete) [2]	21'-3" x 9'-9" x 10'-5" 6.47m x 2.98m x 3.17m	48,280 lbs 21 900 kg	Jib Section ② #621	40'-3" x 5'-10" x 7'-4" 12.28m x 1.77m x 2.23m	9,040 lbs 4 100 kg
Slewing Assembly Upper Part [3]	15'-11" x 9'-10" x 9'-10" 4.85m x 3m x 3m	22,490 lbs 10 200 kg	Jib Section ③ #631	40'-2" x 5'-10" x 6'-7" 12.25m x 1.77m x 1.99m	6,610 lbs 3 000 kg
Slewing Ring	11" x 7'-3" x 7'-3" 0.28m x 2.22m x 2.22m	6,615 lbs 3 000 kg	Jib Section ④ #632	40'-3" x 5'-10" x 6'-6" 12.27m x 1.77m x 1.97m	5,840 lbs 2 650 kg
Slewing Ring Support	4'-11" x 9'-5" x 10'-4" 1.51m x 2.87m x 3.16m	14,550 lbs 6 600 kg	Jib Section ⑤ #633	40'-3" x 5'-10" x 6'-6" 12.27m x 1.77m x 1.97m	6,060 lbs 2 750 kg
Slewing Gears (2) (each)	6'-11" x 2'-0" x 2'-0" 2.12m x 0.6m x 0.6m	2,200 lbs 1 000 kg	Jib Section ⑥ #634	33'-10" x 5'-10" x 6'-5" 10.3m x 1.77m x 1.96m	3,615 lbs 1 640 kg
Slewing Unit Access Platforms	3'-3" x 3'-7" x 3'-7" 1.0m x 1.1m x 1.1m	880 lbs 400 kg	Jib Section ⑦ #635	33'-8" x 5'-10" x 6'-4" 10.25m x 1.77m x 1.95m	2,625 lbs 1 190 kg
AC Hoist Unit (FC) [4] 147 hp (110 kW)	9'-10" x 7'-8" x 8'-4" 2.99m x 2.33m x 2.54m	12,150 lbs 5 510 kg	Jib Tip Section ⑧ #641	8'-5" x 6'-4" x 7'-5" 2.56m x 1.94m x 2.25m	1,190 lbs 540 kg
Counterjib Section 1 [5] (Inner)	22'-8" x 6'-6" x 6'-5" 6.9m x 1.98m x 1.96m	7,720 lbs 3 500 kg	Jib Assembly (Part 1) [10] for 157-ft to 262-ft jibs ①②	79'-6" x 7'-2" x 7'-10" 24.22m x 2.19m x 2.38m	39,020 lbs 17 700 kg
Counterjib Section 2 [5] (Intermediate)	17'-1" x 6'-3" x 6'-5" 5.2m x 1.9m x 1.96m	6,610 lbs 3 000 kg	Jib Assembly (Part 2) [11] 267-ft (81.4m) ③④⑤⑥⑦⑧	192'-1" x 6'-4" x 7'-5" 58.54m x 1.94m x 2.25m	29,100 lbs 13 200 kg
Counterjib Section 3 [5] (Outer)	34'-5" x 7'-7" x 8'-2" 10.5m x 2.32m x 2.48m	13,230 lbs 6 000 kg	Jib Assembly (Part 2) [11] 234-ft (71.4m) ③④⑤⑥⑧	159'-3" x 6'-4" x 7'-5" 48.54m x 1.94m x 2.25m	26,010 lbs 11 800 kg
Counterjib A [6] (1-3)	56'-5" x 9'-4" x 8'-2" 17.2m x 2.84m x 2.48m	26,240 lbs 11 900 kg	Jib Assembly (Part 2) [11] 201-ft (61.4m) ③④⑤⑧	126'-5" x 6'-4" x 7'-5" 38.54m x 1.94m x 2.25m	22,050 lbs 10 000 kg
Counterjib B [7] (1-2-3)	72'-10" x 9'-4" x 8'-2" 22.2m x 2.84m x 2.48m	32,850 lbs 14 900 kg	Jib Assembly (Part 2) [11] 162-ft (49.4m) ③⑤⑧	87'-0" x 6'-4" x 7'-5" 26.54m x 1.94m x 2.25m	15,430 lbs 7 000 kg
Counterjib C [8] (1-2-2-3)	89'-3" x 9'-4" x 8'-2" 27.2m x 2.84m x 2.48m	39,460 lbs 17 900 kg	Jib Assembly (Part 1A) [12] for 123-ft (37.4m) jib ①②	79'-5" x 7'-2" x 7'-10" 24.22m x 2.19m x 2.38m	36,820 lbs 16 700 kg
Tower Section 550 HC (Pin/Pin)	20'-7" x 8'-0" x 8'-0" 6.28m x 2.45m x 2.45m	14,300 lbs 6 485 kg	Jib Assembly (Part 2A) [13] 123-ft (37.4m) ③⑧	47'-8" x 6'-4" x 7'-5" 14.54m x 1.94m x 2.25m	9,040 lbs 4 250 kg
Base Section 630 EC-H (P/B)	40'-9" x 8'-10" x 8'-10" 12.42m x 2.68m x 2.68m	31,965 lbs 14 500 kg	Counterweight Block A	4'-6" x 11" x 9'-10" 1.37m x 0.28 x 3m	6,350 lbs 2 880 kg
Top Climbing Unit [9] w/hydraulics	40'-9" x 9'-1" x 10'-4" 12.42m x 2.77m x 3.16m	22,420 lbs 10 170 kg	Counterweight Block C	4'-6" x 11" x 13'-7" 1.37m x 0.28 x 4.15m	8,730 lbs 3 960 kg
Trolley	10'-8" x 6'-8" x 8'-5" 3.25m x 2.02m x 2.57m	1,920 lbs 870 kg	Hook Block	2'-8" x 1'-8" x 9'-10" 0.8m x 0.5m x 3m	2,130 lbs 965 kg

NOTE! *Weights and dimensions are approximate. Scale components before lifting. Please consult Operations Manual before erecting, operating, servicing or dismantling crane.*

1. *Tower Top includes ladder, service platforms and pendants.*
2. *Slewing Assembly Complete includes operator's cab, 2 slewing gears, slewing ring, slewing ring support, 2 service platforms and 4 climbing shoes. To facilitate erection/dismantlement process, the Slewing Assembly can be broken down into various components. See 630EC-H Operations Manual.*
3. *Slewing Assembly Upper Part includes operator's cab. Does not include slewing gears.*
4. *Includes hoist unit, electrical panel and handrails. Does not include wire rope.*
5. *Counterjib sections include handrails and hardware.*
6. *Counterjib A includes counterjib sections 1 & 3, handrails, hardware, D-block, and pendant bars.*
7. *Counterjib B includes counterjib sections 1, 2 and 3, handrails, hardware, D-block, and pendants.*
8. *Counterjib C includes counterjib sections 1, 2 (2) and 3, handrails, hardware, D-block, and pendants.*
9. *Can be broken down into two panels.*
10. *Jib Assembly (Part 1) includes jib sections, A-frame, pendant bars with pins & plates, and trolley with 20t hook block.*
11. *Jib Assemblies (Part 2) include jib sections, pendant bars with pins and plates.*
12. *Jib Assembly (Part 1A) includes jib sections, pendant bars with pins & plates, and trolley with 20t hook block.*
13. *Jib Assembly (Part 2A) includes jib sections, pendant bars with pins and plates.*

Morrow Equipment
COMPANY, L.L.C.
3218 Pringle Road SE • P O Box 3306 • Salem, Oregon 97302-0306 USA
503.585.5721 • Fax 503.363.1172 • www.morrow.com • info@morrow.com

The American home of LIEBHERR TOWER CRANES

Atlanta, GA • Charlotte, NC • Chicago, IL • Dallas, TX • Denver, CO • Honolulu, HI • Houston, TX • Los Angeles, CA
Las Vegas, NV • Millwood, NY • Pensacola, FL • St. Louis, MO • San Francisco, CA • Salem, OR • Seattle, WA • Miami, FL • Tampa, FL
Washington, DC • Sydney, Australia • Wellington, New Zealand • Vancouver, BC, Canada • Toronto, ON, Canada • Mexico City, Mexico

Printed in the USA

MEC - 630ECH20 Litronic - 1008 – PDF

#1 3350

(d) If the load block is considered a part of the load, the load rating chart shall so state.

(e) If the weight of hoist ropes beyond a stated suspended length is to be considered as part of the load, the load rating chart shall so state.

SECTION 3-1.10: LOAD HOIST AND LUFFING BOOM HOIST MECHANISMS

3-1.10.1 General Requirements

(a) Load and luffing boom hoist drives shall be provided with a clutch or power-disengaging device unless directly coupled to an electric or hydraulic motor power source.

(b) Generators used to power electric motor operated cranes shall be properly sized, or other means provided, to prevent an uncontrolled lowering of the luffing boom or load.

(c) Overspeed protection shall be provided for hoist and luffing boom mechanisms.

(d) *Luffing Boom Hoists*

(1) Luffing boom hoist systems shall be capable of raising the luffing boom and holding it stationary without attention from the operator under all operating conditions.

(2) Luffing boom hoist systems shall be capable of lowering the luffing boom and rated load only under power control; luffing boom free-fall lowering capability shall not be furnished.

(3) Luffing boom hoists powered by hydraulic cylinders shall be provided with an integrally mounted holding device (such as a load hold check valve) to prevent uncontrolled lowering of the luffing boom in the event of a hydraulic system failure (e.g., supply hose rupture).

(4) Luffing boom stops shall be provided to prevent luffing booms from exceeding the maximum luffing boom angle. An alternate means shall be provided to move the luffing boom forward from this position if gravity is not sufficient.

3-1.10.2 Hoist Drums

(a) The end of the rope shall be securely attached to the drum as recommended by the crane or rope manufacturer or by a qualified person.

(b) Drum flanges shall extend a minimum of one-half rope diameter but not less than ½ in. (13 mm) above the top layer of rope during operation.

(c) The diameter of the drum shall be sufficient to provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used.

(d) No less than three full wraps of rope shall remain on the load hoist drum(s) when the hook is in its extreme lowest position.

(e) No less than three full wraps of rope shall remain on the luffing boom hoist drum(s) when the luffing boom is at maximum permissible radius.

(f) Load hoist drums and luffing boom hoist drums shall be provided with a positive holding device, such as ratchets and pawls, unless directly coupled to electric or hydraulic drives.

(g) Positive holding devices shall be controllable from the operator's station, hold the drums from rotating in the lowering direction, and be capable of holding the rated load indefinitely, or holding the luffing boom and rated load indefinitely, as applicable, without further attention from the operator.

(h) Load hoist drums and luffing boom hoist drums shall be provided with drive mechanisms to ensure that lowering shall be done only under power control.

3-1.10.3 Brakes

(a) Luffing boom hoists that utilize ropes, and all load hoists, shall be equipped with at least one braking means that is capable of providing a minimum of 125% of the full load hoisting torque at the point where the braking is applied. A secondary emergency brake shall be provided on the luffing boom hoist drum for use in the event of a main drive failure or overspeed condition.

(b) Each load hoist and luffing boom hoist mechanism shall be equipped with braking means capable of providing controlled lowering speeds. Worm-geared hoists with a worm angle adequate to prevent the load (or the luffing boom and load, in the case of luffing boom hoists) from accelerating in the lowering direction are exempted from this requirement.

(c) When power operated brakes having no continuous mechanical linkage between the actuating and the braking means are used for controlling the load hoist or the luffing boom hoist, an automatic means shall be provided to stop and hold the load (or the luffing boom and load, in the case of the luffing boom hoist) in the event of loss of brake actuating power.

(d) When directly coupled electric or hydraulic motor(s) is used for controlling the load hoist or the luffing boom hoist, an automatic means shall be provided to stop and hold the load (or the luffing boom and load, in the case of luffing boom hoist) in the event of loss of power or pressure.

(e) When automatically applied braking means are provided, a means, such as a manual release, should be furnished to permit controlled lowering of the load (or the luffing boom and load in the case of a luffing boom hoist) in the event of loss of power or pressure.

(f) If provided, foot brake pedals shall be constructed so that the operator's feet will not readily slip off, and a means shall be provided for holding the brakes in the applied position without further attention by the operator.

SJPPROPERTIES

September 25, 2013

Mr. Jerry Del Tufo
Assistant Director
Port Authority of NY & NJ
225 Park Avenue South
19th Floor
New York, NY 10003

Re: WCC III Hoboken, NJ

Dear Mr. Del Tufo:

Thank you for meeting with us yesterday. We appreciate your time working with us for a prompt resolution of the PANYNJ's expressed concerns about utilization of the TG 1900 crane in connection with the above referenced project ("Project").

As you know, the TG 1900 tower crane at issue was specifically approved by the City of Hoboken and the PANYNJ after a series of meetings, and such approval was eventually formalized in the mobilization and logistics plan for the Project and included in the Lease and Development Agreement entered into by the City of Hoboken, Waterfront Corporate Center III JV LLC, and PANYNJ on or about December 4, 2012. We have coordinated all of the planning for the Project, including distances and foundation requirements and the purchase of steel and erection equipment, based on our expectation that we would be erecting the TG 1900 next week.

In response to the PANYNJ's recent reservations about utilizing the TG 1900 for the Project, enclosed are all of the items that were discussed during our meeting yesterday and requested by the PANYNJ. We anticipate that these enclosures should satisfy any remaining concerns of the PANYNJ.

Please do not hesitate to contact me to discuss further or if you have any questions. We look forward to hearing from you.

Very truly yours,

Douglas Allen
EVP, Construction
SJP Properties

DA:dy

MORRIS CORPORATE CENTER IV
379 INTERPACE PARKWAY, BUILDING C, PARSIPPANY, NJ 07054 (973) 257-3001 (973) 402-0073
www.sjpproperties.com

PAVARINI McGOVERN
Higher Standards in Construction

September 25, 2013

Mr. Douglas Allen
Waterfront Corporate Center III JV LLC
Morris Corporate Center IV
379 Interpace Parkway
Parsippany, NJ 07054

RE: Waterfront Corporate Center – Block B

Dear Mr. Allen:

In furtherance of our on-site meeting this past week on September 24, 2013 with regards to the utilization of the TG 1900 Tower Crane (Port Authority, SJP Properties, Pavarini McGovern, Howard Shapiro, Weir Welding, Federated Crane, and McNulty/Cranes Inc). Please note the following information which is accompanied by exhibits we have enclosed in response to the Port Authorities additional questions.

Please note that all responses reflect combined information from Howard Shapiro, Federated Crane, Cranes Inc. and Weir Welding.

Geotechnical Questions:

1. Who is the PA Geotechnical Engineer for the Hoboken project? We will need loads imposed review of the mobile cranes and allowable ground loading.

   Analysis of the loads imposed by the mobile cranes and the bearing pressure under the cribbing have been performed: the mobile crane will exert a maximum outrigger reaction of 270,000lbs (cribbing bearing pressure of 2,100psf) and the assist crane will exert a maximum outrigger reaction of 70,000lbs (cribbing bearing pressure of 3,500psf) – as shown on our drawings (in attachment). The site conditions were inspected and found adequate to safely sustain these loads, as stated in the engineer letter. In addition it is our understanding that the effect of the surcharge from the cranes have been reviewed by the SOE engineer (Mueser Rutledge).

2. Loads imposed for the boom

   The load imposed by the boom (dead weight) during the erection will be insignificant in comparison with the loads from the mobile crane: 10,500lbs maximum at support for a bearing pressure of 263psf at the blocking. Please see the attached sketch and calculations for details.

3. Review of the base design

   We have submitted PE sealed drawings and calculations for the design of the footing and crane installation which can be peer-reviewed (PA engineer and Peter Stroh, PE)

4. Why is the stool support off the centerline of the concrete pad

   The crane is "centered" on the building to provide an optimum "coverage" and reach at the NE and NW corners of the building while the footing location was dictated by the piles location. The eccentric position of the crane on the footing is considered in our design.

Alternate options:

1. I have an email in to the EOR asking about other options

   Alternate options were discussed with Maureen on 09/26. The TG-1900T option is the best option from the logistics and engineering standpoints – which is the reason why it was selected in the first place after careful considerations of the site and project parameters.

Structural Questions:

1. I will need to send the drawing and calculations to P. Stroh for review of design

   Direct Port Authority Item

2. Who is the PA Structural Engineer for Hoboken? For review

   Direct Port Authority Item

3. We were told the heaviest pick was 15,000 lbs. The letter today states 20,000 lbs.

   Picks are discussed with Pavarini McGovern and Weir Welding. Our understanding is that most of the picks for the steel and precast panels will be under 15,000lbs and that there would be one marginal pick of 20,000lbs for a generator. The 20,000lbs pick would still be well below the 56,700lbs line pull capacity of the crane as well as the 30,000lbs restriction recommended by Professor Noah Manring in his report.

Crane design questions:

1. Why weathervane over the building to the south of the project. Weathervane- Pg. 2 states follow Manufacture and in another location states weathervane 240' radius at 10.25 degrees. Weathervaning should preferably be accomplished with a boom angle as low as possible as the weathervaning will occur more easily and the crane will offer less resistance (wind area) for the wind from the rear. Weathervaning over adjacent properties is not an issue and is permitted (the crane does not lift any load during weathervaning).

It should also be noted that both the tower and footing could accommodate a higher boom angle for the weathervaning procedure in the case where larger horizontal and vertical clearances with the adjacent structures would be desired. The weathervaning procedure in case of storm winds shall be implemented in accordance with the manufacturer's requirements (for disengaging the slew-brake, etc.) and with the boom stored at the angle/radius indicated on our drawings.

2. Wind requirements in some locations state to follow Manufacturer and some state 30MPH. We should follow 30MPH.

   The manufacturer specifications establish 30mph wind as a restriction for in-service conditions. The recommendations from the manufacturer and our drawings are in implicit agreement.

3. Load test criteria

   Following NYC DOB Cranes and Derricks standard procedure, the load test procedure would be submitted after the crane is approved and depending on which certified weights would be available at the time of the test, after the crane has been erected.

4. Sign off of mechanical system by PE

   All Port Authority Sign-offs will be adhered to

5. Certificate of test weights

   See answer on #3: procedure for load test

6. Emergency plan for 50 MPH winds

   The crane shall be taken out of service: tower bolts shall be checked and the crane shall be free to weathervane.

7. CD 7

   CD-7 would be submitted with the mobile crane application once the tower crane is approved. The tower crane will not climb so only CD-7 will be filed only for the erection and dismantling.

Crane equipment questions:

1. MAGS for 20' insert

   Please see attached report (CD1850 Mag report 235) Mag report on twenty foot to come shortly.

2. Exhibit "C"-third party inspection

   Will be performed, HS will provide a cover letter once the third party inspection report is sent and reviewed.

3. Unassembled inspection to include sheave curvature

   Agreed, to be arranged at the time of the unassembled inspection.

4. Qualifications of maintenance personnel

   See attached letter (Qualification of Maintance Personnel)

5. Black box

   Load Moment system on tower crane will have a black box included.

6. Certificate of wire rope

   See attached (Main load certs & Boom hoist certs)

7. History of motors

   See attached Staffa Date of Manufacture & Motor Repair Job 277

8. Manufacturer to approve the replacements parts and maintenance work

   See attached Service Qual-Federated Crane

9. Confirmation of history of crane from 8/11 to present (we have 7/99- 8/11)

   See attached five year history

10. Test protocol for mechanical system at time of erection

    All Port Authority Sign-offs will be adhered to

11. Manufacturer to accept 2300 mast

    FMC is the original manufacturer of the TG-1900 and TG-2300 models and tower sections, as well as the transition frame used. FMC Operator's Manual for the TG-1900 shows tower arrangements using 12'x12' tower sections (TG-2300) with a transition frame and 9'x9' tower sections (TG-1900) – see attachment. The 12'x12' tower sections for the TG-2300 have also been used before to support some other cranes such as Favco models.

Please note that Pavarini McGovern remains available to meet and discuss the above subject matter in further detail at your earliest convenience.

Sincerely,
Pavarini McGovern

Marc DePaul
Project Executive

Cc:

SJP	Grant Eula
STI	Eric McGovern, Mike Romano, Ed Lydon, Allen Sokolowski

File: DA 100213 Port Authority TG 1900 info PA further info.doc

Federated Crane Co., L.L.C.

1640 New Market Avenue, South Plainfield, NJ 07080
Engineering Office:
Phone: (585) 381-1663
Fax: (585) 381-5336
Email: tkanzler@rochester.rr.com

February 2, 2010

Mr. Jason P. Ocharsky, P.E.
Executive Director, Cranes and Derricks
280 Broadway, 5th Floor
New York, NY 10007

Dear Mr. Ocharsky:

In response to your request for technical information on the replacement winches Federated Crane Co. is supplying with our TG- series tower cranes, I am pleased to offer the following description and performance evaluation for your consideration.

In summary, none of the modifications to the cranes alter the original FMC load envelope because component weights and force vectors are the same as, and dynamic loading is more constrained than, the original equipment. Because of this, design factors of safety of the cranes have not been reduced.

As always, if there are any questions, or if I can be of any other assistance, please do not hesitate to call.

Sincerely,

Thomas Kanzler, P.E.
Chief Engineer

cc: M. Schiavoni
Enclosure.

STATE OF NEW YORK
THOMAS D. KANZLER
73252
LICENSED PROFESSIONAL ENGINEER

WARNING: It is a violation of Article 145 of the State Education Law for any person to alter any document that bears the seal of a professional engineer, unless the person is acting under the direction of a licensed Professional Engineer.

Replacement Winches for FMC/Link-Belt TG-series Tower Gantry Cranes

General

The original FMC/Link-Belt winch unit, diesel hydraulic power unit, operator's cabin, and control system were replaced with new systems of Federated design.

As with the original winch package, the replacement winch unit contains integral boom hoist and main load hoist drums, and has provisions for installation of an auxiliary load winch. All winch drums are located such that hoist and topping lift rope geometry with respect to the A-frame sheaves and boom remain as originally designed, and the subsequent reactions at the crane deck winch mounts are therefore unchanged with respect to geometry.

The engine is mounted to a substructure that in turn is connected to the winch frame, and can be installed with the winch frame as a single unit to reduce the number of hydraulic connections requiring assembly on site. The engine frame can be separated from the winch frame if needed. Total weight and balance of the engine and winch assembly is essentially unchanged from the original.

The operator's cabin is larger than the original, with generous glass area, and side-mounted for improved visibility. It can be mounted on either side of the machinery deck as jobsite requirements dictate.

Winches

Winch drums are constructed of steel plate, formed, welded and stress relieved, and machined to accept planetary drive units. Lebus parallel-groove shell lagging with integral rope climber is welded onto the drum after fabrication, and is replaceable. Drums have integral wire rope clamps for terminating hoist ropes.

The winch support structure is fabricated of structural steel plates and shapes, stress relieved, and machined to accept planetary drive stationary flanges, boom ratchet pawl, outboard bearings (Boom Hoist only), along with hose and valve supports, and to mount to existing crane deck winch support pads. The winch support structure has mounting pads at the back to connect via bolts to the Hydraulic Power Unit (HPU) structure.

The main hoist drum, planetary reducers, and motor/brake units are removable as an assembly, and locate for/aft in machined pockets on the winch structure for ease of field assembly with rope preloaded on the drum.

The winch and hydraulic power unit (HPU) are normally hoisted to the crane deck during crane erection as a complete unit, either with or without the main hoist drum installed. Heavy lifting lugs are located inside the winch structure for this purpose, and a third sling leg is used to level the assembly, with length and termination point dependent on how it's configured, with or without drum and rope.

Variable displacement hydraulic motors drive planetary speed reducers manufactured by Lantec Incorporated (British Columbia, Canada, a division of Tulsa Winch Group, Tulsa, OK), which in turn drive individual drums. Planetary drives are as follows:

Main Hoist – Two custom Lantec reducers, model D543 76:1 reduction ratio, one at each end.

Boom Hoist – One custom Lantec reducer, model D543 with 76:1 reduction ratio.

All planetary reducers have integral spring-set, hydraulic released brake units. Brakes are incorporated into Formsprag type overrunning clutches, allowing the brake to remain set while hoisting. Brake release is therefore only required for lowering. Load droop is completely eliminated when transitioning from holding to hoisting by the use of overrunning clutches. Load droop prevention while transitioning from holding to lowering is accomplished automatically through hydraulic preloading via the control system.

Brake units on the main and boom hoists are cooled and flushed by low-pressure hydraulic oil from the HPU whenever the brakes are released.

The hoist frame structure, boom hoist drum and associated components, and all planetary drives were sized to the higher line pull requirements of the Link-Belt 2300B, requiring internal gear ratio changes as required and a different main load drum for that application only.

Engine

The engine used is either a Caterpillar 3412 DITTA diesel rated 750 bhp (intermittent), or Caterpillar C18 ACERT diesel rated 760 bhp (intermittent), depending on the year of manufacture. Both engine types have the highest EPA and CARB non-road emissions certification available for their type and power rating at the time of manufacture, with the C18 replacing the 3412 series due to tightened EPA and CARB emissions requirements.

Engine cooling is through an improved custom integral radiator and hydraulic oil cooler unit, designed to preserve the EPA and CARB certification of the engine. The C18 engine also uses an air-to-air aftercooler for engine intake air, which is incorporated into the same cooling package.

Engines are controlled from the operator's cabin in the usual way, but with remote monitoring of engine function through a Caterpillar supplied visual operator interface in the case of the C18. Start/stop, oil pressure and coolant temperature monitoring, engine speed, and emergency stop functions are provided for both engine types.

Hydraulic Power Unit (HPU)

Hydraulic pumps are driven from a 5-pad pump drive unit mounted directly to the diesel engine, and additionally supported by the engine support frame. A hydraulic fluid reservoir is mounted directly over the pump drive and pumps, proving positive suction head to the hydraulic pumps.

Main functions utilize closed-loop (hydrostatic) circuits. Bosch-Rexroth AA4VG variable displacement axial piston pumps with integral charge pumps drive main operating functions. 180cc pumps are used for main load (2 pumps), and boom hoist (1 pump), while a single 71 cc unit drives the slewing function. All hydrostatic pumps use an internal pressure-compensating control unit which limits circuit pressure by reducing pump displacement as the limit is reached, thereby providing more reliable pressure limiting than cross-port relief valves alone, and simultaneously reducing shock and wear on components.

Make-up oil for replenishing closed loop circuit oil taken for cooling and filtration is provided internally within the hydrostatic pumps. Hot oil taken from the low-pressure side of the working circuits is sent directly to the hydraulic oil cooler via a return manifold, and then returned to tank through a return oil filter.

Suction oil to each charge pump is filtered prior to entering the control and make-up sections of their respective main pumps.

An additional fixed displacement (gear) pump is used to augment cooling and filtration of tank oil, particularly when no function is actively working, and to act as a crane climber pump if desired by switching a 2-value relief valve to it's high pressure (climber) setting from the operator's cabin.

Control System

All crane functions are controlled through a Rexroth Mobile Digital Controller (MDC) system, comprised of a single MDC unit operating at 24VDC, mounted in the operator's cab. The operator interface is primarily seat pod mounted joystick controllers and console mounted selector switches and indicator lights. A wiring harness connects joysticks, pumps, and other external feedback devices, limit switches, and load-moment indicator (LMI) to the MDC through plug/socket connections for easy assembly/disassembly.

The MDC unit is programmed and adjusted via notebook computer through a serial cable. Most input/output (I/O) functionality is via the MDC unit. Software is proprietary, and while the control algorithm was developed in-house, Bosch-Rexroth developed the application specifically for this equipment.

An external computer is not used for the crane control system operation, but is required to make control adjustments and calibrations. Access to MDC software and control parameters is restricted to Federated technical personnel.

In the event of catastrophic failure of the MDC (lightning strike, for example), another MDC unit can be preloaded with firmware and software, and configured with stored control parameters specific to the winch and crane its mounted on at our shop facility, and installed in minutes. Absolutely no difference in performance will be experienced when the control system is replaced in this manner, and a small inventory of MDC units can service all winches they're used on.

Operator Interface

Right-hand Joystick – controls Main Hoist and Aux Hoist (forward/back), but only one at a time, as selected on the operator console.

Left-hand Joystick – controls Swing function (left/right) and Boom Hoist (forward/back).

All joystick functions can be operated simultaneously, but load hoist function must be pre-selected between Main and Aux. Due to pump and motor response ramping and interlocks, no amount of aggressive joystick movement can result in improper or dangerous movement of the crane caused by such improper and imprudent operator input, though it is still incumbent on the operator to use safe and accepted procedures at all times, and to operate the crane within the capacity chart.

There is a console mounted fine-control switch, which allows the operator to switch to a slow hoist speed, allowing full joystick travel but only a small speed range and therefore precise control over load speed and placement. All functions are set to slow-speed simultaneously when fine-control is selected, though each function is individually adjustable within the software as to the percent of full-speed that can be attained with full joystick travel.

Control system failure results in either non-movement (if stopped) or shutdown (if moving) of the effected function, or the entire system, as appropriate. All controls are failsafe in that loss of joystick input, limit switch continuity, LMI permission to move, or a fault in the affected pump or motor control or response results in a shutdown of that function(s) and a fault indication at the operator's console and on the MDC enclosure (multiple indicators on the MDC used for trouble-shooting). Total loss of power or major trauma to the MDC neutrals all the pumps and motors, sets the brakes, and engages the boom ratchet pawl.

Hoist Function

Both the boom hoist and the main and auxiliary load hoist functions have the same operating algorithm, with exceptions as noted for the specific function of interest.

Hoist drum hydrostatic transmissions utilize both a variable displacement pump (one or two) and a variable displacement motor (one or two), with the pump being capable of continuously variable displacements from full in one direction, through zero displacement at neutral, to full at in the other direction. Default condition is zero displacement. All variable pumps and motors are electric solenoid controlled by the MDC.

Motors are similarly variable displacement, and default to full displacement. An input signal from the MDC drives the motor displacement smaller. Motors have externally variable pressure limiting controls, which prevents the motor from reducing its displacement (via MDC signal) when a set pressure at the motor ports is reached or exceeded. This means that once torque at the hoist drum exceeds a predetermined threshold (as manifested in the pressure at the motor), the internal motor hydraulic control will not allow the MDC to reduce its displacement any further (which would have the effect of raising motor pressure further if allowed). The higher the torque at the motor, the less the motor is permitted to reduce its displacement, and the slower the load is allowed to move.

The external pressure limiting control also allows for a different, lower, pressure to be permitted at the motor when lowering a load than when raising. In other words, the threshold for restricting the speed of the winch is lower when lowering than when raising, since the dynamics of stopping a load that's lowering is more onerous than when raising.

The default condition for this control is the lower pressure. A failure in the direction valve, which tells the motor which contour to use, defaults to the slower condition, as the valve is energized when raising only, and the motor's internal controls default to the lower pressure setting.

The basic operating sequence for raising a load is as follows:

When the operator moves the right-hand joystick back, the controls leave the brake engaged, and they shift the 'direction valve' (see below). The main hoist pumps begin to come on-stroke to raise the load but restricted in time-to-stroke by preset ramps in the control software.

The output to the pumps is very gradual with joystick movement initially, for good low-speed control and operator 'feel', and increases exponentially (exponent adjustable via software parameters) with stick travel. Since the brakes work through overrunning clutches, no brake release is required, and the hydraulic motors are connected (always) directly to the planetary reducers.

Since the brakes do not release when hoisting up, the load cannot drift downward as the joystick is moved off center, allowing greater fine control for placement of heavy loads.

As the pumps reach full displacement, at approximately 2/3 joystick travel, the motors begin to decrease displacement with additional joystick movement, until the motors achieve minimum displacement (limited by both software and mechanical stops within the motors).

If, during the hoisting process, the hoisted load causes working pressure at the motors greater than that allowed by the motor's pressure control for hoisting up, the motors will automatically restrict the reduction in displacement, thereby limiting the load speed, circuit pressure, and by extension, the power into the circuit. The 'direction valve', which energizes only when hoisting up, increases the pressure allowed by the motors over what would be allowed when lowering the same load, and therefore allows higher raising speeds than lower speeds for a given load.

Lowering a load is similar, with some important exceptions.

Every time a load is brought to a stop, the control system memorizes the last steady (mathematically smoothed) pressure it experienced on the load side of the hydraulic working circuit. When moving the joystick forward to lower a load, the controls will first stroke the pump in the raise direction to reestablish that pressure (very small pump displacement), and send an indication to the operator that the "preload" has been achieved.

The operator then moves the joystick further forward, out of the "preload" band, and the brakes release. The pumps are normally still set to displace in the up direction while the load is being held still by fluid column alone. Some small fluid output to the load side of the circuit will happen as fluid leakage in the hydraulic motors is normal at elevated pressure, so the pump will remain displaced slightly in the hoist direction to suspend the load under pump control alone.

The control system, using this upward displacement as a starting point, calculates a revised joystick/pump displacement relationship, such that further movement of the joystick forward reduces pump displacement through zero (neutral) and continues in the downward direction, lowering the load.

The motors will similarly reduce displacement at the appropriate joystick displacement, but with the direction valve not energized, and therefore the motor pressure threshold not forced higher, a load over a predetermined amount will not be lowered as fast as it can be raised.

When lowering a load, it is never necessary for the operator to wait for a 'preload achieved' indication, however, and moving the joystick from neutral, through the narrow 'preload' band, directly to lower will simply bypass the preload process. Preloading is very effective in preventing load sag when setting heavy loads precisely, but is not needed when in the open, and no harm is done to the system when stepping past it.

Stopping a load that is being lowered is done in the normal fashion, except that the control response ramps will limit the deceleration rate. Brakes will set after a short predetermined delay period, allowing the hoist to come to a complete stop under hydrostatic control first.

It should be noted that this 'preload' function is essentially the same as what an operator would do manually with the original pneumatic controls of the TG-series cranes, where the joysticks have an enlarged slot in the raise direction that allows pump activation without brake release while the operator monitors the load pressure gauge. In the original system, operator skill is required to match the oil column pressure to the load prior to releasing the brakes, where the MDC does this pressure matching automatically.

Boom Hoist Control Specifics

The most significant difference between boom hoist operation and main/aux load hoist operation is that the boom angle is monitored by the control system, and the maximum speed of the boom is gradually restricted as it is lowered through some preset angle from horizontal (adjustable control parameter), as well as when it exceeds another preset angle in the upward direction (approaching min. radius). This is a seamless transition and ramp, and greatly reduces acceleration loads on the structure and topping lift as long load radius is approached, as well as the danger to the operator and the crane from a load strike when approaching minimum radius. With the maximum boom speed smoothly reduced at both ends, max and min radius limits also stop the boom smoothly.

Control ramps are active at all times, including during boom slowdown intervals. Ramps are independently adjustable for all functions, both up/down, and accelerating/decelerating. Ramps are set longer for lowering to minimize dynamic effects on the structure and hoists.

A boom drum ratchet dog is also released when raising or lower the boom, controlled by the MDC, and sets with an adjustable time delay that begins to time-out after the control commands the pump to neutral via the usual deceleration ramp. Like all other control parameters, this time delay adjustment is accessible only by Federated technicians.

Similar to the braking systems, the boom dog defaults to the engaged position, but is hydraulically driven in both directions. It is biased to gravity engage when no hydraulic pressure is present.

Swing System

Swing control is similar to hoist control with two exceptions: there is no automated braking (the braking is operator controlled from the console, same as the original FMC arrangement.), and some of the cranes have fixed-displacement (single-speed) motors. Swing motor and transmission systems are original to the cranes and remain unchanged, and the new engines have integral air compressors to operate the swing holding brake pneumatic-release system.

Relief and pump compensator pressures for hydraulic circuits remain the same as original, as the cross-port relieve and weathervane valves and manifolds are original, and not part of the new hoist systems. Swing torque is therefore not changed from the original FMC design. Maximum swing speed is limited by adjustment of software parameters; however, many original TG-1900 tower cranes used swing pumps displacing more fluid than the 71cc swing pumps used on these new power units. Maximum swing speed is lower than rated as a result.

Performance

Maximum hoist speed up with an empty hook (at boom pin level) is rated at 655 ft/min on the fourth layer, and falls off slightly with any increase in hook load up to 18,000 lb, where the pressure limiting function of the hoist motors begins to reduce hoisting speed with increases in load. The hook speed follows what amounts to a smooth horsepower curve, where speed is reduced with increases in rope load at the winch. At 37,000 lb, which is the maximum rated load based on wire rope strength, hoisting speed upward is limited to approximately 310 ft/min. on the fourth layer.

Maximum hoist speed downward is similar for light loads, and at approximately 8,000 lb the lower (default) pressure control setting of the motors begins to restrict lowering speed with increases in rope load at the

winch in a similar constant power curve to hoisting. At the rated line pull of 37,000, lowering speed is approximately 210 ft/min.

Boom speeds are similarly higher in the raise direction, and are reduced with increased topping lift rope load due to both boom angle and hook load, while the lowering direction uses a more restrictive envelope similar to the main hoist. Unlike the main load hoist, the boom hoist also automatically reduces speed as it approaches its limits at both ends.

Swing speeds are limited by control system setup to the original maximum swing speed for the crane the hoist is used on, and in many cases, will be slower than the original specification. This is due to the various swing drive motor and transmission systems used on the TG series cranes. The original pressure limiting cross-port relief systems have been retained, and therefore the maximum swing drive torque remains as originally designed.

Dynamics

Dynamic effects primarily come into play when accelerating and decelerating a load, the boom, or the swing system. Steady speed hoisting and lowering imposes only the constant gravity load on the rope and structure that would be imposed while holding a load motionless. High frequency vibrations from ropes running over sheaves are orders of magnitude higher than the natural frequency of any of the major structural components and the crane as a system, and have no effect on the overall integrity of the crane.

Stopping deceleration ramp times for the main hoist is approximately 1.0 seconds in the control, and coupled with hydraulic system response times, overall times are approximately 1.5 seconds or more from full speed of 655 ft/min. Deceleration times are slightly longer when lowering a load, and can approach 2.0 seconds.

Maximum acceleration upward (a reduction in the net acceleration due to gravity) is therefore reduced by approximately 7.3 ft/s^2, or a reduction of steady-state rope load to about 77% with any load from an empty hook to approximately 18,000 pounds.

While lowering, the maximum speed is only attainable up to approximately 8,000 lb line-pull, and with a slightly longer deceleration time of 2.0 seconds resulting in additional acceleration of 5.5 ft/s^2, line pull is increased by a factor of 1.17.

In the case of rated load and rated speed, with a maximum rated speed hoisting (up) of 310 ft/min and 37,000 lb, the deceleration with a 1.25 second stopping ramp (motor is at maximum displacement) will be reduced by approximately 5.2 ft/s^2, or a reduction in rope load to approximately 84% of steady-state.

While lowering, maximum speed with rated load is 210 ft/min, and with an approximate deceleration time of 1.5 seconds or more resulting in additional acceleration of 1.75 ft/s^2, line pull is increased by a factor of 5.4% or less.

Both the active control system and the passive pressure limiting functionality of the boom hoist motor similarly reduce boom operation dynamics. Coupled with the gradual onset (with boom angle) of topping lift maximum speed at both ends of its operating envelope, dynamic effects are held to a minimum.

It should be noted that for load lowering and stopping, which is the worst case, line speeds for any given load are less than the rated line speed of the TG-1900, 2300, and 2300B models, and in most cases is less than that of the original standard TG-1500.

In all cases, the deceleration ramps are far longer, as there was no accurate control within the original pneumatic control system of ramp times. As compared to this new system with numerous built-in control limiters (both active and passive), the original FMC design gives the operator much greater opportunity to practice aggressive pump displacement changes and induce harsh dynamic loads on the crane.

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
A continuing tradition of engineering service - since 1946

303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel (516) 791-2600
Fax (516) 791-5425
www.HISAssoc.com

September 25, 2013

Waterfront Corporate Center III JV LLC
Morris Corporate Center IV
379 Interpace Parkway
Parsippany, NJ 07054
Attn: Mr. Douglas Allen

Ref.: Hoboken Waterfront Corporate Center Block B
Proposed of TG1900 Tower Crane

Dear Mr. Allen:

I write in response to reservations expressed by PASNYNJ about the proposed use of the TG1900 tower crane.

The TG1900 was selected, after an extensive study, because it fit the site constraints and lifting requirements of the project. No other lifting solution could meet those needs. The particular demands are driven by the dense mid-rise urban setting, constraints on use of adjoining streets and the necessity to set relatively heavy precast panels at long reaches.

After PA reservations were expressed, alternate solutions were studied and all found to be problematic:

- Favco M760 –This diesel-hydraulic luffing tower crane has ample lifting capacity, but its 226 foot boom would not reach the rear corners of the site as needed to set all of the steel and precast panels. Restrictions imposed by the city of Hoboken proscribe the deployment of mobile cranes on the adjoining streets to erect the back portion of the building.
- Electric luffing tower cranes –there are no machines available in the US market that have sufficient capacity.
- Electric hammerhead cranes –the Liebherr 630 EC-H20 is available and has the physical capabilities to serve the project, but its 267 ft. boom would sweep within four feet of the windows of the W Hotel, and both boom and counterjib would overswing multiple occupied buildings.

Lawrence K. Shapiro, PE *Cell (917) 721-8290* *LKShapiro@hisassoc.com*

In considering concerns about the TG1900 expressed by the PA, none would apply to the operation at the Hoboken site. The incident involving this crane at WTC4 was caused by hydraulic oil contaminated by water that entered through the climbing system. The Hoboken crane will not require a climbing mechanism, as it will be erected and dismantled at full height. There will be no opportunity for outside contaminants to penetrate the closed-loop hydraulic system.

The Manring report, commissioned by the PA following this incident, noted that that the hoist winch of the TG1900 relies on four hydraulic motors to lift its full capacity of 57,600 lbs. If a motor would fail, the winch capacity would be reduced. He proposed that the reliability of the crane could be enhanced by limiting the lift capacity to 30,000 lbs. All of the lifting at the Hoboken project is far below the 30,000 lb. Manring recommendation. The heaviest precast or steel lifts are no more than 15,000 lbs. The hoist motors would, therefore, benefit from both redundancy and very low load demand. The same could be said for the brakes.

Moreover, the overall project demand on the crane is moderate, considering the total number of lift cycles, intensity (The crane will operate single shift, six days per week.) and the moderate lifting heights. In comparison to the robust capabilities of the crane, its mechanical and hydraulic systems will see light service.

As the Manring report attributed the WTC4 incident to maintenance-related deficiencies, this project can be further insulated from such problems by carrying out a vigorous inspection and preventative maintenance program. The program could include third party inspections, frequent oil sampling and program review by qualified engineers.

If further information or study is required, please feel free to contact me.

Regards,

Lawrence K. Shapiro, P.E.

Paonessa, Diane

From: Francis J. Giantomasi [FGiantomasi@genovaburns.com]
Sent: Tuesday, October 29, 2013 2:18 PM
To: Stickelman, Timothy
Cc: Zipf, Peter; Angelo J. Genova; Charles J. Messina; Douglas R. Allen; Kathleen Barnett Einhorn
Subject: Re: Hoboken Crane - SJP Project

Per our call last evening, I await your call regarding the time sensitive crane material.....call my desk or cell as soon as possible, I am available

Sent from my iPad. Please excuse any spelling errors !

> On Oct 28, 2013, at 12:36 PM, "Stickelman, Timothy" <tstickel@panynj.gov> wrote:
>
> Mr. Giantomasi: Please find attached is a .pdf of the letter regarding the above-referenced matter. A hard copy is being sent via overnight mail to you.
>
> Regards,
>
> Tim
>
>
> Timothy G. Stickelman
> Assistant General Counsel
> The Port Authority of New York and New Jersey
> 225 Park Avenue South, 14th Floor
> New York, NY 10003
> Phone Number: 212.435.3425
> Fax Number: 212.435.3563
> To ensure compliance with Treasury Department regulations, please be advised that, unless otherwise expressly indicated, any federal tax advice contained in this message (together with any attachments) is not intended or written to be used, and cannot be used, for the purpose of (i) avoiding tax-related penalties under the Internal Revenue Code or applicable state or local tax law provisions or (ii) promoting, marketing or recommending to another party any tax-related matters.
> ----------
> This e-mail (together with any attachments) is intended only for the use of the named addressee(s) and may contain legally privileged and/or confidential information; please notify me immediately if you received this e-mail in error. Any unauthorized use, dissemination, distribution or copying of this e-mail (or any attachments) is strictly prohibited.
>
>
>
>
>
>
> NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT
>
> AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE
>
> RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY,
>
> PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY

>
> PRINTOUTS.
> <Letter_TGS to GBG_102813_Hoboken Crane.pdf>

This e-mail (including all attachments) is intended for the exclusive use of the individual to whom it is addressed. This e-mail may be proprietary, confidential, privileged and exempt from disclosure under applicable law. If the reader of this e-mail is not the intended recipient or agent responsible for delivering the message to the intended recipient, the reader is hereby put on notice that any use, dissemination, distribution or copying of this communication or any of its contents is strictly prohibited. If you have received this communication in error, please immediately notify the sender by telephone or e-mail and delete the original e-mail and all copies of it from your computer system. Pursuant to Internal Revenue Service Circular 230, only formal opinions satisfying specific requirements may be relied on for the purpose of avoiding certain penalties under the Internal Revenue Code. Any federal tax advice contained in this communication does not constitute a formal opinion satisfying such requirements. Accordingly, we must advise you that any such tax advice was not intended or written to be used, and cannot be used by you or any other person as such an opinion for the purpose of avoiding penalties imposed under the Internal Revenue Code.

Thank you.

Paonessa, Diane

From: Francis J. Giantomasi [FGiantomasi@genovaburns.com]
Sent: Monday, October 28, 2013 5:58 PM
To: Stickelman, Timothy
Cc: Zipf, Peter; Angelo J. Genova; Charles J. Messina
Subject: Re: Hoboken Crane - SJP Project

Tim, I had my initial call with my client regarding your letter . I would like to chat with you regarding its contents.....call me at your earliest opportunity on my cell 9732205355

Sent from my iPad. Please excuse any spelling errors !

> On Oct 28, 2013, at 12:36 PM, "Stickelman, Timothy" <tstickel@panynj.gov> wrote:
>
> Mr. Giantomasi: Please find attached is a .pdf of the letter regarding the above-referenced matter. A hard copy is being sent via overnight mail to you.
>
> Regards,
>
> Tim
>
>
> Timothy G. Stickelman
> Assistant General Counsel
> The Port Authority of New York and New Jersey
> 225 Park Avenue South, 14th Floor
> New York, NY 10003
> Phone Number: 212.435.3425
> Fax Number: 212.435.3563
> To ensure compliance with Treasury Department regulations, please be advised that, unless otherwise expressly indicated, any federal tax advice contained in this message (together with any attachments) is not intended or written to be used, and cannot be used, for the purpose of (i) avoiding tax-related penalties under the Internal Revenue Code or applicable state or local tax law provisions or (ii) promoting, marketing or recommending to another party any tax-related matters.
> ----------
> This e-mail (together with any attachments) is intended only for the use of the named addressee(s) and may contain legally privileged and/or confidential information; please notify me immediately if you received this e-mail in error. Any unauthorized use, dissemination, distribution or copying of this e-mail (or any attachments) is strictly prohibited.
>
>
>
>
>
>
> NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT
>
> AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE
>
> RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY,
>
> PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY
>

> PRINTOUTS.
> <Letter_TGS to GBG_102813_Hoboken Crane.pdf>

This e-mail (including all attachments) is intended for the exclusive use of the individual to whom it is addressed. This e-mail may be proprietary, confidential, privileged and exempt from disclosure under applicable law. If the reader of this e-mail is not the intended recipient or agent responsible for delivering the message to the intended recipient, the reader is hereby put on notice that any use, dissemination, distribution or copying of this communication or any of its contents is strictly prohibited. If you have received this communication in error, please immediately notify the sender by telephone or e-mail and delete the original e-mail and all copies of it from your computer system. Pursuant to Internal Revenue Service Circular 230, only formal opinions satisfying specific requirements may be relied on for the purpose of avoiding certain penalties under the Internal Revenue Code. Any federal tax advice contained in this communication does not constitute a formal opinion satisfying such requirements. Accordingly, we must advise you that any such tax advice was not intended or written to be used, and cannot be used by you or any other person as such an opinion for the purpose of avoiding penalties imposed under the Internal Revenue Code.

Thank you.

Paonessa, Diane

From: Stickelman, Timothy
ent: Monday, October 28, 2013 12:36 PM
To: Francis J. Giantomasi (FGiantomasi@genovaburns.com)
Cc: Zipf, Peter; Angelo J. Genova (agenova@genovaburns.com); Charles J. Messina (cmessina@genovaburns.com)
Subject: Hoboken Crane - SJP Project

Mr. Giantomasi: Please find attached is a .pdf of the letter regarding the above-referenced matter. A hard copy is being sent via overnight mail to you.

Regards,

Tim

Letter_TGS to BG_102813_Hobok.

Timothy G. Stickelman
Assistant General Counsel
The Port Authority of New York and New Jersey
225 Park Avenue South, 14th Floor
New York, NY 10003
Phone Number: 212.435.3425
ax Number: 212.435.3563

To ensure compliance with Treasury Department regulations, please be advised that, unless otherwise expressly indicated, any federal tax advice contained in this message (together with any attachments) is not intended or written to be used, and cannot be used, for the purpose of (i) avoiding tax-related penalties under the Internal Revenue Code or applicable state or local tax law provisions or (ii) promoting, marketing or recommending to another party any tax-related matters.

This e-mail (together with any attachments) is intended only for the use of the named addressee(s) and may contain legally privileged and/or confidential information; please notify me immediately if you received this e-mail in error. Any unauthorized use, dissemination, distribution or copying of this e-mail (or any attachments) is strictly prohibited.

THE PORT AUTHORITY OF NY & NJ

Darrell Buchbinder, General Counsel

October 28, 2013

Genova Burns Giantomasi Webster LLC
Attorneys At Law
494 Broad St., Newark, NJ 07102
Attn: Mr. Francis J. Giantomasi, Partner

SUBJECT: TG-1900 TOWER CRANE AT WATERFRONT CORPORATE CENTER PROJECT IN HOBOKEN

Dear Mr. Giantomasi:

I am writing in response to the letter we received letter, dated October 13, 2013 (copy attached w/o exhibits) referencing the subject crane. The Port Authority of New York and New Jersey (Port Authority) is willing to permit the use of the crane, with the addition of the winch pack noted in your letter, and subject to the following conditions:

1. Provide a diagram of the cross-section of the crane illustrating how the winch pack will make the crane different than the version currently banned in New York City.
2. The crane, with the winch pack addition, is to meet the certification requirements as per attachment A.
3. The crane will not require a climbing section mechanism.
4. The crane will be limited to lifting the loads as described in the subject letter (15,000 lbs maximum with one 20,000 lb lift).
5. SJP is to provide the Authority with a confirmation that they have notified the city of Hoboken of the issues associated with this crane in New York City and the plan for safety assurance at the Hoboken site.
6. Additionally, we require the following:

   - Perform weekly field hydraulic oil testing with a visage and maintain a signed log of temperature and viscosity. All new oil, for the crane machinery, must meet viscosity and temperature compatibility requirements with winch pack components.
   - SJP to supply a competent person to sign off on a Port Authority approved daily checklist.
   - The contractor is to provide monthly third party inspections. The inspector shall be subject to Port Authority approval.
   - The contractor is to supply new wire rope with an associated manufacturer's certification.
   - A qualified rigger shall be utilized for all picks.
   - The Crane is to have a black box with a remote reader.

225 Park Avenue South
New York, NY 10003

- Engineer of Record shall develop the load test criteria in accordance with applicable codes and standards.
- SJP to follow all requirements in the Port Authority "requirements for Cranes and Derricks" previously sent to you.

Provide additional information regarding the specific indemnification, noted in item B2 of the subject letter, for Port Authority review. Upon satisfactory receipt of the above, the Authority is prepared to issue "no objection notification" to use the subject crane. In addition, and as an alternate, in lieu of the TG-1900 crane, we have found other cranes that can satisfactorily fulfill the project requirements and are available to discuss if necessary.

Timothy G. Stickelman
Assistant General Counsel

cc: P. Zipf, J. Starace, W. Caban, M. Lynch

Attachment A
TG 1900 certification requirements

1. The owner of the crane design, Cornell, is to supply the Authority with the following for the crane in the modified configuration (with the new winch pack):
   - A certification from Professional Engineer (representing Cornell) that the overall crane design, including all components, is acceptable for use on this project and is in accordance with recognized codes and standards including ASME, ANSI and SAE J765, SAE J987.
   - A certification from a mechanical Professional Engineer of approval for the overall acceptable design of the hydraulic system.
   - A certification of the Engineer of Record for the crane that all aspects of the crane design and anticipated operation including the hydraulic system design are acceptable for use on the project.
2. SJP is to supply to the Authority the history of crane from 1983 to present including maintenance records.
3. The Mechanical Professional Engineer to supply the Authority with a Test protocol for mechanical system, oversee the testing and certify successful completion.
4. Cornell is to supply Operator's manual showing all configurations for which the engineer is seeking approval, general equipment specifications and manufacturer's recommended maintenance procedures, and load rating chart with chart number and page numbers for identification,
5. The Contractor is to supply to the Authority the following items:
   a. Load test weights certification
   b. Magnavis dry powder test report for the for 20' boom insert
   c. Unassembled inspection on site including sheave curvature
   d. PE stamp on final erection report and survey

GENOVA
BURNS
GIANTOMASI
WEBSTER
ATTORNEYS-AT-LAW

Genova Burns Giantomasi Webster LLC
494 Broad Street, Newark, NJ 07102
973.533.0777 973.533.1112
www.genovaburns.com

Newark, NJ | New York, NY | Camden, NJ | Red Bank, NJ | Philadelphia, PA | Jersey City, NJ

Francis J. Giantomasi, Esq.
Partner
Member of NJ and NY Bars
fgiantomasi@genovaburns.com
Direct: 973-535-7103

October 18, 2013

VIA UPS OVERNIGHT DELIVERY
Peter J. Zipf
Chief Engineer
Port Authority of New York and New Jersey
225 Park Avenue South
New York, New York 10003

Timothy Stickelman, Esq.
Deputy General Counsel
Port Authority of New York and New Jersey
225 Park Avenue South
New York, New York 10003

Re: TG-1900 Tower Crane at Waterfront Corporate Center Project in Hoboken

Dear Messrs. Zipf and Stickelman:

This firm represents SJP Properties and the Waterfront Corporate Center III JV LLC ("WCC") with respect to the development of the Waterfront Corporate Center ("Project") pursuant to a December 2012 Lease and Development Agreement ("Agreement") entered into by WCC with the City of Hoboken ("Hoboken") and the Port Authority of New York and New Jersey ("Port Authority"). We write to provide further information regarding the use of the specific TG-1900 tower crane for the Project ("Hoboken TG-1900").

As you are aware, the Port Authority specifically approved the utilization of the Hoboken TG-1900 after a series of meetings, which approval was formalized in the mobilization and logistics plan and made a part of the Agreement. (Attached as Exhibit A is Exh. O to the Agreement, which specifically references and depicts the Hoboken TG-1900.) Despite its prior approval, the Port Authority has now indicated that it may not allow use of the Hoboken TG-1900 for the Project because a TG-1900 tower crane was involved in an incident at the World Trade Center ("WTC") in New York City ("NYC") nearly two years ago, well before the Port Authority approved the use of the Hoboken TG-1900.

Use of the Hoboken TG-1900 is critical to the construction of the Project, and in an effort to ease the Port Authority's concerns regarding the Hoboken TG-1900, WCC, SJP

Properties and its construction manager for the Project, Pavarini McGovern (collectively, "SJP"), have provided extensive information and documentation evidencing how and why the Hoboken TG-1900 is significantly different from the WTC crane, as well as how SJP's anticipated use of the crane for the Project is vastly different from the WTC crane's use at the WTC project.[1] SJP has also proposed enhanced safeguards to address any reservations concerning use of the Hoboken TG-1900.[2] Additionally, SJP has provided expert reports, including a report from Peter J. Stroh, P.E. (the Port Authority's own expert) – who concludes that the TG-1900 is the most ideal and safest crane for the Project, having found that alternative crane types would present considerable drawbacks from the standpoint of logistics and risk management. Indeed, the Port Authority's expert, Mr. Stroh, in recommending use of the Hoboken TG-1900, opined that it is the safest crane for the Project. Notwithstanding the fact that most of this information has already been provided to the Port Authority, we understand that there remains some confusion as to how the WTC crane and the Hoboken TG-1900 differ and why any risk of an incident, similar to that which occurred at the WTC, is nonexistent.

We are confident that the following explanation will clarify any concerns or misunderstanding the Port Authority may still have regarding SJP's utilization of the Hoboken TG-1900.

A. THE HOBOKEN TG-1900 VASTLY DIFFERS FROM THE WTC CRANE WITH RESPECT TO USE AND EQUIPMENT

1. The Hoboken TG-1900 will include a winch pack that provides superior performance and braking capacity compared to the WTC crane.

Unlike the WTC crane, the Hoboken TG-1900 will include a new/modified winch pack that starkly distinguishes it from the WTC crane and reduces the risk of transmission failure.[3] In particular, because the winch pack provides the crane with two axial/variable displacement hydraulic motors, each with a disc-brake and planetary gearbox, any risk of failure in the

[1] Attached as Exhibit B is much of this correspondence.

[2] SJP and its agents participated in meetings on September 25, 2013 and October 15, 2013 with the Port Authority to discuss these issues.

[3] Attached as Exhibit C is Pierre Gonzalez's written analysis of the Hoboken TG-1900 new/modified winch pack, which was sent to Maureen Lynch-Jacobs and Jim Keane of the PANYNJ on October 16, 2013.

transmission at the pinion/spline is alleviated. (Id.) As such, the Hoboken TG-1900 has markedly superior performance and braking capacity to the WTC crane, making it significantly safer, more reliable, and effectively reducing the risk of transmission failure.

2. Unlike the WTC crane, the Hoboken TG-1900 does not, and will not, require a climbing section mechanism.

Improper maintenance was the determinant cause of failure of the WTC crane. Specifically, a significantly high level of contaminants and extremely high level of water concentrations were found in the WTC crane's hydraulic system.[4] The hydraulic oil was, as a result, contaminated by the water which entered into the crane's climbing system during a "jump." (Id. and Exh. B.)

The Hoboken TG-1900, unlike the WTC crane, does not, and will not require a climbing mechanism. (Id.) Rather, the Hoboken TG-1900 will be erected and dismantled at full height. (Id.) Because the Hoboken TG-1900 does not requires a climbing mechanism, there will be no opportunity for outside contaminants to penetrate its closed-loop hydraulic system. (Id.) Thus, it is impossible for the specific cause of the problem with the WTC crane to occur with the Hoboken TG-1900. (Id.)

3. Unlike the WTC crane, the Hoboken TG-1900 will perform light service, operate a single shift, and lift well below the suggested capacity recommended by the WTC investigative report.

The overall project demand of the Hoboken TG-1900, in comparison to the WTC crane, will be extremely moderate, considering the total number of lift cycles and intensity. (Id.) The Hoboken TG-1900 will only operate a single shift (8 hours), six times per day, while the WTC crane operated 16 hours per day, which is approximately +/-50 lifts of steel and/or 15 lifts of pre-cast panels per day.

Further, the Hoboken TG-1900 will perform relatively light service in comparison to the heavy lifts performed by the WTC crane. (Id.) Specifically, the heaviest loads lifted at the Project will be approximately 15,000lbs, with one exception requiring a 20,000lb lift. (Id.) This is nearly one-third of the load capacity of the TG-1900 (57,600lbs) and half of the maximum load capacity suggested by the WTC investigative Manring report commissioned by

[4] Attached as Exhibit D is an expert report prepared by Lawrence K. Shapiro, P.E.

the Port Authority. (See Exhs. B-D.) In addition, the average weight for the steel lifts at the Project is 2,000lbs and the precast panel lifts at the Project is 6,000lbs, which the WTC crane lifts well exceeded. (Id.) The lifting heights and the amount of uninterrupted time during which the motors have to run to lift the load from the street to the crane's cab level, moreover, will be significantly less for the Hoboken TG-1900 – the WTC crane was approximately 860' above street level when the incident occurred, so by comparison the motors had to run for a duration approximately four times longer than what they will at Hoboken for a load to get from the street to the crane's cab level.

4. There are no feasible alternatives to the Hoboken TG-1900 for the Project.

In a good faith effort to accommodate the Port Authority's concerns, and at the request of the Port Authority, SJP has worked diligently to find alternative cranes for the Project. After studying multiple alternative cranes, it has become clear that there are no workable alternatives to the Hoboken TG-1900. By letter dated September 25, 2013, expert crane consultant, Larry Shapiro, P.E., advised that alternative solutions were studied and found to be problematic for the following reasons:

- *Favco M760 Crane* – The boom would not reach the rear corners of the site as needed to set all of the steel cast and precast panels, and it would require two additional hydraulic or crawler street cranes for the Project. This option would also require crane tie-backs to the building, in lieu of free standing, which is not presently designed in the building steel or approved by the Port Authority.
- *Electric luffing tower cranes* – There are no machines available in the US market that have sufficient capacity.
- *Electric hammerhead cranes* – The booms would sweep approximately 4 feet from the W Hotel, and swing over multiple occupied buildings and a public park; it would also require a temporary generator that would run for the duration of crane operation.

(See Exhs. A, B, and E.) Further, the use of alternative cranes would have substantial impacts upon the community and the construction site, including:

- Closure of River Street and Sinatra Drive, both major thoroughfares in Hoboken, for 24 hours a day for 8 to 10 months, with no vehicular access to those streets during that period;
- No pedestrian traffic would be possible on the portions of the streets closed for construction during this time;

- In order to accommodate different cranes, new base and foundation structures would likely need to be constructed to properly distribute the weight in an effort to avoid damaging underground utilities, which would necessarily include remobilization of the foundation/piling equipment and further disruption of street and pedestrian traffic.[5]

(Id.) Verifying SJP's findings that no acceptable alternatives to the Hoboken TG-1900 exist, the Port Authority's crane expert, Mr. Stroh, recommended that the Port Authority allow the utilization of the Hoboken TG-1900 for the Project.[6] Mr. Stroh advised that he evaluated alternatives and found none as effective, let alone better, than the Hoboken TG-1900 for the Project. (Id.) He further stated that there is nothing inherently unsafe about the Hoboken TG-1900 and that proper maintenance is the most important factor for crane safety. (Id.) Mr. Stroh concluded that it makes the most sense, from a risk management perspective, to utilize the Hoboken TG-1900 for the Project. (Id.)

5. All experts agree that the Hoboken TG-1900 should be used for the Project.

As described by crane expert Pierre Gonzalez and noted by expert Peter Stroh, the new/modified winch pack was designed "in accordance to the current crane codes and design standards and is a proven system," offering "superior performance and brake capacity," making the Hoboken TG-1900 "different equipment altogether than the original TG-1900" (See id. and Exh E.) Gonzalez further recommends in his report that "[a]s engineers placing the safety of the public and workers first and foremost in the list of our preoccupations, it is our professional opinion that *using a modified TG-1900 with a new winch would certainly represent the best outcome for this particular project – especially since using another crane (hammerhead) or a combination of several cranes (M760 + mobile cranes) would likely represent an increase of risk from the logistical and structural standpoints*." (Exh. C; emphasis added.)

Moreover, Gonzalez further notes that even if the Hoboken TG-1900 was used without the new/modified winch pack, it would still differ from the WTC crane because its intended use is different. For instance, the heaviest loads lifted for the Project will be around 15,000lbs

[5] It is important to note that the Port Authority did not ever reject the use of the Hoboken TG-1900; rather, it specifically approved it and SJP has completed the construction of the foundations necessary to support the Hoboken TG-1900 – construction which was specifically approved by the Port Authority.

[6] A copy of Mr. Stroh's findings are attached as Exhibit E.

(with one occurrence at 20,000lbs), which is well below the rated line pull of the original TG-1900 and its braking capacity (150% of line pull). (Id.) Therefore, the TG-1900 - even without the new/modified winch pack (which SJP intends on using) - would still be "more than apt and adequate to perform the work required..." (Id.)

In short, all of the crane experts agree that the Hoboken TG-1900 is the only workable option considering the crane requirements of the Project. Other cranes either cannot meet the Project requirements and/or present real and substantial site-specific risks, as opposed to hypothetical concerns based upon a singular incident with a different crane being used to hoist far greater loads on an entirely different project. (See Exhs. B-E.)

B. SJP'S ADDITIONAL SAFEGUARDS TO SATISFY THE PORT AUTHORITY'S CONCERNS EXPRESSED AT THE SEPTEMBER 25 AND OCTOBER 15 MEETINGS

1. SJP offers several enhanced safety measures to ensure safe use of the TG-1900.

Since no suitable alternative cranes were found by either SJP or the Port Authority's experts, SJP has proposed taking several steps to further safeguard use of the Hoboken TG-1900 for the Project. Such enhanced measures include:

- Additional hydraulic oil testing - once per month;
- Regular third-party inspections of the TG-1900, at intervals acceptable to the Port Authority;
- Additional rope inspections;
- Installation of new boom hoist cable;
- Strict adherence to crane safety protocol and proactive maintenance;
- Utilization of a qualified rigger for larger size picks;
- Monthly unannounced spot inspections by the Port Authority;
- Utilization of a black box load moment system;
- Certificates of manufacturer approval of the wire rope, history of motors on the crane, and the replacement parts and maintenance work (all of which have already been submitted to the Port Authority);

- Permitting the Port Authority to approve test protocol for mechanical systems at the time of crane erection;
- Following the heightened NYC DOB Cranes and Derricks load test standard criteria; and
- Submitting a CD-7 with the mobile crane applications once the Hoboken TG-1900 is approved; since the TG 1900 will not climb, the CD-7 will be filed for the erection and dismantling.

(Exh. B.) All of these proposed enhanced safeguards are in line with Mr. Stroh's finding that maintenance is the key to crane safety. (Id. and Exh. E.) Should Mr. Stroh or the Port Authority recommend any further reasonable maintenance measures, SJP would comply with those as well.

In addition to maintenance, SJP has proposed limiting the use of the Hoboken TG-1900 under certain weather conditions. In particular, SJP proposes the following measures to address wind-related concerns:

- For 50+mph winds, the Hoboken TG-1900 shall be taken out of service and the tower bolts shall be checked so that the crane will be free to weathervane;
- Weathervaning will be accomplished with a boom angle as low as possible and, as a result, the crane will offer less resistance for the wind from the rear of the crane;
- Both the tower and footing can accommodate a higher boom angle for the weathervaning procedure in the case where larger horizontal and vertical clearances with the adjacent structure would be desired;
- All manufacturer requirements and specifications for weathervaning and service conditions shall be followed.

(Exh. B.) These enhanced safety measures, combined with a much lesser demand required of the Hoboken TG-1900 for the Project (in comparison to the WTC crane), provides further safety protection and should fully alleviate any remaining concerns.

2. SJP is willing to provide specific indemnification in connection with the Hoboken TG-1900 even though the Agreement already provides sufficient indemnification.

The Agreement, under Article 12, among other sections, provides that the Port Authority shall be indemnified against liability in connection with the Project. As such, any concerns with respect to potential Port Authority liability caused by use of the Hoboken TG-1900 are baseless. On the other hand, if the Port Authority prohibits the Hoboken TG-1900, in breach of the Agreement, it would not receive the benefit of such indemnity with respect to an alternative crane as those indemnification provisions would not extend to such a circumstance.

Nonetheless, SJP offers to secure an additional credit of indemnity in an amount acceptable to the Port Authority in order to make it absolutely clear and certain that SJP would fully indemnify the Port Authority against any liability arising from the use of the Hoboken TG-1900 during the Project.

C. SJP HAS COMPLIED WITH ALL APPLICABLE WORKPLACE SAFETY REQUIREMENTS

The Project has and will continue to fully comply with all applicable laws and regulations governing workplace safety, including those provided under the Occupational Safety and Health Act ("OSHA") and American National Standards Institute ("ANSI"). Further, SJP has complied with all additional safety standards set forth in the Agreement. With respect to the Hoboken TG-1900, no applicable law or regulation prohibits its use for the Project.

CONCLUSION

While SJP understands that the Port Authority is concerned that an incident will occur similar to the WTC accident, it is impossible that a similar incident can occur at the Project considering the Hoboken TG-1900's anticipated use on the Project and its equipment (including the new/modified winch pack), as well as SJP's agreement to provide additional safety measures and inspections.

We trust the above information and exhibits clarify all of the Port Authority's concerns with respect to utilization of the Hoboken TG-1900. Because there exists no legitimate factual

or legal basis for the Port Authority to prohibit the use of the Hoboken TG-1900 – in addition to the fact that there are no feasible alternatives – the Port Authority's prior approval of the Hoboken TG-1900 cannot be withdrawn. Indeed, use of the Hoboken TG-1900 is fully consistent with the Port Authority's prior approvals, and constitutes the basis on which the Project was planned; any continued insistence by the Port Authority that utilization of the Hoboken TG-1900 crane is forbidden will have a devastating impact on the Project and its prospective tenants. Considering SJP will have no alternative but to seek relief from the Port Authority from all resulting costs, we believe that careful consideration of the many points raised in this letter is warranted and will ultimately obviate the Port Authority's concerns so the Project can proceed as originally approved and agreed by all parties to the Agreement.

We look forward to hearing from you and moving forward with the Project.

Very truly yours,

GENOVA BURNS GIANTOMASI WEBSTER LLC

Francis J. Giantomasi /CJM

FRANCIS J. GIANTOMASI

FJG/KBE/CJM

CC: Angelo J. Genova, Esq.

Paonessa, Diane

From: Starace, Jim
Sent: Wednesday, November 13, 2013 9:46 AM
To: 'Charles J. Messina'
Cc: Stickelman, Timothy; Angelo J. Genova; Francis J. Giantomasi; Lynch-J[illegible] Maureen; Keane, Jim; Del Tufo, Gerard; Caban, Wally; Zipf, Peter
Subject: Hoboken Waterfront Corporate Center TG-1900 Crane

Mr. Messina:

The Port Authority of NY and NJ has no objections to the delivery and use of crane CD 1850 at the Waterfront Corporate Center project site in Hoboken New Jersey. Prior to operating the crane, the following must be witnessed and approved by the Engineer of Record:

- Inspections of the unassembled and assembled crane structure.
- The Plumbness report.
- The performance of a final load test.

The following, previously transmitted requirements, must be adhered to during the crane operation:

- Perform weekly field hydraulic oil testing with a visage and maintain a signed log of temperature and viscosity.
- SJP to supply a competent person to sign-off on a Port Authority approved daily check list.
- The contractor is to provide monthly third party inspections.
- A qualified rigger shall be utilized for all picks.

James Starace, P.E.
Deputy Chief Engineer

From: Charles J. Messina [mailto:cmessina@genovaburns.com]
Sent: Tuesday, November 12, 2013 6:57 PM
To: Starace, Jim
Cc: Stickelman, Timothy; Angelo J. Genova; Francis J. Giantomasi
Subject: RE: SJP - Hoboken Block B, *agreement TIME SENSITIVE

Yes. The Cornell letter, signed by Dennis Bonner, P.E., is attached for your convenience, as well as the signed and sealed letter from Lawrence K. Shapiro, P.E. that we previously sent Tim.

From: Starace, Jim [mailto:jstarace@panynj.gov]
Sent: Tuesday, November 12, 2013 6:51 PM
To: Charles J. Messina
Cc: Stickelman, Timothy; Angelo J. Genova; Francis J. Giantomasi
Subject: Re: SJP - Hoboken Block B, *agreement TIME SENSITIVE

harles: I'm on the blackberry so maybe I missed it-did I get item 2 below? The Cornell certification signed by a PE? Jim

---

Sent from my BlackBerry Wireless Device

From: Charles J. Messina [mailto:cmessina@genovaburns.com]
Sent: Tuesday, November 12, 2013 06:23 PM
To: Starace, Jim
Cc: Stickelman, Timothy; Angelo J. Genova <AGenova@genovaburns.com>; Francis J. Giantomasi <FGiantomasi@genovaburns.com>
Subject: RE: SJP - Hoboken Block B, *agreement TIME SENSITIVE

Jim:

We trust you have now received the requested documentation. Our client intends to move forward with the crane erection process this Thursday.

Best regards,
Charles

Charles J. Messina, Esq.
Direct Dial: 973.646.3278
Main Line: 973.533.0777 Ext. 1209
cmessina@genovaburns.com

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

494 Broad Street
Newark, NJ 07102
Tel: (973) 533-0777
Fax: (973) 533-1112

www.genovaburns.com

From: Charles J. Messina
Sent: Tuesday, November 12, 2013 5:01 PM
To: Starace, Jim (jstarace@panynj.gov)
Cc: Stickelman, Timothy (tstickel@panynj.gov); Angelo J. Genova; Francis J. Giantomasi
Subject: FW: SJP - Hoboken Block B, *agreement TIME SENSITIVE
Importance: High

Jim:

Please see the below and attached.

Thanks,
Charles

Charles J. Messina, Esq.
Direct Dial: 973.646.3278
Main Line: 973.533.0777 Ext. 1209
cmessina@genovaburns.com

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

494 Broad Street
Newark, NJ 07102
Tel: (973) 533-0777
Fax: (973) 533-1112

www.genovaburns.com

From: Charles J. Messina
Sent: Tuesday, November 12, 2013 1:21 PM
To: jstarace@panynj.com
Cc: Angelo J. Genova; Francis J. Giantomasi; Stickelman, Timothy (tstickel@panynj.gov)
Subject: RE: SJP - Hoboken Block B, *agreement TIME SENSITIVE
Importance: High

Jim – please confirm receipt of this email, our below email, and the attached documentation, which we sent you on Friday.

Thanks,
Charles

Charles J. Messina, Esq.
Direct Dial: 973.646.3278
Main Line: 973.533.0777 Ext. 1209
cmessina@genovaburns.com

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

494 Broad Street
Newark, NJ 07102
Tel: (973) 533-0777
Fax: (973) 533-1112

www.genovaburns.com

From: Charles J. Messina
Sent: Friday, November 08, 2013 5:39 PM
To: 'jstarace@panynj.com'
Cc: Stickelman, Timothy (tstickel@panynj.gov); Angelo J. Genova; Francis J. Giantomasi
Subject: RE: SJP - Hoboken Block B, *agreement TIME SENSITIVE
Importance: High

Jim:

Attached is documentation that fully complies with item #1 below. We are still working diligently to obtain item #2 and will forward it to you as soon as we receive it.

Regards,
Charles

Charles J. Messina, Esq.
Direct Dial: 973.646.3278
Main Line: 973.533.0777 Ext. 1209
cmessina@genovaburns.com

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

494 Broad Street
Newark, NJ 07102
Tel: (973) 533-0777
Fax: (973) 533-1112

www.genovaburns.com

From: Angelo J. Genova
Sent: Friday, November 08, 2013 2:03 PM

To: 'jstarace@panynj.com'; tstickel@panynj.com
Cc: Charles J. Messina; Francis J. Giantomasi
Subject: FW: SJP - Hoboken Block B, *agreement TIME SENSITIVE

Jim:

This email will serve as written confirmation of our agreement on the telephone that SJP and its agents will be permitted to proceed with crane erection this Monday, November 11, if it provides the following two items to you (PANYNJ) today:

#1) An updated letter from a mechanical professional engineer for approval for the overall acceptable design of the hydraulic design, addressed to Peter Zipf; and

#2) A certification or letter signed/sealed by a professional engineer on behalf of Cornell that the overall crane design, including all components, is acceptable for use on the Hoboken project and is in accordance with recognized codes and standards.

Assuming you do not advise me otherwise before the close of business today, and we provide the two above items to you, our client will proceed with crane erection forthwith. Please confirm your receipt of this email.

Best regards,
Angelo

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

494 Broad Street
Newark, NJ 07102
Tel: (973) 533-0777
Fax: (973) 533-1112

www.genovaburns.com

This e-mail (including all attachments) is intended for the exclusive use of the individual to whom it is addressed. This e-mail may be proprietary, confidential, privileged and exempt from disclosure under applicable law. If the reader of this e-mail is not the intended recipient or agent responsible for delivering the message to the intended recipient, the reader is hereby put on notice that any use, dissemination, distribution or copying of this communication or any of its contents is strictly prohibited. If you have received this communication in error, please immediately notify the sender by telephone or e-mail and delete the original e-mail and all copies of it from your computer system. Pursuant to Internal Revenue Service Circular 230, only formal opinions satisfying specific requirements may be relied on for the purpose of avoiding certain penalties under the Internal Revenue Code. Any federal tax advice contained in this communication does not constitute a formal opinion satisfying such requirements. Accordingly, we must advise you that any such tax advice was not intended or written to be used, and cannot be used by you or any other person as such an opinion for the purpose of avoiding penalties imposed under the Internal Revenue Code.

Thank you.
[attachment "Letter Port Authority Upgrade Winch Description r1.pdf" deleted by Marc DePaul/PAVARINI/STI]

This e-mail (including all attachments) is intended for the exclusive use of the individual to whom it is addressed. This e-mail may be proprietary, confidential, privileged and exempt from disclosure under applicable law. If the reader of this e-mail is not the intended recipient or agent responsible for delivering the message to the intended recipient, the reader is hereby put on notice that any use, dissemination, distribution or copying of this communication or any of its contents is strictly prohibited. If you have received this communication in error, please immediately notify the sender by telephone or e-mail and delete the original e-mail and all copies of it from your computer system. Pursuant to Internal Revenue Service Circular 230, only formal opinions satisfying specific requirements may be relied on for the purpose of avoiding certain penalties under the Internal Revenue Code. Any federal tax advice contained in this communication does not constitute a formal opinion satisfying such requirements. Accordingly, we must advise you that any such tax advice was not intended or written to be used, and cannot be used by you or any other person as such an opinion for the purpose of avoiding penalties imposed under the Internal Revenue Code.

NYC Buildings

Robert D. LiMandri
Commissioner

Faisal Muhammed, P.E.
Executive Director
Cranes & Derricks Division

280 Broadway, 5th Floor
New York, NY 10007
Nyc.gov/buildings

+1 212 393 2348 tel
+1 212 566 5871 fax

CEASE USE ORDER

June 7th, 2013

Lawrence Weiss
Cranes, Inc.
53-20 44 Street
Maspeth, NY 11378

Re: CD# 2230, 1851 and 1850

To Mr. Weiss:

Following an investigation of two tower cranes similar to CD# 2230, 1851 and 1850 that were involved in recent accidents at the World Trade Center, DOB has determined that the hydraulic system design of the TG and STD series of tower cranes, which does not include a fail-safe mechanism for the hydraulic motors, was a contributing factor in both incidents.

As you are aware, the above-referenced cranes are already unauthorized to work in NYC due to its expired certificate of operation. In light of the foregoing, you are hereby ordered to cease use of the tower cranes referenced above pursuant to Section 28-207.5 of the Administrative Code of the City of New York ("Code").

Furthermore, DOB intends to revoke registrations for all TG and STD series tower cranes pursuant to Code Section 28-105.10. Separate notice of such proposed revocations will follow.

Very truly yours,

Faisal Muhammed, P.E.
Executive Director

cc: Michael Alacha, Assistant Commissioner, Engineering & Emergency Ops.

EXEMPTION 5

From: Ron Yakin [mailto:r.yakin@morrow.com]
Sent: Tuesday, October 22, 2013 11:05 AM
To: Lynch-Jacobs, Maureen
Subject: Liebherr 630 EC-H 20

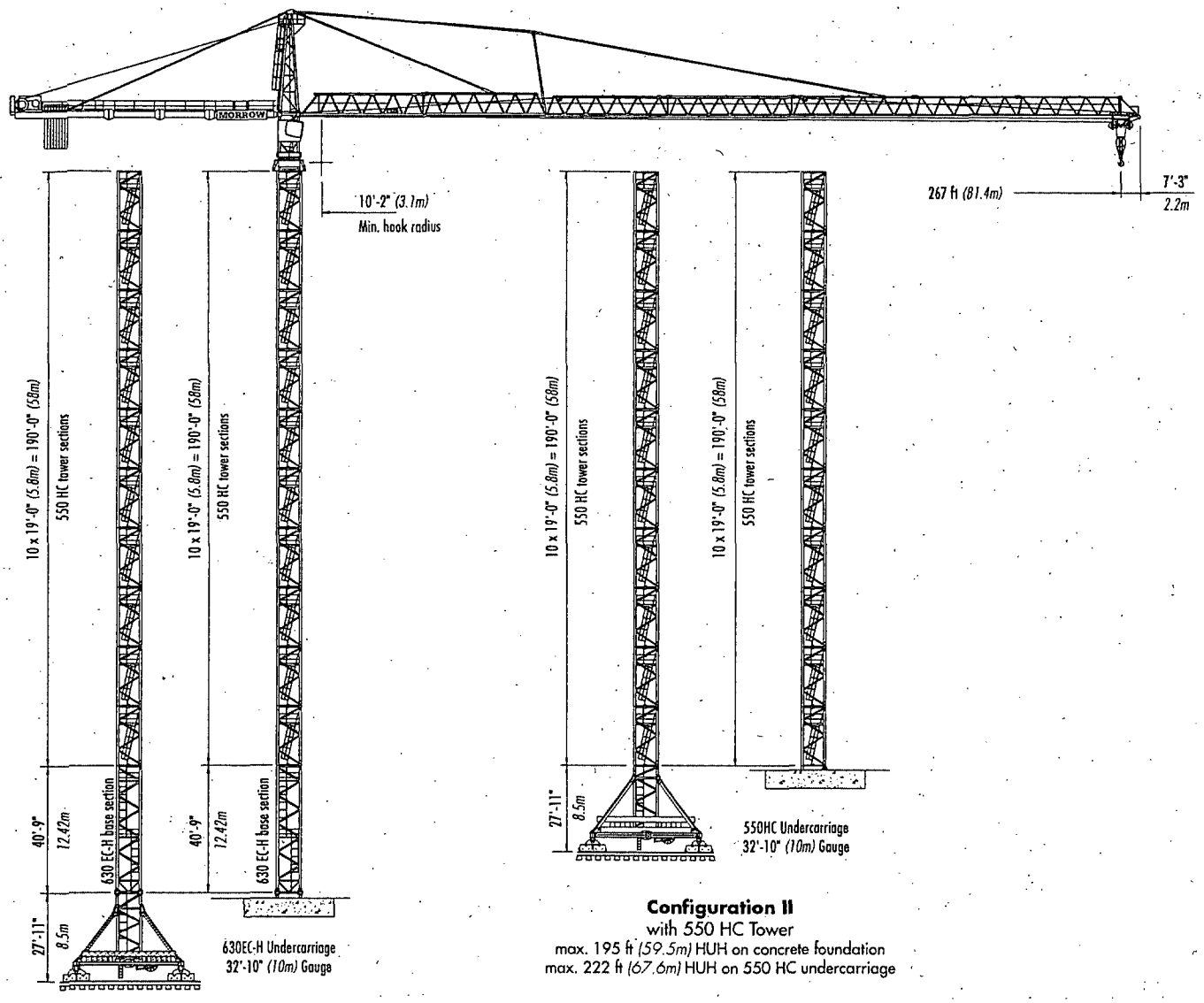
Attached is brochure

Best regards,

Ronald Yakin
Vice President
Morrow Equipment Company, L.L.C.
Millwood, NY USA
Tel (914) 762-0550 ext 22
Fax (914) 762-0759
Cell (914) 589-4997
Email: r.yakin@morrow.com
Website: http://www.morrow.com

LIEBHERR 630 EC-H 20 Litronic®

TOWER CRANE



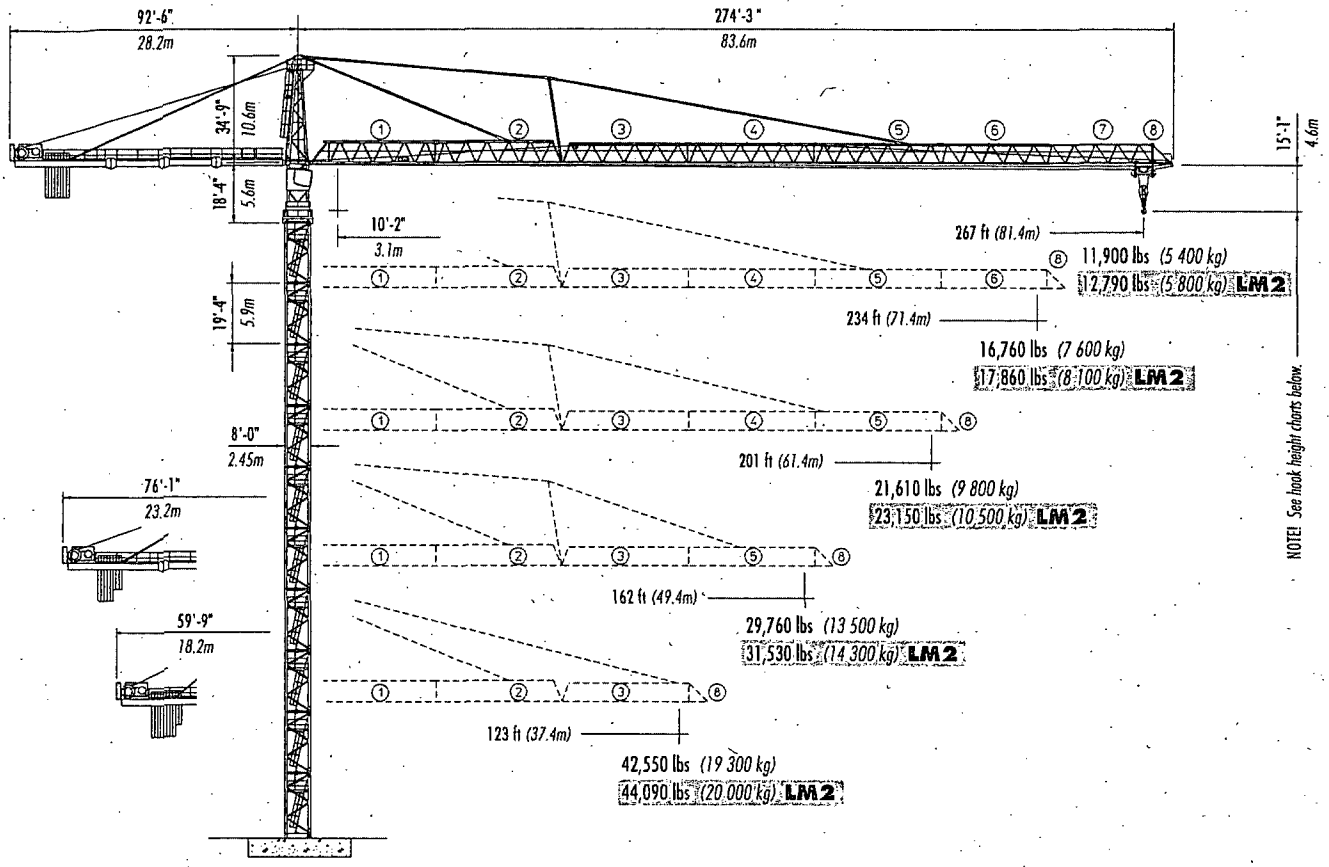
Configuration I
with 550 HC/630 EC-H Tower
max. 235 ft *(71.7m)* HUH on concrete foundation
max. 262 ft *(80m)* HUH on 630 EC-H undercarriage

Configuration II
with 550 HC Tower
max. 195 ft *(59.5m)* HUH on concrete foundation
max. 222 ft *(67.6m)* HUH on 550 HC undercarriage

FREESTANDING
travelling and stationary

Morrow Equipment

LIEBHERR 630 EC-H 20 Litronic®



FREESTANDING
with 550 HC Tower Sections
on concrete slab

Hook Heights

No. of Tower Elements	Tower Configuration I	Hook Height Concrete Foundation ft	Hook Height Concrete Foundation m	Hook Height 10m Undercarriage ft	Hook Height 10m Undercarriage m
1	630ECH BTS	45	13.7	72	22
2	550HC TS	64	19.5	91	27.8
3	550HC TS	83	25.3	110	33.6
4	550HC TS	102	31.1	129	39.4
5	550HC TS	121	36.9	148	45.2
6	550HC TS	140	42.7	167	51
7	550HC TS	159	48.5	186	56.8
8	550HC TS	178	54.3	205	62.6
9	550HC TS	197	60.1	224	68.4
10	550HC TS	216	65.9	243	74.2
11[1]	550HC TS	235	71.7	262	80

No. of Tower Sections	Tower Configuration II	Hook Height Concrete Foundation ft	Hook Height Concrete Foundation m	Hook Height 10m Undercarriage ft	Hook Height 10m Undercarriage m
1	550HC TS	24	7.2	51	15.4
2	550HC TS	43	13.1	70	21.2
3	550HC TS	62	18.9	89	27
4	550HC TS	81	24.7	108	32.8
5	550HC TS	100	30.5	127	38.6
6	550HC TS	119	36.3	146	44.4
7	550HC TS	138	42.1	165	50.2
8	550HC TS	157	47.9	184	56
9	550HC TS	176	53.7	203	61.8
10[1]	550HC TS	195	59.5	222	67.6

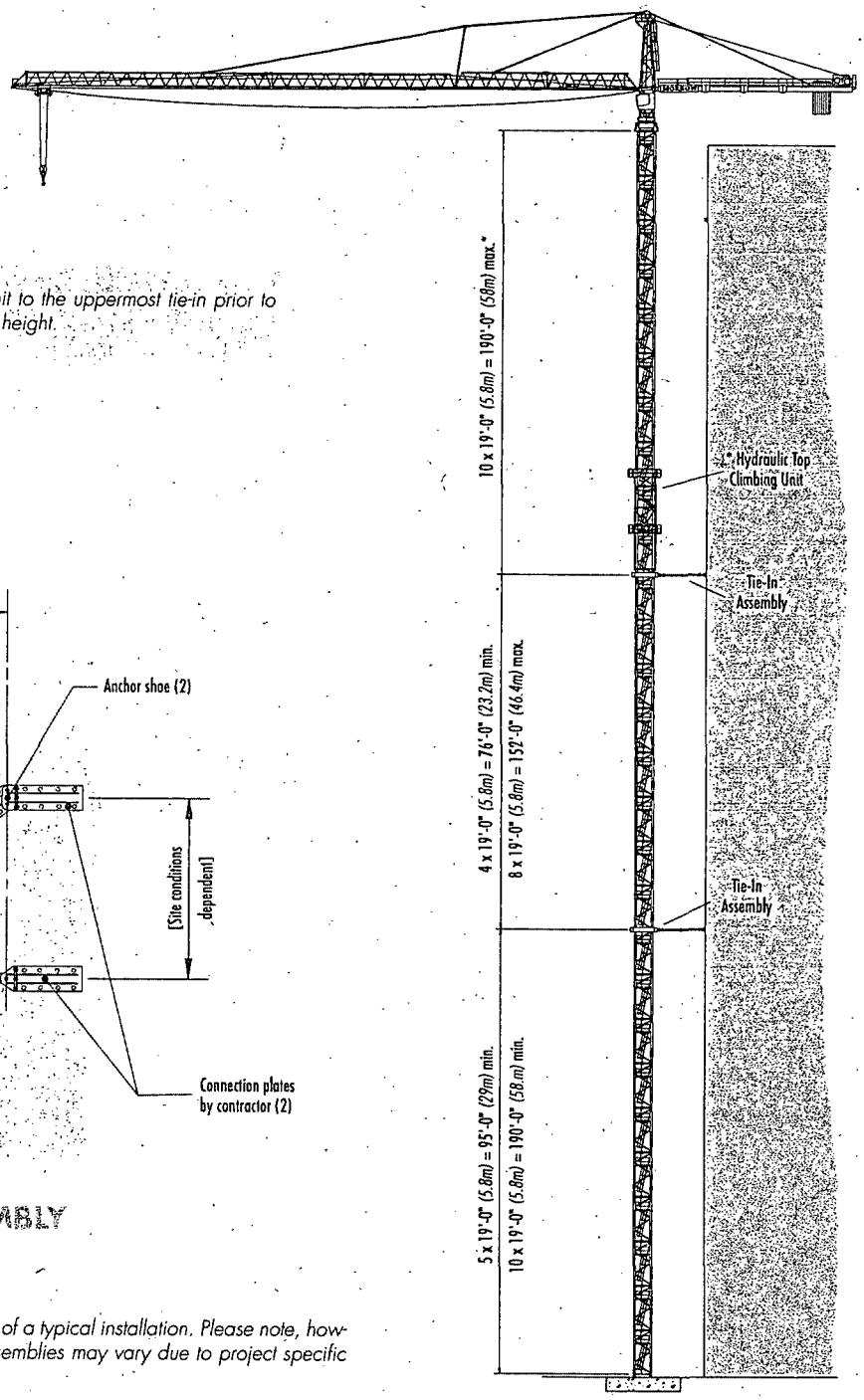
[1] *Lower top climbing unit to base of crane prior to operating at maximum hook height.*

NOTE! *Contact Morrow for specific information regarding alternate tower configurations, special jib assemblies, alternate foundation details, dimensions, reaction forces and slab opening requirements.*

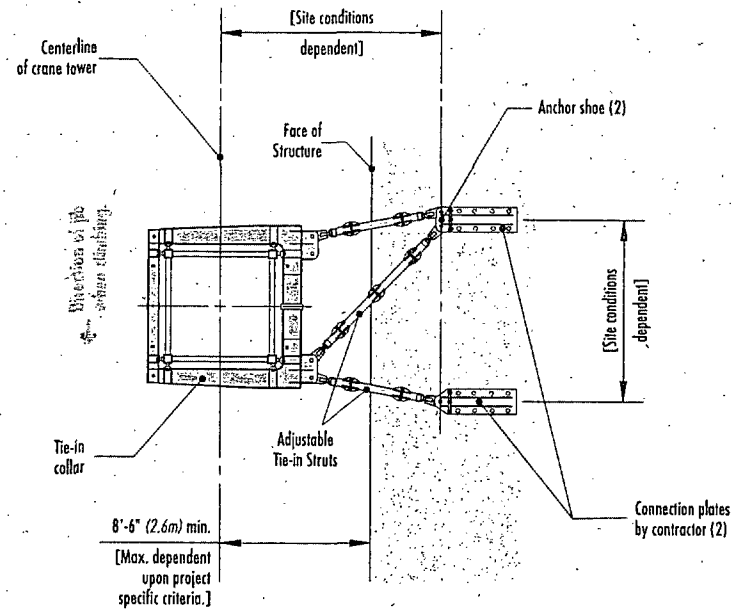
Please consult 630 EC-H 20 Litronic Operations Manual before erecting, operating, servicing or dismantling crane.

LIEBHERR 630 EC-H 20 Litronic®

Consult Operations Manual before erecting, operating, servicing or dismantling crane.



* **NOTE!** *Lower the top climbing unit to the uppermost tie-in prior to operating crane at maximum hook height.*



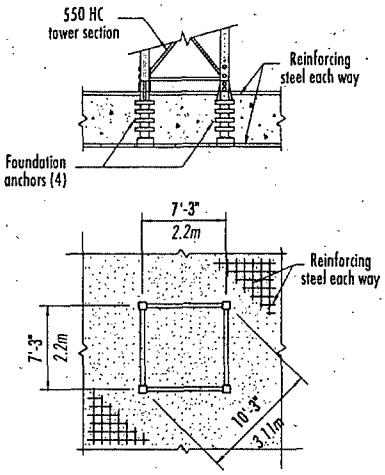
TIE-IN ASSEMBLY
Plan view

NOTE! *The tie-in assembly shown above is an example of a typical installation. Please note, however, that factors determining the installation of tie-in assemblies may vary due to project specific requirements.*

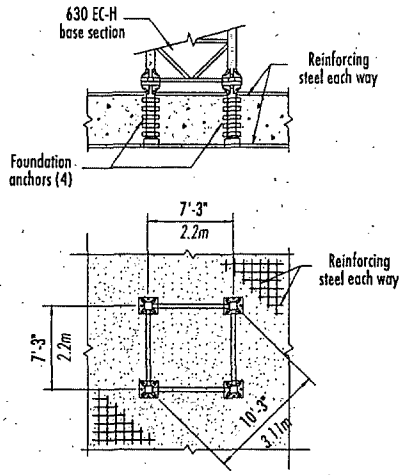
TOP CLIMBING
with 550 HC Tower Sections
Tied to structure

Morrow Equipment Co., L.L.C.

LIEBHERR 630 EC-H 20 Litronic®



with 550 HC Tower Section
on concrete slab



with 630 EC-H Base Section
on concrete slab

	Hook Radius	Jib tip Radius	Maximum Capacity – Radius	ft / m	10 / 3.1	49 / 15	66 / 20	82 / 25	98 / 30	123 / 37.4	148 / 45	162 / 49.4	180 / 55	201 / 61.4	213 / 65	234 / 71.4	246 / 75	267 / 81.4
2-Part Line	267 ft / 81.4m	274'-3" / 83.6m	44,090 lbs – 88 ft / 20 000 kg – 26.73m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	39,040 / 17 710	30,750 / 13 950	24,980 / 11 330	22,400 / 10 160	19,710 / 8 940	17,220 / 7 810	16,030 / 7 270	14,200 / 6 440	13,290 / 6 030	11,900 / 5 400
	234 ft / 71.4m	241'-6" / 73.6m	44,090 lbs – 100 ft / 20 000 kg – 30.54m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	35,540 / 16 120	28,970 / 13 140	26,060 / 11 820	23,020 / 10 440	20,170 / 9 150	18,830 / 8 540	16,760 / 7 600		
	201 ft / 61.4m	208'-8" / 63.6m	44,090 lbs – 106 ft / 20 000 kg – 32.28m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	37,830 / 17 160	30,890 / 14 010	27,820 / 12 620	24,580 / 11 150	21,610 / 9 800				
	162 ft / 49.4m	169'-4" / 51.6m	44,090 lbs – 113 ft / 20 000 kg – 34.41m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	40,370 / 18 310	33,030 / 14 980	29,760 / 13 500						
	123 ft / 37.4m	129'-11" / 39.6m	44,090 lbs – 119 ft / 20 000 kg – 36.16m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	42,550 / 19 300								

LM1

2-Part Line	267 ft / 81.4m	274'-3" / 83.6m	44,090 lbs – 93 ft / 20 000 kg – 28.22m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	41,360 / 18 760	32,630 / 14 800	26,540 / 12 040	23,830 / 10 810	21,010 / 9 530	18,390 / 8 340	17,130 / 7 770	15,210 / 6 900	14,260 / 6 470	12,790 / 5 800
	234 ft / 71.4m	241'-6" / 73.6m	44,090 lbs – 106 ft / 20 000 kg – 32.19m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	37,590 / 17 050	30,690 / 13 920	27,650 / 12 540	24,430 / 11 080	21,450 / 9 730	20,040 / 9 090	17,860 / 8 100		
	201 ft / 61.4m	208'-8" / 63.6m	44,090 lbs – 113 ft / 20 000 kg – 34.37m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	40,300 / 18 280	32,980 / 14 960	29,720 / 13 480	26,300 / 11 930	23,150 / 10 500				
	162 ft / 49.4m	169'-4" / 51.6m	44,090 lbs – 119 ft / 20 000 kg – 36.26m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	42,660 / 19 350	34,940 / 15 850	31,530 / 14 300						
	123 ft / 37.4m	129'-11" / 39.6m	44,090 lbs – 123 ft / 20 000 kg – 37.4m	lbs / kg	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000	44,090 / 20 000								

LM2

IMPORTANT! *Litronic® cranes are equipped with Liebherr's state of the art PLC system that provides precise monitoring, control and coordination of all crane functions. This feature also permits a load increase of up to 10% as illustrated in the heavy lift mode (**LM2**) chart above. Heavy lift mode is permitted only when wind speed is less than 31 mph (50 kph). Contact Morrow for more information regarding the many features of the 630 EC-H 20 Litronic tower crane.*

Drive Information

Hoist Speed and Capacity

Hoist Unit WiW 300 VZ 401	2-Part Line					LM1
147 hp (110 kW) FC hoist unit *Variable frequency drive (VFD)* *3-speed electromagnetic gear shifting*	**Speed**	**Capacity**	**Line Speed**	**Capacity**	**Line Speed**	
	1	up to 44,090 lbs up to 21,605 lbs	@ 89 fpm @ 157 fpm	*up to 20 000 kg* *up to 9 800 kg*	@ *27 m/min* @ *48 m/min*	
	2	up to 25,355 lbs up to 11,245 lbs	@ 151 fpm @ 266 fpm	*up to 11 500 kg* *up to 5 100 kg*	@ *46 m/min* @ *81 m/min*	
6L-237	3	up to 14,110 lbs up to 4,850 lbs	@ 253 fpm @ 459 fpm	*up to 6 400 kg* *up to 2 200 kg*	@ *77 m/min* @ *140 m/min*	

IMPORTANT! *Capacities and line speeds indicated will vary depending on the amount of hoist wire rope installed. This crane model may be equipped with a hoist unit other than that specified in the data shown above. To verify, check serial number and refer to 630 EC-H 20 Litronic Operation Manual for additional information.*

Motor Information

Drive Unit	Horsepower	Kilowatts	Speed	
Trolley (FC)	14.7 hp	*11 kW*	0 – 223 fpm	*0 – 68 m/min*
Swing (fluid coupling)	2 x 14.2 hp	*2 x 10.6 kW*	0.6 rpm	
Traveling (fluid coupling)	4 x 10 hp	*4 x 7.5 kW*	82 fpm	*25.0 m/min*

Power Requirements

Static: 480 V — 3-phase — 60 Hz — 200 Amp. service — 125 kVA

Travelling: 480 V — 3-phase — 60 Hz — 250 Amp. service — 156 kVA

Specifications subject to change without notice. For other configurations and specifications, contact Morrow Equipment.

LIEBHERR 630 EC-H 20 Litronic®

Description	Dimensions L x W x H	Weight	Description	Dimensions L x W x H	Weight
Tower Top [1]	34'-3" x 5'-11" x 7'-3" *10.44m x 1.8m x 2.2m*	15,540 lbs *7 050 kg*	Jib Butt Section ① #611	40'-5" x 6'-6" x 7'-10" *12.31m x 1.99m x 2.38m*	14,770 lbs *6 700 kg*
Slewing Assembly (Complete) [2]	21'-3" x 9'-9" x 10'-5" *6.47m x 2.98m x 3.17m*	48,280 lbs *21 900 kg*	Jib Section ② #621	40'-3" x 5'-10" x 7'-4" *12.28m x 1.77m x 2.23m*	9,040 lbs *4 100 kg*
Slewing Assembly Upper Part [3]	15'-11" x 9'-10" x 9'-10" *4.85m x 3m x 3m*	22,490 lbs *10 200 kg*	Jib Section ③ #631	40'-2" x 5'-10" x 6'-7" *12.25m x 1.77m x 1.99m*	6,610 lbs *3 000 kg*
Slewing Ring	11" x 7'-3" x 7'-3" *0.28m x 2.22m x 2.22m*	6,615 lbs *3 000 kg*	Jib Section ④ #632	40'-3" x 5'-10" x 6'-6" *12.27m x 1.77m x 1.97m*	5,840 lbs *2 650 kg*
Slewing Ring Support	4'-11" x 9'-5" x 10'-4" *1.51m x 2.87m x 3.16m*	14,550 lbs *6 600 kg*	Jib Section ⑤ #633	40'-3" x 5'-10" x 6'-6" *12.27m x 1.77m x 1.97m*	6,060 lbs *2 750 kg*
Slewing Gears (2) (each)	6'-11" x 2'-0" x 2'-0" *2.12m x 0.6m x 0.6m*	2,200 lbs *1 000 kg*	Jib Section ⑥ #634	33'-10" x 5'-10" x 6'-5" *10.3m x 1.77m x 1.96m*	3,615 lbs *1 640 kg*
Slewing Unit Access Platforms	3'-3" x 3'-7" x 3'-7" *1.0m x 1.1m x 1.1m*	880 lbs *400 kg*	Jib Section ⑦ #635	33'-8" x 5'-10" x 6'-4" *10.25m x 1.77m x 1.95m*	2,625 lbs *1 190 kg*
AC Hoist Unit (FC) [4] 147 hp *(110 kW)*	9'-10" x 7'-8" x 8'-4" *2.99m x 2.33m x 2.54m*	12,150 lbs *5 510 kg*	Jib Tip Section ⑧ #641	8'-5" x 6'-4" x 7'-5" *2.56m x 1.94m x 2.25m*	1,190 lbs *540 kg*
Counterjib Section 1 [5] (Inner)	22'-8" x 6'-6" x 6'-5" *6.9m x 1.98m x 1.96m*	7,720 lbs *3 500 kg*	Jib Assembly (Part 1) [10] for 157-ft to 262-ft jibs ①②	79'-6" x 7'-2" x 7'-10" *24.22m x 2.19m x 2.38m*	39,020 lbs *17 700 kg*
Counterjib Section 2 [5] (Intermediate)	17'-1" x 6'-3" x 6'-5" *5.2m x 1.9m x 1.96m*	6,610 lbs *3 000 kg*	Jib Assembly (Part 2) [11] 267-ft *(81.4m)* ③④⑤⑥⑦⑧	192'-1" x 6'-4" x 7'-5" *58.54m x 1.94m x 2.25m*	29,100 lbs *13 200 kg*
Counterjib Section 3 [5] (Outer)	34'-5" x 7'-7" x 8'-2" *10.5m x 2.32m x 2.48m*	13,230 lbs *6 000 kg*	Jib Assembly (Part 2) [11] 234-ft *(71.4m)* ③④⑤⑥⑧	159'-3" x 6'-4" x 7'-5" *48.54m x 1.94m x 2.25m*	26,010 lbs *11 800 kg*
Counterjib A [6] (1-3)	56'-5" x 9'-4" x 8'-2" *17.2m x 2.84m x 2.48m*	26,240 lbs *11 900 kg*	Jib Assembly (Part 2) [11] 201-ft *(61.4m)* ③④⑤⑧	126'-5" x 6'-4" x 7'-5" *38.54m x 1.94m x 2.25m*	22,050 lbs *10 000 kg*
Counterjib B [7] (1-2-3)	72'-10" x 9'-4" x 8'-2" *22.2m x 2.84m x 2.48m*	32,850 lbs *14 900 kg*	Jib Assembly (Part 2) [11] 162-ft *(49.4m)* ③⑤⑧	87'-0" x 6'-4" x 7'-5" *26.54m x 1.94m x 2.25m*	15,430 lbs *7 000 kg*
Counterjib C [8] (1-2-2-3)	89'-3" x 9'-4" x 8'-2" *27.2m x 2.84m x 2.48m*	39,460 lbs *17 900 kg*	Jib Assembly (Part 1A) [12] for 123-ft *(37.4m)* jib ①②	79'-5" x 7'-2" x 7'-10" *24.22m x 2.19m x 2.38m*	36,820 lbs *16 700 kg*
Tower Section 550 HC (Pin/Pin)	20'-7" x 8'-0" x 8'-0" *6.28m x 2.45m x 2.45m*	14,300 lbs *6 485 kg*	Jib Assembly (Part 2A) [13] 123-ft *(37.4m)* ③⑧	47'-8" x 6'-4" x 7'-5" *14.54m x 1.94m x 2.25m*	9,040 lbs *4 250 kg*
Base Section 630 EC-H (P/B)	40'-9" x 8'-10" x 8'-10" *12.42m x 2.68m x 2.68m*	31,965 lbs *14 500 kg*	Counterweight Block A	4'-6" x 11" x 9'-10" *1.37m x 0.28 x 3m*	6,350 lbs *2 880 kg*
Top Climbing Unit [9] w/hydraulics	40'-9" x 9'-1" x 10'-4" *12.42m x 2.77m x 3.16m*	22,420 lbs *10 170 kg*	Counterweight Block C	4'-6" x 11" x 13'-7" *1.37m x 0.28 x 4.15m*	8,730 lbs *3 960 kg*
Trolley	10'-8" x 6'-8" x 8'-5" *3.25m x 2.02m x 2.57m*	1,920 lbs *870 kg*	Hook Block	2'-8" x 1'-8" x 9'-10" *0.8m x 0.5m x 3m*	2,130 lbs *965 kg*

NOTE! *Weights and dimensions are approximate. Scale components before lifting. Please consult Operations Manual before erecting, operating, servicing or dismantling crane.*

1. *Tower Top includes ladder, service platforms and pendants.*
2. *Slewing Assembly Complete includes operator's cab, 2 slewing gears, slewing ring, slewing ring support, 2 service platforms and 4 climbing shoes. To facilitate erection/dismantlement process, the Slewing Assembly can be broken down into various components. See 630EC-H Operations Manual.*
3. *Slewing Assembly Upper Part includes operator's cab. Does not include slewing gears.*
4. *Includes hoist unit, electrical panel and handrails. Does not include wire rope.*
5. *Counterjib sections include handrails and hardware.*
6. *Counterjib A includes counterjib sections 1 & 3, handrails, hardware, D-block, and pendant bars.*
7. *Counterjib B includes counterjib sections 1, 2 and 3, handrails, hardware, D-block, and pendants.*
8. *Counterjib C includes counterjib sections 1, 2 (2) and 3, handrails, hardware, D-block, and pendants.*
9. *Can be broken down into two panels.*
10. *Jib Assembly (Part 1) includes jib sections, A-frame, pendant bars with pins & plates, and trolley with 20t hook block.*
11. *Jib Assemblies (Part 2) include jib sections, pendant bars with pins and plates.*
12. *Jib Assembly (Part 1A) includes jib sections, pendant bars with pins & plates, and trolley with 20t hook block.*
13. *Jib Assembly (Part 2A) includes jib sections, pendant bars with pins and plates.*

Morrow Equipment
COMPANY, L.L.C.
3218 Pringle Road SE • P O Box 3306 • Salem, Oregon 97302-0306 USA
503.585.5721 • Fax 503.363.1172 • www.morrow.com • info@morrow.com

The American home of LIEBHERR TOWER CRANES

Atlanta, GA • Charlotte, NC • Chicago, IL • Dallas, TX • Denver, CO • Honolulu, HI • Houston, TX • Los Angeles, CA
Las Vegas, NV • Millwood, NY • Pensacola, FL • St. Louis, MO • San Francisco, CA • Salem, OR • Seattle, WA • Miami, FL • Tampa, FL
Washington, DC • Sydney, Australia • Wellington, New Zealand • Vancouver, BC, Canada • Toronto, ON, Canada • Mexico City, Mexico

Printed in the USA

MEC - 630ECH20 Litronic - 1008 – PDF

Lynch-Jacobs, Maureen

From: Lynch-Jacobs, Maureen
Sent: Friday, October 11, 2013 10:22 PM
To: 'jflomma@jflommainc.com'
Cc: Starace, Jim
Subject: Re: M760 preliminary loadchart for 240ft boom

Thanks

Sent from my BlackBerry Wireless Handheld

From: James Lomma [mailto:jflomma@jflommainc.com]
Sent: Friday, October 11, 2013 08:23 PM
To: Lynch-Jacobs, Maureen
Subject: FW: M760 preliminary loadchart for 240ft boom

FYI

From: Peter Stroh [mailto:Peter@strohengineering.com]
Sent: Friday, October 11, 2013 11:57 AM
To: James Lomma
Subject: RE: M760 preliminary loadchart for 240ft boom

Jim,

Based on the information I was given, there are 9,000 lb. (4.1 tonne) panels on the north face of the building and with the crane positioned as shown you need ~~about~~ 240' (73 m) radius to reach the corners. In the center of the building are 14,000 lb. (6.4 tonne) panels at about 220' (67 m) radius and 15,000 lb. (6.8 tonne) panels at about 210' (64 m) radius. Typically with Favco, the fly is not used to extend the reach. When lifting from the fly you use the capacity of the main at the radius of the main boom, so that the radius of the fly is the same. For example if lifting from the main boom at 70 m radius the capacity is 4.6 tonne, if lifting from the fly, you need to boom the crane up so that the fly radius is 70 m and the capacity would be the same 4.6 tonne. The fly is essentially a rooster sheave. If you use the fly at the extended radius of 73.2 m (240') the capacity will be less than 4.2 tonne (9,300 lb.) at 71.2 m (234') and more likely 3.5 tonne (7,700 lb.) or so. Again, I am only basing my review on the information I was given and I did not check the steel weights, typically the panel weights will govern on this size building. If they can change the panel weights, that would change the job. If they want to, they can use the 760 and supplement the job with a mobile crane, as I suggested.

Peter J. Stroh, P.E.
President
Stroh Engineering Services, P.C.
41 Robert Street
Babylon, New York 11702 U.S.A.
P - 631-669-7531
F - 631-669-6369
M - 631-553-0077

From: James Lomma [mailto:jflomma@jflommainc.com]
Sent: Thursday, October 10, 2013 10:12 PM
To: Peter Stroh
Subject: FW: M760 preliminary loadchart for 240ft boom

Peter

Will the radius work on the Hoboken job.
We added 15' of Boom and also there is a 7' Jib extension
This would bring main boom to 233' and 240' with jib extensions
What is the max pick at that radius

James Lomma
JF Lomma, Inc
48 3rd Street
So. Kearny, NJ 07032
973-589-2000 1234
201-206-4684 cell
973-589-1250 fax
jflomma@jflommainc.com

From: Michael Khoo [mailto:mkhoo@favcousa.com]
Sent: Thursday, October 10, 2013 4:48 PM
To: Jimmy Lomma
Subject: *M760 preliminary loadchart for 240ft boom*

Jimmy,

The M860 chart is similar to the M760. Everything is unfortunately in metric. Anyway with a 240ft boom, the maximum radius is 233ft and tip load is 9,240 lbs. We still have to double check the numbers but we are reasonably confident it will work for the M760D. Should this work we will also have to re-program the computer as the current max boom length is only 225ft.

Regards

Michael Khoo
Favelle Favco Cranes (USA) Inc
26360 FM 106 Harlingen
TX 78550 USA
Office: 956-428-7488
Cell: 956-495-8488

Privacy / Disclaimer:
This message and its attachments may contain legally privileged or confidential information. It is intended solely for the named addressee. If you are not the addressee indicated in this message (or responsible for delivery of the message to the addressee), you may not copy or deliver this message or its attachments to anyone. Rather, you should permanently delete this message and its attachments and kindly notify the sender by reply e-mail. Any content of this message and its attachments that does not relate to the official business of Favelle Favco Cranes (USA) Inc. must be taken not to have been sent or endorsed by any of them. No representation is made that this email or its attachments are without defect.

EXEMPTION 5

-----Original Message-----
From: Doug Allen [mailto:dallen@sjpproperties.com]
Sent: Friday, October 04, 2013 5:07 PM
To: Del Tufo, Gerard
Subject: Re: WCC III, Hoboken

Mr Del Tufo

In furtherance of the technical information we have been asked to submit we request your consideration in meeting with Chief Engineer and the technical staff that attended our last meeting to review the operational plan of the equipment. We ask for the opportunity to review the submissions and continue discussions.

Please advise of potential meeting times as early next week as possible.

Sincerely

Doug
Sent from my iPhone

On Oct 3, 2013, at 3:13 PM, "Doug Allen" <dallen@sjpproperties.com> wrote:

> Mr Del Tufo
>
> Attached is correspondence I had with Maureen Jacobs today after speaking with her, I had neglected to copy you on.
>
> Sincerely
>
> Doug
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> From: "Doug Allen" <dallen@sjpproperties.com<mailto:dallen@sjpproperties.com>>
> To: "mjacobs@panynj.gov<mailto:mjacobs@panynj.gov>"
<mjacobs@panynj.gov<mailto:mjacobs@panynj.gov>>

> Subject: WCC III, Hoboken
>
> Dear Maureen:
>
> Pursuant to your request regarding intended hours of operation for the crane which was discussed at our meeting on September 24, 2013 and addressed in the Pavarini McGovern letter dated September 25, 2013 under "project site working hours". These are the hours of operation the site within which time erection of steel would be accomplished. Attached is the letter as previously forwarded to your office.
>
> Please call should you require further clarification. Thank you.
>
>
> Appreciatively,
>
> Douglas Allen
> EVP, PreConstruction and Planning
> SJP Properties
> 379 Interpace Parkway
> Parsippany, NJ 07054
> (973) 257-3001 - Telephone
> (973) 714-7797 - Mobile
>
>
>
> <092513 - Port Authority TG1900 Letter.pdf>

Lynch-Jacobs, Maureen

From: Pierre Gonzalez [pgonzalez@hisassoc.com]
Sent: Thursday, September 26, 2013 2:41 PM
To: Lynch-Jacobs, Maureen
Cc: 'Lawrence K. Shapiro P.E.'
Subject: RE: Hoboken
Attachments: Derrick.pdf

Maureen,

That is very unlikely (not to say impossible) due to the following:

- The derrick or Chicago boom cannot be erected on an adjacent property (it would not be high enough anyway if installed on the 4th floor roof of the W hotel) so the only place would be on the roof of the constructed building.
- However, the alternate crane (Favco M760 or other) would miss some steel picks on the Northeast and Northwest part of the building – which means installing the derrick on the roof while the structure of the building is not fully completed. I doubt that the building construction could be segmented that way as this would potentially affect the lateral resisting framing of the building. Even if it was possible it would also present some daunting challenges from the construction standpoint.
- Generally speaking I believe Chicago booms are very seldom used in NYC and there might be a lack of "savoir-faire" to install and use it

Please see the attached sketch highlighting these issues. The Favco M760D with 226' boom would have a better range(219') but would still miss the columns at the NE and NW corners of the high rise part of the building.

Please don't hesitate to let me know if you have any question or comment.

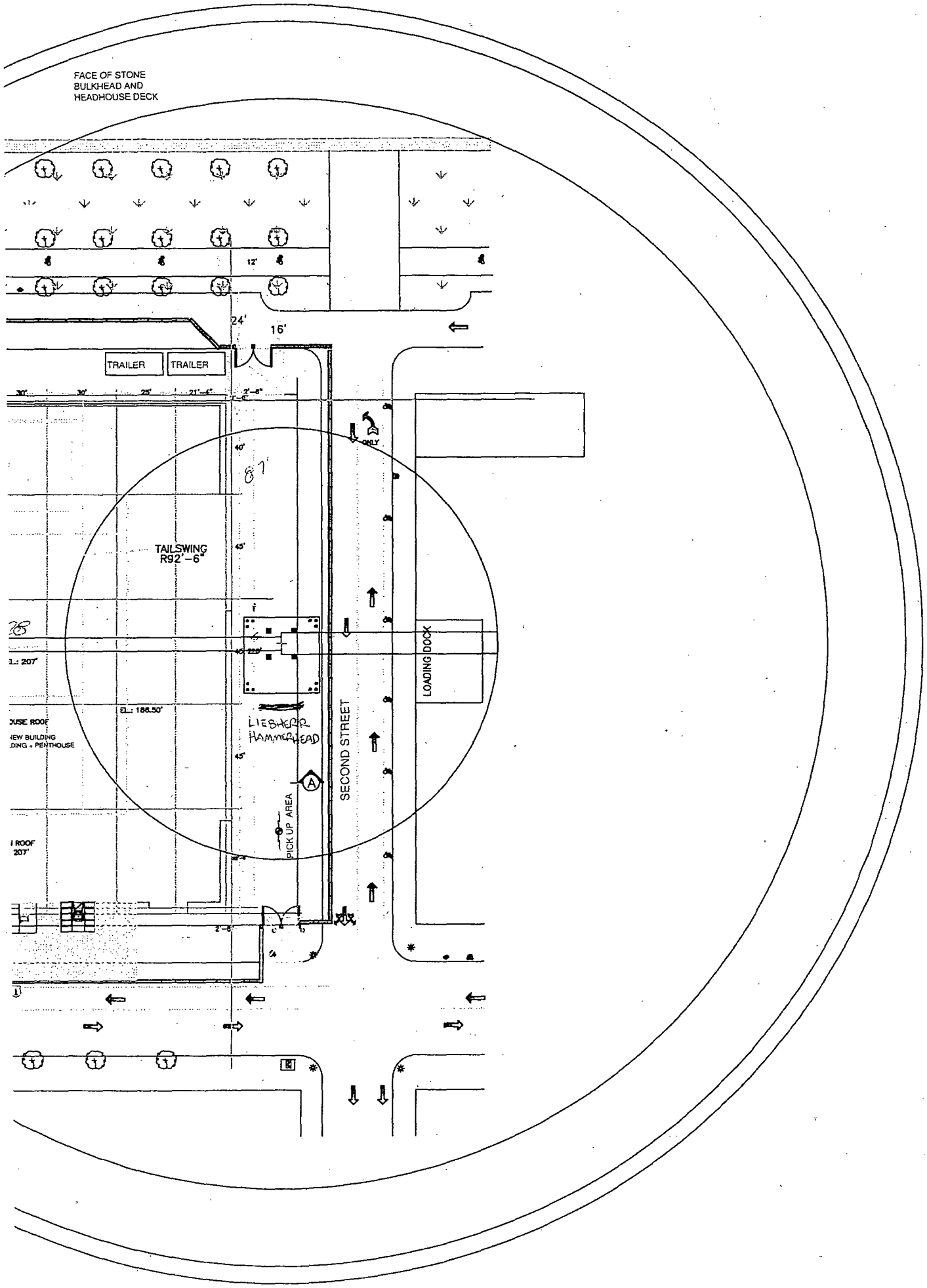
Best regards,
Pierre

Pierre GONZALEZ,
Project Engineer

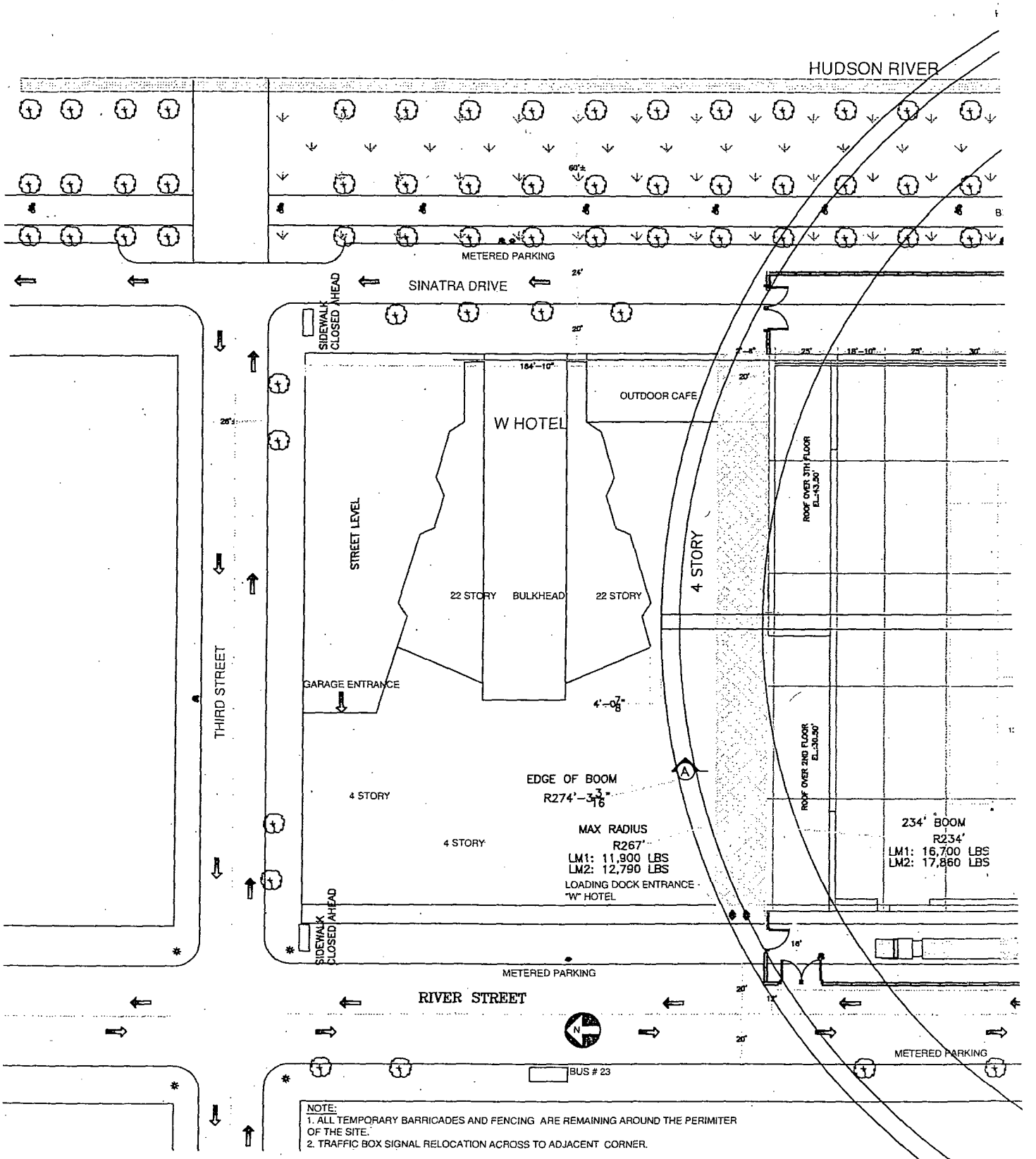
HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel: (516) 791-2600
Fax: (516) 791-5425

From: Lynch-Jacobs, Maureen [mailto:mjacobs@panynj.gov]
Sent: Thursday, September 26, 2013 2:01 PM
To: 'Pierre Gonzalez'
Cc: 'Lawrence K. Shapiro P.E.'
Subject: Hoboken

Pierre,
Can a derrick, Chicago boom or flying strut be used on the west side of the Hoboken project?



43264
7569
50037
2355



NOTE:
1. ALL TEMPORARY BARRICADES AND FENCING ARE REMAINING AROUND THE PERIMITER OF THE SITE.
2. TRAFFIC BOX SIGNAL RELOCATION ACROSS TO ADJACENT CORNER.

3.ABENDON TEMP. POWER TELEPHONE POLE REMOVED

EXEMPTION 5

From: Thomas Kanzler [mailto:tkanzler@federatedcrane.com]
Sent: Saturday, November 16, 2013 01:06 PM
To: 'Mike Schiavoni' <msfederated@aol.com>; 'Lawrence Shapiro' <lkshapiro@hisassoc.com>
Cc: 'Marius Stanescu' <mstanescu@hisassoc.com>; 'Marc DePaul' <MDePaul@pavmcgovern.com>; Lynch-Jacobs, Maureen; 'Pierre Gonzalez' <pgonzalez@hisassoc.com>
Subject: RE: Hoboken TG-1900 - Winch Pack test + Wire Rope inspection

I don't have Mr. Zipf's email address, but here's the letter.

Thomas Kanzler, PE
Chief Engineer

Federated Crane Co., L.L.C.
1640 New Market Avenue, South Plainfield, NJ 07080
Engineering Office:
Phone: (585) 381-1663
Fax: (585) 381-5336
Email: tkanzler@federatedcrane.com

From: Pierre Gonzalez [mailto:pgonzalez@hisassoc.com]
Sent: Friday, November 15, 2013 10:05 AM
To: Maureen Lynch-Jacobs; Mike Schiavoni; Tom Kanzler
Cc: Marius Stanescu; Lawrence Shapiro; Marc DePaul
Subject: Hoboken TG-1900 - Winch Pack test + Wire Rope inspection

Maureen, Mike, Tom,

Marius from our office will come at Federated Crane's yard today to witness the hydraulic test on the winch pack and perform the wire rope inspection.

The wire rope inspection shall be performed with the "rag-and-visual" method by using a spooling reel (I am attaching some literature on the matter). Measurements of the wire rope diameter will also be taken at regular intervals (100' or less).

I can be contacted by phone if there is any question.

Best regards,
Pierre

Pierre GONZALEZ,
Project Engineer

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel: (516) 791-2600
Fax: (516) 791-5425

Federated Crane Co., L.L.C.

1640 New Market Avenue, South Plainfield, NJ 07080
Engineering Office:
Phone: (585) 381-1663
Fax: (585) 381-5336
Email: tkanzler@FederatedCrane.com

November 16, 2013

Mr. Peter Zipf
Chief Engineer
Port Authority of NY & NJ
225 Park Avenue South
New York, NY 10003

Subject: Hoboken TG-1900 with Upgrade Winch

Dear Mr. Zipf:

The subject tower crane Upgrade Winch hydraulic system was tested in our South Plainfield shop to the Hydraulic System Shop/Field Testing Protocol v1.1 dated 10/31/2013 on Friday 11/15/2013 by Federated Crane personnel. Maureen Lynch-Jacobs of the Port Authority and Marius Stanescu of Howard I. Shapiro & Associates were in attendance.

Items specific to the Auxiliary Hoist (pages 1 and 3) were not tested, as the crane is not being supplied to the jobsite with an Auxiliary Hoist.

Boom Limits (ref. page 3 of the protocol) functionality was tested by simulating changes in boom angle, using the actual angle sensor being supplied with the hoist. Anti-Two Block functionality (ref. page 3 of the protocol) was similary demonstrated.

All criteria tested met or exceeded the specified acceptance values or functionality, as applicable.

If there are any questions, or if I can be of any other assistance, please do not hesitate to call.

Sincerely,

STATE OF NEW YORK
THOMAS D. KANZLER
LICENSED PROFESSIONAL ENGINEER

Thomas Kanzler, P.E.
Chief Engineer

cc:
M. Schiavoni
L. Shapiro

EXEMPTION 5

From: Stickelman, Timothy
Sent: Thursday, November 07, 2013 6:01 PM
To: Angelo J. Genova (agenova@genovaburns.com)
Cc: Francis J. Giantomasi (FGiantomasi@genovaburns.com)
Subject: FW: Hoboken Crane -TG-1900 modified

Angelo:

As a follow-up our telephone discussion, PANYNJ staff reviewed the letter from your office dated November 4, 2013 (with all attachments) and have the following comments:

The requirements from the PANYNJ letter of October 28th included the following items which are still open:

- Certification from a Professional Engineer (representing Cornell) that the overall crane design, including all components, is acceptable for use on this project and is in accordance with recognized codes and standards including ASME, ANSI and SAE 1765 and SAE J987. We request that the letter from Cornell, in which they state "we have no objections to this equipment being used on the TG series tower crane". Be signed by a professional Engineer and include the applicable standards. Neither was included in their letter dated October 30, 2013.

- Certification from a Mechanical Professional Engineer for approval for the overall acceptable design of the hydraulic system.

The letter from the Mechanical PE is dated in 2010 and addressed to the NYCDOB C&D. This letter needs to be addressed to the Port Authority Chief Engineer and refer to the actual crane proposed for the Hoboken project.

In addition, your client should be reminded that the following requirements, not yet completed, are still required.

- All new oil, for the crane machinery meeting viscosity and temperature compatibility with the winch pack components.

The Contractor is to supply an assurance from the Rexroth motors' supplier that the oil is acceptable.

- The Contractor is to supply new wire rope with an associated manufacturer's certification.

The contractor plans on using existing wire rope ; therefore, the PA is requesting a complete end to end inspection of the wire by a third party.

- The crane is to have a black box with a remote reader .

This issue is still under review.

- The Engineer of Record shall develop the load test criteria in accordance with applicable codes and standards.

The Engineer of Record is to supply this test.

Finally, as discussed the additional indemnity agreement attached to your letter is acceptable and once the items are provided we can execute and move forward.

Tim

Timothy G. Stickelman
Assistant General Counsel
The Port Authority of New York and New Jersey
225 Park Avenue South, 14th Floor
New York, NY 10003
Phone Number: 212.435.3425
Fax Number: 212.435.3563

To ensure compliance with Treasury Department regulations, please be advised that, unless otherwise expressly indicated, any federal tax advice contained in this message (together with any attachments) is not intended or written to be used, and cannot be used, for the purpose of (i) avoiding tax-related penalties under the Internal Revenue Code or applicable state or local tax law provisions or (ii) promoting, marketing or recommending to another party any tax-related matters.

This e-mail (together with any attachments) is intended only for the use of the named addressee(s) and may contain legally privileged and/or confidential information; please notify me immediately if you received this e-mail in error. Any unauthorized use, dissemination, distribution or copying of this e-mail (or any attachments) is strictly prohibited.

CORNELL & COMPANY

October 30, 2013

The Port Authority of NY & NJ
225 Park Avenue South
New York, NY 10003

Attn: Maureen Lynch Jacobs/Crane Operations Coordinator
Peter Zipf, Chief Engineer

Re: **Federated Crane Company LLC - Winch Package**

Good Afternoon:

Cornell & Company, Inc. currently owns the manufacturing rights to the TG series (formerly FMC LinkBelt) of Tower Gantry Cranes.

While it is our professional opinion that the original winch pack relies on an appropriate design which will provide excellent performance of the crane, it is our understanding that Federated Crane Company, LLC. has designed and constructed a replacement winch pack which can be installed on the TG cranes in lieu of the original equipment. This replacement winch relies on different technology (variable displacement axial motors with planetary gearbox and disk-brakes, instead of radial motors with band brakes).

Although we bear no responsibility in the design and manufacturing of the replacement winch pack, we have no objections to this equipment being used on the TG series tower crane. Any question regarding the installation, setup, maintenance and use of the equipment replaced should be directed directly to Federated Crane, LLC.

Best regards,

CORNELL & COMPANY, INC.

Donald Garrahan
Equipment Manager

DG/kmf

P.O. BOX 807 • WOODBURY, NJ 08096
TELEPHONE 856-742-1900 • FACSIMILE 856-742-8186
www.cornellcraneandsteel.com

"A Certified W.B.E. Firm and Equal Opportunity Employer"

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

Genova Burns Giantomasi Webster LLC
494 Broad Street, Newark, NJ 07102
Tel: 973.533.0777 Fax: 973.533.1112
Web: www.genovaburns.com

Newark, NJ | New York, NY | Camden, NJ | Red Bank, NJ | Philadelphia, PA | Jersey City, NJ

Francis J. Giantomasi, Esq.
Partner
Member of NJ and NY Bars
fgiantomasi@genovaburns.com
Direct: 973-535-7103

November 4, 2013

VIA HAND-DELIVERY

Timothy Stickelman, Esq.
Deputy General Counsel
Port Authority of New York and New Jersey
225 Park Avenue South
New York, New York 10003

Re: TG-1900 Tower Crane at Waterfront Corporate Center Project in Hoboken

Dear Mr. Stickelman:

We write in response to your October 28 letter,[1] where you indicate that the Port Authority will permit the use of the Hoboken TG-1900, subject to certain conditions, listed below.[2] SJP agrees to all such conditions as follows:

Request No. 1: Provide a diagram of the cross-section of the crane illustrating how the winch pack will make the crane different than the version currently banned in New York City.

Response: *See Exhibit C.*

Request No. 2: The crane, with the winch pack addition, is to meet the certification requirements as per Attachment A.

---

[1] Enclosed as Exhibit A is your firm's October 28, 2013 letter, submitted on behalf of the Port Authority of New York and New Jersey ("Port Authority"), which responds to our firm's October 18, 2013 letter, enclosed as Exhibit B.

[2] As you know, this firm represents SJP Properties Company, acting on behalf of Waterfront Corporate Center III JV LLC ("SJP"), with respect to the development of the Waterfront Corporate Center ("Project") pursuant to a December 2012 lease and development agreement ("Agreement") entered into by WCC, the City of Hoboken, and the Port Authority, concerning SJP's anticipated use of a TG-1900 tower crane ("Hoboken TG-1900").

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

Genova Burns Giantomasi Webster LLC
Newark, NJ | New York, NY | Camden, NJ | Red Bank, NJ | Philadelphia, PA | Jersey City, NJ

Response: *Confirmed; see responses to "Attachment A" below.*

Request No. 3: The crane will not require a climbing section mechanism.

Response: *Confirmed; see Exhibit B.*

Request No. 4: The crane will be limited to lifting the loads as described in the subject letter (15,000 lbs maximum with one 20,000 lb lift).

Response: *Confirmed as to erection/setting picks; see Exhibit B.*

Request No. 5: SJP is to provide the Authority with a confirmation that they have notified the City of Hoboken of the issues associated with this crane in New York City and the plan for safety assurance at the Hoboken site.

Response: *Confirmed; the City of Hoboken's counsel, Joseph Maraziti, Esq., has been notified of all such issues.*

Request No. 6: Additionally, we require the following:

- Perform weekly field hydraulic oil testing with a visage and maintain a signed log of temperature and viscosity. All new oil, for the crane machinery, must meet viscosity and temperature compatibility requirements with winch pack components.
  - **Response:** *Confirmed; to be performed by a representative of Federated Crane Co., LLC ("Federated") and/or a qualified third-party consultant.*
- SJP to supply a competent person to sign off on a Port Authority approved daily checklist.
  - **Response:** *Confirmed; either the Hoboken TG-1900 designated crane oiler or designated site safety coordinator will sign off on such checklist.*
- The contractor is to provide monthly third party inspections. The inspector shall be subject to Port Authority approval.

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

Genova Burns Giantomasi Webster LLC
Newark, NJ | New York, NY | Camden, NJ | Red Bank, NJ | Philadelphia, PA | Jersey City, NJ

- **Response:** *Confirmed; to be performed by Howard I. Shapiro & Associates ("Howard"), Enso Crane Services, or a similarly qualified firm.*

- The contractor is to supply new wire rope with an associated manufacturer's certification.

  - **Response:** *Confirmed; the boom hoist will be new with manufacturer's certification.*

- A qualified rigger shall be utilized for all picks.

  - **Response:** *Confirmed; see Exhibit B.*

- The Crane is to have a black box with a remote reader.

  - **Response:** *Confirmed as to the Hoboken TG-1900 being equipped with a black box as previously agreed; the ability for the crane to incorporate a remote reader is unclear and currently under review; if such device exists and is reasonably attainable, it will be utilized.*

- Engineer of Record shall develop the load test criteria in accordance with applicable codes and standards.

  - **Response:** *Confirmed; see Exhibit B.*

- SJP to follow all requirements in the Port Authority "requirements for Cranes and Derricks" previously sent to you.

  - **Response:** *Confirmed.*

Request No. 7: Provide additional information regarding the specified indemnification, noted in item B2 of the subject letter, for Port Authority review.

Response: *See Exhibit D, which includes a draft indemnification agreement for the Port Authority's execution; a 100 million dollar excess policy currently covers the Project including SJP's use of the Hoboken TG-1900 crane.*

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

Genova Burns Giantomasi Webster LLC
Newark, NJ | New York, NY | Camden, NJ | Red Bank, NJ | Philadelphia, PA | Jersey City, NJ

ATTACHMENT A

Request No. A1: The owner of the crane design, Cornell, is to supply the Authority with the following for the crane in the modified configuration (with the new winch pack):

- A certification from Professional Engineer (representing Cornell) that the overall crane design, including all components, is acceptable for use on this project and is in accordance with recognized codes and standards including ASME, ANSI and SAE 1765, SAE J987.
    - **Response:** Confirmed as to all applicable codes and standards including ASME and ANSI; *see Exhibit E, letters from representatives of Cornell & Company, Inc., as well as Exhibit B, Exhibit F, and Exhibit G; note that SAE J765 and SAE J987 are mobile crane standards and do not apply to the Hoboken TG-1900.*
- A certification from a mechanical Professional Engineer of approval for the overall acceptable design of the hydraulic system.
    - **Response:** *See Exhibit F, which is correspondence from the owner of the manufacturing rights for the new winch describing the adequacy of the modified hydraulic system and its suitability for use with the TG-1900 crane, signed and sealed by Thomas Kanzler, P.E.*
- A certification of the Engineer of Record for the crane that all aspects of the crane design and anticipated operation including the hydraulic system design are acceptable for use on the project.
    - **Response:** *See Exhibit G, signed by Lawrence K. Shapiro, P.E..*

Request No. A2: SJP is to supply to the Authority the history of crane from 1983 to present including maintenance records.

Response: *All available history and maintenance records will be provided.*

Request No. A3: The Mechanical Professional Engineer to supply the Authority with a test protocol for mechanical system, oversee the testing and certify successful completion.

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

Genova Burns Giantomasi Webster LLC
Newark, NJ | New York, NY | Camden, NJ | Red Bank, NJ | Philadelphia, PA | Jersey City, NJ

Response: *Confirmed; see Exhibit H.*

Request No. A4: Cornell is to supply Operator's manual showing all configurations for which the engineer is seeking approval, general equipment specifications and manufacturer's recommended maintenance procedures, and load rating chart with chart number and page numbers for identification.

Response: *See Exh. B to Exhibit B.*

Request No. A5: The Contractor is to supply to the Authority the following items:

(a) Load test weights certification

Response: *Confirmed.*

(b) Magnavis dry powder test report for the for 20' boom insert

Response: *See Exhibit I.*

(c) Unassembled inspection on site including sheave curvature

Response: *Confirmed; Shapiro will perform unassembled inspection when the crane components are delivered to the Project site.*[3]

(d) PE stamp on formal erection report and survey

Response: *Confirmed; survey report of plumbness will be performed after the Hoboken TG-1900 is erected, and Shapiro will issue a sealed statement summarizing the results of the load test (which is equivalent to a CD-7) once it is completed.*

Finally, in response to your statement that other cranes can "satisfactorily fulfill the project requirements," which is a reference to the Liebherr 630 EC-H20 electronic hammer head cranes,[4] please note that these cranes are not a suitable alternative for the Project, as

---

[3] Note that an inspection of the Hoboken TG-1900's components was already conducted by Port Authority representatives on September 25, 2013, and found satisfactory.

[4] See Exhibit J, which is Port Authority representative Maureen Lynch-Jacobs' October 30, 2013 email correspondence and attachment specifically referring to the Liebherr 630 EC-H20 electronic hammer head cranes as being the alternative cranes referenced in the Port Authority's October 28 letter.

GENOVA
BURNS
GIANTOMASI
WEBSTER
ATTORNEYS-AT-LAW

Genova Burns Giantomasi Webster LLC
Newark, NJ | New York, NY | Camden, NJ | Red Bank, NJ | Philadelphia, PA | Jersey City, NJ

specifically discussed at length in our October 18 letter and supporting certifications. (See Exhibit B).

We trust this letter and enclosures satisfy the conditions stated in your October 28, 2013 letter. If there are any further issues, please immediately contact me to discuss; otherwise, SJP intends to move forward with construction on the Project to avoid any further delay and potentially devastating damages to it and its prospective tenants.

Very truly yours,

GENOVA BURNS GIANTOMASI WEBSTER LLC

FRANCIS J. GIANTOMASI

FJG/KBE/CJM

C: Angelo J. Genova, Esq.

Zipf, Peter

From: Charles J. Messina [cmessina@genovaburns.com]
Sent: Friday, October 18, 2013 6:00 PM
To: 'TStickelman@panynj.gov'; Zipf, Peter
Cc: Francis J. Giantomasi; Angelo J. Genova
Subject: RE: SJP - Hoboken Block B Project, 2 of 3
Attachments: Exhibit A.PDF; Exhibit C.PDF; Exhibit D.PDF; Exhibit E.PDF

Timothy and Peter:

Attached are Exhibits A, C, D, and E to the letter transmitted to you by email below.

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

494 Broad Street
Newark, NJ 07102
Tel: (973) 533-0777
Fax: (973) 533-1112

www.genovaburns.com

From: Charles J. Messina
Sent: Friday, October 18, 2013 5:57 PM
To: 'TStickelman@panynj.gov'; 'PZipf@panynj.gov'
Cc: Francis J. Giantomasi; Angelo J. Genova
Subject: SJP - Hoboken Block B Project, 1 of 3
Importance: High

Dear Timothy and Peter:

Attached is a letter sent on behalf of Frank Giantomasi, which was mailed to your office today.

Due to the size of the exhibits accompanying the attached letter (A through E), we will send them to you in two separate emails. Note that we attempted sending you these documents earlier but it did not go through due to the imaging/size of the attachments.

Best regards,
Charles

Charles J. Messina, Esq.
Direct Dial: 973.646.3278
Main Line: 973.533.0777 Ext. 1209
cmessina@genovaburns.com

GENOVA BURNS GIANTOMASI WEBSTER
ATTORNEYS-AT-LAW

494 Broad Street
Newark, NJ 07102
Tel: (973) 533-0777
Fax: (973) 533-1112

www.genovaburns.com

This e-mail (including all attachments) is intended for the exclusive use of the individual to whom it is addressed. This e-mail may be proprietary, confidential, privileged and exempt from disclosure under applicable law. If the reader of this e-mail is not the intended recipient or agent responsible for delivering the message to the intended recipient, the reader is hereby put on notice that any use, dissemination, distribution or copying of this communication or any of its contents is

strictly prohibited. If you have received this communication in error, please immediately notify the sender by telephone or e-mail and delete the original e-mail and all copies of it from your computer system. Pursuant to Internal Revenue Service Circular 230, only formal opinions satisfying specific requirements may be relied on for the purpose of avoiding certain penalties under the Internal Revenue Code. Any federal tax advice contained in this communication does not constitute a formal opinion satisfying such requirements. Accordingly, we must advise you that any such tax advice was not intended or written to be used, and cannot be used by you or any other person as such an opinion for the purpose of avoiding penalties imposed under the Internal Revenue Code.

Thank you.

GENOVA
BURNS
GIANTOMASI
WEBSTER
ATTORNEYS-AT-LAW

Genova Burns Giantomasi Webster LLC
494 Broad Street, Newark, NJ 07102
Tel: 973.533.0777 Fax: 973.533.1112
Web: www.genovaburns.com

Newark, NJ | New York, NY | Camden, NJ | Red Bank, NJ | Philadelphia, PA | Jersey City, NJ

Francis J. Giantomasi, Esq.
Partner
Member of NJ and NY Bars
fgiantomasi@genovaburns.com
Direct: 973-535-7103

October 18, 2013

VIA UPS OVERNIGHT DELIVERY
Peter J. Zipf
Chief Engineer
Port Authority of New York and New Jersey
225 Park Avenue South
New York, New York 10003

Timothy Stickelman, Esq.
Deputy General Counsel
Port Authority of New York and New Jersey
225 Park Avenue South
New York, New York 10003

Re: TG-1900 Tower Crane at Waterfront Corporate Center Project in Hoboken

Dear Messrs. Zipf and Stickelman:

This firm represents SJP Properties and the Waterfront Corporate Center III JV LLC ("WCC") with respect to the development of the Waterfront Corporate Center ("Project") pursuant to a December 2012 Lease and Development Agreement ("Agreement") entered into by WCC with the City of Hoboken ("Hoboken") and the Port Authority of New York and New Jersey ("Port Authority"). We write to provide further information regarding the use of the specific TG-1900 tower crane for the Project ("Hoboken TG-1900").

As you are aware, the Port Authority specifically approved the utilization of the Hoboken TG-1900 after a series of meetings, which approval was formalized in the mobilization and logistics plan and made a part of the Agreement. (Attached as Exhibit A is Exh. O to the Agreement, which specifically references and depicts the Hoboken TG-1900.) Despite its prior approval, the Port Authority has now indicated that it may not allow use of the Hoboken TG-1900 for the Project because a TG-1900 tower crane was involved in an incident at the World Trade Center ("WTC") in New York City ("NYC") nearly two years ago, well before the Port Authority approved the use of the Hoboken TG-1900.

Use of the Hoboken TG-1900 is critical to the construction of the Project, and in an effort to ease the Port Authority's concerns regarding the Hoboken TG-1900, WCC, SJP

Properties and its construction manager for the Project, Pavarini McGovern (collectively, "SJP"), have provided extensive information and documentation evidencing how and why the Hoboken TG-1900 is significantly different from the WTC crane, as well as how SJP's anticipated use of the crane for the Project is vastly different from the WTC crane's use at the WTC project.[1] SJP has also proposed enhanced safeguards to address any reservations concerning use of the Hoboken TG-1900.[2] Additionally, SJP has provided expert reports, including a report from Peter J. Stroh, P.E. (the Port Authority's own expert) – who concludes that the TG-1900 is the most ideal and safest crane for the Project, having found that alternative crane types would present considerable drawbacks from the standpoint of logistics and risk management. Indeed, the Port Authority's expert, Mr. Stroh, in recommending use of the Hoboken TG-1900, opined that it is the safest crane for the Project. Notwithstanding the fact that most of this information has already been provided to the Port Authority, we understand that there remains some confusion as to how the WTC crane and the Hoboken TG-1900 differ and why any risk of an incident, similar to that which occurred at the WTC, is nonexistent.

We are confident that the following explanation will clarify any concerns or misunderstanding the Port Authority may still have regarding SJP's utilization of the Hoboken TG-1900.

A. THE HOBOKEN TG-1900 VASTLY DIFFERS FROM THE WTC CRANE WITH RESPECT TO USE AND EQUIPMENT

1. The Hoboken TG-1900 will include a winch pack that provides superior performance and braking capacity compared to the WTC crane.

Unlike the WTC crane, the Hoboken TG-1900 will include a new/modified winch pack that starkly distinguishes it from the WTC crane and reduces the risk of transmission failure.[3] In particular, because the winch pack provides the crane with two axial/variable displacement hydraulic motors, each with a disc-brake and planetary gearbox, any risk of failure in the

[1] Attached as Exhibit B is much of this correspondence.

[2] SJP and its agents participated in meetings on September 25, 2013 and October 15, 2013 with the Port Authority to discuss these issues.

[3] Attached as Exhibit C is Pierre Gonzalez's written analysis of the Hoboken TG-1900 new/modified winch pack, which was sent to Maureen Lynch-Jacobs and Jim Keane of the PANYNJ on October 16, 2013.

transmission at the pinion/spline is alleviated. (Id.) As such, the Hoboken TG-1900 has markedly superior performance and braking capacity to the WTC crane, making it significantly safer, more reliable, and effectively reducing the risk of transmission failure.

2. Unlike the WTC crane, the Hoboken TG-1900 does not, and will not, require a climbing section mechanism.

Improper maintenance was the determinant cause of failure of the WTC crane. Specifically, a significantly high level of contaminants and extremely high level of water concentrations were found in the WTC crane's hydraulic system.[4] The hydraulic oil was, as a result, contaminated by the water which entered into the crane's climbing system during a "jump." (Id. and Exh. B.)

The Hoboken TG-1900, unlike the WTC crane, does not, and will not require a climbing mechanism. (Id.) Rather, the Hoboken TG-1900 will be erected and dismantled at full height. (Id.) Because the Hoboken TG-1900 does not requires a climbing mechanism, there will be no opportunity for outside contaminants to penetrate its closed-loop hydraulic system. (Id.) Thus, it is impossible for the specific cause of the problem with the WTC crane to occur with the Hoboken TG-1900. (Id.)

3. Unlike the WTC crane, the Hoboken TG-1900 will perform light service, operate a single shift, and lift well below the suggested capacity recommended by the WTC investigative report.

The overall project demand of the Hoboken TG-1900, in comparison to the WTC crane, will be extremely moderate, considering the total number of lift cycles and intensity. (Id.) The Hoboken TG-1900 will only operate a single shift (8 hours), six times per day, while the WTC crane operated 16 hours per day, which is approximately +/-50 lifts of steel and/or 15 lifts of pre-cast panels per day.

Further, the Hoboken TG-1900 will perform relatively light service in comparison to the heavy lifts performed by the WTC crane. (Id.) Specifically, the heaviest loads lifted at the Project will be approximately 15,000lbs, with one exception requiring a 20,000lb lift. (Id.) This is nearly one-third of the load capacity of the TG-1900 (57,600lbs) and half of the maximum load capacity suggested by the WTC investigative Manring report commissioned by

[4] Attached as Exhibit D is an expert report prepared by Lawrence K. Shapiro, P.E.

the Port Authority. (See Exhs. B-D.) In addition, the average weight for the steel lifts at the Project is 2,000lbs and the precast panel lifts at the Project is 6,000lbs, which the WTC crane lifts well exceeded. (Id.) The lifting heights and the amount of uninterrupted time during which the motors have to run to lift the load from the street to the crane's cab level, moreover, will be significantly less for the Hoboken TG-1900 – the WTC crane was approximately 860' above street level when the incident occurred, so by comparison the motors had to run for a duration approximately four times longer than what they will at Hoboken for a load to get from the street to the crane's cab level.

4. There are no feasible alternatives to the Hoboken TG-1900 for the Project.

In a good faith effort to accommodate the Port Authority's concerns, and at the request of the Port Authority, SJP has worked diligently to find alternative cranes for the Project. After studying multiple alternative cranes, it has become clear that there are no workable alternatives to the Hoboken TG-1900. By letter dated September 25, 2013, expert crane consultant, Larry Shapiro, P.E., advised that alternative solutions were studied and found to be problematic for the following reasons:

- *Favco M760 Crane* – The boom would not reach the rear corners of the site as needed to set all of the steel cast and precast panels, and it would require two additional hydraulic or crawler street cranes for the Project. This option would also require crane tie-backs to the building, in lieu of free standing, which is not presently designed in the building steel or approved by the Port Authority.
- *Electric luffing tower cranes* – There are no machines available in the US market that have sufficient capacity.
- *Electric hammerhead cranes* – The booms would sweep approximately 4 feet from the W Hotel, and swing over multiple occupied buildings and a public park; it would also require a temporary generator that would run for the duration of crane operation.

(See Exhs. A, B, and E.) Further, the use of alternative cranes would have substantial impacts upon the community and the construction site, including:

- Closure of River Street and Sinatra Drive, both major thoroughfares in Hoboken, for 24 hours a day for 8 to 10 months, with no vehicular access to those streets during that period;
- No pedestrian traffic would be possible on the portions of the streets closed for construction during this time;

- In order to accommodate different cranes, new base and foundation structures would likely need to be constructed to properly distribute the weight in an effort to avoid damaging underground utilities, which would necessarily include remobilization of the foundation/piling equipment and further disruption of street and pedestrian traffic.[5]

(Id.) Verifying SJP's findings that no acceptable alternatives to the Hoboken TG-1900 exist, the Port Authority's crane expert, Mr. Stroh, recommended that the Port Authority allow the utilization of the Hoboken TG-1900 for the Project.[6] Mr. Stroh advised that he evaluated alternatives and found none as effective, let alone better, than the Hoboken TG-1900 for the Project. (Id.) He further stated that there is nothing inherently unsafe about the Hoboken TG-1900 and that proper maintenance is the most important factor for crane safety. (Id.) Mr. Stroh concluded that it makes the most sense, from a risk management perspective, to utilize the Hoboken TG-1900 for the Project. (Id.)

5. All experts agree that the Hoboken TG-1900 should be used for the Project.

As described by crane expert Pierre Gonzalez and noted by expert Peter Stroh, the new/modified winch pack was designed "in accordance to the current crane codes and design standards and is a proven system," offering "superior performance and brake capacity," making the Hoboken TG-1900 "different equipment altogether than the original TG-1900" (See id. and Exh E.) Gonzalez further recommends in his report that "[a]s engineers placing the safety of the public and workers first and foremost in the list of our preoccupations, it is our professional opinion that *using a modified TG-1900 with a new winch would certainly represent the best outcome for this particular project – especially since using another crane (hammerhead) or a combination of several cranes (M760 + mobile cranes) would likely represent an increase of risk from the logistical and structural standpoints.*" (Exh. C; emphasis added.)

Moreover, Gonzalez further notes that even if the Hoboken TG-1900 was used without the new/modified winch pack, it would still differ from the WTC crane because its intended use is different. For instance, the heaviest loads lifted for the Project will be around 15,000lbs

[5] It is important to note that the Port Authority did not ever reject the use of the Hoboken TG-1900; rather, it specifically approved it and SJP has completed the construction of the foundations necessary to support the Hoboken TG-1900 – construction which was specifically approved by the Port Authority.

[6] A copy of Mr. Stroh's findings are attached as Exhibit E.

(with one occurrence at 20,000lbs), which is well below the rated line pull of the original TG-1900 and its braking capacity (150% of line pull). (Id.) Therefore, the TG-1900 – even without the new/modified winch pack (which SJP intends on using) – would still be "more than apt and adequate to perform the work required..." (Id.)

In short, all of the crane experts agree that the Hoboken TG-1900 is the only workable option considering the crane requirements of the Project. Other cranes either cannot meet the Project requirements and/or present real and substantial site-specific risks, as opposed to hypothetical concerns based upon a singular incident with a different crane being used to hoist far greater loads on an entirely different project. (See Exhs. B-E.)

B. SJP'S ADDITIONAL SAFEGUARDS TO SATISFY THE PORT AUTHORITY'S CONCERNS EXPRESSED AT THE SEPTEMBER 25 AND OCTOBER 15 MEETINGS

1. SJP offers several enhanced safety measures to ensure safe use of the TG-1900.

Since no suitable alternative cranes were found by either SJP or the Port Authority's experts, SJP has proposed taking several steps to further safeguard use of the Hoboken TG-1900 for the Project. Such enhanced measures include:

- Additional hydraulic oil testing – once per month;
- Regular third-party inspections of the TG-1900, at intervals acceptable to the Port Authority;
- Additional rope inspections;
- Installation of new boom hoist cable;
- Strict adherence to crane safety protocol and proactive maintenance;
- Utilization of a qualified rigger for larger size picks;
- Monthly unannounced spot inspections by the Port Authority;
- Utilization of a black box load moment system;
- Certificates of manufacturer approval of the wire rope, history of motors on the crane, and the replacement parts and maintenance work (all of which have already been submitted to the Port Authority);

- Permitting the Port Authority to approve test protocol for mechanical systems at the time of crane erection;
- Following the heightened NYC DOB Cranes and Derricks load test standard criteria; and
- Submitting a CD-7 with the mobile crane applications once the Hoboken TG-1900 is approved; since the TG 1900 will not climb, the CD-7 will be filed for the erection and dismantling.

(Exh. B.) All of these proposed enhanced safeguards are in line with Mr. Stroh's finding that maintenance is the key to crane safety. (Id. and Exh. E.) Should Mr. Stroh or the Port Authority recommend any further reasonable maintenance measures, SJP would comply with those as well.

In addition to maintenance, SJP has proposed limiting the use of the Hoboken TG-1900 under certain weather conditions. In particular, SJP proposes the following measures to address wind-related concerns:

- For 50+mph winds, the Hoboken TG-1900 shall be taken out of service and the tower bolts shall be checked so that the crane will be free to weathervane;
- Weathervaning will be accomplished with a boom angle as low as possible and, as a result, the crane will offer less resistance for the wind from the rear of the crane;
- Both the tower and footing can accommodate a higher boom angle for the weathervaning procedure in the case where larger horizontal and vertical clearances with the adjacent structure would be desired;
- All manufacturer requirements and specifications for weathervaning and service conditions shall be followed.

(Exh. B.) These enhanced safety measures, combined with a much lesser demand required of the Hoboken TG-1900 for the Project (in comparison to the WTC crane), provides further safety protection and should fully alleviate any remaining concerns.

2. **SJP is willing to provide specific indemnification in connection with the Hoboken TG-1900 even though the Agreement already provides sufficient indemnification.**

The Agreement, under Article 12, among other sections, provides that the Port Authority shall be indemnified against liability in connection with the Project. As such, any concerns with respect to potential Port Authority liability caused by use of the Hoboken TG-1900 are baseless. On the other hand, if the Port Authority prohibits the Hoboken TG-1900, in breach of the Agreement, it would not receive the benefit of such indemnity with respect to an alternative crane as those indemnification provisions would not extend to such a circumstance.

Nonetheless, SJP offers to secure an additional credit of indemnity in an amount acceptable to the Port Authority in order to make it absolutely clear and certain that SJP would fully indemnify the Port Authority against any liability arising from the use of the Hoboken TG-1900 during the Project.

C. SJP HAS COMPLIED WITH ALL APPLICABLE WORKPLACE SAFETY REQUIREMENTS

The Project has and will continue to fully comply with all applicable laws and regulations governing workplace safety, including those provided under the Occupational Safety and Health Act ("OSHA") and American National Standards Institute ("ANSI"). Further, SJP has complied with all additional safety standards set forth in the Agreement. With respect to the Hoboken TG-1900, no applicable law or regulation prohibits its use for the Project.

CONCLUSION

While SJP understands that the Port Authority is concerned that an incident will occur similar to the WTC accident, it is impossible that a similar incident can occur at the Project considering the Hoboken TG-1900's anticipated use on the Project and its equipment (including the new/modified winch pack), as well as SJP's agreement to provide additional safety measures and inspections.

We trust the above information and exhibits clarify all of the Port Authority's concerns with respect to utilization of the Hoboken TG-1900. Because there exists no legitimate factual

or legal basis for the Port Authority to prohibit the use of the Hoboken TG-1900 – in addition to the fact that there are no feasible alternatives – the Port Authority's prior approval of the Hoboken TG-1900 cannot be withdrawn. Indeed, use of the Hoboken TG-1900 is fully consistent with the Port Authority's prior approvals, and constitutes the basis on which the Project was planned; any continued insistence by the Port Authority that utilization of the Hoboken TG-1900 crane is forbidden will have a devastating impact on the Project and its prospective tenants. Considering SJP will have no alternative but to seek relief from the Port Authority from all resulting costs, we believe that careful consideration of the many points raised in this letter is warranted and will ultimately obviate the Port Authority's concerns so the Project can proceed as originally approved and agreed by all parties to the Agreement.

We look forward to hearing from you and moving forward with the Project.

Very truly yours,

GENOVA BURNS GIANTOMASI WEBSTER LLC

Francis J. Giantomasi /CJM

FRANCIS J. GIANTOMASI

FJG/KBE/CJM

CC: Angelo J. Genova, Esq.

EXEMPTION 4

EXHIBIT C

Candy Ricci

To: Charles J. Messina
Subject: RE: SJP - Exhibit C

From: Pierre Gonzalez [mailto:pgonzalez@hisassoc.com]
Sent: Wednesday, October 16, 2013 4:09 PM
To: Maureen Lynch-Jacobs (mjacobs@panynj.gov)
Cc: Jim Keane (jkeane@panynj.gov); Lawrence Shapiro (lkshapiro@hisassoc.com)
Subject: TG-1900 Hoboken
Importance: High

Maureen,

Following our discussion from yesterday, please find below and in attachment the following information regarding the Favco M760D and TG-1900:

- Favco M760D: disc-brakes installed on each motor (4 motors total for the M760D). As stated by the manufacturer: "brakes are holding brakes only, with a minimum static capacity of 2.0 times motor torque" (see attached). Since there is one disc-brake per motor the braking static capacity is twice the line pull capacity. One potential issue with the arrangement is that the disc-brake is installed between the motor and gearbox/drive pinion: if any of the element mounted after the disc-brake (gearbox, spline or pinion) fails or is compromised (as it happened for the crane at 57th street), then the disc-brake of that motor becomes completely inoperant.

- TG-1900: holding band-brakes installed at opposite end of the shaft from motor (if the motor is compromised the band brake can still be applied at the other end of the drive shaft – as it happened at WTC#4). There are 2 brakes or 3 brakes (latest FMC design) for 4 motors. Each brake has a static capacity of approximately 3 times the torque from one motor, so overall the braking static capacity is approximately 150% the line pull capacity. One potential issue with the TG arrangement is that the band brakes are more "exposed" to the environment (as opposed as disk brakes in a confined housing/carter) and require more maintenance (check for foreign matter between band and brake drum) and proper alignment. As per the user's manual the band brakes have to be checked every 50 hours.

In both the Favco and TG-1900 (as in almost all other cranes), the brakes are designed and intended as static holding brakes only. The "dynamic braking" or control of the rate of descent of the lifted load is primarily achieved by the hydraulic system: normal braking of operational functions is accomplished by the hydraulic motors when the oil flow through the motors is reduced, and the static brakes are applied when the oil flow is stopped.

The static brakes of both the Favco and TG-1900 can be applied in emergency situation and used as "dynamic" brakes but that is not their primary intent - nor should it be considered as a "fail safe device". In such an event the case could be made that the disc brakes offer a better braking ability, mainly because the disc brakes are less dependent on the adjustment to engage and on the maintenance to guarantee their efficiency (the risk of inclusion of foreign matter in the brake affecting adversely the coefficient of friction is more limited for the disc brakes). The heating of the disc brakes is also somewhat more limited since they are placed in a housing filled with oil (wet brakes). On the other hand as pointed previously the TG-1900 brakes can always be applied since they are mounted on the other end of the drive shaft – which is not the case with the Favco's arrangement if a failure occurs on the drive shaft after the brake.

The concern that the TG-1900 band brakes would not engage due to improper adjustment and/or maintenance is one reason (amongst others) why a new/modified winch-pack was designed for the TG-1900 by Federated Cranes (Tom Kanzler and Mike Schiavoni) . The new winch pack has two axial/variable displacement hydraulic motors, each with a disc-brake and planetary gearbox (similar to the arrangement of Favco). The motors are installed on each side of the drum and the torque is transferred directly to the drum shaft (thus alleviating the risk of failure in the transmission at the pinion/spline as happened for the crane at 57th street). The braking capacity is approximately rated to 150%-160% of the line pull (58,000lbs same as original winch for the TG-1900).

The loads lifted on the Hoboken project will be around 15,000lbs (with one occurrence at 20,000lbs) which is well below the rated line pull of the original TG-1900 and its braking capacity (150% of line pull). It is therefore our professional opinion that the TG-1900 with the original winch pack designed by FMC will be more than apt and adequate to perform the work required when maintained and operated properly.

In our view the new winch pack designed by Federated Cranes offers superior performance and braking capacity (disc brakes technology requiring less maintenance to work at peak efficiency) than the original winch pack. The new winch pack was designed in accordance to the current crane codes and design standards and is a proven system (as noted by Peter Stroh). The case could also be made that a modified TG-1900 equipped with this new winch is a different equipment altogether than the original TG-1900 targeted by NYC DOB cease use order (which in any case does not apply in Hoboken).

As engineers placing the safety of the public and workers first and foremost in the list of our preoccupations, it is our professional opinion that using a modified TG-1900 with a new winch would certainly represent the best outcome for this particular project – especially since using another crane (hammerhead) or a combination of several cranes (M760 + mobile cranes) would likely represent an increase of risk from the logistical and structural standpoints and would not guarantee a reduction of risk from the mechanical standpoint.

As always, please do not hesitate to call me if you wish to discuss further, and thank you for your consideration in this matter.

Best regards,
Pierre

Pierre GONZALEZ,
Project Engineer
[cid:image003.jpg@01CB9BB8.4A349980]
303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel: (516) 791-2600
Fax: (516) 791-5425

Tower sections are electrically welded construction and are braced for maximum torsional bending strength. Connections are made by high tensile steel bolts at each corner, developing the full strength of each corner. The tower sections have included a platform and ladders to provide access to the machinery deck.

The counterweights consist of heavy steel plate sections, which are supported on the rear of the machinery deck.

The cabin is ergonomically designed to provide maximum efficiency of operation for all weather and site conditions. All windows are of safety glass structure with side windows slide opening to provide adequate ventilation. All motion controls come readily to hand. The cabin seat is fully adjustable to provide optimum comfort. It is also equipped with lifting armrest and headrest. Excellent visibility is provided for the operator with full length front window shaped to allow full vision when looking down without leaving the seat. The cabin is also equipped with an air conditioner.

Power for all motions is supplied by a turbo-charged diesel engine through which a gearbox drives the four axial piston variable displacement pumps. All pumps are connected in closed loop or hydrostatic transmission system to variable displacement motors for hoist and luff motion, a fixed displacement axial piston motor for the slew motion and variable displacement motors for the fly hoist motion (if applicable).

Motors drive through multi-disc brakes and two or three stages (depending on motion) planetary gearboxes, the pinions, which mesh with the individual drum gears or the internal slew ring gear.

Brakes are holding brakes only, with a minimum static capacity of 2.0 times motor torque.

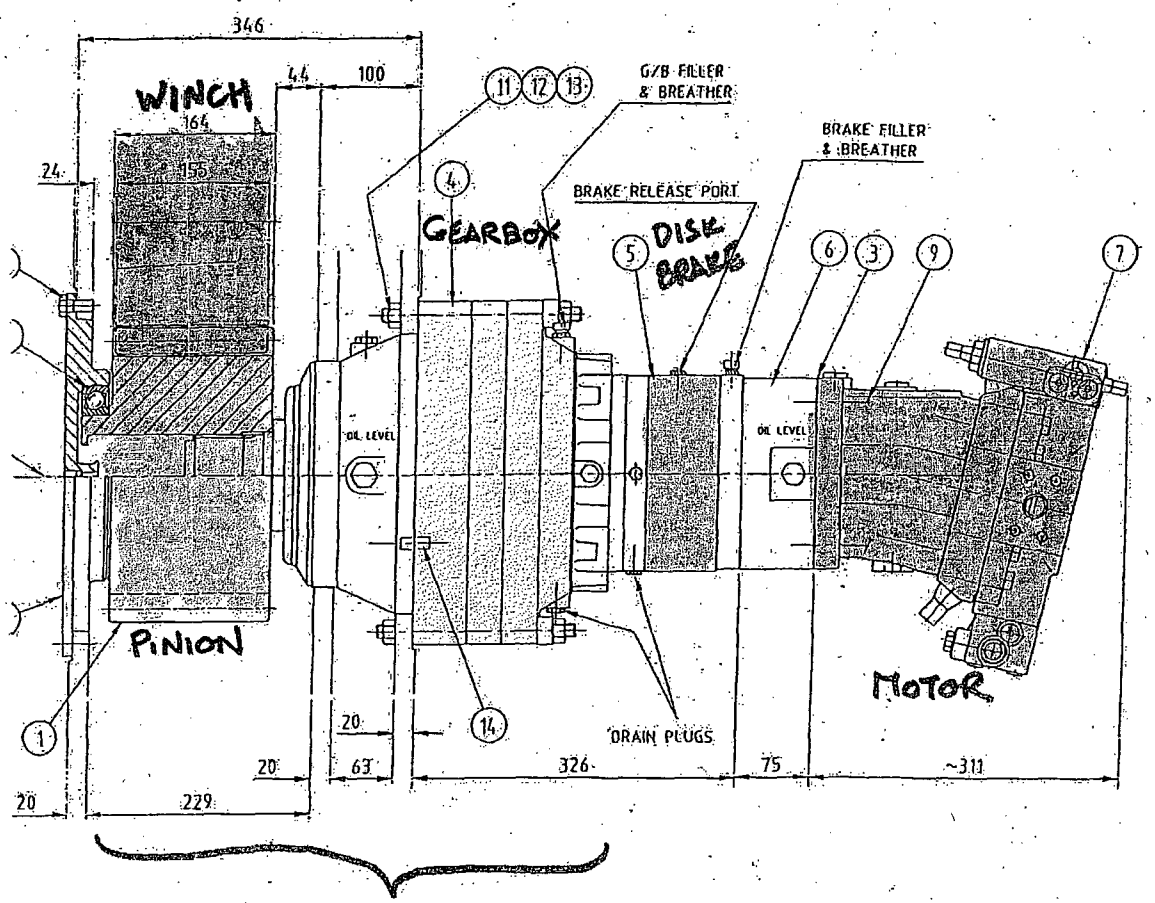
All operating controls for the crane movements are by sensitive 'dead man' type hydraulic pressure related controls. These incorporate the brake control as the brakes are automatically applied when the control lever is in the central position. The control valves give stepless control to each crane motion with all motion speeds selected to give optimum safety in control under any load condition.

The engine and crane safety system is powered by the 12 or 24V (volts) engine alternator.

The key that operates the ignition switch is to be kept remote from the crane during shutdown, preventing either unauthorized usage or starting of engine.

Where necessary, all electrics are wired so that automatic shutdown of engine, functions or switching into a safe mode of operation.

The following sections give the specification of the crane, as well as other relevant information such as the performance charts and hoisting diagrams.



IF ANY OF THESE ELEMENTS FAIL THEN THE BRAKE (AND MOTOR) ARE COMPLETELY INEFFECTIVE.

ATTENTION: MAINTENANCE PERSONNEL

USE ONLY OIL AS NOMINATED IN CRANE MANUAL, SECTION 4 TO FILL GEARBOX, BRAKE AND MOTOR.

DO NOT OVERFILL GEARBOX OR BRAKE.

Material List

Cat.	Item	Code	Q'ty	Description	Reference
	1	REF	1	DRIVE PINION	
	2	REF	1	BEARING HOUSING	
	3	REF	1	MOTOR GASKET	
	4	GBX	1	GEARBOX 20:21	
	5	REF	1	BRAKE	0537303791
	6	ADP	1	MOTOR ADAPTOR	
	7	MTR	REF	HYDRAULIC MOTOR	consult FFC
	8	BR	1	BEARING (120/180/28)	
	9	HEX	4	M16 x 60	GRADE 8.8
	10	HEX	4	M12 x 30	GR. 4.6 GALV.
	11	TB	12	THREADED BAR M14 x 200	GRADE 8.8
	12	W	12	WASHER	
	13	HEX	12	NUT M14	GRADE 8
	14	SPN	3	BISSELL PIN Ø12 x 30	ZINC PLATED

**

NOTES

1. MATERIAL LIST IS FOR ONE (1) DRIVE ONLY REFER TO WINCH ASSEMBLY FOR NUMBER OFF REQUIRED.
2. FULLY CLEAN MATING SURFACE OF GEARBOX AND WINCH AND THEN APPLY "LOCTITE 277" TO PROVIDE FRICTION JOINT.
3. U.O.N. ALL BOLTS TIGHTENED TO DWG. A3-9900.214

** TO BE ORDERED WITH SHAFT SEAL REMOVED AND A LEVEL PLUG ON THE SHAFT CENTERLINE

Checked	Date	Revision	ECN	Name	Issue
	2.02.01	ORIGINAL ISSUE	-	L.Z.	A

FAVELLE FAVCO

Favelle Favco Cranes Pty. Ltd.
ACN 057 562 449
A subsidiary of Multibook Engineering (M) Bhd

Project: 760-515-32-12

First Used On S/No. 1043

Title: DRUM DRIVE ASSEMBLY - HOIST

Activity No. 230

Drawn	Checked	Date Drawn	Sheet	Weight	U/Film	Issue
L.Zubic	AM	2.02.01	1 of 1	295 kg	-	A
	Approved	Scale	Drawing Number			
	BM	1:5	A3-2390.237M			

DO NOT SCALE FROM DRAWING
IF IN DOUBT ASK FFC PTY LTD ENGINEERING DEPT.

© THIS DRAWING REMAINS THE PROPERTY OF FAVELLE FAVCO CRANES PTY. LTD AND MUST NOT BE USED OR COPIED WITHOUT WRITTEN PERMISSION.

Hydraulic system

Swing, boomhoist, main load and auxiliary load hoist drums — all hydraulically operated. Hydraulic power is supplied by reversible flow, variable *displacement, piston-type pumps, flange* mounted to gear reduction unit, which is mounted on output shaft of engine. Hydraulic pumps are connected through a closed loop hydraulic circuit to radial piston hydraulic motors which power operating functions. Normal braking of operational functions accomplished by hydraulic motors when oil flow through motors is reduced by movement of control lever toward neutral position.

Engine Specifications	GM 12V-71T
Number of cylinders	12
Bore and stroke — inches — *(mm)*	4¼ x 5 *(108 x 127)*
Piston displacement — cu. in. — *(cm³)*	852 *(13 964)*
High idle r.p.m.	2 050
Horsepower @ full load speed — — *(W)* Peak torque — ft. lbs. — *(J)*	493 *(367 630)* 1450 @ 1850 r.p.m. *(1966)*
Electrical system Batteries	24-volt 2 - 12-volt

Sump tank

Fabricated steel, non-pressurized; baffled for strength and deaeration. *Mounted above power unit. Return line* filter mounted on internal side of tank, and charge filter mounted in pressurized line between suction pump and charge pumps mounted to power unit. Capacity — 120 gallons *(454.25 L)*.

Principal Operating Functions —

Control system

Air controls; control levers for various functions mounted convenient to operator; "dead man" type controls return to "zero speed, brake on" position if released.

Main load hoist drum

Grooved, 54" *(1.37 m)* root diameter; mounted on anti-friction bearings on non-turning shaft. Drum driven through spur gear reduction by four two-speed, high torque, radial piston hydraulic motors. Infinitely variable rope drum speed control in three speed ranges — low, medium, and high — is standard.

Low Speed — Hydraulic motors each set to run at 90 cu. in. *(1 475.10 cm³)* displacement per revolution.

Medium Speed — Two hydraulic motors each set to run at 25 cu. in. *(409.75 cm³)*, and two hydraulic motors set to run at 90 cu. in. *(1 475.10 cm³)* displacement per revolution.

High Speed — Hydraulic motors each set to run at 25 cu. in. *(409.75 cm³)* displacement per revolution.

Optional main load hoist drum — Available is an optional main hoist drum for greater wire rope capacities.

Auxiliary load hoist drum — Optional. Smooth, 18" *(0.46 m)* root diameter, 33⅛" *(0.84 m)* wide between flanges; mounted on anti-friction bearings on non-turning shaft. Drum driven through spur gear reduction by one 2-speed, high torque, radial piston hydraulic motor. Infinitely variable speed control in two speed ranges — low and high — is standard.

Low speed — Hydraulic motor set to run at 90 cu. in. *(1 475.10 cm³)* displacement per revolution.

High speed — Hydraulic motor set to run at 45 cu. in. *(737.55 cm³)* displacement per revolution.

Drum brakes

External contracting band holding brakes; spring applied, air released. Brake drums involute splined to hydraulic motor counter-shafts at opposite end of shafts from motors. Brakes spring applied when control lever is moved to "brake on" position; air released when control lever is moved to neutral position — at which time hydraulic motor is blocked hydraulically to restrain load.

Load indicating and overload warning system — Equipped with a load-moment device for measuring the load and the load radius. Incorporated with this device is an overload warning system which warns the operator when an overload condition exists and inhibits certain functions of the machine.

EXHIBIT D

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
A continuing tradition of engineering service - since 1946

303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel (516) 791-2600
Fax (516) 791-5425
www.HISAssoc.com

September 25, 2013

Waterfront Corporate Center III JV LLC
Morris Corporate Center IV
379 Interpace Parkway
Parsippany, NJ 07054
Attn: Mr. Douglas Allen

Ref.: Hoboken Waterfront Corporate Center Block B
Proposed of TG1900 Tower Crane

Dear Mr. Allen:

I write in response to reservations expressed by PASNYNJ about the proposed use of the TG1900 tower crane.

The TG1900 was selected, after an extensive study, because it fit the site constraints and lifting requirements of the project. No other lifting solution could meet those needs. The particular demands are driven by the dense mid-rise urban setting, constraints on use of adjoining streets and the necessity to set relatively heavy precast panels at long reaches.

After PA reservations were expressed, alternate solutions were studied and all found to be problematic:

- Favco M760 –This diesel-hydraulic luffing tower crane has ample lifting capacity, but its 226 foot boom would not reach the rear corners of the site as needed to set all of the steel and precast panels. Restrictions imposed by the city of Hoboken proscribe the deployment of mobile cranes on the adjoining streets to erect the back portion of the building.
- Electric luffing tower cranes –there are no machines available in the US market that have sufficient capacity.
- Electric hammerhead cranes –the Liebherr 630 EC-H20 is available and has the physical capabilities to serve the project, but its 267 ft. boom would sweep within four feet of the windows of the W Hotel, and both boom and counterjib would overswing multiple occupied buildings.

Lawrence K. Shapiro, PE *Cell (917) 721-8290* *LKShapiro@hisassoc.com*

In considering concerns about the TG1900 expressed by the PA, none would apply to the operation at the Hoboken site. The incident involving this crane at WTC4 was caused by hydraulic oil contaminated by water that entered through the climbing system. The Hoboken crane will not require a climbing mechanism, as it will be erected and dismantled at full height. There will be no opportunity for outside contaminants to penetrate the closed-loop hydraulic system.

The Manring report, commissioned by the PA following this incident, noted that that the hoist winch of the TG1900 relies on four hydraulic motors to lift its full capacity of 57,600 lbs. If a motor would fail, the winch capacity would be reduced. He proposed that the reliability of the crane could be enhanced by limiting the lift capacity to 30,000 lbs. All of the lifting at the Hoboken project is far below the 30,000 lb. Manring recommendation. The heaviest precast or steel lifts are no more than 15,000 lbs. The hoist motors would, therefore, benefit from both redundancy and very low load demand. The same could be said for the brakes.

Moreover, the overall project demand on the crane is moderate, considering the total number of lift cycles, intensity (The crane will operate single shift, six days per week.) and the moderate lifting heights. In comparison to the robust capabilities of the crane, its mechanical and hydraulic systems will see light service.

As the Manring report attributed the WTC4 incident to maintenance-related deficiencies, this project can be further insulated from such problems by carrying out a vigorous inspection and preventative maintenance program. The program could include third party inspections, frequent oil sampling and program review by qualified engineers.

If further information or study is required, please feel free to contact me.

Regards,

Lawrence K. Shapiro, P.E.

EXHIBIT E

Candy Ricci

From: Doug Allen <dallen@sjpproperties.com>
Sent: Thursday, October 10, 2013 3:49 PM
To: Francis J. Giantomasi; Charles J. Messina
Subject: FW: Hoboken Project - TG 1900 Tower Crane

Importance: High

Frank:
This is the Stroh Engineering report sent to me from Federated cranes as a result of our meetings with the PANYNJ technical team with information provided by the SJP team to the PANYNJ and at Maureen's request to Stroh Engineering. The report seems to affirm the positions we took in our meeting and subsequent correspondence.

Appreciatively,

Douglas Allen
EVP, PreConstruction and Planning
SJP Properties
379 Interpace Parkway
Parsippany, NJ 07054
(973) 257-3001 – Telephone
(973) 714-7797 - Mobile

From: Doug Allen
Sent: Thursday, October 10, 2013 3:47 PM
To: 'Del Tufo, Gerard'
Subject: FW: Hoboken Project - TG 1900 Tower Crane
Importance: High

Jerry:
Below please see Stroh Engineering report on cranes regarding our Hoboken site as submitted to the Port Authority.

Appreciatively,

Douglas Allen
EVP, PreConstruction and Planning
SJP Properties
379 Interpace Parkway
Parsippany, NJ 07054
(973) 257-3001 – Telephone
(973) 714-7797 - Mobile

From: Larry [mailto:Larry@ajmcnulty.com]
Sent: Thursday, October 10, 2013 3:08 PM
To: Doug Allen
Subject: FW: Hoboken Project - TG 1900 Tower Crane

Doug,

I thought you might want to see the report (below) prepared by Peter Stroh, P.E., concerning the TG 1900 tower crane. The report was solicited by Maureen Lynch-Jacobs of the Port Authority. I would hope this report will finally clear the air as to any issues regarding use of this crane on your Hoboken job.

Larry Weiss

Cranes, Inc.

Tel 718-784-1776

From: Lawrence K. Shapiro P.E. [mailto:lkshapiro@hisassoc.com]
Sent: Thursday, October 10, 2013 9:19 AM
To: 'Larry'
Cc: 'John Kelly'
Subject: FW: Hoboken

From: Peter Stroh [mailto:Peter@strohengineering.com]
Sent: Wednesday, October 09, 2013 5:08 PM
To: Larry Shapiro
Subject: FW: Hoboken

Larry,

Here is my response to Maureen.

Peter J. Stroh, P.E.

President

Stroh Engineering Services, P.C.

41 Robert Street

Babylon, New York 11702 U.S.A.

P - 631-669-7531

F - 631-669-6369

M - 631-553-0077

From: Peter Stroh
Sent: Wednesday, October 09, 2013 5:06 PM
To: 'Lynch-Jacobs, Maureen'
Subject: RE: Hoboken

Good Afternoon Maureen,

I looked over the information you sent me. Since a tower crane is to be used on the job, I assume mobile cranes on the streets will not be allowed, so I did not look at mobile cranes as an option. I did not find another luffing boom tower crane that will match the capabilities of the TG 1900 called out that is in its class. This TG 1900 has a special long reach boom that will accommodate the project requirements. The only luffing boom tower crane (non TG crane) that I know of that will make the reach is a Favco 1280. The 1280 is really too large for the project and I don't think there are any available and the current crane foundation would not work, so it is not a choice I would recommend. I looked at horizontal jib (hammerhead) cranes and I found that the Liebherr 630 will reach and have about the same capacity as the TG 1900 as speced out. However, I looked at Google Earth and it appears that the building south of the crane location is approximately 195' high to the cooling tower, so that the crane jib for the Liebherr would most likely not clear the building's mechanical equipment when the crane weathervanes. The European tower cranes tend to deflect much more than the TG cranes and Favco cranes, as the towers are built lighter and are not as rigid. With a long horizontal jib and a high freestanding height the jib tip could deflect down in the range of several feet.

I never saw any official notice stating that the TG cranes are not allowed to be used in New York City, but I have heard that they have been banned unofficially. I assume this ban stems from the incident at WTC Tower 4. While the TG cranes have had a long life, this in and of itself does not automatically determine that they are no longer capable of safe operation. Maintenance is the most important factor in determining the life of a crane. The better the maintenance, the longer the life. As far as structural capabilities are concerned, inspection and testing should adequately prove the integrity of the structure. If the crane is owned or serviced by Federated Equipment, they may be able to use the crane with the custom hoist pack that they designed and built for the TG cranes. I believe they built several of these hoist packs around 2004 ~ 2005. I know two of them were used at the Time Warner Building at Columbus Circle. Since these hoist packs were designed and built to the crane codes at the time, they are basically up to current design standards and have been used in NYC up until the ban on the cranes, so they are a proven system. I would also recommend that if the crane is to be used, new main load line and boom hoist rope be installed. I also note that the building is not that high, so that the hoisting height is relatively low for this crane. I also see that the sidewalks and curb lanes are closed around the jobsite, which will add to the public safety.

If the use of the TG 1900 will not be allowed, than you have several options:

1. Use two tower cranes on the project to meet the lifting requirements. This is not an option I would recommend, since the current crane position would not be able to be utilized. Two new foundations would need to be designed and built (remobilization of the foundation/piling equipment, etc.) two crane erections and dismantling, impacting the community, not to mention the additional expense.

2. Use one tower crane in the current position and erect the remaining portion of the building with mobile cranes from Sinatra Drive and River Street. Fairly large mobile cranes will need to be used and they may not fit into the current sidewalk and lane closings.

3. Use mobile cranes from inside the site to erect the steel and work out toward Second Street. Complete the steel erection from Second Street. Use mobile cranes on Second St., Sinatra Drive and River Street to erect the precast. This will delay the completion of the job, as the erection with mobile cranes is slower than the erection with a tower crane. The impact to the community will be more, as the mobile cranes will need to work on the streets and be assembled and dismantled on the streets. There is a basement in the building, so a platform would need to be designed and built for the crane, or a suitable ramp to provide access. A ramp is probably not practical, as most of the cranes would not be able to negotiate this type of ramp when assembled. A platform would be very expensive and delay the job as it needs to be built, as well as the additional crane to build the platform.

From a risk management prospective, the single tower crane makes the most sense. Put the crane up (one street closing to erect), erect the building (shorter erection time with tower crane and tower crane designed for a storm condition, mobile cranes need to be boomed down to the ground for winds over 50 mph), dismantle crane (one street closing). The mobile cranes will need to be moved around the site. I understand your reservations about the use of the TG 1900 crane for this site, but it is my opinion that the banning of the TG cranes was not fully vetted out. There was an existing bias to ban the cranes and the opportunity was too good to pass up. It is my recommendation that the TG 1900 crane be allowed to be used at this site. Inspections are a must and maintenance must be performed and documented. Please feel free to contact me with any questions or comments.

Peter J. Stroh, P.E.

President

Stroh Engineering Services, P.C.

41 Robert Street

Babylon, New York 11702 U.S.A.

P - 631-669-7531

F - 631-669-6369

M - 631-553-0077

-----Original Message-----
From: Lynch-Jacobs, Maureen [mailto:mjacobs@panynj.gov]
Sent: Saturday, October 05, 2013 1:30 PM
To: Peter Stroh
Subject: Hoboken

Peter,

A contractor has submitted a crane plan using a TG 1900 in Hoboken. They are out of service in NYC, so I can't allow it. If I send drawings on Monday, can look for alternate solutions. This is another rush.

Thanks

Maureen

Sent from my BlackBerry Wireless Handheld

NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT

AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE

RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY,

PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY

PRINTOUTS.

No virus found in this message.
Checked by AVG - www.avg.com
Version: 2014.0.4142 / Virus Database: 3604/6733 - Release Date: 10/08/13

THIRD PARTY TOWER CRANE INSPECTION – RESUME

EXEMPTION 1

Jeffery E. York

Director of crane & hoist operations, Certified California Crane Surveyor, Licensed General Contractor, Safety Expert and Expert Witness

Metro Hoist California, Inc. Vice President, Dir of Operations San Leandro, CA
2007 - 2011

- P & L responsibility for US operations for this Canadian based hoist rental company
- Directed all operations for erection, jump and dismantle of $4M of equipment
- Managed 15+ ironworkers and operating engineers
- 100% equipment utilization for 2007 and 2008
- 100% safety record for no incidents or accidents for four years

Signal-Rite, LLC President, CEO San Leandro, CA
2004 - Present

- Founder and President
- Inspected and certified cranes and hoists all over the world
- Invented verbal signaling system for mobile and tower cranes, 2004
- Designed and implemented a comprehensive training and testing program for crane signal persons and riggers
- NOVA award winner 2008 for Signal-Rite Compensator System
- Holder of three patents
- 2006 Engineering News Record Magazine Top 25 Newsmaker
- Experienced erector of cranes and heavy equipment
- Tower and mobile crane specialist
- Tower and mobile crane signals published in Bob's Rigging & Crane Handbook

Kiewit Construction Tower Crane Operator San Francisco, CA
2002 - 2004

- Operated a portal crane on a travelling bogey for the construction a segmental bridge
- Implemented Signal-Rite placards for hand and voice signals throughout jobsite
- Implemented training video for signal persons
- Performed 164 two crane lifts without incident

LICENSES AND TECHNICAL CERTIFICATIONS

- Cal OSHA Crane Certification/Surveyor License (#CA-384)
- Contractors State License Board License D-21/C-61 (#908476)
- Association of Crane & Rigging Professionals since 2006
- Avro Hoist certified repair and service technician
- Harrington Hoist & Crane certified repair and service technician
- Crosby Group Inc. certified trainer
- Kroll Cranes certified technician

EXPERT WITNESS FOR THE PLAINTIFF – CIVIL LITIGATION

- 100% of the cases resulted in judgments for the Plaintiff
- Law offices of Kubicki Draper, July 2008
- Succar Law, August 2008
- Mitchell, Hoffman, & Wolf, April 2009
- Provost Umphrey, June 2009
- Williams Kherkher Jan 2010

CATALOGUE OF PRINT AND ONLINE TRADE JOURNAL ARTICLES ABOUT JEFF YORK AND/OR SIGNAL-RITE LLC AS OF JANUARY, 2010

- Lift & Access Jan. 2010, "Calling for Stricter Crane Inspector Restrictions"
- Lift and Access Dec. 2009, "Clear the Inspection Fog"
- Hoist Magazine May 2008, "Hoist Keeps Forms Level"
- Crane Hot Line Apr. 2008, p.8, "New System for Flying Deck Forms"
- Engineering News Record Mar. 2008, "Crane Work Needs More Technique"
- Engineering News Record Mar. 2008, "Heavy Metal Fever"
- Engineering News Record, Dec. 2006, pps. 1-6, "Out of the Blind Zone"
- Cranes Today June 2006, "Signal Failure"
- Lift and Access Dec. 2005, pps.36-39, "Equal Jobsite Responsibility"
- Crane Works May 2005, pps. 19-20, "Certification for All"

THIRD PARTY TOWER CRANE INSPECTION – FIELD REPORT

Fw: Photos from TG1900 CD#1850
Allen Sokolowski
to:
Michael Romano
09/23/2013 12:45 PM
Cc:
"Ed Lydon", "Marc DePaul"
Show Details

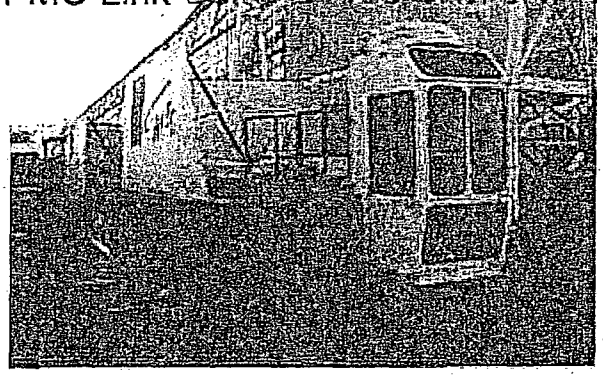
21 Attachments

IMG_4472.jpg IMG_4475.jpg IMG_4486.jpg IMG_4474.jpg IMG_4478.jpg IMG_4468.jpg IMG_4466.jpg IMG_4477.jpg
IMG_4473.jpg IMG_4470.jpg IMG_4476.jpg IMG_4467.jpg IMG_4484.jpg IMG_4485.jpg IMG_4469.jpg IMG_4483.jpg
IMG_4482.jpg IMG_4479.jpg IMG_4481.jpg IMG_4471.jpg IMG_4480.jpg

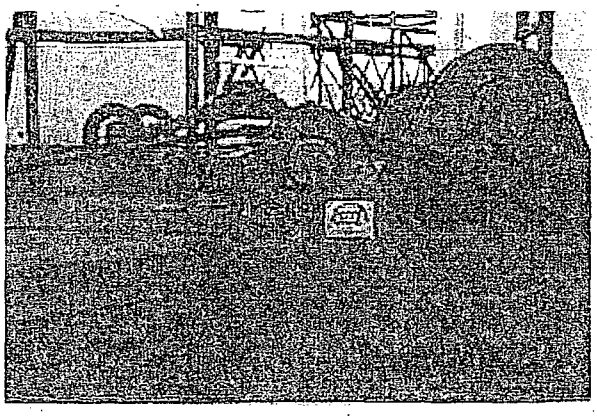
Mike, Here is the TG 1900 Inspection report. Soko

From: Jeff York [jeffmetrohoist@gmail.com]
Sent: 09/23/2013 08:50 AM MST
To: Allen Sokolowski
Subject: Photos from TG1900 CD#1850

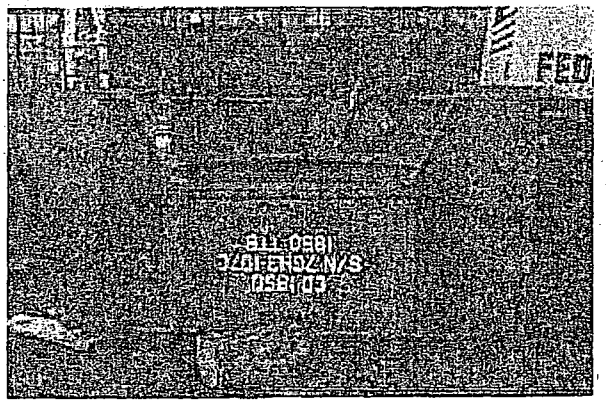
FMC Link-Belt TG1900 SN 76[illegible] 070-CD#1850 Machine Description: Cabin



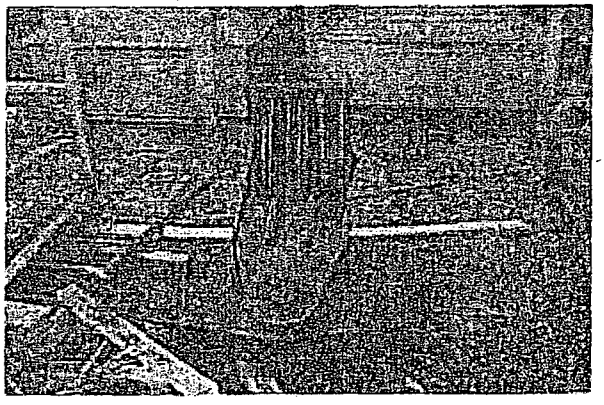
No visible structural damage
Top slew ring bolts all tight
All plumbing looks to have been freshly gone through
Status: Stored in yard



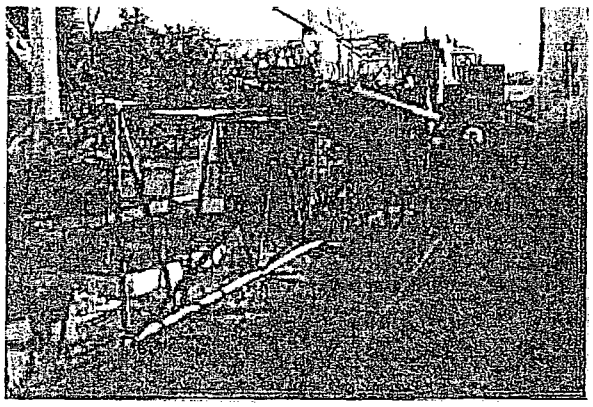
Latest Inspection sticker by CTI for mag particle testing



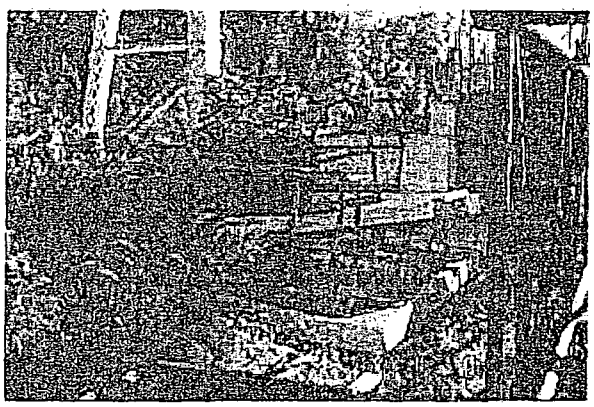
Turntable base is structurally sound passed visual test no visual defects CD#1850
Status: stored in yard



Outer Ball CD#1850 no visual defects.
Status: stored in yard

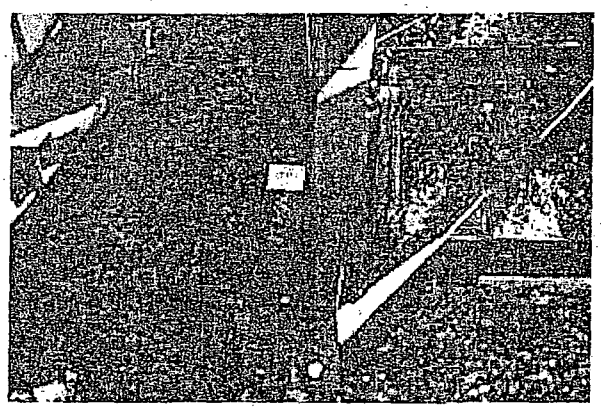


20' Insert-48152 no visual defects
Status: stored in yard

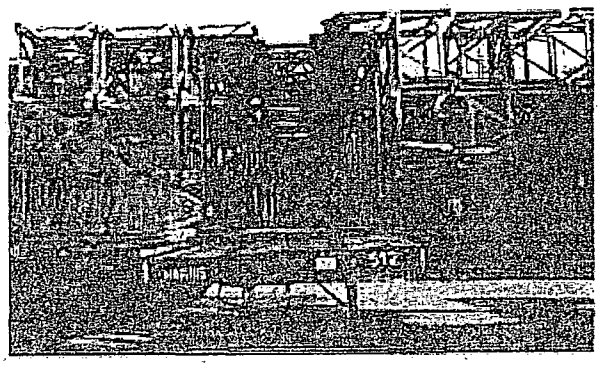


Sheet Metal for machine deck CD#1850 no visible defects.

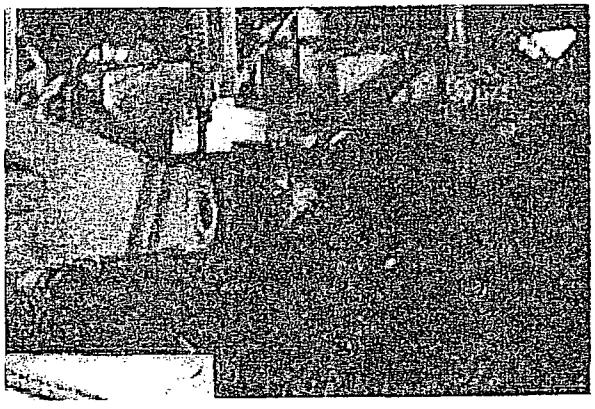
Headache ball for CD#1850 no visible defects
Status: stored in yard



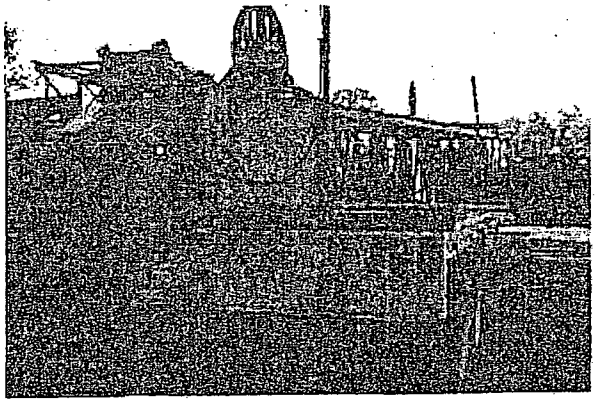
40' Tower Section-17802 no visible defects
Status: stored in yard



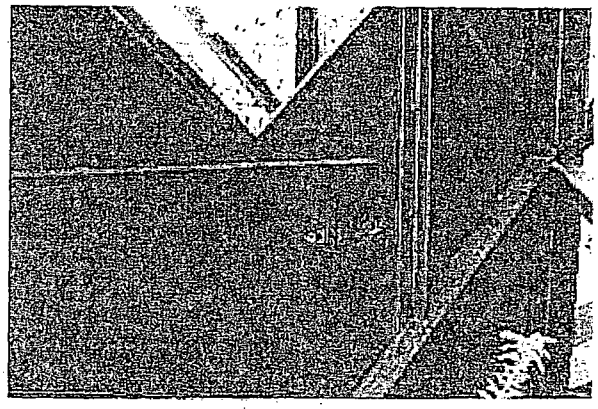
40' Boom insert-7540 no visible damage
Status: loaded on truck for delivery



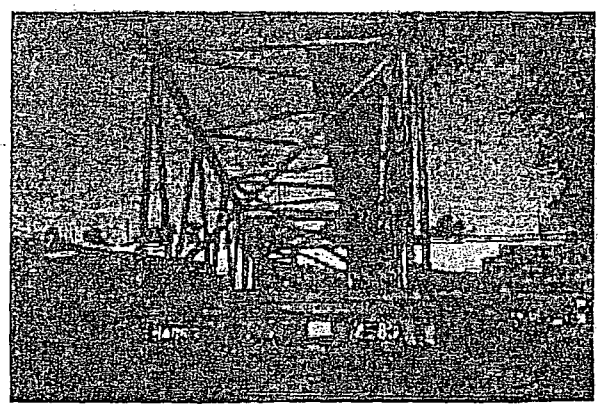
Guard Spider I almost walked into



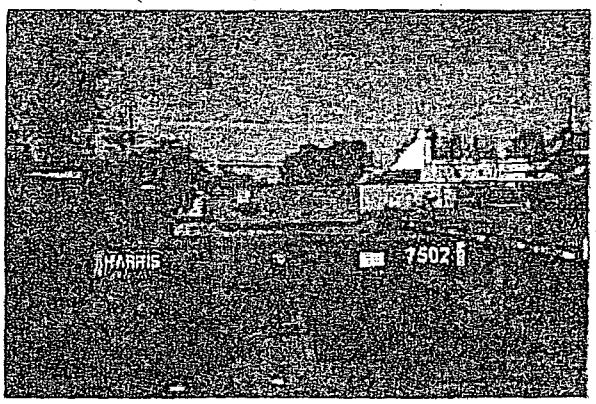
Boom Head 50'- 1900-TB2 no visible damage
Status: Loaded on trailer



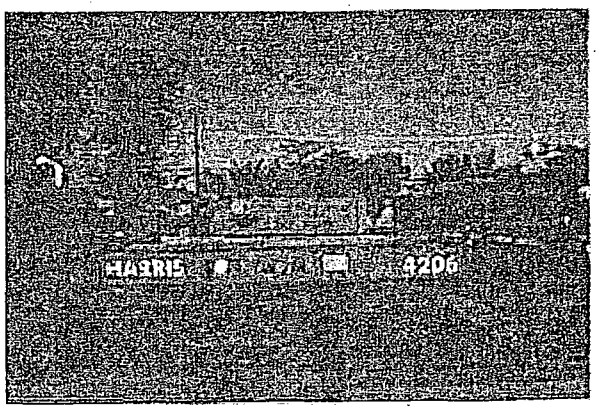
Tower Section-TGT-13028 no visible damage
Status: stored in yard



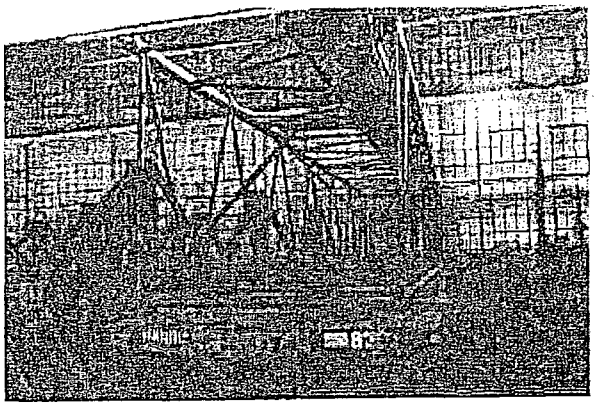
40' Heel Section-12826 no visible damage
Status: Loaded on trailer



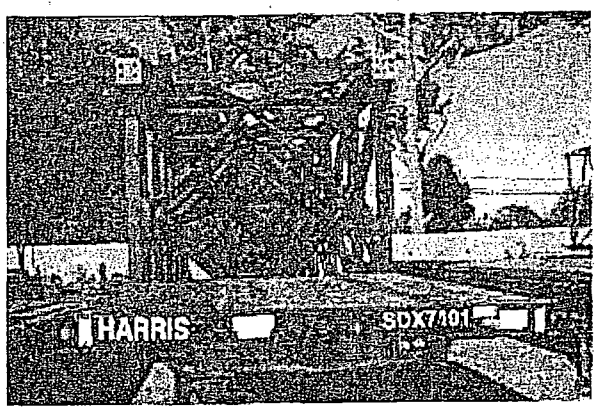
CW107-1/CW107-2 no visual defects
Status: Loaded on trailer



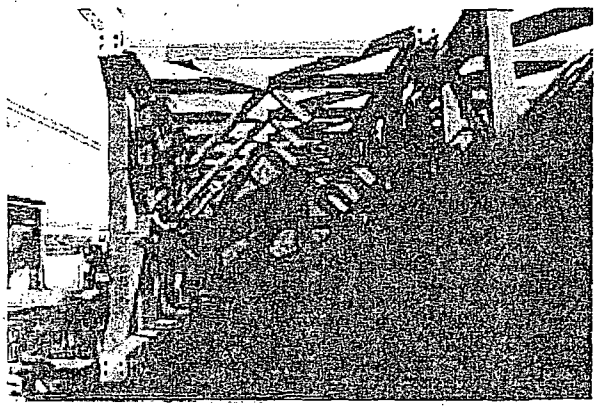
CW107-3/CW107-4 no visual defects
Status: Loaded on trailer



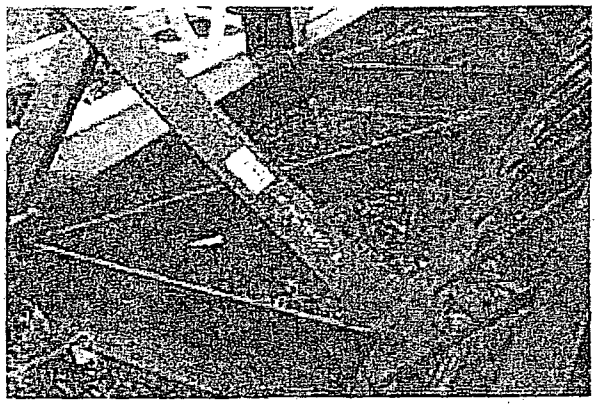
50' Boom Insert 1900-TB1 no visual defects
Status: loaded on trailer



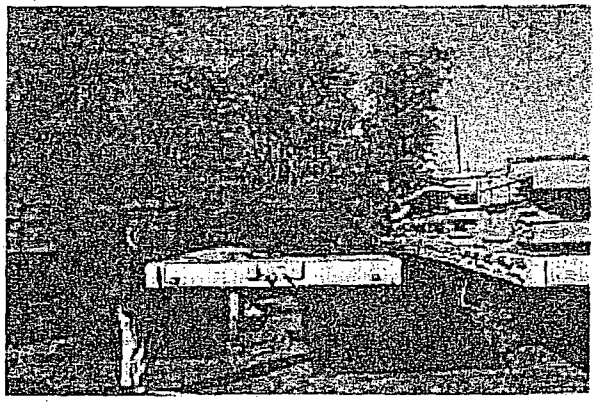
40' Tower section-67901 no visual defects
Status: Loaded on trailer



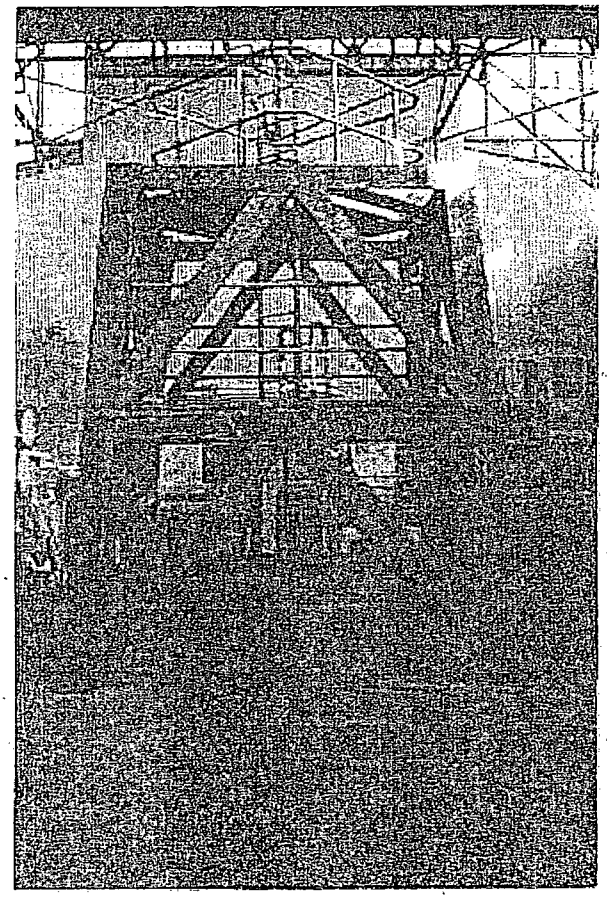
12X12 Tower section-TS1850-1 no visual defects
Status: stored in yard



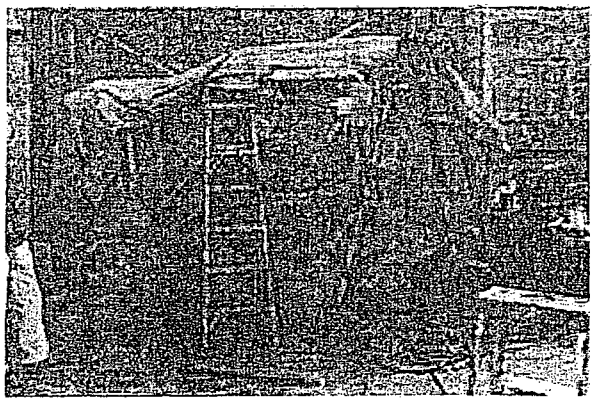
12X12 Tower section-TS1850-2 no visual defects
Status: stored in yard



A-Frame-1850-AF no visual defects
Status: Loaded on trailer



Tower Transition Section-118101 no visible defects
Status: Stripped to bare metal in shop ready for paint



Winch pack recently hooked up and all ropes were inspected and the boom hoist wire replaced along with valve that was found to be out of adjustment. valve replaced to the left of taller ladder.

CERTIFIED TESTING & INSPECTIONS INC

866.602.7733

TESTING INSPECTIONS ENGINEERING

DAILY JOB COMPLETION SHEET

CLIENT: CRANES, INC. DATE: 07-09-13

PROJECT: FMC LINK-BELT TG1900 LOCATION: 1640 NEW MARKET ST. & 2298 MIDDLESEX AVE. S. PLAINFIELD, N.J. 07080

SN: 76H3-107C CD#: 1850

INSPECTOR: C.P. SERVICE: VIMT

START FROM: OFFICE:____ OTHER:____ TIME: 7 AM AM/PM

FINISH TO: OFFICE:____ OTHER:____ TIME: 3 pm AM/PM

LUNCH: ½ HOUR:____ YES ✓ NO

TOTAL AVAILABLE HOURS: 8 DELAY OR STANDBY:

TRAVEL MEANS: XXX PERSONAL____ COMPANY____ OTHER:

ODOMETER START: 0 FINISH 170 TOTAL MILEAGE: 170

EQUIPMENT USED: CRANE KIT

MATERIALS USED: MAGNAVIS DRY POWDER

REMARKS:

#12826 40' HEEL
#1900-TB2 50' HEAD
#1900-TB1 50' BOOM
#127734 30' BOOM
#88110 40' BOOM
#7540 40' BOOM
#67901 40' TOWER
#TS1850-1 40' TOWER
#TS1850-2 40' TOWER
#1850-AF A-FRAME

#CW107-1 12' COUNTERWEIGHT
#CW107-2 12' COUNTERWEIGHT
#CW107-3 12' COUNTERWEIGHT
#CW107-4 12' COUNTERWEIGHT

ALL SECTIONS INSPECTED AND FOUND TO BE ACCEPTABLE.

ALL RESULTS ARE BASED ON THE INSPECTION PERFORMED ON THE ABOVE DATE.

CLIENT REMARKS:

CLIENT APPROVAL: DATE: 070913

PLEASE NOTE: YOUR SIGNATURE VERIFIES ALL TIMES AND MATERIALS TO BE CHARGED TO YOUR COMPANY AS PER PREVIOUS AGREEMENT MADE FOR THIS PROJECT.

P.O. BOX 116 – FLORENCE, NEW JERSEY 08518 – PHONE: 609.239.0994 – FAX: 609.239.2118
P.O. BOX 42 – FLORIDA, NEW YORK 10921 – PHONE: 845.239.8313 – EMAIL: CTICWI@GMAIL.COM

LOGISTICS PLAN

EXEMPTION 4

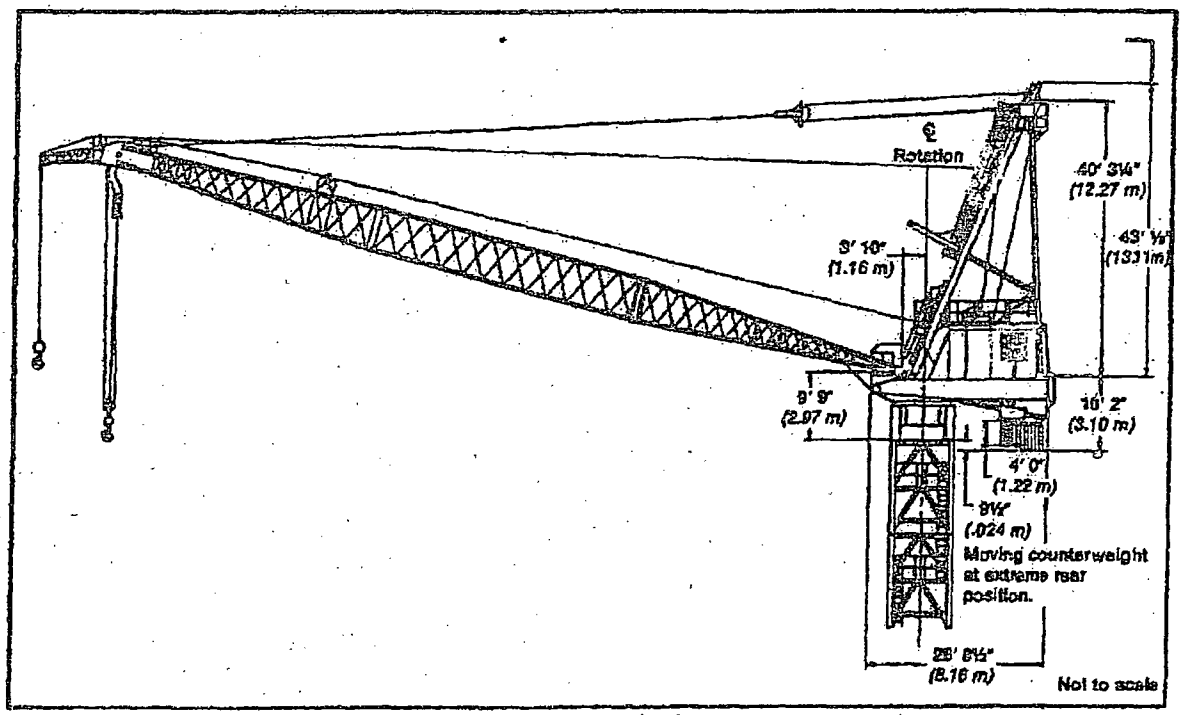
CRANE EQUIPMENT INFORMATION

FMC

General Specifications

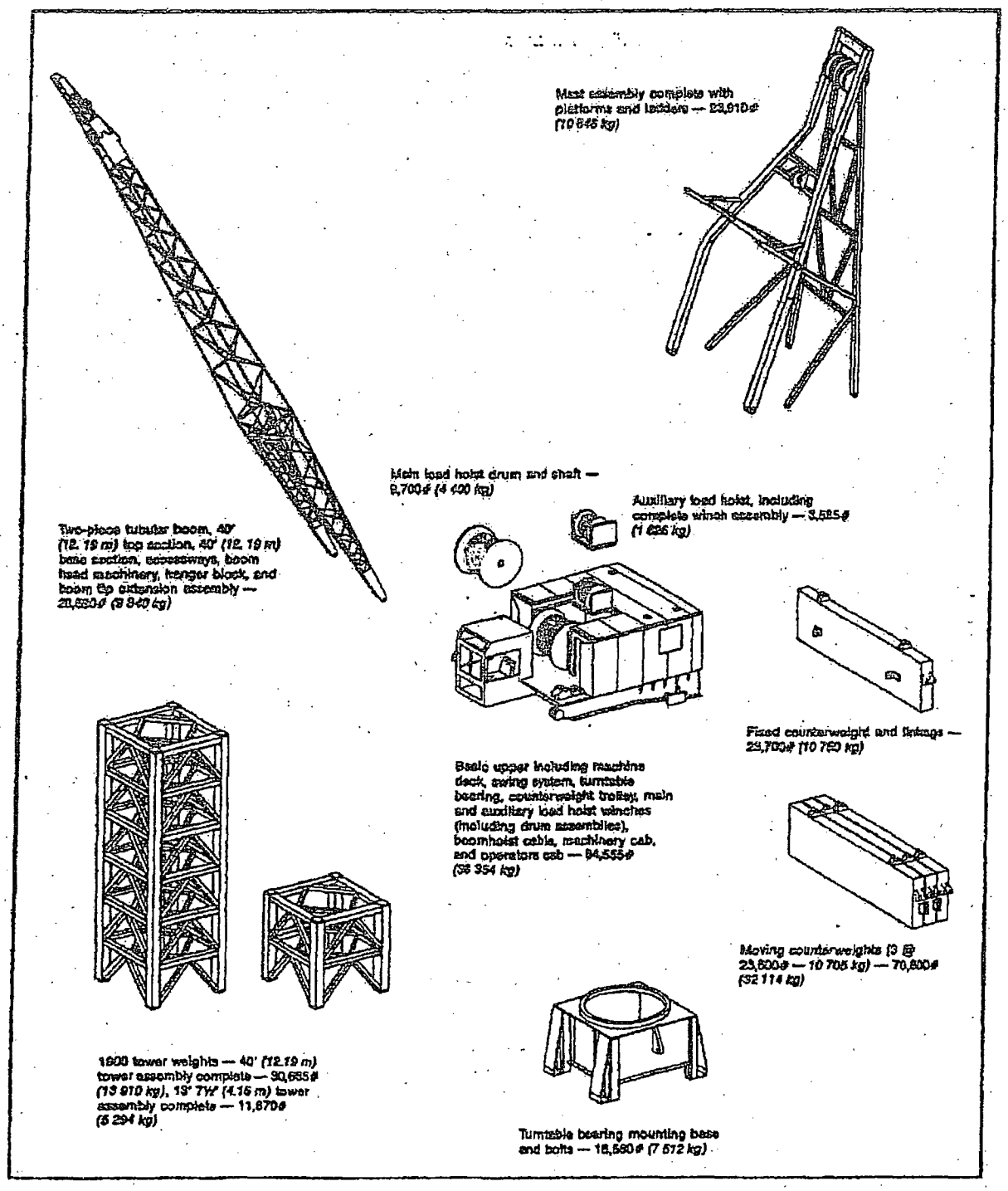
Link-Belt® 115-ton *(104.31 metric ton)* Tower/gantry crane

TG-1900

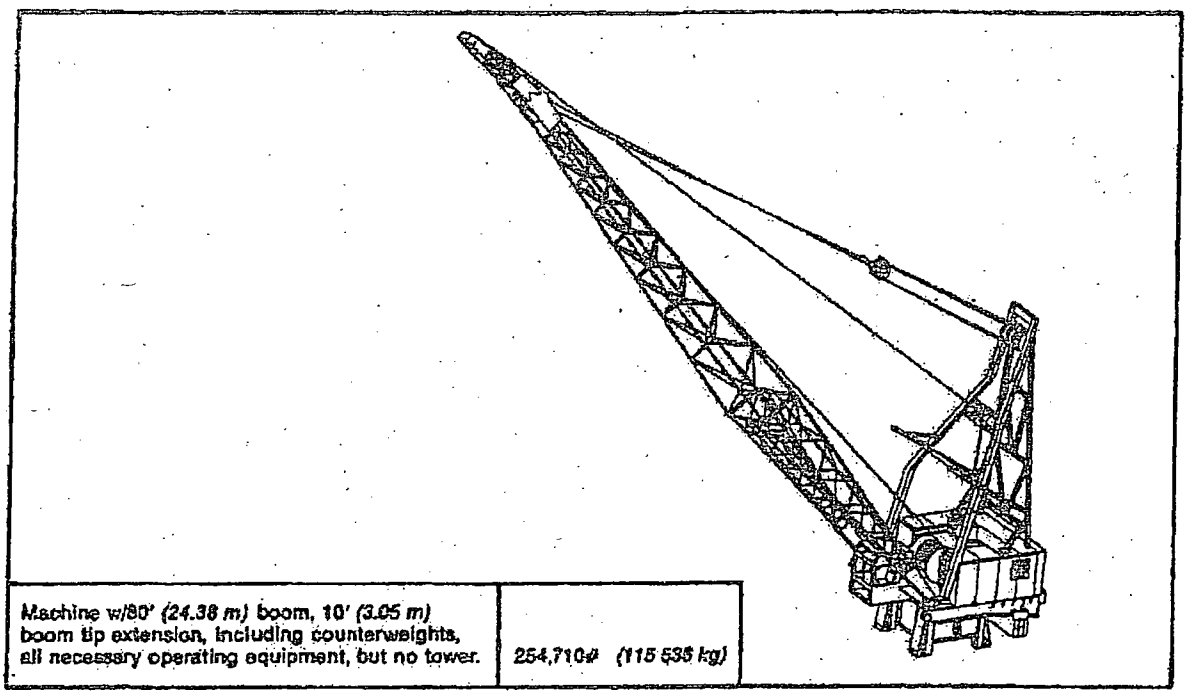


General dimensions	Feet	Meters
Basic boom length	80' 0"	24.38
Maximum boom length	200' 0"	60.96
Length, optional boom tip extension	10' 0"	3.05
Tailswing	20' 10"	6.15
Over-all width, revolving upperstructure	13' 4"	4.06

Weights for transporting — approximate



Machine working weights — approximate



Machine w/80' *(24.38 m)* boom, 10' *(3.05 m)* boom tip extension, including counterweights, all necessary operating equipment, but no tower.	254,710# *(115 535 kg)*

General Specifications

Foundation

Foundation requirements and foundation reaction charts — consult factory.

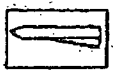
Tower

Free standing tower (non-climbing)

Welded, high strength, low alloy steel, wide flange beams. Sections 13' 7½" *(4.15 m)* or 40' *(12.19 m)* long, 9' 9" x 9' 9" *(2.97 x 2.97 m)* outside dimensions; bolted together on machined pads at each corner.

Climbing tower — consult factory.

Revolving upperstructure

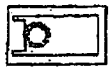


Frame

All-welded, high strength, low alloy steel; machined to accommodate boom, mast, swing-system, main hoist drum mounting frame and drum, power unit and operator's cab. Optional: auxiliary hoist drum mounting frame and drum mounted on top of main hoist drum frame.

Turntable bearing mounting base

Welded, high-strength, low-alloy steel, wide-flange beam construction. The circular turntable bearing mounting pad, along with the tower connecting pads, are machined to assure squareness, proper fit, and a flat surface to uniformly transfer loads. Overall dimensions for the mounting base are 9' 9" x 12' 3⅜" x 5' 3⅜" *(2.97 x 3.75 x 1.61 m)* high.



Turntable bearing

Roller bearing type; inner race with integral swing gear bolted to transition section mounted on top of tower section; outer race bolted to revolving upperstructure frame. Swing gear teeth machine-cut.

Engine

Diesel; turbocharged full pressure lubrication, oil filter, air cleaner, hour meter, hand throttle, and complete set of engine gauges. Optional: electric motor drive — consult factory.

Fuel tank

750 gallons *(2 839 L)* capacity. (Sufficient to run crane for approximately 80 hours of average lifting crane operation.)

Hydraulic system

Swing, boomhoist, main load and auxiliary load hoist drums — all hydraulically operated. Hydraulic power is supplied by reversible flow, variable displacement, piston-type pumps, flange mounted to gear reduction unit, which is mounted on output shaft of engine. Hydraulic pumps are connected through a closed loop hydraulic circuit to radial piston hydraulic motors which power operating functions. Normal braking of operational functions accomplished by hydraulic motors when oil flow through motors is reduced by movement of control lever toward neutral position.

Engine Specifications	GM 12V-71T
Number of cylinders	12
Bore and stroke — inches — *(mm)*	4¼ x 5 *(108 x 127)*
Piston displacement — cu. in. — *(cm³)*	852 *(13 964)*
High idle r.p.m.	2 050
Horsepower @ full load speed — — *(W)*	493 *(367 630)*
Peak torque — ft. lbs. — *(J)*	1450 @ 1850 r.p.m. *(1966)*
Electrical system Batteries	24-volt 2 - 12-volt

Sump tank

Fabricated steel, non-pressurized; baffled for strength and deaeration. *Mounted above power unit.* Return line filter mounted on internal side of tank, and charge filter mounted in pressurized line between suction pump and charge pumps mounted to power unit. Capacity — 120 gallons *(454.25 L)*.

Principal Operating Functions —

Control system

Air controls; control levers for various functions mounted convenient to operator; "dead man" type controls return to "zero speed, brake on" position if released.

Main load hoist drum

Grooved, 54" *(1.37 m)* root diameter; mounted on anti-friction bearings on non-turning shaft. Drum driven through spur gear reduction by four two-speed, high torque, radial piston hydraulic motors. Infinitely variable rope drum speed control in three speed ranges — low, medium, and high — is standard.

Low Speed — Hydraulic motors each set to run at 90 cu. in. *(1 475.10 cm³)* displacement per revolution.

Medium Speed — Two hydraulic motors each set to run at 25 cu. in. *(409.75 cm³)*, and two hydraulic motors set to run at 90 cu. in. *(1 475.10 cm³)* displacement per revolution.

High Speed — Hydraulic motors each set to run at 25 cu. in. *(409.75 cm³)* displacement per revolution.

Optional main load hoist drum — Available is an optional main hoist drum for greater wire rope capacities.

Auxiliary load hoist drum — Optional. Smooth, 18" *(0.46 m)* root diameter, 33⅛" *(0.84 m)* wide between flanges; mounted on anti-friction bearings on non-turning shaft. Drum driven through spur gear reduction by one 2-speed, high torque, radial piston hydraulic motor. Infinitely variable speed control in two speed ranges — low and high — is standard.

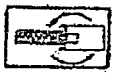
Low speed — Hydraulic motor set to run at 90 cu. in. *(1 475.10 cm³)* displacement per revolution.

High speed — Hydraulic motor set to run at 45 cu. in. *(737.55 cm³)* displacement per revolution.

Drum brakes

External contracting band holding brakes; spring applied, air released. Brake drums involute splined to hydraulic motor counter-shafts at opposite end of shafts from motors. Brakes spring applied when control lever is moved to "brake on" position; air released when control lever is moved to neutral position — at which time hydraulic motor is blocked hydraulically to restrain load.

Load indicating and overload warning system — Equipped with a load-moment device for measuring the load and the load radius. Incorporated with this device is an overload warning system which warns the operator when an overload condition exists and inhibits certain functions of the machine.



Swing Mechanism

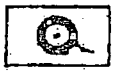
Two fixed displacement, high torque, radial piston hydraulic motors; each drive one vertical swing shaft. Machine-cut swing pinion splined on each vertical swing shaft.

Swing Brake — Disc type, mounted on one hydraulic swing motor, spring applied, air released. Holding brake only, not intended for stopping swing.

Swing Speed — 1.45 r.p.m. @ high idle no load; 1.14 r.p.m. @ engine full load speed.

Independent hydraulic boomhoist

Grooved, wire rope drum, 24" *(0.61 m)* root diameter; mounted on anti-friction bearings on non-turning shaft. Drum driven through spur gear reduction by one hydraulic motor. Infinitely variable control.



Boomhoist brake

Arrangement same as for load hoist drum brakes.

Drum locking pawl

Mechanical drum locking pawl is standard; pawl is air released.

Electrical system

24-volt; two 12-volt batteries.

Operator's cab

Completely enclosed operator's cab is located between boomfeet for greater visibility. Tinted safety glass is used throughout the cab. The side windows are sliding. Main front windows swing outward for ventilation and ease of cleaning, while the upper and lower front windows are stationary. Rear door slides to the right and has provisions for a padlock. To reduce the sound level, the cab is trimmed with sound proofing. Instrumentation includes tachometer, air pressure gauge, load gauges, and load indicator. Standard equipment also includes two dome lights, a dry chemical fire extinguisher, defroster fan and hot water heater.

Machinery cab

Fabricated steel cab has two doorways at front of cab to provide inside access. Two doorways provide access to the sump tank for service, while a doorway is also provided for access to the hydraulic lines. A ladder and platform is provided to gain access to roof. Handrail is provided around the roof of the machinery cab and winch package. Three lights are also provided inside the machinery cab as standard equipment.

Counterweight

Total 94,400# *(42 819 kg)*. One fixed counterweight — 23,600# *(10 705 kg)* — attached to rear of frame. Moving counterweight — 70,800# *(32 114 kg)* consisting of three segments weighing 23,600# *(10 705 kg)* each — is attached to moving trolley which rides on underneath side of revolving upperstructure frame. Counterweight moves toward rear of frame as boom is lowered — provides rear moment to compensate for that which is imposed by lifting load.

Boom

Heavy duty boom

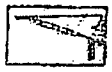
Tubular; basic boom two-piece 80' *(24.38 m)* long; 75" wide *(1.90 m)*, 75" *(1.90 m)* deep at connections. Main chords of T-1 alloy steel are 5¼" *(0.13 m)* outside diameter. Maximum boom length is 200' *(60.96 m)*. Expanded metal walkways are provided on top of the boom for access to the boomhead machinery.

Base section — 40' *(12.19 m)* long, boom feet are 4¾" *(0.12 m)* wide on 96¼" *(2.44 m)* centers.

Boom extensions — Available in 10' *(3.05 m)*, 20' *(6.10 m)*, 30 *(9.14 m)* and 40' *(12.19 m)* lengths with appropriate length pendants.

Top section — 40' *(12.19 m)* long. Equipped with two head sheaves. Sheaves are mounted on anti-friction bearings. A hanger block equipped with single sheave is supplied as standard equipment for use with 3 or 4 parts of line.

Boom connections — In-line pin connected.



Boom tip extension

Optional: Tapered, 10' *(3.05 m)* long, 14,800# *(6 713 kg)* rating, Tubular main chords, 100,000 p.s.i. *(7 031 kg/cm²)* alloy steel; pin-connected to boom top section in fixed position, 18 degrees offset from boom. Equipped with one main load hoist rope sheave and one hoist rope deflector sheave mounted on anti-friction bearings. Mounts on boom lengths 80' *(24.38 m)* through 200' *(60.96 m)*.

Boom stops

Dual, rigid, with spring loaded bumper ends; mounted on mast.

Boomhoist bridle

Connects boomhoist wire rope reeving to boom pendants. Equipped with three sheaves, mounted on anti-friction bearings to accommodate 6-part boomhoist wire rope reeving.

Mast

Supports boom suspension system. Wide flange beam construction, pin-connected to revolving upperstructure frame. Equipped with three boomhoist sheaves on anti-friction bearings and one fleeting auxiliary load hoist line deflector sheave.

Mast ladders and platforms — Accessibility to the mast for reeving rope and maintenance is provided by upper and lower platforms. The upper platform is located near the top of the mast, while the lower platform is located 10½' *(3.20 m)* above the crane deck. A ladder provides accessibility to both platforms.

FMC

Auxiliary Equipment

Boom angle indicator

Standard; pendulum type mounted on boom base section.

Load hoist limit switch — Prevents hoisting load into boom peak.

Engine alarm — Trips warning buzzer if water temperature is too high or if engine oil pressure is too low.

Main air solenoid valve — When properly adjusted, acts to immobilize all systems in event of an engine failure.

We are constantly improving our products and therefore reserve the right to change designs and specifications

FMC

Link-Belt® TG-1900 Performance Specifications

Wire rope and rope drum data —

Main load hoist wire rope length — using 1⅝" *(41 mm)* diameter wire rope.

Table below — indicates length of load hoist wire rope required for handling loads between boomfoot level and boom head sheaves.

Parts of line	Boom lengths															
	80' (24.38 m)		90' (27.43 m)		100' (30.48 m)		110' (33.53 m)		120' (36.58 m)		130' (39.62 m)		140' (42.67 m)		150' (45.72 m)	
	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters
1	220	67.06	240	73.15	260	79.25	280	85.34	300	91.44	320	97.54	340	103.63	360	109.73
2	310	94.49	340	103.63	370	112.78	400	121.92	430	131.06	460	140.21	490	149.35	520	158.50
3	370	112.78	410	124.97	450	137.16	490	149.35	530	161.54	570	173.74	610	185.93	650	198.12
4	450	137.16	500	152.40	550	167.64	600	182.88	650	198.12	700	213.36	750	228.60	800	243.84

Parts of line	Boom lengths									
	160' (48.77 m)		170' (51.82 m)		180' (54.86 m)		190' (57.91 m)		200' (60.96 m)	
	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters
1	380	115.82	400	121.92	420	128.02	440	134.11	460	140.21
2	550	167.64	580	176.78	610	185.93	640	195.07	670	204.22
3	690	210.31	730	222.50	770	234.70	810	246.89	850	259.08
4	850	259.08	900	274.32	950	289.56	1,000	304.80	1,050	320.04

Table below — indicates additional length of load hoist wire rope which must be added to that shown in above table for handling loads between boomfoot level and ground.

Parts of line	Tower heights①							
	40' (12.19 m)		60' (24.38 m)		120' (36.58 m)		160' (48.77 m)	
	Feet	meters	Feet	meters	Feet	meters	Feet	meters
1	50	15.24	90	27.43	130	39.62	170	51.82
2	100	30.48	180	54.85	260	79.25	340	103.63
3	150	45.72	270	82.30	390	118.87	510	155.45
4	200	60.96	360	109.73	520	158.50	680	207.26

①For tower heights in excess of 160' *(48.77 m)*, multiply the additional tower height by the number of parts of line to be used, and add that total to the amount required for 160' *(48.77 m)* of tower.

Auxiliary load hoist wire rope lengths — using ⅞" *(22 mm)* diameter wire rope.

Table below — indicates length of load hoist wire rope required for handling loads between boomfoot level and boom tip extension head sheaves.

Parts of line	Boom lengths															
	80' (24.38 m)		90' (27.43 m)		100' (30.48 m)		110' (33.53 m)		120' (36.58 m)		130' (39.62 m)		140' (42.67 m)		150' (45.72 m)	
	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters
1	200	60.96	220	67.06	240	73.15	260	79.25	280	85.34	300	91.44	320	97.54	340	103.63

Parts of line	Boom lengths									
	160' (48.77 m)		170' (51.82 m)		180' (54.86 m)		190' (57.91 m)		200' (60.96 m)	
	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters
1	360	109.73	380	115.82	400	121.92	420	128.02	440	134.11

TG-1900 performance specifications

Wire rope and rope drum data — (continued)

Auxiliary load hoist lengths — (continued)

Table below — indicates additional length of load hoist wire rope which must be added to that shown in the previous table for handling loads between boomfoot level and ground.

Parts of line	Tower height①							
	40' (12.19 m)		60' (24.38 m)		120' (36.58 m)		160' (48.77 m)	
	Feet	meters	Feet	meters	Feet	meters	Feet	meters
1	50	15.24	90	27.43	190	59.62	170	51.82

①For tower heights in excess of 160' (48.77 m), add the additional tower height to the amount of wire rope required for 160' (48.77 m) of tower.

Drum wire rope capacities —

Wire rope layer	Main load hoist drum — 54" (1.38 m) root diameter grooved drum 1½" (41 mm) wire rope				Optional main load hoist drum — 54" (1.38 m) root diameter grooved drum 1½" (41 mm) wire rope				Auxiliary load hoist drum — 18" (0.46 m) root diameter smooth tagging ⅞" (22 mm) wire rope			
	Rope per layer		Total wire rope		Rope per layer		Total wire rope		Rope per layer		Total wire rope	
	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters	Feet	meters
1	368	112.16	368	112.16	358	109.42	358	109.42	172	52.43	172	52.43
2	421	128.32	789	240.48	412	125.58	771	235.00	199	60.65	371	113.08
3	444	135.33	1,233	375.81	434	132.28	1,205	367.28	215	65.53	586	178.61
4					457	139.29	1,662	506.58	232	70.71	818	249.32
5					480	146.30	2,142	652.88				

Wire rope layer	Boomhoist drum — 54" (3.81 m) root diameter grooved drum 1¾" (22 mm)			
	Rope per layer		Total wire rope	
	Feet	meters	Feet	meters
1	213	64.92	213	64.92
2	248	75.59	461	140.51
3	271	82.60	732	223.11

Rope size and type —

Wire rope application	Size and type used
Boomhoist	1¼" (32 mm) diameter, Type "DB"
Main load hoist	1½" (41 mm) diameter, Type "Y"
Auxiliary load hoist	⅞" (22 mm) diameter, Type "H"
Boom pendants	1¾" (44 mm) diameter, Type "N"

Wire rope types
Type "DB" — 6 x 25 (6 x 19 class), Warrington Seale, extra improved plow steel, preformed, independent wire rope center, right lay, regular lay.
Type "Y" — 35 x 7 non-rotating special tensile formed.
Type "H" — 6 x 25 (6 x 19 class), filler wire, extra improved plow steel, preformed, independent wire rope center, right lay, regular lay.

TG-1900 performance specifications

Wire rope and rope drum data — (continued)

Permissible line speed and line pull — based on Type "Y" wire rope strength for main drums and Type "N" wire rope strength for auxiliary drum.

Main load hoist drum											
Reel diameter	Wire rope diameter		Rope layer	Number of wraps	Rope drum operating speeds	Rated line pull①		Line speed at rated line pull		No load line speed	
	Inches	mm				Pounds	Kilograms	F.p.m.	m/min	F.p.m.	m/min
54" (1.37 m)	1⅝	41.28	1	25.3	Low	63,100	28 622	186	41.45	180	54.86
			2	27.3		61,200	27 760	144	43.89	190	57.91
			3	27.3		58,000	26 309	182	46.33	201	61.26
			1	25.3	Medium	40,100	18 169	209	63.70	279	85.04
			2	27.3		37,900	17 191	222	67.67	295	89.92
			3	27.3		35,900	16 284	234	71.32	312	95.10
			1	25.3	High	15,500	7 031	477	145.39	640	195.07
			2	27.3		14,500	6 577	505	153.92	677	206.35
			3	27.3		13,500	6 305	532	162.16	715	217.93

Optional main load hoist drum											
Reel diameter	Wire rope diameter		Rope layer	Number of wraps	Rope drum operating speeds	Rated line pull①		Line speed at rated line pull		No load line speed	
	Inches	mm				Pounds	Kilograms	F.p.m.	m/min	F.p.m.	m/min
54" (1.37 m)	1⅝	41.28	1	24.7	Low	63,100	28 622	124	37.80	180	54.86
			2	26.7		63,100	28 622	131	39.93	190	57.91
			3	26.7		63,100	28 622	138	42.06	201	61.26
			4	26.7		60,800	27 579	145	44.20	211	64.31
			5	26.7		58,000	26 309	152	46.33	222	67.67
			1	24.7	Medium	44,900	20 684	191	58.22	279	85.04
			2	26.7		41,600	19 005	202	61.57	295	89.92
			3	26.7		39,700	18 008	213	64.92	312	95.10
			4	26.7		37,700	17 101	224	68.26	327	99.67
			5	26.7		35,900	16 284	234	71.32	344	104.85
			1	24.7	High	17,100	7 757	422	128.63	640	195.07
			2	26.7		16,200	7 348	447	136.25	677	206.35
			3	26.7		15,200	6 940	471	143.56	715	217.93
			4	26.7		14,500	6 577	496	151.18	752	229.21
			5	26.7		13,900	6 305	521	158.80	790	240.79

①Permissible line pull based on 1⅝" (41 mm) diameter wire rope is restricted to 63,100 lbs. (28 622 kg).

Optional auxiliary load hoist											
Reel diameter	Wire rope diameter		Rope layer	Number of wraps	Rope drum operating speeds	Rated line pull		Line speed at rated line pull		No load line speed	
	Inches	mm				Pounds	Kilograms	F.p.m.	m/min	F.p.m.	m/min
18" (0.46 m)	⅞"	22.23	1	34.8	Low	19,200	8 709	216	65.84	252	76.81
			2	36.8		17,600	7 983	236	71.93	276	84.12
			3	36.8		16,200	7 348	256	78.03	299	91.14
			4	36.8		15,000	6 804	276	84.12	322	98.15
			1	34.8	High	5,900	2 676	424	129.24	500	152.40
			2	36.8		5,400	2 449	463	141.12	547	166.73
			3	36.8		5,000	2 268	502	153.01	593	180.75
			4	36.8		4,600	2 087	541	164.90	639	194.77

We are constantly improving our products and therefore reserve the right to change designs and specifications

FMC

FMC Corporation

Cable Crane & Excavator Division
1201 Sixth Street Southwest
P.O. Box 2108
Cedar Rapids, Iowa 52406

Link-Belt® cranes & excavators
manufactured in: Cedar Rapids Iowa
Lexington & Bowling Green Kentucky
Ontario Canada • Milan Italy
Queretaro Mexico & Nagoya Japan (under license)

FMC

Link-Belt® TG-1900 lifting crane capacities — without climbing frame

Refer to Notes page 15

Tower — free standing, without climbing frame; 9' 8" x 9' 8" (2.97 x 2.97 m) cross section. Tower heights 19' 7½" (4.16 m) through 162' 7½" (49.57 m) — see footnote②.

Mast — 43' 0½" (13.11 m) over-all height.

Boom — tubular; 75" x 75" (1.91 x 1.91 m) with 40' (12.19 m) base section, 40' (12.19 m) top section, 1¾" (44 mm) diameter boom pendants, with or without boom tip extension.

Boom tip extension — tubular; 14,600# (6 713 kg) rating; 10' (3.05 m) long.

Counterweights — Total 94,400# (42 820 kg). Includes one fixed counterweight — 23,600# (10 705 kg) plus one moving counterweight — 70,800# (32 115 kg) consisting of three sections weighing 23,600# (10 705 kg) each.

Boom				Load radius③		Capacities — Main boom only①							
	Angle	Boom point height②				4-part hoist line		3-part hoist line		2-part hoist line		1-part hoist line	
Length	Degree	Feet	meters	Feet	meters	Pounds	Kilograms	Pounds	Kilograms	Pounds	Kilograms	Pounds	Kilograms
60' (24.38 m)	85.5	89' 6"	27.27	10	3.05					115,200	52 253		
	84.8	89' 5"	27.25	11	3.35								
	84.1	89' 4"	27.22	12	3.66								
	83.4	89' 2"	27.19	13	3.96								
	82.7	89' 1"	27.15	14	4.27							57,600	26 126
	81.9	88' 11"	27.11	15	4.57								
	78.3	88' 7"	26.84	20	6.10	230,400	104 507	172,800	78 380				
	74.6	88' 10"	26.46	25	7.62	230,400	104 507						
	70.9	85' 4"	26.00	30	9.14	204,200	92 623						
	67.0	83' 5"	25.42	35	10.67	177,600	80 612	172,800	78 380				
	63.1	81' 1"	24.71	40	12.19	156,000	71 123	157,100	71 259				
	54.7	76' 0"	22.57	50	15.24	126,800	57 515	127,100	57 651	115,200	52 253		
	45.4	68' 6"	20.91	60	18.29	106,300	48 216	105,600	48 352	102,800	46 449		
	34.1	54' 8"	18.65	70	21.34	90,200	40 914	90,400	41 004	90,700	41 140		
	17.7	34' 1"	10.38	80	24.38	69,000	31 297	69,700	31 615	71,100	32 250	57,600	26 126
80' (24.38 m)	85.4	99' 5"	30.31	11	3.35					115,100	52 208		
	84.8	99' 4"	30.28	12	3.66								
	84.1	99' 3"	30.25	13	3.96								
	83.5	99' 2"	30.22	14	4.27							57,500	26 081
	82.8	99' 0"	30.18	15	4.57								
	79.6	98' 5"	29.95	20	6.10	230,300	104 462	172,700	78 335				
	76.4	97' 2"	29.62	25	7.62	230,300	104 462						
	73.1	95' 10"	29.21	30	9.14	201,800	91 580						
	69.7	94' 2"	28.69	35	10.67	175,400	79 560	172,700	78 335				
	66.3	92' 1"	28.08	40	12.19	154,700	70 170	155,100	70 352				
	59.1	86' 11"	26.50	50	15.24	124,600	56 518	125,200	56 789	115,100	52 208		
	51.4	80' 0"	24.39	60	18.29	104,300	47 309	104,800	47 445	104,900	47 581		
	42.6	70' 8"	21.55	70	21.34	88,500	40 188	88,900	40 324	89,100	40 415		
	32.1	57' 7"	17.56	80	24.38	76,500	34 699	76,700	34 790	77,000	34 926		
	16.7	35' 7"	10.84	90	27.43	59,700	27 079	60,800	27 351	61,400	27 850	57,500	26 081
100' (30.48 m)	85.3	109' 5"	33.34	12	3.66					115,000	52 163		
	84.7	109' 4"	33.31	13	3.96								
	84.1	109' 2"	33.28	14	4.27								
	83.6	109' 1"	33.25	15	4.57							57,500	26 081
	80.7	108' 5"	33.04	20	6.10								
	77.8	107' 5"	32.75	25	7.62	230,100	104 371	172,600	78 244				
	74.8	106' 3"	32.38	30	9.14	189,700	86 092	172,600	78 244				
	71.8	104' 8"	31.92	35	10.67	173,200	78 607	172,600	78 244				
	68.8	102' 11"	31.38	40	12.19	152,700	69 263	153,200	69 490				
	62.5	98' 5"	29.99	50	15.24	122,900	55 746	123,400	55 973	115,000	52 163		
	55.9	92' 5"	28.17	60	18.29	102,400	46 447	102,800	46 629	103,200	46 810		
	48.5	84' 8"	25.81	70	21.34	87,100	39 507	87,500	39 689	87,900	39 870		
	40.4	74' 6"	22.70	80	24.38	74,800	33 974	75,200	34 110	75,600	34 291		
	30.4	60' 5"	18.41	90	27.43	65,600	29 755	65,800	29 846	66,100	29 982	57,500	26 081
	15.6	37' 0"	11.28	100	30.48	51,900	23 541	52,400	23 768	53,300	24 176	55,800	25 310
110' (33.53 m)	85.2	119' 4"	36.37	13	3.96					114,900	52 117		
	84.7	119' 3"	36.35	14	4.27								
	84.2	119' 2"	36.32	15	4.57								
	81.5	118' 6"	36.13	20	6.10	—						57,400	26 036
	78.9	117' 9"	35.66	25	7.62	229,900	104 280	172,400	78 189				
	76.2	116' 7"	35.53	30	9.14	197,500	89 584	172,400	78 189				
	73.5	115' 2"	35.11	35	10.67	171,900	77 700	171,900	77 927				
	70.8	113' 7"	34.62	40	12.19	150,800	68 401	151,300	68 628				
	65.2	109' 7"	33.39	50	15.24	121,100	54 930	121,600	55 156	114,900	52 117		
	59.3	104' 3"	31.78	60	18.29	100,700	45 676	101,100	45 858	101,600	46 084		
	53.0	97' 7"	29.74	70	21.34	85,800	38 918	86,200	39 099	86,600	39 281		
	46.1	89' 1"	27.14	80	24.38	73,600	33 384	74,000	33 565	74,300	33 701		
	38.4	78' 1"	23.79	90	27.43	64,100	29 075	64,400	29 211	64,800	29 392		
	29.0	63' 1"	19.22	100	30.48	56,700	25 718	56,900	25 809	57,200	25 945	57,400	26 036
	15.1	38' 4"	11.69	110	33.53	45,200	20 502	45,600	20 683	46,400	21 046	48,400	21 953

(continued)

②Consult manufacturer for tower heights greater than 162' 7½" (49.57 m).
①Load handled off main boom head sheaves with 10' (3.05 m) boom tip extension mounted on boom.
②Measured vertically from center of boom head sheave to base of turntable bearing mounting
③Measured from center of tower base section to center of gravity of freely suspended load.

TG-1900 lifting crane capacities — without climbing frame

Refer to Notes page 15.

Boom				Load radius②		Capacities — Main boom only①							
	Angle	Boom point height③				4-part hoist line		3-part hoist line		2-part hoist line		1-part hoist line	
Length	Degrees	Feet	meters	Feet	meters	Pounds	Kilograms	Pounds	Kilograms	Pounds	Kilograms	Pounds	Kilograms
120' (36.58 m)	85.6	129' 4"	39.43	13	3.96					114,600	52 072		
	85.1	129' 3"	39.41	14	4.27								
	84.8	129' 2"	39.38	15	4.57								
	82.2	129' 7"	39.20	20	6.10							57,400	26 036
	79.8	127' 10"	38.96	25	7.62	229,700	104 120	172,200	78 109				
	77.4	126' 10"	38.65	30	9.14	195,200	88 585	172,200	78 109				
	74.9	125' 7"	38.28	35	10.67	169,200	76 747	169,900	77 019				
	72.4	124' 2"	37.83	40	12.19	148,900	67 539	149,400	67 763				
	67.4	120' 6"	36.72	50	15.24	119,400	54 158	119,800	54 385	114,800	52 072		
	62.1	116' 9"	35.58	60	18.29	99,000	44 905	99,500	45 132	100,000	45 359		
	55.5	109' 10"	33.47	70	21.34	84,100	38 147	84,600	38 373	85,000	38 555		
	50.6	102' 5"	31.22	80	24.38	72,300	32 794	72,800	33 021	73,200	33 202		
	44.1	93' 2"	28.41	90	27.43	62,800	28 485	63,200	28 667	63,600	28 848	57,600	26 036
	36.7	81' 5"	24.82	100	30.48	55,200	25 038	55,600	25 219	55,900	25 355	58,800	26 491
	27.7	65' 7"	19.99	110	33.53	49,200	22 316	49,500	22 452	49,700	22 543	50,000	22 679
	14.4	39' 0"	12.09	120	36.58	39,600	17 916	39,800	18 052	40,400	18 325	42,000	19 050
130' (39.62 m)	85.5	133' 4"	42.47	14	4.27					114,700	52 027		
	85.1	133' 3"	42.44	15	4.57								
	82.8	133' 0"	42.28	20	6.10							57,300	25 990
	80.6	132' 0"	42.06	25	7.62								
	78.4	131' 1"	41.77	30	9.14	183,200	83 534	172,100	78 063				
	76.1	130' 11"	41.43	35	10.67	167,200	75 840	167,800	76 112				
	73.6	130' 7"	41.02	40	12.19	147,000	66 678	147,600	66 950				
	69.2	131' 3"	40.00	50	15.24	117,600	53 342	118,200	53 614	114,700	52 027		
	64.4	129' 11"	38.69	60	18.29	97,800	44 134	97,200	44 406	98,400	44 633		
	59.4	127' 7"	37.08	70	21.34	82,600	37 421	83,000	37 648	83,600	37 920		
	54.1	123' 1"	35.07	80	24.38	71,100	32 250	71,600	32 477	72,200	32 749		
	48.5	117' 6"	32.62	90	27.43	61,500	27 895	62,000	28 122	62,500	28 349	57,300	25 990
	42.3	107' 2"	29.61	100	30.48	53,600	24 448	54,300	24 630	54,800	24 856	55,200	25 038
	35.2	94' 8"	25.81	110	33.53	47,800	21 691	48,100	21 817	48,600	21 999	48,800	22 180
	26.6	68' 0"	20.73	120	36.58	42,600	19 413	43,100	19 549	43,400	19 685	43,700	19 821
	18.9	40' 11"	12.48	130	39.62	34,400	15 609	34,700	15 739	35,300	16 011	35,600	16 601
140' (42.67 m)	85.4	149' 3"	45.50	15	4.57					114,600	51 981		
	83.4	148' 9"	45.35	20	6.10							57,300	25 990
	81.3	148' 1"	45.14	25	7.62								
	79.2	147' 3"	44.88	30	9.14	190,900	86 590	172,000	78 017				
	77.1	146' 2"	44.56	35	10.67	165,200	74 983	165,900	75 205				
	75.0	145' 0"	44.18	40	12.19	145,100	65 816	145,600	66 043				
	70.7	141' 11"	43.24	50	15.24	115,900	52 571	116,500	52 843	114,600	51 981		
	66.3	137' 11"	42.05	60	18.29	95,700	43 409	96,900	43 950	96,900	43 950		
	61.8	133' 1"	40.55	70	21.34	80,800	36 695	81,500	36 967	82,100	37 239		
	57.0	127' 2"	38.76	80	24.38	69,700	31 615	70,200	31 842	70,800	32 114		
	52.0	120' 0"	36.59	90	27.43	60,400	27 396	60,900	27 623	61,400	27 850	57,300	25 990
	46.6	111' 5"	33.96	100	30.48	52,700	23 904	53,200	24 131	53,700	24 357	54,200	24 584
	40.7	100' 11"	30.77	110	33.53	46,500	21 092	46,900	21 273	47,400	21 500	47,800	21 681
	33.9	87' 10"	26.78	120	36.58	41,400	18 778	41,800	18 960	42,200	19 141	42,500	19 277
	26.6	70' 4"	21.43	130	39.62	37,300	16 919	37,800	17 055	37,900	17 191	38,100	17 281
	18.4	42' 1"	12.83	140	42.67	29,900	13 562	30,200	13 698	30,700	13 925	31,800	14 424
150' (45.72 m)	85.7	159' 4"	48.56	15	4.57					114,500	51 936		
	83.8	158' 10"	48.42	20	6.10							57,200	25 945
	81.9	158' 3"	48.22	25	7.62								
	79.9	157' 8"	47.98	30	9.14	188,800	85 638	171,800	77 927				
	78.0	156' 5"	47.68	35	10.67	163,200	74 026	163,900	74 343				
	76.0	155' 3"	47.33	40	12.19	143,200	64 954	143,900	65 271				
	72.1	152' 5"	46.48	50	15.24	114,200	51 800	114,800	52 117	114,500	51 936		
	68.0	148' 10"	45.35	60	18.29	94,100	42 683	94,700	42 955	95,400	43 272		
	63.8	144' 4"	43.99	70	21.34	79,400	36 016	80,000	36 287	80,700	36 604		
	59.5	139' 11"	42.34	80	24.38	68,200	30 935	68,800	31 207	69,400	31 479		
	54.9	132' 8"	40.38	90	27.43	59,300	26 898	59,800	27 124	60,400	27 396	57,200	25 945
	50.1	124' 10"	38.04	100	30.48	51,500	23 360	52,100	23 632	52,700	23 904	53,200	24 131
	44.9	115' 8"	35.25	110	33.53	45,500	20 547	45,800	20 774	46,300	21 001	46,600	21 228
	39.2	104' 7"	31.87	120	36.58	40,100	18 189	40,600	18 415	41,100	18 642	41,500	18 824
	32.7	90' 9"	27.67	130	39.62	35,800	16 283	36,300	16 465	36,700	16 646	37,100	16 828
	24.8	72' 7"	22.11	140	42.67	32,300	14 651	32,600	14 787	32,900	14 923	33,200	15 059
	12.9	43' 3"	13.18	150	45.72	25,900	11 748	26,200	11 884	26,600	12 065	27,500	12 473

(continued)

①Load handled off main boom head sheaves with 10' (3.05 m) boom tip extension mounted on boom.
②Measured vertically from center of boom head sheave to base of turntable bearing mounting.
③Measured from center of tower base section to center of gravity of freely suspended load.

TG-1900 lifting crane capacities — without climbing frame

Refer to Notes page 15.

Boom				Load radius②		Capacities — Main boom only①							
	Angle	Boom point height③				4-part hoist line		3-part hoist line		2-part hoist line		1-part hoist line	
Length	Degree	Feet	meters	Feet	meters	Pounds	kilograms	Pounds	kilograms	Pounds	kilograms	Pounds	kilograms
160' (48.77 m)	84.2	168' 11"	51.48	20	6.10					114,400	51 890		
	82.4	168' 4"	51.30	25	7.62							57,200	25 945
	80.6	167' 7"	51.07	30	9.14								
	78.8	166' 8"	50.78	35	10.67	161,100	73 073	161,300	73 436				
	76.9	165' 7"	50.47	40	12.19	141,300	64 092	142,100	64 455	114,600	51 890		
	73.2	162' 11"	49.65	50	15.24	112,400	50 983	113,200	51 346	113,900	51 664		
	69.4	159' 6"	48.62	60	18.29	92,500	41 957	93,200	42 274	93,900	42 592		
	65.6	155' 8"	47.36	70	21.34	77,900	35 289	78,500	35 607	79,200	35 924		
	61.6	150' 5"	45.84	80	24.38	66,700	30 254	67,300	30 526	68,000	30 844		
	57.4	144' 6"	44.06	90	27.43	57,600	26 099	58,600	26 580	59,200	26 852	57,200	25 945
	53.0	137' 7"	41.93	100	30.48	50,400	22 861	51,000	23 133	51,700	23 450	52,300	23 722
	48.4	129' 6"	39.44	110	33.53	44,100	20 003	44,700	20 275	45,300	20 547	45,900	20 819
	43.4	119' 8"	36.49	120	36.58	38,800	17 690	39,500	17 918	40,000	18 143	40,500	18 370
	37.9	108' 1"	32.94	130	39.62	34,500	15 654	35,100	15 921	35,600	16 147	36,100	16 374
	31.8	93' 6"	28.55	140	42.67	30,900	14 016	31,400	14 242	31,800	14 424	32,200	14 605
	24.0	74' 9"	22.77	150	45.72	27,900	12 655	28,200	12 791	28,600	12 927	28,900	13 108
	12.5	44' 4"	13.52	160	48.77	22,800	10 115	22,800	10 251	22,900	10 387	23,700	10 750
170' (51.82 m)	84.5	178' 11"	54.54	20	6.10					114,300	51 845		
	82.8	178' 5"	54.37	25	7.62							57,100	25 900
	81.1	177' 8"	54.16	30	9.14								
	79.4	176' 10"	53.90	35	10.67	159,100	72 185	159,900	72 528				
	77.7	175' 10"	53.59	40	12.19	139,400	63 230	140,200	63 593	114,300	51 845		
	74.2	173' 4"	52.83	50	15.24	110,700	50 212	111,500	50 575	112,200	50 893		
	70.7	170' 2"	51.87	60	18.29	90,200	41 231	91,000	41 549	92,400	41 911		
	67.1	166' 4"	50.69	70	21.34	76,300	34 609	77,000	34 928	77,800	35 289		
	63.4	161' 8"	49.28	80	24.38	65,200	29 574	65,900	29 891	66,700	30 254		
	59.5	156' 3"	47.62	90	27.43	56,600	25 627	57,200	25 945	57,900	26 263	57,100	25 900
	55.5	149' 11"	45.68	100	30.48	49,400	22 407	50,000	22 679	50,700	22 997	51,400	23 314
	51.3	142' 6"	43.42	110	33.53	43,000	19 504	43,700	19 821	44,300	20 094	45,000	20 411
	46.9	133' 10"	40.78	120	36.58	37,800	17 145	38,400	17 417	39,000	17 690	39,600	17 962
	42.1	123' 7"	37.68	130	39.62	33,500	15 195	34,000	15 422	34,600	15 694	35,100	15 921
	35.8	111' 5"	33.97	140	42.67	29,700	13 471	30,200	13 698	30,700	13 925	31,200	14 152
	30.7	96' 6"	29.40	150	45.72	26,600	12 065	27,000	12 246	27,400	12 428	27,800	12 609
	23.2	76' 10"	23.41	160	48.77	24,000	10 886	24,300	11 022	24,600	11 158	25,000	11 339
	12.1	45' 5"	13.85	170	51.82	19,000	8 618	19,200	8 708	19,600	8 890	20,200	9 162
180' (54.88 m)	84.8	189' 0"	57.60	20	6.10					114,200	51 800		
	83.2	188' 8"	57.45	25	7.62							57,100	25 900
	81.8	187' 10"	57.24	30	9.14								
	80.0	187' 0"	57.00	35	10.67	152,500	69 172	153,400	69 581				
	78.4	186' 1"	56.71	40	12.19	137,500	62 368	138,300	62 731	114,200	51 800		
	75.1	183' 8"	55.99	50	15.24	109,000	49 441	109,800	49 804	110,700	50 212		
	71.8	180' 9"	55.08	60	18.29	89,200	40 460	90,100	40 868	90,900	41 231		
	68.4	177' 1"	53.98	70	21.34	74,800	33 928	75,600	34 291	76,400	34 654		
	65.0	172' 10"	52.67	80	24.38	63,700	28 893	64,600	29 256	65,300	29 619		
	61.4	167' 9"	51.13	90	27.43	55,000	24 947	55,800	25 310	56,600	25 673	57,100	25 900
	57.7	161' 10"	49.33	100	30.48	48,100	21 817	48,800	22 135	49,500	22 452	50,300	22 815
	53.8	155' 1"	47.28	110	33.53	42,000	19 050	42,700	19 368	43,400	19 685	44,100	20 003
	49.8	147' 2"	44.86	120	36.58	36,700	16 646	37,800	16 964	38,000	17 236	38,700	17 554
	45.5	138' 1"	42.08	130	39.62	32,800	14 651	32,900	14 923	33,800	15 240	34,200	15 512
	40.8	127' 5"	38.83	140	42.67	28,800	12 972	29,100	13 189	29,700	13 471	30,300	13 743
	35.7	114' 9"	34.96	150	45.72	25,800	11 475	25,800	11 702	26,300	11 929	26,900	12 201
	29.8	99' 2"	30.22	160	48.77	22,600	10 251	23,100	10 477	23,500	10 659	23,800	10 840
	22.6	76' 10"	24.09	170	51.82	20,400	9 253	20,700	9 389	21,100	9 570	21,400	9 706
	11.8	48' 6"	14.17	180	54.86	16,000	7 257	16,200	7 348	16,500	7 484	17,100	7 756

(continued)

①Load handled off main boom head sheaves with 10' (3.05 m) boom tip extension mounted on boom.
②Measured vertically from center of boom head sheave to base of turntable bearing mounting.
③Measured from center of tower base section to center of gravity of freely suspended load

TG-1900 lifting crane capacities — without climbing frame

Refer to Notes page 15.

Boom				Load radius②		Capacities — Main boom only①							
	Angle	Boom point height③				4-part hoist line		3-part hoist line		2-part hoist line		1-part hoist line	
Length	Degree	Feet	meters	Feet	meters	Pounds	kilograms	Pounds	kilograms	Pounds	kilograms	Pounds	kilograms
100' (57.91 m)	85.1	199' 0"	60.66	20	6.10					114,100	51 754		
	83.6	198' 6"	60.51	25	7.62					↑	↑	57,000	25 854
	82.1	197' 11"	60.32	30	9.14							↑	↑
	80.5	197' 2"	60.09	35	10.67	139,400	63 230	140,300	63 639	↑	↑		
	78.0	195' 3"	59.51	40	12.19	134,800	60 872	138,500	61 915	114,100	51 754		
	75.9	194' 0"	59.14	50	15.24	105,500	47 854	108,000	48 987	109,000	49 441		
	72.8	191' 3"	58.26	60	18.29	88,800	39 917	88,200	40 142	89,400	40 551		
	69.6	187' 10"	57.26	70	21.34	75,200	33 202	74,100	33 611	75,000	34 019		
	66.4	183' 9"	56.01	80	24.38	62,900	28 258	63,100	28 621	63,800	28 934	57,000	25 854
	63.0	179' 0"	54.57	90	27.43	53,600	24 312	54,400	24 676	55,300	25 083	56,100	25 446
	59.6	173' 7"	52.90	100	30.48	46,700	21 182	47,500	21 545	48,300	21 908	49,000	22 228
	56.0	167' 9"	50.96	110	33.53	40,600	18 551	41,700	18 914	42,400	19 232	43,200	19 595
	52.5	160' 0"	48.78	120	36.58	35,700	16 193	36,400	16 510	37,100	16 828	37,800	17 145
	48.4	151' 9"	46.25	130	39.62	31,200	14 152	31,500	14 469	32,600	14 787	33,300	15 104
	44.2	142' 2"	43.34	140	42.67	27,500	12 473	28,100	12 745	28,700	13 018	29,400	13 335
	39.7	131' 1"	39.95	150	45.72	24,200	10 978	24,800	11 249	25,400	11 521	25,900	11 748
	34.7	117' 11"	35.93	160	48.77	21,400	9 706	21,900	9 933	22,500	10 205	23,000	10 432
	29.0	101' 9"	31.02	170	51.82	19,100	8 663	19,600	8 890	20,000	9 071	20,400	9 253
	22.0	80' 9"	24.63	180	54.86	17,200	7 801	17,600	7 982	17,900	8 119	18,200	8 255
	11.5	47' 6"	14.48	190	57.91	15,500	5 897	13,400	6 078	15,700	6 214	14,200	6 441
200' (60.96 m)	85.4	209' 1"	63.72	20	6.10					114,000	51 709		
	83.9	208' 7"	63.58	25	7.62					↑	↑	57,000	25 854
	82.5	208' 0"	63.40	30	9.14							↑	↑
	81.0	207' 3"	63.18	35	10.67					↑	↑		
	79.6	206' 5"	62.92	40	12.19	125,300	56 835	126,500	57 368	114,000	51 709		
	76.6	204' 4"	62.27	50	15.24	101,600	46 084	104,200	47 264	107,400	48 715		
	73.7	201' 8"	61.47	60	18.29	88,400	37 829	85,600	38 782	87,800	39 870		
	70.7	198' 5"	60.49	70	21.34	70,600	32 023	72,300	32 794	73,500	33 339		
	67.6	194' 8"	59.32	80	24.38	60,800	27 578	61,700	27 986	62,600	28 394	57,000	25 854
	64.5	190' 2"	57.57	90	27.43	52,200	23 677	53,100	24 085	53,900	24 448	54,800	24 856
	61.2	185' 1"	55.41	100	30.48	45,300	20 547	46,100	20 910	47,000	21 318	47,800	21 681
	57.9	179' 2"	54.52	110	33.53	39,800	17 962	40,400	18 325	41,300	18 733	42,100	19 096
	54.5	172' 6"	52.58	120	36.58	34,800	15 654	35,400	16 057	36,200	16 420	36,900	16 737
	50.9	164' 10"	50.25	130	39.62	30,200	13 698	30,900	14 016	31,700	14 378	32,400	14 696
	47.1	156' 2"	47.60	140	42.67	26,400	11 974	27,100	12 292	27,800	12 609	28,500	12 927
	43.0	146' 2"	44.56	150	45.72	23,100	10 477	23,700	10 750	24,400	11 067	25,000	11 339
	38.5	134' 7"	41.03	160	48.77	20,200	9 207	20,800	9 480	21,600	9 752	22,100	10 024
	33.8	121' 0"	36.87	170	51.82	17,900	8 119	18,400	8 346	18,900	8 572	19,500	8 845
	28.2	104' 4"	31.80	180	54.86	15,800	7 166	16,300	7 393	16,700	7 574	17,200	7 801
	21.4	82' 8"	25.21	190	57.91	14,200	6 441	14,500	6 577	14,900	6 758	15,200	6 894
	11.2	48' 6"	14.78	200	60.96	10,600	4 808	10,800	4 898	11,100	5 034	11,500	5 216

①Load handled off main boom head sheaves with 10' (3.05 m) boom tip extension mounted on boom.
②Measured vertically from center of boom head sheave to base of turntable bearing mounting.
③Measured from center of tower base section to center of gravity of freely suspended load.

Link-Belt® TG-1300 lift capacities

Boom — tubular: 75" x 75" *(1.91 x 1.91 m)* with 40' *(12.19 m)* base section, 40' *(12.19 m)* open throat top section and 1¾" *(44 mm)* diameter boom pendants.

Jib — tubular: 36" *(0.91 m)* wide, 30" *(0.76 m)* deep.

Counterweights — Total 94,400 lbs. *(42 820 kg)*. Includes one fixed counterweight — 23,600 lbs. *(10 705 kg)* plus one fifteen-section moving counterweight — 70,800 lbs. *(32 115 kg)*.

Boom length	Jib length	Load radius Ft.	Load radius m	Boom angle Degrees	Jib offset 15° 2-part load hoist line Pounds	Jib offset 15° 2-part load hoist line Kilograms	Jib offset 15° 1-part load hoist line Pounds	Jib offset 15° 1-part load hoist line Kilograms
120' (36.58 m)	30' (9.14 m)	35	10.67	80.4	29,600	13 428	14,600	6 713
		40	12.19	78.5	29,600	13 428	↑	↑
		50	15.24	74.5	29,600	13 428		
		60	18.29	70.4	28,300	12 837		
		70	21.34	66.2	25,400	11 521		
		80	24.38	61.9	23,100	10 478		
		90	27.43	57.3	21,200	9 616		
		100	30.48	52.5	19,700	8 936		
		110	33.53	47.3	18,400	8 346		
		120	36.58	41.5	17,300	7 847		
		130	39.62	35.0	16,500	7 484		
		140	42.67	28.9	15,900	7 212	14,600	6 713
	50' (15.24 m)	50	15.24	78.1	20,400	9 253	14,700	6 668
		60	18.29	74.5	18,100	8 210	↑	↑
		70	21.34	70.9	16,200	7 348		
		80	24.38	67.2	14,700	6 668	14,700	6 668
		90	27.43	63.3	13,500	6 124	14,600	6 623
		100	30.48	59.3	12,500	5 670	13,400	6 078
		110	33.53	56.1	11,600	5 262	12,500	5 670
		120	36.58	50.6	10,900	4 944	11,600	5 262
		130	39.62	45.7	10,300	4 672	10,800	4 944
		140	42.67	40.3	9,700	4 400	10,400	4 717
		150	45.72	34.1	9,300	4 218	9,900	4 491
		160	48.77	28.5	9,000	4 082	9,500	4 309
	70' (21.34 m)	60	18.29	77.7	13,100	5 942	14,300	6 486
		70	21.34	74.5	11,700	5 307	12,700	5 761
		80	24.38	71.3	10,600	4 808	11,400	5 171
		90	27.43	67.9	9,600	4 355	10,400	4 717
		100	30.48	64.5	8,800	3 992	9,500	4 309
		110	33.53	60.9	8,200	3 720	8,800	3 992
		120	36.58	57.1	7,600	3 447	8,100	3 674
		130	39.62	53.2	7,100	3 221	7,600	3 447
		140	42.67	48.9	6,700	3 039	7,100	3 221
		150	45.72	44.4	6,300	2 858	6,700	3 039
		160	48.77	39.3	6,000	2 722	6,400	2 903
		170	51.82	33.4	5,600	2 631	6,100	2 767
		180	54.86	28.2	5,600	2 540	5,800	2 676
130' (39.62 m)	30' (9.14 m)	40	12.19	79.2	29,500	13 381	14,700	6 668
		50	15.24	75.5	29,500	13 381	↑	↑
		60	18.29	71.7	29,300	13 290		
		70	21.34	67.8	26,400	11 976		
		80	24.38	63.8	24,000	10 886		
		90	27.43	59.6	22,100	10 026		
		100	30.48	55.3	20,600	9 299		
		110	33.53	50.8	19,200	8 709		
		120	36.58	46.5	18,000	8 166		
		130	39.62	40.1	17,100	7 757		
		140	42.67	33.7	16,400	7 439		
		150	45.72	28.9	15,800	7 167	14,700	6 668
	50' (15.24 m)	50	15.24	76.8	20,900	9 530	14,700	6 668
		60	18.29	75.4	18,600	8 437	↑	↑
		70	21.34	72.0	16,700	7 575		
		80	24.38	68.5	15,200	6 895	14,700	6 668

Boom length	Jib length	Load radius Ft.	Load radius m	Boom angle Degrees	Jib offset 15° 2-part load hoist line Pounds	Jib offset 15° 2-part load hoist line Kilograms	Jib offset 15° 1-part load hoist line Pounds	Jib offset 15° 1-part load hoist line Kilograms
130' (39.62 m)	50' (15.24 m)	90	27.43	65.0	14,000	6 350	14,700	6 668
		100	30.48	61.2	12,800	5 851	14,000	6 350
		110	33.53	57.4	12,000	5 443	13,000	5 897
		120	36.58	53.3	11,300	5 126	12,100	5 489
		130	39.62	48.9	10,600	4 808	11,400	5 171
		140	42.67	44.2	10,100	4 581	10,600	4 808
		150	45.72	39.0	9,600	4 355	10,200	4 627
		160	48.77	33.0	9,300	4 218	9,800	4 445
		170	51.82	26.6	9,000	4 082	9,500	4 309
	70' (21.34 m)	60	18.29	78.4	13,400	6 078	14,700	6 668
		70	21.34	76.4	12,000	5 443	13,100	5 942
		80	24.38	72.3	10,900	4 944	11,900	5 352
		90	27.43	69.1	9,900	4 491	10,700	4 854
		100	30.48	65.9	9,100	4 128	9,800	4 445
		110	33.53	62.6	8,400	3 810	9,100	4 128
		120	36.58	59.1	7,900	3 583	8,400	3 810
		130	39.62	55.4	7,400	3 357	7,900	3 583
		140	42.67	51.6	6,900	3 130	7,400	3 357
		150	45.72	47.6	6,500	2 948	7,000	3 175
		160	48.77	43.1	6,200	2 812	6,600	2 994
		170	51.82	38.1	6,000	2 722	6,300	2 858
		180	54.86	32.4	5,700	2 585	6,100	2 767
		190	57.91	26.3	5,600	2 540	5,900	2 676
140' (42.67 m)	30' (9.14 m)	40	12.19	79.9	29,500	13 381	14,700	6 668
		50	15.24	76.4	29,500	13 381	↑	↑
		60	18.29	72.8	29,500	13 381		
		70	21.34	69.2	27,300	12 383		
		80	24.38	65.6	24,800	11 295		
		90	27.43	61.8	22,900	10 387		
		100	30.48	57.8	21,300	9 662		
		110	33.53	53.4	19,900	9 027		
		120	36.58	48.9	18,700	8 482		
		130	39.62	44.1	17,700	8 029		
		140	42.67	38.8	16,900	7 666		
		150	45.72	32.6	16,300	7 394		
		160	48.77	25.1	15,800	7 167	14,700	6 668
	50' (15.24 m)	50	15.24	79.4	21,400	9 707	14,700	6 668
		60	18.29	76.2	19,100	8 664	↑	↑
		70	21.34	73.0	17,200	7 802		
		80	24.38	69.6	15,700	7 122		
		90	27.43	66.4	14,400	6 532	14,700	6 668
		100	30.48	63.0	13,300	6 033	14,500	6 577
		110	33.53	59.4	12,400	5 625	13,400	6 078
		120	36.58	55.6	11,700	5 307	12,600	5 715
		130	39.62	51.7	11,000	4 990	11,900	5 352
		140	42.67	47.5	10,400	4 717	11,200	5 080
		150	45.72	42.9	9,900	4 491	10,600	4 808
		160	48.77	37.8	9,500	4 309	10,100	4 581
		170	51.82	32.0	9,200	4 173	9,700	4 400
		180	54.86	24.8	9,000	4 082	9,500	4 309
	70' (21.34 m)	60	18.29	79.0	13,700	6 214	14,700	6 668
		70	21.34	76.1	12,900	5 879	13,400	6 078

(continued)

Refer to Notes page 5.

FMC

TG-1900 jib capacities

Boom length	Jib length	Load radius		Boom angle	Jib offset 15°			
					2-part load hoist line		1-part load hoist line	
		Ft.	m	Degrees	Pounds	Kilograms	Pounds	Kilograms
140' (42.67 m)	70' (21.34 m)	80	24.38	73.2	11,100	5 035	12,100	5 489
		90	27.43	70.2	10,200	4 627	11,100	5 035
		100	30.48	67.2	9,400	4 264	10,200	4 627
		110	33.53	64.0	8,700	3 946	9,400	4 264
		120	36.58	60.8	8,100	3 674	8,700	3 946
		130	39.62	57.4	7,600	3 447	8,200	3 720
		140	42.67	53.9	7,100	3 221	7,700	3 493
		150	45.72	50.2	6,600	3 084	7,200	3 266
		160	48.77	46.2	6,400	2 903	6,800	3 130
		170	51.82	41.9	6,100	2 767	6,500	2 948
		180	54.86	37.0	5,900	2 676	6,300	2 858
		190	57.91	31.5	5,700	2 586	6,000	2 722
		200	60.96	24.8	5,600	2 540	5,900	2 676
150' (45.72 m)	30' (9.14 m)	40	12.19	80.4	29,500	13 381	14,700	6 668
		50	15.24	77.2	29,500	13 381	↑	↑
		60	18.29	73.8	29,500	13 381		
		70	21.34	70.4	28,200	12 792		
		80	24.38	67.0	25,800	11 703		
		90	27.43	63.4	23,800	10 795		
		100	30.48	59.7	22,100	10 025		
		110	33.53	55.8	20,600	9 344		
		120	36.58	51.8	19,400	8 800		
		130	39.62	47.4	18,400	8 346		
		140	42.67	42.7	17,500	7 938		
		150	45.72	37.6	16,700	7 575		
		160	48.77	31.6	16,200	7 348		
		170	51.82	24.3	15,700	7 122	14,700	6 668
	50' (15.24 m)	50	15.24	78.9	21,600	9 888	14,700	6 668
		60	18.29	76.9	19,500	8 845	↑	↑
		70	21.34	73.9	17,700	8 029		
		80	24.38	70.8	16,100	7 303		
		90	27.43	67.7	14,900	6 759		
		100	30.48	64.5	13,800	6 260	14,700	6 668
		110	33.53	61.1	12,800	5 806	13,800	6 305
		120	36.58	57.6	12,000	5 443	13,000	5 897
		130	39.62	54.0	11,400	5 171	12,200	5 534
		140	42.67	50.2	10,800	4 892	11,500	5 216
		150	45.72	46.1	10,200	4 627	11,000	4 990
		160	48.77	41.7	9,800	4 446	10,500	4 763
		170	51.82	36.8	9,400	4 264	10,000	4 536
		180	54.86	31.1	9,100	4 128	9,700	4 400
		190	57.91	24.1	9,000	4 082	9,500	4 309
	70' (21.34 m)	60	18.29	79.8	15,000	6 804	14,700	6 668
		70	21.34	76.8	12,600	5 715	13,700	6 214
		80	24.38	74.0	11,400	5 171	12,600	5 670
		90	27.43	71.2	10,500	4 763	11,400	5 171
		100	30.48	68.3	9,700	4 400	10,500	4 763
		110	33.53	65.4	9,000	4 082	9,700	4 400
		120	36.58	62.3	8,400	3 810	9,000	4 082
		130	39.62	59.2	7,800	3 538	8,400	3 810
		140	42.67	55.9	7,400	3 357	7,900	3 583
		150	45.72	52.5	7,000	3 175	7,500	3 402
		160	48.77	48.8	6,600	2 994	7,100	3 221
		170	51.82	45.0	6,300	2 858	6,800	3 084
		180	54.86	40.7	6,100	2 767	6,500	2 948
		190	57.91	36.1	5,800	2 631	6,200	2 812
		200	60.96	30.8	5,700	2 586	6,000	2 722
		210	64.01	23.9	5,600	2 540	5,900	2 676

Boom length	Jib length	Load radius		Boom angle	Jib offset 15°			
					2-part load hoist line		1-part load hoist line	
		Ft.	m	Degrees	Pounds	Kilograms	Pounds	Kilograms
160' (48.77 m)	30' (9.14 m)	50	15.24	77.9	29,500	13 381	14,700	6 668
		60	18.29	74.7	29,500	13 381	↑	↑
		70	21.34	71.5	29,100	13 120		
		80	24.38	68.3	26,500	12 036		
		90	27.43	64.9	24,500	11 113		
		100	30.48	61.6	22,600	10 342		
		110	33.53	57.9	21,300	9 662		
		120	36.58	54.2	20,100	9 117		
		130	39.62	50.2	19,000	8 618		
		140	42.67	46.0	18,100	8 210		
		150	45.72	41.5	17,300	7 847		
		160	48.77	36.6	16,600	7 530		
		170	51.82	30.7	16,100	7 303		
		180	54.86	23.6	15,700	7 122	14,700	6 668
	50' (15.24 m)	50	15.24	80.4	22,300	10 115	14,700	6 668
		60	18.29	77.6	20,000	9 072	↑	↑
		70	21.34	74.7	18,100	8 210		
		80	24.38	71.8	16,600	7 530		
		90	27.43	68.8	15,300	6 940		
		100	30.48	65.8	14,200	6 441	14,700	6 668
		110	33.53	62.7	13,200	5 988	14,400	6 532
		120	36.58	59.4	12,400	5 625	13,400	6 078
		130	39.62	56.1	11,700	5 307	12,600	5 715
		140	42.67	52.5	11,100	5 035	11,900	5 398
		150	45.72	48.6	10,600	4 808	11,300	5 126
		160	48.77	44.5	10,100	4 581	10,800	4 899
		170	51.82	40.0	9,700	4 400	10,300	4 672
		180	54.86	35.0	9,400	4 264	10,000	4 536
		190	57.91	30.3	9,100	4 128	9,600	4 355
		200	60.96	23.4	8,900	4 037	9,400	4 264
	60' (18.24 m)	60	18.29	80.0	14,200	6 441	14,700	6 668
		70	21.34	77.4	12,600	5 806	14,100	6 396
		80	24.38	74.7	11,700	5 307	12,800	5 806
		90	27.43	72.1	10,700	4 854	11,700	5 307
		100	30.48	69.3	9,900	4 491	10,800	4 899
		110	33.53	66.5	9,200	4 173	10,000	4 536
		120	36.58	63.7	8,600	3 901	9,300	4 218
		130	39.62	60.7	8,100	3 674	8,700	3 946
		140	42.67	57.7	7,600	3 447	8,200	3 720
		150	45.72	54.5	7,200	3 266	7,700	3 493
		160	48.77	51.1	6,800	3 084	7,300	3 311
		170	51.82	47.6	6,500	2 948	7,000	3 175
		180	54.86	43.8	6,200	2 812	6,700	3 039
		190	57.91	39.7	6,000	2 722	6,400	2 903
		200	60.96	35.1	5,800	2 631	6,200	2 812
		210	64.01	29.8	5,600	2 540	6,000	2 721
		220	67.06	23.2	5,600	2 540	5,900	2 631
170' (51.82 m)	30' (9.14 m)	50	15.24	78.5	29,500	13 338	14,700	6 668
		60	18.29	75.5	29,500	13 338	↑	↑
		70	21.34	72.5	29,500	13 338		
		80	24.38	69.4	27,400	12 429		
		90	27.43	66.3	25,300	11 476		
		100	30.48	63.1	23,600	10 660		
		110	33.53	59.7	22,000	9 979		
		120	36.58	56.3	20,700	9 390		
		130	39.62	52.6	19,600	8 891		
		140	42.67	48.6	18,600	8 437		
		150	45.72	44.0	17,500	8 074	14,700	6 668

(continued)

Refer to Notes page 5.

TG-1000 jib capacities

Boom length	Jib length	Load radius Ft.	Load radius m	Boom angle Degrees	Jib offset 15° 2-part load hoist line Pounds	Jib offset 15° 2-part load hoist line Kilograms	Jib offset 15° 1-part load hoist line Pounds	Jib offset 15° 1-part load hoist line Kilograms
170' (51.82 m)	30' (9.14 m)	160	48.77	40.4	17,100	7 757	14,700	6 668
		170	51.82	35.5	16,500	7 484	↑	↑
		180	54.86	29.9	16,000	7 258	↓	↓
		190	57.91	22.9	15,700	7 122	14,700	6 668
	50' (15.24 m)	60	18.29	78.2	20,400	9 253	14,700	6 668
		70	21.34	76.5	18,500	8 392	↑	↑
		80	24.38	72.7	17,000	7 711	↕	↕
		90	27.43	69.9	15,700	7 122		
		100	30.48	67.0	14,600	6 623	↓	↓
		110	33.53	64.1	13,600	6 169	14,700	6 668
		120	36.58	61.0	12,600	5 715	13,900	6 305
		130	39.62	57.9	12,000	5 443	13,000	5 897
		140	42.67	54.6	11,400	5 171	12,300	5 579
		150	45.72	51.2	10,900	4 944	11,700	5 307
		160	48.77	47.6	10,400	4 717	11,100	5 035
		170	51.82	43.7	10,000	4 536	10,700	4 854
		180	54.86	39.5	9,600	4 355	10,200	4 627
		190	57.91	34.8	9,300	4 218	9,900	4 491
		200	60.96	29.5	9,100	4 128	9,600	4 355
		210	64.01	22.8	8,800	4 037	9,400	4 264
	70' (21.34 m)	60	18.29	80.4	14,400	6 532	14,600	6 623
		70	21.34	77.9	13,100	5 942	14,400	6 532
		80	24.38	75.4	11,900	5 398	13,100	5 942
		90	27.43	72.8	11,000	4 990	12,000	5 443
		100	30.48	70.3	10,100	4 581	11,100	5 035
		110	33.53	67.6	9,400	4 264	10,300	4 672
		120	36.58	64.9	8,800	3 992	9,600	4 355
		130	39.62	62.1	8,300	3 765	9,000	4 082
		140	42.67	59.2	7,800	3 538	8,400	3 810
		150	45.72	56.3	7,400	3 357	8,000	3 629
		160	48.77	53.2	7,000	3 176	7,600	3 447
		170	51.82	49.9	6,700	3 039	7,200	3 266
		180	54.86	46.5	6,400	2 903	6,900	3 130
		190	57.91	42.9	6,100	2 767	6,600	2 994
		200	60.96	38.7	5,900	2 676	6,300	2 858
		210	64.01	34.3	5,700	2 585	6,100	2 767
		220	67.06	29.1	5,600	2 540	5,900	2 676
		230	70.10	22.6	5,500	2 495	5,800	2 631
180' (54.86 m)	30' (9.14 m)	50	15.24	79.0	29,400	13 336	14,700	6 668
		60	18.29	76.2	29,400	13 336	↑	↑
		70	21.34	73.4	29,400	13 336	↕	↕
		80	24.38	70.5	28,200	12 792		
		90	27.43	67.5	26,000	11 793		
		100	30.48	64.5	24,200	10 977		
		110	33.53	61.3	22,700	10 297		
		120	36.58	58.1	21,400	9 707		
		130	39.62	54.8	20,200	9 163		
		140	42.67	51.2	19,200	8 709		
		150	45.72	47.5	18,300	8 301		
		160	48.77	43.6	17,600	7 983		
		170	51.82	39.3	16,800	7 620		
		180	54.86	34.6	16,400	7 439		
		190	57.91	29.1	15,900	7 212		
		200	60.96	22.3	14,600	6 623	14,700	6 668
	50' (15.24 m)	60	18.29	79.7	20,800	9 435	14,600	6 623
		70	21.34	78.1	18,900	8 573	↑	↑
		80	24.38	75.5	17,400	7 893	↕	↕
		90	27.43	70.8	16,000	7 258	14,600	6 623

Boom length	Jib length	Load radius Ft.	Load radius m	Boom angle Degrees	Jib offset 15° 2-part load hoist line Pounds	Jib offset 15° 2-part load hoist line Kilograms	Jib offset 15° 1-part load hoist line Pounds	Jib offset 15° 1-part load hoist line Kilograms
160' (54.86 m)	50' (15.24 m)	100	30.48	66.1	14,900	6 759	14,600	6 623
		110	33.53	65.3	14,000	6 350	14,600	6 623
		120	36.58	62.4	13,100	5 942	14,300	6 486
		130	39.62	59.6	12,400	5 625	13,400	6 078
		140	42.67	56.4	11,700	5 307	12,700	5 761
		150	45.72	53.3	11,200	5 080	12,000	5 443
		160	48.77	49.9	10,700	4 854	11,600	5 216
		170	51.82	46.4	10,200	4 627	11,000	4 990
		180	54.86	42.6	9,800	4 445	10,600	4 763
		190	57.91	38.6	9,500	4 309	10,200	4 627
		200	60.96	34.0	9,200	4 173	9,600	4 445
		210	64.01	28.7	9,000	4 082	9,600	4 355
		220	67.06	22.2	8,900	4 037	9,400	4 264
160' (54.86 m)	70' (21.34 m)	60	18.29	80.6	14,600	6 623	14,600	6 623
		70	21.34	78.4	13,300	6 035	14,600	6 623
		80	24.38	76.0	12,200	5 534	13,300	6 035
		90	27.43	73.6	11,200	5 080	12,300	5 579
		100	30.48	71.1	10,400	4 717	11,000	5 126
		110	33.53	68.6	9,700	4 400	10,500	4 763
		120	36.58	66.0	9,000	4 082	9,600	4 445
		130	39.62	63.4	8,500	3 856	9,200	4 173
		140	42.67	60.7	8,000	3 629	8,700	3 946
		150	45.72	57.9	7,600	3 447	8,200	3 720
		160	48.77	55.0	7,200	3 266	7,600	3 538
		170	51.82	51.9	6,900	3 130	7,400	3 357
		180	54.86	48.6	6,600	2 994	7,100	3 221
		190	57.91	45.4	6,300	2 858	6,800	3 084
		200	60.96	41.6	6,100	2 767	6,500	2 948
		210	64.01	37.9	5,900	2 676	6,300	2 858
		220	67.06	33.5	5,700	2 585	6,100	2 767
		230	70.10	28.4	5,600	2 540	5,900	2 676
		240	73.16	22.1	5,500	2 495	5,800	2 631
180' (57.91 m)	30' (9.14 m)	50	15.24	79.6	29,400	13 336	14,700	6 668
		60	18.29	76.9	29,400	13 336	↑	↑
		70	21.34	74.2	29,400	13 336	↕	↕
		80	24.38	71.4	28,900	13 109		
		90	27.43	68.6	26,900	12 156		
		100	30.48	65.7	24,900	11 294		
		110	33.53	62.8	23,400	10 614		
		120	36.58	59.7	22,000	9 979		
		130	39.62	56.6	20,800	9 435		
		140	42.67	53.4	19,800	8 981		
		150	45.72	49.9	18,900	8 573		
		160	48.77	46.2	18,100	8 210		
		170	51.82	42.5	17,400	7 893		
		180	54.86	38.3	16,800	7 620		
		190	57.91	33.7	16,300	7 394		
		200	60.96	28.3	14,600	6 713	↓	↓
		210	64.01	21.6	13,600	5 216	14,700	6 668
	50' (15.24 m)	60	18.29	79.2	21,100	9 571	14,600	6 623
		70	21.34	76.7	19,300	8 754	↑	↑
		80	24.38	74.2	17,700	8 029	↕	↕
		90	27.43	71.7	16,400	7 438		
		100	30.48	69.1	15,300	6 940		
		110	33.53	66.4	14,300	6 486	↓	↓
		120	36.58	63.7	13,500	6 124	14,600	6 623
		130	39.62	60.9	12,700	5 761	13,600	6 260
		140	42.67	58.1	12,000	5 443	13,100	5 942

(continued)

Refer to Notes page 5.

TG-1000 jib capacities

Boom length	Jib length	Load radius Ft.	Load radius m	Boom angle Degrees	Jib offset 15° 2-part load hoist line Pounds	Jib offset 15° 2-part load hoist line Kilograms	Jib offset 15° 1-part load hoist line Pounds	Jib offset 15° 1-part load hoist line Kilograms
190' (57.91 m)	50' (15.24 m)	150	46.72	55.1	11,500	5 216	12,400	5 625
		160	49.77	52.0	10,900	4 944	11,600	5 262
		170	51.82	48.8	10,500	4 763	11,300	5 126
		180	54.86	45.3	10,100	4 581	10,900	4 899
		190	57.91	41.9	9,700	4 400	10,400	4 717
		200	60.96	37.8	9,400	4 264	10,100	4 581
		210	64.01	33.2	9,200	4 173	9,800	4 445
		220	67.06	28.0	9,000	4 082	9,500	4 309
		230	70.10	21.7	8,900	4 037	9,400	4 264
	70' (21.34 m)	70	21.34	78.9	13,500	6 124	14,600	6 623
		80	24.38	76.6	12,400	5 625	13,600	6 169
		90	27.43	74.3	11,400	5 171	12,500	5 670
		100	30.48	71.9	10,600	4 808	11,600	5 262
		110	33.53	69.5	9,900	4 491	10,800	4 899
		120	36.58	67.0	9,200	4 173	10,100	4 581
		130	39.62	64.5	8,700	3 946	9,500	4 309
		140	42.67	61.9	8,200	3 720	9,000	4 037
		150	45.72	59.3	7,800	3 538	8,400	3 810
		160	48.77	56.6	7,400	3 357	8,000	3 629
		170	51.82	53.7	7,000	3 175	7,600	3 447
		180	54.86	50.6	6,700	3 039	7,300	3 311
		190	57.91	47.7	6,400	2 903	7,000	3 175
		200	60.96	44.4	6,200	2 812	6,700	3 039
		210	64.01	40.9	6,000	2 722	6,400	2 903
		220	67.06	37.0	5,800	2 631	6,200	2 812
		230	70.10	32.7	5,700	2 586	6,000	2 721
		240	73.15	27.8	5,600	2 540	5,900	2 676
		250	76.20	21.6	5,500	2 495	5,800	2 631
200' (60.96 m)	30' (9.14 m)	50	15.24	80.0	29,300	13 290	14,600	6 623
		60	18.29	77.6	↑	↑	↑	↑
		70	21.34	74.9				
		80	24.38	72.2	29,300	13 290		
		90	27.43	69.6	27,400	12 429		
		100	30.48	66.9	25,600	11 612		
		110	33.53	64.1	24,000	10 886		
		120	36.58	61.2	22,600	10 251		
		130	39.62	58.3	21,400	9 707		
		140	42.67	55.2	20,300	9 208		
		150	45.72	52.1	19,400	8 800		
		160	48.77	48.7	18,600	8 437		
		170	51.82	45.2	17,800	8 074		
		180	54.86	41.5	17,200	7 802		
		190	57.91	37.4	16,700	7 575	14,600	6 623

Boom length	Jib length	Load radius Ft.	Load radius m	Boom angle Degrees	Jib offset 15° 2-part load hoist line Pounds	Jib offset 15° 2-part load hoist line Kilograms	Jib offset 15° 1-part load hoist line Pounds	Jib offset 15° 1-part load hoist line Kilograms
200' (60.96 m)	30' (9.14 m)	200	60.96	32.8	14,400	6 532	14,600	6 623
		210	64.01	27.7	11,700	5 307	12,800	5 851
		220	67.06	21.2	8,700	3 946	9,600	4 355
	50' (15.24 m)	60	18.29	79.6	21,500	9 752	14,600	6 623
		70	21.34	77.3	19,600	8 891	↑	↑
		80	24.38	74.9	18,100	8 210		
		90	27.43	72.4	16,600	7 529		
		100	30.48	70.0	15,600	7 076		
		110	33.53	67.4	14,600	6 623		
		120	36.58	64.9	13,800	6 260	14,600	6 623
		130	39.62	62.2	13,000	5 897	14,200	6 441
		140	42.67	59.5	12,300	5 579	13,400	6 078
		150	45.72	56.7	11,700	5 307	12,700	5 761
		160	48.77	53.8	11,200	5 080	12,100	5 488
		170	51.82	50.8	10,700	4 854	11,600	5 262
		180	54.86	47.7	10,300	4 672	11,100	5 036
		190	57.91	44.5	10,000	4 536	10,700	4 854
		200	60.96	40.7	9,600	4 355	10,300	4 672
		210	64.01	36.6	9,400	4 264	10,000	4 536
		220	67.06	32.4	9,100	4 129	9,700	4 400
		230	70.10	27.4	9,000	4 082	9,500	4 309
		240	73.15	21.1	7,300	3 311	8,000	3 629
	70' (21.34 m)	70	21.34	78.3	13,700	6 214	14,600	6 623
		80	24.38	77.1	12,600	5 715	13,600	6 169
		90	27.43	74.9	11,600	5 262	12,600	5 715
		100	30.48	72.6	10,600	4 809	11,600	5 262
		110	33.53	70.3	10,100	4 581	11,000	4 990
		120	36.58	68.0	9,400	4 264	10,300	4 672
		130	39.62	65.6	8,900	4 037	9,700	4 400
		140	42.67	63.1	8,400	3 810	9,100	4 128
		150	45.72	60.6	7,900	3 583	8,600	3 901
		160	48.77	58.0	7,600	3 447	8,200	3 720
		170	51.82	55.4	7,200	3 266	7,800	3 538
		180	54.86	52.6	6,800	3 130	7,500	3 402
		190	57.91	49.7	6,600	2 994	7,100	3 221
		200	60.96	46.7	6,300	2 858	6,900	3 130
		210	64.01	43.4	6,100	2 767	6,600	2 994
		220	67.06	40.0	5,900	2 676	6,400	2 903
		230	70.10	36.2	5,800	2 631	6,200	2 812
		240	73.15	32.0	5,800	2 640	6,000	2 722
		250	76.20	27.2	5,900	2 495	5,900	2 676
		260	79.25	21.1	5,500	2 495	5,800	2 631

Refer to Notes page 5.

FMC

Notes — jib capacities

1. Loads shown are maximum permissible and in all cases are limited by strength capabilities of the machine. Proper design of the substructure to withstand the loadings imposed by the machine shall be the responsibility of the purchaser. A deduction must be made from these capacities for the weight of the load handling equipment such as the hook block, hook, slings, grapple, load weighing devices, etc.
2. The operator must make the following considerations when operating the crane:
   a. Make certain the actual load radius is not greater than the radius specified on the capacity chart for the load to be lifted. The load radius is measured from the center of the tower's base section to the center of gravity of the freely suspended load. The operator must make allowances for increases in the load radius caused by stretching of the boom suspension and deflection of the boom and tower.
   b. Prevent shock or impact loading of the crane's structure especially when operating during low temperatures.
   c. Effect of wind, especially on loads with large surface areas.
3. Do not lift a load with the main hoist and a load with the auxiliary hoist at the same time.
4. For each 10 feet boom foot height above the lowest hook position, the following deductions must be made from these capacities:
   30 lbs. *(13.61 kg)* when using 2 parts of auxiliary hoist line
   20 lbs. *(9.07 m)* when using 1 part of auxiliary hoist line
5. If the 30" *(.076 m)* x 36" *(.091 m)* jib is attached to the boom, the following deductions must be made from the main hoist lifting capacities:

Jib Length	Deduction
30' *(9.14 m)*	—
50' *(15.24 m)*	2500 lbs. *(1 134 kg)*
70' *(21.34 m)*	4000 lbs. *(1 814 kg)*

6. These capacities are based on a 30 mph *(48 km/h)* wind in the operating condition. Consult the manufacturer for operating limitations when winds exceed 30 mph *(48 km/h)*.
7. For the nonoperating condition, the machine, reeving, and hook blocks must clear any obstacles with the boom stowed at its specified position. This precaution is necessary due to the weathervane rotation of the crane by the wind.
8. These capacities apply only to the machine as originally manufactured and normally equipped by FMC Corporation, Cable Crane and Excavator Division.

TOWER MOUNTED WITH CLIMBING FRAME

1. The maximum free standing tower height with a climbing frame and 170' *(51.82 m)* boom is 162'-7½" *(49.56 m)*. For tower heights greater than 162' 7½" *(49.56 m)*, consult manufacturer for additional requirements for the crane.
2. When the crane is in the nonoperating condition, the boom must be stowed as listed in the following chart based on tower height:

Tower Height	Boom Position
80'-160' *(24.38-48.77 m)*	Stow boom at maximum rated radius
170' *(51.80 m)*	Stow boom at horizontal position

TOWER MOUNTED WITH CLIMBING FRAME

1. The maximum free standing tower height without a climbing frame and with 200' *(60.96 m)* boom is 162' 7½" *(49.56 m)*. For tower heights greater than 162' 7½" *(49.56 m)*, consult manufacturer for additional requirements for the crane.
2. When the crane is in the nonoperating condition, the boom must be stowed as listed in the following chart based on tower height:

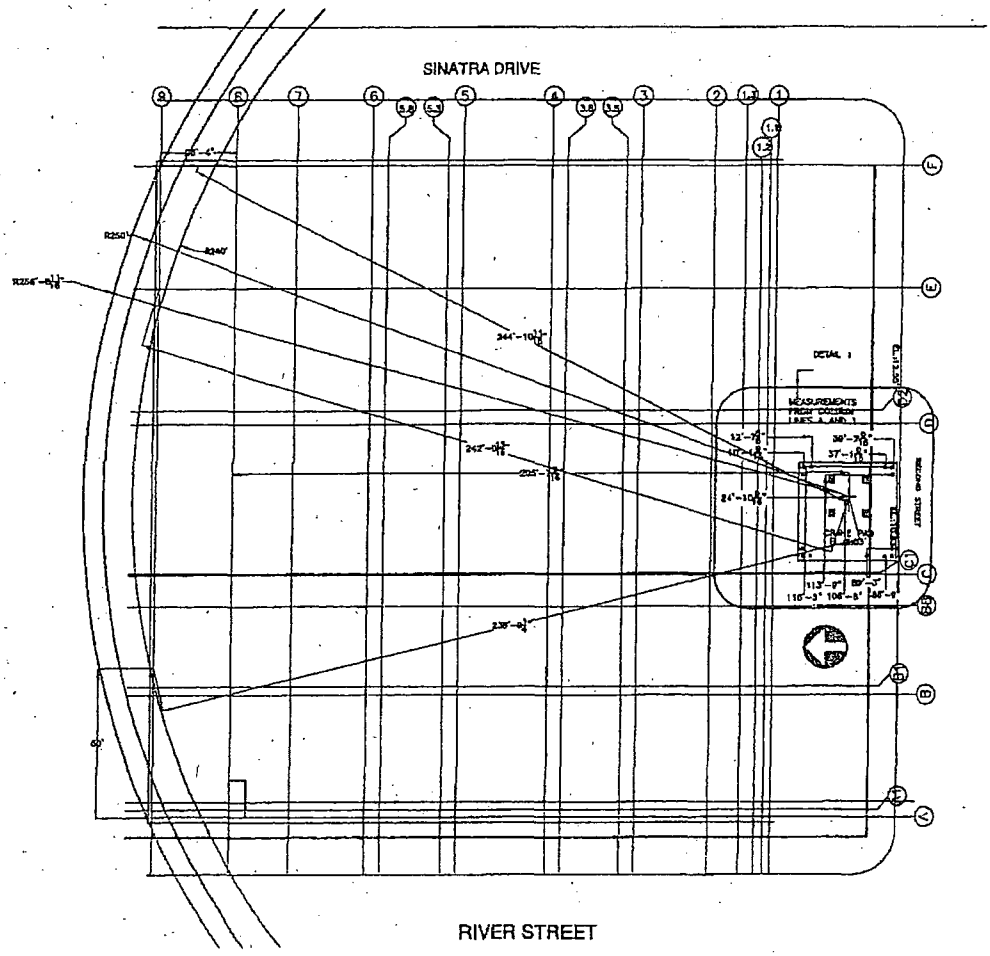
Tower Height	Boom Position
80'-160' *(24.38-48.77 m)*	Stow boom between a 60° boom angle and maximum rated radius
170'-190' *(51.82 m-57.91 m)*	Stow boom at maximum rated radius
200' *(60.96 m)*	Stow boom at horizontal position

RAIL MOUNTED WITH TRAVELING BASE

1. Lifting capacities shown are not more than 66% of the tipping loads calculated under static conditions with the boom in the least stable direction. The operator must take into account the dynamic effects of hoisting, lowering, booming, swinging, and traveling. Additional factors to be considered are freely suspended loads, track, wind, ground conditions, boom length, and proper operating speeds for the existing conditions.
2. The operator must make certain the actual load radius is not greater than the radius specified on the capacity chart for the load to be lifted. The load radius is measured from the center of the traveling base to the center of gravity of the freely suspended load. The operator must make allowances for increases in the load radius caused by stretching of the boom suspension and deflection of the boom and traveling base.
3. For these lifting capacities, the operator must make certain that all specified ballast is properly assembled to the traveling base. Ballast may be necessary to meet the stability requirement as specified on the working areas and ballast requirement plate.
4. Use caution when approaching the rail stops with the crane bumpers. Excessive speed at contact may result in crane instability and/or failure of the rail stops.
5. When the crane is in the nonoperating condition, the rail mounted traveling base must be secured with rail clamps or tie downs to prevent drifting.

Refer to Notes below.

We are constantly improving our products and therefore reserve the right to change designs and specifications.


SINATRA DRIVE
RIVER STREET
DETAIL 1

TG 1900T TOWER CRANE

NYC RATINGS AT FULL OF PROVEN LOAD

(Rated Loads in Kips)

Counterweights - total 94.4 Kips (fixed counterweight 23.6 Kips + moving counterweight 70.8 Kips)

Boom Length	160 ft	170 ft	180 ft	190 ft	200 ft	210 ft	220 ft	230 ft	240 ft	250 ft	260 ft	Boom Length
Radius ft												Radius ft
30	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	30
40	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	40
50	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	50
60	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	60
70	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	70
80	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	80
90	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	90
100	58.0	58.0	58.0	57.4	56.9	56.3	55.8	52.2	48.0	43.3	38.9	100
110	52.7	52.1	51.9	51.3	50.8	50.2	49.7	46.5	43.3	40.0	36.9	110
120	47.5	47.0	46.7	46.1	45.6	45.0	44.5	41.6	38.7	35.7	33.0	120
130	43.1	42.6	42.3	41.7	41.3	40.7	40.2	37.5	34.8	32.2	29.8	130
140	39.4	38.8	38.5	38.0	37.5	36.9	36.4	34.0	31.5	29.0	26.7	140
150	36.0	35.5	35.3	34.7	34.2	33.6	33.1	30.9	28.6	26.3	24.2	150
160	27.7	32.6	32.4	31.8	31.4	30.8	30.3	28.1	26.0	23.9	22.0	160
170		25.0	29.8	29.2	28.8	28.2	27.7	25.8	23.8	21.8	20.0	170
180			22.8	26.9	26.5	26.0	25.5	23.6	21.9	20.0	18.2	180
190				20.5	24.5	23.9	23.4	21.7	20.0	18.2	16.6	190
200					18.6	22.0	21.6	20.0	18.4	16.7	15.2	200
210						16.7	19.9	18.4	16.9	15.3	13.9	210
220							14.9	17.0	15.5	14.1	12.7	220
230								12.5	14.3	12.9	11.6	230
240									10.5	11.8	10.7	240
250										8.5	9.8	250
260											6.9	260

Notes:

1. Lifting capacity does not include load block and slings
2. For each 10 feet of boom foot height above the lowest hook position, 48# deduction must be made from lifting capacity
3. Conduct operations in accordance with ANSI B30.3, OSHA and manufacturer's requirements.
4. Do not operate crane in sustained winds exceeding 30 mph.

prepared by:

Howard I. Shapiro & Associates
Consulting Engineers, P.C.
303 Merrick Road, Suite 202
Lynbrook, NY 11563
(516) 791-2[illegible] Fax: (516) 791-5425

STATE OF NEW YORK
LAWRENCE K. SHAPIRO
60591
LICENSED PROFESSIONAL ENGINEER

11/14/06

Mobile Crane

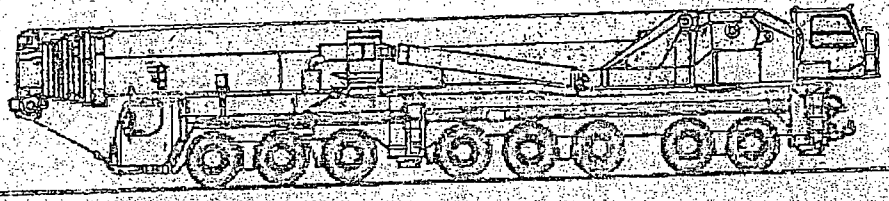
LTM 1500-8.1

Technical Data

53-20 44th Street
Maspeth, Queens, NY 11378
(718) 784-1776

Telescopic boom

276 ft



LIEBHERR

Lifting capacities on telescopic boom

59 - 138 ft | 360° | 363800 lbs / 297800 lbs | 85%

R	59 ft	70 ft	87 ft	104 ft	121 ft	138 ft
9			604			
10	1189	1189	604			
11	1041	1041	604	604		
12	913	913	604	604		
13	802	802	604	604	601	
14	707	707	604	604	590	
15	625	625	603	602	577	
16	553	622	585	592	562	444
17	618	605	581	576	547	437
18	586	584	559	554	532	426	352
20	553	541	518	513	501	404	349
22	518	505	483	478	474	387	331	280
24	485	474	451	446	445	370	315	274
26	456	445	422	417	416	355	300	262
28	430	418	397	391	391	338	287	251
30	405	397	372	367	368	322	274	241
32	385	381	350	344	344	307	263	231
34	365	339	331	325	324	294	252	223
36	344	320	313	307	307	281	241	214
38	323	301	296	290	289	269	231	206
40	305	283	280	273	273	257	221	198	40
45	267	248	247	241	240	230	197	179	45
50				213	212	219	181	162	50
55				189	188	190	167	146	55
60				166	168	170	154	131	60
65				138	150	152	143	121	65
70					139	137	132	112	70
75					123	125	121	104	75
80						113	109	98	80
85						103	99.5	88.5	85
90						94.5	90.5	83.5	90
95						85.5	82.5	78.5	95
100							75	74	100
105							68.5	69	105
110							63	65.5	110
115								61.5	115
120								56.9	120
125								52.4	125
130								48.2	130

* over rear 363800 lbs counterweight
* over rear

TAB 231232 / 231234 / 231235

Remarks relating to load charts

1. The tabulated lifting capacities do not exceed 85% of the tipping load.
2. The crane's structural steelwork is in accordance with DIN 15018, part 3: Design and construction of the crane comply with DIN 15018, part 2, and with F.E.M. regulations.
3. The 85% overturning limit values take into account wind force 5 = wind speed 20 mph.
4. Lifting capacities are given in lbs.
5. The weight of the hook blocks and hooks must be deducted from the lifting capacities.
6. Working radii are measured from the slewing centreline.
7. The lifting capacities given for the telescopic boom only apply if the folding jib is taken off.
8. Lifting capacities are subject to modifications.
9. Lifting capacities above 577710 lbs only with special equipment.

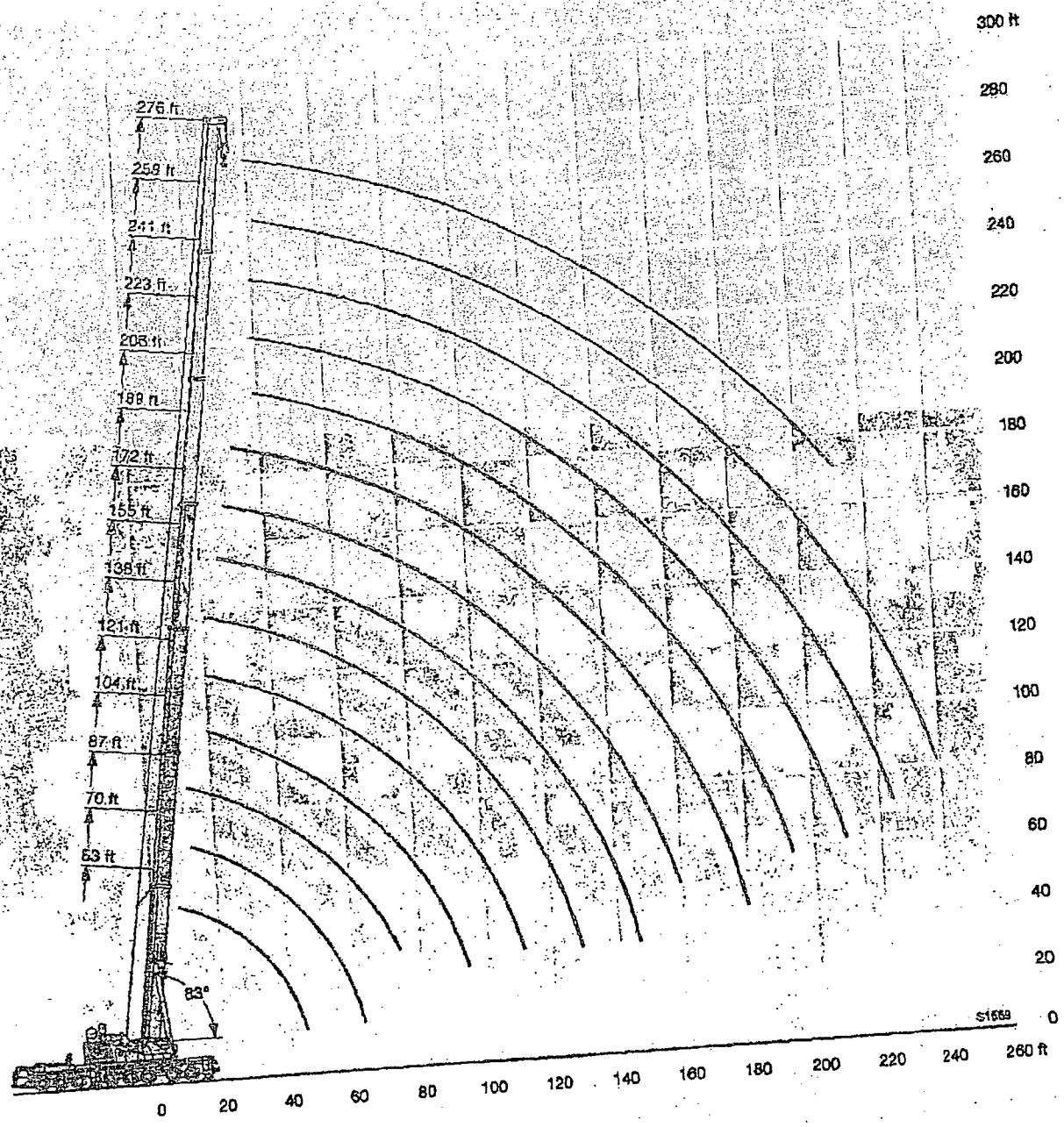
Lifting capacities on telescopic boom

165-276 ft | 380 | 297600 lbs | 85%

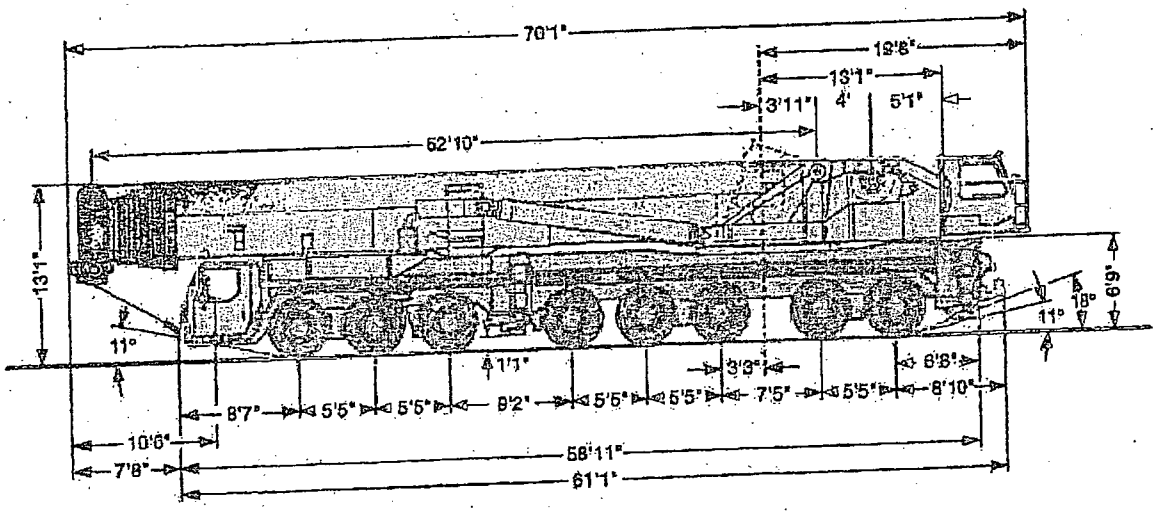
A ft	155 ft	172 ft	189 ft	203 ft	223 ft	241 ft	258 ft	276 ft	A ft
26	224								26
28	217	177							28
30	209	175							30
32	201	170	145						32
34	193	165	142						34
36	186	160	138						36
38	179	155	134	113	99.5				38
40	172	150	130	112	98				40
45	157	140	120	105	93	80.5			45
50	144	130	113	98.5	87.5	77	66.5	50.7	50
55	132	120	108	92	82.5	73	65	49.1	55
60	120	111	99.5	86.5	77.5	69	62	46.8	60
65	110	102	93.5	81	73	65.5	59.1	44.4	65
70	101	94.5	87.5	76.5	69	62	56.1	42.0	70
75	93.5	87	82	72	65.5	58.8	53.2	39.5	75
80	87.5	80.5	76	67.5	62	55.8	50.6	37.2	80
85	82.5	74	70.5	63	58.7	52.8	48.1	35.1	85
90	77.5	69.5	68.5	59.5	55.8	50	45.8	33.2	90
95	73	65.5	62.5	56.1	52.4	47.2	43.7	30.3	95
100	68.5	62	59.1	52.9	49.2	44.4	41.5	29.5	100
105	64.5	58.3	55.8	49.8	46.2	42	39.5	27.6	105
110	60.5	54.9	52.7	47	43.3	39.8	37.1	26.4	110
115	56.9	51.7	49.8	44	40.6	37.7	34.9	23.5	115
120	53	48.6	47	41	38.3	35.6	33	21.8	120
125	49.8	45.7	44.3	38	36.3	33.7	31.2	20.3	125
130	44.8	42.9	41.7	35.2	34.0	31.8	29.5	18.8	130
135	41	40.1	39.2	33	32.6	30	27.8	17.4	135
140	37.5	37.4	36.8	31.1	30.6	28.2	26.4	16.1	140
145	33.5	34.9	34.4	29.2	28.8	26.5	24.9	14.8	145
150	24	32.4	32.1	27.4	26.7	24.9	23.4	13.5	150
155		29.8	29.9	25.7	24.8	23.3	22	12.3	155
160		26.8	27.8	24.1	23	22	20.6	11.1	160
165			25.7	22.5	21.3	20.9	19.4	10.1	165
170			23.6	20.8	20.1	19.8	18.5	9.4	170
175			21.6	19.4	18.9	18.7	17.7	8.7	175
180			17.2	17.8	17.8	17.5	16.9	8.1	180
185				16.5	16.8	16.5	16.1	7.5	185
190				15.1	16.5	15.5	15.4	6.9	190
195				13.7	14.5	14.6	14.8	6.3	195
200					13.4	13.5	13.7	5.8	200
205					12.4	12.6	12.9	5.2	205
210					11.4	11.7	12.1	4.7	210
215					8.8	10.7	11.2	4.3	215
220						9.8	10.4		220
225						9	9.7		225
230							8.9		230
235							8.2		235
240							7.5		240

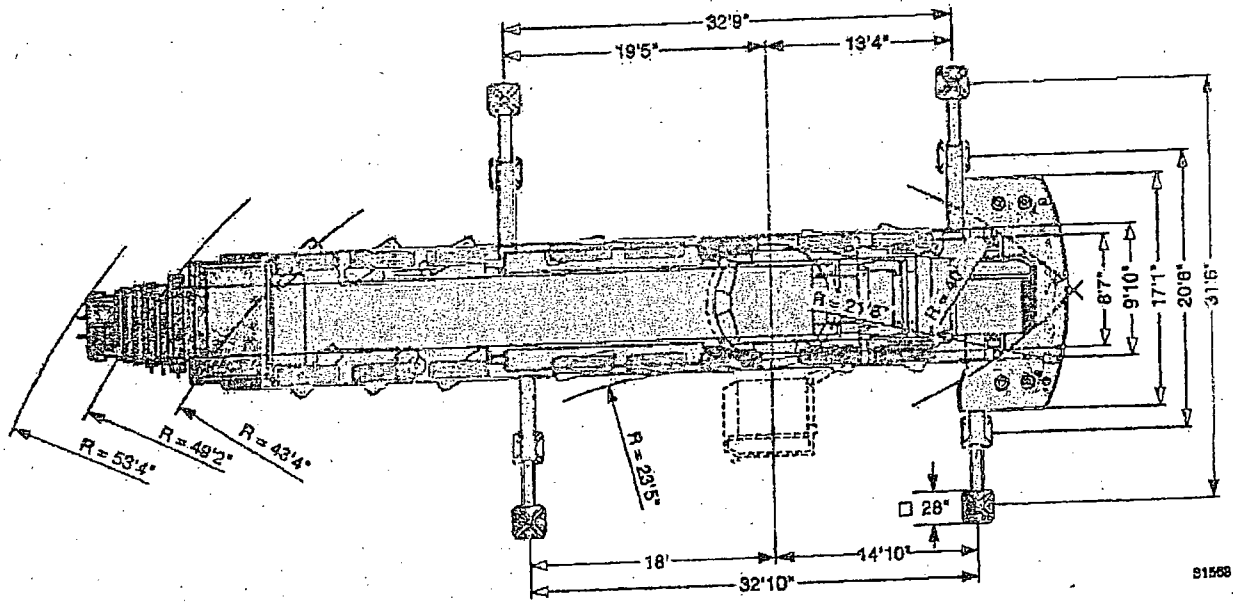
TAB 231285

Lifting heights



Dimensions





Tyres 16.00 R 25

Weights

Axle	1	2	3	4	5	6	7	8	Total weight
lbs	26450	26450	26450	26450	26450	26450	26450	26450	211600

* with 194 ft long telescopic boom

Load (tons)	No. of sheaves	No. of lines	Weight lbs	Type
622	13	27	13200	320 DSM
545	11	23	7700	250 DSM
377	7	15	8080	200 DSM
185	3	7	3970	80 DSM
82	1	3	2710	40 EM
28	-	1	1320	25 E

Working speeds

	1	2	3	4	5	6	[illegible]
km/h	8.9	14.3	22.5	32.6	47.8	9.8	15.1 to 15
mph	5.4	8.2	13	19.1	27.3	5.6	28.56

16.00 R 25

Drive	Infinitely variable	Rope diameter / Rope length	Max. single line pull
1	0 - 426 ft/min single line	1[illegible] / 1478 ft	28350 lbs
2	0 - 475 ft/min single line	1[illegible] / 2460 ft	28350 lbs
3	0 - 426 ft/min single line	1[illegible] / 3445 ft	28350 lbs
	0 - 1 rpm		

approx. 70 seconds to reach -1° to 83° boom angle

approx. 350 seconds for boom extension from 52 ft - 164 ft

approx. 750 seconds for boom extension from 52 ft - 276 ft

Equipment

Crane carrier

Frame	Liebherr designed and manufactured, box-type, torsion resistant design of high tensile fine grained structural steels.
Outriggers	Four hydraulically extendable sliding beams with hydraulic jacks and supporting pads. The front outrigger casing is mounted between axles 3 and 4 and the rear casing is located at the rear of the carrier. Supporting base: 32'10" longitudinally x 31'8" transversally.
Engine	8-cylinder Diesel engine, make Liebherr, type D 9308 TI-E A4, watercooled, output acc. to DIN 440 kW (598 HP) at 2100 rpm acc. to ECE-R 24.03 and 2001/27/EG (Eurro 3), max. torque 2600 Nm at 1200 - 1500 rpm, electronic engine management by data bus technique. Fuel tank: 600 L
Transmission	Automatic transmission, make Allison, type CLBT 755, with torque converter and hydrodynamic brake, 5 forward speeds, 1 reverse. Transfer case with lockable transfer differential and off-road ratio.
Axles	Heavy-duty vehicle axles. All axles suspended. Axles 1 to 4 and 7 and 8 steered. Axles 1, 2, 4 and 8 are planetary axles.
Suspension	All axles with hydropneumatic suspension and automatic levelling system. Load equalization between the axle pairs. The suspension can be locked hydraulically.
Tyre equipment	16 tyres, all axles equipped with single tyres. Size of tyres: 16.00 R 25
Steering	ZF semi-integral power steering, dual circuit system with hydraulic servo system and additional backing pump driven by an axle.
Brakes	Service brake: All-wheel servo-air brake, dual circuit system. Additional brakes: Retarder, TELMA-type eddy current brake. Hand brake: Spring-loaded acting on all wheels of axles 4 to 8.
Driving cab	Spacious and comfortable sheet steel cab mounted on rubber shock absorbers, safety glass windows, operating and control elements.
Electrical system	Modern data bus technique, 24 Volt DC, 2 batteries of 170 Ah each, lighting according to traffic regulations.

Crane superstructure

Frame	Liebherr-made torsion resistant, welded construction of high-tensile structural steel, linked to carrier by a three-row roller slewing rim for 360° continuous rotation.
Crane engine	8-cylinder Diesel engine, make Liebherr, type D 926 TI-E A4, watercooled, output acc. to DIN 240 kW (326 HP) at 1800 rpm, max. torque 1480 Nm at 1200 rpm
Crane drive	Diesel-hydraulic, with 4 axial piston variable displacement pumps, with servo-control and capacity control, operating in closed circuit for hoisting, slewing and luffing of lattice jib. 3 axial piston pumps, operating in open circuit for luffing and telescoping.
Crane control	Two self-centering control levers (joy-sticks). Pedal switches for telescoping. Infinitely variable crane motions through displacement control of the hydraulic pumps. Additional working speed control by variation of the Diesel engine speed.
Hoist gear	Axial piston variable displacement motor, Liebherr hoist drum with integrated planetary gear and spring-loaded static brake.
Luffing gear	2 differential hydraulic rams with nonreturn valve.
Slewing gear	2 slewing gears, consisting of hydraulic motor, planetary gear, slewing pinion and spring-loaded static brake each.
Crane cab	Aluminium design with safety glass, containing all control elements. Cab tilts backwards. The cab will be pivoted to the rear for road transport.
Safety devices	LICCON safe load indicator, test system, hoist limit switches, safety valves against rupture of pipes and hoses.
Counterweight	267700 lbs total counterweight comprising 1 basic slab of 33075 lbs and 8 slabs of 33075 lbs each.
Telescopic boom	Variant 1: Boom length 53 ft to 164 ft, consisting of 1 base section and 3 hydraulic telescopic sections. All telescopic sections extendable individually by means of the rapid-cycle telescoping system TELEMATIK. Variant 2: Boom length 53 ft to 276 ft, consisting of 1 base section and 6 hydraulic telescopic sections. All telescopic sections extendable individually by means of the rapid-cycle telescoping system TELEMATIK.
Electric system	Modern data bus technique, 24 Volt DC, 2 batteries of 170 Ah each.

Complementary equipment

Guying system for telescopic boom	Consisting of guying frame with 2 rope winches, mountable to the 164 ft or 276 ft long telescopic boom, liftable in transport condition.
Additional ballast	2 additional counterweight slabs of 33075 lbs each for a total counterweight of 653900 lbs, required for the operation with guyed telescopic boom.
Telescopic boom extension	46 ft lattice section for extending the 164 ft long telescopic boom in order to mount the lifting or fixed lattice jib.
Lattice jib	Fixed lattice jib 46 ft to 207 ft long; lifting lattice jib 69 ft to 259 ft long.
2nd hoist gear	Axial piston variable displacement motor, Liebherr-made hoist drum with integrated planetary gear and spring-loaded static brake. The 2nd hoist gear is required for 2-hook operation.
3rd hoist gear with luffing block	Axial piston variable displacement motor, Liebherr-made hoist drum with integrated planetary gear and spring-loaded static brake, required for operating the luffing jib.
Assembly frame	Pin-connectable to telescopes 2 or 3, laterally liftable, required for the 276 ft telescopic boom.
Assembly device for the 276 ft telescopic boom	For the quick assembly/dismantling of telescopes 3 to 6. Transportation of the telescopes on low loaders.

CRANES

Crane Rental Service

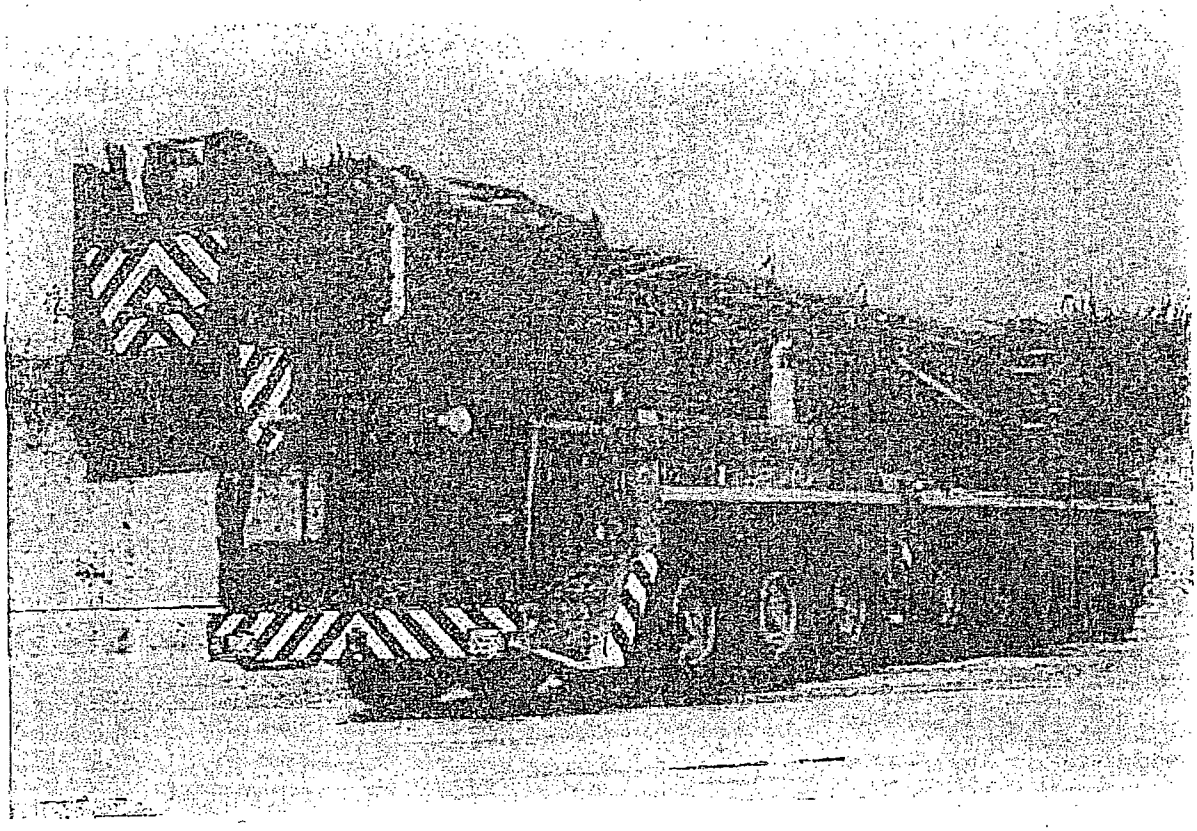
TRUCK CRANES
Capacities 82 to 200 tons
Booms to 390 feet

HYDRAULIC CRANES
Capacities 8.5 to 625 tons
Booms to 480 feet

CRAWLER CRANES
Capacities 115 to 440 tons
Booms to 512 feet

TOWER CRANES
Favco 750 & 1000 "Kangaroos"
Link-Belt TG-1900's

Proudly Offering the Largest and Most Diverse Selection of [illegible] All Terrain and Crawler/Luffer Cranes in New York City



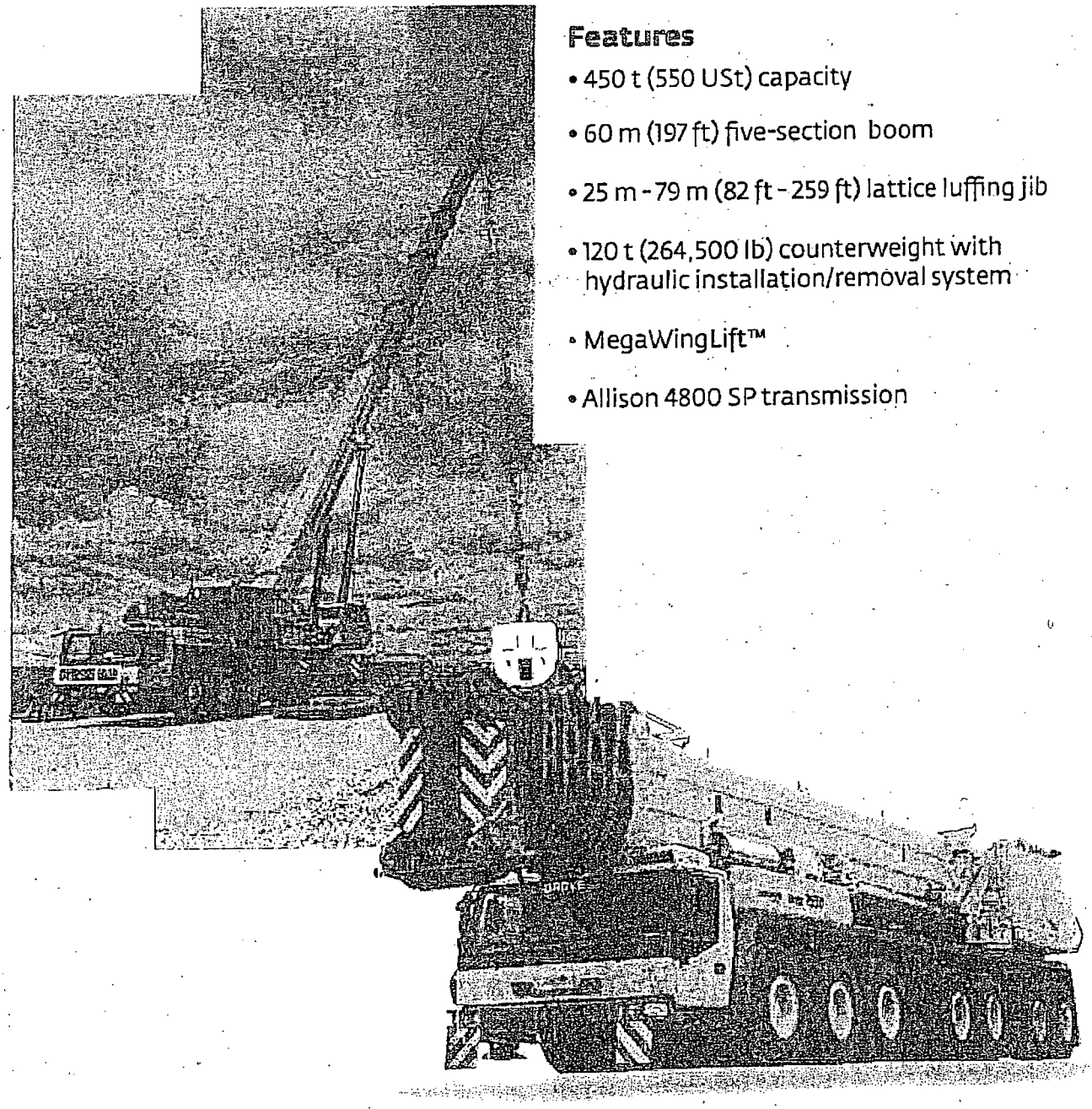
300.10.04

Grove Manitowoc National Crane Potain

Manitowoc

Grove GMK7550

Product Guide



Features

- 450 t (550 USt) capacity
- 60 m (197 ft) five-section boom
- 25 m - 79 m (82 ft - 259 ft) lattice luffing jib
- 120 t (264,500 lb) counterweight with hydraulic installation/removal system
- MegaWingLift™
- Allison 4800 SP transmission

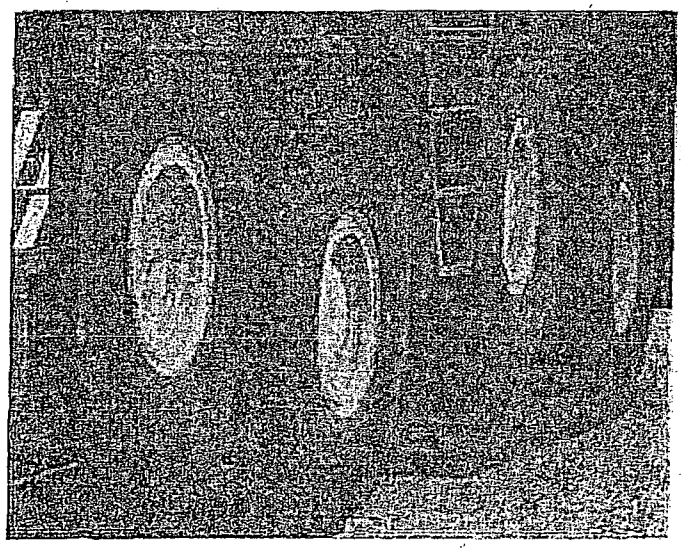
Features

MEGATRAK™

The MEGATRAK™ suspension system is the best off-road driveline available on the market today. The system's versatility and performance allows the GMK7550 to operate as a true all-terrain crane. The MEGATRAK™ independent suspension and all-wheel steer system allows wheels to remain on the ground at all times so stresses and weight are not continually transferred between axles. MEGATRAK™ provides true ground clearance where others just raise the chassis.

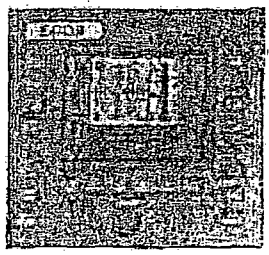
Other benefits of the MEGATRAK™ system are:

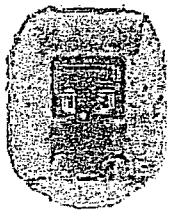
- A reliable suspension system
- Excellent job site maneuverability with all-wheel steering
- Commonality among almost all models
- A driveline that remains aligned at all times
- A steering linkage system that is protected against damage
- Constant tire contact for equal tire wear
- Reduced maintenance



ECOS

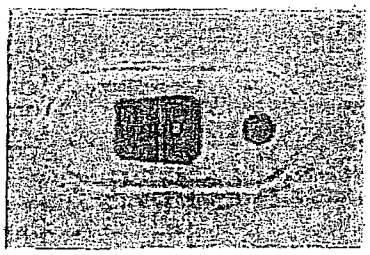
Electronic Crane Operating System - ECOS enables control of the entire crane's principle operations. Simple programming eases lift planning and a supply of essential information allows full concentration on the lift itself.

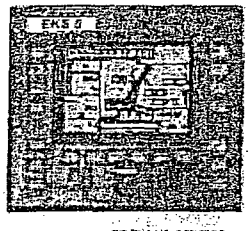




TWIN-LOCK™

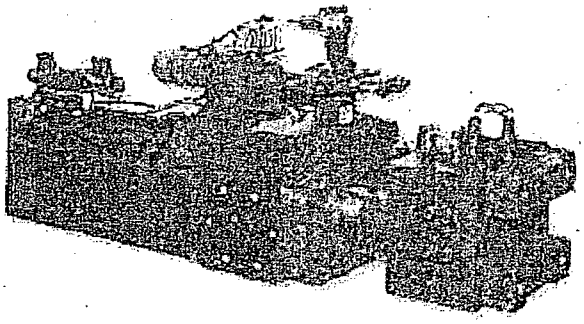
Boom pinning mechanism automatically pins the sections in position using two horizontal pins.

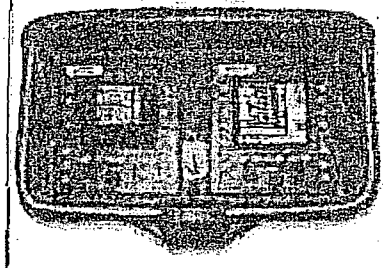




EKS 5

The EKS 5 monitors the lifting conditions of the crane at all times and provides a full graphic display, rear lighting, graphic of boom telescoping percentage, and load charts.





CraneSTAR

CraneSTAR is an exclusive and innovative crane asset management system that helps improve your profitability and reduce costs by remotely monitoring critical crane data. Visit www.cranestar.com for more information.

Contents

Specifications	4
Dimensions	7
Counterweight	12
Travel proposals	13
Working range/load charts main boom	15
Working range/load charts luffing jib	20
Working range/load charts fixed jib	41
Working range/load charts heavy duty jib	49
Symbols glossary	57

Specifications

Superstructure

Boom

16 m - 60 m (53 ft - 197 ft) five-section, full power boom with patented TWIN-LOCK™ boom pinning system. Maximum tip height: 63 m (207 ft).

Boom elevation

Two lift cylinders with safety valves provide boom angles from -1.2° to +82°.

Lattice jib

Luffing jib is a lattice design with lengths of 25 m - 79 m (82 ft -259 ft) in sections of 6,2 m (20 ft) and 12,2 m (40 ft). The luffing jib converts to a fixed offset lattice jib providing lengths of 12 m - 70 m (39 ft -230 ft) offsettable at 3° and 25°.

Load moment and anti-two block system

Graphic display load moment and anti-two block system with audio/visual warning and control lever lockout. These systems provide electronic display of boom angle, length, radius, tip height, relative load moment, maximum permissible load, load indication and warning of impending two-block condition.

Cab

All aluminum construction cab is tiltable (approximately 20°) and includes safety glass and adjustable operator's seat. Other features include engine independent hot water heater including 24 hour timer, air conditioning, armrest integrated crane controls, and ergonomically arranged instrumentation. Cab hydraulically stows to the rear of the superstructure for highway travel.

Swing

Three axial piston fixed displacement motors provide swing speed of 0 - 1.1 RPM thru planetary gear box. Also provided is a spring applied, hydraulically released automatic swing brake with foot operated release for free swing.

Counterweight

120 t (264,500 lb) consisting of various sections with hydraulic installation/removal system (see counterweight configuration on page 12).

Engine

Mercedes OM906LA, diesel, 6 cylinders, water cooled, turbocharged, 205 kW (279 hp) at 1800 rpm. Max. torque: 1100 Nm (811 ft/lb) at 1200 rpm.
Engine emission: EUROMOT/EPA/CARB Tier III (non-road).

Fuel tank capacity

300 L (79 gal).

Hydraulic system

Five separate circuits, Three axial piston variable displacement pumps with electronic power limiting control, 1 axial piston variable displacement pump for slewing and 1 fixed displacement pump for auxiliary gears. Standard thermostatically controlled oil coolers keep oil at optimum operating temperature. Tank capacity: 1570 L (415 gal)

Control system

Full electronic control of all crane movements is accomplished using electrical control levers with automatic reset to zero. Controls are integrated with the LMI and engine management system by CAN-BUS.

Electrical system

24 V system with three-phase alternator 28 V/100 A
2 batteries 12 V/170 Ah.

*Denotes optional equipment

Superstructure continued

Hoist

Main and auxiliary hoist are powered by axial piston variable displacement motor with planetary gear and brake. "Thumb-thumper" hoist drum rotation indicator alerts operator of hoist movement.

	Main Auxiliary	Auxiliary
Line length	460 m (1509 ft)	690 m (2264 ft)
Rope diameter	24 mm	24 mm
Line speed	130 m/min (427 fpm)	130 m/min (427 fpm)
Line pull	110 kN (24,729 lb)	104 kN (23,380 lb)

Hoist cameras and lights included.

*Optional hookblocks

Lifting capacity	Sheaves	Weight	Possible load with the crane*
320 t (353 USt)	11	3500 kg (7716 lb)	231 t / 277 t* (255 USt / 305 USt*)
250 t (275 USt)	9	3000 kg (6614 lb)	231 t (255 USt)
200 t (220 USt)	7	2400 kg (5291 lb)	184 t (203 USt)
160 t (176 USt)	5	1800 kg (3669 lb)	136 t (150 USt)
100 t (110 USt)	3	1300 kg (2866 lb)	88 t (97 USt)
40 t** (44 USt)	1	850 kg (1874 lb)	38 t (42 USt)
16 t*** (18 USt)	H/B	450 kg (992 lb)	12,5 t (13.8 USt)

* Requires additional boom nose sheave
* * Required for overhaul of single part line with boom/jib lengths in excess of 99,4 m (326 ft)
* * * Overhaul weight designed for a maximum of 99,4 m (326 ft) boom/jib lengths

*Optional equipment

- Second spotlight on superstructure cab
- Stereo/CD player
- Lift enhancement system (MegaWingLift™)
- Additional 40 t (88,200 lb) counterweight for MegaWingLift™
- Worklights on boom base section
- Aircraft warning lights
- Hook blocks
- Adapter for heavy duty jib
- 360° positive swing lock

Carrier

Chassis

Special seven-axle carrier, welded torsion resistant frame is fabricated from high-strength steel.

Outrigger system

Hydraulic two-stage outrigger beams are extended by a single hydraulic cylinder and two cables. Outriggers can adjust to two positions:

Fully extended (100%) - 8,9 m (29.2 ft)
Partially extended (50%) - 6,1 m (20 ft)

Four 810 mm x 810 mm (32 in x 32 in), self stowing, steel outrigger pads provide rigid lifting base. Outrigger controls are located on both sides of the carrier. Electronic level indicators with automatic levelling system. Outrigger pad load indication through ECOS and carrier controls. Includes outrigger monitoring system.

Engine

Mercedes, diesel, 8 cylinders, water-cooled, turbocharged, 420 kW (563 hp) at 1800 rpm.
Max. torque: 2700 Nm (1991 ft lb) at 1300 rpm.
Engine emission: EUROMOT/EPA/CARB Tier III (non-road).

Fuel tank capacity

500 L (132 gal).

*Denotes optional equipment

Specifications

Carrier continued

Transmission

Allison automatic 4800 SP-R, seven forward and one reverse speed. Transfer case with two speeds and inter-axle differential lock. Hydraulic transmission retarder.

Drive/steer

14x6x14

Axles

Seven axles. 1, 4 and 5 are drive/steer. Axles 2, 3, 6 and 7 are steer only.

Suspension

GMK7550 features the Grove exclusive MEGATRAK™ suspension. This revolutionary design features an independent hydroneumatic system with hydraulic lockout acting on all wheels. The suspension can be raised 170 mm (6 - 1/2 in) or lowered 130 mm (5 in) both longitudinally and transversely and features an automatic leveling system for on-highway travel.

Tires

14 tires 445/95 R25 (16.00 R25)
(vehicle width: 3,00 m [9.8 ft])

Steering

Dual circuit steering system is hydraulic power assisted with emergency steering pump.
Axles 1, 2, 3, 6 and 7steer on highway.
Separate steering of the 4th, 5th,6th and 7th axles for all wheel steer and crab-steer, controlled by an electric rocker switch.

Brakes

A dual circuit air system operates on all wheels with a spring-applied, air released parking brake acting on axles 2, 4, 5 and 7. An air dryer is fitted to remove moisture from the air system. Standard engine compression brake and transmission retarder.

Cab

Two-man, aluminum construction driver's cab includes the following features: safety glass; driver seat with pneumatic suspension, engine-dependent hot water heater and air conditioning. Complete instrumentation and driving controls.

Electrical system

24 V system with three-phase alternator 28 V/100 A, 2 batteries 12 V/170 Ah.

Maximum speed

85 km/h (53 mph) with 20.5 R25 tires.

Gradeability (theoretical)

32% with 20.5 R25 tires (14x6x14)
50% with 20.5 R25 tires (14x8x14)

Miscellaneous standard equipment

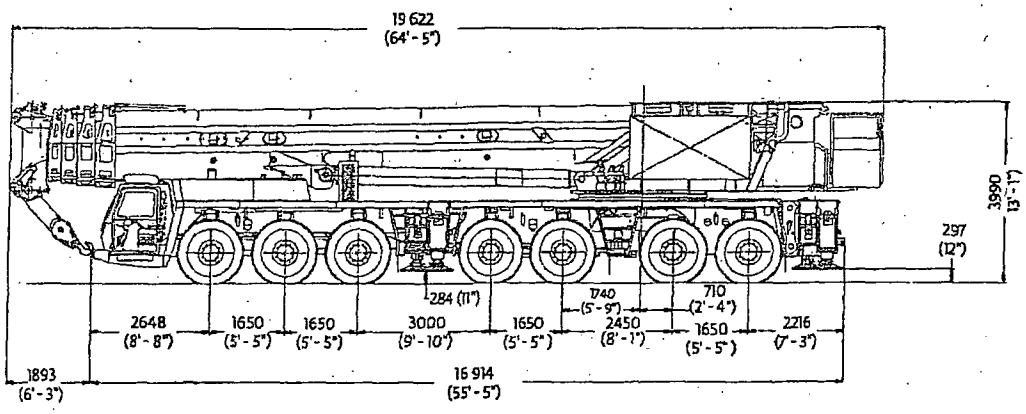
Boom removal kit; trailing boom kit (less dolly), additional hydraulic oil cooler; removable rear outrigger box; tool kit; fire extinguisher; radio/cd player in carrier cab, CraneSTAR asset management system.

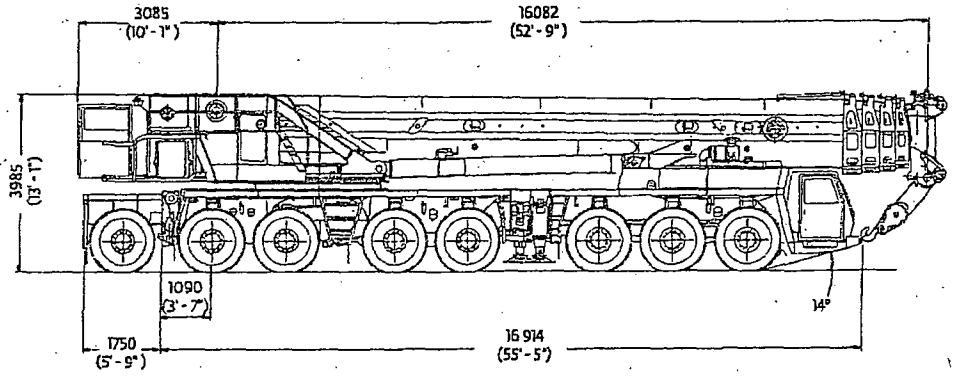
*Optional equipment

- 14 x 8 x 14 (1,2,4 and 5 are drive/steer)
- Engine-independent hot water heater, with engine pre-heater
- 14 tires, 385/95 R25 (14.00 R25). (vehicle width 3,00 m [9.8 ft])
- 14 tires, 525/80 R25 (20.5 R25). (vehicle width 3,1 m [10.2 ft])
- Aluminum rims
- Auxiliary axle, pinned when rear outrigger box is removed
- Hinged bunk bed
- Working range limiter
- Reversing camera system
- Engine shutdown valves (for both engines)

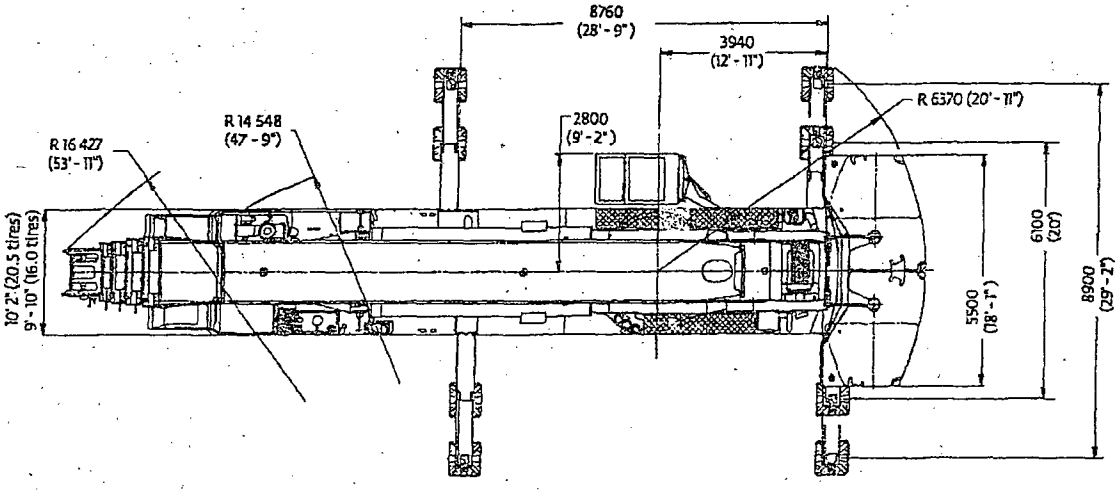
*Denotes optional equipment

Dimensions





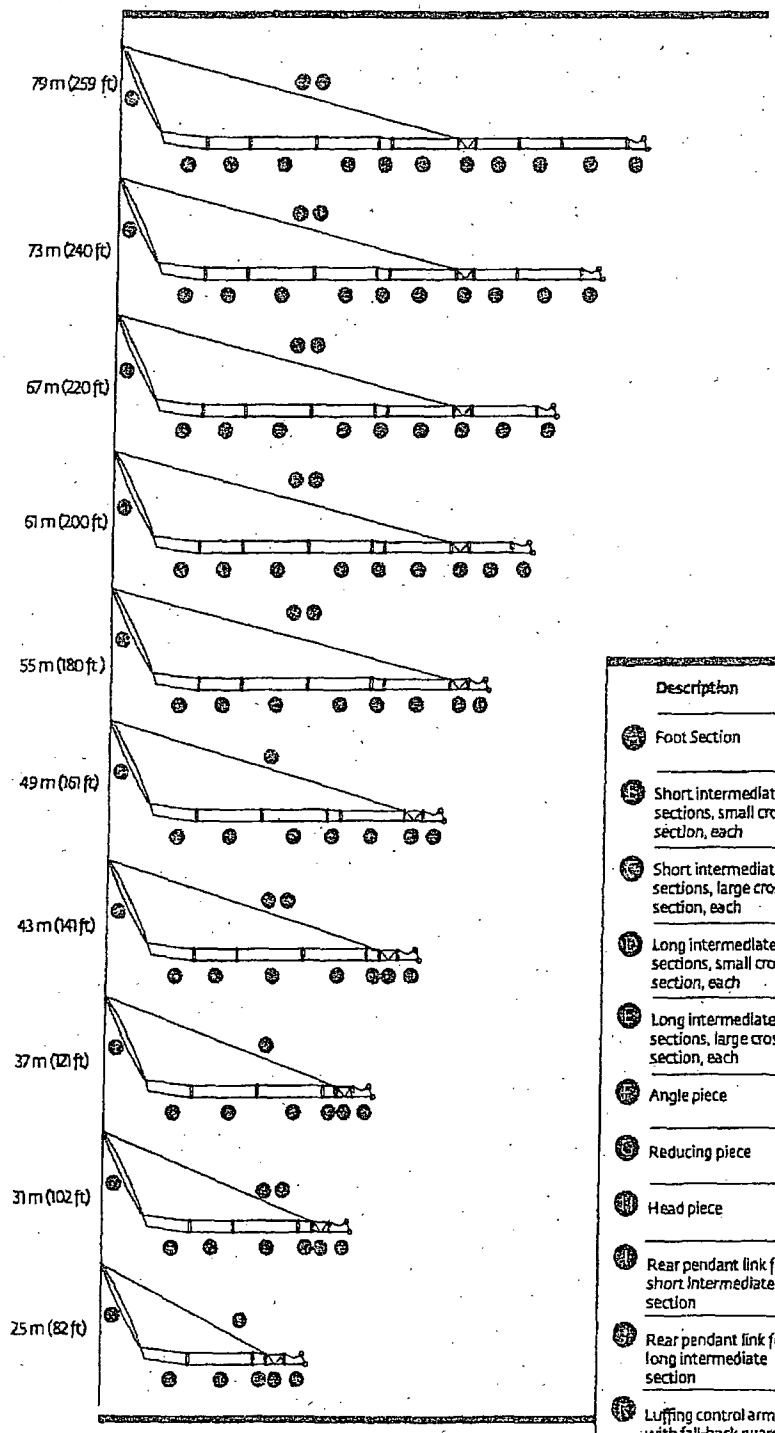
Shown with
8th axle



Dimensions

Luffing jib combinations

Without angle offset



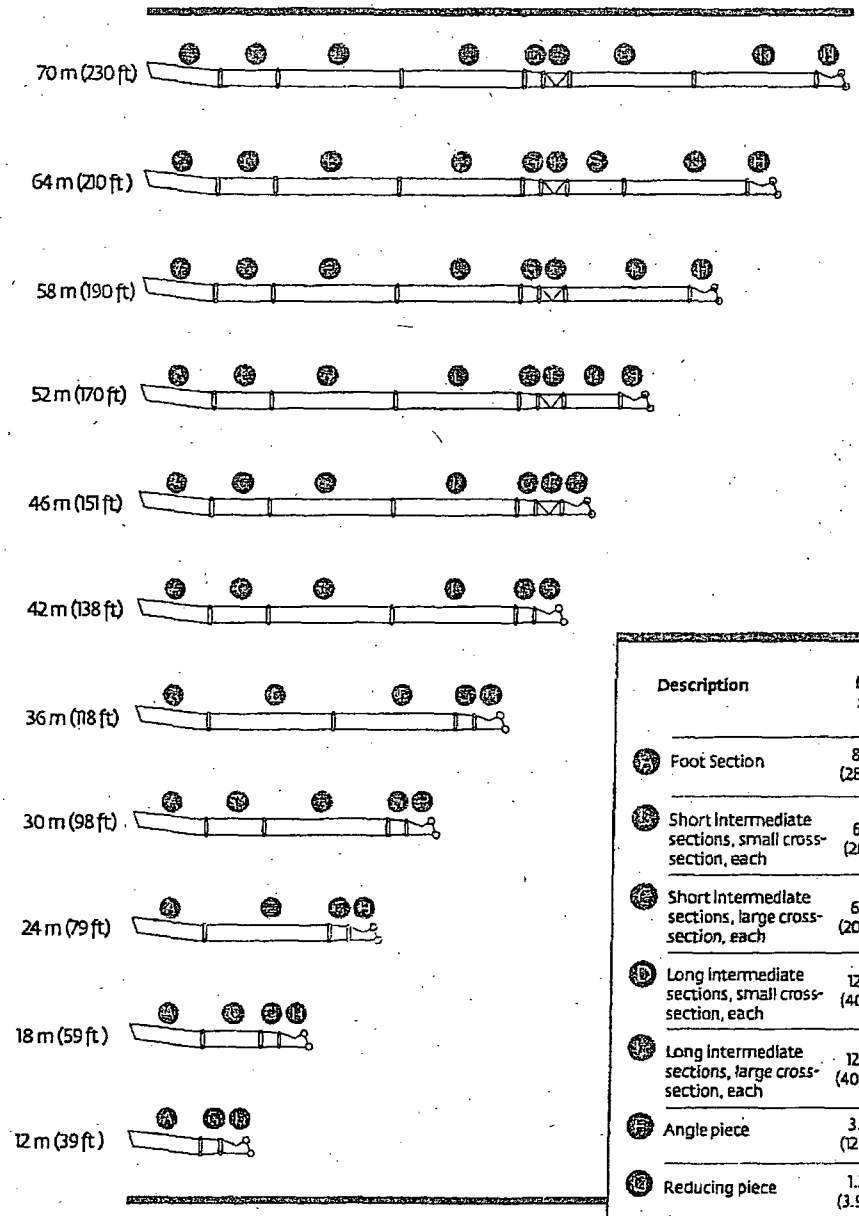
	Description	Length x width x height m (ft)	Weight in kg (lb)
A	Foot Section	8.80 x 1.80 x 2.50 (28.87 x 5.90 x 8.20)	3700 (8160
B	Short intermediate sections, small cross-section, each	6.20 x 1.50 x 1.500 (20.34 x 4.91 x 4.91)	900 (1985)
C	Short intermediate sections, large cross-section, each	6.20 x 1.80 x 1.90 (20.34 x 5.90 X 6.23)	1000 (2205)
D	Long intermediate sections, small cross-section, each	12.20 x 1.50 x 1.50 (40.03 x 4.91 x 4.91)	1600 (3530)
E	Long intermediate sections, large cross-section, each	12.20 x 1.80 x 1.90 (40.03 x 5.90 x 6.23)	1600 (3530)
F	Angle piece	3.70 x 1.50 x 1.80 (12.14 x 4.91 x 5.90)	1600 (3530)
G	Reducing piece	1.20 x 1.80 x 1.90 (3.94 x 5.90 x 6.23)	500 (1105)
H	Head piece	3.20 x 1.50 x 2.10 (10.50 x 4.91 x 6.89)	1200 (2650)
I	Rear pendant link for short intermediate section	6.20 x 0.20 x 0.20 (20.34 x 0.70 x 0.70)	200 (440)
J	Rear pendant link for long intermediate section	12.20 x 0.20 x 0.20 (40.03 x 0.70 x 0.70 80)	400 (880)
K	Luffing control arm with fall-back guard strut	12.20 x 2.10 x 1.80 (40.03 x 6.89 x 5.90)	3200 (*7055)

*Individual weight of rear pendant link: 360 kg (795 lb)

Dimensions

Lattice boom extension combinations

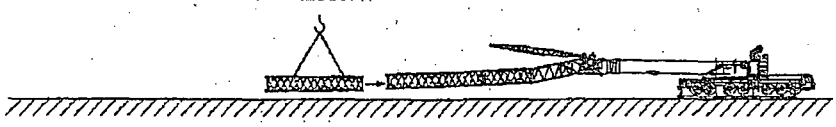
Without angle offset



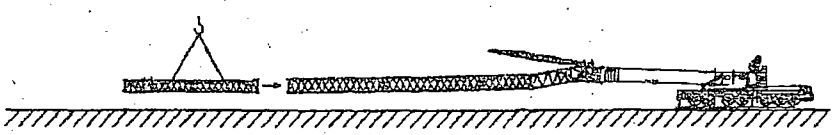
Description	Length x width x height m (ft)	Weight in kg (lb)
Foot Section	8.80 x 1.80 x 2.50 (28.87 x 5.90 x 8.20)	3700 (8160)
Short intermediate sections, small cross-section, each	6.20 x 1.50 x 1.50 (20.34 x 4.91 x 4.91)	900 (1985)
Short intermediate sections, large cross-section, each	6.20 x 1.80 x 1.90 (20.34 x 5.90 X 6.23)	1000 (2205)
Long intermediate sections, small cross-section, each	12.20 x 1.50 x 1.50 (40.03 x 4.91 x 4.91)	1600 (3530)
Long intermediate sections, large cross-section, each	12.20 x 1.80 x 1.90 (40.03 x 5.90 x 6.23)	1600 (3530)
Angle piece	3.70 x 1.50 x 1.80 (12.14 x 4.91 x 5.90)	1600 (3530)
Reducing piece	1.20 x 1.80 x 1.90 (3.94 x 5.90 x 6.23)	500 (1105)
Head piece	3.20 x 1.50 x 2.10 (10.50 x 4.91 x 6.89)	1200 (2650)

Dimensions

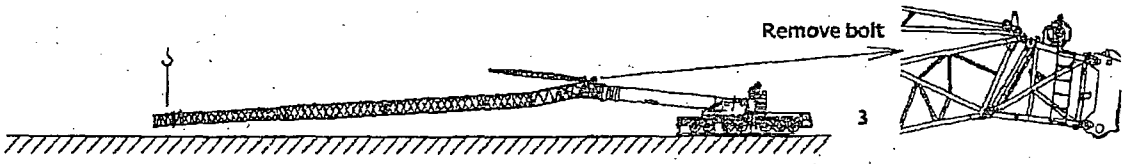
Aerial rigging of JD



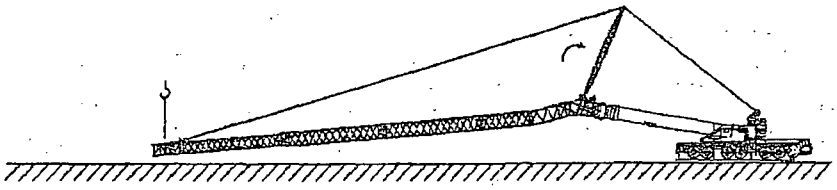
1



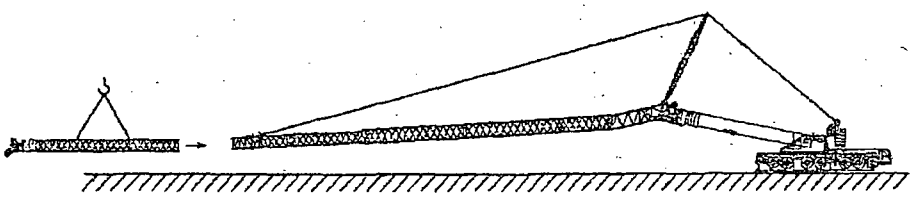
2



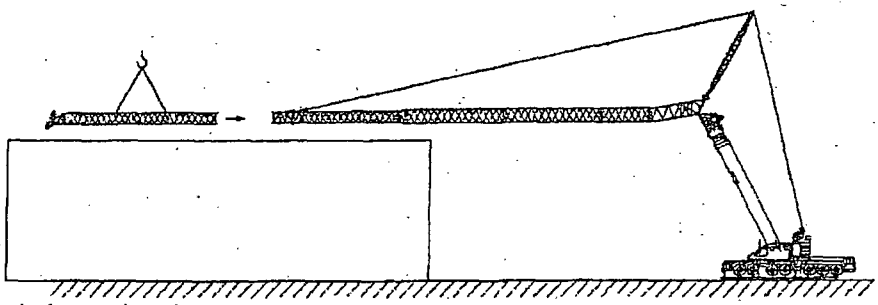
3



4

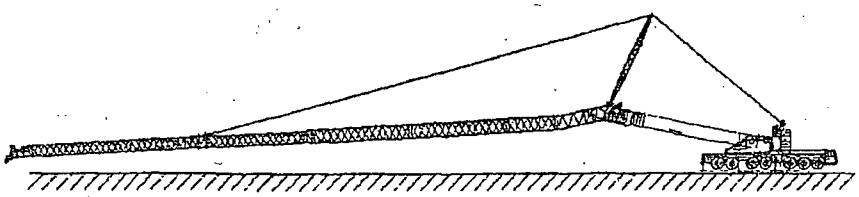


5A



5B

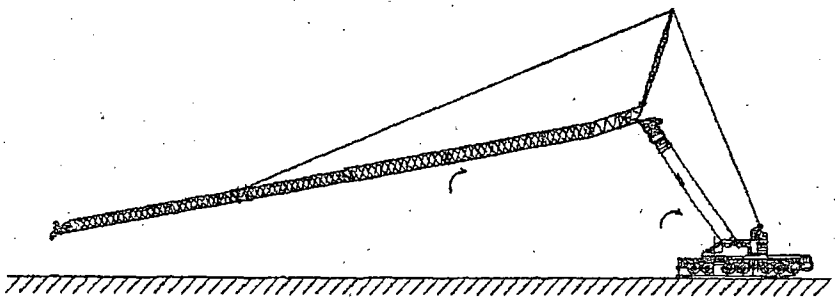
Rigging on obstacles



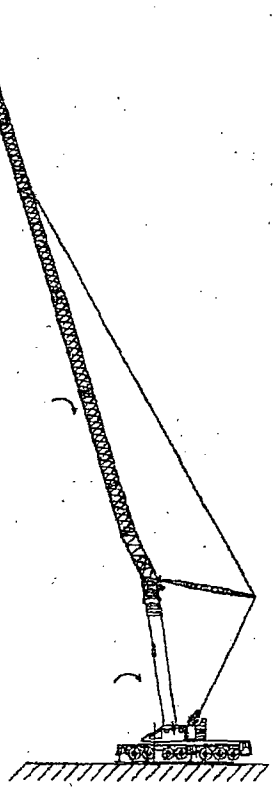
6

Dimensions

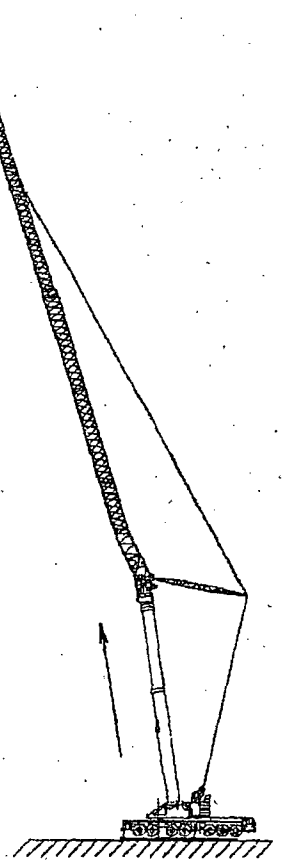
Aerial rigging jib



7

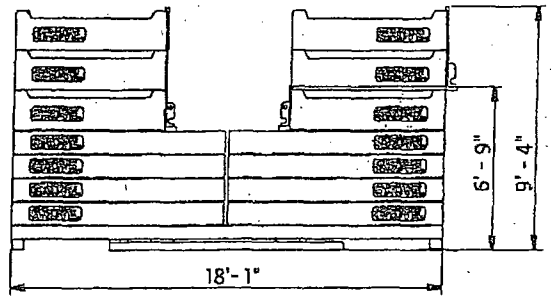


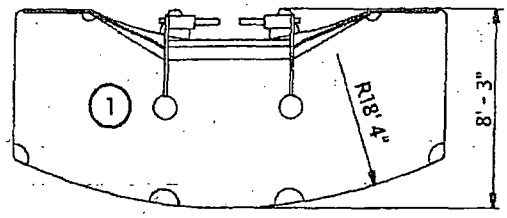
8

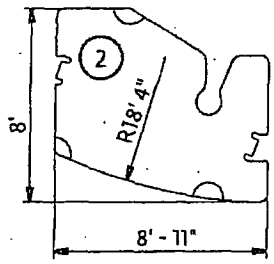


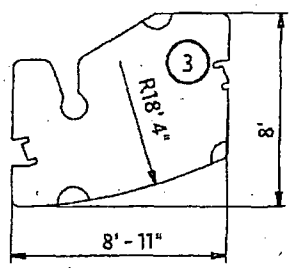
9

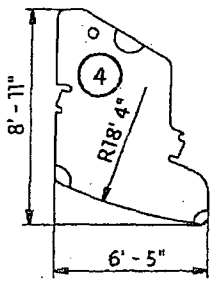
Counterweight

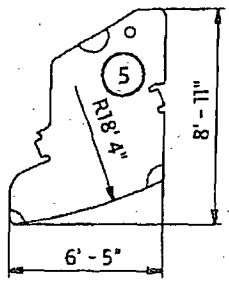








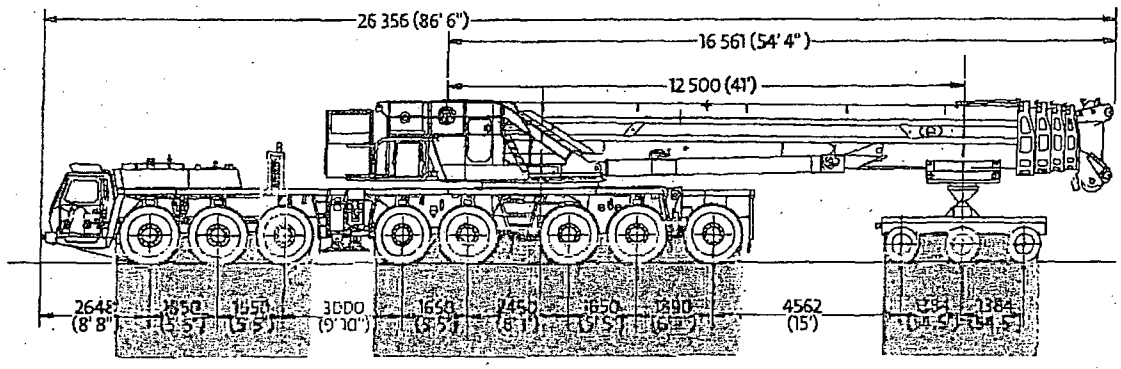




	1 20 t (44,000 lb)	2 10 t (22,000 lb)	3 10 t (22,000 lb)	4 10 t (22,000 lb)	5 10 t (22,000 lb)
20,0 t (44,000 lb)	x				
40,0 t (88,100 lb)	x	x	x		
60,0 t (132,200 lb)	x	2x	2x		
80,0 t (176,000 lb)	x	3x	3x		
100,0 t (220,400 lb)	x	4x	4x		
120,0 t (264,500 lb)	x	4x	4x	x	x
140,0 t (308,600 lb)	x	4x	4x	2x	2x
160,0 t (352,700 lb)	x	4x	4x	3x	3x

Travel proposals

Trailing boom dolly with 8th axle

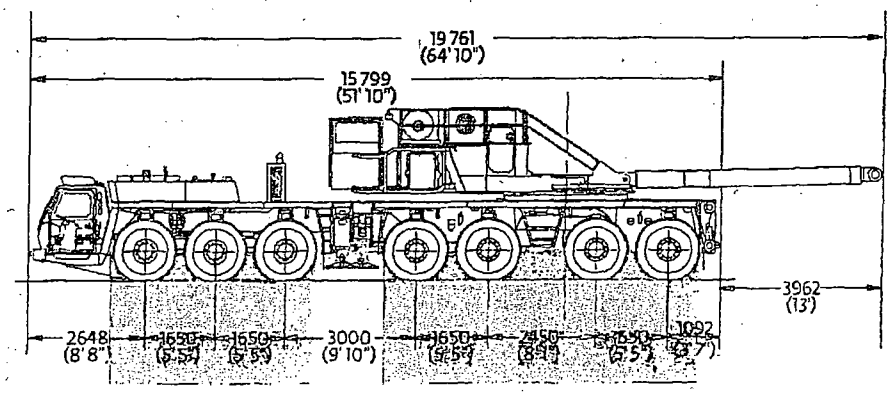


	Axles 1 - 3	Axles 4 - 8	Dolly	Total GVW
Boom removed, rear outrigger box removed, with counterweight	26 254 kg (57,879 lb)	38 388 kg (84,631 lb)	26 822 kg (59,132 lb)	[illegible]

Notes
- 20.5 tires on aluminum rims - axles 1 through 8
- Operator, 75 kg (165 lb)
- Welded on MEGAWINGLIFT hardware
- Dolly weight: 3900 kg (8600 lb)

Allow 3% variation in weight due to manufacturing tolerances

Boom removed, superstructure over rear



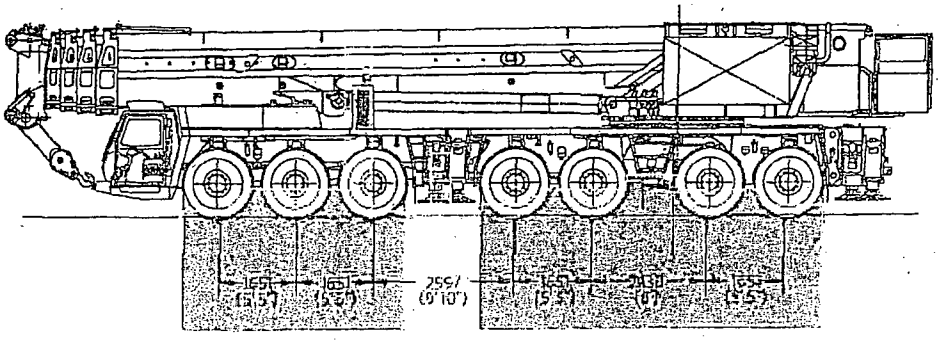
	Axles 1 - 3	Axles 4 - 7	Total GVW
Boom removed, superstructure over rear	16 717 kg (36,855 lb)	34 879 kg (76,895 lb)	[illegible] (116,750 lb)

Notes
- Rear outrigger box removed
- 20.5 tires on aluminum rims
- Operator, 75 kg (165 lb)

Allow 3% variation in weight due to manufacturing tolerances

Travel proposals

Boom over front



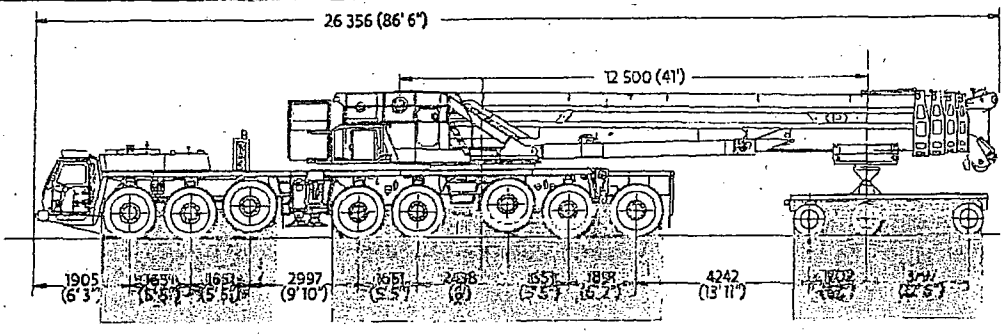
	Axles 1 - 3	Axles 4 - 7/8	Total GVW
[illegible]	37 724 kg (83,167 lb)	47 502 kg (104,722 lb)	[illegible]
[illegible]	33 762 kg (74,431 lb)	58 193 kg (128,292 lb)	[illegible]
Boom over front [illegible]	43 562 kg (96,038 lb)	44 000 kg (97,003 lb)	[illegible]

Dimensions (m)

- 20.5 tires on aluminum rims
- Operator, 75 kg (165 lb)
- Welded on MEGAWINGLIFT hardware

Allow 3% variation in weight due to manufacturing tolerances

Trailing boom (spread dolly) with axles 3 and 6 lifted



	Axles 1 - 2	Axles 4, 5, 7, 8	Dolly	Total GVW
[illegible]	23 899 kg (52,689 lb)	40 743 kg (89,821 lb)	27 485 kg (60,594 lb)	[illegible]

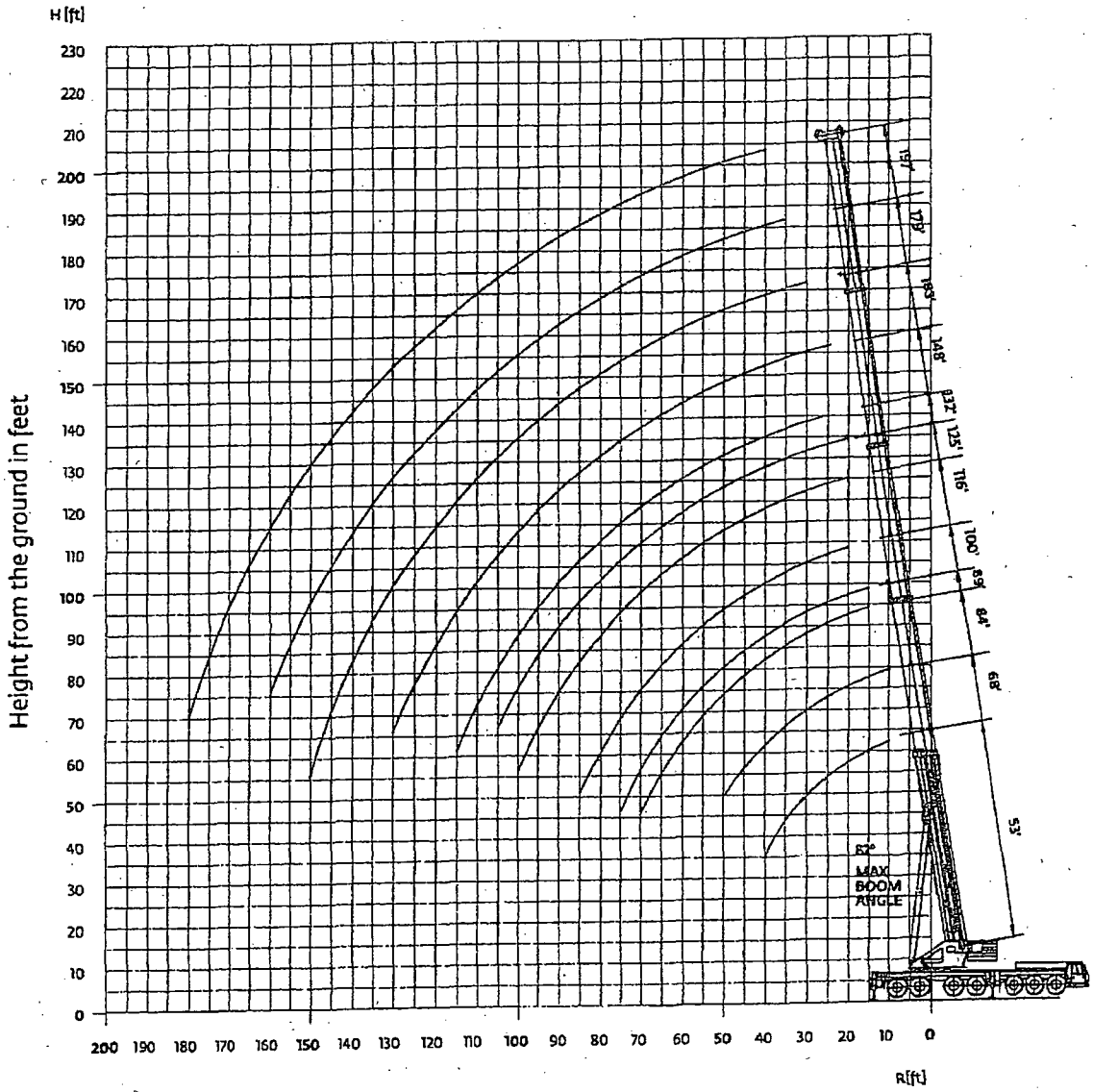
Dimensions (m)

- 20.5 tires on aluminum rims - axles 1 through 8
- Operator, 75 kg (165 lb)
- Welded on MEGAWINGLIFT hardware
- 3 axle dolly (4563 kg (10,000 lb))

Allow 3% variation in weight due to manufacturing tolerances

Working range
Main boom

197 ft main boom



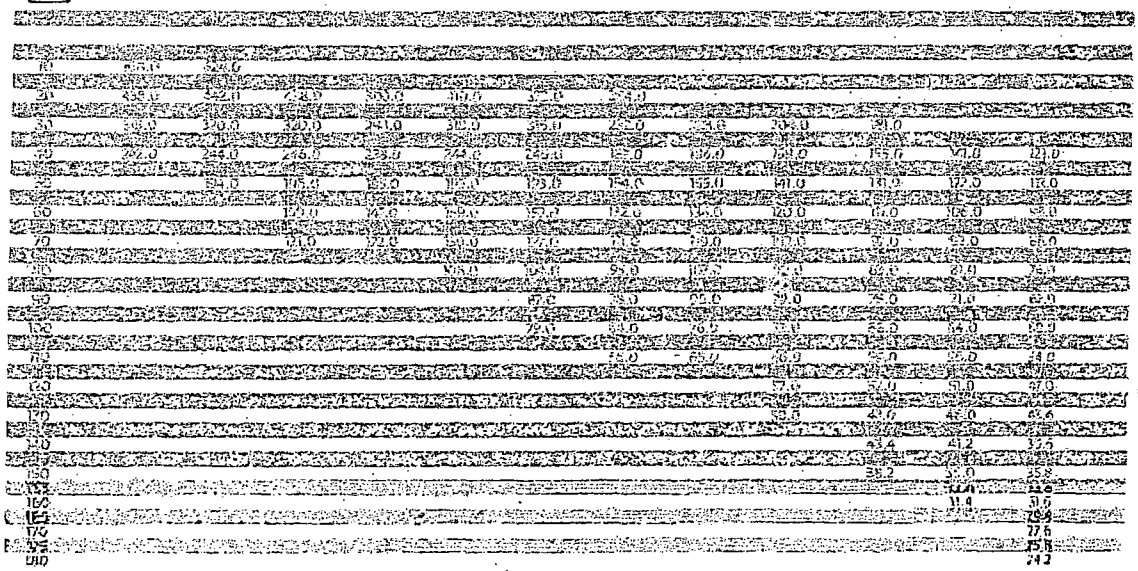
Operating radius in feet from axis of rotation

Hook heights shown in the working diagram do not consider loaded boom deflection.

Load charts
Main boom

16,0 m - 60 m (53 ft - 197 ft) | 120 000 kg (264,500 lb) | 29 ft 2 in spread (100%) | 360°

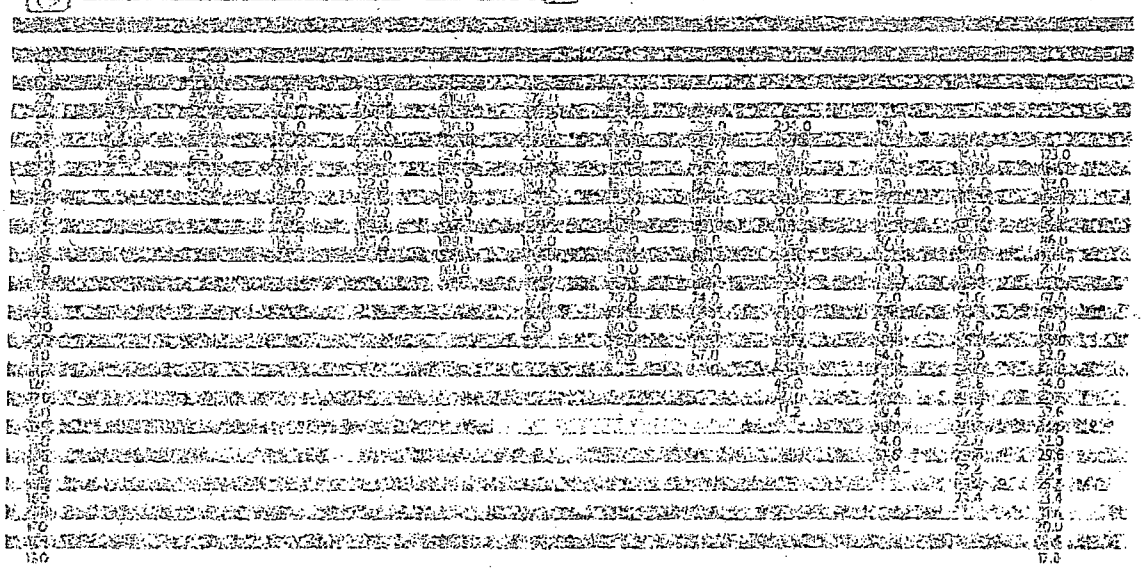
Pounds (thousands)



Loads > 420,000 lb can only be lifted with additional equipment
* Over rear, 20 ft outrigger span, with special equipment

16,0 m - 60 m (53 ft - 197 ft) | 100 000 kg (220,400 lb) | 29 ft 2 in spread (100%) | 360°

Pounds (thousands)

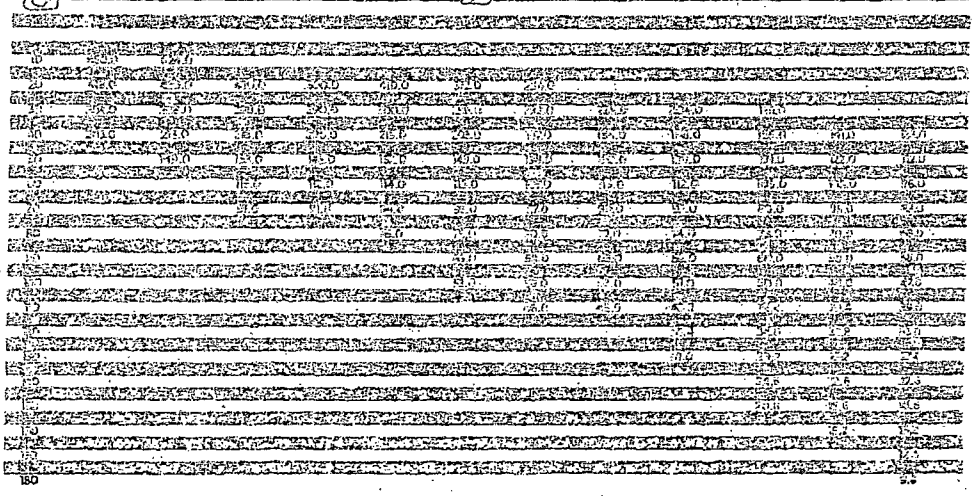


Loads > 420,000 lb can only be lifted with additional equipment
* Over rear, 20 ft outrigger span, with special equipment

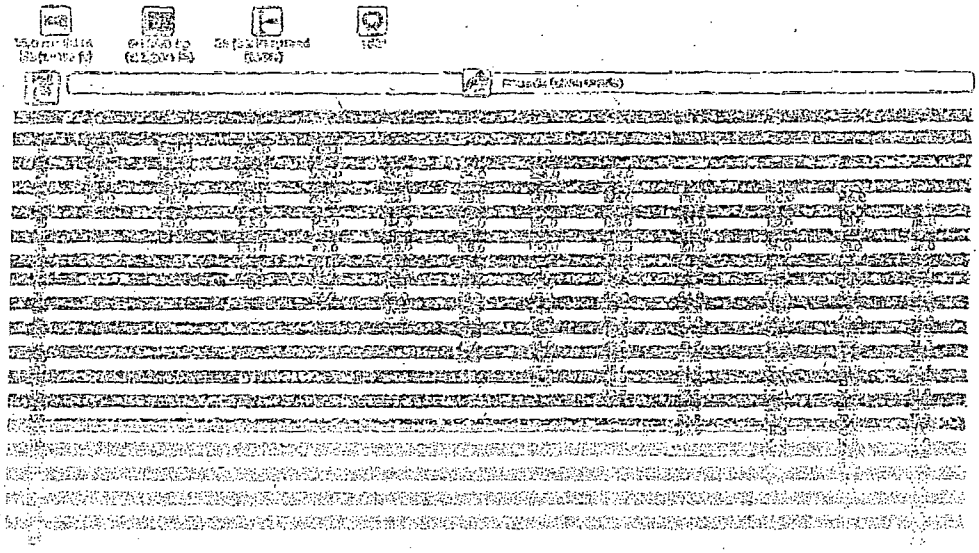
THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane

16,0 m - 60 m (53 ft - 197 ft) | 80 000 kg (176,300 lb) | 29 ft 2 in spread (100%) | 360°

Pounds (thousands)



Loads > 420,000 lb can only be lifted with additional equipment



Loads > 420,000 lb can only be lifted with additional equipment

16,0 m - 65 m (53 ft - 148 ft) | 0 kg (0 lb) | 29 ft 2 in spread (100%) | 360°

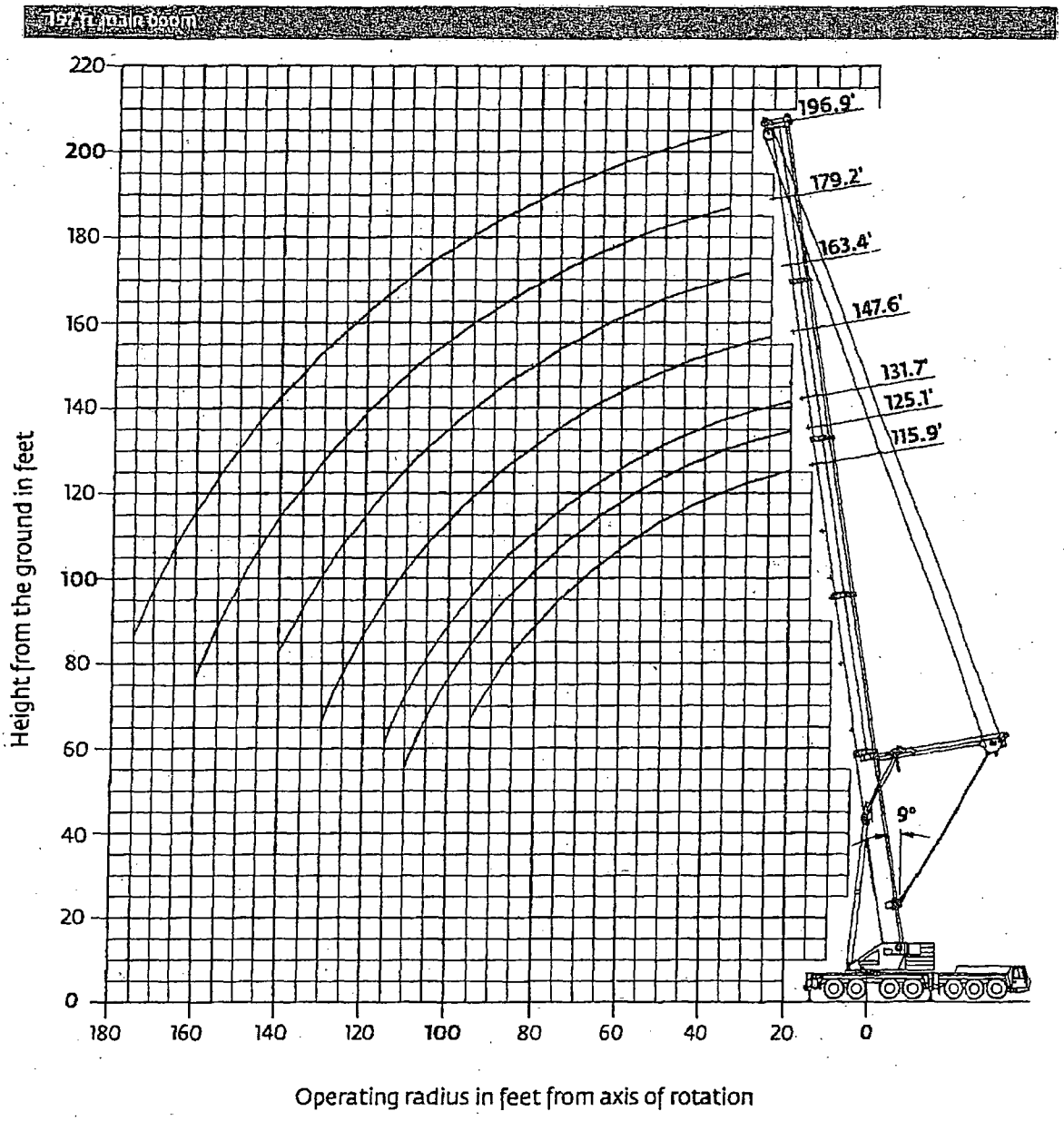
Pounds (thousands)

15	440.0	366.0	302.0	272.0					
20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
25	114.0	111.0	106.0	104.0	99.0	90.0	87.0	81.0	53.0
30	72.0	75.0	76.0	75.0	71.0	65.0	64.0	60.0	40.2
35	49.0	53.0	54.0	54.0	53.0	50.0	49.0	45.0	30.6
40	34.0	38.5	39.5	40.0	39.4	[illegible]	[illegible]	[illegible]	[illegible]
45		28.2	30.8	31.4	31.4	29.8	29.4	27.0	17.8
50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
55			17.6	18.2	18.8	17.8	17.8	16.0	9.2
60			13.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
65			9.2	9.8	10.6	10.0	10.2	8.4	
70			6.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
75				4.0	5.0	4.4	4.8		

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane

Working range

Main boom and MegaWingLift™



Hook heights shown in the working diagram do not consider loaded boom deflection.

35,3 m - 60 m (116 ft - 197 ft) | 160 000 kg (352,700 lb) | 29 ft 2 in spread (100%) | 360°

Pounds (thousands)

25	324.0	254.0	310.0	298.0			
35	274.0	230.0	258.0	244.0	211.0	200.0	167.0
45	222.0	209.0	219.0	212.0	190.0	175.0	169.0
55	192.0	160.0	181.0	175.0	172.0	154.0	134.0
65	153.0	153.0	152.0	152.0	147.0	139.0	121.0
75	129.0	130.0	129.0	128.0	127.0	124.0	110.0
85	111.0	112.0	111.0	110.0	109.0	105.0	100.0
95	97.0	97.0	97.0	96.0	95.0	93.0	91.0
105		85.0	85.0	84.0	83.0	82.0	82.0
115			71.0	75.0	73.0	72.0	72.0
125				67.0	65.0	63.0	64.0
135					58.0	56.0	56.0
145						[illegible]	[illegible]
155						42.6	[illegible]
165							39.0
175							33.8

35,3 m - 60 m (116 ft - 197 ft) | 120 000 kg (264,500 lb) | 29 ft 2 in spread (100%) | 360°

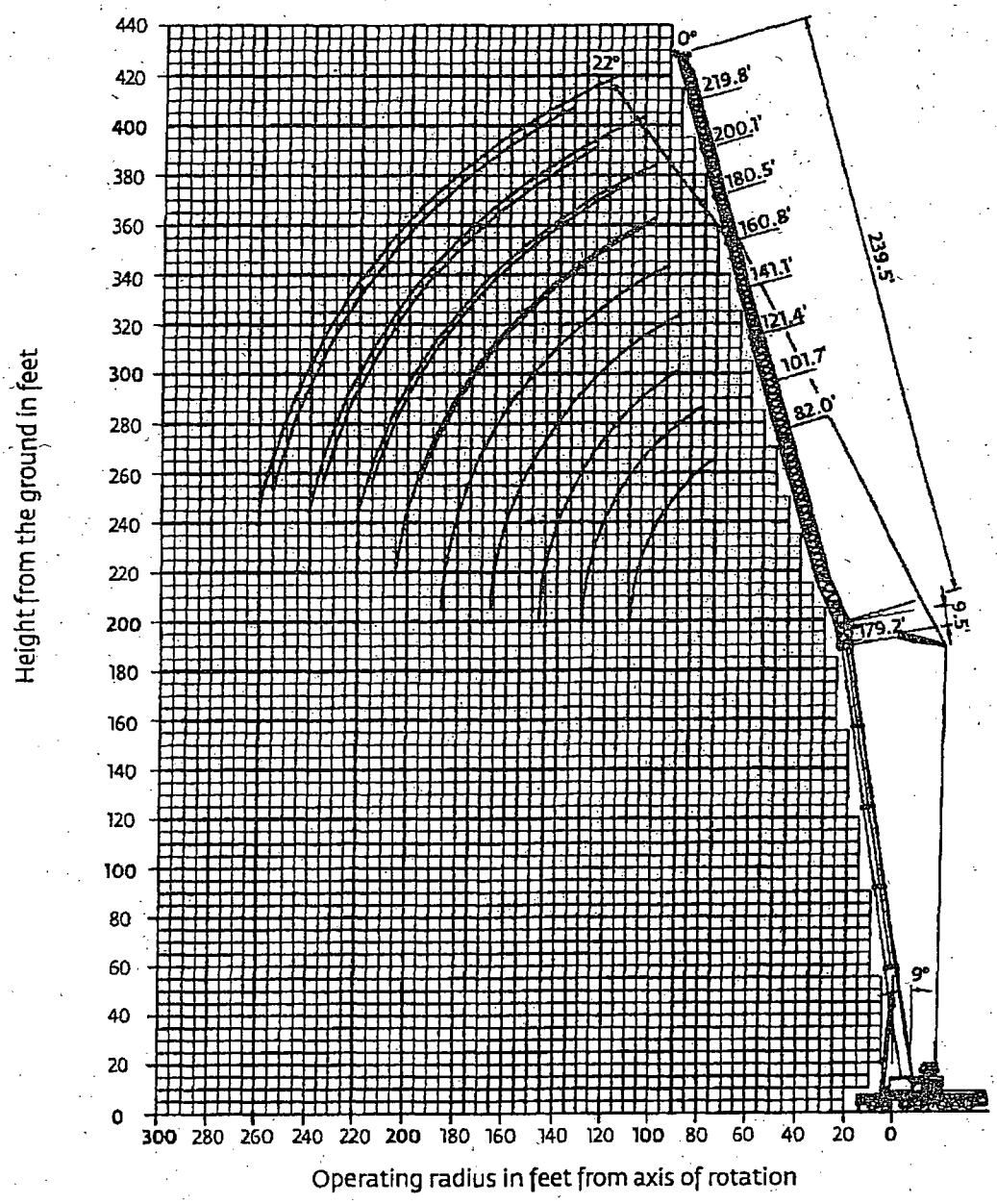
Pounds (thousands)

25	[illegible]	254.0	310.0	298.0			
35	250.0	230.0	258.0	244.0	211.0	200.0	167.0
45	208.0	204.0	205.0	202.0	190.0	175.0	149.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	115.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	80.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]				[illegible]	[illegible]	[illegible]	[illegible]
[illegible]					[illegible]	[illegible]	[illegible]
[illegible]						[illegible]	[illegible]
[illegible]						[illegible]	[illegible]
[illegible]							[illegible]
[illegible]							[illegible]

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range
Luffing jib

82 ft - 240 ft luffing jib - 81 m main boom



Hook heights shown in the working diagram do not consider loaded boom deflection.

81°
16,0 m + 2,9 m
(52.6 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

45	160.0	140.0							
55	152.0	132.0	110.0	91.0					
65	178.0	125.0	106.0	88.0	72.0				
75	107.0	118.0	102.0	84.0	69.0	54.0	41.4	32.6	
85	79.0	96.6	95.0	80.0	65.0	52.0	39.2	29.8	22.8
95		75.0	88.0	76.0	62.0	49.0	37.2	29.0	21.4
105			73.0	74.0	59.0	46.0	35.2	27.0	20.0
115			58.0	69.0	57.0	43.6	33.4	25.2	18.8
125				57.0	54.0	41.6	31.6	23.2	17.6
135				46.0	50.0	39.6	30.2	22.0	16.6
145					43.2	38.0	28.4	20.8	15.4
155					36.2	35.2	26.6	19.6	14.6
165						33.4	24.8	18.6	13.6
175						29.6	23.8	17.8	12.8
185							22.6	16.8	12.0
195							20.6	15.8	11.2
205								14.8	10.6
215								13.8	9.8
225									9.2
235									8.6

81°
25,7 m + 2,9 m
(84,3 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

45	160.0	140.0							
55	152.0	132.0	110.0	91.0					
65	178.0	125.0	106.0	88.0	72.0				
75	107.0	118.0	102.0	84.0	69.0	54.0	41.4	32.6	
85	79.0	96.6	95.0	80.0	65.0	52.0	39.2	29.8	22.8
95		75.0	88.0	76.0	62.0	49.0	37.2	29.0	21.4
105			73.0	74.0	59.0	46.0	35.2	27.0	20.0
115			58.0	69.0	57.0	43.6	33.4	25.2	18.8
125				57.0	54.0	41.6	31.6	23.2	17.6
135				46.0	50.0	39.6	30.2	22.0	16.6
145					43.2	38.0	28.4	20.8	15.4
155					36.2	35.2	26.6	19.6	14.6
165						33.4	24.8	18.6	13.6
175						29.6	23.8	17.8	12.8
185							22.6	16.8	12.0
195							20.6	15.8	11.2
205								14.8	10.6
215								13.8	9.8
225									9.2
235									8.6

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Load charts

Luffing jib

8T
35,3 m + 2,9 m
(115.9 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

50	100.0								
60	97.0	93.0	86.0						
70	97.0	92.0	80.0	65.0					
80	89.0	86.0	71.0	64.0	51.0	40.4	32.0		
90	82.0	77.0	72.0	62.0	49.0	38.2	31.2	23.8	
100		72.0	67.0	61.0	48.0	38.2	30.2	23.0	18.0
110		67.0	62.0	55.0	47.0	37.2	29.2	22.2	17.6
120			56.0	55.0	45.0	36.0	28.2	21.2	16.2
130			55.0	52.0	41.0	35.0	27.2	20.4	15.4
140				49.0	43.0	33.8	26.0	19.4	14.6
150				47.0	41.5	32.8	24.6	18.6	14.0
160					40.6	31.8	24.6	17.8	13.2
170					39.6	30.8	22.6	17.0	12.4
180						29.6	21.8	16.4	11.8

8T
45,0 m + 2,9 m
(147.6 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Load charts
Luffing jib

81°
49,8 m + 2,9 m
(163.4 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

70	67.0								
80	62.0	57.0	45.0	37.0					
90	57.0	53.0	45.0	37.0	28.2				
100	53.0	50.0	45.0	37.0	28.2	23.8	18.2	14.6	
110		46.0	43.2	37.0	28.2	23.6	18.0	14.6	10.6
120		43.6	40.6	36.6	28.2	23.2	18.6	14.4	10.4
130			38.0	34.6	28.2	23.0	18.4	14.0	10.4
140			35.8	33.0	28.8	22.6	18.0	13.6	10.2
150				31.0	28.2	22.4	17.6	13.4	9.8
160				29.2	27.4	22.0	17.4	13.0	9.4
170					26.2	21.8	17.0	12.6	9.2
180					24.8	21.4	16.6	12.4	8.6
190						21.0	16.2	12.0	8.4
200						20.4	16.0	11.6	8.2

81°
54,6 m + 2,9 m
(179.2 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

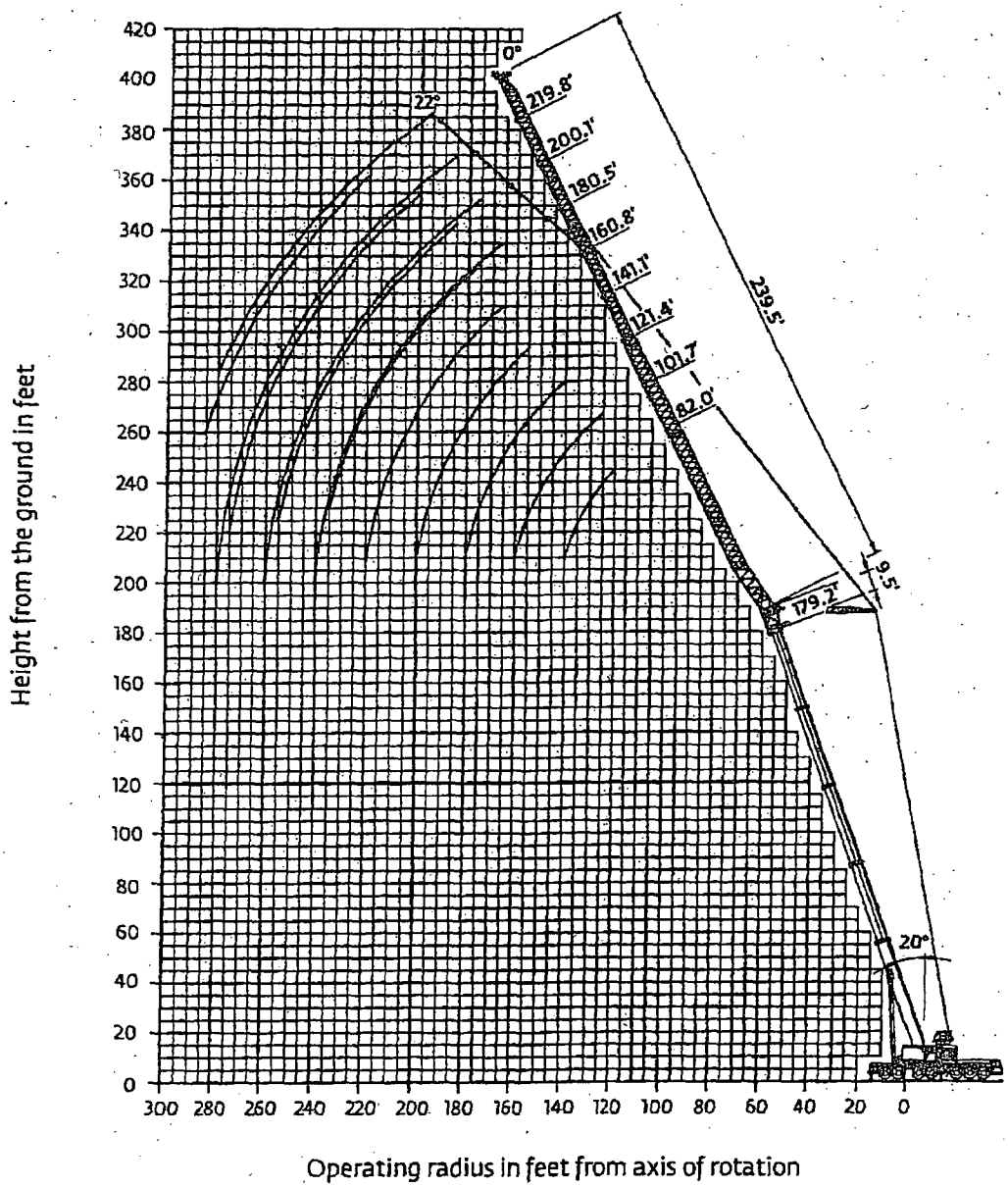
360°

Pounds (thousands)

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range
Luffing jib

8 ft – 46 ft Luffing jib – 74 ft main boom



Hook heights shown in the working diagram do not consider loaded boom deflection.

70° 16,0 m + 2.9 m (52.6 ft + 9.5 ft) | 25 m - 73 m (82 ft - 240 ft) | 120 000 kg (264,500 lb) | 29 ft 2 in spread (100%) | 360°

Pounds (thousands)

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
65	142.0								
75	128.0	125.0							
85	112.0	112.0							
95		98.0	97.0	81.0					
105		86.0	85.0	74.0	62.0				
115			76.0	75.0	59.0	46.0			
125			68.0	67.0	57.0	43.6	33.4	25.4	
135				61.0	54.0	41.6	31.3	22.4	17.6
145				55.0	51.0	39.6	30.2	22.0	16.6
155					49.0	38.0	28.8	20.8	15.6
165					43.2	36.2	27.2	19.8	14.6
175						34.6	25.6	18.8	13.6
185						33.0	24.0	17.8	12.8
[illegible]							22.6	15.0	12.0
[illegible]							[illegible]	[illegible]	[illegible]
[illegible]								[illegible]	[illegible]
[illegible]								[illegible]	[illegible]
[illegible]									[illegible]
[illegible]									8.6

70° 75,7 m + 2,9 m (84.3 ft + 9.5 ft) | 25 m - 73 m (82 ft - 240 ft) | 120 000 kg (264,500 lb) | 29 ft 2 in spread (100%) | 360°

Pounds (thousands)

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]								
[illegible]	[illegible]								
[illegible]	[illegible]	[illegible]	[illegible]						
[illegible]		[illegible]	[illegible]	[illegible]					
[illegible]		70.0	[illegible]	[illegible]	[illegible]				
[illegible]			[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]						[illegible]	[illegible]	[illegible]	[illegible]
[illegible]						[illegible]	[illegible]	[illegible]	[illegible]
215							[illegible]	[illegible]	[illegible]
[illegible]							[illegible]	[illegible]	[illegible]
[illegible]								[illegible]	[illegible]
[illegible]								[illegible]	[illegible]
[illegible]									[illegible]
[illegible]									[illegible]

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Load charts

Luffing jib

70°
35,3 m + 2,9 m
(115.9 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

90	72.0									
100	66.0	63.0								
110	61.0	58.0	55.0							
120		54.0	52.0	49.0						
130		51.0	48.0	46.0						
140			45.0	43.0	41.6	36.8				
150			42.8	40.4	39.0	35.8	27.4			
160				38.0	36.8	34.0	26.2	19.6	14.8	
170				36.0	34.6	32.0	25.0	18.8	14.0	
180					32.8	30.2	23.6	18.0	13.4	
190					30.4	28.6	22.8	17.2	12.6	
200						27.0	22.0	16.4	12.0	
210						25.0	21.0	15.8	11.2	
220							20.4	15.0	10.6	
230							19.6	14.2	10.0	
240								13.6	9.4	
250									8.8	
260									8.4	

70°
45,0 m + 2,9 m
(147.6 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

70°
49,8 m + 2,9 m
(163.4 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

75	39.0								
85	35.2	33.8							
95	33.6	31.5	29.6						
105		29.4	27.6	25.4					
115		27.6	25.8	24.0					
125			24.4	22.4	22.2	19.4	17.4		
135			23.0	21.0	20.6	18.0	16.8	15.6	
145				19.6	19.2	16.6	15.6	13.2	9.6
155				18.4	18.0	15.6	14.6	12.8	9.4
165					16.8	14.4	13.4	12.0	9.0
175					15.8	13.4	12.6	11.2	8.8
185						12.6	11.6	10.4	8.4
195						11.6	10.8	9.6	8.0
205								9.0	7.6
215								7.0	7.4
225									7.4
235									7.4
245									7.4
255									7.4
265									7.4

70°
54,6 m + 2,9 m
(179.2 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

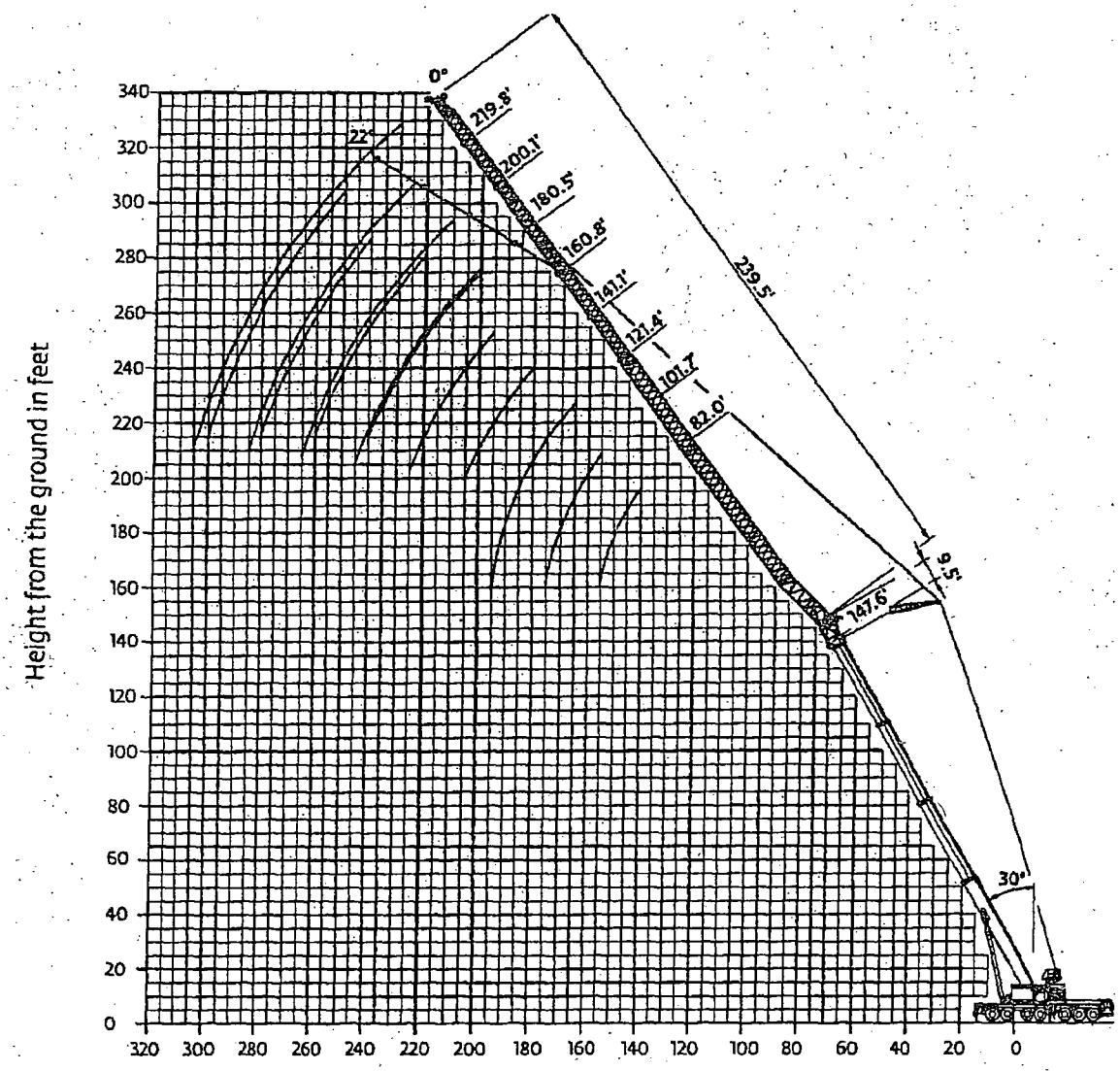
Pounds (thousands)

84	37.0								
95	35.2	33.8							
105	33.6	31.5	29.6						
115		29.4	27.6	25.4					
125		27.6	25.8	24.0					
135			24.4	22.4	22.2	19.4	17.4		
145			23.0	21.0	20.6	18.0	16.8	15.6	
155				19.6	19.2	16.6	15.6	13.2	9.6
165				18.4	18.0	15.6	14.6	12.8	9.4
175					16.8	14.4	13.4	12.0	9.0
185					15.8	13.4	12.6	11.2	8.8
195						12.6	11.6	10.4	8.4
205						11.6	10.8	9.6	8.0
215								9.0	7.6
225								7.0	7.4
235									7.4
245									7.4
255									7.4
265									7.4
275									7.4
285									7.4

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range
Luffing jib

182 ft + 240 ft luffing jib + 60° main boom



Operating radius in feet from axis of rotation

Hook heights shown in the working diagram do not consider loaded boom deflection.

60°
16,0 m + 2,9 m
(52.6 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

60°
25,7 m + 2,9 m
(84.3 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

Load charts
Luffing jib

60°
35,3 m + 2,9 m
(115.9 ft + 9.5 ft)

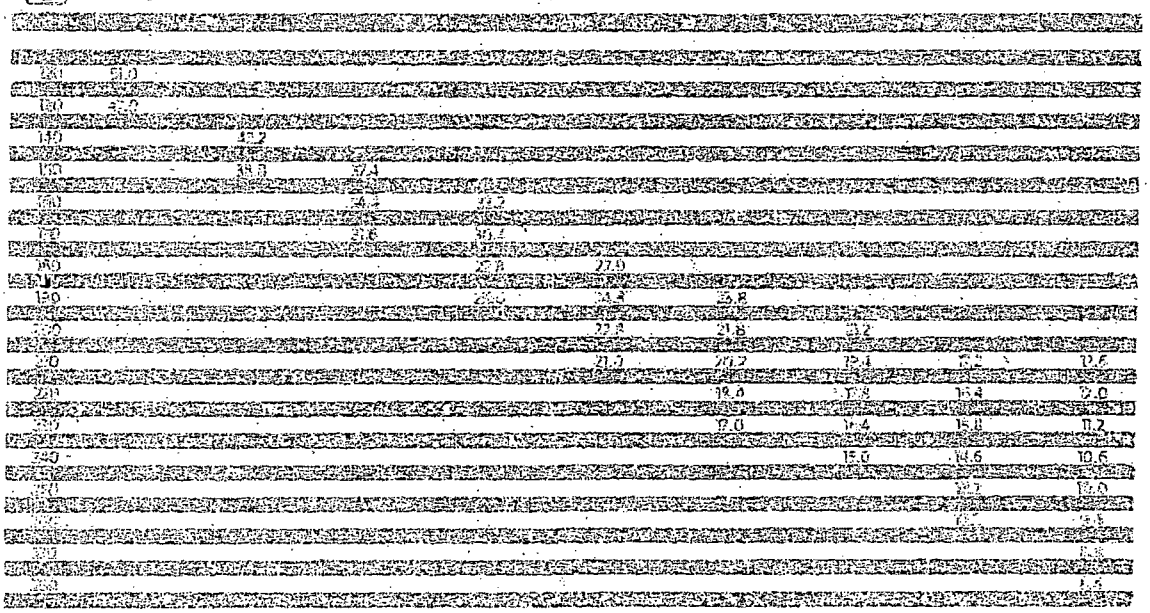
25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)



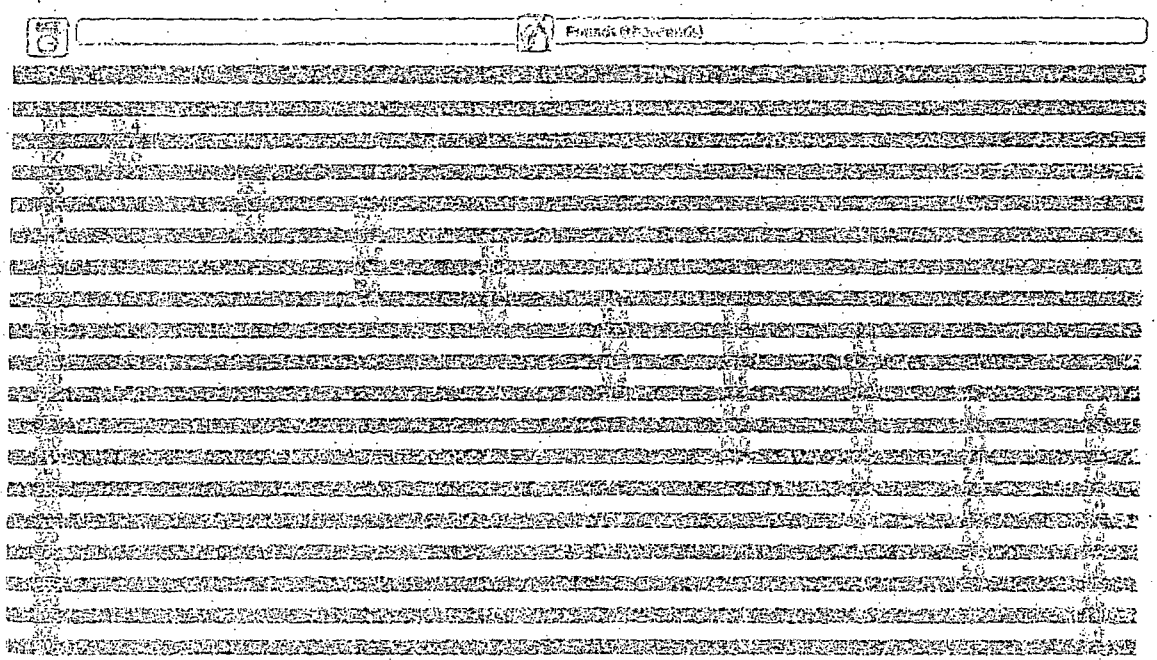
60°
45,0 m + 2,9 m
(147.6 ft + 9.5 ft)

25 m - 73 m
(82 ft - 240 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

360°



THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

60°
49,8 m + 2,9 m
(163.4 ft + 9.5 ft)

25 m - 61 m
(82 ft - 200 ft)

120 000 kg
264,500 lb

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

Feet	82.0	101.7	121.4	141.1	160.8	180.5	200.2
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						

60°
54,6 m + 2,9 m
(179.2 ft + 9.5 ft)

31 m - 49 m
(102 ft - 161 ft)

120 000 kg
(264,500 lb)

29 ft 2 in spread
(100%)

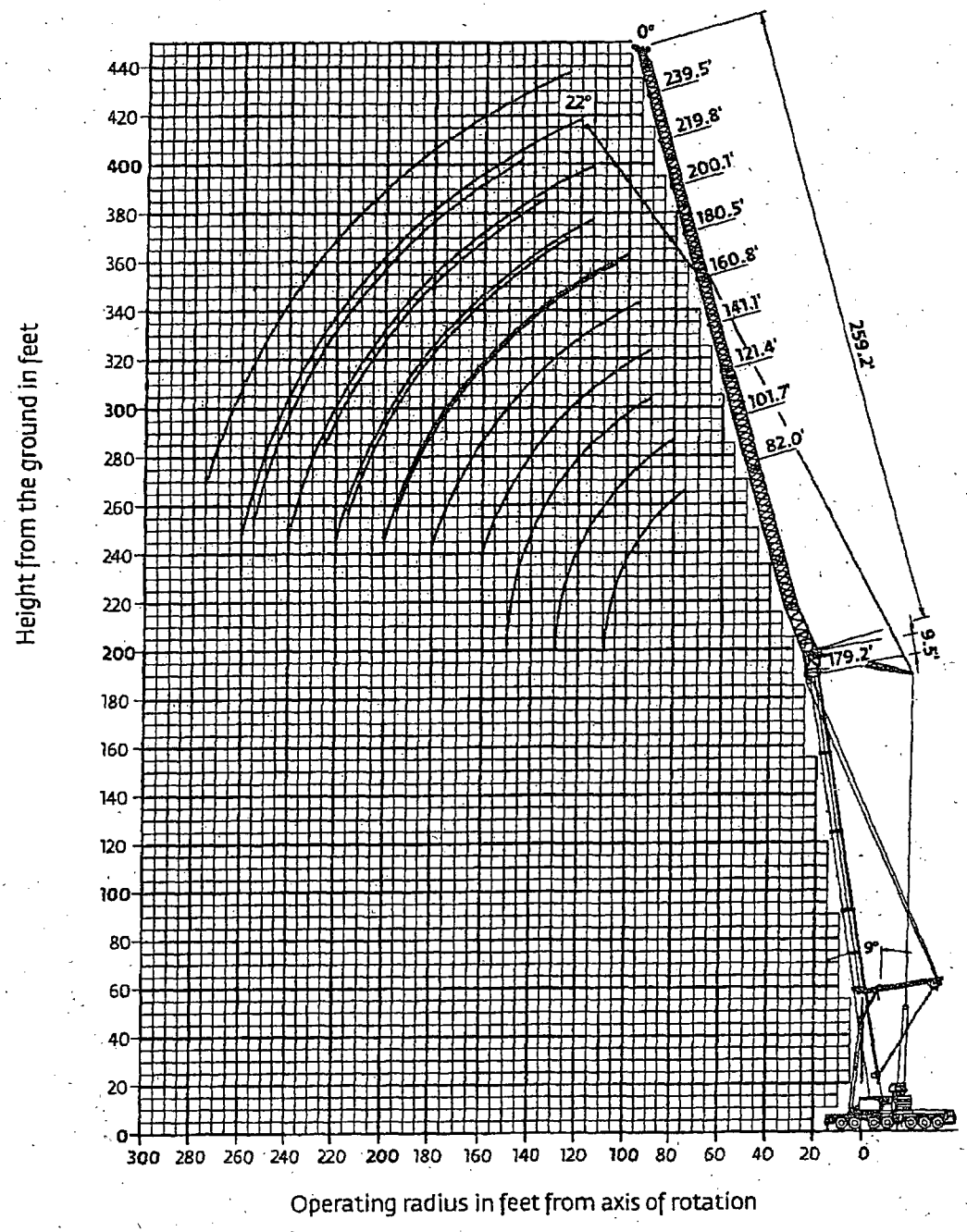
360°

Pounds (thousands)

[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						
[illegible]	[illegible]						

Working range
Luffing jib with MegaWingLift™

B2 fc - 259 ft luffing jib - 8° main boom with MegaWingLift



Hook heights shown in the working diagram do not consider loaded boom deflection.

Load charts

Luffing jib with MegaWingLift™

81°
35,3 m + 2,9 m
(115,9 ft + 9,5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

55	140.0	107.0								
65	122.0	107.0	85.0							
75	109.0	107.0	85.0	69.0	59.0					
85	100.0	107.0	85.0	69.0	59.0	48.0				
95		102.0	85.0	69.0	59.0	48.0	39.6	33.0		
105		93.0	85.0	69.0	59.0	48.0	39.6	33.0	26.7	20.5
115			84.0	69.0	59.0	48.0	39.6	33.0	26.2	20.6
125			77.0	69.0	59.0	46.0	39.6	33.0	26.2	20.6
135				69.0	59.0	45.0	39.6	33.0	26.2	20.6
145				67.0	58.0	47.0	39.6	33.0	26.4	20.4
155					56.0	46.0	39.6	33.6	24.4	19.4
165					46.0	45.0	39.6	33.6	23.2	18.6
175						44.0	39.6	28.4	22.2	17.8
185						37.6	29.6	28.0	21.4	16.8
195							27.0	26.8	20.4	16.0

81°
45,0 m + 2,9 m
(147,6 ft + 9,5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Load charts

Luffing jib with MegaWingLift™

81°
49.8 m + 2.9 m
(163.4 ft + 9.5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

Radius									
75	85.0	85.0							
85	81.0	81.0	73.0						
95	86.0	78.0	70.0	60.0	50.0	41.2			
105		74.0	67.0	60.0	50.0	41.2	34.2	22.6	
115		68.0	64.0	58.0	50.0	41.2	34.2	28.6	22.6
125			60.0	55.0	50.0	41.2	34.2	28.6	22.6	17.2
135			55.0	52.0	50.0	41.2	34.2	28.6	22.6	17.2
145				48.0	48.0	41.2	34.2	28.6	22.6	17.2
155				45.0	46.0	41.2	34.2	28.6	22.6	17.2
165					43.0	39.8	34.2	28.6	22.6	17.2
175					40.2	38.4	34.2	28.6	22.4	17.2
185						36.0	34.2	28.4	21.6	17.2
195						34.0	32.8	27.6	20.8	16.4
205							31.0	26.2	20.0	15.8

81°
54.6 m + 2.9 m
(179.2 ft + 9.5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

360°

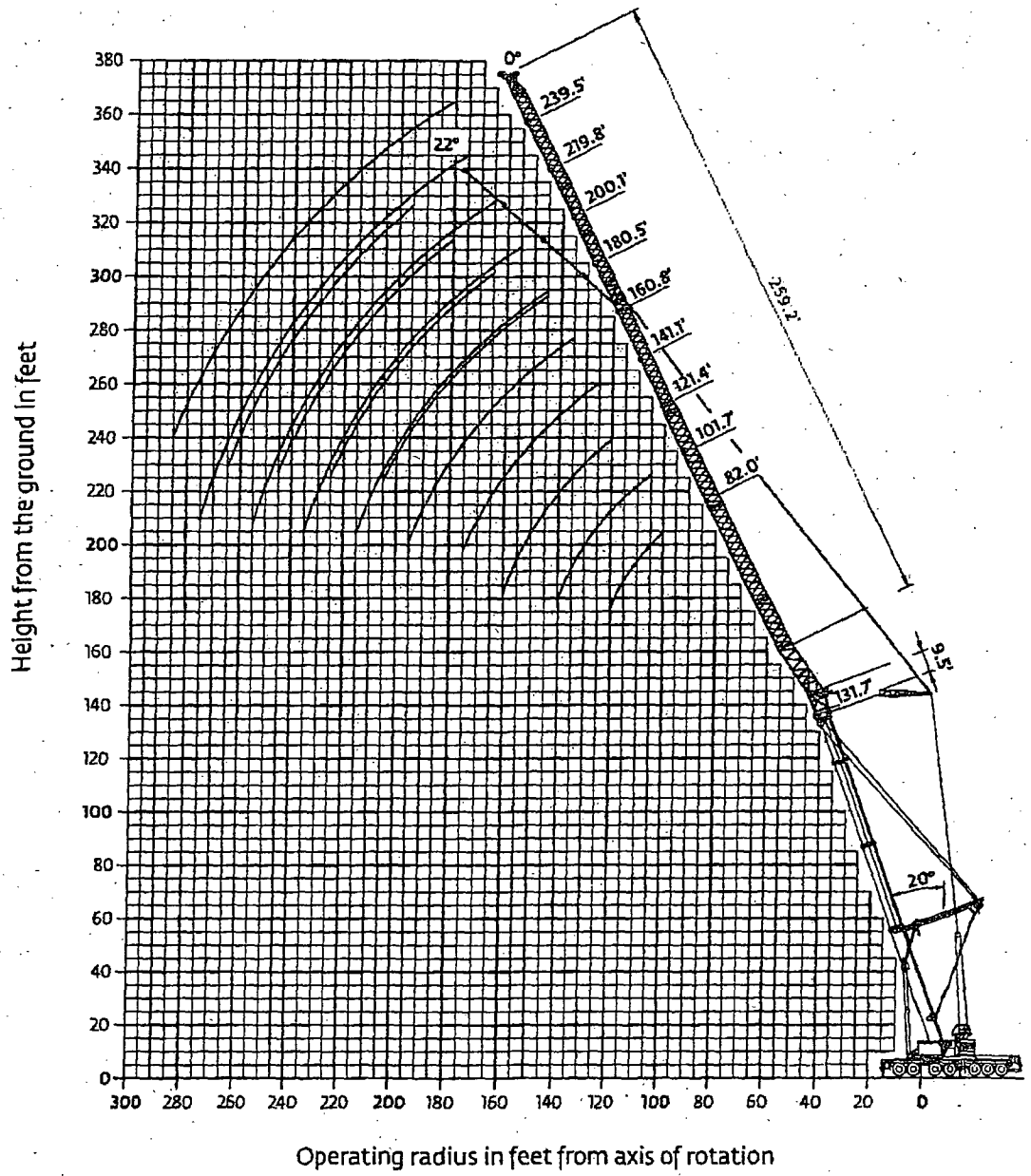
Pounds (thousands)

Radius									
90	75.0	75.0							
95	73.0	73.0	64.0						
105	69.0	69.0	64.0	53.0	47.0	40.0			
115	66.0	65.0	62.0	53.0	47.0	40.0			
125	63.0	62.0	60.0	53.0	47.0	40.0			
135	60.0	59.0	57.0	53.0	47.0	40.0			
145	57.0	56.0	55.0	53.0	47.0	40.0			
155	54.0	53.0	52.0	51.0	47.0	40.0			
165	51.0	50.0	49.0	49.0	47.0	40.0			
175	48.0	47.0	46.0	46.0	46.0	40.0			
185	45.0	44.0	43.0	43.0	43.0	40.0			
195	42.0	41.0	40.0	40.0	40.0	40.0			
205	39.0	38.0	37.0	37.0	37.0	37.0			
215	36.0	35.0	34.0	34.0	34.0	34.0			
225	33.0	32.0	31.0	31.0	31.0	31.0			
235	30.0	29.0	28.0	28.0	28.0	28.0			
245	27.0	26.0	25.0	25.0	25.0	25.0			
255	24.0	23.0	22.0	22.0	22.0	22.0			
265	21.0	20.0	19.0	19.0	19.0	19.0			
275	18.0	17.0	16.0	16.0	16.0	16.0			
285	15.0	14.0	13.0	13.0	13.0	13.0			
295	12.0	11.0	10.0	10.0	10.0	10.0			

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range
Luffing jib with MegaWingLift™

82 ft - 259 ft luffing jib - 70' main boom with MegaWingLift



Hook heights shown in the working diagram do not consider loaded boom deflection.

Load charts

Luffing jib with MegaWingLift™

70°
34,3 m + 2,9 m
(115.9 ft + 9.5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

100	93.0	87.0						
110	84.9	83.0						
120		75.0	74.0	71.0				
130		68.0	65.0	67.0	60.0			
140			62.0	61.0	59.0	48.0		
150			58.0	57.0	56.0	47.0	40.4	
160				52.0	52.0	47.0	40.4	33.4
170				49.0	49.0	46.0	40.4	32.8	24.0
180					45.0	43.6	40.4	32.0	23.8	18.8
190					41.6	40.8	38.8	31.2	23.0	18.4
200						37.8	37.0	29.8	22.0	17.6
210							34.6	25.0	20.0	16.6
220							31.2	24.6	20.0	15.8
230								23.6	19.8	15.0
240									19.0	14.4
250									18.0	13.8
260										13.2
270										12.6
280										12.0
290										11.4

70°
45,0 m + 2,9 m
(147.6 ft + 9.5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Load charts

Luffing jib with MegaWingLift™

70°
49,8 m + 2,9 m
(163.4 ft + 9.5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

170	70.0	62.0							
180	64.0	59.0							
190	56.0	51.0	46.0						
200	52.0	48.0	45.0						
210		47.0	43.2	41.6	45.2				
220		43.6	41.2	40.8	35.3				
230		38.4	39.0	35.0	31.6	28.4			
240		35.3	36.5	33.0	30.6	27.8			
250			34.0	32.8	30.0	27.0	22.4		
260			31.6	29.6	23.2	16.4	16.6	16.0	
270				23.4	27.4	25.6	21.0	14.8	
280					25.4	23.4	20.4	16.0	
290					23.8	23.2	19.6	14.4	
300						21.6	18.0	13.8	
305								12.6	
310								12.0	
320								9.0	

70°
54,6 m + 2,9 m
(179.2 ft + 9.5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

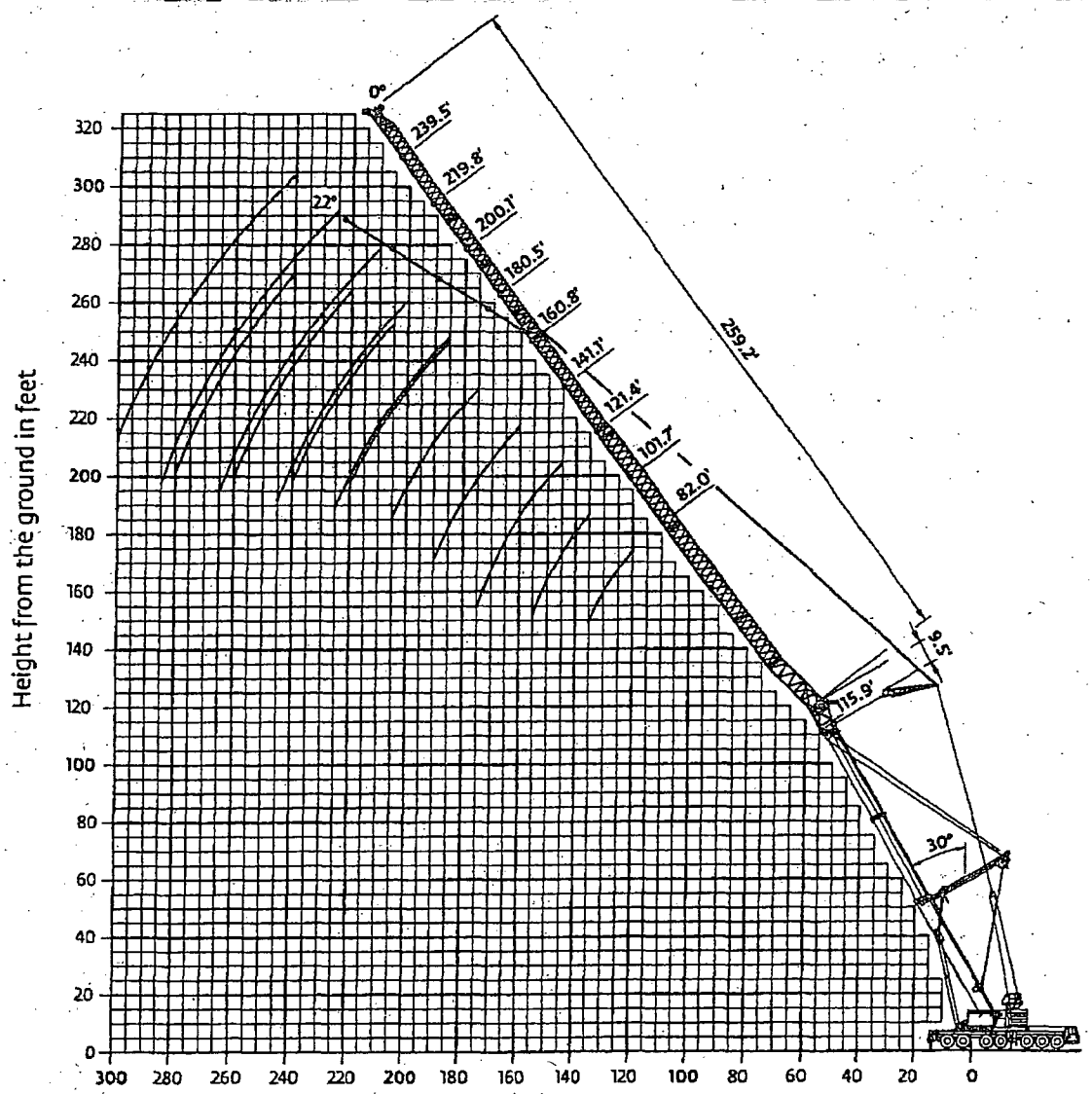
305									9.0

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.

The individual crane load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range
Luffing jib with MegaWingLift™

82 ft - 259 ft luffing jib - 60' main boom with MegaWingLift



Hook heights shown in the working diagram do not consider loaded boom deflection.

60°
35,3 m + 2,9 m
(115.9 ft + 9.5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

60°
45,0 m + 2,9 m
(147.6 ft + 9.5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

Load charts

Luffing jib with MegaWingLift™

60°
49,8 m + 2,9 m
(163,4 ft + 9.5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

360°

Pounds (thousands)

60°
54,6 m + 2,9 m
(179.2 ft + 9.5 ft)

25 m - 79 m
(82 ft - 259 ft)

160 000 kg
(352,700 lb)

29 ft 2 in spread
(100%)

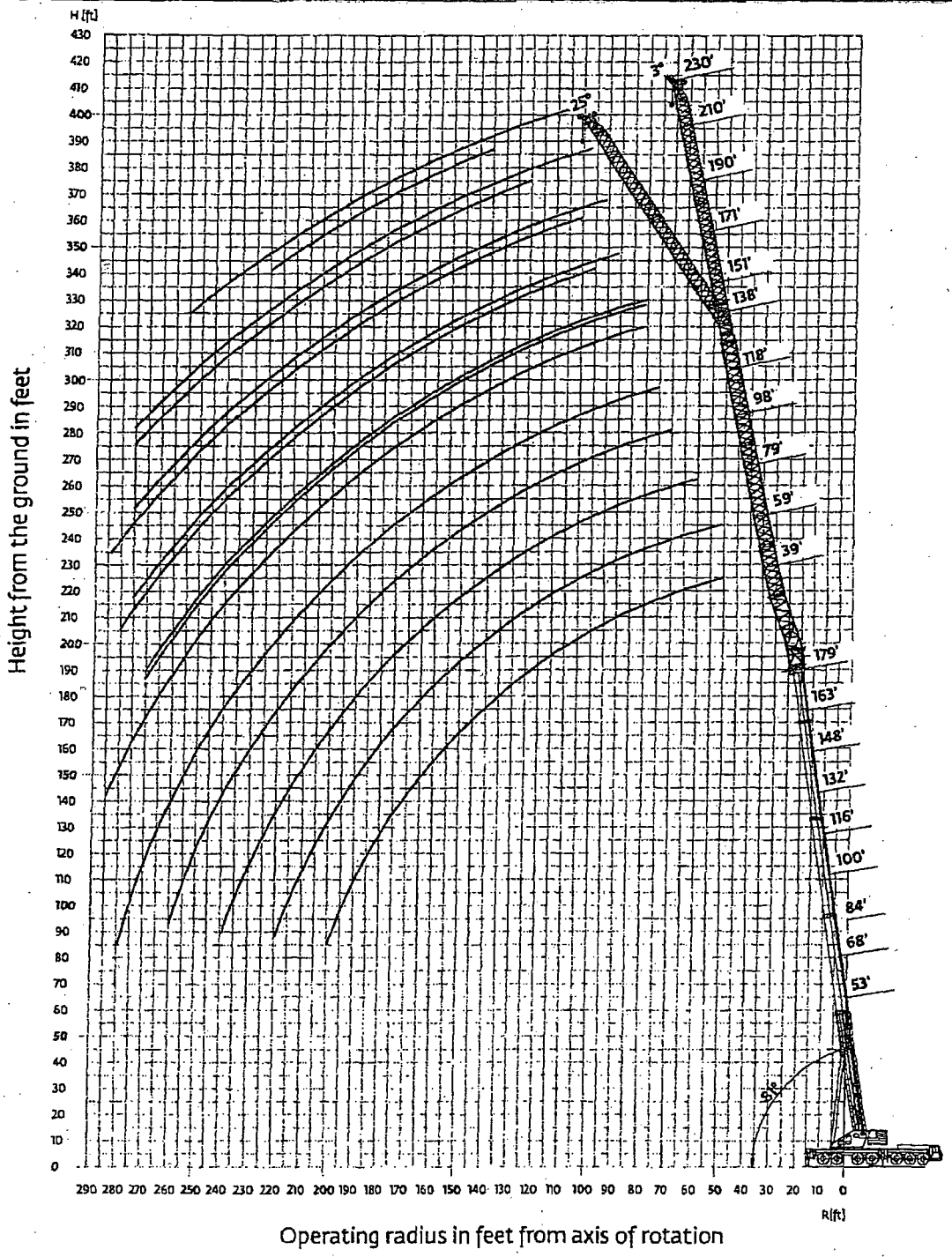
360°

Pounds (thousands)

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range
Lattice extension

39 ft - 230 ft boom extension



Hook heights shown in the working diagram do not consider loaded boom deflection.

Load chart

Lattice extension

49,8 m (163.4 ft)	12 m - 70 m (39 ft - 230 ft)	120 000 kg (264,500 lb)	29 ft 2 in spread (100%)	360°

Pounds (thousands)

50	100.0	87.0												
60	90.0	80.0	63.0	51.0										
70	79.0	72.0	58.0	47.0	41.6									
80	70.0	64.0	53.0	43.6	38.6	32.6	27.0	25.6	23.4					
90	62.0	57.0	50.0	40.4	35.8	29.8	24.8	23.6	21.6		19.0			
100	54.0	51.0	46.0	37.8	33.4	26.8	23.0	21.8	19.8	17.8	17.4	15.0	14.8	12.4
110	48.0	46.0	43.0	35.2	31.2	25.0	21.2	20.2	18.4	16.4	16.0	13.8	13.6	11.4
120	43.6	41.8	39.6	32.8	28.8	23.4	19.6	18.8	17.0	15.2	14.8	12.8	12.6	10.4	10.6
130	38.6	38.0	36.0	30.4	26.4	21.8	18.2	17.4	15.6	14.2	13.6	11.8	11.6	9.6	9.6
140	34.6	34.2	32.6	28.0	24.2	20.4	17.0	16.2	14.4	13.2	12.4	10.8	10.6	8.6	8.8	7.0
150	30.6	30.6	29.0	25.8	23.0	19.2	15.8	15.2	13.4	12.2	11.6	10.0	9.6	8.0	8.2	6.4
160	26.6	27.4	25.6	24.0	21.6	18.2	14.8	14.0	12.4	11.4	10.8	9.2	8.8	7.2	7.4	5.8
170	23.0	24.4	23.4	22.2	20.4	17.2	13.8	13.2	11.6	10.6	9.8	8.6	8.0	6.6	6.6	5.2
180	19.4	21.2	21.4	20.4	19.2	16.2	12.8	12.4	10.8	9.8	9.0	8.0	7.4	6.0	6.0	4.6
190	16.4	19.0	19.2	18.6	17.8	15.4	12.0	11.6	10.0	9.2	8.4	7.2	6.8	5.6	5.4	4.0
200		15.0	16.8	17.0	16.6	14.6	11.4	11.0	9.2	8.6	7.8	6.8	6.0	5.0	4.8	3.6
210			14.2	15.2	15.0	13.8	10.6	10.2	8.6	8.0	7.2	6.2	5.6	4.6	4.2	3.2
220			11.8	12.6	13.6	12.8	10.0	9.6	8.0	7.4	6.6	5.8	5.0	4.2	3.8	2.8
230				10.4	11.4	11.6	9.0	8.8	7.4	7.0	6.0	5.4	4.6	3.8	3.4	
240				8.4	9.4	9.6	7.6	8.0	6.8	6.4	5.6	5.0	4.0	3.4	3.0	
250					7.4	7.8	5.8	6.2	6.2	6.0	5.2	4.6	3.6	3.0		
260					5.8	6.0	4.0	4.4	4.8	5.4	4.6	4.2	3.4	2.6		
270						4.4	2.6	2.8	3.2	4.0	3.8	3.6	3.0			
280						3.0				2.4	2.2	3.2	2.4			

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Load chart
Lattice extension

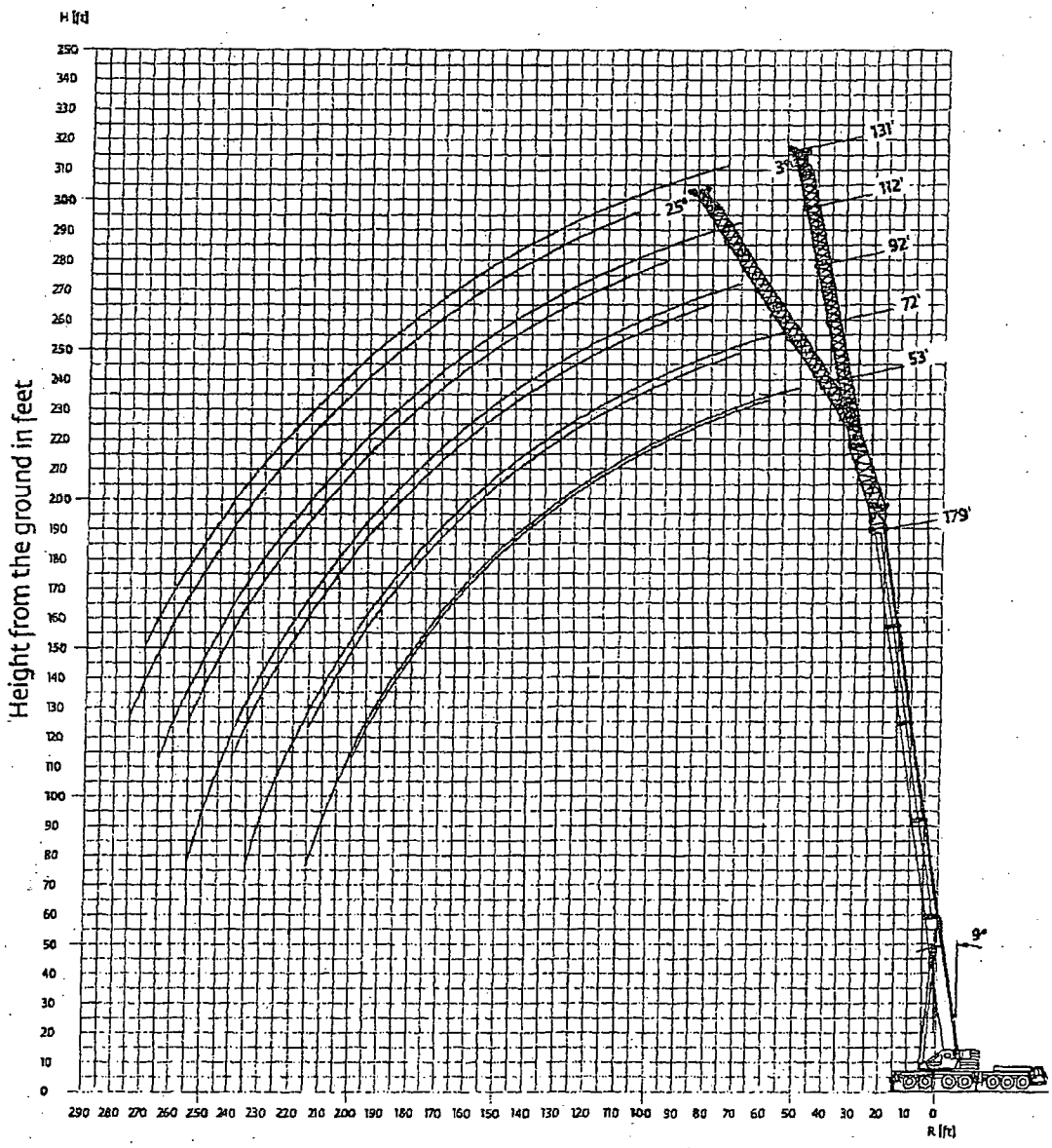
54,6 m (179,2 ft) | 12 m - 70 m (39 ft - 230 ft) | 120 000 kg (264,500 lb) | 29 ft 2 in spread (100%) | 360°

Pounds (thousands)

50	87.0	78.0												
60	80.0	72.0	60.0											
70	72.0	65.0	56.0	47.0										
80	65.0	58.0	52.0	44.0	37.4	31.4	25.8	24.6						
90	57.0	52.0	47.0	41.6	35.0	28.2	24.2	22.8	20.8					
100	51.0	47.0	43.4	38.8	32.8	26.2	22.4	21.2	19.4	17.4	16.6		13.8	11.6
110	46.0	43.0	39.8	35.8	30.2	24.6	20.8	19.8	18.0	15.2	15.6	13.4	13.0	10.8
120	41.8	39.2	36.4	33.2	27.6	23.2	19.4	18.6	16.6	15.0	14.4	12.4	12.0	10.0
130	37.8	35.4	33.6	30.6	25.8	21.8	18.2	17.4	15.4	14.0	13.4	11.6	11.2	9.4	9.2
140	34.0	31.8	30.6	27.8	24.2	20.6	17.0	16.2	14.4	13.0	12.4	10.8	10.4	8.6	8.4	6.8
150	30.4	28.2	28.0	25.2	22.6	19.4	16.0	15.2	13.4	12.2	11.4	10.0	9.6	7.8	7.8	6.2
160	27.2	25.0	25.2	22.6	21.0	18.2	14.8	14.2	12.4	11.4	10.6	9.2	8.8	7.2	7.2	5.6
170	24.0	22.8	22.4	20.8	19.4	17.2	13.8	13.4	11.6	10.6	9.8	8.6	8.2	6.6	6.6	5.0
180	21.0	20.8	20.4	19.2	17.8	16.0	13.0	12.6	10.8	10.0	9.2	8.0	7.4	6.0	6.0	4.6
190	17.6	18.6	18.6	17.4	16.6	14.8	12.0	11.8	10.2	9.4	8.4	7.4	6.8	5.6	5.4	4.2
200	14.8	15.8	16.8	16.0	15.2	13.8	11.2	11.0	9.4	8.8	7.8	6.8	6.2	5.2	5.0	3.6
210		13.2	14.6	14.6	13.8	12.8	10.2	10.2	8.8	8.2	7.4	6.4	5.6	4.6	4.4	3.2
220		10.8	12.2	13.0	12.8	11.6	9.2	9.2	8.2	7.6	6.8	6.0	5.2	4.2	4.0	2.8
230			10.0	10.8	11.6	10.6	8.4	8.4	7.4	7.0	6.2	5.4	4.8	3.8	3.4	
240			8.2	8.8	9.6	9.6	7.4	7.6	6.6	6.4	5.6	5.0	4.2	3.4	3.0	
250				7.0	7.8	7.8	5.8	6.2	5.8	5.8	5.0	4.6	3.8	3.2	2.6	
260				5.2	6.0	6.2	4.2	4.4	4.8	5.2	4.4	4.4	3.2	2.8		
270					4.4	4.6	2.6	2.8	3.2	4.0	3.6	3.8	2.8	2.6		
280					3.0	3.2				2.4		3.2				

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range
Lattice extension



Operating radius in feet from axis of rotation

Hook heights shown in the working diagram do not consider loaded boom deflection.

Load chart
Lattice extension

49,8 m (163.4 ft)	16 m - 60 m (53 ft - 131 ft)	120 000 kg (264,500 lb)	29 ft 2 in spread (100%)	360°

Pounds (thousands)

50	96.0		74.0							
60	82.0	77.0	69.0		54.0					
70	73.0	71.0	63.0	51.0	50.0				34.6	
80	65.0	64.0	58.0	48.0	47.0	36.4			32.0	
90	57.0	57.0	53.0	45.0	43.4	34.4		25.0	29.0	
100	51.0	51.0	48.0	42.8	40.6	32.6		23.8	26.0	19.8
110	46.0	46.0	43.4	40.4	38.0	30.6		22.6	24.4	18.8
120	41.2	41.2	39.4	37.8	35.4	28.2		21.4	22.8	17.8
130	37.0	37.2	35.4	35.2	33.0	26.6		20.4	21.4	17.0
140	32.8	33.4	31.6	31.8	30.6	25.4		19.6	20.2	16.2
150	29.4	29.8	27.8	28.2	27.6	24.2		18.8	19.0	15.4
160	26.0	26.4	24.4	25.0	24.6	23.0		18.0	18.0	14.2
170	22.6	23.2	22.2	22.6	21.6	21.8		17.4	17.0	13.2
180	19.8	19.4	20.0	20.4	19.2	20.4		16.8	16.2	12.6
190	15.6	15.0	17.4	18.2	17.0	18.6		16.2	15.4	12.2
200	12.6		14.4	15.4	16.0	16.8		15.2	14.6	11.6
210			11.8		13.2	15.0		14.2	13.8	11.2
220										
230										
240							11.5			
250							8.8			
260							6.3		6.8	9.0
270									5.2	6.8
280									3.6	

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Load chart

Lattice extension

54,6 m (179.2 ft) | 16 m - 40 m (53 ft - 131 ft) | 120 000 kg (264,500 lb) | 29 ft 2 in spread (100%) | 360°

Pounds (thousands)

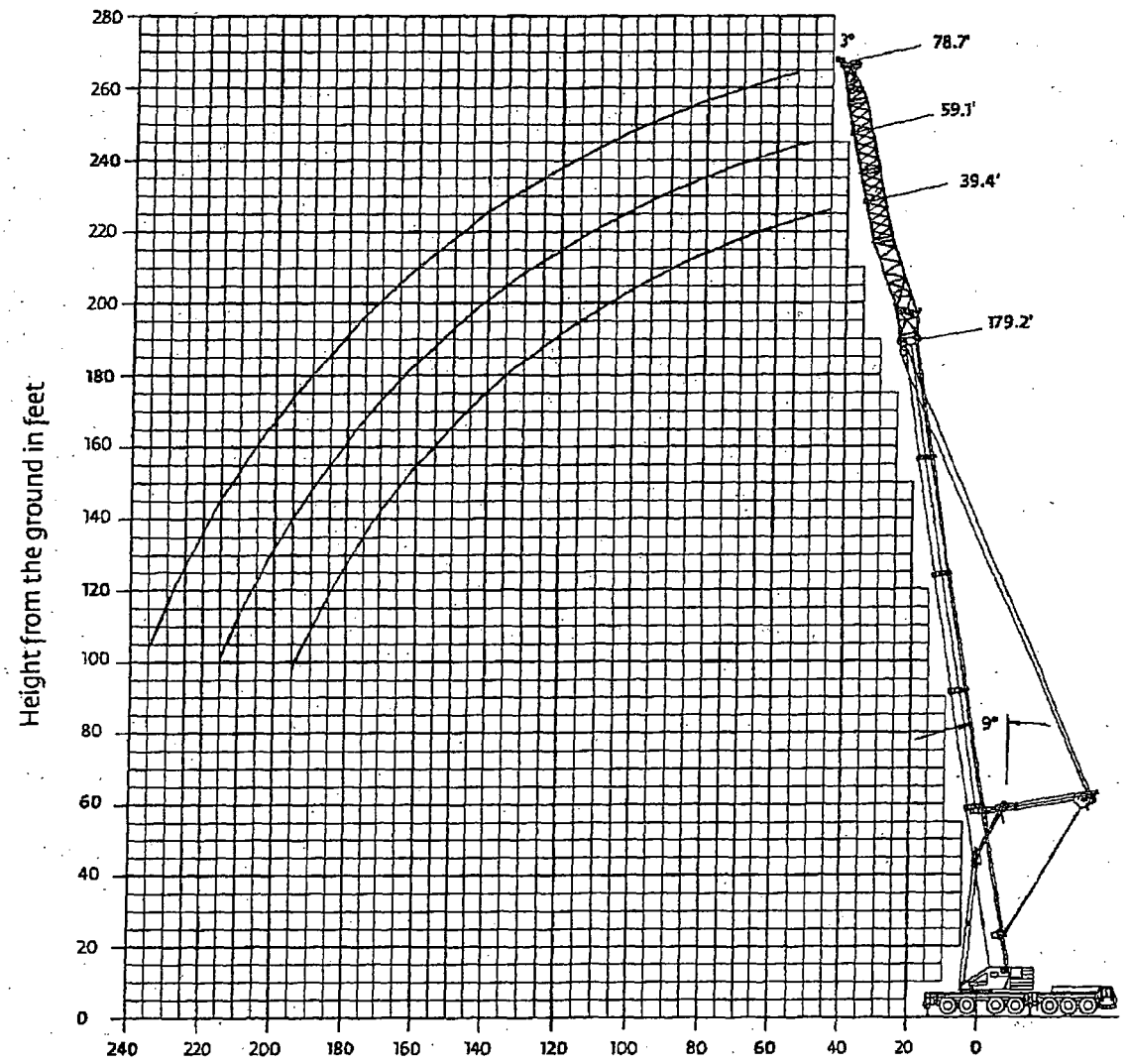
50	81.0									
60	73.0	71.0	65.0							
70	65.0	64.0	58.0	50.0	49.0					
80	59.0	57.0	53.0	47.0	46.0	26.0	[illegible]		30.8	
90	53.0	52.0	48.0	44.0	42.6	34.2	[illegible]		27.6	
100	47.0	47.0	43.6	41.6	39.6	32.4	[illegible]	25.0	25.8	
110	43.0	42.6	39.6	38.4	36.4	30.8	[illegible]	23.6	24.2	18.6
120	38.8	38.6	36.4	35.2	33.4	29.0	[illegible]	22.8	22.6	17.8
130	34.6	34.8	33.0	31.6	30.2	27.0	[illegible]	21.8	21.4	17.0
140	30.8	31.0	29.8	28.2	27.2	25.2	[illegible]	20.8	20.4	15.2
150	27.0	27.2	26.8	25.8	24.4	23.6	[illegible]	20.0	19.2	15.6
160	24.0	24.2	23.6	23.6	22.4	22.2	[illegible]	19.4	18.2	14.8
170	21.6	22.0	21.2	21.6	20.6	20.6	[illegible]	18.6	17.0	14.4
180	19.4	19.6	19.2	19.6	18.6	19.3	[illegible]	17.4	16.0	13.8
190	17.4	17.8	17.4	17.8	17.0	17.4	[illegible]	16.2	15.0	13.2
200	15.6	16.0	15.8	16.2	15.4	15.8	[illegible]	15.0	13.8	12.8
210	14.0	[illegible]	14.4	14.6	13.8	14.2	[illegible]	13.6	12.6	12.4
220	[illegible]	[illegible]	13.0	[illegible]	12.4	12.8	[illegible]	12.6	11.4	11.8
230	[illegible]	[illegible]	11.8	[illegible]	11.0	11.6	[illegible]	11.4	10.4	11.0
240	[illegible]	[illegible]	[illegible]	[illegible]	9.4	10.2	[illegible]	10.4	9.4	10.0
250	[illegible]	[illegible]	[illegible]	[illegible]	8.4	9.2	[illegible]	9.4	8.6	9.0
260	[illegible]	[illegible]	[illegible]	[illegible]	7.4	[illegible]	[illegible]	8.6	7.8	8.4
270	[illegible]	[illegible]	[illegible]	[illegible]	6.4	[illegible]	[illegible]	7.8	7.0	7.8
280	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6.2	7.4
290	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5.4	6.8

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range

Lattice extension with MegaWingLift™

39 ft - 79 ft lattice extension with MegaWingLift



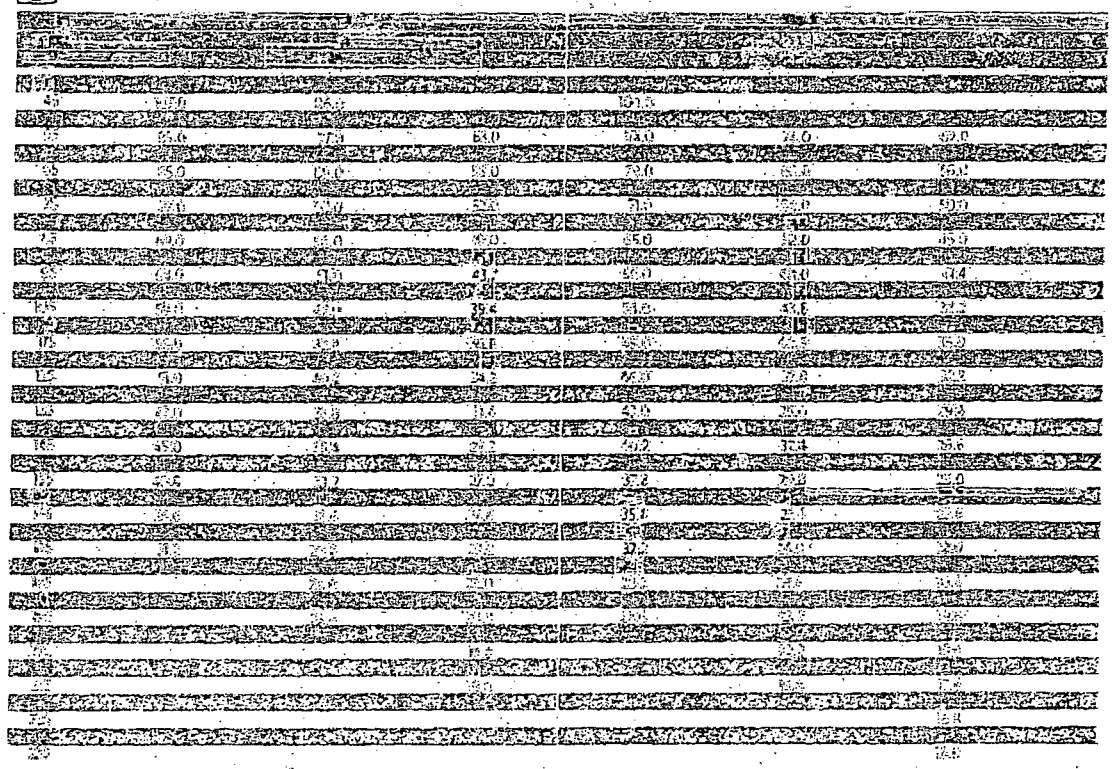
Hook heights shown in the working diagram do not consider loaded boom deflection.

Load chart

Lattice extension with MegaWingLift™

49,8 m - 54,6 m (163,4 ft - 179,2 ft)	12 m - 24 m (39 ft - 79 ft)	160 000 kg (352,700 lb)	29 ft 2 in spread (100%)	360°

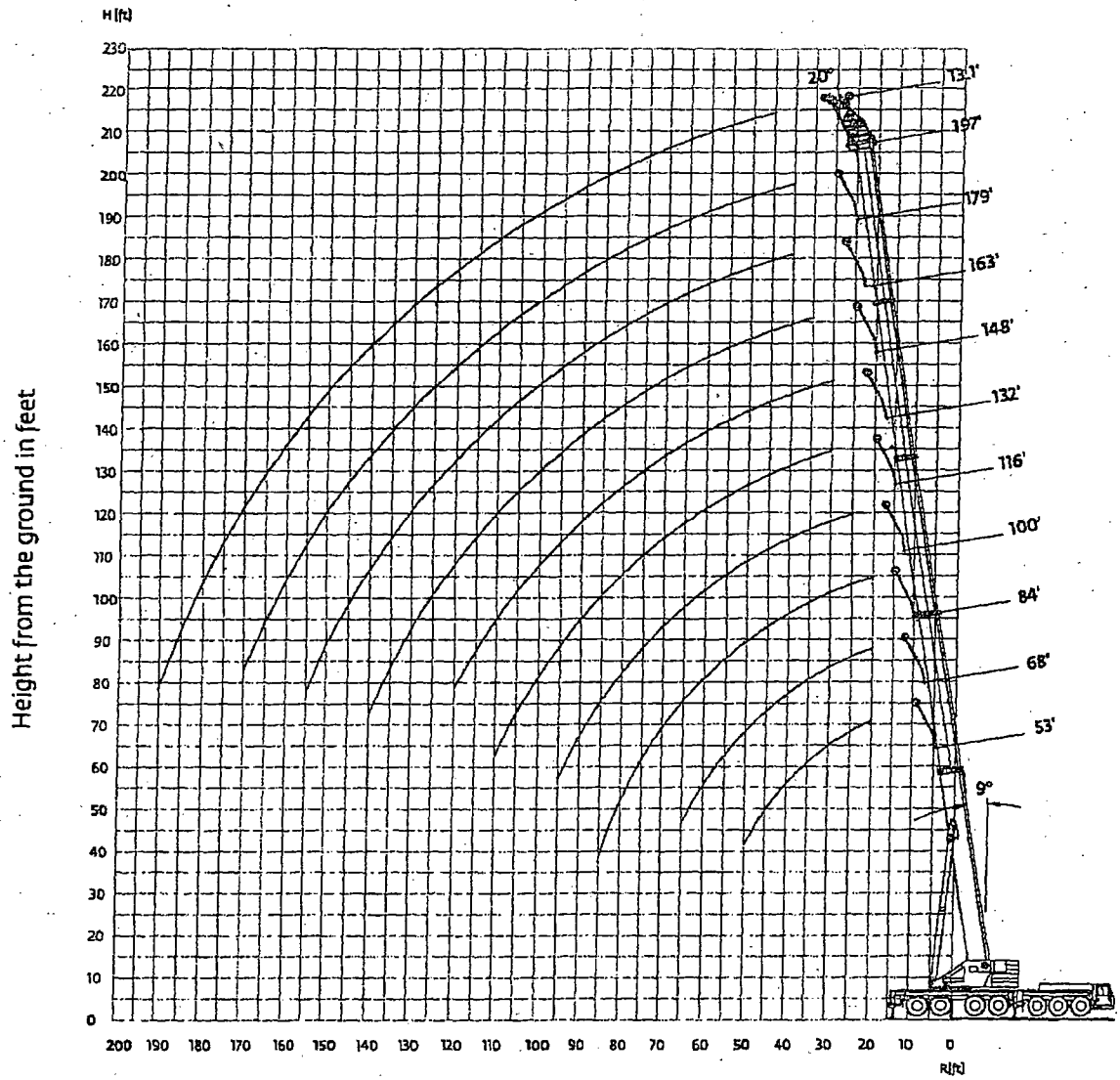
Pounds (thousands)



THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range
Heavy duty jib

13 ft heavy duty jib



Operating radius in feet from axis of rotation

Hook heights shown in the working diagram do not consider loaded boom deflection.

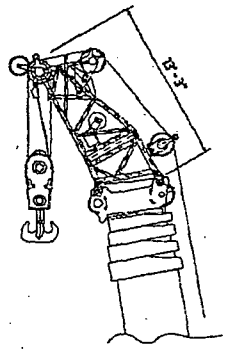
Load chart

Heavy duty jib

16,0 m - 60 m (53 ft - 197 ft) | 4 m (13.1 ft) | 120 000 kg (264,500 lb) | 29 ft 2 in spread (100%) | 360°

Pounds (thousands)

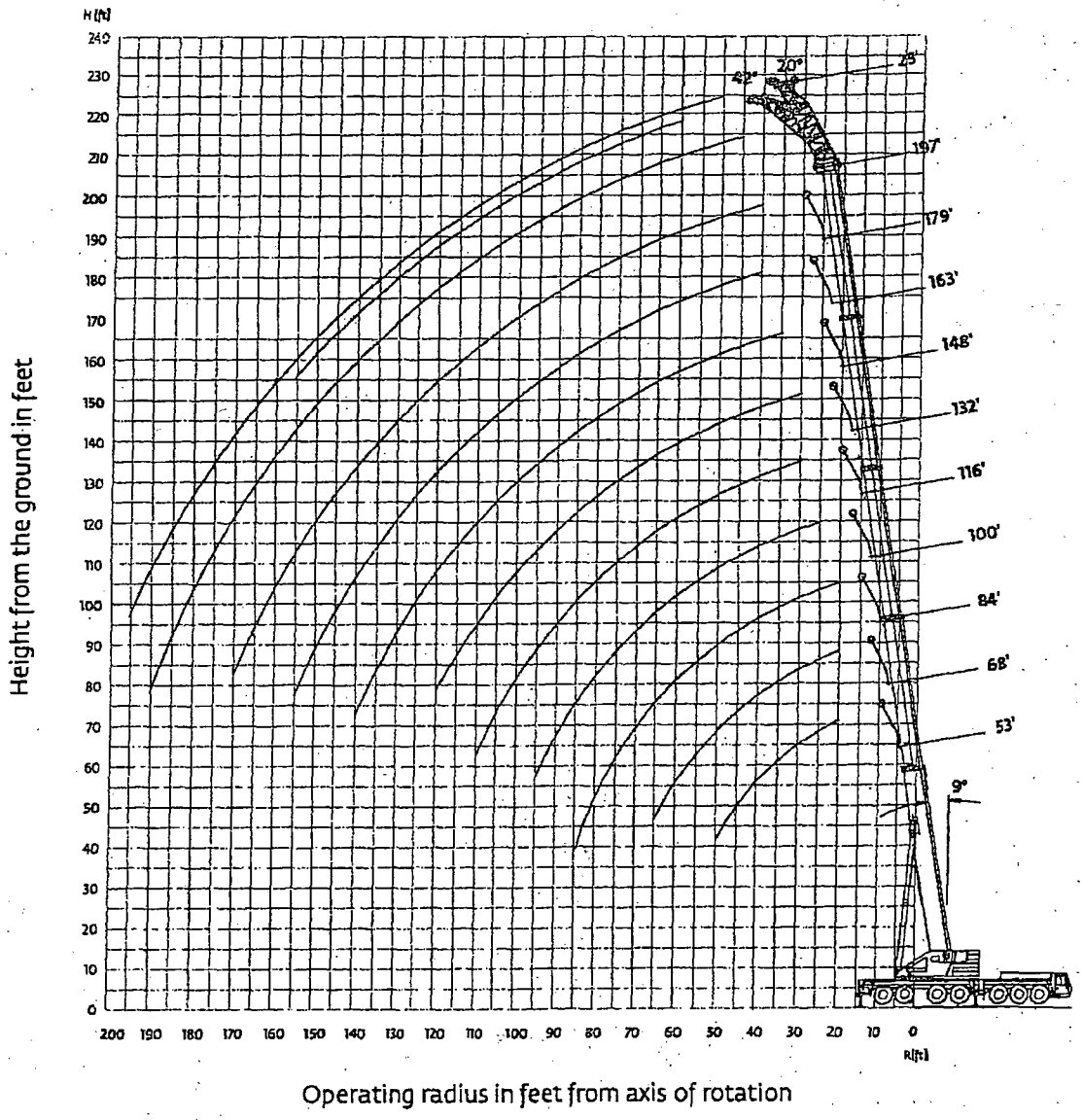
25	190.0	190.0	190.0	190.0						
35	190.0	190.0	190.0	190.0	190.0	182.0	166.0			
45	190.0	190.0	190.0	185.0	164.0	151.0	140.0	129.0	116.0	104.0
55		171.0	169.0	156.0	138.0	129.0	120.0	113.0	102.0	94.0
65		139.0	135.0	132.0	119.0	109.0	102.0	93.0	91.0	84.0
75			107.0	108.0	103.0	95.0	89.0	85.0	80.0	74.0
85			86.0	88.0	88.0	79.0	77.0	74.0	71.0	67.0
95				72.0	73.0	74.0	68.0	66.0	63.0	60.0
105					60.0	62.0	61.0	58.0	57.0	53.0
115						53.0	54.0	52.0	51.0	47.0
125							46.0	47.0	45.0	42.6
135							39.0	41.2	41.4	38.2
[illegible]								[illegible]	37.4	34.4
[illegible]								[illegible]	[illegible]	31.0
[illegible]									[illegible]	[illegible]
[illegible]										[illegible]
[illegible]										[illegible]



THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range
Heavy duty jib

25 ft heavy duty jib



Hook heights shown in the working diagram do not consider loaded boom deflection.

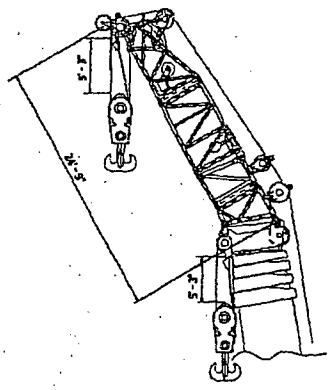
Load chart

Heavy duty jib

16,0 m - 60 m (53 ft - 197 ft) | 7,5 m (24.6 ft) | 120 000 kg (264,500 lb) | 29 ft 2 in spread (100%) | 360°

Pounds (thousands)

	20°	42°	20°	42°	20°	42°	20°	42°	20°	42°	20°	42°	20°	42°	20°	42°	20°	42°	20°	42°
25	107.0	94.0	113.0	97.0	117.0															
35	93.0	85.0	100.0	89.0	104.0	91.0	108.0	93.0	110.0	94.0	111.0									
45	84.0	79.0	89.0	83.0	95.0	85.0	99.0	88.0	101.0	89.0	103.0	90.0	103.0	90.0	101.0		97.0			
55	76.0		82.0	78.0	87.0	81.0	91.0	83.0	94.0	85.0	96.0	86.0	97.0	86.0	95.0	85.0	91.0	83.0	84.0	
65	74.0		76.0	76.0	81.0	78.0	85.0	80.0	88.0	81.0	91.0	82.0	92.0	83.0	87.0	82.0	83.0	80.0	76.0	75.0
75			75.0		76.0	76.0	80.0	78.0	83.0	79.0	85.0	80.0	82.0	78.0	79.0	78.0	73.0	72.0	68.0	68.0
85					74.0		76.0	76.0	78.0	75.0	77.0	74.0	73.0	73.0	70.0	70.0	66.0	65.0	61.0	61.0
95							73.0		72.0	71.0	69.0	69.0	65.0	65.0	62.0	63.0	58.0	59.0	54.0	55.0
105							62.0		62.0		62.0	62.0	57.0	57.0	56.0	56.0	53.0	53.0	49.0	45.0
115									52.0		54.0		51.0	51.0	49.0	50.0	48.0	48.0	44.0	45.0
125											45.0		46.0		44.0	45.0	42.8	43.0	40.0	40.4
135											38.0		39.4		40.2	40.2	38.4	39.0	36.2	36.6
145																				
155																				
165																				
175																				
185																				

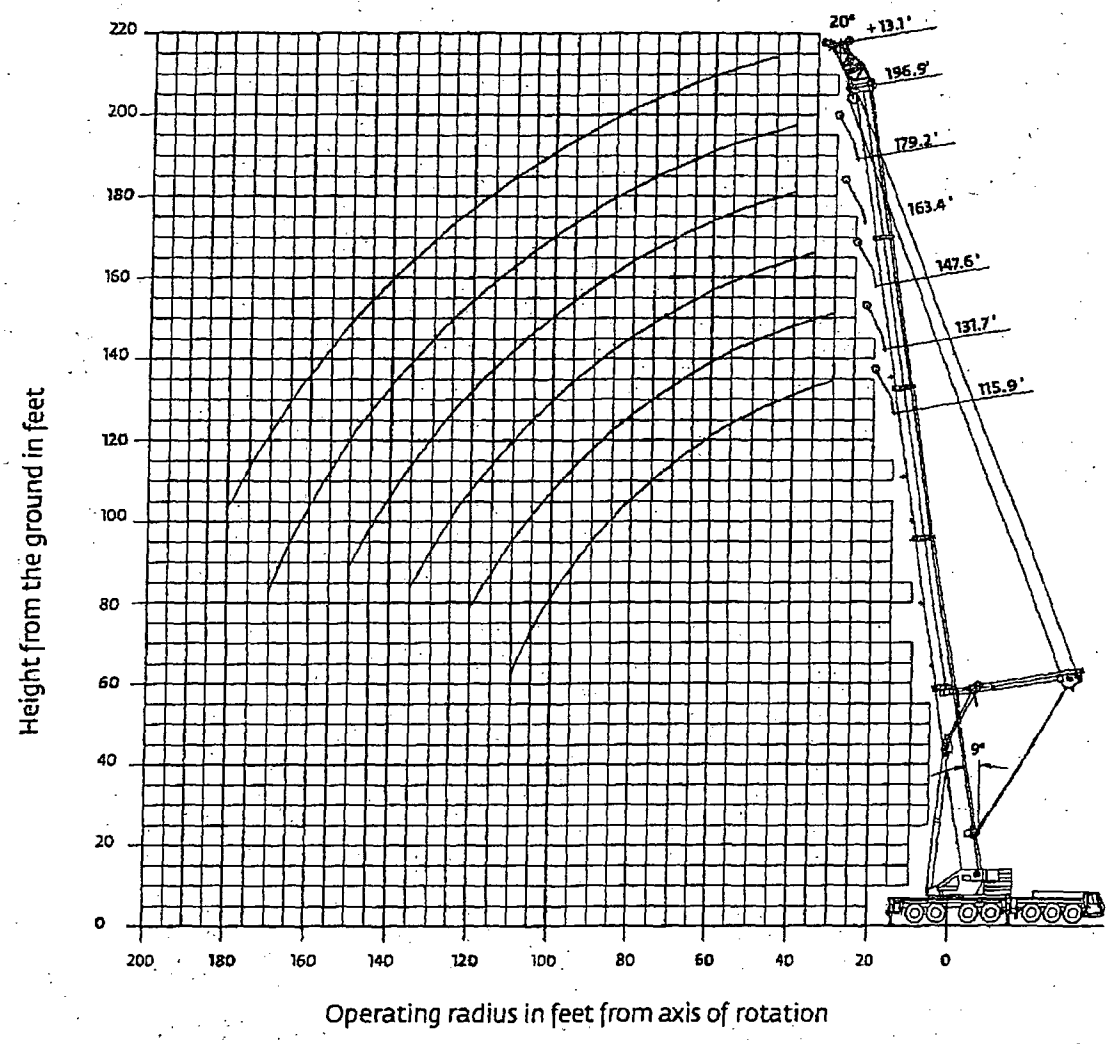


THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range

Heavy duty jib with MegaWingLift™

13 ft Heavy duty jib with MegaWingLift



Hook heights shown in the working diagram do not consider loaded boom deflection.

Load chart

Heavy duty jib with MegaWingLift™

35,3 m - 60 m (116 ft - 197 ft)	4 m (13.1 ft)	160 000 kg (352,700 lb)	29 ft 2 in spread (100%)	360°

Pounds (thousands)

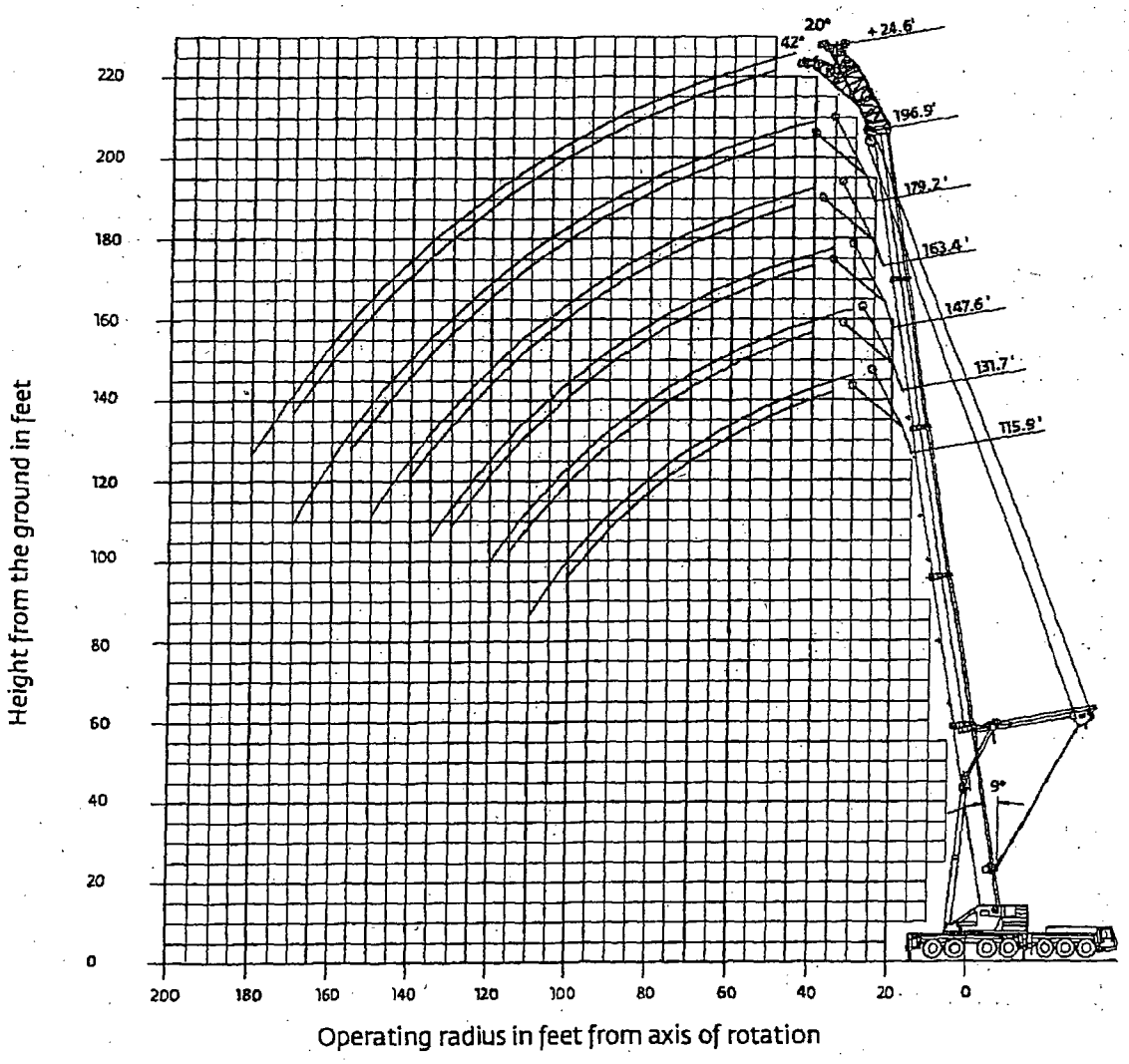
35	190.0	190.0	190.0			
45	190.0	190.0	190.0	162.0	139.0	128.0
55	173.0	175.0	175.0	146.0	125.0	115.0
65	163.0	165.0	155.0	134.0	112.0	104.0
75	120.0	123.0	124.0	122.0	103.0	95.0
85	102.0	104.0	103.0	106.0	95.0	85.0
95	88.0	90.0	93.0	92.0	87.0	81.0
105	76.0	78.0	84.0	80.0	81.0	75.0
115		68.0	73.0	70.0	72.0	70.0
125			59.0	61.0	63.0	63.0
135			51.0	54.0	55.0	56.0
[illegible]				47.0	48.0	49.0
[illegible]					43.0	43.0
[illegible]					38.0	38.0
[illegible]					33.0	33.0
[illegible]						28.0
[illegible]						23.0

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Working range

Heavy duty jib with MegaWingLift™

25 ft heavy duty jib with MegaWingLift™



Hook heights shown in the working diagram do not consider loaded boom deflection.

Load chart

Heavy duty jib with MegaWingLift™

35,3 m - 60,0 m (116 ft - 197 ft) | 7,5 m (24.6 ft) | 160 000 kg (352,700 lb) | 29 ft 2 in spread (100%) | 360°

Pounds (thousands)

	20°	42°	20°	42°	20°	42°	20°	42°	20°	42°	20°	42°
35	140.0	114.0	140.0		138.0							
45	126.0	106.0	126.0	105.0	125.0	104.0	117.0	100.0	108.0			
55	115.0	99.0	115.0	98.0	114.0	97.0	106.0	93.0	97.0	87.0	91.0	81.0
65	106.0	93.0	106.0	93.0	105.0	91.0	97.0	86.0	89.0	80.0	83.0	75.0
75	98.0	88.0	98.0	88.0	97.0	86.0	90.0	81.0	81.0	74.0	75.0	69.0
85	92.0	84.0	92.0	84.0	91.0	82.0	84.0	76.0	75.0	69.0	70.0	65.0
95	86.0	81.0	86.0	80.0	86.0	78.0	78.0	72.0	69.0	65.0	65.0	61.0
105	77.0		79.0	77.0	79.0	75.0	73.0	68.0	65.0	62.0	60.0	57.0
115	65.0		68.0	69.0	69.0	70.0	69.0	66.0	60.0	58.0	55.0	54.0
125			59.0		59.0	60.0	61.0	62.0	57.0	55.0	52.0	50.0
135			51.0		52.0		53.0	54.0	53.0	52.0	49.0	48.0
145					45.0		47.0		49.0	49.0	47.0	46.0
[illegible]												43.0
[illegible]												
[illegible]												
[illegible]												

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Symbols glossary

Axles

Boom

Boom elevation

Boom extension

Boom length

Boom nose

Brakes

Cab

Counterweight

Drive

Electrical system

Engine

Extension

Frame

Fuel tank capacity

Outriggers

Grade

Heavy duty jib

Hoist

Hookblock

Hydraulic system

Lights

Oil

Outrigger controls

Gear

Radius

Rotation

Speed

Steering

Suspension

Swing

Tires

Transmission

Notes

Notes

Grove Manitowoc National Crane Potain

Manitowoc

Manitowoc Cranes

Regional headquarters

Americas
Manitowoc, Wisconsin, USA
Tel: +1 920 684 6621
Fax: +1 920 683 6277

Shady Grove, Pennsylvania, USA
Tel: +1 717 597 8121
Fax: +1 717 597 4062

Europe, Middle East, Africa
Ecully, France
Tel: +33 (0)4 72 18 20 20
Fax: +33 (0)4 72 18 20 00

China
Shanghai, China
Tel: +86 21 6457 0066
Fax: +86 21 6457 4955

Greater Asia-Pacific
Singapore
Tel: +65 6264 1188
Fax: +65 6862 4040

Regional offices

Americas
Brazil
Alphaville
Mexico
Monterrey
Chile
Santiago

Europe, Middle East, Africa
Czech Republic
Netvorice
France
Baudemont
Cergy
Decines
Germany
Langenfeld
Hungary
Budapest
Italy
Lainate
Netherlands
Breda
Poland
Warsaw
Portugal
Baltar
Russia
Moscow
South Africa
Johannesburg
U.A.E.
Dubai
U.K.
Buckingham

China
Beijing
Chengdu
Guangzhou
Xian

Greater Asia-Pacific
Australia
Brisbane
Melbourne
Sydney
India
Chennai
Delhi
Hyderabad
Pune
Korea
Seoul
Philippines
Makati City
Singapore

Factories

Brazil
Passo Fundo
China
TaiAn
Zhangjiagang
France
Charlieu
Moulins
Germany
Wilhelmshaven
India
Pune
Italy
Niella Tanaro
Portugal
Baltar
Fânzeres
Slovakia
Saris
USA
Manitowoc
Port Washington
Shady Grove

This document is non-contractual. Constant improvement and engineering progress make it necessary that we reserve the right to make specification, equipment, and price changes without notice. Illustrations shown may include optional equipment and accessories and may not include all standard equipment.

©2012 Manitowoc

Form No. GMK7550 PG
Part No.02-413 / 0812 / PDF

www.manitowoc.com

TADANO FAUN

ALL-TERRAIN
ATF 90G-4

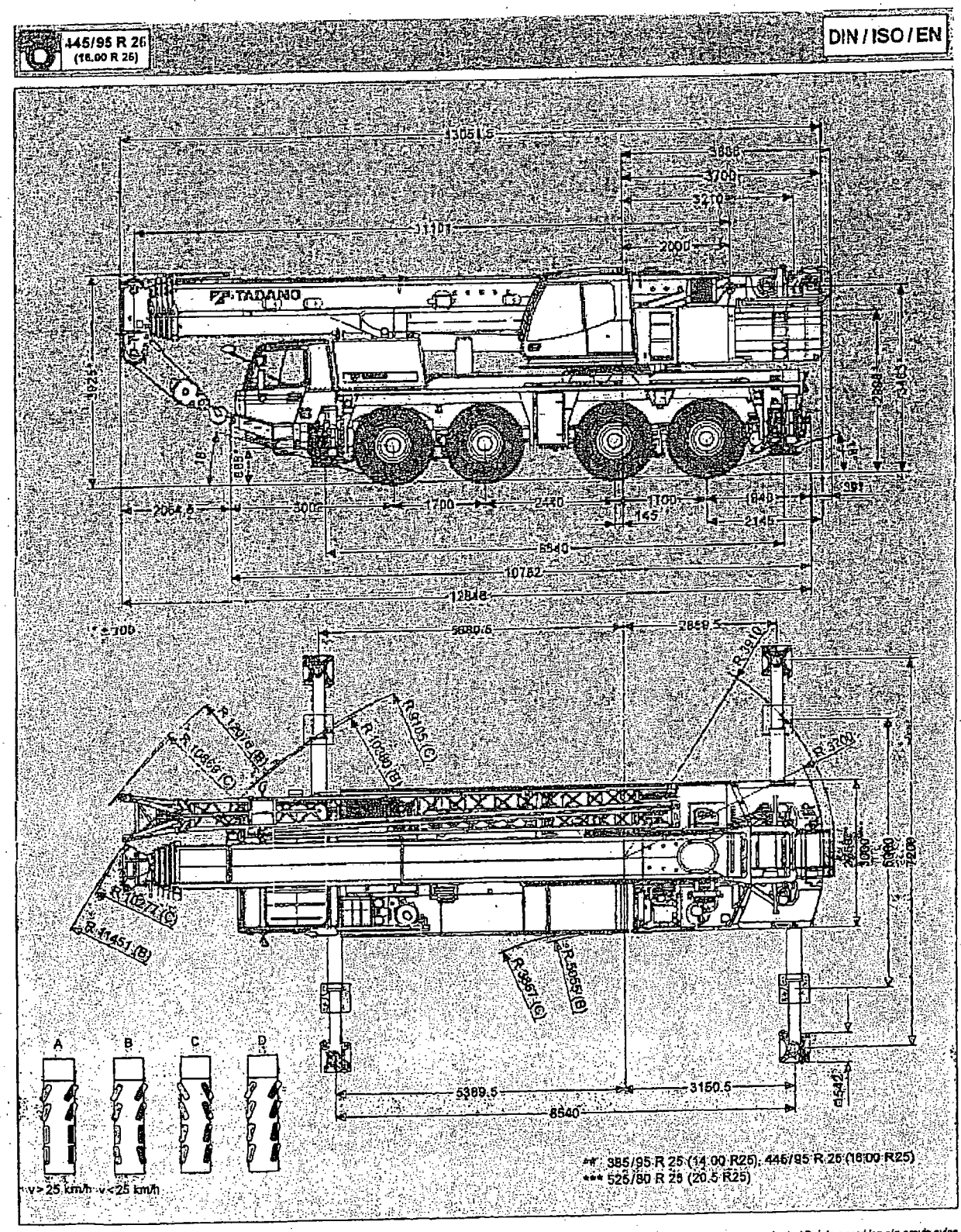
Lift Adjuster

TADANO

BLUETEC

TADANO FAUN ATF 90G-4

Maße (mm)
Dimensions (mm)
Dimensiones (mm)



Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

Gewichte / Geschwindigkeiten
Weights / Working speeds
Poids / Vitesses
Pesos / Velocidades de trabajo

Achse / Axle Essieu / Eje	1	2	3	4	Gesamtgewicht / Total weight Poids total / Peso total
16	12	12	12	12	48

* Incl. 6,5 t Gegengewicht, 10/18 m Auslegerverlängerung, Unterflasche, Hakengeschirr, Bereifung 445/95 R 25 (16.00 R 25).
* Incl. 6,5 t counterweight, 10/18 m boom extension, hook block, swivel hook, tyres 445/95 R 25 (16.00 R 25).
* Incl. de 6,5 t contrepoids, 10 m/18 m flèchette, moufle, elingues, pneus 445/95 R 25 (16.00 R 25).
* Incl. contrapeso de 6,5 t, 10 m/18 m plumín, gancho, gancho de bola, neumáticos 445/95 R 25 (16.00 R 25).

Traglast / Lifting capacity / Force de levage / Capacidad de elevación	Rollen / Sheaves Poulies / Poleas	Stränge / Parts of line Brins / Ramales de cable	Gewicht / Weight Poid / Peso
100 t	8	19	1000 kg
63 t*	5	11	650 kg
40 t*	3	7	550 kg
40 t	3	7	550 kg
20 t	1	3	300 kg
6 t	–	1	150 kg

	1	2	3	4	5	6	7	8	9	10	11	12	R1	R2	
385/95 (14.00) km/h	3	4	5	7	9	11	15	19	24	31	40	51	4	5	70%
	6	7	9	12	15	19	26	33	42	54	69	85	6	8	
445/95 (16.00) 525/80 (20.5) km/h	4	5	6	8	10	12	16	21	27	34	43	56	4	5	62%
	6	8	10	13	16	21	28	36	46	59	75	85	7	8	

	Stufenlos Infinitely variable Progressivement variable Infinitamente variable		Seil Rope Câble Cable	Max. Seilzug Max. single line pull Effort maxi au brin simple Trio máximo por ramal
1	0 - 115 m/min	für einfachen Strang single line au brin simple ramal simple	18 mm / 230 m	55 kN
2	0 - 115 m/min	für einfachen Strang single line au brin simple ramal simple	18 mm / 230 m	55 kN
360°	0 - 2 min^{-1}			
	-1° – +82.4°	ca. 35 s approx. 35 s env. 35 s aproximadamente 35 s		
	11.1 m – 51.2 m	ca. 310 s approx. 310 s env. 310 s aproximadamente 310 s		

TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

m	11.1 m*	11.1 m	14.8 m	18.5 m	22.1 m	25.8 m	29.5 m	33.2 m	36.9 m	40.5 m	44.2 m	47.9 m	51.2 m
3.0	61.6**	78.1**	65.0	65.0									
4.0	68.3	64.2	63.5	59.2	50.0	41.3							
5.0	57.8	54.6	54.2	52.3	50.0	39.2	31.6						
7.0	42.5	41.2	40.7	40.8	40.8	33.1	28.8	23.8	19.7	15.8			
9.0	24.9	24.0	31.2	31.4	31.6	28.5	28.5	22.0	19.7	15.8	12.9	10.2	
11.0			22.6	23.5	24.7	24.8	24.1	19.3	17.4	15.6	12.9	10.2	8.9
14.0				17.2	17.2	17.0	16.6	16.2	14.5	13.3	12.2	10.2	8.9
18.0					11.7	11.5	11.1	11.5	11.2	10.8	10.1	9.3	8.7
22.0						8.3	8.4	8.3	8.5	8.3	8.4	7.9	7.4
26.0							6.9	6.3	6.7	6.5	6.3	6.0	6.0
30.0								5.3	5.2	5.0	4.8	4.5	4.5
34.0									4.2	3.9	3.7	3.4	3.4
38.0										3.1	2.9	2.6	2.5
42.0											2.3	1.9	1.9
46.0													1.4

* Nach hinten / * Over rear / * A l'arrière / * Sobre la parte trasera
** Mit Zusatzhubausrüstung / ** With additional lifting equipment / ** Avec équipement supplémentaire / ** Con equipo adicional

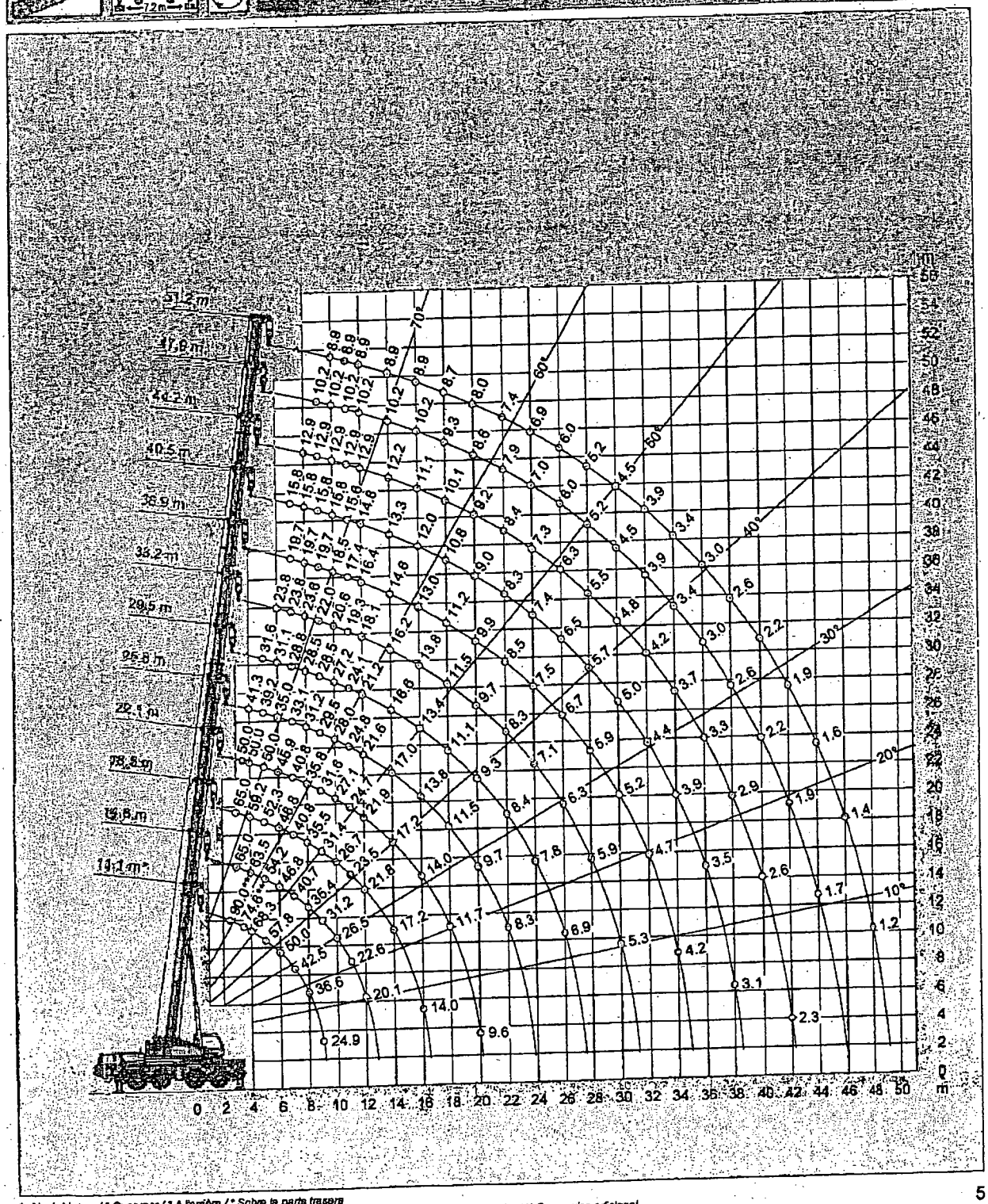
Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN

ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación

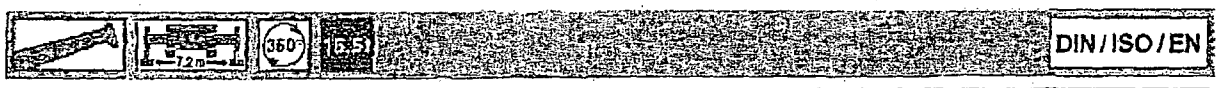
DIN / ISO / EN



* Nach hinten / * Over rear / * A l'arrière / * Sobre la parte trasera
** Mit Zusatzhubeausrüstung / ** With additional lifting equipment / ** Avec équipement supplémentaire / ** Con equipo adicional

TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación



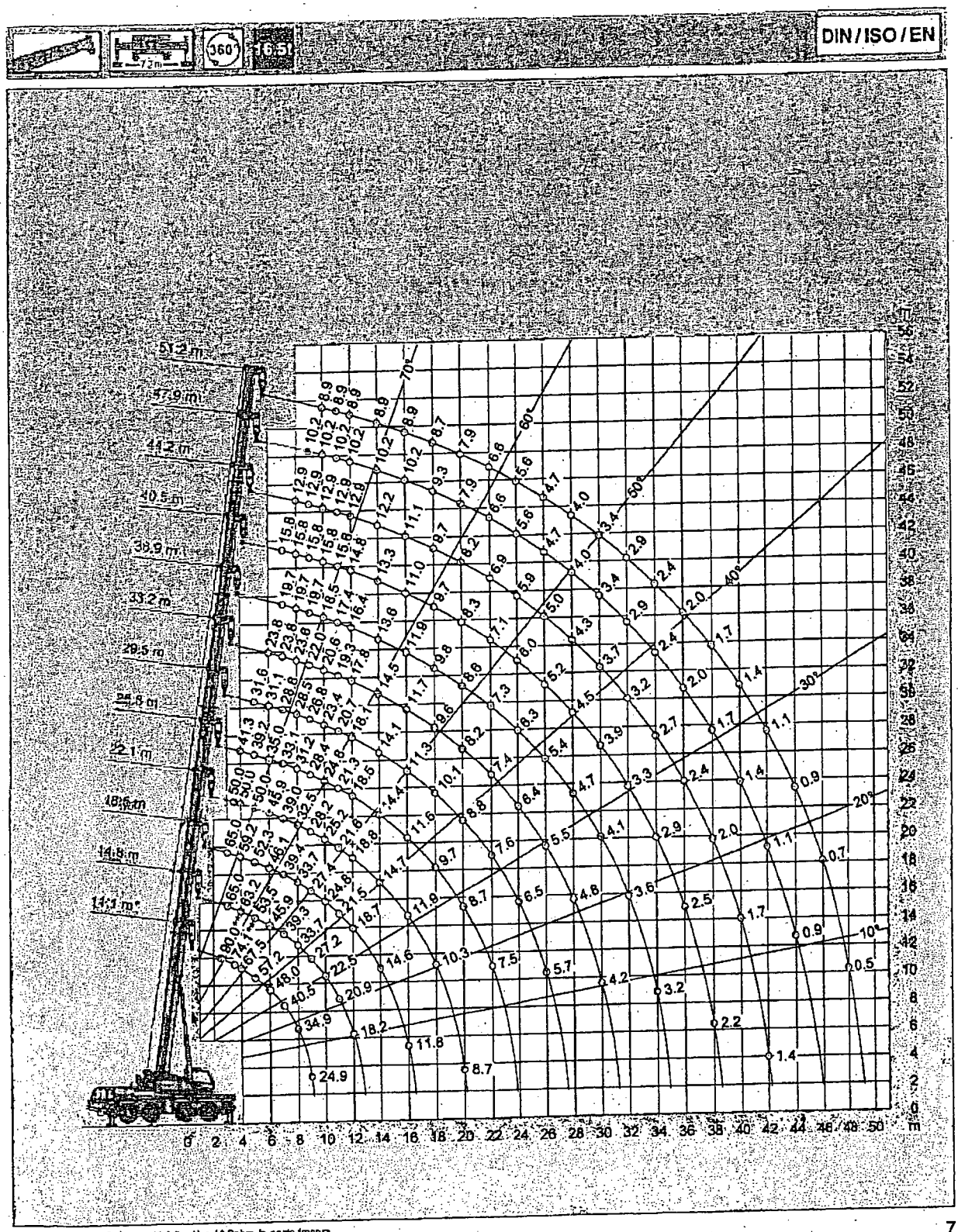
m	11.1 m*	11.1 m	14.8 m	18.5 m	22.1 m	25.8 m	29.5 m	33.2 m	36.9 m	40.5 m	44.2 m	47.9 m	51.2 m
3.0	81.6**	76.5**	65.0	65.0									
4.0	67.5	63.7	63.2	59.2	50.0	41.3							
5.0	57.2	54.0	53.5	52.3	50.0	39.2	31.6						
7.0	40.5	39.8	39.3	39.4	39.0	33.1	28.8	23.8	19.7	15.8			
9.0	24.9	24.0	27.2	27.4	28.2	28.4	26.8	22.0	19.7	15.8	12.9	10.2	
11.0			20.9	21.5	21.6	21.3	20.7	19.3	17.4	15.6	12.9	10.2	8.9
14.0				14.6	14.7	14.4	14.1	14.5	13.5	13.3	12.2	10.2	8.9
18.0					10.3	9.7	10.1	9.6	9.8	9.7	9.7	9.3	8.7
22.0						7.5	7.6	7.4	7.3	7.1	6.9	6.6	6.6
26.0							5.7	5.5	5.4	5.2	5.0	4.7	4.7
30.0								4.2	4.1	3.9	3.7	3.4	3.4
34.0									3.2	2.9	2.7	2.4	2.4
38.0										2.2	2.0	1.7	1.7
42.0											1.5	1.1	1.1
46.0													0.7

* Nach hinten / * Over rear / * A l'arrière / * Sobre la parte trasera
** Mit Zusatzabstützung / ** With additional lifting accessories / ** Avec équipement supplémentaire / ** Con equipo adicional

Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación



* Nach hinten / * Over rear / * A l'arrière / * Sobre la parte trasera
** Mit Zusatzhubausrüstung / ** With additional lifting equipment / ** Avec équipement supplémentaire / ** Con equipo adicional

TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

DIN / ISO / EN

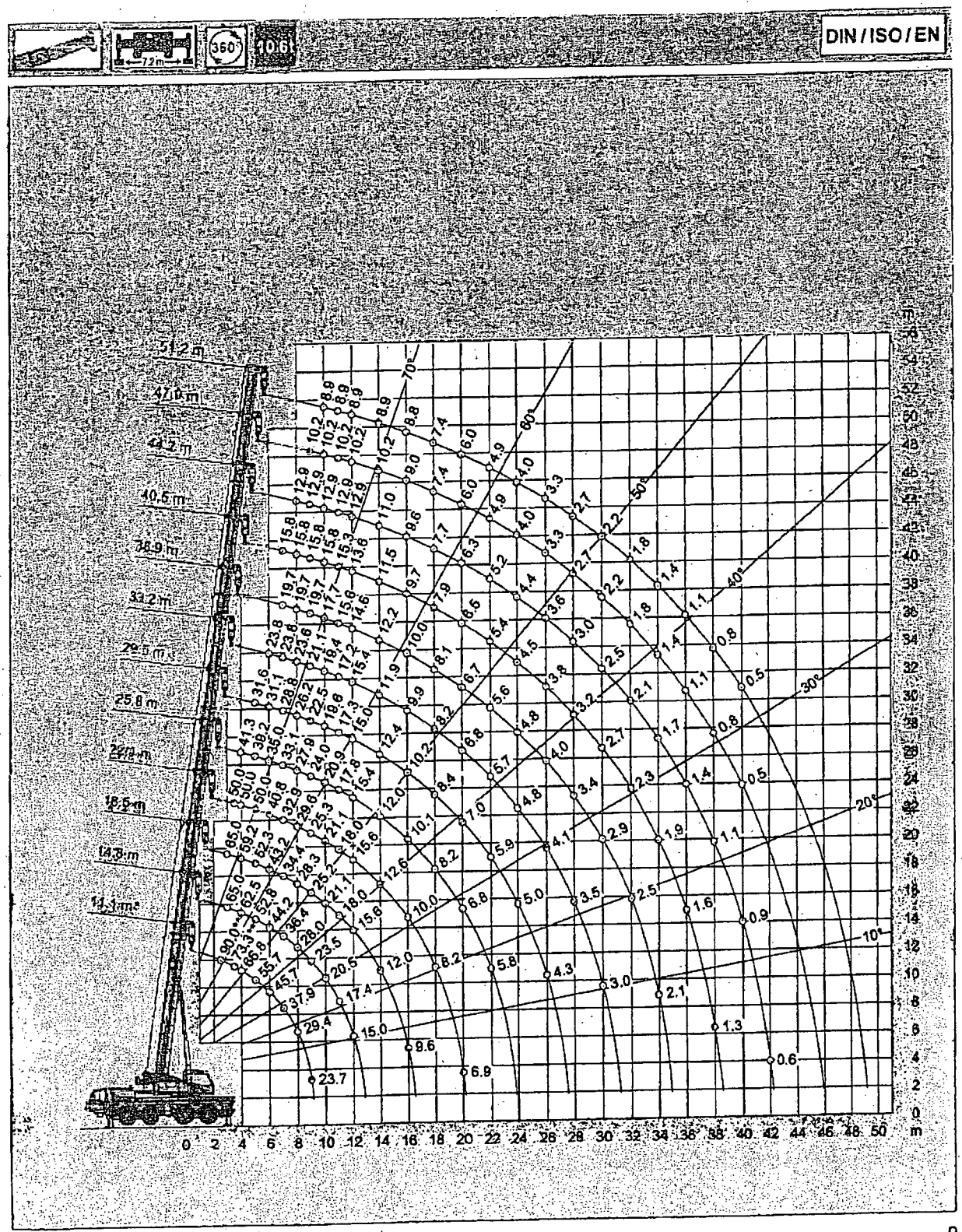
m	11.1 m*	11.1 m	14.8 m	18.5 m	22.1 m	25.8 m	29.5 m	33.2 m	36.9 m	40.5 m	44.2 m	47.9 m	51.2 m
3.0	81.1**	76.0**	65.0	65.0									
4.0	66.8	63.0	62.5	59.2	50.0	41.3							
5.0	55.7	53.3	52.8	52.3	50.0	39.2	31.6						
7.0	37.9	37.5	36.4	34.4	32.9	33.1	28.8	23.8	19.7	15.8			
9.0	23.7	23.4	23.5	25.2	25.3	24.0	22.5	21.1	19.7	15.8	12.9	10.2	
11.0			17.4	18.0	18.0	17.8	17.3	17.2	15.6	15.3	12.9	10.2	8.9
14.0				12.0	12.6	12.0	12.4	11.9	12.2	11.5	11.0	10.2	8.9
18.0					8.2	8.2	8.4	8.2	8.1	7.9	7.7	7.4	7.4
22.0						5.8	5.9	5.7	5.6	5.4	5.2	4.9	4.9
26.0							4.3	4.1	4.0	3.8	3.6	3.3	3.3
30.0								3.0	2.9	2.7	2.5	2.2	2.2
34.0									2.1	1.9	1.7	1.4	1.4
38.0										1.3	1.1	0.8	0.8
42.0											0.5		
46.0													

* Nach hinten / * Over rear / * A l'arrière / * Sobre la parte trasera
** Mit Zusatzhubeinrichtung / ** With additional lifting equipment / ** Avec équipement supplémentaire / ** Con equipo adicional

Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación



* Nach hinten / * Over rear / * A l'arrière / * Sobre la parte trasera
** Mit Zusatzhubausrüstung / ** With additional lifting equipment / ** Avec équipement supplémentaire / ** Con equipo adicional

TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

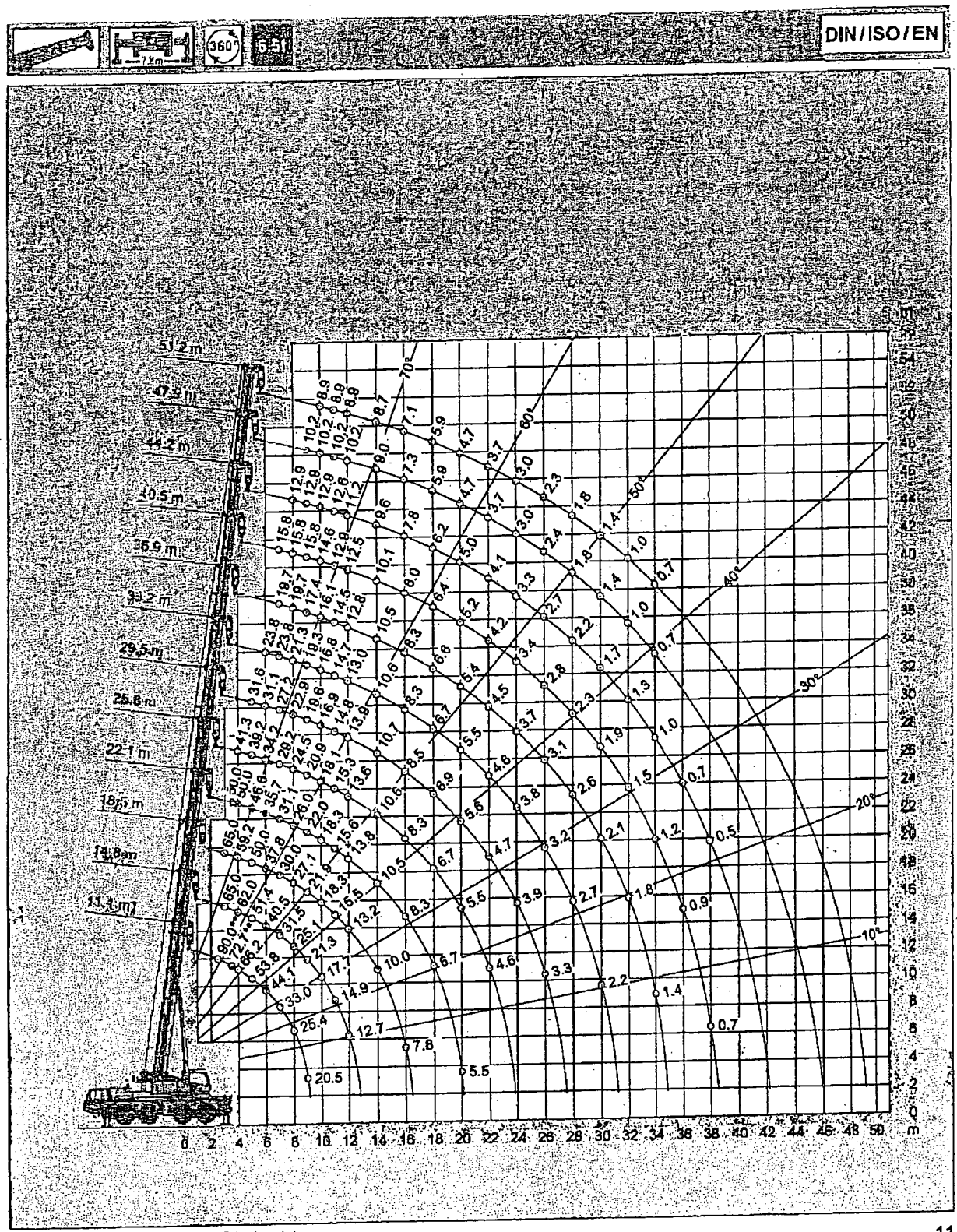
m	11.1 m*	11.1 m	14.8 m	18.5 m	22.1 m	25.8 m	29.5 m	33.2 m	36.9 m	40.5 m	44.2 m	47.9 m	51.2 m
3.0	80.4**	75.6**	65.0	65.0									
4.0	66.2	62.4	62.0	59.2	50.0	41.3							
5.0	53.8	52.0	51.4	50.0	46.6	39.2	31.6						
7.0	33.0	32.6	31.5	30.0	31.1	29.2	27.2	23.8	19.7	15.8			
9.0	20.5	20.1	21.3	21.9	22.0	20.9	19.6	19.3	17.4	15.8	12.9	10.2	
11.0			14.9	15.5	15.8	15.3	14.8	14.7	14.5	12.9	12.6	10.2	8.9
14.0				10.0	10.5	10.6	10.7	10.6	10.5	10.1	9.8	9.0	8.7
18.0					6.7	6.7	6.9	6.7	6.6	6.4	6.2	5.9	5.9
22.0						4.6	4.7	4.6	4.5	4.2	4.1	3.7	3.7
26.0							3.3	3.2	3.1	2.8	2.7	2.4	2.3
30.0								2.2	2.1	1.9	1.7	1.4	1.4
34.0									1.4	1.2	1.0	0.7	0.7
38.0										0.7	0.6		
42.0													
46.0													

* Nach hinten / * Over rear / * A l'arrière / * Sobre la parte trasera
** Mit Zusatzhubausrüstung / ** With additional lifting equipment / ** Avec équipement supplémentaire / ** Con equipo adicional

Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación



* Nach hinten / * Over rear / * A l'arrière / * Sobre la parte trasera
** Mit Zusatzhubausrüstung / ** With additional lifting equipment / ** Avec équipement supplémentaire / ** Con equipo adicional

TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

DIN / ISO / EN

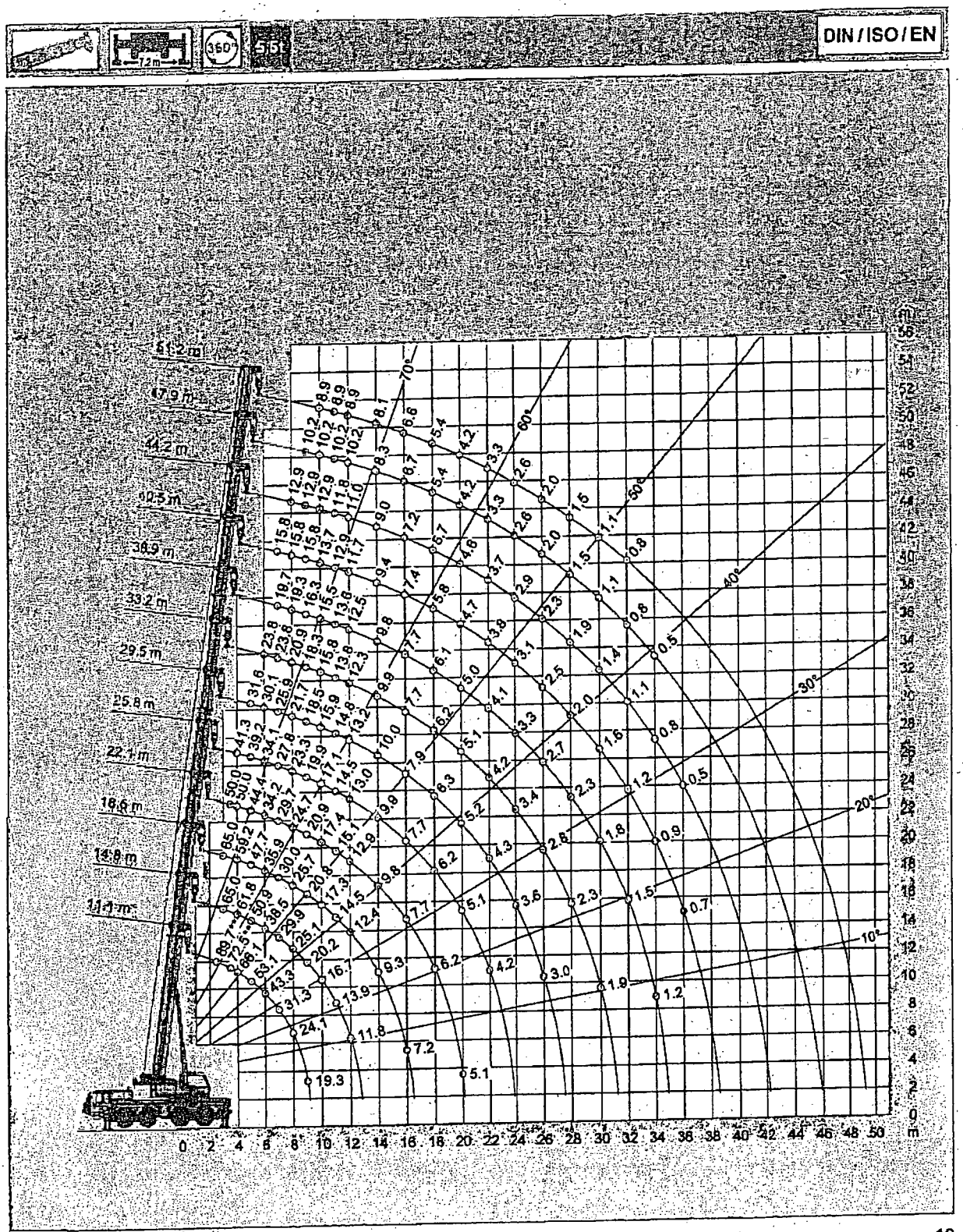
m	11.1 m*	11.1 m	14.8 m	18.5 m	22.1 m	25.8 m	29.5 m	33.2 m	36.9 m	40.5 m	44.2 m	47.9 m	51.2 m
3.0	80.3**	75.4**	65.0	65.0									
4.0	66.1	62.3	61.8	59.2	50.0	41.3							
5.0	53.1	51.5	50.9	47.7	44.4	39.2	31.6						
7.0	31.3	30.9	29.9	30.0	29.7	27.8	25.9	23.8	19.7	15.8			
9.0	19.3	19.0	20.2	20.8	20.9	19.9	18.5	18.3	16.3	15.8	12.9	10.2	
11.0			13.9	14.5	15.1	14.5	14.3	13.8	13.6	12.9	11.8	10.2	8.9
14.0				9.3	9.8	9.9	10.0	9.9	9.8	9.4	9.0	8.3	8.1
18.0					6.2	6.2	6.3	6.2	6.1	5.8	5.7	5.4	5.4
22.0						4.2	4.3	4.2	4.1	3.8	3.7	3.3	3.3
26.0							3.0	2.8	2.7	2.5	2.3	2.0	2.0
30.0								1.9	1.8	1.6	1.4	1.1	1.1
34.0									1.2	0.9	0.8	0.5	
38.0													
42.0													
46.0													

* Rock Buster / * Over front / * A l'avant / * Sobre la parte delante
** Mit Zusatzausrüstung / ** With additional lifting equipment / ** Avec équipement complémentaire / ** Con equipo adicional

Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación



* Nach hinten / * Over rear / * A l'arrière / * Sobre la parte trasera
** Mit Zusatzhubausrüstung / ** With additional lifting equipment / ** Avec équipement supplémentaire / ** Con equipo adicional

TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

DIN / ISO / EN

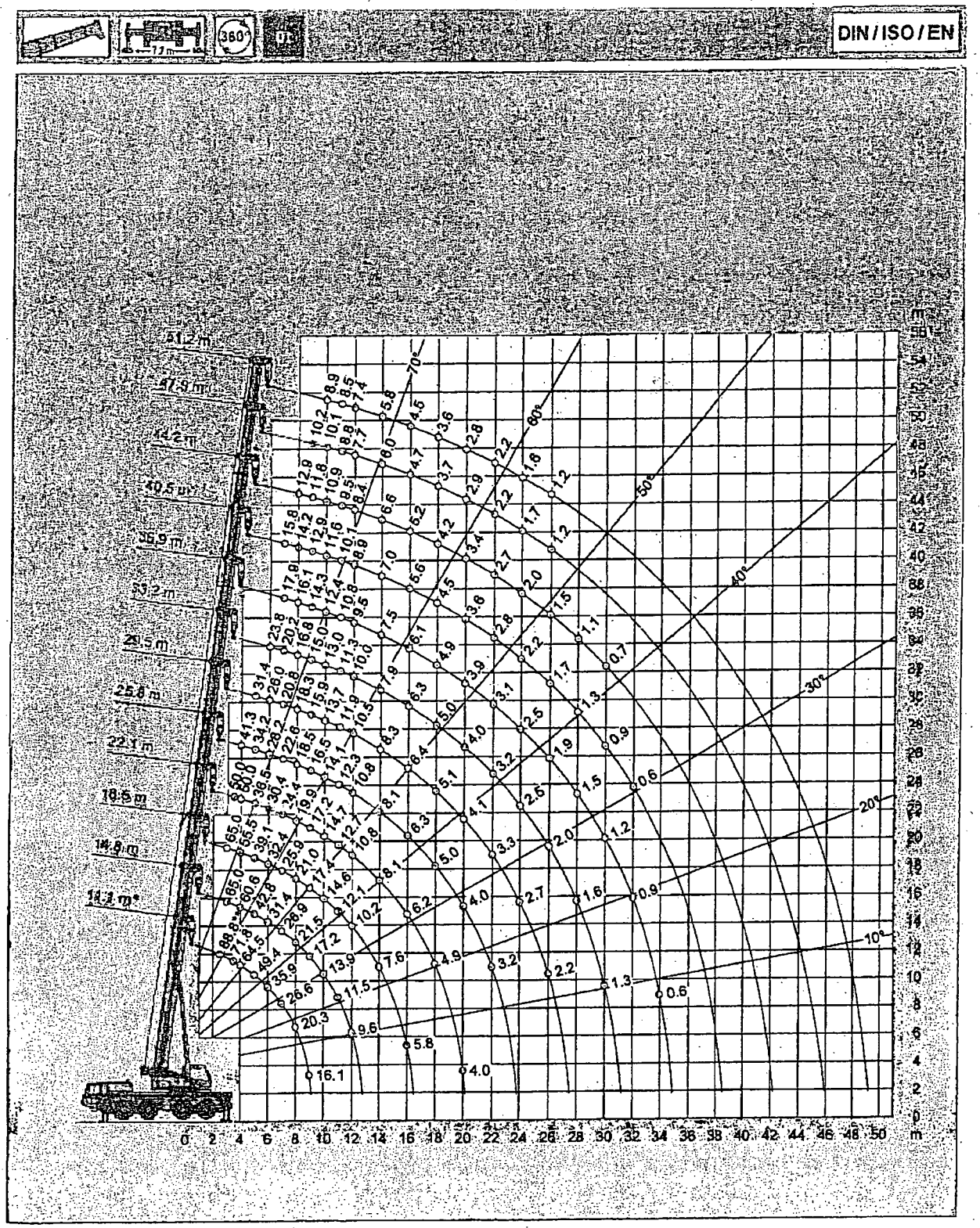
m	11.1 m*	11.1 m	14.8 m	18.5 m	22.1 m	25.8 m	29.5 m	33.2 m	36.9 m	40.5 m	44.2 m	47.9 m	51.2 m
3.0	79.4**	74.7**	65.0	65.0									
4.0	64.5	61.2	60.6	55.5	50.0	41.3							
5.0	49.4	49.4	42.8	39.1	35.5	34.2	31.4						
7.0	26.6	25.5	26.9	25.9	24.4	22.8	20.8	20.2	17.9	15.8			
9.0	16.1	15.9	17.2	17.4	17.2	16.5	15.9	15.0	14.3	12.9	11.8	10.2	
11.0			11.5	12.1	12.7	12.3	11.9	11.3	10.8	10.1	9.5	8.8	8.5
14.0				7.6	8.1	8.1	8.3	7.9	7.5	7.0	6.6	6.0	5.8
18.0					4.9	5.0	5.1	5.0	4.9	4.5	4.2	3.7	3.6
22.0						3.2	3.3	3.2	3.1	2.8	2.7	2.2	2.2
26.0							2.2	2.0	1.9	1.7	1.5	1.2	1.2
30.0								1.3	1.2	0.9	0.7		
34.0									0.8				
38.0													
42.0													
46.0													

* Nach hinten / * Over rear / * A l'arrière / * Sobre la parte trasera
** Mit Zusatzhubausrüstung / ** With additional lifting equipment / ** Avec équipement supplémentaire / ** Con equipo adicional

Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación



* Nach hinten / * Over rear / * A l'arrière / * Sobre la parte trasera

** Mit Zusatzhubausrüstung / ** With additional lifting equipment / ** Avec équipement supplémentaire / ** Con equipo adicional

TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

HYDRO 7.2m 360° DIN / ISO / EN

m	11.1 m + 10.0 m			33.2 m + 10.0 m			47.9 m + 10.0 m			51.2 m + 10.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	12.2*											
4.5	12.2*											
6.0	12.2*	11.5*										
8.0	12.2*	10.2	7.4	10.1								
10.0	11.3*	9.0	6.7	10.1	8.9							
12.0	9.5	8.0	6.2	9.9	8.3		4.9			4.4		
16.0	7.0	6.5		8.5	7.1	6.3	4.9	4.9		4.4	4.4	
20.0				7.4	6.3	5.7	4.9	4.5	4.3	4.4	4.2	4.0
24.0				6.5	5.7	5.2	4.5	4.1	3.9	4.2	3.8	3.7
28.0				4.9	5.2	4.9	4.0	3.8	3.6	3.7	3.6	3.4
32.0				3.6	3.9	3.9	3.5	3.5	3.4	3.4	3.3	3.2
36.0				2.7	2.9		2.9	3.1	3.2	2.8	3.0	3.0
40.0				2.0			2.1	2.3	2.4	2.0	2.2	2.4
44.0							1.5	1.6	1.7	1.4	1.5	1.7
48.0							1.0	1.1		0.9	1.1	
52.0							0.6	0.8		0.5	0.8	

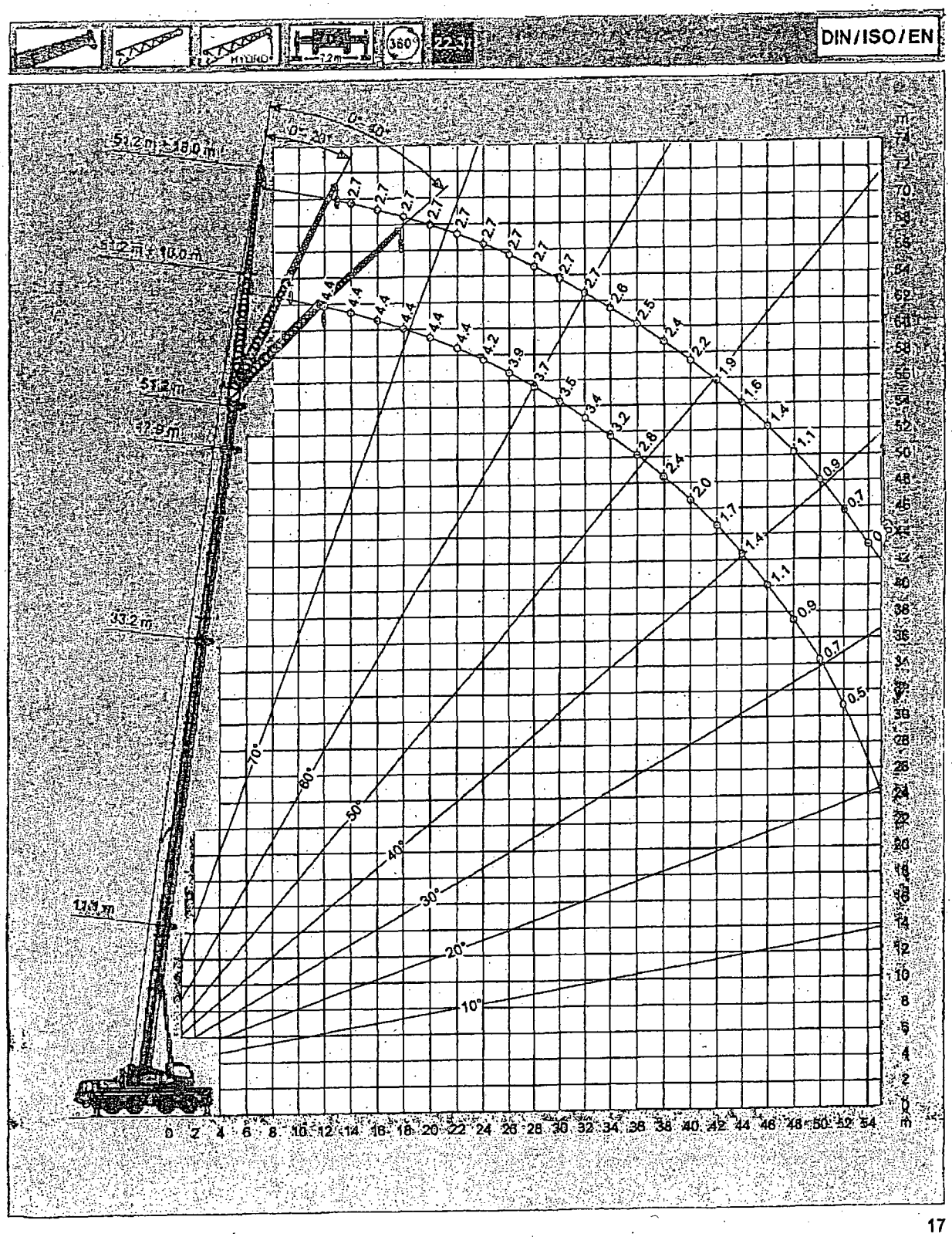
** Mit Zusatzhubausrüstung / * With additional lifting equipment / * Avec équipement supplémentaire / * Con equipo adicional*

m	11.1 m + 18.0 m			33.2 m + 18.0 m			47.9 m + 18.0 m			51.2 m + 18.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	5.8											
4.5	5.8											
6.0	5.8											
8.0	5.8			4.2								
10.0	5.8	5.3		4.2								
12.0	5.7	4.8		4.2			2.9					
16.0	4.7	4.1	3.2	4.2	4.2		2.9			2.7		
20.0	3.7	3.4	2.8	4.2	3.9	3.2	2.9	2.9		2.7		
22.0	3.3	3.1	2.8	4.2	3.8	3.0	2.9	2.9		2.7	2.6	
24.0	3.0	2.9	2.5	4.2	3.6	3.0	2.9	2.9		2.7	2.7	
28.0	2.7	2.6		4.1	3.5	2.9	2.9	2.9	2.6	2.7	2.7	2.6
30.0				3.9	3.4	2.8	2.9	2.8	2.6	2.7	2.7	2.5
32.0				3.8	3.3	2.7	2.9	2.7	2.6	2.7	2.6	2.4
36.0				3.2	3.2	2.6	2.9	2.6	2.5	2.7	2.5	2.3
40.0				2.8	3.1	2.5	2.8	2.5	2.4	2.6	2.4	2.3
44.0				2.4	3.0	2.5	2.7	2.4	2.3	2.5	2.3	2.2
48.0				2.4	2.7	2.5	2.3	2.3	2.2	2.4	2.2	2.1
52.0				1.8	2.0		2.0	2.2	2.1	1.9	2.1	2.0
56.0				1.6	1.7		1.7	2.0	2.1	1.6	2.0	1.9
48.0				1.4			1.4	1.8	2.0	1.3	1.8	1.9
52.0							1.2	1.5	1.7	1.1	1.4	1.4
56.0							1.0	1.2	1.4	0.9	1.2	1.1
52.0							0.8	1.0	1.1	0.7	1.0	0.9
56.0							0.6	0.8		0.5	0.7	
56.0								0.6			0.6	

Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación



TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

DIN / ISO / EN

m	11.1 m + 10.0 m			33.2 m + 10.0 m			47.9 m + 10.0 m			51.2 m + 10.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	12.2*											
4.5	12.2*											
6.0	12.2*	11.5*										
8.0	12.2*	10.2	7.4	10.1								
10.0	11.3*	9.0	6.7	10.1	8.9							
12.0	9.6	8.0	6.2	9.9	8.3		4.9			4.4		
16.0	7.0	6.5		8.5	7.1	6.3	4.9	4.9		4.4	4.4	
20.0				7.4	6.3	5.7	4.9	4.5	4.3	4.4	4.2	4.0
24.0				5.2	5.7	5.2	4.5	4.1	3.9	4.2	3.9	3.7
28.0				3.7	4.0	4.2	3.9	3.8	3.6	3.7	3.6	3.4
32.0				2.8	2.8	3.0	2.7	3.0	3.3	2.7	3.0	3.2
36.0				1.8	1.9		1.9	2.1	2.3	1.8	2.1	2.3
40.0				1.1			1.2	1.4	1.6	1.2	1.4	1.5
44.0							0.7	0.9	0.9	0.6	0.8	0.9

** Mit Zusatzhubausrüstung / * With additional lifting equipment / * Avec équipement supplémentaire / * Con equipo adicional*

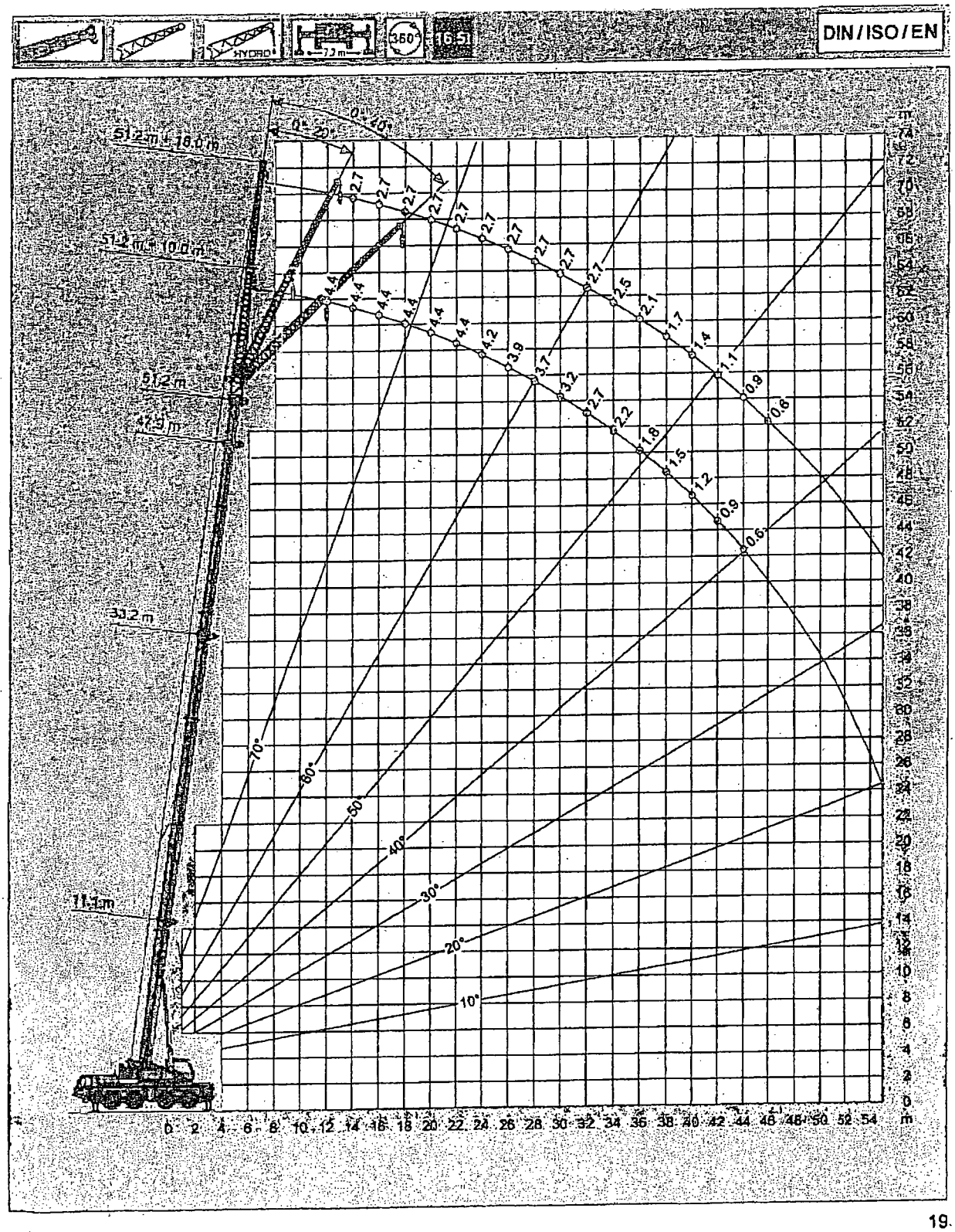
DIN / ISO / EN

m	11.1 m + 18.0 m			33.2 m + 18.0 m			47.9 m + 18.0 m			51.2 m + 18.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	5.8											
4.5	5.3											
6.0	5.8											
8.0	5.8			4.2								
10.0	5.8	5.3		4.2								
12.0	5.7	4.8		4.2			2.9					
16.0	4.7	4.1	3.2	4.2	4.2		2.9			2.7		
18.0	4.2	3.7	3.0	4.2	4.1		2.9			2.7		
20.0	3.7	3.4	2.8	4.2	3.9	3.2	2.9	2.9		2.7		
22.0	3.3	3.1	2.6	4.2	3.8	3.1	2.9	2.9		2.7	2.7	
24.0	3.0	2.9	2.5	4.2	3.6	3.0	2.9	2.9		2.7	2.7	
26.0	2.7	2.6		4.2	3.5	2.9	2.9	2.9	2.8	2.7	2.7	2.5
28.0				4.1	3.4	2.8	2.9	2.8	2.6	2.7	2.7	2.5
30.0				3.6	3.3	2.7	2.9	2.7	2.6	2.7	2.6	2.4
32.0				3.1	3.2	2.6	2.9	2.6	2.5	2.7	2.5	2.3
34.0				2.7	3.0	2.5	2.5	2.6	2.4	2.5	2.4	2.3
36.0				2.3	2.7	2.5	2.1	2.4	2.3	2.1	2.3	2.2
38.0				1.9	2.3	2.5	1.8	2.2	2.2	1.7	2.2	2.1
40.0				1.6	1.9	2.1	1.5	1.9	2.2	1.4	1.8	2.1
42.0				1.3	1.6		1.2	1.6	1.9	1.1	1.5	1.8
44.0				1.1	1.3		0.9	1.3	1.5	0.8	1.2	1.5
46.0				0.8	1.0		0.7	1.0	1.2	0.6	1.0	1.2
48.0				0.7			0.5	0.8	1.0		0.7	0.9
50.0								0.6	0.7		0.5	0.7
52.0									0.5			0.5

Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación



TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

HYDRO 7.2 m 360° 10.61 DIN / ISO / EN

m	11.1 m + 10.0 m			33.2 m + 10.0 m			47.9 m + 10.0 m			51.2 m + 10.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	12.2*											
4.5	12.2*											
6.0	12.2*	11.5*										
8.0	12.2*	10.2	7.4	10.1								
10.0	11.3*	9.0	6.7	10.1	8.9							
12.0	9.6	8.0	6.2	9.9	8.3		4.9			4.4		
16.0	7.0	6.5		8.5	7.1	6.3	4.9	4.9		4.4	4.4	
20.0				5.6	5.3	5.7	4.9	4.5	4.3	4.4	4.2	4.0
24.0				3.7	4.2	4.5	3.9	4.1	3.9	3.8	3.9	3.7
28.0				2.4	2.7	3.0	2.6	3.0	3.5	2.5	2.9	3.2
32.0				1.5	1.7	1.9	1.6	2.0	2.2	1.6	1.9	2.2
36.0				0.8	1.0		0.9	1.2	1.4	0.9	1.1	1.3
40.0								0.6	0.7		0.5	0.7

** Mit Zusatzhubausrüstung / * With additional lifting equipment / * Avec équipement supplémentaire / * Con equipo adicional*

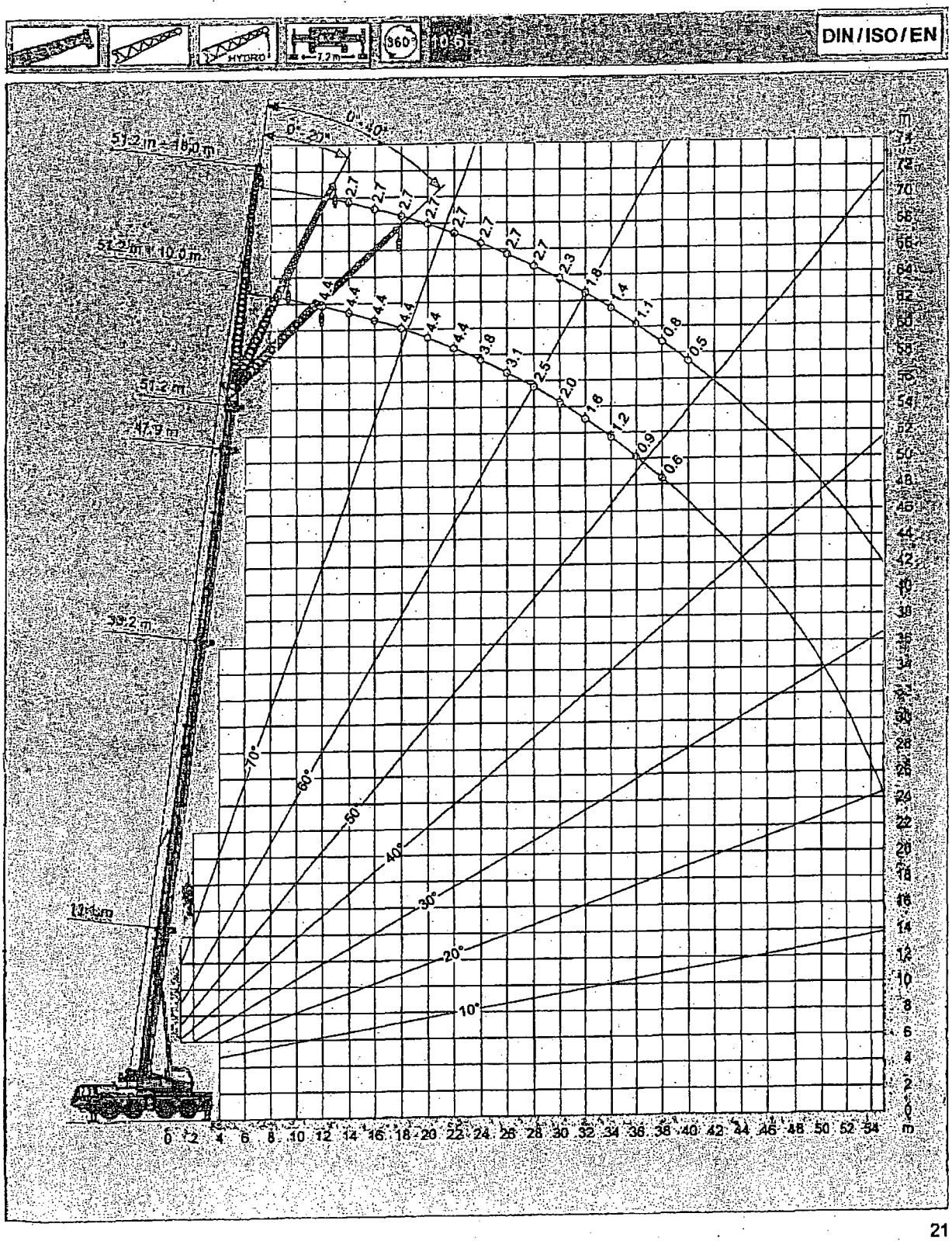
HYDRO 7.2 m 360° 10.61 DIN / ISO / EN

m	11.1 m + 18.0 m			33.2 m + 18.0 m			47.9 m + 18.0 m			51.2 m + 18.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	5.8											
4.5	5.8											
6.0	5.8											
8.0	5.8			4.2								
10.0	5.8	5.3		4.2								
12.0	5.7	4.8		4.2			2.9					
16.0	4.7	4.1	3.2	4.2	4.2		2.9			2.7		
20.0	3.7	3.4	2.8	4.2	3.9	3.2	2.9	2.9		2.7		
24.0	3.0	2.9	2.5	4.2	3.6	3.0	2.9	2.9		2.7	2.7	
28.0	2.7	2.8		3.0	3.4	2.8	2.9	2.8	2.5	2.7	2.7	2.5
30.0				2.5	3.0	2.7	2.3	2.7	2.5	2.3	2.6	2.4
32.0				2.0	2.5	2.6	1.9	2.5	2.5	1.8	2.4	2.3
34.0				1.6	2.1	2.4	1.5	2.1	2.4	1.4	2.1	2.3
36.0				1.3	1.7	2.0	1.2	1.7	2.1	1.1	1.6	2.0
38.0				1.0	1.4	1.6	0.9	1.3	1.7	0.8	1.3	1.6
40.0				0.7	1.0	1.2	0.6	1.0	1.3	0.5	1.0	1.3
42.0				0.5	0.8			0.8	1.0		0.7	1.0
44.0					0.5			0.5	0.6			0.7
46.0									0.5			

Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación



TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

DIN / ISO / EN

m	11.1 m + 10.0 m			33.2 m + 10.0 m			47.9 m + 10.0 m			51.2 m + 10.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	12.2*											
4.5	12.2*											
6.0	12.2*	11.5*										
8.0	12.2*	10.2	7.4	10.1								
10.0	11.3*	9.0	6.7	10.1	8.9							
12.0	9.6	8.0	6.2	9.9	8.3		4.9			4.4		
16.0	7.0	6.5		7.1	7.1	6.3	4.9	4.9		4.4	4.4	
20.0				4.3	4.9	5.4	4.5	4.5	4.3	4.4	4.2	4.0
24.0				2.7	3.1	3.4	2.8	3.3	3.7	2.8	3.3	3.7
28.0				1.5	1.9	2.1	1.7	2.1	2.4	1.6	2.0	2.4
32.0				0.7	1.0	1.1	0.9	1.2	1.4	0.8	1.1	1.4
36.0								0.5	0.7			0.1

* Mit Zusatzhubausrüstung / * With additional lifting equipment / * Avec équipement supplémentaire / * Con equipo adicional

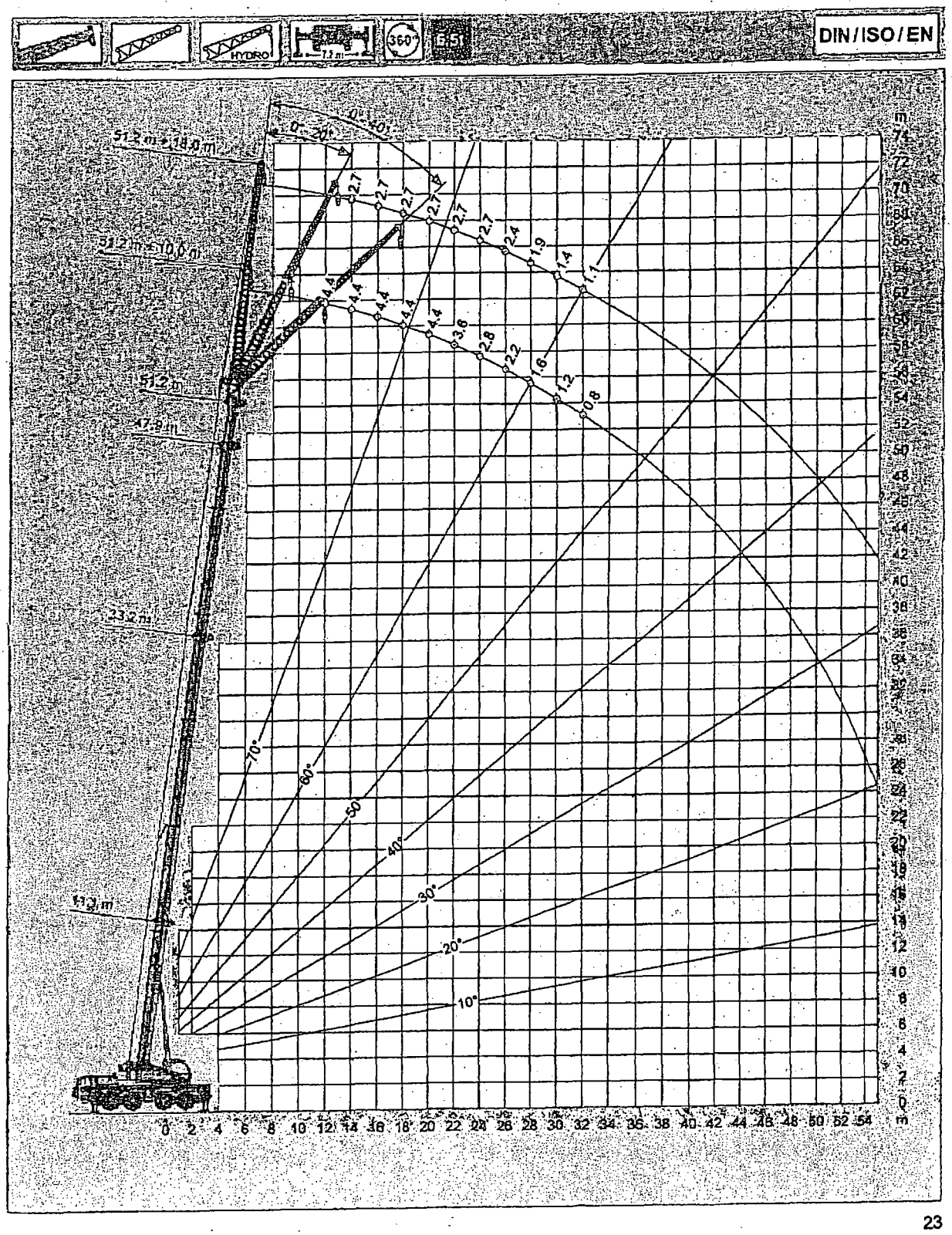
DIN / ISO / EN

m	11.1 m + 18.0 m			33.2 m + 18.0 m			47.9 m + 18.0 m			51.2 m + 18.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	5.8											
4.5	5.8											
6.0	5.8											
8.0	5.8			4.2								
10.0	5.8	5.3		4.2								
12.0	5.7	4.8		4.2			2.9					
16.0	4.7	4.1	3.2	4.2	4.2		2.9			2.7		
20.0	3.7	3.4	2.8	4.2	3.9	3.2	2.9	2.9		2.7		
24.0	3.0	2.9	2.5	3.3	3.6	3.0	2.9	2.9		2.7	2.7	
28.0	2.7	2.6		2.6	3.4	2.9	2.5	2.8	2.6	2.4	2.6	2.6
32.0				2.1	2.7	2.8	2.0	2.7	2.6	1.9	2.5	2.5
36.0				1.6	2.2	2.7	1.5	2.2	2.6	1.4	2.1	2.4
40.0				1.3	1.8	2.2	1.1	1.7	2.2	1.1	1.7	2.2
				0.8	1.6	1.7	0.8	1.6	1.6		1.6	1.7
				0.6	1.0	1.3		1.0	1.4		1.0	1.4
					0.7	1.0		0.7	1.0			1.0
						0.8			0.8			

Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

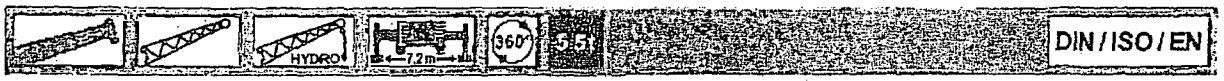
TADANO FAUN ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación



TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación



m	11.1 m + 10.0 m			33.2 m + 10.0 m			47.9 m + 10.0 m			51.2 m + 10.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	12.2*											
4.5	12.2*											
6.0	12.2*	11.5*										
8.0	12.2*	10.2	7.4	10.1								
10.0	11.3*	9.0	6.7	10.1	8.9							
12.0	9.6	8.0	6.2	9.9	8.3		4.9			4.4		
16.0	7.0	6.5		6.5	7.1	6.3	4.9	4.9		4.4	4.4	
20.0				3.9	4.5	5.0	4.1	4.5	4.3	4.0	4.2	4.0
24.0				2.3	2.7	3.1	2.5	3.0	3.4	2.4	2.9	3.3
28.0				1.2	1.6	1.8	1.4	1.8	2.1	1.3	1.7	2.1
32.0				0.5	0.7	0.9	0.6	0.9	1.2	0.9	0.9	1.1

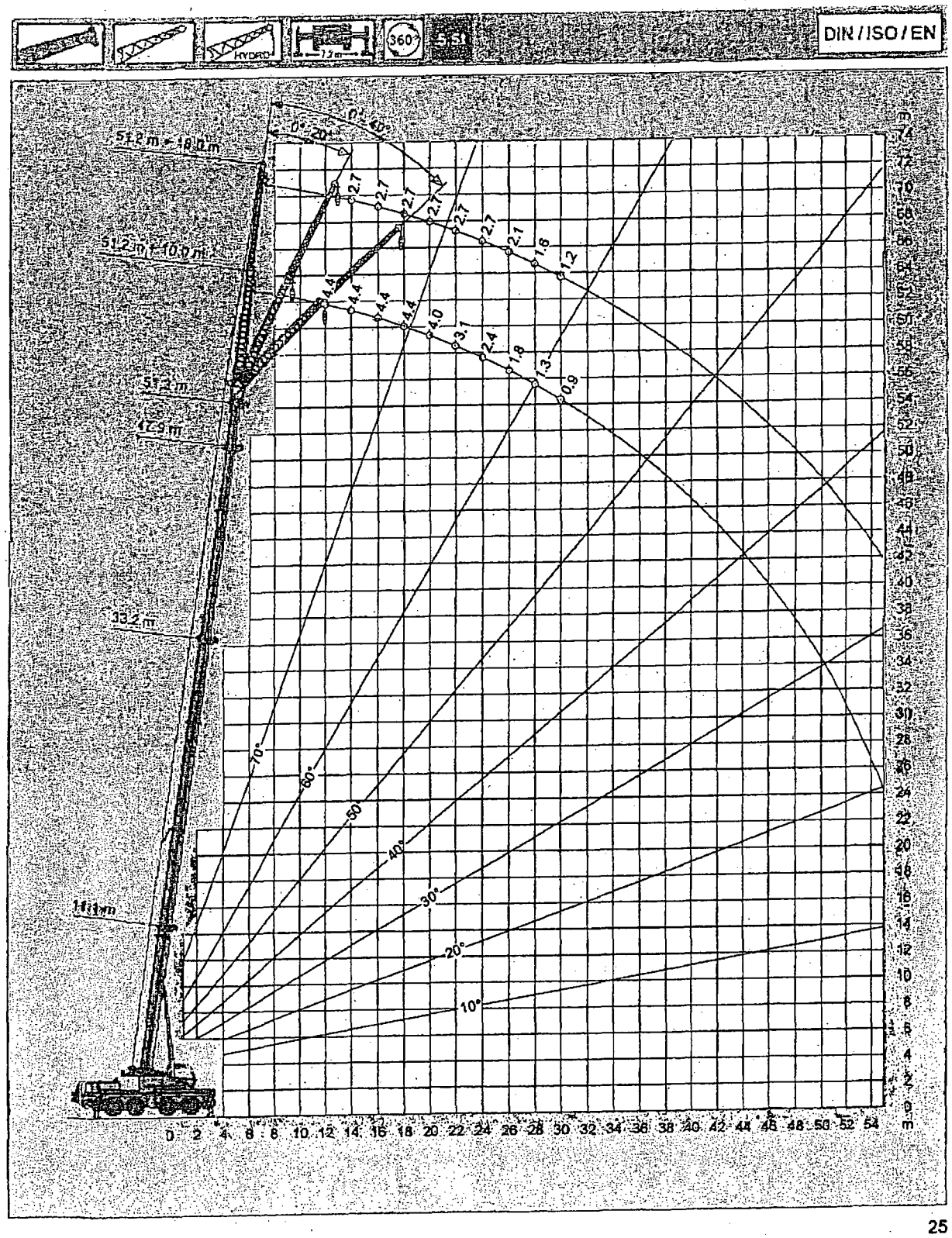
*Mit Zusatzhubausrüstung / *With additional lifting equipment / *Avec équipement supplémentaire / *Con equipo adicional

m	11.1 m + 18.0 m			33.2 m + 18.0 m			47.9 m + 18.0 m			51.2 m + 18.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	5.8											
4.5	5.8											
6.0	5.8											
8.0	5.8			4.2								
10.0	5.8	5.3		4.2								
12.0	5.7	4.8		4.2			2.9					
16.0	4.7	4.1	3.2	4.2	4.2		2.9			2.7		
20.0	3.7	3.4	2.8	4.2	3.9	3.2	2.9	2.9		2.7		
24.0	3.0	2.9	2.5	2.9	3.6	3.0	2.6	2.9		2.7	2.7	
28.0				1.8	2.4	2.8	1.7	2.4	2.6	1.6	2.3	2.5
32.0				1.0	1.5	1.9	0.9	1.5	2.0		1.4	1.9
36.0					0.8	1.1		0.8	1.2			1.1
39.0					0.5	0.7			0.8			

Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación



TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

DIN / ISO / EN

m	11.1 m + 10.0 m			33.2 m + 10.0 m			47.9 m + 10.0 m			51.2 m + 10.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	12.2*											
4.5	12.2*											
6.0	12.2*	11.5*										
8.0	12.2*	10.2	7.4	10.1								
10.0	11.3*	9.0	6.7	10.1	8.9							
12.0	9.6	8.0	6.2	7.8	8.3		4.9			4.4		
16.0	6.7	6.5		4.6	5.4	6.1	4.2	4.9		4.1	4.4	
20.0				2.7	3.3	3.8	2.5	3.1	3.6	2.4	3.0	3.5
24.0				1.4	1.9	2.2	1.4	1.8	2.2		1.7	2.1
28.0					0.8	1.1			1.2			

** Mit Zusatzhubausrüstung / * With additional lifting equipment / * Avec équipement supplémentaire / * Con equipo adicional*

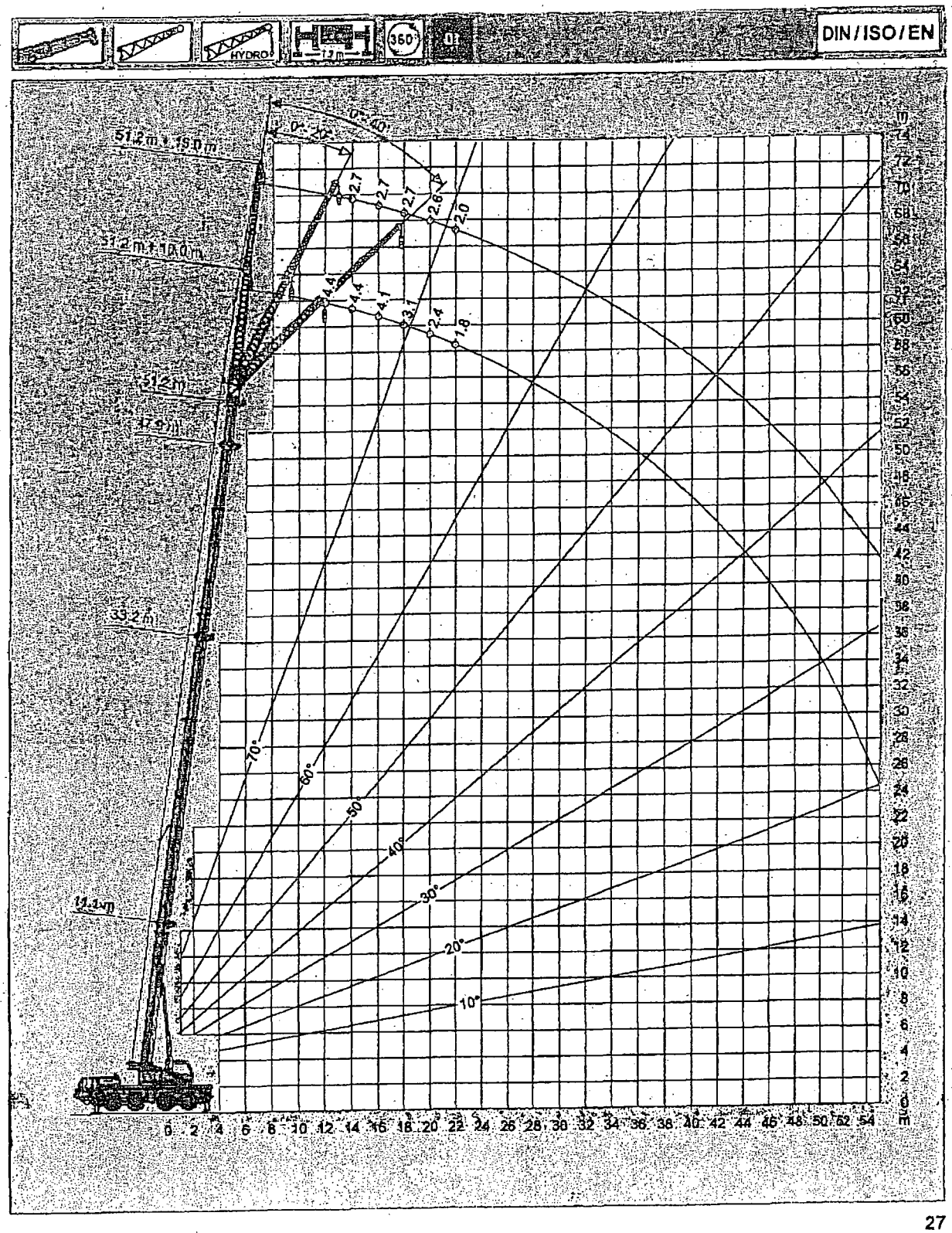
DIN / ISO / EN

m	11.1 m + 18.0 m			33.2 m + 18.0 m			47.9 m + 18.0 m			51.2 m + 18.0 m		
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°
3.5	5.8											
4.5	5.8											
6.0	5.8											
8.0	5.8			4.2								
10.0	5.8	5.3		4.2								
12.0	5.7	4.8		4.2			2.9					
16.0	4.7	4.1	3.2	4.2	4.2		2.9			2.7		
20.0	3.7	3.4	2.8	3.2	3.9	3.2	2.7	2.9		2.7		
24.0	3.0	2.9	2.5	2.0	2.8	3.0	1.6	2.4		2.6		
28.0				1.0	1.7	2.2		1.5	2.1			
32.0					0.9	1.3			1.2			

Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación



TADANO FAUN ATF 90G-4

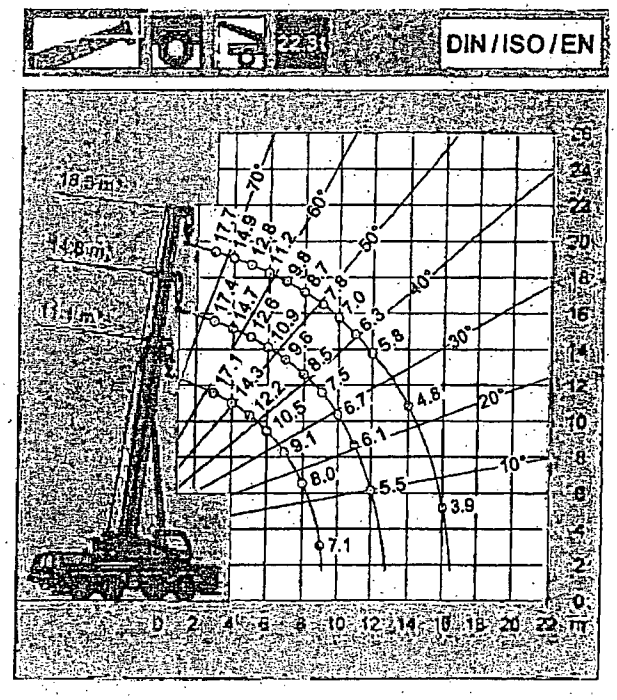
Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación

22.5t DIN/ISO/EN

m	11.1 m*	14.8 m*	18.5 m*
3.5	15.6	16.0	16.2
4.5	13.2	13.6	13.8
6.0	10.5	10.9	11.2
8.0	8.0	8.5	8.7
10.0		6.7	7.0
12.0		5.5	5.8
16.0			3.9

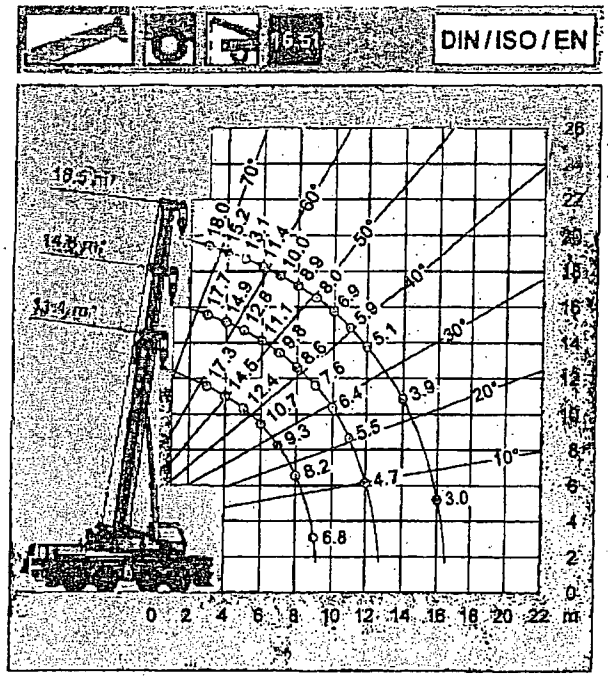
* Oberwagenverriegelung eingelegt / * Superstructure locked
* Superstructure verrouillé / * Bloqueo de superestructura



16.5t DIN/ISO/EN

m	11.1 m*	14.8 m*	18.5 m*
3.5	15.8	16.2	16.5
4.5	13.4	13.8	14.1
6.0	10.7	11.1	11.4
8.0	8.2	8.6	8.9
10.0		6.4	6.9
12.0		4.7	5.1
16.0			3.0

* Oberwagenverriegelung eingelegt / * Superstructure locked
* Superstructure verrouillé / * Bloqueo de superestructura



Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4

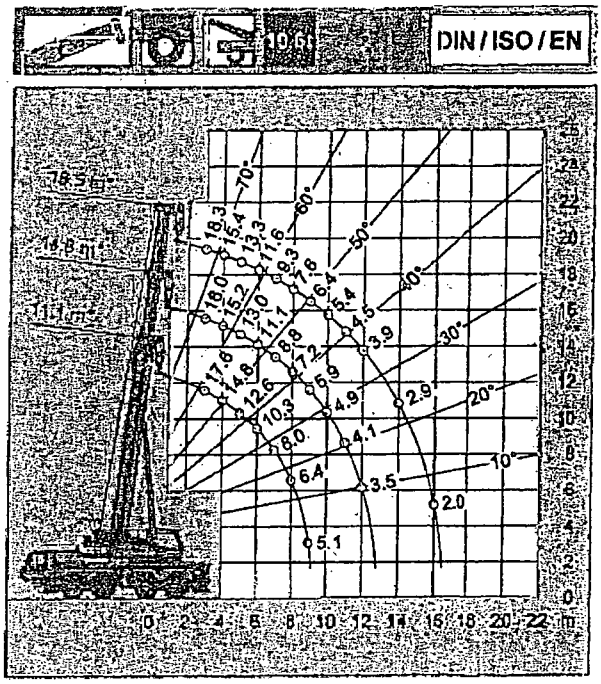
Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación

10.5 t DIN / ISO / EN

m	11.1 m*	14.8 m*	18.5 m*
3.5	16.1	16.5	16.7
4.5	13.6	14.0	14.3
6.0	10.3	11.1	11.6
8.0	5.4	7.2	7.6
10.0		4.9	5.4
12.0		3.5	3.9
16.0			2.0

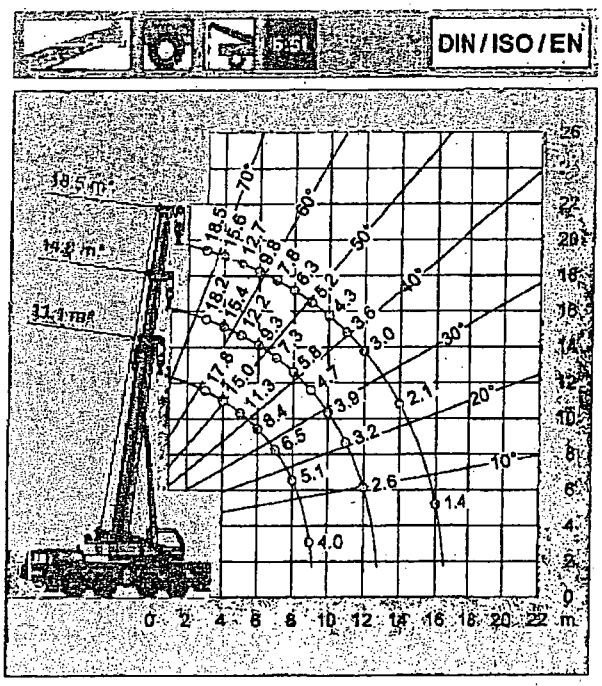
* Oberwagenverriegelung eingelegt * Superstructure verrouillé
* Superstructure locked * Bloqueo de superestructura



5.5 t DIN / ISO / EN

m	11.1 m*	14.8 m*	18.5 m*
3.5	16.3	16.7	16.9
4.5	13.2	14.1	14.5
6.0	8.4	9.3	9.8
8.0	5.1	6.2	6.6
10.0		3.9	4.3
12.0		2.6	3.0
16.0			1.4

* Oberwagenverriegelung eingelegt * Superstructure verrouillé
* Superstructure locked * Bloqueo de superestructura



TADANO FAUN ATF 90G-4

Tragfähigkeiten
Lifting capacities
Capacités de levage
Capacidades de elevación

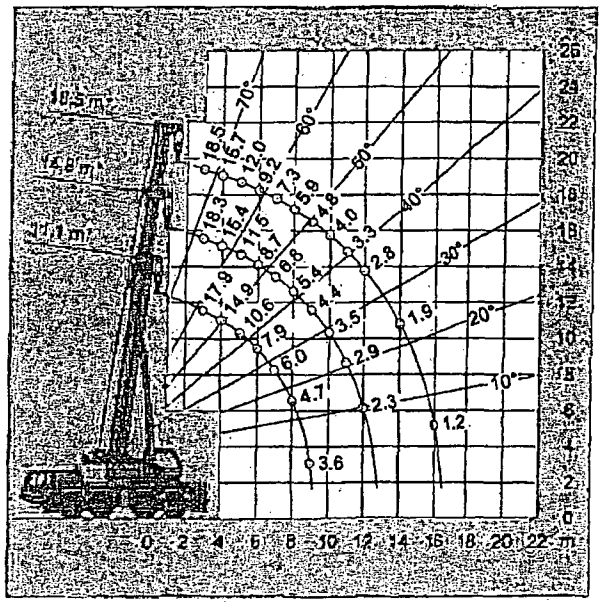
DIN / ISO / EN

m	11.1 m*	14.8 m*	18.5 m*
3.5	16.4	16.7	17.0
4.5	12.4	13.3	13.9
6.0	7.9	8.7	9.2
8.0	4.7	5.4	5.9
10.0		3.5	4.0
12.0		2.3	2.8
16.0			1.2

* Oberwagenverriegelung eingelegt / * Superstructure locked
* Superstructure verrouillé / * Bloqueo de superestructura

Hubhöhen
Lifting heights
Hauteurs de levage
Alturas de elevación

DIN / ISO / EN

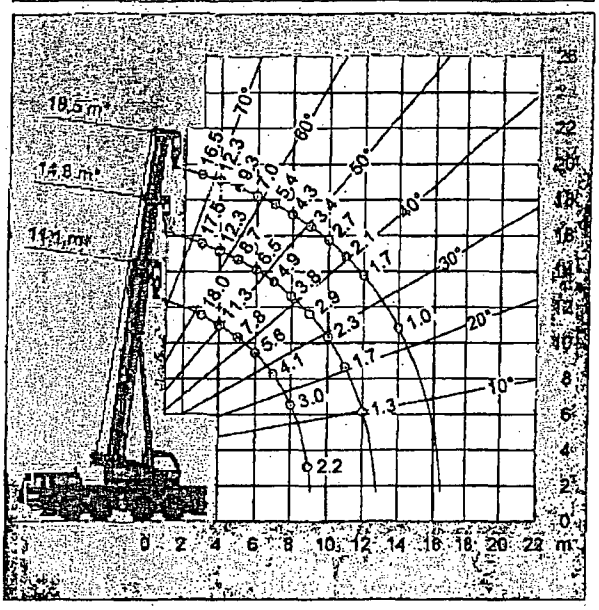


DIN / ISO / EN

m	11.1 m*	14.8 m*	18.5 m*
3.5	14.0	14.8	14.1
4.5	9.3	10.2	10.8
6.0	5.6	6.5	7.0
8.0	3.0	3.5	3.8
10.0		2.3	2.7
12.0		1.3	1.7
16.0			

* Oberwagenverriegelung eingelegt / * Superstructure locked
* Superstructure verrouillé / * Bloqueo de superestructura

DIN / ISO / EN



Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

Anmerkungen zu den Traglasttabellen

Die Tragfähigkeiten im Festigkeitsbereich basieren auf DIN 15018 Blatt 2 und Blatt 3 und F.E.M.

Die Tragfähigkeiten im Standsicherheitsbereich entsprechen DIN 15018 Teil 2 / ISO 4305 / EN 13000.

Die maximal zulässige Windgeschwindigkeit für den Kranbetrieb beträgt max. 15 m/s zulässig.

Die Tragfähigkeiten sind in metrischen Tonnen angegeben.

Das Gewicht des Lastaufnahmemittels wie Haken, Ketten und weiterer Anschlagmittel ist von der Tragfähigkeit abzuziehen.

Die Tragfähigkeiten für den Teleskopausleger gelten nur bei demontierten Spitze.

Die Auslegung ist der horizontale Abstand von Mitte Drehkranz bis Mitte freihängender, nicht schwingender Last.

Tragfähigkeitsänderungen vorbehalten.

Diese Angaben dienen nur zur Information. Die Bedienungsanleitungen müssen zu Rate gezogen werden, bevor die Maschine in Betrieb genommen wird. Alle hier gemachten Angaben beziehen sich auf die Standard-Ausführung. Jegliche Ausrüstungsveränderungen können die angegebenen Werte beeinflussen.

Remarks relating to the rating charts

The lifting capacities in the structural area are based on DIN 15018 parts 2 and 3 and F.E.M.

The lifting capacities in the stability area are based on DIN 15018 part 2 / ISO 4305 / EN 13000.

The maximum permissible wind speed for crane operation is 15 m/sec.

The lifting capacities are shown in metric tons.

The weight of load handling devices such as hook blocks, slings etc., must be considered as part of the load and must be deducted from the lifting capacities.

The lifting capacities for the telescopic boom apply to a crane with no boom extensions being stowed or mounted on the crane.

The working radius is the horizontal distance from the centre of rotation to the centre of the freely suspended non-oscillating load.

The lifting capacities are subject to change without prior notice.

The above remarks are for basic information only and the operator's manual must be consulted before operating this crane. All data and performances refer to the standard crane. The addition of optional and other equipment may affect the performance of the crane.

Remarques relatives aux tableaux des charges

Les forces de levage sont conformes aux normes DIN 15018 p. 2 et 3 et F.E.M.

Les forces de levage dans la partie de stabilité au renversement sont conformes aux normes DIN 15018, chapitre 2 / ISO 4305 / EN 13000.

Le vent peut travailler à une vitesse de vent maximale 15 m/s.

Les forces de levage sont données en tonnes métriques.

Le poids du crochet, moufle et de tous les autres équipements de levage fait partie de la charge et sont à déduire des charges indiquées.

Les forces de levage indiquées pour la flèche télescopique s'entendent flèche démontée.

Comme portée, on entend la distance horizontale du centre de la couronne de rotation au centre de la charge libre, non suspendue et non oscillante.

Sous réservation des forces de levage.

Les données ci-dessus servent à titre d'information seul, le mise en marche de la grue il est nécessaire d'étudier les instructions de service. Toutes les données indiquées ci-dessus se réfèrent à la machine de base. Tout changement de l'équipement de la grue peut influencer ces valeurs.

Notas relativas a los gráficos de carga

En cuanto a los datos referentes a resistencia, las capacidades de carga están basados sobre las normas DIN 15018 pág. 2 y 3, y F.E.M.

En cuanto a los datos referentes a estabilidad antivuelco, las capacidades de carga están basados sobre las normas DIN 15018, Cap. 2 / ISO 4305 / EN 13000.

La velocidad anemométrica max. admisible es de 15 m/seg.

Las capacidades de carga indicadas en las tablas corresponden a toneladas métricas.

Hay que deducir los pesos del gancho, estrobos y de otros dispositivos para fijación de cargas de los valores indicados en las tablas.

Las capacidades de carga referentes a la pluma telescópica valen solamente si el pluma ha sido desmontada.

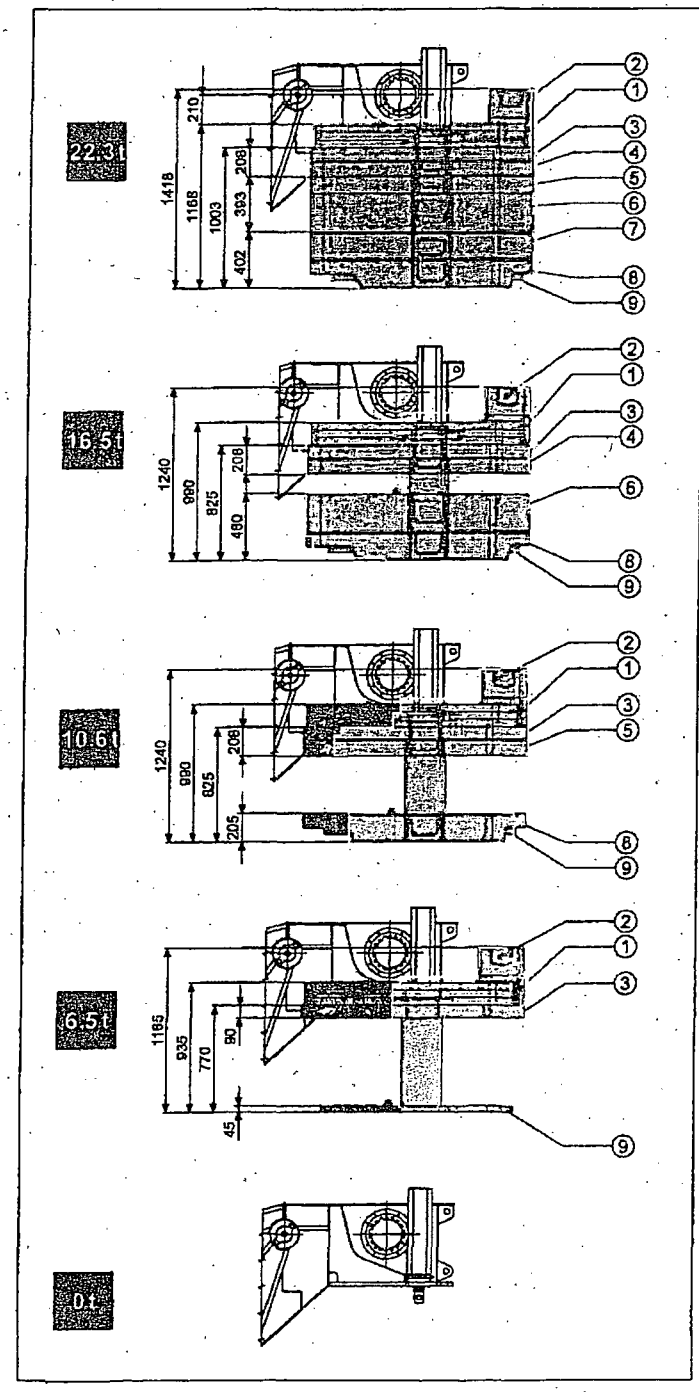
Como alcance se entiende la distancia horizontal desde el centro de la corona de giro hasta el centro de la carga suspendida libremente y no oscilante.

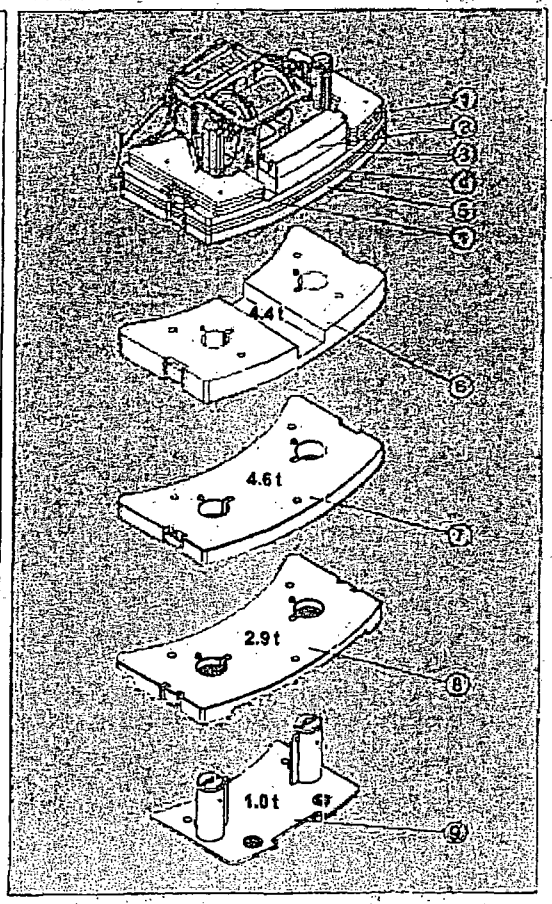
Salvo modificación de capacidades de carga, sin previo aviso.

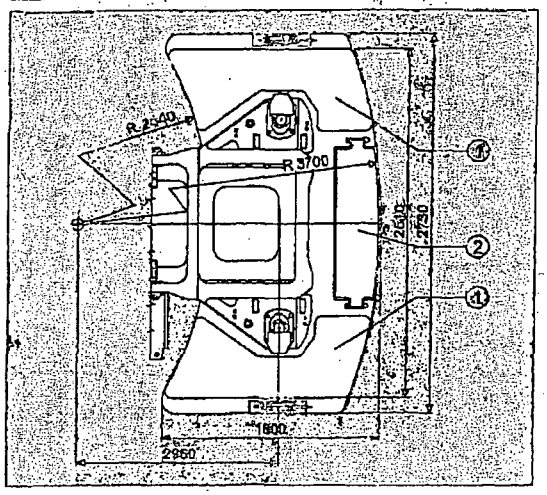
Los datos arriba indicados sirven solamente para su información. Hay que leer las instrucciones para el uso antes de la puesta en servicio de la máquina. Todos los datos mencionados en las siguientes tablas rigen para los modelos standard. Cualquier modificación del equipo montado puede dar lugar a modificaciones de aquellos valores.

Gegengewichtvarianten
Counterweight versions
Variations des contrepoids
Variaciónes de contrapeso

Gegengewicht / Counterweight Contrepoids / Contrapeso	7x	1x	1x	1x	1x	1x	1x	1x	1x
	①	②	③	④	⑤	⑥	⑦	⑧	⑨
[illegible]	0.5	1.0	2.5	2.7	1.2	1.4	4.5	2.9	1.0

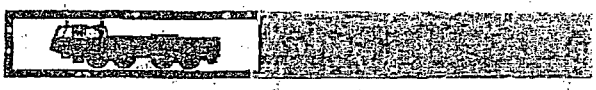






Änderungen vorbehalten / Subject to change without prior notice / Cette documentation est modifiable sans préavis / Sujeto a cambios sin previo aviso

TADANO FAUN ATF 90G-4



Rahmen Verwindungs- und biegesteife Schweißkonstruktion aus hochfestem Feinkornstahl.

Abstützung 4-Punkt-Abstützung, hydraulisch, Bedienungsmöglichkeiten an beiden Seiten des Fahrgestelles und in der Oberwagenkabine.
Abstützbasis 7,2 m (und 5,0 m) x 8,5 m.

Motor Mercedes-Benz 6-Zylinder-Dieselmotor OM 501 LA (Euromot III B), wassergekühlt, Leistung 320 kW (435 PS) bei 1800 min^{-1}. Drehmoment 2100 Nm bei 1300 min^{-1}.
Motorleistung nach 80/1269/EWG.
Kraftstoffbehälter 400 l. AdBlue-Behälter 40 l.

Getriebe ZF-AS-Tronic 12 AS 2302, mechanisches Schaltgetriebe mit integriertem Intarder, elektronisch-pneumatisch betätigter Trockenkupplung und vollautomatischer Schaltung mit 12 Vorwärts- und 2 Rückwärtsgängen.
Power/Economy Modus.

Verteilergetriebe 2-stufiges Verteilergetriebe.

Antrieb 8 x 6 (8 x 8 Option).

Achsen
1. Achse: gelenkt, nicht angetrieben.
2. Achse: gelenkt, angetrieben, Differentialsperre quer.
3. Achse: gelenkt, angetrieben, Differentialsperre längs und quer.
4. Achse: gelenkt, angetrieben, Differentialsperre quer.

Achsaufhängung Hydropneumatische Federung mit Niveauregulierung.

Bremsen Druckluft-Zweikreis-Bremsanlage mit ABS System. Feststellbremse als Federspeicherbremse an der 2., 3. und 4. Achse wirkend. Intarder und Konstantdrosselanlage mit Auspuffklappenbremse als Dauerbremse.

Räder 8-fach 445/95 R 25 (16.00 R 25), Breite 2,75 m.

Lenkung ZF-Servocom-Zweikreishydrolenkung. Mechanische Lenkung der 1. und 2. Achse und Mitlenken der 4. Achse bis zu einer Geschwindigkeit von 25 km/h, hydraulisch unterstützt, mit Notlenkpumpe. Lenkung aller Achsen möglich. Hydrostatische Lenkung aller Achsen aus der Oberwagenkabine.

Unterwagenkabine Zwei-Mann-Frontfahrerhaus in Stahl-Kunststoff-Verbund-Konstruktion, Sicherheitsverglasung, luftgefederte Sitze (Fahrersitz mit Heizung) und motorabhängige Warmwasserheizung, Radio-CD-Player, Kontroll- und Bedienungselemente für den Fahrbetrieb, Tempomat-/Bremsomat-Funktion.

Elektrische Anlage 24 Volt-Gleichstrom, 2 Batterien, Abstützfeldbeleuchtung.
Die elektrische Anlage entspricht der EG-Norm.

Zusatzausrüstung (gegen Mehrpreis)
Anhängekupplung, motorunabhängige Zusatzheizung mit Motorvorwärmung, Klimaanlage, 8 x 8 Antrieb, 525/80 R 25 (20.5 R 25) Bereifung, Reserverad, Sonderlackierung und Beschriftung.

Weitere Zusatzausrüstung auf Anfrage.

Rahmen Verwindungssteife Schweißkonstruktion mit einer außenverzahnten, einreihigen Kugeldrehverbindung, um 360° unbegrenzt drehbar.

Motor Mercedes-Benz 4-Zylinder-Dieselmotor OM 924 LA (Euromot III B), wassergekühlt. Drehzahl ist über Fußpedal stufenlos regelbar, Leistung 127 kW (173 PS) bei 2000 min^{-1}. Drehmoment 675 Nm bei 1200 - 1600 min^{-1}.
Motorleistung nach 80/1269/EWG.
Kraftstoffbehälter 220 l. AdBlue-Behälter 8 l.

Hydraulik System Diesel-hydraulisch mit 3-Kreishydraulik, 1 leistungsgeregelte Axialkolbendoppelpumpe (elektrisch verstellbar), 1 Axialkolbenpumpe und 2 Zahnradpumpen, Ölkühler.

Steuerung Zwei 4-fach Kreuzsteuerhebel mit elektrischer Vorsteuerung.

Teleskopausleger Sechsteiliger Teleskopausleger aus hochfestem Feinkornstahl, bestehend aus einem Grundausleger und 5 Teleskopteilen, 1 Teleskopzylinder, hydraulisch unter Teillast teleskopierbar. 11,1 m - 51,2 m lang.

Wippwerk Ein Differentialzylinder mit angebautem Senkbremssperrventil.

Hubwerk Axialkolben-Motor, Hubwerkstrommel mit eingebautem Planetengetriebe und federbelasteter Hydro-Lamellenbremse mit integriertem Freilauf beim Heben. Hubseil mit 'Super-Stop' Einrichtung.

Drehwerk Axialkolben-Motor, zweistufiges Planetengetriebe mit fußbetätigter Betriebsbremse und Feststellung. Drehgeschwindigkeit stufenlos von 0 - 2 min^{-1}.

Gegengewicht Standard 6,5 t teilbar.
Die Bedienung erfolgt aus der Oberwagenkabine.

Oberwagenkabine Großräumige Krankabine in Stahl-Kunststoffausführung mit Sicherheitsverglasung und getönten Scheiben, kippbarem Arbeitsplatz mit verstellbarem, hydraulisch gedämpftem Fahrersitz mit Heizung, motorunabhängige Warmwasserheizung, Radio-CD-Player, Kontroll- und Bedienungselemente für Kranbetrieb, Verfahrbarkeit vom Oberwagen und Abstützbetätigung.

Elektrische Anlage 24 Volt-Gleichstrom, 2 Batterien.

Sicherheitseinrichtungen Lastmomentbegrenzung (LMB), Arbeitsbereichsbegrenzung, Hubendschalter, Windenendschalter, Seilwindendrehmelder, Sicherheitsventile gegen Rohr- und Schlauchbrüche. Sperrventile an Hydraulik-Zylindern.

Zusatzausrüstung (gegen Mehrpreis)
'Lift Adjuster', Auslegerverlängerung 10,0 m / 18,0 m, wahlweise abwinkelbar 0°, 20° und 40° oder hydraulisch 0°- 40°, Schwerlastspitze 1,6 m, Zusatzgegengewicht 15,8 t, Gegengewichtsvarianten 0 t / 5,5 t / 10,6 t / 16,5 t / 22,3 t, verschiedene Unterflaschen, 2. Hubwerk, Drehbereichsbegrenzung, motorunabhängige Heizung mit Motorvorwärmung, Zusatzölkühler, Klimaanlage, Sonderlackierung und Beschriftung.

Weitere Zusatzausrüstung auf Anfrage.

TADANO FAUN ATF 90G-4

Frame Torsion resistant, welded construction made from high strength, fine-grained steel.

Outriggers 4 point, double telescopic hydraulic outriggers with controls on both sides of carrier and in superstructure cab. Outrigger base 7.2 m (5.0 m mid extension) x 8.5 m.

Carrier engine Mercedes-Benz 6 cylinder model OM 501 LA (Euromot III B), water-cooled diesel engine. Rated at 320 kW (435 HP) at 1800 min^{-1}.
Torque 2100 Nm at 1300 min^{-1}.
Engine rating according to 80/1269/EWG. Fuel tank 400 l. AdBlue-tank 40 l.

Transmission ZF-AS-Tronic 12 AS 2302 mechanical transmission with integrated intarder, electro-pneumatically operated dry-type clutch and automatic gear shifting with 12 forward gears and 2 reverse gears. Power/Economy mode.

Transfer Case Two stage.

Drive 8 x 6 (8 x 8 option)

Axles
1st axle: steered, not driven.
2nd axle: steered, driven, with transverse differential lock.
3rd axle: steered, driven, with transverse and longitudinal differential lock.
4th axle: steered, driven, with transverse differential lock.

Suspension Hydro-pneumatic with levelling adjustment.

Brake system Service brakes: dual circuit compressed air system. Parking brake: spring loaded type acting on 2nd, 3rd and 4th axles. Auxiliary brakes: intarder, engine exhaust brake and constant throttle engine brake system.

Tyres (8) 445/95 R 25 (16.00 R 25), width 2.75 m.

Steering system ZF-Servocom, dual circuit hydraulic steering with emergency steering pump, mechanical hydraulically-assisted steering of front two axles and automatic steering of the 4th axle up to a travel speed of 25 km/h. Steering of all axles possible. All axles steered hydrostatically from superstructure cab.

Carrier cab Two man full width cab of composite (steel sheet metal and fibre-glass) structure, with safety glass, air-cushioned adjustable seats (driver seat with heater) and engine dependent hot-water heater, radio-CD-player, complete controls and instrumentation for road travel. Speed and brake control.

Electrical system 24 volt DC system, 2 batteries, outrigger area lighting.
Electrical system conforms with EEC regulations.

Optional Equipment (at extra charge)
Towing attachment, engine independent additional heater with engine pre-heat, air conditioning, 8 x 8 drive, 525/80 R 25 (20.5 R 25) tyres, spare wheel and tyre, special painting and lettering.
Further optional equipment available upon request.

Frame Torsion-resistant, all-welded structure of high strength steel. Connected to carrier by single-row ball-bearing slewing ring with external gearing for 360° continuous rotation.

Superstructure engine Mercedes-Benz 4 cylinder model OM 924 LA (Euromot III B), water cooled, diesel engine. RPM infinitely variable via foot pedal, rating 127 kW (173 HP) at 2000 min^{-1}. Torque 675 Nm at 1200 - 1600 min^{-1}. Engine rating according to 80/1269/EWG.
Fuel tank 220 l. AdBlue-tank 8 l.

Hydraulic system Three circuit diesel hydraulic system with 1 power controlled double axial piston pump (electrically adjustable), 1 axial piston pump and 2 gear pumps, oil cooler.

Controls Electrical, 2 joy-stick levers for simultaneous operation of crane motions.

Telescopic boom 6 sections, made of high tensile, fine-grained steel, consisting of 1 base section and 5 telescoping sections extended by means of a single telescopic cylinder. All telescope sections extendable under partial load.
11.1 m to 51.2 m long.

Derricking system 1 double acting hydraulic cylinder with integral brake and holding valve.

Main winch Axial piston motor, winch drum with integrated planetary reduction and with hydraulically controlled spring-loaded, multiple disc brake and with integrated free rotation (no sagging of load when hoisting).
Hoist cable with 'Super-Stop' easy reeving system.

Slewing system Axial piston motor with two-stage planetary gear with a foot actuated service and a parking brake. Speed infinitely variable 0 - 2 min^{-1}.

Counterweight Standard 6.5 t divisible, assembled and disassembled by hydraulic cylinders controlled from superstructure cab.

Superstructure cab Spacious panoramic cab of composite structure with safety (tinted) glass windows, tiltable cockpit with hydraulically cushioned adjustable seat with heater, engine independent hot-water heater, radio-CD-player, complete controls and instrumentation for crane operation, on-site travelling and outriggers.

Electrical system 24 volt DC system, 2 batteries.

Safety devices Load moment device (LMD), working area limiter, hoist limit switch, lower limit switch and drum turn indicator, safety valves against pipe and hose rupture, holding valves on hydraulic cylinders.

Optional Equipment (at extra charge)
'Lift Adjuster', Boom extension 10.0 m/18.0 m, offsets 0°, 20° and 40° or hydraulically 0°- 40°, heavy duty jib 1.6 m, additional counterweight 15.8 t, counterweight variations 0 t/5.5 t/10.6 t/16.5 t/22.3 t, selection of hook blocks, auxiliary winch, slewing area limitation, engine independent heater with engine pre-heat, additional oil cooler, air conditioning, special painting and lettering.
Further optional equipment available upon request.

Subject to change without prior notice

TADANO FAUN ATF 90G-4

Châssis Construction mécanosoudé, en acier á grain fin très rigide, résistant aux fléxions et aux torsions.

Calage Dispositif de calage horizontal et vertical en 4 points, entièrement déployable hydrauliquement. Commande des mouvements sur les deux côtés du porteur et depuis la cabine de la superstructure. Calage 7,2 m (aussi 5,0 m) x 8,5 m.

Moteur Mercedes Benz diesel 6 cylindres, modèle OM 501 LA (Euromot III B), refroidi par eau, de 320 kW (435 CV) à 1800 min^{-1}. Couple: 2100 Nm à 1300 min^{-1}. Puissance selon 80/1269/EWG.
Capacité du réservoir 400 l.
AdBlue-capacité du réservoir 40 l.

Boîte de vitesse Boîte mécanique ZF-AS-Tronic, modèle 12 AS 2302 avec embrayage électro-pneumatique reglé à commande et boîte automatique, 12 vitesses AV et 2 vitesses AR. Ralentisseur hydrodynamique, type Intarder directement accouplé à la boîte. Mode max. performance/économique.

Boîte de transfert À 2 gammes.

Entraînement 8 x 6 (8 x 8 option).

Essieux
1er essieu: directeur, non entraîné.
2ième essieu: directeur, entraîné, blocage de différentiel transversal.
3ième essieu: directeur, entraîné, blocage de différentiel longitudinal et transversal.
4ième essieu: directeur, entraîné, blocage de différentiel transversal.

Suspension Hydro-pneumatique, avec réglage de niveau.

Freins Système à air comprimé, à double circuit avec système ABS. Frein de stationnement avec accumulateurs à ressort agissant sur le 2ième, 3ième et 4ième essieu. Intarder, frein continu: Frein sur échappement avec étrangleur.

Pneus 8 x 445/95 R 25 (16.00 R 25), (largeur 2,75 m).

Direction Servocom à double circuit, marque ZF. Direction mécanique du 1er et 2ième essieu, à assistance hydraulique, avec pompe de direction auxiliaire direction du 4ième essieu jusqu'à une vitesse de 25 km/h, avec pompe de direction auxiliaire. Direction de tous les essieux possible. Direction hydro-statique de tous les essieux depuis la cabine du grutier.

Cabine Cabine bi-place, construction en matière composite fibre de verre et acier. Vitrage en verre de sécurité, siège conducteur chauffant suspendu hydrauliquement. Chauffage à eau chaude relié au moteur, radio-CD-player. Organes de contrôle et de commande pour la conduite.
Régulateur de vitesse, système automatique de freinage.

Système électrique 24 V courant continu, 2 batteries, illumination des calages. Conforme aux normes CE.

Equipement supplémentaire (avec supplément de prix) Attache-remorque, chauffage auxiliaire indépendant du moteur avec préchauffage du moteur, climatisation, Entraînement 8 x 8, pneus 525/80 R 25 (20.5 R 25), roue de secours, peinture spéciale et inscription.

Autres équipements supplémentaires sur demande.

Plate forme Construction mécano-soudée résistante à la torsion. Couronne d'orientation à billes à une rangée, à denture extérieure, permettant une rotation illimitée sur 360°.

Moteur Mercedes-Benz diesel 4 cylindres, modèle OM 924 LA (Euromot III B), refroidi par eau, Réglage du nombre de tours par pédale, de 127 kW (173 CV) à 2000 min^{-1}. Couple: 675 Nm à 1200 - 1600 min^{-1}. Puissance selon 80/1269/EWG. Capasité du réservoir 220 l.
AdBlue-capacité du réservoir 8 l.

Système hydraulique Diesel-hydraulique à 3 circuits, 1 double pompe à pistons axiaux à régulation de puissance (à réglage électriquement) 1 pompe à pistons axiaux et 2 pompes à engrenages, refroidisseur d'huile.

Commande 2 manipulateurs à commande en croix (4 sens), assistés électriquement.

Flèche télescopique 1 flèche de base et 5 éléments télescopiques en acier fin, 1 vérin telescopique, hydrauliquement télescopable avec charge partielle. Longueur de 11,1 m à 51,2 m.

Mécanisme de relevage 1 vérin différentiel muni de clapet de freinage de descente.

Mécanisme de levage Moteur hydraulique, tambour de levage avec boîte planétaire incorporée, frein d'arrêt à disques multiples à ressort, libéré lors du levage. Câble de levage avec dispositif 'Super-Stop'.

Orientation Moteur hydraulique avec entraînement planétaire à 2 gammes. Frein de service actionné par l'intermédiaire d'une pédale et frein de stationnement.
Vitesse de rotation 0 à 2 min^{-1} en continu.

Contrepoids Standard 6,5 t divisible, commandé depuis la cabine du grutier.

Cabine du grutier Cabine de grue spacieuse, construction en matière combinée acier/synthétique, avec vitrage de sécurité en verre teinté, siège chauffant, réglable et amorti hydrauliquement, inclinable avec instruments de commande, chauffage à eau chaude indépendant du moteur, radio-CD-player, éléments de commande et de contrôle pour travaux sur chantier, conduite et calage de la grue depuis la cabine du grutier.

Système électrique 24 V courant continu, 2 batteries.

Dispositifs de sécurité Limiteur de charge (CEC), limitation de zone de travail, interrupteur de fin de course de levage et de treuil, indicateur du nombre de tours, soupapes de sécurité contre ruptures des conduites et flexibles, clapets sur verins hydrauliques.

Equipement supplémentaire (avec supplément de prix) 'Lift Adjuster', fléchette 10,0 m / 18,0 m au choix inclinable 0°, 20° et 40° ou hydrauliquement 0° à 40°, fléchette pour levage lourde 1,6 m, contrepoids additionnel de 15,8 t, combinaison différentes de contrepoids 0 t / 5,5 t / 10,6 t / 16,5 t / 22,3 t, sélection de moufles, 2ième treuil de levage, limitation de rotation, chauffage auxiliaire avec préchauffage du moteur, refroidisseur d'huile supplémentaire, climatisation, peinture spéciale et inscription.

Autres équipements supplémentaires sur demande.

TADANO FAUN ATF 90G-4

Chasis portante Construcción de acero de alta resistencia soldado, resistente a la torsión y a la flexión.

Estabilizadores Estabilizadores hidráulicos de 4 puntos. Posibilidad de manejo desde ambos lados del chasis portante y desde la cabina de la grúa. Extensión de los estabilizadores: 7,2 m (y 5,0 m) x 8,5 m.

Motor Mercedes-Benz modelo OM 501 LA (Euromot III B), 6 cilindros, diesel, refrigerado por agua. Nominal 320 kW (435 CV) a 1800 min^{-1}. Par 2100 Nm a 1300 min^{-1}. Potencia del motor según 80/1269/EWG. Depósito de combustible de 400 l. Depósito AdBlue 40 l.

Transmisión Transmisión mecánica tipo ZF-AS Tronic modelo 12 AS 2302 con intarder integrado, accionamiento electro - neumático embrague en seco y cambio automático, 12 marchas delanteras y 2 marchas traseras. Modo rendimiento máximo / económico.

Transmisión Caja de distribución (transfer) con 2 relaciones de velocidad.

Tracción 8 x 6 (8 x 8 opción).

Ejes
1º eje: de dirección, no accionado.
2º eje: de dirección, accionado, con bloqueo diferencial transversal.
3º eje: de dirección, accionado, con bloqueo diferencial transversal y longitudinal.
4º eje: de dirección, accionado, con bloqueo diferencial transversal.

Suspensión Suspensión hidroneumática con regulación de nivel.

Sistemas de frenos Accionamiento neumático de doble circuito con sistema anti bloqueo ABS. Freno de estacionamiento del tipo muelles cargados, liberados por aire, sobre los ejes 2º, 3º y 4º. Intarder y freno continuo: sistema estrangulador constante y freno tipo estrangulación sobre el escape del motor diesel.

Neumáticos 8 x 445/95 R 25 (16.00 R 25), (ancho 2,75 m).

Dirección Hidráulica ZF Servocom de doble circuito. Dirección mecánica del 1º y 2º eje y direccionable del 4º eje hasta una velocidad de 25 km/h, con bomba hidráulica de emergencia accionada por la transmisión. Dirección de todos los ejes posible. Desde la cabina de la superestructura: dirección hidro-estática de ambos ejes.

Cabina Cabina para dos personas, en construcción de acero y fibra de vidrio. Cristales de seguridad, asiento con suspensión neumática, asiento de conductor calefactado. Calefacción por agua caliente del motor, radio-CD-player. Elementos de control y manejo para circular por carretera. Regulador de velocidad, sistema automático de frenado.

Sistema eléctrico Sistema de 24 V c.c. con 2 baterias, faros de trabajo en los estabilizadores. El sistema eléctrico cumple la normativa CEE.

Equipo adicional (con suplemento de precio)
Embrague de remolque, calefacción adicional con precalefacción del motor, climatización, Tracción 8 x 8, neumáticos 525/80 R 25 (20.5 R 25), rueda de repuesto, pintura especial y rotulación.

Otros equipamientos sobre pedido.

Superestructura Construida en aceros soldados, resistente a la torsión. Corona de giro con rodamiento de una fila de bolas con dientes externos para giro continuo de 360°.

Motor Mercedes-Benz modelo OM 924 LA (Euromot III B), 4 cilindros, diesel, refrigerado por agua. Las revoluciones aumentan de forma gradual accionando el acelerador. Nominal 127 kW (173 CV) a 2000 min^{-1}. Par 675 Nm a 1200 - 1600 min^{-1}. Potencia del motor según 80/1269/EWG. Depósito de combustible de 220 l. Depósito AdBlue 8 l.

Sistema hidráulico Sistema hidráulico de 3 circuitos, 1 bomba doble de pistones axiales de caudal variable (regulable eléctricamente) una bomba de pistones axiales y 2 bombas en tandem, enfriador de aceite.

Mandos 2 palancas de control de tipo joy-stick para movimientos simultáneos de la grúa (4 direcciones), asistidos eléctricamente.

Pluma telescópica 6 secciones, un tramo base y 5 telescópicos de acero de alta resistenca soldado, 1 cilindro hidráulico, los tramos se pueden telescopar hidráulicamente bajo carga. Longitud de 11,1 m a 51,2 m.

Elevación de pluma Mediante un cilindro hidráulico de doble efecto con válvula de retención integrada.

Cabrestante principal Motor hidráulico de pistones axiales y caudal fijo. Tambor del cabrestante con reducción planetaria y frenos de disco múltiples accionado, con sistema libre de elevación. Cable de elevación con sistema fácil de guiado y 'Super-Stop'.

Sistema de giro Motor hidráulico de pistones axiales con reducción planetária de dos etapas. Freno de servicio controlado por pedal y freno de estacionamiento. Velocidad de giro variable de 0 a 2 min^{-1}.

Contrapeso El estándar 6,5 t divisible, se acciona desde la cabina de la grúa.

Cabina de la grúa Cabina espaciosa y confortable, en construcción de acero y fibra de vidrio, con cristales tintados de seguridad. Asiento de operador regulable amortiguado hidráulicamente, inclinable junto con los instrumentos y mandos, asiento calefactado. Calefacción por agua caliente independiente del motor, radio-CD-player. Controles, instrumentos y mandos de conducción para la operación de la grúa y para el desplazamiento en obra. Mandos para nivelación y extensión de los estabilizadores.

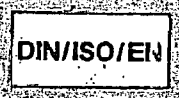
Sistema eléctrico Sistema de 24 V c.c. con 2 baterias.

Medidas de seguridad Limitación del momento de carga (LMC), limitación del área de trabajo, interruptor de final de elevación, interruptor de 3 últimas vueltas en cabrestante, indicador de bajada o subida del cable del cabrestante, válvulas de seguridad para rotura de tubos y latiguillos. Válvulas de retención en los cilindros hidráulicos.

Equipo adicional (con suplemento de precio)
'Lift Adjuster', plumín de 10,0 m / 18,0 m regulable hidráulicamente de 0°, 20° y 40° (o hidráulicamente 0° a 40°), plumín de carga pesada de 1,6 m, contrapeso adicional de 15,8 t, variantes de contrapeso 0 t / 5,5 t / 10,6 t / 16,5 t / 22,3 t, selección de ganchos, 2° cabrestante, limitador de giro, calefacción independiente del motor y précalefacción del motor, enfriador adicional, climatización, pintura especial y rotulación.

Otros equipamientos sobre pedido.

Symbolerklärung
Symbols
Glossaire des symboles
Glosario de simbolos



Siehe Seite 31
As on Page 31
Voyez la page 31
Véase la pagina 31

Abstützung
Outriggers
Calage
Estabilizadores

Getriebe / Gang
Transmission / Gear
Boîte de vitesse / Rapport
Transmisión / Marchas

Achslast
Axle load
Charge à l'essieu
Carga por eje

Räder / Größe
Tyres / Size
Pneus / Largeur
Neumáticos / Tamaño de ruedas

Gelände
Off road
Tout-terrain
Todo terreno

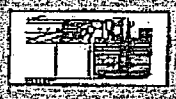
Straße
On road
En route
En carretera

Geschwindigkeiten
Speeds
Vitesses
Velocidades

Steigfähigkeit
Gradeability
Abtitude en pente
Superacion de pendientes

Drehwerk
Slewing system
Orientation
Sistema de giro

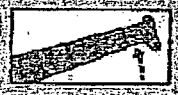
Gegengewicht
Counterweight
Contrepoids
Contrapeso



Gegengewichtvarianten
Counterweight versions
Variations des contrepoids
Variaciónes de contrapeso

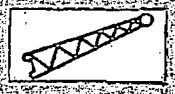
Teleskopausleger
Telescopic boom
Flèche télescopique
Pluma telescópica

Teleskopieren
Boom telescoping
Télescopage de flèche
Telescopaje de pluma



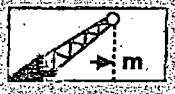
Wippwerk
Derricking system
Mécanisme de relevage
Elevación de pluma

Ausladung
Radius
Portée
Radio



Auslegerverlängerung
Boom extension
Fléchette
Plumín

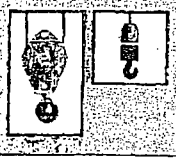
Auslegerverlängerung hydraulisch
Boom extension hydraulically
Fléchette hydrauliquement
Plumín hidráulicamente



Ausladung
Radius
Portée
Radio

Hubwerk
Main winch
Mécanisme de levage
Cabrestante principal

2. Hubwerk
Auxiliary winch
2ième treuil de levage
2° cabrestante



Unterflasche / Hakengeschirr
Hook block / Swivel hook
Moufle / Elingues
Gancho / Gancho de bola

PAULSEN

197715

CERTIFICATE OF TEST MADE IN U.S.A.

THIS IS TO CERTIFY THAT the Wire Rope listed below was manufactured in accordance with PAULSEN WIRE ROPE CORPORATION specifications and Federal Specification RR-W-410d, when applicable.

Order# . . . . : 9959 Cust. PO# . : 108497 CB

Supplied to:
METRO WIRE ROPE CORP
P O BOX 427
KENILWORTH, NJ 07033-0427

Shipped to:
FEDERATED EQUIPMENT (DCM)
1640 NEW MARKET AVENUE
ATT-MIKE
SOUTH PLAINSFIELD, NJ 07080

Sample lengths were tested and found to meet all specified requirements.

Actual Break Strength	Nominal Break Strength	Description of Material
318,900 lbs	313,780 lbs	1-5/8 STARLIFT MILLENNIUM RLL NON-ROTATING WIRE ROPE 41.3MM

Mill Order
004536

Reel No.
138151

PAULSEN WIRE ROPE CORPORATION

Michael F. Catino

MICHAEL F. CATINO, P.E.
VICE PRESIDENT - ENGINEERING
AUGUST 29TH, 2001

Paulsen Wire Rope Corporation • 880 South Second Street, PO Box 192 • Sunbury, PA 17801 USA • Tel 717-286-7141 / Fax 717-286-0731

Test Certificate No. 216152-2

Federated Equipment
PO # Wayne
Form No. 5

CERTIFICATE OF EXAMINATION AND TEST OF WIRE ROPE BEFORE BEING TAKEN INTO USE

This certificate when properly executed by a competent person is accepted by the Government of the United States of America as being in accordance with the requirements of 46 CFR 91.25-25(a)3, 71.25-25(a)5, and 29 CFR 9.12(a).

Name and address of maker or supplier of rope METRO WIRE ROPE CORPORATION

553 LEHIGH AVENUE - UNION, NEW JERSEY 07083

Circumference/ diameter* of rope 1/2" (1 X 250')

Number of strands 6

Number of wires per strand 25

Lay Right Regular Lay

Quality of wire EIPS IWRC

Date of test of sample of rope 3/26/13

Load at which sample broke 26,600 LBS (NOM)

Safe working load, subject to any stated qualifying conditions such as minimum pulley diameter, direct tensile load, etc. Rated at a 5:1 Factor. 5,320 lbs.

Name and address of public service, association, company or firm making the examination and test

METRO WIRE ROPE CORPORATION

Position of signatory in public service, association, company or firm making the examination and test

Manager

I certify that the above particulars are correct, and that the examination and test were carried out by a competent person.

(Date) 9/26/13 (Signature)

NOTE: For the purpose of this certificate a competent person is defined as a surveyor of a classification society or a responsible and technically qualified employee of the manufacturer of wire rope or of a recognized testing laboratory or company.

*Delete what does not apply.
In substantial agreement with I.L.O. Form No. 5

Test Certificate No. 216152-1

Federated Equipment
PO # Wayne
Form No. 5

CERTIFICATE OF EXAMINATION AND TEST OF WIRE ROPE BEFORE BEING TAKEN INTO USE

This certificate when properly executed by a competent person is accepted by the Government of the United States of America as being in accordance with the requirements of 46 CFR 91.25-25(a)3, 71.25-25(a)5, and 29 CFR 9.12(a).

Name and address of maker or supplier of rope METRO WIRE ROPE CORPORATION

553 LEHIGH AVENUE - UNION, NEW JERSEY 07083

Circumference/ diameter* of rope 1-1/4" (600' Long w/ Closed Swage Socket Inside End, Outside End Plain (1 pc)

Number of strands 6

Number of wires per strand 26

Lay Right Regular Lay

Quality of wire EIPS IWRC

Date of test of sample of rope 9/25/13

Load at which sample broke ——— ——— ———

Safe working load, subject to any stated qualifying conditions such as minimum pulley diameter, direct tensile load, etc. Working Load Limit is 16 Tons-Vertical, Rated at a 5:1 Factor.

Name and address of public service, association, company or firm making the examination and test

METRO WIRE ROPE CORPORATION

Position of signatory in public service, association, company or firm making the examination and test

Manager

I certify that the above particulars are correct, and that the examination and test were carried out by a competent person.

(Date) 9/26/13 (Signature)

NOTE: For the purpose of this certificate a competent person is defined as a surveyor of a classification society or a responsible and technically qualified employee of the manufacturer of wire rope or of a recognized testing laboratory or company.

*Delete what does not apply.
In substantial agreement with I.L.O. Form No. 5

Michael Schiavoni

From: Thomas Kanzler [tkanzler@rochester.rr.com]
Sent: Monday, September 30, 2013 1:52 PM
To: 'Mike Schiavoni'
Subject: FW: Manufacture Dates of Staffa Motors for the Hoboken project

Here's the info on the motors.

Thomas Kanzler, PE
Chief Engineer

Federated Crane Co., L.L.C.
1640 New Market Avenue, South Plainfield, NJ 07080
Engineering Office
Phone: (585) 381-1662
Fax: (585) 381-5338
Email: tkanzler@rochester.rr.com

From: Rob Panzarella [mailto:RPanzarella@airlinehyd.com]
Sent: Monday, September 30, 2013 1:49 PM
To: tkanzler@rochester.rr.com
Subject: FW: Manufacture Dates

Rob Panzarella
Airline Hydraulics
609-276-3252 (mobile)

From: Ryan Maciejewski [mailto:ryan.maciejewski@kpm-usa.com]
Sent: Monday, September 30, 2013 1:16 PM
To: Rob Panzarella
Subject: Re: Manufacture Dates

Hello Rob,

I can give you the month and year but if it needs to be more specific then that then I will need to ask our factory.

Please see below in red:

Thanks,

Ryan Maciejewski
Sales Coordinator
Kawasaki Precision Machinery (U.S.A.), Inc.

Ph. 616.975.3128
Fx. 616 975 3103
e-mail: ryan.maciejewski@kpm-usa.com

Kawasaki
Hydraulics

From: Rob Panzarella <RPanzarella@airlinehyd.com>
To Ryan Maciejewski <ryan.maciejewski@kor-usa.com>,
Date 09/30/2013 11:57 AM
Subject: Manufacture Dates

I need dates of manufacture of the following Staffa motors, ASAP.

B200
K92PM5585J = November 1992

C80
97J18785 = October 1997
97J18786 = October 1997
97J18787 = October 1997
F95PM4882Q = June 1995

Rob Panzarella
Airline Hydraulics
609-276-3252 (mobile)

POWERTECH MOTION CONTROL, INC.
305 Island Road
MAHWAH, NJ 07430
(201) 934-9354

I60857

DATE 8-16-06

NAME FEDERATED EQUIPMENT 19051
ADDRESS
CITY PHONE DATE OF ORIGINAL INSTALLATION
MAKE STAFFA MODEL
SERIAL NO. DATE PROMISED
☑ ESTIMATE ☐ WARRANTY ☐ CONTRACT

NATURE OF SERVICE HM/C080/S/90/25/S03/X/31

FOUND MOTOR IN GOOD CONDITION
RESEAL AND TEST.

QTY.	DESCRIPTION	PRICE	AMOUNT	
1	C8-SK SEAL KIT		264	17
32	LABOR	23.00	736	00
	TOTAL MATERIALS			

TOTAL MATERIALS	264	17
TECHNICAL SERVICE TIME ☐ SHOP ☐ HOME	736	00
☐ PICK UP OR DELIVER ☐ SERVICE CALL CHARGE	1000	17
TECHNICIAN (AB)	5	28
DATE COMPLETED TAX		
CASH DISTRIBUTION OF WORK ___ TOTAL	1005	45
SIGNATURE		

COPY THANK YOU

S/N 97J18787

QTY	DESCRIPTION	PRICE	AMOUNT	
5	B8-PISTON DOME TOP	105.49	527	45
1	CB-SK SEAL KIT		264	17
32	LABOR	23.0	736	00
	TOTAL MATERIALS			

POWERTECH MOTION CONTROL, INC.
355 Island Road
MAHWAH, NJ 07430
(201) 934-9884

J60869

DATE 8-16-06

NAME FEDERATED EQUIPMENT — 19054
ADDRESS
CITY | PHONE | DATE OF ORIGINAL INSTALLATION
MAKE STAFFA | MODEL | ☑ ESTIMATE ☐ WARRANTY ☐ CONTRACT
SERIAL NO. | DATE PROVIDED

NATURE OF REPAIRS: HMC080 S 90/25 S03X31
FOUND PISTON BALL SOCKETS
WORN AND DAMAGED, THE REST
OF MOTOR HAS NORMAL WEAR
TO ALL PARTS.

TOTAL MATERIALS	791	62
TECHNICAL SERVICE TIME ☐ SHOP ☐ HOME	736	00
☐ PICK UP OR DELIVER ☐ SERVICE CALL CHARGE	1527	62
TECHNICIAN (AB)	15	83
DATE COMPLETED TAX		
CASH ON COMPLETION OF WORK — TOTAL	1543	45

SIGNATURE

Signature above constitutes acceptance of above work as being satisfactory and that equipment has been left in good condition

COPY

THANK YOU

S/N 97J18785

QTY.	DESCRIPTION	PRICE	AMOUNT	
1	CB-SK SEAL KIT		764	17
32	LABOR	23.00	736	00

I60875

POWERTECH MOTION CONTROL, INC.
305 Inland Road
MAHWAH, NJ 07430
(201) 934-5354

DATE 8-16-06

NAME: FEDERATED EQUIPMENT
ADDRESS:
CITY:
PHONE:
DATE OF ORIGINAL INSTALLATION:
MAKE: STAFFA
MODEL:
SERIAL NO.:
DATE PROMISED:

19055

☑ ESTIMATE
☐ WARRANTY
☐ CONTRACT

NATURE OF SERVICE:

MOTOR APPEARS TO BE IN GOOD CONDITION. NORMAL WEAR TO ALL PARTS. RESEAL AND TEST.

TOTAL MATERIALS	764	17
TECHNICAL SERVICE TIME ☐ SHOP ☐ HOUSE	736	00
☐ PICK UP OR DELIVER ☐ SERVICE CALL CHARGE	100	17
TECHNICIAN AB	5	72
DATE COMPLETED / TAX		
CASH ON COMPLETION OF WORK — TOTAL	1605	45

SIGNATURE:

TOTAL MATERIALS

Equipment shall be returned to shop unless otherwise specified. Materials and old equipment have been left in good condition.

COPY

THANK YOU

S/N F95PM4882Q

QUANTITY	DESCRIPTION	PRICE	AMOUNT	
5	B8-PISTON DOUBLE TOP	105.49	527	45
1	CB-SK SEAL KIT		264	17
32	LABOR 23.00		736	00
	TOTAL MATERIALS			

POWERTECH MOTION CONTROL, INC.
305 Island Road
MAHWAH, NJ 07430
(201) 934-9354

I60881

DATE 8-16-06

NAME FEDERATED EQUIPMENT — 19056

ADDRESS

CITY | PHONE | DATE OF ORIGINAL INSTALLATION

MAKE STAFFA | MODEL

SERIAL NO. | DATE PROMISED

☑ ESTIMATE ☐ WARRANTY ☐ CONTRACT

NATURE OF SERVICE: HMC 5 & 9625 503X31 FOUND PISTON BALL SOCKETS WORN AND DAMAGED. THE REST OF MOTOR WITH NORMAL WEAR TO ALL PARTS.

TOTAL MATERIALS	791	62
TECHNICAL SERVICE TIME ☐ SHOP ☐ HOME	736	00
☐ PICK UP OR DELIVER ☐ SERVICE CALL CHARGE	1527	62
TECHNICIAN AB	15	83
DATE COMPLETED TAX		
CASH ON COMPLETION OF WORK — TOTAL	1543	45

SIGNATURE

Signature above certifies satisfactory work and equipment has been left in good condition

COPY THANK YOU

S/N 97J18786

EXEMPTION 4

EXEMPTION 5

From: Starace, Jim
Sent: Friday, October 18, 2013 07:51 PM
To: 'Jay.Badame@aecom.com' <Jay.Badame@aecom.com>
Subject: Re: The PANYNJ / Confidential

Ok and thanks.

Sent from my BlackBerry Wireless Device

From: Badame, Jay [mailto:Jay.Badame@aecom.com]
Sent: Friday, October 18, 2013 06:27 PM
To: Starace, Jim
Subject: Fw: The PANYNJ / Confidential

Jim,this is for yours and Peter's eyes only.Thx.

From: Paull, Allan
Sent: Friday, October 18, 2013 02:23 PM
To: Badame, Jay; Klein, Bethany
Cc: DeSanctis, Robert; Mennella, Mike; Cettina, Edward
Subject: RE: The PANYNJ

Jay,

We met with Wolff Cranes from Germany today that may have a crane comparable to the capacity and tail swing of TG's. They are electric luffers and we are still investigating. Wolff was brought into NYC by NYC DOB and one of their cranes was just prototyped. Looks like a real quality piece of equipment.

Also for some more color, Alan Sokolowski from Pavarini ask me about the TG's for some project in NJ and I told him it would be extremely difficult to get PA approval for any TG crane.

Allan

Allan M. Paull P.E.
Senior Vice President
Civil and Structural Engineering
O 212.708.6880 C 917.562.2977
E-mail: Allan.Paull@aecom.com

Tishman Construction Corporation
An AECOM Company

100 Park Avenue, 5th floor
New York, NY 10017
T 212.708.6800 F 212.265.5731
www.tishmanconstruction.com

Effective June 15, 2012, my new e-mail address will be Allan.Paull@aecom.com. Please update your contact information accordingly. My former e-mail address paull@tishman.com will be my secondary e-mail address until 2015.

This electronic communication, which includes any files or attachments thereto, contains proprietary or confidential information and may be privileged and otherwise protected under copyright or other applicable intellectual property laws. All information contained in this electronic communication is solely for the use of the individual(s) or entity to which it was addressed. If you are not the intended recipient(s), you are hereby notified that distributing, copying, or in any way disclosing any of the information in this e-mail is strictly prohibited. If you have received this e-mail in error, please notify the sender immediately, and destroy the communication and any files or attachments in their entirety, whether in electronic or hard copy format. Since data stored on electronic media can deteriorate, be translated or modified, AECOM, its subsidiaries, and/or affiliates will not be liable for the completeness, correctness or readability of the electronic data. The electronic data should be verified against the hard copy.

From: Badame, Jay
Sent: Friday, October 18, 2013 5:15 PM
To: Klein, Bethany
Cc: Paull, Allan; DeSanctis, Robert; Mennella, Mike; Cettina, Edward
Subject: The PANYNJ

Bethany,I spoke to The Port Authority (Peter Zipf ,Chief Engineer and Jim Starace ,Deputy Chief Engineer) and offered your limited services .In a nutshell,they are Owner`s of a Property in Hoboken (next to The W Hotel) where SJP is developer and Pavarini/McGovern is GC. SJP and Pav want to use a TG 1900,the Port has ruled them out by virtue of NYC DOB.SJP/Pav state that no other crane can do the job.I said that they might have not explored all options as we did for WTC 3 and will not do so unless mandated to do so.
I did say that I would be hard pressed to allow a TG 1900 on a Tishman job in NJ for fear of an accident whereby I knew it was outlawed in NYC by DOB and PANYNJ.They might call on you.I said we would assist them in finding the truth as safety should govern all.I am a Resident of Hoboken also.

Jay Badame
President and Chief Operating Officer, TCCNY/NJ/PA
D 212-399-3612 C 973-615-4920
jay.badame@aecom.com

Tishman Construction Corporation
An AECOM Company
100 Park Avenue
New York, NY 10017
T 212-708-6800 F 212-582-6216
www.tishmanconstruction.com

Effective June 15, 2012, my new e-mail address will be jay.badame@aecom.com. Please update your contact information accordingly.

See Tishman's confidentiality policy at http://webaccess.tishman.com/emailconf.html

EXEMPTION 5

From: Frank Hegan [mailto:fhegan@ct-sol.com]
Sent: Tuesday, October 08, 2013 2:41 PM
To: Lynch-Jacobs, Maureen
Subject: RE: drawings for alternates.pdf - Adobe Acrobat Professional

Hello Maureen,

We have looked at the large luffing boom cranes and below are what we see from the drawing sent to us and your answers.

1) TG 1900 – Please look at the attached load chart. We assume the configuration is a 200' boom and a 50' jib (smallest combination that reaches the required 230'. The maximum capacity at this radius is 9,500 #. However, we see picks that appear to at the 230' radius (9,735, 11,165, and 9,800) that exceed this capacity. Therefore, there may be an issue with this crane from the capacity side as well.
2) Favco 760 – According to the attached specifications, the maximum boom is 220' and with the auxiliary hoist 230'. However, the capacity of the latter is 5.3 tons (10,600 #), which is less than the maximum pick of 11,165.
3) WolffKran has a large luffing crane (700 B attached) that has the reach but similar capacity as the 760. The backlog on this crane shows an earliest delivery date in the February / March 2014 range.
4) Terex 630 – does not have the reach (slightly less than 200') according to its specification sheet (attached).

It may be better to have two smaller cranes installed diagonally opposed to each other rather than one crane. The rental rate is lower than the larger cranes and there are more of them. Is this a possibility? I hope this helps.

Let me know if you require additional help.

Best regards,

Frank

From: Lynch-Jacobs, Maureen [mailto:mjacobs@panynj.gov]
Sent: Monday, October 07, 2013 12:37 PM
To: 'Frank Hegan'
Subject: RE: drawings for alternates.pdf - Adobe Acrobat Professional

From: Frank Hegan [mailto:fhegan@ct-sol.com]
Sent: Monday, October 07, 2013 11:47 AM
To: Lynch-Jacobs, Maureen
Subject: RE: drawings for alternates.pdf - Adobe Acrobat Professional

Maureen,

We have a few questions before we can suggest alternatives. They are:

1) When is the crane required?last week
2) What is the maximum pick and radius? 11165 at strret level of NW corner and 8855 at NE cornerl see 14,105#, 14,105 is on the south side (same as crane location) but not sure what the radius is for this pick (202' ?). I also see a pick of 9,800 # and would like to know this radius as well. 230'
3) Please confirm the maximum radius is 230'. yes
4) Do they plan to tie the mast to the building? The drawings show free standing
5) What are heights of the surrounding buildings? North side drawing 3 of 5 shows heights of building

South -12 story building, east is street and park next to river, west –street and existing building-I do not know height.

Looking forward to receiving the above.

Best regards,

Frank

From: Lynch-Jacobs, Maureen [mailto:mjacobs@panynj.gov]
Sent: Monday, October 07, 2013 8:44 AM
To: 'Frank Hegan'
Subject: drawings for alternates.pdf - Adobe Acrobat Professional

Frank,
I notified Shapiro I was sending these drawings.
Thanks for your help.
Maureen

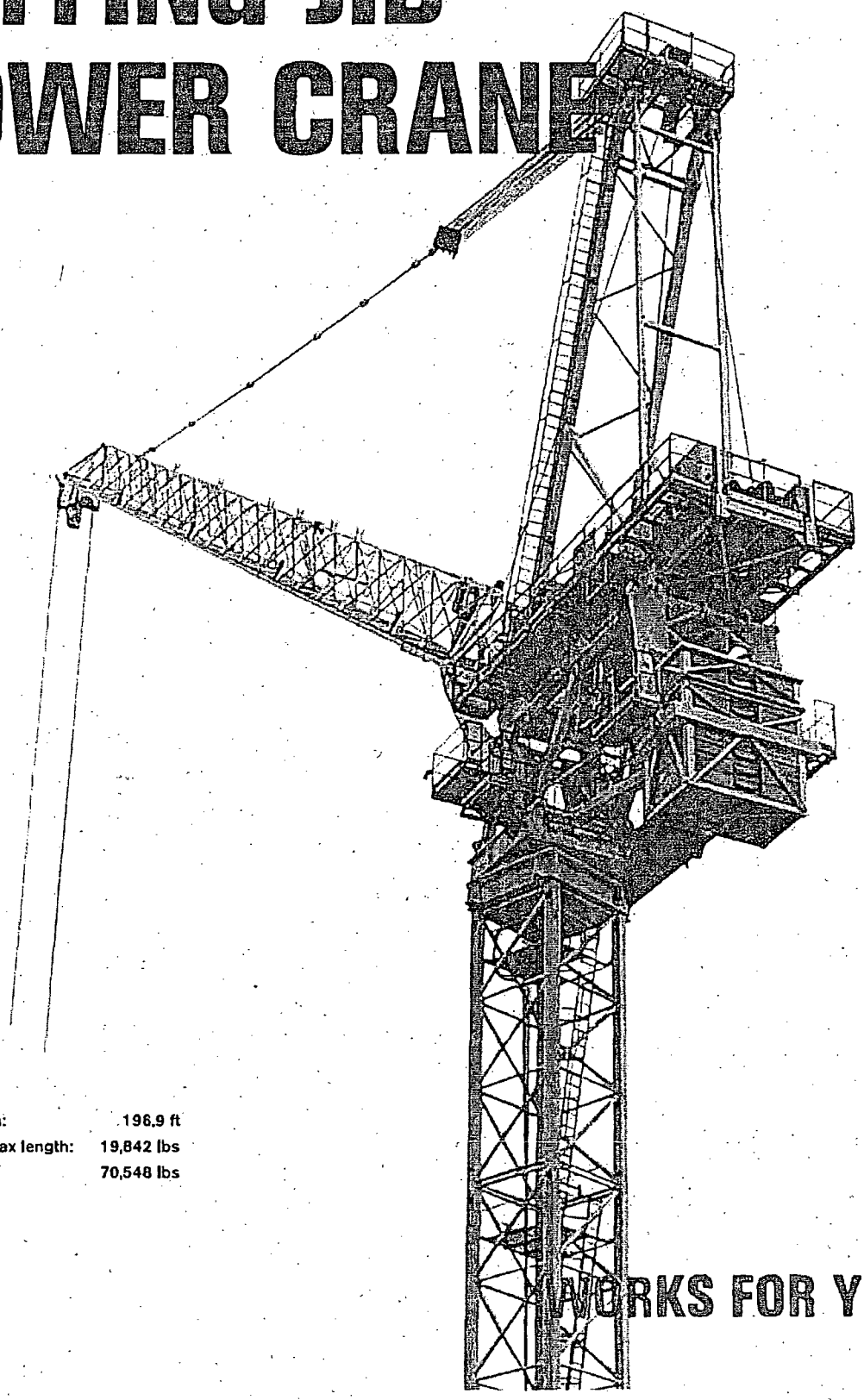
NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE RECEIVED THIS E-MAIL IN ERROR, PLEASE NOTIFY THE SENDER IMMEDIATELY, PERMANENTLY DELETE THIS E-MAIL (ALONG WITH ANY ATTACHMENTS), AND DESTROY ANY PRINTOUTS.

NOTICE: THIS E-MAIL AND ANY ATTACHMENTS CONTAIN INFORMATION FROM THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY AND AFFILIATES. IF YOU BELIEVE YOU HAVE

TEREX®

CTL 630-32 HD23

LUFFING JIB TOWER CRANE



Specifications:

- Max jib length: 196.9 ft
- Capacity at max length: 19,842 lbs
- Max capacity: 70,548 lbs

IT WORKS FOR YOU.™

KEY

Zeichenerklärung · Légende · Leyenda · Legenda

Hoisting · Heben · Levage · Elevación · Sollevamento

Slewing · Schwenken · Orientation · Orientació · Rotazione

Luffing · Ausleger-Einziehen · Relevage · Elevación de pluma · Brandeggio

Travelling · Schienenfahren · Translation · Traslación · Traslazione

Directive on noise level · Richtlinie für den Schall-Leistungspegel · Directive sur le niveau acoustique · Directiva sobre el nivel acustico · Direttiva sul livello acustico

Consult us · Auf Anfrage · Nous consulter · Consultamos · Consultateci

Power requirements · Geforderte Stromstärke · Puissance totale nécessaire · Potencia necesaria · Potenza totale richiesta

Power supply · Stromversorgung · Alimentation · Alimentación · Alimentazione

In service · In Betrieb · En service · En servicio · In servizio

Out of service · Außer Betrieb · Hors service · Fuera de servicio · Fuori servizio

H Max. under hook height · Höchste Hakenhöhe · Hauteur maxi. sous crochet · Maxima altura bajo gancho · Altezza max. sotto gancio

Jib · Ausleger · Flèche · Pluma · Braccio

Without load, without ballast, max. jib and max. height · Ohne Last und Ballast, mit Maximalausleger und Maximalhöhe · A vide, *sans lest, avec flèche et hauteur maximum · Sin carga, sin lastre, con pluma y altura máxima · A vuoto, senza zavorra, braccio* max., altezza max.

Counterweight · Gegengewicht · Lest de contre-flèche · Lastre de contra flecha · Zavorra controbraccio

C25 FEM 1004 Out of service wind condition · FEM 1004 Windverhältnisse im Außerbetriebszustand · FEM 1004 Conditions de vent hors service · FEM 1004 Condiciones de viento fuera de servicio · FEM 1004 Condizioni del vento in fuori servizio

CE FEM

SYSTEM CERTIFICATION SGS

TEREX®

CONTENTS

Inhalt · Contenu · Contenido · Indice

Page · Seite · Page · Pàgina · Pagina:

Load Diagram • Lastkurven • Courbes de charges • Curvas de cargas • Diagramma di portata 4
Tower • Turm • Tour • Torre • Torre 6
Other configurations • Aufstellmöglichkeiten • Autres Implantations
Otras Implantaciones • Altre Installazioni 8
Mechanism • Antriebe • Mécanismes • Mecanismos • Meccanismi 9
Transportation • Transport • Transportation • Transportación • Trasporto 10

WORKS FOR YOU.

OLFF 700 B Kolli Liste · Colli List · Liste de colisage

s. s. s.	Stck. Pce. Pcs.	Beschreibung / Description / Description	Kolli / Colli / Colis	L (m) Length Longueur	B (m) Width Largeur	H (m) Height Hauteur	Gewicht (kg) Weight Poids	Volumen (m³) Volume Volume
	1	Turmspitzenoberteil / Tower top upper part / Porte-flèche		11,95	2,50	2,57	9500	76,78
	1	Turmspitzenabspannung / Tower top bracing / Tirants pointe		10,18	0,72	0,43	1600	3,15
	1	Turmspitzenunterteil / Tower top lower part / Pivot tournant		8,52	3,05	2,66	20400	69,12
	1	Verbindungsbock / Connection frame / Cadre de raccord		4,27	2,35	2,30	4500	23,08
	1	Drehrahmen / Slewing frame / Pivot tournant		2,32	2,57	2,97	13300	17,71
	1	Spitzenuntertelladapter / Adapter lower tower top / Adapter pivot tournant		2,32	2,80	2,52	2600	14,73
	1	Führerhausaufhängung / Cabin attachment / Fixation cabine		2,72	2,00	0,57	400	3,10
	1	*Führerhaus / Operator's cabin / Cabine*		1,90	1,44	2,34	750	6,40
	1	Gegenausleger / Counterjib / Contre-flèche		8,05	2,50	1,09	5900	21,94
	1	Ew 12110 FU Maschinenplattform / Machinery platform / Plateforme avec mécanisme de levage		1,82	2,23	2,60	4700	10,55
	1	Hw 40132 FU Maschinenplattform / Machinery platform / Plateforme avec mécanisme de levage (mit Hubseil / with hoist rope / avec le câble de levage ø 32 mm x 1000 m = 5000 kg)		4,85	2,60	2,45	17500	30,89
	1	Kiste (Kleinteile) / Box (small parts) / Caisse à outils		0,63	0,50	0,38	100	1,12
	1	Normgeländer / Standard railings / Garde-corps		2,60	1,10	0,65	300	1,86
0	1	Auslegerteil **1** / Jib part **1** / Elément de flèche **1**		11,88	2,53	2,25	4100	67,63
1	1	Auslegerteil **2** / Jib part **2** / Elément de flèche **2**		10,60	1,98	2,20	3000	46,17
2	1	Auslegerteil **3** / Jib part **3** / Elément de flèche **3**		5,43	1,98	2,20	1600	23,65
3	1	Auslegerteil **4** / Jib part **4** / Elément de flèche **4**		5,43	1,98	2,20	1400	23,65
4	1	Auslegerteil **5** / Jib part **5** / Elément de flèche **5**		10,60	1,98	2,20	2400	46,17
5	2	Auslegerteil **6** / Jib part **6** / Elément de flèche **6**		10,60	1,98	2,20	2100	46,17
6	1	Auslegerteil **7** / Jib part **7** / Elément de flèche **7**		10,75	1,98	2,23	3500	47,47
17	1	Montagepodest (zu Pos.19) / Assembly platform (to item 19) / Passerelle de montage (à Pos.19)		3,10	0,50	1,50	500	2,33
18		Unterflasche / Hook block / Crochet		1,08	0,34	1,99	600	0,73
				1,20	0,40	1,99	1000	0,96
				1,20	0,50	1,99	1500	1,20
19	1	Abspannstäbe / Braces / Tirants		10,53	0,60	0,19	2200	1,20
20	1	Ausbaukran / Service crane / Grue de service		3,37	0,40	3,43	300	4,62

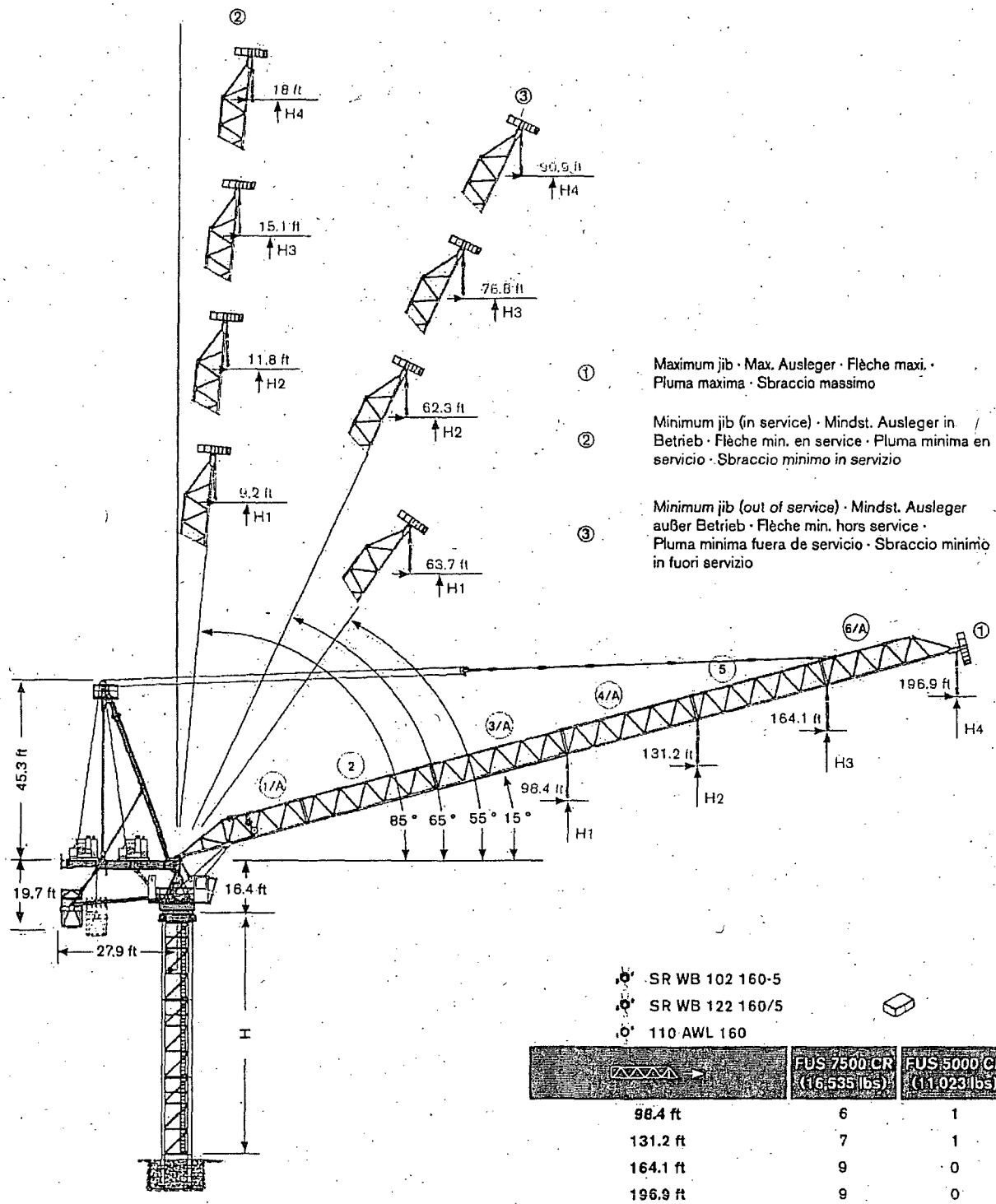
Der Leitwolf.
The leader of the pack.

WOLFFKRAN GmbH
Austraße 72
D-74076 Heilbronn
Tel. +49 7131 9815-0
Fax +49 7131 9815-355
info@wolffkran.de
www.wolffkran.de

ische und inhaltliche Änderungen sind vorbehalten. / All rights reserved regarding technical and content changes. / Sous réserve de modifications techniques et de fond.

LOAD DIAGRAM

Lastkurven · Courbes de charges · Curvas de cargas · Diagramma di portata



SR WB 102 160-5

SR WB 122 160/5

110 AWL 160

	FUS 7500 CR (16,535 lbs)	FUS 5000 CR (11,023 lbs)
98.4 ft	6	1
131.2 ft	7	1
164.1 ft	9	0
196.9 ft	9	0

TEREX®

Load Diagram · Lastkurven · Courbes de charges · Curvas de cargas · Diagramma di portata

			65.6 ft	72.2 ft	82 ft	88.6 ft	98.4 ft	114.8 ft	131.2 ft	147.6 ft	164.1 ft	180.5 ft	196.9 ft
35,274 lbs→	114.8 ft	lbs	35,274	35,274	35,274	35,274	35,274	35,274	30,644	27,051	24,163	21,804	19,842
35,274 lbs→	137.5 ft	lbs	35,274	35,274	35,274	35,274	35,274	35,274	35,274	32,673	29,101		
70,548 lbs→	71.5 ft	lbs	70,548	70,063	61,289	56,527	50,552	42,902	37,148	32,673	29,101		
35,274 lbs→	131.2 ft	lbs	35,274	35,274	35,274	35,274	35,274	35,274	35,274				
70,548 lbs→	74.2 ft	lbs	70,548	70,548	63,581	58,643	52,470	44,533	38,581				
35,274 lbs→	98.4 ft	lbs	35,274	35,274	35,274	35,274	35,274						
70,548 lbs→	74.8 ft	lbs	70,548	70,548	64,110	59,128	52,911						

Jib and Tower Height Configurations · Ausleger- und Turmkonfigurationen · Configurations de la flèche et du mât · Configuraciones de pluma y torre · Configurazioni torre e braccio

98.4 ft	1/A + 2 + 6/A
131.2 ft	1/A + 2 + 3/A + 6/A
164.1 ft	1/A + 2 + 3/A + 4/A + 6/A
196.9 ft	1/A + 2 + 3/A + 4/A + 5 + 6/A

	H		
	①	②	③
H1	H + 30.2 ft	H + 106 ft	H + 87.6 ft
H2	H + 39 ft	H + 139.8 ft	H + 127.6 ft
H3	H + 47.6 ft	H + 173.6 ft	H + 158.1 ft
H4	H + 56.4 ft	H + 207 ft	H + 188.7 ft

WORKS FOR YOU.

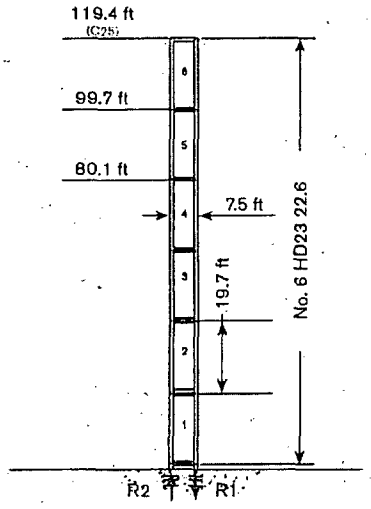
TOWER

Turm · Tour · Torre · Torre

Standard Configurations · Standardkonfiguration · Standard Implantations · Implantaciones Standard · Installazioni Standard

Tower: HD23 & Basement: R1

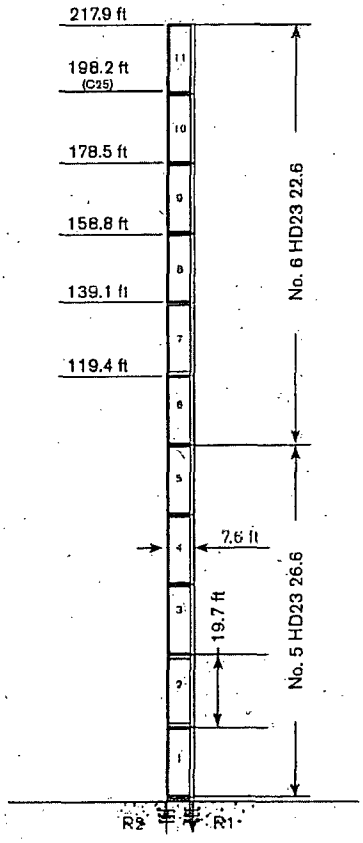
R1	-3600 kN	-3200 kN
R2	2560 kN	2350 kN
	1140 kN	



max. H (ft)		
	FEM 1004 C25	FEM 1001
98.4 ft	119.4	119.4
131.2 ft	119.4	119.4
164.1 ft	99.7	99.7
196.9 ft	99.7	99.7

Tower: HD23 & Basement: R2

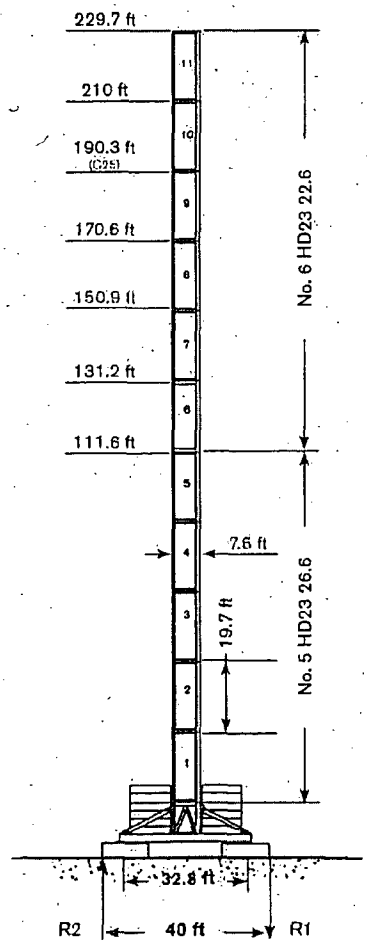
R1	-4750 kN	-6400 kN
R2	3550 kN	5400 kN
	1452 kN	



max. H (ft)		
	FEM 1004 C25	FEM 1001
98.4 ft	198.2	198.2
131.2 ft	178.5	178.5
164.1 ft	158.8	178.5
196.9 ft	158.8	158.8

Tower: HD23 & Basement: FP2

R1	-2000 kN	-2300 kN
R2	0 kN	218 kN
	1766 kN	



max. H (ft)		
	FEM 1004 C25	FEM 1001
98.4 ft	190.3	190.3
131.2 ft	170.6	170.6
164.1 ft	170.6	170.6
196.9 ft	150.9	150.9

Tower height • Turmhohe • Hauteur mat • Altura torre • Altezza torre

TEREX®

TG-1900 jib capacities

Boom length	Jib length	Load radius Ft.	Load radius m	Boom angle Degrees	Jib offset 15° 2-part load hoist line Pounds	2-part load hoist line kilograms	1-part load hoist line Pounds	1-part load hoist line kilograms
190' (57.91 m)	50' (15.24 m)	150	45.72	55.1	11,500	5 216	12,400	5 625
		160	48.77	52.0	10,900	4 944	11,800	5 352
		170	51.82	48.8	10,500	4 763	11,300	5 126
		180	54.86	45.3	10,100	4 581	10,800	4 899
		190	57.91	41.6	9,700	4 400	10,400	4 717
		200	60.96	37.6	9,400	4 264	10,100	4 581
		210	64.01	33.2	9,200	4 173	9,800	4 445
		220	67.06	28.0	9,000	4 082	9,500	4 309
		230	70.10	21.7	8,900	4 037	9,400	4 264
	70' (21.34 m)	70	21.34	78.9	13,500	6 124	14,600	6 623
		80	24.38	76.6	12,400	5 625	13,600	6 169
		90	27.43	74.3	11,400	5 171	12,500	5 670
		100	30.48	71.9	10,600	4 808	11,600	5 262
		110	33.53	69.5	9,900	4 491	10,800	4 899
		120	36.58	67.0	9,200	4 173	10,100	4 581
		130	39.62	64.5	8,700	3 946	9,500	4 309
		140	42.67	61.9	8,200	3 720	8,900	4 037
		150	45.72	59.3	7,800	3 538	8,400	3 810
		160	48.77	56.6	7,400	3 357	8,000	3 629
		170	51.82	53.7	7,000	3 175	7,600	3 447
		180	54.86	50.8	6,700	3 039	7,300	3 311
		190	57.91	47.7	6,400	2 903	7,000	3 175
		200	60.96	44.4	6,200	2 812	6,700	3 039
		210	64.01	40.9	6,000	2 722	6,400	2 903
		220	67.06	37.0	5,800	2 631	6,200	2 812
		230	70.10	32.7	5,700	2 586	6,000	2 721
		240	73.15	27.8	5,600	2 540	5,900	2 676
		250	76.20	21.6	5,500	2 495	5,800	2 631
200' (60.96 m)	30' (9.14 m)	50	15.24	80.0	29,300	13 290	14,600	6 623
		60	18.29	77.5	↕	↕	↕	↕
		70	21.34	74.9	↕	↕	↕	↕
		80	24.38	72.2	29,300	13 290	↕	↕
		90	27.43	69.6	27,400	12 429	↕	↕
		100	30.48	66.9	25,600	11 612	↕	↕
		110	33.53	64.1	24,000	10 886	↕	↕
		120	36.58	61.2	22,600	10 251	↕	↕
		130	39.62	58.3	21,400	9 707	↕	↕
		140	42.67	55.2	20,300	9 208	↕	↕
		150	45.72	52.1	19,400	8 800	↕	↕
		160	48.77	48.7	18,600	8 437	↕	↕
		170	51.82	45.2	17,800	8 074	↕	↕
		180	54.86	41.5	17,200	7 802	↕	↕
		190	57.91	37.4	16,700	7 575	14,600	6 623

Boom length	Jib length	Load radius Ft.	Load radius m	Boom angle Degrees	Jib offset 15° 2-part load hoist line Pounds	2-part load hoist line kilograms	1-part load hoist line Pounds	1-part load hoist line kilograms
200' (60.96 m)	30' (9.14 m)	200	60.96	32.9	14,400	6 532	14,600	6 623
		210	64.01	27.7	11,700	5 307	12,900	5 851
		220	67.06	21.2	8,700	3 946	9,600	4 355
	50' (15.24 m)	60	18.29	79.6	21,500	9 752	14,600	6 623
		70	21.34	77.3	19,600	8 891	↕	↕
		80	24.38	74.9	18,100	8 210	↕	↕
		90	27.43	72.4	16,800	7 620	↕	↕
		100	30.48	70.0	15,600	7 076	↕	↕
		110	33.53	67.4	14,600	6 623	↕	↕
		120	36.58	64.9	13,800	6 260	14,600	6 623
		130	39.62	62.2	13,000	5 897	14,200	6 441
		140	42.67	59.5	12,300	5 579	13,400	6 078
		150	45.72	56.7	11,700	5 307	12,700	5 761
		160	48.77	53.8	11,200	5 080	12,100	5 489
		170	51.82	50.8	10,700	4 854	11,600	5 262
		180	54.86	47.7	10,300	4 672	11,100	5 035
		190	57.91	44.3	10,000	4 536	10,700	4 854
		200	60.96	40.7	9,600	4 355	10,300	4 672
		210	64.01	36.8	9,400	4 264	10,000	4 536
		220	67.06	32.4	9,100	4 128	9,700	4 400
		230	70.10	27.4	9,000	4 082	9,500	4 309
		240	73.15	21.1	7,300	3 311	8,000	3 629
	70' (21.34 m)	70	21.34	79.3	13,700	6 214	14,600	6 623
		80	24.38	77.1	12,600	5 715	13,900	6 305
		90	27.43	74.9	11,600	5 262	12,800	5 806
		100	30.48	72.6	10,800	4 899	11,800	5 352
		110	33.53	70.3	10,100	4 581	11,000	4 990
		120	36.58	68.0	9,400	4 264	10,300	4 672
		130	39.62	65.6	8,900	4 037	9,700	4 400
		140	42.67	63.1	8,400	3 810	9,100	4 128
		150	45.72	60.6	7,900	3 583	8,600	3 901
		160	48.77	58.0	7,600	3 447	8,200	3 720
		170	51.82	55.4	7,200	3 266	7,800	3 538
		180	54.86	52.6	6,900	3 130	7,500	3 402
		190	57.91	49.7	6,600	2 994	7,100	3 221
		200	60.96	46.7	6,300	2 858	6,900	3 130
		210	64.01	43.4	6,100	2 767	6,600	2 994
		220	67.06	40.0	5,900	2 676	6,400	2 903
		230	70.10	36.2	5,800	2 631	6,200	2 812
		240	73.15	32.0	5,600	2 540	6,000	2 722
		250	76.20	27.2	5,500	2 495	5,900	2 676
		260	79.25	21.1	5,500	2 495	5,800	2 631

Refer to Notes page 5.

Notes — jib capacities

1. Loads shown are maximum permissible and in all cases are limited by strength capabilities of the machine. Proper design of the substructure to withstand the loadings imposed by the machine shall be the responsibility of the purchaser. A deduction must be made from these capacities for the weight of the load handling equipment such as the hook block, hook, slings, grapple, load weighing devices, etc.
2. The operator must make the following considerations when operating the crane:
   a. Make certain the actual load radius is not greater than the radius specified on the capacity chart for the load to be lifted. The load radius is measured from the center of the tower's base section to the center of gravity of the freely suspended load. The operator must make allowances for increases in the load radius caused by stretching of the boom suspension and deflection of the boom and tower.
   b. Prevent shock or impact loading of the crane's structure especially when operating during low temperatures.
   c. Effect of wind, especially on loads with large surface areas.
3. Do not lift a load with the main hoist and a load with the auxiliary hoist at the same time.
4. For each 10 feet boom foot height above the lowest hook position, the following deductions must be made from these capacities:
   30 lbs. *(13.61 kg)* when using 2 parts of auxiliary hoist line
   20 lbs. *(9.07 m)* when using 1 part of auxiliary hoist line
5. If the 30" *(.076 m)* x 36" *(.091 m)* jib is attached to the boom, the following deductions must be made from the main hoist lifting capacities:

Jib Length	Deduction
30' *(9.14 m)*	—
50' *(15.24 m)*	2500 lbs. *(1 134 kg)*
70' *(21.34 m)*	4000 lbs. *(1 814 kg)*

6. These capacities are based on a 30 mph *(48 km/h)* wind in the operating condition. Consult the manufacturer for operating limitations when winds exceed 30 mph *(48 km/h)*.
7. For the nonoperating condition, the machine, reeving, and hook blocks must clear any obstacles with the boom stowed at its specified position. This precaution is necessary due to the weathervane rotation of the crane by the wind.
8. These capacities apply only to the machine as originally manufactured and normally equipped by FMC Corporation, Cable Crane and Excavator Division.

TOWER MOUNTED WITH CLIMBING FRAME

1. The maximum free standing tower height with a climbing frame and 170' *(51.82 m)* boom is 162'-7½" *(49.56 m)*. For tower heights greater than 162' 7½" *(49.56 m)*, consult manufacturer for additional requirements for the crane.
2. When the crane is in the nonoperating condition, the boom must be stowed as listed in the following chart based on tower height:

Tower Height	Boom Position
80'-160' *(24.38-48.77 m)*	Stow boom at maximum rated radius
170' *(51.80 m)*	Stow boom at horizontal position

TOWER MOUNTED WITH CLIMBING FRAME

1. The maximum free standing tower height without a climbing frame and with 200' *(60.96 m)* boom is 162' 7½" *(49.56 m)*. For tower heights greater than 162' 7½" *(49.56 m)*, consult manufacturer for additional requirements for the crane.
2. When the crane is in the nonoperating condition, the boom must be stowed as listed in the following chart based on tower height:

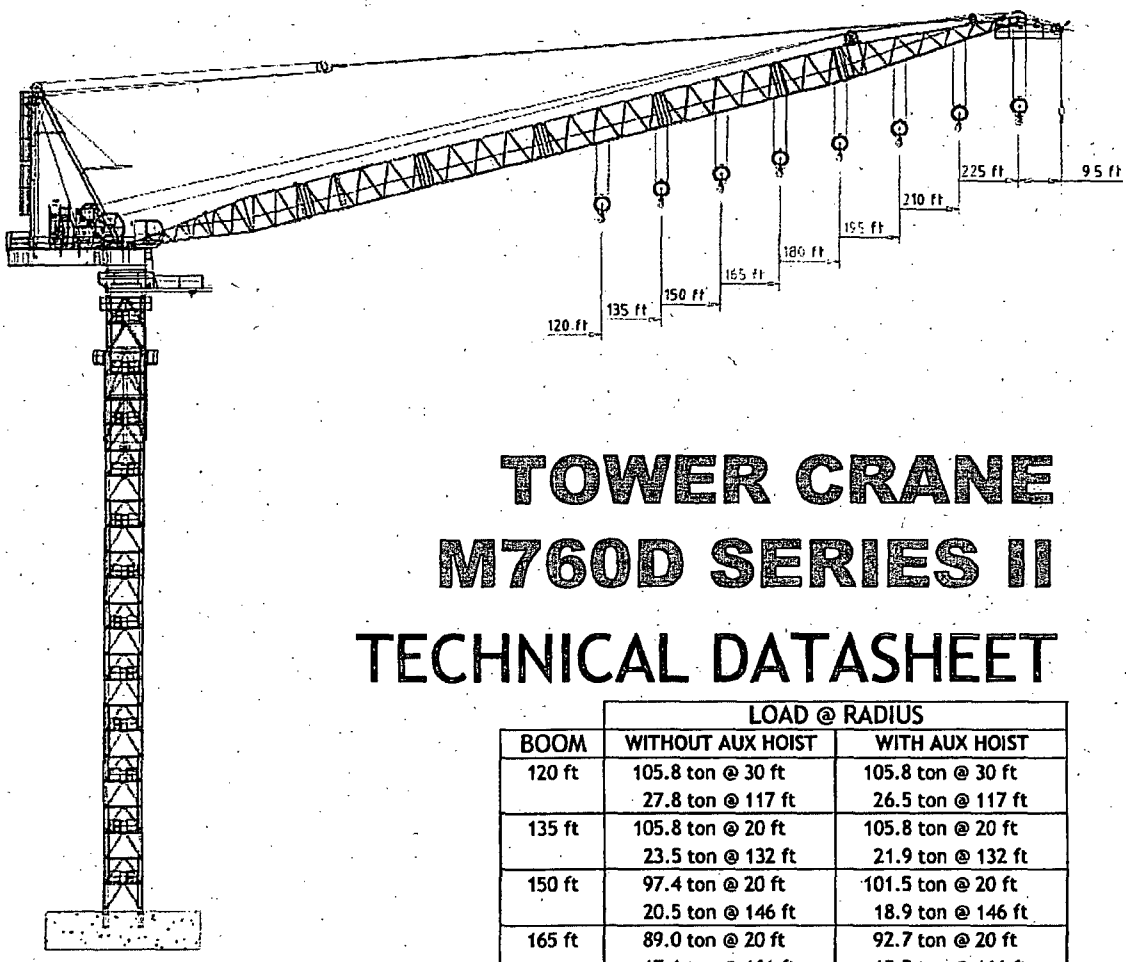
Tower Height	Boom Position
80'-160' *(24.38-48.77 m)*	Stow boom between a 60° boom angle and maximum rated radius
170'-190' *(51.82 m-57.91 m)*	Stow boom at maximum rated radius
200' *(60.96 m)*	Stow boom at horizontal position

RAIL MOUNTED WITH TRAVELING BASE

1. Lifting capacities shown are not more than 66% of the tipping loads calculated under static conditions with the boom in the least stable direction. The operator must take into account the dynamic effects of hoisting, lowering, booming, swinging, and traveling. Additional factors to be considered are freely suspended loads, track, wind, ground conditions, boom length, and proper operating speeds for the existing conditions.
2. The operator must make certain the actual load radius is not greater than the radius specified on the capacity chart for the load to be lifted. The load radius is measured from the center of the traveling base to the center of gravity of the freely suspended load. The operator must make allowances for increases in the load radius caused by stretching of the boom suspension and deflection of the boom and traveling base.
3. For these lifting capacities, the operator must make certain that all specified ballast is properly assembled to the traveling base. Ballast may be necessary to meet the stability requirement as specified on the working areas and ballast requirement plate.
4. Use caution when approaching the rail stops with the crane bumpers. Excessive speed at contact may result in crane instability and/or failure of the rail stops.
5. When the crane is in the nonoperating condition, the rail mounted traveling base must be secured with rail clamps or tie downs to prevent drifting.

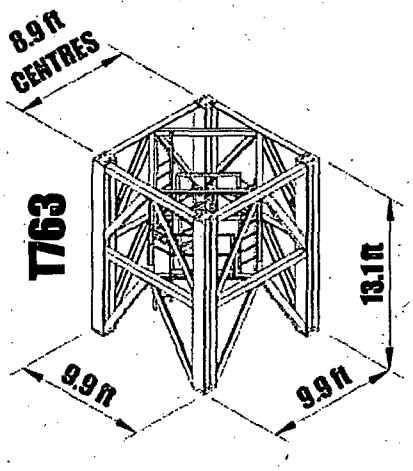
Refer to Notes below.

We are constantly improving our products and therefore reserve the right to change designs and specifications.



TOWER CRANE
M760D SERIES II
TECHNICAL DATASHEET

BOOM	LOAD @ RADIUS	
	WITHOUT AUX HOIST	WITH AUX HOIST
120 ft	105.8 ton @ 30 ft 27.8 ton @ 117 ft	105.8 ton @ 30 ft 26.5 ton @ 117 ft
135 ft	105.8 ton @ 20 ft 23.5 ton @ 132 ft	105.8 ton @ 20 ft 21.9 ton @ 132 ft
150 ft	97.4 ton @ 20 ft 20.5 ton @ 146 ft	101.5 ton @ 20 ft 18.9 ton @ 146 ft
165 ft	89.0 ton @ 20 ft 17.1 ton @ 161 ft	92.7 ton @ 20 ft 15.5 ton @ 161 ft
180 ft	81.4 ton @ 20 ft 14.8 ton @ 176 ft	84.2 ton @ 20 ft 13.2 ton @ 176 ft
195 ft	74.0 ton @ 20 ft 12.1 ton @ 190 ft	73.5 ton @ 20 ft 10.6 ton @ 190 ft
210 ft	64.7 ton @ 20 ft 9.9 ton @ 205 ft	63.6 ton @ 20 ft 8.9 ton @ 205 ft
225 ft	55.3 ton @ 20 ft 8.0 ton @ 219 ft	54.3 ton @ 20 ft 6.4 ton @ 219 ft



FAVELLE FAVCO

www.favellefavco.com

M760D SERIES II MAIN HOIST RADIUS AND CAPACITY (WITHOUT AUXILIARY HOIST)

FAVELLE FAVCO

1-FALL

Boom Length (feet)	225	210	195	180	165	150	135	120
Min Radius (feet)	20	20	19	17	16	15	14	12
SWL at Min Radius (ton)	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
20	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
30	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
40	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
50	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
60	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
70	34.1	35.3	35.3	35.3	35.3	35.3	35.3	35.3
80	33.4	35.3	35.3	35.3	35.3	35.3	35.3	35.3
90	32.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
100	30.8	33.8	33.8	34.7	34.9	35.3	35.3	35.3
110	29.2	29.9	30.3	30.8	31.0	31.5	31.8	32.3
120	26.0	26.6	27.0	27.6	27.8	28.3	28.5	-
130	23.2	23.9	24.3	24.8	25.0	25.5	25.8	-
140	20.9	21.6	21.9	22.5	22.7	23.1		-
150	18.8	19.5	19.9	20.4	20.7	-		-
160	17.0	17.8	18.1	18.7	18.5	-		-
170	15.5	16.2	16.6	16.4		-		-
180	14.1	14.8	14.8	-		-		-
190	12.8	13.6	12.1	-		-		-
200	11.6	12.2		-		-		-
210	10.5	-		-		-		-
Max Radius (feet)	219	205	190	175	160	146	130	117
SWL at Max Radius (ton)	9.1	11.3	12.1	12.6	18.5	22.2	25.8	29.8

2-FALL

Boom Length (feet)	225	210	195	180	165	150	135	120
Min Radius (feet)	20	20	19	17	16	15	14	13
SWL at Min Radius (ton)	53.5	59.7	66.6	70.5	70.5	70.5	70.5	70.5
20	53.5	59.7	65.6	70.5	70.5	70.5	70.5	70.5
30	47.7	53.7	59.1	64.6	70.5	70.5	70.5	70.5
40	42.9	49.2	54.6	59.9	65.7	70.5	70.5	70.5
50	38.9	44.6	50.7	56.4	62.3	69.1	70.5	70.5
60	35.6	40.9	47.7	53.9	59.9	66.7	67.6	68.2
70	34.1	40.2	46.8	52.0	56.0	56.6	56.9	57.4
80	33.4	39.4	43.0	45.3	47.9	48.5	48.8	49.4
90	32.3	37.7	38.0	39.9	41.7	42.3	42.6	43.1
100	30.8	34.8	33.8	35.5	36.7	37.3	37.6	38.2
110	29.3	31.2	31.7	31.7	32.6	33.2	33.5	33.0
120	26.5	27.9	28.3	28.4	29.2	29.8	30.1	-
130	24.0	25.0	25.4	25.4	26.3	26.9	25.9	-
140	21.6	22.5	23.0	23.6	23.8	23.1		-
150	19.4	20.3	20.8	21.5	21.8	-		-
160	17.4	18.4	18.9	19.2	18.5	-		-
170	15.7	16.6	17.0	16.4		-		-
180	14.1	15.1	14.8	-		-		-
190	12.8	13.8	12.1	-		-		-
200	11.6	12.2		-		-		-
210	10.5	-		-		-		-
Max Radius (feet)	220	205	190	176	160	147	130	118
SWL at Max Radius (ton)	8.5	11.0	12.1	15.5	18.5	21.0	25.9	28.0

Note: All charts are for information only and should not be used for lifting purposes. Favelle Favco reserves the right to make specification changes without prior notice.

M760D SERIES II MAIN HOIST RADIUS AND CAPACITY (WITHOUT AUXILIARY HOIST)

FAVELLE FAVCO

3-FALL								
Boom Length (feet)	225	210	195	180	165	150	135	120
Min Radius (feet)	20	20	19	17	16	15	10	10
SWL at Min Radius (ton)	55.3	64.7	74.0	81.4	89.0	97.4	105.8	105.8
20	55.3	64.7	74.0	81.4	89.0	97.4	105.8	105.8
30	49.4	57.2	65.5	73.6	81.0	89.4	95.7	105.8
40	44.3	51.2	58.5	66.6	75.1	84.0	90.5	97.1
50	40.1	46.3	52.9	60.2	69.4	77.0	84.9	85.6
60	36.6	42.9	50.4	58.4	65.2	64.2	69.4	70.0
70	35.5	42.2	47.5	50.0	55.9	54.9	58.3	59.0
80	34.9	41.5	41.4	43.6	48.7	49.7	50.0	50.7
90	34.2	37.4	36.5	38.5	42.5	43.2	43.6	44.2
100	31.6	33.4	32.5	34.2	37.2	38.0	38.4	38.7
110	28.3	30.0	31.4	30.5	32.9	33.7	34.1	32.1
120	25.5	27.0	28.1	27.4	29.3	30.1	30.6	-
130	23.1	24.4	25.1	24.5	26.3	26.5	-	-
140	20.9	21.9	22.5	23.3	23.7	22.4	-	-
150	18.9	19.7	20.3	21.1	21.6	-	-	-
160	16.9	17.7	18.4	18.5	-	-	-	-
170	15.2	16.0	16.3	15.8	-	-	-	-
180	13.7	14.6	14.1	-	-	-	-	-
190	12.4	13.3	12.1	-	-	-	-	-
200	11.3	11.6	-	-	-	-	-	-
210	10.2	-	-	-	-	-	-	-
Max Radius (feet)	219	205	190	176	161	146	132	117
SWL at Max Radius (ton)	8.0	9.9	12.1	14.8	17.1	20.5	23.5	27.8

Note: All charts are for information only and should not be used for lifting purposes. Favelle Favco reserves the right to make specification changes without prior notice.

M760D SERIES II MAIN HOIST RADIUS AND CAPACITY (WITH AUXILIARY HOIST)

FAVELLE FAVCO

1-FALL

Boom Length (feet)	225	210	195	180	165	150	135	120
Min Radius (feet)	20	20	19	17	16	15	14	12
SWL at Min Radius (ton)	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
20	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
30	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
40	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
50	33.7	35.3	35.3	35.3	35.3	35.3	35.3	35.3
60	31.0	35.3	35.3	35.3	35.3	35.3	35.3	35.3
70	28.8	33.1	35.3	35.3	35.3	35.3	35.3	35.3
80	27.5	31.7	35.3	35.3	35.3	35.3	35.3	35.3
90	26.3	30.4	34.7	35.3	35.3	35.3	35.3	35.3
100	25.1	29.1	32.1	33.8	34.5	35.3	35.3	35.3
110	23.9	27.8	29.9	30.1	30.6	31.1	31.3	31.3
120	22.8	26.2	26.5	26.8	27.3	27.8	28.0	-
130	21.7	23.4	23.7	23.8	24.5	25.0	24.3	-
140	20.3	21.0	21.3	21.9	22.1	21.5	-	-
150	18.4	18.9	19.3	19.8	20.0	-	-	-
160	16.6	17.1	17.5	17.6	16.9	-	-	-
170	15.0	15.4	15.4	14.8	-	-	-	-
180	13.4	14.1	13.1	-	-	-	-	-
190	12.1	12.7	10.5	-	-	-	-	-
200	10.8	10.6	-	-	-	-	-	-
210	9.2	-	-	-	-	-	-	-
Max Radius (feet)	219	205	190	175	160	146	130	117
SWL at Max Radius (ton)	7.7	9.6	10.5	11.0	16.9	20.5	24.3	27.9

2-FALL

Boom Length (feet)	225	210	195	180	165	150	135	120
Min Radius (feet)	20	20	19	17	16	15	14	13
SWL at Min Radius (ton)	52.6	61.1	68.9	70.6	70.5	70.5	70.5	70.5
20	52.6	61.1	68.0	70.6	70.5	70.5	70.5	70.5
30	46.8	54.0	61.6	68.4	70.5	70.5	70.5	70.5
40	42.0	48.4	55.1	62.5	70.1	70.5	70.5	70.5
50	38.1	43.8	49.9	56.6	63.9	70.5	70.5	70.5
60	34.7	40.0	46.8	54.5	62.5	65.0	67.8	68.4
70	33.2	39.3	45.9	50.3	56.0	55.2	56.9	57.4
80	32.5	38.5	41.4	43.6	47.8	48.4	48.7	49.2
90	31.8	37.3	36.3	38.3	41.4	42.0	42.3	42.8
100	30.4	33.1	32.1	33.8	36.3	36.9	37.2	37.8
110	28.0	29.6	31.0	30.1	32.1	32.7	33.0	31.3
120	25.1	26.6	27.8	26.8	28.7	29.3	29.6	-
130	22.6	23.9	24.9	23.8	25.7	25.7	24.3	-
140	20.3	21.5	22.3	22.9	23.2	21.5	-	-
150	18.8	19.3	19.9	20.3	20.8	-	-	-
160	16.8	17.3	17.7	17.6	16.9	-	-	-
170	15.0	15.4	15.4	14.8	-	-	-	-
180	13.4	14.2	13.1	-	-	-	-	-
190	12.1	12.7	10.5	-	-	-	-	-
200	10.8	10.6	-	-	-	-	-	-
210	9.2	-	-	-	-	-	-	-
Max Radius (feet)	219	205	190	176	160	147	130	118
SWL at Max Radius (ton)	7.1	9.4	10.5	13.9	16.9	19.4	24.3	26.7

Note: All charts are for information only and should not be used for lifting purposes. Favelle Favco reserves the right to make specification changes without prior notice.

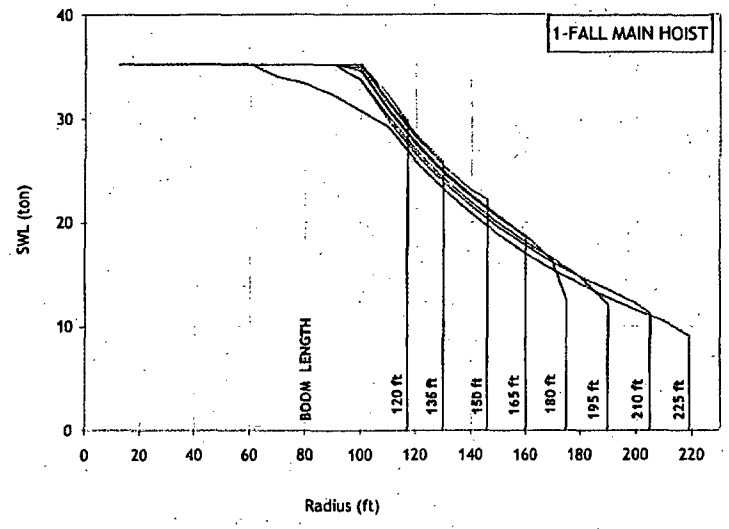
M760D SERIES II MAIN HOIST RADIUS AND CAPACITY (WITH AUXILIARY HOIST)

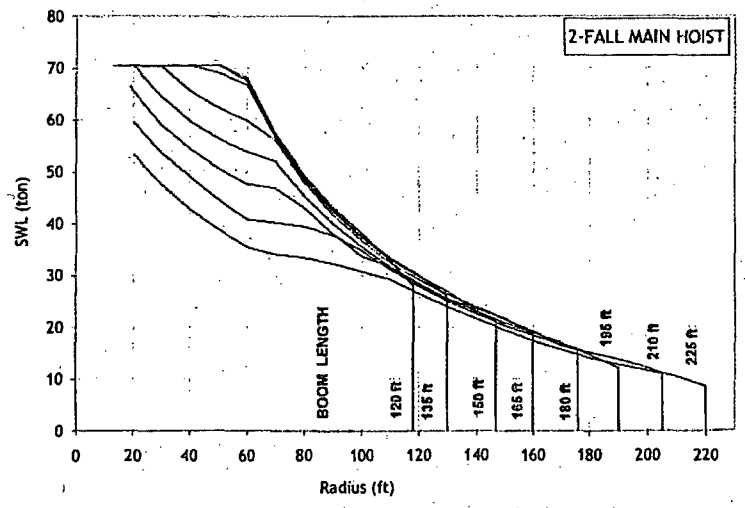
3-FALL								
Boom Length (feet)	225	210	195	180	165	150	135	120
Min Radius (feet)	20	20	19	17	16	15	14	13
SWL at Min Radius (ton)	54.3	63.6	73.5	84.2	92.7	101.5	105.8	105.8
20	54.3	63.6	73.5	84.2	92.7	101.5	105.8	105.8
30	48.4	56.3	64.6	73.7	83.3	93.9	101.4	105.8
40	43.4	50.3	57.6	65.7	74.3	83.8	90.5	96.5
50	39.3	45.4	52.0	59.4	68.5	75.3	84.3	83.1
60	35.8	42.0	49.5	56.8	63.6	62.6	69.6	70.2
70	34.6	41.3	45.9	48.4	54.3	53.2	58.3	59.0
80	33.9	40.5	39.8	42.0	47.1	49.3	49.9	50.5
90	33.2	35.8	34.9	36.8	41.3	42.9	43.3	43.9
100	30.0	31.8	30.9	32.6	36.4	37.5	37.9	37.1
110	26.7	28.4	29.8	28.9	32.2	33.1	32.6	30.5
120	23.9	25.4	26.7	25.7	28.5	28.9	29.2	-
130	21.5	22.8	23.9	22.9	25.1	24.9	-	-
140	19.3	20.5	21.4	22.1	23.0	20.9	-	-
150	18.0	18.4	19.1	19.5	20.1	-	-	-
160	16.1	16.5	16.9	16.9	-	-	-	-
170	14.3	14.6	14.7	14.2	-	-	-	-
180	12.8	13.6	12.5	-	-	-	-	-
190	11.4	12.1	10.6	-	-	-	-	-
200	10.3	10.0	-	-	-	-	-	-
210	8.6	-	-	-	-	-	-	-
Max Radius (feet)	219	205	190	176	161	146	132	117
SWL at Max Radius (ton)	6.4	8.9	10.6	13.2	15.5	18.9	21.9	26.5

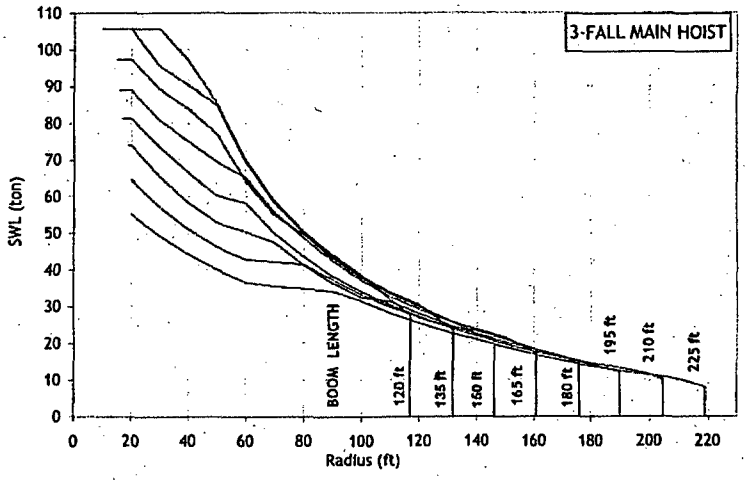
Note: All charts are for information only and should not be used for lifting purposes. Favelle Favco reserves the right to make specification changes without prior notice.

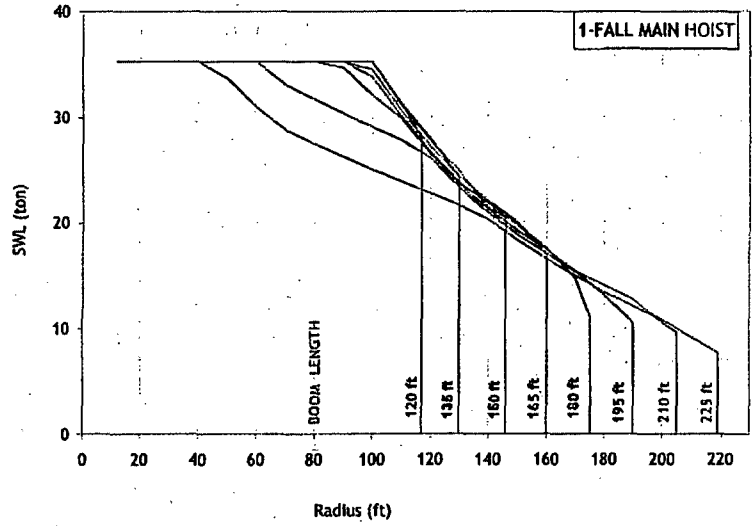
1-FALL								
Boom Length (feet)	225	210	195	180	165	150	135	120
Min Radius (feet)	25	24	23	21	20	19	18	17
SWL at Min Radius (ton)	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
30	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
40	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
50	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
60	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
70	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
80	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
90	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
100	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
110	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
120	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
130	13.2	13.2	13.2	13.2	13.2	13.2	13.2	-
140	13.2	13.2	13.2	13.2	13.2	13.2	13.2	-
150	13.2	13.2	13.2	13.2	13.2	13.2		-
160	13.2	13.2	13.2	13.2	13.2	-		-
170	13.2	13.2	13.2	13.2	13.2	-		-
180	12.3	13.0	12.8	10.4		-		-
190	11.4	11.5	10.9	-		-		-
200	10.5	9.9	8.9	-		-		-
210	8.0	7.8		-		-		-
220	6.7	-		-		-		-
230	5.3	-		-		-		-
Max Radius (feet)	230	216	201	184	170	157	141	128
SWL at Max Radius (ton)	5.3	7.4	8.3	9.1	13.2	13.2	13.2	13.2

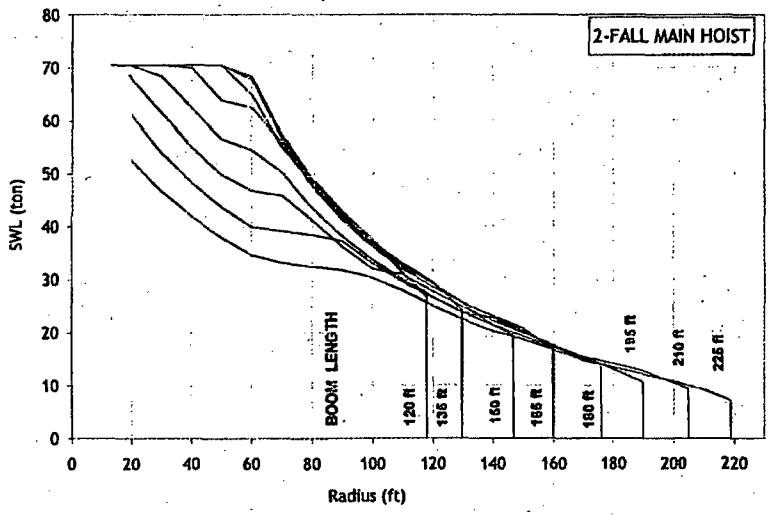
Note: All charts are for information only and should not be used for lifting purposes. Favelle Favco reserves the right to make specification changes without prior notice.

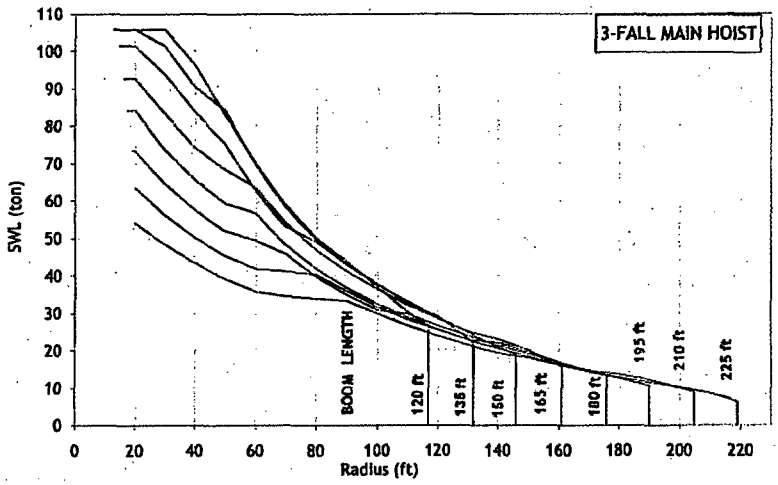

1-FALL MAIN HOIST
SWL (ton)
Radius (ft)
BOOM LENGTH
120 ft
135 ft
150 ft
165 ft
180 ft
195 ft
210 ft
225 ft

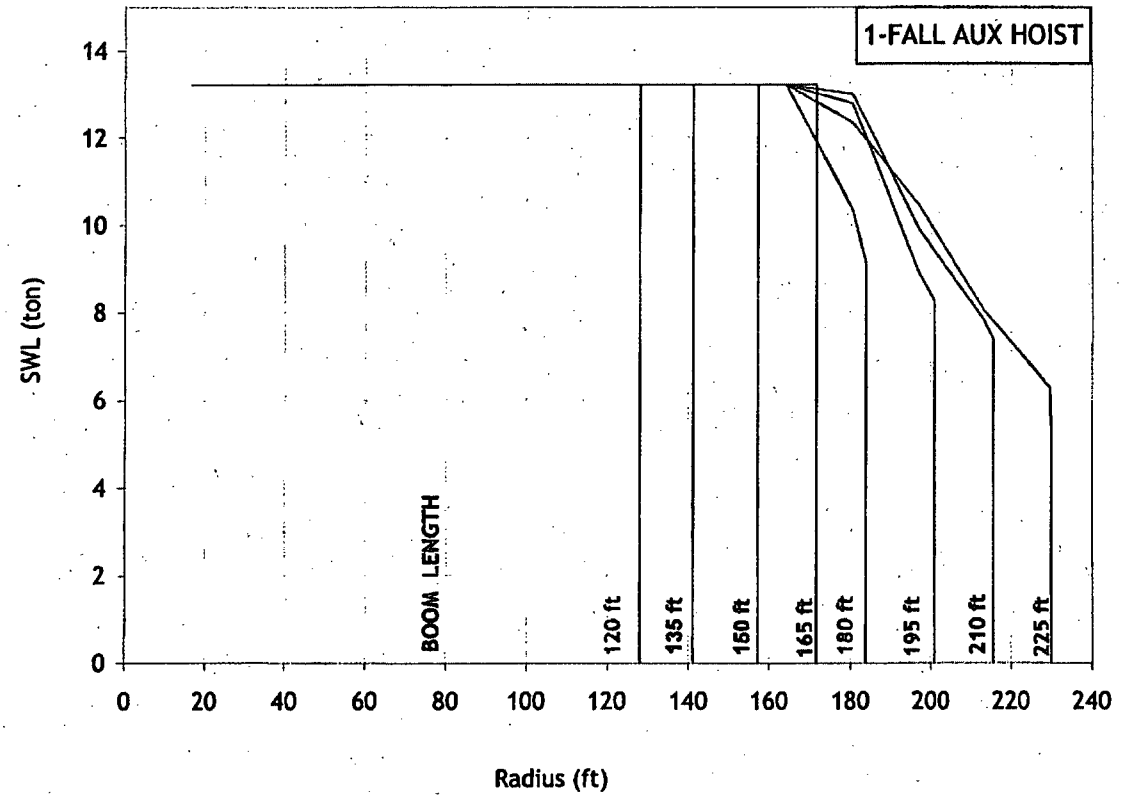

2-FALL MAIN HOIST
SWL (ton)
Radius (ft)
BOOM LENGTH
120 ft
135 ft
150 ft
165 ft
180 ft
195 ft
210 ft
225 ft


3-FALL MAIN HOIST
SWL (ton)
Radius (ft)
BOOM LENGTH
120 ft
135 ft
150 ft
165 ft
180 ft
195 ft
210 ft
225 ft

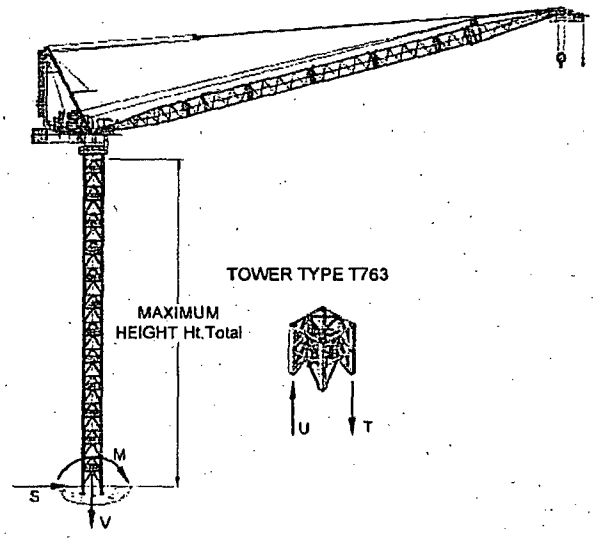

1-FALL MAIN HOIST
SWL (ton)
Radius (ft)
BOOM LENGTH
120 ft
135 ft
150 ft
165 ft
180 ft
195 ft
210 ft
225 ft


2-FALL MAIN HOIST
SWL (ton)
Radius (ft)
BOOM LENGTH
120 ft
135 ft
150 ft
165 ft
180 ft
195 ft
210 ft
225 ft


3-FALL MAIN HOIST
SWL (ton)
Radius (ft)
BOOM LENGTH
120 ft
135 ft
150 ft
165 ft
180 ft
195 ft
210 ft
225 ft


1-FALL AUX HOIST
SWL (ton)
14
12
10
8
6
4
2
0
0
20
40
60
80
100
120
140
160
180
200
220
240
Radius (ft)
BOOM LENGTH
120 ft
135 ft
150 ft
165 ft
180 ft
195 ft
210 ft
225 ft

M760D SERIES II TYPICAL FOUNDATION & BUILDING REACTION (CRANE REEVED 2 FALLS AT 180 ft BOOM LENGTH)



*:IN SERVICE WIND = 45 mph

‡:OUT OF SERVICE WIND = 95 mph

Notes:

1 Structure is designed using permissible stress method.

2 These loads will vary by change of boom length, height and type of tower, actual site wind conditions, no of falls and change of wind speed.

3 To calculate alternative options for M760D Series II refer to Favelle Favco Design Sheet named "Crane Weight Wind Chart".

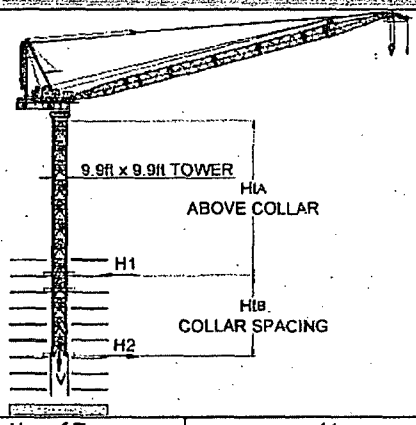
FREE STANDING BUILDING REACTION

WITHOUT CLIMBING FRAME			
No. of Towers		11	
Design Load	Unit	I/S*	O/S‡
M	lb.ft	8,816,953	7,695,848
V	lb	595,247	485,016
S	lb	17,637	79,366
T	lb	742,957	639,340
U	lb	445,333	396,832
Ht_{Total}	ft	144	

WITH EXTERNAL CLIMBING FRAME			
No. of Towers		10	
Design Load	Unit	I/S*	O/S‡
M	lb.ft	9,541,210	6,867,921
V	lb	527,546	470,907
S	lb	18,395	75,927
T	lb	893,516	665,960
U	lb	629,743	430,507
Ht_{Total}	ft	131	

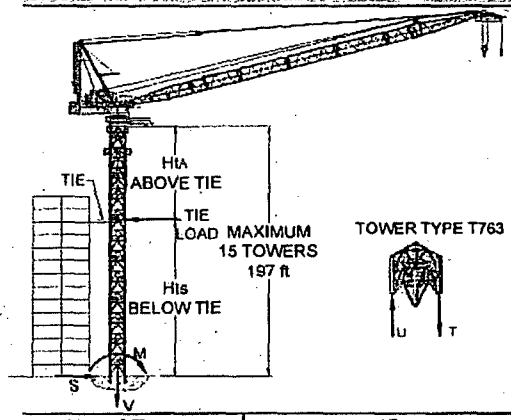
WITH INTERNAL CLIMBER			
No. of Towers		11	
Design Load	Unit	I/S*	O/S‡
M	lb.ft	9,468,917	6,810,496
V	lb	557,529	500,890
S	lb	16,961	70,130
T	lb	895,241	668,872
U	lb	616,476	418,427
Ht_{Total}	ft	144	

INTERNAL CLIMBER ON COLLARS



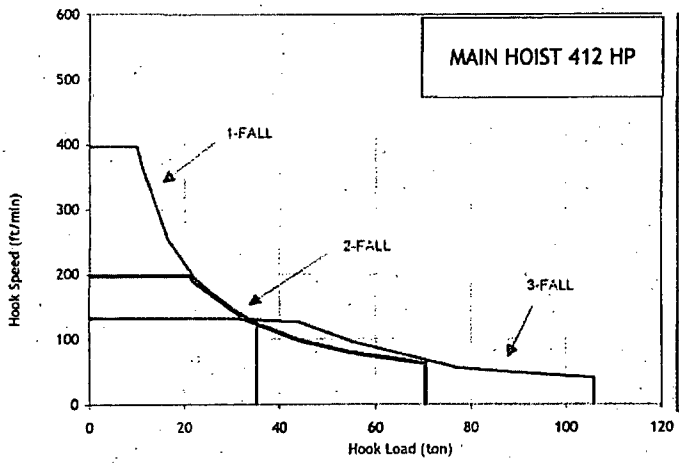
No. of Towers		11	
Design Load	Unit	I/S*	O/S‡
V	lb	557,769	500,449
H_1	lb	248,003	176,484
H_2	lb	231,132	106,716
Max Ht_A	ft	105	
Min Ht_B	ft	38	
Ht_{Total}	ft	143	

EXTERNAL CLIMBER + ONE TIE

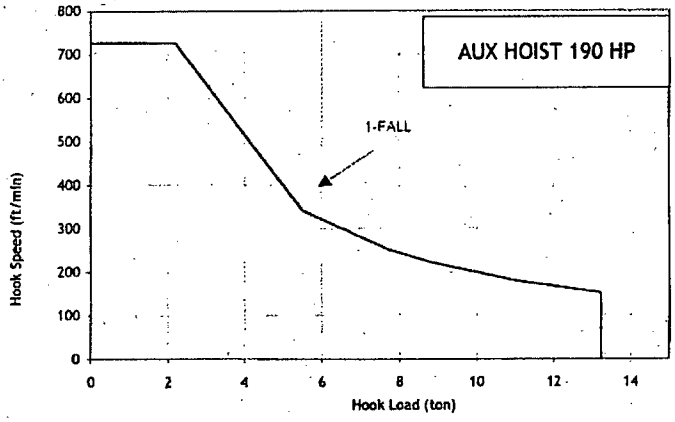


No. of Towers		15	
Design Load	Unit	I/S*	O/S‡
TIE	lb	179,553	176,747
M	lb.ft	4,546,611	2,722,499
V	lb	600,298	543,659
S	lb	157,571	86,330
T	lb	513,009	353,239
U	lb	212,860	81,409
Max Ht_A	ft	112	
Max Ht_B	ft	85	
Ht_{Total}	ft	197	

HOIST SPEED

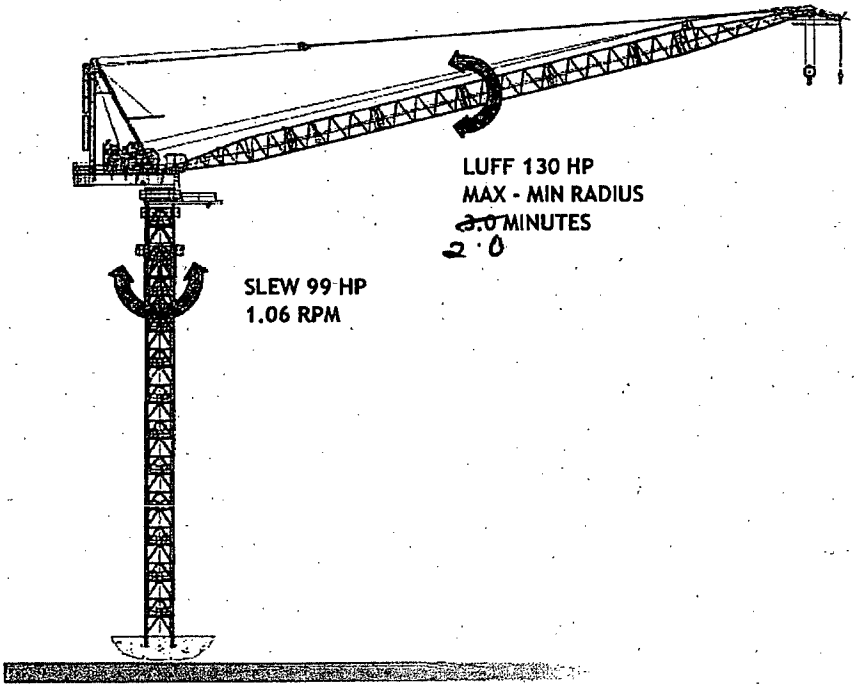


	LOAD (ton)	SPEED (ft/min)
1-FALL	10.0	396
	11.0	365
	16.5	255
	22.0	196
	27.6	158
	35.3	125
2-FALL	20.9	198
	22.0	189
	33.1	130
	44.1	99
	55.1	80
	70.5	63
3-FALL	31.5	132
	44.1	127
	55.1	97
	77.2	57
	88.2	50
	105.8	42

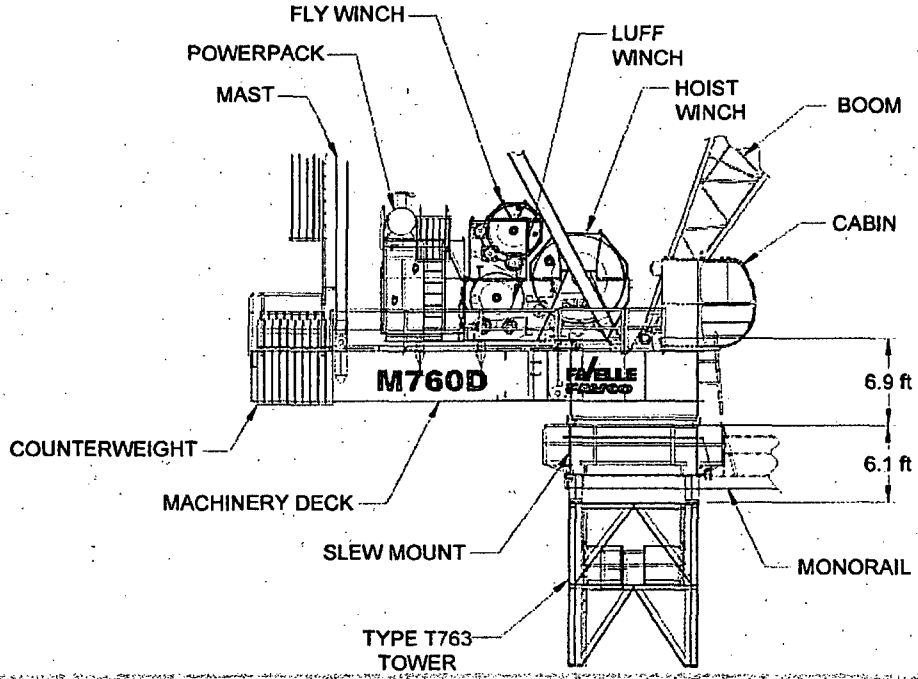


	LOAD (ton)	SPEED (ft/min)
1-FALL	2.2	727
	5.5	342
	7.7	252
	8.8	222
	11.0	180
	13.2	153

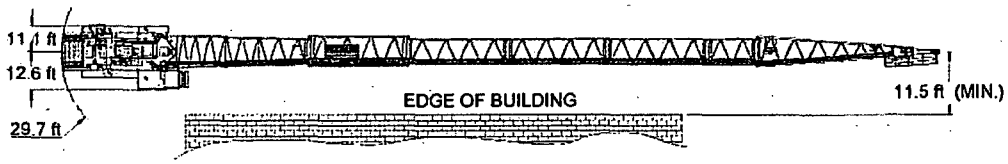
LUFF & SLEW SPEED



TYPICAL CRANE ASSEMBLY



EXTERNAL CLIMBING INSTALLATION CLEARANCE



OUT OF SERVICE CONFIGURATION

Boom Length (ft)	Minimum weathervaning*	
	Radius (ft)	Angle (°)
225	58	75.3
210	53	75.6
195	48	75.9
180	48	75.0
165	51	72.3
150	55	68.8
135	60	64.2
120	65	57.5

*: Minumum weathervaning position is based on a wind speed of 45 mph.

ITEM	QTY	DESCRIPTION	LENGTH L (feet)	HEIGHT H (feet)	WIDTH W (feet)	WEIGHT PER ITEM (ton)
1	1	SPLIT DECK-FRONT (INCL SLEW DRIVE, PINS & HANDRAILS)	11.8	6.9	11.1	9.26
2	1	SPLIT DECK-REAR	23.9	5.2	11.1	9.84
3	1	POWERPACK (INCL 850L OF OIL)	13.1	12.8	6.8	5.56
4	2	MAST FRONT LEG (INCL MAST HEAD SHEAVES & PIN)	43.7	1.7	3.6	2.76
	2	MAST BACK LEG	39.7	1.4	0.8	1.09
	1	BOOM BUFFER	12.3	0.8	9.8	0.22
		MAST ASSEMBLY (INC SHEAVES, HEAD PIN, LADDERS, BUFFER AND PLATFORMS)				10.81
5	1	CABIN & PLATFORM ASSEMBLY	15.1	7.8	5.4	1.76
6	1	HOIST/LUFF WINCH ASSY (WITHOUT ROPE)	13.2	9.6	8.5	13.12
7	1	FLY WINCH ASSEMBLY (EMPTY DRUM)	5.7	6.4	5.7	4.13
8	1	BOOM BOTTOM (INC. WALKWAY & PINS)	45.6	9.9	9.3	3.23
9	1	BOOM TOP ASSY (WITHOUT FLY) (INC. ACCESSORIES)	49.9	9.3	9.3	5.41
		BOOM TOP ASSY (WITH FLY) (INC ACCESSORIES)	55.4	9.3	9.3	6.86
10	1	BOOM EXTENSION 30.18 ft	30.6	9.3	9.3	2.71

ITEM	QTY	DESCRIPTION	LENGTH L (feet)	HEIGHT H (feet)	WIDTH W (feet)	WEIGHT PER ITEM (lcn)
11	1	BOOM EXTENSION 15.09 ft	15.5	9.3	9.3	1.46
12	1	BRIDLE	5.3	3.3	3.9	0.76
13	1	SLEW MOUNT (INCL PLATFORMS)	12.2	6.1	11.3	6.13
	1	SLEW RING (INCL BOLTS)	10.2	0.7	10.2	2.60
14	1	EXTERNAL CLIMBER ASSY	37.7	1.0	12.2	21.30
	2	CLIMBING CYLINDER	18.0	1.1	1.1	1.97
	2	SIDE PANEL	37.7	1.0	10.0	5.55
	2	FRAME TIE	23.4	0.6	12.2	0.85
	2	CLIMBING SUPPORT	8.9	1.3	2.6	0.66
	4	ACCESS PLATFORM	13.1	3.8	2.8	0.30
	1	MONORAIL	26.2	5.3	2.5	2.01
15	1	INTERNAL CLIMBER ASSY	9.9	15.1	9.9	23.26
	1	CLIMBING TOWER	9.9	13.1	9.9	17.36
	2	CYLINDER	12.9	1.1	1.1	1.97
	1	CLIMBING FOOT	10.0	3.1	1.5	1.93
16	10	COUNTERWEIGHT	10.2	0.5	7.4	7.52
17	1	98 TONNE THREE FALL HOOK BLOCK	7.4	1.7	4.1	1.13
	1	16 TONNE SINGLE FALL HOOK BLOCK	4.9	1.3	1.3	0.45
18	1	TOWER SECTION T763	9.9	13.1	9.9	6.71
19	1	HOIST ROPE 42MM (~1-5/8 in, 5.75 lb / ft)	1300.0	N/A	N/A	3.73
20	1	FLY ROPE 32MM (3.33 lb / ft)	650.0	N/A	N/A	1.08
21	1	LUFF ROPE 32MM (3.27 lb / ft)	590.0	N/A	N/A	0.96

Antriebe · WOLFF 700 B · (Hw 40132 FU)
Mechanisms
Mécanismes

Motor (kW) motor Moteur	132	132	132	110	2 x 7,5	8 x 5,5
Geschwindigkeit speed Vitesse	0 – 2,9 t 0…190 m/min stufenlos/ stepless/ en continue 0 – 20,0 t 0...33 m/min	0 – 6,2 t 0…95 m/min stufenlos/ stepless/ en continue 0 – 40,0 t 0...17 m/min	0 – 9,3 t 0…63 m/min stufenlos/ stepless/ en continue 0 – 50,0 t 0...13 m/min	1,8 – 2,8 min	0,7 min^{-1}	30,0 m/min
Hakenweg (m) hook path course du crochet	990	495	330			

Traglasten (t) · WOLFF 700 B
Load Data
Charges

Ausladung (m) / *jib radius (m)* / *Portée (m)*				20	25	30	35	40	45	50	55	60	65	70	
Auslegerlänge (m) *jib length (m)* *Longueur de flèche (m)*	70	7,3 – 28,0	20,0 t	20,0	20,0	18,4	15,1	12,7	10,8	9,3	8,1	7,0	6,2	5,4	Tragfähigkeit (t) *load capacity (t)* *Capacité de charge (t)*
	65	6,8 – 31,5		20,0	20,0	20,0	17,6	14,9	12,8	11,1	9,7	8,6	7,6		
	60	6,2 – 34,0		20,0	20,0	20,0	19,3	16,5	14,4	12,6	11,2	10,0			
	55	5,7 – 35,5		20,0	20,0	20,0	20,0	17,6	15,5	13,8	12,4				
	50	5,1 – 37,5		20,0	20,0	20,0	20,0	18,8	16,7	15,0					
	45	4,6 – 39,5		20,0	20,0	20,0	20,0	19,8	17,7						
	40	4,1 – 40,0		20,0	20,0	20,0	20,0	20,0							
	35	3,5 – 35,0		20,0	20,0	20,0	20,0								
	30	3,0 – 30,0		20,0	20,0	20,0									
Ausladung (m) / *jib radius (m)* / *Portée (m)*				20	25	30	35	40	45	50	55	60	65	70	
Auslegerlänge (m) *jib length (m)* *Longueur de flèche (m)*	70	7,3 – 19,0	30,0 t	28,3	21,6	17,2	14,0	11,6	9,8	8,3	7,1	6,1	5,2	4,5	Tragfähigkeit (t) *load capacity (t)* *Capacité de charge (t)*
	65	6,8 – 18,5	35,0 t	32,0	24,7	19,8	16,4	13,7	11,7	10,1	8,8	7,6	6,7		
	60	6,2 – 17,5	40,0 t	34,6	26,9	21,8	18,2	15,5	13,3	11,6	10,3	9,1			
	55	5,7 – 18,0		35,8	28,1	23,1	19,4	16,7	14,6	12,9	11,5				
	50	5,1 – 18,5		36,9	29,3	24,2	20,6	17,9	15,8	14,1					
	45	4,6 – 19,0		38,0	30,4	25,3	21,6	18,9	16,8						
	40	4,1 – 19,5		39,0	31,3	26,1	22,5	19,7							
	35	3,5 – 20,0		40,0	31,9	26,5	22,6								
	30	3,0 – 20,0		40,0	31,9	26,5									
Ausladung (m) / *jib radius (m)* / *Portée (m)*				20	25	30	35	40	45	50	55	60	65	70	
Auslegerlänge (m) *jib length (m)* *Longueur de flèche (m)*	55	5,7 – 14,2	50,0 t	34,6	27,0	22,0	18,4	15,7	13,6	11,9	10,5				Tragfähigkeit (t) *load capacity (t)* *Capacité de charge (t)*
	50	5,1 – 14,5		35,7	28,2	23,2	19,6	16,9	14,8	13,1					
	45	4,6 – 14,8		36,8	29,2	24,2	20,6	17,9	15,8						
	40	4,1 – 15,2		37,9	30,2	25,1	21,4	18,7							
	35	3,5 – 15,6		38,7	30,7	25,4	21,6								
	30	3,0 – 15,6		38,8	30,8	25,5									

TADANO

Worldwide offices

International

TADANO Ltd
International Division
4-17 Kamezawa 2-chome
Sumida-ku, Tokyo 130-0014 Japan
Phone: +81-3-3623-7751
Fax: +81-3-3623-7785
E-mail: tdnint@tadano.co.jp

TADANO America Corporation
10262 West Greens Road
Houston, TX 77064, USA
Phone: +1-281-869-0830
Fax: +1-281-869-0840
E-mail: sales@tadano-cranes.com

TADANO MANTIS Corporation
1705 Columbia Avenue, Suite 100
Franklin, Tennessee USA 37065
Phone: +1-800-772-4325
Fax: +1-615-793-3800
E-mail: sales@mantiscranes.com

TADANO Ltd. Middle East Representative Office
P.O. Box 18302, LOB15-323
Jabel Ali Free Zone, Dubai, UAE
Phone: +971-4-887-1353
Fax: +971-4-887-1705
E-mail: tadano@tadano.ae

TADANO Oceania Pty. Ltd.
47/12 Archerfield Close, Darra
Queensland 4076
Australia
Phone: +61-7-3120-8750
Fax: +61-7-3120-8760
E-mail: pshelton@tadano.com.au

TADANO Ltd. Beijing Office
Jing Guang Center, Room 2805
Hujia Lou, Chaoyang District
Beijing, China
Phone: +86-10-6597-7210
Fax: +86-10-6597-7220
E-mail: tiemy@tadano.co.jp

TADANO South China Co. Ltd.
Room 1803, 18/F, Seaview Commercial
Building, 21-24 Connaught Road West
Hong Kong
Phone: +852-2544-9311
Fax: +852-2541-6828
E-mail: info@tadanoh.com

TADANO Korea Co. Ltd.
Daeduk Bldg. 2F, #842-4, 3Dongchon-Dong
Sujeong-Gu, Seongnam-Si, Gyeonggi-Do
461-850, Korea
Phone: +82-2-714-1600
Fax: +82-2-714-1604
E-mail: tadano@korea.com

TADANO Asia Pte. Ltd.
61 Tuas View Crescent
Jurong Building
Singapore 637643
Phone: +65-6863-6901
Fax: +65-6863-6902
E-mail: [illegible]

Taiwan TADANO Ltd.
15F, No. 87, Sec. 2, Wenhua S. Rd.
Taipei
Taiwan
Phone: +886-2-2764-0252
Fax: +886-2-2709-2085
E-mail: tadano@ms5.hinet.net

Europe

TADANO FAUN GmbH
Faunburg 2
91207 Lauf a. d. Pegnitz
Germany
Phone: +49-9123-935-0
Fax: +49-9123-9085
E-mail: info@tadanofaun.de

Detaillierte Informationen über unsere internationalen Händler und Service Niederlassungen finden Sie im Internet.
For detailed information about our International Distributor and Service Network, please refer to our homepages:

www.tadano.co.jp + www.tadanoamerica.com + www.mantiscranes.com + www.tadanofaun.de

Herausgeber/Publisher:

TADANO FAUN GmbH
P.O. Box 10 02 64
91205 Lauf
Germany

TÜV ISO 9001

Ev. 10.06.2000

KENVIL SAFETY PROGRAM

@

Waterfront Corporate Center

Hoboken, NJ

April 2013

SAFETY PROGRAM MANUAL

Kenvil United Corporation
PO Box 32
Wharton, NJ 07885
Phone: 973-927-0010
Fax: 973-927-4370

ADDITIONAL EMERGENCY NUMBERS

(Daytime only)

Chemtrec	1-800-424-9300
Agency for Toxic Substances and Disease Registry (ATSDR)	1-888-422-8737
National Response Center	1-800-424-8802
ATF (Explosives)	1-888-283-2662
Pesticide Information Service	1-800-222-1222
Resource Conservation and Recovery Hotline	1-800-424-9346
National Poison Control Center	1-800-942-5969
U.S. DOT	1-202-366-0656

Contents

Contents 2

KENVIL UNITED CORP. EMERGENCY RESPONSE 4

ADDITIONAL EMERGENCY NUMBERS 5

POLICY DECLARATION 6

ACCIDENT AND INJURY PREVENTION PROGRAM 7

Safety Meetings 7

Accident Prevention Policies 7

Hazard Identification and Controls 8

Training 8

Management Commitment 8

Employee Involvement and Compliance 9

Agreement to Participate 9

6' FALL PROTECTION @ Waterfront Corporate Center ..... **Error! Bookmark not defined.**

BOOM LIFT AND AERIAL PLATFORM SAFETY INFORMATION 21

COMPLIANCE WITH OSHA 22

GENERAL RULES 23

Handtools 25

Lifting and Manual Handling 25

Ladder Safety 26

Fall Protection 27

SAFETY GOALS AND OBJECTIVES @ Waterfront Corporate Center 29

GENERAL DESCRIPTION OF PROJECT SCOPE 29

SUBPART D-OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROLS 29

SUBPART E-PERSONAL PROTECTIVE EQUIPMENT 29

SUBPART F-FIRE PROTECTION AND PREVENTION 30

SUBPART G-SIGNS, SIGNALS, AND BARRICADES 32

SUBPART H-MATERIALS HANDLING, STORAGE, USE AND DISPOSAL 34

SUBPART I—TOOLS, HAND AND POWER 34

SUBPART J—WELDING AND CUTTING 34
SUBPART K—ELECTRICAL 35
SUBPART L—SCAFFOLDS 35
SUBPART M—FALL PROTECTION 35
SUBPART N—CRANES, DERRICKS, HOISTS, ELEVATORS, AND CONVEYORS 39
HOISTING, RIGGING AND MULITPLE LIFT RIGGING PROCEDURE @ Waterfront Corporate Center 43
SUBPART O—MOTOR VEHICLES, MECHANIZED EQUIPMENT, ETC. 44
SUBPART P-EXCAVATIONS 44
SUBPART Q-CONCRETE AND MASONRY CONSTRUCTION 44
SUBPART R-STEEL ERECTION (AND PRECAST CONCRETE ERECTION) 44
SUBPART S-TUNNELS AND SHAFTS, CAISSONS, COFFERDAMS, ETC 44
SUBPART T-DEMOLITION 45
SUBPART U-BLASTING AND USE OF EXPLOSIVES 45
SUBPART V-POWER TRANSISSION AND DISTRIBUTION 45
SUBPART W-ROLLOVER PROTECTIVE STRUCTURES, OVERHEAD PROTECTION 45
SUBPART X-STAIRWAYS AND LADDERS 45
SUBPART Y-COMMERCIAL DIVING OPERATIONS 46
SUBPART Z- TOXIC AND HAZARDOUS SUBSTANCES 46
MSDS 47

KENVIL UNITED CORP. EMERGENCY RESPONSE

@

Waterfront Corporate Center

Hoboken, NJ

For all emergencies ***call 911***

Other emergency contacts:
Hoboken Fire Marshall: 201-420-2269
Hoboken Police Department: 201-420-2100
Hospital: Hoboken University Medical Center
Directions to Hospital: Head north on Sinatra Dr, make a left on to 4th St. Go approx. ¼ mile (8 blocks), make a left on to Willow, destination is on the right.

For all emergencies, employees shall report directly to a Kenvil United supervisor/foreman who is equipped with a cellular phone, should it be necessary to contact first aid.

Emergencies or accidents at locations on the building might require assistance to lower the worker to the ground with a boom lift. Care and precaution must be taken to insure the ill/injured workers safety maintaining 100% tie off.

All foremen should contact the Kenvil United office @ 973-927-0010 or Gerry Fahy @ 973-943-7785, after calling 911, should the incident require emergency assistance.
In addition the foreman will also notify the following:

Accidental injuries shall be reported by completing State of New Jersey "Employers First Report" forms and shall forward to the Kenvil United office.

POLICY DECLARATION

Kenvil United Corporation is committed to running a safe job for the very simple reason that it makes good sense.

Effective job planning results in a more productive and efficient work place, while protecting our most important asset: our employees.

ACCIDENT AND INJURY PREVENTION PROGRAM

Hazard control is the heart of an effective accident and injury prevention program. By implementing specific procedures such as pre-job hazard analysis and job site inspections prior to the beginning of all projects, specific pre-construction hazards may be addressed and corrected prior to the start of work. It is always better to begin a project knowing all of the hazards.

Each employee has a responsibility to prevent accidents. You have a responsibility to your family and to your fellow co-workers to use common sense and good judgment when conducting all work practices. Your responsibilities are to include:

- Incorporate safety into every job procedure.
- Plan the work. Work the plan.
- No job is done efficiently unless it has been done safely.
- Know and obey all safety procedures.
- Report all injuries immediately no matter how slight.
- Caution fellow workers if you see an unsafe act.
- Don't take chances.
- Ask questions whenever there is doubt concerning safety.
- Never tamper with things you don't understand.
- Report all unsafe conditions or equipment to your supervisor immediately.

Concentrated efforts shall produce safe working conditions and will result in efficient, productive operations. Safeguarding the health and welfare of yourself as well as others cannot be stressed too strongly. Management, Supervisors, and Foreman will be responsible for the continuous effort, and documentation directed towards the prevention of accidents.

Safety Meetings

Safety meetings are to be held prior to the start of all work regardless of whether it is pre-construction or the beginning of a business day for an ongoing project. Documentation of all safety briefings must be submitted and returned to your supervisor at the end of the workday. Monthly safety meetings will be held and be subject to documentation.

Accident Prevention Policies

The following procedures must be implemented prior to the start of all project work and throughout the duration of the project work.

- Pre-Construction Walk Through
- Preexisting Hazardous Conditions Analysis
- Job planning and Safety Issues
- Pre-Construction Photos
- Job Briefing
- Safety Meetings with Documentation
- Vehicle and Equipment Inspections
- Housekeeping
- Incident Reporting And Documentation

Hazard Identification and Controls

A written Site Specific Health and Safety Plan (HASP) must be implemented prior to the start of all project work to insure that all hazards associated with the project are properly addressed and contingency plans are available. The plans shall include information concerning:

- Worksite Hazards and Controls
- Contact Names and Numbers
- Emergency Telephone Numbers
- Local Police and Fire (non-emergency)
- Nearest Medical Facility and Directions
- Scope of work

Training

Employees of Kenvil United Corp. will have received instruction in the following training programs during the orientation process:

- Personal Protective Equipment
- Fall Protection
- Hazard Communications
- Respirator Protection
- Hearing Conservation Program
- Drug and Alcohol Program
- Chain of Command
- Recognizing Utilities
- Accident Prevention
- Housekeeping

Specific training certifications are required to obtain supervisory and foreman status positions. Certifications regarding these specific job titles may be provided to individuals by an independent provider.

Management Commitment

Ensuring the safety and health of our employees is our first consideration in operating our business. While we cannot guarantee an accident free workplace, following the safety procedures set forth to you in this manual can significantly reduce the risk of danger to you and your co-workers. Prevention of occupationally induced injuries and illness will be given precedence over all operating productivity. Management will provide to you all mechanical and physical protection required for your personal safety and health. It is the ultimate responsibility of the employee to work safely. Common sense, smart planning strategies, and the knowledge of the job can prevent most accidents from occurring.

Employee Involvement and Compliance

Kenvil United Corporation (KU) employees will be subject to an orientation class under direction of Gerald Fahy of KU in order to fulfill part of KU's commitment to worker safety. At orientation you will receive an overview of the company's health and safety programs. All questions regarding the directives within the manual shall be answered at that time. Specialized training requirements for specific job positions at KU may be obtained by an independent instructional provider prior to the start of employment at Kenvil United Corp. Certifications and other licenses must be valid and kept current. Copies of such said qualifications must be submitted to our corporate office for verification.

Agreement to Participate

Employees will be asked to sign and date an acknowledgement located at the end of this manual. Participation in all aspects of the manual is required. If you do not understand any policy in the written plan, please ask for verification on the day of orientation. If you have questions regarding any aspect of your job responsibility, policy, or procedure contact your supervisor before proceeding any further with the job. Employees have the right to stop production procedures at any time to report unsafe working conditions or concerns, and will never be subjected to disciplinary action. However, know that disciplinary action may result from a violation of the company's safety practices.

Competent Persons

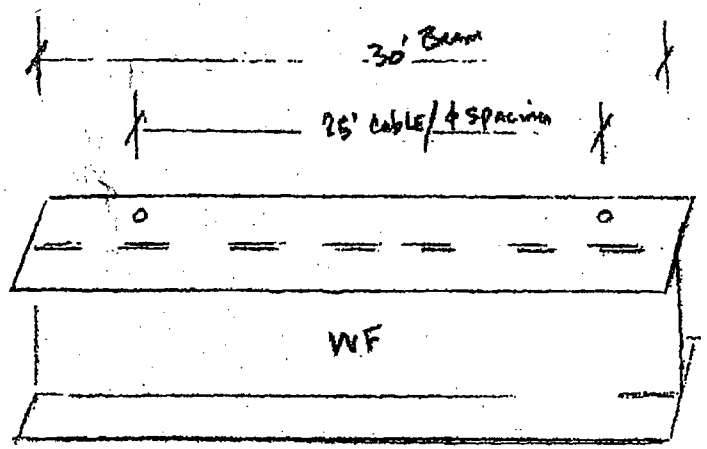
Dave Bennett, Shaun Carter, or Dean Hartman are the Competent Person(s) for Kenvil United Corporation (KU) on the **Waterfront Corporate Center** Project. One of them will be on site at all times when KU is performing work. Each man is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and has the authority to take prompt corrective measures to eliminate them. By way of training and experience, each man is knowledgeable of applicable standards relating to KU's specific operations.

Experience and training:
OSHA 30 Certified
OSHA 10, Subpart R Certified
Lift training Certified

Kenvil United Corporation

Typical fall protection layout @ perimeter beams, tie beams and main girder lines

*Tie off cables will require 2 holes per beam, cables will be dimensioned @ 5' increments



EXAMPLE

Example beam lengths:

12' 7 – 17' 6 use 10' cable / hole spacing

17' 7 – 22' 6 use 15' cable / hole spacing

22' 7 – 27' 6 use 20' cable / hole spacing

27' 7 – 32' 6 use 25' cable / hole spacing

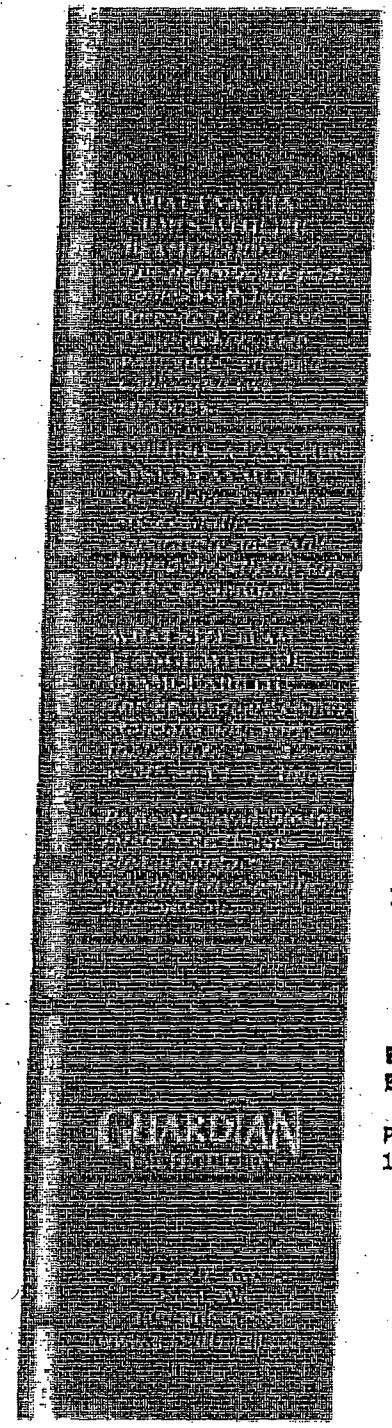
32' 7 – 37' 6 use 30' cable / hole spacing

37' 7 – 42' 6 use 35' cable / hole spacing

42' 7 – 47' 6 use 40' cable / hole spacing

47' 7 – 52' 6 use 45' cable / hole spacing

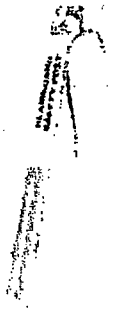
52' 7 – 57' 6 use 50' cable / hole spacing



GUARDIAN
FALL PROTECTION

BeamGuard Safety Post

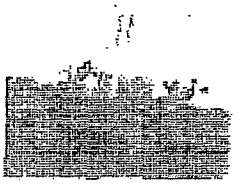
APPLICATIONS:
For use on steel I beams capable of withstanding 5,000 lbs. Can be used as a personal post or in conjunction with a horizontal lifeline system.



FEATURES:

- Post offset at an angle allowing freedom of movement for workers
- Can facilitate horizontal lifeline systems for up to two workers per section
- Unique post design has a "built-in shock absorber" eliminating the need for shock absorbers in the cable
- 42" high post is the tallest on the market
- Requires no tools for installation
- Available with Pass-Thru Tops
- Powder-coated yellow finish

Pass-Thru Top
(Sold separately)



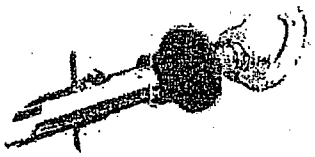
INSTALLATION AND PROPER USE:
Install the BeamGuard on top flanges over 4" wide. Maximum two workers between posts. Spacing is 10 – 60 ft. Install any number of posts in a row without interruption. Maximum worker weight is 310 lbs. Read all warnings and instructions before use.

BEAMGUARD MODEL #: 04700
BEAMGUARD PASS-THRU TOP: 04710

Please contact Guardian for all warnings and instructions:
1-800-466-6385

BeamGuard Safety Posts are tested to meet all applicable ANZI Z359.1 standards and comply with OSHA standards. Use only with compatible equipment.

GUARDIAN
FALL PROTECTION



Bolt Hole Anchor (Girder Grip) Manual

DO NOT THROW AWAY THESE INSTRUCTIONS!
READ AND UNDERSTAND BEFORE USING EQUIPMENT!

This manual should be read and understood in its entirety, and used as part of a training program as required by OSHA or any applicable state regulatory agency.

This and any other included instructions must be provided to the users of the equipment. The user must understand the proper equipment use and limitations

This product meets all applicable OSHA and ANSI standards for fall protection.

Guardian Fall Protection Kent, WA
800-446-6385 www.guardianfall.com

[illegible] Selection of fall protection shall be made by a Competent Person. All fall protection equipment shall be purchased new and unused.

The equipment is designed for use as a part of a personal fall protection system. Components shall not be used for any other operation other than that which it has been designed and approved.

Fall Arrest Systems shall be designed to comply with OSHA or applicable state regulatory limitations. Systems must be used in a compliant manner.

Fall Restraint systems shall be designed by a Qualified Person, and must be installed and used under the supervision of a competent person

Consult a doctor if there is any reason to doubt a user's ability to withstand and safely absorb fall arrest forces. Age, fitness, and health conditions can seriously affect the worker should a fall occur. Pregnant women and minors should not use this equipment.

WARNING!

DO NOT:

- **Do not alter or misuse this equipment.**
- **Do not use combinations of components or subsystems that may affect or interfere with the safe, compatible function of each other.**
- **Do not expose the equipment to chemicals which may produce a harmful effect or degrade the equipment. Consult manufacturer in cases where doubt exists.**
- **Do not use the equipment around moving machinery or electrical hazards unless specifically designed for such use.**
- **Do not use the equipment around sharp edges or abrasive surfaces unless intended for such use.**

[illegible] The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards. Relevant Federal, State, and local regulatory requirements, procedures, and standards shall also be a part of training.

The employer shall ensure that each employee has been trained, as necessary, by a Competent or Qualified Person in the nature of fall hazards in the work area, the correct erecting, maintaining, disassembling, and inspection of the fall protection systems being used, and the use of personal fall arrest systems.

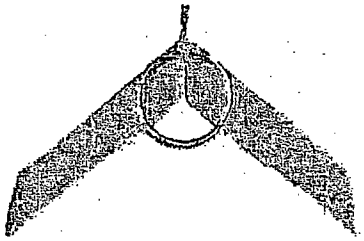
[illegible] The user is required to have a rescue plan and the means at hand to implement it when using the equipment. The plan shall be project specific. Employees shall be trained in self-rescue or alternate means shall be provided for prompt rescue in the event of a fall.

[illegible] Remove the equipment from service immediately if it has been subjected to the forces of a fall arrest. Contact your distributor or Guardian about policies regarding replacement of Guardian components involved in a fall.

- Only the manufacturer of this equipment or persons or entities authorized in writing by the manufacturer shall make repairs to fall protection equipment.
- The date of first inspection should be recorded by the employer on the equipment, and any serial numbers shall be recorded on the Inspection Log.
- Formal inspections shall be made by either a Competent or Qualified Person on at least a semi-annual basis.

- Fall protection equipment shall be inspected by the user for defects, damage, or deterioration.
- Any suspected defective equipment shall be removed from service.
- If the manufacturer's label is not legible or is missing, the equipment shall be removed from service. Fall protection equipment shall be removed from service upon evidence of defects, damage, or deterioration, or upon expiration of the manufacturer's specified service limits, whichever comes first.

GUARDIAN
FALL PROTECTION



GLOBAL ANCHOR

DO NOT THROW AWAY THESE INSTRUCTIONS!
READ AND UNDERSTAND BEFORE USING EQUIPMENT!

This manual should be read and understood in its entirety, and used as part of a training program as required by OSHA or any applicable state regulatory agency.

This and any other included instructions must be provided to the users of the equipment. The user must understand the proper equipment use and limitations.

Guardian Fall Protection Kent, WA
800-466-4385 www.guardianfall.com

[illegible] Selection of fall protection equipment shall be made by a Competent Person. All fall protection equipment shall be purchased new and unused.

The equipment is designed for use as a part of a personal fall protection system. Components shall not be used for any other operation other than that which it has been designed and approved.

Fall Arrest Systems shall be designed to comply with OSHA or applicable state regulatory limitations. Systems must be used in a compliant manner.

Fall Restraint systems shall be designed by a Qualified Person, and must be installed and used under the supervision of a competent person.

Consult a doctor if there is any reason to doubt a user's ability to withstand and safely absorb fall arrest forces. Age, fitness, and health conditions can seriously affect the worker should a fall occur. Pregnant women and minors should not use this equipment.

WARNING

DO NOT:

- *Do not alter or misuse this equipment.*
- Do not use combinations of components or subsystems that may affect or interfere with the safe, compatible function of each other.
- Do not expose the equipment to chemicals which may produce a harmful effect or degrade the equipment. *Consult manufacturer in cases where doubt exists.*
- Do not use the equipment around moving machinery or electrical hazards unless specifically designed for such use.
- Do not use the equipment around sharp edges or abrasive surfaces unless intended for such use.

[illegible] The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize those hazards. Relevant Federal, State, and local regulatory requirements, procedures, and standards shall also be a part of training.

The employer shall ensure that each employee has been trained, as necessary, by a Competent or Qualified Person in the nature of fall hazards in the work area. *Training shall also include the correct erecting, maintaining, disassembling, and inspection of the fall protection systems being used, and* the use of personal fall arrest systems.

[illegible] The user is required to have a rescue plan and the means at hand to implement it when using the equipment. The plan shall be project specific. *Employees shall be trained in self-rescue or alternate means shall be provided for prompt rescue in the event of a fall.*

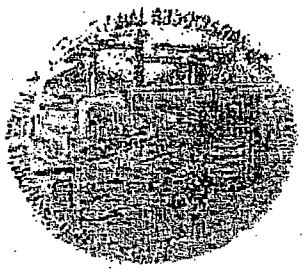
[illegible] Remove the equipment from service immediately if it has been subjected to the forces of a fall arrest. Contact your distributor or Guardian about policies regarding replacement of Guardian components involved in a fall.

- Only the manufacturer of this equipment or persons or entities authorized in writing by the manufacturer shall make repairs to fall protection equipment.
- The date of first inspection should be recorded by the employer on the equipment, and any serial numbers shall be recorded on the *Inspection Log.*
- Formal inspections shall be made by either a Competent or Qualified Person on at least a semi-annual basis.

- Fall protection equipment shall be inspected by the user for defects, damage, or deterioration.
- *Any suspected defective equipment shall be removed from service.*
- If the manufacturer's label is not legible or is missing, the equipment shall be removed from service. Fall protection equipment shall be removed from service upon evidence of defects, damage, or deterioration, or upon expiration of the manufacturer's specified service limits, whichever comes first.

IRONWORKERS'

Standards of Excellence



The purpose of the Ironworkers' Standards of Excellence is to reinforce the pride of every Ironworker and our commitment to be the most skilled, most productive and safest craft in the Building Trades.

As Union Ironworkers, we pledge ourselves to uphold our word, as given through our Collective Bargaining Agreement, and display the professionalism expected of our trade and Union in all aspects of our employment as exemplified by the values engrained in our Standards of Excellence.

It is a commitment to use our training and skills, each and every day, to produce the highest quality work worthy of our name and consistent with the collective bargaining agreement.

As an Iron Worker member, I agree to:

1. Adhere to my responsibilities under the Collective Bargaining Agreement for start and quit times, as well as lunch and break times.
2. Allow my Representatives to handle any disagreements or breaches by refusing to engage in unlawful job disruptions, slowdowns or any activities that affect our good name.
3. Respect the Customer's and Employer's rights, property and tools as I do my own.
4. Meet my responsibility to show up every day; outfitted for work and fit for duty without engaging in substance abuse.
5. Cooperate with the Customer and Employer to meet their statutory, regulatory and contractual responsibilities to maintain a safe, healthy and sanitary workplace.
6. Do my best to work in a manner consistent with the quality, productivity and safety of every task that I am assigned.
7. Do my best to help every co-worker return home safe at the conclusion of every shift.

The Ironworkers' Standards of Excellence will increase the pride, the productivity and the craftsmanship of every Ironworker throughout North America. This commitment will improve work place conditions, increase work opportunities, and help maintain our wages, benefits and standard of living. In addition, the Standards of Excellence will help our signatory employers complete their projects on time, on budget with no injuries or accidents.

In accordance with Article XXVI of the International Constitution, charges may be preferred against any member for violations of the Ironworkers' Standard of Excellence, including but not limited to the following reasons:

- Taking a job referral and not reporting to work.
- Failing pre-employment qualifications.
- Discharged for excessive absenteeism.

Fines for the first offense shall be no less than $100.00 or no more than one (1) day's pay including fringe benefits and working assessments.

BOOM LIFT AND AERIAL PLATFORM SAFETY INFORMATION

The following information should be reviewed and fully understood because a lift operator's primary responsibility is "Safety".

1) The lift operator shall inspect for possible leaks, loose equipment, or damage.
2) Operators shall review machine decals, load charts and safety requirements.
3) Equipment not in proper condition shall be "tagged out" until an authorized representative deems the lift worthy of operation.
4) Site conditions must be inspected to insure lift stability around site. Operators shall inspect for power lines, trenches or other potential hazards.
5) Operators shall familiarize themselves with machine controls and especially the emergency stop button should the need arise.
6) Operators shall immediately "tie-off" in boom lifts and refrain from climbing over safety rails.
7) The operator shall be fully trained and will provide supporting documentation on each job.

I have read the above lift operation information and understand the safety concerns.

_____ _____

Signature Date

COMPLIANCE WITH OSHA

IT IS OUR POLICY TO ADHERE TO THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, OSHA SUBPART R AND THE NJSDA SAFETY MANUAL. WE AGREE WITH ITS INTENT AND PURPOSE AND WILL FULLY COMPLY WITH THE RULES AND REGULATIONS.

IT IS EXPECTED THAT EACH EMPLOYEE, ANY CONTRACTORS AND SUBCONTRACTORS AND ALL THEIR EMPLOYEES WILL COMPLY WITH SECTION 5(b) OF THE ACT, WHICH STATES:

"EACH EMPLOYEE SHALL COMPLY WITH OCCUPATIONAL SAFETY AND HEALTH STANDARDS AND ALL RULES, REGULATIONS AND ORDERS ISSUED PURSUANT TO THIS ACT WHICH ARE APPLICABLE TO HIS OWN ACTIONS AND CONDUCT."

OBEY SAFETY RULES AND REGULATIONS
THEY ARE FOR YOUR PROTECTION

GENERAL RULES

- ALWAYS WEAR A HARDHAT WHEN WORKING ON OR AROUND ERECTION OPERATIONS. KEEP THE CHINSTRAPS FASTENED WHEN WORKING ALOFT.
- USE A SAFETY HARNESS AND LANYARD WHILE WORKING ON A JOB WHERE A FALLING HAZARD EXISTS AND SCAFFOLD PROTECTION IS NOT PRACTICAL. SAFETY BELTS AND LIFT LINES SHOULD ALWAYS BE USED WHILE WORKING ON WOOD FLOATS.
- SAFETY NETS SHOULD BE USED PARTICULARLY WHERE PLATFORMS OR SCAFFOLDS ARE NOT FEASIBLE.
- WEAR GLOVES OF A SUITABLE TYPE WHEN HANDLING STEEL, CABLES OR OTHER ROUGH OR SHARP-EDGED MATERIAL.
- USE GOGGLES WHEN GRINDING, CHIPPING, SCRAPING, CAULKING, HEATING RIVETS, OR CUTTING AND WELDING.
- WEAR SAFETY SHOES IN GOOD REPAIR. KEEP THE SOLES FREE FROM MUD AND GREASE TO AVOID SLIPPING.
- REPORT ALL INJURIES FOR TREATMENT, REGARDLESS OF HOW MINOR THEY MAY SEEM.
- LIFT SAFELY.
- REMOVE DEFECTIVE LADDERS FROM SERVICE. SET LADDERS FIRMLY. SECURE AT THE BOTTOM AND TOP. EXTEND AT LEAST 42 INCES ABOVE THE LANDING. KEEP BOTH HANDS FREE WHILE EXTENDING AND/OR DESCENDING LADDERS.
- AT THE END OF EACH WORKDAY, SECURE NAIL KEGS, BOARDS OR OTHER LOOSE, LIGHT MATERIALS, OR REMOVE THEM FROM OPEN FLOORS OR SCAFFOLDS SO THAT THEY WILL NOT BE BLOWN OFF IN THE EVENT OF HIGH WINDS.

- DO NOT RIDE ON STEEL THAT IS BEING HOISTED. DO NOT RIDE ON THE BALL, HOOKS, CABLES OR SLINGS. ALSO DO NOT SLIDE DOWN ROPES OR CABLES.

- DO NOT THROW MATERIAL FROM WORK AREAS TO THE GROUND. LOWER IT WITH A ROPE.

- DO NOT WORK IN OR BELOW AREAS WHERE RIVET HEATING, RIVETING OR PAINTING IS BEING DONE.

- DO NOT ATTEMPT TO REPAIR ELECTRICAL EQUIPMENT OR WIRING. THIS IS A JOB FOR THE ELECTRICIAN.

- WELDING AND CUTTING SHOULD BE PERFORMED ONLY BY AUTHORIZED AND QUALIFIED PERSONS.

- FIRE EXTINGUISHERS SHOULD BE CONSPICUOUSLY LOCATED.

- WHEN WORK IS STOPPED FOR THE DAY, LOWER THE BOOM TO A HORIZONTAL POSITION OR TIE IT SECURELY IN PLACE TO PREVENT ACCIDENTALLY DROPPING, IF LOCATED NEAR AIRPORT AND OR FLIGHT PATTERN.

- DO NOT SWING LOADS OVER ANY PERSONS, NOR ALLOW ANYONE TO WALK UNDER THE LOAD. USE A TAG LINE TO PREVENT LOAD FROM SWINGING. SIGNAL SHOULD ON LY BE GIVEN BY PERSONS SUPERVISING THE LIFTS OR BY AN ASSIGNED SIGNAL MAN.

- PROVIDE SHIELDING PROTECTION FOR EMPLOYEES AND PUBLIC WHEN X-RAYING WELDS.

Reference:
U.S. Department of Labor
Safety and Health Regulations for Construction
Occupational Safety and Health Act
Subpart R-Steel Erection

Handtools

TOOLS ARE DESIGNED TO DO A SPECIFIC JOB. THEY CAN ONLY DO THEIR JOB IF KEPT IN GOOD CONDITION. NEGLECTED TOOLS WILL CAUSE ACCIDENTS. THE FOLLOWING CARE MUST BE EXERCISED:

BASIC RULES FOR HANDTOOL SAFETY

- SELECT THE RIGHT TOOL FOR THE JOB.
- KEEP TOOLS IN GOOD CONDITION.
- USE TOOLS PROPERLY.
- KEEP TOOLS IN A SAFE PLACE.
- DO NOT USE TOOLS WITH BROKEN OR CRACKED HANDLES.

Lifting and Manual Handling

TO AVOID INJURY, OBSERVE THESE SIMPLE SAFETY PRECAUTIONS:

CHECK THE LOAD BEFORE THE ACTUAL LIFT TO BE SURE YOU CAN LIFT IT. IF NOT, GET HELP.

BEFORE LIFTING GET A SOLID FOOTING, BEND YOUR KNEES AND KEEP YOUR BACK STRAIGHT.

ALWAYS WALK WITH A LOAD, NEVER RUN. BE SURE YOU CAN SEE WHERE YOU ARE GOING.

AVOID TWISTING WHENEVER POSSIBLE.

Ladder Safety

SAFETY STANDARDS AND RECOMMENDED SAFETY PRECAUTIONS RELATED TO THE USE OF LADDERS CUT DOWN ON THE NUMBER OF ACCIDENTS RESULTING FROM FALLS AND IMPROPER USE OF LADDERS.

SAFETY PRACTICES AND PLACEMENT:

ALL LADDERS MUST BE SECURELY TIED OFF.

USE THE FOUR TO ONE RATIO, THAT IS, PLACE THE LADDER SO ITS FEET ARE ONE FOOT AWAY FROM WHAT IT LEANS AGAINST FOR EVERY FOUR FEET IN HEIGHT TO THE POINT WHERE THE LADDER RESTS. EXAMPLE: IF THE TOP OF A 16 FT. LADDER LEANS AGAINST A WALL, ITS FEET SHOULD BE PLACED 4 FT. FROM THE WALL.

NEVER USE A LADDER IN A HORIZONTAL POSITION AS A RUNWAY OR SCAFFOLD.

NEVER PLACE A LADDER IN FRONT OF A DOOR THAT OPENS TOWARD IT UNLESS THE DOOR IS LOCKED, BLOCKED, OR GUARDED BY SOMEONE.

PLACE A LADDER SO THAT BOTH SIDE RAILS HAVE SECURE FOOTING. PROVIDE SOLID FOOTING ON SOFT GROUND TO PREVENT THE LADDER FROM SINKING.

NEVER LEAN A LADDER AGAINST UNSAFE BACKING, SUCH AS LOOSE BOXES OR BARRELS.

EXTEND THE LADDER SIDE RAILS AT LEAST 3 FEET ABOVE THE TOP LANDING.

Fall Protection

WHERE REQUIRED, ALL PERSONNEL WILL BE EQUIPPED WITH A BODY HARNESS AND 6 FOOT LANYARD. THE LANYARD SHALL BE ATTACHED TO THE BODY HARNESS AND SECURED AROUND THE CLOSEST FIXED STEEL MEMBER.

WHEN WORKING IN A BOOM HOIST ALL PERSONNEL SHALL WEAR A FULL BODY HARNESS AND ATTACH LANYARD TO THE WORKING PLATFORM. WHEN WORKING FROM A LADDER, THE LANYARD SHALL BE ATTACHED TO STEEL AS STATED ABOVE.

SAFETY CABLE SHALL BE INSTALLED AROUND ALL FLOOR OPENINGS AND THE PERIMETER OF THE BUILDING AFTER FLOOR DECK HAS BEEN INSTALLED.

VIOLATIONS OF SAFETY REQUIREMENTS WILL BE GROUNDS FOR DISMISSAL.

CRANE SIGNALS

USE LOAD LINE

USE WHIP LINE

RAISE THE BOOM AND LOWER THE LOAD

LOWER THE BOOM AND RAISE THE LOAD

RAISE THE LOAD

LOWER THE LOAD

SWING

STOP

RAISE THE LOAD SLOWLY

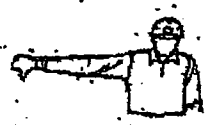
LOWER THE LOAD SLOWLY

EMERGENCY STOP

DOG EVERYTHING

TRAVEL (Both Tracks) Use both fists, making a circular motion indicating direction of travel, forward or backward.

RAISE THE BOOM



LOWER THE BOOM

TRAVEL (One Track) Lock the track on side indicated by extend fist. Travel opposite track in direction indicated by slower motion of other fist.

SAFETY GOALS AND OBJECTIVES @ Waterfront Corporate Center

To provide a safe work environment to construct structural framing, joist and metal deck for Waterfront Corporate Center. Every employee shall leave this job just as he arrived-EVERYDAY.

GENERAL DESCRIPTION OF PROJECT SCOPE

Install structural steel, joist, metal deck and OSHA protection at the perimeter and floor penetrations. Two (2) line OSHA cable with posts where required shall be installed immediately. Bridge safety and logistics plan will be submitted later as separate submittal.

EMPLOYEE AWARENESS OF SAFETY:

Lift training, tool box rules, safety manual review.

PARTIES RESPONSIBLE FOR SITE COMPLIANCE:

All Foremen to be named later, job steward, and Gerald Fahy, president of Kenvil United shall be responsible for compliance at the worksite.

SUBPART D-OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROLS

ANY SPECIAL ENVIRONMENTAL CONDITIONS REQUIRING SPECIAL ATTENTION:
None known
PROPOSED CONTROLS:
Welding shields and eye protection for welding and burning operations are to be worn as appropriate.
COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett (see attached competent person statement)

SUBPART E-PERSONAL PROTECTIVE EQUIPMENT

ANY SPECIAL CONDITIONS REQUIRING UNUSUAL APPARATUS, ADDITIONAL PPE:
All employees shall be equipped with and utilize hard hats, safety glasses, fall protection equipment, face shields and ear protection to ensure the safety of all employees, 100% of the time.
COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART F-FIRE PROTECTION AND PREVENTION

FIRE PROTECTION OF EXISTING FACILITIES:
Provide fire extinguishers for trucks and welding and burning tasks. Separate oxygen and acetylene tanks.
PROPOSED CONTROLS:
All burning and welding will proceed only after a hot work permit has been submitted. Fire watch procedures shall include inspection of area to ensure that no flammable liquids or debris are present. 20ABC extinguishers shall be present as well as fire blankets where material below requires protection.
COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

NJSDA Form G

SDA

NJ SCHOOLS DEVELOPMENT AUTHORITY

HOT WORK PERMIT

School District: _____ **Project/Site:** _____

TIME HOT WORK ALLOWED: _____ **TO:** _____ **DATE:** _____

JOB DESCRIPTION: _____

TYPE OF WORK

- ☐ ELECTRIC WELDING
- ☐ CHISELING
- ☐ GRINDING
- ☐ BRAZING
- ☐ SOLDERING
- ☐ GAS WELDING/BURNING
- ☐ OTHER _____
- ☐ MELTING POT
- ☐ RHD HEADING
- ☐ POWER GUN
- ☐ HAMMERING
- ☐ DRILLING

PERSON DOING THE WORK MUST CHECK ITEMS & SIGN BELOW

HAND FIRE EXTINGUISHER IN AREA	☐ YES	☐ NO
COMBUSTIBLE MATERIALS REMOVED FROM AREA	☐ YES	☐ NO
COMBUSTIBLE MATERIALS REMOVED FROM AREA BELOW	☐ YES	☐ NO
ALL FLAMMABLE LIQUIDS REMOVED FROM AREA	☐ YES	☐ NO
ALL FLAMMABLE GAS SHUT-OFF AND ISOLATED	☐ YES	☐ NO
WELDING SCREENS POSITIONED WHERE NEEDED	☐ YES	☐ NO
SHEATHING PROVIDED WHERE NEEDED	☐ YES	☐ NO
WELDING CABLES & HOSES OUT OF TRAVEL AREAS OR SECURED AT LEAST 7' OVERHEAD	☐ YES	☐ NO
VAPOR COMBUSTION TEST CONDUCTED	☐ YES	☐
VAPOR COMBUSTION TEST CONDUCTED WHERE NECESSARY	☐ YES	☐ NO

ALARMS MUST BE CUT OFF	☐ YES	☐ NO
CUT OFF BLDG. SPRINKLERS	☐ YES	☐ NO
FIRE WATCH REQUIRED	☐ YES	☐ NO
VAPOR/GAS COMBUSTION TEST REQUIRED	☐ YES	☐ NO

IF TESTED, WHO CONDCUTED TEST? _____

TEST RESULTS _____

USING PIPE AS REQUIRED ON SPECIAL WORK PERMIT ☐ YES ☐ NO

_____
(SIGNATURE OF PERSON PERFORMING THE HOT WORK)

APPROVALS (SIGNATURES)

SHIFT	CONTRACTOR'S FOREMAN
DAY	
SWING	
NIGHT	

THE PERSON PERFORMING THE HOT WORK MYST INSURE THAT:

1. SPARKS AND MOLTEN SLUGS OF METAL MUST BE CONFINED TO THE WORK AREA AND KEPT FROM FALLING INTO OR ENTERING OTHER AREAS.
2. WHEN USING HAND TOOLS FOR DRILLING OR CHIPPING IN HAZARDOUS AREAS, USE SPARK-PROOF TOOLS OR KEEP TOOLS LUBRICATED WITH WATER OR OTHER ADEQUATE MATERIAL TO REDUCE RISK OF SPARKS.
3. WHEN USING AIR OR ELECTIR CDRILLS IN HAZARDOUS AREAS, WATER OR OIL MUST BE KEPT ON BIT TO PREVENT SPARKS.
4. WHEN CUTTING OR CHIPPING CONCRETE FLOOR, ETC., KEEP CONCRETE WET.
5. THE PERSON DOING THE WORK MUST ENSURE BEFORE LEAVING THE AREA THAT THERE IS NO DANGER OF A FIRE BEING STARTED AS RESULT OF THE WORK.
6. ANY WORKER WHO LEAVES THE JOBSITE FOR ANY REASON MUST CHECK UPON RETURN TO SEE THAT NO HAZARDOUS CONDITIONS HAVE DEVELOPMENT DURING THE ABSENCE.
7. PERMIT BECOMES VOID IF:
   A. HOT WORK DELAYED FOR ON HOUR OR MORE;
   B. AN EMERGENCY ALARM SOUNDS FOR THE AREA; AND
   C. A FIRE OCCURS IN THE AREA.
8. WHEN "HOT WORK" JOB IS FINISHED, ASSURE THAT ANY FIXED FIRE PROTECTION SYSTEM (SUCH AS SPRINKLERS, ALARMS, SMOKE DETECTORS, ETC.) THAT WERE TURNED OFF ARE NOW RETURNED TO OPERABLE CONDITION. COORDINATE THIS THROUGH THE PLANT'S FIRE BRIGADE CHIEF OR THE SAFETY REPRESENTATIVE WHERE APPLICABLE.
9. THIS TAG MUST BE POSTED AT WORK SITE THEN RETURNED TO THE SITE SAFETY REPRESENTATIVE

SUBPART G-SIGNS, SIGNALS, AND BARRICADES

Provide caution tape around work area. Caution off area around crane. Provide cones @ 10' intervals and signs that define work area for Kenvil United Corporation Employees Only.

PROPOSED CONTROLS:
Kenvil United Corporation will issue an "Area Turnover" letter as areas are completed and turned over to the GC and other trades. See sample attached.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SAMPLE TURNOVER LETTER

To: [NAME OF GC or appropriate company]

From: Kenvil United Corp.
Gerald Fahy, President

Re: [PROJECT NAME, TOWN]
OF FLOOR, AREA X

Date: [mm/dd/yyyy]

MESSAGE:
Kenvil United Corporation (KU) has completed steel installation work on the # floor, area X and turns the floor over to [GC] and/or its subcontractors. [GC] shall immediately report all discrepancies or deficiencies to KU for assessment and/or correction.

X _____
Gerald Fahy
President

SUBPART H-MATERIALS HANDLING, STORAGE, USE AND DISPOSAL

Truck and crane travel routes shall be firm and stable to allow safe travel.

Areas utilized for unloading shall be marked with cones when in use and signs displayed to ensure unauthorized personnel do not enter the area.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART I—TOOLS, HAND AND POWER

Provide safety glasses, face shields and respirators around grinding and chipping of steel.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART J—WELDING AND CUTTING

Provide safety glasses, burning goggles and face shields.

All areas where welding ad cutting are being performed must be properly protected with caution tape, cones and signs that warn others from entering the area.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART K—ELECTRICAL

Utilize GFI outlets for all electrical power tools.
Use fiberglass ladders.
All cords must be kept off floors.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART L—SCAFFOLDS

"No intention" of utilizing scaffolds.

SUBPART M—FALL PROTECTION

Fall protection fully covered in prior pages of this safety manual. All fall protection shall provide for 6' fall protection 100% of the time. Special note that no climbing of steel "unprotected" will be allowed.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

Room 301, Unit 30
#1980 Luo Xu Road
Shanghai, 200237
Tel: 86-21-54810680
Fax: 86-21-54810003

DRAGON TRADING
INCORPORATED

211 East 70th Street
Suite 200
New York, NY 10021
Tel: 212-717-1496
Fax: 212-717-1499
Email: dragontrad@aol.com

WIRE ROPE TEST CERTIFICATE

Date:	August 1, 2009
Client:	Bilco Wire Rope & Supply Corp.
Purchase Order No.:	29176
Sales Confirmation No.:	DTI7745
Invoice No.:	09303
Construction:	7x19
Nominal Diameter:	3/8"
Finish:	Galv
Lubrication:	Dry Lube
Lay Direction:	RHRL
Quantity:	33 × 5,000'
Specification :	RR-W-410E
Grade of Steel Used:	IPS
Min. Breaking Strength:	14,400 LBS
Reel Number:	7745-1-33

Test Results:

Actual Diameter:	0.377"
Actual Breaking Strength:	14,720 LBS
Tensile Strength:	2020-2150 N/mm²
Preforming:	good
Weight of Zinc Coating:	45-56 g/m²

Markings on Reels:	N/M
Markings on Tags:	PO#29176, construction, size, length, weight, reel#, CHINA etc.
Packing:	Wooden Reel

Hereby I certify the above test results are true and correct.

Completed by: Zhou Xiaohua

SUBPART N—CRANES, DERRICKS, HOISTS, ELEVATORS, AND CONVEYORS

Third party crane inspections and operator certifications are attached. See Subpart R concerning lift plans and critical lifts.
Operator will not make lifts with crane that loads are not properly secured, taglined or multiple pieced incorrectly.
*NOTE: No other trades allowed within swing radius of crane

Crane will have a flag and beacon at night if left standing or will be lowered to less than 100' at night. The crane will have less than 200' which does not require a flag or beacon and is not within three miles of an airport.
*Swing radius/work area will be clearly marked with caution tape and the competent person will not allow others within the area.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Crane Operator- Ivan Enriquez

TG 1900T TOWER CRANE

NYC RATINGS AT FULL OF PROVEN LOAD

(Rated Loads in Kips)

Counterweights - total 94.4 Kips (fixed counterweight 23.6 Kips + moving counterweight 70.8 Kips)

Boom Length	160 ft	170 ft	180 ft	190 ft	200 ft	210 ft	220 ft	230 ft	240 ft	250 ft	260 ft	Boom Length
Radius ft												Radius ft
30	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	30
40	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	40
50	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	50
60	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	60
70	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	70
80	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	80
90	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	90
100	58.0	58.0	58.0	57.4	56.9	56.3	55.8	52.2	48.0	43.3	38.9	100
110	52.7	52.1	51.9	51.3	50.8	50.2	49.7	46.5	43.3	40.0	36.9	110
120	47.5	47.0	46.7	46.1	45.6	45.0	44.5	41.6	38.7	35.7	33.0	120
130	43.1	42.6	42.3	41.7	41.3	40.7	40.2	37.5	34.8	32.2	29.6	130
140	39.4	38.8	38.5	38.0	37.5	36.9	36.4	34.0	31.5	29.0	26.7	140
150	36.0	35.5	35.3	34.7	34.2	33.6	33.1	30.9	28.6	26.3	24.2	150
160	27.7	32.6	32.4	31.8	31.4	30.8	30.3	28.1	26.0	23.9	22.0	160
170		25.0	29.6	29.2	28.8	28.2	27.7	25.8	23.8	21.8	20.0	170
180			22.8	26.9	26.5	26.0	25.5	23.6	21.9	20.0	18.2	180
190				20.5	24.5	23.9	23.4	21.7	20.0	18.2	16.6	190
200					18.6	22.0	21.6	20.0	18.4	16.7	15.2	200
210						16.7	19.9	18.4	16.9	15.3	13.9	210
220							14.9	17.0	15.5	14.1	12.7	220
230								12.5	14.3	12.9	11.6	230
240									10.5	11.8	10.7	240
250										8.5	9.8	250
260											6.9	260

Notes:

1. Lifting capacity does not include load block and slings
2. For each 10 feet of boom foot height above the lowest hook position, 48# deduction must be made from lifting capacity
3. Conduct operations in accordance with ANSI B30.3, OSHA and manufacturer's requirements.
4. Do not operate crane in sustained winds exceeding 30 mph.

prepared by:

Howard I. Shapiro & Associates
Consulting Engineers, P.C.
303 Merrick Road, Suite 202
Lynbrook, NY 11563
(516) 791-2[illegible] Fax: (516) 791-5425

STATE OF NEW YORK
LAWRENCE K. SHAPIRO
60597
LICENSED PROFESSIONAL ENGINEER

11/14/06

HOISTING, RIGGING AND MULITPLE LIFT RIGGING PROCEDURE @ Waterfront Corporate Center

Cranes being used in steel erection activities shall be visually inspected prior to each shift by a competent person. The inspection shall include the following:

- All control and drive mechanisms for mal-adjustments and wear
- Safety devices, air, hydraulic, and other pressurized lines
- Hooks, safety latches, wire rope, tires
- Ground conditions and site conditions (existing buildings, power lines, etc.)

Multiple lifts shall only be performed if the following criteria are met:

- A multiple lift rigging assembly is used
- A maximum of five members are hoisted per lift
- Only beams and similar structural members are lifted
- All employees engaged in multiple lifts have been trained in these procedures in accordance with 1926.761©(1)
- No crane is permitted to be used for multiple lifts where such use is contrary to the manufacturer's specifications and limitations.

Components of the "multiple lift" rigging assembly shall be designed and assembled with a maximum capacity for total assembly and for each individual attachment point. This capacity shall be based on the manufacturer's specification with a 5 to 1 safety factor.

The total load shall not exceed the rated capacity of the hoisting equipment specified in the hoisting equipment load charts.

SUBPART O—MOTOR VEHICLES, MECHANIZED EQUIPMENT, ETC.

Company trucks must remain on construction roads as defined on crane mobilization plan. Trucks requiring backup must be monitored to ensure safety of personnel and property. Trucks requiring entry shall notify the foreman (competent person) and proceed only as directed.

A flagman will direct deliveries into construction site.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART P-EXCAVATIONS

Not applicable

SUBPART Q-CONCRETE AND MASONRY CONSTRUCTION

Not applicable

SUBPART R-STEEL ERECTION (AND PRECAST CONCRETE ERECTION)

Plan provided in safety manual

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Ivan Enriquez- crane operator
Gerald Fahy, project manager

SUBPART S-TUNNELS AND SHAFTS, CAISSONS, COFFERDAMS, ETC.

Not applicable

SUBPART T-DEMOLITION

Not applicable

SUBPART U-BLASTING AND USE OF EXPLOSIVES

Not applicable

SUBPART V-POWER TRANSISSION AND DISTRIBUTION

Crane swing radius within 10' of power lines will be marked with caution tape and cones. No steel or material will be stored within 10' of power lines which will prevent the need to swing within the area of 10'. Job fences at the site also prevent working within 10' of power lines.

Crane operator and foreman will walk the site to review all potential power contact locations and cone off areas to prevent placing loads near these areas.

Ivan Enriquez- crane operator
Foreman to be named later

SUBPART W-ROLLOVER PROTECTIVE STRUCTURES, OVERHEAD PROTECTION

Not applicable

SUBPART X-STAIRWAYS AND LADDERS

All ladders shall be fiberglass and extend 3' past floor or landing level and shall be anchored to the structure with 3 to 1 distance from bottom to vertical plane. Ladders will be utilized for access only. Work shall not be performed off ladders.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART Y-COMMERCIAL DIVING OPERATIONS

Not applicable

SUBPART Z- TOXIC AND HAZARDOUS SUBSTANCES

Material Safety Data Sheets are attached and define potential hazardous materials. See Hazcom attachment defining scope and requirements.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

BOC GASES

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: OXYGEN

1. Chemical Product and Company Identification

BOC Gases,
Division of
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974

TELEPHONE NUMBER: (908) 464-8100
24-HOUR EMERGENCY TELEPHONE NUMBER:
CHEMTREC (800) 424-9300

BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6

TELEPHONE NUMBER: (905) 501-1700
24-HOUR EMERGENCY TELEPHONE NUMBER:
(905) 501-0802
EMERGENCY RESPONSE PLAN NO: 20101

PRODUCT NAME: OXYGEN
CHEMICAL NAME: Oxygen
COMMON NAMES/SYNONYMS: None
TDG (Canada) CLASSIFICATION: 2.2 (5.1)
WHMIS CLASSIFICATION: A, C

PREPARED BY: Loss Control (908)464-8100/(905)501-1700
PREPARATION DATE: 6/1/95
REVIEW DATES: 6/7/96

2. Composition, Information on Ingredients

INGREDIENT	[illegible]	[illegible]	TLV-ACGIH[2]	LD_{50} or LC_{50} Route/Species
Oxygen FORMULA: O_2 CAS: 7782-44-7 RTECS #: RS2060000	99.5 to 100.0	Not Available	Not Available	Not Available

[1] As listed in 29 CFR 1910, Subpart Z (updated July 1, 1993)
[2] As listed in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

3. Hazards Identification

EMERGENCY OVERVIEW

Elevated oxygen levels may result in [illegible] pulmonary changes. High concentrations of oxygen (greater than 75%) [illegible] included cramps, nausea, dizziness, hypothermia, amblyopia, [illegible] convulsions capable of leading to death. Nonhemolytic [illegible] and accelerated respiration.

ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
No	No	No	Yes	No

PRODUCT NAME: OXYGEN

HEALTH EFFECTS:

Exposure Limits No	Irritant No	Sensitization No
Teratogen No	Reproductive Hazard No	Mutagen Yes
Synergistic Effects: None Known		

Carcinogenicity: – NTP: No IARC: No OSHA: No

EYE EFFECTS:
Adverse effects not anticipated.

SKIN EFFECTS:
Adverse effects not anticipated.

INGESTION EFFECTS:
Adverse effects not anticipated.

INHALATION EFFECTS:
High concentrations of oxygen (greater than 75%) cause symptoms of hyperoxia which included cramps, capable of leading to death. The property is that of hyperoxia which leads to pneumonia. Concentrations between 25 and 75% present a risk of inflammation of organic matter in the body.

Oxygen concentrations between 20 to 95% have produced genetic changes in mammalian cell assay test systems.

NFPA HAZARD CODES		HMIS HAZARD CODES		RATINGS SYSTEM
Health:	0	Health:	0	0 = No Hazard
Flammability:	0	Flammability:	0	1 = Slight Hazard
Reactivity:	0	Reactivity:	0	2 = Moderate Hazard
				3 = Serious Hazard
				4 = Severe Hazard

4. First Aid Measures

EYES:

ophthalmologist for treatment and follow up.

SKIN:
Remove contaminated clothing and flush affected area with lukewarm water. If irritation persists, seek medical attention.

INGESTION:
Ingestion is not anticipated.

PRODUCT NAME: OXYGEN

INHALATION:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO OXYGEN. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious persons should be moved to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Further treatment should be symptomatic and supportive. Inform the treating physician that the patient could be experiencing hyperoxia.

5. Fire Fighting Measures

Conditions of Flammability: Not flammable, Oxidizer		
Flash point: None	Method: Not Applicable	Autoignition Temperature: None
LEL(%): None	UEL(%): None	
Hazardous combustion products: None		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

FIRE AND EXPLOSION HAZARDS:
High oxygen concentrations vigorously accelerate combustion.

EXTINGUISHING MEDIA:
Water spray to keep cylinders cool. Extinguishing agent appropriate for the combustible material.

FIRE FIGHTING INSTRUCTIONS:
If possible, stop the flow of oxygen which is supporting the fire.

6. Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repair. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

7. Handling and Storage

Electrical classification:
Nonhazardous

Dry product is noncorrosive and may be used with all materials of construction. Moisture causes metal oxides which are formed with air to be hydrated so that they include volume and lose their protective role (rust formation). Concentrations of SO_2, Cl_2, salt, etc. in the moisture enhances the rusting of metals in air.

Carbon steels and low alloy steels are acceptable for use at lower pressures.

For high pressure applications stainless steels are acceptable as are copper and its alloys, nickel and its alloys, brass bronze, silicon alloys, Monel ®, Inconel ® and beryllium. Lead and silver or lead tin alloys are good gasket materials. Teflon ®, Teflon ® composites, or Kel-F ® are preferred non-metallic gasket materials.

Check with the supplier to verify oxygen compatibility for the service conditions.
Oxygen should not be used as a substitute for compressed air in pneumatic equipment since this type generally contains flammable lubricants.

BOC GASES

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: ACETYLENE

1. Chemical Product and Company Identification

BOC Gases,
Division of
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974

TELEPHONE NUMBER: (908) 464-8100
24-HOUR EMERGENCY TELEPHONE NUMBER: CHEMTREC (800) 424-9300

BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6

TELEPHONE NUMBER: (905) 501-1700
24-HOUR EMERGENCY TELEPHONE NUMBER: (905) 501-0802
EMERGENCY RESPONSE PLAN NO: 20101

PRODUCT NAME: ACETYLENE
CHEMICAL NAME: *Acetylene*
COMMON NAMES/SYNONYMS: Ethyne, Acetylene, Ethine
TDG (Canada) CLASSIFICATION: 2.1
WHMIS CLASSIFICATION: A, B1, D2B

PREPARED BY: Loss Control (908)464-8100/(905)501-1700
PREPARATION DATE: 6/1/95
REVIEW DATES: 6/7/96

2. Composition, Information on Ingredients

INGREDIENT	% VOLUME	PEL-OSHA[1]	TLV-ACGIH[2]	LD_{50} or LC_{50} Route/Species
Acetylene FORMULA: C_2H_2 CAS: 74-86-2 RTECS #: AO9000000	95.0 to 99.8	Not Available	Simple Asphyxiant	Not Available
Acetone FORMULA: C_3H_6O CAS: 67-64-1 RTECS #: AL3150000	Not Available	1000 ppm TWA	750 ppm TWA 1000 ppm STEL	LD_{50} 1297 mg/kg (mouse)

[1] As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)
[2] As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

3. Hazards Identification

EMERGENCY OVERVIEW

Simple Asphyxiant. This product does not contain oxygen and may cause asphyxia if released in a confined area. Maintain oxygen levels above 19.5%. May exhibit anesthetic effects. Highly flammable under pressure. Spontaneously combustible in air at pressures above 15 psig. Acetylene liquid is shock sensitive.

PRODUCT NAME: ACETYLENE

ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
No	No	No	Yes	No

HEALTH EFFECTS:

Exposure Limits	Irritant	Sensitization
Yes	Yes	No
Teratogen	**Reproductive Hazard**	**Mutagen**
No	No	No

Synergistic Effects
None Reported

Carcinogenicity: – NTP: No IARC: No OSHA: No

EYE EFFECTS:
None known since product is a gas at room temperature. Contact of liquid acetylene with the eyes may cause temporary irritation.

SKIN EFFECTS:
Skin effects are not likely. Contact with liquid acetylene may cause irritation and dermatitis upon repeated exposure.

INGESTION EFFECTS:
Ingestion is unlikely, since acetylene is a gas at room temperature.

INHALATION EFFECTS:
Acetylene is an asphyxiant and may cause anesthetic effects at high concentrations. High concentrations may exclude an adequate supply of oxygen to the lungs. Effects of oxygen deficiency resulting from simple asphyxiants may include: rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgement, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma, and death.

Under normal operating conditions, acetone is not released from the cylinder. However, if the cylinder is overcharged with acetone or acetylene, acetone may occasionally "spit" out. Acetone is primarily a central nervous system toxin causing headache, nausea, dizziness, vomiting and fatigue. Moderate concentrations may cause respiratory irritation.

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

NFPA HAZARD CODES	HMIS HAZARD CODES	RATINGS SYSTEM
Health: 0	Health: 0	0 = No Hazard
Flammability: 4	Flammability: 4	1 = Slight Hazard
Reactivity: 0	Reactivity: 0	2 = Moderate Hazard
		3 = Serious Hazard
		4 = Severe Hazard

PRODUCT NAME: ACETYLENE

4. First Aid Measures

EYES:
None normally required. Consult a physician if direct contact with pressurized material occurs. Immediately flush with low pressure, cool water for at least 15 minutes, opening eyelids to ensure flushing. Get medical attention.

SKIN:
Wash affected areas with soap and warm water. If irritation develops, seek medical attention.

INGESTION:
None normally required.

INHALATION:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. If breathing has stopped administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive. Keep victim warm and quiet.

5. Fire Fighting Measures

Conditions of Flammability: Flammable		
Flash point: Not Available	Method: Not Applicable	Autoignition: Temperature: 565°F (296°C)
LEL(%): 2.2	UEL(%): 80 to 85*	
Hazardous combustion products: Carbon Monoxide, Carbon Dioxide		
Sensitivity to mechanical shock: Not Available		
Sensitivity to static discharge: Not Available		

FIRE AND EXPLOSION HAZARDS:
*Pure acetylene can ignite by decomposition above 15 psig therefore, the UEL is 100% if the ignition source is of sufficient intensity.

GASEOUS ACETYLENE IS SPONTANEOUSLY COMBUSTIBLE IN AIR AT PRESSURE ABOVE 15 PSI (207 kPa.). It requires a very low ignition energy so that fires which have been extinguished without stopping the flow of gas can easily reignite with possible explosive force. Acetylene has a density very similar to that of air so when leaking it does not readily dissipate. Gas may travel to a source of ignition and flash back.

Fires involving acetylene occur occasionally at fusible metal pressure relief plugs at the tops and bottoms of cylinders, commonly due to hot metal or slag being dropped on the fusible plugs. When the fusible plug releases a large volume of acetylene will rush out, creating a "roaring" sound. The flame may extend a foot or two away from the cylinder until the pressure is reduced. In some cases, the other end of the cylinder may develop a coating of frost.

EXTINGUISHING MEDIA:
Carbon dioxide, dry chemical.

PRODUCT NAME: ACETYLENE

FIRE FIGHTING INSTRUCTIONS:
WARNING: ALWAYS EXTINGUISH A FIRE BEFORE CLOSING THE CYLINDER VALVE. If the flame is small from the fusible plug or valve stem, try to put it out. Wear SCBA and fully protective clothing for fire fighting. If the fire is allowed to keep burning it is likely that the fusible plug will melt and result in a large release of acetylene. A glove or heavy cloth or any wet material slapped on the flame will frequently extinguish it.

If the flame is large, burning from a fusible plug, DO NOT try to put it out unless the cylinder is outdoors or in a very well ventilated area free from sources of ignition. Usually it is very difficult to extinguish large fires because the escaping acetylene may be reignited by adjacent ignition sources, thereby possibly creating a confined space explosion. Keep containers cool with water spray.

6. Accidental Release Measures

Evacuate all personnel from affected area. Isolate the area for over 1/2 mile in all directions in the event of leakage of a tank, rail car or tank truck. Use appropriate protective equipment.

If possible to do safely, shut off ignition sources and stop the leak by closing the valve. For small leaks, cylinders may be moved to an area outdoors and away from any source of ignition. Circumstances which it is advisable to attempt removal of the cylinder are when cylinders are in close proximity to other compressed gases, when highly flammable materials or hazardous materials are in the vicinity of the acetylene cylinder(s), or where protection of the building is unusually difficult and spreading of a fire may produce a major loss of life or property. When the cylinder is removed, it may be hosed down with water to keep it cool. Open valve slowly to let the acetylene escape. Tag the cylinder with "WARNING - Leaking Flammable Gas". Close valve when empty.

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

7. Handling and Storage

Electrical Classification:
Class I, Group A.

Acetylene is shipped in a cylinder packed with a porous mass material, and a liquid solvent, commonly acetone. Acetylene is dissolved in the acetone solution and dispersed throughout the porous medium. When the valve of a charged acetylene cylinder is opened, the acetylene comes out of solution and passes out in the gaseous form.

IT IS CRUCIAL THAT FUSE PLUGS IN THE TOPS AND BOTTOMS OF ALL ACETYLENE CYLINDERS BE THOROUGHLY INSPECTED WHENEVER HANDLED. REMOVE AND QUARANTINE IN A SAFE LOCATION ANY DEFECTIVE CYLINDER.

Post "NO SMOKING OR OPEN FLAMES" signs in the storage area or use area. There should be no sources of ignition in the storage or use area.

13156.00.01 (MC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Work Platform #

#: Grove GMK7550 Crane

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transporatation. Mr/ Ms. Mike Braco, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name: Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address:

Signature of Owner or Contractor: X

Date: 8/23/13

Safety Coordinator

I, Mike Braco (NAME) am a P.E., R.A. or a person having at least 5 years of construction experience

I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name: Mike Braco Tel. No.: (973) 244-1410

Address: 60

Signature of Safety Coordinator: X

Date: 8/23/13

EXEMPTION 1

13156.00.01 (MC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Work Platform #: _____ #: Grove GMK7550 Crane

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transporatation, Mr/ Ms. Dave Cullen representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: [redacted]

Signature of Owner or Contractor: X

Date: 8/23/13

Safety Coordinator

I, Dave Cullen (NAME), am a P.E., R.A. or a person having at least 5 years of construction experience. I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name Dave Cullen Tel. No.: (973) 244-1410

Address: [redacted]

Signature of Safety Coordinator: X

Date: 8/23/13

Crane Operator Lincense

EXEMPTION 1

Mobile Crane Safety Inspection Report

AmQuip
THE CRANE PEOPLE

OSHA CRANE SAFETY INSPECTION REPORT
Meets Requirements of OSHA 1926.1400 and ANSI B30.5 Standards

Inspection Date: 5/10/13 Inspection Type: [X] Annual

Equipment #: 110-09 Capacity: 100 Ton Manufacturer: Tadano

Model #: ATF90G-4 Serial #: 20415245

	SAT	UNSAT	N/A
EQUIPMENT INFORMATION			
Current Certification Posting	X		
Operator Instructions	X		
Maintenance Records	X		
Hand Signal Charts	X		
Proper Load Charts	X		
SAFETY DEVICES			
Crane level indicator	X		
Boom Stops			X
Jib Stops			X
Foot pedal brake locks			X
Hydraulic outrigger & stabilizer locks/holding device/check valve	X		
Fire Extinguisher	X		
Hi-Rail: rails, clamps and stops			X
Hornback up alarm	X		
Levels	X		
OPERATIONAL AIDS			
Category I			
- Boom Hoist limiting device			X
- Lifting jib limiting device			X
- Anti two-blocking device	X		
Category II			
- Boom angle or radius indicator	X		
- Jib angle indicator	X		
- Boom Length Indicator	X		
- Load weighing & similar devices	X		
- Outrigger/stabilizer position sensor/monitor	X		
- Hoist drum rotation indicator	X		
CAB			
Windows/glass	X		
Wiper motor	X		
Wipers	X		
Operator seat	X		
Housekeeping	X		
Controls:proper markings	X		
Pedals	X		

	SAT	UNSAT	N/A
WORK AREA INSPECTION			
Carrier	X		
Upper Works	X		
Hoist System	X		
STRUCTURAL INSPECTION			
Carrier	X		
Upper Works	X		
Hoist System	X		
HYDRAULIC SYSTEM			
Carrier	X		
Upper Works	X		
Hoist System	X		
ENGINE			
Condition	X		
Operation	X		
Fluid levels:			
- Engine oil	X		
- Coolant	X		
Coolant system	X		
Gauges	X		
Belts/hoses/lines	X		
Leaks	X		
Exhaust system	X		
TRANSMISSION			
Condition	X		
Operation	X		
Fluid levels:			
- Engine oil	X		
- Coolant	X		
Coolant system	X		
Gauges	X		
Belts/hoses/lines	X		
Leaks	X		
Exhaust system	X		

	SAT	UNSAT	N/A
CARRIER CHASSIS			
Control mechanisms	X		
Control & drive mechanisms	X		
Hydraulic system fluid level	X		
Hooks & latches	X		
Electrical/electronic apparatus; function/wear	X		
Tires: inflation and condition	X		
Equipment Structure			
- Bolts, rivets & other fasteners	X		
- Structural members	X		
- Welds for cracks	X		
Sheaves & drums	X		
Pins, bearings, shafts, gears, rollers, & locking devices	X		
Brake system: parts, linings, pawls, & ratchets	X		
Clutch system: parts, linings, pawls, & ratchets			X
Chains & chain drive sprockets			X
Travel steering			X
Travel Brakes			X
Travel locking devices			X
Outrigger or stabilizer pads/floats	X		
Slider pads	X		
Electrical components & wiring	X		
Warning labels & decals	X		
Steps/ladders	X		
Guards/handrails	X		
Chassis Steering	X		
Chassis Brakes/clutches	X		
Drive train	X		
Suspension	X		
Lights	X		
Inner/Outer bell			X
Gantry/A-frame			X
Main Cord	X		
Lacings	X		
FUNCTIONAL TEST	X		

WIRE ROPE INSPECTION	SAT	UNSAT	N/A
Main Hoist	X		
Auxiliary Hoist	X		
3rd Drum			X
Boom Hoist			X

WIRE ROPE INSPECTION	SAT	UNSAT	N/A
Main Hoist	X		
Auxiliary Hoist	X		
3rd Drum			X
Boom Hoist			X

WIRE ROPE INSPECTION	SAT	UNSAT	N/A
Main Hoist	X		
Auxiliary Hoist	X		
3rd Drum			X
Boom Hoist			X

Application	Size / Construction	Length	Condition	Dead Ends	Sheaves	Drum	Latch
Main Hoist	18mm Cesar	755'	OK	OK	OK	OK	OK
Aux. Hoist	18mm Cesar	755'	OK	OK	OK		
3rd Drum							
Boom Hoist							
Pendants							
Jib Stays							

Mechanic/Inspector's Signature

M. Cornely
Mechanic/Inspector Print Name

4.5.4-SVC001 Rev02 (1

AmQuip Crane Rental

OSHA CRANE SAFETY INSPECTION REPORT

Meets Requirements of OSHA 1926.1400 and ANSI B30.5 Standards

Inspection Date: 7.21.13 Inspection Type: [✓] Annual

Equipment #: 15504 Capacity: 550 Ton Manufacturer: MANITOWOC

Model #: 7550 Serial #: 8170

	SAT	UNSAT	N/A
Documentation			
Current Certification Posting	X		
Operator Instructions	X		
Maintenance Records	X		
Hand Signal Charts	X		
Proper Load Charts	X		
Safety Devices			
Crane level indicator	X		
Boom Stops	X		
Jib Stops	X		
Foot pedal brake locks			X
Hydraulic outrigger & stabilizer locks/ holding device/check valve	X		
Fire Extinguisher	X		
Hi-Rail rails, clamps and stops			X
Horn/back up alarm	X		
Levels	X		
Load Indicating Devices			
Category I			
- Boom Hoist limiting device			X
- Luffing jib limiting device	X		
- Anti-two-blocking device	X		
Category II			
- Boom angle or radius indicator	X		
- Jib angle indicator	X		
- Boom Length indicator	X		
- Load weighing & similar devices	X		
- Outrigger/stabilizer position sensor/monitor	X		
- Hoist drum rotation indicator	X		
Cab			
Windows/glass	X		
Wiper motor	X		
Wipers	X		
Operator seat	X		
Housekeeping	X		
Controls: proper marking	X		
Pedals		X	

	SAT	UNSAT	N/A
Hoist Rope Condition			
Carrier	X		
Upper Works	X		
Hoist System	X		
Hydraulic Pump/Motor Condition			
Carrier	X		
Upper Works	X		
Hoist System	X		
Hydraulic Hoses/Fittings			
Carrier	X		
Upper Works	X		
Hoist System	X		
Engine			
Condition	X		
Operation	X		
Fluid levels:			
- Engine oil	X		
- Coolant	X		
Coolant system	X		
Gauges	X		
Belts/hoses/lines	X		
Leaks	X		
Exhaust system	X		
Hydraulic Pump/Motor			
Condition	X		
Operation	X		
Fluid levels:			
- Engine oil	X		
- Coolant	X		
Coolant system	X		
Gauges	X		
Belts/hoses/lines	X		
Leaks	X		
Exhaust system	X		

	SAT	UNSAT	N/A
Control Mechanism			
Control mechanisms	X		
Control & drive mechanisms	X		
Hydraulic system fluid level	X		
Hooks & latches	X		
Electrical/electronic apparatus: ignition/wear	X		
Tires: inflation and condition	X		
Equipment Structure			
- Bolts, rivets & other fasteners	X		
- Structural members	X		
- Welds for cracks	X		
Sheaves & drums	X		
Pins, bearings, shafts, gears, rollers, & locking devices	X		
Brake system: parts, linings, pawls, & ratchets	X		
Clutch system: parts, linings, pawls, & ratchets			X
Chains & chain drive sprockets			X
Travel steering	X		
Travel Brakes	X		
Travel locking devices	X		
Outrigger or stabilizer pads/floats	X		
Slider pads	X		
Electrical components & wiring	X		
Warning labels & decals	X		
Steps/ladders	X		
Guards/Handrails	X		
Chassis Steering	X		
Chassis Brakes/clutches	X		
Drive train	X		
Suspension	X		
Lights	X		
Inner/Outer bell	X		
Gantry/A-frame			X
Main Cord	X		
Lamps	X		
FUNCTIONAL TEST	X		

	SAT	UNSAT	N/A
Main Hoist	X		
Auxiliary Hoist	X		
3rd Drum			
Boom Hoist			

	SAT	UNSAT	N/A
Main Hoist	X		
Auxiliary Hoist	X		
3rd Drum			
Boom Hoist			

	SAT	UNSAT	N/A
Main Hoist	X		
Auxiliary Hoist	X		
3rd Drum			
Boom Hoist			

Application	Size / Construction	Length	Condition	Dead Ends	Sheaves	Tram	Latch
Main Hoist	24mm CASHER	6,509	NEW	OK	OK		OK
Aux. Hoist	24 mm CASHER	8,863	NEW	O.K	O.K		O.K
3rd Drum							
Boom Hoist							
Pendants							
Jib Stays							

Mark Orlowski
Mechanic/Inspector's Signature

MARK ORLOWSKI
Mechanic/Inspector Print Name

Tower Crane Equipment Owner ID Form

CD 11

NYC BUILDINGS

Equipment Owner Identification Form

Application Must Be Typewritten

1. Equipment Description

Manufacturer:	FMC CORP	Model:	TC 1900			Serial No.:	7643-107C			Year:	1983
Climber Tower & Mobile Cranes :		Max. Tower:	107	ft	Max. Boom:	150	ft	Max. Jib:		ft	
	Max. Combined Length:	Tower:		ft	Boom:		ft	Jib:	ft	Total:	ft
Derricks:		Mast:		ft	Boom:		ft	Sill:	ft	Leg:	ft
Workplatform:		Single Mast: Mast:		ft	Width:		ft				
		Double Mast: Mast:		ft	Width:		ft				

4. Owner Statement

Last Name:	WEISS	First Name:	LAWRENCE	M.I.:	
Title:	PRESIDENT	Telephone:	718-784-1776	Fax:	
Business Name:	CRANES INC.				
Address:	53-20 44' ST				
City:	MASPETH	State:	NY	ZIP:	11378

- This is to certify that I, the undersigned, am the owner or an officer of the company that owns equipment.
- I am aware that in order to use this machine in New York City, it must first be issued a Temporary Certificate of Approval and Operation (TCAO) which requires the equipment passing an annual inspection conducted by the Hoist and Rigging section of the Cranes and Derricks Division.
- In addition, I am aware that the equipment must demonstrate compliance with all applicable safety device requirements, pertaining department rules and regulations, and relevant sections of the New York City Building Code.
- In the absence of complete compliance, my application may be denied and the Temporary Certificate of Approval and Operation revoked.

Signature Lawrence Weiss Pres. **Date** 8/12/13

Competent Person Letter

Kenvil United Corp

PO Box 32

Wharton, NJ 07885

August 14, 2013

Weir Welding Co. Inc.

316 12th Ave

Carlstadt, NJ 07072

Attn: Mike Diffley

Re: Waterfront Corporate Center

Hoboken, NJ

Competent Persons

Mike

Please find the attached Competent Person Letters for Kenvil United Corp employee's Dave Cullen and Dean Hartman. We are confident that their leadership will make this a successful and safe project for all involved. Please contact me should you have questions. Thank you.

Very truly yours,

Gerald Fahy

President

KENVIL UNITED CORPORATION
PO BOX 32
WHARTON, NJ 07885
PHONE: 973-927-0010
FAX: 973-927-4370

Dean Hartman is the Competent Person for Kenvil United Corporation (KU) on the Waterfront Hoboken job and will be on site when KU is performing work. Dean Hartman is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and has the authority to take prompt corrective measures to eliminate them. By way of training and experience, Dean Hartman is knowledgeable of applicable standards relating to KU's specific operations in crane procedures and steel construction.

Experience and training:
Qualified Rigger certified
OSHA 30, Subpart R Certified
OSHA Construction Safety Certified
Crane signaling certified
28 years crane and steel construction

X

Gerald Fahy
President 8-14-13

Tadano ATF 90G-4 Crane Installation Information & Drawings

HOWARD I. SHAPIRO & ASSOCIATES Consulting Engineers, P.C.
303 Merrick Road (Suite 400), Lynbrook, NY 11563

Howard I. Shapiro, P.E. (1932- 2007) Jay P. Shapiro, P.E. Lawrence K. Shapiro, P.E. Heng Mun Loke, P.E. William Chieco James Scheld, P.E.

August 14, 2013

13156.00.01

Tadano ATF90G-4 FOR ASSISTING TOWER CRANE ERECTION

ASSIST CRANE INSTALLATION
AT
HOBOKEN BUILDING B

FOR

WEIR WELDING COMPANY INC.

BY

STATE OF NEW YORK
JAY P. SHAPIRO
080597
LICENSED PROFESSIONAL ENGINEER

8/27/13

8/27/13

Prepared by: MM

Howard I. Shapiro & Associates
Consulting Engineers, P.C.
303 Merrick Road Suite 400 Lynbrook, NY 11563
Tel (516) 791-2600 Fax (516) 791-5425

24.27k @ 45' Radius

Outrigger Reaction Force Supply Service

Working Configuration

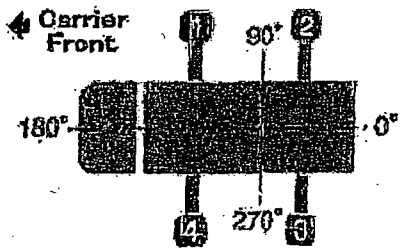
Explanation on this page

(ATF90G-4 51.2m Boom (WithOUT Jib))

Boom Length (ft)	96.7	Counterweight (lbs)	49162.2	Swing Angle	Max_Reaction	Lifting Load (lbs)	24,270
Jib state (ft)	stow	O/R Spread (ft)	23.6/1-4	Working Radius (ft)	48.0	Extension state (%)	46-46-46-46-46
Jib Tilt Angle (°)	---	Hook Block (lbs lifting)	Including in Load	Boom Angle (°)	59.3		

Outrigger Jack Reaction Force (unit lbs)

Swing Angle	1	2	3	4				
138	63,284	46,147	21,196	29,060				
52	29,922	84,283	33,557	11,924				
311	12,540	34,280	82,617	30,249				
227	27,674	20,142	47,131	64,739				



Change Condition | Change Model | Save Result | Readout Result | Clear PDF

[Notes]

1. As to the information we supply in this page on the outrigger jack reaction force, please note that the given value is a calculated value when the outriggers are set on a firm and level surface. It is not an actually measured one. Therefore, we can not guarantee the calculated value to be in conformity with that of your actual machine.
2. As to the data supplied in this page on the outrigger jack reaction force, please note that neither vibration nor shock which may be produced during crane operation is taken into consideration. When setting the outriggers, therefore, be sure to use blocks or steel plates of sufficient strength and size below the outrigger floats.

Back

17,216k @ 55' Radius

OR2

Outrigger Reaction Force Supply Service

Working Configuration

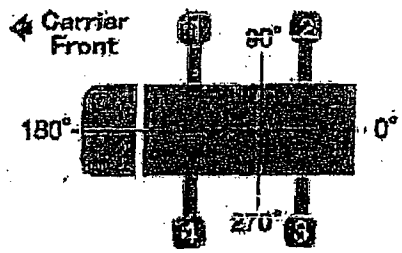
Explanation on this page

(ATF90G-4 51.2m Boom (WithOUT Jib))

Boom Length (ft)	96.7	Counterweight (lbs)	49152.2	Swing Angle	Max_Reaction	Lifting Load (lbs)	17,215
Jib state (ft)	stow	O/R Spread (ft)	23.6/1-4	Working Radius (ft)	58.0	Extension state (%)	46-46-46-46-46
Jib Tilt Angle (°)	—	Hook Block (lbs lifting)	Including in Load	Boom Angle (°)	51.8		

Outrigger Jack Reaction Force (unit :lbs)

Swing Angle	1	2	3	4				
138	60,171	43,908	20,486	28,067				
52	29,054	79,505	32,271	11,803				
311	12,391	32,939	77,952	29,349				
227	26,767	19,497	44,832	61,535				



Change Condition | Change Model

Save Result | Readout Result

Clear PDF

[Notes]

1. As to the information we supply in this page on the outrigger jack reaction force, please note that the given value is a calculated value when the outriggers are set on a firm and level surface. It is not an actually measured one. Therefore, we can not guarantee the calculated value to be in conformity with that of your actual machine.
2. As to the data supplied in this page on the outrigger jack reaction force, please note that neither vibration nor shock which may be produced during crane operation is taken into consideration. When setting the outriggers, therefore, be sure to use blocks or steel plates of sufficient strength and size below the outrigger floats.

Back

7.62k @ 74' Radius

OR

Outrigger Reaction Force Supply Service

Working Configuration

Explanation on this page

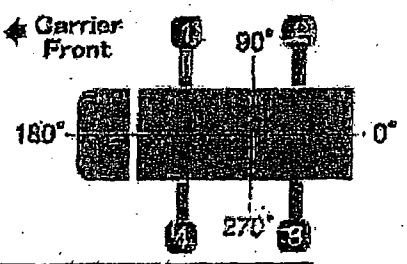
(ATF90G-4 51.2m Boom (WithOUT Jib))

Boom Length (ft)	133	Counterweight (lbs)	49162.2	Swing Angle	Max_Reaction	Lifting Load (lbs)	7,620
Jib state (ft)	stow	O/R Spread (ft)	23.6/1-4	Working Radius (ft)	77.0	Extension state (%)	0-92-92-92-92
Jib Tilt Angle (°)	—	Hook Block (lbs lifting)	Including in Load	Boom Angle (°)	55.1		

Outrigger Jack Reaction Force

(unit :lbs)

Swing Angle	1	2	3	4				
138	47,963	41,818	24,806	28,449				
52	29,327	63,401	34,391	15,918				
307	16,443	33,482	62,434	30,678				
227	27,662	24,088	42,493	48,793				



Change Condition | Change Model | Save Result | Readout Result | Clear PDF

[Notes]

1. As to the information we supply in this page on the outrigger jack reaction force, please note that the given value is a calculated value when the outriggers are set on a firm and level surface. It is not an actually measured one. Therefore, we can not guarantee the calculated value to be in conformity with that of your actual machine.
2. As to the data supplied in this page on the outrigger jack reaction force, please note that neither vibration nor shock which may be produced during crane operation is taken into consideration. When setting the outriggers, therefore, be sure to use blocks or steel plates of sufficient strength and size below the outrigger floats.

Back

OR4

19.12k @ 47' Radius

Outrigger Reaction Force Supply Service

Working Configuration

Explanation on this page

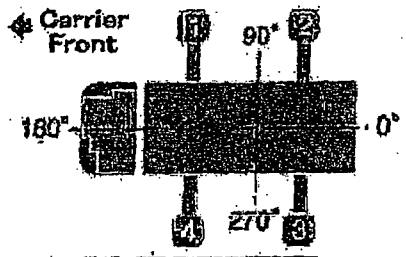
(ATF90G-4 51.2m Boom (WithOUT Jib))

Boom Length (ft)	133	Counterweight (lbs)	49162.2	Swing Angle	Max_Reaction	Lifting Load (lbs)	19,120
Jib state (ft)	show	O/R Spread (ft)	23.6/1-4	Working Radius (ft)	50.0	Extension state (%)	0-92-92-92-92
Jib Tilt Angle (°)	---	Hook Block (lbs lifting)	Including in Load	Boom Angle (°)	68.8		

Outrigger Jack Reaction Force

(unit :lbs)

Swing Angle	1	2	3	4				
138	53,798	45,451	25,321	29,967				
52	30,761	72,034	36,250	15,491				
311	16,018	36,718	70,866	30,935				
223	30,362	24,750	44,653	54,771				



Change Condition | Change Model

Save Result | Readout Result

Clear PDF

[Notes]

1. As to the information we supply in this page on the outrigger jack reaction force, please note that the given value is a calculated value when the outriggers are set on a firm and level surface. It is not an actually measured one. Therefore, we can not guarantee the calculated value to be in conformity with that of your actual machine.
2. As to the data supplied in this page on the outrigger jack reaction force, please note that neither vibration nor shock which may be produced during crane operation is taken into consideration. When setting the outriggers, therefore, be sure to use blocks or steel plates of sufficient strength and size below the outrigger floats.

Back

5.5k @ 120' Radius

OR

Outrigger Reaction Force Supply Service

Working Configuration

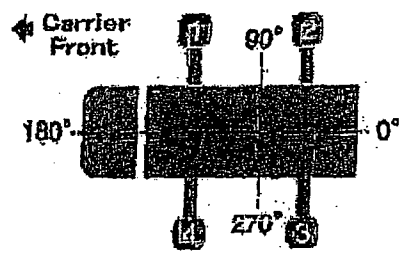
Explanation on this page

(ATF90G-4 51.2m Boom (WithOUT Jib))

Boom Length (ft)	167.9	Counterweight (lbs)	49162.2	Swing Angle	Max_Reaction	Lifting Load (lbs)	5,500
Jib state (ft)	stow	O/R Spread (ft)	23.6/1-4	Working Radius (ft)	122.0	Extension state (%)	100-100-100-100-100
Jib Tilt Angle (°)	—	Hook Block (lbs lifting)	Including in Load	Boom Angle (°)	45.1		

Outrigger Jack Reaction Force (unit :lbs)

Swing Angle	1	2	3	4				
138	68,379	37,544	12,407	22,586				
52	24,111	87,534	22,943	6,327				
311	6,912	23,964	85,385	24,656				
227	20,723	11,346	38,522	70,326				



Change Condition | Change Model | Save Result | Readout Result | Clear PDF

[Notes]

1. As to the information we supply in this page on the outrigger jack reaction force, please note that the given value is a calculated value when the outriggers are set on a firm and level surface. It is not an actually measured one. Therefore, we can not guarantee the calculated value to be in conformity with that of your actual machine.
2. As to the data supplied in this page on the outrigger jack reaction force, please note that neither vibration nor shock which may be produced during crane operation is taken into consideration. When setting the outriggers, therefore, be sure to use blocks or steel plates of sufficient strength and size below the outrigger floats.

Back

HOWARD. I. SHAPIRO & ASSOCIATES
Consulting engineers, P.C.
303 Merrick Road, suite 400
LYNBROOK, NEW YORK 11563
(516) 791-2600
Fax (516) 791-5425

Job Number		13156.00.01	
Calculated by	MM	Date	08/14/13
Checked by	M.G	Date	8/27/13

STEEL PLATE STRESS

A. Equipment

- Tadano ATF90G-4

B. Outrigger load

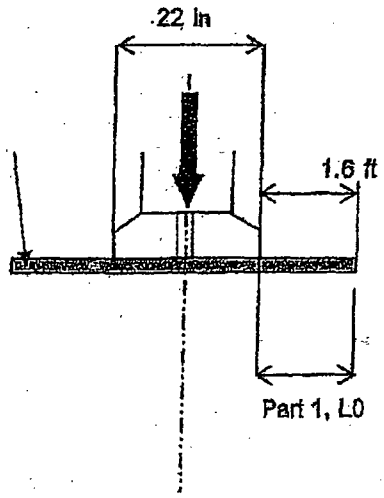
The Maximum Outrigger Reaction is known :

Critical outrigger load L = ***88*** **Kips**

C. Cribbing

Steel Plate :
5 ' x 5 ' x 1 " thick

S=2 In3



HOWARD. I. SHAPIRO & ASSOCIATES
Consulting engineers, P.C.
303 Merrick Road, suite 400
LYNBROOK, NEW YORK 11563
(516) 791-2600
Fax (516) 791-5425

Job Number	13156.00.01		
Calculated by	MM	Date	08/14/13
Checked by	TJ.L	Date	8/27/13

D. Steel Plate Stress

$$P = \frac{88}{5' \times 5'} = 3.5 \text{ ksf}$$ OK!

$$S = 2 \times t_{sp}^{\,2} = 2 \text{ in}^3$$

$$M = \frac{P \times L_o^{\,2}}{2} \times 12 = 53 \text{ K-in/ft}$$

Constant (for steel)	
Fy (KSI)	36
Fb (KSI)	27

As per AISC, 9th Edition, p.5-48, Section F2.1:
Fb = 0.75 * Fy

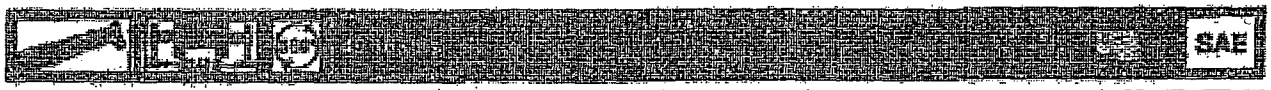
$$\sigma = \frac{6 \times P \times L_o^{\,2}}{2 \times t_{sp}^{\,2}} = \frac{M}{S}$$

L_o= Length of part 1
t_{sp} = Thickness of Steel Plate

σ= 26 KSI < 27 KSI Ok!

TADANO ATF 90G-4

Lifting capacities / Capacidades de elevación

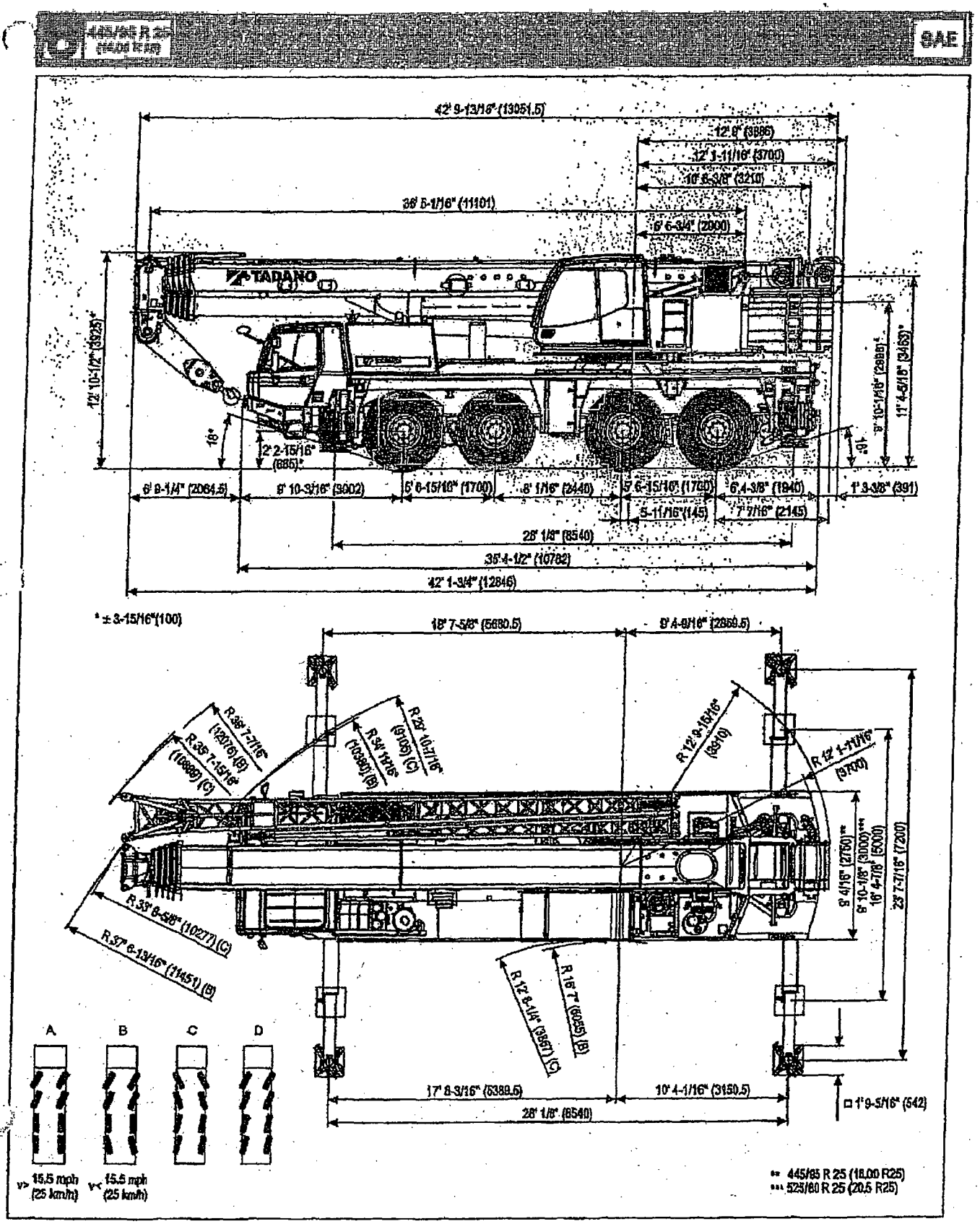


ft	36.4 ft*	36.4 ft	48.6 ft	60.7 ft	72.5 ft	84.6 ft	96.8 ft	108.9 ft	121.1 ft	132.9 ft	145.0 ft	157.2 ft	168.0 ft
8.2	220.0**												
9.8	179.9**	167.8**	143.3	143.3									
11.5	154.5**	154.5	143.3	139.3	110.2								
13.1	150.6	141.5	140.0	130.5	110.2	91.0							
14.8	136.0	130.3	129.4	122.6	110.2	90.2							
16.4	127.4	120.4	119.5	115.3	110.2	86.4	69.7						
19.7	110.2	104.3	103.2	103.2	101.2	77.2	68.6	52.5					
23.0	93.7	90.8	89.7	89.9	89.9	73.0	63.6	52.5	43.4	34.8			
26.2	80.7	78.0	78.0	78.3	78.9	68.8	62.8	52.0	43.4	34.8	28.4		
29.5	64.9	52.9	70.1	69.2	69.7	65.0	62.8	48.5	43.4	34.8	28.4	22.5	
32.8			61.7	61.3	61.6	61.7	60.0	45.4	40.8	34.8	28.4	22.5	19.6
36.1			52.7	52.9	54.5	56.7	53.1	42.5	38.4	34.4	28.4	22.5	19.6
39.4			45.6	49.4	50.3	50.3	46.7	39.9	36.2	32.6	28.4	22.5	19.6
45.9				40.1	40.1	39.7	36.6	35.7	32.2	29.3	26.9	22.5	19.6
52.5				32.8	32.9	32.4	30.4	31.5	28.4	26.5	24.5	22.5	19.6
59.1					27.6	27.1	26.2	27.1	24.7	24.0	22.3	20.5	19.2
65.6					21.6	22.9	22.0	22.9	22.5	20.9	20.5	19.0	17.8
72.2						18.8	19.0	19.8	20.3	18.3	18.5	17.4	16.3
78.7							17.2	17.0	17.4	17.0	16.8	16.1	15.2
85.3							16.1	15.0	15.4	15.4	15.2	14.8	13.9
91.9								13.0	13.9	13.7	13.2	12.6	12.6
98.4								12.1	12.6	12.1	11.7	11.0	11.0
105.0									11.5	10.6	10.1	9.5	9.5
111.5									10.1	9.5	9.0	8.2	8.2
118.1										8.6	7.9	7.1	7.3
124.7										7.5	7.1	6.2	6.4
131.2											6.4	5.3	5.3
137.8											5.5	4.6	4.6
144.4												4.2	4.0
150.9													3.3
157.5													2.9

* Over rear / * Sobre la parte trasera
** With additional lifting equipment / ** Con equipo adicional

Subject to change without prior notice / Sujeto a cambios sin previo aviso

Dimensions (ft, mm) / Dimensiones (ft, mm)



Subject to change without prior notice / Sujeto a cambios sin previo aviso

TADANO ATF 90G-4

Weights / Working speeds / Pesos / Velocidades de trabajo

Axle Eje	1	2	3	4	Total weight Peso total
[lbs]	26,455	26,455	26,455	26,455	105,62*

*Incl. 14,330 lbs counterweight, 62.5' (19.0 m)/69.1' (18.0 m) boom extension, hook block, swivel hook, tyres 445/95 R 25 (16.00 R 25).
*Incl. contrapeso de 6,61, 10 m/18 m pluma, gancho, gancho de bola, neumáticos 445/95 R 25 (16.00 R 25).

Lifting capacity Capacidad de elevación [ton]	Sheaves Poleas	Parts of line Ramales de cable	Weight Peso [lbs]
110.2	9	19	2,205
88.2	7	15	1,874
69.4*	5	11	1,433
44.1*	3	7	1,213
22.1	1	3	661
6.6	–	1	331

Ramal bom
Gancho doble

V+

	1	2	3	4	5	6	7	8	9	10	11	12	R1	R2	
445/95 (16.00) 525/80 (20.5) mph	2.5	3.1	3.7	4.9	6.1	7.4	10.0	13.0	16.7	21.1	26.7	34.8	2.4	3.1	62%
	3.7	4.9	6.1	8.0	10.0	13.0	17.4	22.3	28.5	36.6	46.6	52.8	4.3	4.9	

V+	Infinitely variable Infinitamente variable		Rope Cable	Max. single line pull Tiro máximo por ramal
1	0 – 377 ft/min 0 – 115 m/min	single line ramal simple	0.70" / 755' 18 mm / 230 m	55 kN = 12,860 lbs
2	0 – 377 ft/min 0 – 115 m/min	single line ramal simple	0.70" / 755' 18 mm / 230 m	55 kN
360°	0 – 2 rpm			
	-1° – +82.4°	approx. 35 s aproximadamente 35 s		
	36' 5" – 167' 11-3/4" 11.1 m – 51.2 m	approx. 310 s aproximadamente 310 s		

13156.00.01 (AC)

1A Application Type

[X] New [ ] Renewal [ ] Amendment

1B Equipment Type

[X] Mobile Crane [ ] Mobile Tower Crane [ ] Fix / Climber Tower Crane [ ] Derrick [ ] Mast Climber [ ] Pile Driver

2 Location Information

Borough N/A Block N/A Lot N/A

Address South Waterfront Development, NJ (AKA Hoboken Bldg. B) Job Number

3A Crane / Derrick / Mast Climber / Pile Driver Information

	CD Number	Serial Number	Expiration Date
1	Tadano ATF90-G4		
2			
3			
4			
5			
6			

3B Configuration / Phase Information

	Mast (ft)	Boom (ft)	Jib (ft)	Total (ft)
1		96.8/132.9/168		96.8/132.9/168
2				
3				
4				
5				
6				

4 Applicant Information

Name Lawrence Shapiro E-Mail

Title Vice President Lic.#

Business Name Howard L. Shapiro & Associates

Address 303 Merrick Road - Suite 400

City Lynbrook State NY Zip 11563

Phone 516-791-2600 Fax 516-791-5425

5 Equipment User Information

Name Gerald Fahy E-Mail

Title Project Manager

Company Kenvil United Corp.

Address 60 N. Dell Avenue

City Kenvil State NJ Zip 07847

Phone (973) 927-0010 Fax

6 Statement and Signature

* This On-Site Inspection Certificate will only be issued for the crane & mobile crane / derrick / mast climber / pile driver as the above mentioned site and conforms with approved plans.

6A Applicant's Statement

The applicant, having been authorized by the owner of the premises, building or structure, hereby makes application for the approval of the use of the lower 5 mobile crane / derrick / mast climber / pile driver described above to be used to the above mentioned site in accordance with the accompanying plans and specifications.

Name (please print)

Signature 8/07/13 Date

Seal (apply seal, then sign and date over seal)

6B Equipment User's Statement

I hereby state that the above equipment will not be used until a valid On-Site Inspection is obtained.

Signature X Date 8/23/13

6C Crane Safety Coordinator's Statement

As a Professional Engineer or a person having at least five years of construction experience, I hereby certify that I will act as the designated safety coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoist areas. I shall also supervise compliance with this On-site Inspection Certificate and its drawings.

Name Gerald Fahy License Number

Address 60 N. Dell Avenue

City Kenvil State NJ Zip 07847

Phone (973) 927-0010 Fax

Signature X Date 8/23/13

6D Mast Climber Supervisor's Statement

I am a Professional Engineer or an experienced person qualified for the installation, dismantling, operation and maintenance of the equipment listed in section 3A above. I am aware that this equipment shall not be used as a personnel or material hoist.

Name License Number

Address

City State Zip

Phone Fax

Signature Date

Additional Information:

Internal Use Only

Date Received	Invoice/Receipt Number	Fee Paid	
Examiner's Name (please print)		Inspector's Name (please print)	
Signature	(Issuance) Date	Signature	Date
Expiration date		Badge Number	

13156.00.01 (AC)

Applicants Statement of Notification

Application Type: _____

Application No.: _____

Date filed: _____

Borough: N/A

Community Board: N/A

Address: N/A

I, Lawrence K Shapiro, hereby state that in accordance with requirements, I will mail or fax a copy of this notice within 24 hours to the above Community Board regarding the filing of this project.

Signature	Date	Telephone number
	8/27/13	

Block: N/A Lot: N/A

Location: South Waterfront Development, NJ (AKA Hoboken Bldg. B)

1. Number of Stories N/A

2. Occupancy N/A
(Multiple Dwelling, Commercial, Garage, Stores and Offices, Store and Factory, Bank and Class A, Etc.)

3. No. of Apts. _____ Current _____ Proposed _____

3A. No. of SRO's. _____ Current _____ Proposed _____

4. Work Proposed Use of Tadano ATF90-4 Crane to assemble Grove GMK 7550 Crane and to erect FMC TG-1900 Tower Crane, CD#CD#2187 or CD#2961.

5. Name and Address of

Applicant N/A Address N/A

Owner _____ Address _____

Architect _____ Address _____

Engineer _____ Address _____

13156.00.01 (AC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Hoist Platform #:

#: Tadano ATF90G-4 Crane

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transportation. Mr/ Ms. Mike Braco, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue, Kenvil NJ 07847

Signature of Owner or Contractor: X

Date: 8/23/13

Safety Coordinator

I, Mike Braco (NAME), am a P.E., R.A. or a person having at least 5 years of construction experience

I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name Mike Braco Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue, Kenvil NJ 07847

Signature of Safety Coordinator: X

Date: 8/23/13

13156.00.01 (AC)

DESIGNATION OF SAFETY COORDINATOR

Crane/ Derrick/ Work Platform # _____ Tadano ATF90G-4 Crane

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transporatation. Mr/ Ms. Dave Cullen, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Owner or Contractor X

Date 8/23/13

Safety Coordinator

I, Dave Cullen (NAME), am a P.E., R.A. or a person having at least 5 years of construction experience

I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name Dave Cullen Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Safety Coordinator X

Date 8/23/13

13156.00.01 (AC)

Form 10F

1. Filing Status

✓	Identification of responsibilities		Certification of Completed Inspections / Tests
	Withdrawl of responsibility		Directive 14 Inspection Request

2. Location

Borough: N/A Block: N/A Lot(s): N/A BIN N/A

House No.(s): Street Name: Apt/Condo No(s).:

Special Place Name: South Waterfront Development, NJ Floor(s):

3. Applicant

Last Name: Shapiro First Name: Lawrence M.I.: K.

Business Name: Howard I. Shapiro & Associates Consulting Engineers, P.C.

Address: 303 Merrick Road Suite 400

City: Lynbrook State: NY ZIP: 11563

Telephone: (516) 791-2600 Fax: (516) 791-5425

✓ P.E. | R.A. | Other: Lic. No.: 60597

4. Crane Information (Only 1 crane will be used for this application)

CD No.	Manufacturer	Model	Boom Length	Jib Length	Total
	Tadano	ATF90G-4	96.8/132.9/168 Ft.		96.8/132.9/168 Ft.

5. Applicant's Statement

5A. Applicant's Statement of Responsibility (10 F)

* As a licensed Professional Engineer or Registered Architect representing the owner or contractor, I hereby state that I designed the foundation for the above crane(s) and will be on-site to inspect the said equipment and support before the commencement of work. All inspection and test reports will be signed by me

Signature Date 8/27/13

Seal

5B. Applicant's Statment of Crane Foundation Inspection (10E)

As a licensed Professional Engineer or Registered Architect representing the owner or contractor, I hereby state that I have completed the foundation inspection on _____ and found that it conforms with all approved drawings (see note). I also found no hazardous condition existed within the scope of this examination.

Signature Date

Seal

_____ Amendment Submitted ☐ Y ☐ N

A continuing tradition of engineering service – since 1946

HOWARD I. SHAPIRO & ASSOCIATES Consulting Engineers, P.C.

303 Merrick Road (Suite 400), Lynbrook, NY 11563

Howard I. Shapiro, P.E.(1922-2007) Jay P. Shapiro, P.E. Lawrence K. Shapiro, P.E. William Chieco Heng-Mun Loke, P.E. James Scheld, P.E.

13156.00.01 AC

August 27th, 2013

Port Authority of NY & NJ

New York, NY 10007

Attention: Ms. Maureen Lynch-Jacobs

REFERENCE: **CRANE INSTALLATION AT South Waterfront Development, NJ (AKA Hoboken Bldg. B)**
TYPE: **TADANO ATF90G-4 CRANE**
WITH: **96.8 OR 132.9 OR 168 FT. BOOM**

Dear Ms. Lynch-Jacobs:

We have inspected the above site as required for the installation and operations of the above crane. We found that the roadway & sidewalk in the indicated area can safely sustain a maximum temporary bearing pressure of 3,500 p.s.f.

When the crane is installed and operated as per the attached plan, this safe bearing pressure will not be exceeded.

Very truly yours,

Lawrence K. Shapiro, P.E.

Tel. (516) 791-2600 e-mail: LKShapiro@HISAssoc.com FAX (516) 791-5425

TG 1900 Crane Installation Information & Drawings

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-6425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY LKS

Hoboken

Tower Crane Installation

TG1900 with TG2300 Tower

Table of Contents

Sheet 2-3	Concrete footing calculations
Sheet 4	Bottom reinforcement calculation
Sheet 5	Top reinforcement calculation
Sheet 6	Shear reinforcement calculation
Sheet 7-8	Tower section leg capacity calculation
Sheet 9-11	Tower crane data and wind calculations
Sheet 12	Gust Calculation
Sheet 13-14	Out of service loading
Sheet 15-16	In service loading

8/9/13

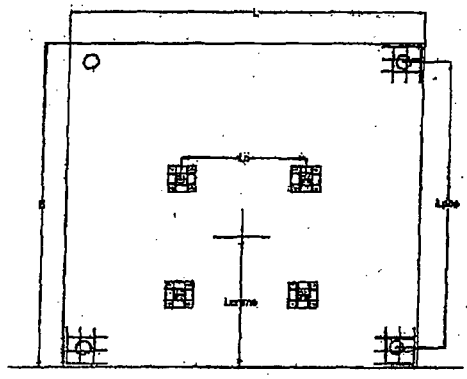
HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY LKS

Design Concrete footing for TG 2300 Tower

Loads at base of crane — See attached calculations for loads

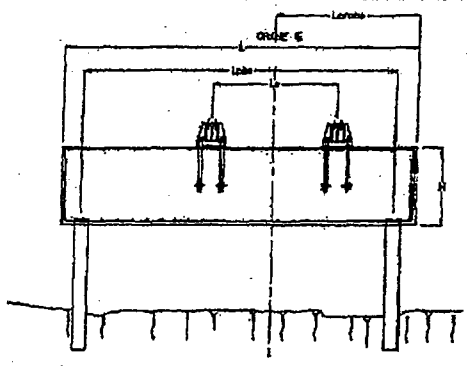
Moment (M)	11320.95	k-ft	Tower Crane Leg Distance
Vertical (W)	439.56	kip	Lc = 11.05 ft
Horizontal (V)	84.62	kip	



Resisting Forces

Concrete footing

L =	32.50	ft	
B =	32.50	ft	
H =	5.00	ft	Lpc = Lcrane-((B-Lpile)/2)
Lcrane =	11.25	ft	Lpc = 9.75 ft
Bcrane =	16.25	ft	Lpc2 = Lpile-Lpc
Lpile =	29.50	ft	Lpc2 = 19.75 ft
Bpile =	29.50	ft	
ρ_{conc} =	145.00	lb/ft³	
G =	765.78	kip	g = 0.725 k/ft²
			w = 0.416147 k/ft²



Tension Piles

T =	20	kips
Lr1 =	1.5	ft
Lr2 =	2.5	ft
Lr3 =	27	ft
Lr4 =	29.5	ft

1. Find minimum resisting moment

Check L direction (Symmetric)

ΣM_{RL} = G*Lpile/2 + W*Lcrane + 2*T*Lr1 + 2*T*Lr2 + 4*T*Lr4
= 19780.27 k-ft

ΣM_{OT} = M + V*(H-0.5')
= 11744.05 k-ft

Minimum resisting moment must exceed moment from crane with a factor of 1.5

Minimum resisting moment	19780.27	k-ft	
Overturning moment	17616.07	k-ft	Resisting moment > Overturning moment, OK.

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

2. Determine number of piles

Pcomp = M/Lpile = 1109.874 kips

Allowable compression/pile = 125 tons
250 kips

Number of piles per side required
n = Pcomp/Allowable = 5
Total Number of Piles 12

Check Compression in piles at corners
Distance 38.75 ft
ForceM 97.38453 kips
ForceG 63.8151 kips
ForceC 47.90022 kips
Total 209.0999 Kips/pile

Check tension in piles at corners
Total -14.3308 Kips/pile

Allowable compression per pile exceeds applied loading, OK.

3. Check moment at tower legs

The maximum moment will be in the B2 direction. North towards the building.

Moment at Pile
Compression in leg from diagonal wind loading and concrete weight are downward forces
Distance used is the distance from the crane legs to the piles (x) x = 11.5 ft

$F_{g+w} = (g+w)*x*B =$ 426.50 k
$M_{g+w} = F_{g+w}*x/2 =$ 2452.40 k-ft
$F_{leg} = M/Lc =$ 1024.33 k
$M_{leg} = F_{leg}*x =$ 11779.75 k-ft
$M_{bot} = M_{leg} + M_{g+w} =$ 14232.14 k-ft
Mu (bottom) = 22771.43 k-ft

Moment at Crane Leg
Concrete weight and crane weight are downward forces.
Distance used is the distance from the crane legs to the piles (x) x = 11.50 ft

$F_{g+w} = (g+w)*x*B =$ 426.50 k
$M_{g+w} = F_{g+w}*x/2 =$ 2452.40 k-ft
$F_{leg} = M/Lc =$ 0.00 k
$M_{leg} = F_{leg}*x =$ 0.00 k-ft
$M_{bot} = M_{leg} + M_{g+w} =$ 2452.40 k-ft
Mu (bottom) = 3923.83 k-ft

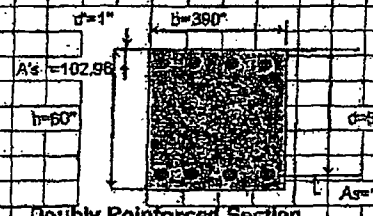
HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road Suite 400
LYNBROOK, NEW YORK 11563
Tel. (516) 791-2600, Fax (516) 791-5425

JOB #	13156.00.00		
SHEET NO.	4 of 16		
CALCULATED BY :	SR	DATE	8/9/2013
CHECKED BY	LKS	DATE	

Concrete Beam Reinforcement

Bottom Bars

Beam, Footing or Slab Section?	Footing	
Exterior or Interior Exposure?	Exterior	
Reinforcing Yield Strength, fy =	60	ksi
Concrete Comp. Strength, f'c =	6	ksi
Slab Section Width, b =	390	in.
Depth to Tension Reinforcing, d =	51	in.
Total Slab Section Depth, h =	60	in.
Tension Reinforcing, As =	102.96	in.^2
No. of Tension Bars in Slab, Nb =	108	
Tension Reinf. Bar Spacing, s1 =	3	in.
Clear Cover to Tension Reinf., Cc =	3	in.
Depth to Compression Reinf., d' =	1	in.
Compression Reinforcing, A's =	102.96	in.^2
Working Stress Moment, Ma =	14232.94	ft-kips
Ultimate Design Moment, Mu =	22771.43	ft-kips



Doubly Reinforced Section

Reinforcement #11 @ 6" => As= 3.12 in/ft

Moment Capacity Check for Slab-Type Section:

β1 =	0.80	
c =	1.754	in.
a =	1.403	in.
ρb =	0.03354	
ρ(prov) =	0.00518	
ρ(min) =	0.00354	
As(min) =	As(temp)	ACI 10.5.4
ρ(temp) =	0.00180	(total for section)
As(temp) =	21.060	in.^2/face As > As(temp), O.K.
ρ(max) =	0.03033	
As(max) =	809.254	in.^2 >= As = 102.96 in.^2, O.K.
f's =	37.41	ksi (A's does not yield)
φMn =	23218.04	ft-k >= Mu = 22771.43 ft-k, O.K.

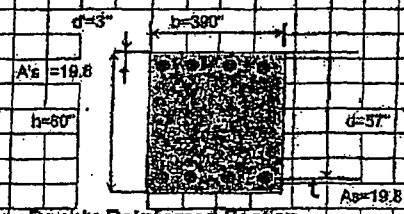
HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road Suite #400
LYNBROOK, NEW YORK 11563
Tel. (516) 791-2600, Fax (516) 791-5425

JOB#	13156.00.00		
SHEET NO.	5 of 18		
CALCULATED BY :	SR	DATE	8/9/2013
CHECKED BY	LKS	DATE	

Concrete Beam Reinforcement:

Top Bars

Beam, Footing or Slab Section?	Footing	
Exterior or Interior Exposure?	Exterior	
Reinforcing Yield Strength, fy =	60	ksi
Concrete Comp. Strength, f'c =	5	ksi
Slab Section Width, b =	390	in.
Depth to Tension Reinforcing, d =	57	in.
Total Slab Section Depth, h =	60	in.
Tension Reinforcing, As =	19.80	in.^2
No. of Tension Bars in Slab, Nb =	33	
Tension Reinf. Bar Spacing, s1 =	12	in.
Clear Cover to Tension Reinf., Cc =	3	in.
Depth to Compression Reinf., d' =	3	in.
Compression Reinforcing, A's =	19.80	in.^2
Working Stress Moment, Ma =	2452.40	ft-kips
Ultimate Design Moment, Mu =	3923.83	ft-kips
Ultimate Design Shear, Vu =	84.62	kips



Doubly Reinforced Section

Reinforcement #7 @ 12 " => As= 0.6 in/ft

Moment Capacity Check for Slab-Type Section:

β1 =	0.80	
c =	0.896	in.
a =	0.717	in.
ρb =	0.03354	
ρ(prov) =	0.00089	
ρ(min) =	0.00354	
As(min) =	As(temp)	ACI 10.5.4
ρ(temp) =	0.00180	(total for section)
As(temp) =	21.060	in.^2/face As < As(temp)
ρ(max) =	0.02604	
As(max) =	578.953	in.^2 >= As = 19.8 in.^2, O.K.
f's =	N.A.	ksi (A's does not yield)
ϕMn =	5046.77	ft-k >= Mu = 3923.83 ft-k, O.K.

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

Check reverse punching shear at crane legs

Tension in Leg	614.42	kips
Load Factor	1.60	
Eff. Area Conc.	10404.00	in^2
f'c	5000	psi
Vc = Ac*2*√f'c	1471.35	lbs
Factor ϕ	0.75	
Vc*ϕ	1103.51	lbs
Factored Load	983.07	

Vc*ϕ is greater than factored load, no reinforcement required.

Check shear at corner piles

Use total loading on piles at corners

Total Shear	627.30	kips
Load Factor	1.60	
Eff. Area Conc.	9599.90	in^2
f'c	5000	psi
Vc = Ac*2*√f'c	1357.63	kips
Factor ϕ	0.75	
Vc*ϕ	1018.22	kips
Factored Load	1003.68	kips

Vc*ϕ is greater than factored load, no reinforcement required.

Use # 4 bars

Vs Required	-14.54	kips
Steel Fy	60.00	ksi
Asreq = Vs/ϕ/Fy	-0.32	ksi
Area of bars	0.20	in^2
Number of Bars	-2	

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY

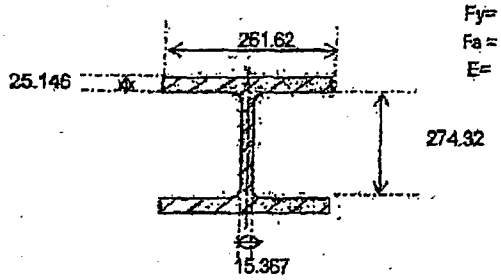
Tower Leg Properties

TG 2300 Tower Section
Legs consist of WF Beam 10x112

material : 350

Fy= 50 Ksi
Fa = 26.861 Ksi
E= 29000 Ksi

$$F_a = \frac{F_y*(1-((kL/r)^2)/((2C_c)^2))}{((5/3)+3*(kL/r))/(8*C_c-((kL/r)^3)/8*C_c^3}$$



Area: A = 21225.8 mm^2 = 32.900 in^2

Inertia: Ix= 2.98E+08 mm^4 = 716.000 in^4
Iy= 9.82E+07 mm^4 = 236.000 in^4

$$r = \sqrt{\frac{I}{A}}$$

x = 4.660
y = 2.680
Use Y as it is more conservative

K = 1

maximum unbraced length:

$L_{unbraced}$ = 2200 mm = 86.6 in

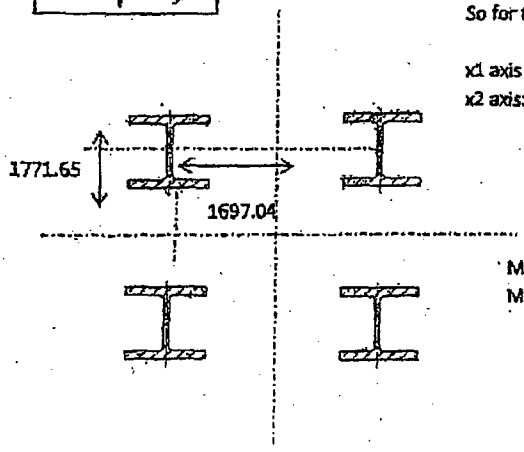
$$\frac{KL}{r} =$$ 32.318721

$$C_c = \sqrt{\frac{2\pi^2 E}{F_y}}$$ = 106.999

$\frac{KL}{r} < C_c$ there will be no elastic buckling.

So for the cross section:

A_{total} = 4 * A = 131.600 in^2
x1 axis : $I_{total-x1}$ = 4*(I + A*d^2) = 2.68E+11 mm^4 = 643106 in^4
x2 axis: $I_{total-x2}$ = 5.88E+05 in^4



These values are used to obtain the gust factor, necessary for the calculation of the wind force applied on the structure

Max All. Comp. = Fa * A = 884 K/in^2
Max All. Tens. = 0.6 * Fy * A = 987 K/in^2

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY

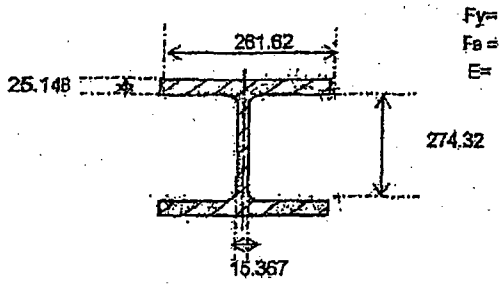
Tower Leg Properties

TG 1900 Tower Section
Legs consist of WF Beam 10x88

material : 350

Fy= 50 Ksi
Fa = 26.783 Ksi
E= 29000 Ksi

$$F_a = \frac{F_y*(1-((kL/r)^2)/((2C_c)^2)}{((5/3)+3*(kL/r))/(8*C_c-((kL/r)^3)/8*C_c^3}$$



Area: A = 16774.2 mm^2 = 26.000 in^2

Inertia: Ix= 2.22E+08 mm^4 = 534.000 in^4
Iy= 7.45E+07 mm^4 = 179.000 in^4

$$r = \sqrt{\frac{I}{A}}$$

x = 4.540
y = 2.630

K = 1

Use Y as it is more conservative

maximum unbraced length:

$L_{unbraced}$ = 2200 mm = 86.6 in

$$\frac{KL}{r} =$$ 32.933146

$$C_c = \sqrt{\frac{2\pi^2 E}{F_y}}$$ = 108.999

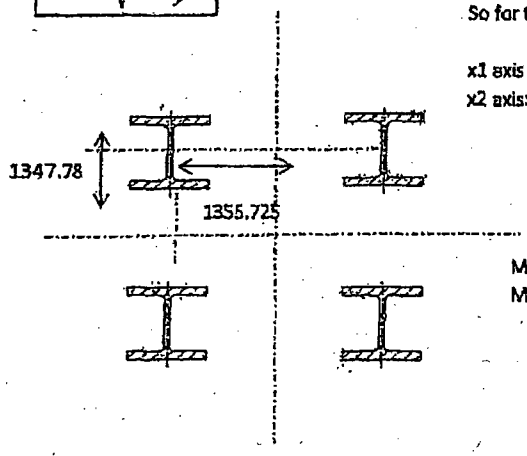
$\frac{KL}{r} < C_c$ there will be no elastic buckling.

So for the cross section:

A_{total} = 4 * A = 104.000 in^2

x1 axis : $I_{total-x1}$ = $4*(I + A*d^2)$ = 1.23E+11 mm^4 = 294958 in^4

x2 axis: $I_{total-x2}$ = 2.97E+05 in^4



These values are used to obtain the gust factor, necessary for the calculation of the wind force applied on the structure

Max All. Comp. = F_a * A = 696 K/in^2
Max All. Tens. = 0.6 * Fy * A = 780 K/in^2

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

Storm wind is applied and upper section of crane is taken as weather veining.

Weathervaning Angle (from Clearance):	10.25	deg
Boom Length:	240	ft
Radius:	240.00	ft
Boom COG:	104.17	ft
Dist. Boom foot to COR:	3.83333	ft
Weathervaning COG:	106.3408	ft
Height:	42.70645	ft

	Weight (Kip)	Distance X (ft)	Moment (K*ft)
A-Frame	24.14	-10.71	-258.61
Slewing Plat.	16.56	0.00	0.00
Deck	83.32	-6.50	-541.55
Fixed CTWT	23.70	-19.43	-460.49
Moving CTWT	72.87	-17.44	-1270.47
Boom	31.33	106.34	3331.66
Total	251.92	-	800.54

Find Wind pressure

		Upper	2300 Sect.	1900 Sect.	Trans	
Height of wind (z)	=	200.58	48.00	150.85	88.18	ft

Exposure Category = C

Wind force is determined using the following formula:

Force $F = G_f * q_z * C_f * A$

Where:

Gust Factor G_f		Calculated		
Wind Pressure q_z	=	$K_z*K_{zt}*K_d*I*V_f^2/391$		
Force Coefficient C_f				
Sum of face area of members in frame A_f		OS	IS	OS
Wind Velocity V	=	100	30	100
Height and terrain factor K_z	=	$2.01*(z/z_g)^{\wedge}2/\alpha$		
Topographic factor K_{zt}	=	1		1
Directional factor K_d	=	0.85		1
Importance factor I	=	1		1
Construction Period Design Factor	=	0.85	1	0.85
$V_f = V*C_{cpdf}$	=	85	30	85

α = 9.5

z_g = 900

		1900 Sect.	2300 Sect.	Trans	Upper
K_z	=	1.38003908	1.08442	1.23253	1.465359

		Tower	2300 Sect.	Trans	Upper	IS
q_z	=	23.0156859	17.0324	19.3587	27.07728	2.867006

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

Determine Cf

Find Face Area

Tower Sections: TG2300

Height = 13.71875 ft

Gross Area A_g = 147.85 ft^2

Area A_f = 61.085 ft^2

ϕ = A_f/A_g = 0.41316

Cf	Eff. Area	OS Fwind	OS Fwind	IS Fwind	IS Fwind	
2.452	149.78042	3447.3	0.25128	429.4213	0.031302	side
3.08	188.1418	4330.21	0.31564	539.4036	0.039319	diagonal

Tower Section: Transition Section

Height = 13.625 ft

Gross Area A_g = 137.5 ft^2

Area A_f = 46.96 ft^2

ϕ = A_f/A_g = 0.34153

Cf	Eff. Area	OS Fwind	OS Fwind	IS Fwind	IS Fwind	
2.452	115.14592	2650.16	0.19451	330.124	0.024229	side
3.08	144.6368	3328.92	0.24432	414.6746	0.030435	diagonal

Tower Sections: TG1900

Height = 13.71875 ft

Gross Area A_g = 128.04 ft^2

Area A_f = 39.63 ft^2

ϕ = A_f/A_g = 0.30951

Cf	Eff. Area	OS Fwind	OS Fwind	IS Fwind	IS Fwind	
2.452	97.17276	2236.5	0.16302	278.5949	0.020308	side
3.08	122.0604	2809.3	0.20478	349.9479	0.025509	diagonal

Wind load on boom

From Previous Calcs

Cf = 1.2 η = 0.75 Aw = 1116.63 in^2

Use qz at Upperworks	OS	IS	
Uniform wind load on boom =	0.00639	0.000677	K/in
Wind load for Boom =	18.4041	1.948669	K

Wind is on angle to boom. Calculate new wind force

$F\alpha = F^*\sin^2\alpha$ OS

Wind force on boom = 0.58275 K

Sum of Moments
Moment from Weight OS 800.54 k-ft

In service loading at max moment radius. See In Service loading calculations.

Out of service (OS)

	Deck	A-Frame	Boom	
Wind height	8	25	31.10323	ft
Wind area	275	342	679.2	ft^2
Wind force	9.6344303	11.9817	0.753993	kips
Wind moment	77.075443	299.543	23.45161	kip-ft

In service (IS) at 110 ft radius (See IS calculations for max moment)

	Deck	A-Frame	Boom	
Wind height	8	25	117.3704	ft
Wind area	275	342	679.2	ft^2
Wind force	0.7884266	0.98052	1.567347	kips
Wind moment	6.3074129	24.5129	183.9602	kip-ft

Find wind force and moment at top

	OS	IS	
Wind shear	22.3702	3.33629	kips
Moment from Wind	400.07	214.781	k-ft
Sum of Moments	1200.61	-	k-ft

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY LKS

Gust Factor Calculations - Free Standing

Number of TG2300 Sections	2.00		Number of TG1900 Sections		7	Transition Section		1
Height of TG2300 Sections	40.00	ft	Height of TG1900 Sections		13.63	Transition Height		13.625
Total Height of Tower	189.00	ft	Width	11.05	Width	9.40		
Total Height above ground	190.83	ft						
Height to machine deck	200.58	ft						

	Out of Service	
Design Wind Speed with 50 years recurrancy	110.00	
Exposure Factor	0.85	As per SEI/ASCE 37-02
Wind Speed over exposure period	93.50	

Exposure Zone	C	Kh	1.47	Kd	0.85	$\bar{\alpha}$	0.15	$\bar{b}$	0.65
		c	0.20	l	500.00	$\bar{\varepsilon}$	0.20		

		Out of Service
Natural Frequency from RISA 3D, n1		0.365
	nh	2.968
	nb	0.146
	nl	0.490
	Rh	0.280
	Rb	0.909
	Rl	0.740
	Rn	0.085
	I_z	0.163
	Q	0.876
	gr	3.942
Equivalent Height of Structure,	$\bar{z}$	114.500
Mean Hourly Wind Speed,	$\bar{V}_{\bar{z}}$	107.939
Integral Length Scale of Turbulence,	$L_{\bar{z}}$	641.251
Reduced Frequency, N1		2.168
Damping Ratio		0.010
Resonant Response Factor		1.379
Gust Factor =		1.294

$$L_{\bar{z}} = \bar{z}\left(\frac{\bar{z}}{33}\right)^{\bar{\varepsilon}}$$

$$N_1 = \frac{n_1 L_{\bar{z}}}{\bar{V}_{\bar{z}}}$$

$$R_\ell = \frac{1}{\eta} - \frac{1}{2\eta^2}(1 - e^{-2\eta}) \quad \text{for } \eta > 0$$

$$R_\ell = 1 \quad \text{for } \eta = 0$$

$$I_{\bar{z}} = c\left(\frac{33}{\bar{z}}\right)^{1/6}$$

$$\bar{V}_{\bar{z}} = \bar{b}\left(\frac{\bar{z}}{33}\right)^{\bar{\alpha}} \bar{V}\left(\frac{88}{60}\right)$$

$$R = \sqrt{\frac{1}{\beta} R_n R_h R_B (0.53 + 0.47 R_L)}$$

$$R_n = \frac{7.47 N_1}{(1 + 10.3 N_1)^{5/3}}$$

$R_\ell = R_h$ setting $\eta = 4.6 n_1 h/\bar{V}_{\bar{z}}$
$R_\ell = R_B$ setting $\eta = 4.6 n_1 B/\bar{V}_{\bar{z}}$
$R_\ell = R_L$ setting $\eta = 15.4 n_1 L/\bar{V}_{\bar{z}}$

$$Q = \sqrt{\frac{1}{1 + 0.63\left(\frac{B + h}{L_{\bar{z}}}\right)^{0.63}}}$$

$$g_R = \sqrt{2 \ln(3{,}600 n_1)} + \frac{0.577}{\sqrt{2 \ln(3{,}600 n_1)}}$$

$$G_f = 0.925\left(\frac{1 + 1.7 I_{\bar{z}}\sqrt{g_Q^2 Q^2 + g_R^2 R^2}}{1 + 1.7 g_v I_{\bar{z}}}\right)$$

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY LKS

Check Freestanding out of service conditions

Height of TG2300 = 80.00 ft Height of TG1900 = 95.38 ft Height of Trans. = 13.63 ft

Total Height = 190.83

Gust Factor Results Compiled (See Gust Factor Calculations)

Gf	1.29

Calculate Force Due to wind on tower sections.

	2300(Diag)	2300	1900 (Diag)	1900	Tran(Diag)	Trans
Lin. Force (k/ft)	0.41	0.33	0.26	0.21	0.32	0.25
Length (ft)	80.00	80.00	95.38	95.38	13.63	13.63
Y Dist. (ft)	40.00	40.00	141.31	141.31	86.81	86.81
Moment	1306.87	1040.41	3570.98	2842.87	373.92	297.68

Sum of forces and moments at top

Shear at top (K)	22.37
Moment On Tower (K*ft)	1200.61
Weight at top (K)	251.92

Find Moment caused by deflection

	TG2300 Tower	TG1900 Tower	Transition	
Moment of Interia (I)	588396.31	294958.15	441677.23	in^4
Young's Modulus (E)	29000.00	29000.00	29000.00	ksi

$$\delta = \frac{12*M_{top}*(height*12)^2}{2*E*I} + \frac{Wr*(height*12)^3}{3*E*I} + \frac{Lin.}{12} * \frac{(height*12)^4}{8*E*I}$$

$$M_{PDelta} = \frac{W_{top}}{12} * \delta$$

Σ Moments at top (Mtop) (K*ft)	1200.61
Deflection TG1900 (in)	28.56
Deflection Transition (in)	
Deflection TG2300 (in)	
Total Deflection (in)	28.56
Moment caused by P-Delta	599.61

Weight of Tower Sections

	Weight	No. Sections	Total	Wt./lin. Ft.
TG2300	45.02	2.00	90.04	1.13
TG1900	11.5	7.00	80.5	0.84
Transition	17.1	1.00	17.1	1.26
		Total:	187.64	

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY LKS

Σ Moments and Forces on Tower Base (max. stressed member)

	OS Diag	OS
Wb=	439.56	439.56
Mb=	11320.95	10250.14
Hb=	84.62	71.93
Width of Sect.	11.05	11.05
Max. Comp.	834.20	437.79
Max. Tension	-614.42	-218.01

From Leg Calculations:

Allowable Compressive Force	883.74	K/in^2
Allowable Tension Force	987.00	K/in^2

Stress Check OK

Σ Moments and Forces on TG1900

	OS Diag	OS
Wb=	439.56	439.56
Mb=	6304.94	0.00
Hb=	47.64	0.00
Width of Sect.	8.89	8.89
Max. Comp.	611.32	109.89
Max. Tension	-391.54	109.89

From Leg Calculations:

Allowable Compressive Force	696.35	K/in^2
Allowable Tension Force	780.00	K/in^2

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/08/13
CALCULATED BY SR
CHECKED BY LKS

Check Freestanding in service conditions

Height of TG2300 = 80.00 ft Height of TG1900 = 95.38 ft Height of Trans. = 13.63 ft

Total Height = 190.83

Calculate Force Due to wind on tower sections.

	TG2300	1900 (Diag)	Trans
Lin. Force (k/ft)	0.04	0.03	0.03
Length (ft)	80.00	95.38	13.63
Y Dist. (ft)	40.00	141.31	86.81
Moment	125.82	343.80	36.00

Find Worst Moment of Load on Tower

Radius	20	30	40	50	60	70	80	90	100	110
Angle	86.14	83.74	81.33	78.91	76.47	74.00	71.50	68.95	66.38	63.75
Load	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	43.30
20% Impact	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60	51.96
Load Moment	1152.00	1728.00	2304.00	2880.00	3456.00	4032.00	4608.00	5184.00	5760.00	5715.60
Boom COG	10.85	15.19	19.53	23.87	28.21	32.55	36.89	41.23	45.57	49.91
Boom Moment	339.94	475.93	611.91	747.90	883.88	1019.87	1155.85	1291.84	1427.82	1563.81
MCTWT Moment	-851.25	-862.08	-873.10	-884.34	-895.82	-907.57	-919.62	-932.01	-944.79	-958.01
Moments	-619.95	81.20	782.16	1482.91	2183.42	2883.65	3583.59	4283.18	4982.38	5060.75

Continued

120	130	140	150	160	170	180	190	200	210	220
61.05	58.28	55.43	52.48	49.41	46.18	42.77	39.13	35.18	30.79	25.75
38.70	34.80	31.50	28.60	26.00	23.80	21.90	20.00	18.40	16.90	15.50
46.44	41.76	37.80	34.32	31.20	28.56	26.28	24.00	22.08	20.28	18.60
5572.80	5428.80	5292.00	5148.00	4992.00	4855.20	4730.40	4560.00	4416.00	4258.80	4092.00
54.25	58.59	62.94	67.28	71.62	75.96	80.30	84.64	88.98	93.32	97.66
1699.79	1835.78	1971.76	2107.75	2243.73	2379.72	2515.71	2651.69	2787.68	2923.66	3059.65
-971.73	-986.02	-1000.96	-1016.68	-1033.31	-1051.04	-1070.11	-1090.88	-1113.88	-1139.96	-1170.69
5040.22	5017.91	5002.15	4978.42	4941.77	4923.23	4915.35	4860.16	4829.15	4761.86	4720.30

Loads on upper structure

Max Moment Boom/Load	5060.75	k-ft
Wind Shear (Kips)	3.34	k
Wind Moment (K*ft)	214.78	k-ft
Sum of Moments (K*ft)	5275.53	k-ft
Axial Load at Top (Kips)	309.52	kips

at 110' radius

230	240
19.55	10.25
14.30	10.50
17.16	12.60
3946.80	3024.00
102.00	106.34
3195.63	3331.62
-1209.64	-1270.45
4672.14	3824.52

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5428

DATE 08/09/13
CALCULATED BY SR
CHECKED BY LKS

Find Moment caused by deflection

	TG2300 Tower	TG1900 Tower	Transition	
Moment of Interia (I)	588396.31	294958.15	441677.23	In^4
Young's Modulus (E)	29000.00	29000.00	29000.00	ksi

$$\delta = \frac{12*M_{top}*(height*12)^2}{2*E*I} + \frac{W_r*(height*12)^3}{3*E*I} + \frac{L_{inF}}{12} * \frac{(height*12)^4}{8*E*I}$$

$$M_{PDelta} = \frac{W_{top}}{12} * \delta$$

Σ Moments at top (M_{top}) (K*ft)	5275.53
Deflection TG1900 (in)	22.28
Total Deflection (in)	22.28
Moment caused by P-Delta	574.76

Weight of Tower Sections

	Weight	No. Sections	Total	Wt./lin. Ft.
TG2300	45.02	2.00	90.04	1.13
TG1900	11.5	7.00	80.5	0.84
Transition	17.1	1.00	17.1	1.26
		Total:	187.64	

Σ Moments and Forces on Tower Base (max. stressed member)

Check TG2300 leg at base

	IS Diag
Wb=	497.16
Mb=	6992.59
Hb=	12.57
Width of Sect.	11.05
Max. Comp.	571.67
Max. Tension	-323.09

Check TG1900 leg at transistion

	IS Diag
Wb=	497.16
Mb=	5709.75
Hb=	12.57
Width of Sect.	8.90
Max. Comp.	577.93
Max. Tension	-329.35

From Leg Calculations:	TG 2300	TG 1900	
Allowable Compression	883.74	696.35	Kip
Allowable Tension Force	987.00	780.00	Kip

Stress Check Allowable stress exceeds maximum stress. OK

13156.00.00 (TC)

1A Application Type

[X] New [ ] Renewal [ ] Amendment

1B Equipment Type

[ ] Mobile Crane [ ] Mobile Tower Crane [X] Fix / Climber Tower Crane [ ] Derrick [ ] Mast Climber [ ] Pile Driver

2 Location Information

Borough N/A Block N/A Lot N/A

Address South Waterfront Development, NJ (AKA Hoboken Bldg. B) Job Number

3A Crane / Derrick / Mast Climber / Pile Driver Information

	CD Number	Serial Number	Expiration Date
1	2187	76-G8-271C	
2	2961	76H1811C	
3			
4			
5			
6			

3B Configuration / Phase Information

	Mast (ft)	Boom (ft)	Jib (ft)	Total (ft)
1		240		240
2		240		240
3				
4				
5				
6				

4 Applicant Information

Name Lawrence Shapiro E-Mail
Title Vice President Lic#
Business Name Howard I. Shapiro & Associates
Address 303 Merrick Road - Suite 400
City Lynbrook State NY Zip 11563
Phone 516-791-2600 Fax 516-791-5425

5 Equipment User Information

Name Gerald Fahy E-Mail
Title Project Manager
Company Kenvil United Corp.
Address 60 N. Dell Avenue
City Kenvil State NJ Zip 07847
Phone (973) 927-0010 Fax

6 Statement and Signature

* This On-Site Inspection Certificate will only be used for the tower & mobile crane / derrick / mast climber / pile driver at the above mentioned site and conforms with approved plans.

6A Applicant's Statement

The applicant, having been authorized by the owner of the premises, building or structure, hereby makes application for the approval of the use of the tower & mobile crane / derrick / mast climber / pile driver described above to be used to the above mentioned site in accordance with the accompanying plans and specifications.

Name (please print)

Signature 8/28/13 Date

Seal (apply seal, then sign and date over seal)

6B Equipment User's Statement

I hereby state that the above equipment will not be used until a valid On-Site Inspection is obtained.

Signature X Date 8/23/13

6C Crane Safety Coordinator's Statement

As a Professional Engineer or a person having at least five years of construction experience, I hereby certify that I will act as the designated safety coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoist areas. I shall also supervise compliance with this On-site Inspection Certificate and its drawings.

Name Gerald Fahy License Number
Address 60 N. Dell Avenue
City Kenvil State NJ Zip 07847
Phone (973) 927-0010 Fax
Signature X Date 8/23/13

6D Mast Climber Supervisor's Statement

I am a Professional Engineer or an experienced person qualified for the installation, dismantling, operation and maintenance of the equipment listed in section 3A above. I am aware that this equipment shall not be used as a personnel or material hoist.

Name License Number
Address
City State Zip
Phone Fax
Signature Date
Additional Information:

Internal Use Only

Date Received	Invoice/Receipt Number	Fee Paid	
Examiner's Name (please print)		Inspector's Name (please print)	
Signature	(Issuance) Date	Signature	Date
Expiration date		Badge Number	

13156.00.00 (TC)

Applicants Statement of Notification

Application Type: _____

Application No.: _____

Date filed: _____

Borough: N/A

Community Board.: N/A

Address: N/A

I, Lawrence K Shapiro, hereby state that in accordance with requirements, I will mail or fax a copy of this notice within 24 hours to the above Community Board regarding the filing of this project.

Signature	Date	Telephone number
	8/28/13	

Block: N/A Lot: N/A

Location: South Waterfront Development, NJ (AKA Hoboken Bldg. B)

1. Number of Stories N/A

2. Occupancy N/A
(Multiple Dwelling, Commercial, Garage, Stores and Offices, Store and Factory, Bank and Class A, Etc.)

3. No. of Apts. _____ Current _____ Proposed _____

3A. No. of SRO's. _____ Current _____ Proposed _____

4. Work Proposed Use of TG-1900T Tower Crane, CD#CD#2187 or CD#2961 to erect building.

5. Name and Address of

Applicant N/A Address N/A

Owner _____ Address _____

Architect _____ Address _____

Engineer _____ Address _____

13156.00.00 (TC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Work Platform #

#: TG-1800T Tower Crane, CD#2187 or 2861

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transportation. Mr/ Ms. Mike Braco, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue, Kenvil, NJ 07847

Signature of Owner or Contractor: X

Date: 8/23/13

Safety Coordinator

I, Mike Braco (NAME), am a P.E., R.A. or a person having at least 8 years of construction experience. I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name: Mike Braco Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue, Kenvil, NJ 07847

Signature of Safety Coordinator: X

Date: 8/23/13

13196.00.00 (TC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Work Platform #: _____ #: TG-1900T Tower Crane, CD#2187 or 2981

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transportation. Mr/ Ms. Dave Cullen, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Owner or Contractor: X

Date: 8/23/13

Safety Coordinator

I, Dave Cullen (NAME), am a P.E., R.A. or a person having at least 5 years of construction experience

I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name Dave Cullen Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Safety Coordinator: X

Date: 8/23/13

A continuing tradition of engineering service – since 1946

HOWARD I. SHAPIRO & ASSOCIATES Consulting Engineers, P.C.

303 Merrick Road (Suite 400), Lynbrook, NY 11563

Howard I. Shapiro, P.E.(1932-2007) Jay P. Shapiro, P.E. Lawrence K. Shapiro, P.E. William Chieco Heng Mun Loke, P.E. James Schold, P.E.

13156.00.00 TC

August 28th, 2013

Port Authority of NY & NJ

New York, NY 10007

Attention: Ms. Maureen Lynch-Jacobs

REFERENCE: **CRANE INSTALLATION AT South Waterfront Development, NJ (AKA Hoboken Bldg. B)**
TYPE: **TG-1900T TOWER CRANE, CD#2187 OR 2961**
WITH: **240 FT. BOOM**

Dear Ms. Lynch-Jacobs:

We have inspected the above site as required for the installation and operation of the above crane. We found that the building structure in the indicated area can safely sustain the imposed crane loads.

Very truly yours,

Lawrence K. Shapiro, P.E.

Tel. (516) 791-2600 e-mail: LKShapiro@HISAssoc.com FAX (516) 791-5425

CRANE FOUNDATION PLANS

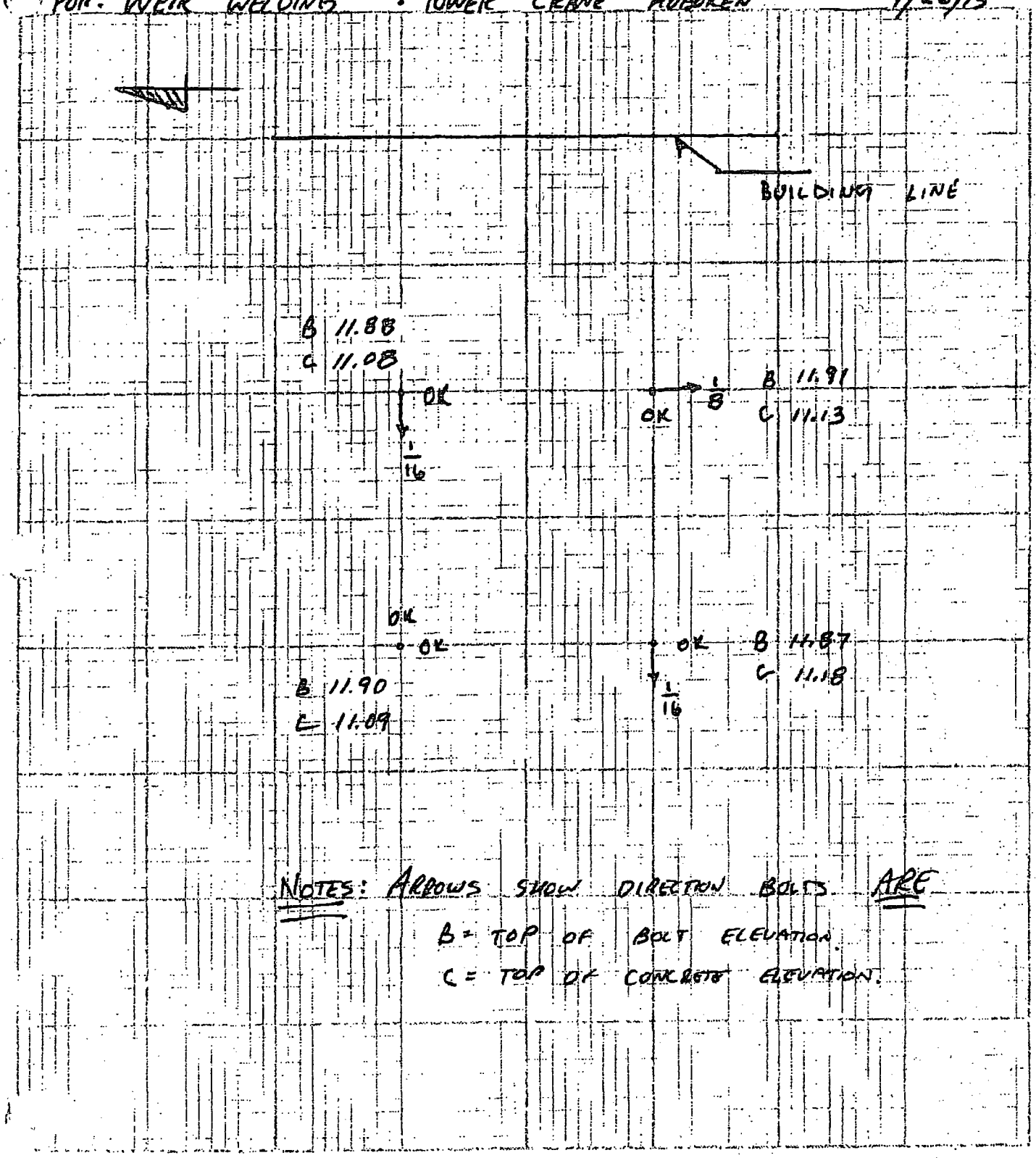
TEL: (908) 876-3097
FAX: (908) 876-3182

JOHN F. EBERTH ASSOCIATES, INC.

JOHN C. EBERTH, Licensed N.J.S. Land Surveyor

2 Blackberry Place, Long Valley, N.J. 07853

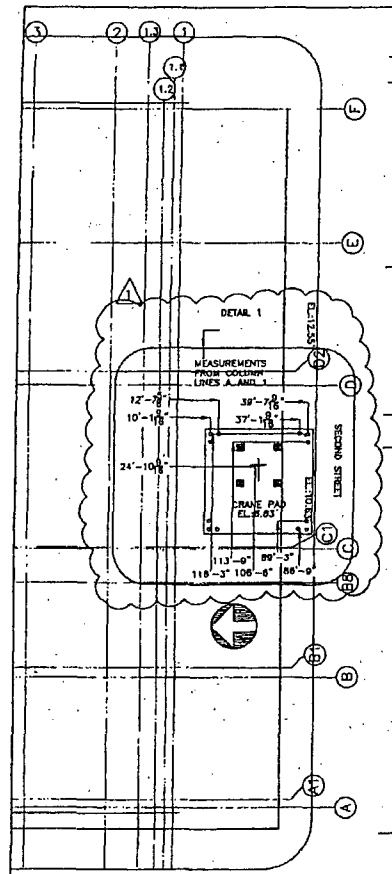
FOR: WEIR WELDING • TOWER CRANE HOBOKEN 4/26/13



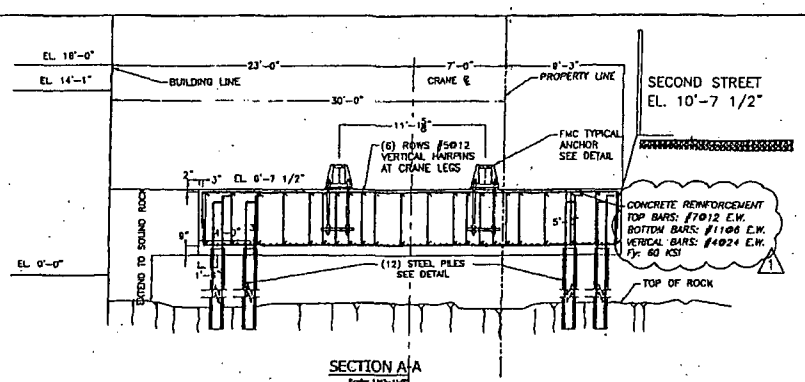
NOTES: ARROWS SHOW DIRECTION BOLTS ARE

B = TOP OF BOLT ELEVATION.

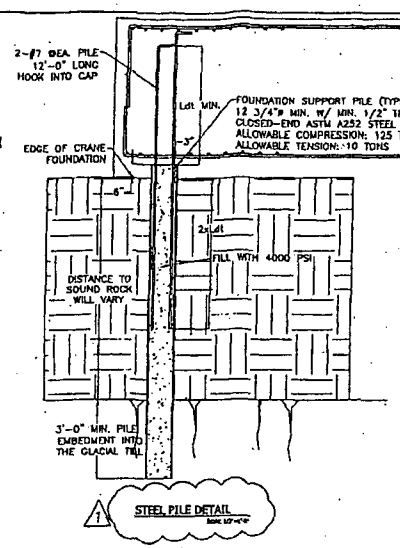
C = TOP OF CONCRETE ELEVATION.



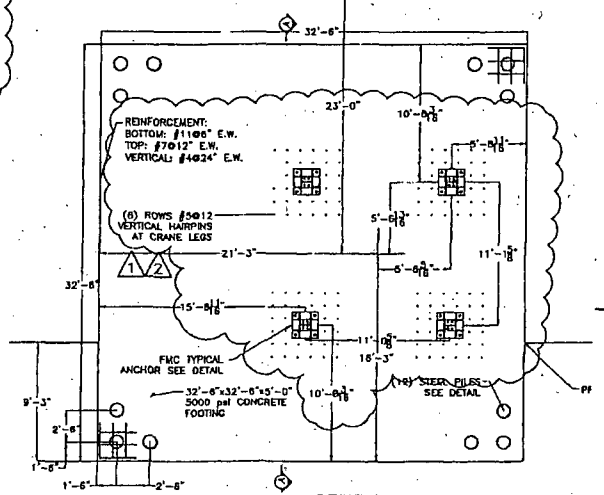
PLAN VIEW
Scale: 1/16"=1'-0"



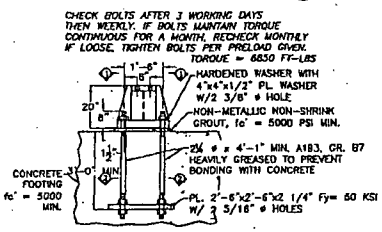
SECTION A-A
Scale: 1/4"=1'-0"



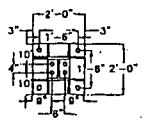
STEEL PILE DETAIL
Scale: 1/2"=1'-0"



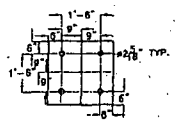
DETAIL 1
Scale: 1/4"=1'-0"



ANCHOR DETAIL AT CRANE LEGS
SCALE: 1" = 2'-0"



SECTION 1-1
SCALE: 1" = 2'-0"



SECTION 2-2
SCALE: 1" = 2'-0"

GENERAL TOWER CRANE FOUNDATION NOTES

1. FOUNDATION SPECIFICATIONS AND THE REACTION FORCES APPLY ONLY TO THE TOWER CRANE CONFIGURATION SHOWN. ANY DEVIATIONS FROM THE CRANE CONFIGURATION SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF HOWARD I. SHAPIRO & ASSOCIATES.
2. CONTRACTOR SHALL VERIFY THAT THERE ARE NO UNDERGROUND UTILITIES, STRUCTURES OR OBSTRUCTIONS IN THE AREA OF THE PROPOSED CRANE LOCATION(S). THE CONTRACTOR IS RESPONSIBLE TO SEE THAT ALL UNDERGROUND UTILITIES WILL BE MARKED AND LOCATED AND NECESSARY STABILIZATION PROVIDED.
3. THE CONTRACTOR SHALL PROVIDE WRITTEN AS-BUILT HORIZONTAL AND VERTICAL LOCATION OF THE CENTERLINE OF THE TOWER CRANE FOUNDATION. THE CONTRACTOR SHALL ALSO PROVIDE THE WRITTEN AS-BUILT ANGLE IF THE TOWER CRANE IS SHOWN FROM A BUILDING CORD LINE.
4. ANCHOR STOOLS SHALL BE SET USING A TEMPLATE PROVIDED BY THE CRANE VENDOR.
5. SPECIAL INSPECTIONS SHALL BE REQUIRED FOR FOUNDATION CONSTRUCTION AS LISTED HEREIN.
6. SPECIAL INSPECTIONS SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL BUILDING CODE
7. TOWER CRANE MUST BE ERECTED PLUMB WITHIN MANUFACTURER'S REQUIREMENTS, BUT IN NO CASE SHALL DEVIATION FROM PLUMB EXCEED 1/300.
8. INSTALLATION OF THE TOWER CRANE SHALL BE IN ACCORDANCE WITH AISC 360-2012 AND OSHA 1926.1435.
9. REINFORCED CONCRETE SHALL BE IN ACCORDANCE WITH ACI318 AND LOCAL BUILDING CODE

SPECIAL INSPECTIONS

1. PILES
2. CONCRETE CAST IN PLACE
3. FOOTING AND FOUNDATION
4. CONCRETE TEST CYLINDERS
5. CONCRETE MIX DESIGN

TOWER CRANE #1
TOWER CONFIGURATION:
(3) TG2300 40'-0" SECTIONS
(1) TRANSITION SECTION
(7) TG1900 13'-7 1/2" SECTIONS
FMC TG-1900T 230' BOOM
CD #2187 OR #2961

Lawrence Shapiro
NJ PE
24GE03495700
4/16/13

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 MERRICK ROAD, SUITE 400, LYNBROOK, N.Y. 11563
TEL. (516) 791-2800 FAX: (516) 791-5425

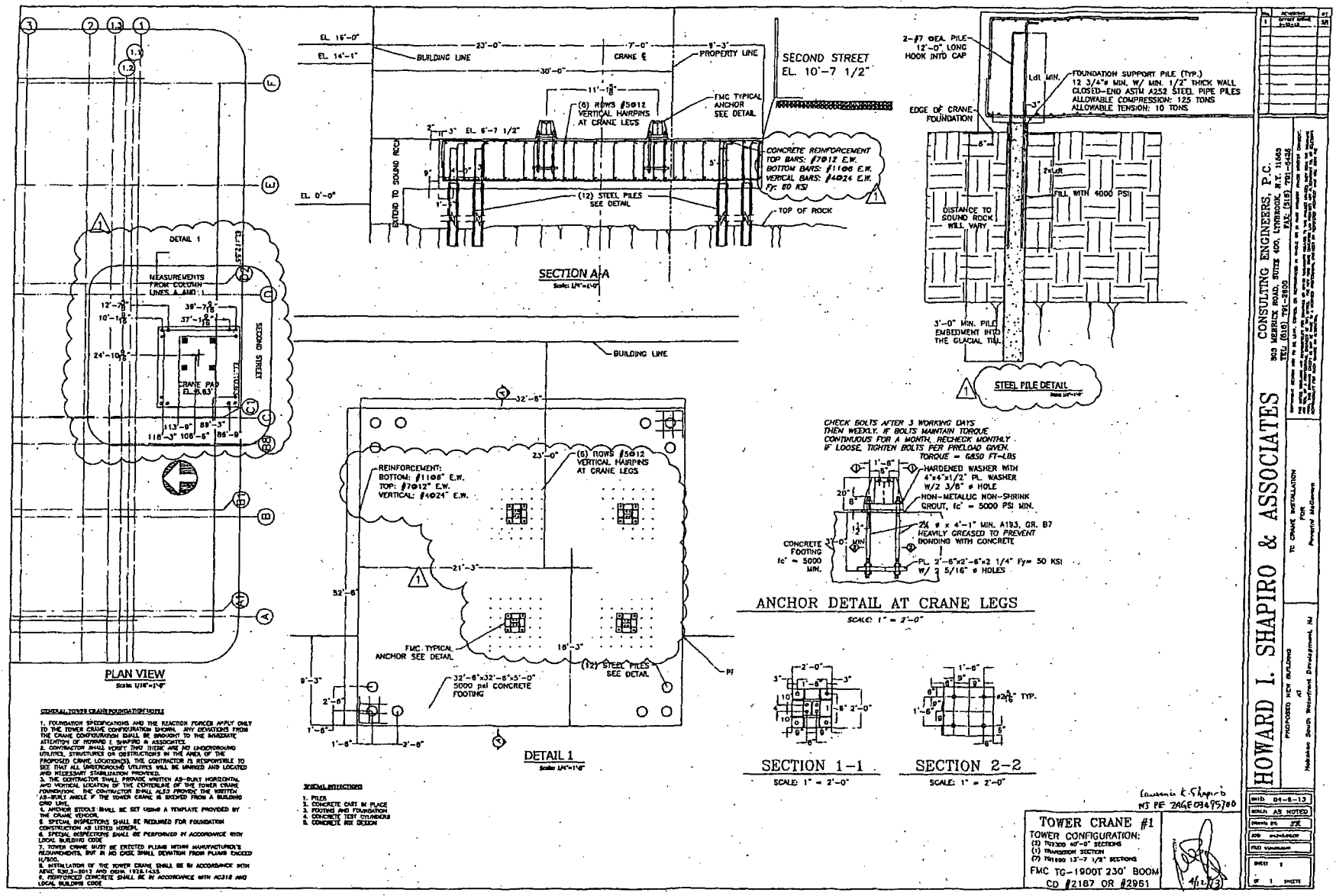
SURVEYING BASED NOT TO BE LEGAL CAPACITY, NOR REPRODUCED IN WHOLE OR IN PART WITHOUT PRIOR WRITTEN APPROVAL. THE ABOVE PLAN IS THE PROPERTY OF HOWARD I. SHAPIRO & ASSOCIATES, CONSULTING ENGINEERS, P.C. AND IS NOT TO BE REPRODUCED IN WHOLE OR IN PART WITHOUT PRIOR WRITTEN APPROVAL. THE ABOVE PLAN IS THE PROPERTY OF HOWARD I. SHAPIRO & ASSOCIATES, CONSULTING ENGINEERS, P.C. AND IS NOT TO BE REPRODUCED IN WHOLE OR IN PART WITHOUT PRIOR WRITTEN APPROVAL.

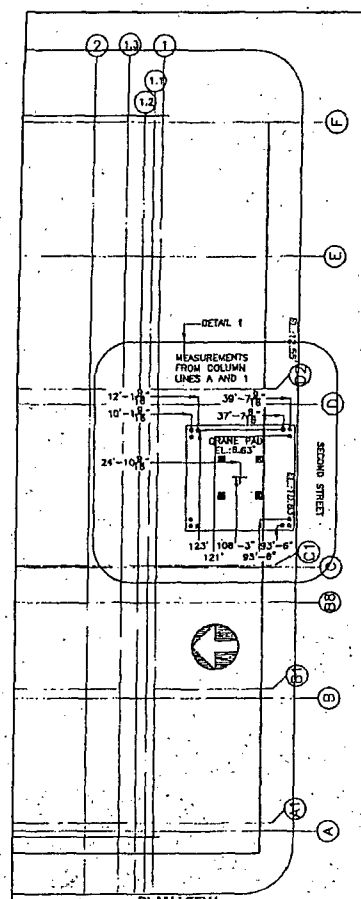
REVISIONS	
1	04-8-13
2	
3	

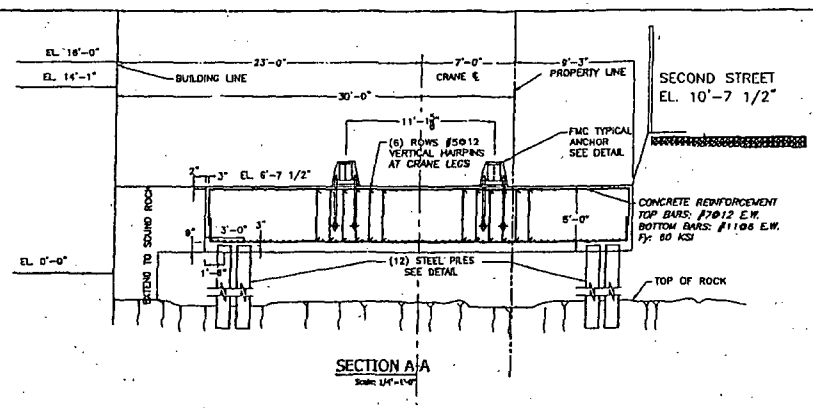
TC CRANE INSTALLATION FOR Paragon Development

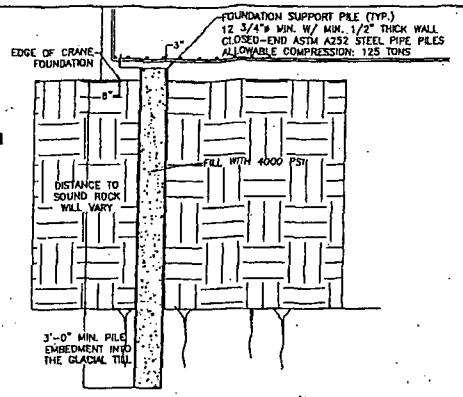
PROPOSED NEW BUILDING AT Hoboken South Waterfront Development, NJ

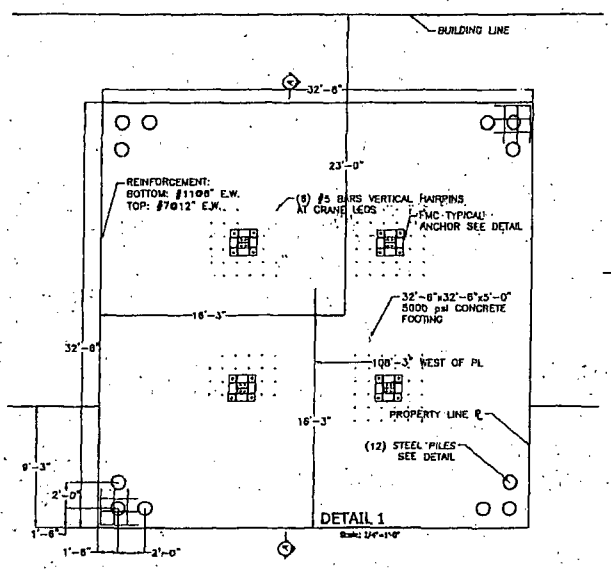
DATE: 04-8-13
SCALE: AS NOTED
DRAWN BY: JJE
JOB: 04-040-06.DWG
FILE: HISA-04-040.DWG
SHEET 1 OF 1 SHEETS

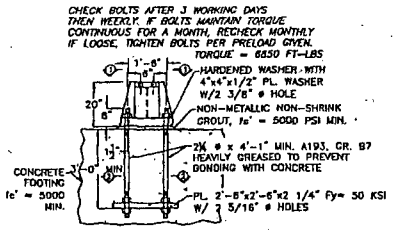

PLAN VIEW
Scale: 1/16"=1'-0"
DETAIL 1
MEASUREMENTS FROM COLUMN LINES A AND 1
CRANE PAD EL. 5.63'
SECOND STREET
SECTION A-A
Scale: 1/4"=1'-0"
EL. 16'-0"
EL. 14'-1"
BUILDING LINE
CRANE ℄
PROPERTY LINE
SECOND STREET EL. 10'-7 1/2"
(6) ROWS #5@12 VERTICAL HAIRPINS AT CRANE LEGS
FMC TYPICAL ANCHOR SEE DETAIL
EL. 6'-7 1/2"
EL. 0'-0"
EXTEND TO SOUND ROCK
CONCRETE REINFORCEMENT TOP BARS: #7@12 E.W. BOTTOM BARS: #11@8 E.W. VERICAL BARS: #4@24 E.W. Fy: 60 KSI
(12) STEEL PILES SEE DETAIL
TOP OF ROCK
DETAIL 1
Scale: 1/4"=1'-0"
REINFORCEMENT: BOTTOM: #11@8 E.W. TOP: #7@12 E.W. VERTICAL: #4@24 E.W.
(6) ROWS #5@12 VERTICAL HAIRPINS AT CRANE LEGS
FMC TYPICAL ANCHOR SEE DETAIL
32'-6"x32'-6"x5'-0" 5000 psi CONCRETE FOOTING
(12) STEEL PILES SEE DETAIL
2-#7 @EA. PILE 12'-0" LONG HOOK INTO CAP
FOUNDATION SUPPORT PILE (TYP.) 12 3/4"ø MIN. W/ MIN. 1/2" THICK WALL CLOSED-END ASTM A252 STEEL PIPE PILES ALLOWABLE COMPRESSION: 125 TONS ALLOWABLE TENSION: 10 TONS
EDGE OF CRANE FOUNDATION
DISTANCE TO SOUND ROCK WILL VARY
FILL WITH 4000 PSI
3'-0" MIN. PILE EMBEDMENT INTO THE GLACIAL TILL
STEEL PILE DETAIL
CHECK BOLTS AFTER 3 WORKING DAYS THEN WEEKLY. IF BOLTS MAINTAIN TORQUE CONTINUOUS FOR A MONTH, RECHECK MONTHLY IF LOOSE, TIGHTEN BOLTS PER PRELOAD GIVEN. TORQUE = 6850 FT-LBS
HARDENED WASHER WITH 4"x4"x1/2" PL. WASHER W/2 3/8" ø HOLE
NON-METALLIC NON-SHRINK GROUT, fc' = 5000 PSI MIN.
2¼ ø x 4'-1" MIN. A193, GR. B7 HEAVILY GREASED TO PREVENT BONDING WITH CONCRETE
CONCRETE FOOTING fc' = 5000 MIN.
PL. 2'-6"x2'-6"x2 1/4" Fy= 50 KSI W/ 2 5/16" ø HOLES
ANCHOR DETAIL AT CRANE LEGS
SCALE: 1" = 2'-0"
SECTION 1-1
SCALE: 1" = 2'-0"
SECTION 2-2
SCALE: 1" = 2'-0"
GENERAL TOWER CRANE FOUNDATION NOTES
1. FOUNDATION SPECIFICATIONS AND THE REACTION FORCES APPLY ONLY TO THE TOWER CRANE CONFIGURATION SHOWN. ANY DEVIATIONS FROM THE CRANE CONFIGURATION SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF HOWARD I. SHAPIRO & ASSOCIATES.
2. CONTRACTOR SHALL VERIFY THAT THERE ARE NO UNDERGROUND UTILITIES, STRUCTURES OR OBSTRUCTIONS IN THE AREA OF THE PROPOSED CRANE LOCATION(S). THE CONTRACTOR IS RESPONSIBLE TO SEE THAT ALL UNDERGROUND UTILITIES WILL BE MARKED AND LOCATED AND NECESSARY STABILIZATION PROVIDED.
3. THE CONTRACTOR SHALL PROVIDE WRITTEN AS-BUILT HORIZONTAL AND VERTICAL LOCATION OF THE CENTERLINE OF THE TOWER CRANE FOUNDATION. THE CONTRACTOR SHALL ALSO PROVIDE THE WRITTEN AS-BUILT ANGLE IF THE TOWER CRANE IS SKEWED FROM A BUILDING GRID LINE.
4. ANCHOR STOOLS SHALL BE SET USING A TEMPLATE PROVIDED BY THE CRANE VENDOR.
5. SPECIAL INSPECTIONS SHALL BE REQUIRED FOR FOUNDATION CONSTRUCTION AS LISTED HEREIN.
6. SPECIAL INSPECTIONS SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL BUILDING CODE
7. TOWER CRANE MUST BE ERECTED PLUMB WITHIN MANUFACTURER'S REQUIREMENTS, BUT IN NO CASE SHALL DEVIATION FROM PLUMB EXCEED 1/500.
8. INSTALLATION OF THE TOWER CRANE SHALL BE IN ACCORDANCE WITH ASME B30.3-2012 AND OSHA 1926.1435.
9. REINFORCED CONCRETE SHALL BE IN ACCORDANCE WITH ACI318 AND LOCAL BUILDING CODE
SPECIAL INSPECTIONS
1. PILES
2. CONCRETE CAST IN PLACE
3. FOOTING AND FOUNDATION
4. CONCRETE TEST CYLINDERS
5. CONCRETE MIX DESIGN
TOWER CRANE #1
TOWER CONFIGURATION:
(2) TG2300 40'-0" SECTIONS
(1) TRANSITION SECTION
(7) TG1600 13'-7 1/2" SECTIONS
FMC TG-1900T 230' BOOM
CD #2187 OR #2951
NJ PE 24GE03475700
HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
363 MERRICK ROAD, SUITE 400, LYNBROOK, N.Y. 11563
TEL: (516) 791-2600 FAX: (516) 791-6456
TC CRANE INSTALLATION FOR Pennrock McGovern
PROPOSED NEW BUILDING AT Hoboken South Waterfront Development, NJ
DATE 04-8-13
SCALE AS NOTED
DRAWN BY JTR
SHEET 1 OF 1 SHEETS





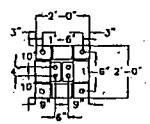






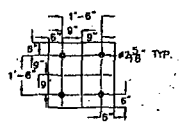
ANCHOR DETAIL AT CRANE LEGS

SCALE: 1" = 2'-0"



SECTION 1-1

SCALE: 1" = 2'-0"



SECTION 2-2

SCALE: 1" = 2'-0"

GENERAL TOWER CRANE FOUNDATION NOTES

1. FOUNDATION SPECIFICATIONS AND THE REACTION FORCES APPLY ONLY TO THE TOWER CRANE CONFIGURATION SHOWN. ANY DEVIATIONS FROM THE CRANE CONFIGURATION SHALL BE BROUGHT TO THE DIRECTATE ATTENTION OF HOWARD I. SHAPIRO & ASSOCIATES.
2. CONTRACTOR SHALL VERIFY THAT THERE ARE NO UNDERGROUND UTILITIES, STRUCTURES OR OBSTRUCTIONS IN THE AREA OF THE PROPOSED CRANE LOCATION(S). THE CONTRACTOR IS RESPONSIBLE TO SEE THAT ALL UNDERGROUND UTILITIES WILL BE MARKED AND LOCATED AND NECESSARY STABILIZATION PROVIDED.
3. THE CONTRACTOR SHALL PROVIDE WRITTEN AS-BUILT HORIZONTAL AND VERTICAL LOCATION OF THE CENTERLINE OF THE TOWER CRANE FOUNDATION. THE CONTRACTOR SHALL ALSO PROVIDE THE WRITTEN AS-BUILT ANGLE IF THE TOWER CRANE IS SKEWED FROM A BUILDING GRID LINE.
4. ANCHOR STOOLS SHALL BE SET USING A TEMPLATE PROVIDED BY THE CRANE VENDOR.
5. SPECIAL INSPECTIONS SHALL BE REQUIRED FOR FOUNDATION CONSTRUCTION AS LISTED HEREIN.
6. SPECIAL INSPECTIONS SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL BUILDING CODE.
7. TOWER CRANE MUST BE ERECTED PLUMB WITHIN MANUFACTURER'S REQUIREMENTS, BUT IN NO CASE SHALL DEVIATION FROM PLUMB EXCEED 1/4:12.
8. INSTALLATION OF THE TOWER CRANE SHALL BE IN ACCORDANCE WITH ASME B30.3-2012 AND OSHA 1926.1435.
9. REINFORCED CONCRETE SHALL BE IN ACCORDANCE WITH ACI318 AND LOCAL BUILDING CODE

SPECIAL INSPECTIONS

1. PILES
2. CONCRETE CAST IN PLACE
3. FOOTING AND FOUNDATION
4. CONCRETE TEST CYLINDERS
5. CONCRETE MIX DESIGN

TOWER CRANE #1

TOWER CONFIGURATION:
(2) TC2300 40'-0" SECTIONS
(1) TRANSITION SECTION
(7) TC1800 13'-7 1/2" SECTIONS

FMC TG-1900T 230' BOOM

CD #2187 OR #2961

Lawrence K Shapiro
NJ PE 24GE04195100

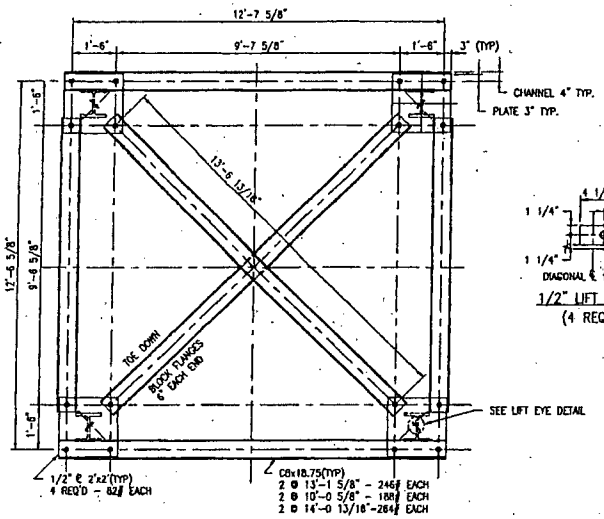
HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
399 VERONICA ROAD, SUITE 400, LYNBROOK, N.Y. 11563
TEL. (516) 791-2000 FAX: (516) 791-6425

Unauthorized reuse of this drawing is a violation of law. All rights reserved. This drawing and specification, as an instrument of service, is the property of Howard I. Shapiro & Associates, Consulting Engineers, P.C. and shall not be reused in whole or in part without written permission.

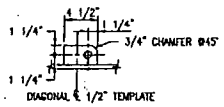
TC CRANE INSTALLATION
FOR
Pavarini McGovern

PROPOSED NEW BUILDING
AT
Hoboken South Waterfront Development, NJ

DATE: 04-9-13
SCALE: AS NOTED
DRAWN BY: JTR
APPR: KSHAPIRO
FILE: HYP0000
SHEET 1
OF 1 SHEETS

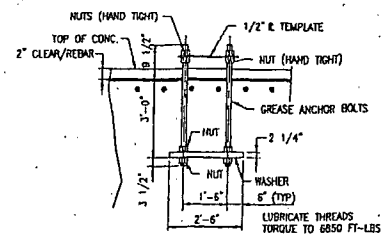


ANCHOR BOLT SETTING TEMPLATE
FMC 2300
SCALE 1/2"=1'-0"
(MUST BE EXACT)

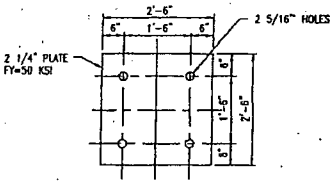


1/2" LIFT EYE DETAIL
(4 REQUIRED)

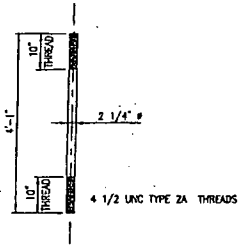
ANCHOR BOLT ASSEMBLY	
4 – EMBED R.'s @ 574 LBS.	2,296 LBS
16 – 2 1/4"ø ANCHOR BOLTS @ 56#	896
48 – 2 1/4" NUTS @ 5#	240
32 – 2 1/4" WASHERS @ 1#	32
SUB TOTAL	3,464 LBS
TEMPLATE ASSEMBLY	
4 – 1/2" R.'s @ 82 LBS	328 LBS
2 – C8x18.75 @ 246 LBS	492
2 – C8x18.75 @ 188 LBS	378
2 – C8x18.75 @ 264 LBS	528
SUB TOTAL	1,724 LBS
TOTAL	5,188 LBS



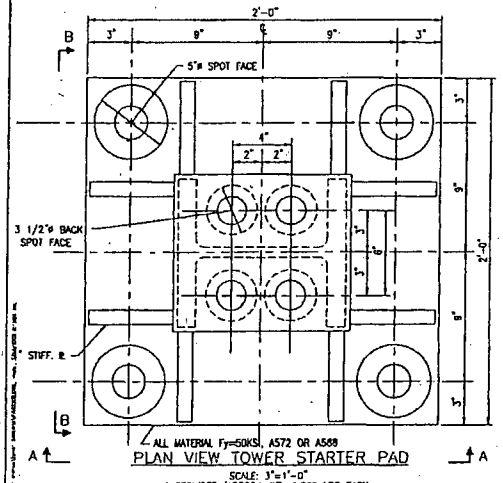
EMBEDDED ASSEMBLIES
1 OF 4 REQ'D



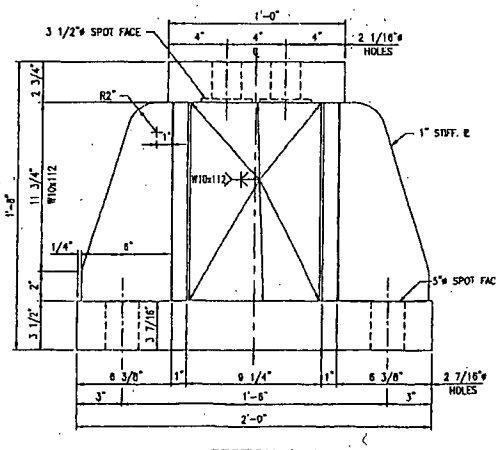
ANCHOR PLATE DETAIL
SCALE 3/4"=1'-0"



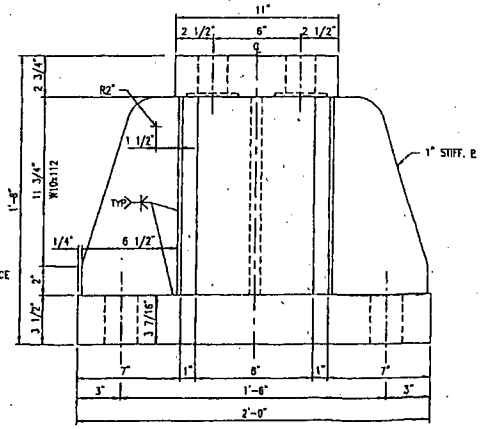
ANCHOR BOLTS
SCALE 3/4"=1'-0"
16 REQUIRED
ASTM SPEC. A354 GR. BD
120 KSI PROOF LOAD
130 KSI MINIMUM YIELD STRENGTH
150 KSI MINIMUM TENSILE STRENGTH
48 – 2 1/4" NUTS, GRADE 8 ALLOY
32 – 2 1/4" HARDENED FLAT WASHERS



PLAN VIEW TOWER STARTER PAD
SCALE: 3"=1'-0"
4 REQUIRED (APPROX. WT.=1,000 LBS EACH



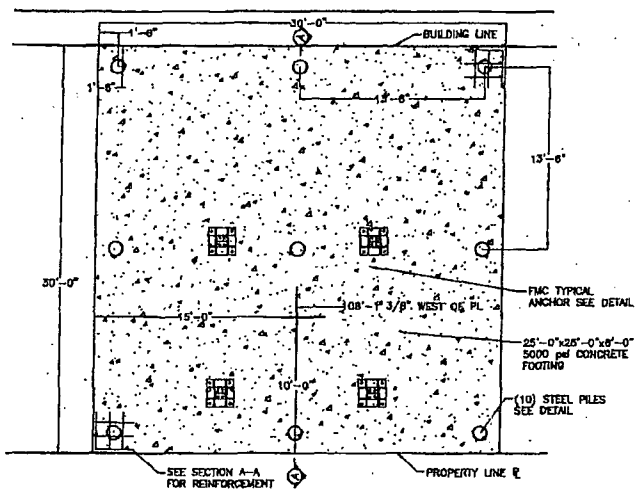
SECTION A–A
SCALE: 3"=1'-0"

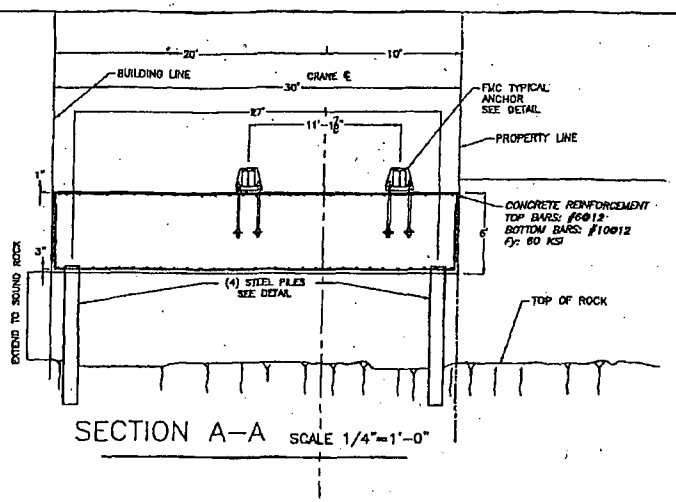


SECTION B–B
SCALE: 3"=1'-0"

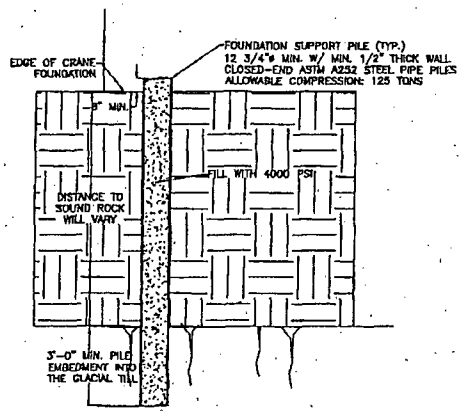
ULTASONIC INSPECT ALL FULL PENETRATION WELDS AND 2 3/4" & 3 1/2" PLATES FOR LAMINATION.

ANCHORAGE BASE TG-2300		
SCALE:1/2"=1'-0" DATE		DRAWN BY MJD CHECKED BY
CORNELL & CO., INC.		DRAWING NO.

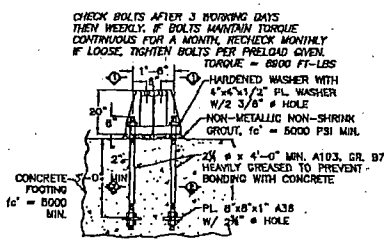




SECTION A–A SCALE 1/4"=1'-0"

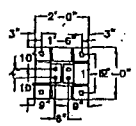


STEEL PILE DETAIL



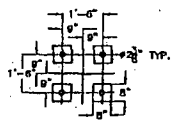
ANCHOR DETAIL AT CRANE LEGS

SCALE: 1" = 2'-0"



SECTION 1–1

SCALE: 1" = 2'-0".



SECTION 2–2

SCALE: 1" = 2'-0"

PRELIMINARY
NOT TO BE USED
FOR CONSTRUCTION

TOWER CRANE #1

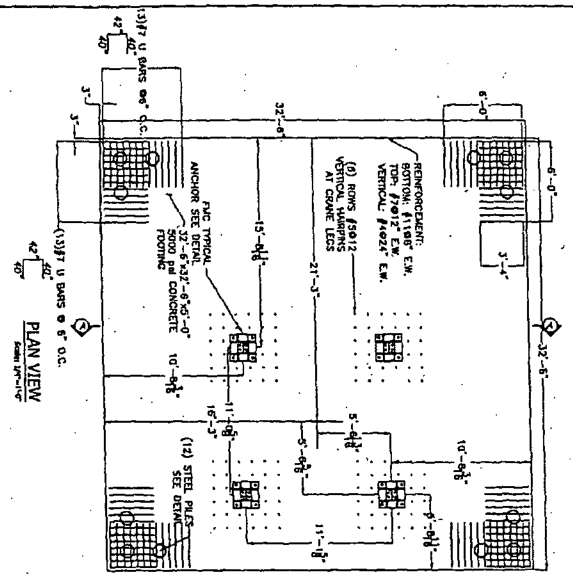
FMC TC-1900 230' BOOM
CD #2187 DR #2961

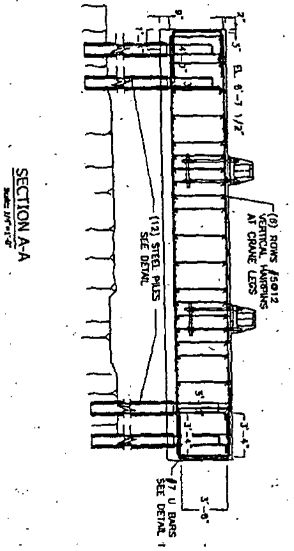
HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 MERRICK ROAD, SUITE 400, LYNBROOK, N.Y. 11563
TEL. (516) 791-8900 FAX. (516) 791-8425

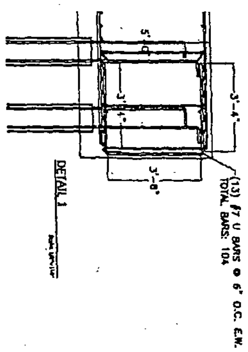
TO CRANE INSTALLATION FOR Porsche McGovern

PROPOSED NEW BUILDING AT Hoboken South Waterfront Development, NJ

DATE 02-14-13
SCALE AS NOTED
DRAWN BY SV
CHKD
FILE NUMBER
SHEET 1







HOWARD I. SHAPIRO & ASSOCIATES

CONSULTING ENGINEERS, P.C.
303 MERRICK ROAD, SUITE 400, LYNBROOK, N.Y. 11563
TEL: (516) 791-2500 FAX: (516) 791-5425

PROPOSED NEW BUILDING
AT
Hoboken South Waterfront Development, NJ

TO CRANE INSTALLATION
FOR
Peverini McGovern

DATE: 04-17-13
SCALE: AS NOTED
SHEET 1 OF 1 SHEETS

CRANE FOUNDATION SUBMITTALS

PAVARINI McGOVERN
Higher Standards in Construction
770 Broadway 10th Floor
New York, NY 10003
P212-907-0900 F 212-907-0901

T R A N S M I T T A L

To: Brian Jasopersad - HLW
Leon Bolleu - HLW
Shop Dwg Dept @ HLW
Shira Kinzbrunner - GACE
Brad Kiefer - GACE
Jan Cemark - MRCE

Date: 4/3/2013

Re: Waterfront Corp Center - Submittals

Job No.: 51000009

We are sending via:		The Following Items:		Sent For the Following Reasons:	
	By Hand	X	Shop Dwgs	X	For Approval
	Fedex.		O & M Manuals		For Information & use
X	FTP site		Samples		As requested
	Fax		Drawings		Signature
X	E-Mail		Specifications		Quotation
	Pick Up		Photostats		Review and Comments
			Product Data		Resubmit
			Calculations		

Copies	Number	Dated	Due Date	Sub	Description
1	02000-036			Crisdel	Crane Pad reinforcing shop dwg

Remarks:

Here are the steps for accessing the Esteban FTP site if you don't have it:

Address: ftp://ftp2.esteban.com
Username: sjp-hobokenblockb
Password: hobokensjp
File: PMG / Submittals / Issued to consultants / Crisdel

Accepted by:_____

CC

Sent By: Michael Romano

PAVARINI McGOVERN
Higher Standards in Construction

770 Broadway 10th Floor
New York, NY 10003
P212-807-0900 F 212-807-0901

T R A N S M I T T A L

To: Brian Jasopersad - HLW
Leon Boileau - HLW
Shop Dwg Dept @ HLW
Shira Kinzbrunner - GACE
Brad Kiefer - GACE
Jan Cernark - MRCE

Date: 4/3/2013

Re: Waterfront Corp Center - Submittals

Job No.: 51000009

We are sending via:		The Following Items:		Sent For the Following Reasons:	
	By Hand	X	Shop Dwgs	X	For Approval
	Fedex		O & M Manuals		For Information & use
X	FTP site		Samples		As requested
	Fax		Drawings		Signature
X	E-Mail		Specifications		Quotation
	Pick Up		Photostats		Review and Comments
			Product Data		Resubmit
			Calculations		

Copies	Number	Dated	Due Date	Sub	Description
1	02000-036			Crisdel	Crane Pad reinforcing shop dwg

Remarks:

Here are the steps for accessing the Esteban FTP site if you don't have it:

Address: ftp://ftp2.esteban.com
Username: sjp-hobokenblockb
Password: hobokensjp
File: PMG / Submittals / Issued to consultants / Crisdel

Accepted by:_____

CC

Sent By: Michael Romano

PAVARINI McGOVERN
Higher Standards in Construction

Waterfront Corporate Center - Block B - Hoboken

Submittal

Contractor:	Crisdel Group	Submittal #:	02000-036
Date Received:	4/3/2013	Submission #:	1
Date Sent:	4/3/2013		
Date Returned:		Specification:	
		Section:	
Item:	Crane Pad Reinforcing Dwg	Page:	
		Paragrahph:	
	Howard I Shapiro & Assoc Dwg		
	Option # 2	Dwg #:	Howard I Shapiro & Assoc Dwg
Manufacture:	JM AHLE CO, INC		

The undersigned has reviewed this submittal and it is in accordance with the contract documents.

Michael Romano

EXEMPTION 4

CRANE FOUNDATION TEST / INSPECTION REPORTS

Eastern Concrete Materials Inc.

5896

475 Market St. Elmwood Park, NJ 07407 201-797-7979

04/17/13

CONCRETE MIX PROPORTIONS

CONTRACTOR : **CRISDEL GROUP**
PROJECT : **HOBOKEN**
MIX DATA : **EF TECHNOLOGY**

CEMENT	LAFARGE, ASTM C-150 TYPE I/II
FLY ASH	STI PRO ASH F ASTM C-618
FINE AGGREGATE	ECMI SAND, ASTM C-33
COARSE AGGREGATE	TILCON #57, ASTM C-33
AIR ENTRAINING AGENT	MBVR, BASF
ADMIXTURES	
WATER REDUCER	GLENIUM 7500, BASF
PLANT PLAST	GLENIUM 7500, BASF

HOWARD I. SHAPIRO & ASSOCIATES CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel (516) 791-2600
Fax (516) 791-2625

☑ Approved.
☐ Approved As Noted.
☐ Revise And Resubmit.
☐ For Review.

Job No: 13156.00.00
By: SR
Date: 4-17-13
Submittal No: 1

WEIGHTS PER CUBIC YARD

MIX ID:		5000 PSI REG 16611527	5000 PSI PUMP SP 46811589
CEMENT	(LBS)	528	578
FLY ASH	(LBS)	132	102
FINE AGGREGATE	(LBS)	1184	1273
COARSE AGGREGATE	(LBS)	1760	1660
WATER	(GAL)	31.5	31.5
AIR ENTRAINING AGENT	(OZ)	6.6	6.8
ADMIX: WATER REDUCER	(OZ)	6.6	0.0
ADMIX: PLASTICIZER	(OZ)	0.0	27.2
ADMIX:	(OZ)	0.0	0.0
SLUMP	(")	2"-4"	5"-8"
AIR CONTENT	(%)	6+/-1.5	6+/-1.5
WATER/CEMENT RATIO	(LB/LB)	0.40	0.39
UNIT WEIGHT, FRESH	(PCF)	143.2	143.5

These mixes are designed to achieve the design strength if sampled and tested in accordance with all ACI and ASTM testing procedures by a certified technician. The concrete proportions have been selected in accordance with ACI 211 and established on the basis of laboratory trial mixtures following the guidelines of ASTM C192 and ACI 318.

MasterFiber F70 Polyproplyene Fibers (BASF) may be added to these mix at 1.5#/yd.

Please order fibers as an additional item when needed.

5896

MATERIAL ANALYSIS

SIEVE SIZE	% PASSING FINE AGG	% PASSING COARSE AGG
1 1/2"	--	--
1"	--	100.0
3/4"	--	95.0
1/2"	--	46.5
3/8"	100.0	29.6
# 4	98.3	4.0
# 8	89.3	1.8
# 16	74.5	--
# 30	52.4	--
# 50	18.1	--
#100	2.6	--
#200	1.0	--
FINENESS MODULUS	2.65	
SPECIFIC GRAVITY	2.65	2.70

TEST RESULTS

COMPRESSIVE STRENGTH

AGE	5000 PSI REG	5000 PSI PUMP SP
7	4580	4890
28	6580	6740
	6630	6680
	6470	6680
AVG	6560	6700

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook NY 11563
Tel (516) 791-2600
Fax (516) 791-9625

- [x] Approved.
- [ ] Approved As Noted.
- [ ] Revise And Resubmit.
- [ ] For Review.

Job No: 13156.00.00
by: SR
Date: 4-17-13
Submittal No: 1

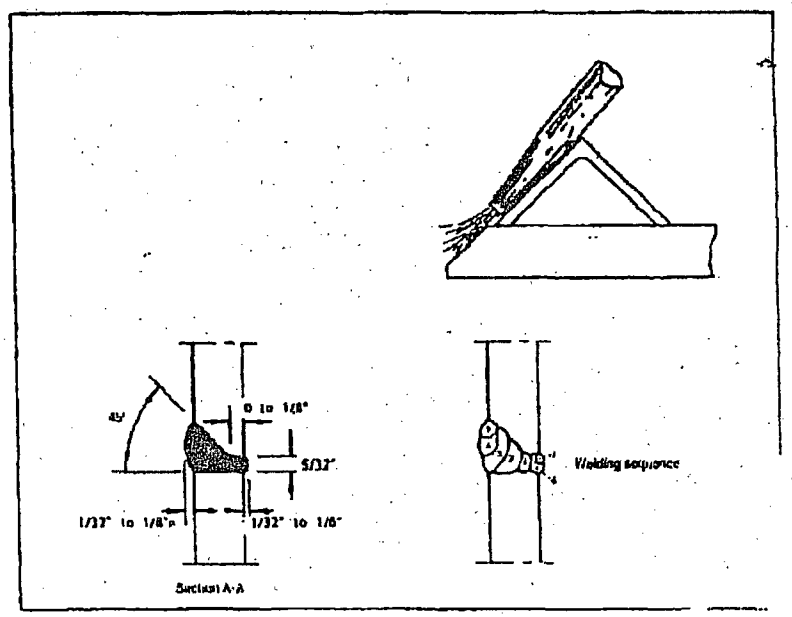
HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook NY 11563
Tel (516) 791-2600
Fax (516) 791-5925

Approved.
Approved As Noted.
Revise And Resubmit.
☑ For Review.

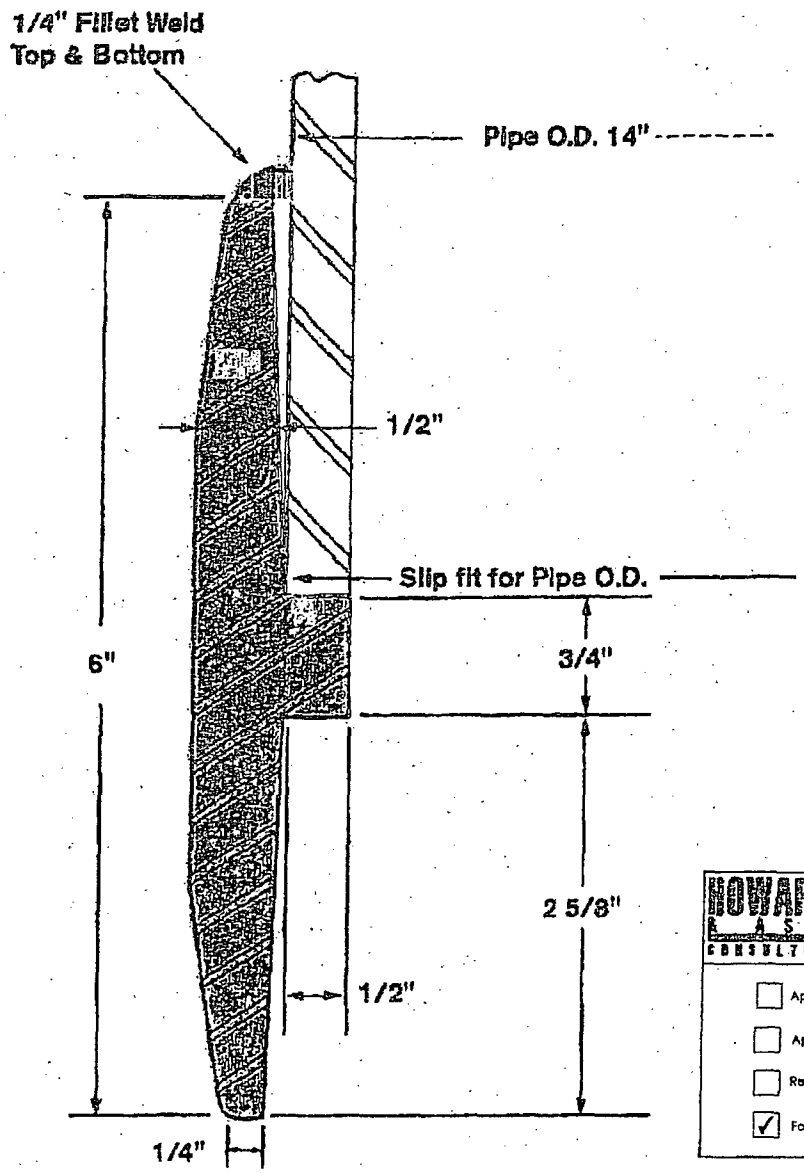
Job No: 13156.00.00
By: SR
Date: 4-17-13
Submittal No: 1

Welding Procedure

Electrode	AWS A5.5: E 8015 – X E 7015 – X [a)b)] E 8016 – X E 7016 – X [a)b)] E 8018 – X E 7018 – X [a)b)] Notes: a) E 70 electrodes may be used if splice is not loaded to full tensile capacity of cross section, b) the strength level must be adapted to the corresponding steel grade, c) electrode diameter range: 5/32" and 3/16", d) the electrodes should be stored in accordance with the recommendations of the manufacturer
Welding Parameters	AC welding set. Electrode Ø 5/32" I = 120-160 A; E = 50 kJ/in Electrode Ø 3/16" I = 180-240 A; E = 50 kJ/in Operating parameters shall be in accordance with the recommendations of the electrode manufacturer.
Welding Position	Horizontal (2G)
Joint preparation Joint type	Bevelling by manual flame cutting Single bevel at 45° with backing (optional) The gap should be 0.1 – 0.15 in.
Weld Metal Built up	- electrode Ø 5/32" for root layer - electrode Ø 3/16" for subsequent layers - inter run cleaning – each run of weld metal should be thoroughly cleaned by hand tools before a further layer is applied.
Preheating Interpass Temperature (PWHT)	No preheat, interpass temperature and post weld heat treatment requirements for temperatures ≥32°F. Provisions of AWS D1.1 apply.



SPLICER SLEEVE



MATERIAL: CAST STEEL

ASTM A148 90/60

Weight: 33#

SECTION THROUGH PIPE AND SPLICER BEFORE DRIVING.

NORMAL FOUNDRY TOLERANCES APPLY.

HOWARD I. SHAPIRO & ASSOCIATES CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook NY 11563
Tel (516) 791-2600
Fax (516) 791-5425

☐ Approved.	Job No: 13156.00.00
☐ Approved As Noted.	By: SR
☐ Revise And Resubmit.	Date: 4-17-13
☑ For Review.	Submittal No: 1

ASSOCIATED PILE & FITTING

PO Box 5933 Parsippany, NJ 07054-5933
Tel: 973-773-8400
Fax: 973-428-5146
email: apf@associatedpile.com
www.associatedpile.com
Call Toll Free: 800-526-9047

ASSOCIATED PILE & FITTING CORP.
ENGINEERED PRODUCTS FOR PILE FOUNDATIONS
Box 1048, Clifton, New Jersey 07014-1048

PHONE TOLL FREE
800-526-9047
(Continental U.S.)
(In NJ) 201-773-8400

BOX 1048 262 RUTHERFORD BLVD CLIFTON NEW JERSEY 07014 PHONE 201-773-8100

UPLIFT CAPACITY

8 5/8"	100.55 KIPS 100,554 LBS 50.28 TONS
10 3/4"	125.33 KIPS 125,328 LBS 62.66 TONS
12"	139.90 KIPS 139,900 LBS 69.95 TONS
12 3/4"	148.65 KIPS 148,650 LBS 74.3 TONS
14"	163.22 KIPS 163,218 LBS 81.61 TONS
16"	186.54 KIPS 186,535 LBS 93.27 TONS
18"	209.85 KIPS 209,852 LBS 104.93 TONS

NOTE: Based on ¼" circumferential fillet weld with E 70 rod top and bottom of splicer.

Figures are based on information from 7th Edition AISC Manual of Steel Construction.

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
303 Merrick Road Suite 400
Lynbrook, NY 11563
Tel (516) 791-2600
Fax (516) 791-5425

☐ Approved.	Job No: 13156.00.00
☐ Approved As Noted.	By: SR
☐ Revise And Resubmit.	Date: 4-17-13
☑ For Review.	Submittal No: 1

Atlantic Engineering Laboratories Inc.
41 Murray Road
Rahway, NJ 07065
Phone 732-815-0400
Fax 732-815-0422

AEL, INC.

Transmittal

To:	Grant Eula	**From:**	Chris O'Malley, P.E.
Co.:	Waterfront Corporate Center III JV LLC	**Date:**	April 30, 2013
Project:	Block 8 – Hoboken Office Building	**Project #**	13-02-72
Re:	Report Distribution (Email)	**CC:**	geula@sjpproperties.com rntatelo@cox.net Michael.Romano@pavmcgovern.com BKiefer@gace.net Sean.McKay@pavmcgovern.com lbolleu@hlw.com Elydon@pavmcgovern.com skinzbrunner@gace.net

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Comments:

Daily Field (Concrete) Reports Dated: April 16 & 19, 2013

SO

Atlantic Engineering Laboratories, Inc.

AASHTO Accredited

DAILY FIELD REPORT

Client:	WaterFront Corporate Center III JV LLC	**Date:**	April 19, 2013
Project:	Block B – Hoboken Office Bldg.	**Project #:**	13-02-72 Pg. 1 of 2
Project Address:	1152 River Street, Hoboken, NJ	**Report #:**	C-005

As requested by the client, a representative of Atlantic Engineering Laboratories Inc. (AEL) arrived on site to perform the following services:

Location of Work Inspected: Slab deck for crane pad

☒ Concrete Testing
(See Attached Report for Details)

☐ Reinforcing Steel Inspection
Rebar was checked for compliance with approved project and/or shop drawings for clearance, cover, lap splices, ties, placement and cleanliness.
Drawings Used: _____
Drawing Date: _____

☐ Soil Compaction Testing
(See Attached Report for Details)

☐ Footing Bottom Inspection Location: _____
Soil materials encountered at footing sub grades were verified for the design allowable soil bearing capacity of _____ pounds per square foot (psf).

☐ Masonry Testing
(See Attached Report for Details)

☐ Other (Specify): _____

Summary of Observations: Concrete was placed at the location mentioned above. Concrete was tested for slump, air content, unit weight and temperature. 16 cylinders were taken for compressive strength testing at the lab. **Note:** No curing box was provided.

Discrepancies Observed : ☐ Yes ☒ No
Summary of Discrepancies: None observed at this time.

Technicians: Hany Ishak /Joseph Morcos
ACI #: 01238581/01137379

41 Murray Street * Rahway, NJ 07065 * Tel: 732-815-0400 * Fax: 732-815-0422
www.aelinc.net

Atlantic Engineering Laboratories, Inc.

AASHTO Accredited

FIELD TESTING OF CONCRETE

Client: Waterfront Corporate Center III JV LLC **Date:** April 19, 2013
Project: Block B – Hoboken Office Bldg. **Project #:** 13-02-72 Pg. 2 of 2
Address: 1152 River Street, Hoboken, NJ **Report #:** C-005

Concrete Supplier: Eastern **Contractor:** ----
Type/Strength of Concrete: 5000 PSI **Air Temperature:** 66-73°F
Superplastisizer: Yes _____ No X **Mix Design ID#:** 46811589
General Location: Slab deck, crane pad

# of Cyl. Made	AEL Control #	Truck Ticket	Time Truck Dispatched	Time Truck Unloaded	Yards of Concrete	Slump	Air Content	Concrete Temp	Specific Location
4	051014	19357659	11:13 am	12:15 pm	10	6 ¼"	5.5%	75°F	Slab deck, crane pad
4	051015	19357726	12:29 pm	1:15 pm	60	6 ½"	5.6%	77°F	Slab deck, crane pad
4	051026	19357772	1:22 pm	2:15 pm	110	8 ½"	5.2%	75°F	Slab deck, crane pad
4	052027	19357831	2:23 pm	3:15 pm	160	6 ¾"	5.4%	76°F	Slab deck, crane pad

Specifications: **Air Content:** 6 ± 1.5% **Slump:** 7 ± 1" **Temperature:** 60-90°F
Air Pressure / Volumetric Meter # : 41 **Unit Weight Scale # :** 45
Remarks:
Technicians: Hany Ishak/ Joseph Morcos
ACI #: 01238581/ 01137379

41 Murray Street * Rahway, NJ 07065 * Tel: 732-815-0400 * Fax: 732-815-0422
www.aelinc.net

Atlantic Engineering Laboratories, Inc.

AASHTO Accredited

DAILY FIELD REPORT

Client:	Waterfront Corporate Center III JV LLC	**Date:**	April 16, 2013
Project:	Block B – Hoboken Office Bldg.	**Project #:**	13-02-72 Pg. 1 of 2
Project Address:	1152 River Street, Hoboken, NJ	**Report #:**	C-004

As requested by the client, a representative of Atlantic Engineering Laboratories Inc. (AEL) arrived on site to perform the following services:

Location of Work Inspected: Tower Crane #1

☒ Concrete Testing
(See Attached Report for Details)

☐ Reinforcing Steel Inspection
Rebar was checked for compliance with approved project and/or shop drawings for clearance, cover, lap splices, ties, placement and cleanliness.
Drawings Used: _____
Drawing Date: _____

☐ Soil Compaction Testing
(See Attached Report for Details)

☐ Footing Bottom Inspection Location: _____
Soil materials encountered at footing sub grades were verified for the design allowable soil bearing capacity of _____ pounds per square foot (psf).

☐ Masonry Testing
(See Attached Report for Details)

☐ Other (Specify): _____

Summary of Observations: Concrete was poured at this location mentioned above. The area of the pour is clean and clear of debris. Concrete was tested for slump, air content, unit weight and temperature. 4 cylinders were taken for compressive strength testing at the lab.

Discrepancies Observed : ☐ Yes ☒ No
Summary of Discrepancies: None observed at this time.

Technicians: Bharat Patel
ACI #: 00071415

41 Murray Street * Rahway, NJ 07065 * Tel: 732-815-0400 * Fax: 732-815-0422
www.aelinc.net

Atlantic Engineering Laboratories, Inc.

AASHTO Accredited

FIELD TESTING OF CONCRETE

Client: Waterfront Corporate Center III JV LLC **Date:** April 16, 2013
Project: Block B – Hoboken Office Bldg. **Project #:** 13-02-72 Pg. 2 of 2
Address: 1152 River Street, Hoboken, NJ **Report #:** C-004

Concrete Supplier: Colonial **Contractor:** Linde-Griffith
Type/Strength of Concrete: 4000 PSI **Air Temperature:** 60°F
Superplastisizer: Yes ____ No X **Mix Design ID#:** ----
General Location: Footings at tower crane #1

# of Cyl. Made	AEL Control #	Truck Ticket	Time Truck Dispatched	Time Truck Unloaded	Yards of Concrete	Slump	Air Content	Concrete Temp	Specific Location
4	048006	200202	10:50 am	11:30 am	10	4"	2%	70°F	Footings at tower crane #1

Specifications: **Air Content:** 0 **Slump:** 4" **Temperature:** 60°F
Air Pressure / Volumetric Meter # : 7 **Unit Weight Scale # :** 41
Remarks:
Technicians: Bharat Patel
ACI #: 00071415

41 Murray Street * Rahway, NJ 07065 * Tel: 732-815-0400 * Fax: 732-815-0422
www.aclinc.net

Atlantic Engineering Laboratories of, Inc.

AASHTO Accredited

CONCRETE COMPRESSIVE STRENGTH REPORT

CLIENT: Waterfront Corporate Center III JV LLC
PROJECT: Block B - Hoboken Office Building
PROJECT #: 13-02-72
ADDRESS: 1152 River Street, Hoboken, NJ

DATE: April 26, 2013
UPDATED:
UPDATED:
UPDATED:

COMPRESSION TESTING MACHINE

MANUFACTURER Forney MODEL # F-502F-COPILOT SERIAL # 09008

LABORATORY TECHNICIAN

NAME Fidel Nieto ACI CONCRETE STRENGTH TESTING # 1032767

LOCATION: Slab for crane pad
TECHNICIAN: Hany Ishak
DATE POURED: 04/19/13
TIME POURED: 12:15 PM
SLUMP: 6 1/4"
AIR CONTENT: 5.5%
AIR TEMP: 66 Degrees F
CONCRETE TEMP: 75 Degrees F

DESIGN STRENGTH REQ'D: 5000 PSI
DESIGN STRENGTH PLACED: 5000 PSI
CONCRETE SUPPLIER: Eastern
TICKET #: 19357659
SUPERPLASTICIZER: Yes
MIX ID#: 46811589
UNIT WEIGHT: 144.2 pcf

COMPRESSIVE STRENGTH DATA

SPECIMEN ID NO.	DATE MOLDED	DATE TESTED	AGE DAYS	DIAMETER (INCHES)	AVG. AREA (SQ.IN.)	COMP.FAILURE LOAD	STRENGTH (PSI)	TYPE OF FRACTURE
051014-A	04/19/13	04/26/13	7	4	12.57	58,465	4,651	3
051014-B	04/19/13	05/17/13	28					
051014-C	04/19/13	05/17/13	28					
051014-D	04/19/13	05/17/13	28					

REMARKS:

X Samples made by AEL representatives
___ Samples made by others
___ Samples delivered to laboratory
X Samples picked up by AEL representative
___ Test results comply with applicable specifications
___ Test results do not comply with applicable specifications

TYPES OF FRACTURES:

1- Well formed cone on both ends, less than 1" of cracking
2 - Well formed cone on one end, vertical cracks running thru ends
3- Columnar Vertical cracking thru both ends .
4- Diag. fracture w/no cracking thru ends; tap w/hammer
5- Side fracture at top or bottom
6- Similar to Type 5 but end of cyl. is pointed.

CERTIFICATION OF COMPLIANCE:

All work, unless otherwise noted, complies with approved plans, specifications and applicable sections of the Building codes. All tests were performed to ASTM procedures C-31, C-39, C-138, C-143, C-172, C-173 or C-231 , C-1064 & C-617 or C-1231 unless noted otherwise. This report covers the locations of the work tested only and does not constitute engineering opinion or project control.

Atlantic Engineering Laboratories of, Inc.

AASHTO Accredited

CONCRETE COMPRESSIVE STRENGTH REPORT

CLIENT: Waterfront Corporate Center III JV LLC
PROJECT: Block B - Hoboken Office Building
PROJECT #: 13-02-72
ADDRESS: 1152 River Street, Hoboken, NJ

DATE: April 26, 2013
UPDATED:
UPDATED:
UPDATED:

COMPRESSION TESTING MACHINE

MANUFACTURER Forney MODEL # F-502F-COPILOT SERIAL # 09006

LABORATORY TECHNICIAN

NAME Fidel Nieto ACI CONCRETE STRENGTH TESTING # 1032767

LOCATION: Slab for crane pad
TECHNICIAN: Hany Ishak
DATE POURED: 04/19/13
TIME POURED: 3:15 PM
SLUMP: 6 1/2"
AIR CONTENT: 5.6%
AIR TEMP: 68 Degrees F
CONCRETE TEMP: 77 Degrees F

DESIGN STRENGTH REQ'D: 5000 PSI
DESIGN STRENGTH PLACED: 5000 PSI
CONCRETE SUPPLIER: Eastern
TICKET #: 19357726
SUPERPLASTICIZER: Yes
MIX ID#: 46811589
UNIT WEIGHT: 144 pcf

COMPRESSIVE STRENGTH DATA

SPECIMEN ID NO.	DATE MOLDED	DATE TESTED	AGE DAYS	DIAMETER (INCHES)	AVG. AREA (SQ.IN.)	COMP.FAILURE LOAD	STRENGTH (PSI)	TYPE OF FRACTURE
051015-A	04/19/13	04/26/13	7	4	12.57	53,715	4,273	3
051015-B	04/19/13	05/17/13	28					
051015-C	04/19/13	05/17/13	28					
051015-D	04/19/13	05/17/13	28					

REMARKS:

X Samples made by AEL representatives
____ Samples made by others
____ Samples delivered to laboratory
X Samples picked up by AEL representative
____ Test results comply with applicable specifications
____ Test results do not comply with applicable specifications

TYPES OF FRACTURES:

1- Well formed cone on both ends, less than 1" of cracking
2 - Well formed cone on one end, vertical cracks running thru ends
3- Columnar Vertical cracking thru both ends.
4- Diag. fracture w/no cracking thru ends; tap w/hammer
5- Side fracture at top or bottom
6- Similar to Type 5 but end of cyl. is pointed.

CERTIFICATION OF COMPLIANCE:

All work, unless otherwise noted, complies with approved plans, specifications and applicable sections of the Building codes. All tests were performed to ASTM procedures C-31, C-39, C-138, C-143, C-172, C-173 or C-231, C-1064 & C-617 or C-1231 unless noted otherwise. This report covers the locations of the work tested only and does not constitute engineering opinion or project control.

Atlantic Engineering Laboratories of, Inc.

AASHTO Accredited

CONCRETE COMPRESSIVE STRENGTH REPORT

CLIENT: Waterfront Corporate Center III JV LLC
PROJECT: Block B - Hoboken Office Building
PROJECT #: 13-02-72
ADDRESS: 1152 River Street, Hoboken, NJ

DATE: April 26, 2013
UPDATED:
UPDATED:
UPDATED:

COMPRESSION TESTING MACHINE

MANUFACTURER Forney MODEL # F-502F-COPILOT SERIAL # 09006

LABORATORY TECHNICIAN

NAME Fidel Nieto ACI CONCRETE STRENGTH TESTING # 1032767

LOCATION: Slab for crane pad
TECHNICIAN: Hany Ishak
DATE POURED: 04/19/13
TIME POURED: 3:15 PM
SLUMP: 8 1/2"
AIR CONTENT: 5.2%
AIR TEMP: 70 Degrees F
CONCRETE TEMP: 75 Degrees F

DESIGN STRENGTH REQ'D: 5000 PSI
DESIGN STRENGTH PLACED: 5000 PSI
CONCRETE SUPPLIER: Eastern
TICKET #: 19357772
SUPERPLASTICIZER: Yes
MIX ID#: 46811589
UNIT WEIGHT: 143.8 pcf

COMPRESSIVE STRENGTH DATA

SPECIMEN ID NO.	DATE MOLDED	DATE TESTED	AGE DAYS	DIAMETER (INCHES)	AVG. AREA (SQ.IN.)	COMP.FAILURE LOAD	STRENGTH (PSI)	TYPE OF FRACTURE
051026-A	04/19/13	04/26/13	7	4	12.57	52,105	4,145	3
051026-B	04/19/13	05/17/13	28					
051026-C	04/19/13	05/17/13	28					
051026-D	04/19/13	05/17/13	28					

REMARKS:

X Samples made by AEL representatives
____ Samples made by others
____ Samples delivered to laboratory
X Samples picked up by AEL representative
____ Test results comply with applicable specifications
____ Test results do not comply with applicable specifications

TYPES OF FRACTURES:

1- Well formed cone on both ends, less than 1" of cracking
2 - Well formed cone on one end, vertical cracks running thru ends
3- Columnar Vertical cracking thru both ends .
4- Diag. fracture w/no cracking thru ends; tap w/hammer
5- Side fracture at top or bottom
6- Similar to Type 5 but end of cyl. is pointed.

CERTIFICATION OF COMPLIANCE:

All work, unless otherwise noted, complies with approved plans, specifications and applicable sections of the Building codes. All tests were performed to ASTM procedures C-31, C-39, C-138, C-143, C-172, C-173 or C-231 , C-1064 & C-617 or C-1231 unless noted otherwise. This report covers the locations of the work tested only and does not constitute engineering opinion or project control.

41 Murray Street Rahway, NJ 07065 * www.aelinc.net * Office: 732-815-0400 * Fax: 732-815-0422

Atlantic Engineering Laboratories of, Inc.

AASHTO Accredited

CONCRETE COMPRESSIVE STRENGTH REPORT

CLIENT: Waterfront Corporate Center III JV LLC
PROJECT: Block B - Hoboken Office Building
PROJECT #: 13-02-72
ADDRESS: 1152 River Street, Hoboken, NJ

DATE: April 26, 2013
UPDATED:
UPDATED:
UPDATED:

COMPRESSION TESTING MACHINE

MANUFACTURER Forney MODEL # F-502F-COPILOT SERIAL # 09006

LABORATORY TECHNICIAN

NAME Fidel Nieto ACI CONCRETE STRENGTH TESTING # 1032767

LOCATION: Slab for crane pad
TECHNICIAN: Hany Ishak
DATE POURED: 04/19/13
TIME POURED: 3:15 PM
SLUMP: 6 3/4"
AIR CONTENT: 5.4%
AIR TEMP: 72 Degrees F
CONCRETE TEMP: 76 Degrees F

DESIGN STRENGTH REQ'D: 5000 PSI
DESIGN STRENGTH PLACED: 5000 PSI
CONCRETE SUPPLIER: Eastern
TICKET #: 19357831
SUPERPLASTICIZER: Yes
MIX ID#: 46811589
UNIT WEIGHT: 144.4 pcf

COMPRESSIVE STRENGTH DATA

SPECIMEN ID NO.	DATE MOLDED	DATE TESTED	AGE DAYS	DIAMETER (INCHES)	AVG. AREA (SQ.IN.)	COMP.FAILURE LOAD	STRENGTH (PSI)	TYPE OF FRACTURE
052027-A	04/19/13	04/26/13	7	4	12.57	57,875	4,604	3
052027-B	04/19/13	05/17/13	28					
052027-C	04/19/13	05/17/13	28					
052027-D	04/19/13	05/17/13	28					

REMARKS:

- X Samples made by AEL representatives
- ___ Samples made by others
- ___ Samples delivered to laboratory
- X Samples picked up by AEL representative
- ___ Test results comply with applicable specifications
- ___ Test results do not comply with applicable specifications

TYPES OF FRACTURES:

1- Well formed cone on both ends, less than 1" of cracking
2 - Well formed cone on one end, vertical cracks running thru ends
3- Columnar Vertical cracking thru both ends .
4- Diag. fracture w/no cracking thru ends; tap w/hammer
5- Side fracture at top or bottom
6- Similar to Type 5 but end of cyl. is pointed.

CERTIFICATION OF COMPLIANCE:

All work, unless otherwise noted, complies with approved plans, specifications and applicable sections of the Building codes. All tests were performed to ASTM procedures C-31, C-39, C-138, C-143, C-172, C-173 or C-231 , C-1064 & C-617 or C-1231 unless noted otherwise. This report covers the locations of the work tested only and does not constitute engineering opinion or project control.

Atlantic Engineering Laboratories Inc.
41 Murray Road
Rahway, NJ 07065
Phone 732-815-0400
Fax 732-815-0422

AEL, INC.

Transmittal

To:	Mr. Grant Eula	**From:**	Chris O'Malley, P.E.
Co.:	Waterfront Corporate Center III JV LLC	**Date:**	May 21, 2013
Project:	Block B – Hoboken Office Building	**Project #**	13-02-72
Re:	Report Distribution (Email)	**CC:**	geula@sjpproperties.com mtateco@cox.net Michael.Romano@pavmcgovern.com BKiefer@gace.net Sean.McKay@pavmcgovern.com lbolieu@hlw.com Elydon@pavmcgovern.com skinzbrunner@gace.net rich.greenberg@jvi-intl.com

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Comments:

Concrete Break Reports Dated: May 14 &17 (3), 2013

SO

Atlantic Engineering Laboratories of, Inc.

AASHTO Accredited

CONCRETE COMPRESSIVE STRENGTH REPORT

CLIENT: Waterfront Corporate Center III JV LLC
PROJECT: Block B - Hoboken Office Building
PROJECT #: 13-02-72
ADDRESS: 1152 River Street, Hoboken, NJ

DATE: April 23, 2013
UPDATED: May 14, 2013
UPDATED:
UPDATED:

COMPRESSION TESTING MACHINE

MANUFACTURER Forney MODEL # F-502F-COPILOT SERIAL # 09006

LABORATORY TECHNICIAN

NAME Fidel Nieto ACI CONCRETE STRENGTH TESTING # 1032767

LOCATION: Footings at tower crane #1
TECHNICIAN: Peter Nwachukwu
DATE POURED: 04/16/13
TIME POURED: 11:30 AM
SLUMP: 4"
AIR CONTENT: 2.0%
AIR TEMP: 60 Degrees F
CONCRETE TEMP: 70 Degrees F

DESIGN STRENGTH REQ'D: 4000 PSI
DESIGN STRENGTH PLACED: 4000 PSI
CONCRETE SUPPLIER: Colonial
TICKET #: 200201
SUPERPLASTICIZER: —
MIX ID#: —
UNIT WEIGHT: 147 pcf

COMPRESSIVE STRENGTH DATA

SPECIMEN ID NO.	DATE MOLDED	DATE TESTED	AGE DAYS	DIAMETER (INCHES)	AVG. AREA (SQ.IN.)	COMP.FAILURE LOAD	STRENGTH (PSI)	TYPE OF FRACTURE
048006-A	04/16/13	04/23/13	7	4	12.57	41,790	3,325	3
048006-B	04/16/13	05/14/13	28	4	12.57	67,670	5,383	3
048006-C	04/16/13	05/14/13	28	4	12.57	64,910	5,164	4
048006-D	04/16/13	05/14/13	28	4	12.57	65,380	5,201	3

REMARKS:

X Samples made by AEL representatives
Samples made by others
Samples delivered to laboratory
X Samples picked up by AEL representative
X Test results comply with applicable specifications
Test results do not comply with applicable specifications

TYPES OF FRACTURES:

1- Well formed cone on both ends, less than 1" of cracking
2 - Well formed cone on one end, vertical cracks running thru ends
3- Columnar Vertical cracking thru both ends .
4- Diag. fracture w/no cracking thru ends; tap w/hammer
5- Side fracture at top or bottom
6- Similar to Type 5 but end of cyl. is pointed.

CERTIFICATION OF COMPLIANCE:

All work, unless otherwise noted, complies with approved plans, specifications and applicable sections of the Building codes. All tests were performed to ASTM procedures C-31, C-39, C-138, C-143, C-172, C-173 or C-231 , C-1064 & C-617 or C-1231 unless noted otherwise. This report covers the locations of the work tested only and does not constitute engineering opinion or project control.

Atlantic Engineering Laboratories of, Inc.

AASHTO Accredited

CONCRETE COMPRESSIVE STRENGTH REPORT

CLIENT: Waterfront Corporate Center III JV LLC
PROJECT: Block B - Hoboken Office Building
PROJECT #: 13-02-72
ADDRESS: 1152 River Street, Hoboken, NJ

DATE: April 26, 2013
UPDATED: May 17, 2013
UPDATED:
UPDATED:

COMPRESSION TESTING MACHINE

MANUFACTURER Forney MODEL # F-502F-COPILOT SERIAL # 09006

LABORATORY TECHNICIAN

NAME Fidel Nieto ACI CONCRETE STRENGTH TESTING # 1032767

LOCATION: Slab for crane pad
TECHNICIAN: Hany Ishak
DATE POURED: 04/19/13
TIME POURED: 3:15 PM
SLUMP: 6 3/4"
AIR CONTENT: 5.4%
AIR TEMP: 72 Degrees F
CONCRETE TEMP: 76 Degrees F

DESIGN STRENGTH REQ'D: 5000 PSI
DESIGN STRENGTH PLACED: 5000 PSI
CONCRETE SUPPLIER: Eastern
TICKET #: 19357831
SUPERPLASTICIZER: Yes
MIX ID#: 46811589
UNIT WEIGHT: 144.4 pcf

COMPRESSIVE STRENGTH DATA

SPECIMEN ID NO.	DATE MOLDED	DATE TESTED	AGE DAYS	DIAMETER (INCHES)	AVG. AREA (SQ.IN.)	COMP.FAILURE LOAD	STRENGTH (PSI)	TYPE OF FRACTURE
052027-A	04/19/13	04/26/13	7	4	12.57	57,875	4,604	3
052027-B	04/19/13	05/17/13	28	4	12.57	77,400	6,158	3
052027-C	04/19/13	05/17/13	28	4	12.57	80,350	6,392	3
052027-D	04/19/13	05/17/13	28	4	12.57	77,530	6,168	4

REMARKS:

- x Samples made by AEL representatives
- Samples made by others
- Samples delivered to laboratory
- x Samples picked up by AEL representative
- x Test results comply with applicable specifications
- Test results do not comply with applicable specifications

TYPES OF FRACTURES:

1- Well formed cone on both ends, less than 1" of cracking
2 - Well formed cone on one end, vertical cracks running thru ends
3- Columnar Vertical cracking thru both ends.
4- Diag. fracture w/no cracking thru ends; tap w/hammer
5- Side fracture at top or bottom
6- Similar to Type 5 but end of cyl. is pointed.

CERTIFICATION OF COMPLIANCE:

All work, unless otherwise noted, complies with approved plans, specifications and applicable sections of the Building codes. All tests were performed to ASTM procedures C-31, C-39, C-138, C-143, C-172, C-173 or C-231, C-1064 & C-617 or C-1231 unless noted otherwise. This report covers the locations of the work tested only and does not constitute engineering opinion or project control.

Atlantic Engineering Laboratories of, Inc.

AASHTO Accredited

CONCRETE COMPRESSIVE STRENGTH REPORT

CLIENT: Waterfront Corporate Center III JV LLC
PROJECT: Block B - Hoboken Office Building
PROJECT #: 13-02-72
ADDRESS: 1152 River Street, Hoboken, NJ

DATE: April 26, 2013
UPDATED: May 17, 2013
UPDATED:
UPDATED:

COMPRESSION TESTING MACHINE

MANUFACTURER Forney MODEL # F-502F-COPILOT SERIAL # 09006

LABORATORY TECHNICIAN

NAME Fidel Nieto ACI CONCRETE STRENGTH TESTING # 1032767

LOCATION: Slab for crane pad
TECHNICIAN: Hany Ishak
DATE POURED: 04/19/13
TIME POURED: 3:15 PM
SLUMP: 8 1/2"
AIR CONTENT: 5.2%
AIR TEMP: 70 Degrees F
CONCRETE TEMP: 75 Degrees F

DESIGN STRENGTH REQ'D: 5000 PSI
DESIGN STRENGTH PLACED: 5000 PSI
CONCRETE SUPPLIER: Eastern
TICKET #: 19357772
SUPERPLASTICIZER: Yes
MIX ID#: 46811589
UNIT WEIGHT: 143.8 pcf

COMPRESSIVE STRENGTH DATA

SPECIMEN ID NO.	DATE MOLDED	DATE TESTED	AGE DAYS	DIAMETER (INCHES)	AVG. AREA (SQ.IN.)	COMP.FAILURE LOAD	STRENGTH (PSI)	TYPE OF FRACTURE
051026-A	04/19/13	04/26/13	7	4	12.57	52,105	4,145	3
051026-B	04/19/13	05/17/13	28	4	12.57	71,810	5,713	4
051026-C	04/19/13	05/17/13	28	4	12.57	73,480	5,846	3
051026-D	04/19/13	05/17/13	28	4	12.57	74,440	5,922	4

REMARKS:

X Samples made by AEL representatives
Samples made by others
Samples delivered to laboratory
X Samples picked up by AEL representative
X Test results comply with applicable specifications
Test results do not comply with applicable specifications

TYPES OF FRACTURES:

1- Well formed cone on both ends, less than 1" of cracking
2 - Well formed cone on one end, vertical cracks running thru ends
3- Columnar Vertical cracking thru both ends.
4- Diag. fracture w/no cracking thru ends; tap w/hammer
5- Side fracture at top or bottom
6- Similar to Type 5 but end of cyl. is pointed.

CERTIFICATION OF COMPLIANCE:

All work, unless otherwise noted, complies with approved plans, specifications and applicable sections of the Building codes. All tests were performed to ASTM procedures C-31, C-39, C-138, C-143, C-172, C-173 or C-231 ; C-1064 & C-617 or C-1231 unless noted otherwise. This report covers the locations of the work tested only and does not constitute engineering opinion or project control.

41 Murray Street Rahway, NJ 07065 * www.aelinc.net * Office: 732-815-0400 * Fax: 732-815-0422

Atlantic Engineering Laboratories of, Inc.

AASHTO Accredited

CONCRETE COMPRESSIVE STRENGTH REPORT

CLIENT: Waterfront Corporate Center III JV LLC
PROJECT: Block B - Hoboken Office Building
PROJECT #: 13-02-72
ADDRESS: 1152 River Street, Hoboken, NJ

DATE: April 26, 2013
UPDATED: May 17, 2013
UPDATED:
UPDATED:

COMPRESSION TESTING MACHINE

MANUFACTURER Forney MODEL # F-502F-COPILOT SERIAL # 09006

LABORATORY TECHNICIAN

NAME Fidel Nieto ACI CONCRETE STRENGTH TESTING # 1032767

LOCATION: Slab for crane pad
TECHNICIAN: Hany Ishak
DATE POURED: 04/19/13
TIME POURED: 12:15 PM
SLUMP: 6 1/4"
AIR CONTENT: 5.5%
AIR TEMP: 66 Degrees F
CONCRETE TEMP: 75 Degrees F

DESIGN STRENGTH REQ'D: 5000 PSI
DESIGN STRENGTH PLACED: 5000 PSI
CONCRETE SUPPLIER: Eastern
TICKET #: 19357659
SUPERPLASTICIZER: Yes
MIX ID#: 46811589
UNIT WEIGHT: 144.2 pcf

COMPRESSIVE STRENGTH DATA

SPECIMEN ID NO.	DATE MOLDED	DATE TESTED	AGE DAYS	DIAMETER (INCHES)	AVG. AREA (SQ.IN.)	COMP.FAILURE LOAD	STRENGTH (PSI)	TYPE OF FRACTURE
051014-A	04/19/13	04/26/13	7	4	12.57	58,465	4,651	3
051014-B	04/19/13	05/17/13	28	4	12.57	80,030	6,367	3
051014-C	04/19/13	05/17/13	28	4	12.57	71,430	5,683	4
051014-D	04/19/13	05/17/13	28	4	12.57	76,360	6,075	3

REMARKS:

X Samples made by AEL representatives
___ Samples made by others
___ Samples delivered to laboratory
X Samples picked up by AEL representative
X Test results comply with applicable specifications
___ Test results do not comply with applicable specifications

TYPES OF FRACTURES:

1- Well formed cone on both ends, less than 1" of cracking
2 - Well formed cone on one end, vertical cracks running thru ends
3- Columnar Vertical cracking thru both ends.
4- Diag. fracture w/no cracking thru ends; tap w/hammer
5- Side fracture at top or bottom
6- Similar to Type 5 but end of cyl. is pointed.

CERTIFICATION OF COMPLIANCE:

All work, unless otherwise noted, complies with approved plans, specifications and applicable sections of the Building codes. All tests were performed to ASTM procedures C-31, C-39, C-138, C-143, C-172, C-173 or C-231, C-1064 & C-617 or C-1231 unless noted otherwise. This report covers the locations of the work tested only and does not constitute engineering opinion or project control.

41 Murray Street Rahway, NJ 07065 * www.aelinc.net * Office: 732-815-0400 * Fax: 732-815-0422

KENVIL SAFETY PROGRAM

@

Waterfront Corporate Center

Hoboken, NJ

April 2013

SAFETY PROGRAM MANUAL

Kenvil United Corporation
PO Box 32
Wharton, NJ 07885
Phone: 973-927-0010
Fax: 973-927-4370

Contents

Contents 2

KENVIL UNITED CORP. EMERGENCY RESPONSE 4

ADDITIONAL EMERGENCY NUMBERS 5

POLICY DECLARATION 6

ACCIDENT AND INJURY PREVENTION PROGRAM 7

- Safety Meetings 7
- Accident Prevention Policies 7
- Hazard Identification and Controls 8
- Training 8
- Management Commitment 8
- Employee Involvement and Compliance 9
- Agreement to Participate 9

6' FALL PROTECTION @ Waterfront Corporate Center ..... **Error! Bookmark not defined.**

BOOM LIFT AND AERIAL PLATFORM SAFETY INFORMATION 21

COMPLIANCE WITH OSHA 22

GENERAL RULES 23

- Handtools 25
- Lifting and Manual Handling 25
- Ladder Safety 26
- Fall Protection 27

SAFETY GOALS AND OBJECTIVES @ Waterfront Corporate Center 29

GENERAL DESCRIPTION OF PROJECT SCOPE 29

SUBPART D-OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROLS 29

SUBPART E-PERSONAL PROTECTIVE EQUIPMENT 29

SUBPART F-FIRE PROTECTION AND PREVENTION 30

SUBPART G-SIGNS, SIGNALS, AND BARRICADES 32

SUBPART H-MATERIALS HANDLING, STORAGE, USE AND DISPOSAL 34

SUBPART I—TOOLS, HAND AND POWER 34

SUBPART J—WELDING AND CUTTING 34
SUBPART K—ELECTRICAL 35
SUBPART L—SCAFFOLDS 35
SUBPART M—FALL PROTECTION 35
SUBPART N—CRANES, DERRICKS, HOISTS, ELEVATORS, AND CONVEYORS 39
HOISTING, RIGGING AND MULITPLE LIFT RIGGING PROCEDURE @ Waterfront Corporate Center 43
SUBPART O—MOTOR VEHICLES, MECHANIZED EQUIPMENT, ETC. 44
SUBPART P-EXCAVATIONS 44
SUBPART Q-CONCRETE AND MASONRY CONSTRUCTION 44
SUBPART R-STEEL ERECTION (AND PRECAST CONCRETE ERECTION) 44
SUBPART S-TUNNELS AND SHAFTS, CAISSONS, COFFERDAMS, ETC. 44
SUBPART T-DEMOLITION 45
SUBPART U-BLASTING AND USE OF EXPLOSIVES 45
SUBPART V-POWER TRANSISSION AND DISTRIBUTION 45
SUBPART W-ROLLOVER PROTECTIVE STRUCTURES, OVERHEAD PROTECTION 45
SUBPART X-STAIRWAYS AND LADDERS 45
SUBPART Y-COMMERCIAL DIVING OPERATIONS 46
SUBPART Z- TOXIC AND HAZARDOUS SUBSTANCES 46
MSDS 47

KENVIL UNITED CORP. EMERGENCY RESPONSE

@

Waterfront Corporate Center

Hoboken, NJ

For all emergencies ***call 911***

Other emergency contacts:
Hoboken Fire Marshall: 201-420-2269
Hoboken Police Department: *201-420-2100*
Hospital: Hoboken University Medical Center
Directions to Hospital: Head north on Sinatra Dr, make a left on to 4th St. Go approx. ¼ mile (8 blocks), make a left on to Willow, destination is on the right.

For all emergencies, employees shall report directly to a Kenvil United supervisor/foreman who is equipped with a cellular phone, should it be necessary to contact first aid.

Emergencies or accidents at locations on the building might require assistance to lower the worker to the ground with a boom lift. Care and precaution must be taken to insure the ill/injured workers safety maintaining 100% tie off.

All foremen should contact the Kenvil United office @ 973-927-0010 or Gerry Fahy @ 973-943-7785, after calling 911, should the incident require emergency assistance.
In addition the foreman will also notify the following:

Accidental injuries shall be reported by completing State of New Jersey "Employers First Report" forms and shall forward to the Kenvil United office.

ADDITIONAL EMERGENCY NUMBERS

(Daytime only)

Chemtrec	1-800-424-9300
Agency for Toxic Substances and Disease Registry (ATSDR)	1-888-422-8737
National Response Center	1-800-424-8802
ATF (Explosives)	1-888-283-2662
Pesticide Information Service	1-800-222-1222
Resource Conservation and Recovery Hotline	1-800-424-9346
National Poison Control Center	1-800-942-5969
U.S. DOT	1-202-366-0656

POLICY DECLARATION

Kenvil United Corporation is committed to running a safe job for the very simple reason that it makes good sense.

Effective job planning results in a more productive and efficient work place, while protecting our most important asset: our employees.

ACCIDENT AND INJURY PREVENTION PROGRAM

Hazard control is the heart of an effective accident and injury prevention program. By implementing specific procedures such as pre-job hazard analysis and job site inspections prior to the beginning of all projects, specific pre-construction hazards may be addressed and corrected prior to the start of work. It is always better to begin a project knowing all of the hazards.

Each employee has a responsibility to prevent accidents. You have a responsibility to your family and to your fellow co-workers to use common sense and good judgment when conducting all work practices. Your responsibilities are to include:

- Incorporate safety into every job procedure.
- Plan the work. Work the plan.
- No job is done efficiently unless it has been done safely.
- Know and obey all safety procedures.
- Report all injuries immediately no matter how slight.
- Caution fellow workers if you see an unsafe act.
- Don't take chances.
- Ask questions whenever there is doubt concerning safety.
- Never tamper with things you don't understand.
- Report all unsafe conditions or equipment to your supervisor immediately.

Concentrated efforts shall produce safe working conditions and will result in efficient, productive operations. Safeguarding the health and welfare of yourself as well as others cannot be stressed too strongly. Management, Supervisors, and Foreman will be responsible for the continuous effort, and documentation directed towards the prevention of accidents.

Safety Meetings

Safety meetings are to be held prior to the start of all work regardless of whether it is pre-construction or the beginning of a business day for an ongoing project. Documentation of all safety briefings must be submitted and returned to your supervisor at the end of the workday. Monthly safety meetings will be held and be subject to documentation.

Accident Prevention Policies

The following procedures must be implemented prior to the start of all project work and throughout the duration of the project work.

- Pre-Construction Walk Through
- Preexisting Hazardous Conditions Analysis
- Job planning and Safety Issues
- Pre-Construction Photos
- Job Briefing
- Safety Meetings with Documentation
- Vehicle and Equipment Inspections
- Housekeeping
- Incident Reporting And Documentation

Hazard Identification and Controls

A written Site Specific Health and Safety Plan (HASP) must be implemented prior to the start of all project work to insure that all hazards associated with the project are properly addressed and contingency plans are available. The plans shall include information concerning:

- Worksite Hazards and Controls
- Contact Names and Numbers
- Emergency Telephone Numbers
- Local Police and Fire (non-emergency)
- Nearest Medical Facility and Directions
- Scope of work

Training

Employees of Kenvil United Corp. will have received instruction in the following training programs during the orientation process:

- Personal Protective Equipment
- Fall Protection
- Hazard Communications
- Respirator Protection
- Hearing Conservation Program
- Drug and Alcohol Program
- Chain of Command
- Recognizing Utilities
- Accident Prevention
- Housekeeping

Specific training certifications are required to obtain supervisory and foreman status positions. Certifications regarding these specific job titles may be provided to individuals by an independent provider.

Management Commitment

Ensuring the safety and health of our employees is our first consideration in operating our business. While we cannot guarantee an accident free workplace, following the safety procedures set forth to you in this manual can significantly reduce the risk of danger to you and your co-workers. Prevention of occupationally induced injuries and illness will be given precedence over all operating productivity. Management will provide to you all mechanical and physical protection required for your personal safety and health. It is the ultimate responsibility of the employee to work safely. Common sense, smart planning strategies, and the knowledge of the job can prevent most accidents from occurring.

Employee Involvement and Compliance

Kenvil United Corporation (KU) employees will be subject to an orientation class under direction of Gerald Fahy of KU in order to fulfill part of KU's commitment to worker safety. At orientation you will receive an overview of the company's health and safety programs. All questions regarding the directives within the manual shall be answered at that time. Specialized training requirements for specific job positions at KU may be obtained by an independent instructional provider prior to the start of employment at Kenvil United Corp. Certifications and other licenses must be valid and kept current. Copies of such said qualifications must be submitted to our corporate office for verification.

Agreement to Participate

Employees will be asked to sign and date an acknowledgement located at the end of this manual. Participation in all aspects of the manual is required. If you do not understand any policy in the written plan, please ask for verification on the day of orientation. If you have questions regarding any aspect of your job responsibility, policy, or procedure contact your supervisor before proceeding any further with the job. Employees have the right to stop production procedures at any time to report unsafe working conditions or concerns, and will never be subjected to disciplinary action. However, know that disciplinary action may result from a violation of the company's safety practices.

Competent Persons

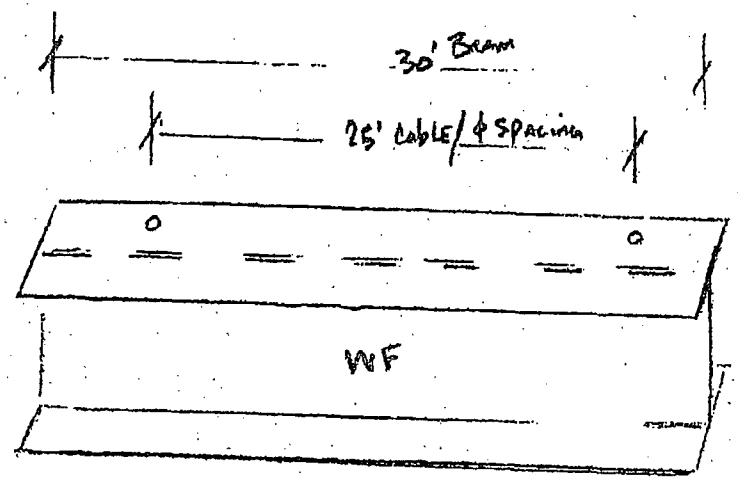
Dave Bennett, Shaun Carter, or Dean Hartman are the Competent Person(s) for Kenvil United Corporation (KU) on the **Waterfront Corporate Center** Project. One of them will be on site at all times when KU is performing work. Each man is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and has the authority to take prompt corrective measures to eliminate them. By way of training and experience, each man is knowledgeable of applicable standards relating to KU's specific operations.

Experience and training:
OSHA 30 Certified
OSHA 10, Subpart R Certified
Lift training Certified

Kenvil United Corporation

Typical fall protection layout @ perimeter beams, tie beams and main girder lines

*Tie off cables will require 2 holes per beam, cables will be dimensioned @ 5' increments



EXAMPLE

Example beam lengths:

12' 7 – 17' 6 use 10' cable / hole spacing

17' 7 – 22' 6 use 15' cable / hole spacing

22' 7 – 27' 6 use 20' cable / hole spacing

27' 7 – 32' 6 use 25' cable / hole spacing

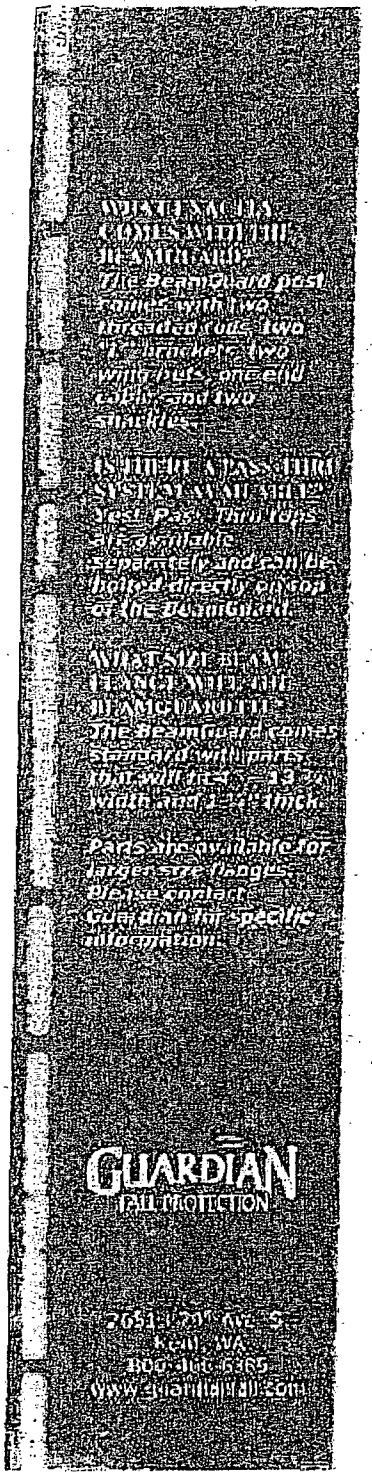
32' 7 – 37' 6 use 30' cable / hole spacing

37' 7 – 42' 6 use 35' cable / hole spacing

42' 7 – 47' 6 use 40' cable / hole spacing

47' 7 – 52' 6 use 45' cable / hole spacing

52' 7 – 57' 6 use 50' cable / hole spacing



GUARDIAN
FALL PROTECTION

BeamGuard Safety Post

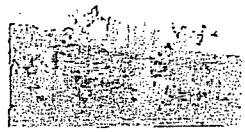
APPLICATIONS:

For use on steel I beams capable of withstanding 5,000 lbs. Can be used as a personal post or in conjunction with a horizontal lifeline system.

FEATURES:

- Post offset at an angle allowing freedom of movement for workers
- Can facilitate horizontal lifeline systems for up to two workers per section
- Unique post design has a "built-in shock absorber" eliminating the need for shock absorbers in the cable
- 42" high post is the tallest on the market
- Requires no tools for installation
- Available with Pass-Thru Tops
- Powder-coated yellow finish

Pass-Thru Top
(Sold separately)



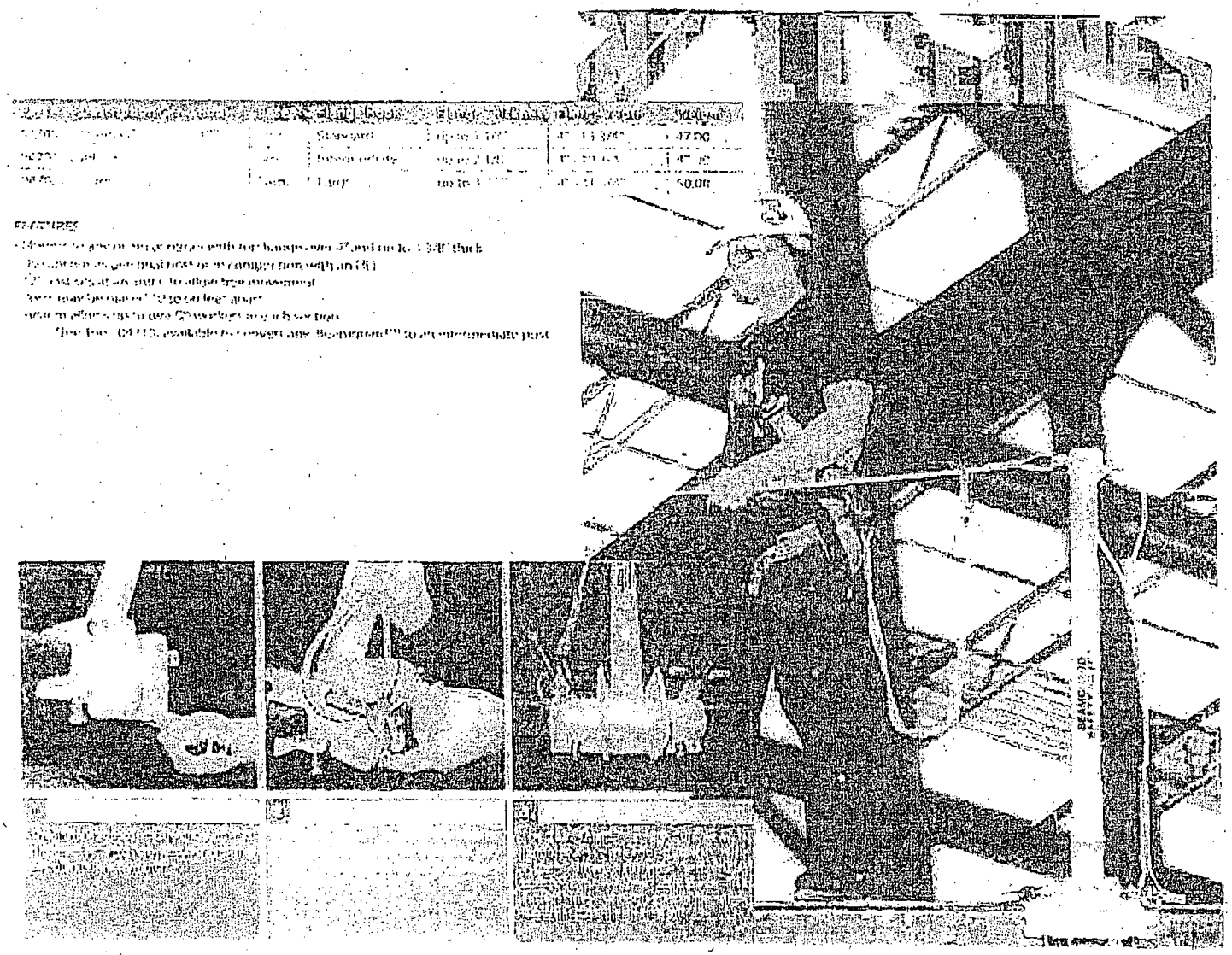
INSTALLATION AND PROPER USE:

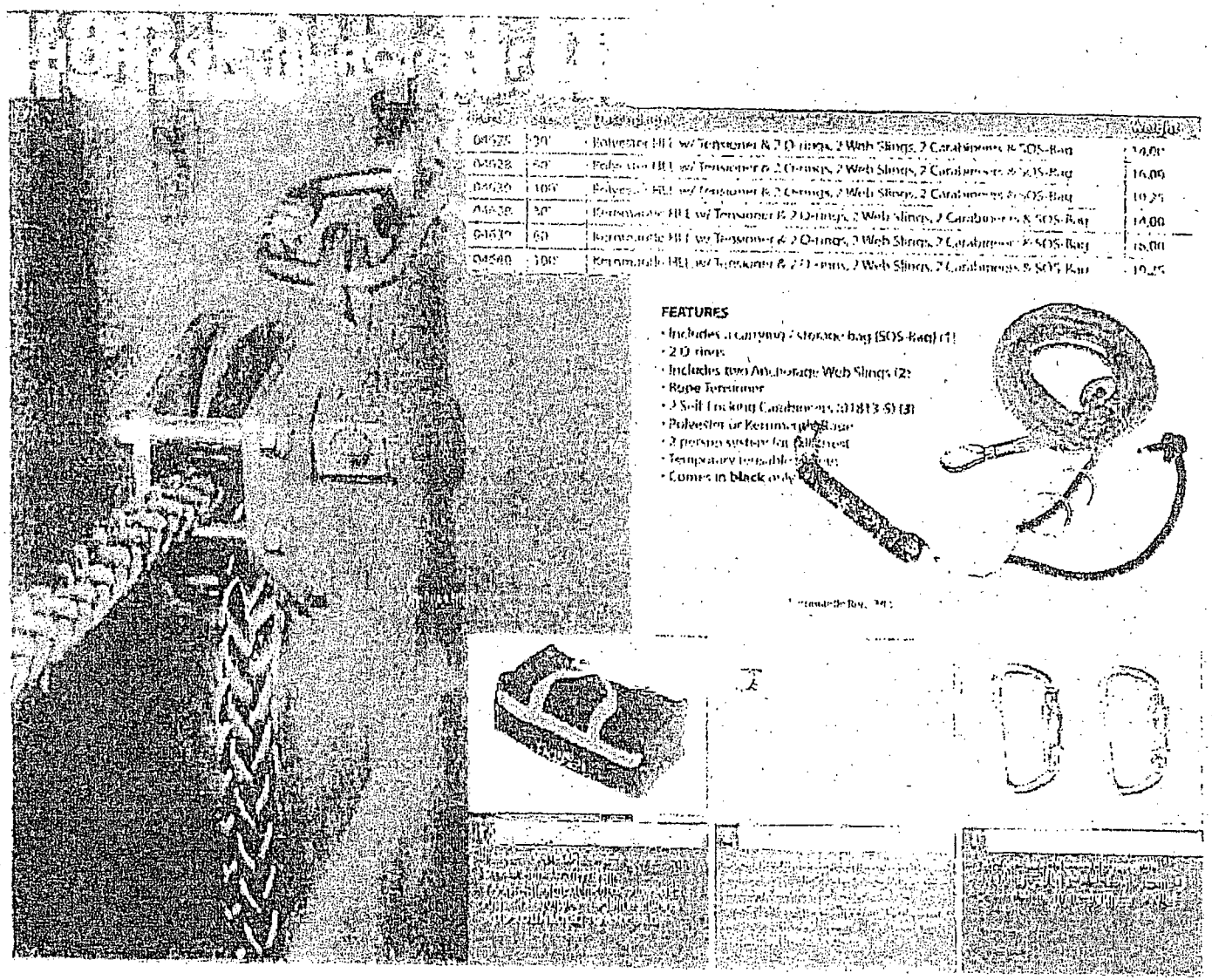
Install the BeamGuard on top flanges over 4" wide. Maximum two workers between posts. Spacing is 10 - 60 ft. Install any number of posts in a row without interruption. Maximum worker weight is 310 lbs. Read all warnings and instructions before use.

BEAMGUARD MODEL #: 04700
BEAMGUARD PASS-THRU TOP: 04710

Please contact Guardian for all warnings and instructions:
1-800-466-6385

BeamGuard Safety Posts are tested to meet all applicable ANZI Z359.1 standards and comply with OSHA standards. Use only with compatible equipment.





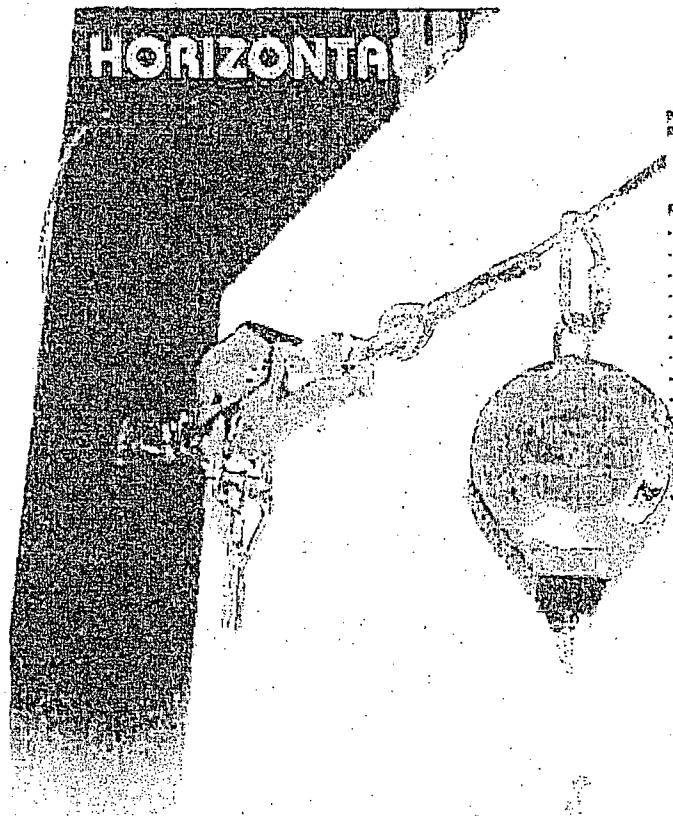
Item	Size	Description	Weight
04527	30'	Polyester HLL w/ Tensioner & 2 D-rings, 2 Web Slings, 2 Carabiners & SOS-Bag	14.00
04528	60'	Polyester HLL w/ Tensioner & 2 O-rings, 2 Web Slings, 2 Carabiners & SOS-Bag	16.00
04529	100'	Polyester HLL w/ Tensioner & 2 O-rings, 2 Web Slings, 2 Carabiners & SOS-Bag	19.25
04530	30'	Kernmantle HLL w/ Tensioner & 2 D-rings, 2 Web slings, 2 Carabiners & SOS-Bag	14.00
04531	60'	Kernmantle HLL w/ Tensioner & 2 O-rings, 2 Web Slings, 2 Carabiners & SOS-Bag	16.00
04532	100'	Kernmantle HLL w/ Tensioner & 2 D-rings, 2 Web Slings, 2 Carabiners & SOS-Bag	19.25

FEATURES

- Includes a carrying / storage bag (SOS-Bag) (1)
- 2 D-rings
- Includes two Anchorage Web Slings (2)
- Rope Tensioner
- 2 Self Locking Carabiners (01813-S) (3)
- Polyester or Kernmantle Rope
- 2 person system for fall arrest
- Temporary removable [illegible]
- Comes in black or [illegible]

* Grounded Rig, 30'

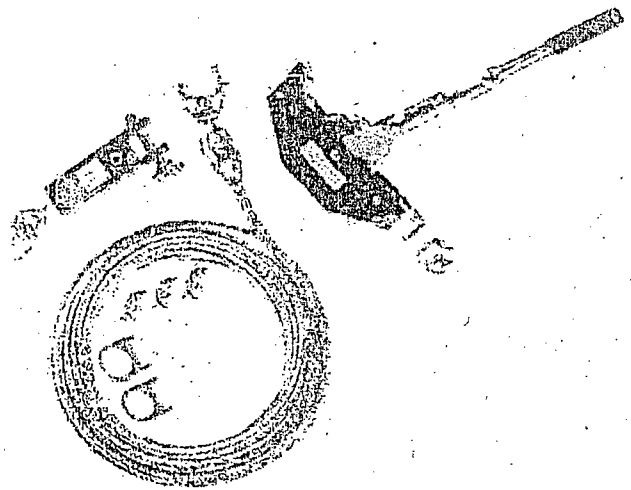
HORIZONTAL



Cable	Tensioner	2 Web Slings, 3 Cable Clamps & Impact Attenuator

FEATURES

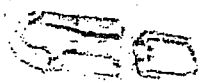
- Maintains and controls desired tension
- Permits adjustments substantially reducing the forces on the anchorages in case of a fall
- 340 lbs combined maximum worker weight
- 2 person system for fall arrest
- 3/8" diameter cable
- 2 anchorage web slings
- Web tensioner
- 100' of cable
- Impact attenuator
- 3 Cable clamps
- Retractables sold separately



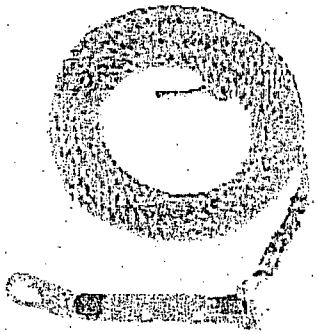
[illegible] POLY STEEL ROPE

[illegible] Poly Steel rope is a [illegible] synthetic. It is ideal for environments that are found to be [illegible] of wet. Most rope, if you said, will become 10% to 15% weaker than dry ropes. While [illegible] enough does return when most rope does not, the Blue Poly Steel will hold up better [illegible] in the presence of environments as they do not absorb water. Blue Poly Steel is partially [illegible] water of course to ultraviolet light damage. The synthetic material of Blue Poly [illegible] the rope's excellent abrasion resistant characteristics resulting in a longer life. The [illegible] Blue Poly Steel® is 10% stronger than Polypropylene. While the rope will [illegible] fibers, the [illegible] and [illegible] it needs to be replaced. This is a result of normal wear [illegible]

[illegible] to all Blue [illegible] [illegible] stock [illegible] [illegible] to [illegible] life of the [illegible]



[illegible] Blue [illegible] to any rope [illegible] the [illegible] life of the rope

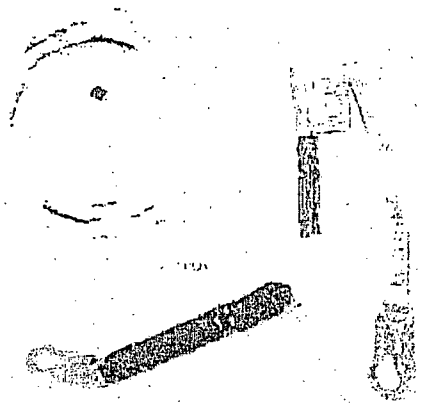


CABLE SYSTEM

- [illegible]" aircraft cable
- 13,400 pound break strength
- Cut to order [illegible]

WHITE POLYDAC™ ROPE

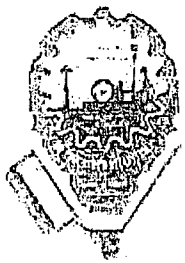
Polydac® rope is one of the strongest conventional [illegible] available today. The Polydac® rope is 100% resistant to rot or mildew, even if stored wet. Polydac® rope absorbs more energy than any other type of rope available today, 17 times as much as Manila and 50% more than polyester. The working load elongation is 8%. Polydac™ rope has excellent resistance to alkalis and most solvents. Polydac™ rope provides good abrasion protection but UV rays still degrade all synthetic fibers. Polydac® rope has a melting point of over 300 degrees.

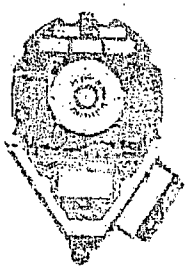


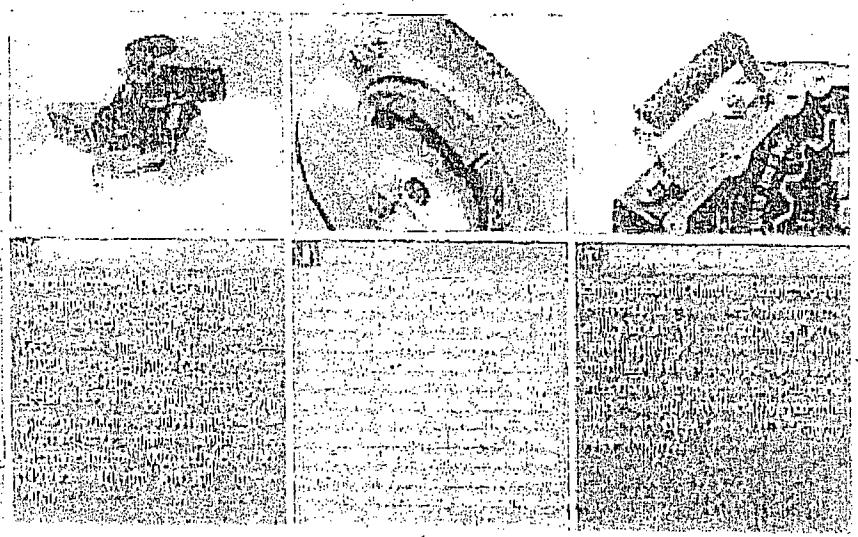
[illegible]	[illegible]	[illegible] Cable w/ Swivel Top & Swivel Snap Hook	[illegible]
[illegible]	[illegible]	[illegible] Cable w/ Swivel Top & Swivel Snap Hook	[illegible]
[illegible]	[illegible]	[illegible] w/ Swivel Top & Swivel Snap Hook	[illegible]
[illegible]	[illegible]	[illegible] 12 Cable w/ Swivel Top & Swivel Snap Hook	[illegible]

PRODUCT SPECIFICATIONS:

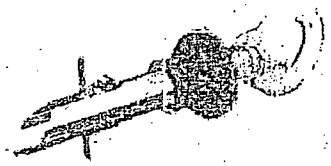
[illegible]







GUARDIAN
FALL PROTECTION



Guardian Fall Protection Kent, WA
800-466-6385 www.guardianfall.com

Selection of fall protection shall be made by a Competent Person. All fall protection equipment shall be purchased new and unused.

The equipment is designed for use as a part of a personal fall protection system. Components shall not be used for any other operation other than that which it has been designed and approved.

Fall Arrest Systems shall be designed to comply with OSHA or applicable state regulatory limitations. Systems must be used in a compliant manner.

Fall Restraint systems shall be designed by a Qualified Person, and must be installed and used under the supervision of a competent person

Consult a doctor if there is any reason to doubt a user's ability to withstand and safely absorb fall arrest forces. Age, fitness, and health conditions can seriously affect the worker should a fall occur. Pregnant women and minors should not use this equipment.

WARNING

DO NOT:

- Do not alter or misuse this equipment.
- Do not use combinations of components or subsystems that may affect or interfere with the safe, compatible function of each other.
- Do not expose the equipment to chemicals which may produce a harmful effect or degrade the equipment. Consult manufacturer in cases where doubt exists.
- Do not use this equipment around moving machinery or electrical hazards unless specifically designed for such use.
- Do not use the equipment around sharp edges or abrasive surfaces unless intended for such use.

Bolt Hole Anchor (Girder Grip) Manual

DO NOT THROW AWAY THESE INSTRUCTIONS!
READ AND UNDERSTAND BEFORE USING EQUIPMENT!

This manual should be read and understood in its entirety, and used as part of a training program as required by OSHA or any applicable state regulatory agency.

This and any other included instructions must be provided to the users of the equipment. The user must understand the proper equipment use and limitations

This product meets all applicable OSHA and ANSI standards for fall protection.

The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards. Relevant Federal, State, and local regulatory requirements, procedures, and standards shall also be a part of training.

The employer shall ensure that each employee has been trained, as necessary, by a Competent or Qualified Person in the nature of fall hazards in the work area, the correct erecting, maintaining, disassembling, and inspection of the fall protection systems being used, and the use of personal fall arrest systems.

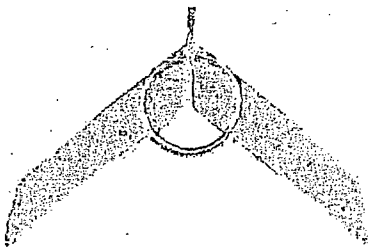
The user is required to have a rescue plan and the means at hand to implement it when using the equipment. The plan shall be project specific. Employees shall be trained in self-rescue or alternate means shall be provided for prompt rescue in the event of a fall.

Remove the equipment from service immediately if it has been subjected to the forces of a fall arrest. Contact your distributor or Guardian about policies regarding replacement of Guardian components involved in a fall.

- Only the manufacturer of this equipment or persons or entities authorized in writing by the manufacturer shall make repairs to fall protection equipment.
- The date of first inspection should be recorded by the employer on the equipment, and any serial numbers shall be recorded on the Inspection Log.
- Formal inspections shall be made by either a Competent or Qualified Person on at least a semi-annual basis.

- Fall protection equipment shall be inspected by the user for defects, damage, or deterioration.
- Any suspected defective equipment shall be removed from service.
- If the manufacturer's label is not legible or is missing, the equipment shall be removed from service. Fall protection equipment shall be removed from service upon evidence of defects, damage, or deterioration, or upon expiration of the manufacturer's specified service limits, whichever comes first.

GUARDIAN
FALL PROTECTION



GLOBAL ANCHOR

DO NOT THROW AWAY THESE INSTRUCTIONS!
READ AND UNDERSTAND BEFORE USING EQUIPMENT!

This manual should be read and understood in its entirety, and used as part of a *training program as required by OSHA or any applicable state regulatory agency.*

This and any other included instructions must be provided to the users of the equipment. The user must understand the proper equipment use and limitations.

Guardian Fall Protection Kent, WA
800-466-6386 www.guardianfall.com

[illegible] Selection of fall protection equipment shall be made by a Competent Person. All fall protection equipment shall be purchased new and unused.

The equipment is designed for use as a part of a personal fall protection system. Components shall not be used for any other operation other than that which it has been designed and approved.

Fall Arrest Systems shall be designed to comply with OSHA or applicable state regulatory limitations. Systems must be used in a compliant manner.

Fall Restraint systems shall be designed by a Qualified Person, and must be installed and used under the supervision of a competent person.

Consult a doctor if there is any reason to doubt a user's ability to withstand and safely absorb fall arrest forces. Age, fitness, and health conditions can seriously affect the worker should a fall occur. Pregnant women and minors should not use this equipment.

WARNING

DO NOT:

- ***Do not alter or misuse this equipment.***
- **Do not use combinations of components or subsystems that may affect or interfere with the safe, compatible function of each other.**
- **Do not expose the equipment to chemicals which may produce a harmful effect or degrade the equipment. Consult manufacturer in cases where doubt exists.**
- **Do not use the equipment around moving machinery or electrical hazards unless specifically designed for such use.**
- **Do not use the equipment around sharp edges or abrasive surfaces unless intended for such use.**

[illegible] The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards. Relevant Federal, State, and local regulatory requirements, procedures, and standards shall also be a part of training.

The employer shall ensure that each employee has been trained, as necessary, by a Competent or Qualified Person in the nature of fall hazards in the work area. Training shall also include the correct erecting, maintaining, disassembling, and inspection of the fall protection systems being used, and the use of personal fall arrest systems.

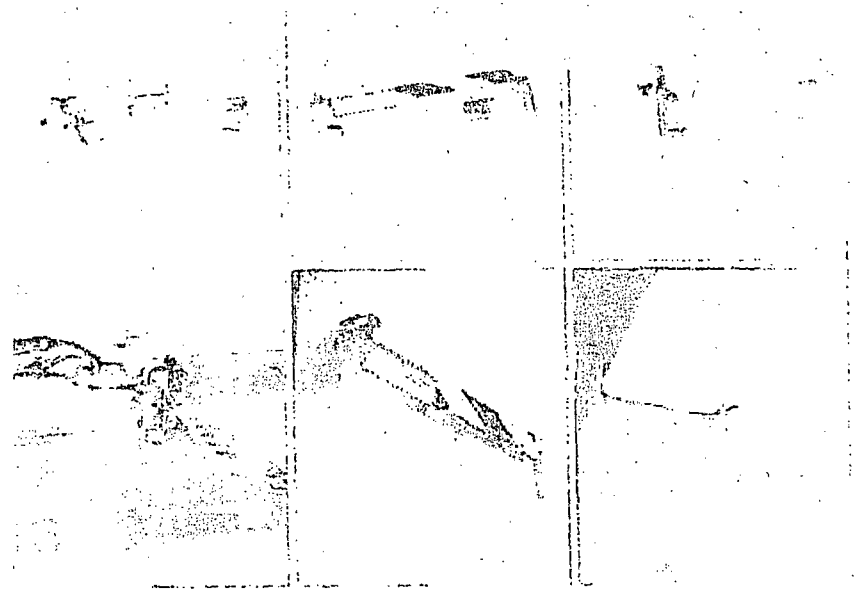
[illegible] *The user is required to have a rescue plan and the means at hand to implement it when using the equipment. The plan shall be* project specific. Employees shall be trained in self-rescue or alternate means shall be provided for prompt rescue in the event of a fall.

[illegible] Remove the equipment from service immediately if it has been subjected to the forces of a fall arrest. Contact your distributor or Guardian about policies regarding replacement of Guardian components involved in a fall.

- *Only the manufacturer of this equipment or persons or entities authorized in writing by the manufacturer shall make repairs to fall* protection equipment.
- The date of first inspection should be recorded by the employer on the equipment, and any serial numbers shall be recorded on the Inspection Log.
- Formal inspections shall be made by either a Competent or Qualified Person on at least a semi-annual basis.

- Fall protection equipment shall be inspected by the user for defects, damage, or deterioration.
- *Any suspected defective equipment shall be removed from service.*
- If the manufacturer's label is not legible or is missing, the equipment shall be removed from service. Fall protection equipment shall be removed from service upon evidence of defects, damage, or deterioration, or upon expiration of the manufacturer's specified service limits, whichever comes first.

COMMERCIAL ANCHOR POINTS



[illegible]	Beam Size	Flange Thickness	Flange Use	Weight
[illegible]	[illegible]	up to [illegible]	top or bottom	[illegible]
[illegible]	[illegible]	up to [illegible]	top only	[illegible]
[illegible]	[illegible]	up to [illegible]	top only	[illegible]
[illegible]	[illegible]	up to [illegible]	top or bottom	8.00
[illegible]	[illegible]	up to [illegible]	top or bottom	8.00
[illegible]	[illegible]	[illegible] to [illegible]	top or bottom	8.00
[illegible]	[illegible]	up to [illegible]	top or bottom	8.00
[illegible]	[illegible]	[illegible] to [illegible]	top or bottom	8.00
[illegible]	[illegible]			[illegible]

BEAMER™ BMB 12-1 (00110) 1

- Fits 4" - 12" beam widths
- Fits up to 1" thick flange
- For use on top or bottom flange of an I or H beam
- Will accommodate a retractable when used on the bottom of an overhead beam
- Lightweight
- Slides easily in both directions

BEAMER™ BMB 18-2 (00120)

- Fits 8" - 18" beam widths
- Fits up to 2" thick flange
- For use on top flange only of an I or H beam
- Lightweight
- Slides easily in both direction

BEAMER™ BMB 24-2 (00133)

- Fits 12" - 24" beam widths
- Fits up to 2" thick flange
- For use on top flange only of an I or H beam
- Lightweight
- Slides easily in both directions

VERTICAL BEAMER™ (00140) 2

- Stationary attachment point for an I or H beam
- Lightweight
- Attaches to vertical angle or horizontal column
- Attaches by hand tightening with no tools required
- Can accommodate a retractable
- Will accommodate vertical & horizontal cable lifeline

BEAMER™ BBC SERIES 3

- For use on top or bottom flange of an I or H beam
- Will accommodate a retractable when used on the bottom of an overhead beam

IRONWORKERS'

Standards of Excellence

The purpose of the Ironworkers' Standards of Excellence is to reinforce the pride of every Ironworker and our commitment to be the most skilled, most productive and safest craft in the Building Trades.

As Union Ironworkers, we pledge ourselves to uphold our word, as given through our Collective Bargaining Agreement, and display the professionalism expected of our trade and Union in all aspects of our employment as exemplified by the values contained in our Standards of Excellence.

It is a commitment to use our training and skills, each and every day, to produce the highest quality work worthy of our name and consistent with the collective bargaining agreement.

As an Iron Worker member, I agree to:

1. Adhere to my responsibilities under the Collective Bargaining Agreement for start and quit times, as well as lunch and break times.
2. Allow my Representatives to handle any disagreements or breaches by refusing to engage in unlawful job disruptions, slowdowns or any activities that affect our good name.
3. Respect the Customer's and Employer's rights, property and tools as I do my own.
4. Meet my responsibility to show up every day; outfitted for work and fit for duty without engaging in substance abuse.
5. Cooperate with the Customer and Employer to meet their statutory, regulatory and contractual responsibilities to maintain a safe, healthy and sanitary workplace.
6. Do my best to work in a manner consistent with the quality, productivity and safety of every task that I am assigned.
7. Do my best to help every co-worker return home safe at the conclusion of every shift.

The Ironworkers' Standards of Excellence will increase the pride, the productivity and the craftsmanship of every Ironworker throughout North America. This commitment will improve work place conditions, increase work opportunities, and help maintain our wages, benefits and standard of living. In addition, the Standards of Excellence will help our signatory employers complete their projects on time, on budget with no injuries or accidents.

In accordance with Article XXVI of the International Constitution, charges may be preferred against any member for violations of the Ironworkers' Standard of Excellence, including but not limited to the following reasons:

- Taking a job referral and not reporting to work.
- Failing pre-employment qualifications.
- Discharged for excessive absenteeism.

Fines for the first offense shall be no less than $100.00 or no more than one (1) day's pay including fringe benefits and working assessments.

BOOM LIFT AND AERIAL PLATFORM SAFETY INFORMATION

The following information should be reviewed and fully understood because a lift operator's primary responsibility is "Safety".

1) The lift operator shall inspect for possible leaks, loose equipment, or damage.
2) Operators shall review machine decals, load charts and safety requirements.
3) Equipment not in proper condition shall be "tagged out" until an authorized representative deems the lift worthy of operation.
4) Site conditions must be inspected to insure lift stability around site. Operators shall inspect for power lines, trenches or other potential hazards.
5) Operators shall familiarize themselves with machine controls and especially the emergency stop button should the need arise.
6) Operators shall immediately "tie-off" in boom lifts and refrain from climbing over safety rails.
7) The operator shall be fully trained and will provide supporting documentation on each job.

I have read the above lift operation information and understand the safety concerns.

_____ _____

Signature Date

COMPLIANCE WITH OSHA

IT IS OUR POLICY TO ADHERE TO THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, OSHA SUBPART R AND THE NJSDA SAFETY MANUAL. WE AGREE WITH ITS INTENT AND PURPOSE AND WILL FULLY COMPLY WITH THE RULES AND REGULATIONS.

IT IS EXPECTED THAT EACH EMPLOYEE, ANY CONTRACTORS AND SUBCONTRACTORS AND ALL THEIR EMPLOYEES WILL COMPLY WITH SECTION 5(b) OF THE ACT, WHICH STATES:

"EACH EMPLOYEE SHALL COMPLY WITH OCCUPATIONAL SAFETY AND HEALTH STANDARDS AND ALL RULES, REGULATIONS AND ORDERS ISSUED PURSUANT TO THIS ACT WHICH ARE APPLICABLE TO HIS OWN ACTIONS AND CONDUCT."

OBEY SAFETY RULES AND REGULATIONS
THEY ARE FOR YOUR PROTECTION

GENERAL RULES

- ALWAYS WEAR A HARDHAT WHEN WORKING ON OR AROUND ERECTION OPERATIONS. KEEP THE CHINSTRAPS FASTENED WHEN WORKING ALOFT.
- USE A SAFETY HARNESS AND LANYARD WHILE WORKING ON A JOB WHERE A FALLING HAZARD EXISTS AND SCAFFOLD PROTECTION IS NOT PRACTICAL. SAFETY BELTS AND LIFT LINES SHOULD ALWAYS BE USED WHILE WORKING ON WOOD FLOATS.
- SAFETY NETS SHOULD BE USED PARTICULARLY WHERE PLATFORMS OR SCAFFOLDS ARE NOT FEASIBLE.
- WEAR GLOVES OF A SUITABLE TYPE WHEN HANDLING STEEL, CABLES OR OTHER ROUGH OR SHARP-EDGED MATERIAL.
- USE GOGGLES WHEN GRINDING, CHIPPING, SCRAPING, CAULKING, HEATING RIVETS, OR CUTTING AND WELDING.
- WEAR SAFETY SHOES IN GOOD REPAIR. KEEP THE SOLES FREE FROM MUD AND GREASE TO AVOID SLIPPING.
- REPORT ALL INJURIES FOR TREATMENT, REGARDLESS OF HOW MINOR THEY MAY SEEM.
- LIFT SAFELY.
- REMOVE DEFECTIVE LADDERS FROM SERVICE. SET LADDERS FIRMLY. SECURE AT THE BOTTOM AND TOP. EXTEND AT LEAST 42 INCES ABOVE THE LANDING. KEEP BOTH HANDS FREE WHILE EXTENDING AND/OR DESCENDING LADDERS.
- AT THE END OF EACH WORKDAY, SECURE NAIL KEGS, BOARDS OR OTHER LOOSE, LIGHT MATERIALS, OR REMOVE THEM FROM OPEN FLOORS OR SCAFFOLDS SO THAT THEY WILL NOT BE BLOWN OFF IN THE EVENT OF HIGH WINDS.

- DO NOT RIDE ON STEEL THAT IS BEING HOISTED. DO NOT RIDE ON THE BALL, HOOKS, CABLES OR SLINGS. ALSO DO NOT SLIDE DOWN ROPES OR CABLES.

- DO NOT THROW MATERIAL FROM WORK AREAS TO THE GROUND. LOWER IT WITH A ROPE.

- DO NOT WORK IN OR BELOW AREAS WHERE RIVET HEATING, RIVETING OR PAINTING IS BEING DONE.

- DO NOT ATTEMPT TO REPAIR ELECTRICAL EQUIPMENT OR WIRING. THIS IS A JOB FOR THE ELECTRICIAN.

- WELDING AND CUTTING SHOULD BE PERFORMED ONLY BY AUTHORIZED AND QUALIFIED PERSONS.

- FIRE EXTINGUISHERS SHOULD BE CONSPICUOUSLY LOCATED.

- WHEN WORK IS STOPPED FOR THE DAY, LOWER THE BOOM TO A HORIZONTAL POSITION OR TIE IT SECURELY IN PLACE TO PREVENT ACCIDENTALLY DROPPING, IF LOCATED NEAR AIRPORT AND OR FLIGHT PATTERN.

- DO NOT SWING LOADS OVER ANY PERSONS, NOR ALLOW ANYONE TO WALK UNDER THE LOAD. USE A TAG LINE TO PREVENT LOAD FROM SWINGING. SIGNAL SHOULD ON LY BE GIVEN BY PERSONS SUPERVISING THE LIFTS OR BY AN ASSIGNED SIGNAL MAN.

- PROVIDE SHIELDING PROTECTION FOR EMPLOYEES AND PUBLIC WHEN X-RAYING WELDS.

Reference:
U.S. Department of Labor
Safety and Health Regulations for Construction
Occupational Safety and Health Act
Subpart R-Steel Erection

Handtools

TOOLS ARE DESIGNED TO DO A SPECIFIC JOB. THEY CAN ONLY DO THEIR JOB IF KEPT IN GOOD CONDITION. NEGLECTED TOOLS WILL CAUSE ACCIDENTS. THE FOLLOWING CARE MUST BE EXERCISED:

BASIC RULES FOR HANDTOOL SAFETY

- SELECT THE RIGHT TOOL FOR THE JOB.
- KEEP TOOLS IN GOOD CONDITION.
- USE TOOLS PROPERLY.
- KEEP TOOLS IN A SAFE PLACE.
- DO NOT USE TOOLS WITH BROKEN OR CRACKED HANDLES.

Lifting and Manual Handling

TO AVOID INJURY, OBSERVE THESE SIMPLE SAFETY PRECAUTIONS:

CHECK THE LOAD BEFORE THE ACTUAL LIFT TO BE SURE YOU CAN LIFT IT. IF NOT, GET HELP.

BEFORE LIFTING GET A SOLID FOOTING, BEND YOUR KNEES AND KEEP YOUR BACK STRAIGHT.

ALWAYS WALK WITH A LOAD, NEVER RUN. BE SURE YOU CAN SEE WHERE YOU ARE GOING.

AVOID TWISTING WHENEVER POSSIBLE.

Ladder Safety

SAFETY STANDARDS AND RECOMMENDED SAFETY PRECAUTIONS RELATED TO THE USE OF LADDERS CUT DOWN ON THE NUMBER OF ACCIDENTS RESULTING FROM FALLS AND IMPROPER USE OF LADDERS.

SAFETY PRACTICES AND PLACEMENT:

ALL LADDERS MUST BE SECURELY TIED OFF.

USE THE FOUR TO ONE RATIO, THAT IS, PLACE THE LADDER SO ITS FEET ARE ONE FOOT AWAY FROM WHAT IT LEANS AGAINST FOR EVERY FOUR FEET IN HEIGHT TO THE POINT WHERE THE LADDER RESTS. EXAMPLE: IF THE TOP OF A 16 FT. LADDER LEANS AGAINST A WALL, ITS FEET SHOULD BE PLACED 4 FT. FROM THE WALL.

NEVER USE A LADDER IN A HORIZONTAL POSITION AS A RUNWAY OR SCAFFOLD.

NEVER PLACE A LADDER IN FRONT OF A DOOR THAT OPENS TOWARD IT UNLESS THE DOOR IS LOCKED, BLOCKED, OR GUARDED BY SOMEONE.

PLACE A LADDER SO THAT BOTH SIDE RAILS HAVE SECURE FOOTING. PROVIDE SOLID FOOTING ON SOFT GROUND TO PREVENT THE LADDER FROM SINKING.

NEVER LEAN A LADDER AGAINST UNSAFE BACKING, SUCH AS LOOSE BOXES OR BARRELS.

EXTEND THE LADDER SIDE RAILS AT LEAST 3 FEET ABOVE THE TOP LANDING.

Fall Protection

WHERE REQUIRED, ALL PERSONNEL WILL BE EQUIPPED WITH A BODY HARNESS AND 6 FOOT LANYARD. THE LANYARD SHALL BE ATTACHED TO THE BODY HARNESS AND SECURED AROUND THE CLOSEST FIXED STEEL MEMBER.

WHEN WORKING IN A BOOM HOIST ALL PERSONNEL SHALL WEAR A FULL BODY HARNESS AND ATTACH LANYARD TO THE WORKING PLATFORM. WHEN WORKING FROM A LADDER, THE LANYARD SHALL BE ATTACHED TO STEEL AS STATED ABOVE.

SAFETY CABLE SHALL BE INSTALLED AROUND ALL FLOOR OPENINGS AND THE PERIMETER OF THE BUILDING AFTER FLOOR DECK HAS BEEN INSTALLED.

VIOLATIONS OF SAFETY REQUIREMENTS WILL BE GROUNDS FOR DISMISSAL.

CRANE SIGNALS

USE LOAD LINE
Tap fist on head then give regular signals.

USE WHIP LINE
Tap elbow with one hand then give regular signals.

RAISE THE BOOM AND LOWER THE LOAD
Extend thumb upward and flex fingers to and fro as long as load movement is desired.

LOWER THE BOOM AND RAISE THE LOAD
Extend thumb downward and flex fingers to and fro as long as load movement is desired.

RAISE THE LOAD

LOWER THE LOAD

SWING
Extend arm, with forefinger indicating direction of swing.

STOP
Extend forearm and hand in horizontal position and make sharp motion.

RAISE THE LOAD SLOWLY

LOWER THE LOAD SLOWLY

EMERGENCY STOP

DOG EVERYTHING

RAISE THE BOOM

LOWER THE BOOM

TRAVEL (Both Tracks) Use both fists, making a circular motion indicating direction of travel, forward or backward.

TRAVEL (One Track) Lock the track on side indicated by extended fist. Travel opposite track in direction indicated by circular motion of other fist.

SAFETY GOALS AND OBJECTIVES @ Waterfront Corporate Center

To provide a safe work environment to construct structural framing, joist and metal deck for Waterfront Corporate Center. Every employee shall leave this job just as he arrived-EVERYDAY.

GENERAL DESCRIPTION OF PROJECT SCOPE

Install structural steel, joist, metal deck and OSHA protection at the perimeter and floor penetrations. Two (2) line OSHA cable with posts where required shall be installed immediately. Bridge safety and logistics plan will be submitted later as separate submittal.

EMPLOYEE AWARENESS OF SAFETY:

Lift training, tool box rules, safety manual review.

PARTIES RESPONSIBLE FOR SITE COMPLIANCE:

All Foremen to be named later, job steward, and Gerald Fahy, president of Kenvil United shall be responsible for compliance at the worksite.

SUBPART D-OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROLS

ANY SPECIAL ENVIRONMENTAL CONDITIONS REQUIRING SPECIAL ATTENTION:
None known
PROPOSED CONTROLS:
Welding shields and eye protection for welding and burning operations are to be worn as appropriate.
COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett (see attached competent person statement)

SUBPART E-PERSONAL PROTECTIVE EQUIPMENT

ANY SPECIAL CONDITIONS REQUIRING UNUSUAL APPARATUS, ADDITIONAL PPE:
All employees shall be equipped with and utilize hard hats, safety glasses, fall protection equipment, face shields and ear protection to ensure the safety of all employees, 100% of the time.
COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART F-FIRE PROTECTION AND PREVENTION

FIRE PROTECTION OF EXISTING FACILITIES:
Provide fire extinguishers for trucks and welding and burning tasks. Separate oxygen and acetylene tanks.
PROPOSED CONTROLS:
All burning and welding will proceed only after a hot work permit has been submitted. Fire watch procedures shall include inspection of area to ensure that no flammable liquids or debris are present. 20ABC extinguishers shall be present as well as fire blankets where material below requires protection.
COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SDA

NJ SCHOOL DEVELOPMENT AUTHORITY

HOT WORK PERMIT

School District: _____ **Project/Site:** _____

TIME HOT WORK ALLOWED: _____ **TO:** _____ **DATE:** _____

JOB DESCRIPTION: _____

TYPE OF WORK

- ☐ ELECTRIC WELDING
- ☐ CHISELING
- ☐ GRINDING
- ☐ BRAZING
- ☐ SOLDERING
- ☐ GAS WELDING/BURNING
- ☐ OTHER _____
- ☐ MELTING POT
- ☐ RED HEADING
- ☐ POWER GUN
- ☐ HAMMERING
- ☐ DRILLING

ALARMS MUST BE CUT OFF	☐ YES	☐ NO
CUT OFF BLDG. SPRINKLERS	☐ YES	☐ NO
FIRE WATCH REQUIRED	☐ YES	☐ NO
VAPOR/GAS COMBUSTION TEST REQUIRED	☐ YES	☐ NO

PERSON DOING THE WORK MUST CHECK ITEMS & SIGN BELOW

HAND FIRE EXTINGUISHER IN AREA	☐ YES	☐ NO
COMBUSTIBLE MATERIALS REMOVED FROM AREA	☐ YES	☐ NO
COMBUSTIBLE MATERIALS REMOVED FROM AREA BELOW	☐ YES	☐ NO
ALL FLAMMABLE LIQUIDS REMOVED FROM AREA	☐ YES	☐ NO
ALL FLAMMABLE GAS SHUT-OFF AND ISOLATED	☐ YES	☐ NO
WELDING SCREENS POSITIONED WHERE NEEDED	☐ YES	☐ NO
SHEATHING PROVIDED WHERE NEEDED	☐ YES	☐ NO
WELDING CABLES & HOSES OUT OF TRAVEL AREAS OR SECURED AT LEAST 7' OVERHEAD	☐ YES	☐ NO
VAPOR COMBUSTION TEST CONDUCTED	☐ YES	
VAPOR COMBUSTION TEST CONDUCTED WHERE NECESSARY	☐ YES	☐ NO

IF TESTED, WHO CONDCUTED TEST? _____

TEST RESULTS _____

USING PIPE AS REQUIRED ON SPECIAL WORK PERMIT ☐ YES ☐ NO

_____
(SIGNATURE OF PERSON PERFORMING THE HOT WORK)

APPROVALS (SIGNATURES)

SHIFT	CONTRACTOR'S FOREMAN
DAY	
SWING	
NIGHT	

THE PERSON PERFORMING THE HOT WORK MYST INSURE THAT:

1. SPARKS AND MOLTEN SLUGS OF METAL MUST BE CONFINED TO THE WORK AREA AND KEPT FROM FALLING INTO OR ENTERING OTHER AREAS.
2. WHEN USING HAND TOOLS FOR DRILLING OR CHIPPING IN HAZARDOUS AREAS, USE SPARK-PROOF TOOLS OR KEEP TOOLS LUBRICATED WITH WATER OR OTHER ADEQUATE MATERIAL TO REDUCE RISK OF SPARKS.
3. WHEN USING AIR OR ELECTIR CDRILLS IN HASARDOUS AREAS, WATER OR OIL MUST BE KEPT ON BIT TO PREVENT SPARKS.
4. WHEN CUTTING OR CHIPPING CONCRETE FLOOR, ETC., KEEP CONCRETE WET.
5. THE PERSON DOING THE WORK MUST ENSURE BEFORE LEAVING THE AREA THAT THERE IS NO DANGER OF A FIRE BEING STARTED AS RESULT OF THE WORK.
6. ANY WORKER WHO LEAVES THE JOBSITE FOR ANY REASON MUST CHECK UPON RETURN TO SEE THAT NO HAZARDOUS CONDITIONS HAVE DEVELOPMENT DURING THE ABSENCE.
7. PERMIT BECOMES VOID IF:
   A. HOT WORK DELAYED FOR ON HOUR OR MORE;
   B. AN EMERGENCY ALARM SOUNDS FOR THE AREA; AND
   C. A FIRE OCCUES IN THE AREA.
8. WHEN "HOT WORK" JOB IS FINISHED, ASSURE THAT ANY FIXED FIRE PROTECTION SYSTEM (SUCH AS SPRINKLERS, ALARMS, SMOKE DETECTORS, ETC.) THAT WERE TURNED OFF ARE NOW RETURNED TO OPERABLE CONDITION. COORDINATE THIS THROUGH THE PLANT'S FIRE BRIGADE CHIEF OR THE SAFETY REPRESENTATIVE WHERE APPLICABLE.
   THIS TAG MUST BE POSTED AT WORK SITE THEN RETURNED TO THE SITE SAFETY REPRESENTATIVE

SUBPART G-SIGNS, SIGNALS, AND BARRICADES

Provide caution tape around work area. Caution off area around crane. Provide cones @ 10' intervals and signs that define work area for Kenvil United Corporation Employees Only.

PROPOSED CONTROLS:
Kenvil United Corporation will issue an "Area Turnover" letter as areas are completed and turned over to the GC and other trades. See sample attached.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SAMPLE TURNOVER LETTER

To: [NAME OF GC or appropriate company]

From: Kenvil United Corp.
Gerald Fahy, President

Re: [PROJECT NAME, TOWN]
OF FLOOR, AREA X

Date: [mm/dd/yyyy]

MESSAGE:
Kenvil United Corporation (KU) has completed steel installation work on the # floor, area X and turns the floor over to [GC] and/or its subcontractors. [GC] shall immediately report all discrepancies or deficiencies to KU for assessment and/or correction.

X _____
Gerald Fahy
President

SUBPART H-MATERIALS HANDLING, STORAGE, USE AND DISPOSAL

Truck and crane travel routes shall be firm and stable to allow safe travel.

Areas utilized for unloading shall be marked with cones when in use and signs displayed to ensure unauthorized personnel do not enter the area.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART I—TOOLS, HAND AND POWER

Provide safety glasses, face shields and respirators around grinding and chipping of steel.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART J—WELDING AND CUTTING

Provide safety glasses, burning goggles and face shields.

All areas where welding ad cutting are being performed must be properly protected with caution tape, cones and signs that warn others from entering the area.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART K—ELECTRICAL

Utilize GFI outlets for all electrical power tools.
Use fiberglass ladders.
All cords must be kept off floors.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART L—SCAFFOLDS

"No intention" of utilizing scaffolds.

SUBPART M—FALL PROTECTION

Fall protection fully covered in prior pages of this safety manual. All fall protection shall provide for 6' fall protection 100% of the time. Special note that no climbing of steel "unprotected" will be allowed.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

3/8" 40,000 lb
4-14-10
Charge-u
Steve
QC 10,057

FAX

CHARTER STEEL

A Division of
Charter Manufacturing Company, Inc.

1658 Cold Springs Road
Saukville, Wisconsin 53080
(262) 268-2400
1-800-437-8769
FAX (262) 268-3570

CHARTER STEEL TEST REPORT
Reverse Has Test And Codes

Cust P.O.	27935
Customer Part #	045B030UVP
Charter Sales Order	70006953
Heat #	10040120
Sub Lot #	30000470
Grade	1008 A AK FG RHQ 28/32
Process	HRCC
Finish Size	28/32

I hereby certify that the material described herein has been manufactured in accordance with the specifications and standards listed below and on the reverse side and that it satisfies these requirements.

Test Results of Heat Lot# 10040120

Lab Code: 7389

CHEM	C	MN	P	S	SI	NI	CR	MO	CU	SN	V
%Wt	.09	.41	.007	.011	.09	.04	.05	.02	.09	.005	.003

AL	N	B	TI	NB
.028	.007	.0001	.001	.001

JOBINY(HRC) JOB01
88

JOBINY SAMPLE TYPE ENGLISH = C

LOC1 = 1-4	AT = 1	AH = 0	ST = .5	BK = 0	CT = 0	CH = 0	DT = .5	DH = 0
LOC2 = 2-4	AT = 1	AH = 0	ST = .5	BH = 0	CT = 0	CH = 0	DT = .5	DH = 0
LOC3 = 3-4	AT = 1	AH = 0	ST = 1	BH = 0	CT = 0	CH = 0	DT = .5	DH = .5
LOC4 = 3-4	AT = 1	AH = 0	ST = .5	BH = 0	CT = 0	CH = 0	DT = .5	DH = 0
LOC5 = 4-3	AT = 1	AH = 0	ST = 1	BH = 0	CT = 0	CH = 0	DT = .5	DH = .5
LOC6 = 5-12	AT = 1	AH = 0	ST = 1	BH = 0	CT = 0	CH = 0	DT = .5	DH = 0

CHEM. DEVIATION EXT. GREEN =

Test Results of Heating Lot# 4353970

	# of Tests	Min Value	Max Value	Mean Value
ROCKWELL B	1	88	89	88

REDUCTION RATIO = 67:1

RR LIB = 0878-02

Specifications: Manufactured per Charter Steel Quality Manual Rev 6,12-05-07
Meets customer specifications with any applicable Charter Steel exceptions for the following customer documents:
Customer Document = 045-0320 Revision = 1 Dated = 01-05-08

Charter Steel
Saukville, WI, USA

Form: Lcm0,Fax1,Mo00

Testing Laboratory

Janice Barnard
Manager of Quality Assurance
01/25/2010

Room 301, Unit 30
#1980 Luo Xu Road
Shanghai, 200237
Tel: 86-21-54810680
Fax: 86-21-54810003

DRAGON TRADING
INCORPORATED

211 East 70th Street
Suite 20D
New York, NY 10021
Tel: 212-717-1496
Fax: 212-717-1499
Email: dragontrad@aol.com

WIRE ROPE TEST CERTIFICATE

Date:	August 1, 2009
Client:	Bilco Wire Rope & Supply Corp.
Purchase Order No.:	29176
Sales Confirmation No.:	DTI7745
Invoice No.:	09303
Construction:	7x19
Nominal Diameter:	3/8"
Finish:	Galv
Lubrication:	Dry Lube
Lay Direction:	RHRL
Quantity:	33 x 5,000'
Specification :	RR-W-410E
Grade of Steel Used:	IPS
Min. Breaking Strength:	14,400 LBS
Reel Number:	7745-1~33

Test Results:

Actual Diameter:	0.377"
Actual Breaking Strength:	14,720 LBS
Tensile Strength:	2020-2150 N/mm²
Preforming:	good
Weight of Zinc Coating:	45-56 g/m²
Markings on Reels:	N/M
Markings on Tags:	PO#29176, construction, size, length, weight, reel#, CHINA etc.
Packing:	Wooden Reel

Hereby I certify the above test results are true and correct.

Completed by: Zhou Xiaohua

SUBPART N—CRANES, DERRICKS, HOISTS, ELEVATORS, AND CONVEYORS

Third party crane inspections and operator certifications are attached. See Subpart R concerning lift plans and critical lifts.
Operator will not make lifts with crane that loads are not properly secured, taglined or multiple pieced incorrectly.
*NOTE: No other trades allowed within swing radius of crane

Crane will have a flag and beacon at night if left standing or will be lowered to less than 100' at night. The crane will have less than 200' which does not require a flag or beacon and is not within three miles of an airport.
*Swing radius/work area will be clearly marked with caution tape and the competent person will not allow others within the area.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Crane Operator- Ivan Enriquez

TG 1900T TOWER CRANE

NYC RATINGS AT FULL OF PROVEN LOAD

(Rated Loads in Kips)

Counterweights - total 94.4 Kips (fixed counterweight 23.6 Kips + moving counterweight 70.8 Kips)

Boom Length	160 ft	170 ft	180 ft	190 ft	200 ft	210 ft	220 ft	230 ft	240 ft	250 ft	260 ft	Boom Length
Radius ft												Radius ft
30	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	30
40	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	40
50	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	50
60	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	60
70	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	70
80	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	80
90	58.0	58.0	58.0	58.0	58.0	58.0	58.0	53.0	48.0	43.3	38.9	90
100	58.0	58.0	58.0	57.4	56.9	56.3	55.8	52.2	48.0	43.3	38.9	100
110	52.7	52.1	51.9	51.3	50.8	50.2	49.7	46.5	43.3	40.0	36.9	110
120	47.5	47.0	46.7	46.1	45.6	45.0	44.5	41.6	38.7	35.7	33.0	120
130	43.1	42.6	42.3	41.7	41.3	40.7	40.2	37.5	34.8	32.2	29.8	130
140	39.4	38.8	38.5	38.0	37.5	36.9	36.4	34.0	31.5	29.0	26.7	140
150	36.0	35.5	35.3	34.7	34.2	33.6	33.1	30.9	28.6	26.3	24.2	150
160	27.7	32.6	32.4	31.8	31.4	30.8	30.3	28.1	26.0	23.9	22.0	160
170		25.0	29.8	29.2	28.8	28.2	27.7	25.8	23.6	21.8	20.0	170
180			22.8	26.9	26.5	26.0	25.5	23.6	21.9	20.0	18.2	180
190				20.5	24.5	23.9	23.4	21.7	20.0	18.2	16.6	190
200					18.6	22.0	21.6	20.0	18.4	16.7	15.2	200
210						16.7	19.9	18.4	16.9	15.3	13.9	210
220							14.9	17.0	15.5	14.1	12.7	220
230								12.5	14.3	12.9	11.6	230
240									10.5	11.8	10.7	240
250										8.5	9.8	250
260											6.9	260

Notes:

1. Lifting capacity does not include load block and slings
2. For each 10 feet of boom foot height above the lowest hook position, 48# deduction must be made from lifting capacity
3. Conduct operations in accordance with ANSI B30.3, OSHA and manufacturer's requirements.
4. Do not operate crane in sustained winds exceeding 30 mph.

prepared by:

Howard I. Shapiro & Associates
Consulting Engineers, P.C.
303 Merrick Road, Suite 202
Lynbrook, NY 11563
(516) 791-2[illegible] Fax: (516) 791-5425

STATE OF NEW YORK
LAWRENCE K. SHAPIRO
60597
LICENSED PROFESSIONAL ENGINEER

11/14/06

HOISTING, RIGGING AND MULITPLE LIFT RIGGING PROCEDURE @ Waterfront Corporate Center

Cranes being used in steel erection activities shall be visually inspected prior to each shift by a competent person. The inspection shall include the following:

- All control and drive mechanisms for mal-adjustments and wear
- Safety devices, air, hydraulic, and other pressurized lines
- Hooks, safety latches, wire rope, tires
- Ground conditions and site conditions (existing buildings, power lines, etc.)

Multiple lifts shall only be performed if the following criteria are met:

- A multiple lift rigging assembly is used
- A maximum of five members are hoisted per lift
- Only beams and similar structural members are lifted
- All employees engaged in multiple lifts have been trained in these procedures in accordance with 1926.761©(1)
- No crane is permitted to be used for multiple lifts where such use is contrary to the manufacturer's specifications and limitations.

Components of the "multiple lift" rigging assembly shall be designed and assembled with a maximum capacity for total assembly and for each individual attachment point. This capacity shall be based on the manufacturer's specification with a 5 to 1 safety factor.

The total load shall not exceed the rated capacity of the hoisting equipment specified in the hoisting equipment load charts.

SUBPART O—MOTOR VEHICLES, MECHANIZED EQUIPMENT, ETC.

Company trucks must remain on construction roads as defined on crane mobilization plan. Trucks requiring backup must be monitored to ensure safety of personnel and property. Trucks requiring entry shall notify the foreman (competent person) and proceed only as directed.

A flagman will direct deliveries into construction site.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART P-EXCAVATIONS

Not applicable

SUBPART Q-CONCRETE AND MASONRY CONSTRUCTION

Not applicable

SUBPART R-STEEL ERECTION (AND PRECAST CONCRETE ERECTION)

Plan provided in safety manual

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Ivan Enriquez- crane operator
Gerald Fahy, project manager

SUBPART S-TUNNELS AND SHAFTS, CAISSONS, COFFERDAMS, ETC.

Not applicable

SUBPART T-DEMOLITION

Not applicable

SUBPART U-BLASTING AND USE OF EXPLOSIVES

Not applicable

SUBPART V-POWER TRANSISSION AND DISTRIBUTION

Crane swing radius within 10' of power lines will be marked with caution tape and cones. No steel or material will be stored within 10' of power lines which will prevent the need to swing within the area of 10'. Job fences at the site also prevent working within 10' of power lines.

Crane operator and foreman will walk the site to review all potential power contact locations and cone off areas to prevent placing loads near these areas.

Ivan Enriquez- crane operator
Foreman to be named later

SUBPART W-ROLLOVER PROTECTIVE STRUCTURES, OVERHEAD PROTECTION

Not applicable

SUBPART X-STAIRWAYS AND LADDERS

All ladders shall be fiberglass and extend 3' past floor or landing level and shall be anchored to the structure with 3 to 1 distance from bottom to vertical plane. Ladders will be utilized for access only. Work shall not be performed off ladders.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

SUBPART Y-COMMERCIAL DIVING OPERATIONS

Not applicable

SUBPART Z- TOXIC AND HAZARDOUS SUBSTANCES

Material Safety Data Sheets are attached and define potential hazardous materials. See Hazcom attachment defining scope and requirements.

COMPETENT PERSON(S) RESPONSIBLE FOR OVERSIGHT:
Dave Bennett-competent person
Foreman to be named later
Gerald Fahy, project manager

MSDS

CGI INDUSTRIES, INC.
[illegible] • Fine Lane, New Jersey [illegible] • (908) [illegible]-7613 • Fax (908) [illegible]-4144

ATTN: SAFETY DIRECTOR

REFERENCE: YOUR P.O. NO.

Dear Customer:

Thank you for your recent purchase order noted above. It has always been CGI'S policy to assist customers in using our products safely.

As a part of this program, comprehensive material safety data sheets have been developed. Our records believe that you do not have the current revision for one or more gases or gas mixture components included in this order.

Enclosed, is a copy of the current material safety data sheet(s) listed below. Should you require further information about any CGI product, please contact the nearest CGI office.

Very truly yours,

Joseph Burke
Safety, Health, and Environmental
Compliance Department

MSDS NO.	MSDS DESCRIPTION

BOC GASES

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: OXYGEN

1. Chemical Product and Company Identification

BOC Gases,
Division of
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974

TELEPHONE NUMBER: (908) 464-8100
24-HOUR EMERGENCY TELEPHONE NUMBER:
CHEMTREC (800) 424-9300

BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6

TELEPHONE NUMBER: (905) 501-1700
24-HOUR EMERGENCY TELEPHONE NUMBER:
(905) 501-0802
EMERGENCY RESPONSE PLAN NO: 20101

PRODUCT NAME: OXYGEN
CHEMICAL NAME: Oxygen
COMMON NAMES/SYNONYMS: None
TDG (Canada) CLASSIFICATION: 2.2 (5.1)
WHMIS CLASSIFICATION: A, C

PREPARED BY: Loss Control (908)464-8100/(905)501-1700
PREPARATION DATE: 6/1/85
REVIEW DATES: 6/7/96

2. Composition, Information on Ingredients

INGREDIENTS	% [illegible]	[illegible]	TLV-ACGIH[2]	LD_{50} or LC_{50} Route/Species
Oxygen FORMULA: O_2 CAS: 7782-44-7 RTECS #: [illegible]	99.0 to 100.0	Not Available	Not Available	Not Available

[1] As stated in 29 CFR 1910, Subpart Z (updated July 1, 1993)
[2] As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

3. Hazards Identification

[illegible]
Elevated oxygen levels may result in [illegible] changes. High concentrations of oxygen greater than 75% [illegible] included cramps, nausea, dizziness, hypothermia, amblyopia, [illegible] spots and convulsions capable of [illegible] death. [illegible] convulsion.

ROUTS OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
No	No	No	Yes	No

PRODUCT NAME: OXYGEN

HEALTH EFFECTS:

Exposure Limits No	Irritant No	Sensitization No
Teratogen No	Reproductive Hazard No	Mutagen Yes
Synergistic Effects None known		

Carcinogenicity: – NTP: No IARC: No OSHA: No

EYE EFFECTS:
Adverse effects not anticipated.

SKIN EFFECTS:
Adverse effects not anticipated.

INGESTION EFFECTS:
Adverse effects not anticipated.

INHALATION EFFECTS:
High concentrations of oxygen (greater than 75%) causes symptoms of hyperoxia which included cramps,

capable of leading to death. The property is that of hyperoxia which leads to pneumonia. Concentrations between 25 and 75% present a risk of inflammation of organic matter in the body.

Oxygen concentrations between 20 to 95% have produced genetic changes in mammalian cell assay test systems.

NFPA HAZARD CODES		HMIS HAZARD CODES		RATINGS SYSTEM
Health:	0	Health:	0	0 = No Hazard
Flammability:	0	Flammability:	0	1 = Slight Hazard
Reactivity:	0	Reactivity:	0	2 = Moderate Hazard
				3 = Serious Hazard
				4 = Severe Hazard

4. First Aid Measures

EYES:

ophthalmologist for treatment and follow up.

SKIN:
Remove contaminated clothing and flush affected area with lukewarm water. If irritation persists, seek medical attention.

INGESTION:
Ingestion is not anticipated.

PRODUCT NAME: OXYGEN

INHALATION:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO OXYGEN. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Further treatment should be symptomatic and supportive. Inform the treating physician that the patient could be experiencing hypoxia.

5. Fire Fighting Measures

Conditions of Flammability: Not flammable, Oxidizer		
Flash point None	Method: Not Applicable	Autoignition Temperature: None
LEL(%): None	UEL(%): None	
Hazardous combustion products: None		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

FIRE AND EXPLOSION HAZARDS:
High oxygen concentrations vigorously accelerate combustion.

EXTINGUISHING MEDIA:
Water spray to keep cylinders cool. Extinguishing agent appropriate for the combustible material.

FIRE FIGHTING INSTRUCTIONS:
If possible, stop the flow of oxygen which is supporting the fire.

6. Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repair. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

7. Handling and Storage

Electrical classifications:
Nonhazardous

Dry product is noncorrosive and may be used with all materials of construction. Moisture causes metal oxides which are formed with air to be hydrated so that they include volume and lose their protective role (rust formation). Concentrations of SO_2, Cl_2, salt, etc. in the moisture enhances the rusting of metals in air.

Carbon steels and low alloy steels are acceptable for use at lower pressures.

For high pressure applications stainless steels are acceptable as are copper and its alloys, nickel and its alloys, brass bronze, silicon alloys, Monel ®, Inconel ® and beryllium. Lead and silver or lead tin alloys are good gasket materials. Teflon ®, Teflon ® composites, or Kel-F ® are preferred non-metallic gasket materials.

Check with the supplier to verify oxygen compatibility for the service conditions.
Oxygen should not be used as a substitute for compressed air in pneumatic equipment since this type generally contains flammable lubricants.

BOC GASES

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: ACETYLENE

1. Chemical Product and Company Identification

BOC Gases,
Division of
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974

TELEPHONE NUMBER: (908) 464-8100
24-HOUR EMERGENCY TELEPHONE NUMBER:
CHEMTREC (800) 424-9300

BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 3
Mississauga, Ontario L5R 3W6

TELEPHONE NUMBER: (905) 501-1700
24-HOUR EMERGENCY TELEPHONE NUMBER:
(905) 501-0802
EMERGENCY RESPONSE PLAN NO: 20101

PRODUCT NAME: ACETYLENE
CHEMICAL NAME: Acetylene
COMMON NAMES/SYNONYMS: Ethyne, Acetylene, Ethine
TDG (Canada) CLASSIFICATION: 2.1
WHMIS CLASSIFICATION: A, B1, D2B

PREPARED BY: Loss Control (908)464-8100/(905)501-1700
PREPARATION DATE: 6/1/95
REVIEW DATE: 6/7/96

2. Composition, Information on Ingredients

INGREDIENT	% VOLUME	% WEIGHT	TLV-ACGIH*	LD_{50} or LC_{50} Route/Species
Acetylene FORMULA: C_2H_2 CAS: 74-86-2 RTECS #: AC9000000	95.0 to 99.8	Not Available	Simple Asphyxiant	Not Available
Acetone FORMULA: C_3H_6O CAS: 67-64-1 RTECS #: AL3150000	Not Available	1000 ppm TWA	750 ppm TWA 1000 ppm STEL	LD_{50} 1297 mg/kg (mouse)

*As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)
*As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

3. Hazards Identification

EMERGENCY OVERVIEW

Simple Asphyxiant. This product does not contain oxygen and may cause asphyxia if released in a confined area. Maintain oxygen levels above 19.5%. May induce anesthetic effects. Highly flammable under pressure. Spontaneously combustible in air at pressures above 15 psig. Acetylene liquid is shock sensitive.

PRODUCT NAME: ACETYLENE

ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
No	No	No	Yes	No

HEALTH EFFECTS:

Exposure Limits	Irritant	Sensitization
Yes	Yes	No
Teratogen	**Reproductive Hazard**	**Mutagen**
No	No	No
Synergistic Effects None Reported		

Carcinogenicity: – NTP: No IARC: No OSHA: No

EYE EFFECTS:
None known since product is a gas at room temperature. Contact of liquid acetylene with the eyes may cause temporary irritation.

SKIN EFFECTS:
Skin effects are not likely. Contact with liquid acetylene may cause irritation and dermatitis upon repeated exposure.

INGESTION EFFECTS:
Ingestion is unlikely, since acetylene is a gas at room temperature.

INHALATION EFFECTS:
Acetylene is an asphyxiant and may cause anesthetic effects at high concentrations. High concentrations may exclude an adequate supply of oxygen to the lungs. Effects of oxygen deficiency resulting from simple asphyxiants may include: rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgement, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma, and death.

Under normal operating conditions, acetone is not released from the cylinder. However, if the cylinder is overcharged with acetone or acetylene, acetone may occasionally "spit" out. Acetone is primarily a central nervous system toxin causing headache, nausea, dizziness, vomiting and fatigue. Moderate concentrations may cause respiratory irritation.

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

NFPA HAZARD CODES	HMIS HAZARD CODES	RATINGS SYSTEM
Health: 0	Health: 0	0 = No Hazard
Flammability: 4	Flammability: 4	1 = Slight Hazard
Reactivity: 0	Reactivity: 0	2 = Moderate Hazard
		3 = Serious Hazard
		4 = Severe Hazard

PRODUCT NAME: ACETYLENE

4. First Aid Measures

EYES:
None normally required. Consult a physician if direct contact with pressurized material occurs. Immediately flush with low pressure, cool water for at least 15 minutes, opening eyelids to ensure flushing. Get medical attention.

SKIN:
Wash affected areas with soap and warm water. If irritation develops, seek medical attention.

INGESTION:
None normally required.

INHALATION:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. If breathing has stopped administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive. Keep victim warm and quiet.

5. Fire Fighting Measures

Conditions of Flammability: Flammable		
Flash point: Not Available	Method: Not Applicable	Autoignition: Temperature: 565°F (296°C)
LEL(%): 2.2	UEL(%): 80 to 85*	
Hazardous combustion products: Carbon Monoxide, Carbon Dioxide		
Sensitivity to mechanical shock: Not Available		
Sensitivity to static discharge: Not Available		

FIRE AND EXPLOSION HAZARDS:
*Pure acetylene can ignite by decomposition above 15 psig therefore, the UEL is 100% if the ignition source is of sufficient intensity.

GASEOUS ACETYLENE IS SPONTANEOUSLY COMBUSTIBLE IN AIR AT PRESSURE ABOVE 15 PSI (207 kPa.). It requires a very low ignition energy so that fires which have been extinguished without stopping the flow of gas can easily reignite with possible explosive force. Acetylene has a density very similar to that of air so when leaking it does not readily dissipate. Gas may travel to a source of ignition and flash back.

Fires involving acetylene occur occasionally at fusible metal pressure relief plugs at the tops and bottoms of cylinders, commonly due to hot metal or slag being dropped on the fusible plugs. When the fusible plug releases a large volume of acetylene will rush out, creating a "roaring" sound. The flame may extend a foot or two away from the cylinder until the pressure is reduced. In some cases, the other end of the cylinder may develop a coating of frost.

EXTINGUISHING MEDIA:
Carbon dioxide, dry chemical.

PRODUCT NAME: ACETYLENE

FIRE FIGHTING INSTRUCTIONS:
WARNING: ALWAYS EXTINGUISH A FIRE BEFORE CLOSING THE CYLINDER VALVE. If the flame is small from the fusible plug or valve stem, try to put it out. Wear SCBA and fully protective clothing for fire fighting. If the fire is allowed to keep burning it is likely that the fusible plug will melt and result in a large release of acetylene. A glove or heavy cloth or any wet material slapped on the flame will frequently extinguish it.

If the flame is large, burning from a fusible plug, DO NOT try to put it out unless the cylinder is outdoors or in a very well ventilated area free from sources of ignition. Usually it is very difficult to extinguish large fires because the escaping acetylene may be reignited by adjacent ignition sources, thereby possibly creating a confined space explosion. Keep containers cool with water spray.

6. Accidental Release Measures

Evacuate all personnel from affected area. Isolate the area for over 1/2 mile in all directions in the event of leakage of a tank, rail car or tank truck. Use appropriate protective equipment.

If possible to do safely, shut off ignition sources and stop the leak by closing the valve. For small leaks, cylinders may be moved to an area outdoors and away from any source of ignition. Circumstances which, it is advisable to attempt removal of the cylinder are when cylinders are in close proximity to other compressed gases, when highly flammable materials or hazardous materials are in the vicinity of the acetylene cylinder(s), or where protection of the building is unusually difficult and freezing of a fire may produce a major loss of life or property. When the cylinder is removed, it may be hosed down with water to keep it cool. Open valve slowly to let the acetylene escape. Tag the cylinder with "WARNING - Leaking Flammable Gas". Close valve when empty.

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

7. Handling and Storage

Electrical Classification:
Class I, Group A.

Acetylene is shipped in a cylinder packed with a porous mass material, and a liquid solvent, commonly acetone. Acetylene is dissolved in the acetone solution and dispersed throughout the porous medium. When the valve of a charged acetylene cylinder is opened, the acetylene comes out of solution and passes out in the gaseous form.

IT IS CRUCIAL THAT FUSE PLUGS IN THE TOPS AND BOTTOMS OF ALL ACETYLENE CYLINDERS BE THOROUGHLY INSPECTED WHENEVER HANDLED. REMOVE AND QUARANTINE IN A SAFE LOCATION ANY DEFECTIVE CYLINDER.

Post "NO SMOKING OR OPEN FLAMES" signs in the storage area or use area. There should be no sources of ignition in the storage or use area.

Crane Operator Lincense

EXEMPTION 1

Mobile Crane Safety Inspection Report

AmQuip
THE CRANE PEOPLE

OSHA CRANE SAFETY INSPECTION REPORT

Meets Requirements of OSHA 1926.1400 and ANSI B30.5 Standards

Inspection Date: 5/10/13 Inspection Type: [X] Annual

Equipment #: 110-09 Capacity: 100 Ton Manufacturer: Tadano

Model #: ATF 90G-4 Serial #: 2045245

	SAT	UNSAT	N/A		SAT	UNSAT	N/A		SAT	UNSAT	N/A
EQUIPMENT DOCUMENTATION				**Hydraulic System**				**Control Mechanisms**			
Current Certification Posting	X			Cartier	X			Control mechanisms	X		
Operator Instructions	X			Upper Works	X			Control & drive mechanisms	X		
Maintenance Records	X			Hoist System	X			Hydraulic system fluid level	X		
Hand Signal Charts	X			**Hydraulic Hoses/Lines**				Hooks & latches	X		
Proper Load Charts	X			Cartier	X			Electrical/electronic apparatus; function/wear	X		
SAFETY DEVICES & OPERATIONAL AIDS				Upper Works	X			Tires: inflation and condition	X		
Crane level indicator	X			Hoist System	X			Equipment Structure			
Boom Stops			X	**Hydraulic Reservoir**				- Bolts, rivets & other fasteners	X		
Jib Stops			X	Cartier	X			- Structural members	X		
Foot pedal brake locks			X	Upper Works	X			- Welds for cracks	X		
Hydraulic outrigger & stabilizer jacks' holding device/check valve	X			Hoist System	X			Sheaves & drums	X		
Fire Extinguisher	X			**Operational Components**				Pins, bearings, shafts, gears, rollers, & locking devices	X		
Hi-Rail: rails, clamps and stops			X	Cartier	X			Brake system: parts, linings, pawls, & ratchets	X		
Horn/back up alarm	X			Upper Works	X			Clutch system: parts, linings, pawls, & ratchets			X
Levels	X			Hoist System	X			Chains & chain drive sprockets			X
OPERATIONAL AIDS				**Engine**				Travel steering			X
Category I				Condition	X			Travel Brakes			X
- Boom Hoist limiting device			X	Operation	X			Travel locking devices			X
- Luffing jib limiting device			X	Fluid levels:				Outrigger or stabilizer pads/foots	X		
- Anti two-blocking device	X			- Engine oil	X			Slider pads	X		
Category II				- Coolant	X			Electrical components & wiring	X		
- Boom angle or radius indicator	X			Coolant system	X			Warning labels & decals	X		
- Jib angle indicator	X			Gauges	X			Steps/ladders	X		
- Boom Length indicator	X			Belts/hoses/lines	X			Guards/handrails	X		
- Load weighing & similar devices	X			Leaks	X			Chassis Steering	X		
- Outrigger/stabilizer position sensor/monitor	X			Exhaust system	X			Chassis Brakes/clutches	X		
- Hoist drum rotation indicator	X			**Hydraulic Pump**				Drive train	X		
Cab				Condition	X			Suspension	X		
Windows/glass	X			Operation	X			Lights	X		
Wiper motor	X			Fluid levels:				Inner/Outer bell			X
Wipers	X			- Engine oil	X			Gantry/A-frame			X
Operator seat	X			- Coolant	X			Main Cord	X		
Housekeeping	X			Coolant system	X			Lacings	X		
Controls: proper markings	X			Gauges	X			FUNCTIONAL TEST	X		
Pedals	X			Belts/hoses/lines	X						
				Leaks	X						
				Exhaust system	X						

WIRE ROPE INSPECTION	SAT	UNSAT	N/A	WIRE ROPE INSPECTION	SAT	UNSAT	N/A	WIRE ROPE INSPECTION	SAT	UNSAT	N/A
Main Hoist	X			Main Hoist	X			Main Hoist	X		
Auxiliary Hoist	X			Auxiliary Hoist	X			Auxiliary Hoist	X		
3rd Drum			X	3rd Drum			X	3rd Drum			X
Boom Hoist			X	Boom Hoist			X	Boom Hoist			X

Application	Size / Construction		Length	Condition	Dead Ends	Sheaves	Train	Latch
Main Hoist	18mm	Carver	755'	OK	OK	OK	OK	OK
Aux. Hoist	18mm	Carver	755'	OK	OK	OK		
3rd Drum								
Boom Hoist								
Pendants								
Jib Stays								

Mechanic/Inspector's Signature

M. Cornely
Mechanic/Inspector Print Name

4.5.4-SVC001 Rev02 (1110)

AmQuip
THE CRANE PEOPLE

OSHA CRANE SAFETY INSPECTION REPORT

Meets Requirements of OSHA 1926.1400 and ANSI B30.5 Standards

Inspection Date: 7.21.13 Inspection Type: ☑ Annual

Equipment #: 155-04 Capacity: 550 Ton Manufacturer: MANITOWOC

Model #: 7550 Serial #: 8170

	SAT	UNSAT	N/A
Signals, Operator Warnings			
Current Certification Posting	X		
Operator Instructions	X		
Maintenance Records	X		
Hand Signal Charts	X		
Proper Load Charts	X		
Safety Devices, Displays			
Crane level indicator	X		
Boom Stops	X		
Jib Stops	X		
Foot pedal brake locks			X
Hydraulic outrigger & stabilizer jacks' holding device/check valve	X		
Fire Extinguisher	X		
Hi-Rail: rails, clamps and stops			X
Horn/back up alarm	X		
Levels	X		
Boom/Jib Anti-Two Block Devices			
Category I			
- Boom Hoist limiting device			X
- Luffing jib limiting device	X		
- Anti two-blocking device	X		
Category II			
- Boom angle or radius indicator	X		
- Jib angle indicator	X		
- Boom Length indicator	X		
- Load weighing & similar devices	X		
- Outrigger/stabilizer position sensor/monitor	X		
- Hoist drum rotation indicator	X		
Cab			
Windows/glass	X		
Wiper motor	X		
Wipers	X		
Operator seat	X		
Housekeeping	X		
Controls: proper markings	X		
Pedals		X	

	SAT	UNSAT	N/A
Hydraulic/pneumatic connections, hoses			
Hydraulic Cylinders			
Carrier	X		
Upper Works	X		
Hoist System	X		
Hydraulic/pneumatic pumps & motors			
Carrier	X		
Upper Works	X		
Hoist System	X		
Hydraulic/pneumatic valves			
Carrier	X		
Upper Works	X		
Hoist System	X		
Hydraulic/pneumatic lines			
Condition	X		
Operation	X		
Fluid levels:			
- Engine oil	X		
- Coolant	X		
Coolant system	X		
Gauges	X		
Belts/hoses/lines	X		
Leaks	X		
Exhaust system	X		
Fuel Tank/Lines			
Condition	X		
Operation	X		
Fluid levels:			
- Engine oil	X		
- Coolant	X		
Coolant system	X		
Gauges	X		
Belts/hoses/lines	X		
Leaks	X		
Exhaust system	X		

	SAT	UNSAT	N/A
Mechanical Lines			
Control mechanisms	X		
Control & drive mechanisms	X		
Hydraulic system fluid level	X		
Hooks & latches	X		
Electrical/electronic apparatus: function/wear	X		
Tires: inflation and condition	X		
Equipment Structure			
- Bolts, rivets & other fasteners	X		
- Structural members	X		
- Welds for cracks	X		
Sheaves & drums	X		
Pins, bearings, shafts, gears, rollers, & locking devices	X		
Brake system: parts, linings, pawls, & ratchets	X		
Clutch system: parts, linings, pawls, & ratchets			X
Chains & chain drive sprockets			X
Travel steering	X		
Travel Brakes	X		
Travel locking devices	X		
Outrigger or stabilizer pads/floats	X		
Slider pads	X		
Electrical components & wiring	X		
Warning labels & decals	X		
Steps/ladders	X		
Guards/Handrails	X		
Chassis Steering	X		
Chassis Brakes/clutches	X		
Drive train	X		
Suspension	X		
Lights	X		
Inner/Outer ball	X		
Gantry/A-frame			X
Main Cord	X		
Lacings	X		
FUNCTIONAL TEST	X		

	SAT	UNSAT	N/A
Wire Rope Condition			
Main Hoist	X		
Auxiliary Hoist	X		
3rd Drum			
Boom Hoist			

	SAT	UNSAT	N/A
Wire Rope Condition			
Main Hoist	X		
Auxiliary Hoist	X		
3rd Drum			
Boom Hoist			

	SAT	UNSAT	N/A
Wire Rope Condition			
Main Hoist	X		
Auxiliary Hoist	X		
3rd Drum			
Boom Hoist			

Application	Size / Construction	Length	Condition	Dead Ends	Sheaves	Tram	Latch
Main Hoist	24mm CARBON	1,509	NEW	OK	OK		OK
Aux. Hoist	24mm CARBON	3,263	NEW	O.K.	O.K.		O.K.
3rd Drum							
Boom Hoist							
Pendants							
Jib Stays							

Mark Orlowski
Mechanic/Inspector's Signature

MARK ORLOWSKI
Mechanic/Inspector Print Name

Tower Crane Equipment Owner ID Form

Competent Person Letter

CD 11

NYC BUILDINGS

Equipment Owner Identification Form

Application Must Be Typewritten

1. Equipment Description

Manufacturer:	FMC CORP	Model:	TG 1900			Serial No.:	76H3-107C			Year:	1983
Climber Tower & Mobile Cranes :		Max. Tower:	107	ft	Max. Boom:	150	ft	Max. Jib:		ft	
	Max. Combined Length:	Tower:		ft	Boom:		ft	Jib:	ft	Total:	ft
Derricks.		Mast:		ft	Boom:		ft	Sill:	ft	Leg:	ft
Workplatform:	Single Mast:	Mast:		ft	Width:		ft				
	Double Mast:	Mast:		ft	Width:		ft				

4. Owner Statement

Last Name:	WEISS	First Name:	LAWRENCE	M.I.:	
Title:	PRESIDENT	Telephone:	718-784-1776	Fax:	
Business Name:	CRANES INC.				
Address:	53-20 44' ST				
City:	MASPETH	State:	NY	ZIP:	11378

- *This is to certify that I, the undersigned, am the owner or an officer of the company that owns equipment.*
- I am aware that in order to use this machine in New York City, it must first be issued a Temporary Certificate of Approval and Operation (TCAO) which requires the equipment passing an annual inspection conducted by the Hoist and Rigging section of the Cranes and Derricks Division.
- *In addition, I am aware that the equipment must demonstrate compliance with all applicable safety device requirements, pertaining department rules and regulations, and relevant sections of the New York City Building Code.*
- In the absence of complete compliance, my application may be denied and the Temporary Certificate of Approval and Operation revoked.

Signature Lawrence Weiss Pres. **Date** 8/22/13

Kenvil United Corp

PO Box 32

Wharton, NJ 07885

August 14, 2013

Weir Welding Co. Inc.

316 12th Ave

Carlstadt, NJ 07072

Attn: Mike Diffley

Re: Waterfront Corporate Center

Hoboken, NJ

Competent Persons

Mike

Please find the attached Competent Person Letters for Kenvil United Corp employee's Dave Cullen and Dean Hartman. We are confident that their leadership will make this a successful and safe project for all involved. Please contact me should you have questions. Thank you.

Very truly yours,

Gerald Fahy

President

KENVIL UNITED CORPORATION
PO BOX 32
WHARTON, NJ 07885
PHONE: 973-927-0010
FAX: 973-927-4370

Dean Hartman is the Competent Person for Kenvil United Corporation (KU) on the Waterfront Hoboken Job and will be on site when KU is performing work. Dean Hartman is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and has the authority to take prompt corrective measures to eliminate them. By way of training and experience, Dean Hartman is knowledgeable of applicable standards relating to KU's specific operations in crane procedures and steel construction.

Experience and training
Qualified Rigger certified
OSHA 30, Subpart R Certified
OSHA Construction Safety Certified
Crane signaling certified
28 years crane and steel construction

X

Gerald Fahy
President 8-14-13

TG 1900 TOWER CRANE
ERECTION/DISMANTLE PLANS

GENERAL NOTES FOR MOBILE CRANE INSTALLATIONS

A. Codes, Regulations and Permits

B. Crane Operations

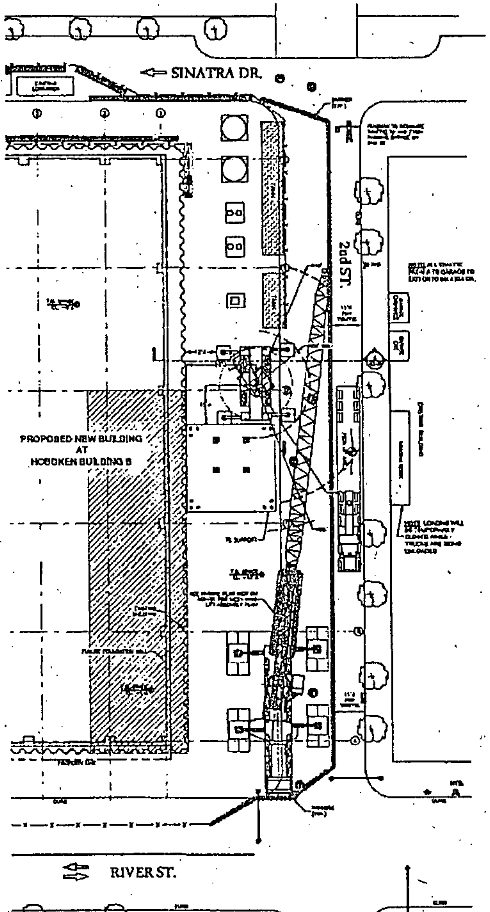
C. Crane Foundation & Support

D. Site Conditions

E. Responsibilities

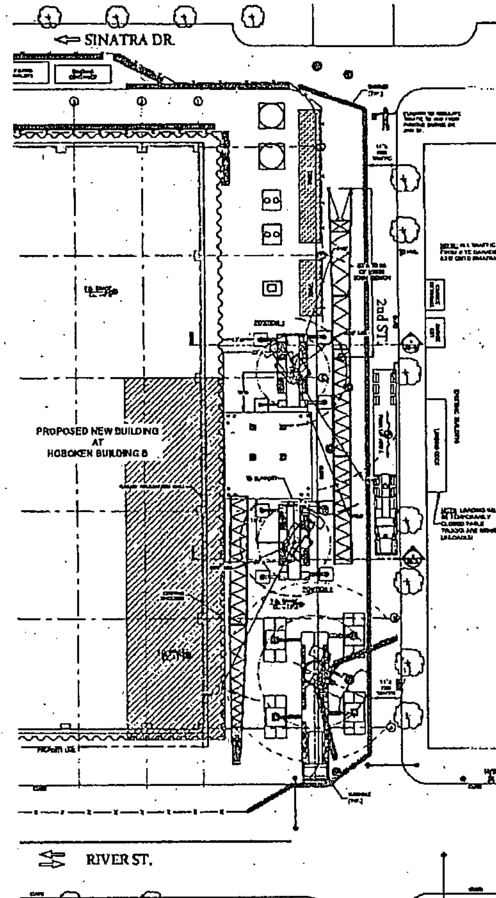
F. Wind and Parking

G. Load Handling



PLAN VIEW
SCALE 1" = 20'-0"

ASSEMBLE GMK7550 LUFFING JIB



PLAN VIEW
SCALE 1" = 20'-0"

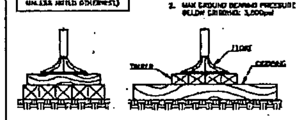
ASSEMBLE TG-1900 BOOM

CRIBBING NOTES:

(USE ONE OF THE FOLLOWING UNDER EACH OUTRIGGER, UNLESS NOTED OTHERWISE)

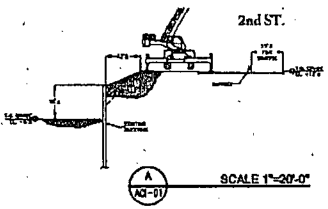
LOADING:

1. MAX OUTRIGGER REACTION: 70kips
2. MAX GROUND BEARING PRESSURE BELOW CRIBBING: 3,000psf

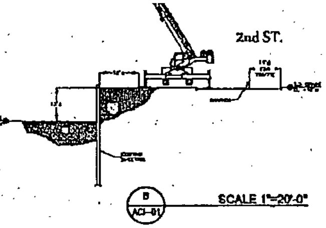


OPTION 1: (8) 10"x10"x8'-0" LONG TIMBERS w/ (4) 8"x8"x3'-3" LONG TIMBERS ON TOP OR EQUIVALENT (SHOWN ABOVE)

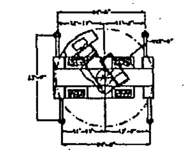
OPTION 2: 8'x8'x1" MIN. TH. STEEL PLATE w/ (4) 4"x8"x8'-0" LONG TIMBERS ON TOP OR EQUIVALENT



A / ACI-01 SCALE 1"=20'-0"



B / ACI-01 SCALE 1"=20'-0"



RT175 N.T.S.
DIMENSIONS

TEREX RT175: 15,200LBS CTWT, FULLY EXTENDED OUTRIGGERS

REQ. #	LOAD DESCRIPTION *	LOAD NET WEIGHT (lbs)	BLOCK & RIGGING (lbs)	LIFTED LOAD (lbs)	CRANE CAPACITY			% OF CAPACITY
					CONFIGURATION	MAX RADIUS (ft)	CAPACITY (lbs)	
-	101.7 JIB (GMK7550) SECTION	16,215	1,000	18,215	89' BOOM	[illegible]	17,800	[illegible]
-	TG-1900 BOOM [illegible] SECTION	6,620	1,000	7,620	89' BOOM	[illegible]	17,800	[illegible]
-	TG-1900 NEXT BOOM SECTION	4,800	1,000	6,000	89' BOOM	[illegible]	15,170	[illegible]

LINE PULL FOR RT175 IS [illegible] MAX. Refer to manufacturer data for additional information. Use multiple parts as required.

* LOAD DESCRIPTION IS AN EXAMPLE, CONTRACTOR MAY LIFT MISCELLANEOUS WITH SIMILAR WEIGHTS TO SAME RADII

ASSIST CRANE:

TEREX RT175
35' BOOM
FULLY EXTENDED OUTRIGGERS (23'-7")
15,200LBS CTWT

MAIN CRANE:

GROVE GMK7550
WITH MEGA WING LIFT, 101.7' LUFFING JIB, AND 264,500LBS CTWT

TOWER CRANE:

FMC TG-1900
WITH 240' BOOM

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.

SUBJECT: CRANE INSTALLATION (RT175) FOR GMK7550 AND TOWER CRANE ASSISTING

ADDRESS: SOUTH WATERFRONT DEVELOPMENT, NJ AKA HOBOKEN BLDG. B

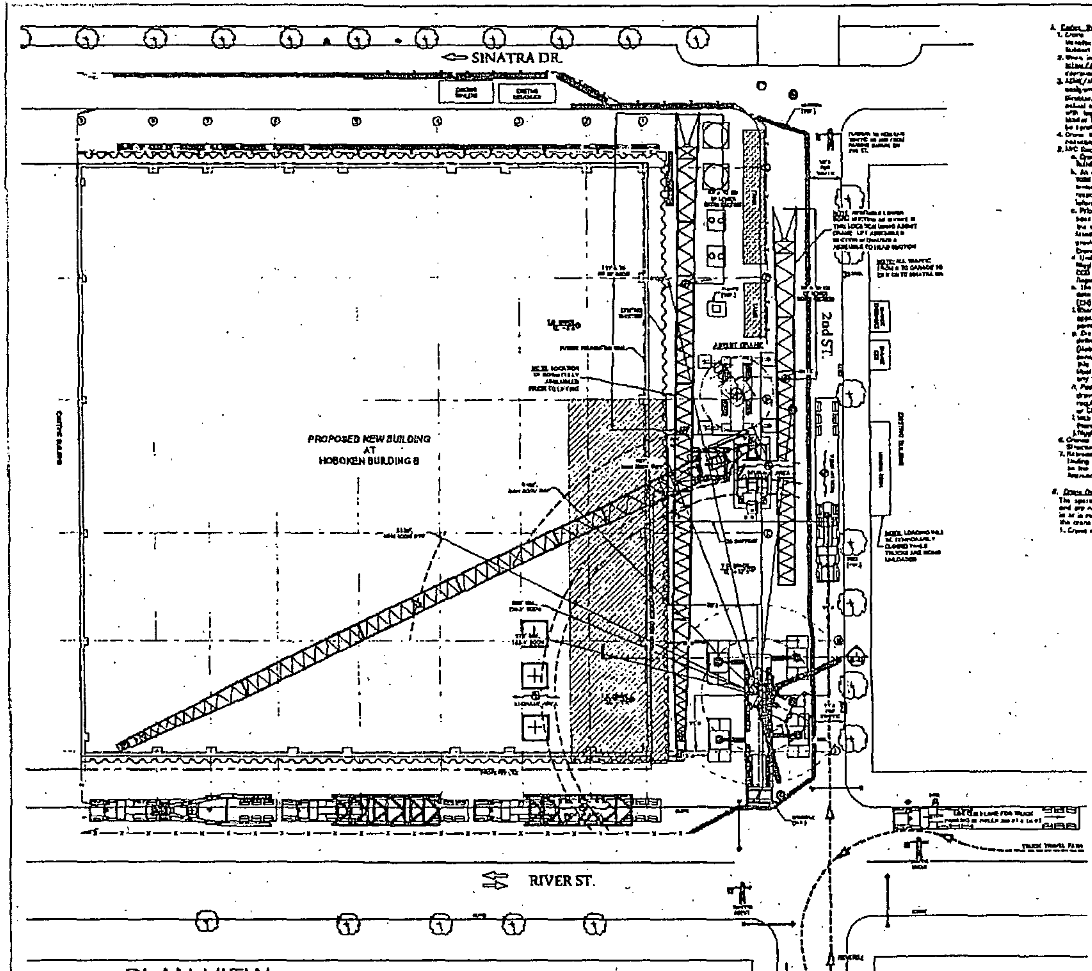
CLIENT: WEIR WELDING COMPANY INC.

No.	DATE	REVISIONS	BY
1	[illegible]	AS PER CLIENT	[illegible]

CHECKED BY: DATE: / /

DATE: [illegible]
SCALE: AS NOTED
PAGE 1 OF 1

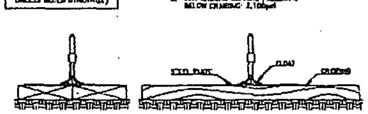
ACI-01.01



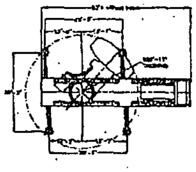
PLAN VIEW SCALE 1" = 20'-0"

CRIBBING NOTES:
(USE ONE OF THE FOLLOWING UNDER EACH OUTRIGGER UNLESS NOTED OTHERWISE)

LOADING
1. MAX OUTRIGGER REACTION: [illegible] kips
2. MAX GROUND BEARING PRESSURE BELOW CRIBBING: 2,100psf



(2) 4'x16' LONG TIMBER MATS (SIDE BY SIDE) w/ 7'x7'x1.75" MIN. TH. STEEL PLATE ON TOP OR EQUIVALENT



GMK7550 N.T.S.
DIMENSIONS

GENERAL NOTES FOR MOBILE CRANE INSTALLATIONS

A. Codes, Regulations and Permits
1. Crane operations are to be conducted in accordance with Manufacturer's requirements, ANSI/ASME B30.5-2011 and OSHA 1926 Subpart CC.
2. When in a potential flight zone, notify the FAA [illegible]
3. ASME/ANSI B30.5-2.1 and OSHA shall be applied with respect to the assignment of duties of Crane Owner, Crane User, Operator, Lift Director, Site Supervisor and Assembly/Disassembly Director. [illegible]
4. Crane Owner is responsible for any transit permits and approvals necessary to bring the crane to the site.
5. NYC Requirements: [illegible]
6. Cranes placed within 200ft of a NYC TA Underground Subway Structures requires MTA approval.
7. Railroad entities other than NYC TA Underground Subway [illegible]

B. Crane Operations
The operational notes herein are offered for information and guidance and are not to be taken to infer that the Engineer is in any way involved or is responsible for the actual placement, installation or operation of the crane in the field.
1. Crane shall be mounted on firm level support. [illegible]
2. The Assembly/Disassembly Director and the Crane Operator are responsible for [illegible]
3. Crane shall be operated by a qualified operator, with appropriate license/certification.
4. When multiple cranes work on the same site, operations must be properly coordinated to avoid conflicts.
5. Boom/jib elevation views shown on drawings may be schematic, [illegible]
6. Do not swing loads over: [illegible]

C. Crane Foundation & Support
1. Materials used for cribbing shall be in sound condition, [illegible]
2. Some variation of cribbing may be permitted based on site conditions and availability of material. [illegible]
3. Do not place crane support directly over manholes or vaults except as directed by the Engineer.
4. Cranes shall be level in accordance with Manufacturer instructions. [illegible]

D. Site Conditions
1. Dimensions, site conditions and equipment availability, as depicted on these drawings, must be verified by the Crane User [illegible]
2. When traffic and pedestrian barriers are required, the crane user shall determine the needs of the site and furnish barricades accordingly. [illegible]
3. All dimensions indicated with ± on these drawings have a [illegible] tolerance, whichever is greater, unless otherwise noted.

E. Responsibilities
1. The condition of the crane and its fitness for use are the responsibility of the Crane Owner.
2. The Crane Operator is responsible for the operation of the crane in accordance with the load charts, Manufacturer instructions and applicable codes and standards.
3. For specific guidance concerning responsibilities for inspection, maintenance and operation of the crane, refer to OSHA 1926 Subpart CC, ASME B30.5 and, in NYC, NYC Building Code 3319-2.
4. In NYC, the Engineer's responsibility for inspection is limited to the crane support and foundation [illegible]
5. As conditions of support may change, the Operator and Lift Director are responsible for monitoring these conditions [illegible]

F. Wind and Parking
1. Do not operate crane in winds exceeding Manufacturer's limitations and, in NYC, 30 mph.
2. When lifting loads with large surface areas, further limitations for wind may be necessary [illegible]
3. When not attended by an Operator the crane, the crane shall be parked in accordance with Manufacturer's requirements. [illegible]
4. Appropriate parties, including public authorities, shall be contacted as needed [illegible]

G. Load Handling
1. Prior to lifting any loads, the Crane Operator, in communication with the Lift Director shall determine the lifted load weight [illegible]
2. Crane shall load and unload trucks only in designated area as shown on this drawing.
3. Loads shall be picked plumb. Do not use the crane for side pulling, dragging or for freeing up a load that is bound.
4. Do not lift a load that cannot be maintained under control while swing, [illegible]
5. The crane support arrangement on this drawing was determined using the load/radius/configuration combinations shown herein, [illegible]
   a. Do not lift heavier loads than shown on this drawing without written clearance from the Engineer.
   b. Do not extend maximum radii shown on this drawing without written clearance from the Engineer.
6. [illegible]
7. Rigging
   a. Lift Director is responsible for verifying suitability and condition of rigging used.
   b. Rigging shown on this drawing is schematic only, unless it is clearly specified.
   c. In NYC, Master Rigger may modify rigging as required.

GMK7550 264,500LBS CTWT, FULLY EXTENDED OUTRIGGERS, & MEGA WING LIFT

SEQ. #	LOAD DESCRIPTION *	LOAD NET WEIGHT (lbs)	BLOCK & RIGGING (lbs)	LIFTED LOAD (lbs)	CRANE CAPACITY			% OF CAPACITY
					CONFIGURATION	MAX RADIUS (ft)	CAPACITY (lbs)	
1	40' TO-EXO TOWER SECTION	47,630	4,000	51,630	163.4' B (QR[illegible]) + 101.7' JIB	87	73,000	69%
2	13'-7.5" + TRANSITION TOWER SECTION	30,000	4,000	34,000	163.4' B (QR[illegible]) + 101.7' JIB	87	73,000	47%
3	40' TOWER SECTION	30,606	4,000	34,606	163.4' B (QR[illegible]) + 101.7' JIB	87	73,000	47%
4A	TURNTABLE BEARING MOUNT (PORALLO BASE)	16,800	4,000	20,800	163.4' B (QR[illegible]) + 101.7' JIB	87	73,000	29%
4B	MACHINERY DECK PACKAGE **	41,300	4,000	45,300	163.4' B (QR[illegible]) + 101.7' JIB	87	73,000	37%
4C	UPPER (MACHINERY DECK + TURNTABLE)	27,860	4,000	31,860	163.4' B (QR[illegible]) + 101.7' JIB	87	73,000	79%
5	WINCH PACK ***	46,000	4,000	50,000	163.4' B (QR[illegible]) + 101.7' JIB	87	73,000	62%
6	ENGINE POWER PACK	11,840	4,000	15,840	163.4' B (QR[illegible]) + 101.7' JIB	87	73,000	20%
7	FIXED CTWT	23,700	4,000	27,700	163.4' B (QR[illegible]) + 101.7' JIB	87	73,000	30%
8	MOVING CTWT (x3)	33,600	4,000	37,600	163.4' B (QR[illegible]) + 101.7' JIB	87	73,000	30%
9	A-FRAME	24,140	4,000	28,140	179.2' B (QR[illegible]) + 101.7' JIB	87	65,000	41%
10	LOWER BOOM SECTION	17,130	4,000	21,130	179.2' B (QR[illegible]) + 101.7' JIB	123	39,000	54%
11	240' BOOM	34,320	4,000	38,320	179.2' B (QR[illegible]) + 101.7' JIB	130	47,000	82%

LINE PULL FOR GMK7550 IS 24,725lbs 4/L. Refer to Manufacturer data for additional information. Use multiple parts as required.
* LOAD DESCRIPTION IS AN EXAMPLE. CONTRACTOR MAY LIFT MISCELLANEOUS WITH SIMILAR WEIGHTS TO SAME RADII
** MACHINERY DECK PACKAGE IS COMPOSED OF CRANE DECK, OPERATOR'S CAB, SWING DRIVES, CATWALKS, CTWT TROLLEY, AND SHEET METAL HOUSING
*** WINCH PACK CONSISTS OF MAIN HOIST WINCH AND BOOM HOIST WINCH

No.	DATE	REVISIONS	BY
1	[illegible]	AS PER CLIENT	[illegible]

CHECKED BY: DATE: / /

MAIN CRANE:
GROVE GMK7550
163.4' BOOM (88-88-88-44) OR
179.2' BOOM (88-88-88-88)
WITH 101.7' LUFFING JIB
& MEGA WING LIFT
FULLY EXTENDED OUTRIGGERS (29'-2")
264,500LBS CTWT

TOWER CRANE:
FMC TG-1900
WITH 180' BOOM

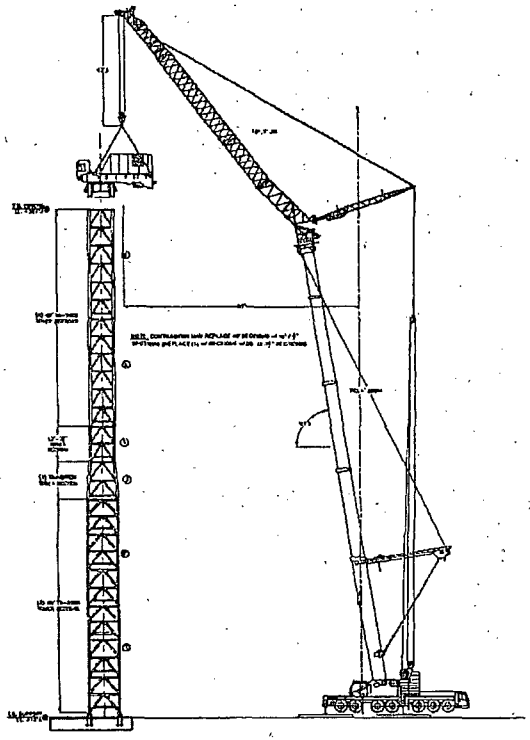
HOWARD I. SHAPIRO
& ASSOCIATES
CONSULTING ENGINEERS, P.C.
101 MERRICK ROAD, SUITE 400, LYNBROOK, N.Y. 11563

SUBJECT:	CRANE INSTALLATION (GMK7550) FOR TOWER CRANE ERECTION
ADDRESS:	SOUTH WATERFRONT DEVELOPMENT, NJ AKA HOBOKEN BLDG. B
CLIENT:	WEIR WELDING COMPANY INC.

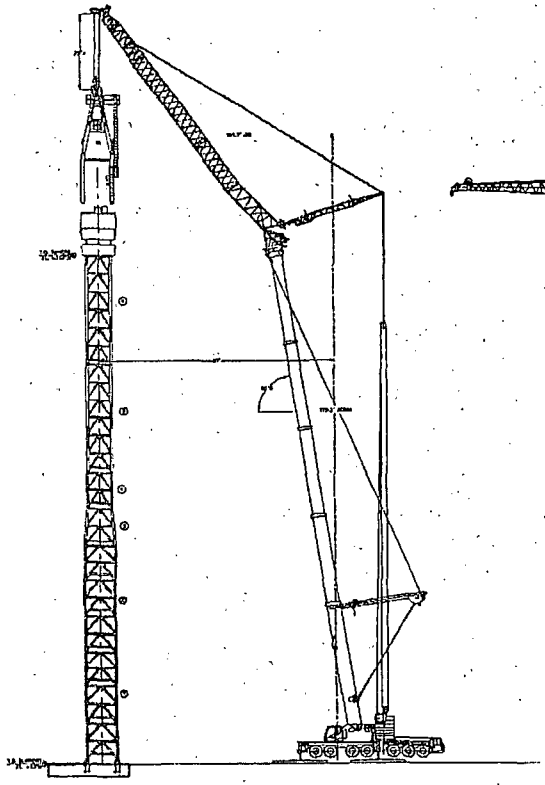
[illegible]

DATE: [illegible]
SCALE: AS NOTED
DRAWN: [illegible]
ENGINEER: [illegible]
FILE: [illegible]
PAGE 1 OF 1

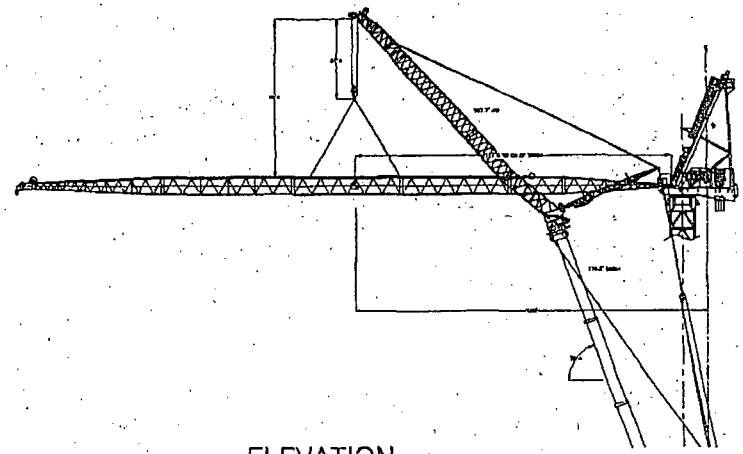
GMK7550 FOR TC ERECTION
CI-01.01



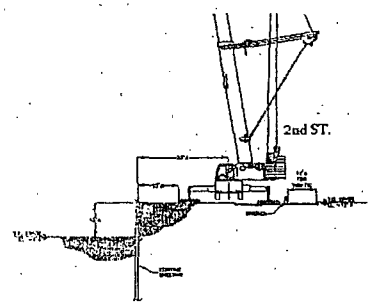
ELEVATION SCALE 1" = 20'-0"
TC UPPER ERECTION



ELEVATION SCALE 1" = 20'-0"
A-FRAME ERECTION



ELEVATION SCALE 1" = 20'-0"
240' BOOM ERECTION



A
CI-02
SCALE 1"=20'-0"

NO.	DATE	REVISIONS	BY
3	8/28/13	AS BUILT	

CHECKED BY DATE / /

HOWARD I. SHAPIRO & ASSOCIATES
CONSULTING ENGINEERS, P.C.
343 MERRICK ROAD, SUITE 400, LYNBROOK, N.Y. 11563

SUBJECT :	CRANE INSTALLATION (GMK7550) FOR TOWER CRANE ERECTION
ADDRESS :	SOUTH WATERFRONT DEVELOPMENT, NJ AKA HOBOKEN BLDG. 8
CLIENT :	WEIR WELDING COMPANY INC.

DATE: 10/4/2013
SCALE: AS NOTED
DRAWN BY: MT
CHECKED: HIS / C.A.K.
JOB: 13-135-01
PAGE 3 OF 3

GMK7550 FOR TO ERECTION
CI-02.01

Kenvil United Corp - TG1900 Tower Crane Installation

Day One: Deliver and setup 100t assist crane. Deliver and unload 2 trailers of GMK7550 "jib" and counterweight(cwt).

Deliver, unload and assemble 5 loads of TG1900 Boom along 1 line as follows:

1 load with 40' heel section and outer bail 10,000# (permit load 10'3 wide)

1 load 40' boom section 5000# (legal load)

1 load with (1) 30' and (1) 20' boom sections 6000# (legal)

1 load with (1) 50' boom section 5000# (legal)

1 load 50' point section, and hook block 7600# (legal)

Total Loads in this day : 7

Day 2: Deliver GMK755 Assembly crane and 5 additional loads of counterweights. GKK7550 unloads counterweights from trailers on River and 2nd Ave and installs directly on crane. Once counterweights are in place on GMK7550, proceed to receive and install tower sections as follows:

1 load 40'long x12'x12' wide tower section (permit 12' wide)

1 load 40'long x12'x12' wide tower section (permit 12' wide)

1 load transition tower 28' long x 12' wide (permit load 12' wide)

1 load 40' long x 9'9"x9'9" tower section 31,000# (permit load 10' wide)

1 load 40' long x 9'9"x9'9" tower section 31,000# (permit load 10' wide)

1 load Turntable Base, Engine package, roof panels 28,000# (permit 12' wide - park load for am)

Total Loads in this day: 11 loads

Day 3: Unload Turntable from day before and commence assembly of crane on ground. Receive and Machinery Deck, Winch package, counterweights and A-frame as follows:

1 load Machinery deck 46,000# (permit load 13'6" wide)

1 load Winch Package 45,000# (legal load)

1 load (2) counterweights 45,000# (legal load)

Continued

1 load 2nd load (2) counterweights 45,000# (legal load)

1 load A-frame, (3) platforms, (2)ladders 24,000# (permit load 11' wide)

Total loads this day: 5

Day 4 Assemble crane, hoist to top of tower, install boom, counterweights, reeve cables

No Loads this day

Day 5 Complete assembly, test, load out 7 loads of GMK755 Assembly Crane

Total loads out this day: 7

IMPOSED LOAD LETTERS FOR TG-1900 AND ASSIST CRANES

Grove GMK 7550 Crane Installation Information & Drawings

HOWARD I. SHAPIRO & ASSOCIATES Consulting Engineers, P.C.
303 Merrick Road (Suite 400), Lynbrook, NY 11563

Howard I. Shapiro, P.E. (1932-2007) Jay P. Shapiro, P.E. Lawrence K. Shapiro, P.E. Heng Mun Loke, P.E. William Chieco James Scheid, P.E.

August 14, 2013

13156.00.01

Grove GMK7550 FOR TOWER CRANE ERECTION

CRANE INSTALLATION
AT
HOBOKEN BUILDING B

FOR

WEIR WELDING COMPANY INC.

STATE OF NEW YORK
JAYE I. SHAPIRO
060597
LICENSED PROFESSIONAL ENGINEER

8/27/13

BY

Prepared by: MM

Howard I. Shapiro & Associates
Consulting Engineers, P.C.
303 Merrick Road Suite 400 Lynbrook, NY 11563
Tel (516) 791-2600 Fax (516) 791-5425

OR1

Outrigger Pad Loads - All Terrain - Results

Enter Email > Select Model > Configure Boom > Lift Details > Results

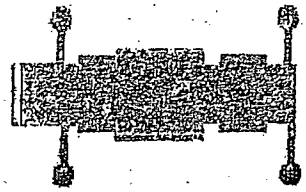
Model: Grove GMK7550 Mega Wing Lift w/ Hydraulic Luffing Jib (81 Deg.) - English
Boom Length: 179.2 ft [88-88-88-88]
Boom Extension Length: 101.7 ft
Boom Extension Offset: 0Â°
Counterweight: 264500# Cwt
Support Base: 28.7 x 29.2
Load Radius: 80 ft
Load Weight: 0 lbs

Slew Angle: 0Â° = Directly Over Rear

Max Chart 75000 Load lbs =

Front Right: 177100 lbs

Front Left: 177100 lbs



Rear Right: 83700 lbs

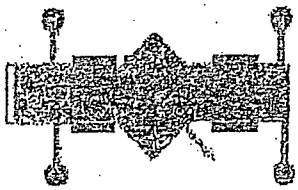
Rear Left: 83700 lbs

Slew Angle: 45Â° = Over Rear Left Outrigger

Max Chart 75000 Load lbs =

Front Right: 191800 lbs

Front Left: 135000 lbs



Rear Right: 133900 lbs

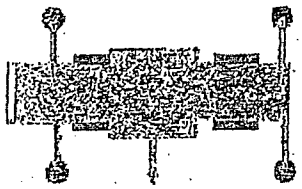
Rear Left: 60800 lbs

Slew Angle: 90Â° = Directly Over Left Side

Max Chart 75000 Load lbs =

Front Right: 170600 lbs

Front Left: 90300 lbs



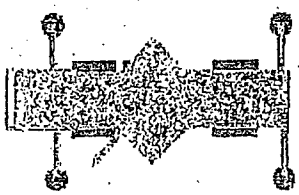
Rear Right: 182000 lbs

Rear Left: 78700 lbs

Slew Angle: 135Â° = Over Front Left Outrigger

Front Right: 125800 lbs

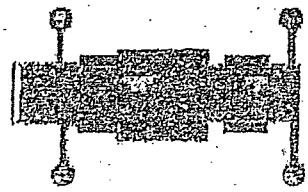
69000 lbs

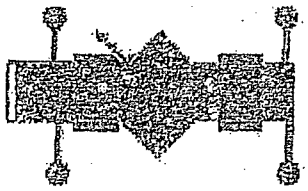


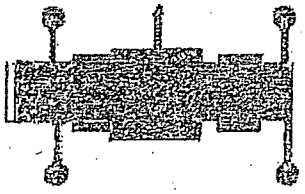
Rear Right: 199900 lbs

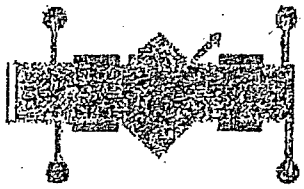
OR2

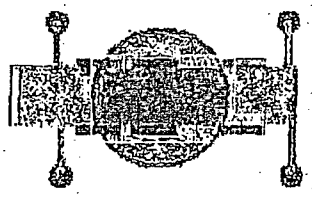
Max Chart Load = 75000 lbs	Front Left:		Rear Left: 126800 lbs

Slew Angle: 180Â° = Directly Over Front	Front Right: 83800 lbs		Rear Right: 177000 lbs
Max Chart Load = 75000 lbs	Front Left: 83800 lbs		Rear Left: 177000 lbs

Slew Angle: 225Â° = Over Front Right Outrigger	Front Right: 69000 lbs		Rear Right: 126800 lbs
Max Chart Load = 75000 lbs	Front Left: 125800 lbs		Rear Left: 199900 lbs

Slew Angle: 270Â° = Directly Over Right Side	Front Right: 90300 lbs		Rear Right: 78700 lbs
Max Chart Load = 75000 lbs	Front Left: 170600 lbs		Rear Left: 182000 lbs

Slew Angle: 315Â° = Over Rear Right Outrigger	Front Right: 135000 lbs		Rear Right: 60800 lbs
Max Chart Load = 75000 lbs	Front Left: 191800 lbs		Rear Left: 133900 lbs

Slew Angle: Maximum Outrigger Pad Loads	Front Right: 191800 lbs		Rear Right: 199900 lbs
Max Chart Load = 75000 lbs	Front Left: 191800 lbs		Rear Left: 199900 lbs

OR3

Outrigger Pad Loads - All Terrain - Results

Enter Email > Select Model > Configure Boom > Lift Details > Results

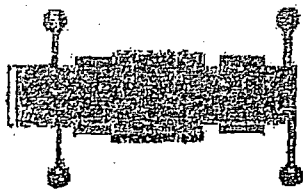
Model: Grove GMK7550 Mega Wing Lift w/ Hydraulic Luffing Jib (81 Deg.) - English
Boom Length: 163.4 ft [88-88-88-44]
Boom Extension Length: 101.7 ft
Boom Extension Offset: 0°
Counterweight: 264500# Cwt
Support Base: 28.7 x 29.2
Load Radius: 90 ft
Load Weight: 61860 lbs

Slew Angle: 0° = Directly Over Rear

Max Chart 79000 Load lbs =

Front Right: 94676 lbs

Front Left: 94676 lbs



Rear Right: 197032 lbs

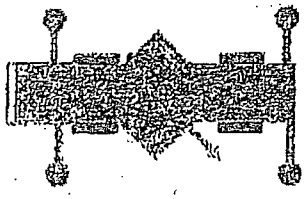
Rear Left: 197032 lbs

Slew Angle: 45° = Over Rear Left Outrigger

Max Chart 79000 Load lbs =

Front Right: 78959 lbs

Front Left: 139407 lbs



Rear Right: 143531 lbs

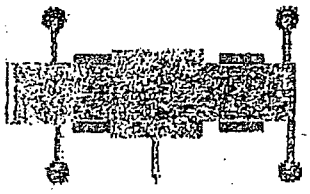
Rear Left: 221384 lbs

Slew Angle: 90° = Directly Over Left Side

Max Chart 79000 Load lbs =

Front Right: 101545 lbs

Front Left: 187053 lbs



Rear Right: 92316 lbs

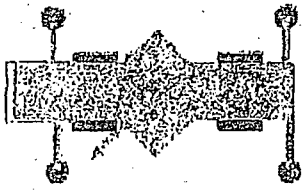
Rear Left: 202346 lbs

Slew Angle: 135° = Over Front Left Outrigger

Max Chart 79000 lbs

Front Right: 149191 lbs

Front Left: 209638 lbs

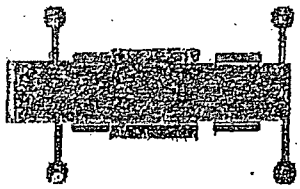
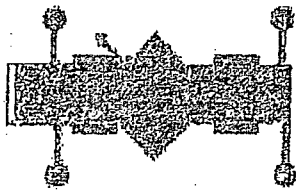
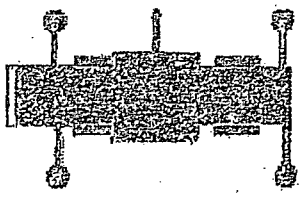
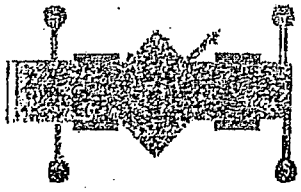
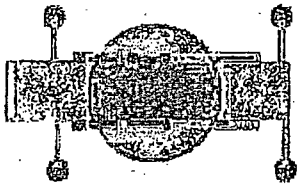


Rear Right: 73300 lbs

Rear Left: 151131 lbs

OR4

Load
=

Slew Angle: 180° = Directly Over Front	Front Right:	194000 lbs		Rear Right: 97708 lbs
Max Chart 79000 Load lbs =	Front Left:	194000 lbs		Rear Left: 97708 lbs
Slew Angle: 225° = Over Front Right Outrigger	Front Right:	209638 lbs		Rear Right: 151131 lbs
Max Chart 79000 Load lbs =	Front Left:	149191 lbs		Rear Left: 73300 lbs
Slew Angle: 270° = Directly Over Right Side	Front Right:	187053 lbs		Rear Right: 202346 lbs
Max Chart 79000 Load lbs =	Front Left:	101545 lbs		Rear Left: 92316 lbs
Slew Angle: 315° = Over Rear Right Outrigger	Front Right:	139407 lbs		Rear Right: 221384 lbs
Max Chart 79000 Load lbs =	Front Left:	78959 lbs		Rear Left: 143531 lbs
Slew Angle: Maximum Outrigger Pad Loads	Front Right:	209638 lbs		Rear Right: 221384 lbs
Max Chart 79000 Load lbs =	Front Left:	209638 lbs		Rear Left: 221384 lbs

Back Start Over

OR5

Outrigger Pad Loads - All Terrain - Results

Enter Email > Select Model > Configure Boom > Lift Details > Results

Model: Grove GMK7550 Mega Wing Lift w/ Hydraulic Luffing Jib (81 Deg.) - English

Boom Length: 179.2 ft [88-88-88-88]

Boom Extension Length: 101.7 ft

Boom Extension Offset: 0°

Counterweight: 264500# Cwt

Support Base: 28.7 x 29.2

Load Radius: 90 ft

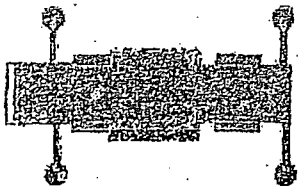
Load Weight: 43005 lbs

Slew Angle: 0° = Directly Over Rear

Max Chart Load = 68000 lbs

Front Right: 117423 lbs

Front Left: 117423 lbs



Rear Right: 164880 lbs

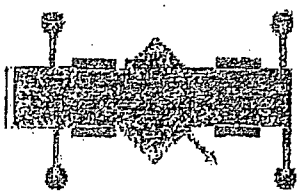
Rear Left: 164880 lbs

Slew Angle: 45° = Over Rear Left Outrigger

Max Chart Load = 68000 lbs

Front Right: 110273 lbs

Front Left: 137836 lbs



Rear Right: 140440 lbs

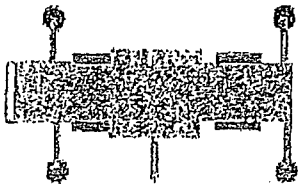
Rear Left: 175992 lbs

Slew Angle: 90° = Directly Over Left Side

Max Chart Load = 68000 lbs

Front Right: 120583 lbs

Front Left: 159606 lbs



Rear Right: 117100 lbs

Rear Left: 167289 lbs

Slew Angle: 135° = Over Front Left Outrigger

Max Chart 68000 lbs

Front Right: 142317 lbs

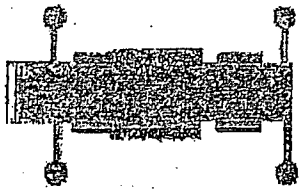
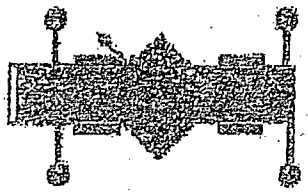
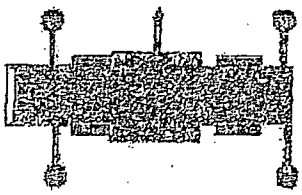
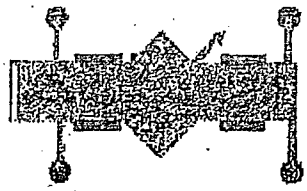
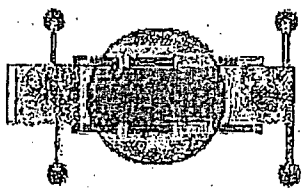
Front Left: 169879 lbs

Rear Right: 108460 lbs

Rear Left: 143912 lbs

OR_c

Load
=

Slew Angle: 180° = Directly Over Front	Front Right: 162730 lbs		Rear Right: 119536 lbs
Max Chart 68000 Load lbs =	Front Left: 162730 lbs		Rear Left: 119536 lbs
Slew Angle: 225° = Over Front Right Outrigger	Front Right: 169879 lbs		Rear Right: 143912 lbs
Max Chart 68000 Load lbs =	Front Left: 142317 lbs		Rear Left: 108460 lbs
Slew Angle: 270° = Directly Over Right Side	Front Right: 159606 lbs		Rear Right: 167289 lbs
Max Chart 68000 Load lbs =	Front Left: 120583 lbs		Rear Left: 117100 lbs
Slew Angle: 315° = Over Rear Right Outrigger	Front Right: 137836 lbs		Rear Right: 175992 lbs
Max Chart 68000 Load lbs =	Front Left: 110273 lbs		Rear Left: 140440 lbs
Slew Angle: Maximum Outrigger Pad Loads	Front Right: 169879 lbs		Rear Right: 175992 lbs
Max Chart 68000 Load lbs =	Front Left: 169879 lbs		Rear Left: 175992 lbs

Back | Start Over

OR7

Outrigger Pad Loads - All Terrain - Results

Enter Email > Select Model > Configure Boom > Lift Details > Results

Model: Grove GMK7550 Mega Wing Lift w/ Hydraulic Luffing Jib (70 Deg.) - English

Boom Length: 179.2 ft [88-88-88-88]

Boom Extension Length: 101.7 ft

Boom Extension Offset: 0°

Counterweight: 264500# Cwt

Support Base: 28.7 x 29.2

Load Radius: 130 ft

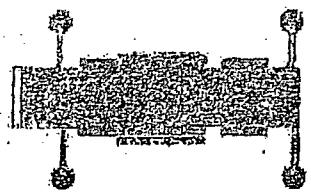
Load Weight: 38320 lbs

Slew Angle: 0° = Directly Over Rear

Max Chart Load = 47000 lbs

Front Right: 55274 lbs

Front Left: 55274 lbs



Rear Right: 224386 lbs

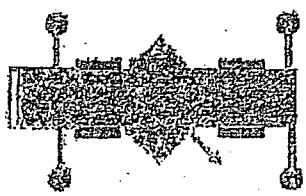
Rear Left: 224386 lbs

Slew Angle: 45° = Over Rear Left Outrigger

Max Chart Load = 47000 lbs

Front Right: 28861 lbs

Front Left: 130682 lbs



Rear Right: 134314 lbs

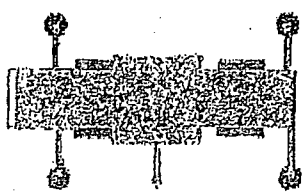
Rear Left: 265446 lbs

Slew Angle: 90° = Directly Over Left Side

Max Chart Load = 47000 lbs

Front Right: 66941 lbs

Front Left: 210863 lbs



Rear Right: 48055 lbs

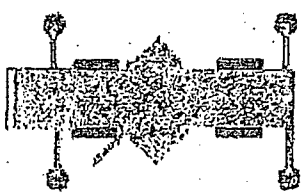
Rear Left: 233462 lbs

Slew Angle: 135° = Over Front Left Outrigger

Max Chart 47000 lbs

Front Right: 138316 lbs

Front Left: 257811 lbs

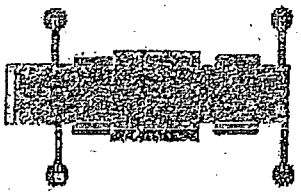
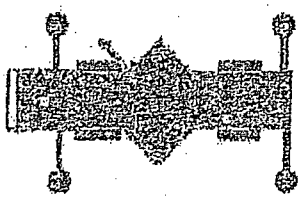
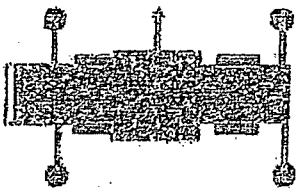
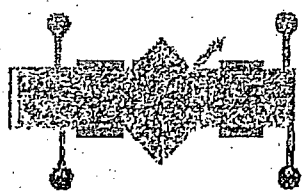
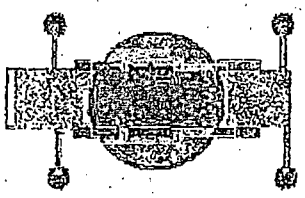


Rear Right: 24877 lbs

Rear Left: 138316 lbs

OR

Load
=

Slew Angle: 180° = Directly Over Front	Front Right: 222529 lbs		Rear Right: 57049 lbs	
Max Chart 47000 Load lbs =	Front Left: 222529 lbs		Rear Left: 57049 lbs	
Slew Angle: 225° = Over Front Right Outrigger	Front Right: 257811 lbs		Rear Right: 138316 lbs	
Max Chart 47000 Load lbs =	Front Left: 138316 lbs		Rear Left: 24877 lbs	
Slew Angle: 270° = Directly Over Right Side	Front Right: 210863 lbs		Rear Right: 233462 lbs	
Max Chart 47000 Load lbs =	Front Left: 66941 lbs		Rear Left: 48055 lbs	
Slew Angle: 315° = Over Rear Right Outrigger	Front Right: 130682 lbs		Rear Right: 265446 lbs	
Max Chart 47000 Load lbs =	Front Left: 28861 lbs		Rear Left: 134314 lbs	
Slew Angle: Maximum Outrigger Pad Loads	Front Right: 257811 lbs		Rear Right: 265446 lbs	
Max Chart 47000 Load lbs =	Front Left: 257811 lbs		Rear Left: 265446 lbs	

Max Outrigger Reaction!
Use 270 kips!

Back | Start Over

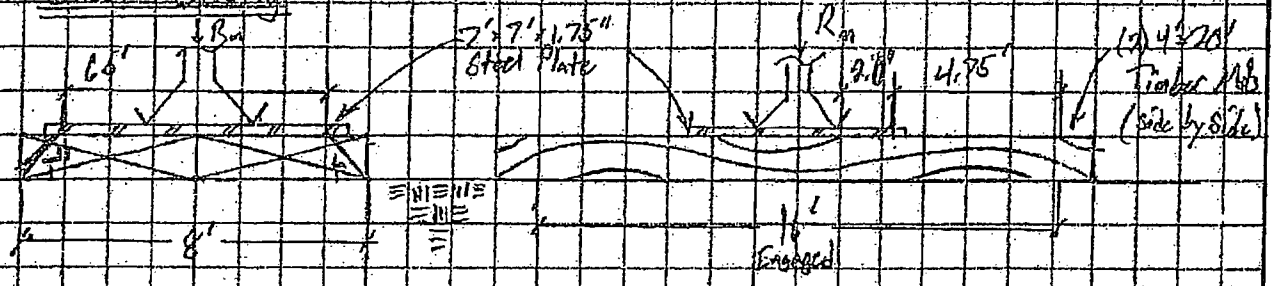
HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Suite 400
LYNBROOK, NEW YORK 11563
(516) 791-2600
staff@hisassoc.com

JOB 13156.00.01
SHEET NO. 1 OF
CALCULATED BY MM DATE 8/14/13
CHECKED BY T.C. DATE 8/27/13
SCALE

1 Max Outrigger Reaction

As per manufacturer data, $R_{max} = 270^k$!

2 Check Cribbing



Check Top Steel Plate: $W_{sp} = \frac{270^k}{6.5' \times 6.5'} = 6.4\,ksf$

$M = 6.4 \times \frac{(2.0')^2}{2} \times 12 = 154\,k\text{-}in/ft$

$S = 2(1.75")^2 = 6.125\,in^3$

$f_b = M/S = 25.1\,ksi < F_b = 27\,ksi$ OK!

Check Timber Mats $W_{ts} = \frac{270^k}{8' \times 16'} = 2.11\,ksf = 2110\,psf < 3.5\,ksf$ OK!

Bearing: $f_b = 3 \times 2110 \times \frac{(4.25')^2}{144} = 992\,psi < 1200\,psi$ OK!

Shear: $v = 1.5 \times 2110 \times \frac{(4.25' - 1')}{144} = 82.4\,psi < 100\,psi$ OK!

	Crane with 264 500 lbs (120 t) counterweight (outrigger base 28.7 x 29.2 ft)				
	Luffing jib 101.7 ft / 0° (*)				
	Main boom angle 81°				
	Main boom - fixed length in ft				
	115.9	131.7	147.6	163.4	179.2
Tel. sec. I	0.88	0.88	0.88	0.88	0.88
Tel. sec. II	0.88	0.88	0.88	0.88	0.88
Tel. sec. III	0.00	0.44	0.88	0.88	0.88
Tel. sec. IV	0.00	0.00	0.00	0.44	0.88
Slewing range	360°				
Radius in feet	Lifting capacities in 1000 lbs				
55.0	107.0				
60.0	107.0	104.0			
65.0	107.0	104.0			
70.0	107.0	104.0	101.0		
75.0	107.0	104.0	98.0	85.0	
80.0	107.0	104.0	94.0	83.0	75.0
85.0	107.0	104.0	91.0	81.0	71.0
90.0	104.0	103.0	89.0	79.0	68.0
95.0	98.0	97.0	87.0	78.0	65.0
100.0	93.0	91.0	85.0	76.0	62.0
105.0	88.0	86.0	84.0	74.0	60.0
110.0	81.0	81.0	79.0	71.0	57.0
115.0		77.0	75.0	68.0	54.0
120.0				65.0	51.0
125.0					49.0
130.0					46.0
SLI Code	4361				
Max. permitted windspeed	7 m/s				

(*)

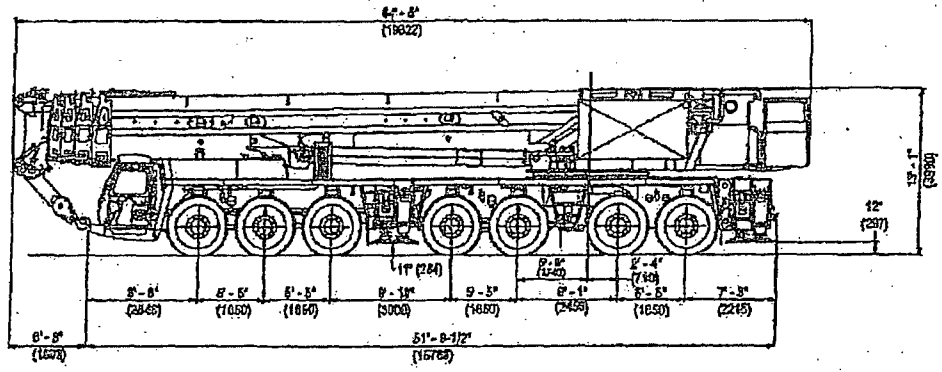
- The " length of the luffing jib " only gives the length of the part which can be derricked.
- For the determination of the entire length of the boom system, the " main boom fixed length ", the length of the fixed point part (2.90 m / 9.5 ft), as well as the length of the luffing jib have to be considered.
- The offset of the jib head section (part in front of suspension) is 0 degree.

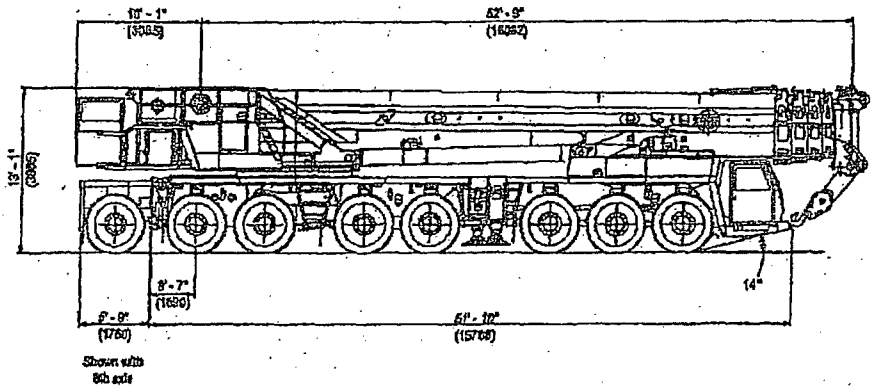
	Crane with 264 500 lbs (120 t) counterweight (outrigger base 28.7 x 29.2 ft)				
	Luffing jib 101.7 ft / 0° (*)				
	Main boom angle 70°				
	Main boom - fixed length in ft				
	115.9	131.7	147.6	163.4	179.2
Tel. sec. I	0.88	0.88	0.88	0.88	0.88
Tel. sec. II	0.88	0.88	0.88	0.88	0.88
Tel. sec. III	0.00	0.44	0.88	0.88	0.88
Tel. sec. IV	0.00	0.00	0.00	0.44	0.88
Slewing range	360°				
Radius in feet	Lifting capacities in 1000 lbs				
100.0	79.0				
105.0	74.0	72.0			
110.0	70.0	67.0			
115.0	68.0	64.0	61.0		
120.0	62.0	60.0	57.0	55.0	
125.0	59.0	57.0	54.0	52.0	49.0
130.0	56.0	54.0	52.0	50.0	47.0
135.0	53.0	51.0	49.0	47.0	46.0
140.0		49.0	47.0	45.0	43.4
145.0			44.0	42.8	41.4
150.0			42.2	40.8	39.4
155.0				38.8	37.6
160.0					36.0
SLI Code	4461				
Max. permitted windspeed	7 m/s				

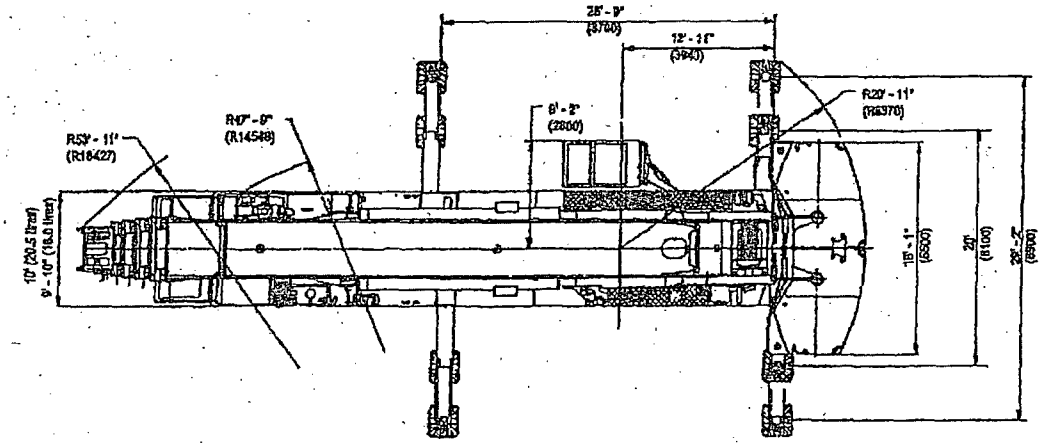
(*)

- The " length of the luffing jib " only gives the length of the part which can be derricked.
- For the determination of the entire length of the boom system, the " main boom fixed length ", the length of the fixed point part (2.90 m / 9.5 ft), as well as the length of the luffing jib have to be considered.
- The offset of the jib head section (part in front of suspension) is 0 degree.

dimensions







GMK7550

GROVE.

specifications

Superstructure

Boom

53 ft. - 197 ft. (16 m - 60 m) five section, full power boom with patented TWIN-LOCK™ boom pinning system. Maximum tip height: 207 ft. (63 m).

Boom Elevation

Two lift cylinders with safety valves provide boom angles from -3° to +82°.

Lattice Jib

Luffing jib is a lattice design with lengths of 82 ft. -240 ft. (25 m - 73 m) in sections of 20 ft. (6 m). The luffing jib converts to a fixed offset lattice jib providing lengths of 89 ft. -230 ft. (12 m - 70 m) offsettable at 3° and 25°.

Load Moment & Anti-Two Block System

Graphic display load moment and anti-two block system with audio/visual warning and control lever lockout. These systems provide electronic display of boom angle, length, radius, tip height, relative load moment, maximum permissible load, load indication and warning of impending two-block condition.

Cab

All aluminum construction cab is tiltable (approximately 20°) and includes safety glass and adjustable operator's seat with hydraulic suspension. Other features include engine dependent hot water heater, air conditioning, armrest integrated crane controls, and ergonomically arranged instrumentation. Cab hydraulically slows to the rear of the superstructure for highway travel.

Swing

3 axial piston fixed displacement motors provide swing speed of 0 - 1 RPM thru planetary gear box. Also provided is a spring applied, hydraulically released automatic swing brake with foot operated release for free swing.

Counterweight

264,500 lbs. (120 Tonnes) consisting of various sections with hydraulic installation/removal system (see counterweight configuration on page 8).

Engine

Mercedes OM906LA, diesel, 6 cylinders, water cooled, turbocharged, 255 HP (190 kW) at 1800 rpm. Max. torque: 811 ft./lbs. (1100 Nm) at 1300 rpm. Engine emission: EUROMOT/EPA/CARB (off highway).

Fuel Tank Capacity

79 gal. (300 L).

Hydraulic System

5 separate circuits, 3 axial piston variable displacement pumps with electronic power limiting control, 1 axial piston variable displacement pump for slewing and 1 fixed displacement pump for auxiliary gears. Standard thermostatically controlled oil cooler keeps oil at optimum operating temperature. Tank capacity: 428 gal. (1620 L)

Control system

Full electronic control of all crane movements is accomplished using electrical control levers with automatic reset to zero. Controls are integrated with the LMI and engine management system by CAN-BUS.

Hoist

Main and auxiliary hoist are powered by axial piston variable displacement motor with planetary gear and brake. "Thumb-thumper" hoist drum rotation indicator alerts operator of hoist movement.

	Main Auxiliary	Auxiliary
Line length:	1509 ft. (460 m)	2,264 ft. (690 m)
Rope diameter:	24 mm	24 mm
Line speed:	443 ft/min (135 m/min)	443 ft/min (135 m/min)
Line pull:	24,729 lbs. (110 kN)	24,729 lbs. (110 kN)

Electrical system

24 V system with three-phase alternator 28 V/100 A
2 batteries 12 V/170 Ah.

* Optional equipment

* Engine-independent hot water heater, with engine pre-heater
* Second spotlight
* Stereo/CD player
* Lift enhancement system
* 360° positive swing lock

* Denotes optional equipment

GMK 7550

GROVE.

13156.00.01 (MC)

1A Application Type

☒ New ☐ Renewal ☐ Amendment

1B Equipment Type

☒ Mobile Crane ☐ Mobile Tower Crane ☐ Fix / Climber Tower Crane ☐ Derrick ☐ Mast Climber ☐ Pile Driver

2 Location Information

Borough N/A Block N/A Lot N/A

Address South Waterfront Development, NJ (AKA Hoboken Bldg. B) Job Number

3A Crane / Derrick / Mast Climber / Pile Driver Information

	CD Number	Serial Number	Expiration Date
1	Grove GMK7550		
2			
3			
4			
5			
6			

3B Configuration / Phase Information

	Mast (ft)	Boom (ft)	Jib (ft)	Total (ft)
1		163.4/ 179.2	101.7 luffing	265.1 / 280.9
2				
3				
4				
5				
6				

4 Applicant Information

Name Lawrence Shapiro E-Mail

Title Vice President Lic #

Business Name Howard I. Shapiro & Associates

Address 303 Merrick Road - Suite 400

City Lynbrook State NY Zip 11563

Phone 516-791-2600 Fax 516-791-5425

5 Equipment User Information

Name Gerald Fahy E-Mail

Title Project Manager

Company Kenvil United Corp.

Address 60 N. Dell Avenue

City Kenvil State NJ Zip 07847

Phone (973) 927-0010 Fax

6 Statement and Signature

- This On-Site Inspection Certificate will only be used for the tower & mobile crane / derrick / mast climber / pile driver at the above mentioned site and conforms with approved plans.

6A Applicant's Statement

The applicant, having been authorized by the owner of the premises, building or structure, hereby makes application for the approval of the use of the tower & mobile crane / derrick / mast climber / pile driver described above to be used to the above mentioned site in accordance with the accompanying plans and specifications.

Name (please print)

Signature Date 8/27/13

Seal *(apply seal, then sign and date over seal)*

6B Equipment User's Statement

I hereby state that the above equipment will not be used until a valid On-Site Inspection is obtained.

Signature X Date 8/23/13

6C Crane Safety Coordinator's Statement

As a Professional Engineer or a person having at least five years of construction experience, I hereby certify that I will act as the designated safety coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoist areas. I shall also supervise compliance with this On-site Inspection Certificate and its drawings.

Name Gerald Fahy License Number

Address 60 N. Dell Avenue

City Kenvil State NJ Zip 07847

Phone (973) 927-0010 Fax

Signature X Date 8/23/13

6D Mast Climber Supervisor's Statement

I am a Professional Engineer or an experienced person qualified for the installation, dismantling, operation and maintenance of the equipment listed in section 3A above. I am aware that this equipment shall not be used as a personnel or material hoist.

Name License Number

Address

City State Zip

Phone Fax

Signature Date

Additional Information:

Internal Use Only

Date Received	Invoice/Receipt Number		Fee Paid
Examiner's Name (please print)		Inspector's Name (please print)	
Signature	(Issuance) Date	Signature	Date
Expiration date		Badge Number	

13156.00.01 (MC)

Applicants Statement of Notification

Application Type: _____

Application No.: _____

Date filed: _____

Borough: N/A

Community Board.: N/A

Address: N/A

I, Lawrence K Shapiro, hereby state that in accordance with requirements, I will mail or fax a copy of this notice within 24 hours to the above Community Board regarding the filing of this project.

Signature	Date	Telephone number
	8/27/13	

Block: N/A Lot: N/A

Location. South Waterfront Development, NJ (AKA Hoboken Bldg. B)

1. Number of Stories N/A
2. Occupancy N/A
   (Multiple Dwelling, Commercial, Garage, Stores and Offices, Store and Factory, Bank and Class A, Etc.)
3. No. of Apts. _____ Current _____ Proposed _____

3A. No. of SRO's. _____ Current _____ Proposed _____

4. Work Proposed Use of Grove GMK 7550 Crane to erect FMC TG-1900 Tower Crane, CD#CD#2187 or CD#2961.

5. Name and Address of

Applicant N/A Address N/A

Owner _____ Address _____

Architect _____ Address _____

Engineer _____ Address _____

13156.00.01 (MC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Work Platform #

#: Grove GMK7550 Crane

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transporatation. Mr/ Ms. Mike Braco, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name: Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Owner or Contractor X

Date 8/23/13

Safety Coordinator

I, Mike Braco (NAME) am a P.E., R.A. or a person having at least 5 years of construction experience

I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name: Mike Braco Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Safety Coordinator X

Date 8/23/13

13156.00.01 (MC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Work Platform #: _____ #: Grove GMK7550 Crane

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transporatation. Mr/ Ms. Dave Cullen representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue., Kenvil NJ 07847

Signature of Owner or Contractor X

Date 8/23/13

Safety Coordinator

Dave Cullen, am a P.E., R.A. or a person having at least 5 years of construction experience
(NAME)

I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name Dave Cullen Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue., Kenvil NJ 07847

Signature of Safety Coordinator X

Date 8/23/13

13156.00.01 (MC)

1A Application Type

[X] New [ ] Renewal [ ] Amendment

1B Equipment Type

[X] Mobile Crane [ ] Mobile Tower Crane [ ] Fix / Climber Tower Crane [ ] Derrick [ ] Mast Climber [ ] Pile Driver

2 Location Information

Borough N/A Block N/A Lot N/A

Address South Waterfront Development, NJ (AKA Hoboken Bldg. B) Job Number

3A Crane / Derrick / Mast Climber / Pile Driver Information

	CD Number	Serial Number	Expiration Date
1	Grove GMK7550		
2			
3			
4			
5			
6			

3B Configuration / Phase Information

	Mast (ft)	Boom (ft)	Jib (ft)	Total (ft)
1		163.4/ 179.2	101.7 luffing	265.1 / 280.9
2				
3				
4				
5				
6				

4 Applicant Information

Name Lawrence Shapiro E-Mail

Title Vice President Lic #

Business Name Howard I. Shapiro & Associates

Address 303 Merrick Road - Suite 400

City Lynbrook State NY Zip 11563

Phone 516-791-2600 Fax 516-791-5425

5 Equipment User Information

Name Gerald Fahy E-Mail

Title Project Manager

Company Kenvil United Corp.

Address 60 N. Dell Avenue

City Kenvil State NJ Zip 07847

Phone (973) 927-0010 Fax

6 Statement and Signature

* This On-Site Inspection Certificate will only be used for the tower & mobile crane / derrick / mast climber / pile driver at the above mentioned site and conforms with approved plans.

6A Applicant's Statement

The applicant, having been authorized by the owner of the premises, building or structure, hereby makes application for the approval of the use of the tower & mobile crane / derrick / mast climber / pile driver described above, to be used in the above mentioned site in accordance with the accompanying plans and specifications.

Name (please print)

Signature Date 8/27/13

Seal (apply seal, then sign and date over seal)

6B Equipment User's Statement

I hereby state that the above equipment will not be used until a valid On-Site Inspection is obtained.

Signature X Date 8/23/13

6C Crane Safety Coordinator's Statement

As a Professional Engineer or a person having at least five years of construction experience, I hereby certify that I will act as the designated safety coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoist areas. I shall also supervise compliance with this On-site Inspection Certificate and its drawings.

Name Gerald Fahy License Number

Address 60 N. Dell Avenue

City Kenvil State NJ Zip07847

Phone (973) 927-0010 Fax

Signature X Date 8/23/13

6D Mast Climber Supervisor's Statement

I am a Professional Engineer or an experienced person qualified for the installation, dismantling, operation and maintenance of the equipment listed in section 3A above. I am aware that this equipment shall not be used as a personnel or material hoist.

Name License Number

Address

City State Zip

Phone Fax

Signature Date

Additional Information:

Internal Use Only

Date Received	Invoice/Receipt Number		Fee Paid
Examiner's Name (please print)		Inspector's Name (please print)	
Signature	(Issuance) Date	Signature	Date
Expiration date		Badge Number	

13156.00.01 (MC)

Applicants Statement of Notification

Application Type: _____

Application No.: _____

Date filed: _____

Borough: N/A

Community Board.: N/A

Address: N/A

I, Lawrence K Shapiro, hereby state that in accordance with requirements, I will mail or fax a copy of this notice within 24 hours to the above Community Board regarding the filing of this project.

Signature	Date	Telephone number
	8/27/13	

Block: N/A Lot: N/A

Location: South Waterfront Development, NJ (AKA Hoboken Bldg. B)

1. Number of Stories N/A

2. Occupancy N/A
(Multiple Dwelling, Commercial, Garage, Stores and Offices, Store and Factory, Bank and Class A, Etc.)

3. No. of Apts. _____ Current _____ Proposed _____

3A. No. of SRO's. _____ Current _____ Proposed _____

4. Work Proposed Use of Grove GMK 7550 Crane to erect FMC TG-1900 Tower Crane, CD#CD#2187 or CD#2961.

5. Name and Address of

Applicant N/A Address N/A

Owner _____ Address _____

Architect _____ Address _____

Engineer _____ Address _____

13156.00.01 (MC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Work Platform #

_____ #: Grove GMK7550 Crane

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transportation. Mr/ Ms. Mike Braco, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil, NJ 07847

Signature of Owner or Contractor Date

X 8/23/13

Safety Coordinator

I Mike Braco (NAME), am a P.E., R.A. or a person having at least 5 years of construction experience

I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name Mike Braco Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil, NJ 07847

Signature of Safety Coordinator Date

X 8/23/13

13156.00.01 (MC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Work Platform #: _____ #: Grove GMK7550 Crane

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transporatation. Mr/ Ms. Dave Cullen, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Owner or Contractor: X

Date: 8/23/13

Safety Coordinator

I, Dave Cullen (NAME), am a P.E., R.A. or a person having at least 5 years of construction experience. I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name Dave Cullen Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Safety Coordinator: X

Date: 8/23/13

13156.00.01 (MC)

Form 10F

1. Filing Status

✓	Identification of responsibilities		Certification of Completed Inspections / Tests
	Withdrawl of responsibility		Directive 14 Inspection Request

2. Location

Borough: N/A Block: N/A Lot(s): N/A BIN N/A

House No.(s): Street Name: Apt/Condo No(s):

Special Place Name: South Waterfront Development, NJ Floor(s):

3. Applicant

Last Name: Shapiro First Name: Lawrence M.I.: K.

Business Name: Howard I. Shapiro & Associates Consulting Engineers, P.C.

Address: 303 Merrick Road Suite 400

City: Lynbrook State: NY ZIP: 11563

Telephone: (516) 791-2600 Fax: (516) 791-5425

✓ P.E. R.A. Other: Lic. No.: 60597

4. Crane Information (Only 1 crane will be used for this application)

CD No.	Manufacturer	Model	Boom Length	Jib Length	Total
	GROVE	GMK 7550	163.4 OR 179.2 Ft.	101.7 luffing Ft.	265.1 or 280.9 Ft.

5. Applicant's Statement

5A. Applicant's Statement of Responsibility (10 F)

* As a licensed Professional Engineer or Registered Architect representing the owner or contractor, I hereby state that I designed the foundation for the above crane(s) and will be on-site to inspect the said equipment and support before the commencement of work. All inspection and test reports will be signed by me

Signature Date 8/27/13

Seal

5B. Applicant's Statment of Crane Foundation Inspection (10E)

As a licensed Professional Engineer or Registered Architect representing the owner or contractor, I hereby state that I have completed the foundation inspection on _____ and found that it conforms with all approved drawings (see note). I also found no hazardous condition existed within the scope of this examination.

Signature Date

Seal

_____ Amendment Submitted ☐ Y ☐ N

A continuing tradition of engineering service – since 1946

HOWARD I. SHAPIRO & ASSOCIATES Consulting Engineers, P.C.

303 Merrick Road (Suite 400), Lynbrook, NY 11563

Howard I. Shapiro, P.E. (1932-2007) Jay P. Shapiro, P.E. Lawrence K. Shapiro, P.E. William Chieco Heng Mun Loke, P.E. James Scheld, P.E.

13156.00.01 MC

August 27th, 2013

Port Authority of NY & NJ

New York, NY 10007

Attention: Ms. Maureen Lynch-Jacobs

REFERENCE: **CRANE INSTALLATION AT South Waterfront Development, NJ (AKA Hoboken Bldg. B)**
TYPE: **GROVE GMK 7550 CRANE**
WITH: **163.4 OR 179.2 FT. BOOM + 101.7 FT. JIB**

Dear Ms. Lynch-Jacobs:

We have inspected the above site as required for the installation and operations of the above crane. We found that the roadway & sidewalk in the indicated area can safely sustain a maximum temporary bearing pressure of 3,500 p.s.f.

When the crane is installed and operated as per the attached plan, this safe bearing pressure will not be exceeded.

Very truly yours,

Lawrence K. Shapiro, P.E.

Tel. (516) 791-2600 e-mail: LKShapiro@HISAssoc.com FAX (516) 791-5425

Tadano ATF 90G-4 Crane Installation Information & Drawings

HOWARD I. SHAPIRO & ASSOCIATES Consulting Engineers, P.C.
303 Merrick Road (Suite 400), Lynbrook, NY 11563

Howard I. Shapiro, P.E. (1932- 2007) Jay P. Shapiro, P.E. Lawrence K. Shapiro, P.E. Heng Mun Loke, P.E. William Chieco James Scheld, P.E.

August 14, 2013

13156.00.01

Tadano ATF90G-4 FOR ASSISTING TOWER CRANE ERECTION

ASSIST CRANE INSTALLATION
AT
HOBOKEN BUILDING B

FOR

WEIR WELDING COMPANY INC.

BY

Prepared by: MM

STATE OF NEW YORK ★ LAWRENCE K. SHAPIRO ★ 060597 ★ LICENSED PROFESSIONAL ENGINEER

8/27/13

8/27/13

Howard I. Shapiro & Associates
Consulting Engineers, P.C.
303 Merrick Road Suite 400 Lynbrook, NY 11563
Tel (516) 791-2600 Fax (516) 791-5425

24.27k @ 45' Radius

OK

Outrigger Reaction Force Supply Service

Working Configuration

Explanation on this page

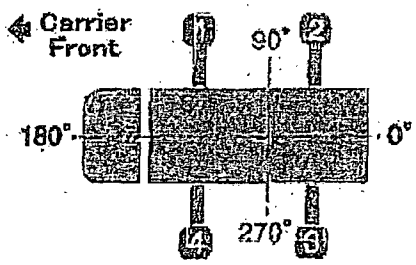
(ATF90G-4 51.2m Boom (WithOUT Jib))

Boom Length (ft)	96.7	Counterweight (lbs)	49162.2	Swing Angle	Max_Reaction	Lifting Load (lbs)	24,270
Jib state (ft)	stow	O/R Spread (ft)	23.6/1-4	Working Radius (ft)	48.0	Extension state (%)	46-46-46-46-46
Jib Tilt Angle (°)	---	Hook Block (lbs lifting)	Including in Load	Boom Angle (°)	59.3		

Outrigger Jack Reaction Force

(unit :lbs)

Swing Angle	1	2	3	4				
138	63,284	46,147	21,196	29,060				
52	29,922	84,283	33,557	11,924				
311	12,540	34,280	82,617	30,249				
227	27,674	20,142	47,131	64,739				



Change Condition | Change Model | Save Result | Readout Result | Clear PDF

[Notes]

1. As to the information we supply in this page on the outrigger jack reaction force, please note that the given value is a calculated value when the outriggers are set on a firm and level surface. It is not an actually measured one. Therefore, we can not guarantee the calculated value to be in conformity with that of your actual machine.
2. As to the data supplied in this page on the outrigger jack reaction force, please note that neither vibration nor shock which may be produced during crane operation is taken into consideration. When setting the outriggers, therefore, be sure to use blocks or steel plates of sufficient strength and size below the outrigger floats.

Back

17,215k @ 55' Radius

OR2

Outrigger Reaction Force Supply Service

Working Configuration

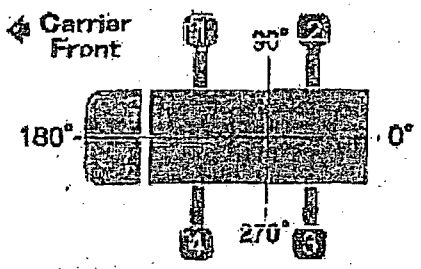
Explanation on this page

(ATF90G-4 51.2m Boom (WithOUT Jib))

Boom Length (ft)	96.7	Counterweight (lbs)	49162.2	Swing Angle	Max_Reaction	Lifting Load (lbs)	17,215
Jib state (ft)	stow	O/R Spread (ft)	23.6/1-4	Working Radius (ft)	58.0	Extension state (%)	46-46-46-46-46
Jib Tilt Angle (°)	---	Hook Block (lbs lifting)	Including in Load	Boom Angle (°)	51.8		

Outrigger Jack Reaction Force (unit :lbs)

Swing Angle	1	2	3	4				
138	60,171	43,908	20,486	28,067				
52	29,054	79,505	32,271	11,803				
311	12,391	32,939	77,952	29,349				
227	26,767	19,497	44,832	61,535				



Change Condition | Change Model | Save Result | Readout Result | Clear PDF

[Notes]

1. As to the information we supply in this page on the outrigger jack reaction force, please note that the given value is a calculated value when the outriggers are set on a firm and level surface. It is not an actually measured one. Therefore, we can not guarantee the calculated value to be in conformity with that of your actual machine.
2. As to the data supplied in this page on the outrigger jack reaction force, please note that neither vibration nor shock which may be produced during crane operation is taken into consideration. When setting the outriggers, therefore, be sure to use blocks or steel plates of sufficient strength and size below the outrigger floats.

Back

7.62k @ 74' Radius

OR

Outrigger Reaction Force Supply Service

Working Configuration

Explanation on this page

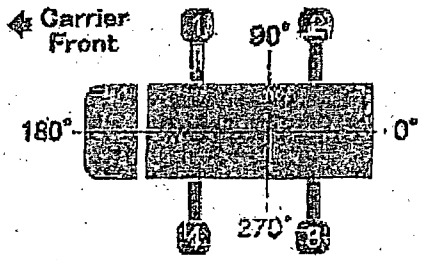
(ATF90G-4 51.2m Boom (WithOUT Jib))

Boom Length (ft)	133	Counterweight (lbs)	49162.2	Swing Angle	Max_Reaction	Lifting Load (lbs)	7,620
Jib state (ft)	stow	O/R Spread (ft)	23.6/1-4	Working Radius (ft)	77.0	Extension state (%)	0-92-92-92-92
Jib Tilt Angle (°)	---	Hook Block (lbs lifting)	Including in Load	Boom Angle (°)	55.1		

Outrigger Jack Reaction Force

(unit :lbs)

Swing Angle	1	2	3	4				
138	47,963	41,818	24,806	28,449				
52	29,327	63,401	34,391	15,918				
307	16,443	33,482	62,434	30,678				
227	27,662	24,088	42,493	48,793				



Change Condition | Change Model | Save Result | Readout Result | Clear PDF

[Notes]

1. As to the information we supply in this page on the outrigger jack reaction force, please note that the given value is a calculated value when the outriggers are set on a firm and level surface. It is not an actually measured one. Therefore, we can not guarantee the calculated value to be in conformity with that of your actual machine.
2. As to the data supplied in this page on the outrigger jack reaction force, please note that neither vibration nor shock which may be produced during crane operation is taken into consideration. When setting the outriggers, therefore, be sure to use blocks or steel plates of sufficient strength and size below the outrigger floats.

Back

19.12k @ 47' Radius

OR4

Outrigger Reaction Force Supply Service

Working Configuration

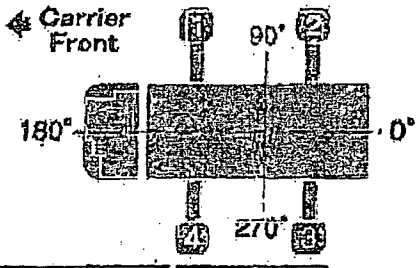
Explanation on this page

(ATF90G-4 51.2m Boom (WithOUT Jib))

Boom Length (ft)	133	Counterweight (lbs)	49162.2	Swing Angle	Max_Reaction	Lifting Load (lbs)	19,120
Jib state (ft)	stow	O/R Spread (ft)	23.6/1-4	Working Radius (ft)	50.0	Extension state (%)	0-92-92-92-92
Jib Tilt Angle (°)	---	Hook Block (lbs lifting)	Including in Load	Boom Angle (°)	68.8		

Outrigger Jack Reaction Force (unit :lbs)

Swing Angle	1	2	3	4				
138	53,798	45,451	25,321	29,967				
52	30,761	72,034	36,250	15,491				
311	16,018	36,718	70,866	30,935				
223	30,362	24,750	44,653	54,771				



Change Condition | Change Model

Save Result | Readout Result

Clear PDF

[Notes]

1. As to the information we supply in this page on the outrigger jack reaction force, please note that the given value is a calculated value when the outriggers are set on a firm and level surface. It is not an actually measured one. Therefore, we can not guarantee the calculated value to be in conformity with that of your actual machine.
2. As to the data supplied in this page on the outrigger jack reaction force, please note that neither vibration nor shock which may be produced during crane operation is taken into consideration. When setting the outriggers, therefore, be sure to use blocks or steel plates of sufficient strength and size below the outrigger floats.

Back

5.5k @ 120' Radius

OR5

Outrigger Reaction Force Supply Service

Working Configuration

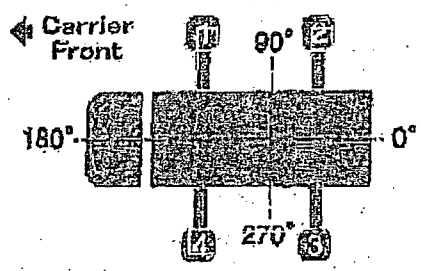
Explanation on this page

(ATF90G-4 51.2m Boom (WithOUT Jib))

Boom Length (ft)	167.9	Counterweight (lbs)	49162.2	Swing Angle	Max_Reaction	Lifting Load (lbs)	5,500
Jib state (ft)	stow	O/R Spread (ft)	23.6/1-4	Working Radius (ft)	122.0	Extension state (%)	100-100-100-100-100
Jib Tilt Angle (°)	—	Hook Block (lbs lifting)	Including in Load	Boom Angle (°)	45.1		

Outrigger Jack Reaction Force (unit :lbs)

Swing Angle	1	2	3	4				
138	68,379	37,544	12,407	22,586				
52	24,111	87,534	22,943	6,327				
311	6,912	23,964	85,385	24,656				
227	20,723	11,346	38,522	70,326				



Change Condition | Change Model | Save Result | Readout Result | Clear PDF

[Notes]

1. As to the information we supply in this page on the outrigger jack reaction force, please note that the given value is a calculated value when the outriggers are set on a firm and level surface. It is not an actually measured one. Therefore, we can not guarantee the calculated value to be in conformity with that of your actual machine.
2. As to the data supplied in this page on the outrigger jack reaction force, please note that neither vibration nor shock which may be produced during crane operation is taken into consideration. When setting the outriggers, therefore, be sure to use blocks or steel plates of sufficient strength and size below the outrigger floats.

Back

HOWARD. I. SHAPIRO & ASSOCIATES
Consulting engineers, P.C.
303 Merrick Road, suite 400
LYNBROOK, NEW YORK 11563
(516) 791-2600
Fax (516) 791-5425

Job Number	13156.00.01		
Calculated by	MM	Date	08/14/13
Checked by	M.L	Date	8/27/13

STEEL PLATE STRESS

A. Equipment

- Tadano ATF90G-4

B. Outrigger load

The Maximum Outrigger Reaction is known :

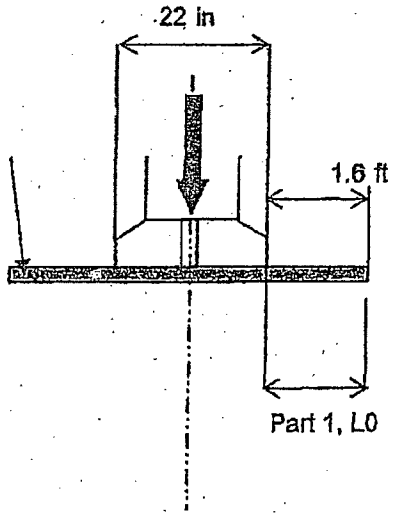
Critical outrigger load L = ***88*** **Kips**

C. Cribbing

Steel Plate :

5 ' x 5 ' x 1 " thick

S=2 in3



HOWARD. I. SHAPIRO & ASSOCIATES
Consulting engineers, P.C.
303 Merrick Road, suite 400
LYNBROOK, NEW YORK 11563
(516) 791-2600
Fax (516) 791-5425

Job Number	13156.00.01		
Calculated by	MM	Date	08/14/13
Checked by	T.L	Date	8/27/13

D. Steel Plate Stress

$$P = \frac{88}{5' \times 5'} = 3.5 \text{ ksf}$$ OK!

$$S = 2 \times t_{sp}^2 = 2 \text{ in}^3$$

$$M = \frac{P \times L_o^2}{2} \times 12 = 53 \text{ K-in/ft}$$

Constant (for steel)	
Fy (KSI)	36
Fb (KSI)	27

As per AISC, 9th Edition, p.5-48, Section F2.1:
Fb = 0.75 * Fy

$$\sigma = \frac{6 \times P \times L_o^2}{2 \times t_{sp}^2} = \frac{M}{S}$$

L_o = Length of part 1
t_{sp} = Thickness of Steel Plate

σ = 26 KSI < 27 KSI Ok!

TADANO ATF 90G-4

Lifting capacities / Capacidades de elevación

360° | 9 465 lbs | SAE

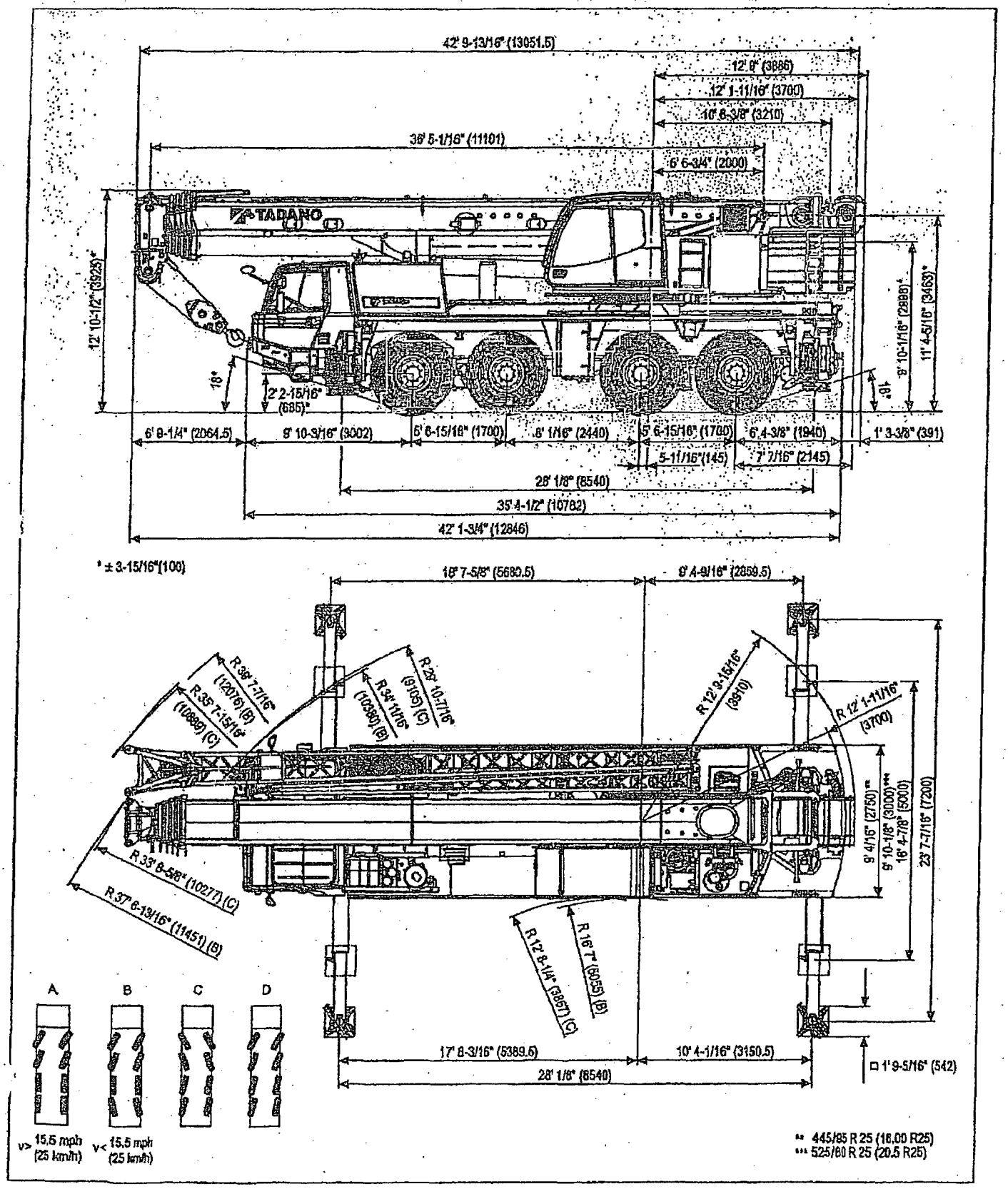
ft	36.4 ft*	36.4 ft	48.6 ft	60.7 ft	72.5 ft	84.6 ft	96.8 ft	108.9 ft	121.1 ft	132.9 ft	145.0 ft	157.2 ft	168.0 ft
8.2	220.0**												
9.8	179.8**	167.8**	143.3	143.3									
11.5	154.5**	154.5	143.3	139.3	110.2								
13.1	150.6	141.5	140.0	130.5	110.2	91.0							
14.8	138.0	130.3	129.4	122.6	110.2	90.2							
16.4	127.4	120.4	119.5	115.3	110.2	86.4	69.7						
19.7	110.2	104.3	103.2	103.2	101.2	77.2	68.6	52.5					
23.0	93.7	90.8	89.7	89.9	89.9	73.0	63.5	52.5	43.4	34.8			
26.2	80.7	78.0	78.0	78.3	78.9	68.8	62.8	52.0	43.4	34.8	28.4		
29.5	54.9	52.9	70.1	69.2	69.7	65.0	62.8	48.5	43.4	34.8	28.4	22.5	
32.8			51.7	61.3	61.5	61.7	60.0	45.4	40.8	34.8	28.4	22.5	19.6
36.1			52.7	52.9	54.5	56.7	53.1	42.5	38.4	34.4	28.4	22.5	19.6
39.4			45.8	49.4	50.3	50.3	48.7	39.9	36.2	32.6	28.4	22.5	19.6
45.9				40.1	40.1	39.7	36.6	35.7	32.2	29.3	26.9	22.5	19.6
52.5				32.8	32.8	32.4	30.4	31.5	28.4	26.5	24.5	22.5	19.6
59.1					27.6	27.1	26.2	27.1	24.7	24.0	22.3	20.5	19.2
65.6					21.6	22.9	22.0	22.9	22.5	20.9	20.5	19.0	17.6
72.2						18.8	19.0	19.8	20.3	18.3	18.5	17.4	16.3
78.7							17.2	17.0	17.4	17.0	16.8	16.1	15.2
85.3							16.1	15.0	15.4	15.4	15.2	14.6	13.9
91.9								13.0	13.9	13.7	13.2	12.6	12.6
98.4								12.1	12.6	12.1	11.7	11.0	11.0
105.0									11.5	10.6	10.1	9.5	9.5
111.5									10.1	9.5	9.0	8.2	8.2
118.1										8.6	7.9	7.1	7.3
124.7										7.5	7.1	6.2	6.4
131.2											6.4	5.3	5.3
137.8											5.5	4.6	4.6
144.4												4.2	4.0
150.9													3.3
157.5													2.9

* *Over rear / * Sobre la parte trasera*
** *With additional lifting equipment / ** Con equipo adicional*

Subject to change without prior notice / Sujeto a cambios sin previo aviso

Dimensions (ft, mm) / Dimensiones (ft, mm)

445/95 R 25 (16.00 R 25) — SAE



Subject to change without prior notice / Sujeto a cambios sin previo aviso

TADANO ATF 90G-4

Weights / Working speeds / Pesos / Velocidades de trabajo

Axle Eje	1	2	3	4	Total weight Peso total
[lbs]	26,455	26,455	26,455	26,455	105,82*

* Incl. 14,330 lbs counterweight, 32.8' (10.0 m)/59.1' (18.0 m) boom extension, hook block, swivel hook, tyres 445/95 R 25 (18.00 R 25).
* Incl. contrapeso de 6,5 t, 10 m/18 m pluma, gancho, gancho de bola, neumáticos 445/95 R 25 (18.00 R 25).

Lifting capacity Capacidad de elevación [ton]	Sheaves Poleas	Parts of line Ramales de cable	Weight Peso [lbs]
110.2	9	19	2,205
88.2	7	15	1,874
69.4*	5	11	1,433
44.1*	3	7	1,213
22.1	1	3	661
6.6	–	1	331

* Reme bom
* Gancho doble

V+

	1	2	3	4	5	6	7	8	9	10	11	12	R1	R2	
445/95 (16.00) 525/80 (20.5) mph	2.5	3.1	3.7	4.9	6.1	7.4	10.0	13.0	16.7	21.1	26.7	34.8	2.4	3.1	62%
	3.7	4.9	6.1	8.0	10.0	13.0	17.4	22.3	28.5	36.6	46.6	52.8	4.3	4.9	

V+	Infinitely variable Infinitamente variable		Rope Cable	Max. single line pull Tiro máximo por ramal
1	0 – 377 ft/min 0 – 115 m/min	single line ramal simple	0.70" / 755' 18 mm / 230 m	55 kN = 12,360 lbs
2	0 – 377 ft/min 0 – 115 m/min	single line ramal simple	0.70" / 755' 18 mm / 230 m	55 kN
360°	0 - 2 rpm			
	-1° – +82.4°	approx. 35 s aproximadamente 35 s		
	36' 5" – 167' 11-3/4" 11.1 m – 51.2 m	approx. 310 s aproximadamente 310 s		

13156.00.01 (AC)

1A Application Type

[X] New [ ] Renewal [ ] Amendment

1B Equipment Type

[X] Mobile Crane [ ] Mobile Tower Crane [ ] Fix / Climber Tower Crane [ ] Derrick [ ] Mast Climber [ ] Pile Driver

2 Location Information

Borough N/A Block N/A Lot N/A

Address South Waterfront Development, NJ (AKA Hoboken Bldg. B) Job Number

3A Crane / Derrick / Mast Climber / Pile Driver Information

	CD Number	Serial Number	Expiration Date
1	Tadano ATF90-G4		
2			
3			
4			
5			
6			

3B Configuration / Phase Information

	Mast (ft)	Boom (ft)	Jib (ft)	Total (ft)
1		96.8/132.9/168		96.8/132.9/168
2				
3				
4				
5				
6				

4 Applicant Information

Name Lawrence Shapiro E-Mail

Title Vice President Lic#

Business Name Howard I. Shapiro & Associates

Address 303 Merrick Road - Suite 400

City Lynbrook State NY Zip 11563

Phone 516-791-2600 Fax 516-791-5425

5 Equipment User Information

Name Gerald Fahy E-Mail

Title Project Manager

Company Kenvil United Corp.

Address 60 N. Dell Avenue

City Kenvil State NJ Zip 07847

Phone (973) 927-0010 Fax

6 Statement and Signature

- This On-Site Inspection Certificate will only be used for the crane & mobile crane / derrick / mast climber / pile driver at the above mentioned site and conforms with approved plans.

6A Applicant's Statement

The applicant, having been authorized by the owner of the premises, building or structure, hereby makes application for the approval of the use of the tower & mobile crane / derrick / mast climber / pile driver described above to be used to the above mentioned site in accordance with the accompanying plans and specifications.

Name (please print)

Signature Date 8/07/13

Seal *(apply seal, then sign and date over seal)*

6B Equipment User's Statement

I hereby state that the above equipment will not be used until a valid On-Site Inspection is obtained.

Signature X Date 8/23/13

6C Crane Safety Coordinator's Statement

As a Professional Engineer or a person having at least five years of construction experience, I hereby certify that I will act as the designated safety coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoist areas. I shall also supervise compliance with this On-site Inspection Certificate and its drawings.

Name Gerald Fahy License Number

Address 60 N. Dell Avenue

City Kenvil State NJ Zip 07847

Phone (973) 927-0010 Fax

Signature X Date 8/23/13

6D Mast Climber Supervisor's Statement

I am a Professional Engineer or an experienced person qualified for the installation, dismantling, operation and maintenance of the equipment listed in section 3A above. I am aware that this equipment shall not be used as a personnel or material hoist.

Name License Number

Address

City State Zip

Phone Fax

Signature Date

Additional Information:

Internal Use Only

Date Received	Invoice/Receipt Number		Fee Paid
Examiner's Name (please print)		Inspector's Name (please print)	
Signature	(Issuance) Date	Signature	Date
Expiration date		Badge Number	

13156.00.01 (AC)

Applicants Statement of Notification

Application Type: _____

Application No.: _____

Date filed: _____

Borough: N/A

Community Board.: N/A

Address: N/A

I, Lawrence K Shapiro, hereby state that in accordance with requirements, I will mail or fax a copy of this notice within 24 hours to the above Community Board regarding the filing of this project.

Signature	Date	Telephone number
	8/27/13	

Block: N/A Lot: N/A

Location: South Waterfront Development, NJ (AKA Hoboken Bldg. B)

1. Number of Stories N/A

2. Occupancy N/A
(Multiple Dwelling, Commercial, Garage, Stores and Offices, Store and Factory, Bank and Class A, Etc.)

3. No. of Apts. _____ Current _____ Proposed _____

3A. No. of SRO's _____ Current _____ Proposed _____

4. Work Proposed Use of Tadano ATF90-4 Crane to assemble Grove GMK 7550 Crane and to erect FMC TG-1900 Tower Crane, CD#CD#2187 or CD#2961.

5. Name and Address of

Applicant N/A Address N/A

Owner _____ Address _____

Architect _____ Address _____

Engineer _____ Address _____

13156.00.01 (AC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Hoist Platform #

#: Tadano ATF90G-4 Crane

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transportation. Mr/ Ms. Mike Braco, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Owner or Contractor X

Date 8/23/13

Safety Coordinator

I, Mike Braco (NAME), am a P.E., R.A. or a person having at least 5 years of construction experience

I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name Mike Braco Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Safety Coordinator X

Date 8/23/13

13156.00.01 (AC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Work Platform # _____ # Tadano ATF90G-4 Crane

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transporatation. Mr/ Ms. Dave Cullen, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil , NJ 07847

Signature of Owner or Contractor X

Date 8/23/13

Safety Coordinator

I, Dave Cullen (NAME), am a P.E., R.A. or a person having at least 5 years of construction experience

I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name Dave Cullen Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil , NJ 07847

Signature of Safety Coordinator X

Date 8/23/13

13156.00.01 (AC)

Form 10F

1. Filing Status

✓	Identification of responsibilities		Certification of Completed Inspections / Tests
	Withdrawl of responsibility		Directive 14 Inspection Request

2. Location

Borough: N/A Block: N/A Lot(s): N/A BIN N/A

House No.(s): Street Name: Apt/Condo No(s).:

Special Place Name: South Waterfront Development, NJ Floor(s):

3. Applicant

Last Name: Shapiro First Name: Lawrence M.I.: K.

Business Name: Howard I. Shapiro & Associates Consulting Engineers, P.C.

Address: 303 Merrick Road Suite 400

City: Lynbrook State: NY ZIP 11563

Telephone: (516) 791-2600 Fax: (516) 791-5425

✓	P.E.		R.A.		Other: Lic. No. 60597

4. Crane Information (Only 1 crane will be used for this application)

CD No.	Manufacturer	Model	Boom Length	Jib Length	Total
	Tadano	ATF90G-4	96.8/132.9/168 Ft.		96.8/132.9/168 Ft.

5. Applicant's Statement

5A. Applicant's Statement of Responsibility (10 F)

* As a licensed Professional Engineer or Registered Architect representing the owner or contractor, I hereby state that I designed the foundation for the above crane(s) and will be on-site to inspect the said equipment and support before the commencement of work. All inspection and test reports will be signed by me

Signature Date 8/27/13

Seal

5B. Applicant's Statment of Crane Foundation Inspection (10E)

As a licensed Professional Engineer or Registered Architect representing the owner or contractor, I hereby state that I have completed the foundation inspection on _____ and found that it conforms with all approved drawings (see note). I also found no hazardous condition existed within the scope of this examination.

Signature Date

Seal

_____ Amendment Submitted ☐ Y ☐ N

A continuing tradition of engineering service – since 1946
HOWARD I. SHAPIRO & ASSOCIATES Consulting Engineers, P.C.
303 Merrick Road (Suite 400), Lynbrook, NY 11563

Howard I. Shapiro, P.E.(1932- 2007) Jay P. Shapiro, P.E. Lawrence K. Shapiro, P.E. William Chieco Heng-Mun Loke, P.E. James Scheld, P.E.

13156.00.01 AC

August 27th, 2013

Port Authority of NY & NJ

New York, NY 10007

Attention: Ms. Maureen Lynch-Jacobs

REFERENCE: **CRANE INSTALLATION AT South Waterfront Development, NJ (AKA Hoboken Bldg. B)**
TYPE: **TADANO ATF90G-4 CRANE**
WITH: **96.8 OR 132.9 OR 168 FT. BOOM**

Dear Ms. Lynch-Jacobs:

We have inspected the above site as required for the installation and operations of the above crane. We found that the roadway & sidewalk in the indicated area can safely sustain a maximum temporary bearing pressure of 3,500 p.s.f.

When the crane is installed and operated as per the attached plan, this safe bearing pressure will not be exceeded.

Very truly yours,

Lawrence K. Shapiro, P.E.

Tel. (516) 791-2600 e-mail: LKShapiro@HISAssoc.com FAX (516) 791-5425

TG 1900 Crane Installation Information & Drawings

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY LKS

Hoboken

Tower Crane Installation

TG1900 with TG2300 Tower

Table of Contents

Sheet 2-3	Concrete footing calculations
Sheet 4	Bottom reinforcement calculation
Sheet 5	Top reinforcement calculation
Sheet 6	Shear reinforcement calculation
Sheet 7-8	Tower section leg capacity calculation
Sheet 9-11	Tower crane data and wind calculations
Sheet 12	Gust Calculation
Sheet 13-14	Out of service loading
Sheet 15-16	In service loading

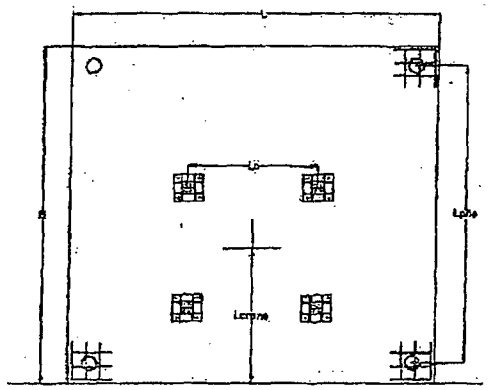
8/9/13

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

Design Concrete footing for TG 2300 Tower

Loads at base of crane — See attached calculations for loads

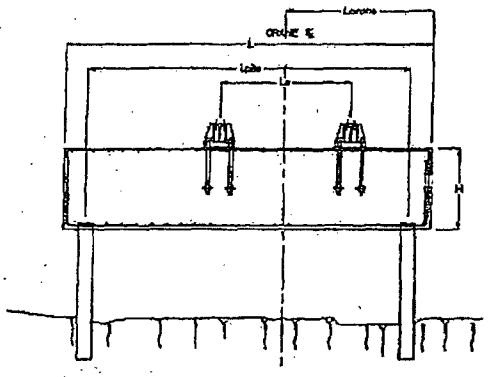
Moment (M)	11320.95	k-ft	Tower Crane Leg Distance		
Vertical (V)	439.56	kip	Lc =	11.05	ft
Horizontal (V)	84.62	kip			



Resisting Forces

Concrete footing

L =	32.50	ft			
B =	32.50	ft			
H =	5.00	ft	Lpc = Lcrane-((B-Lpile)/2)		
Lcrane =	11.25	ft	Lpc =	9.75	ft
Bcrane =	16.25	ft	Lpc2 = Lpile-Lpc		
Lpile =	29.50	ft	Lpc2 =	19.75	ft
Bpile =	29.50	ft			
ρ_{conc} =	145.00	lb/ft³			
G =	765.78	kip	g =	0.725	k/ft²
			w =	0.416147	k/ft²



Tension Piles

T =	20	kips
Lr1 =	1.5	ft
Lr2 =	2.5	ft
Lr3 =	27	ft
Lr4 =	29.5	ft

1. Find minimum resisting moment

Check L direction (Symmetric)

ΣM_{RL} = G*Lpile/2 + W*Lcrane + 2*T*Lr1 + 2*T*Lr2 + 4*T*Lr4
= 19780.27 k-ft

ΣM_{OT} = M + V*(H-0.5')
= 11744.05 k-ft

Minimum resisting moment must exceed moment from crane with a factor of 1.5

Minimum resisting moment	19780.27	k-ft	
Overturning moment	17616.07	k-ft	Resisting moment > Overturning moment, OK.

2. Determine number of piles

Pcomp = M/Lpile = 1109.874 kips

Allowable compression/pile = 125 tons
250 kips

Number of piles per side required
n = Pcomp/Allowable = 5
Total Number of Piles 12

Check Compression in piles at corners
Distance 38.75 ft
ForceM 97.38453 kips
ForceG 63.8151 kips
ForceC 47.90022 kips
Total 209.0999 Kips/pile
Allowable compression per pile exceeds applied loading, OK.

Check tension in piles at corners
Total -14.3308 Kips/pile

3. Check moment at tower legs

The maximum moment will be in the B2 direction. North towards the building.

Moment at Pile
Compression in leg from diagonal wind loading and concrete weight are downward forces
Distance used is the distance from the crane legs to the piles (x) x = 11.5 ft

$F_{g+w} = (g+w)*x*B =$	426.50	k
$M_{g+w} = F_{g+w}*x/2 =$	2452.40	k-ft
$F_{leg} = M/Lc =$	1024.33	k
$M_{leg} = F_{leg}*x =$	11779.75	k-ft
$M_{bot} = M_{leg} + M_{g+w} =$	14232.14	k-ft
Mu (bottom) =	22771.43	k-ft

Moment at Crane Leg
Concrete weight and crane weight are downward forces.
Distance used is the distance from the crane legs to the piles (x) x = 11.50 ft

$F_{g+w} = (g+w)*x*B =$	426.50	k
$M_{g+w} = F_{g+w}*x/2 =$	2452.40	k-ft
$F_{leg} = M/Lc =$	0.00	k
$M_{leg} = F_{leg}*x =$	0.00	k-ft
$M_{bot} = M_{leg} + M_{g+w} =$	2452.40	k-ft
Mu (bottom) =	3923.83	k-ft

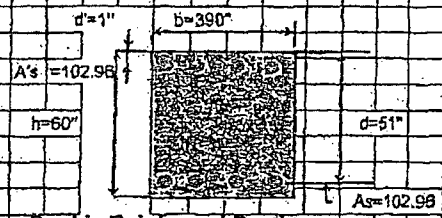
HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road Suite 400
LYNBROOK, NEW YORK 11563
Tel. (516) 791-2600, Fax (516) 791-5425

JOB#	13156.00.00		
SHEET NO.	4 of 16		
CALCULATED BY :	SR	DATE	8/9/2013
CHECKED BY	LKS	DATE	

Concrete Beam Reinforcement

Bottom Bars

Beam, Footing or Slab Section?	Footing	
Exterior or Interior Exposure?	Exterior	
Reinforcing Yield Strength, fy =	60	ksi
Concrete Comp. Strength, f'c =	6	ksi
Slab Section Width, b =	390	in.
Depth to Tension Reinforcing, d =	51	in.
Total Slab Section Depth, h =	60	in.
Tension Reinforcing, As =	102.96	in.^2
No. of Tension Bars in Slab, Nb =	66	
Tension Reinf. Bar Spacing, s1 =	6	in.
Clear Cover to Tension Reinf., Cc =	3	in.
Depth to Compression Reinf., d' =	1	in.
Compression Reinforcing, A's =	102.96	in.^2
Working Stress Moment, Ma =	14232.14	ft-kips
Ultimate Design Moment, Mu =	22771.43	ft-kips



Doubly Reinforced Section

Reinforcement #11 @ 6" => As= 3.12 in/ft

Moment Capacity Check for Slab-Type Section:

β1 =	0.80	
c =	1.754	in.
a =	1.403	in.
ρb =	0.03354	
ρ(prov) =	0.00518	
ρ(min) =	0.00354	
As(min) =	As(temp)	ACI 10.5.4
ρ(temp) =	0.00180	(total for section)
As(temp) =	21.060	in.^2/face As > As(temp), O.K.
ρ(max) =	0.03033	
As(max) =	603.254	in.^2 >= As = 102.96 in.^2, O.K.
f's =	37.41	ksi (A's does not yield)
φMn =	23218.04	ft-k >= Mu = 22771.43 ft-k, O.K.

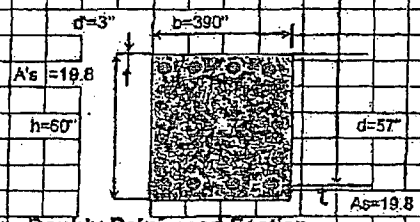
HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road Suite 400
LYNBROOK, NEW YORK 11563
Tel. (516) 791-2600, Fax (516) 791-5425

JOB#	13156.00.00		
SHEET NO.	5 of 16		
CALCULATED BY :	SR	DATE	8/9/2013
CHECKED BY	LKS	DATE	

Concrete Beam Reinforcement:

Top Bars

Beam, Footing or Slab Section?	Footing	
Exterior or Interior Exposure?	Exterior	
Reinforcing Yield Strength, fy =	60	ksi
Concrete Comp. Strength, f'c =	5	ksi
Slab Section Width, b =	390	in.
Depth to Tension Reinforcing, d =	57	in.
Total Slab Section Depth, h =	60	in.
Tension Reinforcing, As =	19.80	in.^2
No. of Tension Bars in Slab, Nb =	33	
Tension Reinf. Bar Spacing, s1 =	12	in.
Clear Cover to Tension Reinf., Cc =	3	in.
Depth to Compression Reinf., d' =	3	in.
Compression Reinforcing, A's =	19.80	in.^2
Working Stress Moment, Ma =	2452.40	ft-kips
Ultimate Design Moment, Mu =	3923.83	ft-kips
Ultimate Design Shear, Vu =	89.62	kips



Doubly Reinforced Section

Reinforcement #7 @ 12 " => As= 0.6 in/ft

Moment Capacity Check for Slab-Type Section:

β1 =	0.80	
c =	0.896	in.
a =	0.717	in.
ρb =	0.03354	
ρ(prov) =	0.00089	
ρ(min) =	0.00354	
As(min) =	As(temp)	ACI 10.5.4
ρ(temp) =	0.00180	(total for section)
As(temp) =	21.060	in.^2/face As < As(temp)
ρ(max) =	0.02604	
As(max) =	578.953	in.^2 >= As = 19.8 in.^2, O.K.
f's =	N.A.	ksi (A's does not yield)
φMn =	5046.77	ft-k >= Mu = 3923.83 ft-k, O.K.

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

Check reverse punching shear at crane legs

Tension in Leg	614.42	kips
Load Factor	1.60	
Eff. Area Conc.	10404.00	in^2
f'c	5000	psi
Vc = Ac*2*√f'c	1471.35	lbs
Factor ϕ	0.75	
Vc*ϕ	1103.51	lbs
Factored Load	983.07	

Vc*ϕ is greater than factored load, no reinforcement required.

Check shear at corner piles

Use total loading on piles at corners

Total Shear	627.30	kips
Load Factor	1.60	
Eff. Area Conc.	9599.90	in^2
f'c	5000	psi
Vc = Ac*2*√f'c	1357.63	kips
Factor ϕ	0.75	
Vc*ϕ	1018.22	kips
Factored Load	1003.68	kips

Vc*ϕ is greater than factored load, no reinforcement required.

Use # 4 bars

Vs Required	-14.54	kips
Steel Fy	60.00	ksi
A_{sreq} = Vs/ϕ/Fy	-0.32	ksi
Area of bars	0.20	in^2
Number of Bars	-2	

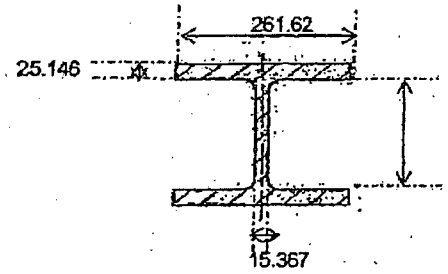
HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY

Tower Leg Properties

TG 2300 Tower Section
Legs consist of WF Beam 10x112

material : 350



Fy= 50 Ksi
Fa = 26.861 Ksi
E= 29000 Ksi

$$F_a = \frac{F_y*(1-((kL/r)^2)/((2C_c)^2)}{((5/3)+3*(kL/r))/(8*C_c-((kL/r)^3)/8*C_c^3}$$

Area: A = 21225.8 mm^2 = 32.900 in^2

Inertia: I x= 2.98E+08 mm^4 = 716.000 in^4
I y= 9.82E+07 mm^4 = 236.000 in^4

$$r = \sqrt{\frac{I}{A}}$$

x = 4.660
y = 2.680
Use Y as it is more conservative

K = 1

maximum unbraced length:

$L_{unbraced}$ = 2200 mm = 86.6 in

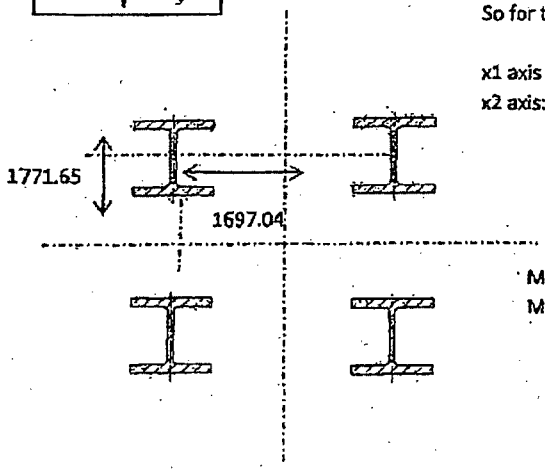
$$\frac{KL}{r} =$$ 32.318721

$$C_c = \sqrt{\frac{2\pi^2 E}{F_y}}$$ = 106.999

$\frac{KL}{r} < C_c$ there will be no elastic buckling.

So for the cross section:

A_{total} = 4 * A = 131.600 in^2
x1 axis : $I_{total-x1}$ = 4*(I + A*d^2) = 2.68E+11 mm^4 = 643106 in^4
x2 axis: $I_{total-x2}$ = 5.88E+05 in^4



These values are used to obtain the gust factor, necessary for the calculation of the wind force applied on the structure

Max All. Comp. = Fa * A = 884 K/in^2
Max All. Tens. = 0.6 * Fy * A = 987 K/in^2

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

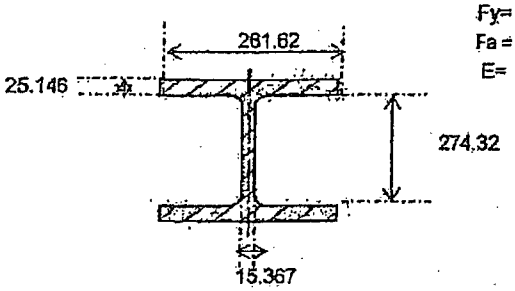
Tower Leg Properties

TG 1900 Tower Section
Legs consist of WF Beam 10x88

material : 350

Fy= 50 Ksi
Fa = 26.783 Ksi
E= 29000 Ksi

$$F_a = \frac{Fy*(1-((kL/r)^2)/((2C_c)^2)}{((5/3)+3*(kL/r))/(8*C_c-((kL/r)^3)/8*C_c^3}$$



Area: A = 16774.2 mm^2 = 26.000 in^2

Inertia: I x= 2.22E+08 mm^4 = 534.000 in^4
I y= 7.45E+07 mm^4 = 179.000 in^4

$$r = \sqrt{\frac{I}{A}}$$

x = 4.540
y = 2.630
Use Y as it is more conservative

K = 1

maximum unbraced length:

$L_{unbraced}$ = 2200 mm = 86.6 in

$$\frac{KL}{r} =$$ 32.933146

$$C_c = \sqrt{\frac{2\pi^2 E}{F_y}}$$ = 108.999

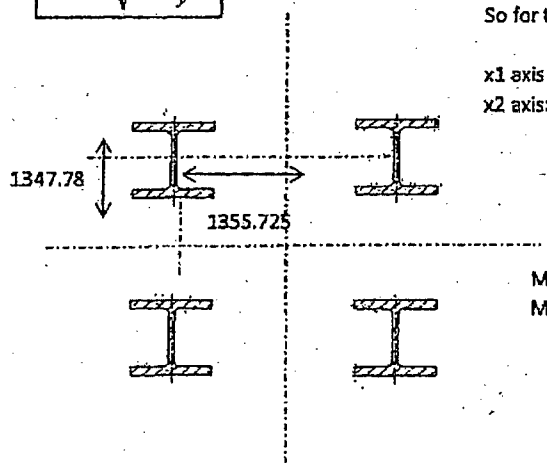
$\frac{KL}{r} < C_c$ there will be no elastic buckling.

So for the cross section:

A_{total} = 4 * A = 104.000 in^2

x1 axis : $I_{total\text{-}x1}$ = $4*(I + A*d^2)$ = 1.23E+11 mm^4 = 294958 in^4

x2 axis: $I_{total\text{-}x2}$ = 2.97E+05 in^4



These values are used to obtain the gust factor, necessary for the calculation of the wind force applied on the structure

Max All. Comp. = F_a * A = 696 K/in^2
Max All. Tens. = 0.6 * Fy * A = 780 K/in^2

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

Storm wind is applied and upper section of crane is taken as weather veining.

Weathervaning Angle (from Clearance):	10.25	deg
Boom Length:	240	ft
Radius:	240.00	ft
Boom COG:	104.17	ft
Dist. Boom foot to COR:	3.83333	ft
Weathervaning COG:	106.3408	ft
Height:	42.70645	ft

	Weight (Kip)	Distance X (ft)	Moment (K*ft)
A-Frame	24.14	-10.71	-258.61
Slewing Plat.	16.56	0.00	0.00
Deck	83.32	-6.50	-541.55
Fixed CTWT	23.70	-19.43	-460.49
Moving CTWT	72.87	-17.44	-1270.47
Boom	31.33	106.34	3331.66
Total	251.92	-	800.54

Find Wind pressure

		Upper	2300 Sect.	1900 Sect.	Trans	
Height of wind (z)	=	200.58	48.00	150.85	88.18	ft

Exposure Category = C

Wind force is determined using the following formula:

Force $F = G_f * q_z * C_f * A$

Where:

Gust Factor G_f		Calculated		
Wind Pressure q_z	=	$K_z*K_{zt}*K_d*I*V_f^2/391$		
Force Coefficient C_f				
Sum of face area of members in frame A_f		OS	IS	OS
Wind Velocity V	=	100	30	100
Height and terrain factor K_z	=	$2.01*(z/z_g)^{\wedge}2/\alpha$		
Topographic factor K_{zt}	=	1		1
Directional factor K_d	=	0.85		1
Importance factor I	=	1		1
Construction Period Design Factor	=	0.85	1	0.85
$V_f=V*C_{cpdf}$	=	85	30	85

α = 9.5

z_g = 900

		1900 Sect.	2300 Sect.	Trans	Upper
K_z	=	1.38003908	1.08442	1.23253	1.465359

		Tower	2300 Sect.	Trans	Upper	IS
q_z	=	23.0156859	17.0324	19.3587	27.07728	2.867006

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

Determine Cf

Find Face Area

Tower Sections: TG2300

Height = 13.71875 ft

Gross Area A_g = 147.85 ft^2

Area A_f = 61.085 ft^2

ϕ = A_f/A_g = 0.41316

Cf	Eff. Area	OS Fwind	OS Fwind	IS Fwind	IS Fwind	
2.452	149.78042	3447.3	0.25128	429.4213	0.031302	side
3.08	188.1418	4330.21	0.31564	539.4036	0.039319	diagonal

Tower Section: Transition Section

Height = 13.625 ft

Gross Area A_g = 137.5 ft^2

Area A_f = 46.96 ft^2

ϕ = A_f/A_g = 0.34153

Cf	Eff. Area	OS Fwind	OS Fwind	IS Fwind	IS Fwind	
2.452	115.14592	2650.16	0.19451	330.124	0.024229	side
3.08	144.6368	3328.92	0.24432	414.6746	0.030435	diagonal

Tower Sections: TG1900

Height = 13.71875 ft

Gross Area A_g = 128.04 ft^2

Area A_f = 39.63 ft^2

ϕ = A_f/A_g = 0.30951

Cf	Eff. Area	OS Fwind	OS Fwind	IS Fwind	IS Fwind	
2.452	97.17276	2236.5	0.16302	278.5949	0.020308	side
3.08	122.0604	2809.3	0.20478	349.9479	0.025509	diagonal

Wind load on boom

From Previous Calcs

Cf = 1.2 η = 0.75 Aw = 1116.63 in^2

Use qz at Upperworks	OS	IS	
Uniform wind load on boom =	0.00639	0.000677	K/in
Wind load for Boom =	18.4041	1.948669	K

Wind is on angle to boom. Calculate new wind force

$F\alpha = F^*\sin^2\alpha$ OS

Wind force on boom = 0.58275 K

Sum of Moments

Moment from Weight OS 800.54 k-ft

In service loading at max moment radius. See In Service loading calculations.

Out of service (OS)

	Deck	A-Frame	Boom	
Wind height	8	25	31.10323	ft
Wind area	275	342	679.2	ft^2
Wind force	9.6344303	11.9817	0.753993	kips
Wind moment	77.075443	299.543	23.45161	kip-ft

In service (IS) at 110 ft radius (See IS calculations for max moment)

	Deck	A-Frame	Boom	
Wind height	8	25	117.3704	ft
Wind area	275	342	679.2	ft^2
Wind force	0.7884266	0.98052	1.567347	kips
Wind moment	6.3074129	24.5129	183.9602	kip-ft

Find wind force and moment at top

	OS	IS	
Wind shear	22.3702	3.33629	kips
Moment from Wind	400.07	214.781	k-ft
Sum of Moments	1200.61	-	k-ft

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY LKS

Gust Factor Calculations - Free Standing

Number of TG2300 Sections	2.00		Number of TG1900 Sections		7	Transition Section	1
Height of TG2300 Sections	40.00	ft	Height of TG1900 Sections		13.63	Transition Height	13.625
Total Height of Tower	189.00	ft	Width	11.05	Width	9.40	
Total Height above ground	190.83	ft					
Height to machine deck	200.58	ft					

	Out of Service	
Design Wind Speed with 50 years recurrancy	110.00	
Exposure Factor	0.85	As per SEI/ASCE 37-02
Wind Speed over exposure period	93.50	

Exposure Zone	C	Kh	1.47	Kd	0.85	$\bar{\alpha}$	0.15	$\bar{b}$	0.65
		c	0.20	l	500.00	$\bar{\varepsilon}$	0.20		

		Out of Service
Natural Frequency from RISA 3D, n1		0.365
	nh	2.968
	nb	0.146
	nl	0.490
	Rh	0.280
	Rb	0.909
	Rl	0.740
	Rn	0.085
	$I_{\bar{z}}$	0.163
	Q	0.876
	gr	3.942
Equivalent Height of Structure,	z	114.500
Mean Hourly Wind Speed,	$\bar{V}_{\bar{z}}$	107.939
Integral Length Scale of Turbulence,	$L_{\bar{z}}$	641.251
Reduced Frequency, N1		2.168
Damping Ratio		0.010
Resonant Response Factor		1.379
Gust Factor =		1.294

$$L_{\bar{z}} = \bar{\varepsilon}\left(\frac{\bar{z}}{33}\right)^{\bar{\alpha}}$$

$$N_1 = \frac{n_1 L_{\bar{z}}}{\bar{V}_{\bar{z}}}$$

$$R_\ell = \frac{1}{\eta} - \frac{1}{2\eta^2}(1 - e^{-2\eta}) \quad \text{for } \eta > 0$$

$$R_\ell = 1 \quad \text{for } \eta = 0$$

$$I_{\bar{z}} = c\left(\frac{33}{\bar{z}}\right)^{1/6}$$

$$R = \sqrt{\frac{1}{\beta} R_n R_h R_B (0.53 + 0.47 R_L)}$$

$R_\ell = R_h$ setting $\eta = 4.6 n_1 h/\bar{V}_{\bar{z}}$
$R_\ell = R_B$ setting $\eta = 4.6 n_1 B/\bar{V}_{\bar{z}}$
$R_\ell = R_L$ setting $\eta = 15.4 n_1 L/\bar{V}_{\bar{z}}$

$$\bar{V}_{\bar{z}} = \bar{b}\left(\frac{\bar{z}}{33}\right)^{\bar{\alpha}} \bar{V}\left(\frac{88}{60}\right)$$

$$R_n = \frac{7.47 N_1}{(1 + 10.3 N_1)^{5/3}}$$

$$Q = \sqrt{\frac{1}{1 + 0.63\left(\frac{B+h}{L_{\bar{z}}}\right)^{0.63}}}$$

$$g_R = \sqrt{2\ln(3{,}600 n_1)} + \frac{0.577}{\sqrt{2\ln(3{,}600 n_1)}}$$

$$G_f = 0.925\left(\frac{1 + 1.7 I_{\bar{z}}\sqrt{g_Q^2 Q^2 + g_R^2 R^2}}{1 + 1.7 g_v I_{\bar{z}}}\right)$$

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

Check Freestanding out of service conditions

Height of TG2300 = 80.00 ft Height of TG1900 = 95.38 ft Height of Trans. = 13.63 ft

Total Height = 190.83

Gust Factor Results Compiled (See Gust Factor Calculations)

Gf	1.29

Calculate Force Due to wind on tower sections.

	2300(Diag)	2300	1900 (Diag)	1900	Tran(Diag)	Trans
Lin. Force (k/ft)	0.41	0.33	0.26	0.21	0.32	0.25
Length (ft)	80.00	80.00	95.38	95.38	13.63	13.63
Y Dist. (ft)	40.00	40.00	141.31	141.31	86.81	86.81
Moment	1306.87	1040.41	3570.98	2842.87	373.92	297.68

Sum of forces and moments at top

Shear at top (K)	22.37
Moment On Tower (K*ft)	1200.61
Weight at top (K)	251.92

Find Moment caused by deflection

	TG2300 Tower	TG1900 Tower	Transition	
Moment of Interia (I)	588396.31	294958.15	441677.23	in^4
Young's Modulus (E)	29000.00	29000.00	29000.00	ksi

$$\delta = \frac{12*M_{top}*(height*12)^2}{2*E*I} + \frac{W_t*(height*12)^3}{3*E*I} + \frac{L_{inf.}}{12} * \frac{(height*12)^4}{8*E*I}$$

$$M_{PDelta} = \frac{W_{top}}{12} * \delta$$

Σ Moments at top (M_{top}) (K*ft)	1200.61
Deflection TG1900 (in)	28.56
Deflection Transition (in)	
Deflection TG2300 (in)	
Total Deflection (in)	28.56
Moment caused by P-Delta	599.61

Weight of Tower Sections

	Weight	No. Sections	Total	Wt./lin. Ft.
TG2300	45.02	2.00	90.04	1.13
TG1900	11.5	7.00	80.5	0.84
Transition	17.1	1.00	17.1	1.26
		Total:	187.64	

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

Σ Moments and Forces on Tower Base (max. stressed member)

	OS Diag	OS
Wb=	439.56	439.56
Mb=	11320.95	10250.14
Hb=	84.62	71.93
Width of Sect.	11.05	11.05
Max. Comp.	834.20	437.79
Max. Tension	-614.42	-218.01

From Leg Calculations:

Allowable Compressive Force	883.74	K/in^2
Allowable Tension Force	987.00	K/in^2

Σ Moments and Forces on TG1900

	OS Diag	OS
Wb=	439.56	439.56
Mb=	6304.14	0.00
Hb=	47.64	0.00
Width of Sect.	8.89	8.89
Max. Comp.	611.32	109.89
Max. Tension	-391.54	109.89

From Leg Calculations:

Allowable Compressive Force	696.35	K/in^2
Allowable Tension Force	780.00	K/in^2

Stress Check OK

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY LKS

Check Freestanding in service conditions

Height of TG2300 = 80.00 ft Height of TG1900 = 95.38 ft Height of Trans. = 13.63 ft

Total Height = 190.83

Calculate Force Due to wind on tower sections.

	TG2300	1900 (Diag)	Trans
Lin. Force (k/ft)	0.04	0.03	0.03
Length (ft)	80.00	95.38	13.63
Y Dist. (ft)	40.00	141.31	86.81
Moment	125.82	343.80	36.00

Find Worst Moment of Load on Tower

Radius	20	30	40	50	60	70	80	90	100	110
Angle	86.14	83.74	81.33	78.91	76.47	74.00	71.50	68.96	66.38	63.75
Load	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	43.30
20% Impact	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60	51.96
Load Moment	1152.00	1728.00	2304.00	2880.00	3456.00	4032.00	4608.00	5184.00	5760.00	5715.60
Boom COG	10.85	15.19	19.53	23.87	28.21	32.55	36.89	41.23	45.57	49.91
Boom Moment	339.94	475.93	611.91	747.90	883.88	1019.87	1155.85	1291.84	1427.82	1563.81
MCTWT Moment	-851.25	-862.08	-873.10	-884.34	-895.82	-907.57	-919.62	-932.01	-944.79	-958.01
Moments	-619.95	81.20	782.16	1482.91	2183.42	2883.65	3583.59	4283.18	4982.38	5060.75

Continued

120	130	140	150	160	170	180	190	200	210	220
61.05	58.28	55.43	52.48	49.41	46.18	42.77	39.13	35.18	30.79	25.75
38.70	34.80	31.50	28.60	26.00	23.80	21.90	20.00	18.40	16.90	15.50
46.44	41.76	37.80	34.32	31.20	28.56	26.28	24.00	22.08	20.28	18.60
5572.80	5428.80	5292.00	5148.00	4992.00	4855.20	4730.40	4560.00	4416.00	4258.80	4092.00
54.25	58.59	62.94	67.28	71.62	75.96	80.30	84.64	88.98	93.32	97.66
1699.79	1835.78	1971.76	2107.75	2243.73	2379.72	2515.71	2651.69	2787.68	2923.66	3059.65
-971.73	-986.02	-1000.96	-1016.68	-1033.31	-1051.04	-1070.11	-1090.88	-1113.88	-1139.96	-1170.69
5040.22	5017.91	5002.15	4978.42	4941.77	4923.23	4915.35	4860.16	4829.15	4781.86	4720.30

Loads on upper structure

Max Moment Boom/Load	5060.75	k-ft	at 110' radius
Wind Shear (Kips)	3.34	k	
Wind Moment (K*ft)	214.78	k-ft	
Sum of Moments (K*ft)	5275.53	k-ft	
Axial Load at Top (Kips)	309.52	kips	

230	240
19.55	10.25
14.30	10.50
17.16	12.60
3946.80	3024.00
102.00	106.34
3195.63	3331.62
-1209.64	-1270.45
4672.14	3824.52

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Ste 400
LYNBROOK, NY 11563
(516) 791-2600
Fax (516) 791-5425

DATE 08/09/13
CALCULATED BY SR
CHECKED BY LKS

Find Moment caused by deflection

	TG2300 Tower	TG1900 Tower	Transition	
Moment of Interia (I)	588396.31	294958.15	441677.23	in^4
Young's Modulus (E)	29000.00	29000.00	29000.00	ksi

$$\delta = \frac{12*M_{top}*(height*12)^2}{2*E*I} + \frac{W_t*(height*12)^3}{3*E*I} + \frac{L_{inF}}{12} * \frac{(height*12)^4}{8*E*I}$$

$$M_{PDelta} = \frac{W_{top}}{12} * \delta$$

Σ Moments at top (M_{top}) (K*ft)	5275.53
Deflection TG1900 (in)	22.28
Total Deflection (in)	22.28
Moment caused by P-Delta	574.76

Weight of Tower Sections

	Weight	No. Sections	Total	Wt./lin. Ft.
TG2300	45.02	2.00	90.04	1.13
TG1900	11.5	7.00	80.5	0.84
Transition	17.1	1.00	17.1	1.26
		Total:	187.64	

Σ Moments and Forces on Tower Base (max. stressed member)

Check TG2300 leg at base

	IS Diag
Wb=	497.16
Mb=	6992.59
Hb=	12.57
Width of Sect.	11.05
Max. Comp.	571.67
Max. Tension	-323.09

Check TG1900 leg at transistion

	IS Diag
Wb=	497.16
Mb=	5709.75
Hb=	12.57
Width of Sect.	8.90
Max. Comp.	577.93
Max. Tension	-329.35

From Leg Calculations:	TG 2300	TG 1900	
Allowable Compression	883.74	696.35	Kip
Allowable Tension Force	987.00	780.00	Kip

Stress Check Allowable stress exceeds maximum stress. OK

13156.00.00 (TC)

1A Application Type

[X] New [ ] Renewal [ ] Amendment

1B Equipment Type

[ ] Mobile Crane [ ] Mobile Tower Crane [X] Fix / Climber Tower Crane [ ] Derrick [ ] Mast Climber [ ] Pile Driver

2 Location Information

Borough N/A Block N/A Lot N/A

Address South Waterfront Development, NJ (AKA Hoboken Bldg. B) Job Number

3A Crane / Derrick / Mast Climber / Pile Driver Information

	CD Number	Serial Number	Expiration Date
1	2187	76-G8-271C	
2	2961	76H1811C	
3			
4			
5			
6			

3B Configuration / Phase Information

	Mast (ft)	Boom (ft)	Jib (ft)	Total (ft)
1		240		240
2		240		240
3				
4				
5				
6				

4 Applicant Information

Name Lawrence Shapiro E-Mail
Title Vice President Lic #
Business Name Howard I. Shapiro & Associates
Address 303 Merrick Road - Suite 400
City Lynbrook State NY Zip 11563
Phone 516-791-2600 Fax 516-791-5425

5 Equipment User Information

Name Gerald Fahy E-Mail
Title Project Manager
Company Kenvil United Corp.
Address 60 N. Dell Avenue
City Kenvil State NJ Zip 07847
Phone (973) 927-0010 Fax

6 Statement and Signature

- This On-Site Inspection Certificate will only be used for the tower & mobile crane / derrick / mast climber / pile driver at the above mentioned site and conforms with approved plans.

6A Applicant's Statement

The applicant, having been authorized by the owner of the premises, building or structure, hereby makes application for the approval of the use of the tower & mobile crane / derrick / mast climber / pile driver described above to be used to the above mentioned site in accordance with the accompanying plans and specifications.

Name (please print)

Signature Date 8/28/13

Seal (apply seal, then sign and date over seal)

6B Equipment User's Statement

I hereby state that the above equipment will not be used until a valid On-Site Inspection is obtained.

Signature X Date 8/23/13

6C Crane Safety Coordinator's Statement

As a Professional Engineer or a person having at least five years of construction experience, I hereby certify that I will act as the designated safety coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoist areas. I shall also supervise compliance with this On-site Inspection Certificate and its drawings.

Name Gerald Fahy License Number
Address 60 N. Dell Avenue
City Kenvil State NJ Zip 07847
Phone (973) 927-0010 Fax
Signature X Date 8/23/13

6D Mast Climber Supervisor's Statement

I am a Professional Engineer or an experienced person qualified for the installation, dismantling, operation and maintenance of the equipment listed in section 3A above. I am aware that this equipment shall not be used as a personnel or material hoist.

Name License Number
Address
City State Zip
Phone Fax
Signature Date

Additional Information:

Internal Use Only

Date Received Invoice/Receipt Number	Fee Paid
Examiner's Name (please print)	Inspector's Name (please print)
Signature (Issuance) Date	Signature Date
Expiration date	Badge Number

13156.00.00 (TC)

Applicants Statement of Notification

Application Type: _____

Application No.: _____

Date filed: _____

Borough: N/A

Community Board.: N/A

Address: N/A

I, Lawrence K Shapiro, hereby state that in accordance with requirements, I will mail or fax a copy of this notice within 24 hours to the above Community Board regarding the filing of this project.

Signature	Date	Telephone number
	8/28/13	

Block: N/A Lot: N/A

Location: South Waterfront Development, NJ (AKA Hoboken Bldg. B)

1. Number of Stories N/A

2. Occupancy N/A
(Multiple Dwelling, Commercial, Garage, Stores and Offices, Store and Factory, Bank and Class A, Etc.)

3. No. of Apts. _____ Current _____ Proposed _____

3A. No. of SRO's. _____ Current _____ Proposed _____

4. Work Proposed Use of TG-1900T Tower Crane, CD#CD#2187 or CD#2961 to erect building.

5. Name and Address of

Applicant N/A Address N/A

Owner _____ Address _____

Architect _____ Address _____

Engineer _____ Address _____

13156.00.00 (TC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Work Platform #

#: TG-1900T Tower Crane, CD#2187 or 2961

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transportation. Mr/ Ms. Mike Braco, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue, Kenvil, NJ 07847

Signature of Owner or Contractor X

Date 8/23/13

Safety Coordinator

I, Mike Braco (NAME), am a P.E., R.A. or a person having at least 5 years of construction experience

I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name Mike Braco Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue, Kenvil, NJ 07847

Signature of Safety Coordinator X

Date 8/23/13

13156.00.00 (TC)

DESIGNATION OF SAFETY COORDINATOR

Crane / Derrick / Work Platform #: _____ #: TG-1900T Tower Crane, CD#2187 or 2961

Address / Borough: South Waterfront Development, NJ (AKA Hoboken Bldg. B) Block: N/A Lot: N/A

Owner or Contractor

I have been apprised of the requirements to provide flag person to stop pedestrian traffic when lifting over the sidewalk and to stop vehicular traffic when lifting over the roadway. I am also aware that closing of sidewalk or roadway or temporary obstruction of same requires concurrent approval from the Department of Transporatation. Mr/ Ms. Dave Cullen, representing the owner or contractor, has been designated as safety coordinator to ensure that these safety precautions are adhered to.

Name Gerald Fahy - Kenvil United Corp. Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Owner or Contractor X

Date 8/23/13

Safety Coordinator

I, Dave Cullen (NAME), am a P.E., R.A. or a person having at least 5 years of construction experience

I hereby certify that I will act as the designated Safety Coordinator and shall be responsible for the control of pedestrian and vehicular traffic within the designated hoisting areas. I will also supervise compliance with the Crane Notice Application and the drawings which form part of this On-Site Hoisting Device Application.

Name Dave Cullen Tel. No.: (973) 244-1410

Address: 60 N. Dell Avenue , Kenvil NJ 07847

Signature of Safety Coordinator X

Date 8/23/13

A continuing tradition of engineering service – since 1946
HOWARD I. SHAPIRO & ASSOCIATES Consulting Engineers, P.C.
303 Merrick Road (Suite 400), Lynbrook, NY 11563

Howard I. Shapiro, P.E.(1932-2007) Jay P. Shapiro, P.E. Lawrence K. Shapiro, P.E. William Chieco Heng Mun Loke, P.E. James Schield, P.E.

13156.00.00 TC

August 28th, 2013

Port Authority of NY & NJ

New York, NY 10007

Attention: Ms. Maureen Lynch-Jacobs

REFERENCE: **CRANE INSTALLATION AT South Waterfront Development, NJ (AKA Hoboken Bldg. B)**
TYPE: **TG-1900T TOWER CRANE, CD#2187 OR 2961**
WITH: **240 FT. BOOM**

Dear Ms. Lynch-Jacobs:

We have inspected the above site as required for the installation and operation of the above crane. We found that the building structure in the indicated area can safely sustain the imposed crane loads.

Very truly yours,

Lawrence K. Shapiro, P.E.

Tel. (516) 791-2600 e-mail: LKShapiro@HISAssoc.com FAX (516) 791-5425

EXEMPTION 4

HOWARD I. SHAPIRO & ASSOCIATES Consulting Engineers, P.C.
303 Merrick Road (Suite 400), Lynbrook, NY 11563

Howard I. Shapiro, P.E. (1932-2007) Jay P. Shapiro, P.E. Lawrence K. Shapiro, P.E. Heng Mun Loke, P.E. William Chieco James Schell, P.E.

August 14, 2013

13156.00.01

Grove GMK7550 FOR TOWER CRANE ERECTION

CRANE INSTALLATION
AT
HOBOKEN BUILDING B

FOR

WEIR WELDING COMPANY INC.

BY

Prepared by: MM

Howard I. Shapiro & Associates
Consulting Engineers, P.C.
303 Merrick Road Suite 400 Lynbrook, NY 11563
Tel (516) 791-2600 Fax (516) 791-5425

OR1

Outrigger Pad Loads - All Terrain - Results

Enter Email > Select Model > Configure Boom > Lift Details > Results

Model: Grove GMK7550 Mega Wing Lift w/ Hydraulic Luffing Jib (81 Deg.) - English

Boom Length: 179.2 ft [88-88-88-88]

Boom Extension Length: 101.7 ft

Boom Extension Offset: 0Â°

Counterweight: 264500# Cwt

Support Base: 28.7 x 29.2

Load Radius: 80 ft

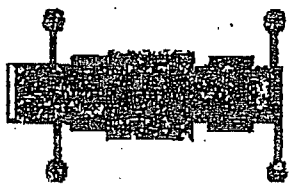
Load Weight: 0 lbs

Slew Angle: 0Â° = Directly Over Rear

Max Chart 75000 Load lbs =

Front Right: 177100 lbs

Front Left: 177100 lbs



Rear Right: 83700 lbs

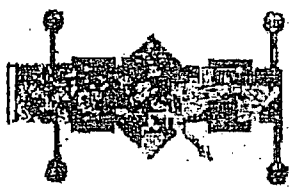
Rear Left: 83700 lbs

Slew Angle: 45Â° = Over Rear Left Outrigger

Max Chart 75000 Load lbs =

Front Right: 191800 lbs

Front Left: 135000 lbs



Rear Right: 133900 lbs

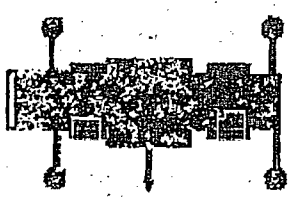
Rear Left: 60800 lbs

Slew Angle: 90Â° = Directly Over Left Side

Max Chart 75000 Load lbs =

Front Right: 170600 lbs

Front Left: 90300 lbs



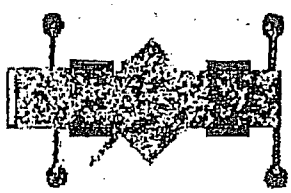
Rear Right: 182000 lbs

Rear Left: 78700 lbs

Slew Angle: 135Â° = Over Front Left Outrigger

Front Right: 125800 lbs

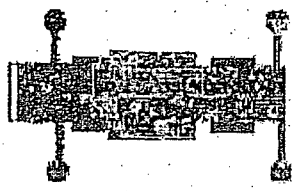
69000 lbs

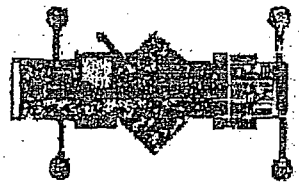


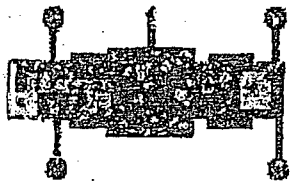
Rear Right: 199900 lbs

OR2

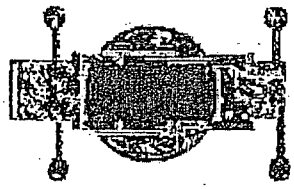
Max Chart Load = 75000 lbs	Front Left:			Rear Left: 126800 lbs

Slew Angle: 180Å° = Directly Over Front	Front Right:	83800 lbs		Rear Right: 177000 lbs
Max Chart Load = 75000 lbs	Front Left:	83800 lbs		Rear Left: 177000 lbs

Slew Angle: 225Å° = Over Front Right Outrigger	Front Right:	69000 lbs		Rear Right: 126800 lbs
Max Chart Load = 75000 lbs	Front Left:	125800 lbs		Rear Left: 199900 lbs

Slew Angle: 270Å° = Directly Over Right Side	Front Right:	90300 lbs		Rear Right: 78700 lbs
Max Chart Load = 75000 lbs	Front Left:	170600 lbs		Rear Left: 182000 lbs

Slew Angle: 315Å° = Over Rear Right Outrigger	Front Right:	135000 lbs		Rear Right: 60800 lbs
Max Chart Load = 75000 lbs	Front Left:	191800 lbs		Rear Left: 133900 lbs

Slew Angle: Maximum Outrigger Pad Loads	Front Right:	191800 lbs		Rear Right: 199900 lbs
Max Chart Load = 75000 lbs	Front Left:	191800 lbs		Rear Left: 199900 lbs

OR

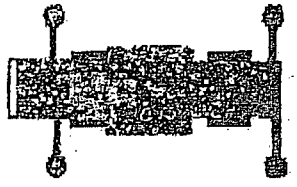
Outrigger Pad Loads - All Terrain - Results

Enter Email > Select Model > Configure Boom > Lift Details > Results

Model: Grove GMK7550 Mega Wing Lift w/ Hydraulic Luffing Jib (81 Deg.) - English
Boom Length: 163.4 ft [88-88-88-44]
Boom Extension Length: 101.7 ft
Boom Extension Offset: 0°
Counterweight: 264500# Cwt
Support Base: 28.7 x 29.2
Load Radius: 90 ft
Load Weight: 61860 lbs

Slew Angle: 0° = Directly Over Rear

Front Right: 94676 lbs



Rear Right: 197032 lbs

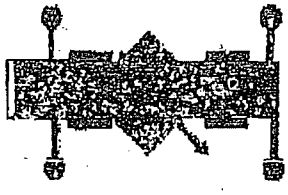
Max Chart Load = 79000 lbs

Front Left: 94676 lbs

Rear Left: 197032 lbs

Slew Angle: 45° = Over Rear Left Outrigger

Front Right: 78959 lbs



Rear Right: 143531 lbs

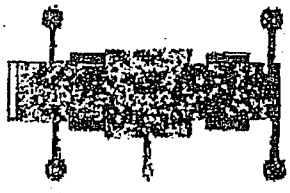
Max Chart Load = 79000 lbs

Front Left: 139407 lbs

Rear Left: 221384 lbs

Slew Angle: 90° = Directly Over Left Side

Front Right: 101545 lbs



Rear Right: 92316 lbs

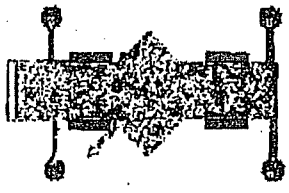
Max Chart Load = 79000 lbs

Front Left: 187053 lbs

Rear Left: 202346 lbs

Slew Angle: 135° = Over Front Left Outrigger

Front Right: 149191 lbs



Rear Right: 73300 lbs

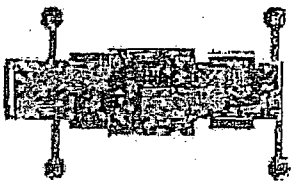
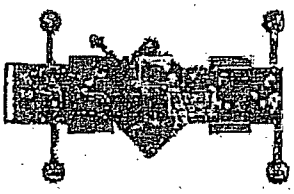
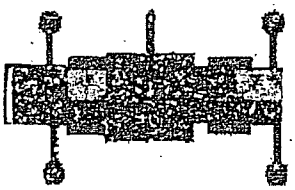
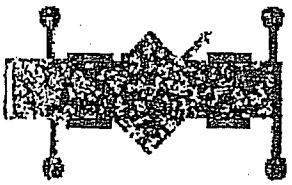
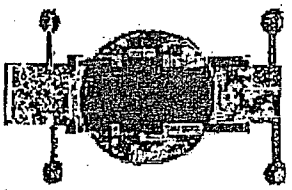
Max Chart 79000 lbs

Front Left: 209638 lbs

Rear Left: 151131 lbs

OR4

Load
=

Slew Angle: 180° = Directly Over Front	Front Right: 194000 lbs		Rear Right: 97708 lbs	
Max Chart 79000 Load lbs =	Front Left: 194000 lbs		Rear Left: 97708 lbs	
Slew Angle: 225° = Over Front Right Outrigger	Front Right: 209638 lbs		Rear Right: 151131 lbs	
Max Chart 79000 Load lbs =	Front Left: 149191 lbs		Rear Left: 73300 lbs	
Slew Angle: 270° = Directly Over Right Side	Front Right: 187053 lbs		Rear Right: 202346 lbs	
Max Chart 79000 Load lbs =	Front Left: 101545 lbs		Rear Left: 92316 lbs	
Slew Angle: 315° = Over Rear Right Outrigger	Front Right: 139407 lbs		Rear Right: 221384 lbs	
Max Chart 79000 Load lbs =	Front Left: 78959 lbs		Rear Left: 143531 lbs	
Slew Angle: Maximum Outrigger Pad Loads	Front Right: 209638 lbs		Rear Right: 221384 lbs	
Max Chart 79000 Load lbs =	Front Left: 209638 lbs		Rear Left: 221384 lbs	

Back | Start Over

OR5

Outrigger Pad Loads - All Terrain - Results

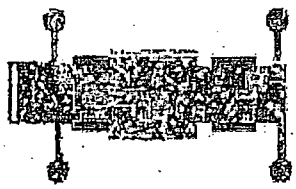
Enter Email > Select Model > Configure Boom > Lift Details > Results

Model: Grove GMK7550 Mega Wing Lift w/ Hydraulic Luffing Jib (81 Deg.) - English
Boom Length: 179.2 ft [88-88-88-88]
Boom Extension Length: 101.7 ft
Boom Extension Offset: 0°
Counterweight: 264500# Cwt
Support Base: 28.7 x 29.2
Load Radius: 90 ft
Load Weight: 43005 lbs

Slew Angle: 0° = Directly Over Rear

Max Chart Load = 68000 lbs

Front Right: 117423 lbs
Front Left: 117423 lbs

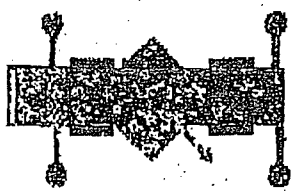


Rear Right: 164880 lbs
Rear Left: 164880 lbs

Slew Angle: 45° = Over Rear Left Outrigger

Max Chart Load = 68000 lbs

Front Right: 110273 lbs
Front Left: 137836 lbs

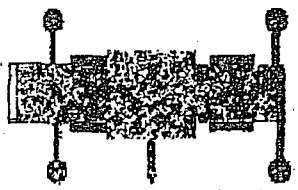


Rear Right: 140440 lbs
Rear Left: 175992 lbs

Slew Angle: 90° = Directly Over Left Side

Max Chart Load = 68000 lbs

Front Right: 120583 lbs
Front Left: 159606 lbs



Rear Right: 117100 lbs
Rear Left: 167289 lbs

Slew Angle: 135° = Over Front Left Outrigger

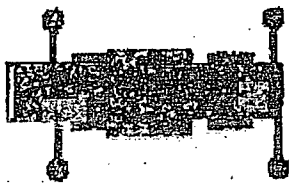
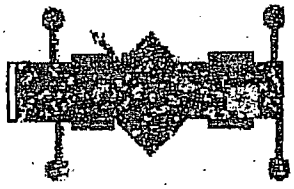
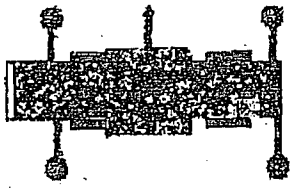
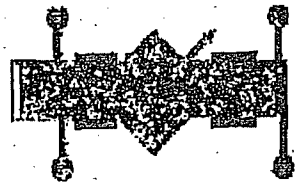
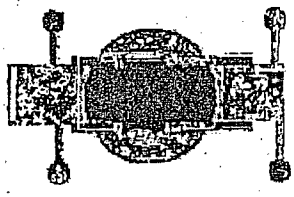
Max Chart = 68000 lbs

Front Right: 142317 lbs
Front Left: 169879 lbs

Rear Right: 108460 lbs
Rear Left: 143912 lbs

OR$_c$

Load
=

Slew Angle: 180° = Directly Over Front	Front Right:	162730 lbs		Rear Right: 119536 lbs
Max Chart 68000 Load lbs =	Front Left:	162730 lbs		Rear Left: 119536 lbs
Slew Angle: 225° = Over Front Right Outrigger	Front Right:	169879 lbs		Rear Right: 143912 lbs
Max Chart 68000 Load lbs =	Front Left:	142317 lbs		Rear Left: 108460 lbs
Slew Angle: 270° = Directly Over Right Side	Front Right:	159606 lbs		Rear Right: 167289 lbs
Max Chart 68000 Load lbs =	Front Left:	120583 lbs		Rear Left: 117100 lbs
Slew Angle: 315° = Over Rear Right Outrigger	Front Right:	137836 lbs		Rear Right: 175992 lbs
Max Chart 68000 Load lbs =	Front Left:	110273 lbs		Rear Left: 140440 lbs
Slew Angle: Maximum Outrigger Pad Loads	Front Right:	169879 lbs		Rear Right: 175992 lbs
Max Chart 68000 Load lbs =	Front Left:	169879 lbs		Rear Left: 175992 lbs

Back | Start Over

OR7

Outrigger Pad Loads - All Terrain - Results

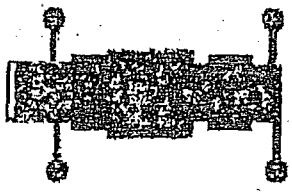
Enter Email > Select Model > Configure Boom > Lift Details > Results

Model: Grove GMK7550 Mega Wing Lift w/ Hydraulic Luffing Jib (70 Deg.) - English
Boom Length: 179.2 ft [88-88-88-88]
Boom Extension Length: 101.7 ft
Boom Extension Offset: 0°
Counterweight: 264500# Cwt
Support Base: 28.7 x 29.2
Load Radius: 130 ft
Load Weight: 38320 lbs

Slew Angle: 0° = Directly Over Rear

Max Chart Load = 47000 lbs

Front Right: 55274 lbs
Front Left: 55274 lbs

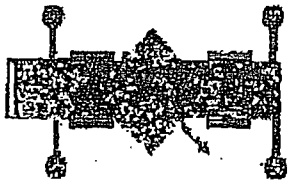


Rear Right: 224386 lbs
Rear Left: 224386 lbs

Slew Angle: 45° = Over Rear Left Outrigger

Max Chart Load = 47000 lbs

Front Right: 28861 lbs
Front Left: 130682 lbs

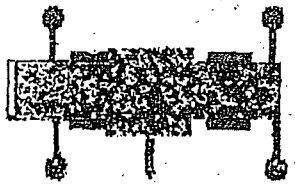


Rear Right: 134314 lbs
Rear Left: 265446 lbs

Slew Angle: 90° = Directly Over Left Side

Max Chart Load = 47000 lbs

Front Right: 66941 lbs
Front Left: 210863 lbs

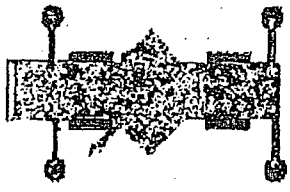


Rear Right: 48055 lbs
Rear Left: 233462 lbs

Slew Angle: 135° = Over Front Left Outrigger

Max Chart 47000 lbs

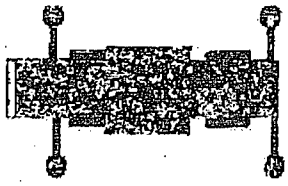
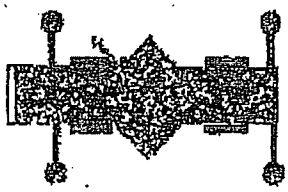
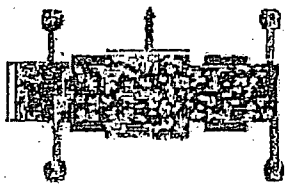
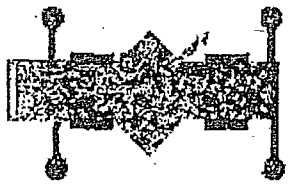
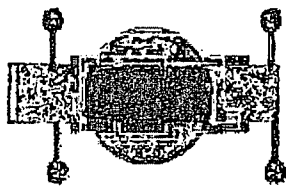
Front Right: 138316 lbs
Front Left: 257811 lbs



Rear Right: 24877 lbs
Rear Left: 138316 lbs

OR

Load
=

Slew Angle: 180° = Directly Over Front	Front Right: 222529 lbs		Rear Right: 57049 lbs	
Max Chart 47000 Load lbs =	Front Left: 222529 lbs		Rear Left: 57049 lbs	
Slew Angle: 225° = Over Front Right Outrigger	Front Right: 257811 lbs		Rear Right: 138316 lbs	
Max Chart 47000 Load lbs =	Front Left: 138316 lbs		Rear Left: 24877 lbs	
Slew Angle: 270° = Directly Over Right Side	Front Right: 210863 lbs		Rear Right: 233462 lbs	
Max Chart 47000 Load lbs =	Front Left: 66941 lbs		Rear Left: 48055 lbs	
Slew Angle: 315° = Over Rear Right Outrigger	Front Right: 130682 lbs		Rear Right: 265446 lbs	
Max Chart 47000 Load lbs =	Front Left: 28861 lbs		Rear Left: 134314 lbs	
Slew Angle: Maximum Outrigger Pad Loads	Front Right: 257811 lbs		Rear Right: 265446 lbs	
Max Chart 47000 Load lbs =	Front Left: 257811 lbs		Rear Left: 265446 lbs	

Max Outrigger Reaction!
Use 270 kips!

Back | Start Over

OR

Outrigger Pad Loads - All Terrain - Results

Enter Email > Select Model > Configure Boom > Lift Details > Results

Model: Grove GMK7550 Mega Wing Lift w/ Hydraulic Luffing Jib (70 Deg.) - English

Boom Length: 179.2 ft [88-88-88-88]

Boom Extension Length: 101.7 ft

Boom Extension Offset: 0°

Counterweight: 264500# Cwt

Support Base: 28.7 x 29.2

Load Radius: 160 ft

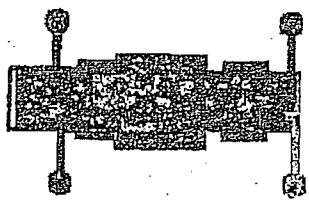
Load Weight: 21120 lbs

Slew Angle: 0° = Directly Over Rear

Max Chart 36000 Load lbs =

Front Right: 72468 lbs

Front Left: 72468 lbs



Rear Right: 198692 lbs

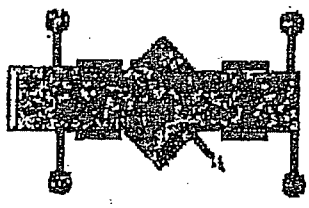
Rear Left: 198692 lbs

Slew Angle: 45° = Over Rear Left Outrigger

Max Chart 36000 Load lbs =

Front Right: 52629 lbs

Front Left: 128944 lbs



Rear Right: 131291 lbs

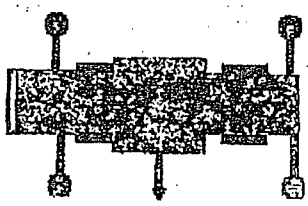
Rear Left: 229456 lbs

Slew Angle: 90° = Directly Over Left Side

Max Chart 36000 Load lbs =

Front Right: 81181 lbs

Front Left: 189023 lbs



Rear Right: 66629 lbs

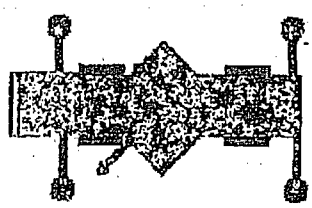
Rear Left: 205487 lbs

Slew Angle: 135° = Over Front Left Outrigger

Max Chart 36000 Load lbs

Front Right: 132460 lbs

Front Left: 226275 lbs



Rear Right: 51460 lbs

Rear Left: 132025 lbs

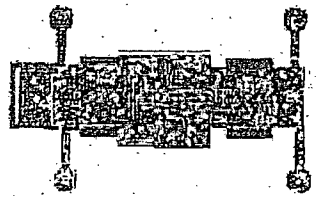
=

Slew Angle: 180° = Directly Over Front

Max Chart 36000 Load lbs =

Front Right: 197736 lbs

Front Left: 197736 lbs



Rear Right: 73424 lbs

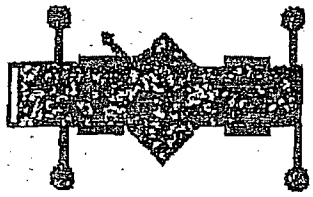
Rear Left: 73424 lbs

Slew Angle: 225° = Over Front Right Outrigger

Max Chart 36000 Load lbs =

Front Right: 226275 lbs

Front Left: 132460 lbs



Rear Right: 132025 lbs

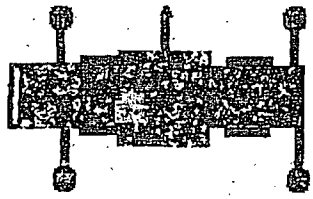
Rear Left: 51460 lbs

Slew Angle: 270° = Directly Over Right Side

Max Chart 36000 Load lbs =

Front Right: 189023 lbs

Front Left: 81181 lbs



Rear Right: 205487 lbs

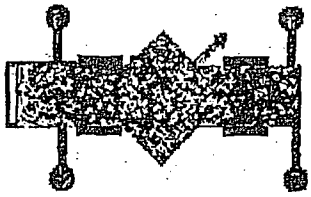
Rear Left: 66629 lbs

Slew Angle: 315° = Over Rear Right Outrigger

Max Chart 36000 Load lbs =

Front Right: 128944 lbs

Front Left: 52629 lbs



Rear Right: 229456 lbs

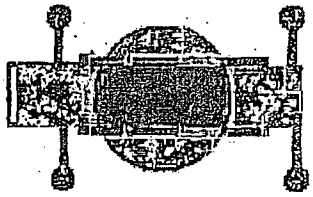
Rear Left: 131291 lbs

Slew Angle: Maximum Outrigger Pad Loads

Max Chart 36000 Load lbs =

Front Right: 226275 lbs

Front Left: 226275 lbs



Rear Right: 229456 lbs

Rear Left: 229456 lbs

Back Start Over

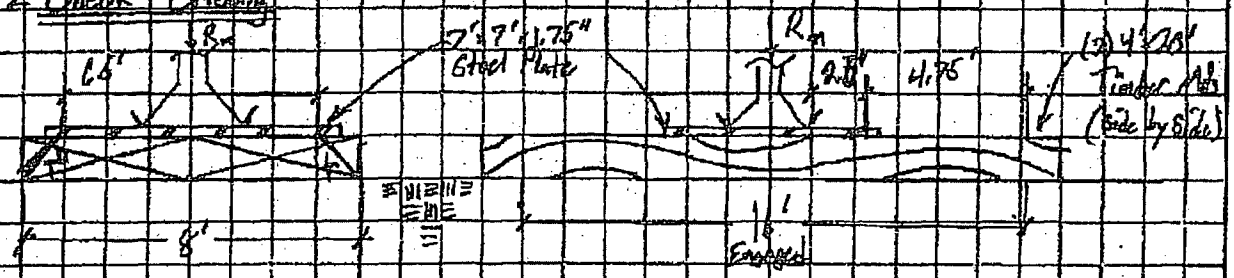
HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Suite 400
LYNBROOK, NEW YORK 11563
(516) 791-2600
staff@hisassoc.com

JOB: 13156.00.01
SHEET NO. 1 OF
CALCULATED BY: MM DATE: 8/14/13
CHECKED BY: DATE:
SCALE:

1 Max Outrigger Reaction

As per manufacturer data, $R_m = 270^k$!

2 Check Cribbing



Check Top Steel Plate: $W_{op} = \frac{270^k}{6.5' \times 1.5'} = 2.4\,ksf$

$M = 2.4 \times \frac{(2.0')^2}{8} \times 12 = 164\,k\text{-in}/ft$

$S = 2(1.75")^2 = 6.125\,in^3$

$f_b = M/S = 26.1\,ksi < F_b = 27\,ksi$ OK!

Check Timber Mats $W_m = \frac{270^k}{4' \times 16'} = 2.11\,ksf = 2110\,psf < 3.5\,ksf$ OK!

Bearing: $f_b = 3 \times 2110 \times \frac{(4.75')^2}{144} = 992\,psi < 2200\,psi$ OK!

Shear: $v = 1.5 \times 2110 \times \frac{(4.75' - 1')}{144} = 92.4\,psi < 100\,psi$ OK!

	Crane with 264 500 lbs (120 t) counterweight (outrigger base 28.7 x 29.2 ft)				
	Luffing jib 101.7 ft / 0° (*)				
	Main boom angle 81°				
	Main boom - fixed length in ft				
	115.9	131.7	147.6	163.4	179.2
Tel. sec. I	0.88	0.88	0.88	0.88	0.88
Tel. sec. II	0.88	0.88	0.88	0.88	0.88
Tel. sec. III	0.00	0.44	0.88	0.88	0.88
Tel. sec. IV	0.00	0.00	0.00	0.44	0.88
Slewing range	360°				
Radius in feet	Lifting capacities in 1000 lbs				
55.0	107.0				
60.0	107.0	104.0			
65.0	107.0	104.0			
70.0	107.0	104.0	101.0		
75.0	107.0	104.0	98.0	85.0	
80.0	107.0	104.0	94.0	83.0	75.0
85.0	107.0	104.0	91.0	81.0	71.0
90.0	104.0	103.0	89.0	79.0	68.0
95.0	98.0	97.0	87.0	78.0	65.0
100.0	93.0	91.0	85.0	76.0	62.0
105.0	88.0	88.0	84.0	74.0	60.0
110.0	81.0	81.0	79.0	71.0	57.0
115.0		77.0	75.0	68.0	54.0
120.0				65.0	51.0
125.0					49.0
130.0					46.0
SLI Code	4361				
Max. permitted windspeed	7 m/s				

(*)

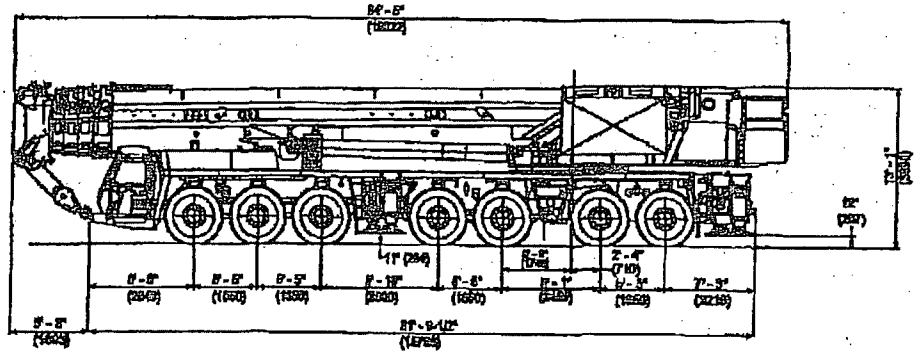
- The " length of the luffing jib " only gives the length of the part which can be derricked.
- For the determination of the entire length of the boom system, the " main boom fixed length ", the length of the fixed point part (2.90 m / 9.5 ft), as well as the length of the luffing jib have to be considered.
- The offset of the jib head section (part in front of suspension) is 0 degree.

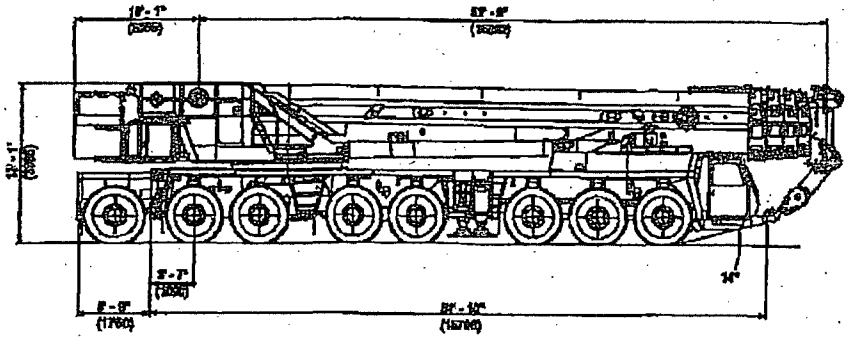
	Crane with 264 500 lbs (120 t) counterweight (outrigger base 28.7 x 29.2 ft)				
	Luffing jib 101.7 ft / 0° (*)				
	Main boom angle 70°				
	Main boom - fixed length in ft				
	115.9	131.7	147.6	163.4	179.2
Tel. sec. I	0.88	0.88	0.88	0.88	0.88
Tel. sec. II	0.88	0.88	0.88	0.88	0.88
Tel. sec. III	0.00	0.44	0.88	0.88	0.88
Tel. sec. IV	0.00	0.00	0.00	0.44	0.88
Slewing range	360°				
Radius in feet	Lifting capacities in 1000 lbs				
100.0	79.0				
105.0	74.0	72.0			
110.0	70.0	67.0			
115.0	66.0	64.0	61.0		
120.0	62.0	60.0	57.0	55.0	
125.0	59.0	57.0	54.0	52.0	49.0
130.0	56.0	54.0	52.0	50.0	47.0
135.0	53.0	51.0	49.0	47.0	46.0
140.0		49.0	47.0	45.0	43.4
145.0			44.0	42.6	41.4
150.0			42.2	40.6	39.4
155.0				38.8	37.6
160.0					36.0
SLI Code	4481				
Max. permitted windspeed	7 m/s				

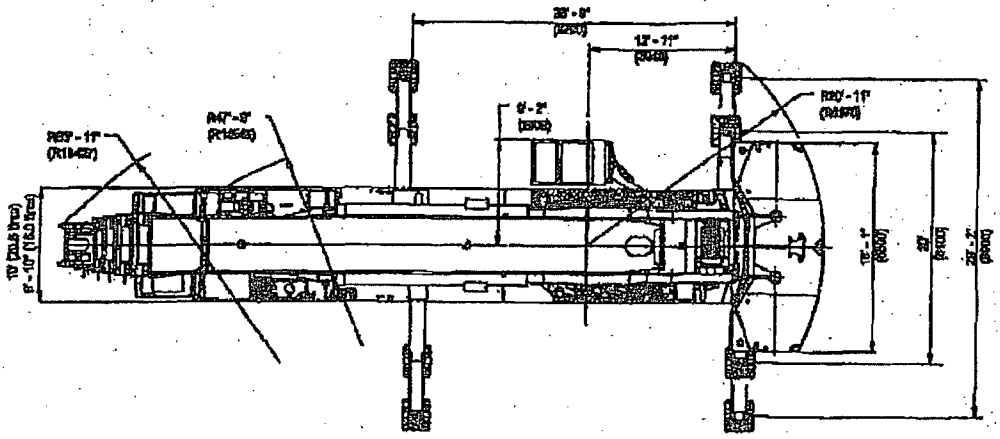
(*)

- The " length of the luffing jib " only gives the length of the part which can be derricked.
- For the determination of the entire length of the boom system, the " main boom fixed length ", the length of the fixed point part (2.90 m / 9.5 ft), as well as the length of the luffing jib have to be considered.
- The offset of the jib head section (part in front of suspension) is 0 degree.

dimensions







GMK 7550

GROVE

specifications

Superstructure

Boom

53 ft. - 197 ft. (16 m - 60 m) five section, full power boom with patented TWIN-LOCK™ boom pinning system. Maximum tip height: 207 ft. (63 m).

Boom Elevation

Two lift cylinders with safety valves provide boom angles from -3° to +82°.

Lattice Jib

Luffing jib is a lattice design with lengths of 82 ft. -240 ft. (25 m - 73 m) in sections of 20 ft. (6 m). The luffing jib converts to a fixed offset lattice jib providing lengths of 39 ft. -230 ft. (12 m - 70 m) offsettable at 3° and 25°.

Load Moment & Anti-Two Block System

Graphic display load moment and anti-two block system with audio/visual warning and control lever lockout. These systems provide electronic display of boom angle, length, radius, tip height, relative load moment, maximum permissible load, load indication and warning of impending two-block condition.

Cab

All aluminum construction cab is tiltable (approximately 20°) and includes safety glass and adjustable operator's seat with hydraulic suspension. Other features include engine dependent hot water heater, air conditioning, armrest integrated crane controls, and ergonomically arranged instrumentation. Cab hydraulically stows to the rear of the superstructure for highway travel.

Swing

3 axial piston fixed displacement motors provide swing speed of 0 - 1 RPM thru planetary gear box. Also provided is a spring applied, hydraulically released automatic swing brake with foot operated release for free swing.

Counterweight

264,500 lbs. (120 Tonnes) consisting of various sections with hydraulic installation/removal system (see counterweight configuration on page 8).

Engine

Mercedes OM906LA, diesel, 6 cylinders, water cooled, turbocharged, 255 HP (190 kW) at 1800 rpm. Max. torque: 811 ft./lbs. (1100 Nm) at 1300 rpm. Engine emission: EUROMOT/EPA/CARB (off highway).

Fuel Tank Capacity

79 gal. (300 L).

Hydraulic System

5 separate circuits, 3 axial piston variable displacement pumps with electronic power limiting control, 1 axial piston variable displacement pump for slewing and 1 fixed displacement pump for auxiliary gears. Standard thermostatically controlled oil cooler keeps oil at optimum operating temperature. Tank capacity: 428 gal. (1620 L)

Control system

Full electronic control of all crane movements is accomplished using electrical control levers with automatic reset to zero. Controls are integrated with the LMI and engine management system by CAN-BUS.

Hoist

Main and auxiliary hoist are powered by axial piston variable displacement motor with planetary gear and brake. "Thumb-thumper" hoist drum rotation indicator alerts operator of hoist movement.

	Main Auxiliary	Auxiliary
Line length:	1608 ft. (490 m)	2,264 ft. (690 m)
Rope diameter:	24 mm	24 mm
Line speed:	443 ft/min (135 m/min)	443 ft/min (135 m/min)
Line pull:	24,729 lbs. (110 kN)	24,729 lbs. (110 kN)

Electrical system

24 V system with three-phase alternator 28 V/100 A
2 batteries 12 V/170 Ah.

* Optional equipment

* Engine-independent hot water heater, with engine pre-heater
* Second spotlight
* Stereo/CD player
* Lift enhancement system
* 360° positive swing lock

* Denotes optional equipment

GMK7550

GROVE

HOWARD I. SHAPIRO & ASSOCIATES Consulting Engineers, P.C.
303 Merrick Road (Suite 400), Lynbrook, NY 11563

Howard I. Shapiro, P.E. (1932-2007) Jay P. Shapiro, P.E. Lawrence K. Shapiro, P.E. Henn Mun Loke, P.E. William Chiaco James Schekl, P.E.

September 20, 2013

13156.00.01 REV1

Terex RT175 FOR ASSISTING TOWER CRANE ERECTION

ASSIST CRANE INSTALLATION
AT
HOBOKEN BUILDING B

FOR

WEIR WELDING COMPANY INC.

BY

Prepared by: MM

Howard I. Shapiro & Associates
Consulting Engineers, P.C.
303 Merrick Road Suite 400 Lynbrook, NY 11563
Tel (516) 791-2600 Fax (516) 791-5425

9/20/13

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Suite 400
LYNBROOK, NY 11563
staff@hisassoc.com
(516) 791-2600

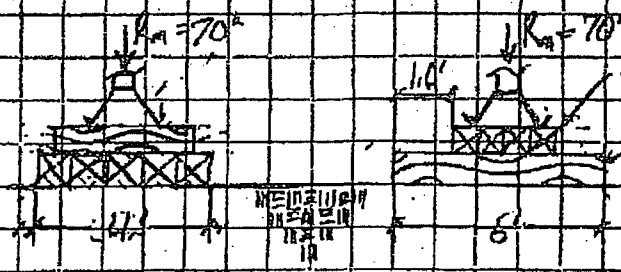
JOB: 13156.00.01 (AC)
SHEET NO.: 1 OF:
CALCULATED BY: MM DATE: 9/20/13
CHECKED BY: DATE:
SCALE:

1 Max Outrigger Reaction

Max outrigger reaction = 0.6 × (99.2k + 15.25k) = 68 kips → Use 70 kips

2 Check Cribbing

Opt. 1:



Check 10"×10" Timbers:

$W_r = \frac{70^k}{1.0' \times 8'} = 8.5\,ksf$, $M = 8.5\,ksf \times \frac{(1.0')^2}{2} \times 12''/ft = 53.8\,k\text{-}in/ft$

$S = 12''/ft \times (9.5'')^2/6 = 188.2\,in^3/ft$, $f_b = M/S = 4.3\,ksi < 1.2\,ksi$ OK!

$V = 8.5\,ksf \times \left(1.0' - \frac{9.5''}{12''}\right) = 2.63\,k/ft$

$v = \frac{1.5 \times 2.63\,k/ft}{12''/ft \times 9.5''} \times 1000\,lb/k = 139\,psi < 180\,psi$ OK!

Opt. 2: See p.23 for validation

HOWARD. I. SHAPIRO & ASSOCIATES
Consulting engineers, P.C.
303 Merrick Road, suite 400
LYNBROOK, NEW YORK 11563
(516) 791-2600
Fax (516) 791-5425

Job Number		13156.00.01	
Calculated by	MM	Date	09/20/13
Checked by		Date	

STEEL PLATE STRESS

A. Equipment

- Terex RT175

B. Outrigger load

The Maximum Outrigger Reaction is known :

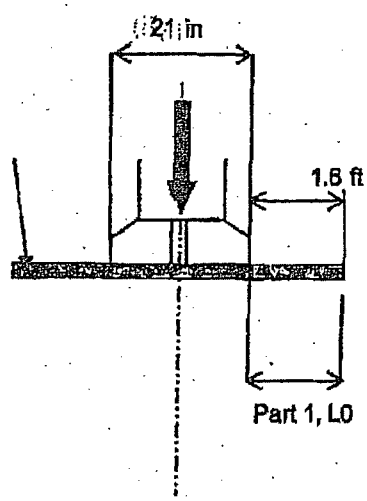
Critical outrigger load L = *70* Kips

C. Cribbing

Steel Plate :

5 ' x 5 ' x 1 " thick

S=2 In3



HOWARD. I. SHAPIRO & ASSOCIATES
Consulting engineers, P.C.
303 Merrick Road, suite 400
LYNBROOK, NEW YORK 11563
(516) 791-2600
Fax (516) 791-5425

Job Number		13156.00.01	
Calculated by	MM	Date	09/20/13
Checked by		Date	

D. Steel Plate Stress

$$P = \frac{70}{5' \times 5'} = 2.8 \text{ ksf}$$

$$S = 2 \times t_{sp}^2 = 2 \text{ in}^3$$

$$M = \frac{P \times L_o^2}{2} \times 12 = 44.4 \text{ K-in/ft}$$

Constant (for steel)	
Fy (KSI)	36
Fb (KSI)	27

As per AISC, 9th Edition, p.5-48, Section F2.1:
Fb = 0.75 * Fy

$$\sigma = \frac{6 \times P \times L_o^2}{2 \times t_{sp}^2} = \frac{M}{S}$$

L_o= Length of part 1
t_{sp} = Thickness of Steel Plate

σ= 22 KSI < 27 KSI Ok !

4 SECTION BOOM: LOAD RATINGS OVER 360° WITH OUTRIGGERS FULLY EXTENDED

40.5 to 95 ft. Boom

CHART 1

POWERED BOOM LENGTH IN FEET															
RADIUS IN FEET	40.5		45		55		65		75		85		95		RADIUS IN FEET
	∠°	POUNDS	∠°	POUNDS	∠°	POUNDS	∠°	POUNDS	∠°	POUNDS	∠°	POUNDS	∠°	POUNDS	
10	68	160000	71	102000	75	95000									10
12	65	116000	68	100000	73	94700	78	80500							12
15	60	92500	64	91700	69	89000	73	73500	76	61000					15
20	52	69800	58	69500	63	69000	68	64000	72	65700	74	48200	76	40000	20
25	41	55700	48	55200	57	54600	63	54000	68	48500	71	42200	73	38300	25
30	28	46400	38	46000	51	45300	58	45000	63	44500	67	39000	70	34000	30
35			25	38000	43	35600	52	35400	59	35000	63	33400	67	30200	35
40					34	28300	46	28000	54	27600	59	27200	64	26900	40
45					23	24800	40	23200	49	23100	55	22500	60	21900	45
50							32	20700	43	21000	51	21200	56	18800	50
55							21	17200	37	17500	44	17700	52	17600	55
60									30	14700	41	14900	48	15100	60
65									20	12400	35	12600	44	12800	65
70											28	10800	39	10900	70
75											19	9200	33	9400	75
80													27	8000	80
85													18	6800	85

MINIMUM BOOM ANGLE (DEGREES) FOR INDICATED BOOM LENGTH (NO LOAD)	-2°
MAXIMUM BOOM LENGTH (FEET) AT -2° BOOM ANGLE (NO LOAD)	128

LIFTING CAPACITIES ON OUTRIGGERS - OVER 360° AT 0° BOOM ANGLE								
AREA OF OPERATION	BOOM ANGLE	MAIN BOOM LENGTH IN FEET						
		40.5	45	55	65	75	85	95
OVER 360°	0	24800	20500	16600	11700	9200	6600	4700

Stability loads Do not exceed 85%
15200 lb Total Counterweight
LMI Code #04

105 to 126 ft. Boom

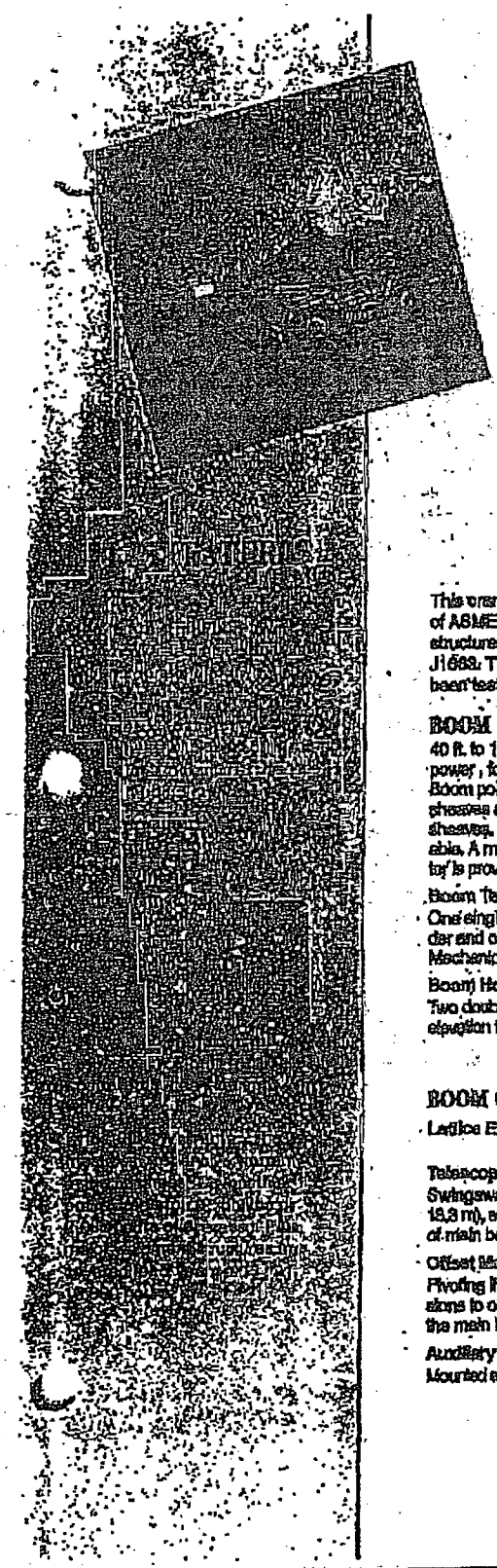
CHART 2

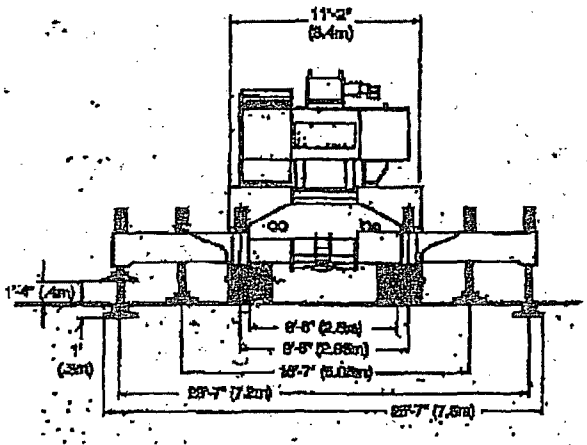
POWERED BOOM LENGTH IN FEET							
RADIUS IN FEET	105		116		126		RADIUS IN FEET
	∠°	POUNDS	∠°	POUNDS	∠°	POUNDS	
25	78	33500	77	32000			25
30	73	31000	75	26500	77	26000	30
35	70	28000	72	25000	74	22500	35
40	67	24900	70	22900	72	20800	40
45	64	21100	67	20300	70	18900	45
50	60	18400	64	17900	67	17100	50
55	57	17200	61	16000	65	15500	55
60	54	16200	58	15300	62	14100	60
65	50	12500	55	13100	59	13200	65
70	46	11100	51	11200	56	11300	70
75	42	9600	48	9600	53	9700	75
80	37	8100	44	8300	50	8400	80
85	32	7000	40	7100	47	7200	85
90	28	6000	36	6100	43	6200	90
95			31	5200	39	5300	95
100					35	4500	100
110					25	3100	110

MINIMUM BOOM ANGLE (DEGREES) FOR INDICATED BOOM LENGTH (NO LOAD)	-4°
MAXIMUM BOOM LENGTH (FEET) AT -4° BOOM ANGLE (NO LOAD)	126

LIFTING CAPACITIES ON OUTRIGGERS - OVER 360° AT 0° BOOM ANGLE				
AREA OF OPERATION	BOOM ANGLE	MAIN BOOM LENGTH IN FEET		
		105	116	126
OVER 360°	0	8000	0	0

Stability loads Do not exceed 85%
15200 lb Total Counterweight
LMI Code #04





This crane meets the requirements of ASME B30.5. The machine structure has been tested per SAE J1653. The machine stability has been tested per SAE J765.

BOOM

40 ft. to 126 ft. (12.2 m to 38.4 m), full power, four-section telescopic boom. Boom point has five non-metallic main sheaves and two non-metallic idler sheaves. Metallic sheaves are available. A mechanical boom angle indicator is provided.

Boom Telescope:
One single stage double acting cylinder and chain crowd mechanism. Mechanically synchronized boom.

Boom Hoist:
Two double-acting cylinders provide elevation from -2 degrees to 78 degrees.

BOOM OPTIONS

Lattice Extension:

Telescopic Lattice Extension:
Swingaway, 38 ft. to 60 ft. (12.2 m to 18.3 m), self-storing on the base section of main boom.

Offset Mechanism:
Pivoting links which allow lattice extensions to offset 17 or 30 degrees from the main boom.

Auxiliary Boom Point:
Mounted at boom point with single sheave.

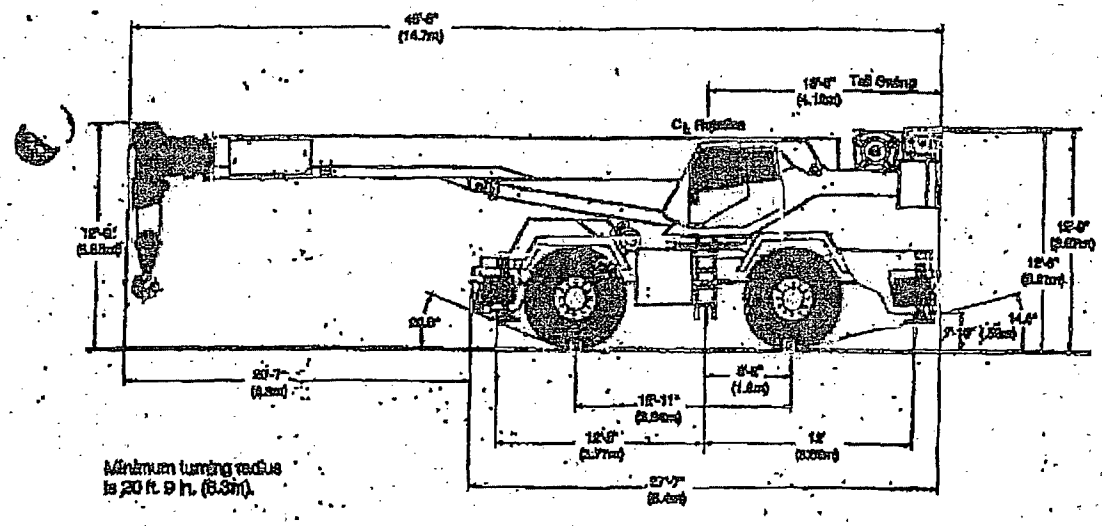
COUNTERWEIGHT

16,200 lbs. (8395 kg) bolt-on type.

CAB

All-weather environmental cab of steel has locking door and opening ceiling, side, and rear windows with tinted safety glass throughout. Operator's cloth-covered seat is fully adjustable and has shock-absorbing suspension and seat belt. Steering column tilts and telescopes for comfort. Cab is cushion-mounted for vibration dampening and noise reduction. Contains all loading and crane function controls including armrest-mounted joystick or twin lever controls for swing, auxiliary winch, main winch, and boom hoist. Foot pedals for swing brake, boom telescope, service brakes and engine throttle.

Front console includes gauges for engine water temperature, engine oil pressure, hydraulic oil temperature, transmission oil temperature, air pressure and fuel. Also includes hourmeter, speedometer, tachometer, voltmeter, winch high speed indicator, rear steer centering light, engine-condition warning system, anti-two block device and electronic LMI. Additional cab equipment includes windshield wiper and washer, defroster fan, interior cab light, fire extinguisher, machine level gauge, electric horn and hand throttle.



Minimum turning radius is 20 ft. 9 in. (6.3m).

WINCH

2030:
Two-speed with bent axis piston motor, planetary gearing with equal speed power raising and lowering, and infinitely variable speed control. Has automatic multi-disc brake and drum turn indicator.

Drum Capacity:
780 ft. (238 m) of 3/4 in. (19 mm) wire rope.

Wire Rope:
550 ft. (167 m) of 3/4 in. (19 mm) diameter, 6x37 EIPS with 7x7 IWRC.

Line Pull (Max):
22,410 lbs. (10168 kg) first layer, low speed. 16,845 lbs. (7640 kg) fifth layer.

Line Pull (Max available for starting loads in mid-air):
15,000 lbs. (6802 kg) fifth layer.

Line Speed (Max):
441 fpm (134 mpm) fifth layer, high speed.

HOISTING OPTIONS

Auxiliary Winch:
1560 two-speed with bent axis piston motor, planetary gearing with equal speed power raising and lowering, and infinitely variable speed control. Has automatic multi-disc brake and drum turn indicator. Wire rope is optional.

Drum Capacity:
554 ft. (168 m) of 3/4 in. (19 mm) wire rope.

Line Pull (Max):
18,282 lbs (8291 kg) first layer, low speed. 13,223 lbs (5997 kg) fifth layer. Maximum available line for starting loads in mid-air 11,000 lbs (4991 kg) fifth layer.

Line Speed (Max):
631 fpm (192 mpm) fifth layer, high speed.

Auxiliary Winch:
Same as main winch. Wire rope is optional.

Auxiliary Winch Wire Rope:
550 ft. (168 m) of 3/4 in. (19 mm) diameter, 6x37 EIPS with 7x7 IWRC or rotation resistant 8x19 EIPS with 7x7 IWRC.

Cable Spooling Device:
For main or auxiliary winches.

Hook Blocks:
75 ton (68 tonne) with five sheaves; or 20 ton (18 tonne) with one sheave.

Headache Ball:
8.5 ton (7.7 tonne) weighted hook.

SWING UNIT

360 degree continuous rotation to 2.1 rpm with disc brake, integral with swing reducer.

House Lock:
Manually engaged 360 degree house lock.

HYDRAULIC SYSTEM:

System uses two tandem gear-type pumps with a total flow of 142 gpm (538 lpm). Filtration is by two 7-micron return line filters externally mounted to the reservoir and one 20-micron pressure line filter. An oil cooler and manual disconnect are standard.

Oil Reservoir:
177 gallon (670 liter) capacity.

CARRIER

Outriggers:
Independent, out and down type with control from the cab. Outriggers may be set in three positions with full extensions to 23 ft. 7 in. (7.2m). Front to rear spread is 24 ft. 6 in. (7.4 m).

Outrigger Floats:
21 in. (533 mm) square with storage on carrier.

Front Axle:
Planetary drive/steer, rigid mounted.

Rear Axle:
Planetary drive/steer, mounted on oscillating cradle with hydraulic lockout cylinders. Oscillation is ± 5.2 in. (132 mm). Oscillation lockout override control. Drive disconnect for two-wheel drive operation.

Service Brakes:
Dual circuit, air over hydraulic drum brakes at each wheel.

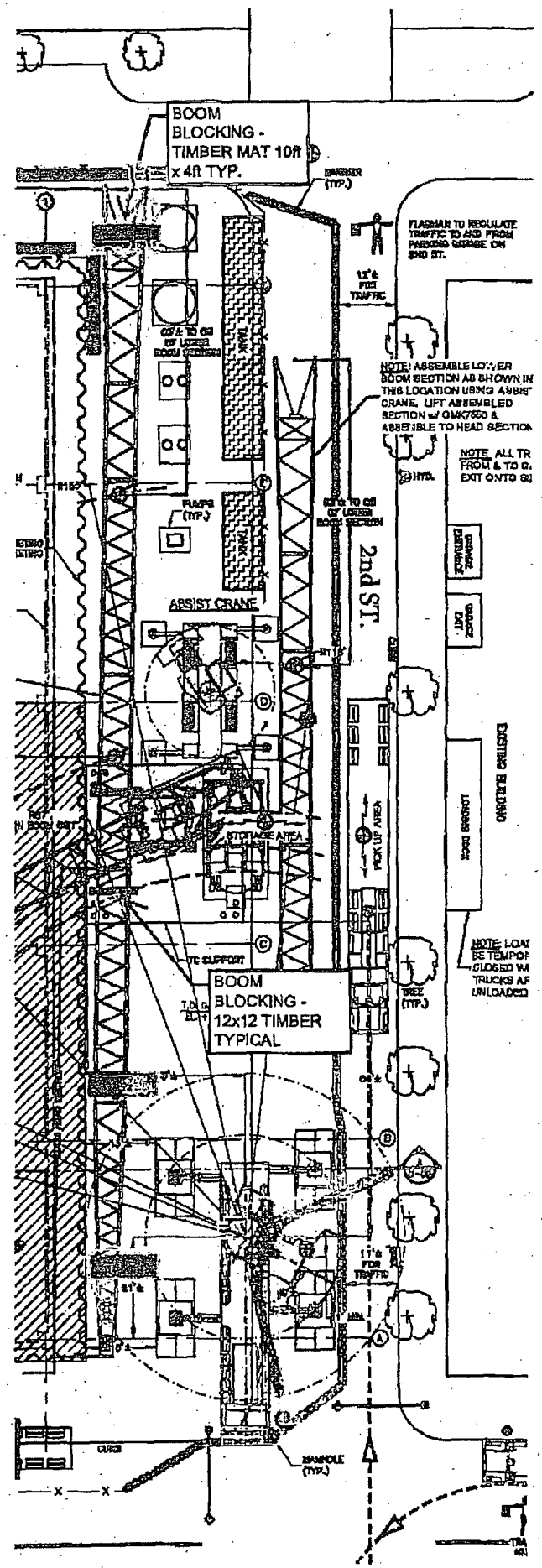
Parking Brakes:
Drum brake on rear axle input shaft.

Steering:
Hydrostatic power steering, front and rear axles. Control modes for front only, four-wheel crawl and crab steering, all controlled by the steering wheel. Switch for independent rear steer. Minimum turning radius is 20 ft. 9 in. (6.3 m).

Tires:
28.5x25-28PR tubeless with rock tread (E-3).

Tire Options:
Spare tire with rim.
Tire inflation kit.

(continued on back)


BOOM BLOCKING - TIMBER MAT 10ft x 4ft TYP.
FLAGMAN TO REGULATE TRAFFIC TO AND FROM PARKING GARAGE ON 2ND ST.
12'± FOR TRAFFIC
NOTE: ASSEMBLE LOWER BOOM SECTION AS SHOWN IN THIS LOCATION USING ASSIST CRANE. LIFT ASSEMBLED SECTION w/ GMK7550 & ASSEMBLE TO HEAD SECTION
NOTE: ALL TR FROM & TO D EXIT ONTO 2ND
PUMPS (TYP.)
2nd ST.
ASSIST CRANE
STORAGE AREA
PICK UP AREA
EXISTING BUILDING
NOTE: LOAD BE TEMPOR CLOSED W TRUCKS AR UNLOADED
BOOM BLOCKING - 12x12 TIMBER TYPICAL
TREE (TYP.)
12'± FOR TRAFFIC
MANHOLE (TYP.)

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Suite 400
LYNBROOK, NEW YORK 11563
(516) 791-2600
staff@hisassoc.com

JOB B156.00.01 TC Beam Loading
SHEET NO. 4 OF
CALCULATED BY T.C. DATE 9/30/17
CHECKED BY DATE
SCALE

A' x 12' long blocking

B_1 = 10.5 kips (2.63 psf max)

weight of section 1 20,900 lbs
= 20.9 kips

Section 1

B_2 = 10.5 kips
TC footing

B_3 = 3.4 kips

Section 2

B_4 = 6.7 kips
weight of section 2: 13.4 kips

B_5 = 3.4 kips
Blocking

load on blocking B_1: $P_{B_1} = \frac{20.9}{2} = 10.5$ kips

load on TC blocking B_2: $P_{B_2} = 10.5$ kips

B_3: $P_{B_3} = \frac{13.4}{4} = 3.4$ kips

HOWARD I. SHAPIRO & ASSOCIATES
Consulting Engineers, P.C.
303 Merrick Road, Suite 400
LYNBROOK, NEW YORK 11563
(516) 791-2600
staff@hisassoc.com

JOB B156.00.01-TC Boom Loading
SHEET NO. 2 OF
CALCULATED BY T.C DATE 9/30/15
CHECKED BY DATE
SCALE

load on blocking B4 : $P_{B4} = 6.7$ kips

load on blocking B5 : $P_{B5} = 3.4$ kips

The maximum pressure under the lower mat supporting the boom

$$W_{BB} = \frac{10.5\text{ kip}}{4 \times 10'} = 263 \text{ psf}$$

Average width of the boom

The maximum pressure from the boom is 263 psf under its supports. The loading is localized. This either placed at the corner of the opening, on the TC foundation or in an area partially excavated.

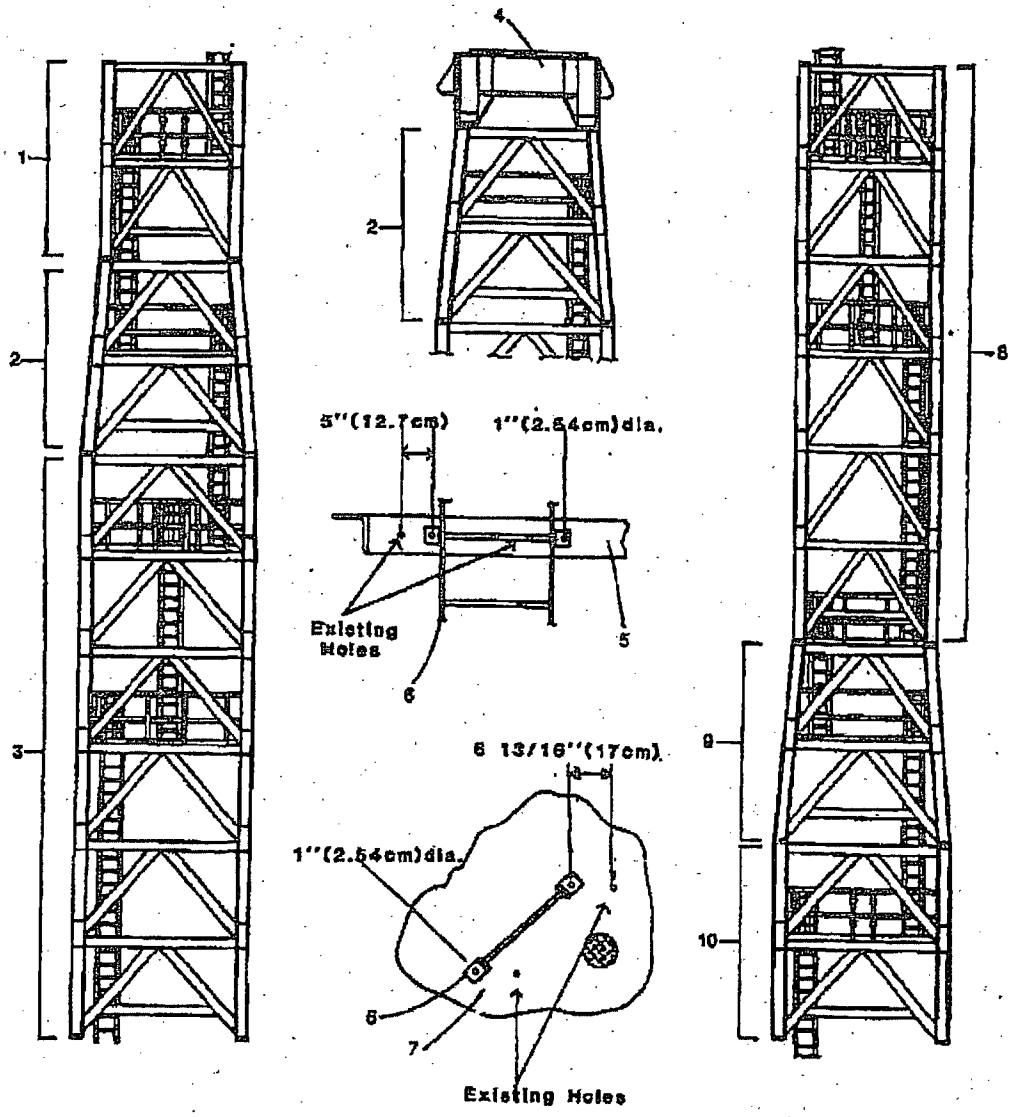


Fig. 2-2
Transition Tower Section (Optional)

(1) Tower Section, 13' 7-1/2" (4.15m) X 9'-9" (2.97m)
(2) Transition Section Without Top Ladder And Platform.
(3) Tower Section, 40' (12m) X 12' (3.6m)
(4) Turntable Bearing Mtg. Base
(5) Angle
(6) Ladder
(7) Platform
(8) Tower Section, 40' (12m) X 9'-9" (2.97m)
(9) Transition Section With Top Ladder And Platform
(10) Tower Section, 13' 7-1/2" (4.15m) X 12' (3.6m)

CERTIFIED TESTING & INSPECTIONS, INC.

TESTING • INSPECTIONS • ENGINEERING

Date: 07-09-13
CD # 1850
Report # 235

CLIENT: Cranes Inc.
53-20 44th Street
Maspeth, NY 11378

SUBJECT: Magnetic Particle Inspection 100% of All welds on 14 Sections of boom on FMC Linkbelt Crane Model # TG1900 Serial # 76H3-107C in accordance with New York City Building Code Specifications. Tests were performed at 1640 New Market Ave. & 2298 Middlesex Ave. S. Plainsfied, NJ on 07-09-13

TEST METHOD AND PROCEDURE: Magnetic Particle Inspection was accomplished using 'white line' portable magnetic particle machine and using the dry powder and prod methods of inspection. All areas are inspected from two planes to insure 100% coverage. All test results are based at time of inspection.

RESULTS:
X INDICATES WELD LOCATION.

DISTANCE FROM REAR OF SECTION	TOP RIGHT CORD	BOTTOM RIGHT CORD	TOP LEFT CORD	BOTTOM LEFT CORD
#12826 40' Heel Section 0'3" through 39'9"	X Accepted	X Accepted	X Accepted	X Accepted
#1900-TB1 50' Boom Section 0'3" through 49'9"	X Accepted	X Accepted	X Accepted	X Accepted
#1900-TB2 50' Head Section 0'3" through 49'9"	X Accepted	X Accepted	X Accepted	X Accepted
#127734 30' Boom Section 0'3" through 29'9"	X Accepted	X Accepted	X Accepted	X Accepted
#88110 40' Boom Section 0'3" through 39'9"	X Accepted	X Accepted	X Accepted	X Accepted
#7540 40' Boom Section 0'3" through 39'9"	X Accepted	X Accepted	X Accepted	X Accepted
#67901 40' Tower Section 0'3" through 39'9"	X Accepted	X Accepted	X Accepted	X Accepted
#TS1850-1 40' Tower Section 0'3" through 39'9"	X Accepted	X Accepted	X Accepted	X Accepted
#TS1850-2 40' Tower Section 0'3" through 39'9"	X Accepted	X Accepted	X Accepted	X Accepted

Respectfully submitted,
CERTIFIED TESTING & INSPECTIONS, INC.

Joseph Cuozzo
NDE – Level III

All reports are confidential property of clients, and information contained may not be published or reproduced, pending our written approval.

P.O. Box 116 • Florence, NJ 08518 • 609.239.0994 • FAX 609.239.2118

CERTIFIED TESTING & INSPECTIONS, INC.

TESTING • INSPECTIONS • ENGINEERING

CLIENT: Cranes Inc.
53-20 44th Street
Maspeth, NY 11378

Date: 07-09-13
CD # 1850
Report # 235

RESULTS:
X INDICATES WELD LOCATION.

DISTANCE FROM REAR OF SECTION	TOP RIGHT CORD	BOTTOM RIGHT CORD	TOP LEFT CORD	BOTTOM LEFT CORD
#1850-AF 45' A-Frame				
0'3" through 44'9"	X Accepted	X Accepted	X Accepted	X Accepted
#CW107-1 12' Counterweight				
0'3" through 11'9"	X Accepted	X Accepted	X Accepted	X Accepted
#CW107-2 12' Counterweight				
0'3" through 11'9"	X Accepted	X Accepted	X Accepted	X Accepted
#CW107-3 12' Counterweight				
0'3" through 11'9"	X Accepted	X Accepted	X Accepted	X Accepted
#CW107-4 12' Counterweight				
0'3" through 11'9"	X Accepted	X Accepted	X Accepted	X Accepted

Respectfully submitted,
CERTIFIED TESTING & INSPECTIONS, INC.

Joseph Cuozzo
NDE -- Level III

All reports are confidential property of clients, and information contained may not be published or reproduced, pending our written approval.

P.O. Box 116 • Florence, NJ 08518 • 609.239.0994 • FAX 609.239.2118

CERTIFIED TESTING & INSPECTIONS, INC.

TESTING • INSPECTIONS • ENGINEERING

MAGNETIC PARTICLE INSPECTION

CLIENT: Cranes Inc. DATE: 07-09-13 REPORT# 235MT
JOB #: WEATHER: Hot & Sunny
JOB LOCATION: 1640 New Market Avenue & 2298 Middlesex Avenue – South Plainfield, NJ
CREW: C.P.
SHIFT TIME: 7:00 A.M. to 3:00 P.M. HOURS REG: 8 STAND BY: OT
REQUESTED BY: PHONE #:
CLIENT SIGNATURE, NUMBER & DEPT.:

EQUIPMENT: Contour Probe - DA400 MANUFACTURER: Parker Research
S/N: 9809 CALIBRATION DATE: 08-15-12
MEDIA: Dry Powder MANUFACTURER: Magnavis BATCH #: 11B041
METHOD YOKE: XX PROD: COIL: CIR: LONG: XX
DRY: XX FLOURESCENT:
PART DESCRIPTION: FMC Link-Belt TG1900
PART S/N: 76H3-107C / CD#1850
PROCEDURE: CTI-MT-001
ACCEPTANCE CRITERIA: CTI-MT-001 AWS D1.1

JOB OR DRAWING#	PIECE#	SERIAL #	ACCEPT	REJECT	DEFECT LOCATION	DEFECT TYPE
40' Heel Section	12826	76H3-107C	X			
50' Boom Section	1900-TB1	76H3-107C	X			
50' Head Section	1900-TB2	76H3-107C	X			
30' Boom Section	127734	76H3-107C	X			
40' Boom Section	88110	76H3-107C	X			
40' Boom Section	7540	76H3-107C	X			
40' Tower Section	67901	76H3-107C	X			
40' Tower Section	TS1850-1	76H3-107C	X			
40' Tower Section	TS1850-2	76H3-107C	X			
45' A-Frame	1850-AF	76H3-107C	X			
12' Counterweight	CW107-1	76H3-107C	X			
12' Counterweight	CW107-2	76H3-107C	X			
12' Counterweight	CW107-3	76H3-107C	X			
12' Counterweight	CW107-4	76H3-107C	X			

REMARKS: All test results are based at time of inspection.

Respectfully submitted,
CERTIFIED TESTING & INSPECTIONS, INC.

Joseph Cuozzo
President/NDE – Level III

All reports are confidential property of clients, and information contained may not be published or reproduced, pending our written approval.

P.O. Box 116 • Florence, NJ 08518 • 609.239.0994 • FAX 609.239.2118

CERTIFIED TESTING & INSPECTIONS, INC.

TESTING • INSPECTIONS • ENGINEERING

Date: 09-20-13
CD # 1850
Report # 83

CLIENT: Federated Crane Co.
1640 New Market Ave.
S. Plainsfield, NJ

SUBJECT: Magnetic Particle Inspection 100% of All welds on 8 Sections of boom on FMC Linkbelt Crane Model # TG1900 Serial # 76H3-107C in accordance with New York City Building Code Specifications. Tests were performed at 1640 New Market Ave., S. Plainfield, NJ on 09-20-13

TEST METHOD AND PROCEDURE: Magnetic Particle Inspection was accomplished using 'white line' portable magnetic particle machine and using the dry powder and prod methods of inspection. All areas are inspected from two planes to insure 100% coverage. All test results are based at time of inspection.

RESULTS:
X INDICATES WELD LOCATION.

DISTANCE FROM REAR OF SECTION	TOP RIGHT CORD	BOTTOM RIGHT CORD	TOP LEFT CORD	BOTTOM LEFT CORD
#107802 40'0" Tower Section				
0'3" through 39'9"	X Accepted	X Accepted	X Accepted	X Accepted
#TGT13-028 13'7" Tower Section				
0'3" through 13'4"	X Accepted	X Accepted	X Accepted	X Accepted
#118101 13'9 ½" Transition Tower Section				
0'3" through 13'6 ½"	X Accepted	X Accepted	X Accepted	X Accepted
#48152 20' Boom Section				
0'3" through 19'9"	X Accepted	X Accepted	X Accepted	X Accepted
#2630 1'9" Starter Stool				
0'3" through 1'6"	X Accepted	X Accepted	X Accepted	X Accepted
#2631 1'9" Starter Stool				
0'3" through 1'6"	X Accepted	X Accepted	X Accepted	X Accepted
#2632 1'9" Starter Stool				
0'3" through 1'6"	X Accepted	X Accepted	X Accepted	X Accepted
#2633 1'9" Starter Stool				
0'3" through 1'6"	X Accepted	X Accepted	X Accepted	X Accepted

REMARKS: Visual inspection was also performed on the items listed above.

Respectfully submitted,
CERTIFIED TESTING & INSPECTIONS, INC.

Joseph Cuozzo
President / NDE-Level III

All reports are confidential property of clients, and information contained may not be published or reproduced, pending our written approval.

P.O. Box 116 • Florence, NJ 08518 • 609.239.0994 • FAX 609.239.2118

CERTIFIED TESTING & INSPECTIONS, INC.

TESTING • INSPECTIONS • ENGINEERING

MAGNETIC PARTICLE INSPECTION

CLIENT: Federated Crane DATE: 09-20-13 REPORT# 83MT
JOB #: WEATHER:
JOB LOCATION: 1640 New Market Ave., S. Plainfield, NJ
CREW: S.K.M.
SHIFT TIME: 7:00 AM to 3:00 AM HOURS REG: 8 STAND BY: OT
REQUESTED BY: PHONE #:
CLIENT SIGNATURE, NUMBER & DEPT.:

EQUIPMENT: Contour Probe DA400 MANUFACTURER: Parker Research
S/N: 19457 CALIBRATION DATE: 12-10-12
MEDIA: Dry Powder MANUFACTURER: Magnaflux BATCH #: 10K064
METHOD YOKE: X PROD: COIL: CIR: X LONG: X
DRY: X FLOURESCENT:
PART DESCRIPTION: FMC Linkbelt TG1900
PART S/N: 76H3-107C / CD#1850
PROCEDURE: CTI-MT-001
ACCEPTANCE CRITERIA: CTI-MT-001 / AWS D1.1

JOB OR DRAWING#	PIECE#	SERIAL #	ACCEPT	REJECT	DEFECT LOCATION	DEFECT TYPE
40' Tower Section	107802	76H3-107C	X			
13'7" Tower Section	TGT13-028	76H3-107C	X			
13'9 ½" Transition Tower Section	118101	76H3-107C	X			
20' Boom Section	48152	76H3-107C	X			
1'9" Starter Stool	2630	76H3-107C	X			
1'9" Starter Stool	2631	76H3-107C	X			
1'9" Starter Stool	2632	76H3-107C	X			
1'9" Starter Stool	2633	76H3-107C	X			

REMARKS: All test results are based at the time of inspections.
Visual inspection was also performed on the items listed above.

Respectfully submitted,
CERTIFIED TESTING & INSPECTIONS, INC.

Joseph Cuozzo
President / NDE-Level III

All reports are confidential property of clients, and information contained may not be published or reproduced, pending our written approval.

P.O. Box 116 • Florence, NJ 08518 • 609.239.0994 • FAX 609.239.2118

Federated Crane Co., L.L.C.
1640 New Market Avenue South Plainfield NJ 07080
Phone: (917) 797 –3441
Fax: (908) 941-5142

October 1, 2013

Port Authority of NY & NJ
115 Broadway
8th Floor
New York, NY 10006

Attn: Ms. Maureen Lynch- Jacobs

Re: Qualifications of Maintance Personal

Dear Maureen,

This letter is in response to your inquiry regarding the qualifications of the Maintenance personnel of Federated Crane employees.

Wayne Data who is our service manager has been under my supervision for the last twenty four years. He has also worked with Tom Kanzler for the last twelve years.

Tom Kanzler is one of the most respected Mechanical Engineers with regard to the TG series tower cranes in North America.

Personally I have been involved with the TG series tower cranes for the past thirty five years.

Federated Crane and its employees are the highest qualified people in North America currently servicing the TG series tower cranes.

Regards,

Michael Schiavoni
Federated Crane Co. LLC