STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

VIA ELECTRONIC MAIL

April 9, 2019

William Stone
Real Estate Specialist
Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

RE: **EM-T-MOBILE-011-190308** – T-Mobile notice of intent to modify an existing telecommunications facility located at 28 Brewer Drive, Bloomfield, Connecticut.

Dear Mr. Stone:

The Connecticut Siting Council (Council) is in receipt of your correspondence of April 4, 2019, submitted in response to the Council's March 13, 2019 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/emr

Robidoux, Evan

From: Stone, William <William.Stone@crowncastle.com>
Sent: Thursday, April 04, 2019 9:19 AM
To: Robidoux, Evan
Cc: CSC-DL Siting Council
Subject: RE: Council Incomplete Letter for EM-T-MOBILE-011-190308-BrewerDr-Bloomfield
Attachments: 876329_APP#446055_Revised SA.pdf; 876329_APP#446055 _Rev0.MountModificationDesign_PASS_TMobile__107ft.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Good morning Evan,

Revised structural analysis and mount analysis attached. I will be sending originals overnight.

Thank you!

WILL STONE
Real Estate Specialist
T: (518) 373-3543 | M: (518) 210-0495 I F: (724) 416-6581

CROWN CASTLE
3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065
Crowncastle.com

From: "Robidoux, Evan" <Evan.Robidoux@ct.gov>
Date: March 18, 2019 at 8:22:09 AM EDT
To: "'Barbadora, Jeff'" <Jeff.Barbadora@crowncastle.com>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: Council Incomplete Letter for EM-T-MOBILE-011-190308-BrewerDr-Bloomfield

Please see the attached correspondence.

Evan Robidoux
Clerk Typist
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

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PAUL J. FORD & COMPANY

Date: **March 22, 2019**

Denice Nicholson
Crown Castle
3 Corporate Park Drive Suite 101
Clifton Park, NY 12065

Paul J. Ford and Company
250 East Broad st., Suite 600
Columbus, OH 43215
(614) 221-6679

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11278A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876329
	Crown Castle Site Name:	MTN. VIEW CEM. (FILLEY PARK)
	Crown Castle JDE Job Number:	512592
	Crown Castle Work Order Number:	1660464
	Crown Castle Order Number:	446055 Rev. 1
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37518-2442.005.7805 (Revised to 2018 CSBC)
Site Data:	**28 Brewer Dr., BLOOMFIELD, Hartford County, CT**	
	Latitude *41° 50' 6.57"*, Longitude *-72° 44' 28.2"*	
	120 Foot - Monopole Tower	

Dear Denice Nicholson,

Paul J. Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

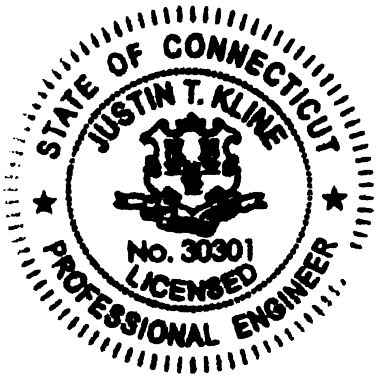
LC 4.7: Modified Structure w/ Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph from the 2018 Connecticut State Building Code per section 1609.3 and Appendix N. Standard references and design criteria are listed in Section 2 – Analysis Criteria.

All modifications and equipment proposed in this report shall be installed in accordance with the proposed modifications drawings, referenced in Table 3 of this report, for the determined available structural capacity to be effective.

Respectfully submitted by:

Gowtham Penumatsa
Structural Designer
gpenumatsa@pauljford.com



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1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by ROHN in October of 1996. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

TIA-222 Revision: TIA-222-G
Risk Category: II
Ultimate Wind Speed: 125 mph
Exposure Category: C
Topographic Factor: 1
Ice Thickness: 1 in
Wind Speed with Ice: 50 mph
Service Wind Speed: 60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
107.0	108.0	3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe	12 1	1-5/8 1-3/8
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
	107.0	1	cci tower mounts	Platform Mount [LP 712-1]		
		1	Mount Modification	SitePro1 PRK-1245L & HR12-U		
48.0	50.0	1	gps	GPS_A	1	1/2
	48.0	1	tower mounts	Side Arm Mount [SO 701-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
118.0	120.0	3	alcatel lucent	TD-RRH8X20-25	1 3 2	5/8 1-1/4 1/2
		1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe		
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
		3	rfs celwave	IBC1900BB-1		
		3	rfs celwave	IBC1900HG-2A		
	118.0	1	cci tower mounts	Platform Mount [LP 502-1]		
	116.0	1	andrew	VHLP1-18		
		1	andrew	VHLP1-23-DW1		
		2	dragonwave	HORIZON COMPACT		
114.0	115.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	-	-
	114.0	1	cci tower mounts	Pipe Mount [PM 602-3]		
	113.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER		
99.0	100.0	6	cci antennas	TPX-070821	12 4 2	7/8 3/4 3/8
		3	communication components inc.	DTMABP7819VG12A		
		3	ericsson	RRUS 11		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 8843 B2/B66A		
		6	quintel technology	QS66512-2 w/ Mount Pipe		
		1	raycap	DC6-48-60-18-8C		
		1	raycap	DC6-48-60-18-8F		
	99.0	1	cci tower mounts	Platform Mount [LP 502-1]		
59.0	59.0	1	tower mounts	Side Arm Mount [SO 701-1]	-	-

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti P.E.; P.C.	1529722	CCISITES
4-POST-MODIFICATION INSPECTION	B+T Group, 79582, 11/03/2008	2343686	CCISITES
4-POST-MODIFICATION INSPECTION	GPD Group, 2011111.27, 05/31/2011	4092494	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals, Inc.	6693484	CCISITES
4-POST-MODIFICATION INSPECTION	TUV Rheinland Industrial Solutions, Inc.	6898999	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, 4963307, 10/11/1996	1616549	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn, 34738/SW, 10/23/1996	2158527	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions, 080063.01, 01/22/2008	2205450	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group, 79582, 11/03/2008	2343687	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Group, 20111111.27, 05/31/2011	2917489	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37516-0115.006.7700, 08/18/2016	6413631	CCISITES
4-PROPSOED REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37518-2442.004.7700, 10/10/2018	7922716	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Monopole was modified in conformance with the referenced modification drawings.
5) Reinforcement from documents CCI# 6898999, 2205450, 4092494 are partially found ineffective and are not considered in the analysis. Please see attached designed drawings for the existing reinforcement considered in this analysis.
6) In accordance with discussions with CCI Corporate Engineering: Based on the assumption that the monopole manufacturer (ROHN/PiRod) has designed the flange plates at splices to adequately develop the full capacity of the unreinforced shaft section using unpublished and/or proprietary methodologies, we are assuming that if our analysis shows that both the existing shaft and the existing flange bolts are at a usage capacity of 100% or less, then the existing flange plates are at a usage capacity of 100% or less and no additional analysis of the flange plate is required.

7) It is assumed that the welded bridge stiffeners at 30' elevation takes all the loads and no load is shared between the original flange connection.
8) Monopole will be modified in conformance with the attached proposed modification drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
120 - 115	Pole	TP24x24x0.25	Pole	7.2%	Pass
115 - 110	Pole	TP24x24x0.25	Pole	16.5%	Pass
110 - 105	Pole	TP24x24x0.25	Pole	30.9%	Pass
105 - 100	Pole	TP24x24x0.25	Pole	48.5%	Pass
100 - 95	Pole	TP24x24x0.25	Pole	71.4%	Pass
95 - 90	Pole	TP24x24x0.25	Pole	94.8%	Pass
90 - 85	Pole	TP24x24x0.375	Pole	75.3%	Pass
85 - 80	Pole	TP24x24x0.375	Pole	90.8%	Pass
80 - 79.75	Pole + Reinf.	TP24x24x0.625	Reinf. 1 Tension Rupture	78.2%	Pass
79.75 - 78.5	Pole + Reinf.	TP24x24x0.625	Reinf. 1 Tension Rupture	81.6%	Pass
78.5 - 78.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	51.1%	Pass
78.25 - 73.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	59.7%	Pass
73.25 - 68.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	68.6%	Pass
68.25 - 68	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	69.1%	Pass
68 - 67.75	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	66.8%	Pass
67.75 - 62.75	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	75.7%	Pass
62.75 - 60	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	80.6%	Pass
60 - 59.75	Pole + Reinf.	TP30x30x0.675	Pole	59.5%	Pass
59.75 - 54.75	Pole + Reinf.	TP30x30x0.675	Pole	66.7%	Pass
54.75 - 49.75	Pole + Reinf.	TP30x30x0.675	Pole	74.0%	Pass
49.75 - 45.42	Pole + Reinf.	TP30x30x0.675	Pole	80.5%	Pass
45.42 - 45.17	Pole + Reinf.	TP30x30x0.8375	Pole	67.0%	Pass
45.17 - 40.17	Pole + Reinf.	TP30x30x0.8375	Pole	73.4%	Pass
40.17 - 36.42	Pole + Reinf.	TP30x30x0.8375	Pole	78.4%	Pass
36.42 - 36.17	Pole + Reinf.	TP30x30x1	Pole	67.1%	Pass
36.17 - 32.75	Pole + Reinf.	TP30x30x1	Pole	71.0%	Pass
32.75 - 32.5	Pole + Reinf.	TP30x30x3.025	Reinf. 10 Compression	44.8%	Pass
32.5 - 32.25	Pole + Reinf.	TP30x30x3.525	Reinf. 10 Compression	40.9%	Pass
32.25 - 30	Pole + Reinf.	TP30x30x3.525	Reinf. 10 Compression	42.4%	Pass
30 - 28.66	Pole + Reinf.	TP36x36x2.225	Reinf. 10 Compression	37.0%	Pass
28.66 - 28.41	Pole + Reinf.	TP36x36x1.45	Reinf. 10 Compression	53.1%	Pass
28.41 - 26.75	Pole + Reinf.	TP36x36x1.45	Reinf. 10 Compression	54.5%	Pass
26.75 - 26.5	Pole + Reinf.	TP36x36x0.7125	Pole	75.1%	Pass
26.5 - 21.5	Pole + Reinf.	TP36x36x0.7125	Pole	81.0%	Pass
21.5 - 21	Pole + Reinf.	TP36x36x0.7125	Pole	81.6%	Pass
21 - 20.75	Pole + Reinf.	TP36x36x0.975	Pole	61.3%	Pass
20.75 - 15.75	Pole + Reinf.	TP36x36x0.975	Pole	65.9%	Pass
15.75 - 10.75	Pole + Reinf.	TP36x36x0.975	Pole	70.5%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
10.75 - 5.75	Pole + Reinf.	TP36x36x0.975	Pole	75.2%	Pass
5.75 - 2	Pole + Reinf.	TP36x36x0.975	Pole	78.7%	Pass
2 - 1.75	Pole + Reinf.	TP36x36x1.15	Reinf. 9 Connection	70.6%	Pass
1.75 - 0	Pole + Reinf.	TP36x36x1.15	Reinf. 9 Connection	72.1%	Pass
				Summary	
			Pole	94.8%	Pass
			Reinforcement	81.6%	Pass
			Overall	94.8%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	89.1	Pass
1	Base Plate	0	66.4	Pass
1	Base Foundation Structural Steel	0	85.1	Pass
1	Base Foundation Soil Interaction	0	33.8	Pass
1	Flange Connection	30	63.1	Pass
1	Flange Connection	60	62.9	Pass
1,2	Flange Connection	90	94.8	Pass

Structure Rating (max from all components) =	94.8%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) See assumption #6

4.1) Recommendations

The monopole and its foundation will have sufficient capacity to carry the proposed loading configuration once the proposed modifications are installed.

- Install the modifications as per the proposed modification drawings referenced in Table 3.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

1) Tower is located in Hartford County, Connecticut.
2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3) Basic wind speed of 97 mph.
4) Structure Class II.
5) Exposure Category C.
6) Topographic Category 1.
7) Crest Height 0.00 ft.
8) Nominal ice thickness of 1.0000 in.
9) Ice thickness is considered to increase with height.
10) Ice density of 56.00 pcf.
11) A wind speed of 50 mph is used in combination with ice.
12) Temperature drop of 50 °F.
13) Deflections calculated using a wind speed of 60 mph.
14) A non-linear (P-delta) analysis was used.
15) Pressures are calculated at each section.
16) Stress ratio used in pole design is 1.
17) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity	√	Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Pole Section Geometry

Section	*Elevation*	*Section Length*	*Pole Size*	*Pole Grade*	*Socket Length*
	ft	*ft*			*ft*
L1	120.00-115.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L2	115.00-110.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L3	110.00-105.00	5.00	P24x0.25	A53-B-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L4	105.00-100.00	5.00	P24x0.25	(42 ksi) A53-B-42 (42 ksi)	
L5	100.00-95.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L6	95.00-90.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L7	90.00-85.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L8	85.00-80.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L9	80.00-79.75	0.25	P24x0.625	A53-B-42 (42 ksi)	
L10	79.75-78.50	1.25	P24x0.625	A53-B-42 (42 ksi)	
L11	78.50-78.25	0.25	P24x1.075	A53-B-42 (42 ksi)	
L12	78.25-73.25	5.00	P24x1.075	A53-B-42 (42 ksi)	
L13	73.25-68.25	5.00	P24x1.075	A53-B-42 (42 ksi)	
L14	68.25-68.00	0.25	P24x1.075	A53-B-42 (42 ksi)	
L15	68.00-67.75	0.25	P24x0.775	A53-B-42 (42 ksi)	
L16	67.75-62.75	5.00	P24x0.775	A53-B-42 (42 ksi)	
L17	62.75-60.00	2.75	P24x0.775	A53-B-42 (42 ksi)	
L18	60.00-59.75	0.25	P30x0.675	A53-B-42 (42 ksi)	
L19	59.75-54.75	5.00	P30x0.675	A53-B-42 (42 ksi)	
L20	54.75-49.75	5.00	P30x0.675	A53-B-42 (42 ksi)	
L21	49.75-45.42	4.33	P30x0.675	A53-B-42 (42 ksi)	
L22	45.42-45.17	0.25	P30x0.8375	A53-B-42 (42 ksi)	
L23	45.17-40.17	5.00	P30x0.8375	A53-B-42 (42 ksi)	
L24	40.17-36.42	3.75	P30x0.8375	A53-B-42 (42 ksi)	
L25	36.42-36.17	0.25	P30x1	A53-B-42 (42 ksi)	
L26	36.17-32.75	3.42	P30x1	A53-B-42 (42 ksi)	
L27	32.75-32.50	0.25	P30x3.025	A53-B-42 (42 ksi)	
L28	32.50-32.25	0.25	P30x3.525	A53-B-42 (42 ksi)	
L29	32.25-30.00	2.25	P30x3.525	A53-B-42 (42 ksi)	
L30	30.00-28.66	1.34	P36x2.225	A53-B-42 (42 ksi)	
L31	28.66-28.41	0.25	P36x1.45	A53-B-42 (42 ksi)	
L32	28.41-26.75	1.66	P36x1.45	A53-B-42 (42 ksi)	
L33	26.75-26.50	0.25	P36x0.7125	A53-B-42 (42 ksi)	
L34	26.50-21.50	5.00	P36x0.7125	A53-B-42 (42 ksi)	
L35	21.50-21.00	0.50	P36x0.7125	A53-B-42 (42 ksi)	
L36	21.00-20.75	0.25	P36x0.975	A53-B-42 (42 ksi)	
L37	20.75-15.75	5.00	P36x0.975	A53-B-42 (42 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L38	15.75-10.75	5.00	P36x0.975	A53-B-42 (42 ksi)	
L39	10.75-5.75	5.00	P36x0.975	A53-B-42 (42 ksi)	
L40	5.75-2.00	3.75	P36x0.975	A53-B-42 (42 ksi)	
L41	2.00-1.75	0.25	P36x1.15	A53-B-42 (42 ksi)	
L42	1.75-0.00	1.75	P36x1.15	A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 120.00-115.00				1	1	1			
L2 115.00-110.00				1	1	1			
L3 110.00-105.00				1	1	1			
L4 105.00-100.00				1	1	1			
L5 100.00-95.00				1	1	1			
L6 95.00-90.00				1	1	1			
L7 90.00-85.00				1	1	1			
L8 85.00-80.00				1	1	1			
L9 80.00-79.75				1	1	0.933238			
L10 79.75-78.50				1	1	0.933238			
L11 78.50-78.25				1	1	0.863218			
L12 78.25-73.25				1	1	0.863218			
L13 73.25-68.25				1	1	0.863218			
L14 68.25-68.00				1	1	0.863218			
L15 68.00-67.75				1	1	0.916633			
L16 67.75-62.75				1	1	0.916633			
L17 62.75-60.00				1	1	0.916633			
L18 60.00-59.75				1	1	0.947179			
L19 59.75-54.75				1	1	0.947179			
L20 54.75-49.75				1	1	0.947179			
L21 49.75-45.42				1	1	0.947179			
L22 45.42-45.17				1	1	0.91779			
L23 45.17-40.17				1	1	0.91779			
L24 40.17-36.42				1	1	0.91779			
L25 36.42-36.17				1	1	0.892768			
L26 36.17-				1	1	0.892768			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
32.75									
L27 32.75-32.50				1	1	0.434312			
L28 32.50-32.25				1	1	0.293843			
L29 32.25-30.00				1	1	0.293843			
L30 30.00-28.66				1	1	0.39485			
L31 28.66-28.41				1	1	0.457282			
L32 28.41-26.75				1	1	0.457282			
L33 26.75-26.50				1	1	0.94281			
L34 26.50-21.50				1	1	0.94281			
L35 21.50-21.00				1	1	0.94281			
L36 21.00-20.75				1	1	0.917846			
L37 20.75-15.75				1	1	0.917846			
L38 15.75-10.75				1	1	0.917846			
L39 10.75-5.75				1	1	0.917846			
L40 5.75-2.00				1	1	0.917846			
L41 2.00-1.75				1	1	0.790024			
L42 1.75-0.00				1	1	0.790024			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
****											

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
****									
HB058-M12-XXXF(5/8)	C	No	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.24
							1/2" Ice	0.00	0.24
							1" Ice	0.00	0.24
HB114-1-08U4-M5J(1-1/4)	C	No	No	Inside Pole	118.00 - 0.00	3	No Ice	0.00	1.08
							1/2" Ice	0.00	1.08
							1" Ice	0.00	1.08
FSJ4-50B(1/2)	C	No	No	CaAa (Out Of Face)	118.00 - 0.00	1	No Ice	0.00	0.14
							1/2" Ice	0.00	0.77
							1" Ice	0.00	2.01
FSJ4-50B(1/2)	C	No	No	CaAa (Out Of Face)	118.00 - 0.00	1	No Ice	0.05	0.14
							1/2" Ice	0.15	0.77
							1" Ice	0.25	2.01
****									
****									
FB-L98B-034-	C	No	No	Inside Pole	99.00 - 0.00	1	No Ice	0.00	0.06

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
XXX(3/8)							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	99.00 - 0.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
LDF5-50A(7/8)	C	No	No	Inside Pole	99.00 - 0.00	12	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	99.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	99.00 - 0.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
***									
LDF4-50A(1/2)	C	No	No	CaAa (Out Of Face)	48.00 - 0.00	3	No Ice	0.00	0.15
							1/2" Ice	0.00	0.84
							1" Ice	0.00	2.14
****									
1 1/4" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	25.00 - 0.00	2	No Ice	0.21	0.00
							1/2" Ice	0.32	0.00
							1" Ice	0.43	0.00
1" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	55.00 - 48.00	2	No Ice	0.17	0.00
							1/2" Ice	0.28	0.00
							1" Ice	0.39	0.00
1 1/4" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	80.50 - 65.00	2	No Ice	0.21	0.00
							1/2" Ice	0.32	0.00
							1" Ice	0.43	0.00
Aero MP3-03	C	No	No	CaAa (Out Of Face)	48.00 - 35.00	2	No Ice	0.26	0.00
							1/2" Ice	0.37	0.00
							1" Ice	0.48	0.00
***									
HCS 6X12 6AWG(1-3/8)	C	No	No	CaAa (Out Of Face)	107.00 - 0.00	1	No Ice	0.00	1.70
							1/2" Ice	0.00	2.85
							1" Ice	0.00	4.61
FLC 158-50J(1-5/8)	C	No	No	Inside Pole	107.00 - 0.00	6	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
FLC 158-50J(1-5/8)	C	No	No	CaAa (Out Of Face)	107.00 - 0.00	5	No Ice	0.00	0.92
							1/2" Ice	0.00	2.46
							1" Ice	0.00	4.60
FLC 158-50J(1-5/8)	C	No	No	CaAa (Out Of Face)	107.00 - 0.00	1	No Ice	0.20	0.92
							1/2" Ice	0.30	2.46
							1" Ice	0.40	4.60

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.00-115.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.159	0.01
L2	115.00-110.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.265	0.02
L3	110.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.668	0.04
L4	105.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.273	0.08

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L5	100.00-95.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.273	0.11
L6	95.00-90.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.273	0.11
L7	90.00-85.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.273	0.11
L8	85.00-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.481	0.11
L9	80.00-79.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.168	0.01
L10	79.75-78.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.839	0.03
L11	78.50-78.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.168	0.01
L12	78.25-73.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.356	0.11
L13	73.25-68.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.356	0.11
L14	68.25-68.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.168	0.01
L15	68.00-67.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.168	0.01
L16	67.75-62.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.418	0.11
L17	62.75-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.700	0.06
L18	60.00-59.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.064	0.01
L19	59.75-54.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.356	0.11
L20	54.75-49.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.939	0.11
L21	49.75-45.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.040	0.10
L22	45.42-45.17	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.195	0.01
L23	45.17-40.17	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.897	0.12
L24	40.17-36.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.923	0.09
L25	36.42-36.17	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.195	0.01
L26	36.17-32.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.485	0.08
L27	32.75-32.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.064	0.01

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L28	32.50-32.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.064	0.01
L29	32.25-30.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.573	0.05
L30	30.00-28.66	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.341	0.03
L31	28.66-28.41	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.064	0.01
L32	28.41-26.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.422	0.04
L33	26.75-26.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.064	0.01
L34	26.50-21.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.731	0.12
L35	21.50-21.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.336	0.01
L36	21.00-20.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.168	0.01
L37	20.75-15.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.356	0.12
L38	15.75-10.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.356	0.12
L39	10.75-5.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.356	0.12
L40	5.75-2.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.517	0.09
L41	2.00-1.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.168	0.01
L42	1.75-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.175	0.04

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.00-115.00	A	2.271	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.521	0.06
L2	115.00-110.00	A	2.261	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.526	0.10
L3	110.00-105.00	A	2.251	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.819	0.29
L4	105.00-100.00	A	2.240	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.753	0.58
L5	100.00-95.00	A	2.229	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.730	0.60

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L6	95.00-90.00	A	2.217	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.707	0.60
L7	90.00-85.00	A	2.205	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.682	0.60
L8	85.00-80.00	A	2.192	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.352	0.59
L9	80.00-79.75	A	2.185	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.629	0.03
L10	79.75-78.50	A	2.183	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.143	0.15
L11	78.50-78.25	A	2.181	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.628	0.03
L12	78.25-73.25	A	2.173	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	12.532	0.58
L13	73.25-68.25	A	2.158	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	12.469	0.58
L14	68.25-68.00	A	2.150	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.622	0.03
L15	68.00-67.75	A	2.150	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.622	0.03
L16	67.75-62.75	A	2.141	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	9.317	0.57
L17	62.75-60.00	A	2.128	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.041	0.31
L18	60.00-59.75	A	2.123	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.276	0.03
L19	59.75-54.75	A	2.113	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.817	0.56
L20	54.75-49.75	A	2.094	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.781	0.55
L21	49.75-45.42	A	2.075	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.625	0.53
L22	45.42-45.17	A	2.064	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.631	0.03
L23	45.17-40.17	A	2.052	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	12.561	0.64
L24	40.17-36.42	A	2.030	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	9.351	0.47
L25	36.42-36.17	A	2.019	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.621	0.03
L26	36.17-32.75	A	2.009	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.277	0.42
L27	32.75-32.50	A	1.998	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.263	0.03
L28	32.50-32.25	A	1.996	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.263	0.03

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L29	32.25-30.00	A	1.988	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.362	0.27
L30	30.00-28.66	A	1.977	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.400	0.16
L31	28.66-28.41	A	1.971	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.261	0.03
L32	28.41-26.75	A	1.964	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.727	0.20
L33	26.75-26.50	A	1.958	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.259	0.03
L34	26.50-21.50	A	1.937	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	9.619	0.59
L35	21.50-21.00	A	1.914	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.144	0.06
L36	21.00-20.75	A	1.910	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.571	0.03
L37	20.75-15.75	A	1.885	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.315	0.57
L38	15.75-10.75	A	1.826	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.064	0.55
L39	10.75-5.75	A	1.741	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.707	0.53
L40	5.75-2.00	A	1.614	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	7.629	0.37
L41	2.00-1.75	A	1.501	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.485	0.02
L42	1.75-0.00	A	1.391	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.230	0.15

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	120.00-115.00	-0.2683	0.1549	-1.0012	0.5781
L2	115.00-110.00	-0.4396	0.2538	-1.5638	0.9028
L3	110.00-105.00	-1.0411	0.6011	-2.1964	1.2681
L4	105.00-100.00	-1.7916	1.0344	-2.9902	1.7264
L5	100.00-95.00	-1.7916	1.0344	-2.9836	1.7226
L6	95.00-90.00	-1.7916	1.0344	-2.9767	1.7186
L7	90.00-85.00	-1.7916	1.0344	-2.9693	1.7143
L8	85.00-80.00	-1.9475	1.1244	-3.2131	1.8551
L9	80.00-79.75	-2.2711	1.3112	-4.8847	2.8202
L10	79.75-78.50	-2.2711	1.3112	-4.8833	2.8194
L11	78.50-78.25	-2.2711	1.3112	-4.8819	2.8186
L12	78.25-73.25	-2.2711	1.3112	-4.8768	2.8156
L13	73.25-68.25	-2.2711	1.3112	-4.8666	2.8097
L14	68.25-68.00	-2.2711	1.3112	-4.8609	2.8064
L15	68.00-67.75	-2.2711	1.3112	-4.8603	2.8061
L16	67.75-62.75	-1.7431	1.0064	-4.1277	2.3831
L17	62.75-60.00	-1.7916	1.0344	-2.9229	1.6875

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L18	60.00-59.75	-1.8844	1.0879	-3.1660	1.8279
L19	59.75-54.75	-1.9889	1.1483	-3.2955	1.9027
L20	54.75-49.75	-3.0307	1.7498	-5.3000	3.0600
L21	49.75-45.42	-2.4633	1.4222	-5.4315	3.1359
L22	45.42-45.17	-2.6790	1.5467	-5.5210	3.1876
L23	45.17-40.17	-2.6790	1.5467	-5.5102	3.1813
L24	40.17-36.42	-2.6790	1.5467	-5.4907	3.1701
L25	36.42-36.17	-2.6790	1.5467	-5.4811	3.1645
L26	36.17-32.75	-2.6409	1.5247	-4.0536	2.3403
L27	32.75-32.50	-1.8844	1.0879	-3.0735	1.7745
L28	32.50-32.25	-1.8844	1.0879	-3.0723	1.7738
L29	32.25-30.00	-1.8844	1.0879	-3.0664	1.7704
L30	30.00-28.66	-1.9310	1.1149	-3.2322	1.8661
L31	28.66-28.41	-1.9310	1.1149	-3.2276	1.8635
L32	28.41-26.75	-1.9310	1.1149	-3.2219	1.8602
L33	26.75-26.50	-1.9310	1.1149	-3.2160	1.8567
L34	26.50-21.50	-3.2429	1.8723	-5.0732	2.9290
L35	21.50-21.00	-3.5612	2.0561	-5.6867	3.2832
L36	21.00-20.75	-3.5612	2.0561	-5.6827	3.2809
L37	20.75-15.75	-3.5612	2.0561	-5.6532	3.2639
L38	15.75-10.75	-3.5612	2.0561	-5.5834	3.2236
L39	10.75-5.75	-3.5612	2.0561	-5.4817	3.1649
L40	5.75-2.00	-3.5612	2.0561	-5.3235	3.0735
L41	2.00-1.75	-3.5612	2.0561	-5.1763	2.9885
L42	1.75-0.00	-3.5612	2.0561	-5.0270	2.9023

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8"x4'	B	From Leg	2.00 0.00 7.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.25 0.66 0.97	0.25 0.66 0.97	0.00 0.01 0.01
10'x4" Mount Pipe	B	From Leg	2.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	3.46 5.24 5.85	3.46 5.24 5.85	0.13 0.16 0.19
***									
Platform Mount [LP 502-1]	C	None		0.0000	118.00	No Ice 1/2" Ice 1" Ice	32.35 45.67 58.99	32.35 45.67 58.99	0.93 1.19 1.46
10'x2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	2.38 3.40 4.45	2.38 3.40 4.45	0.04 0.05 0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) 7'x2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	1.66 2.39 2.83	1.66 2.39 2.83	0.03 0.04 0.06
(2) 7'x2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	1.66 2.39 2.83	1.66 2.39 2.83	0.03 0.04 0.06
10'x2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	2.38 3.40 4.45	2.38 3.40 4.45	0.04 0.05 0.08
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	7.47 8.66 9.56	0.09 0.16 0.24
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 6.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 -6.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 6.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
(2) HORIZON COMPACT	B	From Leg	4.00 0.00 -2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.72 0.83 0.94	0.37 0.45 0.54	0.01 0.02 0.03
IBC1900BB-1	A	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900BB-1	B	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900BB-1	C	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900HG-2A	A	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900HG-2A	B	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900HG-2A	C	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
TD-RRH8X20-25	A	From Leg	4.00	0.0000	118.00	No Ice	4.05	1.53	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	4.30	1.71	0.10
			2.00			1" Ice	4.56	1.90	0.13
(2) TD-RRH8X20-25	B	From Leg	4.00	0.0000	118.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			2.00			1" Ice	4.56	1.90	0.13
***									
Pipe Mount [PM 602-3]	C	None		0.0000	114.00	No Ice	7.68	7.68	0.28
						1/2" Ice	9.50	9.50	0.35
						1" Ice	11.32	11.32	0.43
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.00	0.0000	114.00	No Ice	2.32	2.24	0.06
			0.00			1/2" Ice	2.53	2.44	0.08
			1.00			1" Ice	2.74	2.65	0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.00	0.0000	114.00	No Ice	2.32	2.24	0.06
			0.00			1/2" Ice	2.53	2.44	0.08
			1.00			1" Ice	2.74	2.65	0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.00	0.0000	114.00	No Ice	2.32	2.24	0.06
			0.00			1/2" Ice	2.53	2.44	0.08
			1.00			1" Ice	2.74	2.65	0.11
800MHz 2X50W RRH W/FILTER	A	From Leg	1.00	0.0000	114.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			-1.00			1" Ice	2.43	2.29	0.11
800MHz 2X50W RRH W/FILTER	B	From Leg	1.00	0.0000	114.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			-1.00			1" Ice	2.43	2.29	0.11
800MHz 2X50W RRH W/FILTER	C	From Leg	1.00	0.0000	114.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			-1.00			1" Ice	2.43	2.29	0.11
***									
*****									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	107.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			1.00			1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	107.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			1.00			1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	107.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			1.00			1" Ice	7.21	7.13	0.23
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00	0.0000	107.00	No Ice	6.75	6.07	0.15
			0.00			1/2" Ice	7.20	6.87	0.21
			1.00			1" Ice	7.65	7.58	0.28
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00	0.0000	107.00	No Ice	6.75	6.07	0.15
			0.00			1/2" Ice	7.20	6.87	0.21
			1.00			1" Ice	7.65	7.58	0.28
AIR 32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00	0.0000	107.00	No Ice	6.75	6.07	0.15
			0.00			1/2" Ice	7.20	6.87	0.21
			1.00			1" Ice	7.65	7.58	0.28
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00	0.0000	107.00	No Ice	20.48	11.02	0.16
			0.00			1/2" Ice	21.23	12.55	0.30
			1.00				21.99	14.10	0.44

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	11.02 12.55 14.10	0.16 0.30 0.44
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	11.02 12.55 14.10	0.16 0.30 0.44
RADIO 4449 B12/B71	A	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RADIO 4449 B12/B71	B	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RADIO 4449 B12/B71	C	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
KRY 112 144/1	A	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
KRY 112 144/1	B	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
KRY 112 144/1	C	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
Platform Mount [LP 712-1]	C	None		0.0000	107.00	No Ice 1/2" Ice 1" Ice	24.53 29.94 35.35	24.53 29.94 35.35	1.34 1.65 1.96
Miscellaneous [NA 509-3]	C	None		0.0000	107.00	No Ice 1/2" Ice 1" Ice	11.84 16.96 22.08	11.84 16.96 22.08	0.28 0.30 0.32
Miscellaneous [NA 507-1]	C	None		0.0000	107.00	No Ice 1/2" Ice 1" Ice	4.80 6.70 8.60	4.80 6.70 8.60	0.25 0.29 0.34
****									
(2) QS66512-2 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	2.60 9.29 9.91	5.00 9.66 10.62	0.14 0.21 0.30
(2) QS66512-2 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	2.60 9.29 9.91	5.00 9.66 10.62	0.14 0.21 0.30
(2) QS66512-2 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	2.60 9.29 9.91	5.00 9.66 10.62	0.14 0.21 0.30
RRUS 8843 B2/B66A	A	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	1.35 1.50 1.65	0.07 0.09 0.11
RRUS 8843 B2/B66A	B	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	1.35 1.50 1.65	0.07 0.09 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
RRUS 8843 B2/B66A	C	From Leg	4.00	0.0000	99.00	No Ice	1.64	1.35	0.07
			0.00			1/2" Ice	1.80	1.50	0.09
			1.00			1" Ice	1.97	1.65	0.11
(2) TPX-070821	A	From Leg	4.00	0.0000	99.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			1.00			1" Ice	0.66	0.20	0.02
(2) TPX-070821	B	From Leg	4.00	0.0000	99.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			1.00			1" Ice	0.66	0.20	0.02
(2) TPX-070821	C	From Leg	4.00	0.0000	99.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			1.00			1" Ice	0.66	0.20	0.02
(2) DTMABP7819VG12A	A	From Leg	4.00	0.0000	99.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			1.00			1" Ice	1.23	0.51	0.04
DTMABP7819VG12A	C	From Leg	4.00	0.0000	99.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			1.00			1" Ice	1.23	0.51	0.04
RRUS 32	A	From Leg	4.00	0.0000	99.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			1.00			1" Ice	3.32	2.17	0.10
RRUS 32	B	From Leg	4.00	0.0000	99.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			1.00			1" Ice	3.32	2.17	0.10
RRUS 32	C	From Leg	4.00	0.0000	99.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			1.00			1" Ice	3.32	2.17	0.10
RRUS 11	A	From Leg	4.00	0.0000	99.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			1.00			1" Ice	3.21	1.50	0.10
RRUS 11	B	From Leg	4.00	0.0000	99.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			1.00			1" Ice	3.21	1.50	0.10
RRUS 11	C	From Leg	4.00	0.0000	99.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			1.00			1" Ice	3.21	1.50	0.10
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	99.00	No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			1.00			1" Ice	1.64	1.64	0.06
DC6-48-60-18-8C	A	From Leg	4.00	0.0000	99.00	No Ice	2.74	2.74	0.03
			0.00			1/2" Ice	2.96	2.96	0.05
			1.00			1" Ice	3.20	3.20	0.08
Platform Mount [LP 502-1]	C	None		0.0000	99.00	No Ice	32.35	32.35	0.93
						1/2" Ice	45.67	45.67	1.19
						1" Ice	58.99	58.99	1.46
****									
Side Arm Mount [SO 701-1]	A	None		0.0000	59.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
****									
GPS_A	B	From Leg	4.00 0.00 2.00	0.0000	48.00	No Ice 1/2" Ice 1" Ice	0.26 0.32 0.39	0.26 0.32 0.39	0.00 0.00 0.01
Side Arm Mount [SO 701-1]	B	None		0.0000	48.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
**									
(2) Bridge Stiffener (137" x 15.5" x 1.25")	C	None		0.0000	30.00	No Ice 1/2" Ice 1" Ice	21.55 22.42 23.30	2.38 3.66 4.96	0.75 0.83 0.92
(2) Bridge Stiffener (109" x 15.75" x 1.25")	C	None		0.0000	60.00	No Ice 1/2" Ice 1" Ice	16.65 17.33 18.01	1.89 2.92 3.96	0.61 0.67 0.75

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP1-18	B	Paraboloid w/o Radome	From Leg	1.00 0.00 -2.00	-6.0000		118.00	1.27	No Ice 1/2" Ice 1" Ice	1.28 1.45 1.62	0.01 0.02 0.03
VHLP1-23-DW1	B	Paraboloid w/o Radome	From Leg	1.00 0.00 -2.00	-6.0000		118.00	1.27	No Ice 1/2" Ice 1" Ice	1.28 1.45 1.62	0.01 0.02 0.03

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice

Comb. No.	Description
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 115	Pole	Max Tension	42	0.00	-0.00	0.00
			Max. Compression	26	-8.58	-11.33	-1.79
			Max. Mx	8	-2.41	-26.51	-1.40
			Max. My	14	-2.42	-3.55	-23.71
			Max. Vy	20	-6.13	20.35	0.63
			Max. Vx	2	-6.03	-1.41	22.73
			Max. Torque	14			7.08
L2	115 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11.34	-11.34	-1.85
			Max. Mx	8	-3.47	-61.78	-2.46
			Max. My	14	-3.48	-4.80	-58.54
			Max. Vy	20	-7.49	55.95	2.12
			Max. Vx	2	-7.39	0.40	57.80
			Max. Torque	14			7.08
L3	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.70	-11.20	-2.01
			Max. Mx	8	-7.43	-115.01	-3.54
			Max. My	14	-7.45	-6.06	-111.36
			Max. Vy	20	-13.60	109.54	3.61
			Max. Vx	2	-13.50	2.22	110.85
			Max. Torque	14			7.06
L4	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.04	-10.86	-2.31
			Max. Mx	8	-7.91	-183.65	-4.65
			Max. My	14	-7.93	-7.33	-179.61
			Max. Vy	20	-14.00	178.58	5.11
			Max. Vx	2	-13.90	4.08	179.31
			Max. Torque	14			7.03
L5	100 - 95	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-33.66	-10.21	-0.53
			Max. Mx	8	-11.11	-271.21	-5.30
			Max. My	2	-11.12	6.00	267.47
			Max. Vy	20	-18.17	266.75	6.98
			Max. Vx	2	-18.10	6.00	267.47
			Max. Torque	14			6.97
L6	95 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.02	-9.86	-0.83
			Max. Mx	8	-11.70	-362.52	-6.36
			Max. My	2	-11.71	7.84	358.79
			Max. Vy	20	-18.51	358.47	8.45
			Max. Vx	2	-18.45	7.84	358.79
			Max. Torque	14			6.84
L7	90 - 85	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.56	-9.49	-1.13
			Max. Mx	8	-12.48	-455.56	-7.42
			Max. My	2	-12.49	9.68	451.85
			Max. Vy	20	-18.86	451.92	9.91
			Max. Vx	2	-18.80	9.68	451.85
			Max. Torque	14			6.78
L8	85 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.09	-9.11	-1.42
			Max. Mx	8	-13.28	-550.35	-8.48
			Max. My	2	-13.28	11.53	546.66
			Max. Vy	20	-19.21	547.12	11.36
			Max. Vx	2	-19.15	11.53	546.66
			Max. Torque	14			6.72
L9	80 - 79.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.19	-9.09	-1.44
			Max. Mx	8	-13.34	-555.14	-8.53
			Max. My	2	-13.35	11.63	551.44
			Max. Vy	20	-19.24	551.93	11.43
			Max. Vx	2	-19.18	11.63	551.44
			Max. Torque	14			6.66
L10	79.75 - 78.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.64	-8.99	-1.51
			Max. Mx	8	-13.60	-579.21	-8.79
			Max. My	2	-13.60	12.09	575.52
			Max. Vy	20	-19.44	576.11	11.80
			Max. Vx	2	-19.37	12.09	575.52
			Max. Torque	14			6.65
L11	78.5 - 78.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.76	-8.98	-1.52
			Max. Mx	8	-13.68	-584.05	-8.85
			Max. My	2	-13.69	12.18	580.37
			Max. Vy	20	-19.47	580.98	11.87
			Max. Vx	2	-19.40	12.18	580.37
			Max. Torque	14			6.61
L12	78.25 - 73.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.08	-8.59	-1.81
			Max. Mx	8	-15.19	-682.98	-9.90
			Max. My	2	-15.20	14.03	679.31
			Max. Vy	20	-20.25	680.31	13.33
			Max. Vx	2	-20.19	14.03	679.31
			Max. Torque	14			6.61
L13	73.25 - 68.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.39	-8.20	-2.10
			Max. Mx	8	-16.73	-785.73	-10.95
			Max. My	2	-16.73	15.88	782.08
			Max. Vy	20	-21.01	783.48	14.78
			Max. Vx	2	-20.94	15.88	782.08
			Max. Torque	14			6.46
L14	68.25 - 68	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.51	-8.18	-2.11
			Max. Mx	8	-16.81	-790.97	-11.00
			Max. My	2	-16.81	15.98	787.32
			Max. Vy	20	-21.04	788.74	14.86

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-20.97	15.98	787.32
			Max. Torque	14			6.33
L15	68 - 67.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.61	-8.16	-2.13
			Max. Mx	8	-16.87	-796.21	-11.06
			Max. My	2	-16.87	16.07	792.57
			Max. Vy	20	-21.07	794.01	14.93
			Max. Vx	2	-21.01	16.07	792.57
			Max. Torque	14			6.32
L16	67.75 - 62.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.60	-7.77	-2.41
			Max. Mx	8	-18.14	-902.79	-12.11
			Max. My	2	-18.14	17.93	899.16
			Max. Vy	20	-21.72	901.00	16.38
			Max. Vx	2	-21.65	17.93	899.16
			Max. Torque	14			6.31
L17	62.75 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.69	-7.55	-2.56
			Max. Mx	8	-18.86	-962.49	-12.69
			Max. My	2	-18.86	18.96	958.87
			Max. Vy	20	-21.88	960.93	17.18
			Max. Vx	2	-21.81	18.96	958.87
			Max. Torque	14			6.21
L18	60 - 59.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.94	-7.52	-2.58
			Max. Mx	8	-20.34	-968.33	-12.74
			Max. My	2	-20.34	19.05	964.72
			Max. Vy	20	-23.47	966.80	17.25
			Max. Vx	2	-23.40	19.05	964.72
			Max. Torque	14			6.18
L19	59.75 - 54.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.28	-7.02	-2.91
			Max. Mx	8	-21.82	-1086.57	-13.80
			Max. My	2	-21.82	20.93	1082.98
			Max. Vy	20	-23.93	1085.47	18.70
			Max. Vx	2	-23.86	20.93	1082.98
			Max. Torque	14			6.18
L20	54.75 - 49.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.46	-6.53	-3.24
			Max. Mx	8	-23.24	-1207.09	-14.85
			Max. My	2	-23.24	22.80	1203.53
			Max. Vy	20	-24.45	1206.43	20.14
			Max. Vx	2	-24.38	22.80	1203.53
			Max. Torque	14			6.11
L21	49.75 - 45.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.57	-6.16	-3.62
			Max. Mx	8	-24.55	-1314.21	-15.76
			Max. My	2	-24.55	24.42	1310.66
			Max. Vy	20	-25.18	1313.93	21.39
			Max. Vx	2	-25.11	24.42	1310.66
			Max. Torque	14			5.97
L22	45.42 - 45.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.69	-6.14	-3.64
			Max. Mx	8	-24.64	-1320.48	-15.82
			Max. My	2	-24.64	24.51	1316.94
			Max. Vy	20	-25.21	1320.22	21.46
			Max. Vx	2	-25.14	24.51	1316.94
			Max. Torque	14			5.87
L23	45.17 - 40.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.19	-5.52	-4.01
			Max. Mx	20	-26.29	1448.16	22.89
			Max. My	2	-26.30	26.38	1444.46
			Max. Vy	20	-25.96	1448.16	22.89

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-25.89	26.38	1444.46
			Max. Torque	14			5.86
L24	40.17 - 36.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.06	-5.07	-4.27
			Max. Mx	20	-27.55	1546.50	23.96
			Max. My	2	-27.55	27.78	1542.48
			Max. Vy	20	-26.49	1546.50	23.96
			Max. Vx	2	-26.42	27.78	1542.48
			Max. Torque	14			5.68
L25	36.42 - 36.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.19	-5.04	-4.29
			Max. Mx	20	-27.65	1553.12	24.03
			Max. My	2	-27.66	27.87	1549.08
			Max. Vy	20	-26.51	1553.12	24.03
			Max. Vx	2	-26.45	27.87	1549.08
			Max. Torque	14			5.55
L26	36.17 - 32.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.03	-4.64	-4.52
			Max. Mx	20	-28.94	1644.24	25.00
			Max. My	2	-28.95	29.15	1639.92
			Max. Vy	20	-26.77	1644.24	25.00
			Max. Vx	2	-26.70	29.15	1639.92
			Max. Torque	14			5.54
L27	32.75 - 32.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.22	-4.61	-4.54
			Max. Mx	20	-29.09	1650.94	25.07
			Max. My	2	-29.10	29.24	1646.60
			Max. Vy	20	-26.77	1650.94	25.07
			Max. Vx	2	-26.71	29.24	1646.60
			Max. Torque	14			5.48
L28	32.5 - 32.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.42	-4.58	-4.56
			Max. Mx	20	-29.25	1657.64	25.15
			Max. My	2	-29.26	29.34	1653.27
			Max. Vy	20	-26.79	1657.64	25.15
			Max. Vx	2	-26.73	29.34	1653.27
			Max. Torque	14			5.47
L29	32.25 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.22	-4.32	-4.71
			Max. Mx	20	-30.68	1718.13	25.78
			Max. My	2	-30.68	30.17	1713.58
			Max. Vy	20	-26.96	1718.13	25.78
			Max. Vx	2	-26.89	30.17	1713.58
			Max. Torque	14			5.47
L30	30 - 28.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.71	-4.13	-4.81
			Max. Mx	20	-33.13	1756.67	26.16
			Max. My	2	-33.14	30.67	1752.00
			Max. Vy	20	-28.81	1756.67	26.16
			Max. Vx	2	-28.75	30.67	1752.00
			Max. Torque	14			5.45
L31	28.66 - 28.41	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.85	-4.10	-4.83
			Max. Mx	20	-33.23	1763.88	26.23
			Max. My	2	-33.23	30.77	1759.19
			Max. Vy	20	-28.83	1763.88	26.23
			Max. Vx	2	-28.76	30.77	1759.19
			Max. Torque	14			5.43
L32	28.41 - 26.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.74	-3.87	-4.96
			Max. Mx	20	-33.81	1811.85	26.70
			Max. My	2	-33.82	31.39	1807.02
			Max. Vy	20	-28.96	1811.85	26.70
			Max. Vx	2	-28.89	31.39	1807.02

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	14			5.42
L33	26.75 - 26.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.87	-3.83	-4.98
			Max. Mx	20	-33.91	1819.09	26.77
			Max. My	2	-33.91	31.48	1814.24
			Max. Vy	20	-28.97	1819.09	26.77
			Max. Vx	2	-28.90	31.48	1814.24
			Max. Torque	14			5.40
L34	26.5 - 21.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.45	-3.16	-5.38
			Max. Mx	20	-35.66	1964.95	28.19
			Max. My	2	-35.66	33.35	1959.67
			Max. Vy	20	-29.37	1964.95	28.19
			Max. Vx	2	-29.30	33.35	1959.67
			Max. Torque	14			5.40
L35	21.5 - 21	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.71	-3.09	-5.41
			Max. Mx	20	-35.84	1979.64	28.33
			Max. My	2	-35.85	33.54	1974.32
			Max. Vy	20	-29.40	1979.64	28.33
			Max. Vx	2	-29.34	33.54	1974.32
			Max. Torque	14			5.27
L36	21 - 20.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.86	-3.06	-5.43
			Max. Mx	20	-35.96	1987.00	28.40
			Max. My	2	-35.96	33.63	1981.65
			Max. Vy	20	-29.42	1987.00	28.40
			Max. Vx	2	-29.35	33.63	1981.65
			Max. Torque	14			5.25
L37	20.75 - 15.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.91	-2.40	-5.81
			Max. Mx	20	-38.19	2135.25	29.80
			Max. My	2	-38.19	35.50	2129.47
			Max. Vy	20	-29.87	2135.25	29.80
			Max. Vx	2	-29.80	35.50	2129.47
			Max. Torque	14			5.24
L38	15.75 - 10.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.92	-1.77	-6.18
			Max. Mx	20	-40.43	2285.57	31.20
			Max. My	2	-40.43	37.35	2279.36
			Max. Vy	20	-30.26	2285.57	31.20
			Max. Vx	2	-30.19	37.35	2279.36
			Max. Torque	14			5.09
L39	10.75 - 5.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-80.88	-1.18	-6.52
			Max. Mx	20	-42.69	2437.78	32.58
			Max. My	2	-42.69	39.20	2431.15
			Max. Vy	20	-30.63	2437.78	32.58
			Max. Vx	2	-30.56	39.20	2431.15
			Max. Torque	14			4.94
L40	5.75 - 2	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.05	-0.77	-6.75
			Max. Mx	20	-44.38	2553.12	33.62
			Max. My	2	-44.38	40.58	2546.16
			Max. Vy	20	-30.89	2553.12	33.62
			Max. Vx	2	-30.83	40.58	2546.16
			Max. Torque	16			4.80
L41	2 - 1.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.19	-0.74	-6.77
			Max. Mx	20	-44.51	2560.84	33.69
			Max. My	2	-44.51	40.67	2553.87
			Max. Vy	20	-30.89	2560.84	33.69
			Max. Vx	2	-30.83	40.67	2553.87
			Max. Torque	16			4.73
L42	1.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.17	-0.59	-6.86
			Max. Mx	20	-45.29	2615.03	34.17

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-45.29	41.31	2607.90
			Max. Vy	20	-31.04	2615.03	34.17
			Max. Vx	2	-30.97	41.31	2607.90
			Max. Torque	16			4.73

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	84.17	-10.73	-0.03
	Max. H_x	20	45.31	31.01	0.28
	Max. H_z	2	45.31	0.35	30.95
	Max. M_x	2	2607.90	0.35	30.95
	Max. M_z	8	2611.13	-30.95	-0.20
	Max. Torsion	16	4.70	15.32	-26.62
	Min. Vert	25	33.98	15.77	26.87
	Min. H_x	8	45.31	-30.95	-0.20
	Min. H_z	15	33.98	-0.22	-30.90
	Min. M_x	14	-2603.40	-0.22	-30.90
	Min. M_z	20	-2615.03	31.01	0.28
	Min. Torsion	4	-4.67	-15.30	26.63

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	37.76	0.00	0.00	0.53	-1.72	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	45.31	-0.35	-30.95	-2607.90	41.31	4.52
0.9 Dead+1.6 Wind 0 deg - No Ice	33.98	-0.35	-30.95	-2587.32	41.46	4.45
1.2 Dead+1.6 Wind 30 deg - No Ice	45.31	15.30	-26.63	-2237.14	-1284.71	4.67
0.9 Dead+1.6 Wind 30 deg - No Ice	33.98	15.30	-26.63	-2219.53	-1273.99	4.62
1.2 Dead+1.6 Wind 60 deg - No Ice	45.31	26.68	-15.28	-1279.10	-2247.05	3.59
0.9 Dead+1.6 Wind 60 deg - No Ice	33.98	26.68	-15.28	-1269.12	-2228.65	3.55
1.2 Dead+1.6 Wind 90 deg - No Ice	45.31	30.95	0.20	25.18	-2611.13	1.51
0.9 Dead+1.6 Wind 90 deg - No Ice	33.98	30.95	0.20	24.77	-2589.81	1.51
1.2 Dead+1.6 Wind 120 deg - No Ice	45.31	26.91	15.64	1325.85	-2275.06	-1.05
0.9 Dead+1.6 Wind 120 deg - No Ice	33.98	26.91	15.64	1315.11	-2256.39	-1.01
1.2 Dead+1.6 Wind 150 deg - No Ice	45.31	15.64	26.88	2269.06	-1327.01	-3.31
0.9 Dead+1.6 Wind 150 deg - No Ice	33.98	15.64	26.88	2250.84	-1315.87	-3.26
1.2 Dead+1.6 Wind 180 deg - No Ice	45.31	0.22	30.90	2603.40	-30.04	-4.61
0.9 Dead+1.6 Wind 180 deg - No Ice	33.98	0.22	30.90	2582.54	-29.21	-4.55
1.2 Dead+1.6 Wind 210 deg - No Ice	45.31	-15.32	26.62	2237.02	1283.53	-4.70
0.9 Dead+1.6 Wind 210 deg - No Ice	33.98	-15.32	26.62	2219.10	1273.89	-4.64

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.6 Wind 240 deg - No Ice	45.31	-26.81	15.17	1267.87	2258.38	-3.49
0.9 Dead+1.6 Wind 240 deg - No Ice	33.98	-26.81	15.17	1257.69	2240.96	-3.46
1.2 Dead+1.6 Wind 270 deg - No Ice	45.31	-31.01	-0.28	-34.17	2615.03	-1.38
0.9 Dead+1.6 Wind 270 deg - No Ice	33.98	-31.01	-0.28	-34.00	2594.76	-1.38
1.2 Dead+1.6 Wind 300 deg - No Ice	45.31	-26.98	-15.66	-1326.47	2279.75	1.01
0.9 Dead+1.6 Wind 300 deg - No Ice	33.98	-26.98	-15.66	-1316.05	2262.12	0.98
1.2 Dead+1.6 Wind 330 deg - No Ice	45.31	-15.77	-26.87	-2267.43	1339.28	3.14
0.9 Dead+1.6 Wind 330 deg - No Ice	33.98	-15.77	-26.87	-2249.54	1329.11	3.08
1.2 Dead+1.0 Ice+1.0 Temp	84.17	0.00	0.00	6.86	-0.59	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	84.17	-0.07	-10.73	-979.80	8.16	0.81
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	84.17	5.34	-9.26	-843.31	-490.75	1.17
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	84.17	9.28	-5.34	-482.51	-852.65	1.21
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	84.17	10.73	0.03	10.40	-987.20	0.93
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	84.17	9.31	5.39	503.25	-857.10	0.37
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	84.17	5.39	9.30	862.44	-496.65	-0.28
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	84.17	0.03	10.72	992.10	-5.01	-0.83
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	84.17	-5.35	9.26	856.86	490.36	-1.17
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	84.17	-9.31	5.31	492.91	855.82	-1.19
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	84.17	-10.75	-0.05	0.63	988.26	-0.90
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	84.17	-9.33	-5.39	-489.85	858.38	-0.39
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	84.17	-5.42	-9.30	-848.40	500.08	0.23
Dead+Wind 0 deg - Service	37.76	-0.08	-6.62	-555.15	7.48	0.97
Dead+Wind 30 deg - Service	37.76	3.27	-5.70	-476.16	-274.99	1.00
Dead+Wind 60 deg - Service	37.76	5.71	-3.27	-272.08	-479.99	0.77
Dead+Wind 90 deg - Service	37.76	6.62	0.04	5.76	-557.55	0.32
Dead+Wind 120 deg - Service	37.76	5.76	3.35	282.85	-485.97	-0.23
Dead+Wind 150 deg - Service	37.76	3.35	5.75	483.78	-284.00	-0.71
Dead+Wind 180 deg - Service	37.76	0.05	6.61	555.00	-7.71	-0.99
Dead+Wind 210 deg - Service	37.76	-3.28	5.69	476.94	272.11	-1.01
Dead+Wind 240 deg - Service	37.76	-5.74	3.25	270.50	479.78	-0.75
Dead+Wind 270 deg - Service	37.76	-6.64	-0.06	-6.87	555.77	-0.30
Dead+Wind 300 deg - Service	37.76	-5.77	-3.35	-282.18	484.35	0.22
Dead+Wind 330 deg - Service	37.76	-3.37	-5.75	-482.64	283.99	0.67

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-37.76	0.00	-0.00	37.76	0.00	0.000%
2	-0.35	-45.31	-30.95	0.35	45.31	30.95	0.000%
3	-0.35	-33.98	-30.95	0.35	33.98	30.95	0.000%
4	15.30	-45.31	-26.63	-15.30	45.31	26.63	0.000%
5	15.30	-33.98	-26.63	-15.30	33.98	26.63	0.000%
6	26.68	-45.31	-15.28	-26.68	45.31	15.28	0.000%
7	26.68	-33.98	-15.28	-26.68	33.98	15.28	0.000%
8	30.95	-45.31	0.20	-30.95	45.31	-0.20	0.000%
9	30.95	-33.98	0.20	-30.95	33.98	-0.20	0.000%
10	26.91	-45.31	15.64	-26.91	45.31	-15.64	0.000%
11	26.91	-33.98	15.64	-26.91	33.98	-15.64	0.000%
12	15.64	-45.31	26.88	-15.64	45.31	-26.88	0.000%
13	15.64	-33.98	26.88	-15.64	33.98	-26.88	0.000%
14	0.22	-45.31	30.90	-0.22	45.31	-30.90	0.000%
15	0.22	-33.98	30.90	-0.22	33.98	-30.90	0.000%
16	-15.32	-45.31	26.62	15.32	45.31	-26.62	0.000%
17	-15.32	-33.98	26.62	15.32	33.98	-26.62	0.000%
18	-26.81	-45.31	15.17	26.81	45.31	-15.17	0.000%
19	-26.81	-33.98	15.17	26.81	33.98	-15.17	0.000%
20	-31.01	-45.31	-0.28	31.01	45.31	0.28	0.000%
21	-31.01	-33.98	-0.28	31.01	33.98	0.28	0.000%
22	-26.98	-45.31	-15.66	26.98	45.31	15.66	0.000%
23	-26.98	-33.98	-15.66	26.98	33.98	15.66	0.000%
24	-15.77	-45.31	-26.87	15.77	45.31	26.87	0.000%
25	-15.77	-33.98	-26.87	15.77	33.98	26.87	0.000%
26	0.00	-84.17	0.00	-0.00	84.17	-0.00	0.000%
27	-0.07	-84.17	-10.73	0.07	84.17	10.73	0.000%
28	5.34	-84.17	-9.26	-5.34	84.17	9.26	0.000%
29	9.28	-84.17	-5.34	-9.28	84.17	5.34	0.000%
30	10.73	-84.17	0.03	-10.73	84.17	-0.03	0.000%
31	9.31	-84.17	5.39	-9.31	84.17	-5.39	0.000%
32	5.39	-84.17	9.30	-5.39	84.17	-9.30	0.000%
33	0.03	-84.17	10.72	-0.03	84.17	-10.72	0.000%
34	-5.35	-84.17	9.26	5.35	84.17	-9.26	0.000%
35	-9.31	-84.17	5.31	9.31	84.17	-5.31	0.000%
36	-10.75	-84.17	-0.05	10.75	84.17	0.05	0.000%
37	-9.33	-84.17	-5.39	9.33	84.17	5.39	0.000%
38	-5.42	-84.17	-9.30	5.42	84.17	9.30	0.000%
39	-0.08	-37.76	-6.62	0.08	37.76	6.62	0.000%
40	3.27	-37.76	-5.70	-3.27	37.76	5.70	0.000%
41	5.71	-37.76	-3.27	-5.71	37.76	3.27	0.000%
42	6.62	-37.76	0.04	-6.62	37.76	-0.04	0.000%
43	5.76	-37.76	3.35	-5.76	37.76	-3.35	0.000%
44	3.35	-37.76	5.75	-3.35	37.76	-5.75	0.000%
45	0.05	-37.76	6.61	-0.05	37.76	-6.61	0.000%
46	-3.28	-37.76	5.69	3.28	37.76	-5.69	0.000%
47	-5.74	-37.76	3.25	5.74	37.76	-3.25	0.000%
48	-6.64	-37.76	-0.06	6.64	37.76	0.06	0.000%
49	-5.77	-37.76	-3.35	5.77	37.76	3.35	0.000%
50	-3.37	-37.76	-5.75	3.37	37.76	5.75	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000568
2	Yes	5	0.00000001	0.00094897
3	Yes	5	0.00000001	0.00043138
4	Yes	6	0.00000001	0.00018378
5	Yes	6	0.00000001	0.00005921
6	Yes	6	0.00000001	0.00014357
7	Yes	6	0.00000001	0.00004510
8	Yes	5	0.00000001	0.00028028
9	Yes	5	0.00000001	0.00012676
10	Yes	6	0.00000001	0.00015594

11	Yes	6	0.00000001	0.00004857
12	Yes	6	0.00000001	0.00018730
13	Yes	6	0.00000001	0.00005957
14	Yes	6	0.00000001	0.00005010
15	Yes	5	0.00000001	0.00058685
16	Yes	6	0.00000001	0.00013844
17	Yes	6	0.00000001	0.00004355
18	Yes	6	0.00000001	0.00017279
19	Yes	6	0.00000001	0.00005543
20	Yes	5	0.00000001	0.00007651
21	Yes	5	0.00000001	0.00003134
22	Yes	6	0.00000001	0.00017436
23	Yes	6	0.00000001	0.00005505
24	Yes	6	0.00000001	0.00015013
25	Yes	6	0.00000001	0.00004665
26	Yes	5	0.00000001	0.00011380
27	Yes	6	0.00000001	0.00088794
28	Yes	7	0.00000001	0.00012255
29	Yes	7	0.00000001	0.00011886
30	Yes	6	0.00000001	0.00090355
31	Yes	7	0.00000001	0.00012315
32	Yes	7	0.00000001	0.00012499
33	Yes	6	0.00000001	0.00090126
34	Yes	7	0.00000001	0.00011627
35	Yes	7	0.00000001	0.00011955
36	Yes	6	0.00000001	0.00087042
37	Yes	7	0.00000001	0.00011821
38	Yes	7	0.00000001	0.00011712
39	Yes	5	0.00000001	0.00005572
40	Yes	5	0.00000001	0.00008942
41	Yes	5	0.00000001	0.00004863
42	Yes	4	0.00000001	0.00037688
43	Yes	5	0.00000001	0.00005183
44	Yes	5	0.00000001	0.00008826
45	Yes	5	0.00000001	0.00005988
46	Yes	5	0.00000001	0.00005419
47	Yes	5	0.00000001	0.00007347
48	Yes	4	0.00000001	0.00030543
49	Yes	5	0.00000001	0.00006833
50	Yes	5	0.00000001	0.00005477

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 115	14.38	43	1.1104	0.0187
L2	115 - 110	13.21	43	1.1067	0.0175
L3	110 - 105	12.06	43	1.0944	0.0155
L4	105 - 100	10.93	43	1.0725	0.0134
L5	100 - 95	9.82	43	1.0355	0.0114
L6	95 - 90	8.76	43	0.9807	0.0094
L7	90 - 85	7.77	43	0.9050	0.0074
L8	85 - 80	6.86	43	0.8393	0.0061
L9	80 - 79.75	6.02	43	0.7588	0.0047
L10	79.75 - 78.5	5.98	43	0.7560	0.0047
L11	78.5 - 78.25	5.79	43	0.7420	0.0045
L12	78.25 - 73.25	5.75	43	0.7402	0.0045
L13	73.25 - 68.25	4.99	43	0.7017	0.0040
L14	68.25 - 68	4.28	43	0.6572	0.0035
L15	68 - 67.75	4.24	43	0.6548	0.0035
L16	67.75 - 62.75	4.21	43	0.6516	0.0034
L17	62.75 - 60	3.56	43	0.5829	0.0028
L18	60 - 59.75	3.24	43	0.5415	0.0024
L19	59.75 - 54.75	3.21	43	0.5393	0.0024
L20	54.75 - 49.75	2.67	43	0.4920	0.0021
L21	49.75 - 45.42	2.18	43	0.4392	0.0017
L22	45.42 - 45.17	1.81	43	0.3891	0.0014

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L23	45.17 - 40.17	1.79	43	0.3866	0.0014
L24	40.17 - 36.42	1.41	43	0.3345	0.0011
L25	36.42 - 36.17	1.16	43	0.2923	0.0009
L26	36.17 - 32.75	1.15	43	0.2898	0.0009
L27	32.75 - 32.5	0.95	43	0.2548	0.0008
L28	32.5 - 32.25	0.94	43	0.2537	0.0008
L29	32.25 - 30	0.93	43	0.2528	0.0008
L30	30 - 28.66	0.81	43	0.2439	0.0007
L31	28.66 - 28.41	0.74	43	0.2396	0.0007
L32	28.41 - 26.75	0.73	43	0.2385	0.0007
L33	26.75 - 26.5	0.65	43	0.2307	0.0007
L34	26.5 - 21.5	0.63	43	0.2285	0.0007
L35	21.5 - 21	0.42	43	0.1814	0.0005
L36	21 - 20.75	0.40	43	0.1765	0.0005
L37	20.75 - 15.75	0.39	43	0.1746	0.0005
L38	15.75 - 10.75	0.23	43	0.1363	0.0004
L39	10.75 - 5.75	0.11	43	0.0952	0.0002
L40	5.75 - 2	0.03	43	0.0513	0.0001
L41	2 - 1.75	0.00	43	0.0165	0.0000
L42	1.75 - 0	0.00	43	0.0145	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	Lightning Rod 5/8"x4'	43	13.91	1.1095	0.0184	35230
116.00	VHLP1-18	43	13.45	1.1080	0.0179	35230
114.00	Pipe Mount [PM 602-3]	43	12.98	1.1050	0.0172	29490
107.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	43	11.38	1.0828	0.0143	12058
99.00	(2) QS66512-2 w/ Mount Pipe	43	9.60	1.0264	0.0111	5774
60.00	(2) Bridge Stiffener (109" x 15.75" x 1.25")	43	3.24	0.5415	0.0025	4740
59.00	Side Arm Mount [SO 701-1]	43	3.13	0.5327	0.0024	5142
48.00	GPS_A	43	2.03	0.4182	0.0016	5105
30.00	(2) Bridge Stiffener (137" x 15.5" x 1.25")	43	0.81	0.2439	0.0007	11722

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 115	66.93	10	5.1362	0.0885
L2	115 - 110	61.57	10	5.1245	0.0828
L3	110 - 105	56.23	10	5.0762	0.0732
L4	105 - 100	50.97	10	4.9827	0.0636
L5	100 - 95	45.85	22	4.8182	0.0539
L6	95 - 90	40.94	22	4.5694	0.0444
L7	90 - 85	36.35	22	4.2219	0.0349
L8	85 - 80	32.09	22	3.9184	0.0286
L9	80 - 79.75	28.18	22	3.5453	0.0223
L10	79.75 - 78.5	27.99	22	3.5327	0.0221
L11	78.5 - 78.25	27.08	22	3.4677	0.0211
L12	78.25 - 73.25	26.90	22	3.4595	0.0210
L13	73.25 - 68.25	23.37	22	3.2812	0.0187
L14	68.25 - 68	20.04	22	3.0744	0.0164
L15	68 - 67.75	19.88	22	3.0633	0.0163
L16	67.75 - 62.75	19.72	22	3.0484	0.0161
L17	62.75 - 60	16.70	22	2.7287	0.0131

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L18	60 - 59.75	15.18	22	2.5355	0.0115
L19	59.75 - 54.75	15.05	22	2.5252	0.0114
L20	54.75 - 49.75	12.52	22	2.3044	0.0097
L21	49.75 - 45.42	10.23	22	2.0579	0.0081
L22	45.42 - 45.17	8.47	22	1.8233	0.0067
L23	45.17 - 40.17	8.38	22	1.8117	0.0066
L24	40.17 - 36.42	6.61	22	1.5680	0.0053
L25	36.42 - 36.17	5.45	22	1.3703	0.0044
L26	36.17 - 32.75	5.38	22	1.3587	0.0043
L27	32.75 - 32.5	4.46	22	1.1948	0.0036
L28	32.5 - 32.25	4.40	22	1.1898	0.0036
L29	32.25 - 30	4.34	22	1.1853	0.0036
L30	30 - 28.66	3.79	22	1.1435	0.0034
L31	28.66 - 28.41	3.47	22	1.1237	0.0033
L32	28.41 - 26.75	3.41	22	1.1184	0.0033
L33	26.75 - 26.5	3.03	22	1.0821	0.0031
L34	26.5 - 21.5	2.98	22	1.0715	0.0031
L35	21.5 - 21	1.97	22	0.8506	0.0023
L36	21 - 20.75	1.88	22	0.8276	0.0023
L37	20.75 - 15.75	1.84	22	0.8189	0.0022
L38	15.75 - 10.75	1.07	22	0.6392	0.0017
L39	10.75 - 5.75	0.50	22	0.4465	0.0011
L40	5.75 - 2	0.14	22	0.2406	0.0006
L41	2 - 1.75	0.02	22	0.0775	0.0002
L42	1.75 - 0	0.01	22	0.0679	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	Lightning Rod 5/8"x4'	10	64.78	5.1341	0.0866	9849
116.00	VHLP1-18	10	62.64	5.1291	0.0842	9849
114.00	Pipe Mount [PM 602-3]	10	60.50	5.1182	0.0811	8020
107.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	10	53.06	5.0273	0.0674	2851
99.00	(2) QS66512-2 w/ Mount Pipe	22	44.85	4.7771	0.0520	1298
60.00	(2) Bridge Stiffener (109" x 15.75" x 1.25")	22	15.18	2.5355	0.0115	1020
59.00	Side Arm Mount [SO 701-1]	22	14.65	2.4944	0.0112	1106
48.00	GPS_A	22	9.50	1.9598	0.0075	1095
30.00	(2) Bridge Stiffener (137" x 15.5" x 1.25")	22	3.79	1.1435	0.0034	2504

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K
L1	120 - 115 (1)	P24x0.25	5.00	0.00	0.0	18.6532	-2.39
L2	115 - 110 (2)	P24x0.25	5.00	0.00	0.0	18.6532	-3.45
L3	110 - 105 (3)	P24x0.25	5.00	0.00	0.0	18.6532	-7.40
L4	105 - 100 (4)	P24x0.25	5.00	0.00	0.0	18.6532	-7.88

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u
	ft		ft	ft		in^2	K
L5	100 - 95 (5)	P24x0.25	5.00	0.00	0.0	18.6532	-11.08
L6	95 - 90 (6)	P24x0.25	5.00	0.00	0.0	18.6532	-11.68
L7	90 - 85 (7)	P24x0.375	5.00	0.00	0.0	27.8325	-12.46
L8	85 - 80 (8)	P24x0.375	5.00	0.00	0.0	27.8325	-13.26
L9	80 - 79.75 (9)	P24x0.625	0.25	0.00	0.0	45.8967	-13.32
L10	79.75 - 78.5 (10)	P24x0.625	1.25	0.00	0.0	45.8967	-13.57
L11	78.5 - 78.25 (11)	P24x1.075	0.25	0.00	0.0	77.4226	-13.66
L12	78.25 - 73.25 (12)	P24x1.075	5.00	0.00	0.0	77.4226	-15.17
L13	73.25 - 68.25 (13)	P24x1.075	5.00	0.00	0.0	77.4226	-16.71
L14	68.25 - 68 (14)	P24x1.075	0.25	0.00	0.0	77.4226	-16.79
L15	68 - 67.75 (15)	P24x0.775	0.25	0.00	0.0	56.5467	-16.85
L16	67.75 - 62.75 (16)	P24x0.775	5.00	0.00	0.0	56.5467	-18.12
L17	62.75 - 60 (17)	P24x0.775	2.75	0.00	0.0	56.5467	-18.84
L18	60 - 59.75 (18)	P30x0.675	0.25	0.00	0.0	62.1859	-20.32
L19	59.75 - 54.75 (19)	P30x0.675	5.00	0.00	0.0	62.1859	-21.80
L20	54.75 - 49.75 (20)	P30x0.675	5.00	0.00	0.0	62.1859	-23.22
L21	49.75 - 45.42 (21)	P30x0.675	4.33	0.00	0.0	62.1859	-24.53
L22	45.42 - 45.17 (22)	P30x0.8375	0.25	0.00	0.0	76.7290	-24.63
L23	45.17 - 40.17 (23)	P30x0.8375	5.00	0.00	0.0	76.7290	-26.28
L24	40.17 - 36.42 (24)	P30x0.8375	3.75	0.00	0.0	76.7290	-27.54
L25	36.42 - 36.17 (25)	P30x1	0.25	0.00	0.0	91.1062	-27.64
L26	36.17 - 32.75 (26)	P30x1	3.42	0.00	0.0	91.1062	-28.93
L27	32.75 - 32.5 (27)	P30x3.025	0.25	0.00	0.0	256.3520	-29.09
L28	32.5 - 32.25 (28)	P30x3.525	0.25	0.00	0.0	293.1870	-29.24
L29	32.25 - 30 (29)	P30x3.525	2.25	0.00	0.0	293.1870	-30.67
L30	30 - 28.66 (30)	P36x2.225	1.34	0.00	0.0	236.0890	-33.12
L31	28.66 - 28.41 (31)	P36x1.45	0.25	0.00	0.0	157.3860	-33.22
L32	28.41 - 26.75 (32)	P36x1.45	1.66	0.00	0.0	157.3860	-33.80
L33	26.75 - 26.5 (33)	P36x0.7125	0.25	0.00	0.0	78.9870	-33.90
L34	26.5 - 21.5 (34)	P36x0.7125	5.00	0.00	0.0	78.9870	-35.66
L35	21.5 - 21 (35)	P36x0.7125	0.50	0.00	0.0	78.9870	-35.84
L36	21 - 20.75 (36)	P36x0.975	0.25	0.00	0.0	107.2830	-35.95
L37	20.75 - 15.75 (37)	P36x0.975	5.00	0.00	0.0	107.2830	-38.18
L38	15.75 - 10.75 (38)	P36x0.975	5.00	0.00	0.0	107.2830	-40.43
L39	10.75 - 5.75	P36x0.975	5.00	0.00	0.0	107.28	-42.69

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K
	(39)					30	
L40	5.75 - 2 (40)	P36x0.975	3.75	0.00	0.0	107.28	-44.38
						30	
L41	2 - 1.75 (41)	P36x1.15	0.25	0.00	0.0	125.90	-44.51
						70	
L42	1.75 - 0 (42)	P36x1.15	1.75	0.00	0.0	125.90	-45.29
						70	

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft
L1	120 - 115 (1)	P24x0.25	27.16
L2	115 - 110 (2)	P24x0.25	63.33
L3	110 - 105 (3)	P24x0.25	117.48
L4	105 - 100 (4)	P24x0.25	187.06
L5	100 - 95 (5)	P24x0.25	275.35
L6	95 - 90 (6)	P24x0.25	367.61
L7	90 - 85 (7)	P24x0.375	461.60
L8	85 - 80 (8)	P24x0.375	557.34
L9	80 - 79.75 (9)	P24x0.625	562.17
L10	79.75 - 78.5 (10)	P24x0.625	586.49
L11	78.5 - 78.25 (11)	P24x1.075	591.38
L12	78.25 - 73.25 (12)	P24x1.075	691.25
L13	73.25 - 68.25 (13)	P24x1.075	794.95
L14	68.25 - 68 (14)	P24x1.075	800.24
L15	68 - 67.75 (15)	P24x0.775	805.53
L16	67.75 - 62.75 (16)	P24x0.775	913.06
L17	62.75 - 60 (17)	P24x0.775	973.27
L18	60 - 59.75 (18)	P30x0.675	979.17
L19	59.75 - 54.75 (19)	P30x0.675	1098.36
L20	54.75 - 49.75 (20)	P30x0.675	1219.90
L21	49.75 - 45.42 (21)	P30x0.675	1328.20
L22	45.42 - 45.17 (22)	P30x0.8375	1334.54
L23	45.17 - 40.17 (23)	P30x0.8375	1463.41
L24	40.17 - 36.42 (24)	P30x0.8375	1562.43
L25	36.42 - 36.17 (25)	P30x1	1569.10
L26	36.17 - 32.75 (26)	P30x1	1660.86
L27	32.75 - 32.5 (27)	P30x3.025	1667.59
L28	32.5 - 32.25 (28)	P30x3.525	1674.34
L29	32.25 - 30 (29)	P30x3.525	1735.24
L30	30 - 28.66 (30)	P36x2.225	1774.03
L31	28.66 - 28.41	P36x1.45	1781.28

Section No.	Elevation ft	Size	M_{ux} kip-ft
	(31)		
L32	28.41 - 26.75	P36x1.45	1829.56
	(32)		
L33	26.75 - 26.5	P36x0.7125	1836.85
	(33)		
L34	26.5 - 21.5	P36x0.7125	1983.63
	(34)		
L35	21.5 - 21 (35)	P36x0.7125	1998.41
L36	21 - 20.75	P36x0.975	2005.81
	(36)		
L37	20.75 - 15.75	P36x0.975	2154.97
	(37)		
L38	15.75 - 10.75	P36x0.975	2306.18
	(38)		
L39	10.75 - 5.75	P36x0.975	2459.30
	(39)		
L40	5.75 - 2 (40)	P36x0.975	2575.31
L41	2 - 1.75 (41)	P36x1.15	2583.07
L42	1.75 - 0 (42)	P36x1.15	2637.57

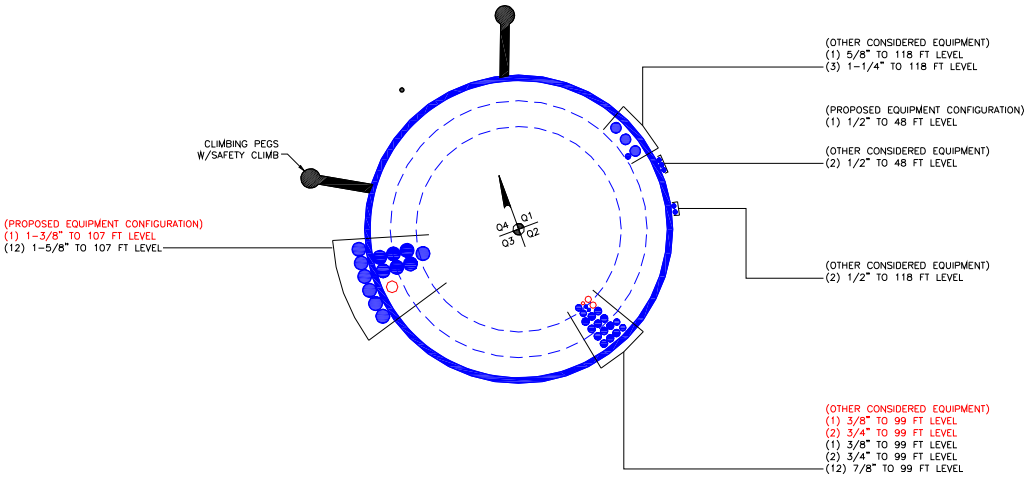
Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K
L1	120 - 115 (1)	P24x0.25	6.24
L2	115 - 110 (2)	P24x0.25	7.61
L3	110 - 105 (3)	P24x0.25	13.72
L4	105 - 100 (4)	P24x0.25	14.12
L5	100 - 95 (5)	P24x0.25	18.29
L6	95 - 90 (6)	P24x0.25	18.63
L7	90 - 85 (7)	P24x0.375	18.98
L8	85 - 80 (8)	P24x0.375	19.33
L9	80 - 79.75 (9)	P24x0.625	19.36
L10	79.75 - 78.5	P24x0.625	19.56
	(10)		
L11	78.5 - 78.25	P24x1.075	19.59
	(11)		
L12	78.25 - 73.25	P24x1.075	20.37
	(12)		
L13	73.25 - 68.25	P24x1.075	21.13
	(13)		
L14	68.25 - 68	P24x1.075	21.16
	(14)		
L15	68 - 67.75	P24x0.775	21.19
	(15)		
L16	67.75 - 62.75	P24x0.775	21.84
	(16)		
L17	62.75 - 60	P24x0.775	22.00
	(17)		
L18	60 - 59.75	P30x0.675	23.59
	(18)		
L19	59.75 - 54.75	P30x0.675	24.05
	(19)		
L20	54.75 - 49.75	P30x0.675	24.64
	(20)		
L21	49.75 - 45.42	P30x0.675	25.37
	(21)		
L22	45.42 - 45.17	P30x0.8375	25.40
	(22)		
L23	45.17 - 40.17	P30x0.8375	26.15
	(23)		
L24	40.17 - 36.42	P30x0.8375	26.68
	(24)		
L25	36.42 - 36.17	P30x1	26.70

Section No.	Elevation ft	Size	Actual V_u K
	(25)		
L26	36.17 - 32.75	P30x1	26.96
	(26)		
L27	32.75 - 32.5	P30x3.025	26.96
	(27)		
L28	32.5 - 32.25	P30x3.525	26.98
	(28)		
L29	32.25 - 30	P30x3.525	27.15
	(29)		
L30	30 - 28.66	P36x2.225	29.00
	(30)		
L31	28.66 - 28.41	P36x1.45	29.02
	(31)		
L32	28.41 - 26.75	P36x1.45	29.15
	(32)		
L33	26.75 - 26.5	P36x0.7125	29.15
	(33)		
L34	26.5 - 21.5	P36x0.7125	29.55
	(34)		
L35	21.5 - 21 (35)	P36x0.7125	29.59
L36	21 - 20.75	P36x0.975	29.61
	(36)		
L37	20.75 - 15.75	P36x0.975	30.05
	(37)		
L38	15.75 - 10.75	P36x0.975	30.44
	(38)		
L39	10.75 - 5.75	P36x0.975	30.81
	(39)		
L40	5.75 - 2 (40)	P36x0.975	31.08
L41	2 - 1.75 (41)	P36x1.15	31.08
L42	1.75 - 0 (42)	P36x1.15	31.22

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(1) 5/8" TO 118 FT LEVEL
(3) 1-1/4" TO 118 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1/2" TO 48 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(2) 1/2" TO 48 FT LEVEL
CLIMBING PEGS
W/SAFETY CLIMB
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-3/8" TO 107 FT LEVEL
(12) 1-5/8" TO 107 FT LEVEL
Q4
Q1
Q3
Q2
(OTHER CONSIDERED EQUIPMENT)
(2) 1/2" TO 118 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 99 FT LEVEL
(2) 3/4" TO 99 FT LEVEL
(1) 3/8" TO 99 FT LEVEL
(2) 3/4" TO 99 FT LEVEL
(12) 7/8" TO 99 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- G

Site BU: 876329

Work Order:

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	120	30		0	24	24	0.25		A53-B-42
2	90	30		0	24.00	24	0.375		A53-B-42
3	60	30		0	30.00	30	0.375		A53-B-42
4	30	30		0	36.00	36	0.375		A53-B-42

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	68	80	plate	P 3 x 1.25; (1) (1.1875)	4	80	170	260	350														
2	32.5	36.42	channel	MP3-05; (1) (1.21875)_	4					5	95	185	275										
3	36.42	45.42	channel	MP3-03; (1) (1.21875)_	4					5	95	185	275										
4	2	26.75	plate	CCI-SFP-065125	4									30	120	210	300						
5	32.5	60	plate	CCI-AFP-060100	4									30	120	210	300						
6	60	78.5	plate	CCI-SFP-060100	4									30	120	210	300						
7	2	21	plate	CI-060100; (1) (1.1875)	4													60	150	240	330		
8	0	2	plate	FP 1.25 x 6_1	4													34	124	214	304		
9	0	2	plate	FP 1.25 x 5.5_1	4					56	150	236	330										
10	26.75	32.75	plate	FP 1.25 x 6_2	4					50	140	230	320										
11	28.66	32.5	plate	FP 1.25 x 4.25_1	4	0	90	180	270														
12																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	3	1.25	3.75	0.625	n/a	n/a	24.000	2.188	1.1875	A572-65
2	5.3307	2.087	5.6089	0.783	n/a	n/a	18.000	4.968	1.2188	A572-65
3	4.062992126	1.57480315	2.88	0.5873	n/a	n/a	18.000	2.492	1.2188	A572-65
4	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
5	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
6	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
7	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
8	1.25	6	7.5	3	n/a	n/a	0.000	7.500	0.0000	A572-65
9	1.25	5.5	6.875	2.75	n/a	n/a	0.000	6.875	0.0000	A572-65
10	1.25	6	7.5	15.5	n/a	n/a	0.000	7.500	0.0000	A572-65
11	1.25	4.25	5.3125	12.75	n/a	n/a	0.000	5.313	0.0000	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	120 - 115	5		0	24.000	24.000	0.25	A53-B-42	1.000
2	115 - 110	5		0	24.000	24.000	0.25	A53-B-42	1.000
3	110 - 105	5		0	24.000	24.000	0.25	A53-B-42	1.000
4	105 - 100	5		0	24.000	24.000	0.25	A53-B-42	1.000
5	100 - 95	5		0	24.000	24.000	0.25	A53-B-42	1.000
6	95 - 90	5	0	0	24.000	24.000	0.25	A53-B-42	1.000
7	90 - 85	5		0	24.000	24.000	0.375	A53-B-42	1.000
8	85 - 80	5		0	24.000	24.000	0.375	A53-B-42	1.000
9	80 - 79.75	0.25		0	24.000	24.000	0.625	A53-B-42	0.933
10	79.75 - 78.5	1.25		0	24.000	24.000	0.625	A53-B-42	0.933
11	78.5 - 78.25	0.25		0	24.000	24.000	1.075	A53-B-42	0.863
12	78.25 - 73.25	5		0	24.000	24.000	1.075	A53-B-42	0.863
13	73.25 - 68.25	5		0	24.000	24.000	1.075	A53-B-42	0.863
14	68.25 - 68	0.25		0	24.000	24.000	1.075	A53-B-42	0.863
15	68 - 67.75	0.25		0	24.000	24.000	0.775	A53-B-42	0.917
16	67.75 - 62.75	5		0	24.000	24.000	0.775	A53-B-42	0.917
17	62.75 - 60	2.75	0	0	24.000	24.000	0.775	A53-B-42	0.917
18	60 - 59.75	0.25		0	30.000	30.000	0.675	A53-B-42	0.947
19	59.75 - 54.75	5		0	30.000	30.000	0.675	A53-B-42	0.947
20	54.75 - 49.75	5		0	30.000	30.000	0.675	A53-B-42	0.947
21	49.75 - 45.42	4.33		0	30.000	30.000	0.675	A53-B-42	0.947
22	45.42 - 45.17	0.25		0	30.000	30.000	0.8375	A53-B-42	0.918
23	45.17 - 40.17	5		0	30.000	30.000	0.8375	A53-B-42	0.918
24	40.17 - 36.42	3.75		0	30.000	30.000	0.8375	A53-B-42	0.918
25	36.42 - 36.17	0.25		0	30.000	30.000	1	A53-B-42	0.893
26	36.17 - 32.75	3.42		0	30.000	30.000	1	A53-B-42	0.893
27	32.75 - 32.5	0.25		0	30.000	30.000	3.025	A53-B-42	0.434
28	32.5 - 32.25	0.25		0	30.000	30.000	3.525	A53-B-42	0.294
29	32.25 - 30	2.25	0	0	30.000	30.000	3.525	A53-B-42	0.294
30	30 - 28.66	1.34		0	36.000	36.000	2.225	A53-B-42	0.395
31	28.66 - 28.41	0.25		0	36.000	36.000	1.45	A53-B-42	0.457
32	28.41 - 26.75	1.66		0	36.000	36.000	1.45	A53-B-42	0.457
33	26.75 - 26.5	0.25		0	36.000	36.000	0.7125	A53-B-42	0.943
34	26.5 - 21.5	5		0	36.000	36.000	0.7125	A53-B-42	0.943
35	21.5 - 21	0.5		0	36.000	36.000	0.7125	A53-B-42	0.943
36	21 - 20.75	0.25		0	36.000	36.000	0.975	A53-B-42	0.918
37	20.75 - 15.75	5		0	36.000	36.000	0.975	A53-B-42	0.918
38	15.75 - 10.75	5		0	36.000	36.000	0.975	A53-B-42	0.918
39	10.75 - 5.75	5		0	36.000	36.000	0.975	A53-B-42	0.918
40	5.75 - 2	3.75		0	36.000	36.000	0.975	A53-B-42	0.918
41	2 - 1.75	0.25		0	36.000	36.000	1.15	A53-B-42	0.790
42	1.75 - 0	1.75		0	36.000	36.000	1.15	A53-B-42	0.790

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	120 - 115	2.39	27.16	6.24
2	115 - 110	3.45	63.33	7.61
3	110 - 105	7.40	117.48	13.72
4	105 - 100	7.88	187.06	14.12
5	100 - 95	11.08	275.35	18.29
6	95 - 90	11.68	367.61	18.63
7	90 - 85	12.46	461.60	18.98
8	85 - 80	13.26	557.34	19.33
9	80 - 79.75	13.32	562.17	19.36
10	79.75 - 78.5	13.57	586.49	19.56
11	78.5 - 78.25	13.66	591.38	19.59
12	78.25 - 73.25	15.17	691.25	20.37
13	73.25 - 68.25	16.71	794.95	21.13
14	68.25 - 68	16.79	800.24	21.16
15	68 - 67.75	16.85	805.53	21.19
16	67.75 - 62.75	18.12	913.06	21.84
17	62.75 - 60	18.84	973.28	22.00
18	60 - 59.75	20.32	979.17	23.59
19	59.75 - 54.75	21.80	1098.36	24.05
20	54.75 - 49.75	23.22	1219.90	24.64
21	49.75 - 45.42	24.53	1328.20	25.37
22	45.42 - 45.17	24.63	1334.54	25.40
23	45.17 - 40.17	26.28	1463.40	26.15
24	40.17 - 36.42	27.54	1562.43	26.68
25	36.42 - 36.17	27.64	1569.10	26.70
26	36.17 - 32.75	28.93	1660.86	26.96
27	32.75 - 32.5	29.09	1667.60	26.96
28	32.5 - 32.25	29.24	1674.34	26.98
29	32.25 - 30	30.67	1735.24	27.15
30	30 - 28.66	33.12	1774.03	29.00
31	28.66 - 28.41	33.22	1781.28	29.02
32	28.41 - 26.75	33.80	1829.56	29.15
33	26.75 - 26.5	33.90	1836.85	29.15
34	26.5 - 21.5	35.66	1983.62	29.55
35	21.5 - 21	35.84	1998.41	29.59
36	21 - 20.75	35.95	2005.81	29.61
37	20.75 - 15.75	38.18	2154.96	30.05
38	15.75 - 10.75	40.43	2306.19	30.44
39	10.75 - 5.75	42.69	2459.30	30.81
40	5.75 - 2	44.38	2575.31	31.08
41	2 - 1.75	44.51	2583.07	31.08
42	1.75 - 0	45.29	2637.57	31.22

Analysis Results

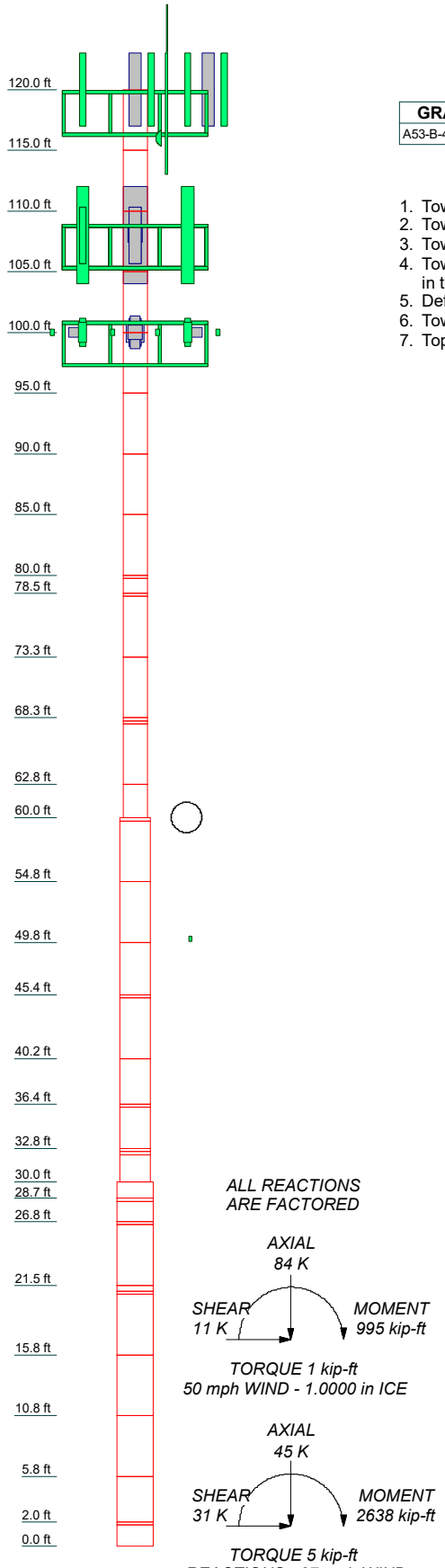
Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
120 - 115	Pole	TP24x24x0.25	Pole	7.2%	Pass
115 - 110	Pole	TP24x24x0.25	Pole	16.5%	Pass
110 - 105	Pole	TP24x24x0.25	Pole	30.9%	Pass
105 - 100	Pole	TP24x24x0.25	Pole	48.5%	Pass
100 - 95	Pole	TP24x24x0.25	Pole	71.4%	Pass
95 - 90	Pole	TP24x24x0.25	Pole	94.8%	Pass
90 - 85	Pole	TP24x24x0.375	Pole	75.3%	Pass
85 - 80	Pole	TP24x24x0.375	Pole	90.8%	Pass
80 - 79.75	Pole + Reinf.	TP24x24x0.625	Reinf. 1 Tension Rupture	78.2%	Pass
79.75 - 78.5	Pole + Reinf.	TP24x24x0.625	Reinf. 1 Tension Rupture	81.6%	Pass
78.5 - 78.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	51.1%	Pass
78.25 - 73.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	59.7%	Pass
73.25 - 68.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	68.6%	Pass
68.25 - 68	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	69.1%	Pass
68 - 67.75	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	66.8%	Pass
67.75 - 62.75	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	75.7%	Pass
62.75 - 60	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	80.6%	Pass
60 - 59.75	Pole + Reinf.	TP30x30x0.675	Pole	59.5%	Pass
59.75 - 54.75	Pole + Reinf.	TP30x30x0.675	Pole	66.7%	Pass
54.75 - 49.75	Pole + Reinf.	TP30x30x0.675	Pole	74.0%	Pass
49.75 - 45.42	Pole + Reinf.	TP30x30x0.675	Pole	80.5%	Pass
45.42 - 45.17	Pole + Reinf.	TP30x30x0.8375	Pole	67.0%	Pass
45.17 - 40.17	Pole + Reinf.	TP30x30x0.8375	Pole	73.4%	Pass
40.17 - 36.42	Pole + Reinf.	TP30x30x0.8375	Pole	78.4%	Pass
36.42 - 36.17	Pole + Reinf.	TP30x30x1	Pole	67.1%	Pass
36.17 - 32.75	Pole + Reinf.	TP30x30x1	Pole	71.0%	Pass
32.75 - 32.5	Pole + Reinf.	TP30x30x3.025	Reinf. 10 Compression	44.8%	Pass
32.5 - 32.25	Pole + Reinf.	TP30x30x3.525	Reinf. 10 Compression	40.9%	Pass
32.25 - 30	Pole + Reinf.	TP30x30x3.525	Reinf. 10 Compression	42.4%	Pass
30 - 28.66	Pole + Reinf.	TP36x36x2.225	Reinf. 10 Compression	37.0%	Pass
28.66 - 28.41	Pole + Reinf.	TP36x36x1.45	Reinf. 10 Compression	53.1%	Pass
28.41 - 26.75	Pole + Reinf.	TP36x36x1.45	Reinf. 10 Compression	54.5%	Pass
26.75 - 26.5	Pole + Reinf.	TP36x36x0.7125	Pole	75.1%	Pass
26.5 - 21.5	Pole + Reinf.	TP36x36x0.7125	Pole	81.0%	Pass
21.5 - 21	Pole + Reinf.	TP36x36x0.7125	Pole	81.6%	Pass
21 - 20.75	Pole + Reinf.	TP36x36x0.975	Pole	61.3%	Pass
20.75 - 15.75	Pole + Reinf.	TP36x36x0.975	Pole	65.9%	Pass
15.75 - 10.75	Pole + Reinf.	TP36x36x0.975	Pole	70.5%	Pass
10.75 - 5.75	Pole + Reinf.	TP36x36x0.975	Pole	75.2%	Pass
5.75 - 2	Pole + Reinf.	TP36x36x0.975	Pole	78.7%	Pass
2 - 1.75	Pole + Reinf.	TP36x36x1.15	Reinf. 9 Connection	70.6%	Pass
1.75 - 0	Pole + Reinf.	TP36x36x1.15	Reinf. 9 Connection	72.1%	Pass
				Summary	
			Pole	94.8%	Pass
			Reinforcement	81.6%	Pass
			Overall	94.8%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity											
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
120 - 115	1315	n/a	1315	18.65	n/a	18.65	7.2%											
115 - 110	1315	n/a	1315	18.65	n/a	18.65	16.5%											
110 - 105	1315	n/a	1315	18.65	n/a	18.65	30.9%											
105 - 100	1315	n/a	1315	18.65	n/a	18.65	48.5%											
100 - 95	1315	n/a	1315	18.65	n/a	18.65	71.4%											
95 - 90	1315	n/a	1315	18.65	n/a	18.65	94.8%											
90 - 85	1942	n/a	1942	27.83	n/a	27.83	75.3%											
85 - 80	1942	n/a	1942	27.83	n/a	27.83	90.8%											
80 - 79.75	1942	1202	3144	27.83	15.00	42.83	56.5%	78.2%										
79.75 - 78.5	1942	1202	3144	27.83	15.00	42.83	58.9%	81.6%										
78.5 - 78.25	1942	3114	5056	27.83	39.00	66.83	36.9%	51.1%					37.4%					
78.25 - 73.25	1942	3114	5056	27.83	39.00	66.83	43.1%	59.7%					43.7%					
73.25 - 68.25	1942	3114	5056	27.83	39.00	66.83	49.6%	68.6%					50.2%					
68.25 - 68	1942	3114	5056	27.83	39.00	66.83	49.9%	69.1%					50.6%					
68 - 67.75	1942	1912	3854	27.83	24.00	51.83	65.9%						66.8%					
67.75 - 62.75	1942	1912	3854	27.83	24.00	51.83	74.6%						75.7%					
62.75 - 60	1942	1912	3854	27.83	24.00	51.83	79.5%						80.6%					
60 - 59.75	3829	2920	6749	34.90	24.00	58.90	59.5%					57.7%						
59.75 - 54.75	3829	2920	6749	34.90	24.00	58.90	66.7%					64.6%						
54.75 - 49.75	3829	2920	6749	34.90	24.00	58.90	74.0%					71.7%						
49.75 - 45.42	3829	2920	6749	34.90	24.00	58.90	80.5%					78.1%						
45.42 - 45.17	3829	4323	8152	34.90	35.52	70.42	67.0%			63.9%		64.9%						
45.17 - 40.17	3829	4323	8152	34.90	35.52	70.42	73.4%			70.1%		71.2%						
40.17 - 36.42	3829	4323	8152	34.90	35.52	70.42	78.4%			74.8%		76.0%						
36.42 - 36.17	3829	5729	9558	34.90	46.44	81.34	67.1%		61.3%			65.1%						
36.17 - 32.75	3829	5729	9558	34.90	46.44	81.34	71.0%		64.8%			68.9%						
32.75 - 32.5	3829	19729	23559	34.90	76.44	111.34	29.1%		26.6%			28.3%					44.8%	
32.5 - 32.25	3829	22200	26029	34.90	51.25	86.15	26.7%										40.9%	37.3%
32.25 - 30	3829	22200	26029	34.90	51.25	86.15	27.7%										42.4%	38.7%
30 - 28.66	6659	26945	33604	41.97	51.25	93.22	27.0%										37.0%	34.1%
28.66 - 28.41	6659	16881	23540	41.97	30.00	71.97	38.7%										53.1%	
28.41 - 26.75	6659	16881	23540	41.97	30.00	71.97	39.7%										54.5%	
26.75 - 26.5	6659	5696	12355	41.97	32.50	74.47	75.1%				69.7%							
26.5 - 21.5	6659	5696	12355	41.97	32.50	74.47	81.0%				75.2%							
21.5 - 21	6659	5696	12355	41.97	32.50	74.47	81.6%				75.8%							
21 - 20.75	6659	9840	16499	41.97	56.50	98.47	61.3%				56.9%			57.7%				
20.75 - 15.75	6659	9840	16499	41.97	56.50	98.47	65.9%				61.1%			62.0%				
15.75 - 10.75	6659	9840	16499	41.97	56.50	98.47	70.5%				65.4%			66.3%				
10.75 - 5.75	6659	9840	16499	41.97	56.50	98.47	75.2%				69.8%			70.7%				
5.75 - 2	6659	9840	16499	41.97	56.50	98.47	78.7%				73.0%			74.0%				
2 - 1.75	6659	12590	19249	41.97	57.50	99.47	67.7%								59.6%	70.6%		
1.75 - 0	6659	12590	19249	41.97	57.50	99.47	69.2%								60.9%	72.1%		

Note: Section capacity checked in 5 degree increments.

Section	Size	Length (ft)	Grade	Weight (K)
1	P24x0.25	5.00	A53-B-42	0.3
2	P24x0.25	5.00		0.3
3	P24x0.25	5.00		0.3
4	P24x0.25	5.00		0.3
5	P24x0.25	5.00		0.3
6	P24x0.25	5.00		0.3
7	P24x0.375	5.00		0.5
8	P24x0.375	5.00		0.5
9				
10				
11				
12		5.00		1.1
13	P24x1.075	5.00		1.1
14				
15				
16		5.00		0.9
17				
18		2.75		0.5
19		5.00		1.0
20	P30x0.675	5.00		1.0
21				
22		4.33		0.9
23		5.00		1.2
24				
25		3.75		0.9
26				
27				
28				
29				
30				
31				
32				
33				
34		5.00		1.3
35				
36				
37	P36x0.975	5.00		1.7
38	P36x0.975	5.00		1.7
39	P36x0.975	5.00		1.7
40				
41		3.75		1.3
42				
		1.75		0.1
				23.9



ALL REACTIONS ARE FACTORED

AXIAL 84 K

SHEAR 11 K *MOMENT 995 kip-ft*

TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 45 K

SHEAR 31 K *MOMENT 2638 kip-ft*

TORQUE 5 kip-ft
REACTIONS - 97 mph WIND

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

Paul J. Ford and Company
250 East Broad st., Suite 600
Columbus, OH 43215
Phone: (614) 221-6679
FAX:

Job:	***MTN. VIEW CEM. (FILLEY PARK) (BU# 876329***		
Project:	***37518-2442 (876329.1558710)***		
Client: Crown Castle	Drawn by: gpenumatsa		App'd:
Code: TIA-222-G	Date: 11/15/18		Scale: NTS
Path:			Dwg No. E-1

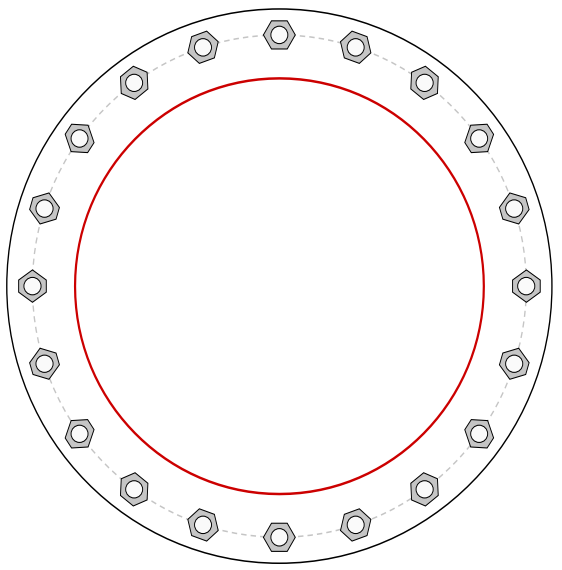
Monopole Flange Plate Connection

Elevation = 90 ft.

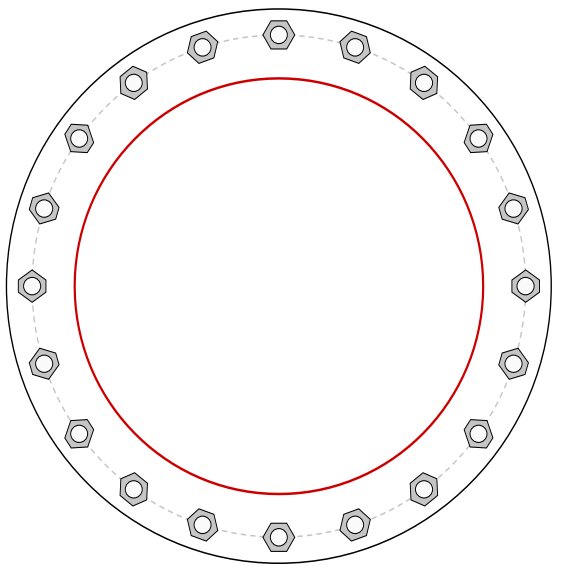
BU #	876329
Site Name	
Order #	
TIA-222 Revision	G

Applied Loads	
Moment (kip-ft)	367.61
Axial Force (kips)	11.68
Shear Force (kips)	18.63

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(20) 1" ø bolts (A325; Fy=92 ksi, Fu=120 ksi) on 29" BC

Top Plate Data

32" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

32" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.25" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	29.82	
Allowable (kips)	54.52	
Stress Ratio:	54.7%	**Pass**

Top Plate Capacity

Max Stress (ksi):	21.08	
Allowable Stress (ksi):	32.40	
Stress Ratio:	65.1%	**Pass**
Tension Side Stress Ratio:	31.3%	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	21.08	
Allowable Stress (ksi):	32.40	
Stress Ratio:	65.1%	**Pass**
Tension Side Stress Ratio:	31.3%	**Pass**

PAUL J. FORD & COMPANY
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v2.1, Effective Date: 05-03-17

Date: 11/15/2018
Project No: 37518-2442.005.7805
Site Name: MTN. View CEM (filley Park)
Site Number/BUN: 876329
Description:
Owner:
Engineer:

Welded Bridge Stiffener Analysis per TIA-222-G & AISC 13th Ed. (Black)

General Parameters and Loading:

Flange Elevation:	60.00	ft
TIA Reference Standard:	TIA-222-G	
AISC Manual:	13th Ed. (Black)	
Method:	LRFD	
ASD Stress Increase, ASIF:	N/A	
Moment, Muf:	973.3	k-ft
Axial, Puf:	18.8	kips
Shear, Vf:	22.0	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	24.00	30.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	60	60	ksi
Flange Diameter, Df:	41.00	41.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	4	0	
Upper Weld Length, L1:	51.19	0.00	in
Lower Weld Length, L2:	51.19	0.00	in
Weld Size, w:	0.3750	0.0000	in
Electrode:	E80	E70	
Effective Stiffener Width, Ws:	6.00	0.00	in
Stiffener Thickness, ts:	1.25	0.00	in
Notch, n:	1.00	0.00	in
Stiffener Fy:	65	0	ksi
Stiffener Fu:	80	0	ksi
Unbraced Length, L:	5.63	0.00	in
K:	0.80	0.00	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	50	0	degrees
Stiffener Circle:	49.00	41.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	12.50	8.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	9.50	5.50	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

Number of Bolt Circles: (1) Bolt Circle

	Bolt Circle 1	Bolt Circle 2	
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	35.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Tables 8-4 & 8-3:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	0	Num. of Sixteenths in Weld
a:	0.2442	0.0000	= e1 / L1
k:	0	0	
C:	3.3332	3.7100	Tabulated Cofficient
C1:	1.0300	1.0000	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	243.2	0.0	kips
Axial Capacity, ΦPn:	790.8	0.0	kips = Φ C C1 D L
Ratio:	30.8%	0.0%	

Lower Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	0	Num. of Sixteenths in Weld
a:	0.1856	0.0000	= e2 / L2
k:	0	0	
C:	3.5561	3.7100	Tabulated Cofficient
C1:	1.0300	1.0000	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	243.2	0.0	kips
Axial Capacity, ΦPn:	843.7	0.0	kips = Φ C C1 D L
Ratio:	28.8%	0.0%	

Pole Analysis per AISC Table J2.5 & Sect. J4.2:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, Pu:	243.2	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fuv:	2.4	0.0	kips/in= Pu / (2 L1)
Section Modulus, S:	873.4	0.0	in^2 = $L1^2$ / 3
Bending Stress, fub:	3.5	0.0	kips/in = Pu e1 / S
Combined Stress, fu:	4.2	0.0	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	0.0000	
Stress Capacity, ΦFn	9.5	0.0	kips/in = Φ 0.6 Fy tp
Ratio:	44.6%	0.0%	

Lower Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, Pu:	243.2	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fuv:	2.4	0.0	ksi = Pu / (2 L2)
Section Modulus, S:	873.4	0.0	in^2 = $L2^2$ / 3
Bending Stress, fub:	2.6	0.0	ksi = Pu e2 / S
Combined Stress, fu:	3.6	0.0	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	0.0000	
Stress Capacity, ΦFn	9.5	0.0	kips/in = Φ 0.6 Fy tp
Ratio:	37.6%	0.0%	

Stiffener 1 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 1	
Gross Area, Ag:	7.5000	in^2
Effective Net Area, Aen:	7.5000	in^2 = Ag U, where U = 1.000
Stiffener Axial, Pu:	243.2	kips
Stiffener Stress, fu:	32.4	ksi = Pu / Ag
b:	15.5000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.4000	in
Q, Where Qa = 1.0:	0.8938	= Qa 1.34 - 0.76 (b / ts) (Fy / E)$^{1/2}$
r:	0.3608	in^3
K L / r:	12.4708	
Φ:	0.9000	
Axial Capacity, ΦFcr:	51.60	ksi = Φ Q [0.658$^{Q Fy / Fe}$] Fy
Φ:	0.9000	
Ten. Yielding Cap., ΦFnt:	58.50	ksi = Φ Fy
Φ:	0.7500	
Ten. Rupture Cap., ΦFnr:	60.00	ksi = Φ Fu (Aen / Ag)
Ratio:	62.9%	

Stiffener 2 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 2	
Gross Area, Ag:	0.0000	in^2
Effective Net Area, Aen:	0.0000	in^2 = Ag U, where U = 1.000
Stiffener Axial, Pu:	0.0	kips
Stiffener Stress, fu:	0.0	ksi = Pu / Ag
b:	0.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	0.0000	in
Q, Where Qa = 1.0:	0.0000	
r:	0.0000	in^3
K L / r:	0.0000	
Φ:	0.0000	
Axial Capacity, ΦFcr:	0.00	ksi = Φ Fy
Φ:	0.0000	
Ten. Yielding Cap., ΦFnt:	0.00	ksi = Φ Fy
Φ:	0.0000	
Ten. Rupture Cap., ΦFnr:		ksi = Φ Fu (Aen / Ag)
Ratio:	0.0%	

Analysis Summary:

Bridge Stiffener Type 1	Bridge Stiffener Type 2
Weld Analysis Ratio: 30.8% PASS	Weld Analysis Ratio: 0.0% PASS
Pole Analysis Ratio: 44.6% PASS	Pole Analysis Ratio: 0.0% PASS
Stiffener Analysis Ratio: 62.9% PASS	Stiffener Analysis Ratio: 0.0% PASS

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v2.1, Effective Date: 05-03-17

Date: 11/15/2018
Project No: 37518-2442.005.7805
Site Name: MTN. View CEM (filley Park)
Site Number/BUN: 876329
Description:
Owner:
Engineer:

Welded Bridge Stiffener Analysis per TIA-222-G & AISC 13th Ed. (Black)

General Parameters and Loading:

Flange Elevation:	30.00	ft
TIA Reference Standard:	TIA-222-G	
AISC Manual:	13th Ed. (Black)	
Method:	LRFD	
ASD Stress Increase, ASIF:	N/A	
Moment, Muf:	1735.2	k-ft
Axial, Puf:	30.7	kips
Shear, Vf:	27.2	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	30.00	36.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	60	60	ksi
Flange Diameter, Df:	47.00	47.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	4	4	
Upper Weld Length, L1:	27.00	60.00	in
Lower Weld Length, L2:	21.25	67.00	in
Weld Size, w:	0.3750	0.3750	in
Electrode:	E80	E80	
Effective Stiffener Width, Ws:	4.25	6.00	in
Stiffener Thickness, ts:	1.25	1.25	in
Notch, n:	0.63	1.00	in
Stiffener Fy:	65	65	ksi
Stiffener Fu:	80	80	ksi
Unbraced Length, L:	12.00	5.63	in
K:	0.80	0.80	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	50	degrees
Stiffener Circle:	52.50	55.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	11.25	12.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	8.25	9.50	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

Number of Bolt Circles: (1) Bolt Circle

	Bolt Circle 1	Bolt Circle 2	
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	41.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Tables 8-4 & 8-3:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	6	Num. of Sixteenths in Weld
a:	0.4167	0.2083	= e1 / L1
k:	0	0	
C:	2.5983	3.4767	Tabulated Cofficient
C1:	1.0300	1.0300	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	158.8	234.7	kips
Axial Capacity, ΦPn:	325.2	966.9	kips = Φ C C1 D L
Ratio:	48.8%	24.3%	

Lower Pole			
D:	6	6	Num. of Sixteenths in Weld
a:	0.3882	0.1418	= e2 / L2
k:	0	0	
C:	2.7106	3.6782	Tabulated Cofficient
C1:	1.0300	1.0300	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	158.8	234.7	kips
Axial Capacity, ΦPn:	267.0	1142.2	kips = Φ C C1 D L
Ratio:	59.5%	20.5%	

Pole Analysis per AISC Table J2.5 & Sect. J4.2:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, Pu:	158.8	234.7	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fuv:	2.9	2.0	kips/in= Pu / (2 L1)
Section Modulus, S:	243.0	1200.0	in^2 = $L1^2$ / 3
Bending Stress, fub:	7.4	2.4	kips/in = Pu e1 / S
Combined Stress, fu:	7.9	3.1	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	1.0000	
Stress Capacity, ΦFn	9.5	9.5	kips/in = Φ 0.6 Fy tp
Ratio:	83.8%	33.1%	

Lower Pole			
Stiffener Axial, Pu:	158.8	234.7	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fuv:	3.7	1.8	ksi = Pu / (2 L2)
Section Modulus, S:	150.5	1496.3	in^2 = $L2^2$ / 3
Bending Stress, fub:	8.7	1.5	ksi = Pu e2 / S
Combined Stress, fu:	9.5	2.3	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	1.0000	
Stress Capacity, ΦFn	9.5	9.5	kips/in = Φ 0.6 Fy tp
Ratio:	63.12%	24.3%	

Stiffener 1 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 1	
Gross Area, Ag:	5.3125	in^2
Effective Net Area, Aen:	5.3125	in^2 = Ag U, where U = 1.000
Stiffener Axial, Pu:	158.8	kips
Stiffener Stress, fu:	29.9	ksi = Pu / Ag
b:	13.3750	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	10.7000	in
Q, Where Qa = 1.0:	0.9550	= Qa 1.34 - 0.76 (b / ts) (Fy / E)$^{1/2}$
r:	0.3608	in^3
K L / r:	26.6043	
Φ:	0.9000	
Axial Capacity, ΦFcr:	52.39	ksi = Φ Q [0.658$^{Q Fy / Fe}$] Fy
Φ:	0.9000	
Ten. Yielding Cap., ΦFnt:	58.50	ksi = Φ Fy
Φ:	0.7500	
Ten. Rupture Cap., ΦFnr:	60.00	ksi = Φ Fu (Aen / Ag)
Ratio:	57.1%	

Stiffener 2 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 2	
Gross Area, Ag:	7.5000	in^2
Effective Net Area, Aen:	7.5000	in^2 = Ag U, where U = 1.000
Stiffener Axial, Pu:	234.7	kips
Stiffener Stress, fu:	31.3	ksi = Pu / Ag
b:	15.5000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.4000	in
Q, Where Qa = 1.0:	0.8938	= Qa 1.34 - 0.76 (b / ts) (Fy / E)$^{1/2}$
r:	0.3608	in^3
K L / r:	12.4708	
Φ:	0.9000	
Axial Capacity, ΦFcr:	51.60	ksi = Φ Q [0.658$^{Q Fy / Fe}$] Fy
Φ:	0.9000	
Ten. Yielding Cap., ΦFnt:	58.50	ksi = Φ Fy
Φ:	0.7500	
Ten. Rupture Cap., ΦFnr:	60.00	ksi = Φ Fu (Aen / Ag)
Ratio:	60.6%	

Analysis Summary:

Bridge Stiffener Type 1

Weld Analysis Ratio: 59.5% PASS
Pole Analysis Ratio: 63.12% Pass
Stiffener Analysis Ratio: 57.1% PASS

Bridge Stiffener Type 2

Weld Analysis Ratio: 24.3% PASS
Pole Analysis Ratio: 33.1% PASS
Stiffener Analysis Ratio: 60.6% PASS

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v4.5.2 - Effective 10-16-18

Date: 11/15/2018
PJF Project: 37518-2442.005.7805
Client Ref. # BU 876329
Site Name: Site Name
Description: Description
Owner: Owner
Engineer: GP

Asymmetric Anchor Rod Analysis

Moment =	2638	k-ft	TIA Ref.	G		η =	0.50	for Base Plates, Rev. G Sect. 4.9.9
Axial =	45.0	kips (+Comp, -Tension)	ASIF =	N/A		Threads =	N-Included	for Flange Plates, Rev. G & H
Shear =	31.0	kips	Max Ratio =	100.0%		lar =	1.50	in, for Base Plates, Rev. H Sect 4.9.9 (Max of Original Items)
Anchor Qty =	20		Location =	Base Plate		Grout =	0.00	psi, for Base Plates, Rev. H Sect 4.9.9 (Note)

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

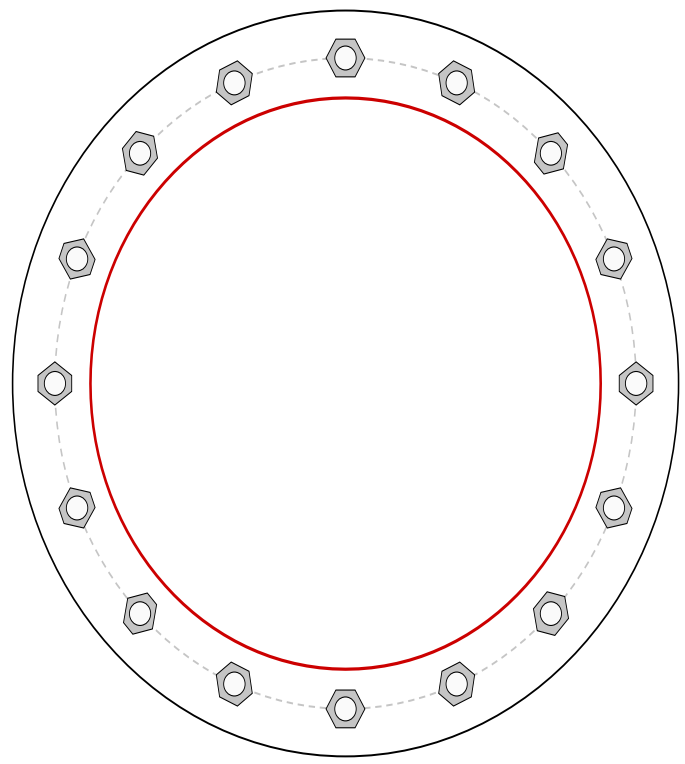
Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Type	Area Override, in^2	Area, in^2	Max Net Comp, kips	Max Net Tension, kips	Tension Override, kips	Comp Override, kips	Tension Cap, kips	Comp Cap, kips	Capacity Ratio
1	1.500	A354 Gr BC	109	125	0.0	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
2	1.500	A354 Gr BC	109	125	22.5	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
3	1.500	A354 Gr BC	109	125	45.0	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
4	1.500	A354 Gr BC	109	125	67.5	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
5	1.500	A354 Gr BC	109	125	90.0	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
6	1.500	A354 Gr BC	109	125	112.5	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
7	1.500	A354 Gr BC	109	125	135.0	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
8	1.500	A354 Gr BC	109	125	157.5	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
9	1.500	A354 Gr BC	109	125	180.0	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
10	1.500	A354 Gr BC	109	125	202.5	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
11	1.500	A354 Gr BC	109	125	225.0	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
12	1.500	A354 Gr BC	109	125	247.5	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
13	1.500	A354 Gr BC	109	125	270.0	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
14	1.500	A354 Gr BC	109	125	292.5	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
15	1.500	A354 Gr BC	109	125	315.0	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
16	1.500	A354 Gr BC	109	125	337.5	41.00	Original	0.00	1.77	99.55	93.92	0.00	0.00	140.52		73.6%
17	2.250	A193 Gr B7	105	125	34.0	54.50	Post-Installed	0.00	3.98	289.32	289.32	0.00	0.00	324.77		89.1%
18	2.250	A193 Gr B7	105	125	124.0	54.50	Post-Installed	0.00	3.98	289.32	289.32	0.00	0.00	324.77		89.1%
19	2.250	A193 Gr B7	105	125	214.0	54.50	Post-Installed	0.00	3.98	289.32	289.32	0.00	0.00	324.77		89.1%
20	2.250	A193 Gr B7	105	125	304.0	54.50	Post-Installed	0.00	3.98	289.32	289.32	0.00	0.00	324.77		89.1%
									44.18							

Monopole Base Plate Connection

Site Info	
BU #	876329
Site Name	
Order #	

Analysis Considerations	
TIA-222 Revision	G
Grout Considered:	No
l_{ar} (in)	1.5
Eta Factor, η	0.5

Applied Loads	
Moment (kip-ft)	1322.00
Axial Force (kips)	45.00
Shear Force (kips)	31.00



Connection Properties

Anchor Rod Data

(16) 1-1/2" ø bolts (A354-BC; Fy=109 ksi, Fu=125 ksi) on 41" BC

Base Plate Data

47" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Stiffener Data

N/A

Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Anchor Rod Summary		*(units of kips, kip-ft)*
Pu = 99.49	ϕPn = 141	**Stress Rating**
Vu = 1.94	ϕVn = n/a	**73.3%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary		
Max Stress (ksi):	21.5	
Allowable Stress (ksi):	32.4	
Stress Ratio:	**66.4%**	**Pass**

Drilled Pier Foundation

BU # :	876329
Site Name:	MTN. View CEM. (Fille
App. Number:	

TIA-222 Revison:	G
Tower Type:	Monopole

Applied Loads	**Comp.**	**Uplift**
Moment (kip-ft)	2638	
Axial Force (kips)	45	
Shear Force (kips)	31	

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	25	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 25' below grade		
Pier Diameter	6	ft
Rebar Quantity	24	
Rebar Size	9	
Clear Cover to Ties	3	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	6.62	-
Soil Safety Factor	3.93	-
Max Moment (kip-ft)	2806.36	-
Rating	*33.8%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	526.86	-
End Bearing (kips)	169.65	-
Weight of Concrete (kips)	108.61	-
Total Capacity (kips)	696.50	-
Axial (kips)	153.61	-
Rating	*22.1%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.67	-
Critical Moment (kip-ft)	2806.34	-
Critical Moment Capacity	3295.90	-
Rating	*85.1%*	-

Soil Interaction Rating	**33.8%**
Structural Foundation Rating	**85.1%**

Soil Profile

Groundwater Depth	15	ft	
# of Layers	3		

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.33	3.33	135	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.33	15	11.67	135	150		36	1.350	1.350				50	Cohesionless
3	15	25	10	75	87.6		36	2.151	2.151			8	42	Cohesionless

Date: **March 29, 2019**

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Subject:	**Mount Modification Design and Analysis Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CT11278A
	Carrier Site Name:	CT11278A
Crown Castle Designation:	**Crown Castle BU Number:**	876329
	Crown Castle Site Name:	MT. VIEW CEM (FILLEY PARK)
	Crown Castle JDE Job Number:	512592
	Crown Castle PO Number:	1349141
	Crown Castle Order Number:	446055, Rev 0
Engineering Firm Designation:	**Maser Consulting Connecticut Project Number:** 18922049A	
Site Data:	**28 Brewer Dr. , Bloomfield, Hartford County, CT, 06002** **Latitude 41°50'6.57" Longitude -72°44'28.2"**	
Structure Information:	**Tower Height & Type:**	**120 ft Monopole**
	Mount Elevation:	**107 ft**
	Mount Type:	**10 ft Modified Platform**

Dear Charles McGuirt,

Maser Consulting, Connecticut. is pleased to submit this **"Mount Modification Design and Analysis Report"** to determine the structural integrity of T-Mobile's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

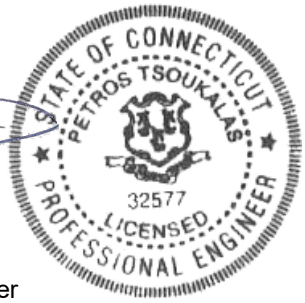
10 ft Modified Platform **Sufficient***

***Sufficient upon completion of the modifications listed in the 'Recommendations' section of this repot.**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Cameron E. Snook

Respectfully Submitted by:



Petros E. Tsoukalas, P.E.
Geographic Discipline Leader

TABLE OF CONTENTS

1) INTRODUCTION

This mount is an existing modified 10 ft Platform mapped by Tower Engineering Professionals (TEP).This mount is installed at the 107 ft elevation of the 120 ft Monopole**.**

2) ANALYSIS CRITERIA

Building Code:	2018 Connecticut State Building Code incorporating the 2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	C
Mean Base Elevation (AMSL):	192.79 ft
Topographic Factor at Base:	1
Topographic Factor at Mount:	1
Ice Thickness:	2 in
Wind Speed with Ice:	50 mph
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lbs.
Man Live Load at Mount Pipes:	500 lbs.

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
107.0	108.0	3	Ericsson	AIR 32 B2A/B66AA	Modified Platform Mount
		3	Ericsson	APXVAARR24_43-U-NA20	
		3	Ericsson	Radio 4449 B12/B71	
		3	Ericsson	AIR 21 B2A B4P	
		3	Ericsson	KRY 112 144/1	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Mount Mapping Report	Tower Engineering Professionals Project #: 25704.177458, dated 9/11/18	-	Maser Consutling P.A.
Platform Reinforcement	Site Pro 1 Part #: PRK-1245L	-	Site Pro 1
Handrail Kit	Site Pro 1 Part #: HRK12		Site Pro 1
Mount Modification Drawings	Maser Consutling P.A. Project #: 18922050A, dated 3/27/19	-	Maser Consutling P.A.

3.1) Analysis Method

RISA-3D, a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.The program performs design checks of structures under user specified loads. The user specified loads have been calculated separately based on the requirements of the above referenced codes. The program performs an analysis based on the steel code to determine the adequacy of the members and produces the reactions at the connection points of the mounts to the existing structure.

Proprietary excel sheets were used to calculate appurtenance and member loading for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 Tower Mount Analysis (Revision B).

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) The connection from the tower to the mount is in good condition and has been analyzed and found sufficient assuming it will achieve its theoretical strength.
5) Due to site specific analysis parameters, it is assumed that wind forces will control over seismic forces and as such, seismic forces have not been considered in this analysis.
6) Equipment installations are only conducted when the wind speed is less than 30 mph.
7) Proposed antennas are assumed to have associated equipment installed on the same mount pipe unless explicitly stated otherwise in the 'Recommendations' section of this report.
8) Proposed loading is assumed to be installed in the location shown in Appendix A of this report. Any changes made to the proposed loading location will render this report invalid.
9) All existing equipment model numbers, quantities, the configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced documents.
10) If applicable, steel grades have been assumed as follows:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

Discrepancies between in-field conditions and the assumptions listed above may render this analysis invalid unless explicitly approved by Maser Consulting. Connecticut Crown Castle should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Platform)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2	Face Horizontal	28	107.0	68.0	Pass
1,2	Inner Double Angle	33		38.0	Pass
1,2	Inner Angles	12		38.0	Pass
1,2	HSS Support	40		33.0	Pass
1,2	Kicker Angle	44		6.0	Pass
1,2	Mount Pipe	7		76.0	Pass
1,2	Support Rail	56		27.0	Pass
1,2,3	Mount Connection Check	-		59.0	Pass

Structure Rating (max from all components) =	76.0%

Notes:
1) See additional documentation in “Appendix B – Software Input Calculations” for calculations supporting the % capacity consumed
2) See additional documentation in “Appendix C – Analysis Output” for calculations supporting the % capacity consumed
3) See additional documentation in “Appendix D – Additional Calculations” for calculations supporting the % capacity consumed

4.1) Recommendations

In order for the results of this analysis to be considered valid, the modifications listed below and shown in the attached sketches and in **“Appendix E”** shall be completed:

1. Replace existing mount pipes with 96” long P2.0 STD mount pipes at locations shown in attached sketch. Attach to mount using connection hardware similar to existing.

2. Install platform reinforcement kit (Site Pro 1 Part #: PRK-1245L or EOR approved equivalent) to the existing LL3x3x4 members. [mount modification drawings and specification sheet attached].

3. Install support rail kit (Site Pro 1 Part #: HRK-12 or EOR approved equivalent) [mount modification drawings and specification sheet attached].

5) DISCLAIMER OF WARRANTIES

The engineering services rendered by Maser Consulting Connecticut. in connection with this structural analysis are limited to a computer analysis of the mounting frame structure and theoretical capacity of its main structural members. No allowance has been made for any damaged, bent, missing, loose, or rusted members or connections.

Maser Consulting Connecticut will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, or lack of maintenance. Maser Consulting Connecticut has performed a site visit at the aforementioned facility to verify member sizes and equipment loading. Contractor should inspect the condition of the existing structure, mounting frames and connections and notify Maser Consulting Connecticut of any discrepancies or deficiencies before proceeding with installation.

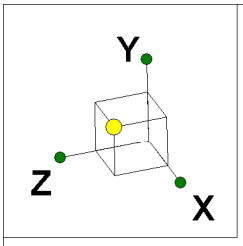
The attached sketch is a schematic representation of the analyzed mounting frames. The contractor shall be responsible for field verifying the existing conditions, proper fit, and clearances in the field.

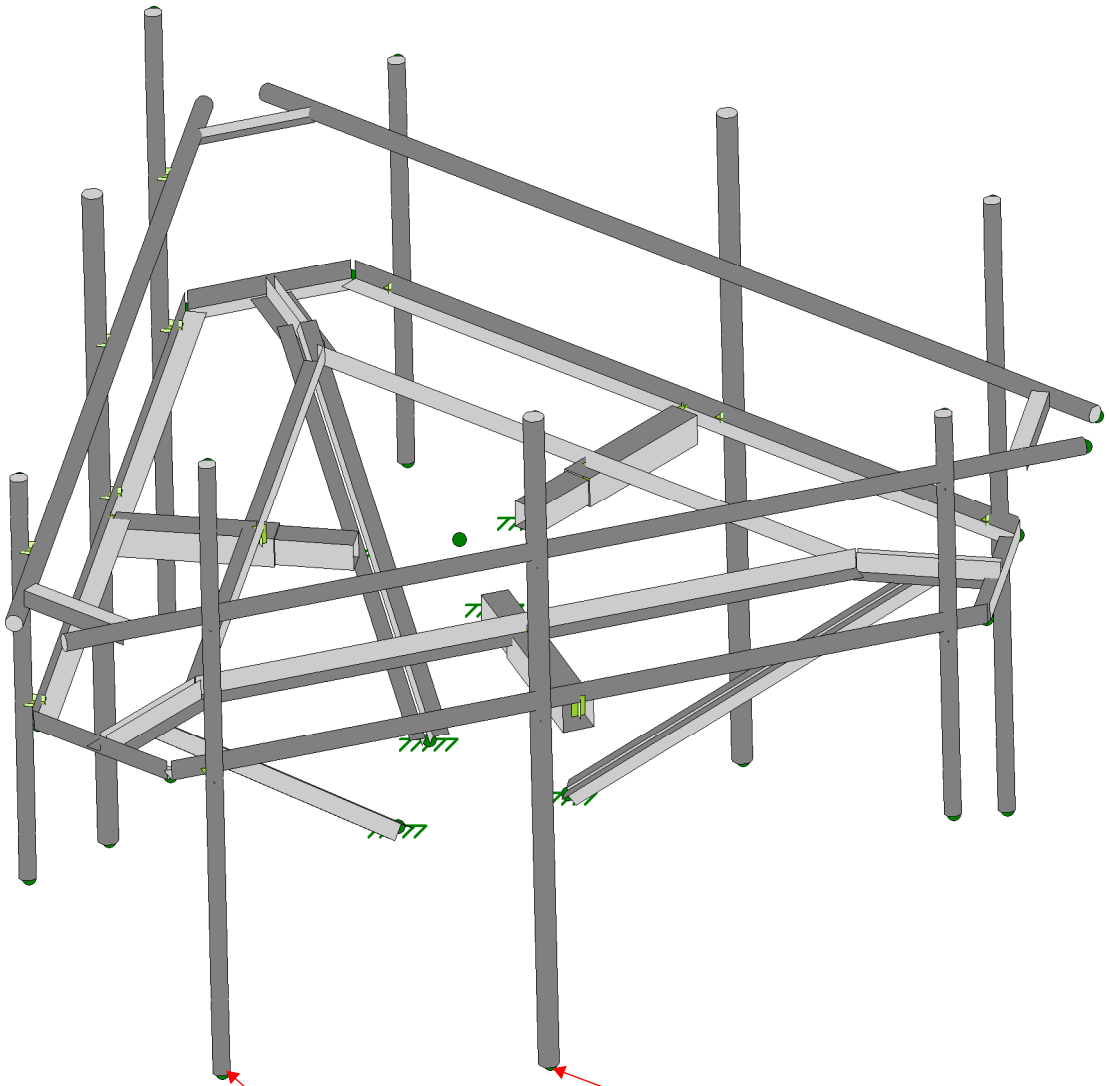
Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of suitable size and strength be purchased from a reputable manufacturer.

Maser Consulting Connecticut makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of the mounting frames. Maser Consulting Connecticut will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report.

APPENDIX A

WIRE FRAME AND RENDERED MODELS





Envelope Only Solution

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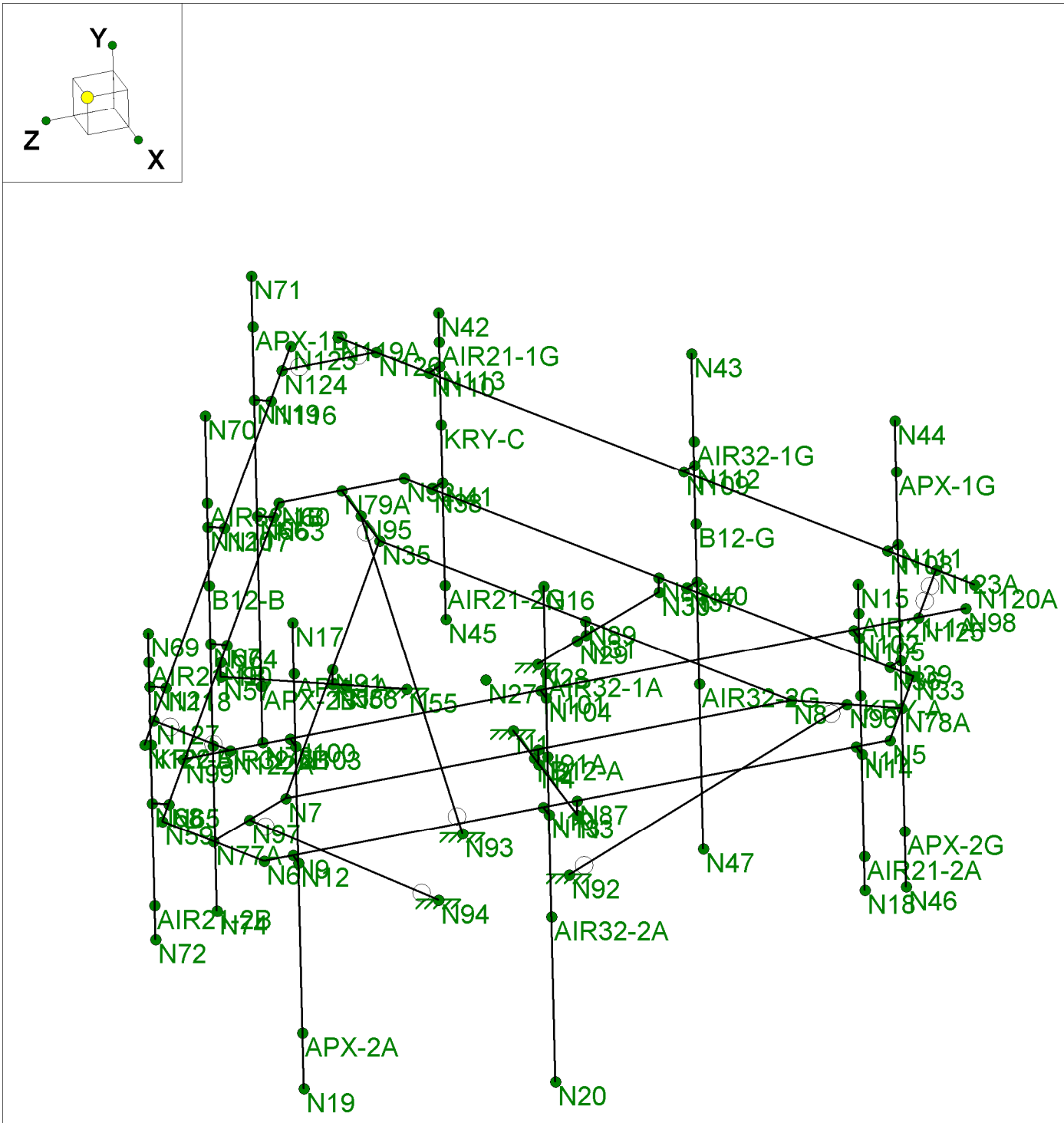

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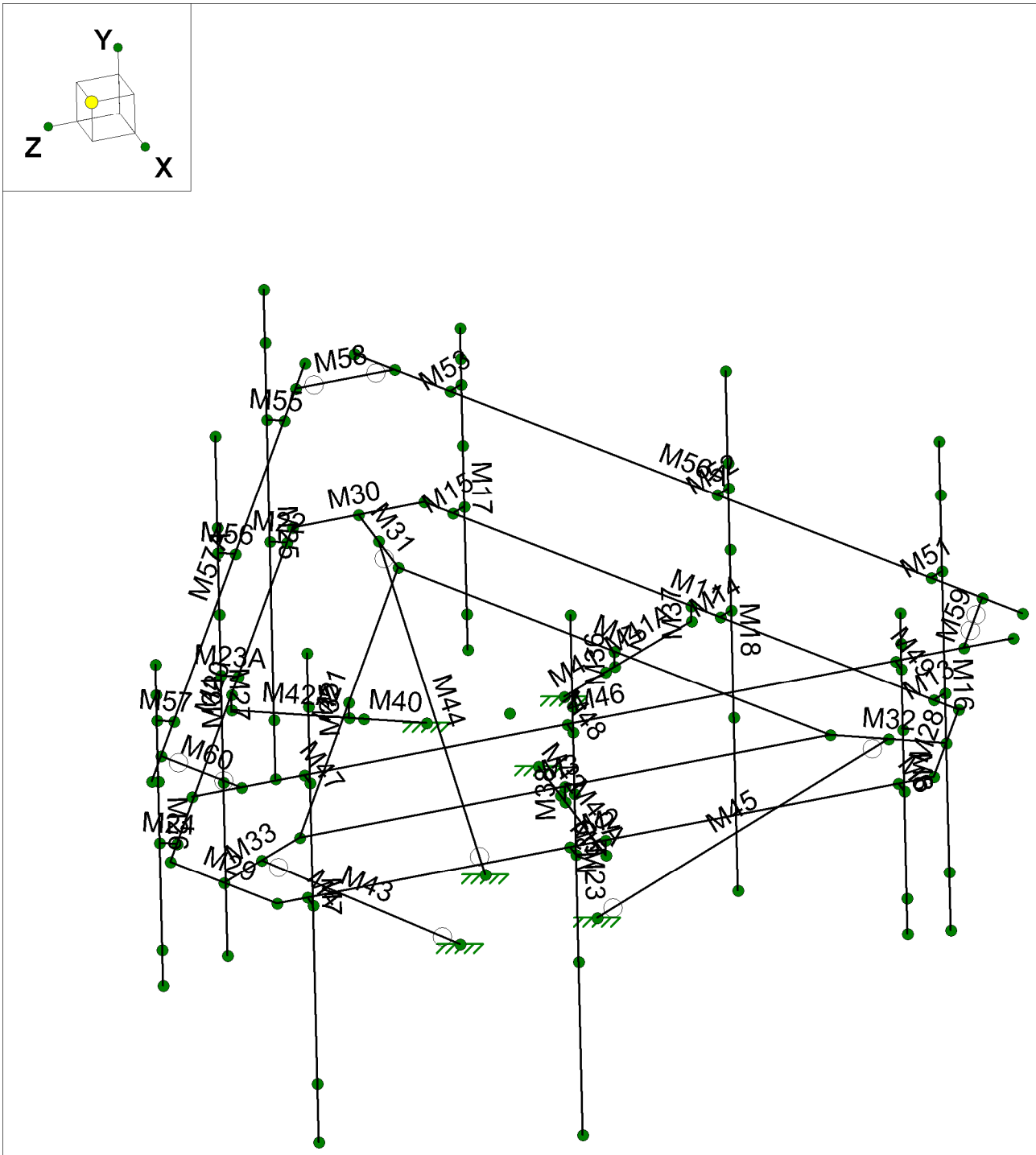

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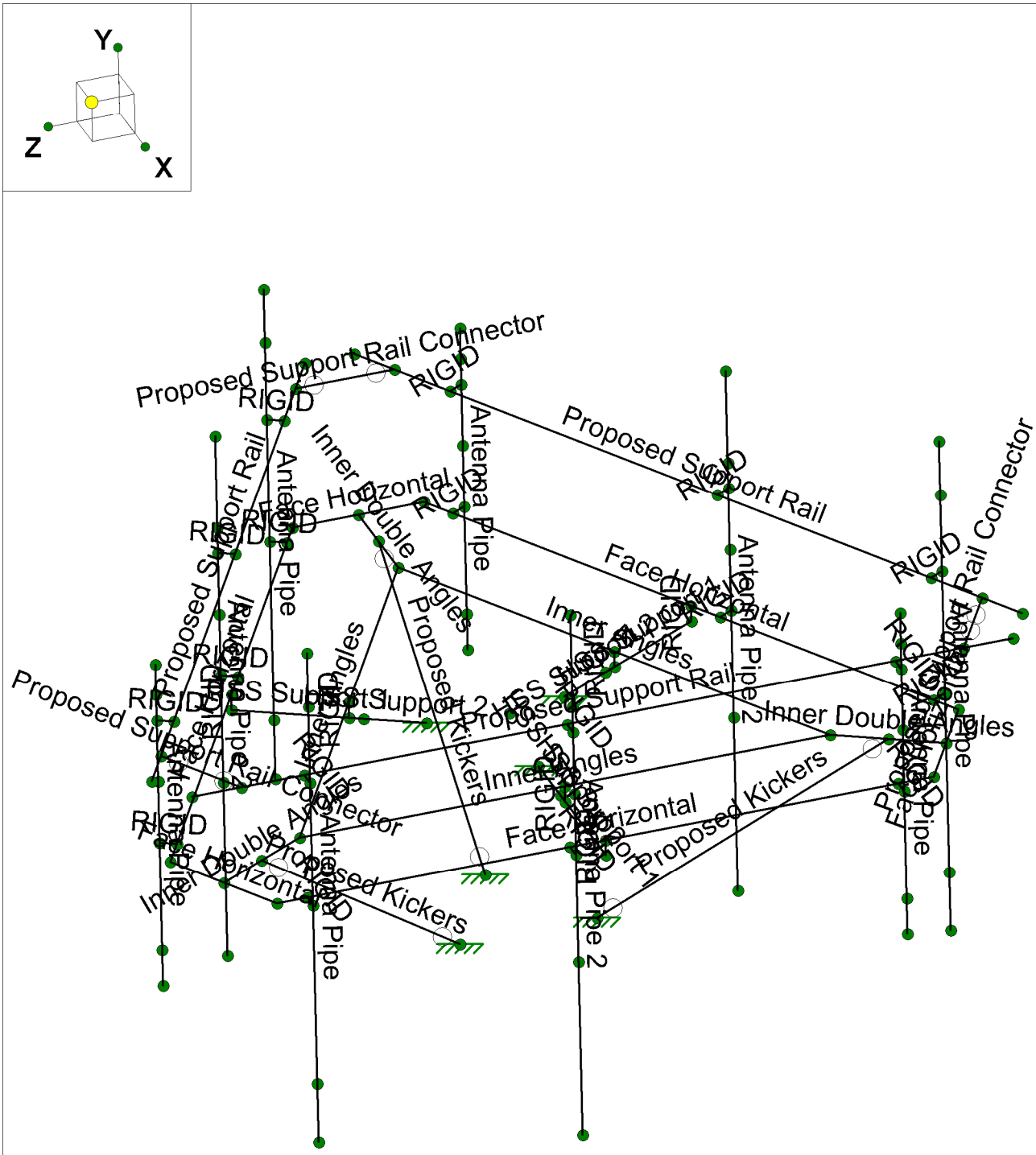

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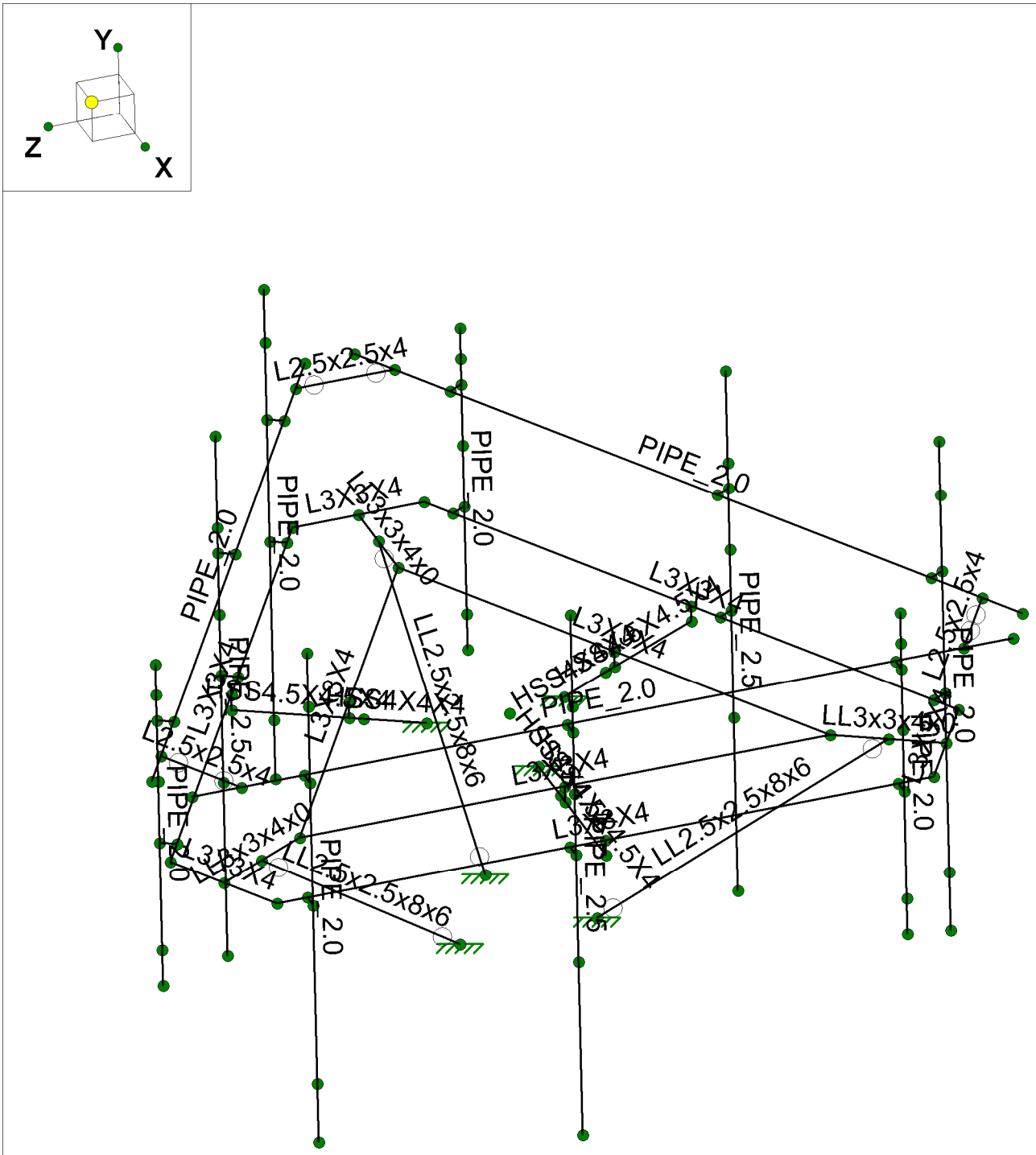

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APPENDIX B

SOFTWARE INPUT CALCULATIONS

LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
3	ERICSSON	AIR 21 B2A B4P	Existing	Alpha, Beta, & Gamma
3	**ERICSSON**	**Air 32 DB B2A B66Aa**	**Proposed**	**Alpha, Beta, & Gamma**
3	**RFS**	**APXVAARR24_43-U-NA20**	**Proposed**	**Alpha, Beta, & Gamma**
3	ERICSSON	KRY 112 144/1	Existing	Alpha, Beta, & Gamma
3	**ERICSSON**	**RRU 4449 B71 + B12**	**Proposed**	**Alpha, Beta, & Gamma**

I. DESIGN INPUTS

Calculations for gravity and lateral loading on equipment and support mounts are determined as per the ANSI/TIA-222-H Code

				Reference	Equation
Wind Load Inputs Parameters					
Antenna Centerline	z	108	ft		
Ultimate Wind Speed	V_u	125	mph		
Normal Wind Speed with Ice (3 sec. Gust):	V_i	50	mph	Figure B9, p. 238	
Maintenace Wind Speed:	V_s	30	mph	Section 2.8.3	
Design Ice Thickness	t_i	2.0	in	Figure B9, p. 238	
Surface Roughness:		C		Section 2.6.5.1.1	
Exposure Category:		C		Section 2.6.5.1.2	
Risk Category:		II		Table 2-1	
Ground Elevation:		192.8	ft		
Ground Elevation Factor:	K_e	0.99305		Table 2-6	
Gust Effect Factor:	G_h	1.00		Section 2.6.9	
Wind Directionality Factor:	K_d	0.95		Table 2-2	
Topographic Category:		1		Section 2.6.6.2	
Shielding Factor	K_a	0.9		Section 16.6	
Wind Load Coefficients					
Importance Factors:					
Iced:	I_{ice}	1		Table 2-3	
Exposure Category Coefficients:					
3-s Gust-Speed Power Law Exponent:	α	9.5		Table 2-4	
Nominal Height of the Atmospheric Boundary Layer:	Z_g	900	ft	Table 2-4	
Min. Value for k_z:	Kz_{min}	0.85		Table 2-4	
Terrain Constant:	K_e	1.00		Table 2-4	
Velocity Pressure Exposure Coefficient:	K_z	1.286		Section 2.6.5.2	$=2.01\cdot(z/z_g)^{2/\alpha'}$
Topographic Category Coefficients:					
Topographic Constant:	K_t	N/A		Table 2-5	
Height Attenuation Factor:	f	N/A		Table 2-5	
Height Reduction Factor:	K_h	N/A		Section 2.6.6.2.1	$=e^{(f\cdot z/H)}$
Topographic Factor:	K_{zt}	1.00		Section 2.6.6.2	$=[1+(K_c\cdot K_t/K_h)]^2$
Ice Accumulation:					
Ice Velocity Pressure Exposure Coefficient:	K_{iz}	1.13			$=(z/33)^{0.10}$
Factored Ice Thickness:	t_{iz}	2.25	in	Section 2.6.10	$=t_i\cdot I\cdot K_{iz}\cdot(K_{zt})^{0.35}$
Ice Density:	ρ_i	56.00	pcf		
Design Wind Pressures:					
Velocity Pressure:	q_z	43.69	psf	Section 2.6.11.6	$=0.00256\cdot K_z\cdot K_{zt\cdot Ks\cdot Ke}\cdot K_d\cdot K_a\cdot V^2$
Velocity Pressure (With Ice):	q_{zi}	6.99	psf	Section 2.6.11.6	$=0.00256\cdot K_z\cdot K_{zt\cdot Ks\cdot Ke}\cdot K_d\cdot K_a\cdot V_i^2$
Velocity Pressure (Maintenance):	q_{zm}	2.52	psf	Section 2.6.11.6	$=0.00256\cdot K_z\cdot K_{zt\cdot Ks\cdot Ke}\cdot K_d\cdot K_a\cdot V_m^2$

II. CALCULATIONS

- ***Wind Load on Appurtenances***

Dimensions and Force Coefficients

Antenna/ Appurtenance	Non-Iced Condition								Iced Condition							
	Mounting Pipe			Equipment					Mounting Pipe			Equipment				
	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	Force Coefficient $C_{a\ Front}$	Force Coefficient $C_{a\ Side}$	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	Force Coefficient $C_{a\ Front}$	Force Coefficient $C_{a\ Side}$
AIR 21 B2A B4P	63.0	2.375	1.200	56.00	12.10	7.90	1.29	1.40	67.5	6.9	0.863	60.50	16.60	12.40	1.25	1.31
Air 32 DB B2A B66Aa	102.0	2.875	1.200	56.60	12.90	8.70	1.28	1.38	106.5	7.4	0.965	61.10	17.40	13.20	1.24	1.29
APXVAARR24_43-U-NA20	96.0	2.375	1.200	95.90	24.00	8.70	1.27	1.53	100.5	6.9	0.969	100.40	28.50	13.20	1.25	1.42
KRY 112 144/1	0.0	0.000	0.000	7.70	7.50	3.40	1.20	1.20	0.0	0.0	0.000	12.20	12.00	7.90	1.20	1.20
RRU 4449 B71 + B12	0.0	0.000	0.000	14.95	13.19	9.26	1.20	1.20	0.0	0.0	0.000	19.45	17.69	13.76	1.20	1.20

Antenna/ Appurtenance	# of Brackets	Non-Iced Condition			Iced Condition			Maintenance Condition	
		Wind Force (lbs.)		Gravity (lbs.)	Wind Force (lbs.)		Gravity (lbs.)	Wind Force (lbs.)	
		F_N	F_T		F_N	F_T		F_N	F_T
AIR 21 B2A B4P	2	136.1	121.4	**58.8**	31.9	33.5	**115.8**	7.8	7.0
Air 32 DB B2A B66Aa	2	165.9	156.3	**73.6**	41.9	43.8	**124.8**	9.6	9.0
APXVAARR24_43-U-NA20	2	442.2	235.6	**76.7**	86.5	62.0	**319.7**	25.5	13.6
KRY 112 144/1	1	21.0	9.5	**21.0**	8.5	5.6	**29.3**	1.2	0.5
RRU 4449 B71 + B12	1	71.8	50.4	**83.0**	20.0	15.6	**81.9**	4.1	2.9

**** ALL CALCULATED LOADS ARE PER MOUNTING BRACKET. TO GET THE TOTAL EQUIPMENT LOAD, MULTIPLY THE INDIVIDUAL LOADS BY THE NUMBER OF BRACKETS***

- ***Wind Load on Framing Members***

Member Category	Member Shape	Length (in)	Member Surface	Non-Iced Condition			Iced Condition						Maintenance Condition
				Exposed Wind Height (in)	Force Coefficient C_a	Wind Load (plf)	Exposed Wind Height (in)	Depth (in)	Length (in)	Force Coefficient C_a	Wind Load (plf)	Ice Weight (plf)	Wind Load (plf)
Equal Angle	L3x3	120	Square	3.00	2.00	21.84	7.50	7.50	124.50	2.00	8.74	17.87	1.26
Square HSS	HSS 4x4x1/4	10	HSS	4.00	0.85	12.38	8.50	8.50	14.50	0.85	4.21	21.76	0.71
Pipe	Pipe 2.0	96	Round	2.38	1.20	10.38	6.88	6.88	100.50	1.20	4.81	12.73	0.60
Square HSS	HSS 4.5x4.5x1/4	24	HSS	4.50	0.88	14.44	9.00	9.00	28.50	0.88	4.62	23.70	0.83
Double Angle	2L2.5x2.5	64.6	Square	5.00	1.60	29.07	9.50	7.00	69.10	1.60	8.84	21.57	1.67
											Grating	23.35	psf

BASIC EQUATIONS

ANSI/TIA-222-H Reference

Force Coefficient: (Square) — Table 2-9

$$C_{f\_square}(h,w) := \begin{cases} 1.2 \text{ if } \frac{h}{w} \le 2.5 \\ \left[1.2 + \frac{0.2}{4.5}\cdot\left(\frac{h}{w} - 2.5\right)\right] \text{ if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[1.4 + \frac{0.6}{18}\cdot\left(\frac{h}{w} - 7\right)\right] \text{ if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 2.0 \text{ otherwise} \end{cases}$$

Force Coefficient: (Round) — Table 2-9

$$C_{f\_round}(h,w) := \begin{cases} 0.7 \text{ if } \frac{h}{w} \le 2.5 \\ \left[0.7 + \frac{0.1}{4.5}\cdot\left(\frac{h}{w} - 2.5\right)\right] \text{ if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[0.8 + \frac{0.4}{18}\cdot\left(\frac{h}{w} - 7\right)\right] \text{ if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 1.2 \text{ otherwise} \end{cases}$$

Terrain Exposure Constants: — Table 2-5

$$\alpha := \begin{cases} 7.0 \text{ if } Exp = \text{"B"} \\ 9.5 \text{ if } Exp = \text{"C"} \\ 11.5 \text{ if } Exp = \text{"D"} \end{cases} \quad Z_g := \begin{cases} 1200\text{ft} \text{ if } Exp = \text{"B"} \\ 900\text{ft} \text{ if } Exp = \text{"C"} \\ 700\text{ft} \text{ if } Exp = \text{"D"} \end{cases} \quad K_{zmin} := \begin{cases} 0.70 \text{ if } Exp = \text{"B"} \\ 0.85 \text{ if } Exp = \text{"C"} \\ 1.03 \text{ if } Exp = \text{"D"} \end{cases}$$

BASIC EQUATIONS

ANSI/TIA-222-H Reference

Velocity Pressure Coefficient:

$$Kz(z) := \left| \begin{array}{l} K_z \leftarrow \max\left[2.01 \cdot \left(\frac{z}{Z_g} \right)^{\frac{2}{\alpha}}, K_{zmin} \right] \\ K_z \leftarrow \min\left(K_z, 2.01 \right) \end{array} \right.$$

Section 2.6.5.6

$$K_z := Kz(z)$$

$$Kzt(z) := K_{zt} \leftarrow \left| \begin{array}{l} 1.0 \quad \text{if Topo} = \text{"1"} \\ \text{otherwise} \\ \quad \left| \begin{array}{l} K_e \leftarrow \left| \begin{array}{l} 0.90 \quad \text{if Exp} = \text{"B"} \\ 1.00 \quad \text{if Exp} = \text{"C"} \\ 1.10 \quad \text{if Exp} = \text{"D"} \end{array} \right. \\ K_t \leftarrow \left| \begin{array}{l} 0.43 \quad \text{if Topo} = \text{"2"} \\ 0.53 \quad \text{if Topo} = \text{"3"} \\ 0.72 \quad \text{if Topo} = \text{"4"} \end{array} \right. \\ f \leftarrow \left| \begin{array}{l} 1.25 \quad \text{if Topo} = \text{"2"} \\ 2.00 \quad \text{if Topo} = \text{"3"} \\ 1.50 \quad \text{if Topo} = \text{"4"} \end{array} \right. \\ K_h \leftarrow e^{\left(\frac{f \cdot z}{CH} \right)} \\ \left(1 + \frac{K_e \cdot K_t}{K_h} \right)^2 \end{array} \right. \end{array} \right.$$

Table 2-4

$$K_{zt} := Kzt(z)$$

Velocity Pressure:

$$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot V^2 \cdot psf$$

Section 2.6.9.6

LOAD EQUATIONS

WIND LOAD

Area (Normal):	$AN_{area} = H_{ant} \cdot Want$
Area (Side):	$AT_{area} = H_{ant} \cdot Dant$
Force Coefficient (Normal):	$C_{fn} = C_{fsquare}(H_{ant}, Want)$
Force Coefficient (Side):	$C_{fs} = C_{fsquare}(H_{ant}, Dant)$
Pipe Area (Normal):	$AN_p = \max[(L_p - H_{ant}) * Dp, 0]$
Pipe Area (Side):	$AT_p = L_p \cdot Dp$
Force Coefficient (Normal):	$C_{fp} = C_{fround}(Lp, Dp)$
Normal Effective Projected Area:	$E_{pan} = (C_{fn} \cdot ANarea) + (Cfp \cdot ANp)$
Side Effective Projected Area:	$E_{pat} = (C_{fs} \cdot ATarea) + (Cfp \cdot ATp)$
Effective Projected Area:	$EPA = max(E_{pan}, Epat)$
Wind Force:	$F_{ant} = q_z \cdot Gh \cdot EPA$

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		24	72	0
3	Total General		24	72	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	L2.5x2.5x4	3	54	0
7	A36 Gr.36	L3X3X4	9	723	.3
8	A36 Gr.36	LL2.5x2.5x8x6	3	194.1	.2
9	A36 Gr.36	LL3x3x4x0	3	60.6	0
10	A500 Gr. B 42	HSS4.5X4.5X4	3	69	0
11	A500 Gr. B 42	HSS4X4X4	3	33	0
12	A53 Gr. B	PIPE_2.0	9	927	.3
13	A53 Gr. B	PIPE_2.5	3	306	.1
14	Total HR Steel		36	2366.7	1.1

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	Dead	DL		-1.05		24			6	
2	Wx	WL				24		24		
3	Wz	WL				24		24		
4	Ice Wx	WL				24		24		
5	Ice Wz	None				24		24		
6	Ice weight	None				24		33	6	
7	Service X	None				24		21		
8	Service Z	None				24		21		
9	Service 1 Pipe	None				1				
10	Service 2 Pipe	None				1				
11	Service 3 Pipe	None				1				
12	Service 4 Pipe	None								
13	Service 5 Middle	None				1				
14	Service 6 End	None				1				
15	BLC 1 Transient Area Loads	None						59		
16	BLC 6 Transient Area Loads	None						59		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.4D	Yes	Y		1	1.4																		
2	1.2D+1.0W1	Yes	Y		1	1.2	2	1	3															
3	1.2D+1.0W2	Yes	Y		1	1.2	2	.866	3	.5														
4	1.2D+1.0W3	Yes	Y		1	1.2	2	.5	3	.866														
5	1.2D+1.0W4	Yes	Y		1	1.2	2		3	1														
6	1.2D+1.0W5	Yes	Y		1	1.2	2	-.5	3	.866														
7	1.2D+1.0W6	Yes	Y		1	1.2	2	-.866	3	.5														
8	1.2D+1.0W7	Yes	Y		1	1.2	2	-1	3															
9	1.2D+1.0W8	Yes	Y		1	1.2	2	-.866	3	-.5														
10	1.2D+1.0W9	Yes	Y		1	1.2	2	-.5	3	-.866														
11	1.2D+1.0W10	Yes	Y		1	1.2	2		3	-1														
12	1.2D+1.0W11	Yes	Y		1	1.2	2	.5	3	-.866														
13	1.2D+1.0W12	Yes	Y		1	1.2	2	.866	3	-.5														
14	1.2D+1.0 Ice	Yes	Y		1	1.2	6	1																
15	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4	1	5													
16	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4	.866	5	.5												
17	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4	.5	5	.866												

Load Combinations (Continued)

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
18	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4		5	1												
19	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4	-.5	5	.866												
20	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4	-.866	5	.5												
21	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4	-1	5													
22	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4	-.866	5	-.5												
23	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4	-.5	5	-.866												
24	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4		5	-1												
25	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4	.5	5	-.866												
26	1.2D+1.0ICE+1.0W...	Yes	Y		1	1.2	6	1	4	.866	5	-.5												
27	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	1	8													
28	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	.866	8	.5												
29	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	.5	8	.866												
30	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7		8	1												
31	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	-.5	8	.866												
32	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	-.866	8	.5												
33	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	-1	8													
34	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	-.866	8	-.5												
35	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	-.5	8	-.866												
36	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7		8	-1												
37	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	.5	8	-.866												
38	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	.866	8	-.5												
39																								
40	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	1	8													
41	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	.866	8	.5												
42	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	.5	8	.866												
43	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7		8	1												
44	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	-.5	8	.866												
45	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	-.866	8	.5												
46	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	-1	8													
47	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	-.866	8	-.5												
48	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	-.5	8	-.866												
49	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7		8	-1												
50	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	.5	8	-.866												
51	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	.866	8	-.5												
52																								
53	1.2D+1.5LV1	Yes	Y		1	1.2	13	1.5																
54	1.2D+1.5LV2	Yes	Y		1	1.2	14	1.5																
55			Y																					
56	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	1	8													
57	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	.866	8	.5												
58	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	.5	8	.866												
59	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7		8	1												
60	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	-.5	8	.866												
61	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	-.866	8	.5												
62	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	-1	8													
63	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	-.866	8	-.5												
64	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	-.5	8	-.866												
65	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7		8	-1												
66	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	.5	8	-.866												
67	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	.866	8	-.5												
68			Y																					
69	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7	1	8													
70	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7	.866	8	.5												
71	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7	.5	8	.866												
72	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7		8	1												
73	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7	-.5	8	.866												
74	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7	-.866	8	.5												

Load Combinations (Continued)

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
75	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7	-1	8													
76	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7	-.866	8	-.5												
77	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7	-.5	8	-.866												
78	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7		8	-1												
79	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7	.5	8	-.866												
80	1.2D+1.5LM4+1.0...		Y		1	1.2	12	1.5	7	.866	8	-.5												

Joint Loads and Enforced Displacements (BLC 1 : Dead)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	AIR21-1A	L	Y	-58.8
2	AIR21-2A	L	Y	-58.8
3	AIR21-1B	L	Y	-58.8
4	AIR21-2B	L	Y	-58.8
5	AIR21-1G	L	Y	-58.8
6	AIR21-2G	L	Y	-58.8
7	AIR32-1A	L	Y	-73.6
8	AIR32-2A	L	Y	-73.6
9	AIR32-1B	L	Y	-73.6
10	AIR32-2B	L	Y	-73.6
11	AIR32-1G	L	Y	-73.6
12	AIR32-2G	L	Y	-73.6
13	APX-1A	L	Y	-76.65
14	APX-2A	L	Y	-76.65
15	APX-1B	L	Y	-76.65
16	APX-2B	L	Y	-76.65
17	APX-1G	L	Y	-76.65
18	APX-2G	L	Y	-76.65
19	KRY-A	L	Y	-21
20	KRY-B	L	Y	-21
21	KRY-C	L	Y	-21
22	B12-A	L	Y	-83
23	B12-B	L	Y	-83
24	B12-G	L	Y	-83

Joint Loads and Enforced Displacements (BLC 2 : Wx)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	KRY-C	L	X	-9.5
2	KRY-B	L	X	-9.5
3	KRY-A	L	X	0
4	B12-G	L	X	-50.4
5	B12-B	L	X	-50.4
6	B12-A	L	X	0
7	APX-2G	L	X	-235.6
8	APX-2B	L	X	-235.6
9	APX-2A	L	X	-442.2
10	APX-1G	L	X	-235
11	APX-1B	L	X	-235
12	APX-1A	L	X	-442.2
13	AIR32-2G	L	X	-156.3
14	AIR32-2B	L	X	-156.3
15	AIR32-2A	L	X	-165.9
16	AIR32-1G	L	X	-156.3
17	AIR32-1B	L	X	-156.3
18	AIR32-1A	L	X	-165.9
19	AIR21-2G	L	X	-121.4

Joint Loads and Enforced Displacements (BLC 2 : Wx) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
20	AIR21-2B	L	X	-121.4
21	AIR21-2A	L	X	-136.1
22	AIR21-1G	L	X	-121.4
23	AIR21-1B	L	X	-121.4
24	AIR21-1A	L	X	-136.1

Joint Loads and Enforced Displacements (BLC 3 : Wz)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	KRY-C	L	Z	0
2	KRY-B	L	Z	0
3	KRY-A	L	Z	-9.5
4	B12-G	L	Z	0
5	B12-B	L	Z	0
6	B12-A	L	Z	-71.7
7	APX-2G	L	Z	-442.2
8	APX-2B	L	Z	-442.2
9	APX-2A	L	Z	-235.6
10	APX-1G	L	Z	-442.2
11	APX-1B	L	Z	-442.2
12	APX-1A	L	Z	-235.6
13	AIR32-2G	L	Z	-165.9
14	AIR32-2B	L	Z	-165.9
15	AIR32-2A	L	Z	-156.3
16	AIR32-1G	L	Z	-165.9
17	AIR32-1B	L	Z	-165.9
18	AIR32-1A	L	Z	-156.3
19	AIR21-2G	L	Z	-136.1
20	AIR21-2B	L	Z	-136.1
21	AIR21-2A	L	Z	-121.4
22	AIR21-1G	L	Z	-136.1
23	AIR21-1B	L	Z	-136.1
24	AIR21-1A	L	Z	-121.4

Joint Loads and Enforced Displacements (BLC 4 : Ice Wx)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	KRY-C	L	X	-5.6
2	KRY-B	L	X	-5.6
3	KRY-A	L	X	0
4	B12-G	L	X	-15.6
5	B12-B	L	X	-15.6
6	B12-A	L	X	0
7	APX-2G	L	X	-62
8	APX-2B	L	X	-62
9	APX-2A	L	X	-86.5
10	APX-1G	L	X	-62
11	APX-1B	L	X	-62
12	APX-1A	L	X	-86.5
13	AIR32-2G	L	X	-43.8
14	AIR32-2B	L	X	-43.8
15	AIR32-2A	L	X	-41.9
16	AIR32-1G	L	X	-43.8
17	AIR32-1B	L	X	-43.8
18	AIR32-1A	L	X	-41.9
19	AIR21-2G	L	X	-33.5
20	AIR21-2B	L	X	-33.5
21	AIR21-2A	L	X	-31.9

Joint Loads and Enforced Displacements (BLC 4 : Ice Wx) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
22	AIR21-1G	L	X	-33.5
23	AIR21-1B	L	X	-33.5
24	AIR21-1A	L	X	-31.9

Joint Loads and Enforced Displacements (BLC 5 : Ice Wz)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	KRY-C	L	Z	0
2	KRY-B	L	Z	0
3	KRY-A	L	Z	-5.6
4	B12-G	L	Z	0
5	B12-B	L	Z	0
6	B12-A	L	Z	-15.6
7	APX-2G	L	Z	-86.5
8	APX-2B	L	Z	-86.5
9	APX-2A	L	Z	-62
10	APX-1G	L	Z	-86.5
11	APX-1B	L	Z	-86.5
12	APX-1A	L	Z	-62
13	AIR32-2G	L	Z	-41.9
14	AIR32-2B	L	Z	-41.9
15	AIR32-2A	L	Z	-43.8
16	AIR32-1G	L	Z	-41.9
17	AIR32-1B	L	Z	-41.9
18	AIR32-1A	L	Z	-43.8
19	AIR21-2G	L	Z	-31.9
20	AIR21-2B	L	Z	-31.9
21	AIR21-2A	L	Z	-33.5
22	AIR21-1G	L	Z	-31.9
23	AIR21-1B	L	Z	-31.9
24	AIR21-1A	L	Z	-33.5

Joint Loads and Enforced Displacements (BLC 6 : Ice weight)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	AIR21-1A	L	Y	-115.8
2	AIR21-2A	L	Y	-115.8
3	AIR21-1B	L	Y	-115.8
4	AIR21-2B	L	Y	-115.8
5	AIR21-1G	L	Y	-115.8
6	AIR21-2G	L	Y	-115.8
7	AIR32-1A	L	Y	-124.8
8	AIR32-2A	L	Y	-124.8
9	AIR32-1B	L	Y	-124.8
10	AIR32-2B	L	Y	-124.8
11	AIR32-1G	L	Y	-124.8
12	AIR32-2G	L	Y	-124.8
13	APX-1A	L	Y	-319.7
14	APX-2A	L	Y	-319.7
15	APX-1B	L	Y	-319.7
16	APX-2B	L	Y	-319.7
17	APX-1G	L	Y	-319.7
18	APX-2G	L	Y	-319.7
19	KRY-A	L	Y	-29.3
20	KRY-B	L	Y	-29.3
21	KRY-C	L	Y	-29.3
22	B12-A	L	Y	-81.9
23	B12-B	L	Y	-81.9

Joint Loads and Enforced Displacements (BLC 6 : Ice weight) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
24	B12-G	L	Y	-81.9

Joint Loads and Enforced Displacements (BLC 7 : Service X)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	KRY-C	L	X	-.531
2	KRY-B	L	X	-.531
3	KRY-A	L	X	0
4	B12-G	L	X	-2.809
5	B12-B	L	X	-2.809
6	B12-A	L	X	0
7	APX-2G	L	X	-13.119
8	APX-2B	L	X	-13.119
9	APX-2A	L	X	-24.619
10	APX-1G	L	X	-13.119
11	APX-1B	L	X	-13.119
12	APX-1A	L	X	-24.619
13	AIR32-2G	L	X	-8.702
14	AIR32-2B	L	X	-8.702
15	AIR32-2A	L	X	-9.239
16	AIR32-1G	L	X	-8.702
17	AIR32-1B	L	X	-8.702
18	AIR32-1A	L	X	-9.239
19	AIR21-2G	L	X	-6.758
20	AIR21-2B	L	X	-6.758
21	AIR21-2A	L	X	-7.576
22	AIR21-1G	L	X	-6.758
23	AIR21-1B	L	X	-6.758
24	AIR21-1A	L	X	-7.576

Joint Loads and Enforced Displacements (BLC 8 : Service Z)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	KRY-C	L	Z	0
2	KRY-B	L	Z	0
3	KRY-A	L	Z	-.531
4	B12-G	L	Z	0
5	B12-B	L	Z	0
6	B12-A	L	Z	-2.809
7	APX-2G	L	Z	-24.619
8	APX-2B	L	Z	-24.619
9	APX-2A	L	Z	-13.119
10	APX-1G	L	Z	-24.619
11	APX-1B	L	Z	-24.619
12	APX-1A	L	Z	-13.119
13	AIR32-2G	L	Z	-9.239
14	AIR32-2B	L	Z	-9.239
15	AIR32-2A	L	Z	-8.702
16	AIR32-1G	L	Z	-9.239
17	AIR32-1B	L	Z	-9.239
18	AIR32-1A	L	Z	-8.702
19	AIR21-2G	L	Z	-7.576
20	AIR21-2B	L	Z	-7.576
21	AIR21-2A	L	Z	-6.758
22	AIR21-1G	L	Z	-7.576
23	AIR21-1B	L	Z	-7.576
24	AIR21-1A	L	Z	-6.758

Joint Loads and Enforced Displacements (BLC 9 : Service 1 Pipe)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	N11	L	Y	-500

Joint Loads and Enforced Displacements (BLC 10 : Service 2 Pipe)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	N10	L	Y	-500

Joint Loads and Enforced Displacements (BLC 11 : Service 3 Pipe)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	N9	L	Y	-500

Joint Loads and Enforced Displacements (BLC 13 : Service 5 Middle)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	N87	L	Y	-250

Joint Loads and Enforced Displacements (BLC 14 : Service 6 End)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), ...
1	N5	L	Y	-250

Member Distributed Loads (BLC 2 : Wx)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M43	PX	-29	-29	0	0
2	M44	PX	-29	-29	0	0
3	M45	PX	-29	-29	0	0
4	M2	PX	-22	-22	0	0
5	M11	PX	-22	-22	0	0
6	M20	PX	-22	-22	0	0
7	M28	PX	-22	-22	0	0
8	M29	PX	-22	-22	0	0
9	M30	PX	-22	-22	0	0
10	M46	PX	-22	-22	0	0
11	M56A	PX	-22	-22	0	0
12	M57A	PX	-22	-22	0	0
13	M40A	PX	-14.5	-14.5	0	0
14	M41A	PX	-14.5	-14.5	0	0
15	M42A	PX	-14.5	-14.5	0	0
16	M40	PX	-12.5	-12.5	0	0
17	M41	PX	-12.5	-12.5	0	0
18	M42	PX	-12.5	-12.5	0	0
19	M46	PX	-10.5	-10.5	0	0
20	M56A	PX	-10.5	-10.5	0	0
21	M57A	PX	-10.5	-10.5	0	0
22	M28	PX	-22	-22	0	0
23	M29	PX	-22	-22	0	0
24	M30	PX	-22	-22	0	0

Member Distributed Loads (BLC 3 : Wz)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M43	PZ	-29	-29	0	0
2	M44	PZ	-29	-29	0	0
3	M45	PZ	-29	-29	0	0
4	M2	PZ	-22	-22	0	0
5	M11	PZ	-22	-22	0	0
6	M20	PZ	-22	-22	0	0

Member Distributed Loads (BLC 3 : Wz) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
7	M28	PZ	-22	-22	0	0
8	M29	PZ	-22	-22	0	0
9	M30	PZ	-22	-22	0	0
10	M46	PZ	-22	-22	0	0
11	M56A	PZ	-22	-22	0	0
12	M57A	PZ	-22	-22	0	0
13	M40A	PZ	-14.5	-14.5	0	0
14	M41A	PZ	-14.5	-14.5	0	0
15	M42A	PZ	-14.5	-14.5	0	0
16	M40	PZ	-12.5	-12.5	0	0
17	M41	PZ	-12.5	-12.5	0	0
18	M42	PZ	-12.5	-12.5	0	0
19	M46	PZ	-10.5	-10.5	0	0
20	M56A	PZ	-10.5	-10.5	0	0
21	M57A	PZ	-10.5	-10.5	0	0
22	M28	PZ	-22	-22	0	0
23	M29	PZ	-22	-22	0	0
24	M30	PZ	-22	-22	0	0

Member Distributed Loads (BLC 4 : Ice Wx)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M43	PX	-9	-9	0	0
2	M44	PX	-9	-9	0	0
3	M45	PX	-9	-9	0	0
4	M2	PX	-9	-9	0	0
5	M11	PX	-9	-9	0	0
6	M20	PX	-9	-9	0	0
7	M28	PX	-9	-9	0	0
8	M29	PX	-9	-9	0	0
9	M30	PX	-9	-9	0	0
10	M46	PX	-9	-9	0	0
11	M56A	PX	-9	-9	0	0
12	M57A	PX	-9	-9	0	0
13	M40A	PX	-5	-5	0	0
14	M41A	PX	-5	-5	0	0
15	M42A	PX	-5	-5	0	0
16	M40	PX	-4.5	-4.5	0	0
17	M41	PX	-4.5	-4.5	0	0
18	M42	PX	-4.5	-4.5	0	0
19	M46	PX	-5	-5	0	0
20	M56A	PX	-5	-5	0	0
21	M57A	PX	-5	-5	0	0
22	M28	PX	-9	-9	0	0
23	M29	PX	-9	-9	0	0
24	M30	PX	-9	-9	0	0

Member Distributed Loads (BLC 5 : Ice Wz)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M43	PZ	-9	-9	0	0
2	M44	PZ	-9	-9	0	0
3	M45	PZ	-9	-9	0	0
4	M2	PZ	-9	-9	0	0
5	M11	PZ	-9	-9	0	0
6	M20	PZ	-9	-9	0	0
7	M28	PZ	-9	-9	0	0
8	M29	PZ	-9	-9	0	0

Member Distributed Loads (BLC 5 : Ice Wz) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
9	M30	PZ	-9	-9	0	0
10	M46	PZ	-9	-9	0	0
11	M56A	PZ	-9	-9	0	0
12	M57A	PZ	-9	-9	0	0
13	M40A	PZ	-5	-5	0	0
14	M41A	PZ	-5	-5	0	0
15	M42A	PZ	-5	-5	0	0
16	M40	PZ	-4.5	-4.5	0	0
17	M41	PZ	-4.5	-4.5	0	0
18	M42	PZ	-4.5	-4.5	0	0
19	M46	PZ	-5	-5	0	0
20	M56A	PZ	-5	-5	0	0
21	M57A	PZ	-5	-5	0	0
22	M28	PZ	-9	-9	0	0
23	M29	PZ	-9	-9	0	0
24	M30	PZ	-9	-9	0	0

Member Distributed Loads (BLC 6 : Ice weight)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M2	Y	-18	-18	0	%100
2	M3	Y	-18	-18	0	%100
3	M11	Y	-18	-18	0	%100
4	M12	Y	-18	-18	0	%100
5	M20	Y	-18	-18	0	%100
6	M21	Y	-18	-18	0	%100
7	M28	Y	-18	-18	0	%100
8	M29	Y	-18	-18	0	%100
9	M30	Y	-18	-18	0	%100
10	M31	Y	-18	-18	0	%100
11	M32	Y	-18	-18	0	%100
12	M33	Y	-18	-18	0	%100
13	M16	Y	-13	-13	0	%100
14	M8	Y	-13	-13	0	%100
15	M17	Y	-13	-13	0	%100
16	M25	Y	-13	-13	0	%100
17	M26	Y	-13	-13	0	%100
18	M7	Y	-13	-13	0	%100
19	M18	Y	-13	-13	0	%100
20	M56A	Y	-13	-13	0	%100
21	M57A	Y	-13	-13	0	%100
22	M27	Y	-13	-13	0	%100
23	M23	Y	-13	-13	0	%100
24	M46	Y	-13	-13	0	%100
25	M41A	Y	-24	-24	0	%100
26	M42A	Y	-24	-24	0	%100
27	M40A	Y	-24	-24	0	%100
28	M41	Y	-22	-22	0	%100
29	M40	Y	-22	-22	0	%100
30	M42	Y	-22	-22	0	%100
31	M45	Y	-22	-22	0	%100
32	M44	Y	-22	-22	0	%100
33	M43	Y	-22	-22	0	%100

Member Distributed Loads (BLC 7 : Service X)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M2	PX	-1.22	-1.22	0	0

Member Distributed Loads (BLC 7 : Service X) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
2	M11	PX	-1.22	-1.22	0	0
3	M20	PX	-1.22	-1.22	0	0
4	M28	PX	-.87	-.87	0	0
5	M29	PX	-.87	-.87	0	0
6	M30	PX	-.87	-.87	0	0
7	M40A	PX	-.8	-.8	0	0
8	M41A	PX	-.8	-.8	0	0
9	M42A	PX	-.8	-.8	0	0
10	M40	PX	-.69	-.69	0	0
11	M41	PX	-.69	-.69	0	0
12	M42	PX	-.69	-.69	0	0
13	M43	PX	1.6	1.6	0	0
14	M44	PX	1.6	1.6	0	0
15	M45	PX	1.6	1.6	0	0
16	M46	PX	-1.22	-1.22	0	0
17	M56A	PX	-1.22	-1.22	0	0
18	M57A	PX	-1.22	-1.22	0	0
19	M46	PX	.58	.58	0	0
20	M56A	PX	.58	.58	0	0
21	M57A	PX	.58	.58	0	0

Member Distributed Loads (BLC 8 : Service Z)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M2	PZ	-1.22	-1.22	0	0
2	M11	PZ	-1.22	-1.22	0	0
3	M20	PZ	-1.22	-1.22	0	0
4	M28	PZ	-.87	-.87	0	0
5	M29	PZ	-.87	-.87	0	0
6	M30	PZ	-.87	-.87	0	0
7	M40A	PZ	-.8	-.8	0	0
8	M41A	PZ	-.8	-.8	0	0
9	M42A	PZ	-.8	-.8	0	0
10	M40	PZ	-.69	-.69	0	0
11	M41	PZ	-.69	-.69	0	0
12	M42	PZ	-.69	-.69	0	0
13	M43	PZ	1.6	1.6	0	0
14	M44	PZ	1.6	1.6	0	0
15	M45	PZ	1.6	1.6	0	0
16	M46	PZ	-1.22	-1.22	0	0
17	M56A	PZ	-1.22	-1.22	0	0
18	M57A	PZ	-1.22	-1.22	0	0
19	M46	PZ	.58	.58	0	0
20	M56A	PZ	.58	.58	0	0
21	M57A	PZ	.58	.58	0	0

Member Distributed Loads (BLC 15 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M28	Y	8.726	-26.178	12.002	18.003
2	M28	Y	-26.178	-95.985	18.003	24.004
3	M29	Y	-90.048	-29.721	12.158	13.343
4	M29	Y	-29.721	.442	13.343	14.527
5	M29	Y	.442	.442	14.527	15.712
6	M29	Y	.442	-77.822	15.712	16.896
7	M29	Y	-77.822	-143.641	16.896	18.081
8	M29	Y	-143.641	-107.222	18.081	19.265
9	M29	Y	-107.222	-59.275	19.265	20.45

Member Distributed Loads (BLC 15 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
10	M32	Y	-1.987	-36.886	2.021	8.085
11	M32	Y	-36.886	-42.847	8.085	14.148
12	M32	Y	-42.847	-1.987	14.148	20.212
13	M33	Y	-104.038	-81.784	6.148	8.157
14	M33	Y	-81.784	-124.873	8.157	10.166
15	M33	Y	-124.873	-87.855	10.166	12.175
16	M33	Y	-87.855	3.381	12.175	14.184
17	M33	Y	3.381	3.381	14.184	16.193
18	M33	Y	3.381	-32.823	16.193	18.202
19	M33	Y	-32.823	-105.231	18.202	20.212
20	M29	Y	-59.275	-107.222	3.555	4.739
21	M29	Y	-107.222	-143.641	4.739	5.924
22	M29	Y	-143.641	-77.822	5.924	7.108
23	M29	Y	-77.822	.442	7.108	8.293
24	M29	Y	.442	.442	8.293	9.477
25	M29	Y	.442	-29.721	9.477	10.662
26	M29	Y	-29.721	-90.048	10.662	11.846
27	M30	Y	8.726	-26.178	12.002	18.003
28	M30	Y	-26.178	-95.985	18.003	24.004
29	M31	Y	-3.974	-85.694	0	6.063
30	M31	Y	-85.694	-73.773	6.063	12.127
31	M31	Y	-73.773	-3.974	12.127	18.19
32	M2	Y	-2.58	-2.58	0	9.014
33	M20	Y	-2.58	-2.58	110.986	120
34	M33	Y	-2.331	-7.701	0	10.106
35	M33	Y	-7.701	-13.071	10.106	20.212
36	M2	Y	-2.58	-2.58	110.986	120
37	M11	Y	-2.58	-2.58	0	9.014
38	M32	Y	-2.331	-7.701	0	10.106
39	M32	Y	-7.701	-13.071	10.106	20.212
40	M28	Y	-59.275	-107.222	3.555	4.739
41	M28	Y	-107.222	-143.641	4.739	5.924
42	M28	Y	-143.641	-77.822	5.924	7.108
43	M28	Y	-77.822	.442	7.108	8.293
44	M28	Y	.442	.442	8.293	9.477
45	M28	Y	.442	-29.721	9.477	10.662
46	M28	Y	-29.721	-90.048	10.662	11.846
47	M30	Y	-95.985	-26.178	0	6.001
48	M30	Y	-26.178	8.726	6.001	12.002
49	M32	Y	-52.019	-40.892	6.148	8.157
50	M32	Y	-40.892	-62.437	8.157	10.166
51	M32	Y	-62.437	-43.927	10.166	12.175
52	M32	Y	-43.927	1.69	12.175	14.184
53	M32	Y	1.69	1.69	14.184	16.193
54	M32	Y	1.69	-16.412	16.193	18.202
55	M32	Y	-16.412	-52.616	18.202	20.212
56	M11	Y	-2.58	-2.58	110.986	120
57	M20	Y	-2.58	-2.58	0	9.014
58	M31	Y	-13.071	-7.701	0	10.106
59	M31	Y	-7.701	-2.331	10.106	20.212

Member Distributed Loads (BLC 16 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M28	Y	20.419	-61.256	12.002	18.003
2	M28	Y	-61.256	-224.606	18.003	24.004
3	M29	Y	-210.713	-69.548	12.158	13.343

Member Distributed Loads (BLC 16 : BLC 6 Transient Area Loads) (Continued)

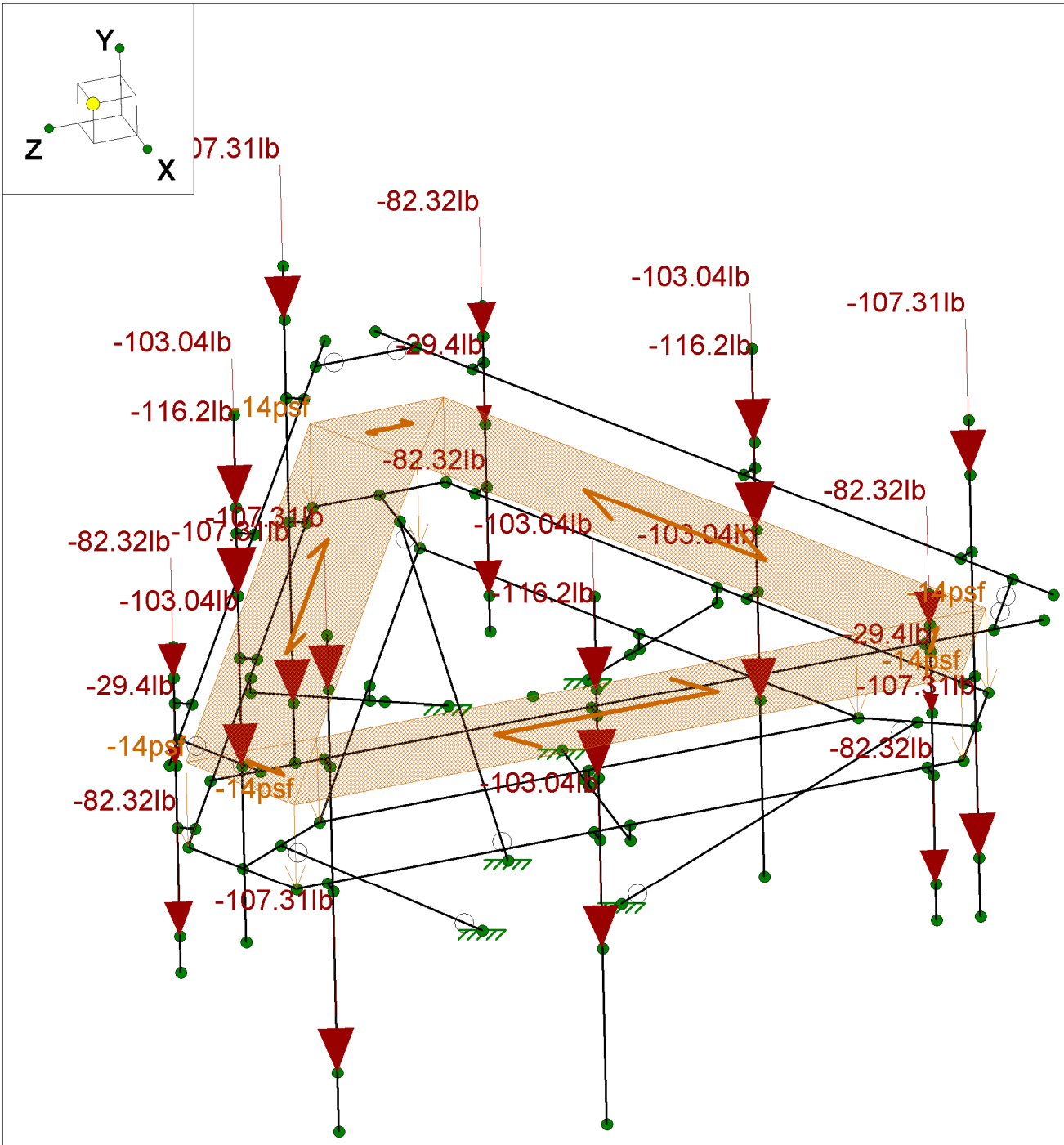
	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
4	M29	Y	-69.548	1.035	13.343	14.527
5	M29	Y	1.035	1.035	14.527	15.712
6	M29	Y	1.035	-182.102	15.712	16.896
7	M29	Y	-182.102	-336.119	16.896	18.081
8	M29	Y	-336.119	-250.9	18.081	19.265
9	M29	Y	-250.9	-138.704	19.265	20.45
10	M32	Y	-4.649	-86.314	2.021	8.085
11	M32	Y	-86.314	-100.262	8.085	14.148
12	M32	Y	-100.262	-4.649	14.148	20.212
13	M33	Y	-243.449	-191.374	6.148	8.157
14	M33	Y	-191.374	-292.204	8.157	10.166
15	M33	Y	-292.204	-205.58	10.166	12.175
16	M33	Y	-205.58	7.911	12.175	14.184
17	M33	Y	7.911	7.911	14.184	16.193
18	M33	Y	7.911	-76.806	16.193	18.202
19	M33	Y	-76.806	-246.241	18.202	20.212
20	M29	Y	-138.704	-250.9	3.555	4.739
21	M29	Y	-250.9	-336.119	4.739	5.924
22	M29	Y	-336.119	-182.102	5.924	7.108
23	M29	Y	-182.102	1.035	7.108	8.293
24	M29	Y	1.035	1.035	8.293	9.477
25	M29	Y	1.035	-69.548	9.477	10.662
26	M29	Y	-69.548	-210.713	10.662	11.846
27	M30	Y	20.419	-61.256	12.002	18.003
28	M30	Y	-61.256	-224.606	18.003	24.004
29	M31	Y	-9.299	-200.525	0	6.063
30	M31	Y	-200.525	-172.629	6.063	12.127
31	M31	Y	-172.629	-9.299	12.127	18.19
32	M2	Y	-6.038	-6.038	0	9.015
33	M20	Y	-6.038	-6.038	110.985	120
34	M33	Y	-5.454	-18.018	0	10.106
35	M33	Y	-18.018	-30.582	10.106	20.212
36	M2	Y	-6.038	-6.038	110.985	120
37	M11	Y	-6.038	-6.038	0	9.015
38	M32	Y	-5.454	-18.018	0	10.106
39	M32	Y	-18.018	-30.582	10.106	20.212
40	M28	Y	-138.704	-250.9	3.555	4.739
41	M28	Y	-250.9	-336.119	4.739	5.924
42	M28	Y	-336.119	-182.102	5.924	7.108
43	M28	Y	-182.102	1.035	7.108	8.293
44	M28	Y	1.035	1.035	8.293	9.477
45	M28	Y	1.035	-69.548	9.477	10.662
46	M28	Y	-69.548	-210.713	10.662	11.846
47	M30	Y	-224.606	-61.256	0	6.001
48	M30	Y	-61.256	20.419	6.001	12.002
49	M32	Y	-121.724	-95.687	6.148	8.157
50	M32	Y	-95.687	-146.102	8.157	10.166
51	M32	Y	-146.102	-102.79	10.166	12.175
52	M32	Y	-102.79	3.956	12.175	14.184
53	M32	Y	3.956	3.956	14.184	16.193
54	M32	Y	3.956	-38.403	16.193	18.202
55	M32	Y	-38.403	-123.121	18.202	20.212
56	M11	Y	-6.038	-6.038	110.985	120
57	M20	Y	-6.038	-6.038	0	9.015
58	M31	Y	-30.582	-18.018	0	10.106
59	M31	Y	-18.018	-5.454	10.106	20.212

Envelope Joint Reactions

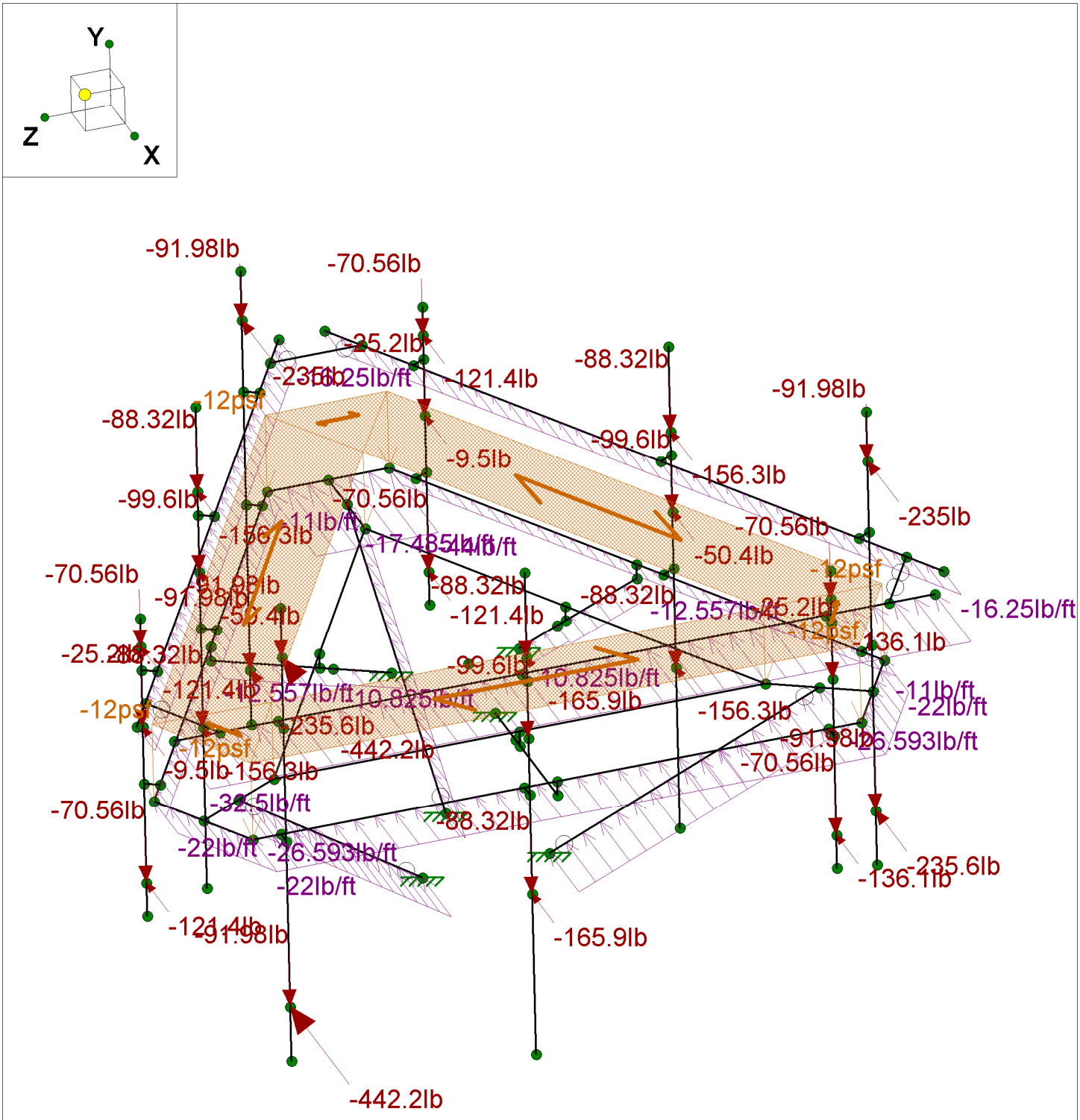
	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N55	max	3039.634	3	921.482	19	2045.978	4	-.44	4	3.794	3	.167	9
2		min	-3195.828	9	192.641	65	-1812.873	10	-2.592	22	-3.814	9	-1.882	16
3	N28	max	2691.199	13	918.551	24	1756.646	6	2.76	19	3.386	7	.224	7
4		min	-2830.83	7	161.691	28	-1995.479	12	.52	12	-3.393	13	-1.51	26
5	N1	max	889.911	2	927.368	15	2945.758	5	.704	5	2.824	11	2.997	20
6		min	-606.242	8	241.848	8	-2950.031	11	-.821	11	-2.829	5	.947	13
7	N92	max	2017.311	18	3193.621	19	-722.449	13	.114	3	.324	9	.205	9
8		min	411.505	11	650.676	12	-3529.186	20	-.118	9	-.311	3	-.197	3
9	N93	max	-825.323	8	3184.919	15	190.311	5	.387	5	.53	5	0	67
10		min	-4054.404	15	640.916	8	-185.723	11	-.378	11	-.517	11	0	1
11	N94	max	2054.433	24	3204.203	23	3526.113	23	.146	8	.414	2	.253	8
12		min	407.601	5	641.048	4	708.774	4	-.151	2	-.4	8	-.262	2
13	Totals:	max	5537.514	2	11878.665	18	5782.596	5						
14		min	-5537.516	8	3915.24	11	-5782.595	11						

Envelope AISC 13th(360-05): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc...	phi*Pnt ...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M7	PIPE_2.0	.755	49	2	.111	26		23	14916.0...	32130	1.872	1.872	1...	H1-1b
2	M25	PIPE_2.0	.748	49	5	.128	26		3	14916.0...	32130	1.872	1.872	1...	H1-1b
3	M16	PIPE_2.0	.686	49	10	.123	26		6	14916.0...	32130	1.872	1.872	1...	H1-1b
4	M28	L3X3X4	.685	12.002	11	.176	12.0...	y	19	42698.4...	46656	1.688	3.756	1...	H2-1
5	M29	L3X3X4	.669	12.002	3	.177	12.0...	z	23	42698.4...	46656	1.688	3.756	1...	H2-1
6	M30	L3X3X4	.632	12.002	7	.175	12.0...	z	15	42698.4...	46656	1.688	3.756	1...	H2-1
7	M11	L3X3X4	.384	60	4	.633	60	y	4	7731.283	46656	1.688	3.104	1...	H2-1
8	M21	L3X3X4	.383	96.995	22	.024	0	y	17	11833.5...	46656	1.688	3.445	1...	H2-1
9	M3	L3X3X4	.378	0	24	.024	0	y	26	11833.5...	46656	1.688	3.478	2...	H2-1
10	M12	L3X3X4	.377	0	20	.024	0	y	21	11833.5...	46656	1.688	3.486	2...	H2-1
11	M33	LL3x3x4x0	.376	10.106	24	.135	10.1...	y	62	83006.02	93312	6.48	4.911	1...	H1-1b
12	M32	LL3x3x4x0	.370	10.106	20	.128	10.1...	y	33	83006.02	93312	6.48	4.911	1...	H1-1b
13	M31	LL3x3x4x0	.368	10.106	15	.127	10.1...	y	26	83006.02	93312	6.48	4.911	1...	H1-1b
14	M20	L3X3X4	.346	60	11	.626	60	y	12	7731.283	46656	1.688	3.023	1...	H2-1
15	M2	L3X3X4	.337	60	8	.628	60	y	8	7731.283	46656	1.688	3.152	1...	H2-1
16	M40	HSS4X4X4	.331	11	9	.177	11	z	3	126977....	127386	14.774	14.774	1...	H1-1b
17	M41	HSS4X4X4	.304	0	13	.160	0	z	7	126977....	127386	14.774	14.774	1...	H1-1b
18	M17	PIPE_2.0	.285	34.781	12	.107	23.6...		2	23088.1...	32130	1.872	1.872	1...	H1-1b
19	M56A	PIPE_2.0	.270	21.875	7	.195	21.8...		7	6295.422	32130	1.872	1.872	1...	H1-1b
20	M42	HSS4X4X4	.267	0	5	.150	0	z	11	126977....	127386	14.774	14.774	1...	H1-1b
21	M26	PIPE_2.0	.265	34.781	9	.133	23.6...		10	23088.1...	32130	1.872	1.872	1...	H1-1b
22	M8	PIPE_2.0	.251	34.781	3	.114	23.6...		6	23088.1...	32130	1.872	1.872	1...	H1-1b
23	M57A	PIPE_2.0	.250	21.875	3	.215	21.8...		3	6295.422	32130	1.872	1.872	1...	H1-1b
24	M46	PIPE_2.0	.236	21.875	11	.209	128....		6	6295.422	32130	1.872	1.872	1...	H1-1b
25	M59	L2.5x2.5x4	.190	18.004	6	.198	18.0...	z	3	35825.4...	38556	1.114	2.537	1...	H2-1
26	M27	PIPE_2.5	.190	46.75	9	.139	35.0...		3	28077.3...	50715	3.596	3.596	2...	H1-1b
27	M18	PIPE_2.5	.190	46.75	13	.141	35.0...		7	28077.3...	50715	3.596	3.596	2...	H1-1b
28	M60	L2.5x2.5x4	.183	18.004	9	.200	18.0...	z	7	35825.4...	38556	1.114	2.537	1...	H2-1
29	M23	PIPE_2.5	.175	46.75	5	.142	35.0...		11	28077.3...	50715	3.596	3.596	2...	H1-1b
30	M58	L2.5x2.5x4	.160	18.004	13	.203	18.0...	z	11	35825.4...	38556	1.114	2.537	1...	H2-1
31	M42A	HSS4.5X4.5X4	.124	23	23	.147	23	z	3	143572....	145152	19.089	19.089	1...	H1-1b
32	M41A	HSS4.5X4.5X4	.122	23	26	.133	23	z	7	143572....	145152	19.089	19.089	1...	H1-1b
33	M40A	HSS4.5X4.5X4	.119	23	19	.124	23	z	11	143572....	145152	19.089	19.089	1...	H1-1b
34	M44	LL2.5x2.5x8x6	.058	64.685	5	.011	64.6...	z	5	97380.3...	146448	13.118	6.211	1...	H1-1b
35	M43	LL2.5x2.5x8x6	.053	64.685	23	.009	64.6...	z	2	97380.3...	146448	13.118	6.211	2...	H1-1b*
36	M45	LL2.5x2.5x8x6	.053	64.685	19	.007	64.6...	z	9	97380.3...	146448	13.118	6.211	2...	H1-1b*

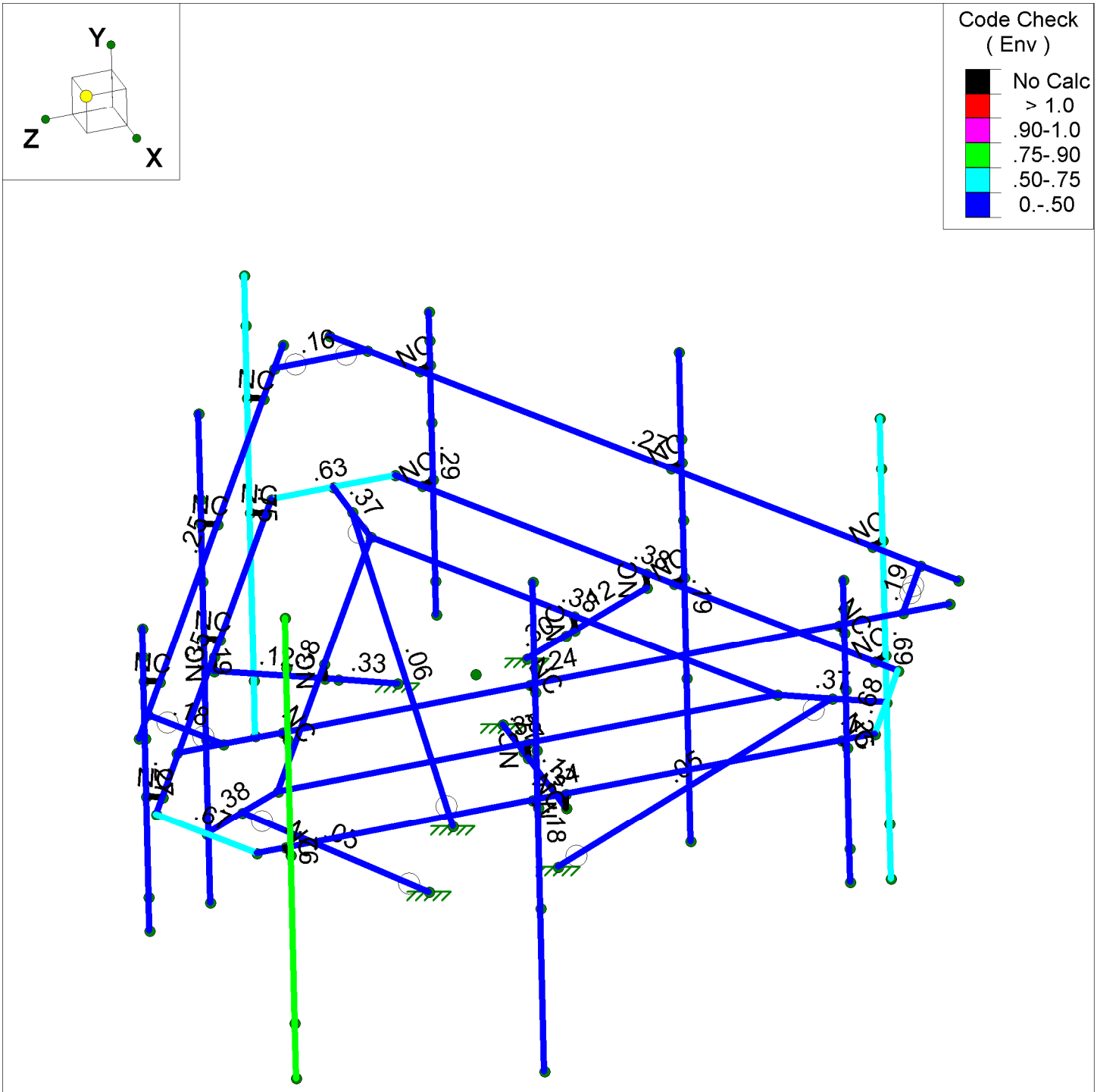


Loads: LC 1, 1.4D
Envelope Only Solution



Loads: LC 2, 1.2D+1.0W1
Envelope Only Solution

Maser Consulting P.A.	Mount Modification Design and Analysis Report	SK - 8
CES		Mar 27, 2019 at 3:10 PM
18922049A		876329_APP#446055 Rev0.Mount...



Member Code Checks Displayed (Enveloped)
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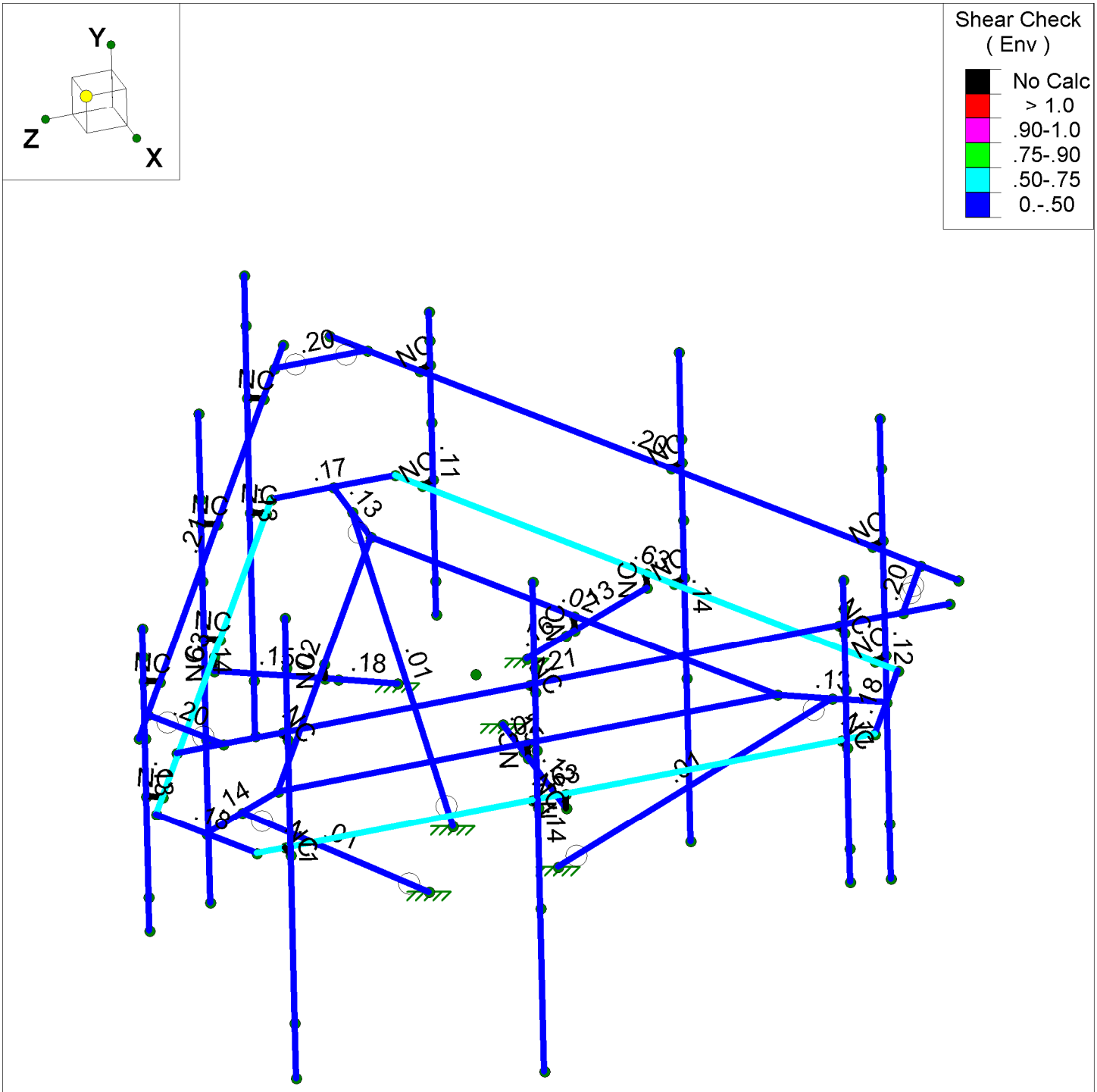

Member Shear Checks Displayed (Enveloped)
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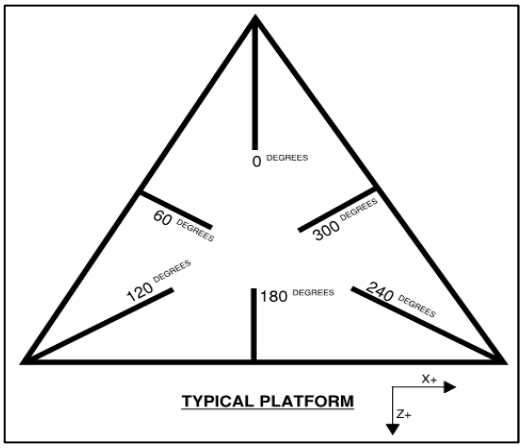
APPENDIX D

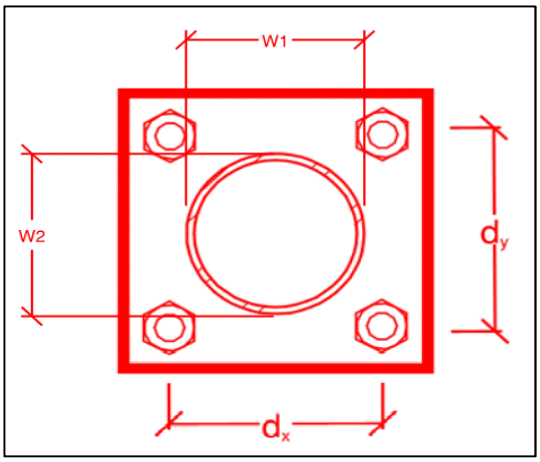
ADDITIONAL CALCULATIONS

Mount-to-Tower Connection Check

RAM Model Data

Nodes *(numbered per RAM)*	Orientation *(per graphic of typical platform)*
1	180





Tower Connection Plate and Weld Check

Connecting Standoff Member Shape	Rect
Plate Height (in)	12
W1 (in)	4
W2 (in)	4
Fy (ksi, plate)	36
t_{Plate} (in)	0.5
Weld Size (1/16 in)	3
Phi*Rn (kip/in)	4.18
Required Weld Strength (kip/in)	2.46
Weld Capacity	**59.0%**

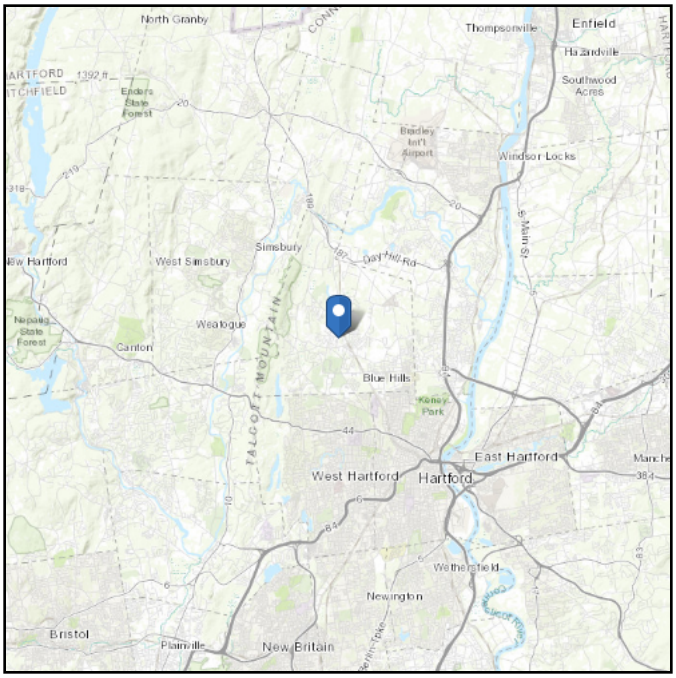
v2.4

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 192.79 ft (NAVD 88)
Latitude: 41.835158
Longitude: -72.741167



Wind

Results:

Wind Speed:	121 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph

125 per local jurisdiction.

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

Date Accessed: Wed Mar 27 2019

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

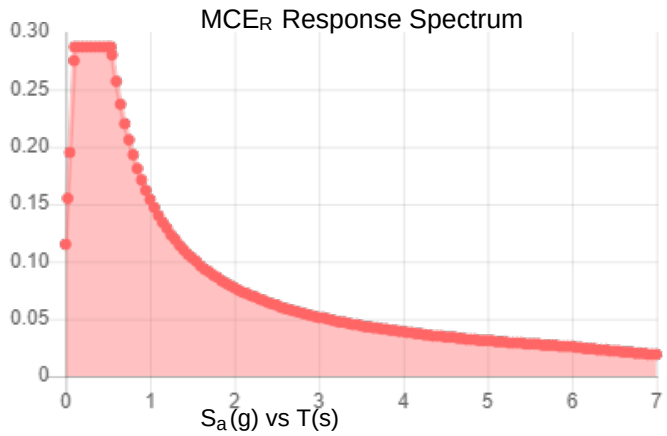
Seismic

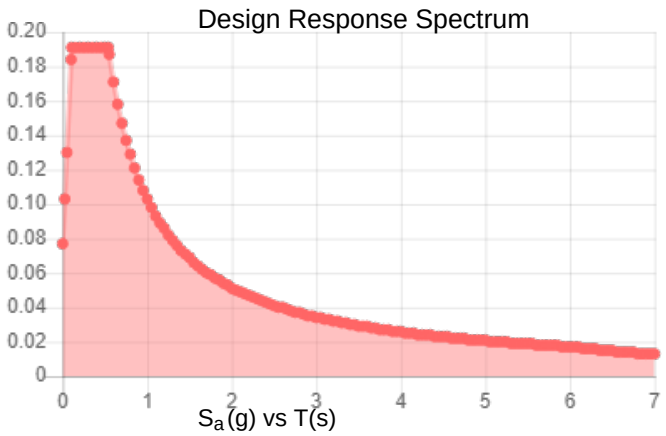
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.18	S_{DS} :	0.191
S_1 :	0.064	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.09
S_{MS} :	0.287	PGA_M :	0.144
S_{M1} :	0.154	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Mar 27 2019

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

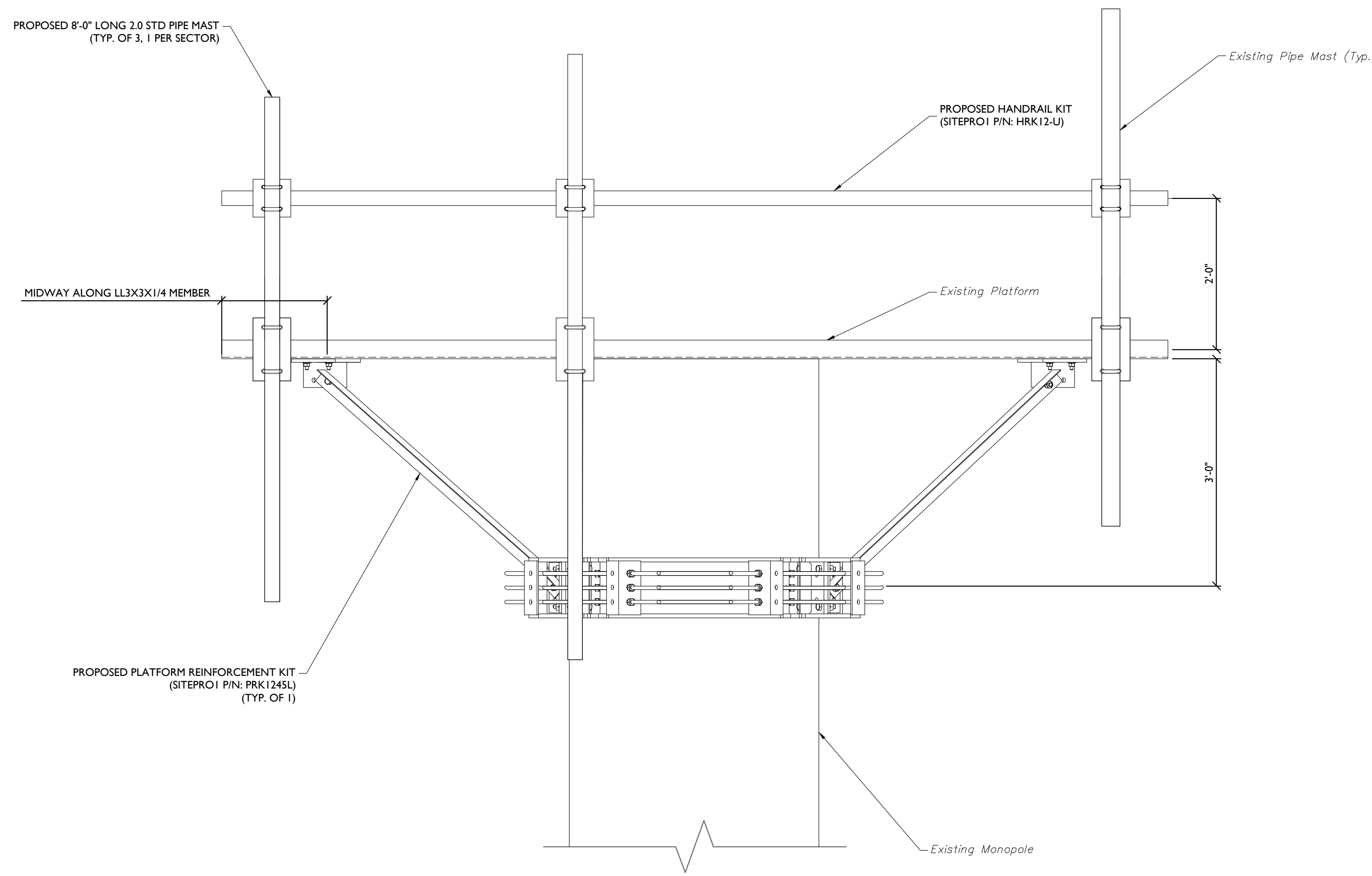
Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Mar 27 2019

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

APPENDIX E

MOUNT MODIFICATION DESIGN DRAWINGS (MDD)



PLATFORM MODIFICATION DETAILS ELEVATION VIEW

NOT TO SCALE

LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
3	ERICSSON	AIR 21 B2A B4P	Existing	Alpha, Beta, & Gamma
3	**ERICSSON**	**Air 32 DB B2A B66Aa**	**Proposed**	**Alpha, Beta, & Gamma**
3	**RFS**	**APXVAARR24_43-U-NA20**	**Proposed**	**Alpha, Beta, & Gamma**
3	ERICSSON	KRY 112 144/1	Existing	Alpha, Beta, & Gamma
3	**ERICSSON**	**RRU 4449 B71 + B12**	**Proposed**	**Alpha, Beta, & Gamma**

NOTE:

MASER CONSULTING CONNECTICUT HAS DETERMINED THAT THE SUPPORT MOUNTS, WITH THE PROPOSED MODIFICATIONS, HAVE ADEQUATE STRUCTURAL CAPACITY TO SUPPORT THE EXISTING AND PROPOSED LOADING. THE SUPPORT MOUNTS HAVE BEEN DETERMINED TO BE STRESSED TO A MAXIMUM OF 76.0% OF ITS STRUCTURAL CAPACITY, ONCE THE PROPOSED MODIFICATIONS IN THIS DRAWING ARE INSTALLED AS INTENDED AT EACH SUPPORT MOUNT.

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1	3/29/19	FOR CONSTRUCTION	CS	PET
0	10/15/18	FOR CONSTRUCTION	CB	SMS

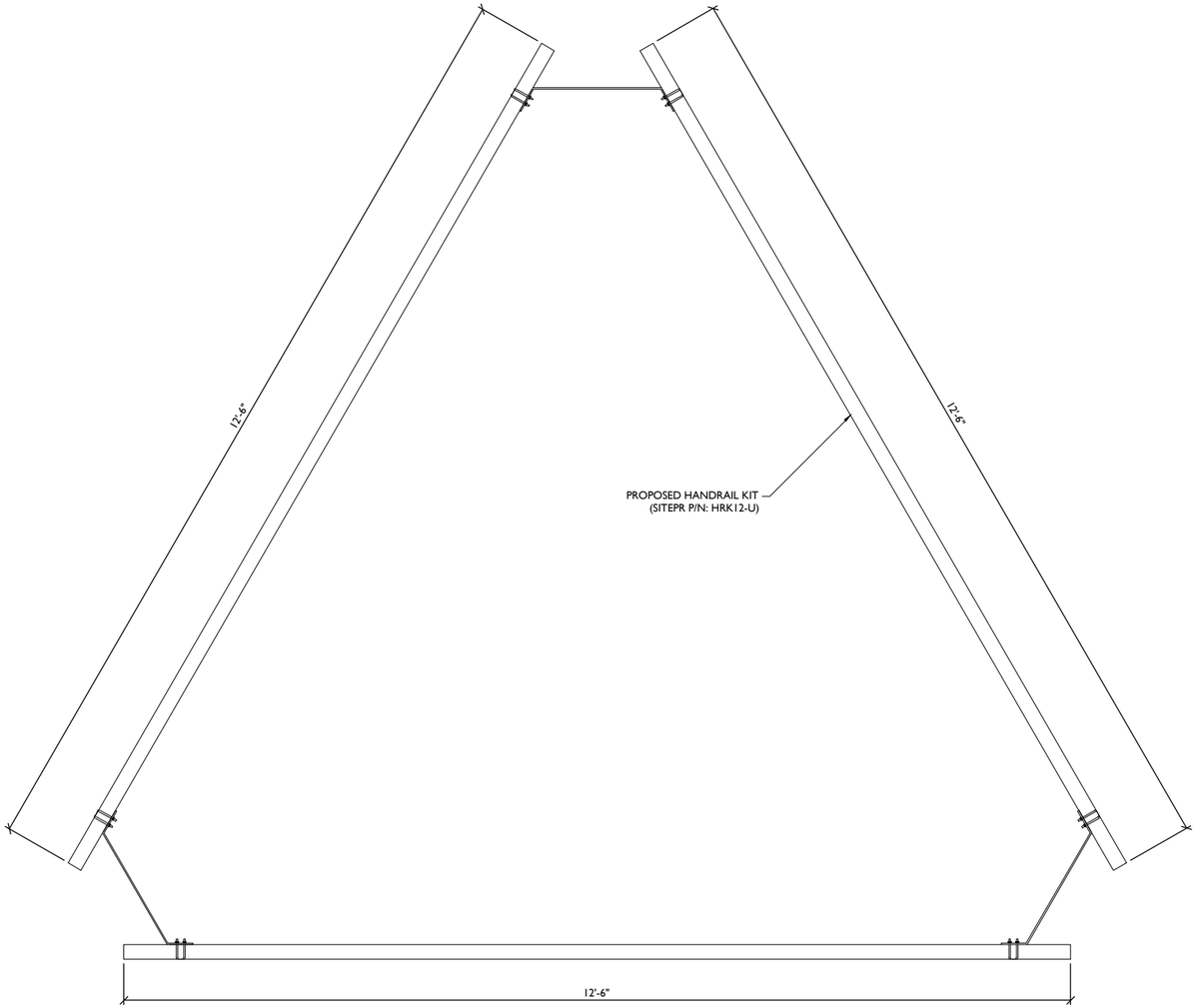
PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL
ENGINEER - LICENSE NUMBER: 32577

SITE NAME:
BU: 876329
SITE NAME:
MT. VIEW CEM (FILLEY PARK)
CARRIER SITE NUMBER:
CT11278A
28 BREWER DRIVE
BLOOMFIELD, CT 06002
HARTFORD COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

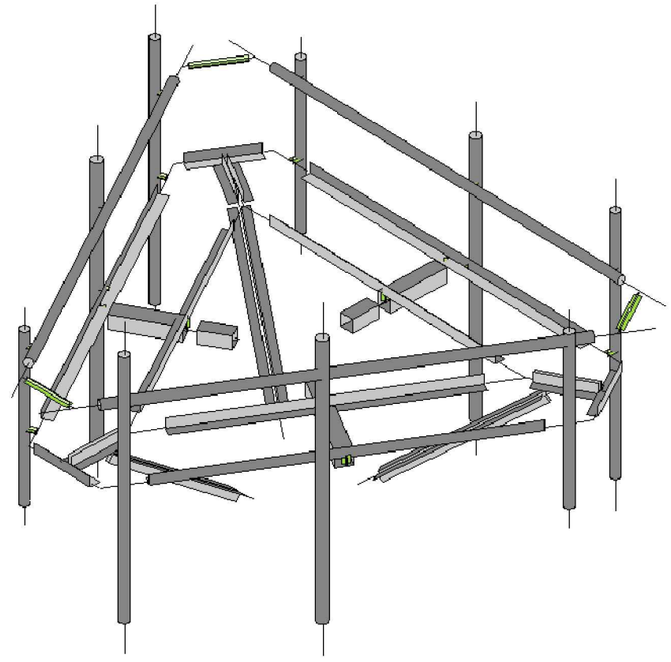
SHEET TITLE : STRUCTURAL MODIFICATION DETAILS

SHEET NUMBER : S-1



PROPOSED HANDRAIL DETAILS PLAN VIEW

NOT TO SCALE



MOUNT MODIFICATIONS RISA 3D MODEL

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HARTFORD COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

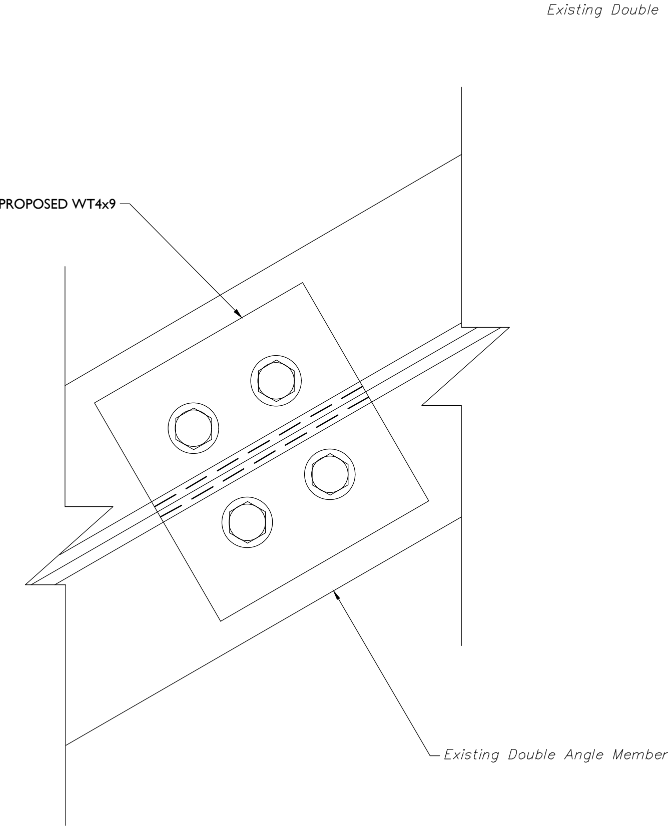
SHEET TITLE :
STRUCTURAL MODIFICATION DETAILS

SHEET NUMBER :
S-2

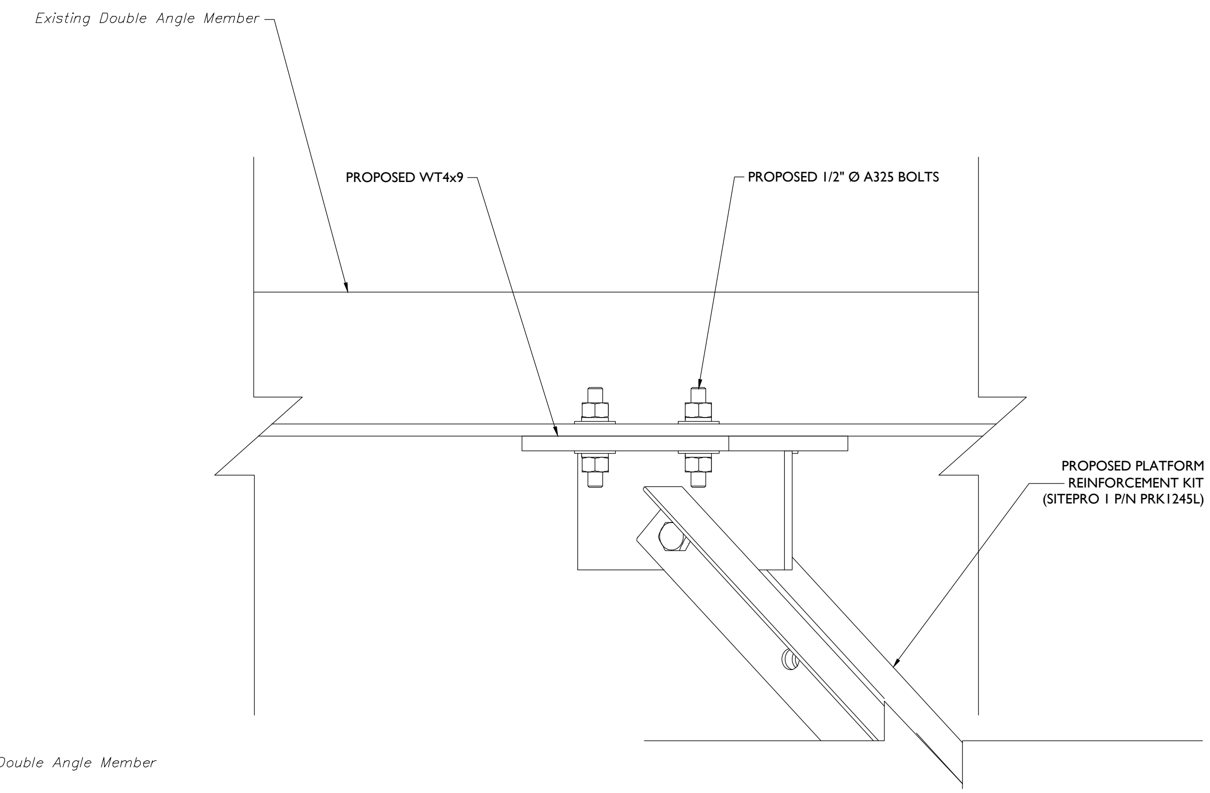
STRUCTURAL STEEL

1. DESIGN, FABRICATION, ERECTION AND WORKMANSHIP SHALL CONFORM TO AISC MANUAL OF STEEL CONSTRUCTION, FIFTEENTH EDITION.
2. CONNECTION BOLTS SHALL BE 3/4"Ø ASTM A325N UNLESS OTHERWISE NOTED.
3. ALL COPES, BLOCKS, CUT OUTS, AND OTHER CUTTING OF STRUCTURAL MEMBERS SHALL HAVE ALL RE-ENTRANT CORNERS SHAPED, NOTCHED FREE TO A RADIUS OF AT LEAST 1/2".
4. CONTRACTOR IS RESPONSIBLE FOR ADEQUATE BRACING OF STEEL CONSTRUCTION.
5. ALL NEW STRUCTURAL STEEL SHAPES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
6. ALL NEW STEEL BOLTS, NUTS, AND HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
7. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
8. ALL STRUCTURAL STEEL SHALL ABIDE BY THE FOLLOWING MATERIAL STRENGTH LIST UNLESS OTHERWISE NOTED:

ANGLES, WT SHAPES	ASTM A36 (GR 36)
PIPES	ASTM A53 (GR B)
BOLTS	ASTM A325 (ALL BOLT HOLES STANDARD SIZE U.N.O.
NUTS	ASTM A194-2H
WASHERS	ASTM F436
HOT-DIPPED GALVANIZING	ASTM A123

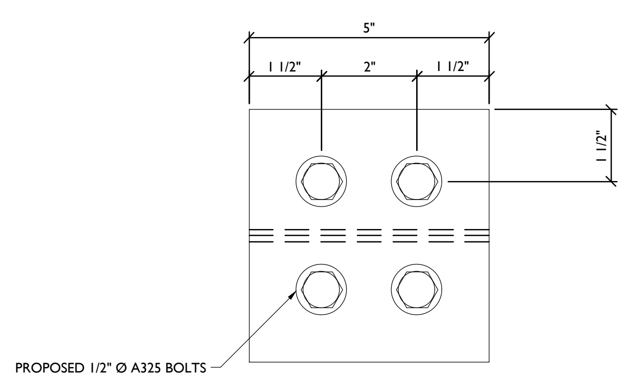


CUSTOM MOUNTING BRACKET PLAN VIEW
NOT TO SCALE



CUSTOM MOUNTING BRACKET ELEVATION VIEW
NOT TO SCALE

NOTE:
1. CONTRACTOR SHALL FIELD DRILL INTO THE EXISTING STEEL AS REQUIRED FOR THE PROPOSED CONNECTIONS. DAMAGED GALVANIZED SURFACES, SUCH AS THE PROPOSED BOLT HOLE LOCATIONS, SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.



WT4x9 DETAIL
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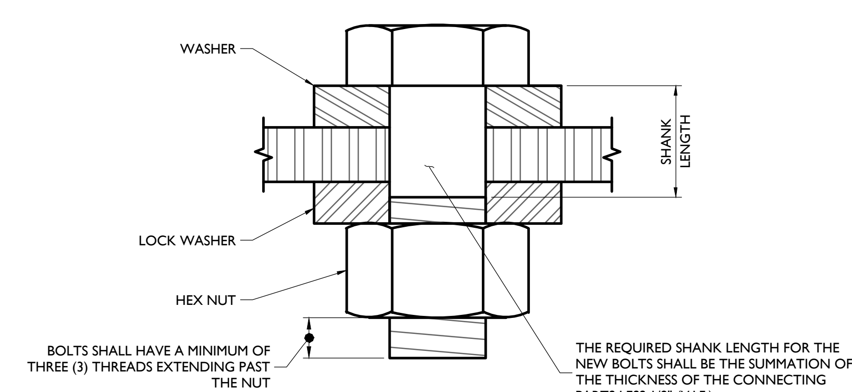

BOLT DETAIL
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1	3/29/19	FOR CONSTRUCTION	CS	PET
0	10/15/18	FOR CONSTRUCTION	CB	SMS

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577

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SITE NAME:
BU: 876329
SITE NAME:
MT. VIEW CEM (FILLEY PARK)
CARRIER SITE NUMBER:
CT11278A
28 BREWER DRIVE
BLOOMFIELD, CT 06002
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Suite 100
Mt. Laurel NJ 08054
Phone: 856.797.0412
Fax: 856.722.1120
email: solutions@maserconsulting.com

SHEET TITLE :
STRUCTURAL MODIFICATION DETAILS

SHEET NUMBER :
S-3

GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR DISSEMINATION OF REVISIONS TO CONTRACT DOCUMENTS AND REQUIREMENTS TO ALL SUBCONTRACTORS. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES AND EQUIPMENT MANUFACTURERS.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND EXISTING FIELD CONDITIONS BEFORE PROCEEDING WITH CONSTRUCTION. DETERMINE EXACT LOCATIONS OF EXISTING UTILITIES, GROUNDS, DRAIN PIPES AND VENTS BEFORE COMMENCING WORK. CONTRACTOR SHALL NOTIFY ENGINEER IF ACTUAL CONDITIONS DIFFER SIGNIFICANTLY FROM WHAT IS SHOWN ON DRAWINGS.
3. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A NEAT AND ORDERLY PROJECT SITE, REMOVE AND DISPOSE OF OFF SITE RUBBISH, WASTE MATERIALS, LITTER, AND ALL FOREIGN SUBSTANCES DAILY.
4. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE OWNER'S WRITTEN APPROVAL.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUCH COVERING, SHIELDING, AND BARRICADES AS REQUIRED TO PROTECT BYSTANDERS AND PASSERSBY, EQUIPMENT, SUPPLIES, ETC. FROM DUST, DEBRIS AND OTHER CAUSE OF DAMAGE RESULTING FROM CONSTRUCTION. ANY DAMAGE DURING CONSTRUCTION SHALL BE RESTORED TO PREVIOUS CONDITIONS.
6. IN AREAS WHERE EXISTING ANTENNA MOUNTS, TRANSMISSION LINES OR OTHER SUPPORTING EQUIPMENT IS TO BE REMOVED, THE EXISTING STRUCTURE SHALL BE REPAIRED AS REQUIRED.
7. ALL SAFETY AND OSHA REGULATIONS SHALL BE FOLLOWED STRICTLY. METHODS OF CONSTRUCTION AND ERECTION OF STRUCTURAL MATERIAL ARE THE CONTRACTOR'S RESPONSIBILITY.
8. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT FOR ALL EXISTING ANTENNAS, TRANSMISSION LINES OR OTHER APPURTENANCES DURING CONSTRUCTION.
9. CONTRACTOR SHALL PROTECT EXISTING APPURTENANCES FROM DAMAGE DURING CONSTRUCTION.
10. NO ANTENNAS, CABLES, OR OTHER APPURTENANCES SHALL BE ADDED TO THE TOWER UNTIL THE MODIFICATION WORK IS COMPLETE.
11. ALL DIMENSIONS SHOWN ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE DIMENSIONS WITH TOWER MANUFACTURER OR FIELD VERIFY DIMENSIONS PRIOR TO FABRICATING MEMBERS.
12. THE CONTRACTOR SHALL LOCATE ALL UTILITIES IN THE AREA OF CONSTRUCTION AND PREVENT DAMAGE TO THEM. SHOULD DAMAGE OCCUR TO ANY UTILITIES, THE CONTRACTOR IS REQUIRED TO REPAIR THE DAMAGE TO THE SATISFACTION OF THE OWNER AT HIS OWN EXPENSE.
13. ALL EXISTING PLANS, DETAILS, DIMENSIONS, AND ELEVATIONS INDICATE EXISTING CONDITIONS AS KNOWN. THE EXISTING INFORMATION SHOWN IS NOT INTENDED TO BE "AS BUILT" AND THE ACTUAL CONSTRUCTION MAY DIFFER FROM THAT SHOWN. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING DIMENSIONS AND ELEVATIONS PRIOR TO STARTING CONSTRUCTION. MINOR VARIATIONS CAN BE EXPECTED AND ANY REQUIRED DEVIATION FROM THE CONTRACT DOCUMENTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
14. MODIFICATION DETAILS REPRESENTS TYPICAL CONDITIONS. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DEVIATION AS A RESULT OF SITE SPECIFIC CONDITIONS. REINFORCE ALL TOWER FACES IDENTICALLY, UNLESS OTHERWISE NOTED.
15. IN AREAS TO BE MODIFIED, ANY ANTENNA, COAX, OR CONDUIT SHALL BE TEMPORARILY MOVED AND THEN REPLACED AFTER COMPLETION OF WORK. COORDINATE WITH OWNER.
16. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL MATERIAL TO BE REMOVED.
17. CONTRACTOR SHALL ENSURE STABILITY OF THE ANTENNA PLATFORM DURING ALL WORK.
18. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE TEMPORARY BRACING OF THE STRUCTURE DURING ALL STAGES OF CONSTRUCTION. THE STRUCTURE IS DESIGNED FOR A COMPLETED CONDITION ONLY AND THEREFORE MAY REQUIRE ADDITIONAL SUPPORT BEFORE COMPLETIONS.
19. THIS DESIGN ASSUMES THE ANTENNA PLATFORM HAVE BEEN WELL MAINTAINED, IN GOOD CONDITION, AND ARE WITHOUT DEFECT. BENT MEMBERS, CORRODED MEMBERS, LOOSE BOLTS, CRACKED WELDS AND OTHER MEMBER DEFECTS HAVE NOT BEEN CONSIDERED. THE TOWER IS ASSUMED TO BE PLUMB AND THE SITE IS ASSUMED TO BE LEVEL. THIS DESIGN IS BEING PROVIDED WITHOUT THE BENEFIT OF A CONDITION BY MASER CONSULTING P.A.. CONTRACTOR SHALL COMMISSION A COMPLETE CONDITION ASSESSMENT PRIOR TO ORDERING ANY REINFORCING MATERIALS. CONTRACTOR SHALL SUPPLY CONDITION ASSESSMENT TD ENGINEER FOR REVIEW. SEE CONTRACTOR NOTES.
20. ALL SUBSTITUTES PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE. REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.
21. PROVIDE STRUCTURAL STEEL SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO FABRICATION.
22. INSPECTION OF THE MODIFICATIONS SHALL BE COMPLETED BY A THIRD PARTY. INSPECTION SHALL TAKE PLACE WITHIN 72 HOURS OF THE COMPLETION OF THE ANTENNA PLATFORM MODIFICATIONS. NO PROPOSED LOADING SHALL BE INSTALLED PRIOR TO INSPECTOR APPROVAL.

DESIGN LOADS

1. WIND: ANSI/TIA/EIA-222-H
   ULTIMATE WIND SPEED: 125 MPH
2. ANTENNA PLATFORM MODIFICATIONS WERE DESIGNED IN ACCORDANCE TO TIA-222-H AND 2018 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2015 IBC, AS WELL AS APPLICABLE LOCAL BUILDING CODES.

STRUCTURAL STEEL

1. DESIGN, FABRICATION, ERECTION AND WORKMANSHIP SHALL CONFORM TO AISC MANUAL OF STEEL CONSTRUCTION, FOURTEENTH EDITION.
2. CONNECTION BOLTS SHALL BE 3/4"Ø ASTM A325N UNLESS OTHERWISE NOTED.
3. ALL COPES, BLOCKS, CUT OUTS, AND OTHER CUTTING OF STRUCTURAL MEMBERS SHALL HAVE ALL RE-ENTRANT CORNERS SHAPED, NOTCHED FREE TO A RADIUS OF AT LEAST 1/2".
4. CONTRACTOR IS RESPONSIBLE FOR ADEQUATE BRACING OF STEEL CONSTRUCTION.
5. ALL NEW STRUCTURAL STEEL SHAPES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
6. ALL NEW STEEL BOLTS, NUTS, AND HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
7. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
8. ALL STRUCTURAL STEEL SHALL ABIDE BY THE FOLLOWING MATERIAL STRENGTH LIST UNLESS OTHERWISE NOTED:

ANGLES, WT SHAPES	ASTM A36 (GR 36)
PIPES	ASTM A53 (GR B)
BOLTS	ASTM A325 (ALL BOLT HOLES STANDARD SIZE U.N.O.
NUTS	ASTM A194-2H
WASHERS	ASTM F436
HOT-DIPPED GALVANIZING	ASTM A123

CONTRACTOR NOTES

1. ALL CONTRACTORS AND LOWER TIER CONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER AND MASER CONSULTING P.A. THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW TOWER OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED MODIFICATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR TOWER OWNER AND MASER CONSULTING P.A. ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM LOWER TIER SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO TOWER OWNER AND MASER CONSULTING P.A.
2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE MODIFICATIONS, MASER CONSULTING P.A. SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.
3. IT IS ASSUMED THAT ANY STRUCTURAL MODIFICATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TELECOMMUNICATION CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE TOWER OWNER AND ENGINEER.
4. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES, AND PROCEDURES.
5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PROGRAMS AND PRECAUTIONS IN CONNECTION WITH THIS WORK.
6. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING; ANY PROBLEMS WITH ACCESS, INTERFERENCE, ETC. SHALL BE RESOLVED PRIOR TO MOBILIZATION. THE CONTRACTOR MUST VISIT THE SITE PRIOR TO ORDERING ANY MATERIAL AND MUST RESOLVE ALL ISSUES WITH THE OWNER PREVENTING A CONTINUOUS INSTALLATION. CONTRACTOR SHALL NOTE ALL ANTENNAS, MOUNTS, COAX, LIGHTING AND ANY OTHER TOWER APPURTENANCES IN THE REGION OF THE MODIFICATIONS.
7. CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY REMOVING ALL COAX, T-BRACKETS, ANTENNA MOUNTS, AND ANY OTHER TOWER APPURTENANCE THAT MAY INTERFERE WITH THE ANTENNA PLATFORM MODIFICATIONS. ALL TOWER APPURTENANCES MUST BE REPLACED AND/OR RESTORED TO ITS ORIGINAL LOCATION. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.
8. SOME ATTACHMENTS MAY REQUIRE CUSTOM MODIFICATIONS TO PROPERLY FIT THE MODIFIED REGION OF THE STRUCTURE. THESE CUSTOMIZATIONS ARE DESIGNED BY OTHERS AND MUST BE APPROVED BY THE ENGINEER PRIOR TO REMOVING SUCH ATTACHMENTS. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.
9. CONTRACTOR SHALL ONLY WORK WITHIN THE LIMITS OF THE TOWER OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. CONTRACTOR SHALL EMPLOY A SURVEYOR AS REQUIRED. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION. CONSTRUCTION STAKING AND BOUNDARY MARKING IS THE RESPONSIBILITY OF THE CONTRACTOR.
10. WORK SHALL ONLY BE PERFORMED DURING CALM DRY DAYS (WINDS LESS THAN 10-MPH) CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY LOCAL ANTENNA PLATFORM SHORING, TEMPORARY GLOBAL ANTENNA PLATFORM SHORING, AND ALL SHORING OF SURROUNDING BUILDINGS, PADS, AND OTHER OUTDOOR SITE OBSTRUCTIONS. ALL SHORING. TEMPORARY BRACING, AND TEMPORARY SUPPORTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.

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SCALE : AS SHOWN | JOB NUMBER : 18922049A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	3/29/19	FOR CONSTRUCTION	CS	PET
0	10/15/18	FOR CONSTRUCTION	CB	SMS

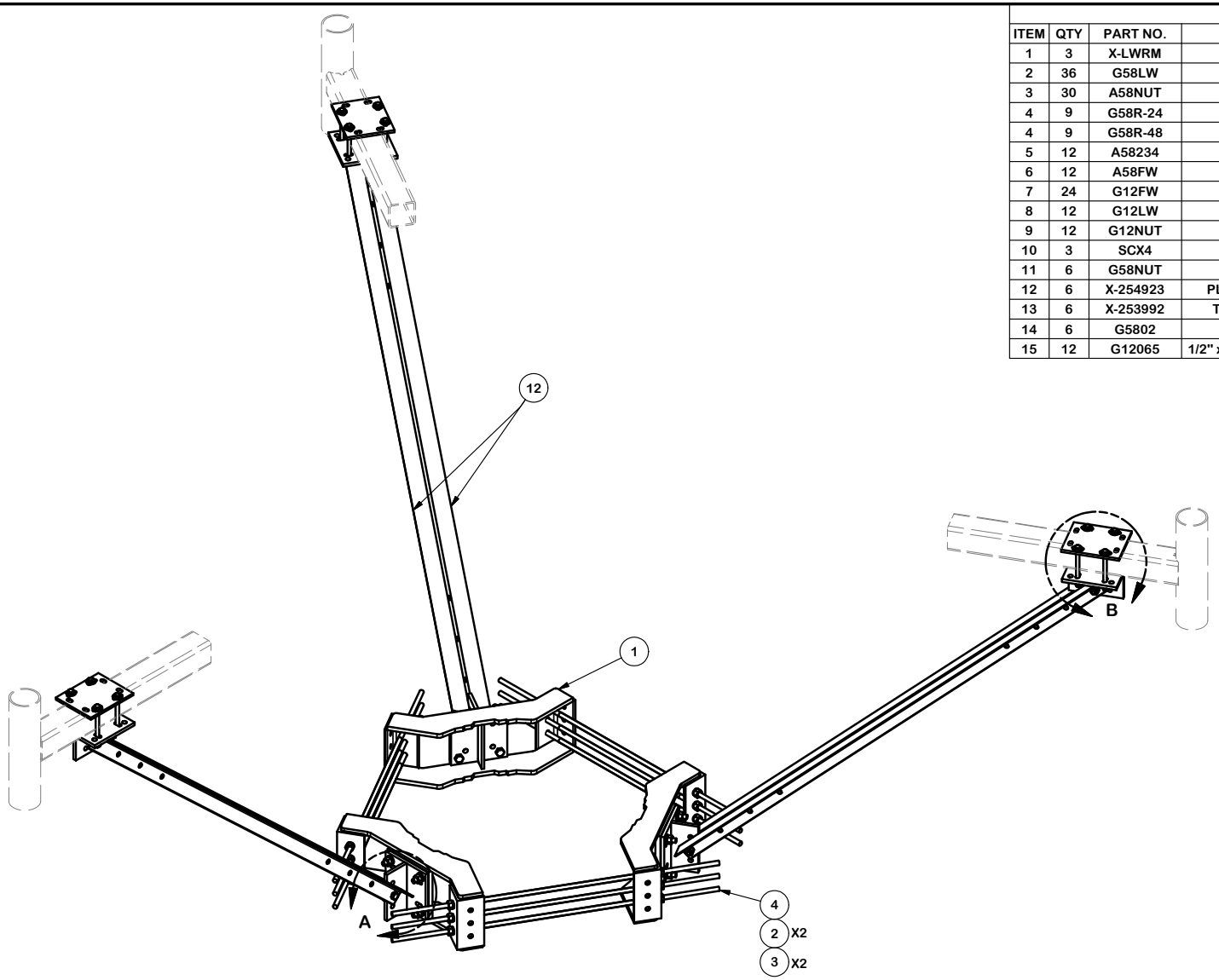
PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL
ENGINEER - LICENSE NUMBER: 32577

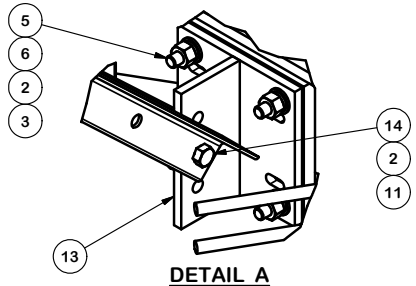
SITE NAME:
BU: 876329
SITE NAME:
MT. VIEW CEM (FILLEY PARK)
CARRIER SITE NUMBER:
CT11278A
28 BREWER DRIVE
BLOOMFIELD, CT 06002
HARTFORD COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

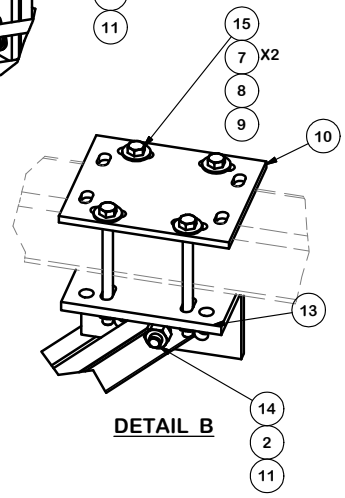
SHEET TITLE : STRUCTURAL NOTES

SHEET NUMBER : S-4





DETAIL A



DETAIL B

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	36	G58LW	5/8" HDG LOCKWASHER		0.03	0.94
3	30	A58NUT	5/8" HDG A325 HEX NUT		0.13	3.90
4	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.55	4.94
4	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.55	4.94
5	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	4.27
6	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
7	24	G12FW	1/2" HDG USS FLATWASHER		0.03	0.82
8	12	G12LW	1/2" HDG LOCKWASHER		0.01	0.17
9	12	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	0.86
10	3	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	18.06
11	6	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	0.78
12	6	X-254923	PLATFORM REINFORCEMENT KIT ANGLE	84 in	22.83	137.00
13	6	X-253992	T-BRACKET FOR REINFORCEMENT KIT		13.55	81.27
14	6	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.62
15	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
					TOTAL WT. #	515.92

TOLERANCE NOTES

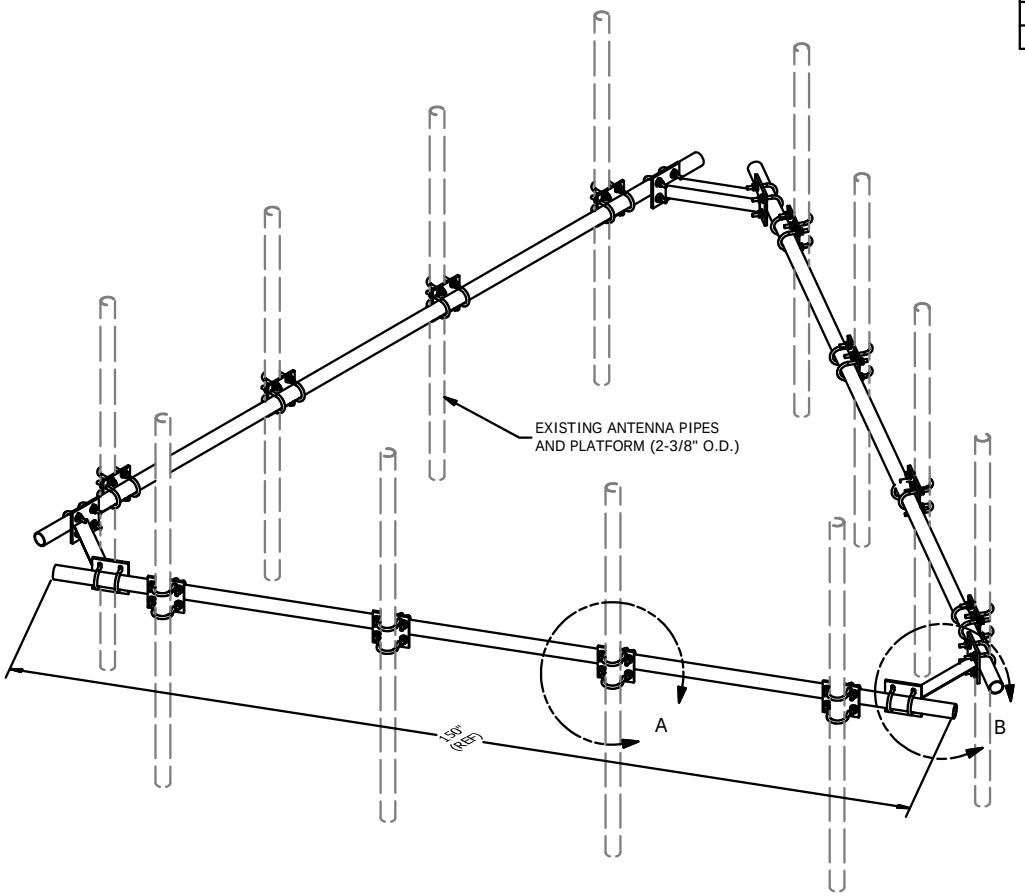
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

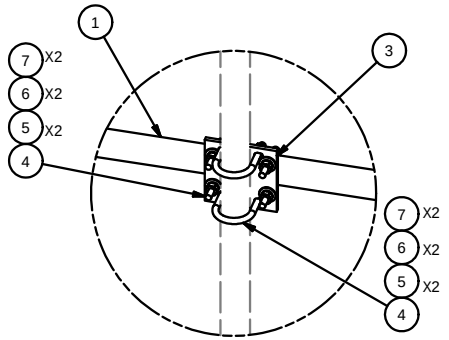
DESCRIPTION
PLATFORM REINFORCEMENT
ON A 12" T0 45" POLE
7' ANGLE

SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

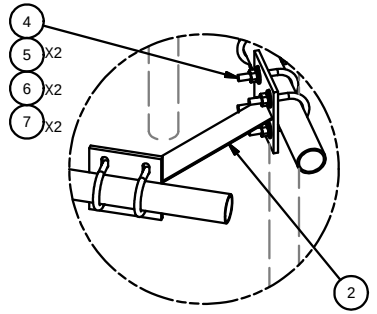
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	
4488	CEK 7/15/2014		PRK-1245L	PAGE 1 OF 2
CLASS / SUB: 81 / 01	DRAWING USAGE: CUSTOMER	CHECKED BY: BMC 7/22/2014	DWG. NO.: PRK-1245L	

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2150	2-3/8" OD X 150" SCH 40 GALVANIZED PIPE	150 in	48.06	144.17
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	12	SCX1	CROSSOVER PLATE 2-3/8" X 2-3/8"		3.71	44.50
4	120	G12FW	1/2" HDG USS FLATWASHER		0.03	4.08
5	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	43.90
6	120	G12LW	1/2" HDG LOCKWASHER		0.01	1.67
7	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.58
					TOTAL WT. #	261.72





DETAIL A



DETAIL B

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	REPLACED HCP WITH X-AHCP		CEK	7/10/2014

REVISION HISTORY

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
HANDRAIL KIT
FOR 12'-6" FACE

SITE PRO 1
A valmont COMPANY

Engineering Support Team:
1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	KC8 5/30/2012		HRK12

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 7/14/2014	HRK12