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

March 7, 2019

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: **Notice of Exempt Modification for Verizon: 876401**
Verizon Site ID: NG71936
47-51 Unity Street, Plainfield, CT 06374
Latitude: 41° 42' 54.49"/ Longitude: -71° 53' 46.73"

Dear Ms. Bachman:

Verizon currently maintains nine (9) antennas at the 127-foot level of the existing 160-foot monopole tower at 47-51 Unity Street, Plainfield, CT. The tower is owned by Crown Castle. The property is owned by the Town of Plainfield. Verizon now intends to add three (3) new remote radio units, RRU's to their existing equipment. These remote radio units would be installed at the 127-foot level of the tower. Verizon will also modify their existing antenna mount.

This facility was approved by the Connecticut Siting Council in Docket No. 234 on April 9, 2003. This approval included the condition that:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunication services, sufficient to accommodate the antennas of Sprint and other entities, both public and private, but such tower shall not exceed a height of 160 feet above ground level. The tower shall also be constructed in such a manner that, in the unlikely event of failure, it would collapse upon itself in a way that it would effectively reduce the diameter of the fall zone.

This modification complies with the aforementioned condition (s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to the property owner and jurisdiction First-Selectman Ms. Cathy Tendrich, and Ms. Mary Ann Chinatti, Planning & Zoning Supervisor Town of Plainfield. Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, Verizon respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: First-Selectman - Ms. Cathy Tendrich
Town of Plainfield
8 Community Avenue
Plainfield, CT 06374

Planning & Zoning Supervisor - Ms. Mary Ann Chinatti
Town of Plainfield
8 Community Avenue
Plainfield, CT 06374

Connecticut Siting Council

Decisions

DOCKET NO. 234 – Sprint Spectrum, L.P. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility in Plainfield, Connecticut.	}	Connecticut Siting Council

April 9, 2003

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes **§** 16-50k, be issued to Sprint Spectrum L. P. (Sprint) for the construction, maintenance and operation of a wireless telecommunications facility at proposed Candidate B site located at 47-51 Unity Street, Plainfield, Connecticut. We deny certification of the proposed Candidate A site (Saad property) located at 180 Town Farm Road, Plainfield, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Sprint and other entities, both public and private, but such tower shall not exceed a height of 160 feet above ground level. The tower shall also be constructed in such a manner that, in the unlikely event of failure, it would collapse upon itself in a way that would effectively reduce the diameter of the fall zone.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include:

    a. a detailed site development plan that depicts the location of the access road, compound, tower, and utility line;

    b. specifications for the tower, tower foundation, antennas, equipment building, and security fence; and

    c. construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council

worst-case modeling of electromagnetic radio frequency power densities of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new state or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. If the facility does not initially provide, or permanently ceases to provide wireless services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and ceases to function.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Norwich Bulletin.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant

Sprint Spectrum, L.P.
d/b/a Sprint PCS

Its Representative

Thomas J. Regan, Esquire
Brown Rudnick Berlack Israels LLP
CityPlace I, 38th Floor
185 Asylum Street
Hartford, CT 06103-3402
(860) 509-6522

Content Last Modified on 4/22/2003 12:15:21 PM

47-51 UNITY ST

Location	47-51 UNITY ST	**Mblu**	015/ 0071/ 0009/ /
Acct#	00145200	**Owner**	PLAINFIELD TOWN OF
Assessment	$404,060	**Appraisal**	$577,220
PID	1571	**Building Count**	3

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$386,850	$190,370	$577,220
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$270,800	$133,260	$404,060

Owner of Record

Owner PLAINFIELD TOWN OF
Co-Owner
Address 651 NORWICH RD
PLAINFIELD, CT 06374

Sale Price $0
Certificate
Book & Page 0025/0002
Sale Date 04/01/1878
Instrument

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
PLAINFIELD TOWN OF	$0		0025/0002		04/01/1878

Building Information

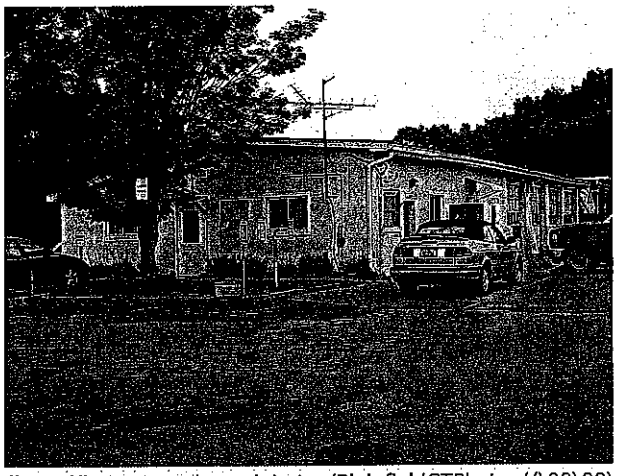
Building 1 : Section 1

Year Built: 1973
Living Area: 12,000
Replacement Cost: $345,480
Building Percent Good: 73
Replacement Cost Less Depreciation: $252,200

Building Attributes	
Field	**Description**

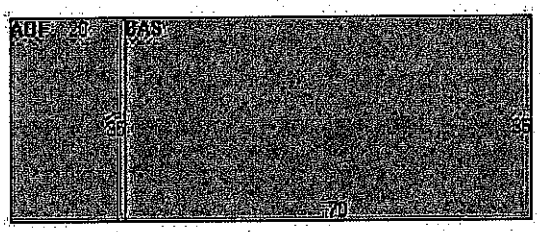
Stories:	1
Occupancy	
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Typical
Interior Wall 2	
Interior Floor 1	Average
Interior Floor 2	
Heating Fuel	None
Heating Type	None
AC Type	None
Bldg Use	MUNICIPAL MDL-94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	9030
Heat/AC	NONE
Frame Type	NONE
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	10
% Comn Wall	

Building Photo



(http://images.vgsi.com/photos/PlainfieldCTPhotos//\00\00\59/1

Building Layout



(http://images.vgsi.com/photos/PlainfieldCTPhotos//Sketches/15

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	2,450	2,450
AOF	Office	700	700
		3,150	3,150

Building 3 : Section 1

Year Built: 1975
Living Area: 378
Replacement Cost: $20,782
Building Percent Good: 73
Replacement Cost Less Depreciation: $15,170

Building Attributes : Bldg 3 of 3	
Field	Description
STYLE	Office/Warehs
MODEL	Comm/Ind

Land

Land Use

Use Code	903C
Description	MUNICIPAL MDL-94
Zone	IND
Neighborhood	2000
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	12
Frontage	
Depth	
Assessed Value	$133,260
Appraised Value	$190,370

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
AQ1	Quonset Bldg			840 S.F.	$12,180	1
KEN2	Kennel-Good			468 S.F.	$5,970	3
CNP1	Canopy Avg			312 S.F.	$1,870	3
CNP1	Canopy Avg			800 S.F.	$3,200	2
SH1	Frame Shed			128 S.F.	$800	1
SH1	Frame Shed			170 S.F.	$1,060	1
CNP1	Canopy Avg			800 S.F.	$3,200	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$386,850	$190,370	$577,220
2017	$386,850	$190,370	$577,220
2016	$358,420	$538,130	$896,550

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$270,800	$133,260	$404,060
2017	$270,800	$133,260	$404,060
2016	$250,900	$376,690	$627,590

unity st

Search Results

Parcel Details

Return To Search Results

47-51 UNITY ST

PLAINFIELD TOWN OF

651 NORWICH RD
PLAINFIELD, CT 06374

Parcel ID: 015-0071-0009
Sale Price: $0

Links
Parcel Details
Photo
Google Map
Abutter Distance:
Adjacent
Adjacent
50 ft
100 ft
150 ft
200 ft
300 ft
400 ft
500 ft

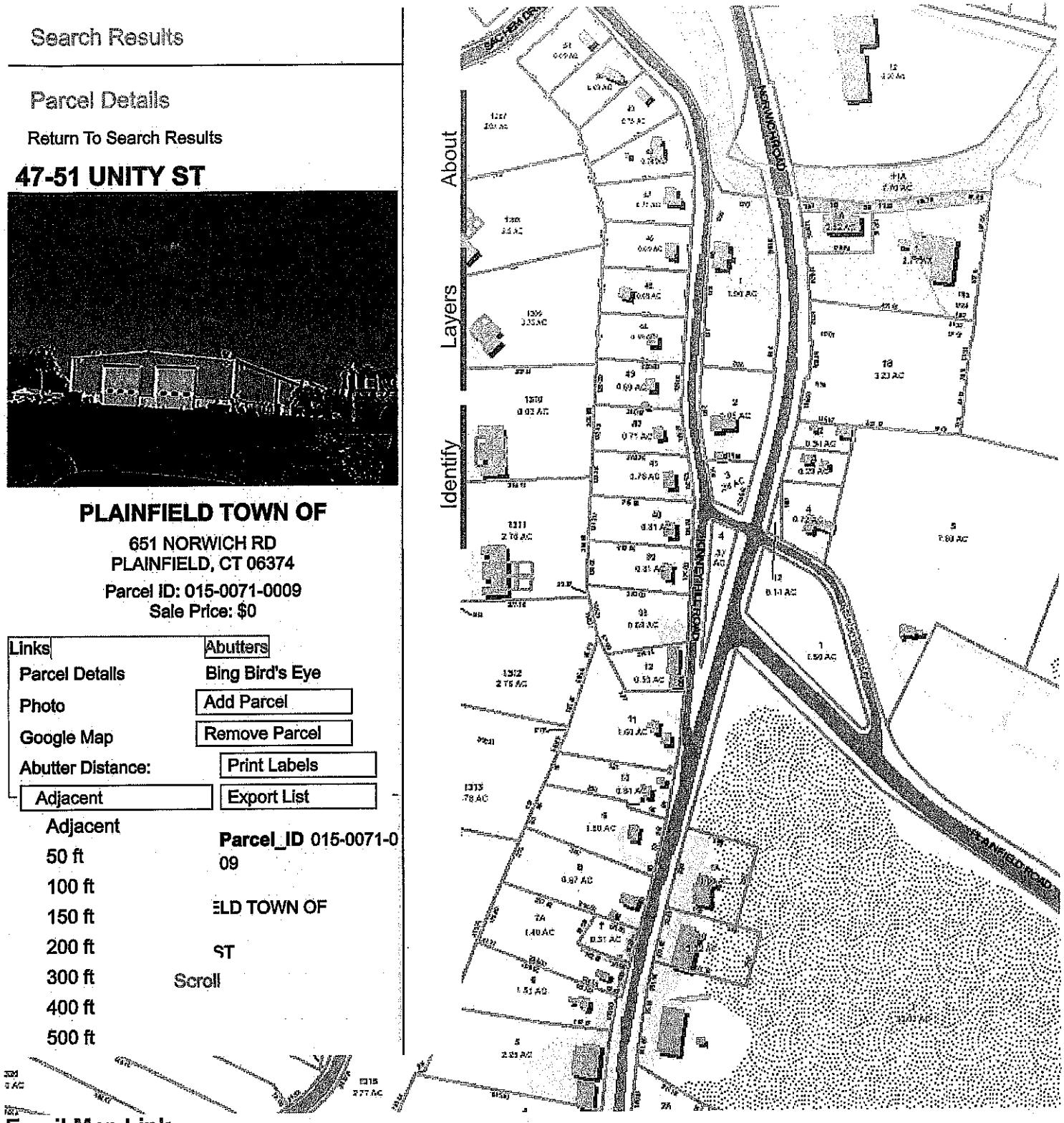
Abutters
Bing Bird's Eye
Add Parcel
Remove Parcel
Print Labels
Export List

Parcel_ID 015-0071-0
09

ELD TOWN OF

ST

Scroll



Email Map Link

Copy ar aste the following string into an email to link to the current map view:

100m
400ft

Close lat:41.7168, long:-71.8963

TighеBond

unity st

Search Results

Parcel Details

Return To Search Results

47-51 UNITY ST

PLAINFIELD TOWN OF

651 NORWICH RD
PLAINFIELD, CT 06374

Parcel ID: 015-0071-0009
Sale Price: $0

Links | Abutters

Parcel Details | Bing Bird's Eye

Photo | Add Parcel

Google Map | Remove Parcel

Abutter Distance: | Print Labels

Adjacent | Export List

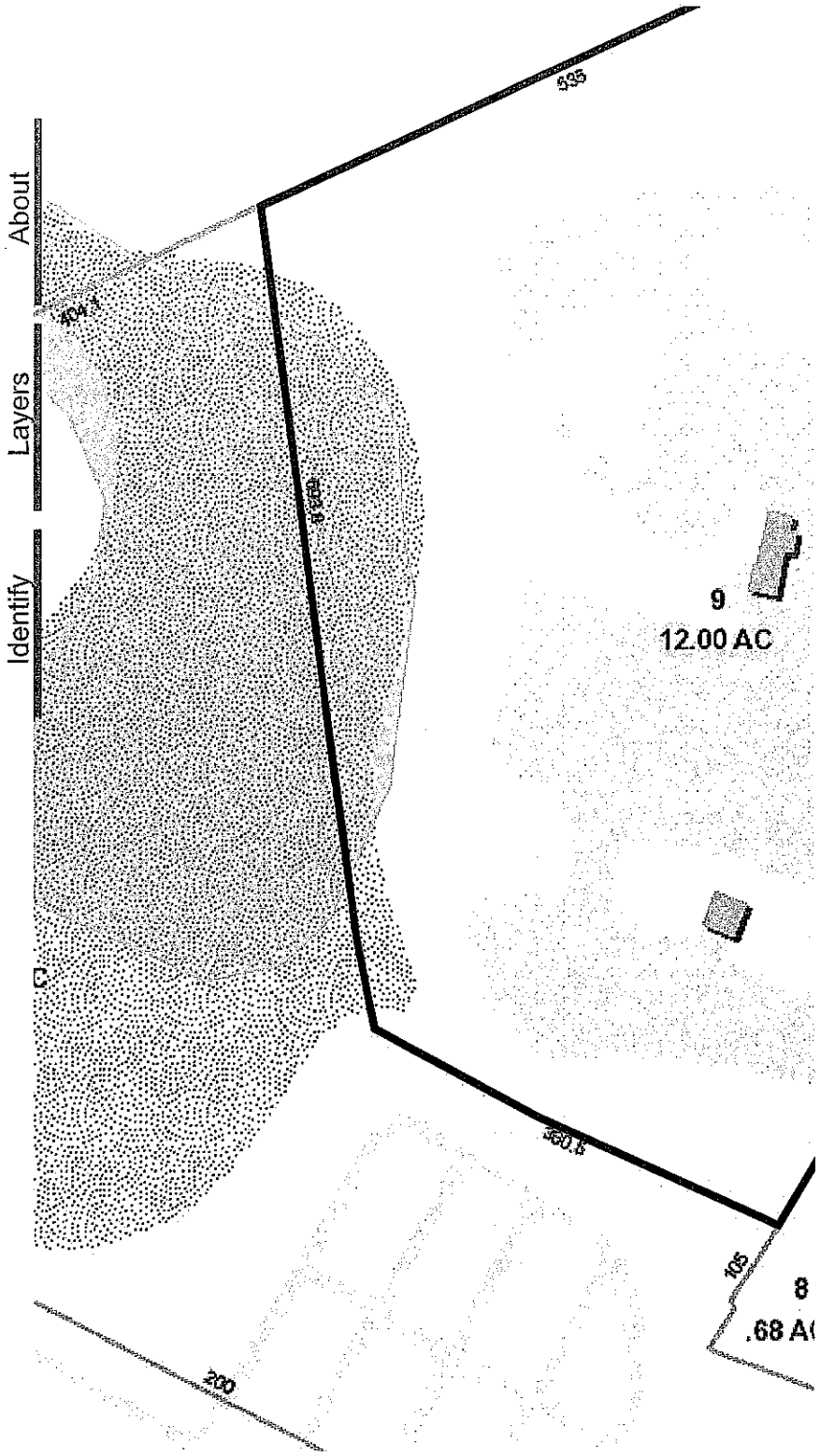
Adjacent
50 ft
100 ft
150 ft
200 ft
300 ft
400 ft
500 ft

Parcel_ID 015-0071-0
09

ELD TOWN OF

ST

Scroll



Email Map Link

Copy ar aste the following string into an email to link to the current map view:

40m
200ft

Close lat:41.7153, long:-71.8972

Tighe&Bond

Site Name: PLAINFIELD NORTH 2 CT
Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissible Exposure	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
VZW PCS	1970	1	6445.79	6445.79	127	0.1437	1.0	14.37%
VZW Cellular	869	1	2529.8	2529.8	127	0.0564	0.579333333	9.74%
VZW AWS	2145	1	7067.6	7067.6	127	0.1576	1.0	15.76%
VZW 700	746	1	3014.9	3014.9	127	0.0672	0.497333333	13.52%

Total Percentage of Maximum Permissible Exposure 53.38%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used, including the following assumptions:
1. closest accessible point is distance from antenna to base of pole;
2. continuous transmission from all available channels at full power for indefinite time period; and,
3. all RF energy is assumed to be directed solely to the base of the pole.

774648860606

Scheduled delivery: Pending

DELIVERY EXCEPTION

NORWICH, CT

GET STATUS UPDATES

FROM

Crown Castle
Jeff Barbadora
12 Gill Street
Suite 5800
WOBURN, MA US 01801
781 970-0053

TO

Town of Plainfield
Planning- Mary Ann Chinatti
8 Community Avenue
PLAINFIELD, CT US 06374
860 230-3028

Shipment Facts

TRACKING NUMBER
774648860606

SERVICE
FedEx Priority Overnight

WEIGHT
0.5 lbs / 0.23 kgs

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
0.5 lbs / 0.23 kgs

TERMS
Shipper

SHIPPER REFERENCE
1766.6680

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

STANDARD TRANSIT

3/11/2019 by 10:30 am

SHIP DATE

Thu 3/07/2019

SCHEDULED DELIVERY
Pending

Travel History

			Local Scan Time
Friday , 3/08/2019			
9:45 am	NORWICH, CT	Delivery exception Business closed - No delivery attempt	
8:31 am	NORWICH, CT	At local FedEx facility	
3:54 am	NEWARK, NJ	Departed FedEx location	
Thursday , 3/07/2019			
11:30 pm	NEWARK, NJ	Arrived at FedEx location	

8:05 pm	WILMINGTON, MA	Left FedEx origin facility
6:00 pm	WILMINGTON, MA	Picked up
2:57 pm		Shipment information sent to FedEx

774648835259

Scheduled delivery: Pending

DELIVERY EXCEPTION

NORWICH, CT

GET STATUS UPDATES

FROM

Crown Castle
Jeff Barbadora
12 Gill Street
Suite 5800
WOBURN, MA US 01801
781 970-0053

TO

Town of Plainfield
First Selectman- Cathy Tendrich
8 Community Avenue
PLAINFIELD, CT US 06374
860 230-3001

Shipment Facts

TRACKING NUMBER
774648835259

SERVICE
FedEx Priority Overnight

WEIGHT
1 lbs / 0.45 kgs

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

SHIPPER REFERENCE
1766.6680

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

STANDARD TRANSIT

3/11/2019 by 10:30 am

SHIP DATE

Thu 3/07/2019

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3:54 am	NEWARK, NJ	Departed FedEx location	
Thursday , 3/07/2019			
11:30 pm	NEWARK, NJ	Arrived at FedEx location	

8:05 pm	WILMINGTON, MA	Left FedEx origin facility
6:00 pm	WILMINGTON, MA	Picked up
3:05 pm		Shipment cancelled by sender
2:56 pm		Shipment information sent to FedEx

Date: **December 12, 2018**

BLACK & VEATCH
Building a world of difference.

Amanda D Brown
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Black & Veatch Corp.
6800 W. 115th St., Suite 2292
Overland Park, KS 66211
(913) 458-8145

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	NG71936
	Carrier Site Name:	PLAINFIELD N 2 CT
Crown Castle Designation:	**Crown Castle BU Number:**	876401
	Crown Castle Site Name:	TOWN OF PLAINFIELD/SSUSA
	Crown Castle JDE Job Number:	548522
	Crown Castle Work Order Number:	1668738
	Crown Castle Order Number:	471523 Rev. 0
Engineering Firm Designation:	**Black & Veatch Corp. Project Number:**	400087
Site Data:	**47-51 Unity Street, Plainfield, Windham County, CT** **Latitude *41° 42' 54.49"*, Longitude *-71° 53' 46.73"*** **159.857 Foot - Monopole Tower**	

Dear Amanda D Brown,

Black & Veatch Corp. 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:

LC7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 135 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: Adichon Akkarapunyathorn / Teddy Haile-Mariam

Respectfully submitted by:

Josh Riley, P.E.
Professional Engineer

12/12/2018

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 159.854 ft Monopole tower designed by Engineered Endeavors Inc.

The tower has been modified multiple times in the past to accommodate additional loading.

The tower has been modified per reinforcement drawing prepared by Semaan Endeavors in September of 2005. Reinforcement consists of installation of base plate stiffeners. These modifications are considered ineffective due to no PMI.

The tower was later reinforced per reinforcement drawing prepared by Vertical Solutions in August of 2008. Reinforcement consists of installation of plates from 0' to 127'. This modification has been considered effective in this analysis.

The tower was later reinforced per reinforcement drawing prepared by Paul J. Ford & Company in February of 2013. Reinforcement consists of installation of channels from 0.6' to 76.5' and (3) new anchor rods with brackets. Refer to Modification Inspection Report by Tower Engineering Professionals in September of 2013. This modification has been considered effective in this analysis.

The tower was later reinforced per reinforcement drawing prepared by Black & Veatch Corp. in November of 2014. Reinforcement consists of installation of plates from 0' to 100' and (9) new anchor rods with brackets. Refer to Modification Inspection Report by FDH Velocitel, Inc. in May of 2015. This modification has been considered effective in this analysis.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	135 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.500 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)
125.0	127.0	3	alcatel lucent	B13 RRH 4X30	2	1-5/8
		3	alcatel lucent	B25 RRH4X30		
		3	alcatel lucent	B66A RRH4X45		
		3	amphenol	QUAD656C0000X w/ Mount Pipe		
		6	commscope	SBNHH-1D65B w/ Mount Pipe		
		3	nokia	AIRSCALE RRH 4T4R B5 160W		
		2	rfs celwave	DB-T1-6Z-8AB-0Z		
	125.0	1	cci tower mounts	Platform Mount [LP 303-1]		

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)
159.0	159.0	3	alcatel lucent	TD-RRH8x20-25	4	1-1/4
		1	cci tower mounts	Platform Mount [LP 714-1]		
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe		
157.0	157.0	2	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-
		1	alcatel lucent	PCS 1900MHz 4x45W-65MHz		
		1	cci tower mounts	Pipe Mount [PM 601-3]		
		1	cci tower mounts	Side Arm Mount [SO 102-3]		
	154.0	1	alcatel lucent	800MHz 2X50W RRH W/FILTER		
		2	alcatel lucent	PCS 1900MHz 4x45W-65MHz		
152.0	152.0	1	cci tower mounts	Pipe Mount [PM 601-3]	-	-
		1	cci tower mounts	Side Arm Mount [SO 102-3]		
		3	ericsson	RRUS-11		
150.0	150.0	3	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe	1 2 12 1	3/8 7/16 1-5/8 Conduit
		1	cci tower mounts	Platform Mount [LP 303-1]		
		3	ericsson	RRUS 32 B2		
		3	powerwave technologies	1001983		
		12	powerwave technologies	7020.00		
		6	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		6	powerwave technologies	LGP21901		
		1	raycap	DC6-48-60-18-8F		
139.0	139.0	1	cci tower mounts	T-Arm Mount [TA 602-3]	12	1-5/8
		3	commscope	ATBT-BOTTOM-24V		
		3	commscope	LNX-6512DS-VTM w/ Mount Pipe		
		3	commscope	TMAT7LA-11A		
		3	rfs celwave	APXV18-203219-C-A20 w/ Mount Pipe		
109.0	114.0	1	decibel	DB589	1	7/8
	109.0	1	cci tower mounts	Side Arm Mount [SO 201-1]		
		1	cci tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Associates, Inc / FDH Engineering, Inc.	1610729	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors, Inc.	1615418	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors, Inc.	1615382	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions	2819430	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford & Company	3667143	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Black & Veatch Corp.	5422409	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	3986355	CCISITES
4-POST-MODIFICATION INSPECTION	FDH Velocitel, Inc.	5666814	CCISITES
4-EXPOSURE CATEGORY/TOPOGRAPHIC FACTOR	Crown Castle	6799672	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.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are presented in Appendix C.

3.2) Assumptions

1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) The existing base plate grout was not considered in this analysis.
4) The wind loading Exposure Category / Topographic Category for this site have been analyzed and determined by the tower owner. Black & Veatch does not assume any responsibility for its accuracy.
5) This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, appurtenance loading, tower/foundation details, and geotechnical data. The loading on the structure is based on CAD level drawings and carrier orders provided by the owner. If any of this information is not current and correct, this report should be considered obsolete and further analysis will be required.

This analysis may be affected if any assumptions are not valid or have been made in error. Black & Veatch Corp. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary) (Monopole Tower)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
159.86 - 154.86	Pole	TP17.62x16.5x0.1875	Pole	8.2%	Pass
154.86 - 149.86	Pole	TP18.741x17.62x0.1875	Pole	18.5%	Pass
149.86 - 144.86	Pole	TP19.861x18.741x0.1875	Pole	32.9%	Pass
144.86 - 139.86	Pole	TP20.981x19.861x0.1875	Pole	45.1%	Pass
139.86 - 134.86	Pole	TP22.102x20.981x0.1875	Pole	57.7%	Pass
134.86 - 129.86	Pole	TP23.222x22.102x0.1875	Pole	68.7%	Pass
129.86 - 125.75	Pole	TP24.142x23.222x0.1875	Pole	76.7%	Pass
125.75 - 125.5	Pole	TP24.199x24.142x0.1875	Pole	77.2%	Pass
125.5 - 122.73	Pole	TP25.66x24.199x0.1875	Pole	86.2%	Pass
122.73 - 117.98	Pole + Reinf.	TP25.489x24.445x0.4938	Reinf. 13 Bolt Shear	64.2%	Pass
117.98 - 112.98	Pole + Reinf.	TP26.588x25.489x0.4813	Reinf. 13 Tension Rupture	71.3%	Pass
112.98 - 107.98	Pole + Reinf.	TP27.688x26.588x0.475	Reinf. 13 Tension Rupture	78.5%	Pass
107.98 - 103	Pole + Reinf.	TP28.782x27.688x0.4625	Reinf. 13 Tension Rupture	85.0%	Pass
103 - 102.75	Pole + Reinf.	TP28.837x28.782x0.55	Reinf. 13 Tension Rupture	76.7%	Pass
102.75 - 100.21	Pole + Reinf.	TP29.396x28.837x0.5375	Reinf. 13 Tension Rupture	79.6%	Pass
100.21 - 100.02	Pole + Reinf.	TP30.39x29.396x0.6875	Reinf. 13 Tension Rupture	60.1%	Pass
100.02 - 94.69	Pole + Reinf.	TP30.119x28.937x0.7375	Reinf. 13 Tension Rupture	60.5%	Pass
94.69 - 93.5	Pole + Reinf.	TP30.382x30.119x0.7375	Reinf. 13 Tension Rupture	61.4%	Pass
93.5 - 93.25	Pole + Reinf.	TP30.437x30.382x0.9125	Reinf. 13 Tension Rupture	50.6%	Pass
93.25 - 89.25	Pole + Reinf.	TP31.323x30.437x0.8875	Reinf. 13 Tension Rupture	53.2%	Pass
89.25 - 89	Pole + Reinf.	TP31.379x31.323x0.9375	Reinf. 9 Tension Rupture	49.8%	Pass
89 - 86.5	Pole + Reinf.	TP31.933x31.379x0.925	Reinf. 9 Tension Rupture	51.3%	Pass
86.5 - 86.25	Pole + Reinf.	TP31.988x31.933x0.7625	Reinf. 12 Tension Rupture	58.5%	Pass
86.25 - 81.25	Pole + Reinf.	TP33.096x31.988x0.7375	Reinf. 12 Tension Rupture	61.4%	Pass
81.25 - 76.25	Pole + Reinf.	TP34.203x33.096x0.725	Reinf. 12 Tension Rupture	64.2%	Pass
76.25 - 75.42	Pole + Reinf.	TP34.388x34.203x0.725	Reinf. 12 Tension Rupture	64.7%	Pass
75.42 - 75.17	Pole + Reinf.	TP34.443x34.388x0.8125	Reinf. 12 Tension Rupture	57.6%	Pass
75.17 - 70.17	Pole + Reinf.	TP35.551x34.443x0.8	Reinf. 12 Tension Rupture	60.0%	Pass
70.17 - 65.17	Pole + Reinf.	TP36.659x35.551x0.7875	Reinf. 12 Tension Rupture	62.4%	Pass
65.17 - 60.17	Pole + Reinf.	TP37.766x36.659x0.7625	Reinf. 12 Tension Rupture	64.6%	Pass
60.17 - 59.5	Pole + Reinf.	TP37.914x37.766x0.7625	Reinf. 12 Tension Rupture	64.9%	Pass
59.5 - 59.25	Pole + Reinf.	TP37.97x37.914x0.7625	Reinf. 11 Tension Rupture	65.0%	Pass
59.25 - 54.25	Pole + Reinf.	TP39.077x37.97x0.75	Reinf. 11 Tension Rupture	67.1%	Pass
54.25 - 53	Pole + Reinf.	TP39.354x39.077x0.7375	Reinf. 11 Tension Rupture	67.7%	Pass
53 - 52.75	Pole + Reinf.	TP39.41x39.354x0.7375	Reinf. 11 Tension Rupture	67.8%	Pass
52.75 - 52.64	Pole + Reinf.	TP40.67x39.41x0.7375	Reinf. 11 Tension Rupture	67.8%	Pass

52.64 - 46.06	Pole + Reinf.	TP40.27x38.808x0.7625	Reinf. 11 Tension Rupture	68.2%	Pass
46.06 - 41.06	Pole + Reinf.	TP41.381x40.27x0.75	Reinf. 11 Tension Rupture	69.9%	Pass
41.06 - 39.33	Pole + Reinf.	TP41.765x41.381x0.75	Reinf. 11 Tension Rupture	70.4%	Pass
39.33 - 39.08	Pole + Reinf.	TP41.821x41.765x0.825	Reinf. 11 Tension Rupture	64.3%	Pass
39.08 - 37.75	Pole + Reinf.	TP42.116x41.821x0.825	Reinf. 11 Tension Rupture	64.7%	Pass
37.75 - 37.5	Pole + Reinf.	TP42.171x42.116x0.75	Reinf. 11 Tension Rupture	71.0%	Pass
37.5 - 32.5	Pole + Reinf.	TP43.282x42.171x0.7375	Reinf. 11 Tension Rupture	72.6%	Pass
32.5 - 29.75	Pole + Reinf.	TP43.893x43.282x0.725	Reinf. 11 Tension Rupture	73.4%	Pass
29.75 - 29.5	Pole + Reinf.	TP43.948x43.893x0.725	Reinf. 10 Tension Rupture	73.5%	Pass
29.5 - 24.5	Pole + Reinf.	TP45.059x43.948x0.7125	Reinf. 10 Tension Rupture	74.9%	Pass
24.5 - 21.25	Pole + Reinf.	TP45.781x45.059x0.7125	Reinf. 10 Tension Rupture	75.8%	Pass
21.25 - 21	Pole + Reinf.	TP45.836x45.781x0.725	Reinf. 7 Tension Rupture	72.4%	Pass
21 - 20	Pole + Reinf.	TP46.058x45.836x0.725	Reinf. 7 Tension Rupture	72.7%	Pass
20 - 19.75	Pole + Reinf.	TP46.114x46.058x0.825	Reinf. 10 Tension Rupture	67.7%	Pass
19.75 - 17	Pole + Reinf.	TP46.724x46.114x0.8125	Reinf. 10 Tension Rupture	68.4%	Pass
17 - 16.75	Pole + Reinf.	TP46.78x46.724x0.775	Reinf. 10 Tension Rupture	74.8%	Pass
16.75 - 11.75	Pole + Reinf.	TP47.89x46.78x0.7625	Reinf. 10 Tension Rupture	76.0%	Pass
11.75 - 6.75	Pole + Reinf.	TP49.001x47.89x0.75	Reinf. 10 Tension Rupture	77.3%	Pass
6.75 - 1.75	Pole + Reinf.	TP50.111x49.001x0.7375	Reinf. 10 Tension Rupture	78.4%	Pass
1.75 - 0	Pole + Reinf.	TP50.5x50.111x0.7375	Reinf. 10 Tension Rupture	78.8%	Pass
				Summary	
			Pole	86.2%	Pass
			Reinforcement	85.0%	Pass
			Overall	86.2%	Pass

Table 5 - Tower Component Stresses vs. Capacity (Monopole Tower) – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods (Group 1)	0	50.3	Pass
	Anchor Rods (Group 2)		36.0	Pass
	Anchor Rods (Group 3)		57.5	Pass
	Base Plate		66.5	Pass
1	Base Foundation	0	53.3	Pass
	Base Foundation Soil Interaction		30.6	Pass

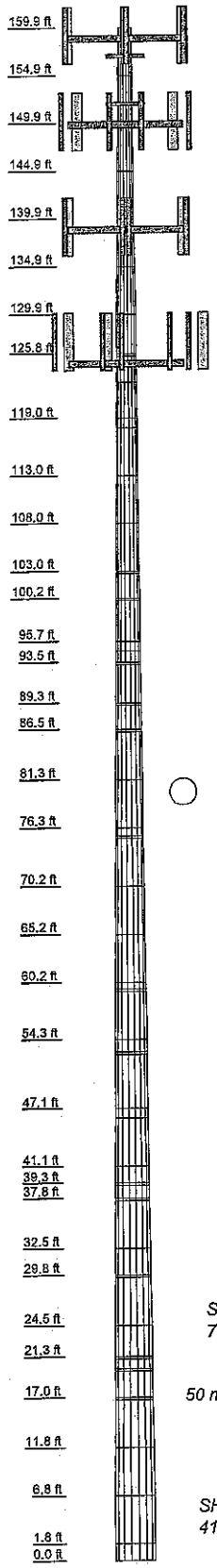
Structure Rating (max from all components) =	86.2%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed. Rating Per TIA-222-H Section 15.5.

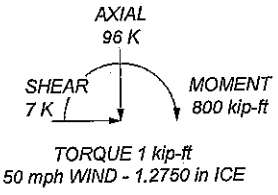
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

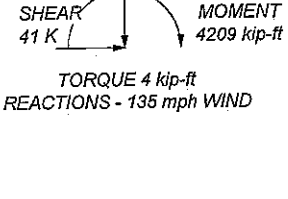
Section		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
Length (ft)		5.00	5.00	5.00	5.00	5.00	5.00	5.11	0.11	4.52	0.48	5.00	5.00	4.98	0.02	2.50	0.02	4.98	0.02	4.98	0.02	4.98	0.02	4.98	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	0.25	5.00	0.25	5.00	0.25	5.00	0.25	5.00	0.25	5.00	0.25	5.00	0.25	5.00	0.25	5.00	0.25	5.00	0.25	5.00	0.25	5.00	1.75
Number of Sides		18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)		0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.4750	0.4750	0.4750	0.4750	0.4750	0.4750	0.4750	0.4750	0.4750	0.4750	0.4750	0.4750	0.4750	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7500	0.7375
Socket Length (ft)																																																																	
Top Dia (in)		16.5000	17.6204	18.7407	19.8611	20.9814	22.1018	22.2222	23.3426	23.4629	24.5833	25.7037	26.8240	27.9444	29.0648	29.1851	30.3055	31.4259	32.5462	33.6666	34.7870	35.9073	37.0277	38.1481	39.2684	40.3888	41.5092	42.6295	43.7499	44.8703	45.9906	47.1110	48.2314	49.3517	50.4721	51.5925	52.7128	53.8332	54.9536	56.0739	57.1943	58.3147	59.4350	60.5554	61.6758	62.7961	63.9165	65.0369	66.1572	67.2776	68.3980	69.5183	70.6387	71.7591	72.8794	73.9998	75.1202
Bot Dia (in)		17.6204	18.7407	19.8611	20.9814	22.1018	23.2221	23.3426	24.4629	24.5833	25.7037	26.8240	27.9444	29.0648	30.1851	30.3055	31.4259	32.5462	33.6666	34.7870	35.9073	37.0277	38.1481	39.2684	40.3888	41.5092	42.6295	43.7499	44.8703	45.9906	47.1110	48.2314	49.3517	50.4721	51.5925	52.7128	53.8332	54.9536	56.0739	57.1943	58.3147	59.4350	60.5554	61.6758	62.7961	63.9165	65.0369	66.1572	67.2776	68.3980	69.5183	70.6387	71.7591	72.8794	73.9998	75.1202	76.2405
Grade		A572-65																																																														
Weight (K)		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.3	0.0	0.6	0.6	0.6	0.0	0.4	0.0	0.9	0.0	1.1	0.0	1.1	0.0	1.2	1.2	1.2	0.0	1.2	1.4	1.4	0.0	1.4	0.0	1.4	0.0	1.7	0.0	1.6	0.0	1.6	0.0	1.6	0.0	1.6	0.0	0.9	0.0	1.7	0.0	1.1	0.0	2.0	0.0	2.0	38.4



ALL REACTIONS ARE FACTORED



TORQUE 1 kip-ft
50 mph WIND - 1.2750 in ICE



TORQUE 4 kip-ft
REACTIONS - 135 mph WIND

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 135 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.27 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S

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Job: *TOWN OF PLAINFIELD/SSUSA (BU# 876401)*		
Project: *400087 (876401.1668738)*		
Client: Crown Castle	Drawn by: TH	App'd:
Code: TIA-222-H	Date: 12/12/18	Scale: NTS
Path: C:\Users\thal923111\Desktop\Completed Projects\876401\876401.1668738 - TSA\Structural\mod.eri		Dwg No. E-1

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in Windham County, Connecticut.
2) Tower base elevation above sea level: 219.00 ft.
3) Basic wind speed of 135 mph.
4) Risk Category II.
5) Exposure Category B.
6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
7) Topographic Category: 1.
8) Crest Height 0.00 ft.
9) Nominal ice thickness of 1.2750 in.
10) Ice thickness is considered to increase with height.
11) Ice density of 56 pcf.
12) A wind speed of 50 mph is used in combination with ice.
13) Deflections calculated using a wind speed of 60 mph.
14) TIA-222-H Annex S.
15) A non-linear (P-delta) analysis was used.
16) Pressures are calculated at each section.
17) Stress ratio used in pole design is 1.05.
18) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	159.86-154.86	5.00	0.00	18	16.5000	17.6204	0.1875	0.7500	A572-65 (65 ksi)
L2	154.86-149.86	5.00	0.00	18	17.6204	18.7407	0.1875	0.7500	A572-65 (65 ksi)
L3	149.86-144.86	5.00	0.00	18	18.7407	19.8611	0.1875	0.7500	A572-65 (65 ksi)
L4	144.86-139.86	5.00	0.00	18	19.8611	20.9814	0.1875	0.7500	A572-65 (65 ksi)
L5	139.86-134.86	5.00	0.00	18	20.9814	22.1018	0.1875	0.7500	A572-65 (65 ksi)
L6	134.86-129.86	5.00	0.00	18	22.1018	23.2221	0.1875	0.7500	A572-65 (65 ksi)
L7	129.86-125.75	4.11	0.00	18	23.2221	24.1425	0.1875	0.7500	A572-65 (65 ksi)
L8	125.75-125.50	0.25	0.00	18	24.1425	24.1985	0.1875	0.7500	A572-65 (65 ksi)
L9	125.50-118.98	6.52	3.75	18	24.1985	25.6600	0.1875	0.7500	A572-65 (65 ksi)
L10	118.98-117.98	4.75	0.00	18	24.4447	25.4891	0.4938	1.9750	A572-65 (65 ksi)
L11	117.98-112.98	5.00	0.00	18	25.4891	26.5885	0.4813	1.9250	A572-65 (65 ksi)
L12	112.98-107.98	5.00	0.00	18	26.5885	27.6878	0.4750	1.9000	A572-65 (65 ksi)
L13	107.98-103.00	4.98	0.00	18	27.6878	28.7822	0.4625	1.8500	A572-65 (65 ksi)
L14	103.00-102.75	0.25	0.00	18	28.7822	28.8372	0.5500	2.2000	A572-65 (65 ksi)
L15	102.75-100.21	2.54	0.00	18	28.8372	29.3961	0.5375	2.1500	A572-65 (65 ksi)
L16	100.21-95.69	4.52	4.33	18	29.3961	30.3900	0.6875	2.7500	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
									(65 ksi)
L17	95.69-94.69	5.33	0.00	18	28.9372	30.1188	0.7375	2.9500	A572-65 (65 ksi)
L18	94.69-93.50	1.19	0.00	18	30.1188	30.3819	0.7375	2.9500	A572-65 (65 ksi)
L19	93.50-93.25	0.25	0.00	18	30.3819	30.4372	0.9125	3.6500	A572-65 (65 ksi)
L20	93.25-89.25	4.00	0.00	18	30.4372	31.3234	0.8875	3.5500	A572-65 (65 ksi)
L21	89.25-89.00	0.25	0.00	18	31.3234	31.3788	0.9375	3.7500	A572-65 (65 ksi)
L22	89.00-86.50	2.50	0.00	18	31.3788	31.9326	0.9250	3.7000	A572-65 (65 ksi)
L23	86.50-86.25	0.25	0.00	18	31.9326	31.9880	0.7625	3.0500	A572-65 (65 ksi)
L24	86.25-81.25	5.00	0.00	18	31.9880	33.0957	0.7375	2.9500	A572-65 (65 ksi)
L25	81.25-76.25	5.00	0.00	18	33.0957	34.2034	0.7250	2.9000	A572-65 (65 ksi)
L26	76.25-75.42	0.83	0.00	18	34.2034	34.3880	0.7250	2.9000	A572-65 (65 ksi)
L27	75.42-75.17	0.25	0.00	18	34.3880	34.4434	0.8125	3.2500	A572-65 (65 ksi)
L28	75.17-70.17	5.00	0.00	18	34.4434	35.5511	0.8000	3.2000	A572-65 (65 ksi)
L29	70.17-65.17	5.00	0.00	18	35.5511	36.6588	0.7875	3.1500	A572-65 (65 ksi)
L30	65.17-60.17	5.00	0.00	18	36.6588	37.7665	0.7625	3.0500	A572-65 (65 ksi)
L31	60.17-59.50	0.67	0.00	18	37.7665	37.9142	0.7625	3.0500	A572-65 (65 ksi)
L32	59.50-59.25	0.25	0.00	18	37.9142	37.9696	0.7625	3.0500	A572-65 (65 ksi)
L33	59.25-54.25	5.00	0.00	18	37.9696	39.0773	0.7500	3.0000	A572-65 (65 ksi)
L34	54.25-53.00	1.25	0.00	18	39.0773	39.3542	0.7375	2.9500	A572-65 (65 ksi)
L35	53.00-52.75	0.25	0.00	18	39.3542	39.4096	0.7375	2.9500	A572-65 (65 ksi)
L36	52.75-47.06	5.69	5.58	18	39.4096	40.6700	0.7375	2.9500	A572-65 (65 ksi)
L37	47.06-46.06	6.58	0.00	18	38.8081	40.2702	0.7625	3.0500	A572-65 (65 ksi)
L38	46.06-41.06	5.00	0.00	18	40.2702	41.3807	0.7500	3.0000	A572-65 (65 ksi)
L39	41.06-39.33	1.73	0.00	18	41.3807	41.7651	0.7500	3.0000	A572-65 (65 ksi)
L40	39.33-39.08	0.25	0.00	18	41.7651	41.8206	0.8250	3.3000	A572-65 (65 ksi)
L41	39.08-37.75	1.33	0.00	18	41.8206	42.1160	0.8250	3.3000	A572-65 (65 ksi)
L42	37.75-37.50	0.25	0.00	18	42.1160	42.1715	0.7500	3.0000	A572-65 (65 ksi)
L43	37.50-32.50	5.00	0.00	18	42.1715	43.2820	0.7375	2.9500	A572-65 (65 ksi)
L44	32.50-29.75	2.75	0.00	18	43.2820	43.8927	0.7250	2.9000	A572-65 (65 ksi)
L45	29.75-29.50	0.25	0.00	18	43.8927	43.9482	0.7250	2.9000	A572-65 (65 ksi)
L46	29.50-24.50	5.00	0.00	18	43.9482	45.0587	0.7125	2.8500	A572-65 (65 ksi)
L47	24.50-21.25	3.25	0.00	18	45.0587	45.7805	0.7125	2.8500	A572-65 (65 ksi)
L48	21.25-21.00	0.25	0.00	18	45.7805	45.8360	0.7250	2.9000	A572-65 (65 ksi)
L49	21.00-20.00	1.00	0.00	18	45.8360	46.0581	0.7250	2.9000	A572-65 (65 ksi)
L50	20.00-19.75	0.25	0.00	18	46.0581	46.1137	0.8250	3.3000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L51	19.75-17.00	2.75	0.00	18	46.1137	46.7244	0.8125	3.2500	A572-65 (65 ksi)
L52	17.00-16.75	0.25	0.00	18	46.7244	46.7799	0.7750	3.1000	A572-65 (65 ksi)
L53	16.75-11.75	5.00	0.00	18	46.7799	47.8904	0.7625	3.0500	A572-65 (65 ksi)
L54	11.75-6.75	5.00	0.00	18	47.8904	49.0009	0.7500	3.0000	A572-65 (65 ksi)
L55	6.75-1.75	5.00	0.00	18	49.0009	50.1113	0.7375	2.9500	A572-65 (65 ksi)
L56	1.75-0.00	1.75		18	50.1113	50.5000	0.7375	2.9500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.7256	9.7080	326.3677	5.7909	8.3820	38.9367	653.1649	4.8549	2.5740	13.728
	17.8632	10.3747	398.3373	6.1887	8.9511	44.5013	797.1988	5.1883	2.7712	14.78
L2	17.8632	10.3747	398.3373	6.1887	8.9511	44.5013	797.1988	5.1883	2.7712	14.78
	19.0009	11.0415	480.1782	6.5864	9.5203	50.4374	960.9882	5.5218	2.9684	15.831
L3	19.0009	11.0415	480.1782	6.5864	9.5203	50.4374	960.9882	5.5218	2.9684	15.831
	20.1385	11.7082	572.5248	6.9841	10.0894	56.7451	1145.8029	5.8552	3.1655	16.883
L4	20.1385	11.7082	572.5248	6.9841	10.0894	56.7451	1145.8029	5.8552	3.1655	16.883
	21.2762	12.3750	676.0115	7.3818	10.6586	63.4243	1352.9124	6.1887	3.3627	17.935
L5	21.2762	12.3750	676.0115	7.3818	10.6586	63.4243	1352.9124	6.1887	3.3627	17.935
	22.4138	13.0417	791.2726	7.7796	11.2277	70.4751	1583.5865	6.5221	3.5599	18.986
L6	22.4138	13.0417	791.2726	7.7796	11.2277	70.4751	1583.5865	6.5221	3.5599	18.986
	23.5514	13.7085	918.9427	8.1773	11.7968	77.8974	1839.0946	6.8555	3.7571	20.038
L7	23.5514	13.7085	918.9427	8.1773	11.7968	77.8974	1839.0946	6.8555	3.7571	20.038
	24.4860	14.2562	1033.5542	8.5040	12.2644	84.2728	2068.4683	7.1295	3.9191	20.902
L8	24.4860	14.2562	1033.5542	8.5040	12.2644	84.2728	2068.4683	7.1295	3.9191	20.902
	24.5429	14.2895	1040.8219	8.5239	12.2928	84.6690	2083.0133	7.1461	3.9289	20.954
L9	24.5429	14.2895	1040.8219	8.5239	12.2928	84.6690	2083.0133	7.1461	3.9289	20.954
	26.0269	15.1593	1242.6830	9.0427	13.0353	95.3323	2487.0012	7.5811	4.1862	22.326
L10	25.5829	37.5351	2720.3304	8.5026	12.4179	219.0648	5444.2404	18.7711	3.4333	6.953
	25.8062	39.1718	3091.9319	8.8734	12.9485	238.7874	6187.9322	19.5896	3.6171	7.326
L11	25.8081	38.1992	3018.1787	8.8778	12.9485	233.0915	6040.3288	19.1032	3.6391	7.562
	26.9244	39.8784	3433.9704	9.2681	13.5069	254.2375	6872.4593	19.9430	3.8326	7.964
L12	26.9254	39.3700	3391.8082	9.2703	13.5069	251.1160	6788.0794	19.6887	3.8436	8.092
	28.0417	41.0274	3838.4688	9.6605	14.0654	272.9014	7681.9883	20.5176	4.0371	8.499
L13	28.0436	39.9661	3742.6091	9.6650	14.0654	266.0861	7490.1428	19.9868	4.0591	8.776
	29.1549	41.5726	4212.3295	10.0535	14.6214	288.0942	8430.2018	20.7903	4.2517	9.193
L14	29.1414	49.2850	4962.9684	10.0224	14.6214	339.4327	9932.4673	24.6472	4.0977	7.45
	29.1972	49.3809	4992.0132	10.0419	14.6493	340.7684	9990.5950	24.6952	4.1073	7.468
L15	29.1991	48.2800	4885.0287	10.0464	14.6493	333.4654	9776.4852	24.1446	4.1293	7.682
	29.7666	49.2335	5180.2148	10.2448	14.9332	346.8923	10367.245 8	24.6214	4.2277	7.866
L16	29.7435	62.6457	6523.0733	10.1915	14.9332	436.8166	13054.729 9	31.3288	3.9637	5.765
	30.7528	64.8146	7224.3053	10.5444	15.4381	467.9524	14458.116 5	32.4134	4.1386	6.02
L17	30.2447	66.0106	6631.9525	10.0109	14.7001	451.1497	13272.631 4	33.0116	3.7950	5.146
	30.4696	68.7764	7500.9897	10.4304	15.3003	490.2498	15011.849 4	34.3948	4.0029	5.428
L18	30.4696	68.7764	7500.9897	10.4304	15.3003	490.2498	15011.849 4	34.3948	4.0029	5.428
	30.7368	69.3923	7704.2900	10.5237	15.4340	499.1770	15418.717 5	34.7027	4.0492	5.49
L19	30.7098	85.3514	9364.6025	10.4616	15.4340	606.7521	18741.527 1	42.6838	3.7412	4.1
	30.7660	85.5118	9417.5016	10.4813	15.4621	609.0692	18847.395 0	42.7640	3.7510	4.111
L20	30.7699	83.2394	9182.7749	10.4902	15.4621	593.8885	18377.632	41.6276	3.7950	4.276

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	31.6697	85.7357	10033.9379	10.8047	15.9123	630.5779	20081.0788	42.8760	3.9509	4.452
L21	31.6620	90.4171	10547.0789	10.7870	15.9123	662.8260	21108.0358	45.2171	3.8629	4.12
	31.7182	90.5819	10604.8572	10.8067	15.9404	665.2807	21223.6685	45.2995	3.8727	4.131
L22	31.7202	89.4108	10476.3541	10.8111	15.9404	657.2192	20966.4933	44.7139	3.8947	4.21
	32.2826	91.0369	11058.3996	11.0077	16.2218	681.7007	22131.3501	45.5271	3.9921	4.316
L23	32.3076	75.4372	9259.7767	11.0654	16.2218	570.8237	18531.7376	37.7258	4.2781	5.611
	32.3639	75.5712	9309.2245	11.0851	16.2499	572.8783	18630.6983	37.7928	4.2879	5.623
L24	32.3677	73.1520	9025.6479	11.0939	16.2499	555.4273	18063.1719	36.5830	4.3319	5.874
	33.4925	75.7449	10019.8342	11.4872	16.8126	595.9707	20052.8527	37.8797	4.5268	6.138
L25	33.4944	74.4899	9861.4261	11.4916	16.8126	586.5487	19735.8281	37.2520	4.5488	6.274
	34.6192	77.0389	10908.8138	11.8848	17.3753	627.8331	21831.9816	38.5268	4.7438	6.543
L26	34.6192	77.0389	10908.8138	11.8848	17.3753	627.8331	21831.9816	38.5268	4.7438	6.543
	34.8066	77.4635	11090.2078	11.9504	17.4691	634.8475	22195.0084	38.7391	4.7763	6.588
L27	34.7931	86.5869	12332.0154	11.9193	17.4691	705.9335	24680.2576	43.3017	4.6223	5.689
	34.8494	86.7298	12393.1436	11.9390	17.4972	708.2920	24802.5945	43.3731	4.6320	5.701
L28	34.8513	85.4272	12216.0913	11.9434	17.4972	698.1731	24448.2568	42.7217	4.6540	5.818
	35.9761	88.2399	13462.8927	12.3366	18.0599	745.4563	26943.5003	44.1283	4.8490	6.061
L29	35.9780	86.8924	13266.8410	12.3411	18.0599	734.6006	26551.1389	43.4544	4.8710	6.185
	37.1028	89.6611	14575.8778	12.7343	18.6226	782.6963	29170.9350	44.8391	5.0659	6.433
L30	37.1066	86.8752	14142.6801	12.7432	18.6226	759.4344	28303.9694	43.4459	5.1099	6.702
	38.2314	89.5561	15492.7584	13.1364	19.1854	807.5302	31005.9026	44.7865	5.3049	6.957
L31	38.2314	89.5561	15492.7584	13.1364	19.1854	807.5302	31005.9026	44.7865	5.3049	6.957
	38.3815	89.9137	15679.1015	13.1889	19.2604	814.0579	31378.8339	44.9654	5.3309	6.991
L32	38.3815	89.9137	15679.1015	13.1889	19.2604	814.0579	31378.8339	44.9654	5.3309	6.991
	38.4377	90.0477	15749.3283	13.2085	19.2886	816.5113	31519.3800	45.0324	5.3407	7.004
L33	38.4397	88.6013	15506.7610	13.2130	19.2886	803.9356	31033.9261	44.3091	5.3627	7.15
	39.5644	91.2382	16932.8742	13.6062	19.8513	852.9868	33888.0291	45.6278	5.5576	7.41
L34	39.5664	89.7468	16666.9562	13.6106	19.8513	839.5913	33355.8432	44.8819	5.5796	7.566
	39.8476	90.3950	17030.7231	13.7089	19.9920	851.8790	34083.8556	45.2061	5.6283	7.632
L35	39.8476	90.3950	17030.7231	13.7089	19.9920	851.8790	34083.8556	45.2061	5.6283	7.632
	39.9038	90.5247	17104.1058	13.7286	20.0201	854.3472	34230.7177	45.2709	5.6381	7.645
L36	39.9038	90.5247	17104.1058	13.7286	20.0201	854.3472	34230.7177	45.2709	5.6381	7.645
	41.1836	93.4750	18831.5427	14.1760	20.6604	911.4818	37687.8643	46.7464	5.8599	7.946
L37	40.5483	92.0769	16838.2294	13.5062	19.7145	854.1039	33698.6150	46.0472	5.4882	7.198
	40.7738	95.6155	18855.103	14.0252	20.4573	921.6831	37735.017	47.8168	5.7456	7.535

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L38	40.7757	94.0778	18563.6127	14.0297	20.4573	907.4343	37151.6514	47.0478	5.7676	7.69
	41.9033	96.7213	20172.8380	14.4239	21.0214	959.6347	40372.2199	48.3698	5.9630	7.951
L39	41.9033	96.7213	20172.8380	14.4239	21.0214	959.6347	40372.2199	48.3698	5.9630	7.951
	42.2937	97.6363	20750.8383	14.5603	21.2166	978.0450	41528.9811	48.8275	6.0307	8.041
L40	42.2821	107.2036	22700.9327	14.5337	21.2166	1069.9584	45431.7359	53.6120	5.8987	7.15
	42.3385	107.3490	22793.4199	14.5534	21.2449	1072.8913	45616.8320	53.6847	5.9084	7.162
L41	42.3385	107.3490	22793.4199	14.5534	21.2449	1072.8913	45616.8320	53.6847	5.9084	7.162
	42.6384	108.1225	23289.6771	14.6583	21.3949	1088.5615	46609.9994	54.0715	5.9604	7.225
L42	42.6500	98.4717	21288.0148	14.6849	21.3949	995.0037	42604.0410	49.2452	6.0924	8.123
	42.7064	98.6039	21373.8514	14.7046	21.4231	997.7004	42775.8270	49.3113	6.1022	8.136
L43	42.7083	96.9897	21036.6541	14.7091	21.4231	981.9605	42100.9887	48.5041	6.1242	8.304
	43.8359	99.5891	22773.7936	15.1033	21.9872	1035.7734	45577.5536	49.8040	6.3196	8.569
L44	43.8378	97.9299	22407.5362	15.1077	21.9872	1019.1157	44844.5569	48.9743	6.3416	8.747
	44.4580	99.3354	23386.1953	15.3245	22.2975	1048.8259	46803.1627	49.6771	6.4491	8.895
L45	44.4580	99.3354	23386.1953	15.3245	22.2975	1048.8259	46803.1627	49.6771	6.4491	8.895
	44.5144	99.4632	23476.5511	15.3442	22.3257	1051.5480	46983.9933	49.7410	6.4589	8.909
L46	44.5163	97.7765	23091.8056	15.3487	22.3257	1034.3147	46213.9960	48.8976	6.4809	9.096
	45.6439	100.2878	24917.1676	15.7429	22.8898	1088.5697	49867.1219	50.1534	6.6763	9.37
L47	45.6439	100.2878	24917.1676	15.7429	22.8898	1088.5697	49867.1219	50.1534	6.6763	9.37
	46.3768	101.9202	26153.7769	15.9991	23.2565	1124.5793	52341.9676	50.9698	6.8034	9.549
L48	46.3749	103.6795	26590.4775	15.9947	23.2565	1143.3568	53215.9435	51.8496	6.7814	9.354
	46.4313	103.8073	26688.9037	16.0144	23.2847	1146.1989	53412.9254	51.9135	6.7911	9.367
L49	46.4313	103.8073	26688.9037	16.0144	23.2847	1146.1989	53412.9254	51.9135	6.7911	9.367
	46.6568	104.3183	27085.0373	16.0933	23.3975	1157.6025	54205.7137	52.1691	6.8302	9.421
L50	46.6414	118.4452	30617.3913	16.0578	23.3975	1308.5737	61275.0697	59.2339	6.6542	8.066
	46.6978	118.5906	30730.2777	16.0775	23.4257	1311.8170	61500.9912	59.3066	6.6640	8.078
L51	46.6997	116.8260	30289.7342	16.0819	23.4257	1293.0111	60619.3244	58.4241	6.6860	8.229
	47.3199	118.4011	31531.4388	16.2987	23.7360	1328.4226	63104.3675	59.2118	6.7935	8.361
L52	47.3257	113.0287	30149.8988	16.3120	23.7360	1270.2182	60339.4695	56.5251	6.8595	8.851
	47.3820	113.1652	30259.3266	16.3318	23.7642	1273.3153	60558.4692	56.5934	6.8693	8.864
L53	47.3840	111.3702	29795.5470	16.3362	23.7642	1253.7994	59630.2998	55.6957	6.8913	9.038
	48.5116	114.0578	32005.0485	16.7304	24.3283	1315.5468	64052.2101	57.0397	7.0867	9.294
L54	48.5135	112.2177	31505.4314	16.7348	24.3283	1295.0104	63052.3185	56.1195	7.1087	9.478
	49.6411	114.8612	33784.7751	17.1291	24.8924	1357.2303	67614.0051	57.4415	7.3042	9.739
L55	49.6430	112.9761	33247.521	17.1335	24.8924	1335.6473	66538.791	56.4988	7.3262	9.934

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	50.7706	115.5755	35595.6577 0	17.5277	25.4566	1398.2902	71238.1514 6	57.7987	7.5216	10.199
L56	50.7706	115.5755	35595.6577 0	17.5277	25.4566	1398.2902	71238.1514 6	57.7987	7.5216	10.199
	51.1653	116.4853	36442.9033	17.6657	25.6540	1420.5544	72933.7592	58.2537	7.5900	10.292

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 159.86-154.86				1	1	1			
L2 154.86-149.86				1	1	1			
L3 149.86-144.86				1	1	1			
L4 144.86-139.86				1	1	1			
L5 139.86-134.86				1	1	1			
L6 134.86-129.86				1	1	1			
L7 129.86-125.75				1	1	1			
L8 125.75-125.50				1	1	1			
L9 125.50-118.98				1	1	1			
L10 118.98-117.98				1	1	0.93011			
L11 117.98-112.98				1	1	0.935503			
L12 112.98-107.98				1	1	0.930567			
L13 107.98-103.00				1	1	0.939252			
L14 103.00-102.75				1	1	1.03463			
L15 102.75-100.21				1	1	1.04674			
L16 100.21-95.69				1	1	0.917623			
L17 95.69-94.69				1	1	0.930138			
L18 94.69-93.50				1	1	0.925644			
L19 93.50-93.25				1	1	0.909675			
L20 93.25-89.25				1	1	0.917552			
L21 89.25-89.00				1	1	0.910469			
L22 89.00-86.50				1	1	0.911953			
L23 86.50-86.25				1	1	0.920665			
L24 86.25-81.25				1	1	0.933059			
L25 81.25-76.25				1	1	0.931649			
L26 76.25-75.42				1	1	0.928904			
L27 75.42-75.17				1	1	0.931301			
L28 75.17-70.17				1	1	0.927814			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
L29 70.17-65.17				1	1	0.925361			
L30 65.17-60.17				1	1	0.938715			
L31 60.17-59.50				1	1	0.936611			
L32 59.50-59.25				1	1	0.935827			
L33 59.25-54.25				1	1	0.935659			
L34 54.25-53.00				1	1	0.947425			
L35 53.00-52.75				1	1	0.946675			
L36 52.75-47.06				1	1	0.946358			
L37 47.06-46.06				1	1	0.987321			
L38 46.06-41.06				1	1	0.989699			
L39 41.06-39.33				1	1	0.985109			
L40 39.33-39.08				1	1	0.978201			
L41 39.08-37.75				1	1	0.974455			
L42 37.75-37.50				1	1	0.980349			
L43 37.50-32.50				1	1	0.983922			
L44 32.50-29.75				1	1	0.993754			
L45 29.75-29.50				1	1	0.993141			
L46 29.50-24.50				1	1	0.998154			
L47 24.50-21.25				1	1	0.990597			
L48 21.25-21.00				1	1	1.07558			
L49 21.00-20.00				1	1	1.07285			
L50 20.00-19.75				1	1	1.02229			
L51 19.75-17.00				1	1	1.03007			
L52 17.00-16.75				1	1	1.02529			
L53 16.75-11.75				1	1	1.02885			
L54 11.75-6.75				1	1	1.03316			
L55 6.75-1.75				1	1	1.03821			
L56 1.75-0.00				1	1	1.03408			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	B	No	Surface Af (CaAa)	159.85 - 9.00	1	1	-0.010 0.010	0.0000	0.7500	0.22

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Reinforcement										
Aero Channel MP303	A	No	Surface Af (CaAa)	76.58 - 36.58	1	1	0.000 0.000	4.0625	11.2600	0.00
Aero Channel MP303	B	No	Surface Af (CaAa)	76.58 - 36.58	1	1	0.000 0.000	4.0625	11.2600	0.00
Aero Channel MP303	C	No	Surface Af (CaAa)	76.58 - 36.58	1	1	0.000 0.000	4.0625	11.2600	0.00
Aero Channel MP303	A	No	Surface Af (CaAa)	40.50 - 0.50	1	1	0.000 0.000	4.0625	11.2600	0.00
Aero Channel MP303	B	No	Surface Af (CaAa)	40.50 - 0.50	1	1	0.000 0.000	4.0625	11.2600	0.00
Aero Channel MP303	C	No	Surface Af (CaAa)	40.50 - 0.50	1	1	0.000 0.000	4.0625	11.2600	0.00
PL1.25x5.375	A	No	Surface Af (CaAa)	89.25 - 0.00	1	1	0.000 0.000	5.3750	13.2500	0.00
PL1.25x5.375	B	No	Surface Af (CaAa)	89.25 - 0.00	1	1	0.000 0.000	5.3750	13.2500	0.00
PL1.25x5.375	C	No	Surface Af (CaAa)	89.25 - 0.00	1	1	0.000 0.000	5.3750	13.2500	0.00
PL1.25x4.375	A	No	Surface Af (CaAa)	119.00 - 89.25	1	1	0.000 0.000	4.3750	11.2500	0.00
PL1.25x4.375	B	No	Surface Af (CaAa)	119.00 - 89.25	1	1	0.000 0.000	4.3750	11.2500	0.00
PL1.25x4.375	C	No	Surface Af (CaAa)	119.00 - 89.25	1	1	0.000 0.000	4.3750	11.2500	0.00
PL1.25x3.125	A	No	Surface Af (CaAa)	127.00 - 119.00	1	1	0.000 0.000	3.1250	8.7500	0.00
PL1.25x3.125	B	No	Surface Af (CaAa)	127.00 - 119.00	1	1	0.000 0.000	3.1250	8.7500	0.00
PL1.25x3.125	C	No	Surface Af (CaAa)	127.00 - 119.00	1	1	0.000 0.000	3.1250	8.7500	0.00
CCI-SFP-085125	A	No	Surface Af (CaAa)	25.00 - 0.00	1	1	0.000 0.000	8.5000	19.5000	0.00
CCI-SFP-085125	B	No	Surface Af (CaAa)	20.00 - 0.00	1	1	0.000 0.000	8.5000	19.5000	0.00
CCI-SFP-085125	C	No	Surface Af (CaAa)	20.00 - 0.00	1	1	0.000 0.000	8.5000	19.5000	0.00
CCI-SFP-060100	A	No	Surface Af (CaAa)	105.00 - 15.00	1	1	0.000 0.000	6.0000	14.0000	0.00
CCI-SFP-060100	C	No	Surface Af (CaAa)	105.00 - 20.00	1	1	0.000 0.000	6.0000	14.0000	0.00
CCI-SFP-060100	B	No	Surface Af (CaAa)	55.00 - 20.00	1	1	0.000 0.000	6.0000	14.0000	0.00
CCI-SFP-060100	B	No	Surface Af (CaAa)	102.20 - 47.20	1	1	0.000 0.000	6.0000	14.0000	0.00
CCI-SFP-045100	A	No	Surface Af (CaAa)	95.00 - 85.00	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-045100	B	No	Surface Af (CaAa)	95.00 - 85.00	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-045100	C	No	Surface Af (CaAa)	95.00 - 85.00	1	1	0.000 0.000	4.5000	11.0000	0.00

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 ft²/ft	Weight plf
***									
HB114-21U3M12-XXXF(1-1/4)	C	No	No	Inside Pole	159.00 - 0.00	1	No Ice	0.00	1.22
							1/2" Ice	0.00	1.22
							1" Ice	0.00	1.22
							2" Ice	0.00	1.22
HB114-1-08U4-M5J(1-1/4)	C	No	No	Inside Pole	159.00 - 0.00	3	No Ice	0.00	1.08
							1/2" Ice	0.00	1.08

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
							1" Ice	0.00	1.08
							2" Ice	0.00	1.08
***									
LDF7-50A(1-5/8)	C	No	No	Inside Pole	150.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	150.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG122ST-BRDA(7/16)	C	No	No	Inside Pole	150.00 - 0.00	2	No Ice	0.00	0.14
							1/2" Ice	0.00	0.14
							1" Ice	0.00	0.14
							2" Ice	0.00	0.14
2" innerduct conduit	C	No	No	Inside Pole	150.00 - 0.00	1	No Ice	0.00	0.20
							1/2" Ice	0.00	0.20
							1" Ice	0.00	0.20
							2" Ice	0.00	0.20
***									
LDF7-50A(1-5/8)	C	No	No	Inside Pole	139.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
***									
HB158-1-08U8-S8J18(1-5/8)	C	No	No	Inside Pole	125.00 - 0.00	2	No Ice	0.00	1.30
							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
							2" Ice	0.00	1.30
***									
CR 50 1070(7/8)	C	No	No	Inside Pole	109.00 - 8.50	1	No Ice	0.00	0.28
							1/2" Ice	0.00	0.28
							1" Ice	0.00	0.28
							2" Ice	0.00	0.28

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	159.86-154.86	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	0.000	0.02
L2	154.86-149.86	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	0.000	0.02
L3	149.86-144.86	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	0.000	0.07
L4	144.86-139.86	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	0.000	0.07
L5	139.86-134.86	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	0.000	0.11
L6	134.86-129.86	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	0.000	0.12
L7	129.86-125.75	A	0.000	0.000	0.651	0.000	0.00
		B	0.000	0.000	0.651	0.000	0.00
		C	0.000	0.000	0.651	0.000	0.10
L8	125.75-125.50	A	0.000	0.000	0.130	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
		B	0.000	0.000	0.130	0.000	0.00
		C	0.000	0.000	0.130	0.000	0.01
L9	125.50-118.98	A	0.000	0.000	3.402	0.000	0.00
		B	0.000	0.000	3.402	0.000	0.00
		C	0.000	0.000	3.402	0.000	0.18
L10	118.98-117.98	A	0.000	0.000	0.729	0.000	0.00
		B	0.000	0.000	0.729	0.000	0.00
		C	0.000	0.000	0.729	0.000	0.03
L11	117.98-112.98	A	0.000	0.000	3.646	0.000	0.00
		B	0.000	0.000	3.646	0.000	0.00
		C	0.000	0.000	3.646	0.000	0.14
L12	112.98-107.98	A	0.000	0.000	3.646	0.000	0.00
		B	0.000	0.000	3.646	0.000	0.00
		C	0.000	0.000	3.646	0.000	0.14
L13	107.98-103.00	A	0.000	0.000	5.629	0.000	0.00
		B	0.000	0.000	3.629	0.000	0.00
		C	0.000	0.000	5.629	0.000	0.14
L14	103.00-102.75	A	0.000	0.000	0.432	0.000	0.00
		B	0.000	0.000	0.182	0.000	0.00
		C	0.000	0.000	0.432	0.000	0.01
L15	102.75-100.21	A	0.000	0.000	4.396	0.000	0.00
		B	0.000	0.000	3.846	0.000	0.00
		C	0.000	0.000	4.396	0.000	0.07
L16	100.21-95.69	A	0.000	0.000	7.817	0.000	0.00
		B	0.000	0.000	7.817	0.000	0.00
		C	0.000	0.000	7.817	0.000	0.12
L17	95.69-94.69	A	0.000	0.000	1.964	0.000	0.00
		B	0.000	0.000	1.964	0.000	0.00
		C	0.000	0.000	1.964	0.000	0.03
L18	94.69-93.50	A	0.000	0.000	2.944	0.000	0.00
		B	0.000	0.000	2.944	0.000	0.00
		C	0.000	0.000	2.944	0.000	0.03
L19	93.50-93.25	A	0.000	0.000	0.620	0.000	0.00
		B	0.000	0.000	0.620	0.000	0.00
		C	0.000	0.000	0.620	0.000	0.01
L20	93.25-89.25	A	0.000	0.000	9.917	0.000	0.00
		B	0.000	0.000	9.917	0.000	0.00
		C	0.000	0.000	9.917	0.000	0.11
L21	89.25-89.00	A	0.000	0.000	0.661	0.000	0.00
		B	0.000	0.000	0.661	0.000	0.00
		C	0.000	0.000	0.661	0.000	0.01
L22	89.00-86.50	A	0.000	0.000	6.615	0.000	0.00
		B	0.000	0.000	6.615	0.000	0.00
		C	0.000	0.000	6.615	0.000	0.07
L23	86.50-86.25	A	0.000	0.000	0.661	0.000	0.00
		B	0.000	0.000	0.661	0.000	0.00
		C	0.000	0.000	0.661	0.000	0.01
L24	86.25-81.25	A	0.000	0.000	10.417	0.000	0.00
		B	0.000	0.000	10.417	0.000	0.00
		C	0.000	0.000	10.417	0.000	0.14
L25	81.25-76.25	A	0.000	0.000	9.705	0.000	0.00
		B	0.000	0.000	9.705	0.000	0.00
		C	0.000	0.000	9.705	0.000	0.14
L26	76.25-75.42	A	0.000	0.000	2.143	0.000	0.00
		B	0.000	0.000	2.143	0.000	0.00
		C	0.000	0.000	2.143	0.000	0.02
L27	75.42-75.17	A	0.000	0.000	0.643	0.000	0.00
		B	0.000	0.000	0.643	0.000	0.00
		C	0.000	0.000	0.643	0.000	0.01
L28	75.17-70.17	A	0.000	0.000	12.865	0.000	0.00
		B	0.000	0.000	12.865	0.000	0.00
		C	0.000	0.000	12.865	0.000	0.14
L29	70.17-65.17	A	0.000	0.000	12.865	0.000	0.00
		B	0.000	0.000	12.865	0.000	0.00
		C	0.000	0.000	12.865	0.000	0.14
L30	65.17-60.17	A	0.000	0.000	12.865	0.000	0.00
		B	0.000	0.000	12.865	0.000	0.00
		C	0.000	0.000	12.865	0.000	0.14
L31	60.17-59.50	A	0.000	0.000	1.716	0.000	0.00

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
		B	0.000	0.000	1.716	0.000	0.00
		C	0.000	0.000	1.716	0.000	0.02
L32	59.50-59.25	A	0.000	0.000	0.643	0.000	0.00
		B	0.000	0.000	0.643	0.000	0.00
		C	0.000	0.000	0.643	0.000	0.01
L33	59.25-54.25	A	0.000	0.000	12.865	0.000	0.00
		B	0.000	0.000	13.615	0.000	0.00
		C	0.000	0.000	12.865	0.000	0.14
L34	54.25-53.00	A	0.000	0.000	3.216	0.000	0.00
		B	0.000	0.000	4.466	0.000	0.00
		C	0.000	0.000	3.216	0.000	0.03
L35	53.00-52.75	A	0.000	0.000	0.643	0.000	0.00
		B	0.000	0.000	0.893	0.000	0.00
		C	0.000	0.000	0.643	0.000	0.01
L36	52.75-47.06	A	0.000	0.000	14.638	0.000	0.00
		B	0.000	0.000	20.188	0.000	0.00
		C	0.000	0.000	14.638	0.000	0.16
L37	47.06-46.06	A	0.000	0.000	2.573	0.000	0.00
		B	0.000	0.000	2.573	0.000	0.00
		C	0.000	0.000	2.573	0.000	0.03
L38	46.06-41.06	A	0.000	0.000	12.865	0.000	0.00
		B	0.000	0.000	12.865	0.000	0.00
		C	0.000	0.000	12.865	0.000	0.14
L39	41.06-39.33	A	0.000	0.000	5.245	0.000	0.00
		B	0.000	0.000	5.245	0.000	0.00
		C	0.000	0.000	5.245	0.000	0.05
L40	39.33-39.08	A	0.000	0.000	0.813	0.000	0.00
		B	0.000	0.000	0.813	0.000	0.00
		C	0.000	0.000	0.813	0.000	0.01
L41	39.08-37.75	A	0.000	0.000	4.322	0.000	0.00
		B	0.000	0.000	4.322	0.000	0.00
		C	0.000	0.000	4.322	0.000	0.04
L42	37.75-37.50	A	0.000	0.000	0.813	0.000	0.00
		B	0.000	0.000	0.813	0.000	0.00
		C	0.000	0.000	0.813	0.000	0.01
L43	37.50-32.50	A	0.000	0.000	13.485	0.000	0.00
		B	0.000	0.000	13.485	0.000	0.00
		C	0.000	0.000	13.485	0.000	0.14
L44	32.50-29.75	A	0.000	0.000	7.076	0.000	0.00
		B	0.000	0.000	7.076	0.000	0.00
		C	0.000	0.000	7.076	0.000	0.08
L45	29.75-29.50	A	0.000	0.000	0.643	0.000	0.00
		B	0.000	0.000	0.643	0.000	0.00
		C	0.000	0.000	0.643	0.000	0.01
L46	29.50-24.50	A	0.000	0.000	13.573	0.000	0.00
		B	0.000	0.000	12.865	0.000	0.00
		C	0.000	0.000	12.865	0.000	0.14
L47	24.50-21.25	A	0.000	0.000	12.966	0.000	0.00
		B	0.000	0.000	8.362	0.000	0.00
		C	0.000	0.000	8.362	0.000	0.09
L48	21.25-21.00	A	0.000	0.000	0.997	0.000	0.00
		B	0.000	0.000	0.643	0.000	0.00
		C	0.000	0.000	0.643	0.000	0.01
L49	21.00-20.00	A	0.000	0.000	3.990	0.000	0.00
		B	0.000	0.000	2.573	0.000	0.00
		C	0.000	0.000	2.573	0.000	0.03
L50	20.00-19.75	A	0.000	0.000	0.997	0.000	0.00
		B	0.000	0.000	0.747	0.000	0.00
		C	0.000	0.000	0.747	0.000	0.01
L51	19.75-17.00	A	0.000	0.000	10.971	0.000	0.00
		B	0.000	0.000	8.221	0.000	0.00
		C	0.000	0.000	8.221	0.000	0.08
L52	17.00-16.75	A	0.000	0.000	0.997	0.000	0.00
		B	0.000	0.000	0.747	0.000	0.00
		C	0.000	0.000	0.747	0.000	0.01
L53	16.75-11.75	A	0.000	0.000	16.698	0.000	0.00
		B	0.000	0.000	14.948	0.000	0.00
		C	0.000	0.000	14.948	0.000	0.14
L54	11.75-6.75	A	0.000	0.000	14.948	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
		B	0.000	0.000	14.948	0.000	0.00
		C	0.000	0.000	14.948	0.000	0.14
L55	6.75-1.75	A	0.000	0.000	14.948	0.000	0.00
		B	0.000	0.000	14.948	0.000	0.00
		C	0.000	0.000	14.948	0.000	0.14
L56	1.75-0.00	A	0.000	0.000	4.893	0.000	0.00
		B	0.000	0.000	4.893	0.000	0.00
		C	0.000	0.000	4.893	0.000	0.05

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	159.86-154.86	A	1.491	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.489	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.02
L2	154.86-149.86	A	1.486	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.486	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.02
L3	149.86-144.86	A	1.481	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.481	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.07
L4	144.86-139.86	A	1.476	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.476	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.07
L5	139.86-134.86	A	1.470	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.470	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.11
L6	134.86-129.86	A	1.465	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.465	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.12
L7	129.86-125.75	A	1.460	0.000	0.000	0.882	0.000	0.01
		B		0.000	0.000	2.081	0.000	0.03
		C		0.000	0.000	0.882	0.000	0.11
L8	125.75-125.50	A	1.457	0.000	0.000	0.176	0.000	0.00
		B		0.000	0.000	0.249	0.000	0.00
		C		0.000	0.000	0.176	0.000	0.01
L9	125.50-118.98	A	1.453	0.000	0.000	4.606	0.000	0.05
		B		0.000	0.000	6.502	0.000	0.08
		C		0.000	0.000	4.606	0.000	0.23
L10	118.98-117.98	A	1.449	0.000	0.000	1.020	0.000	0.01
		B		0.000	0.000	1.311	0.000	0.01
		C		0.000	0.000	1.020	0.000	0.04
L11	117.98-112.98	A	1.445	0.000	0.000	5.091	0.000	0.05
		B		0.000	0.000	6.536	0.000	0.07
		C		0.000	0.000	5.091	0.000	0.18
L12	112.98-107.98	A	1.439	0.000	0.000	5.085	0.000	0.05
		B		0.000	0.000	6.523	0.000	0.07
		C		0.000	0.000	5.085	0.000	0.18
L13	107.98-103.00	A	1.432	0.000	0.000	7.628	0.000	0.07
		B		0.000	0.000	6.481	0.000	0.06
		C		0.000	0.000	7.628	0.000	0.21
L14	103.00-102.75	A	1.429	0.000	0.000	0.575	0.000	0.01
		B		0.000	0.000	0.325	0.000	0.00
		C		0.000	0.000	0.575	0.000	0.01
L15	102.75-100.21	A	1.427	0.000	0.000	5.846	0.000	0.05
		B		0.000	0.000	5.864	0.000	0.05
		C		0.000	0.000	5.846	0.000	0.12
L16	100.21-95.69	A	1.422	0.000	0.000	10.387	0.000	0.09
		B		0.000	0.000	11.672	0.000	0.11
		C		0.000	0.000	10.387	0.000	0.21
L17	95.69-94.69	A	1.417	0.000	0.000	2.583	0.000	0.02
		B		0.000	0.000	2.867	0.000	0.03
		C		0.000	0.000	2.583	0.000	0.05
L18	94.69-93.50	A	1.416	0.000	0.000	3.807	0.000	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
		B		0.000	0.000	4.144	0.000	0.04
		C		0.000	0.000	3.807	0.000	0.07
L19	93.50-93.25	A	1.415	0.000	0.000	0.801	0.000	0.01
		B		0.000	0.000	0.872	0.000	0.01
		C		0.000	0.000	0.801	0.000	0.01
L20	93.25-89.25	A	1.411	0.000	0.000	12.816	0.000	0.11
		B		0.000	0.000	13.945	0.000	0.13
		C		0.000	0.000	12.816	0.000	0.23
L21	89.25-89.00	A	1.408	0.000	0.000	0.842	0.000	0.01
		B		0.000	0.000	0.913	0.000	0.01
		C		0.000	0.000	0.842	0.000	0.01
L22	89.00-86.50	A	1.406	0.000	0.000	8.420	0.000	0.07
		B		0.000	0.000	9.123	0.000	0.08
		C		0.000	0.000	8.420	0.000	0.14
L23	86.50-86.25	A	1.404	0.000	0.000	0.842	0.000	0.01
		B		0.000	0.000	0.912	0.000	0.01
		C		0.000	0.000	0.842	0.000	0.01
L24	86.25-81.25	A	1.399	0.000	0.000	13.414	0.000	0.11
		B		0.000	0.000	14.814	0.000	0.13
		C		0.000	0.000	13.414	0.000	0.25
L25	81.25-76.25	A	1.391	0.000	0.000	12.579	0.000	0.11
		B		0.000	0.000	13.970	0.000	0.12
		C		0.000	0.000	12.579	0.000	0.24
L26	76.25-75.42	A	1.386	0.000	0.000	2.836	0.000	0.02
		B		0.000	0.000	3.067	0.000	0.03
		C		0.000	0.000	2.836	0.000	0.05
L27	75.42-75.17	A	1.385	0.000	0.000	0.851	0.000	0.01
		B		0.000	0.000	0.920	0.000	0.01
		C		0.000	0.000	0.851	0.000	0.01
L28	75.17-70.17	A	1.380	0.000	0.000	17.004	0.000	0.15
		B		0.000	0.000	18.383	0.000	0.16
		C		0.000	0.000	17.004	0.000	0.28
L29	70.17-65.17	A	1.370	0.000	0.000	16.974	0.000	0.14
		B		0.000	0.000	18.344	0.000	0.16
		C		0.000	0.000	16.974	0.000	0.28
L30	65.17-60.17	A	1.359	0.000	0.000	16.943	0.000	0.14
		B		0.000	0.000	18.302	0.000	0.16
		C		0.000	0.000	16.943	0.000	0.28
L31	60.17-59.50	A	1.353	0.000	0.000	2.258	0.000	0.02
		B		0.000	0.000	2.438	0.000	0.02
		C		0.000	0.000	2.258	0.000	0.04
L32	59.50-59.25	A	1.352	0.000	0.000	0.846	0.000	0.01
		B		0.000	0.000	0.914	0.000	0.01
		C		0.000	0.000	0.846	0.000	0.01
L33	59.25-54.25	A	1.346	0.000	0.000	16.903	0.000	0.14
		B		0.000	0.000	19.200	0.000	0.16
		C		0.000	0.000	16.903	0.000	0.28
L34	54.25-53.00	A	1.338	0.000	0.000	4.220	0.000	0.03
		B		0.000	0.000	6.139	0.000	0.05
		C		0.000	0.000	4.220	0.000	0.07
L35	53.00-52.75	A	1.337	0.000	0.000	0.844	0.000	0.01
		B		0.000	0.000	1.227	0.000	0.01
		C		0.000	0.000	0.844	0.000	0.01
L36	52.75-47.06	A	1.329	0.000	0.000	19.174	0.000	0.16
		B		0.000	0.000	27.711	0.000	0.23
		C		0.000	0.000	19.174	0.000	0.31
L37	47.06-46.06	A	1.320	0.000	0.000	3.370	0.000	0.03
		B		0.000	0.000	3.636	0.000	0.03
		C		0.000	0.000	3.370	0.000	0.06
L38	46.06-41.06	A	1.311	0.000	0.000	16.797	0.000	0.14
		B		0.000	0.000	18.108	0.000	0.15
		C		0.000	0.000	16.797	0.000	0.27
L39	41.06-39.33	A	1.300	0.000	0.000	6.900	0.000	0.06
		B		0.000	0.000	7.350	0.000	0.06
		C		0.000	0.000	6.900	0.000	0.10
L40	39.33-39.08	A	1.297	0.000	0.000	1.072	0.000	0.01
		B		0.000	0.000	1.137	0.000	0.01
		C		0.000	0.000	1.072	0.000	0.02
L41	39.08-37.75	A	1.295	0.000	0.000	5.700	0.000	0.05

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
		B		0.000	0.000	6.044	0.000	0.05
		C		0.000	0.000	5.700	0.000	0.08
L42	37.75-37.50	A	1.292	0.000	0.000	1.071	0.000	0.01
		B		0.000	0.000	1.135	0.000	0.01
		C		0.000	0.000	1.071	0.000	0.02
L43	37.50-32.50	A	1.282	0.000	0.000	17.568	0.000	0.14
		B		0.000	0.000	18.850	0.000	0.15
		C		0.000	0.000	17.568	0.000	0.28
L44	32.50-29.75	A	1.268	0.000	0.000	9.167	0.000	0.07
		B		0.000	0.000	9.864	0.000	0.08
		C		0.000	0.000	9.167	0.000	0.15
L45	29.75-29.50	A	1.261	0.000	0.000	0.832	0.000	0.01
		B		0.000	0.000	0.895	0.000	0.01
		C		0.000	0.000	0.832	0.000	0.01
L46	29.50-24.50	A	1.250	0.000	0.000	17.447	0.000	0.13
		B		0.000	0.000	17.863	0.000	0.14
		C		0.000	0.000	16.613	0.000	0.27
L47	24.50-21.25	A	1.229	0.000	0.000	16.162	0.000	0.12
		B		0.000	0.000	11.558	0.000	0.09
		C		0.000	0.000	10.759	0.000	0.17
L48	21.25-21.00	A	1.219	0.000	0.000	1.241	0.000	0.01
		B		0.000	0.000	0.887	0.000	0.01
		C		0.000	0.000	0.826	0.000	0.01
L49	21.00-20.00	A	1.216	0.000	0.000	4.962	0.000	0.04
		B		0.000	0.000	3.545	0.000	0.03
		C		0.000	0.000	3.302	0.000	0.05
L50	20.00-19.75	A	1.212	0.000	0.000	1.240	0.000	0.01
		B		0.000	0.000	0.979	0.000	0.01
		C		0.000	0.000	0.918	0.000	0.01
L51	19.75-17.00	A	1.202	0.000	0.000	13.617	0.000	0.10
		B		0.000	0.000	10.746	0.000	0.08
		C		0.000	0.000	10.085	0.000	0.15
L52	17.00-16.75	A	1.192	0.000	0.000	1.236	0.000	0.01
		B		0.000	0.000	0.975	0.000	0.01
		C		0.000	0.000	0.916	0.000	0.01
L53	16.75-11.75	A	1.172	0.000	0.000	20.625	0.000	0.15
		B		0.000	0.000	19.432	0.000	0.14
		C		0.000	0.000	18.260	0.000	0.27
L54	11.75-6.75	A	1.123	0.000	0.000	18.316	0.000	0.12
		B		0.000	0.000	18.753	0.000	0.13
		C		0.000	0.000	18.135	0.000	0.26
L55	6.75-1.75	A	1.038	0.000	0.000	18.063	0.000	0.11
		B		0.000	0.000	17.924	0.000	0.11
		C		0.000	0.000	17.924	0.000	0.25
L56	1.75-0.00	A	0.887	0.000	0.000	5.736	0.000	0.03
		B		0.000	0.000	5.713	0.000	0.03
		C		0.000	0.000	5.713	0.000	0.08

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	159.86-154.86	0.0000	0.0000	0.9672	-0.5584
L2	154.86-149.86	0.0000	0.0000	0.9795	-0.5655
L3	149.86-144.86	0.0000	0.0000	0.9898	-0.5714
L4	144.86-139.86	0.0000	0.0000	0.9988	-0.5766
L5	139.86-134.86	0.0000	0.0000	1.0066	-0.5811
L6	134.86-129.86	0.0000	0.0000	1.0133	-0.5850
L7	129.86-125.75	0.0000	0.0000	0.8378	-0.4837
L8	125.75-125.50	0.0000	0.0000	0.6014	-0.3472
L9	125.50-118.98	0.0000	0.0000	0.6092	-0.3517
L10	118.98-117.98	0.0000	0.0000	0.5220	-0.3014
L11	117.98-112.98	0.0000	0.0000	0.5273	-0.3044
L12	112.98-107.98	0.0000	0.0000	0.5378	-0.3105

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L13	107.98-103.00	-0.8741	0.5047	-0.4084	0.2358
L14	103.00-102.75	-1.7813	1.0284	-1.4263	0.8235
L15	102.75-100.21	-0.3476	0.2007	0.0043	-0.0025
L16	100.21-95.69	0.0000	0.0000	0.3553	-0.2051
L17	95.69-94.69	0.0000	0.0000	0.3295	-0.1902
L18	94.69-93.50	0.0000	0.0000	0.2835	-0.1637
L19	93.50-93.25	0.0000	0.0000	0.2845	-0.1643
L20	93.25-89.25	0.0000	0.0000	0.2873	-0.1659
L21	89.25-89.00	0.0000	0.0000	0.2796	-0.1614
L22	89.00-86.50	0.0000	0.0000	0.2813	-0.1624
L23	86.50-86.25	0.0000	0.0000	0.2829	-0.1633
L24	86.25-81.25	0.0000	0.0000	0.3352	-0.1935
L25	81.25-76.25	0.0000	0.0000	0.3561	-0.2056
L26	76.25-75.42	0.0000	0.0000	0.2922	-0.1687
L27	75.42-75.17	0.0000	0.0000	0.2928	-0.1691
L28	75.17-70.17	0.0000	0.0000	0.2957	-0.1707
L29	70.17-65.17	0.0000	0.0000	0.3008	-0.1737
L30	65.17-60.17	0.0000	0.0000	0.3057	-0.1765
L31	60.17-59.50	0.0000	0.0000	0.3083	-0.1780
L32	59.50-59.25	0.0000	0.0000	0.3087	-0.1782
L33	59.25-54.25	0.2163	-0.1249	0.5302	-0.3061
L34	54.25-53.00	1.3474	-0.7779	1.6768	-0.9681
L35	53.00-52.75	1.3514	-0.7802	1.6816	-0.9709
L36	52.75-47.06	1.3353	-0.7710	1.6688	-0.9635
L37	47.06-46.06	0.0000	0.0000	0.3171	-0.1831
L38	46.06-41.06	0.0000	0.0000	0.3174	-0.1832
L39	41.06-39.33	0.0000	0.0000	0.2830	-0.1634
L40	39.33-39.08	0.0000	0.0000	0.2689	-0.1553
L41	39.08-37.75	0.0000	0.0000	0.2694	-0.1555
L42	37.75-37.50	0.0000	0.0000	0.2697	-0.1557
L43	37.50-32.50	0.0000	0.0000	0.3112	-0.1797
L44	32.50-29.75	0.0000	0.0000	0.3234	-0.1867
L45	29.75-29.50	0.0000	0.0000	0.3238	-0.1870
L46	29.50-24.50	-0.2257	-0.1303	0.1003	-0.3124
L47	24.50-21.25	-2.0550	-1.1865	-1.7213	-1.3311
L48	21.25-21.00	-2.0666	-1.1932	-1.7339	-1.3382
L49	21.00-20.00	-2.0708	-1.1956	-1.7384	-1.3407
L50	20.00-19.75	-1.3680	-0.7898	-1.2245	-1.0296
L51	19.75-17.00	-1.3747	-0.7937	-1.2311	-1.0329
L52	17.00-16.75	-1.3814	-0.7975	-1.2376	-1.0360
L53	16.75-11.75	-0.5058	-0.2920	-0.2991	-0.5077
L54	11.75-6.75	0.0000	0.0000	0.1126	-0.1204
L55	6.75-1.75	0.0000	0.0000	-0.0383	-0.0221
L56	1.75-0.00	0.0000	0.0000	-0.0194	-0.0112

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
L1	1	Safety Line 3/8	154.86 - 159.85	1.0000	1.0000
L2	1	Safety Line 3/8	149.86 - 154.86	1.0000	1.0000
L3	1	Safety Line 3/8	144.86 - 149.86	1.0000	1.0000
L4	1	Safety Line 3/8	139.86 - 144.86	1.0000	1.0000
L5	1	Safety Line 3/8	134.86 - 139.86	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L6	1	Safety Line 3/8	129.86 - 134.86	1.0000	1.0000
L7	1	Safety Line 3/8	125.75 - 129.86	1.0000	1.0000
L7	30	PL1.25x3.125	125.75 - 127.00	1.0000	1.0000
L7	31	PL1.25x3.125	125.75 - 127.00	1.0000	1.0000
L7	32	PL1.25x3.125	125.75 - 127.00	1.0000	1.0000
L8	1	Safety Line 3/8	125.50 - 125.75	1.0000	1.0000
L8	30	PL1.25x3.125	125.50 - 125.75	1.0000	1.0000
L8	31	PL1.25x3.125	125.50 - 125.75	1.0000	1.0000
L8	32	PL1.25x3.125	125.50 - 125.75	1.0000	1.0000
L9	1	Safety Line 3/8	118.98 - 125.50	1.0000	1.0000
L9	27	PL1.25x4.375	118.98 - 119.00	1.0000	1.0000
L9	28	PL1.25x4.375	118.98 - 119.00	1.0000	1.0000
L9	29	PL1.25x4.375	118.98 - 119.00	1.0000	1.0000
L9	30	PL1.25x3.125	119.00 - 125.50	1.0000	1.0000
L9	31	PL1.25x3.125	119.00 - 125.50	1.0000	1.0000
L9	32	PL1.25x3.125	119.00 - 125.50	1.0000	1.0000
L11	1	Safety Line 3/8	112.98 - 117.98	1.0000	1.0000
L11	27	PL1.25x4.375	112.98 - 117.98	1.0000	1.0000
L11	28	PL1.25x4.375	112.98 - 117.98	1.0000	1.0000
L11	29	PL1.25x4.375	112.98 - 117.98	1.0000	1.0000
L12	1	Safety Line 3/8	107.98 - 112.98	1.0000	1.0000
L12	27	PL1.25x4.375	107.98 - 112.98	1.0000	1.0000
L12	28	PL1.25x4.375	107.98 - 112.98	1.0000	1.0000
L12	29	PL1.25x4.375	107.98 - 112.98	1.0000	1.0000
L13	1	Safety Line 3/8	103.00 - 107.98	1.0000	1.0000
L13	27	PL1.25x4.375	103.00 - 107.98	1.0000	1.0000
L13	28	PL1.25x4.375	103.00 - 107.98	1.0000	1.0000
L13	29	PL1.25x4.375	103.00 - 107.98	1.0000	1.0000
L13	36	CCI-SFP-060100	103.00 - 105.00	1.0000	1.0000
L13	37	CCI-SFP-060100	103.00 - 105.00	1.0000	1.0000
L14	1	Safety Line 3/8	102.75 - 103.00	1.0000	1.0000
L14	27	PL1.25x4.375	102.75 - 103.00	1.0000	1.0000
L14	28	PL1.25x4.375	102.75 - 103.00	1.0000	1.0000
L14	29	PL1.25x4.375	102.75 - 103.00	1.0000	1.0000
L14	36	CCI-SFP-060100	102.75 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L14	37	CCI-SFP-060100	103.00 - 102.75	1.0000	1.0000
L15	1	Safety Line 3/8	103.00 - 100.21	1.0000	1.0000
L15	27	PL1.25x4.375	102.75 - 100.21	1.0000	1.0000
L15	28	PL1.25x4.375	102.75 - 100.21	1.0000	1.0000
L15	29	PL1.25x4.375	102.75 - 100.21	1.0000	1.0000
L15	36	CCI-SFP-060100	102.75 - 100.21	1.0000	1.0000
L15	37	CCI-SFP-060100	102.75 - 100.21	1.0000	1.0000
L15	39	CCI-SFP-060100	102.75 - 100.21	1.0000	1.0000
L16	1	Safety Line 3/8	102.20 - 95.69	1.0000	1.0000
L16	27	PL1.25x4.375	100.21 - 95.69	1.0000	1.0000
L16	28	PL1.25x4.375	100.21 - 95.69	1.0000	1.0000
L16	29	PL1.25x4.375	100.21 - 95.69	1.0000	1.0000
L16	36	CCI-SFP-060100	100.21 - 95.69	1.0000	1.0000
L16	37	CCI-SFP-060100	100.21 - 95.69	1.0000	1.0000
L16	39	CCI-SFP-060100	100.21 - 95.69	1.0000	1.0000
L16	40	CCI-SFP-045100	100.21 - 95.69	1.0000	1.0000
L16	41	CCI-SFP-045100	95.00 - 95.69	1.0000	1.0000
L16	42	CCI-SFP-045100	95.00 - 95.69	1.0000	1.0000
L18	1	Safety Line 3/8	95.00 - 93.50	1.0000	1.0000
L18	27	PL1.25x4.375	94.69 - 93.50	1.0000	1.0000
L18	28	PL1.25x4.375	94.69 - 93.50	1.0000	1.0000
L18	29	PL1.25x4.375	94.69 - 93.50	1.0000	1.0000
L18	36	CCI-SFP-060100	94.69 - 93.50	1.0000	1.0000
L18	37	CCI-SFP-060100	94.69 - 93.50	1.0000	1.0000
L18	39	CCI-SFP-060100	94.69 - 93.50	1.0000	1.0000
L18	40	CCI-SFP-045100	94.69 - 93.50	1.0000	1.0000
L18	41	CCI-SFP-045100	94.69 - 93.50	1.0000	1.0000
L18	42	CCI-SFP-045100	94.69 - 93.50	1.0000	1.0000
L19	1	Safety Line 3/8	94.69 - 93.25	1.0000	1.0000
L19	27	PL1.25x4.375	93.50 - 93.25	1.0000	1.0000
L19	28	PL1.25x4.375	93.50 - 93.25	1.0000	1.0000
L19	29	PL1.25x4.375	93.50 - 93.25	1.0000	1.0000
L19	36	CCI-SFP-060100	93.50 - 93.25	1.0000	1.0000
L19	37	CCI-SFP-060100	93.50 - 93.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L19	39	CCI-SFP-060100	93.25 - 93.50	1.0000	1.0000
L19	40	CCI-SFP-045100	93.25 - 93.50	1.0000	1.0000
L19	41	CCI-SFP-045100	93.25 - 93.50	1.0000	1.0000
L19	42	CCI-SFP-045100	93.25 - 93.50	1.0000	1.0000
L20	1	Safety Line 3/8	89.25 - 93.25	1.0000	1.0000
L20	27	PL1.25x4.375	89.25 - 93.25	1.0000	1.0000
L20	28	PL1.25x4.375	89.25 - 93.25	1.0000	1.0000
L20	29	PL1.25x4.375	89.25 - 93.25	1.0000	1.0000
L20	36	CCI-SFP-060100	89.25 - 93.25	1.0000	1.0000
L20	37	CCI-SFP-060100	89.25 - 93.25	1.0000	1.0000
L20	39	CCI-SFP-060100	89.25 - 93.25	1.0000	1.0000
L20	40	CCI-SFP-045100	89.25 - 93.25	1.0000	1.0000
L20	41	CCI-SFP-045100	89.25 - 93.25	1.0000	1.0000
L20	42	CCI-SFP-045100	89.25 - 93.25	1.0000	1.0000
L21	1	Safety Line 3/8	89.00 - 89.25	1.0000	1.0000
L21	24	PL1.25x5.375	89.00 - 89.25	1.0000	1.0000
L21	25	PL1.25x5.375	89.00 - 89.25	1.0000	1.0000
L21	26	PL1.25x5.375	89.00 - 89.25	1.0000	1.0000
L21	36	CCI-SFP-060100	89.00 - 89.25	1.0000	1.0000
L21	37	CCI-SFP-060100	89.00 - 89.25	1.0000	1.0000
L21	39	CCI-SFP-060100	89.00 - 89.25	1.0000	1.0000
L21	40	CCI-SFP-045100	89.00 - 89.25	1.0000	1.0000
L21	41	CCI-SFP-045100	89.00 - 89.25	1.0000	1.0000
L21	42	CCI-SFP-045100	89.00 - 89.25	1.0000	1.0000
L22	1	Safety Line 3/8	86.50 - 89.00	1.0000	1.0000
L22	24	PL1.25x5.375	86.50 - 89.00	1.0000	1.0000
L22	25	PL1.25x5.375	86.50 - 89.00	1.0000	1.0000
L22	26	PL1.25x5.375	86.50 - 89.00	1.0000	1.0000
L22	36	CCI-SFP-060100	86.50 - 89.00	1.0000	1.0000
L22	37	CCI-SFP-060100	86.50 - 89.00	1.0000	1.0000
L22	39	CCI-SFP-060100	86.50 - 89.00	1.0000	1.0000
L22	40	CCI-SFP-045100	86.50 - 89.00	1.0000	1.0000
L22	41	CCI-SFP-045100	86.50 - 89.00	1.0000	1.0000
L22	42	CCI-SFP-045100	86.50 - 89.00	1.0000	1.0000
L23	1	Safety Line 3/8	86.25 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L23	24	PL1.25x5.375	86.50 - 86.50	1.0000	1.0000
L23	25	PL1.25x5.375	86.25 - 86.50	1.0000	1.0000
L23	26	PL1.25x5.375	86.25 - 86.50	1.0000	1.0000
L23	36	CCI-SFP-060100	86.25 - 86.50	1.0000	1.0000
L23	37	CCI-SFP-060100	86.25 - 86.50	1.0000	1.0000
L23	39	CCI-SFP-060100	86.25 - 86.50	1.0000	1.0000
L23	40	CCI-SFP-045100	86.25 - 86.50	1.0000	1.0000
L23	41	CCI-SFP-045100	86.25 - 86.50	1.0000	1.0000
L23	42	CCI-SFP-045100	86.25 - 86.50	1.0000	1.0000
L24	1	Safety Line 3/8	81.25 - 86.25	1.0000	1.0000
L24	24	PL1.25x5.375	81.25 - 86.25	1.0000	1.0000
L24	25	PL1.25x5.375	81.25 - 86.25	1.0000	1.0000
L24	26	PL1.25x5.375	81.25 - 86.25	1.0000	1.0000
L24	36	CCI-SFP-060100	81.25 - 86.25	1.0000	1.0000
L24	37	CCI-SFP-060100	81.25 - 86.25	1.0000	1.0000
L24	39	CCI-SFP-060100	81.25 - 86.25	1.0000	1.0000
L24	40	CCI-SFP-045100	85.00 - 86.25	1.0000	1.0000
L24	41	CCI-SFP-045100	85.00 - 86.25	1.0000	1.0000
L24	42	CCI-SFP-045100	85.00 - 86.25	1.0000	1.0000
L25	1	Safety Line 3/8	76.25 - 81.25	1.0000	1.0000
L25	18	Aero Channel MP303	76.25 - 76.58	1.0000	1.0000
L25	19	Aero Channel MP303	76.25 - 76.58	1.0000	1.0000
L25	20	Aero Channel MP303	76.25 - 76.58	1.0000	1.0000
L25	24	PL1.25x5.375	76.25 - 81.25	1.0000	1.0000
L25	25	PL1.25x5.375	76.25 - 81.25	1.0000	1.0000
L25	26	PL1.25x5.375	76.25 - 81.25	1.0000	1.0000
L25	36	CCI-SFP-060100	76.25 - 81.25	1.0000	1.0000
L25	37	CCI-SFP-060100	76.25 - 81.25	1.0000	1.0000
L25	39	CCI-SFP-060100	76.25 - 81.25	1.0000	1.0000
L26	1	Safety Line 3/8	75.42 - 76.25	1.0000	1.0000
L26	18	Aero Channel MP303	75.42 - 76.25	1.0000	1.0000
L26	19	Aero Channel MP303	75.42 - 76.25	1.0000	1.0000
L26	20	Aero Channel MP303	75.42 - 76.25	1.0000	1.0000
L26	24	PL1.25x5.375	75.42 - 76.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L26	25	PL1.25x5.375	75.42 - 76.25	1.0000	1.0000
L26	26	PL1.25x5.375	75.42 - 76.25	1.0000	1.0000
L26	36	CCI-SFP-060100	75.42 - 76.25	1.0000	1.0000
L26	37	CCI-SFP-060100	75.42 - 76.25	1.0000	1.0000
L26	39	CCI-SFP-060100	75.42 - 76.25	1.0000	1.0000
L27	1	Safety Line 3/8	75.17 - 75.42	1.0000	1.0000
L27	18	Aero Channel MP303	75.17 - 75.42	1.0000	1.0000
L27	19	Aero Channel MP303	75.17 - 75.42	1.0000	1.0000
L27	20	Aero Channel MP303	75.17 - 75.42	1.0000	1.0000
L27	24	PL1.25x5.375	75.17 - 75.42	1.0000	1.0000
L27	25	PL1.25x5.375	75.17 - 75.42	1.0000	1.0000
L27	26	PL1.25x5.375	75.17 - 75.42	1.0000	1.0000
L27	36	CCI-SFP-060100	75.17 - 75.42	1.0000	1.0000
L27	37	CCI-SFP-060100	75.17 - 75.42	1.0000	1.0000
L27	39	CCI-SFP-060100	75.17 - 75.42	1.0000	1.0000
L28	1	Safety Line 3/8	70.17 - 75.17	1.0000	1.0000
L28	18	Aero Channel MP303	70.17 - 75.17	1.0000	1.0000
L28	19	Aero Channel MP303	70.17 - 75.17	1.0000	1.0000
L28	20	Aero Channel MP303	70.17 - 75.17	1.0000	1.0000
L28	24	PL1.25x5.375	70.17 - 75.17	1.0000	1.0000
L28	25	PL1.25x5.375	70.17 - 75.17	1.0000	1.0000
L28	26	PL1.25x5.375	70.17 - 75.17	1.0000	1.0000
L28	36	CCI-SFP-060100	70.17 - 75.17	1.0000	1.0000
L28	37	CCI-SFP-060100	70.17 - 75.17	1.0000	1.0000
L28	39	CCI-SFP-060100	70.17 - 75.17	1.0000	1.0000
L29	1	Safety Line 3/8	65.17 - 70.17	1.0000	1.0000
L29	18	Aero Channel MP303	65.17 - 70.17	1.0000	1.0000
L29	19	Aero Channel MP303	65.17 - 70.17	1.0000	1.0000
L29	20	Aero Channel MP303	65.17 - 70.17	1.0000	1.0000
L29	24	PL1.25x5.375	65.17 - 70.17	1.0000	1.0000
L29	25	PL1.25x5.375	65.17 - 70.17	1.0000	1.0000
L29	26	PL1.25x5.375	65.17 - 70.17	1.0000	1.0000
L29	36	CCI-SFP-060100	65.17 - 70.17	1.0000	1.0000
L29	37	CCI-SFP-060100	65.17 - 70.17	1.0000	1.0000
L29	39	CCI-SFP-060100	65.17 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L30	1	Safety Line 3/8	70.17 - 60.17	1.0000	1.0000
L30	18	Aero Channel MP303	65.17 - 60.17	1.0000	1.0000
L30	19	Aero Channel MP303	65.17 - 60.17	1.0000	1.0000
L30	20	Aero Channel MP303	65.17 - 60.17	1.0000	1.0000
L30	24	PL1.25x5.375	65.17 - 60.17	1.0000	1.0000
L30	25	PL1.25x5.375	65.17 - 60.17	1.0000	1.0000
L30	26	PL1.25x5.375	65.17 - 60.17	1.0000	1.0000
L30	36	CCI-SFP-060100	65.17 - 60.17	1.0000	1.0000
L30	37	CCI-SFP-060100	65.17 - 60.17	1.0000	1.0000
L30	39	CCI-SFP-060100	65.17 - 60.17	1.0000	1.0000
L31	1	Safety Line 3/8	60.17 - 59.50	1.0000	1.0000
L31	18	Aero Channel MP303	60.17 - 59.50	1.0000	1.0000
L31	19	Aero Channel MP303	60.17 - 59.50	1.0000	1.0000
L31	20	Aero Channel MP303	60.17 - 59.50	1.0000	1.0000
L31	24	PL1.25x5.375	60.17 - 59.50	1.0000	1.0000
L31	25	PL1.25x5.375	60.17 - 59.50	1.0000	1.0000
L31	26	PL1.25x5.375	60.17 - 59.50	1.0000	1.0000
L31	36	CCI-SFP-060100	60.17 - 59.50	1.0000	1.0000
L31	37	CCI-SFP-060100	60.17 - 59.50	1.0000	1.0000
L31	39	CCI-SFP-060100	60.17 - 59.50	1.0000	1.0000
L32	1	Safety Line 3/8	59.50 - 59.25	1.0000	1.0000
L32	18	Aero Channel MP303	59.50 - 59.25	1.0000	1.0000
L32	19	Aero Channel MP303	59.50 - 59.25	1.0000	1.0000
L32	20	Aero Channel MP303	59.50 - 59.25	1.0000	1.0000
L32	24	PL1.25x5.375	59.50 - 59.25	1.0000	1.0000
L32	25	PL1.25x5.375	59.50 - 59.25	1.0000	1.0000
L32	26	PL1.25x5.375	59.50 - 59.25	1.0000	1.0000
L32	36	CCI-SFP-060100	59.50 - 59.25	1.0000	1.0000
L32	37	CCI-SFP-060100	59.50 - 59.25	1.0000	1.0000
L32	39	CCI-SFP-060100	59.50 - 59.25	1.0000	1.0000
L33	1	Safety Line 3/8	59.25 - 54.25	1.0000	1.0000
L33	18	Aero Channel MP303	59.25 - 54.25	1.0000	1.0000
L33	19	Aero Channel MP303	59.25 - 54.25	1.0000	1.0000
L33	20	Aero Channel MP303	59.25 - 54.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L33	24	PL1.25x5.375	54.25 - 59.25	1.0000	1.0000
L33	25	PL1.25x5.375	54.25 - 59.25	1.0000	1.0000
L33	26	PL1.25x5.375	54.25 - 59.25	1.0000	1.0000
L33	36	CCI-SFP-060100	54.25 - 59.25	1.0000	1.0000
L33	37	CCI-SFP-060100	54.25 - 59.25	1.0000	1.0000
L33	38	CCI-SFP-060100	54.25 - 55.00	1.0000	1.0000
L33	39	CCI-SFP-060100	54.25 - 59.25	1.0000	1.0000
L34	1	Safety Line 3/8	53.00 - 54.25	1.0000	1.0000
L34	18	Aero Channel MP303	53.00 - 54.25	1.0000	1.0000
L34	19	Aero Channel MP303	53.00 - 54.25	1.0000	1.0000
L34	20	Aero Channel MP303	53.00 - 54.25	1.0000	1.0000
L34	24	PL1.25x5.375	53.00 - 54.25	1.0000	1.0000
L34	25	PL1.25x5.375	53.00 - 54.25	1.0000	1.0000
L34	26	PL1.25x5.375	53.00 - 54.25	1.0000	1.0000
L34	36	CCI-SFP-060100	53.00 - 54.25	1.0000	1.0000
L34	37	CCI-SFP-060100	53.00 - 54.25	1.0000	1.0000
L34	38	CCI-SFP-060100	53.00 - 54.25	1.0000	1.0000
L34	39	CCI-SFP-060100	53.00 - 54.25	1.0000	1.0000
L35	1	Safety Line 3/8	52.75 - 53.00	1.0000	1.0000
L35	18	Aero Channel MP303	52.75 - 53.00	1.0000	1.0000
L35	19	Aero Channel MP303	52.75 - 53.00	1.0000	1.0000
L35	20	Aero Channel MP303	52.75 - 53.00	1.0000	1.0000
L35	24	PL1.25x5.375	52.75 - 53.00	1.0000	1.0000
L35	25	PL1.25x5.375	52.75 - 53.00	1.0000	1.0000
L35	26	PL1.25x5.375	52.75 - 53.00	1.0000	1.0000
L35	36	CCI-SFP-060100	52.75 - 53.00	1.0000	1.0000
L35	37	CCI-SFP-060100	52.75 - 53.00	1.0000	1.0000
L35	38	CCI-SFP-060100	52.75 - 53.00	1.0000	1.0000
L35	39	CCI-SFP-060100	52.75 - 53.00	1.0000	1.0000
L36	1	Safety Line 3/8	47.06 - 52.75	1.0000	1.0000
L36	18	Aero Channel MP303	47.06 - 52.75	1.0000	1.0000
L36	19	Aero Channel MP303	47.06 - 52.75	1.0000	1.0000
L36	20	Aero Channel MP303	47.06 - 52.75	1.0000	1.0000
L36	24	PL1.25x5.375	47.06 - 52.75	1.0000	1.0000
L36	25	PL1.25x5.375	47.06 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L36	26	PL1.25x5.375	52.75 47.06 - 52.75	1.0000	1.0000
L36	36	CCI-SFP-060100	47.06 - 52.75	1.0000	1.0000
L36	37	CCI-SFP-060100	47.06 - 52.75	1.0000	1.0000
L36	38	CCI-SFP-060100	47.06 - 52.75	1.0000	1.0000
L36	39	CCI-SFP-060100	47.20 - 52.75	1.0000	1.0000
L38	1	Safety Line 3/8	41.06 - 46.06	1.0000	1.0000
L38	18	Aero Channel MP303	41.06 - 46.06	1.0000	1.0000
L38	19	Aero Channel MP303	41.06 - 46.06	1.0000	1.0000
L38	20	Aero Channel MP303	41.06 - 46.06	1.0000	1.0000
L38	24	PL1.25x5.375	41.06 - 46.06	1.0000	1.0000
L38	25	PL1.25x5.375	41.06 - 46.06	1.0000	1.0000
L38	26	PL1.25x5.375	41.06 - 46.06	1.0000	1.0000
L38	36	CCI-SFP-060100	41.06 - 46.06	1.0000	1.0000
L38	37	CCI-SFP-060100	41.06 - 46.06	1.0000	1.0000
L38	38	CCI-SFP-060100	41.06 - 46.06	1.0000	1.0000
L39	1	Safety Line 3/8	39.33 - 41.06	1.0000	1.0000
L39	18	Aero Channel MP303	39.33 - 41.06	1.0000	1.0000
L39	19	Aero Channel MP303	39.33 - 41.06	1.0000	1.0000
L39	20	Aero Channel MP303	39.33 - 41.06	1.0000	1.0000
L39	21	Aero Channel MP303	39.33 - 40.50	1.0000	1.0000
L39	22	Aero Channel MP303	39.33 - 40.50	1.0000	1.0000
L39	23	Aero Channel MP303	39.33 - 40.50	1.0000	1.0000
L39	24	PL1.25x5.375	39.33 - 41.06	1.0000	1.0000
L39	25	PL1.25x5.375	39.33 - 41.06	1.0000	1.0000
L39	26	PL1.25x5.375	39.33 - 41.06	1.0000	1.0000
L39	36	CCI-SFP-060100	39.33 - 41.06	1.0000	1.0000
L39	37	CCI-SFP-060100	39.33 - 41.06	1.0000	1.0000
L39	38	CCI-SFP-060100	39.33 - 41.06	1.0000	1.0000
L40	1	Safety Line 3/8	39.08 - 39.33	1.0000	1.0000
L40	18	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000
L40	19	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000
L40	20	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000
L40	21	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000
L40	22	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L40	23	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000
L40	24	PL1.25x5.375	39.08 - 39.33	1.0000	1.0000
L40	25	PL1.25x5.375	39.08 - 39.33	1.0000	1.0000
L40	26	PL1.25x5.375	39.08 - 39.33	1.0000	1.0000
L40	36	CCI-SFP-060100	39.08 - 39.33	1.0000	1.0000
L40	37	CCI-SFP-060100	39.08 - 39.33	1.0000	1.0000
L40	38	CCI-SFP-060100	39.08 - 39.33	1.0000	1.0000
L41	1	Safety Line 3/8	37.75 - 39.08	1.0000	1.0000
L41	18	Aero Channel MP303	37.75 - 39.08	1.0000	1.0000
L41	19	Aero Channel MP303	37.75 - 39.08	1.0000	1.0000
L41	20	Aero Channel MP303	37.75 - 39.08	1.0000	1.0000
L41	21	Aero Channel MP303	37.75 - 39.08	1.0000	1.0000
L41	22	Aero Channel MP303	37.75 - 39.08	1.0000	1.0000
L41	23	Aero Channel MP303	37.75 - 39.08	1.0000	1.0000
L41	24	PL1.25x5.375	37.75 - 39.08	1.0000	1.0000
L41	25	PL1.25x5.375	37.75 - 39.08	1.0000	1.0000
L41	26	PL1.25x5.375	37.75 - 39.08	1.0000	1.0000
L41	36	CCI-SFP-060100	37.75 - 39.08	1.0000	1.0000
L41	37	CCI-SFP-060100	37.75 - 39.08	1.0000	1.0000
L41	38	CCI-SFP-060100	37.75 - 39.08	1.0000	1.0000
L42	1	Safety Line 3/8	37.50 - 37.75	1.0000	1.0000
L42	18	Aero Channel MP303	37.50 - 37.75	1.0000	1.0000
L42	19	Aero Channel MP303	37.50 - 37.75	1.0000	1.0000
L42	20	Aero Channel MP303	37.50 - 37.75	1.0000	1.0000
L42	21	Aero Channel MP303	37.50 - 37.75	1.0000	1.0000
L42	22	Aero Channel MP303	37.50 - 37.75	1.0000	1.0000
L42	23	Aero Channel MP303	37.50 - 37.75	1.0000	1.0000
L42	24	PL1.25x5.375	37.50 - 37.75	1.0000	1.0000
L42	25	PL1.25x5.375	37.50 - 37.75	1.0000	1.0000
L42	26	PL1.25x5.375	37.50 - 37.75	1.0000	1.0000
L42	36	CCI-SFP-060100	37.50 - 37.75	1.0000	1.0000
L42	37	CCI-SFP-060100	37.50 - 37.75	1.0000	1.0000
L42	38	CCI-SFP-060100	37.50 - 37.75	1.0000	1.0000
L43	1	Safety Line 3/8	32.50 - 37.50	1.0000	1.0000
L43	18	Aero Channel MP303	36.58 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L43	19	Aero Channel MP303	37.50 - 36.58	1.0000	1.0000
L43	20	Aero Channel MP303	37.50 - 36.58	1.0000	1.0000
L43	21	Aero Channel MP303	37.50 - 32.50	1.0000	1.0000
L43	22	Aero Channel MP303	37.50 - 32.50	1.0000	1.0000
L43	23	Aero Channel MP303	37.50 - 32.50	1.0000	1.0000
L43	24	PL1.25x5.375	37.50 - 32.50	1.0000	1.0000
L43	25	PL1.25x5.375	37.50 - 32.50	1.0000	1.0000
L43	26	PL1.25x5.375	37.50 - 32.50	1.0000	1.0000
L43	36	CCI-SFP-060100	37.50 - 32.50	1.0000	1.0000
L43	37	CCI-SFP-060100	37.50 - 32.50	1.0000	1.0000
L43	38	CCI-SFP-060100	37.50 - 32.50	1.0000	1.0000
L44	1	Safety Line 3/8	32.50 - 29.75	1.0000	1.0000
L44	21	Aero Channel MP303	32.50 - 29.75	1.0000	1.0000
L44	22	Aero Channel MP303	32.50 - 29.75	1.0000	1.0000
L44	23	Aero Channel MP303	32.50 - 29.75	1.0000	1.0000
L44	24	PL1.25x5.375	32.50 - 29.75	1.0000	1.0000
L44	25	PL1.25x5.375	32.50 - 29.75	1.0000	1.0000
L44	26	PL1.25x5.375	32.50 - 29.75	1.0000	1.0000
L44	36	CCI-SFP-060100	32.50 - 29.75	1.0000	1.0000
L44	37	CCI-SFP-060100	32.50 - 29.75	1.0000	1.0000
L44	38	CCI-SFP-060100	32.50 - 29.75	1.0000	1.0000
L45	1	Safety Line 3/8	29.50 - 24.50	1.0000	1.0000
L45	21	Aero Channel MP303	29.50 - 24.50	1.0000	1.0000
L45	22	Aero Channel MP303	29.50 - 24.50	1.0000	1.0000
L45	23	Aero Channel MP303	29.50 - 24.50	1.0000	1.0000
L45	24	PL1.25x5.375	29.50 - 24.50	1.0000	1.0000
L45	25	PL1.25x5.375	29.50 - 24.50	1.0000	1.0000
L45	26	PL1.25x5.375	29.50 - 24.50	1.0000	1.0000
L45	36	CCI-SFP-060100	29.50 - 24.50	1.0000	1.0000
L45	37	CCI-SFP-060100	29.50 - 24.50	1.0000	1.0000
L45	38	CCI-SFP-060100	29.50 - 24.50	1.0000	1.0000
L46	1	Safety Line 3/8	24.50 - 0.00	1.0000	1.0000
L46	21	Aero Channel MP303	24.50 - 0.00	1.0000	1.0000
L46	22	Aero Channel MP303	24.50 - 0.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L46	23	Aero Channel MP303	24.50 - 29.50	1.0000	1.0000
L46	24	PL1.25x5.375	24.50 - 29.50	1.0000	1.0000
L46	25	PL1.25x5.375	24.50 - 29.50	1.0000	1.0000
L46	26	PL1.25x5.375	24.50 - 29.50	1.0000	1.0000
L46	33	CCI-SFP-085125	24.50 - 25.00	1.0000	1.0000
L46	36	CCI-SFP-060100	24.50 - 29.50	1.0000	1.0000
L46	37	CCI-SFP-060100	24.50 - 29.50	1.0000	1.0000
L46	38	CCI-SFP-060100	24.50 - 29.50	1.0000	1.0000
L47	1	Safety Line 3/8	21.25 - 24.50	1.0000	1.0000
L47	21	Aero Channel MP303	21.25 - 24.50	1.0000	1.0000
L47	22	Aero Channel MP303	21.25 - 24.50	1.0000	1.0000
L47	23	Aero Channel MP303	21.25 - 24.50	1.0000	1.0000
L47	24	PL1.25x5.375	21.25 - 24.50	1.0000	1.0000
L47	25	PL1.25x5.375	21.25 - 24.50	1.0000	1.0000
L47	26	PL1.25x5.375	21.25 - 24.50	1.0000	1.0000
L47	33	CCI-SFP-085125	21.25 - 24.50	1.0000	1.0000
L47	36	CCI-SFP-060100	21.25 - 24.50	1.0000	1.0000
L47	37	CCI-SFP-060100	21.25 - 24.50	1.0000	1.0000
L47	38	CCI-SFP-060100	21.25 - 24.50	1.0000	1.0000
L48	1	Safety Line 3/8	21.00 - 21.25	1.0000	1.0000
L48	21	Aero Channel MP303	21.00 - 21.25	1.0000	1.0000
L48	22	Aero Channel MP303	21.00 - 21.25	1.0000	1.0000
L48	23	Aero Channel MP303	21.00 - 21.25	1.0000	1.0000
L48	24	PL1.25x5.375	21.00 - 21.25	1.0000	1.0000
L48	25	PL1.25x5.375	21.00 - 21.25	1.0000	1.0000
L48	26	PL1.25x5.375	21.00 - 21.25	1.0000	1.0000
L48	33	CCI-SFP-085125	21.00 - 21.25	1.0000	1.0000
L48	36	CCI-SFP-060100	21.00 - 21.25	1.0000	1.0000
L48	37	CCI-SFP-060100	21.00 - 21.25	1.0000	1.0000
L48	38	CCI-SFP-060100	21.00 - 21.25	1.0000	1.0000
L49	1	Safety Line 3/8	20.00 - 21.00	1.0000	1.0000
L49	21	Aero Channel MP303	20.00 - 21.00	1.0000	1.0000
L49	22	Aero Channel MP303	20.00 - 21.00	1.0000	1.0000
L49	23	Aero Channel MP303	20.00 - 21.00	1.0000	1.0000
L49	24	PL1.25x5.375	20.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L49	25	PL1.25x5.375	21.00 20.00 - 21.00	1.0000	1.0000
L49	26	PL1.25x5.375	20.00 - 21.00	1.0000	1.0000
L49	33	CCI-SFP-085125	20.00 - 21.00	1.0000	1.0000
L49	36	CCI-SFP-060100	20.00 - 21.00	1.0000	1.0000
L49	37	CCI-SFP-060100	20.00 - 21.00	1.0000	1.0000
L49	38	CCI-SFP-060100	20.00 - 21.00	1.0000	1.0000
L50	1	Safety Line 3/8	19.75 - 20.00	1.0000	1.0000
L50	21	Aero Channel MP303	19.75 - 20.00	1.0000	1.0000
L50	22	Aero Channel MP303	19.75 - 20.00	1.0000	1.0000
L50	23	Aero Channel MP303	19.75 - 20.00	1.0000	1.0000
L50	24	PL1.25x5.375	19.75 - 20.00	1.0000	1.0000
L50	25	PL1.25x5.375	19.75 - 20.00	1.0000	1.0000
L50	26	PL1.25x5.375	19.75 - 20.00	1.0000	1.0000
L50	33	CCI-SFP-085125	19.75 - 20.00	1.0000	1.0000
L50	34	CCI-SFP-085125	19.75 - 20.00	1.0000	1.0000
L50	35	CCI-SFP-085125	19.75 - 20.00	1.0000	1.0000
L50	36	CCI-SFP-060100	19.75 - 20.00	1.0000	1.0000
L51	1	Safety Line 3/8	17.00 - 19.75	1.0000	1.0000
L51	21	Aero Channel MP303	17.00 - 19.75	1.0000	1.0000
L51	22	Aero Channel MP303	17.00 - 19.75	1.0000	1.0000
L51	23	Aero Channel MP303	17.00 - 19.75	1.0000	1.0000
L51	24	PL1.25x5.375	17.00 - 19.75	1.0000	1.0000
L51	25	PL1.25x5.375	17.00 - 19.75	1.0000	1.0000
L51	26	PL1.25x5.375	17.00 - 19.75	1.0000	1.0000
L51	33	CCI-SFP-085125	17.00 - 19.75	1.0000	1.0000
L51	34	CCI-SFP-085125	17.00 - 19.75	1.0000	1.0000
L51	35	CCI-SFP-085125	17.00 - 19.75	1.0000	1.0000
L51	36	CCI-SFP-060100	17.00 - 19.75	1.0000	1.0000
L52	1	Safety Line 3/8	16.75 - 17.00	1.0000	1.0000
L52	21	Aero Channel MP303	16.75 - 17.00	1.0000	1.0000
L52	22	Aero Channel MP303	16.75 - 17.00	1.0000	1.0000
L52	23	Aero Channel MP303	16.75 - 17.00	1.0000	1.0000
L52	24	PL1.25x5.375	16.75 - 17.00	1.0000	1.0000
L52	25	PL1.25x5.375	16.75 - 17.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L52	26	PL1.25x5.375	16.75 - 17.00	1.0000	1.0000
L52	33	CCI-SFP-085125	16.75 - 17.00	1.0000	1.0000
L52	34	CCI-SFP-085125	16.75 - 17.00	1.0000	1.0000
L52	35	CCI-SFP-085125	16.75 - 17.00	1.0000	1.0000
L52	36	CCI-SFP-060100	16.75 - 17.00	1.0000	1.0000
L53	1	Safety Line 3/8	11.75 - 16.75	1.0000	1.0000
L53	21	Aero Channel MP303	11.75 - 16.75	1.0000	1.0000
L53	22	Aero Channel MP303	11.75 - 16.75	1.0000	1.0000
L53	23	Aero Channel MP303	11.75 - 16.75	1.0000	1.0000
L53	24	PL1.25x5.375	11.75 - 16.75	1.0000	1.0000
L53	25	PL1.25x5.375	11.75 - 16.75	1.0000	1.0000
L53	26	PL1.25x5.375	11.75 - 16.75	1.0000	1.0000
L53	33	CCI-SFP-085125	11.75 - 16.75	1.0000	1.0000
L53	34	CCI-SFP-085125	11.75 - 16.75	1.0000	1.0000
L53	35	CCI-SFP-085125	11.75 - 16.75	1.0000	1.0000
L53	36	CCI-SFP-060100	15.00 - 16.75	1.0000	1.0000
L54	1	Safety Line 3/8	9.00 - 11.75	1.0000	1.0000
L54	21	Aero Channel MP303	6.75 - 11.75	1.0000	1.0000
L54	22	Aero Channel MP303	6.75 - 11.75	1.0000	1.0000
L54	23	Aero Channel MP303	6.75 - 11.75	1.0000	1.0000
L54	24	PL1.25x5.375	6.75 - 11.75	1.0000	1.0000
L54	25	PL1.25x5.375	6.75 - 11.75	1.0000	1.0000
L54	26	PL1.25x5.375	6.75 - 11.75	1.0000	1.0000
L54	33	CCI-SFP-085125	6.75 - 11.75	1.0000	1.0000
L54	34	CCI-SFP-085125	6.75 - 11.75	1.0000	1.0000
L54	35	CCI-SFP-085125	6.75 - 11.75	1.0000	1.0000
L55	21	Aero Channel MP303	1.75 - 6.75	1.0000	1.0000
L55	22	Aero Channel MP303	1.75 - 6.75	1.0000	1.0000
L55	23	Aero Channel MP303	1.75 - 6.75	1.0000	1.0000
L55	24	PL1.25x5.375	1.75 - 6.75	1.0000	1.0000
L55	25	PL1.25x5.375	1.75 - 6.75	1.0000	1.0000
L55	26	PL1.25x5.375	1.75 - 6.75	1.0000	1.0000
L55	33	CCI-SFP-085125	1.75 - 6.75	1.0000	1.0000
L55	34	CCI-SFP-085125	1.75 - 6.75	1.0000	1.0000
L55	35	CCI-SFP-085125	1.75 - 6.75	1.0000	1.0000
L56	21	Aero Channel MP303	0.50 - 1.75	1.0000	1.0000
L56	22	Aero Channel MP303	0.50 - 1.75	1.0000	1.0000
L56	23	Aero Channel MP303	0.50 - 1.75	1.0000	1.0000
L56	24	PL1.25x5.375	0.00 - 1.75	1.0000	1.0000
L56	25	PL1.25x5.375	0.00 - 1.75	1.0000	1.0000
L56	26	PL1.25x5.375	0.00 - 1.75	1.0000	1.0000
L56	33	CCI-SFP-085125	0.00 - 1.75	1.0000	1.0000
L56	34	CCI-SFP-085125	0.00 - 1.75	1.0000	1.0000
L56	35	CCI-SFP-085125	0.00 - 1.75	1.0000	1.0000

Discrete Tower Loads

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
159											
Platform Mount [LP 714-1]	C	None				0.0000	159.00	No Ice	37.47	37.47	1.60
								1/2" Ice	44.23	44.23	2.04
								1" Ice	50.99	50.99	2.48
								2" Ice	64.51	64.51	3.36
(2) 6'x2" Mount Pipe	A	From Leg	3.00	0.00	0.00	0.0000	159.00	No Ice	1.43	1.43	0.02
								1/2" Ice	1.92	1.92	0.03
								1" Ice	2.29	2.29	0.05
								2" Ice	3.06	3.06	0.09
(2) 6'x2" Mount Pipe	B	From Leg	3.00	0.00	0.00	0.0000	159.00	No Ice	1.43	1.43	0.02
								1/2" Ice	1.92	1.92	0.03
								1" Ice	2.29	2.29	0.05
								2" Ice	3.06	3.06	0.09
(2) 6'x2" Mount Pipe	C	From Leg	3.00	0.00	0.00	0.0000	159.00	No Ice	1.43	1.43	0.02
								1/2" Ice	1.92	1.92	0.03
								1" Ice	2.29	2.29	0.05
								2" Ice	3.06	3.06	0.09
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	3.00	6.00	0.00	0.0000	159.00	No Ice	8.26	6.95	0.08
								1/2" Ice	8.82	8.13	0.15
								1" Ice	9.35	9.02	0.23
								2" Ice	10.42	10.84	0.41
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	3.00	6.00	0.00	0.0000	159.00	No Ice	8.26	6.95	0.08
								1/2" Ice	8.82	8.13	0.15
								1" Ice	9.35	9.02	0.23
								2" Ice	10.42	10.84	0.41
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	3.00	6.00	0.00	0.0000	159.00	No Ice	8.26	6.95	0.08
								1/2" Ice	8.82	8.13	0.15
								1" Ice	9.35	9.02	0.23
								2" Ice	10.42	10.84	0.41
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	3.00	-6.00	0.00	0.0000	159.00	No Ice	6.58	4.96	0.08
								1/2" Ice	7.03	5.75	0.13
								1" Ice	7.47	6.47	0.19
								2" Ice	8.38	7.94	0.34
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	3.00	-6.00	0.00	0.0000	159.00	No Ice	6.58	4.96	0.08
								1/2" Ice	7.03	5.75	0.13
								1" Ice	7.47	6.47	0.19
								2" Ice	8.38	7.94	0.34
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	3.00	-6.00	0.00	0.0000	159.00	No Ice	6.58	4.96	0.08
								1/2" Ice	7.03	5.75	0.13
								1" Ice	7.47	6.47	0.19
								2" Ice	8.38	7.94	0.34
TD-RRH8x20-25	A	From Leg	3.00	0.00	0.00	0.0000	159.00	No Ice	4.05	1.53	0.07
								1/2" Ice	4.30	1.71	0.10
								1" Ice	4.56	1.90	0.13
								2" Ice	5.10	2.30	0.20
TD-RRH8x20-25	B	From Leg	3.00	0.00	0.00	0.0000	159.00	No Ice	4.05	1.53	0.07
								1/2" Ice	4.30	1.71	0.10
								1" Ice	4.56	1.90	0.13
								2" Ice	5.10	2.30	0.20
TD-RRH8x20-25	C	From Leg	3.00	0.00	0.00	0.0000	159.00	No Ice	4.05	1.53	0.07
								1/2" Ice	4.30	1.71	0.10
								1" Ice	4.56	1.90	0.13
								2" Ice	5.10	2.30	0.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							2" Ice			
157										
Side Arm Mount [SO 102-3]	C	None			0.0000	157.00	No Ice	3.00	3.00	0.08
							1/2" Ice	3.48	3.48	0.11
							1" Ice	3.96	3.96	0.14
							2" Ice	4.92	4.92	0.20
Pipe Mount [PM 601-3]	C	None			0.0000	157.00	No Ice	4.39	4.39	0.20
							1/2" Ice	5.48	5.48	0.24
							1" Ice	6.57	6.57	0.28
							2" Ice	8.75	8.75	0.36
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00	0.00	0.0000	157.00	No Ice	2.32	2.24	0.06
			0.00				1/2" Ice	2.53	2.44	0.08
			0.00				1" Ice	2.74	2.65	0.11
							2" Ice	3.19	3.09	0.17
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00	0.00	0.0000	157.00	No Ice	2.32	2.24	0.06
			0.00				1/2" Ice	2.53	2.44	0.08
			-3.00				1" Ice	2.74	2.65	0.11
							2" Ice	3.19	3.09	0.17
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00	0.00	0.0000	157.00	No Ice	2.32	2.24	0.06
			0.00				1/2" Ice	2.53	2.44	0.08
			-3.00				1" Ice	2.74	2.65	0.11
							2" Ice	3.19	3.09	0.17
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00	0.00	0.0000	157.00	No Ice	2.06	1.93	0.06
			0.00				1/2" Ice	2.24	2.11	0.09
			-3.00				1" Ice	2.43	2.29	0.11
							2" Ice	2.83	2.68	0.17
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00	0.00	0.0000	157.00	No Ice	2.06	1.93	0.06
			0.00				1/2" Ice	2.24	2.11	0.09
			0.00				1" Ice	2.43	2.29	0.11
							2" Ice	2.83	2.68	0.17
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00	0.00	0.0000	157.00	No Ice	2.06	1.93	0.06
			0.00				1/2" Ice	2.24	2.11	0.09
			0.00				1" Ice	2.43	2.29	0.11
							2" Ice	2.83	2.68	0.17
152										
Side Arm Mount [SO 102-3]	C	None			0.0000	152.00	No Ice	3.00	3.00	0.08
							1/2" Ice	3.48	3.48	0.11
							1" Ice	3.96	3.96	0.14
							2" Ice	4.92	4.92	0.20
Pipe Mount [PM 601-3]	C	None			0.0000	152.00	No Ice	4.39	4.39	0.20
							1/2" Ice	5.48	5.48	0.24
							1" Ice	6.57	6.57	0.28
							2" Ice	8.75	8.75	0.36
RRUS-11	A	From Leg	2.00	0.00	0.0000	152.00	No Ice	2.78	1.19	0.05
			0.00				1/2" Ice	2.99	1.33	0.07
			0.00				1" Ice	3.21	1.49	0.09
							2" Ice	3.66	1.83	0.15
RRUS-11	B	From Leg	2.00	0.00	0.0000	152.00	No Ice	2.78	1.19	0.05
			0.00				1/2" Ice	2.99	1.33	0.07
			0.00				1" Ice	3.21	1.49	0.09
							2" Ice	3.66	1.83	0.15
RRUS-11	C	From Leg	2.00	0.00	0.0000	152.00	No Ice	2.78	1.19	0.05
			0.00				1/2"	2.99	1.33	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			Ice	3.21	1.49	0.09
						1" Ice	3.66	1.83	0.15
						2" Ice			
150									
Platform Mount [LP 303-1]	C	None		0.0000	150.00	No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						1" Ice	23.08	23.08	1.71
						2" Ice	31.50	31.50	2.18
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			0.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			0.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			0.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
HPA-65R-BUU-H8 w/ Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	13.21	9.58	0.10
			-6.00			1/2" Ice	13.90	11.05	0.20
			0.00			1" Ice	14.59	12.50	0.30
						2" Ice	15.91	14.75	0.55
HPA-65R-BUU-H8 w/ Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	13.21	9.58	0.10
			2.00			1/2" Ice	13.90	11.05	0.20
			0.00			1" Ice	14.59	12.50	0.30
						2" Ice	15.91	14.75	0.55
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	13.21	9.58	0.10
			2.00			1/2" Ice	13.90	11.05	0.20
			0.00			1" Ice	14.59	12.50	0.30
						2" Ice	15.91	14.75	0.55
DC6-48-60-18-8F	A	From Leg	1.00	0.0000	150.00	No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			0.00			1" Ice	1.64	1.64	0.06
						2" Ice	2.04	2.04	0.11
(2) LGP21401	A	From Leg	4.00	0.0000	150.00	No Ice	1.10	0.35	0.01
			-2.00			1/2" Ice	1.24	0.44	0.02
			0.00			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
(2) LGP21401	B	From Leg	4.00	0.0000	150.00	No Ice	1.10	0.35	0.01
			-6.00			1/2" Ice	1.24	0.44	0.02
			0.00			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
(2) LGP21401	C	From Leg	4.00	0.0000	150.00	No Ice	1.10	0.35	0.01
			-6.00			1/2" Ice	1.24	0.44	0.02
			0.00			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
(2) LGP21901	A	From Leg	4.00	0.0000	150.00	No Ice	0.23	0.16	0.01
			6.00			1/2" Ice	0.29	0.21	0.01
			0.00			1" Ice	0.36	0.28	0.01
						2" Ice	0.53	0.42	0.02
(2) LGP21901	B	From Leg	4.00	0.0000	150.00	No Ice	0.23	0.16	0.01

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
			6.00 0.00			1/2" Ice 1" Ice 2" Ice	0.29 0.36 0.53	0.21 0.28 0.42	0.01 0.01 0.02
(2) LGP21901	C	From Leg	4.00 6.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.23 0.29 0.36 0.53	0.16 0.21 0.28 0.42	0.01 0.01 0.01 0.02
RRUS 32 B2	A	From Leg	4.00 -6.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	B	From Leg	4.00 2.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	C	From Leg	4.00 2.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
(4) 7020.00	A	From Leg	4.00 2.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.10 0.15 0.20 0.33	0.17 0.24 0.31 0.48	0.00 0.01 0.01 0.02
(4) 7020.00	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.10 0.15 0.20 0.33	0.17 0.24 0.31 0.48	0.00 0.01 0.01 0.02
(4) 7020.00	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.10 0.15 0.20 0.33	0.17 0.24 0.31 0.48	0.00 0.01 0.01 0.02
1001983	A	From Leg	4.00 6.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.18 0.23 0.30 0.44	0.08 0.13 0.18 0.30	0.00 0.00 0.01 0.01
1001983	B	From Leg	4.00 6.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.18 0.23 0.30 0.44	0.08 0.13 0.18 0.30	0.00 0.00 0.01 0.01
1001983	C	From Leg	4.00 6.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.18 0.23 0.30 0.44	0.08 0.13 0.18 0.30	0.00 0.00 0.01 0.01
*** T-Arm Mount [TA 602-3]	C	None		0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.59 15.44 19.29 26.99	11.59 15.44 19.29 26.99	0.77 0.99 1.21 1.64
6'x2" Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
6'x2" Mount Pipe	B	From Leg	3.00	0.00	0.0000	139.00	No Ice	1.43	1.43	0.02
			0.00				1/2" Ice	1.92	1.92	0.03
							1" Ice	2.29	2.29	0.05
							2" Ice	3.06	3.06	0.09
6'x2" Mount Pipe	C	From Leg	3.00	0.00	0.0000	139.00	No Ice	1.43	1.43	0.02
			0.00				1/2" Ice	1.92	1.92	0.03
							1" Ice	2.29	2.29	0.05
							2" Ice	3.06	3.06	0.09
APXV18-203219-C-A20 w/ Mount Pipe	A	From Leg	3.00	-6.00	0.0000	139.00	No Ice	5.76	4.00	0.06
			0.00				1/2" Ice	6.19	4.74	0.11
							1" Ice	6.62	5.43	0.16
							2" Ice	7.49	6.85	0.29
APXV18-203219-C-A20 w/ Mount Pipe	B	From Leg	3.00	-6.00	0.0000	139.00	No Ice	5.76	4.00	0.06
			0.00				1/2" Ice	6.19	4.74	0.11
							1" Ice	6.62	5.43	0.16
							2" Ice	7.49	6.85	0.29
APXV18-203219-C-A20 w/ Mount Pipe	C	From Leg	3.00	-6.00	0.0000	139.00	No Ice	5.76	4.00	0.06
			0.00				1/2" Ice	6.19	4.74	0.11
							1" Ice	6.62	5.43	0.16
							2" Ice	7.49	6.85	0.29
LNX-6512DS-VTM w/ Mount Pipe	A	From Leg	3.00	6.00	0.0000	139.00	No Ice	5.33	4.53	0.05
			0.00				1/2" Ice	5.72	5.15	0.10
							1" Ice	6.12	5.77	0.15
							2" Ice	6.94	7.07	0.28
LNX-6512DS-VTM w/ Mount Pipe	B	From Leg	3.00	6.00	0.0000	139.00	No Ice	5.33	4.53	0.05
			0.00				1/2" Ice	5.72	5.15	0.10
							1" Ice	6.12	5.77	0.15
							2" Ice	6.94	7.07	0.28
LNX-6512DS-VTM w/ Mount Pipe	C	From Leg	3.00	6.00	0.0000	139.00	No Ice	5.33	4.53	0.05
			0.00				1/2" Ice	5.72	5.15	0.10
							1" Ice	6.12	5.77	0.15
							2" Ice	6.94	7.07	0.28
TMAT7LA-11A	A	From Leg	3.00	0.00	0.0000	139.00	No Ice	0.64	0.35	0.02
			0.00				1/2" Ice	0.75	0.42	0.03
							1" Ice	0.86	0.51	0.04
							2" Ice	1.10	0.69	0.06
TMAT7LA-11A	B	From Leg	3.00	0.00	0.0000	139.00	No Ice	0.64	0.35	0.02
			0.00				1/2" Ice	0.75	0.42	0.03
							1" Ice	0.86	0.51	0.04
							2" Ice	1.10	0.69	0.06
TMAT7LA-11A	C	From Leg	3.00	0.00	0.0000	139.00	No Ice	0.64	0.35	0.02
			0.00				1/2" Ice	0.75	0.42	0.03
							1" Ice	0.86	0.51	0.04
							2" Ice	1.10	0.69	0.06
ATBT-BOTTOM-24V	A	From Leg	3.00	0.00	0.0000	139.00	No Ice	0.10	0.06	0.00
			0.00				1/2" Ice	0.15	0.10	0.00
							1" Ice	0.20	0.15	0.01
							2" Ice	0.32	0.26	0.01
ATBT-BOTTOM-24V	B	From Leg	3.00	0.00	0.0000	139.00	No Ice	0.10	0.06	0.00
			0.00				1/2" Ice	0.15	0.10	0.00
							1" Ice	0.20	0.15	0.01
							2" Ice	0.32	0.26	0.01

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
ATBT-BOTTOM-24V	C	From Leg	3.00 0.00 0.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.10 0.15 0.20 0.32	0.06 0.10 0.15 0.26	0.00 0.00 0.01 0.01
125 Platform Mount [LP 303-1]	C	None		0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.66 18.87 23.08 31.50	14.66 18.87 23.08 31.50	1.25 1.48 1.71 2.18
6'x2" Mount Pipe	A	From Leg	3.00 6.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
6'x2" Mount Pipe	B	From Leg	3.00 6.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
6'x2" Mount Pipe	C	From Leg	3.00 6.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
QUAD656C0000X w/ Mount Pipe	A	From Leg	3.00 -6.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.48 14.10 14.68 15.87	7.33 8.55 9.50 11.38	0.08 0.17 0.28 0.51
QUAD656C0000X w/ Mount Pipe	B	From Leg	3.00 -6.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.48 14.10 14.68 15.87	7.33 8.55 9.50 11.38	0.08 0.17 0.28 0.51
QUAD656C0000X w/ Mount Pipe	C	From Leg	3.00 -6.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.48 14.10 14.68 15.87	7.33 8.55 9.50 11.38	0.08 0.17 0.28 0.51
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	3.00 3.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.44 9.00 9.53 10.62	7.10 8.30 9.21 11.06	0.07 0.14 0.21 0.40
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	3.00 3.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.44 9.00 9.53 10.62	7.10 8.30 9.21 11.06	0.07 0.14 0.21 0.40
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	3.00 3.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.44 9.00 9.53 10.62	7.10 8.30 9.21 11.06	0.07 0.14 0.21 0.40
AIRSCALE RRH 4T4R B5 160W	A	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.29 1.43 1.58 1.90	0.72 0.83 0.96 1.22	0.04 0.05 0.06 0.09
AIRSCALE RRH 4T4R B5 160W	B	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	1.29 1.43 1.58 1.90	0.72 0.83 0.96 1.22	0.04 0.05 0.06 0.09

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" Ice			
AIRSCALE RRH 4T4R B5 160W	C	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.29 1.43 1.58 1.90	0.72 0.83 0.96 1.22	0.04 0.05 0.06 0.09
DB-T1-6Z-8AB-0Z	A	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	0.04 0.08 0.12 0.21
DB-T1-6Z-8AB-0Z	C	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	0.04 0.08 0.12 0.21
B25 RRH4X30	A	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.74 1.92 2.11 2.50	0.06 0.08 0.10 0.16
B25 RRH4X30	B	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.74 1.92 2.11 2.50	0.06 0.08 0.10 0.16
B25 RRH4X30	C	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.74 1.92 2.11 2.50	0.06 0.08 0.10 0.16
B66A RRH4X45	A	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.58 2.79 3.01 3.48	1.63 1.81 2.00 2.40	0.06 0.08 0.10 0.16
B66A RRH4X45	B	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.58 2.79 3.01 3.48	1.63 1.81 2.00 2.40	0.06 0.08 0.10 0.16
B66A RRH4X45	C	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.58 2.79 3.01 3.48	1.63 1.81 2.00 2.40	0.06 0.08 0.10 0.16
B13 RRH 4X30	A	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.06 2.24 2.43 2.84	1.32 1.48 1.64 2.00	0.06 0.07 0.09 0.14
B13 RRH 4X30	B	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.06 2.24 2.43 2.84	1.32 1.48 1.64 2.00	0.06 0.07 0.09 0.14
B13 RRH 4X30	C	From Leg	3.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.06 2.24 2.43 2.84	1.32 1.48 1.64 2.00	0.06 0.07 0.09 0.14
109 DB589	B	From Leg	6.00 0.00 5.00	0.0000	109.00	No Ice 1/2" Ice	2.13 3.00 3.76	2.13 3.00 3.76	0.01 0.03 0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	4.82	4.82	0.11
						2" Ice			
Side Arm Mount [SO 701-1]	B	From Leg	3.00 0.00 0.00	0.0000	109.00	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
						2" Ice	2.01	4.35	0.12
Side Arm Mount [SO 201-1]	B	From Leg	1.00 0.00 0.00	0.0000	109.00	No Ice	2.96	2.11	0.10
						1/2" Ice	4.10	2.93	0.12
						1" Ice	5.24	3.75	0.14
						2" Ice	7.52	5.39	0.18
**********									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service

Comb. No.	Description
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	159.857 - 154.857	Pole	Max Tension	36	0.00	-0.00	0.00
			Max. Compression	26	-7.92	0.02	0.01
			Max. Mx	20	-3.17	22.43	-0.00
			Max. My	14	-3.15	0.03	-22.46
			Max. Vy	20	-6.21	22.43	-0.00
			Max. Vx	14	6.22	0.03	-22.46
			Max. Torque	19			-0.00
L2	154.857 - 149.857	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15.29	4.20	0.17
			Max. Mx	20	-5.99	57.61	0.03
			Max. My	2	-5.99	0.84	56.33
			Max. Vy	20	-11.46	57.61	0.03
			Max. Vx	14	11.47	0.83	-56.32
			Max. Torque	2			4.82
L3	149.857 - 144.857	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15.82	4.26	0.18
			Max. Mx	20	-6.32	115.67	0.03
			Max. My	14	-6.29	0.91	-114.45
			Max. Vy	20	-11.77	115.67	0.03
			Max. Vx	14	11.79	0.91	-114.45
			Max. Torque	2			4.82
L4	144.857 - 139.857	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-16.38	4.31	0.19
			Max. Mx	20	-6.69	175.29	0.02
			Max. My	14	-6.66	0.97	-174.15
			Max. Vy	20	-12.09	175.29	0.02
			Max. Vx	14	12.10	0.97	-174.15
			Max. Torque	2			4.82
L5	139.857 - 134.857	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.32	4.35	0.20
			Max. Mx	20	-8.40	245.34	0.02
			Max. My	14	-8.37	1.03	-244.30
			Max. Vy	20	-14.54	245.34	0.02
			Max. Vx	14	14.56	1.03	-244.30
			Max. Torque	2			4.81
L6	134.857 - 129.857	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.98	4.38	0.22
			Max. Mx	20	-8.91	318.79	0.01
			Max. My	14	-8.87	1.07	-317.86
			Max. Vy	20	-14.85	318.79	0.01
			Max. Vx	14	14.88	1.07	-317.86
			Max. Torque	2			4.81
L7	129.857 - 125.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.57	4.40	0.23
			Max. Mx	20	-9.35	380.29	0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	14	-9.31	1.10	-379.46
			Max. Vy	20	-15.11	380.29	0.01
			Max. Vx	14	15.13	1.10	-379.46
			Max. Torque	2			4.80
L8	125.75 - 125.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.61	4.40	0.23
			Max. Mx	20	-9.39	384.07	0.01
			Max. My	14	-9.35	1.10	-383.24
			Max. Vy	20	-15.12	384.07	0.01
			Max. Vx	14	15.16	1.10	-383.24
			Max. Torque	2			4.80
L9	125.5 - 118.978	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.33	5.01	0.58
			Max. Mx	20	-12.53	446.22	-0.12
			Max. My	14	-12.46	1.47	-445.66
			Max. Vy	20	-20.48	446.22	-0.12
			Max. Vx	14	20.71	1.47	-445.66
			Max. Torque	2			5.07
L10	118.978 - 117.978	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.95	5.03	0.59
			Max. Mx	20	-13.66	544.36	-0.35
			Max. My	14	-13.57	1.72	-545.48
			Max. Vy	20	-20.86	544.36	-0.35
			Max. Vx	14	21.34	1.72	-545.48
			Max. Torque	2			5.06
L11	117.978 - 112.978	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.27	5.04	0.60
			Max. Mx	20	-14.64	649.58	-0.59
			Max. My	14	-14.53	1.99	-653.76
			Max. Vy	20	-21.24	649.58	-0.59
			Max. Vx	14	21.99	1.99	-653.76
			Max. Torque	2			5.06
L12	112.978 - 107.978	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.98	3.82	-0.10
			Max. Mx	20	-15.83	756.94	-1.13
			Max. My	14	-15.70	1.76	-766.44
			Max. Vy	20	-21.91	756.94	-1.13
			Max. Vx	14	22.94	1.76	-766.44
			Max. Torque	2			5.06
L13	107.978 - 103	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.38	3.84	-0.10
			Max. Mx	20	-16.83	867.57	-1.37
			Max. My	14	-16.71	2.01	-882.25
			Max. Vy	20	-22.56	867.57	-1.37
			Max. Vx	14	23.62	2.01	-882.25
			Max. Torque	3			3.95
L14	103 - 102.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.47	3.84	-0.11
			Max. Mx	20	-16.91	873.21	-1.38
			Max. My	14	-16.79	2.03	-888.15
			Max. Vy	20	-22.58	873.21	-1.38
			Max. Vx	14	23.64	2.03	-888.15
			Max. Torque	3			3.95
L15	102.75 - 100.208	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.37	3.85	-0.10
			Max. Mx	20	-17.54	931.06	-1.50
			Max. My	14	-17.42	2.16	-948.74
			Max. Vy	20	-22.95	931.06	-1.50
			Max. Vx	14	24.04	2.16	-948.74
			Max. Torque	3			3.95
L16	100.208 - 95.6875	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	-36.45	3.85	-0.10
			Max. Mx	20	-17.61	935.36	-1.51
			Max. My	14	-17.49	2.17	-953.24
			Max. Vy	20	-22.97	935.36	-1.51
			Max. Vx	14	24.06	2.17	-953.24
			Max. Torque	3			3.94
L17	95.6875 - 94.6875	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.90	3.85	-0.09
			Max. Mx	20	-20.18	1060.19	-1.77
			Max. My	14	-20.06	2.44	-1084.14
			Max. Vy	20	-23.84	1060.19	-1.77
			Max. Vx	14	25.02	2.44	-1084.14
			Max. Torque	3			3.94
L18	94.6875 - 93.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.42	3.85	-0.09
			Max. Mx	20	-20.54	1088.59	-1.83
			Max. My	14	-20.41	2.50	-1113.96
			Max. Vy	20	-24.02	1088.59	-1.83
			Max. Vx	14	25.23	2.50	-1113.96
			Max. Torque	3			3.94
L19	93.5 - 93.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.55	3.85	-0.09
			Max. Mx	20	-20.64	1094.60	-1.84
			Max. My	14	-20.51	2.51	-1120.27
			Max. Vy	20	-24.05	1094.60	-1.84
			Max. Vx	14	25.26	2.51	-1120.27
			Max. Torque	3			3.94
L20	93.25 - 89.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.53	3.83	-0.08
			Max. Mx	20	-22.05	1192.05	-2.04
			Max. My	14	-21.93	2.72	-1222.73
			Max. Vy	20	-24.68	1192.05	-2.04
			Max. Vx	14	25.98	2.72	-1222.73
			Max. Torque	3			3.94
L21	89.25 - 89	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.66	3.83	-0.08
			Max. Mx	20	-22.15	1198.22	-2.05
			Max. My	14	-22.03	2.73	-1229.23
			Max. Vy	20	-24.72	1198.22	-2.05
			Max. Vx	14	26.02	2.73	-1229.23
			Max. Torque	3			3.94
L22	89 - 86.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.96	3.82	-0.07
			Max. Mx	20	-23.08	1260.51	-2.17
			Max. My	14	-22.95	2.86	-1294.83
			Max. Vy	20	-25.12	1260.51	-2.17
			Max. Vx	14	26.48	2.86	-1294.83
			Max. Torque	3			3.94
L23	86.5 - 86.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.07	3.82	-0.07
			Max. Mx	20	-23.17	1266.79	-2.18
			Max. My	14	-23.04	2.87	-1301.46
			Max. Vy	20	-25.15	1266.79	-2.18
			Max. Vx	14	26.52	2.87	-1301.46
			Max. Torque	3			3.94
L24	86.25 - 81.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.31	3.80	-0.06
			Max. Mx	20	-24.80	1394.40	-2.42
			Max. My	14	-24.67	3.13	-1436.09
			Max. Vy	20	-25.91	1394.40	-2.42
			Max. Vx	14	27.35	3.13	-1436.09
			Max. Torque	3			3.94
L25	81.25 - 76.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.55	3.77	-0.05

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	20	-26.46	1525.73	-2.67
			Max. My	14	-26.34	3.38	-1574.85
			Max. Vy	20	-26.64	1525.73	-2.67
			Max. Vx	14	28.17	3.38	-1574.85
			Max. Torque	3			3.94
L26	76.25 - 75.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.95	3.77	-0.04
			Max. Mx	20	-26.74	1547.97	-2.71
			Max. My	14	-26.62	3.42	-1598.37
			Max. Vy	20	-26.77	1547.97	-2.71
			Max. Vx	14	28.31	3.42	-1598.37
			Max. Torque	3			3.94
L27	75.417 - 75.167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.08	3.77	-0.04
			Max. Mx	20	-26.84	1554.66	-2.72
			Max. My	14	-26.72	3.43	-1605.45
			Max. Vy	20	-26.80	1554.66	-2.72
			Max. Vx	14	28.35	3.43	-1605.45
			Max. Torque	3			3.94
L28	75.167 - 70.167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.65	3.75	-0.03
			Max. Mx	20	-28.70	1690.60	-2.96
			Max. My	14	-28.58	3.68	-1749.38
			Max. Vy	20	-27.59	1690.60	-2.96
			Max. Vx	14	29.24	3.68	-1749.38
			Max. Torque	3			3.94
L29	70.167 - 65.167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.25	3.73	-0.02
			Max. Mx	20	-30.59	1830.42	-3.21
			Max. My	14	-30.47	3.93	-1897.68
			Max. Vy	20	-28.36	1830.42	-3.21
			Max. Vx	14	30.11	3.93	-1897.68
			Max. Torque	3			3.94
L30	65.167 - 60.167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.88	3.70	-0.00
			Max. Mx	20	-32.50	1974.07	-3.45
			Max. My	14	-32.39	4.18	-2050.30
			Max. Vy	20	-29.12	1974.07	-3.45
			Max. Vx	14	30.97	4.18	-2050.30
			Max. Torque	3			3.94
L31	60.167 - 59.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.23	3.70	-0.00
			Max. Mx	20	-32.77	1993.52	-3.48
			Max. My	14	-32.66	4.21	-2070.99
			Max. Vy	20	-29.22	1993.52	-3.48
			Max. Vx	14	31.08	4.21	-2070.99
			Max. Torque	3			3.94
L32	59.5 - 59.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.36	3.70	-0.00
			Max. Mx	20	-32.87	2000.83	-3.49
			Max. My	14	-32.76	4.22	-2078.76
			Max. Vy	20	-29.26	2000.83	-3.49
			Max. Vx	14	31.11	4.22	-2078.76
			Max. Torque	3			3.94
L33	59.25 - 54.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.02	3.66	0.02
			Max. Mx	20	-34.81	2148.96	-3.73
			Max. My	14	-34.71	4.47	-2236.43
			Max. Vy	20	-30.02	2148.96	-3.73
			Max. Vx	14	31.97	4.47	-2236.43
			Max. Torque	3			3.94
L34	54.25 - 53	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	-60.70	3.64	0.03
			Max. Mx	20	-35.31	2186.58	-3.79
			Max. My	14	-35.20	4.53	-2276.52
			Max. Vy	20	-30.20	2186.58	-3.79
			Max. Vx	14	32.19	4.53	-2276.52
			Max. Torque	3			3.94
L35	53 - 52.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.84	3.64	0.03
			Max. Mx	20	-35.41	2194.14	-3.81
			Max. My	14	-35.31	4.54	-2284.57
			Max. Vy	20	-30.23	2194.14	-3.81
			Max. Vx	14	32.23	4.54	-2284.57
			Max. Torque	3			3.94
L36	52.75 - 47.0608	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.90	3.63	0.04
			Max. Mx	20	-35.46	2197.34	-3.81
			Max. My	14	-35.35	4.55	-2287.98
			Max. Vy	20	-30.25	2197.34	-3.81
			Max. Vx	14	32.24	4.55	-2287.98
			Max. Torque	3			3.94
L37	47.0608 - 46.0608	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.04	3.52	0.10
			Max. Mx	20	-40.19	2400.09	-4.13
			Max. My	14	-40.08	4.87	-2504.43
			Max. Vy	20	-31.35	2400.09	-4.13
			Max. Vx	14	33.50	4.87	-2504.43
			Max. Torque	3			3.94
L38	46.0608 - 41.0608	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-69.90	3.50	0.11
			Max. Mx	20	-42.36	2558.51	-4.37
			Max. My	14	-42.27	5.12	-2673.83
			Max. Vy	20	-32.05	2558.51	-4.37
			Max. Vx	14	34.29	5.12	-2673.83
			Max. Torque	3			3.94
L39	41.0608 - 39.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-70.92	3.49	0.12
			Max. Mx	20	-43.12	2614.16	-4.45
			Max. My	14	-43.02	5.20	-2733.39
			Max. Vy	20	-32.30	2614.16	-4.45
			Max. Vx	14	34.58	5.20	-2733.39
			Max. Torque	3			3.93
L40	39.33 - 39.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.08	3.49	0.12
			Max. Mx	20	-43.25	2622.24	-4.46
			Max. My	14	-43.16	5.21	-2742.03
			Max. Vy	20	-32.32	2622.24	-4.46
			Max. Vx	14	34.60	5.21	-2742.03
			Max. Torque	3			3.93
L41	39.08 - 37.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.93	3.48	0.12
			Max. Mx	20	-43.88	2665.35	-4.53
			Max. My	14	-43.78	5.28	-2788.19
			Max. Vy	20	-32.52	2665.35	-4.53
			Max. Vx	14	34.83	5.28	-2788.19
			Max. Torque	3			3.93
L42	37.75 - 37.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.08	3.48	0.12
			Max. Mx	20	-44.00	2673.48	-4.54
			Max. My	14	-43.91	5.29	-2796.90
			Max. Vy	20	-32.55	2673.48	-4.54
			Max. Vx	14	34.86	5.29	-2796.90
			Max. Torque	3			3.93
L43	37.5 - 32.5	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	-75.01	3.46	0.14
			Max. Mx	20	-46.22	2837.86	-4.78
			Max. My	14	-46.14	5.53	-2973.03
			Max. Vy	20	-33.23	2837.86	-4.78
			Max. Vx	14	35.62	5.53	-2973.03
			Max. Torque	3			3.93
L44	32.5 - 29.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.61	3.45	0.14
			Max. Mx	20	-47.45	2929.68	-4.91
			Max. My	14	-47.38	5.66	-3071.49
			Max. Vy	20	-33.59	2929.68	-4.91
			Max. Vx	14	36.02	5.66	-3071.49
			Max. Torque	3			3.93
L45	29.75 - 29.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.76	3.44	0.14
			Max. Mx	20	-47.58	2938.08	-4.92
			Max. My	14	-47.51	5.67	-3080.49
			Max. Vy	20	-33.60	2938.08	-4.92
			Max. Vx	14	36.04	5.67	-3080.49
			Max. Torque	3			3.93
L46	29.5 - 24.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.70	3.43	0.16
			Max. Mx	20	-49.85	3107.67	-5.16
			Max. My	14	-49.79	5.91	-3262.44
			Max. Vy	20	-34.26	3107.67	-5.16
			Max. Vx	14	36.76	5.91	-3262.44
			Max. Torque	3			3.93
L47	24.5 - 21.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-81.66	3.48	0.21
			Max. Mx	20	-51.35	3219.68	-5.31
			Max. My	14	-51.29	6.07	-3382.67
			Max. Vy	20	-34.70	3219.68	-5.31
			Max. Vx	14	37.26	6.07	-3382.67
			Max. Torque	3			3.93
L48	21.25 - 21	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-81.82	3.48	0.21
			Max. Mx	20	-51.48	3228.36	-5.33
			Max. My	14	-51.43	6.08	-3391.99
			Max. Vy	20	-34.73	3228.36	-5.33
			Max. Vx	14	37.28	6.08	-3391.99
			Max. Torque	3			3.93
L49	21 - 20	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-82.47	3.50	0.23
			Max. Mx	20	-51.99	3263.15	-5.37
			Max. My	14	-51.93	6.12	-3429.35
			Max. Vy	20	-34.88	3263.15	-5.37
			Max. Vx	14	37.45	6.12	-3429.35
			Max. Torque	3			3.93
L50	20 - 19.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-82.64	3.50	0.23
			Max. Mx	20	-52.13	3271.87	-5.38
			Max. My	14	-52.08	6.14	-3438.71
			Max. Vy	20	-34.90	3271.87	-5.38
			Max. Vx	14	37.48	6.14	-3438.71
			Max. Torque	3			3.93
L51	19.75 - 17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.54	3.53	0.26
			Max. Mx	20	-53.62	3368.37	-5.51
			Max. My	14	-53.57	6.27	-3542.36
			Max. Vy	20	-35.31	3368.37	-5.51
			Max. Vx	14	37.93	6.27	-3542.36
			Max. Torque	3			3.93
L52	17 - 16.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.71	3.53	0.26
			Max. Mx	20	-53.76	3377.20	-5.53
			Max. My	14	-53.72	6.28	-3551.85
			Max. Vy	20	-35.33	3377.20	-5.53
			Max. Vx	14	37.96	6.28	-3551.85
			Max. Torque	3			3.93

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L53	16.75 - 11.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-88.01	3.53	0.29
			Max. Mx	20	-56.38	3555.55	-5.76
			Max. My	14	-56.35	6.51	-3743.54
			Max. Vy	20	-36.03	3555.55	-5.76
			Max. Vx	14	38.74	6.51	-3743.54
			Max. Torque	3			3.93
L54	11.75 - 6.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.30	3.52	0.30
			Max. Mx	20	-59.04	3737.34	-5.99
			Max. My	14	-59.02	6.74	-3939.07
			Max. Vy	20	-36.72	3737.34	-5.99
			Max. Vx	14	39.51	6.74	-3939.07
			Max. Torque	3			3.93
L55	6.75 - 1.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-94.54	3.52	0.30
			Max. Mx	20	-61.72	3922.54	-6.23
			Max. My	14	-61.72	6.97	-4138.45
			Max. Vy	20	-37.40	3922.54	-6.23
			Max. Vx	14	40.28	6.97	-4138.45
			Max. Torque	3			3.93
L56	1.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-95.65	3.52	0.30
			Max. Mx	20	-62.66	3988.18	-6.31
			Max. My	14	-62.66	7.05	-4209.13
			Max. Vy	20	-37.66	3988.18	-6.31
			Max. Vx	14	40.56	7.05	-4209.13
			Max. Torque	3			3.93

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	95.65	0.00	0.00
	Max. H_x	20	62.68	37.63	-0.05
	Max. H_z	3	47.01	-0.05	37.61
	Max. M_x	2	3992.63	-0.05	37.61
	Max. M_z	8	3986.26	-37.63	0.05
	Max. Torsion	3	3.93	-0.05	37.61
	Min. Vert	19	47.01	32.35	-18.73
	Min. H_x	8	62.68	-37.63	0.05
	Min. H_z	15	47.01	0.05	-40.53
	Min. M_x	14	-4209.13	0.05	-40.53
	Min. M_z	20	-3988.18	37.63	-0.05
	Min. Torsion	15	-3.92	0.05	-40.53

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	52.24	0.00	0.00	0.13	0.76	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	62.68	0.05	-37.61	-3992.63	-5.23	-3.93
0.9 Dead+1.0 Wind 0 deg - No Ice	47.01	0.05	-37.61	-3954.26	-5.42	-3.93
1.2 Dead+1.0 Wind 30 deg - No Ice	62.68	18.70	-32.39	-3436.55	-1983.28	-3.19
0.9 Dead+1.0 Wind 30 deg -	47.01	18.70	-32.39	-3403.51	-1964.43	-3.20

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
No Ice						
1.2 Dead+1.0 Wind 60 deg - No Ice	62.68	35.05	-20.29	-2109.48	-3640.83	-1.59
0.9 Dead+1.0 Wind 60 deg - No Ice	47.01	35.05	-20.29	-2089.51	-3606.53	-1.60
1.2 Dead+1.0 Wind 90 deg - No Ice	62.68	37.63	-0.05	-5.97	-3986.26	0.42
0.9 Dead+1.0 Wind 90 deg - No Ice	47.01	37.63	-0.05	-5.96	-3948.18	0.42
1.2 Dead+1.0 Wind 120 deg - No Ice	62.68	32.56	18.80	1991.99	-3449.02	2.33
0.9 Dead+1.0 Wind 120 deg - No Ice	47.01	32.56	18.80	1972.79	-3416.10	2.32
1.2 Dead+1.0 Wind 150 deg - No Ice	62.68	18.74	32.55	3454.96	-1986.62	3.61
0.9 Dead+1.0 Wind 150 deg - No Ice	47.01	18.74	32.55	3421.69	-1967.75	3.61
1.2 Dead+1.0 Wind 180 deg - No Ice	62.68	-0.05	40.53	4209.13	7.05	3.92
0.9 Dead+1.0 Wind 180 deg - No Ice	47.01	-0.05	40.53	4169.16	6.75	3.92
1.2 Dead+1.0 Wind 210 deg - No Ice	62.68	-18.70	32.39	3436.93	1985.14	3.19
0.9 Dead+1.0 Wind 210 deg - No Ice	47.01	-18.70	32.39	3403.79	1965.78	3.20
1.2 Dead+1.0 Wind 240 deg - No Ice	62.68	-32.35	18.73	1987.94	3431.56	1.60
0.9 Dead+1.0 Wind 240 deg - No Ice	47.01	-32.35	18.73	1968.75	3398.27	1.61
1.2 Dead+1.0 Wind 270 deg - No Ice	62.68	-37.63	0.05	6.31	3988.18	-0.42
0.9 Dead+1.0 Wind 270 deg - No Ice	47.01	-37.63	0.05	6.21	3949.58	-0.41
1.2 Dead+1.0 Wind 300 deg - No Ice	62.68	-34.96	-20.19	-2098.28	3635.54	-2.33
0.9 Dead+1.0 Wind 300 deg - No Ice	47.01	-34.96	-20.19	-2078.41	3600.80	-2.32
1.2 Dead+1.0 Wind 330 deg - No Ice	62.68	-18.74	-32.55	-3454.66	1988.47	-3.61
0.9 Dead+1.0 Wind 330 deg - No Ice	47.01	-18.74	-32.55	-3421.46	1969.10	-3.61
1.2 Dead+1.0 Ice	95.65	-0.00	-0.00	-0.30	3.52	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	95.65	0.01	-6.67	-796.95	2.72	-0.51
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	95.65	3.34	-5.78	-690.72	-394.89	-0.37
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	95.65	5.77	-3.34	-399.49	-685.70	-0.13
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	95.65	6.66	-0.01	-1.30	-791.77	0.14
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	95.65	5.77	3.33	397.15	-684.70	0.37
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	95.65	3.32	5.77	689.11	-393.16	0.51
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	95.65	-0.01	6.67	796.34	4.72	0.51
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	95.65	-3.34	5.78	690.11	402.33	0.37
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	95.65	-5.77	3.34	398.88	693.14	0.13
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	95.65	-6.66	0.01	0.69	799.21	-0.14
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	95.65	-5.77	-3.33	-397.77	692.14	-0.37
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	95.65	-3.32	-5.77	-689.72	400.60	-0.51
Dead+Wind 0 deg - Service	52.24	0.01	-6.65	-701.85	-0.28	-0.71
Dead+Wind 30 deg - Service	52.24	3.31	-5.73	-604.08	-348.05	-0.58
Dead+Wind 60 deg - Service	52.24	6.19	-3.59	-370.82	-639.56	-0.29

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+Wind 90 deg - Service	52.24	6.65	-0.01	-0.94	-700.21	0.07
Dead+Wind 120 deg - Service	52.24	5.75	3.32	350.33	-605.75	0.42
Dead+Wind 150 deg - Service	52.24	3.31	5.75	607.54	-348.64	0.65
Dead+Wind 180 deg - Service	52.24	-0.01	7.16	740.24	1.88	0.71
Dead+Wind 210 deg - Service	52.24	-3.31	5.73	604.36	349.65	0.58
Dead+Wind 240 deg - Service	52.24	-5.72	3.31	349.61	603.94	0.29
Dead+Wind 270 deg - Service	52.24	-6.65	0.01	1.22	701.81	-0.07
Dead+Wind 300 deg - Service	52.24	-6.18	-3.57	-368.84	639.90	-0.42
Dead+Wind 330 deg - Service	52.24	-3.31	-5.75	-607.26	350.24	-0.65

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-52.24	0.00	0.00	52.24	0.00	0.000%
2	0.05	-62.68	-37.61	-0.05	62.68	37.61	0.000%
3	0.05	-47.01	-37.61	-0.05	47.01	37.61	0.000%
4	18.70	-62.68	-32.39	-18.70	62.68	32.39	0.000%
5	18.70	-47.01	-32.39	-18.70	47.01	32.39	0.000%
6	35.05	-62.68	-20.29	-35.05	62.68	20.29	0.000%
7	35.05	-47.01	-20.29	-35.05	47.01	20.29	0.000%
8	37.63	-62.68	-0.05	-37.63	62.68	0.05	0.000%
9	37.63	-47.01	-0.05	-37.63	47.01	0.05	0.000%
10	32.56	-62.68	18.80	-32.56	62.68	-18.80	0.000%
11	32.56	-47.01	18.80	-32.56	47.01	-18.80	0.000%
12	18.74	-62.68	32.55	-18.74	62.68	-32.55	0.000%
13	18.74	-47.01	32.55	-18.74	47.01	-32.55	0.000%
14	-0.05	-62.68	40.53	0.05	62.68	-40.53	0.000%
15	-0.05	-47.01	40.53	0.05	47.01	-40.53	0.000%
16	-18.70	-62.68	32.39	18.70	62.68	-32.39	0.000%
17	-18.70	-47.01	32.39	18.70	47.01	-32.39	0.000%
18	-32.35	-62.68	18.73	32.35	62.68	-18.73	0.000%
19	-32.35	-47.01	18.73	32.35	47.01	-18.73	0.000%
20	-37.63	-62.68	0.05	37.63	62.68	-0.05	0.000%
21	-37.63	-47.01	0.05	37.63	47.01	-0.05	0.000%
22	-34.96	-62.68	-20.19	34.96	62.68	20.19	0.000%
23	-34.96	-47.01	-20.19	34.96	47.01	20.19	0.000%
24	-18.74	-62.68	-32.55	18.74	62.68	32.55	0.000%
25	-18.74	-47.01	-32.55	18.74	47.01	32.55	0.000%
26	0.00	-95.65	0.00	0.00	95.65	0.00	0.000%
27	0.01	-95.65	-6.67	-0.01	95.65	6.67	0.000%
28	3.34	-95.65	-5.78	-3.34	95.65	5.78	0.000%
29	5.77	-95.65	-3.34	-5.77	95.65	3.34	0.000%
30	6.66	-95.65	-0.01	-6.66	95.65	0.01	0.000%
31	5.77	-95.65	3.33	-5.77	95.65	-3.33	0.000%
32	3.32	-95.65	5.77	-3.32	95.65	-5.77	0.000%
33	-0.01	-95.65	6.67	0.01	95.65	-6.67	0.000%
34	-3.34	-95.65	5.78	3.34	95.65	-5.78	0.000%
35	-5.77	-95.65	3.34	5.77	95.65	-3.34	0.000%
36	-6.66	-95.65	0.01	6.66	95.65	-0.01	0.000%
37	-5.77	-95.65	-3.33	5.77	95.65	3.33	0.000%
38	-3.32	-95.65	-5.77	3.32	95.65	5.77	0.000%
39	0.01	-52.24	-6.65	-0.01	52.24	6.65	0.000%
40	3.31	-52.24	-5.73	-3.31	52.24	5.73	0.000%
41	6.19	-52.24	-3.59	-6.19	52.24	3.59	0.000%
42	6.65	-52.24	-0.01	-6.65	52.24	0.01	0.000%
43	5.75	-52.24	3.32	-5.75	52.24	-3.32	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
44	3.31	-52.24	5.75	-3.31	52.24	-5.75	0.000%
45	-0.01	-52.24	7.16	0.01	52.24	-7.16	0.000%
46	-3.31	-52.24	5.73	3.31	52.24	-5.73	0.000%
47	-5.72	-52.24	3.31	5.72	52.24	-3.31	0.000%
48	-6.65	-52.24	0.01	6.65	52.24	-0.01	0.000%
49	-6.18	-52.24	-3.57	6.18	52.24	3.57	0.000%
50	-3.31	-52.24	-5.75	3.31	52.24	5.75	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	6	0.00000001	0.00007320
3	Yes	5	0.00000001	0.00072883
4	Yes	6	0.00000001	0.00056457
5	Yes	6	0.00000001	0.00017919
6	Yes	6	0.00000001	0.00066377
7	Yes	6	0.00000001	0.00020936
8	Yes	5	0.00000001	0.00030159
9	Yes	5	0.00000001	0.00011176
10	Yes	6	0.00000001	0.00062374
11	Yes	6	0.00000001	0.00020025
12	Yes	6	0.00000001	0.00056456
13	Yes	6	0.00000001	0.00017892
14	Yes	6	0.00000001	0.00007757
15	Yes	5	0.00000001	0.00076686
16	Yes	6	0.00000001	0.00063206
17	Yes	6	0.00000001	0.00020357
18	Yes	6	0.00000001	0.00057892
19	Yes	6	0.00000001	0.00018417
20	Yes	5	0.00000001	0.00035260
21	Yes	5	0.00000001	0.00013985
22	Yes	6	0.00000001	0.00061899
23	Yes	6	0.00000001	0.00019354
24	Yes	6	0.00000001	0.00064028
25	Yes	6	0.00000001	0.00020618
26	Yes	4	0.00000001	0.00008332
27	Yes	5	0.00000001	0.00065324
28	Yes	6	0.00000001	0.00012100
29	Yes	6	0.00000001	0.00012832
30	Yes	5	0.00000001	0.00058568
31	Yes	6	0.00000001	0.00013205
32	Yes	6	0.00000001	0.00011910
33	Yes	5	0.00000001	0.00065416
34	Yes	6	0.00000001	0.00013830
35	Yes	6	0.00000001	0.00012885
36	Yes	5	0.00000001	0.00060807
37	Yes	6	0.00000001	0.00012559
38	Yes	6	0.00000001	0.00014094
39	Yes	5	0.00000001	0.00006877
40	Yes	5	0.00000001	0.00010527
41	Yes	5	0.00000001	0.00013426
42	Yes	5	0.00000001	0.00004392
43	Yes	5	0.00000001	0.00012730
44	Yes	5	0.00000001	0.00010614
45	Yes	5	0.00000001	0.00007149
46	Yes	5	0.00000001	0.00013497
47	Yes	5	0.00000001	0.00010810
48	Yes	5	0.00000001	0.00004443
49	Yes	5	0.00000001	0.00011723
50	Yes	5	0.00000001	0.00013904

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	159.857 - 154.857	18.386	49	1.2413	0.0151
L2	154.857 - 149.857	17.088	49	1.2354	0.0151
L3	149.857 - 144.857	15.805	49	1.2136	0.0150
L4	144.857 - 139.857	14.555	49	1.1706	0.0121
L5	139.857 - 134.857	13.361	45	1.1108	0.0096
L6	134.857 - 129.857	12.240	45	1.0380	0.0074
L7	129.857 - 125.75	11.200	45	0.9543	0.0056
L8	125.75 - 125.5	10.412	45	0.8798	0.0043
L9	125.5 - 118.978	10.367	45	0.8752	0.0042
L10	122.728 - 117.978	9.874	45	0.8212	0.0034
L11	117.978 - 112.978	9.072	45	0.7896	0.0030
L12	112.978 - 107.978	8.269	45	0.7432	0.0025
L13	107.978 - 103	7.517	45	0.6942	0.0020
L14	103 - 102.75	6.820	45	0.6426	0.0017
L15	102.75 - 100.208	6.786	45	0.6404	0.0017
L16	100.208 - 95.6875	6.451	45	0.6172	0.0016
L17	100.021 - 94.6875	6.427	45	0.6158	0.0015
L18	94.6875 - 93.5	5.750	45	0.5929	0.0014
L19	93.5 - 93.25	5.604	45	0.5844	0.0014
L20	93.25 - 89.25	5.573	45	0.5830	0.0014
L21	89.25 - 89	5.095	45	0.5586	0.0013
L22	89 - 86.5	5.066	45	0.5571	0.0013
L23	86.5 - 86.25	4.778	45	0.5425	0.0012
L24	86.25 - 81.25	4.750	45	0.5408	0.0012
L25	81.25 - 76.25	4.202	45	0.5048	0.0011
L26	76.25 - 75.417	3.693	45	0.4686	0.0009
L27	75.417 - 75.167	3.611	45	0.4626	0.0009
L28	75.167 - 70.167	3.587	45	0.4610	0.0009
L29	70.167 - 65.167	3.121	45	0.4284	0.0008
L30	65.167 - 60.167	2.690	45	0.3956	0.0007
L31	60.167 - 59.5	2.293	45	0.3624	0.0006
L32	59.5 - 59.25	2.243	45	0.3580	0.0006
L33	59.25 - 54.25	2.224	45	0.3563	0.0006
L34	54.25 - 53	1.868	45	0.3231	0.0005
L35	53 - 52.75	1.785	45	0.3148	0.0005
L36	52.75 - 47.0608	1.769	45	0.3131	0.0005
L37	52.6442 - 46.0608	1.762	45	0.3124	0.0005
L38	46.0608 - 41.0608	1.346	45	0.2872	0.0005
L39	41.0608 - 39.33	1.063	45	0.2538	0.0004
L40	39.33 - 39.08	0.973	45	0.2425	0.0004
L41	39.08 - 37.75	0.960	45	0.2410	0.0004
L42	37.75 - 37.5	0.894	45	0.2331	0.0004
L43	37.5 - 32.5	0.882	45	0.2315	0.0004
L44	32.5 - 29.75	0.657	45	0.1986	0.0003
L45	29.75 - 29.5	0.548	45	0.1804	0.0003
L46	29.5 - 24.5	0.538	45	0.1788	0.0003
L47	24.5 - 21.25	0.369	45	0.1458	0.0002
L48	21.25 - 21	0.277	45	0.1246	0.0002
L49	21 - 20	0.270	45	0.1230	0.0002
L50	20 - 19.75	0.245	45	0.1167	0.0002
L51	19.75 - 17	0.239	45	0.1153	0.0002
L52	17 - 16.75	0.177	45	0.0998	0.0001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L53	16.75 - 11.75	0.172	45	0.0983	0.0001
L54	11.75 - 6.75	0.084	45	0.0688	0.0001
L55	6.75 - 1.75	0.028	45	0.0394	0.0001
L56	1.75 - 0	0.002	45	0.0100	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
159.00	Platform Mount [LP 714-1]	49	18.163	1.2408	0.0151	20704
157.00	Side Arm Mount [SO 102-3]	49	17.643	1.2391	0.0150	20704
152.00	Side Arm Mount [SO 102-3]	49	16.352	1.2255	0.0153	12079
150.00	Platform Mount [LP 303-1]	49	15.841	1.2145	0.0150	9086
139.00	T-Arm Mount [TA 602-3]	45	13.164	1.0992	0.0092	4167
125.00	Platform Mount [LP 303-1]	45	10.276	0.8653	0.0041	3442
109.00	DB589	45	7.666	0.7044	0.0021	5681

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	159.857 - 154.857	104.328	14	7.0086	0.0849
L2	154.857 - 149.857	97.021	14	6.9753	0.0849
L3	149.857 - 144.857	89.796	14	6.8513	0.0843
L4	144.857 - 139.857	82.752	14	6.6189	0.0677
L5	139.857 - 134.857	76.000	14	6.2902	0.0536
L6	134.857 - 129.857	69.630	14	5.8866	0.0417
L7	129.857 - 125.75	63.715	14	5.4193	0.0314
L8	125.75 - 125.5	59.237	14	5.0020	0.0240
L9	125.5 - 118.978	58.976	14	4.9759	0.0236
L10	122.728 - 117.978	56.177	14	4.6728	0.0189
L11	117.978 - 112.978	51.614	14	4.4952	0.0166
L12	112.978 - 107.978	47.048	14	4.2309	0.0137
L13	107.978 - 103	42.766	14	3.9516	0.0113
L14	103 - 102.75	38.802	14	3.6580	0.0094
L15	102.75 - 100.208	38.611	14	3.6454	0.0094
L16	100.208 - 95.6875	36.706	14	3.5134	0.0086
L17	100.021 - 94.6875	36.569	14	3.5057	0.0086
L18	94.6875 - 93.5	32.718	14	3.3751	0.0080
L19	93.5 - 93.25	31.885	14	3.3269	0.0077
L20	93.25 - 89.25	31.711	14	3.3185	0.0077
L21	89.25 - 89	28.991	14	3.1797	0.0071
L22	89 - 86.5	28.825	14	3.1715	0.0071
L23	86.5 - 86.25	27.187	14	3.0881	0.0067
L24	86.25 - 81.25	27.025	14	3.0782	0.0067
L25	81.25 - 76.25	23.910	14	2.8737	0.0059
L26	76.25 - 75.417	21.010	14	2.6674	0.0052
L27	75.417 - 75.167	20.548	14	2.6335	0.0051

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L28	75.167 - 70.167	20.411	14	2.6243	0.0051
L29	70.167 - 65.167	17.761	14	2.4384	0.0045
L30	65.167 - 60.167	15.306	14	2.2520	0.0040
L31	60.167 - 59.5	13.048	14	2.0624	0.0035
L32	59.5 - 59.25	12.761	14	2.0374	0.0035
L33	59.25 - 54.25	12.655	14	2.0281	0.0034
L34	54.25 - 53	10.631	14	1.8388	0.0030
L35	53 - 52.75	10.156	14	1.7917	0.0029
L36	52.75 - 47.0608	10.062	14	1.7822	0.0029
L37	52.6442 - 46.0608	10.023	14	1.7782	0.0029
L38	46.0608 - 41.0608	7.659	14	1.6344	0.0026
L39	41.0608 - 39.33	6.047	14	1.4441	0.0022
L40	39.33 - 39.08	5.535	14	1.3800	0.0021
L41	39.08 - 37.75	5.463	14	1.3714	0.0021
L42	37.75 - 37.5	5.087	14	1.3265	0.0020
L43	37.5 - 32.5	5.018	14	1.3172	0.0020
L44	32.5 - 29.75	3.737	14	1.1298	0.0016
L45	29.75 - 29.5	3.116	14	1.0265	0.0015
L46	29.5 - 24.5	3.063	14	1.0172	0.0014
L47	24.5 - 21.25	2.096	14	0.8292	0.0011
L48	21.25 - 21	1.573	14	0.7089	0.0010
L49	21 - 20	1.536	14	0.6998	0.0009
L50	20 - 19.75	1.393	14	0.6640	0.0009
L51	19.75 - 17	1.359	14	0.6561	0.0009
L52	17 - 16.75	1.006	14	0.5677	0.0007
L53	16.75 - 11.75	0.977	14	0.5594	0.0007
L54	11.75 - 6.75	0.479	14	0.3914	0.0005
L55	6.75 - 1.75	0.157	14	0.2240	0.0003
L56	1.75 - 0	0.010	14	0.0570	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
159.00	Platform Mount [LP 714-1]	14	103.073	7.0059	0.0847	3742
157.00	Side Arm Mount [SO 102-3]	14	100.147	6.9966	0.0845	3742
152.00	Side Arm Mount [SO 102-3]	14	92.876	6.9179	0.0860	2242
150.00	Platform Mount [LP 303-1]	14	90.000	6.8564	0.0846	1706
139.00	T-Arm Mount [TA 602-3]	14	74.878	6.2259	0.0515	768
125.00	Platform Mount [LP 303-1]	14	58.459	4.9206	0.0227	621
109.00	DB589	14	43.618	4.0100	0.0117	1012

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	159.857 - 154.857 (1)	TP17.6204x16.5x0.1875	5.00	0.00	0.0	10.3747	-3.15	770.79	0.004
L2	154.857 - 149.857 (2)	TP18.7407x17.6204x0.1875	5.00	0.00	0.0	11.0415	-5.96	812.33	0.007
L3	149.857 - 144.857 (3)	TP19.8611x18.7407x0.1875	5.00	0.00	0.0	11.7082	-6.29	848.35	0.007

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L4	144.857 - 139.857 (4)	TP20.9814x19.8611x0.1875	5.00	0.00	0.0	12.3750	-6.66	882.88	0.008
L5	139.857 - 134.857 (5)	TP22.1018x20.9814x0.1875	5.00	0.00	0.0	13.0417	-8.37	915.93	0.009
L6	134.857 - 129.857 (6)	TP23.2221x22.1018x0.1875	5.00	0.00	0.0	13.7085	-8.87	947.50	0.009
L7	129.857 - 125.75 (7)	TP24.1425x23.2221x0.1875	4.11	0.00	0.0	14.2562	-9.31	972.32	0.010
L8	125.75 - 125.5 (8)	TP24.1985x24.1425x0.1875	0.25	0.00	0.0	14.2895	-9.35	973.80	0.010
L9	125.5 - 118.978 (9)	TP25.66x24.1985x0.1875	6.52	0.00	0.0	14.6593	-12.47	989.95	0.013
L10	118.978 - 117.978 (10)	TP25.4891x24.4447x0.4938	4.75	0.00	0.0	39.1718	-13.58	2910.27	0.005
L11	117.978 - 112.978 (11)	TP26.5885x25.4891x0.4813	5.00	0.00	0.0	39.8784	-14.54	2962.77	0.005
L12	112.978 - 107.978 (12)	TP27.6878x26.5885x0.475	5.00	0.00	0.0	41.0274	-15.70	3048.13	0.005
L13	107.978 - 103 (13)	TP28.7822x27.6878x0.4625	4.98	0.00	0.0	41.5726	-16.71	3088.64	0.005
L14	103 - 102.75 (14)	TP28.8372x28.7822x0.55	0.25	0.00	0.0	49.3809	-16.79	3668.76	0.005
L15	102.75 - 100.208 (15)	TP29.3961x28.8372x0.5313	2.54	0.00	0.0	49.2335	-17.42	3657.80	0.005
L16	100.208 - 95.6875 (16)	TP30.39x29.3961x0.6875	4.52	0.00	0.0	62.7355	-17.49	4660.94	0.004
L17	95.6875 - 94.6875 (17)	TP30.1188x28.9372x0.7375	5.33	0.00	0.0	68.7764	-20.06	5109.75	0.004
L18	94.6875 - 93.5 (18)	TP30.3819x30.1188x0.7375	1.19	0.00	0.0	69.3923	-20.41	5155.50	0.004
L19	93.5 - 93.25 (19)	TP30.4372x30.3819x0.9125	0.25	0.00	0.0	85.5118	-20.51	6353.10	0.003
L20	93.25 - 89.25 (20)	TP31.3234x30.4372x0.8875	4.00	0.00	0.0	85.7357	-21.93	6369.73	0.003
L21	89.25 - 89 (21)	TP31.3788x31.3234x0.9375	0.25	0.00	0.0	90.5819	-22.03	6729.78	0.003
L22	89 - 86.5 (22)	TP31.9326x31.3788x0.925	2.50	0.00	0.0	91.0369	-22.95	6763.59	0.003
L23	86.5 - 86.25 (23)	TP31.988x31.9326x0.7625	0.25	0.00	0.0	75.5712	-23.04	5614.57	0.004
L24	86.25 - 81.25 (24)	TP33.0957x31.988x0.7375	5.00	0.00	0.0	75.7449	-24.67	5627.47	0.004
L25	81.25 - 76.25 (25)	TP34.2034x33.0957x0.725	5.00	0.00	0.0	77.0389	-26.34	5723.60	0.005
L26	76.25 - 75.417 (26)	TP34.388x34.2034x0.725	0.83	0.00	0.0	77.4635	-26.62	5755.15	0.005
L27	75.417 - 75.167 (27)	TP34.4434x34.388x0.8125	0.25	0.00	0.0	86.7298	-26.72	6443.59	0.004
L28	75.167 - 70.167 (28)	TP35.5511x34.4434x0.8	5.00	0.00	0.0	88.2399	-28.58	6555.78	0.004
L29	70.167 - 65.167 (29)	TP36.6588x35.5511x0.7875	5.00	0.00	0.0	89.6611	-30.47	6661.37	0.005
L30	65.167 - 60.167 (30)	TP37.7665x36.6588x0.7625	5.00	0.00	0.0	89.5561	-32.39	6653.57	0.005
L31	60.167 - 59.5 (31)	TP37.9142x37.7665x0.7625	0.67	0.00	0.0	89.9137	-32.66	6680.14	0.005
L32	59.5 - 59.25 (32)	TP37.9696x37.9142x0.7625	0.25	0.00	0.0	90.0477	-32.76	6690.10	0.005
L33	59.25 - 54.25 (33)	TP39.0773x37.9696x0.75	5.00	0.00	0.0	91.2382	-34.71	6778.54	0.005
L34	54.25 - 53 (34)	TP39.3542x39.0773x0.7375	1.25	0.00	0.0	90.3950	-35.20	6715.90	0.005
L35	53 - 52.75 (35)	TP39.4096x39.3542x0.7375	0.25	0.00	0.0	90.5247	-35.31	6725.53	0.005
L36	52.75 - 47.0608 (36)	TP40.67x39.4096x0.7375	5.69	0.00	0.0	90.5796	-35.35	6729.61	0.005
L37	47.0608 - 46.0608 (37)	TP40.2702x38.8081x0.7625	6.58	0.00	0.0	95.6155	-40.08	7103.75	0.006
L38	46.0608 -	TP41.3807x40.2702x0.75	5.00	0.00	0.0	96.7215	-42.27	7185.91	0.006

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L39	41.0608 (38) 41.0608 - 39.33 (39)	TP41.7651x41.3807x0.75	1.73	0.00	0.0	3 97.636	-43.02	7253.89	0.006
L40	39.33 - 39.08 (40)	TP41.8206x41.7651x0.82 5	0.25	0.00	0.0	3 107.34 90	-43.16	7975.49	0.005
L41	39.08 - 37.75 (41)	TP42.116x41.8206x0.825	1.33	0.00	0.0	108.12 20	-43.78	8032.96	0.005
L42	37.75 - 37.5 (42)	TP42.1715x42.116x0.75	0.25	0.00	0.0	98.603 9	-43.91	7325.77	0.006
L43	37.5 - 32.5 (43)	TP43.282x42.1715x0.737 5	5.00	0.00	0.0	99.589 1	-46.14	7398.97	0.006
L44	32.5 - 29.75 (44)	TP43.8927x43.282x0.725	2.75	0.00	0.0	99.335 4	-47.38	7380.12	0.006
L45	29.75 - 29.5 (45)	TP43.9482x43.8927x0.72 5	0.25	0.00	0.0	99.463 2	-47.51	7389.62	0.006
L46	29.5 - 24.5 (46)	TP45.0587x43.9482x0.71 25	5.00	0.00	0.0	100.28 80	-49.79	7450.89	0.007
L47	24.5 - 21.25 (47)	TP45.7805x45.0587x0.71 25	3.25	0.00	0.0	101.92 00	-51.29	7572.16	0.007
L48	21.25 - 21 (48)	TP45.836x45.7805x0.725	0.25	0.00	0.0	103.80 70	-51.43	7712.36	0.007
L49	21 - 20 (49)	TP46.0581x45.836x0.725	1.00	0.00	0.0	104.31 80	-51.93	7750.33	0.007
L50	20 - 19.75 (50)	TP46.1137x46.0581x0.82 5	0.25	0.00	0.0	118.59 10	-52.08	8810.69	0.006
L51	19.75 - 17 (51)	TP46.7244x46.1137x0.81 25	2.75	0.00	0.0	118.40 10	-53.57	8796.61	0.006
L52	17 - 16.75 (52)	TP46.7799x46.7244x0.77 5	0.25	0.00	0.0	113.16 50	-53.72	8407.61	0.006
L53	16.75 - 11.75 (53)	TP47.8904x46.7799x0.76 25	5.00	0.00	0.0	114.05 80	-56.35	8473.92	0.007
L54	11.75 - 6.75 (54)	TP49.0009x47.8904x0.75	5.00	0.00	0.0	114.86 10	-59.02	8533.61	0.007
L55	6.75 - 1.75 (55)	TP50.1113x49.0009x0.73 75	5.00	0.00	0.0	115.57 60	-61.72	8586.68	0.007
L56	1.75 - 0 (56)	TP50.5x50.1113x0.7375	1.75	0.00	0.0	116.48 50	-62.66	8654.28	0.007

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	159.857 - 154.857 (1)	TP17.6204x16.5x0.1875	22.46	275.52	0.082	0.00	275.52	0.000
L2	154.857 - 149.857 (2)	TP18.7407x17.6204x0.18 75	57.53	309.23	0.186	0.00	309.23	0.000
L3	149.857 - 144.857 (3)	TP19.8611x18.7407x0.18 75	115.66	342.63	0.338	0.00	342.63	0.000
L4	144.857 - 139.857 (4)	TP20.9814x19.8611x0.18 75	175.36	377.08	0.465	0.00	377.08	0.000
L5	139.857 - 134.857 (5)	TP22.1018x20.9814x0.18 75	245.51	412.46	0.595	0.00	412.46	0.000
L6	134.857 - 129.857 (6)	TP23.2221x22.1018x0.18 75	319.06	448.68	0.711	0.00	448.68	0.000
L7	129.857 - 125.75 (7)	TP24.1425x23.2221x0.18 75	380.66	478.97	0.795	0.00	478.97	0.000
L8	125.75 - 125.5 (8)	TP24.1985x24.1425x0.18 75	384.44	480.83	0.800	0.00	480.83	0.000
L9	125.5 - 118.978 (9)	TP25.66x24.1985x0.1875	446.80	501.55	0.891	0.00	501.55	0.000
L10	118.978 - 117.978 (10)	TP25.4891x24.4447x0.49 38	546.22	1478.39	0.369	0.00	1478.39	0.000
L11	117.978 - 112.978 (11)	TP26.5885x25.4891x0.48 13	654.08	1574.05	0.416	0.00	1574.05	0.000
L12	112.978 -	TP27.6878x26.5885x0.47	766.44	1689.60	0.454	0.00	1689.60	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L13	107.978 (12) 107.978 - 103 (13)	5 TP28.7822x27.6878x0.46	882.25	1783.67	0.495	0.00	1783.67	0.000
L14	103 - 102.75 (14)	25 TP28.8372x28.7822x0.55	888.16	2109.78	0.421	0.00	2109.78	0.000
L15	102.75 - 100.208 (15)	75 TP29.3961x28.8372x0.53	948.74	2147.70	0.442	0.00	2147.70	0.000
L16	100.208 - 95.6875 (16)	75 TP30.39x29.3961x0.6875	953.24	2712.29	0.351	0.00	2712.29	0.000
L17	95.6875 - 94.6875 (17)	75 TP30.1188x28.9372x0.73	1084.14	3035.26	0.357	0.00	3035.26	0.000
L18	94.6875 - 93.5 (18)	75 TP30.3819x30.1188x0.73	1113.97	3090.53	0.360	0.00	3090.53	0.000
L19	93.5 - 93.25 (19)	75 TP30.4372x30.3819x0.91	1120.28	3770.90	0.297	0.00	3770.90	0.000
L20	93.25 - 89.25 (20)	25 TP31.3234x30.4372x0.88	1222.73	3904.07	0.313	0.00	3904.07	0.000
L21	89.25 - 89 (21)	75 TP31.3788x31.3234x0.93	1229.23	4118.92	0.298	0.00	4118.92	0.000
L22	89 - 86.5 (22)	75 TP31.9326x31.3788x0.92	1294.83	4220.58	0.307	0.00	4220.58	0.000
L23	86.5 - 86.25 (23)	5 TP31.988x31.9326x0.762	1301.46	3546.83	0.367	0.00	3546.83	0.000
L24	86.25 - 81.25 (24)	5 TP33.0957x31.988x0.737	1436.10	3689.80	0.389	0.00	3689.80	0.000
L25	81.25 - 76.25 (25)	5 TP34.2034x33.0957x0.72	1574.85	3887.07	0.405	0.00	3887.07	0.000
L26	76.25 - 75.417 (26)	5 TP34.388x34.2034x0.725	1598.37	3930.50	0.407	0.00	3930.50	0.000
L27	75.417 - 75.167 (27)	5 TP34.4434x34.388x0.812	1605.45	4385.22	0.366	0.00	4385.22	0.000
L28	75.167 - 70.167 (28)	5 TP35.5511x34.4434x0.8	1749.38	4615.31	0.379	0.00	4615.31	0.000
L29	70.167 - 65.167 (29)	5 TP36.6588x35.5511x0.78	1897.68	4845.87	0.392	0.00	4845.87	0.000
L30	65.167 - 60.167 (30)	75 TP37.7665x36.6588x0.76	2050.31	4999.63	0.410	0.00	4999.63	0.000
L31	60.167 - 59.5 (31)	25 TP37.9142x37.7665x0.76	2070.99	5040.03	0.411	0.00	5040.03	0.000
L32	59.5 - 59.25 (32)	25 TP37.9696x37.9142x0.76	2078.76	5055.23	0.411	0.00	5055.23	0.000
L33	59.25 - 54.25 (33)	25 TP39.0773x37.9696x0.75	2236.56	5281.06	0.424	0.00	5281.06	0.000
L34	54.25 - 53 (34)	TP39.3542x39.0773x0.73	2276.67	5274.19	0.432	0.00	5274.19	0.000
L35	53 - 52.75 (35)	75 TP39.4096x39.3542x0.73	2284.72	5289.48	0.432	0.00	5289.48	0.000
L36	52.75 - 47.0608 (36)	75 TP40.67x39.4096x0.7375	2288.13	5295.95	0.432	0.00	5295.95	0.000
L37	47.0608 - 46.0608 (37)	TP40.2702x38.8081x0.76	2504.43	5706.37	0.439	0.00	5706.37	0.000
L38	46.0608 - 41.0608 (38)	25 TP41.3807x40.2702x0.75	2673.83	5941.34	0.450	0.00	5941.34	0.000
L39	41.0608 - 39.33 (39)	TP41.7651x41.3807x0.75	2733.40	6055.32	0.451	0.00	6055.32	0.000
L40	39.33 - 39.08 (40)	TP41.8206x41.7651x0.82	2742.04	6642.54	0.413	0.00	6642.54	0.000
L41	39.08 - 37.75 (41)	5 TP42.116x41.8206x0.825	2788.19	6739.56	0.414	0.00	6739.56	0.000
L42	37.75 - 37.5 (42)	TP42.1715x42.116x0.75	2796.90	6177.02	0.453	0.00	6177.02	0.000
L43	37.5 - 32.5 (43)	TP43.282x42.1715x0.737	2973.04	6412.73	0.464	0.00	6412.73	0.000
L44	32.5 - 29.75 (44)	5 TP43.8927x43.282x0.725	3071.49	6493.54	0.473	0.00	6493.54	0.000
L45	29.75 - 29.5 (45)	TP43.9482x43.8927x0.72	3080.50	6510.40	0.473	0.00	6510.40	0.000
L46	29.5 - 24.5 (46)	5 TP45.0587x43.9482x0.71 25	3262.45	6739.61	0.484	0.00	6739.61	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L47	24.5 - 21.25 (47)	TP45.7805x45.0587x0.71 25	3382.68	6962.55	0.486	0.00	6962.55	0.000
L48	21.25 - 21 (48)	TP45.836x45.7805x0.725	3391.99	7096.40	0.478	0.00	7096.40	0.000
L49	21 - 20 (49)	TP46.0581x45.836x0.725	3429.35	7167.01	0.478	0.00	7167.01	0.000
L50	20 - 19.75 (50)	TP46.1137x46.0581x0.82 5	3438.72	8121.78	0.423	0.00	8121.78	0.000
L51	19.75 - 17 (51)	TP46.7244x46.1137x0.81 25	3542.37	8224.60	0.431	0.00	8224.60	0.000
L52	17 - 16.75 (52)	TP46.7799x46.7244x0.77 5	3551.85	7883.42	0.451	0.00	7883.42	0.000
L53	16.75 - 11.75 (53)	TP47.8904x46.7799x0.76 25	3743.54	8144.88	0.460	0.00	8144.88	0.000
L54	11.75 - 6.75 (54)	TP49.0009x47.8904x0.75	3939.08	8402.92	0.469	0.00	8402.92	0.000
L55	6.75 - 1.75 (55)	TP50.1113x49.0009x0.73 75	4138.45	8657.17	0.478	0.00	8657.17	0.000
L56	1.75 - 0 (56)	TP50.5x50.1113x0.7375	4209.14	8795.00	0.479	0.00	8795.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	159.857 - 154.857 (1)	TP17.6204x16.5x0.1875	6.22	182.08	0.034	0.00	272.02	0.000
L2	154.857 - 149.857 (2)	TP18.7407x17.6204x0.18 75	11.47	193.78	0.059	2.35	308.52	0.008
L3	149.857 - 144.857 (3)	TP19.8611x18.7407x0.18 75	11.79	205.48	0.057	2.35	347.31	0.007
L4	144.857 - 139.857 (4)	TP20.9814x19.8611x0.18 75	12.10	217.18	0.056	2.35	388.39	0.006
L5	139.857 - 134.857 (5)	TP22.1018x20.9814x0.18 75	14.56	228.88	0.064	2.35	431.77	0.005
L6	134.857 - 129.857 (6)	TP23.2221x22.1018x0.18 75	14.88	240.58	0.062	2.34	477.45	0.005
L7	129.857 - 125.75 (7)	TP24.1425x23.2221x0.18 75	15.13	250.20	0.060	2.34	516.69	0.005
L8	125.75 - 125.5 (8)	TP24.1985x24.1425x0.18 75	15.16	250.78	0.060	2.34	519.13	0.005
L9	125.5 - 118.978 (9)	TP25.66x24.1985x0.1875	20.63	257.27	0.080	2.34	546.56	0.004
L10	118.978 - 117.978 (10)	TP25.4891x24.4447x0.49 38	21.25	687.47	0.031	2.34	1445.97	0.002
L11	117.978 - 112.978 (11)	TP26.5885x25.4891x0.48 13	21.91	699.87	0.031	2.34	1541.68	0.002
L12	112.978 - 107.978 (12)	TP27.6878x26.5885x0.47 5	22.94	720.03	0.032	3.94	1656.57	0.002
L13	107.978 - 103 (13)	TP28.7822x27.6878x0.46 25	23.62	729.60	0.032	3.94	1750.86	0.002
L14	103 - 102.75 (14)	TP28.8372x28.7822x0.55	23.64	866.63	0.027	3.94	2064.20	0.002
L15	102.75 - 100.208 (15)	TP29.3961x28.8372x0.53 75	24.04	864.05	0.028	3.94	2103.11	0.002
L16	100.208 - 95.6875 (16)	TP30.39x29.3961x0.6875	24.06	1101.01	0.022	3.94	2641.07	0.001
L17	95.6875 - 94.6875 (17)	TP30.1188x28.9372x0.73 75	25.02	1207.03	0.021	3.93	2951.80	0.001
L18	94.6875 - 93.5 (18)	TP30.3819x30.1188x0.73 75	25.23	1217.83	0.021	3.93	3006.27	0.001
L19	93.5 - 93.25 (19)	TP30.4372x30.3819x0.91 25	25.26	1500.73	0.017	3.93	3644.19	0.001
L20	93.25 - 89.25 (20)	TP31.3234x30.4372x0.88 75	25.98	1504.66	0.017	3.93	3780.07	0.001
L21	89.25 - 89 (21)	TP31.3788x31.3234x0.93 75	26.02	1589.71	0.016	3.93	3980.99	0.001

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L22	89 - 86.5 (22)	TP31.9326x31.3788x0.925	26.48	1597.70	0.017	3.93	4083.55	0.001
L23	86.5 - 86.25 (23)	TP31.988x31.9326x0.7625	26.52	1326.28	0.020	3.93	3451.83	0.001
L24	86.25 - 81.25 (24)	TP33.0957x31.988x0.7375	27.35	1329.32	0.021	3.93	3597.24	0.001
L25	81.25 - 76.25 (25)	TP34.2034x33.0957x0.725	28.17	1352.03	0.021	3.93	3794.16	0.001
L26	76.25 - 75.417 (26)	TP34.388x34.2034x0.725	28.31	1359.49	0.021	3.93	3837.03	0.001
L27	75.417 - 75.167 (27)	TP34.4434x34.388x0.8125	28.35	1522.11	0.019	3.93	4268.95	0.001
L28	75.167 - 70.167 (28)	TP35.5511x34.4434x0.8	29.24	1548.61	0.019	3.93	4498.43	0.001
L29	70.167 - 65.167 (29)	TP36.6588x35.5511x0.7875	30.11	1573.55	0.019	3.93	4728.53	0.001
L30	65.167 - 60.167 (30)	TP37.7665x36.6588x0.7625	30.97	1571.71	0.020	3.93	4885.57	0.001
L31	60.167 - 59.5 (31)	TP37.9142x37.7665x0.7625	31.08	1577.99	0.020	3.93	4925.49	0.001
L32	59.5 - 59.25 (32)	TP37.9696x37.9142x0.7625	31.11	1580.34	0.020	3.93	4940.49	0.001
L33	59.25 - 54.25 (33)	TP39.0773x37.9696x0.75	31.99	1601.23	0.020	1.60	5166.27	0.000
L34	54.25 - 53 (34)	TP39.3542x39.0773x0.7375	32.20	1586.43	0.020	1.60	5162.13	0.000
L35	53 - 52.75 (35)	TP39.4096x39.3542x0.7375	32.23	1588.71	0.020	1.60	5177.23	0.000
L36	52.75 - 47.0608 (36)	TP40.67x39.4096x0.7375	32.26	1589.67	0.020	1.60	5183.63	0.000
L37	47.0608 - 46.0608 (37)	TP40.2702x38.8081x0.7625	33.50	1678.05	0.020	3.92	5583.93	0.001
L38	46.0608 - 41.0608 (38)	TP41.3807x40.2702x0.75	34.29	1697.46	0.020	3.92	5819.02	0.001
L39	41.0608 - 39.33 (39)	TP41.7651x41.3807x0.75	34.58	1713.52	0.020	3.92	5931.74	0.001
L40	39.33 - 39.08 (40)	TP41.8206x41.7651x0.825	34.60	1883.97	0.018	3.92	6494.32	0.001
L41	39.08 - 37.75 (41)	TP42.116x41.8206x0.825	34.83	1897.55	0.018	3.92	6590.19	0.001
L42	37.75 - 37.5 (42)	TP42.1715x42.116x0.75	34.86	1730.50	0.020	3.92	6052.09	0.001
L43	37.5 - 32.5 (43)	TP43.282x42.1715x0.7375	35.62	1747.79	0.020	3.92	6288.16	0.001
L44	32.5 - 29.75 (44)	TP43.8927x43.282x0.725	36.02	1743.34	0.021	3.92	6371.01	0.001
L45	29.75 - 29.5 (45)	TP43.9482x43.8927x0.725	36.04	1745.58	0.021	3.92	6387.69	0.001
L46	29.5 - 24.5 (46)	TP45.0587x43.9482x0.7125	36.76	1760.05	0.021	3.92	6617.48	0.001
L47	24.5 - 21.25 (47)	TP45.7805x45.0587x0.7125	37.26	1788.70	0.021	3.92	6838.23	0.001
L48	21.25 - 21 (48)	TP45.836x45.7805x0.725	37.28	1821.82	0.020	3.92	6967.78	0.001
L49	21 - 20 (49)	TP46.0581x45.836x0.725	37.45	1830.79	0.020	3.92	7037.69	0.001
L50	20 - 19.75 (50)	TP46.1137x46.0581x0.825	37.48	2081.27	0.018	3.92	7956.62	0.000
L51	19.75 - 17 (51)	TP46.7244x46.1137x0.8125	37.93	2077.94	0.018	3.92	8061.75	0.000
L52	17 - 16.75 (52)	TP46.7799x46.7244x0.775	37.96	1986.05	0.019	3.92	7734.24	0.001
L53	16.75 - 11.75 (53)	TP47.8904x46.7799x0.7625	38.74	2001.71	0.019	3.92	7996.35	0.000
L54	11.75 - 6.75 (54)	TP49.0009x47.8904x0.75	39.51	2015.81	0.020	3.92	8255.22	0.000
L55	6.75 - 1.75 (55)	TP50.1113x49.0009x0.7375	40.28	2028.35	0.020	3.92	8510.33	0.000
L56	1.75 - 0 (56)	TP50.5x50.1113x0.7375	40.56	2044.32	0.020	3.92	8646.92	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	159.857 - 154.857 (1)	0.004	0.082	0.000	0.034	0.000	0.087	1.050	4.8.2
L2	154.857 - 149.857 (2)	0.007	0.186	0.000	0.059	0.008	0.198	1.050	4.8.2
L3	149.857 - 144.857 (3)	0.007	0.338	0.000	0.057	0.007	0.349	1.050	4.8.2
L4	144.857 - 139.857 (4)	0.008	0.465	0.000	0.056	0.006	0.476	1.050	4.8.2
L5	139.857 - 134.857 (5)	0.009	0.595	0.000	0.064	0.005	0.609	1.050	4.8.2
L6	134.857 - 129.857 (6)	0.009	0.711	0.000	0.062	0.005	0.725	1.050	4.8.2
L7	129.857 - 125.75 (7)	0.010	0.795	0.000	0.060	0.005	0.809	1.050	4.8.2
L8	125.75 - 125.5 (8)	0.010	0.800	0.000	0.060	0.005	0.813	1.050	4.8.2
L9	125.5 - 118.978 (9)	0.013	0.891	0.000	0.080	0.004	0.911	1.050	4.8.2
L10	118.978 - 117.978 (10)	0.005	0.369	0.000	0.031	0.002	0.375	1.050	4.8.2
L11	117.978 - 112.978 (11)	0.005	0.416	0.000	0.031	0.002	0.422	1.050	4.8.2
L12	112.978 - 107.978 (12)	0.005	0.454	0.000	0.032	0.002	0.460	1.050	4.8.2
L13	107.978 - 103 (13)	0.005	0.495	0.000	0.032	0.002	0.501	1.050	4.8.2
L14	103 - 102.75 (14)	0.005	0.421	0.000	0.027	0.002	0.426	1.050	4.8.2
L15	102.75 - 100.208 (15)	0.005	0.442	0.000	0.028	0.002	0.447	1.050	4.8.2
L16	100.208 - 95.6875 (16)	0.004	0.351	0.000	0.022	0.001	0.356	1.050	4.8.2
L17	95.6875 - 94.6875 (17)	0.004	0.357	0.000	0.021	0.001	0.362	1.050	4.8.2
L18	94.6875 - 93.5 (18)	0.004	0.360	0.000	0.021	0.001	0.365	1.050	4.8.2
L19	93.5 - 93.25 (19)	0.003	0.297	0.000	0.017	0.001	0.301	1.050	4.8.2
L20	93.25 - 89.25 (20)	0.003	0.313	0.000	0.017	0.001	0.317	1.050	4.8.2
L21	89.25 - 89 (21)	0.003	0.298	0.000	0.016	0.001	0.302	1.050	4.8.2
L22	89 - 86.5 (22)	0.003	0.307	0.000	0.017	0.001	0.310	1.050	4.8.2
L23	86.5 - 86.25 (23)	0.004	0.367	0.000	0.020	0.001	0.371	1.050	4.8.2
L24	86.25 - 81.25 (24)	0.004	0.389	0.000	0.021	0.001	0.394	1.050	4.8.2
L25	81.25 - 76.25 (25)	0.005	0.405	0.000	0.021	0.001	0.410	1.050	4.8.2
L26	76.25 - 75.417 (26)	0.005	0.407	0.000	0.021	0.001	0.412	1.050	4.8.2
L27	75.417 - 75.167 (27)	0.004	0.366	0.000	0.019	0.001	0.371	1.050	4.8.2
L28	75.167 - 70.167 (28)	0.004	0.379	0.000	0.019	0.001	0.384	1.050	4.8.2
L29	70.167 - 65.167 (29)	0.005	0.392	0.000	0.019	0.001	0.397	1.050	4.8.2
L30	65.167 - 60.167 (30)	0.005	0.410	0.000	0.020	0.001	0.415	1.050	4.8.2
L31	60.167 - 59.5 (31)	0.005	0.411	0.000	0.020	0.001	0.416	1.050	4.8.2
L32	59.5 - 59.25 (32)	0.005	0.411	0.000	0.020	0.001	0.417	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L33	59.25 - 54.25 (33)	0.005	0.424	0.000	0.020	0.000	0.429	1.050	4.8.2
L34	54.25 - 53 (34)	0.005	0.432	0.000	0.020	0.000	0.437	1.050	4.8.2
L35	53 - 52.75 (35)	0.005	0.432	0.000	0.020	0.000	0.438	1.050	4.8.2
L36	52.75 - 47.0608 (36)	0.005	0.432	0.000	0.020	0.000	0.438	1.050	4.8.2
L37	47.0608 - 46.0608 (37)	0.006	0.439	0.000	0.020	0.001	0.445	1.050	4.8.2
L38	46.0608 - 41.0608 (38)	0.006	0.450	0.000	0.020	0.001	0.456	1.050	4.8.2
L39	41.0608 - 39.33 (39)	0.006	0.451	0.000	0.020	0.001	0.458	1.050	4.8.2
L40	39.33 - 39.08 (40)	0.005	0.413	0.000	0.018	0.001	0.419	1.050	4.8.2
L41	39.08 - 37.75 (41)	0.005	0.414	0.000	0.018	0.001	0.420	1.050	4.8.2
L42	37.75 - 37.5 (42)	0.006	0.453	0.000	0.020	0.001	0.459	1.050	4.8.2
L43	37.5 - 32.5 (43)	0.006	0.464	0.000	0.020	0.001	0.470	1.050	4.8.2
L44	32.5 - 29.75 (44)	0.006	0.473	0.000	0.021	0.001	0.480	1.050	4.8.2
L45	29.75 - 29.5 (45)	0.006	0.473	0.000	0.021	0.001	0.480	1.050	4.8.2
L46	29.5 - 24.5 (46)	0.007	0.484	0.000	0.021	0.001	0.491	1.050	4.8.2
L47	24.5 - 21.25 (47)	0.007	0.486	0.000	0.021	0.001	0.493	1.050	4.8.2
L48	21.25 - 21 (48)	0.007	0.478	0.000	0.020	0.001	0.485	1.050	4.8.2
L49	21 - 20 (49)	0.007	0.478	0.000	0.020	0.001	0.486	1.050	4.8.2
L50	20 - 19.75 (50)	0.006	0.423	0.000	0.018	0.000	0.430	1.050	4.8.2
L51	19.75 - 17 (51)	0.006	0.431	0.000	0.018	0.000	0.437	1.050	4.8.2
L52	17 - 16.75 (52)	0.006	0.451	0.000	0.019	0.001	0.457	1.050	4.8.2
L53	16.75 - 11.75 (53)	0.007	0.460	0.000	0.019	0.000	0.467	1.050	4.8.2
L54	11.75 - 6.75 (54)	0.007	0.469	0.000	0.020	0.000	0.476	1.050	4.8.2
L55	6.75 - 1.75 (55)	0.007	0.478	0.000	0.020	0.000	0.486	1.050	4.8.2
L56	1.75 - 0 (56)	0.007	0.479	0.000	0.020	0.000	0.486	1.050	4.8.2

Section Capacity Table

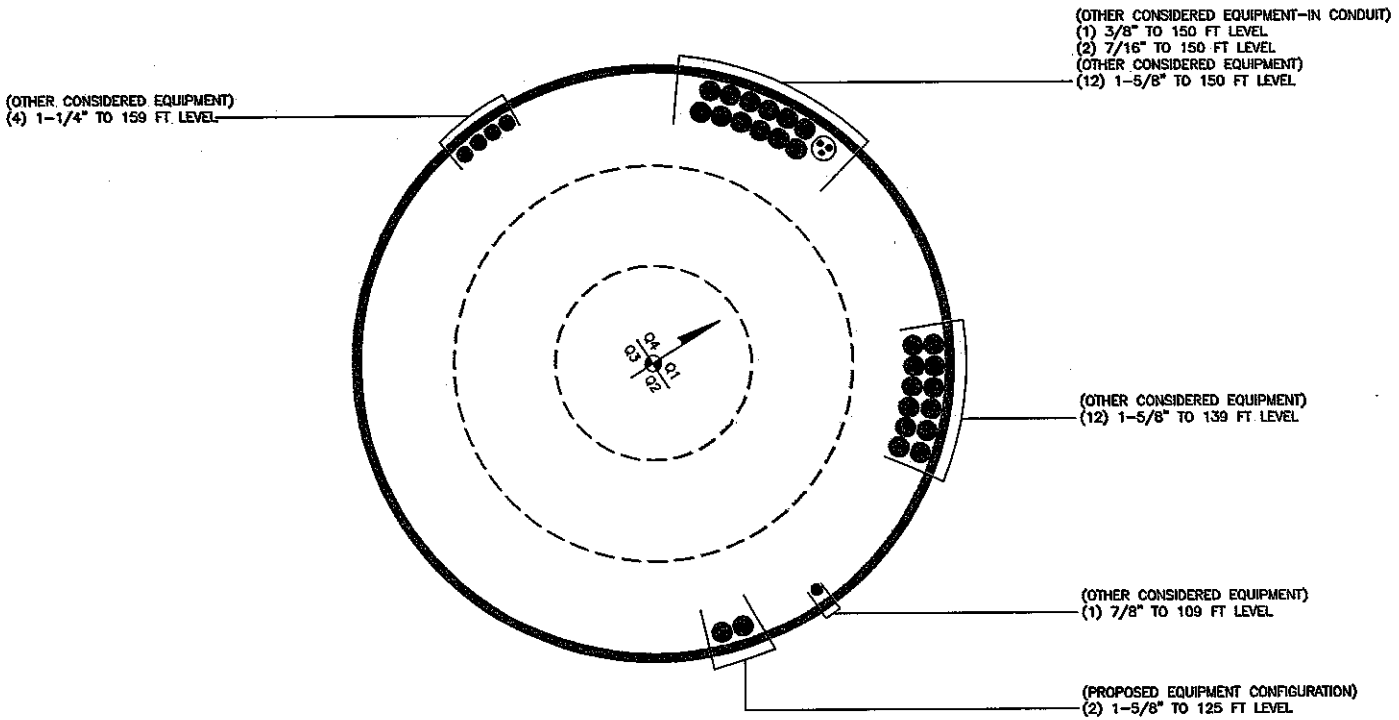
Section No.	Elevation ft	Component Type	Size	Critical Element	P / K	ϕP_{allow} / K	% Capacity	Pass Fail
L1	159.857 - 154.857	Pole	TP17.6204x16.5x0.1875	1	-3.15	809.33	8.3	Pass
L2	154.857 - 149.857	Pole	TP18.7407x17.6204x0.1875	2	-5.96	852.94	18.8	Pass
L3	149.857 - 144.857	Pole	TP19.8611x18.7407x0.1875	3	-6.29	890.76	33.2	Pass
L4	144.857 - 139.857	Pole	TP20.9814x19.8611x0.1875	4	-6.66	927.03	45.4	Pass
L5	139.857 - 134.857	Pole	TP22.1018x20.9814x0.1875	5	-8.37	961.73	58.0	Pass
L6	134.857 - 129.857	Pole	TP23.2221x22.1018x0.1875	6	-8.87	994.87	69.0	Pass
L7	129.857 - 125.75	Pole	TP24.1425x23.2221x0.1875	7	-9.31	1020.94	77.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L8	125.75 - 125.5	Pole	TP24.1985x24.1425x0.1875	8	-9.35	1022.49	77.5	Pass
L9	125.5 - 118.978	Pole	TP25.66x24.1985x0.1875	9	-12.47	1039.44	86.7	Pass
L10	118.978 - 117.978	Pole	TP25.4891x24.4447x0.4938	10	-13.58	3055.78	35.7	Pass
L11	117.978 - 112.978	Pole	TP26.5885x25.4891x0.4813	11	-14.54	3110.91	40.1	Pass
L12	112.978 - 107.978	Pole	TP27.6878x26.5885x0.475	12	-15.70	3200.54	43.8	Pass
L13	107.978 - 103	Pole	TP28.7822x27.6878x0.4625	13	-16.71	3243.07	47.7	Pass
L14	103 - 102.75	Pole	TP28.8372x28.7822x0.55	14	-16.79	3852.20	40.6	Pass
L15	102.75 - 100.208	Pole	TP29.3961x28.8372x0.5375	15	-17.42	3840.69	42.6	Pass
L16	100.208 - 95.6875	Pole	TP30.39x29.3961x0.6875	16	-17.49	4893.99	33.9	Pass
L17	95.6875 - 94.6875	Pole	TP30.1188x28.9372x0.7375	17	-20.06	5365.24	34.4	Pass
L18	94.6875 - 93.5	Pole	TP30.3819x30.1188x0.7375	18	-20.41	5413.27	34.8	Pass
L19	93.5 - 93.25	Pole	TP30.4372x30.3819x0.9125	19	-20.51	6670.75	28.6	Pass
L20	93.25 - 89.25	Pole	TP31.3234x30.4372x0.8875	20	-21.93	6688.22	30.2	Pass
L21	89.25 - 89	Pole	TP31.3788x31.3234x0.9375	21	-22.03	7066.27	28.8	Pass
L22	89 - 86.5	Pole	TP31.9326x31.3788x0.925	22	-22.95	7101.77	29.6	Pass
L23	86.5 - 86.25	Pole	TP31.988x31.9326x0.7625	23	-23.04	5895.30	35.4	Pass
L24	86.25 - 81.25	Pole	TP33.0957x31.988x0.7375	24	-24.67	5908.84	37.5	Pass
L25	81.25 - 76.25	Pole	TP34.2034x33.0957x0.725	25	-26.34	6009.78	39.1	Pass
L26	76.25 - 75.417	Pole	TP34.388x34.2034x0.725	26	-26.62	6042.91	39.2	Pass
L27	75.417 - 75.167	Pole	TP34.4434x34.388x0.8125	27	-26.72	6765.77	35.3	Pass
L28	75.167 - 70.167	Pole	TP35.5511x34.4434x0.8	28	-28.58	6883.57	36.6	Pass
L29	70.167 - 65.167	Pole	TP36.6588x35.5511x0.7875	29	-30.47	6994.44	37.8	Pass
L30	65.167 - 60.167	Pole	TP37.7665x36.6588x0.7625	30	-32.39	6986.25	39.6	Pass
L31	60.167 - 59.5	Pole	TP37.9142x37.7665x0.7625	31	-32.66	7014.15	39.6	Pass
L32	59.5 - 59.25	Pole	TP37.9696x37.9142x0.7625	32	-32.76	7024.60	39.7	Pass
L33	59.25 - 54.25	Pole	TP39.0773x37.9696x0.75	33	-34.71	7117.47	40.9	Pass
L34	54.25 - 53	Pole	TP39.3542x39.0773x0.7375	34	-35.20	7051.69	41.7	Pass
L35	53 - 52.75	Pole	TP39.4096x39.3542x0.7375	35	-35.31	7061.81	41.7	Pass
L36	52.75 - 47.0608	Pole	TP40.67x39.4096x0.7375	36	-35.35	7066.09	41.7	Pass
L37	47.0608 - 46.0608	Pole	TP40.2702x38.8081x0.7625	37	-40.08	7458.94	42.4	Pass
L38	46.0608 - 41.0608	Pole	TP41.3807x40.2702x0.75	38	-42.27	7545.21	43.5	Pass
L39	41.0608 - 39.33	Pole	TP41.7651x41.3807x0.75	39	-43.02	7616.58	43.6	Pass
L40	39.33 - 39.08	Pole	TP41.8206x41.7651x0.825	40	-43.16	8374.26	39.9	Pass
L41	39.08 - 37.75	Pole	TP42.116x41.8206x0.825	41	-43.78	8434.61	40.0	Pass
L42	37.75 - 37.5	Pole	TP42.1715x42.116x0.75	42	-43.91	7692.06	43.7	Pass
L43	37.5 - 32.5	Pole	TP43.282x42.1715x0.7375	43	-46.14	7768.92	44.8	Pass
L44	32.5 - 29.75	Pole	TP43.8927x43.282x0.725	44	-47.38	7749.13	45.7	Pass
L45	29.75 - 29.5	Pole	TP43.9482x43.8927x0.725	45	-47.51	7759.10	45.7	Pass
L46	29.5 - 24.5	Pole	TP45.0587x43.9482x0.7125	46	-49.79	7823.43	46.8	Pass
L47	24.5 - 21.25	Pole	TP45.7805x45.0587x0.7125	47	-51.29	7950.77	47.0	Pass
L48	21.25 - 21	Pole	TP45.836x45.7805x0.725	48	-51.43	8097.98	46.2	Pass
L49	21 - 20	Pole	TP46.0581x45.836x0.725	49	-51.93	8137.85	46.3	Pass
L50	20 - 19.75	Pole	TP46.1137x46.0581x0.825	50	-52.08	9251.22	40.9	Pass
L51	19.75 - 17	Pole	TP46.7244x46.1137x0.8125	51	-53.57	9236.44	41.6	Pass
L52	17 - 16.75	Pole	TP46.7799x46.7244x0.775	52	-53.72	8827.99	43.6	Pass
L53	16.75 - 11.75	Pole	TP47.8904x46.7799x0.7625	53	-56.35	8897.62	44.4	Pass
L54	11.75 - 6.75	Pole	TP49.0009x47.8904x0.75	54	-59.02	8960.29	45.3	Pass
L55	6.75 - 1.75	Pole	TP50.1113x49.0009x0.7375	55	-61.72	9016.01	46.3	Pass
L56	1.75 - 0	Pole	TP50.5x50.1113x0.7375	56	-62.66	9086.99	46.3	Pass
							Summary	
						Pole (L9)	86.7	Pass
						RATING =	**86.7**	**Pass**

***NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876401 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 876401

Work Order: 1668738

CROWN CASTLE

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	159.8575	40.88	3.75	18	16.5	25.66	0.1875	Auto	A572-65
2	122.7275	27.04	4.333333	18	24.44	30.39	0.25	Auto	A572-65
3	100.020833	52.96	5.583333	18	28.94	40.67	0.3125	Auto	A572-65
4	52.644166	52.644166	0	18	38.81	50.5	0.375	Auto	A572-65

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	0	39.33	channel	MP3-03 (1.1875in)	3																		
2	37.75	75.417	channel	MP3-03 (1.1875in)	3																		
3	0	20	plate	CCI-WSFP-085125	2																		
4	0	21.25	plate	CCI-WSFP-085125	1																		
5	17	103	plate	CCI-SFP-060100	1																		
6	20	53	plate	CCI-SFP-060100	1																		
7	20	103	plate	CCI-SFP-060100	1																		
8	49.208	100.208	plate	CCI-SFP-060100	1																		
9	86.5	93.5	plate	CCI-SFP-045100	3																		
10	0	29.75	plate	PL 5.375x1.25" (1)	3																		
11	29.75	59.5	plate	PL 5.375x1.25" (2)	3																		
12	59.5	89.25	plate	PL 5.375x125" (3)	3																		
13	89.25	119	plate	PL4.375"x1.25"	3																		
14	119	125.75	plate	PL3.125"x1.25"	3																		
16																							

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	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
2	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
3	8.5	1.25	10.625	0.625	n/a	45.000	17.000	9.063	1.1875	A572-65
4	8.5	1.25	10.625	0.625	n/a	45.000	17.000	9.063	1.1875	A572-65
5	6	1	6	0.5	24.000	24.000	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	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
9	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
10	5.375	1.25	6.71875	0.625	n/a	30.000	15.000	5.156	1.1875	A572-65
11	5.375	1.25	6.71875	0.625	n/a	30.000	15.000	5.156	1.1875	A572-65
12	5.375	1.25	6.71875	0.625	n/a	24.000	15.000	5.156	1.1875	A572-65
13	4.375	1.25	5.46875	0.625	n/a	15.000	21.000	3.906	1.1875	A572-65
14	3.125	1.25	3.90625	0.625	n/a	15.000	24.000	2.344	1.1875	A572-65
15										

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	159.858 - 154.858	5		18	16.500	17.620	0.1875	A572-65	1.000
2	154.858 - 149.858	5		18	17.620	18.741	0.1875	A572-65	1.000
3	149.858 - 144.858	5		18	18.741	19.861	0.1875	A572-65	1.000
4	144.858 - 139.858	5		18	19.861	20.981	0.1875	A572-65	1.000
5	139.858 - 134.858	5		18	20.981	22.102	0.1875	A572-65	1.000
6	134.858 - 129.858	5		18	22.102	23.222	0.1875	A572-65	1.000
7	129.858 - 125.75	4.1075		18	23.222	24.142	0.1875	A572-65	1.000
8	125.75 - 125.5	0.25		18	24.142	24.199	0.1875	A572-65	1.000
9	125.5 - 122.728	6.5225	3.75	18	24.199	25.660	0.1875	A572-65	1.000
10	122.728 - 117.978	4.75		18	24.445	25.489	0.49375	A572-65	0.930
11	117.978 - 112.978	5		18	25.489	26.588	0.48125	A572-65	0.936
12	112.978 - 107.978	5		18	26.588	27.688	0.475	A572-65	0.931
13	107.978 - 103	4.9775		18	27.688	28.782	0.4625	A572-65	0.939
14	103 - 102.75	0.25		18	28.782	28.837	0.55	A572-65	1.035
15	102.75 - 100.208	2.542		18	28.837	29.396	0.5375	A572-65	1.047
16	100.208 - 100.021	4.5205	4.333333	18	29.396	30.390	0.6875	A572-65	0.918
17	100.021 - 94.6875	5.333333		18	28.937	30.119	0.7375	A572-65	0.930
18	94.6875 - 93.5	1.1875		18	30.119	30.382	0.7375	A572-65	0.926
19	93.5 - 93.25	0.25		18	30.382	30.437	0.9125	A572-65	0.910
20	93.25 - 89.25	4		18	30.437	31.323	0.8875	A572-65	0.918
21	89.25 - 89	0.25		18	31.323	31.379	0.9375	A572-65	0.910
22	89 - 86.5	2.5		18	31.379	31.933	0.925	A572-65	0.912
23	86.5 - 86.25	0.25		18	31.933	31.988	0.7625	A572-65	0.921
24	86.25 - 81.25	5		18	31.988	33.096	0.7375	A572-65	0.933
25	81.25 - 76.25	5		18	33.096	34.203	0.725	A572-65	0.932
26	76.25 - 75.417	0.833		18	34.203	34.388	0.725	A572-65	0.929
27	75.417 - 75.167	0.25		18	34.388	34.443	0.8125	A572-65	0.931
28	75.167 - 70.167	5		18	34.443	35.551	0.8	A572-65	0.928
29	70.167 - 65.167	5		18	35.551	36.659	0.7875	A572-65	0.925
30	65.167 - 60.167	5		18	36.659	37.766	0.7625	A572-65	0.939
31	60.167 - 59.5	0.667		18	37.766	37.914	0.7625	A572-65	0.937
32	59.5 - 59.25	0.25		18	37.914	37.970	0.7625	A572-65	0.936
33	59.25 - 54.25	5		18	37.970	39.077	0.75	A572-65	0.936
34	54.25 - 53	1.25		18	39.077	39.354	0.7375	A572-65	0.947
35	53 - 52.75	0.25		18	39.354	39.410	0.7375	A572-65	0.947
36	52.75 - 52.6442	5.689167	5.583333	18	39.410	40.670	0.7375	A572-65	0.946
37	52.6442 - 46.0608	6.583333		18	38.808	40.270	0.7625	A572-65	0.987
38	46.0608 - 41.0608	5		18	40.270	41.381	0.75	A572-65	0.990
39	41.0608 - 39.33	1.730833		18	41.381	41.765	0.75	A572-65	0.985
40	39.33 - 39.08	0.25		18	41.765	41.821	0.825	A572-65	0.978
41	39.08 - 37.75	1.33		18	41.821	42.116	0.825	A572-65	0.974
42	37.75 - 37.5	0.25		18	42.116	42.171	0.75	A572-65	0.980
43	37.5 - 32.5	5		18	42.171	43.282	0.7375	A572-65	0.984
44	32.5 - 29.75	2.75		18	43.282	43.893	0.725	A572-65	0.994
45	29.75 - 29.5	0.25		18	43.893	43.948	0.725	A572-65	0.993
46	29.5 - 24.5	5		18	43.948	45.059	0.7125	A572-65	0.998
47	24.5 - 21.25	3.25		18	45.059	45.781	0.7125	A572-65	0.991
48	21.25 - 21	0.25		18	45.781	45.836	0.725	A572-65	1.076
49	21 - 20	1		18	45.836	46.058	0.725	A572-65	1.073
50	20 - 19.75	0.25		18	46.058	46.114	0.825	A572-65	1.022
51	19.75 - 17	2.75		18	46.114	46.724	0.8125	A572-65	1.030
52	17 - 16.75	0.25		18	46.724	46.780	0.775	A572-65	1.025
53	16.75 - 11.75	5		18	46.780	47.890	0.7625	A572-65	1.029
54	11.75 - 6.75	5		18	47.890	49.001	0.75	A572-65	1.033
55	6.75 - 1.75	5		18	49.001	50.111	0.7375	A572-65	1.038
56	1.75 - 0	1.75		18	50.111	50.500	0.7375	A572-65	1.034

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	159.8575 - 154.8575	3.15	22.46	6.22
2	154.8575 - 149.8575	5.99	57.61	11.46
3	149.8575 - 144.8575	6.32	115.67	11.77
4	144.8575 - 139.8575	6.66	175.36	12.10
5	139.8575 - 134.8575	8.37	245.51	14.56
6	134.8575 - 129.8575	8.87	319.06	14.87
7	129.8575 - 125.75	9.31	380.66	15.13
8	125.75 - 125.5	9.35	384.44	15.16
9	125.5 - 122.7275	12.47	446.80	20.63
10	122.7275 - 117.9775	13.58	546.22	21.25
11	117.9775 - 112.9775	14.54	654.08	21.91
12	112.9775 - 107.9775	15.70	766.44	22.94
13	107.9775 - 103	16.71	882.25	23.62
14	103 - 102.75	16.79	888.16	23.64
15	102.75 - 100.208	17.42	948.74	24.04
16	100.208 - 100.0208	17.49	953.24	24.06
17	100.0208 - 94.6875	20.06	1084.14	25.02
18	94.6875 - 93.5	20.41	1113.96	25.23
19	93.5 - 93.25	20.51	1120.27	25.26
20	93.25 - 89.25	21.93	1222.73	25.98
21	89.25 - 89	22.03	1229.23	26.02
22	89 - 86.5	22.95	1294.84	26.48
23	86.5 - 86.25	23.04	1301.46	26.52
24	86.25 - 81.25	24.67	1436.10	27.35
25	81.25 - 76.25	26.34	1574.85	28.17
26	76.25 - 75.417	26.62	1598.37	28.31
27	75.417 - 75.167	26.72	1605.45	28.35
28	75.167 - 70.167	28.58	1749.38	29.24
29	70.167 - 65.167	30.47	1897.68	30.11
30	65.167 - 60.167	32.39	2050.30	30.97
31	60.167 - 59.5	32.65	2071.00	31.10
32	59.5 - 59.25	32.76	2078.77	31.14
33	59.25 - 54.25	34.71	2236.56	31.99
34	54.25 - 53	35.20	2276.66	32.20
35	53 - 52.75	35.31	2284.72	32.23
36	52.75 - 52.64417	35.35	2288.13	32.26
37	52.64417 - 46.06083	40.09	2504.49	33.47
38	46.06083 - 41.06083	42.27	2673.83	34.29
39	41.06083 - 39.33	43.02	2733.40	34.58
40	39.33 - 39.08	43.16	2742.04	34.60
41	39.08 - 37.75	43.78	2788.19	34.83
42	37.75 - 37.5	43.91	2796.90	34.86
43	37.5 - 32.5	46.14	2973.04	35.62
44	32.5 - 29.75	47.38	3071.49	36.02
45	29.75 - 29.5	47.51	3080.50	36.04
46	29.5 - 24.5	49.79	3262.45	36.76
47	24.5 - 21.25	51.29	3382.68	37.26
48	21.25 - 21	51.43	3391.99	37.28
49	21 - 20	51.93	3429.35	37.45
50	20 - 19.75	52.08	3438.71	37.48
51	19.75 - 17	53.57	3542.37	37.93
52	17 - 16.75	53.72	3551.85	37.96
53	16.75 - 11.75	56.35	3743.54	38.74
54	11.75 - 6.75	59.02	3939.08	39.51
55	6.75 - 1.75	61.72	4138.45	40.28
56	1.75 - 0	62.66	4209.14	40.56

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
159.86 - 154.86	Pole	TP17.62x16.5x0.1875	Pole	8.2%	Pass
154.86 - 149.86	Pole	TP18.741x17.62x0.1875	Pole	18.5%	Pass
149.86 - 144.86	Pole	TP19.861x18.741x0.1875	Pole	32.9%	Pass
144.86 - 139.86	Pole	TP20.981x19.861x0.1875	Pole	45.1%	Pass
139.86 - 134.86	Pole	TP22.102x20.981x0.1875	Pole	57.7%	Pass
134.86 - 129.86	Pole	TP23.222x22.102x0.1875	Pole	68.7%	Pass
129.86 - 125.75	Pole	TP24.142x23.222x0.1875	Pole	76.7%	Pass
125.75 - 125.5	Pole	TP24.199x24.142x0.1875	Pole	77.2%	Pass
125.5 - 122.73	Pole	TP25.66x24.199x0.1875	Pole	86.2%	Pass
122.73 - 117.98	Pole + Reinf.	TP25.489x24.445x0.4938	Reinf. 13 Bolt Shear	64.2%	Pass
117.98 - 112.98	Pole + Reinf.	TP26.588x25.489x0.4813	Reinf. 13 Tension Rupture	71.3%	Pass
112.98 - 107.98	Pole + Reinf.	TP27.688x26.588x0.475	Reinf. 13 Tension Rupture	78.5%	Pass
107.98 - 103	Pole + Reinf.	TP28.782x27.688x0.4625	Reinf. 13 Tension Rupture	85.0%	Pass
103 - 102.75	Pole + Reinf.	TP28.837x28.782x0.55	Reinf. 13 Tension Rupture	76.7%	Pass
102.75 - 100.21	Pole + Reinf.	TP29.396x28.837x0.5375	Reinf. 13 Tension Rupture	79.6%	Pass
100.21 - 100.02	Pole + Reinf.	TP30.39x29.396x0.6875	Reinf. 13 Tension Rupture	60.1%	Pass
100.02 - 94.69	Pole + Reinf.	TP30.119x28.937x0.7375	Reinf. 13 Tension Rupture	60.5%	Pass
94.69 - 93.5	Pole + Reinf.	TP30.382x30.119x0.7375	Reinf. 13 Tension Rupture	61.4%	Pass
93.5 - 93.25	Pole + Reinf.	TP30.437x30.382x0.9125	Reinf. 13 Tension Rupture	50.6%	Pass
93.25 - 89.25	Pole + Reinf.	TP31.323x30.437x0.8875	Reinf. 13 Tension Rupture	53.2%	Pass
89.25 - 89	Pole + Reinf.	TP31.379x31.323x0.9375	Reinf. 9 Tension Rupture	49.8%	Pass
89 - 86.5	Pole + Reinf.	TP31.933x31.379x0.925	Reinf. 9 Tension Rupture	51.3%	Pass
86.5 - 86.25	Pole + Reinf.	TP31.988x31.933x0.7625	Reinf. 12 Tension Rupture	58.5%	Pass
86.25 - 81.25	Pole + Reinf.	TP33.096x31.988x0.7375	Reinf. 12 Tension Rupture	61.4%	Pass
81.25 - 76.25	Pole + Reinf.	TP34.203x33.096x0.725	Reinf. 12 Tension Rupture	64.2%	Pass
76.25 - 75.42	Pole + Reinf.	TP34.388x34.203x0.725	Reinf. 12 Tension Rupture	64.7%	Pass
75.42 - 75.17	Pole + Reinf.	TP34.443x34.388x0.8125	Reinf. 12 Tension Rupture	57.6%	Pass
75.17 - 70.17	Pole + Reinf.	TP35.551x34.443x0.8	Reinf. 12 Tension Rupture	60.0%	Pass
70.17 - 65.17	Pole + Reinf.	TP36.659x35.551x0.7875	Reinf. 12 Tension Rupture	62.4%	Pass
65.17 - 60.17	Pole + Reinf.	TP37.766x36.659x0.7625	Reinf. 12 Tension Rupture	64.6%	Pass
60.17 - 59.5	Pole + Reinf.	TP37.914x37.766x0.7625	Reinf. 12 Tension Rupture	64.9%	Pass
59.5 - 59.25	Pole + Reinf.	TP37.97x37.914x0.7625	Reinf. 11 Tension Rupture	65.0%	Pass
59.25 - 54.25	Pole + Reinf.	TP39.077x37.97x0.75	Reinf. 11 Tension Rupture	67.1%	Pass
54.25 - 53	Pole + Reinf.	TP39.354x39.077x0.7375	Reinf. 11 Tension Rupture	67.7%	Pass
53 - 52.75	Pole + Reinf.	TP39.41x39.354x0.7375	Reinf. 11 Tension Rupture	67.8%	Pass
52.75 - 52.64	Pole + Reinf.	TP40.67x39.41x0.7375	Reinf. 11 Tension Rupture	67.8%	Pass
52.64 - 46.06	Pole + Reinf.	TP40.27x38.808x0.7625	Reinf. 11 Tension Rupture	68.2%	Pass
46.06 - 41.06	Pole + Reinf.	TP41.381x40.27x0.75	Reinf. 11 Tension Rupture	69.9%	Pass
41.06 - 39.33	Pole + Reinf.	TP41.765x41.381x0.75	Reinf. 11 Tension Rupture	70.4%	Pass
39.33 - 39.08	Pole + Reinf.	TP41.821x41.765x0.825	Reinf. 11 Tension Rupture	64.3%	Pass
39.08 - 37.75	Pole + Reinf.	TP42.116x41.821x0.825	Reinf. 11 Tension Rupture	64.7%	Pass
37.75 - 37.5	Pole + Reinf.	TP42.171x42.116x0.75	Reinf. 11 Tension Rupture	71.0%	Pass
37.5 - 32.5	Pole + Reinf.	TP43.282x42.171x0.7375	Reinf. 11 Tension Rupture	72.6%	Pass
32.5 - 29.75	Pole + Reinf.	TP43.893x43.282x0.725	Reinf. 11 Tension Rupture	73.4%	Pass
29.75 - 29.5	Pole + Reinf.	TP43.948x43.893x0.725	Reinf. 10 Tension Rupture	73.5%	Pass
29.5 - 24.5	Pole + Reinf.	TP45.059x43.948x0.7125	Reinf. 10 Tension Rupture	74.9%	Pass
24.5 - 21.25	Pole + Reinf.	TP45.781x45.059x0.7125	Reinf. 10 Tension Rupture	75.8%	Pass
21.25 - 21	Pole + Reinf.	TP45.836x45.781x0.725	Reinf. 7 Tension Rupture	72.4%	Pass
21 - 20	Pole + Reinf.	TP46.058x45.836x0.725	Reinf. 7 Tension Rupture	72.7%	Pass
20 - 19.75	Pole + Reinf.	TP46.114x46.058x0.825	Reinf. 10 Tension Rupture	67.7%	Pass
19.75 - 17	Pole + Reinf.	TP46.724x46.114x0.8125	Reinf. 10 Tension Rupture	68.4%	Pass
17 - 16.75	Pole + Reinf.	TP46.78x46.724x0.775	Reinf. 10 Tension Rupture	74.8%	Pass
16.75 - 11.75	Pole + Reinf.	TP47.89x46.78x0.7625	Reinf. 10 Tension Rupture	76.0%	Pass
11.75 - 6.75	Pole + Reinf.	TP49.001x47.89x0.75	Reinf. 10 Tension Rupture	77.3%	Pass
6.75 - 1.75	Pole + Reinf.	TP50.111x49.001x0.7375	Reinf. 10 Tension Rupture	78.4%	Pass
1.75 - 0	Pole + Reinf.	TP50.5x50.111x0.7375	Reinf. 10 Tension Rupture	78.8%	Pass
				Summary	
			Pole	86.2%	Pass
			Reinforcement	85.0%	Pass
			Overall	86.2%	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	R12	R13	R14	R15
159.86 - 154.86	398	n/a	398	10.37	n/a	10.37	8.2%															
154.86 - 149.86	480	n/a	480	11.04	n/a	11.04	18.5%															
149.86 - 144.86	572	n/a	572	11.71	n/a	11.71	32.9%															
144.86 - 139.86	676	n/a	676	12.37	n/a	12.37	45.1%															
139.86 - 134.86	791	n/a	791	13.04	n/a	13.04	57.7%															
134.86 - 129.86	919	n/a	919	13.71	n/a	13.71	68.7%															
129.86 - 125.75	1033	n/a	1033	14.26	n/a	14.26	76.7%															
125.75 - 125.5	1040	n/a	1040	14.29	n/a	14.29	77.2%															
125.5 - 122.73	1123	n/a	1123	14.66	n/a	14.66	86.2%													64.2%		
122.73 - 117.98	1611	1480	3092	20.03	16.41	36.43	35.8%													71.3%		
117.98 - 112.98	1831	1603	3435	20.90	16.41	37.31	40.6%													76.5%		
112.98 - 107.98	2070	1731	3802	21.77	16.41	38.18	45.3%													85.0%		
107.98 - 103	2328	1864	4192	22.64	16.41	39.05	48.7%													75.7%		
103 - 102.75	2398	2615	5013	22.68	28.41	51.09	46.9%					52.2%		52.2%						79.6%		
102.75 - 100.21	2541	2713	5254	23.13	28.41	51.53	49.0%					54.3%		54.3%						80.1%		
100.21 - 100.02	2492	4058	6549	23.16	34.41	57.57	35.4%					53.8%		53.8%	53.8%					60.5%		
100.02 - 94.69	3317	4239	7556	29.56	34.41	63.97	33.8%					54.2%		54.2%	54.2%					61.4%		
94.69 - 93.5	3406	4310	7715	29.82	34.41	64.23	34.4%					55.0%		55.0%	55.0%					60.6%		
93.5 - 93.25	3425	5004	9429	29.88	47.91	77.79	28.4%					45.4%		45.4%	45.4%	49.7%				53.2%		
93.25 - 89.25	3736	6844	10080	30.76	47.91	78.66	30.0%					47.6%		47.6%	47.6%	52.2%						
89.25 - 89	3756	6876	10632	30.81	51.66	82.47	28.7%					45.5%		45.5%	45.5%	49.8%			47.3%			
89 - 86.5	3960	7110	11070	31.36	51.66	83.02	29.7%					46.8%		46.8%	46.8%	51.3%			48.6%			
86.5 - 86.25	3981	5285	9266	31.42	38.16	69.57	35.7%					56.3%		56.3%	56.3%				58.5%			
86.25 - 81.25	4414	5641	10055	32.52	38.16	70.67	37.9%					59.1%		59.1%	59.1%				61.4%			
81.25 - 76.25	4876	6009	10885	33.61	38.16	71.77	40.0%					61.9%		61.9%	61.9%				64.2%			
76.25 - 75.42	4956	6071	11027	33.80	38.16	71.95	40.3%					62.3%		62.3%	62.3%				64.7%			
75.42 - 75.17	4981	7482	12463	33.85	46.92	80.77	35.9%		53.3%			55.5%		55.5%	55.5%				57.6%			
75.17 - 70.17	5481	7952	13433	34.95	46.92	81.87	37.9%		55.5%			57.8%		57.8%	57.8%				60.0%			
70.17 - 65.17	6015	8436	14450	36.05	46.92	82.97	39.7%		57.7%			60.1%		60.1%	60.1%				62.4%			
65.17 - 60.17	6582	8934	15515	37.15	46.92	84.06	41.6%		59.8%			62.3%		62.3%	62.3%				64.6%			
60.17 - 59.5	6660	9001	15661	37.29	46.92	84.21	41.8%		60.1%			62.5%		62.5%	62.5%				64.9%			
59.5 - 59.25	6689	9027	15716	37.35	46.92	84.27	41.9%		60.2%			62.7%		62.7%	62.7%			65.0%				
59.25 - 54.25	7297	9542	16839	38.45	46.92	85.36	43.7%		62.1%			64.7%		64.7%	64.7%			67.1%				
54.25 - 53	7455	9673	17128	38.72	46.92	85.64	44.2%		62.6%			65.2%		65.2%	65.2%			67.7%				
53 - 52.75	7486	9700	17186	38.78	46.92	85.69	44.3%		62.7%			65.3%		65.3%	65.3%			67.8%				
52.75 - 52.64	7500	9711	17211	38.80	46.92	85.72	44.3%		62.7%			65.4%		65.4%	65.4%			67.8%				
52.64 - 46.06	9548	9354	18902	47.48	46.92	94.40	43.4%		65.2%			62.3%	63.1%	64.6%				68.2%				
46.06 - 41.06	10367	9859	20226	48.81	46.92	95.72	44.8%		66.8%			63.9%	64.7%	66.3%				69.9%				
41.06 - 39.33	10661	10037	20699	49.26	46.92	96.18	45.3%		67.3%			64.5%	65.2%	66.8%				70.4%				
39.33 - 39.08	10704	12091	22795	49.33	55.68	105.01	41.3%	60.7%	61.3%			59.1%	59.8%	61.1%				64.3%				
39.08 - 37.75	10935	12257	23192	49.68	55.68	105.36	41.7%	61.1%	61.7%			59.5%	60.1%	61.5%				64.7%				
37.75 - 37.5	10979	10227	21206	49.75	45.92	95.66	45.8%	67.2%				65.0%	65.8%	67.4%				71.0%				
37.5 - 32.5	11877	10755	22632	51.07	45.92	97.98	47.2%	68.6%				66.5%	67.3%	68.8%				72.6%				
32.5 - 29.75	12391	11051	23442	51.80	45.92	99.71	48.0%	69.4%				67.3%	68.0%	69.6%				73.4%				
29.75 - 29.5	12439	11078	23517	51.86	45.92	98.78	48.0%	69.5%				67.4%	68.1%	69.7%			73.5%					
29.5 - 24.5	13414	11627	25042	53.18	45.92	100.10	49.4%	70.8%				68.7%	69.5%	71.1%			74.9%					
24.5 - 21.25	14075	11992	26066	54.04	45.92	100.96	50.2%	71.6%				69.6%	70.3%	71.9%			75.8%					
21.25 - 21	14123	12518	26642	54.11	57.54	111.65	48.9%	70.8%			49.4%	55.2%	68.3%	72.4%			71.1%					
21 - 20	14331	12636	26967	54.37	57.54	111.91	49.1%	71.0%			49.6%	55.5%	68.5%	72.7%			71.4%					
20 - 19.75	14402	16056	30458	54.44	66.79	121.23	45.4%	66.1%		59.9%	48.3%	54.6%					67.7%					
19.75 - 17	14987	16469	31456	55.17	66.79	121.96	46.1%	66.7%		60.6%	48.9%	55.2%					68.4%					
17 - 16.75	15128	15010	30138	55.23	60.79	116.02	49.7%	70.5%		61.0%	56.0%						74.8%					
16.75 - 11.75	16237	15708	31945	56.55	60.79	117.34	51.0%	71.6%		62.1%	57.1%						76.0%					
11.75 - 6.75	17399	16422	33821	57.87	60.79	118.67	52.2%	72.9%		63.2%	58.1%						77.3%					
6.75 - 1.75	18616	17152	35768	59.20	60.79	119.99	53.5%	73.9%		64.2%	59.1%						78.4%					
1.75 - 0	19055	17411	36466	59.66	60.79	120.45	53.9%	74.2%		64.5%	59.4%						78.8%					

Note: Section capacity checked in 5 degree increments.
Rating per TIA-222-H Section 15.5.

Monopole Base Plate Connection

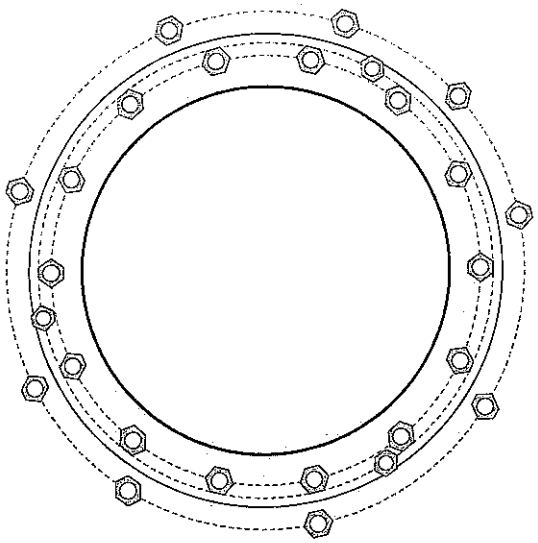
CROWN CASTLE

Site Info	
BU #	876401
Site Name	WN OF PLAINFIELD/SSL
Order #	471523 Rev.0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2

Applied Loads	
Moment (kip-ft)	4209.00
Axial Force (kips)	63.00
Shear Force (kips)	41.00

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (14) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 59" BC

GROUP 2: (3) 2" ø bolts (A193 Gr. B7 N; Fy=105 ksi, Fu=125 ksi) on 62.5" BC

pos. (deg): 61.4, 191.4, 301.4

GROUP 3: (9) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 71.1" BC

pos. (deg): 11.4, 41.4, 71.4, 111.4, 161.4, 206.4, 237.4, 281.4, 327.4

Base Plate Data

65" OD x 1.75" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

50.5" x 0.375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

GROUP 1:		
Pu_c = 128.33	ϕPn_c = 243.75	Stress Rating
Vu = 2.93	ϕVn = 73.13	50.3%
Mu = n/a	ϕMn = n/a	Pass
GROUP 2:		
Pu_c = 99.36	ϕPn_c = 262.5	Stress Rating
Vu = 0	ϕVn = 78.75	36.0%
Mu = n/a	ϕMn = n/a	Pass
GROUP 3:		
Pu_c = 147.15	ϕPn_c = 243.75	Stress Rating
Vu = 0	ϕVn = 73.13	57.5%
Mu = 0	ϕMn = 94.7	Pass

Base Plate Summary

Max Stress (ksi):	37.7	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	66.5%	Pass

Additional Anchor Rods: Division of Forces

Base Reactions from tnxTower:

$Moment := 4209 \cdot kip \cdot ft$

$Axial := 63 \cdot kip$

$Shear := 41 \cdot kip$

Apply TIA-222-H Section 15.5? No / Yes

Existing Anchor Rod Group Moment of Inertia:

$N_{existing} := 14$ $\quad D_{existing} := 2.25 \cdot in$

$BC_{existing} := 59 \cdot in$ $\quad A_{existing} := 3.25 in^2$

$$I_{existing} := \left(\frac{N_{existing}}{8}\right) \cdot \left(BC_{existing}^{2}\right) \cdot \left(A_{existing}\right) = 19798.19 \cdot in^4$$

Additonal (New) Anchor Rod Group Moment of Inertia:

$N_{new} := 3$ $\quad D_{new} := 2 \cdot in$ $\quad Fu_{rod} := 125 ksi$

$BC_{new} := 62.5 \cdot in$ $\quad A_{new} := 2.5 \cdot in^2$ $\quad Fy_{rod} := 105 ksi$

$$I_{new} := \left(\frac{N_{new}}{8}\right) \cdot \left(BC_{new}^{2}\right) \cdot \left(A_{new}\right) = 3662.11 \cdot in^4$$

Division of Forces:

$$I_{total} := \left(I_{existing}\right) + \left(I_{new}\right) = 23460.3 \cdot in^4$$

$$Percentage_{existing} := \left(\frac{I_{existing}}{I_{total}}\right) = 84.39 \cdot \%$$

$$Percentage_{new} := \left(\frac{I_{new}}{I_{total}}\right) = 15.61 \cdot \%$$

Forces Remaining in Existing Anchor Rods:

$$M_{existing} := Moment \cdot \left(Percentage_{existing}\right) = 3551.98 \cdot kip \cdot ft$$

$$Ax_{existing} := Axial = 63 \cdot kip$$

$$S_{existing} := Shear = 41 \cdot kip$$

Forces to New Anchor Rods:

$$M_{new} := Moment \cdot \left(Percentage_{new}\right) = 657.02 \cdot kip \cdot ft$$

$$Ax_{new} := 0 \cdot kip$$

$$S_{new} := 0 \cdot kip$$

(It is assumed that all of the Axial and Shear loads will go to the existing anchor rods)

--See attached CCIplate output for additional anchor rod group capacity and structural rating values--

Anchor Rod Bracket Calculations

Analyze the anchor rod bracket and all components to resist the demand load of the additional anchors.

Bracket Demand Load: $\phi P_n := 99.36 \cdot kip$

Tube Design (Square HSS)

Member Size: HSS 4" x 4" x 1/2"

Member Properties (AISC 15th Ed., Table 1-12):

Outside Diameter: $OD_{HSS} := 4 \cdot in$

Area: $A_{HSS} := 6.02 \cdot in^2$ $A_{e\_HSS} := 0.75 \cdot A_{HSS} = 4.51 \cdot in^2$

Thickness: $t_{HSS} := 0.5 \cdot in$

Yield Strength: $F_{y\_HSS} := 46 \cdot ksi$ $F_{u\_HSS} := 58 \cdot ksi$

Length: $L_{HSS} := 12 \cdot in$

Moment of Inertia: $I_{HSS} := 11.9 \cdot in^4$

Radius of Gyration: $r_{HSS} := 1.41 \cdot in$

Inside Dimension: $ID_{HSS} := OD_{HSS} - 2 \cdot t_{HSS} = 3 \cdot in$

Bearing Check (AISC 15th Ed., Equation J7-1):

$\phi_b := 0.75$

$\phi P_n = \phi_b \cdot R_n = \phi_b \cdot 1.8 \cdot F_{y\_HSS} \cdot A_{pb}$

$$A_{pb} := \frac{\phi P_n}{\phi_b \cdot 1.8 \cdot F_{y\_HSS}} = 1.6 \cdot in^2$$

$$Check_{bear} := \begin{cases} \text{"OK"} & \text{if } A_{HSS} \geq A_{pb} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{bear} = \text{"OK"}$

Compression Check
(AISC 15th Ed., Eqs. E3-1 to E3-4):

$\phi_c := 0.9$

$K := 1$

$\phi P_{n\_comp} = \phi_c \cdot F_{cr} \cdot A_g$

$L_c := K \cdot L_{HSS} = 12 \cdot in$

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{L_c}{r_{HSS}}\right)^2} = 3951.6 \cdot ksi$$

$$\frac{L_c}{r_{HSS}} = 8.51 \quad < \quad 4.71 \cdot \sqrt{\frac{29000 \cdot ksi}{F_{y\_HSS}}} = 118.26$$

$$\therefore \quad F_{cr} := 0.658^{\frac{F_{y\_HSS}}{F_e}} \cdot F_{y\_HSS} = 45.78 \cdot ksi$$

(AISC 15th Ed., Equation J4-6):

$$\phi P_{n\_comp} := \begin{cases} \phi_c \cdot F_{y\_HSS} \cdot A_{HSS} & \text{if } \frac{L_c}{r_{HSS}} \le 25 \\ \phi_c \cdot F_{cr} \cdot A_{HSS} & \text{otherwise} \end{cases}$$

$\phi P_{n\_comp} = 249.23 \cdot kip$

$$Check_{comp} := \begin{cases} \text{"OK"} & \text{if } \phi P_{n\_comp} \ge \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{comp} = \text{"OK"}$

Gusset Plate Design

Gusset Plate width: $w_{plate} := 4 \cdot in$

Gusset Plate thickness: $t_{plate} := 1.25in$

$L_{plate1} := 30in$

$L_{plate2} := 18in$

Gusset Plate Strength: $Fy_{plate} := 65ksi$

$Fu_{plate} := 80ksi$

Pole thickness: $t_{pole} := 0.375in$

Shear Check
(AISC 15th Ed., Eqs. J4-3 and J4-4):

$A_g := t_{plate} \cdot L_{plate2} = 22.5 \cdot in^2$

$A_{nv} := A_g = 22.5 \cdot in^2$

Shear Yielding

$\phi_v := 1$

$\phi V_{plate} := \phi_v \cdot 0.6 \cdot A_g \cdot Fy_{plate} = 877.5 \cdot kip$

$$Check_{shear} := \begin{cases} \text{"OK"} & \text{if } \phi V_{plate} \geq \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{shear} = \text{"OK"}$

Shear Rupture

$\phi_{sw} := 0.75$

$\phi V_{plate} := \phi_v \cdot 0.6 \cdot A_{nv} \cdot Fu_{plate} = 810 \cdot kip$

$$Check_{shear} := \begin{cases} \text{"OK"} & \text{if } \phi V_{plate} \geq \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{shear} = \text{"OK"}$

Gusset Plate to Pole and Base Plate Weld Design (Horizontal and Vertical Weld):
(AISC 15th Ed., Part 8)

Gusset plate thickness: $t_{plate} = 1.25 \cdot in$

Pole Grade: $Fy_{pole} := 65ksi$ $Fu_{pole} := 80ksi$

Base Plate Grade: $Fy_{base} := 60ksi$ $Fu_{base} := 75ksi$

Gussett Plate Grade: $Fy_{plate} = 65 \cdot ksi$ $Fu_{plate} = 80 \cdot ksi$

Height of vertical weld from base plate: $H_w := L_{plate1} = 30 \cdot in$

$Notch := 0.75 \cdot in$

Gap between Base Plate and HSS: $Gap := 0in$

Vertical fillet weld size to pole: (in sixteenths of an inch) $D_{vpole} := 6$

$$weldsize_{pole} := \frac{D_{vpole}}{16} = \frac{3}{8}$$

Weld Material Grade: $F_{EXX} := 80ksi$

$$Check := \begin{cases} \text{"OK"} & \text{if Capacity} < 100\% \\ \text{"INSUFFICIENT"} & \text{otherwise} \end{cases}$$

Check = "OK"

Gusset Plate to HSS Weld Design
(AISC 15th Ed., Table 8-4)

Electrode Strength: $F_{EXX} = 80ksi$

Weld Size (in sixteenths of an inch): $D_1 = 8$ $\quad weldsize_1 := \frac{D_1}{16} = \frac{1}{2}$

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$$ecc_2 := OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 2.5 \cdot in$$

Load not in plane with weld group: $k := 0$

$$a := \frac{ecc_2}{L_{plate2}} = 0.14$$

$C_1 := 1.03$

$Coeff_1 := 3.71$

$\phi_w := 0.75$

$$D_{min1} := ceil\left(\frac{\phi P_n \cdot in}{\phi_w \cdot Coeff_1\, C_1 \cdot L_{plate2} \cdot kip}\right) = 2$$

$$minweldsize := \frac{D_{min1}}{16} = \frac{1}{8}$$

$$Check_{weld} := \begin{cases} \text{"OK"} & \text{if } D_1 \geq D_{min1} \wedge D_1 \geq Min_{weldsize} \wedge D_1 \leq Max_{weldsize} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{weld} = \text{"OK"}$

$\phi Rn_{weld1} := \phi_w \cdot Coeff_1\, ksi \cdot in \cdot C_1 \cdot D_1 \cdot L_{plate2} = 412.7 \cdot kip$

$$Check_{weld1} := \begin{cases} \text{"OK"} & \text{if } \phi Rn_{weld1} \geq \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{weld1} = \text{"OK"}$

Gusset Plate to Pole Punching Shear Check (max per unit length): (AISC 15th Ed., Section J4.2)

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$\phi_{sy} := 1.0$

$\phi_{sr} := 0.75$

$$ecc_1 := w_{plate} + OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 6.5 \cdot in$$

$M_1 := \phi P_n \cdot ecc_1 = 645.84 \cdot kip \cdot in$

$$S_1 := \frac{t_{plate} \cdot L_{plate1}^2}{6} = 187.5 \cdot in^3$$

$$f_{ww} := \frac{M_1}{S_1} \cdot t_{plate} \cdot 1in = 4.31 \cdot kip$$

AISC 15th Ed., Equation J4-3:

$\phi F_{sy} := \phi_{sy} \cdot 0.6 \cdot Fy_{pole} \cdot 2 \cdot t_{pole} \cdot 1in = 29.25 \cdot kip$

AISC 15th Ed., Equation J4-4:

$\phi F_{sr} := \phi_{sr} \cdot 0.6 \cdot Fu_{pole} \cdot 2 \cdot t_{pole} \cdot 1in = 27 \cdot kip$

$$\phi F_v := \min(\phi F_{sy}, \phi F_{sr}) = 27 \cdot kip$$

$$Check_{PS1} := \begin{cases} \text{"OK"} & \text{if } \phi F_v \geq f_v \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

Check_PS1 = "OK"

Gusset Plate to HSS Punching Shear Check (max per unit length): (AISC 15th Ed., Section J4.2)

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$$ecc_2 := OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 2.5 \cdot in$$

$$M_2 := \phi P_n \cdot ecc_2 = 248.4 \cdot kip \cdot in$$

$$S_2 := \frac{t_{plate} \cdot L_{plate2}^2}{6} = 67.5 \cdot in^3$$

$$f_v := \frac{M_2}{S_2} \cdot t_{plate} \cdot 1in = 4.6 \cdot kip$$

AISC 15th Ed., Equation J4-3:

$$\phi F_{sy} := \phi_{sy} \cdot 0.6 \cdot F_{y\_HSS} \cdot 2 \cdot t_{HSS} \cdot 1in = 27.6 \cdot kip$$

AISC 15th Ed., Equation J4-4:

$$\phi F_{sr} := \phi_{sr} \cdot 0.6 \cdot F_{u\_HSS} \cdot 2 \cdot t_{HSS} \cdot 1in = 26.1 \cdot kip$$

$$\phi F_v := \min(\phi F_{sy}, \phi F_{sr}) = 26.1 \cdot kip$$

$$Check_{PS2} := \begin{cases} \text{"OK"} & \text{if } \phi F_v \geq f_v \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

Check_PS2 = "OK"

Embedment Depth Calculations

Projected Embedment Depth: $L_{em} := 17.5 \cdot ft$

Yield Strength of Rebar: $f_y := 60ksi$

Concrete Strength: $f'_c := 4000psi$

Transverse Reinforcement Index: $k_{tr} := 0$ Can be taken as 0 for design per ACI 318-14

Epoxy Factor: $\psi_e := 1$

Rebar Size Factor: $\psi_s := 1$

Casting Position Factor: $\psi_t := 1$

Concrete Weight Factor: $\lambda := 1\sqrt{psi}$

Pier Diameter: $D_{pier} := 7ft$

Cover: $c_c := 4in$

Rebar Size: $d_s := 11$ $d_b := \text{vlookup}(d_s, \text{Rebar}, 2) \cdot in = 1.41 \cdot in$

Tie Size: $\text{Tie} := 5$

Number of Vertical Rebar: $n := 18$

Development Length
(ACI 318-14 Chapter 25):

$$BC_{rebar} := D_{pier} - 2 \cdot c_c - \frac{\text{Tie} \cdot in}{4} - d_b = 73.34 \cdot in$$

$$S_{rebar} := \frac{\pi \cdot BC_{rebar}}{n} = 12.8 \cdot in$$

$$c_b := \min\left(c_c + \frac{\text{Tie}}{8}in + \frac{d_b}{2}, S_{rebar} \cdot 0.5\right) = 5.33 \cdot in$$

ACI 318-14, Equation 25.4.2.3a:

$$l_d := \left[\frac{3}{40} \cdot \frac{f_y}{\lambda \cdot \sqrt{f'_c}} \cdot \frac{\psi_t \cdot \psi_e \cdot \psi_s}{\min\left[\left(\frac{c_b + k_{tr}}{d_b}\right), 2.5\right]}\right] \cdot d_b = 40.13 \cdot in$$

Calculate Max Distance Between Rebar and New Anchor Rods:

$$A := \frac{1}{2} \cdot S_{rebar} = 6.4 \cdot in$$

$$B := \frac{BC_{rebar}}{2} - \frac{BC_{new}}{2} = 5.42 \cdot in$$

$$G := \sqrt{A^2 + B^2} = 8.387 \cdot in$$

$$l'_d := l_d + \frac{G}{1.5} + 3in = 4.06\,ft$$

Epoxy Development Length:

Bond Strength:

Epoxy :=

$$\phi_{bond} := 0.65$$

$$S_b := \begin{cases} S_{bh} & \text{if Epoxy} = 0 \\ S_{bA} & \text{otherwise} \end{cases}$$

$$S_b = 1280\,psi$$

$$L_{be} := \frac{\phi P_n}{\pi \cdot D_{new} \cdot S_b \cdot \phi_{bond}} = 19.01 \cdot in$$

Required Embedment Length:

$$L_{min} := \max\left(L_{be} + 12in, l'_d + 0.25 \cdot L_{be}\right) = 4.46\,ft$$

$$L_{min} := \text{ceil}\left(\frac{L_{min}}{0.5ft}\right) \cdot 0.5ft$$

$$L_{min} = 4.5\,ft$$

$$Check := \begin{cases} \text{"OK"} & \text{if } L_{min} \le L_{em} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

Check = "OK"

Anchor Rod Pullout Test:

$\phi_p := 0.75$

Is this a CA DSA site?

$$\text{Pullout} := \begin{cases} \dfrac{\phi_p \cdot Fu_{rod} \cdot A_{new}}{1.6} & \text{if } CA = 0 \\ \left(0.8 \cdot Fy_{rod} \cdot A_{new}\right) & \text{otherwise} \end{cases} = 146 \cdot \text{kip}$$

Additional Anchor Rods: Division of Forces

Base Reactions from tnxTower:

$Moment := 4209 \cdot kip \cdot ft$

$Axial := 63 \cdot kip$

$Shear := 41 \cdot kip$

Apply TIA-222-H Section 15.5? No / Yes

Existing Anchor Rod Group Moment of Inertia:

$N_{existing} := 14$ $\quad D_{existing} := 2.25 \cdot in$

$BC_{existing} := 59 \cdot in$ $\quad A_{existing} := 3.25 in^2$

$$I_{existing} := \left(\frac{N_{existing}}{8}\right) \cdot \left(BC_{existing}^{2}\right) \cdot \left(A_{existing}\right) = 19798.19 \cdot in^4$$

Additonal (New) Anchor Rod Group Moment of Inertia:

$N_{new} := 9$ $\quad D_{new} := 2.25 \cdot in$ $\quad Fu_{rod} := 100 ksi$

$BC_{new} := 71.1 \cdot in$ $\quad A_{new} := 3.25 \cdot in^2$ $\quad Fy_{rod} := 75 ksi$

$$I_{new} := \left(\frac{N_{new}}{8}\right) \cdot \left(BC_{new}^{2}\right) \cdot \left(A_{new}\right) = 18483.11 \cdot in^4$$

Division of Forces:

$$I_{total} := \left(I_{existing}\right) + \left(I_{new}\right) = 38281.3 \cdot in^4$$

$$Percentage_{existing} := \left(\frac{I_{existing}}{I_{total}}\right) = 51.72 \cdot \%$$

$$Percentage_{new} := \left(\frac{I_{new}}{I_{total}}\right) = 48.28 \cdot \%$$

Forces Remaining in Existing Anchor Rods:

$$M_{existing} := Moment \cdot \left(Percentage_{existing}\right) = 2176.8 \cdot kip \cdot ft$$

$$Ax_{existing} := Axial = 63 \cdot kip$$

$$S_{existing} := Shear = 41 \cdot kip$$

Forces to New Anchor Rods:

$$M_{new} := Moment \cdot \left(Percentage_{new}\right) = 2032.2 \cdot kip \cdot ft$$

$$Ax_{new} := 0 \cdot kip$$

$$S_{new} := 0 \cdot kip$$

(It is assumed that all of the Axial and Shear loads will go to the existing anchor rods)

--See attached CCIplate output for additional anchor rod group capacity and structural rating values--

Anchor Rod Bracket Calculations

Analyze the anchor rod bracket and all components to resist the demand load of the additional anchors.

Bracket Demand Load: $\phi P_n := 147.15 \cdot kip$

Tube Design (Square HSS)

Member Size: HSS 4" x 4" x 1/2"

Member Properties (AISC 15th Ed., Table 1-12):

Outside Diameter: $OD_{HSS} := 5 \cdot in$

Area: $A_{HSS} := 7.88 \cdot in^2$ $A_{e\_HSS} := 0.75 \cdot A_{HSS} = 5.91 \cdot in^2$

Thickness: $t_{HSS} := 0.5 \cdot in$

Yield Strength: $F_{y\_HSS} := 46 \cdot ksi$ $F_{u\_HSS} := 58 \cdot ksi$

Length: $L_{HSS} := 45 \cdot in$

Moment of Inertia: $I_{HSS} := 26 \cdot in^4$

Radius of Gyration: $r_{HSS} := 1.82 \cdot in$

Inside Dimension: $ID_{HSS} := OD_{HSS} - 2 \cdot t_{HSS} = 4 \cdot in$

Bearing Check (AISC 15th Ed., Equation J7-1):

$\phi_b := 0.75$

$\phi P_n = \phi_b \cdot R_n = \phi_b \cdot 1.8 \cdot F_{y\_HSS} \cdot A_{pb}$

$$A_{pb} := \frac{\phi P_n}{\phi_b \cdot 1.8 \cdot F_{y\_HSS}} = 2.37 \cdot in^2$$

$$Check_{bear} := \begin{cases} \text{"OK"} & \text{if } A_{HSS} \geq A_{pb} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{bear} = \text{"OK"}$

Compression Check
(AISC 15th Ed., Eqs. E3-1 to E3-4):

$\phi_c := 0.9$

$K := 1$

$\phi P_{n\_comp} = \phi_c \cdot F_{cr} \cdot A_g$

$L_c := K \cdot L_{HSS} = 45 \cdot in$

$$F_e := \frac{\pi^2 \cdot 29000ksi}{\left(\frac{L_c}{r_{HSS}}\right)^2} = 468.18 \cdot ksi$$

$$\frac{L_c}{r_{HSS}} = 24.73 \quad < \quad 4.71 \cdot \sqrt{\frac{29000 \cdot ksi}{F_{y\_HSS}}} = 118.26$$

$$\therefore \quad F_{cr} := 0.658^{\frac{F_{y\_HSS}}{F_e}} \cdot F_{y\_HSS} = 44.15 \cdot ksi$$

(AISC 15th Ed., Equation J4-6):

$$\phi P_{n\_comp} := \begin{cases} \phi_c \cdot F_{y\_HSS} \cdot A_{HSS} & \text{if } \frac{L_c}{r_{HSS}} \le 25 \\ \phi_c \cdot F_{cr} \cdot A_{HSS} & \text{otherwise} \end{cases}$$

$\phi P_{n\_comp} = 326.23 \cdot kip$

$$Check_{comp} := \begin{cases} \text{"OK"} & \text{if } \phi P_{n\_comp} \ge \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{comp} = \text{"OK"}$

Gusset Plate Design

Gusset Plate width: $w_{plate} := 8.25 \cdot in$

Gusset Plate thickness: $t_{plate} := 1.25in$

$L_{plate1} := 44in$

$L_{plate2} := 36in$

Gusset Plate Strength: $Fy_{plate} := 65ksi$

$Fu_{plate} := 80ksi$

Pole thickness: $t_{pole} := 0.375in$

Shear Check
(AISC 15th Ed., Eqs. J4-3 and J4-4):

$A_g := t_{plate} \cdot L_{plate2} = 45 \cdot in^2$

$A_{nv} := A_g = 45 \cdot in^2$

Shear Yielding

$\phi_v := 1$

$\phi V_{plate} := \phi_v \cdot 0.6 \cdot A_g \cdot Fy_{plate} = 1755 \cdot kip$

$$Check_{shear} := \begin{cases} \text{"OK"} & \text{if } \phi V_{plate} \geq \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{shear} = \text{"OK"}$

Shear Rupture

$\phi_{rw} := 0.75$

$\phi V_{plate} := \phi_v \cdot 0.6 \cdot A_{nv} \cdot Fu_{plate} = 1620 \cdot kip$

$$Check_{shear} := \begin{cases} \text{"OK"} & \text{if } \phi V_{plate} \geq \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{shear} = \text{"OK"}$

Gusset Plate to Pole Weld Design
(AISC 15th Ed., Table 8-4)

Electrode Strength: $F_{EXX} := 80ksi$

Weld Size (in sixteenths of an inch): $D_1 := 5$ $\quad weldsize_1 := \frac{D_1}{16} = \frac{5}{16}$

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$$ecc_1 := w_{plate} + OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 11.63 \cdot in$$

Load not in plane with weld group: $k := 0$

$$a := \frac{ecc_1}{L_{plate1}} = 0.26$$

$\phi_w := 0.75$

$C_1 := 1.03$

$Coeff_1 := 3.247$

$$D_{min1} := ceil\left(\frac{\phi P_n \cdot in}{\phi_w \cdot Coeff_1 \, C_1 \cdot L_{plate1} \cdot kip}\right) = 2$$

$$minweldsize := \frac{D_{min1}}{16} = \frac{1}{8}$$

Check weld
OK

Gusset Plate to HSS Weld Design
(AISC 15th Ed., Table 8-4)

Electrode Strength: $F_{EXX} := 80ksi$

Weld Size (in sixteenths of an inch): $D_1 := 5$ $\quad weldsize_1 := \frac{D_1}{16} = \frac{5}{16}$

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$$ecc_2 := OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 3.38 \cdot in$$

Load not in plane with weld group: $k := 0$

$$a := \frac{ecc_2}{L_{plate2}} = 0.09$$

$C_{1w} := 1.03$

$Coeff_1 := 3.72$

$\phi_w := 0.75$

$$D_{min1} := ceil\left(\frac{\phi P_n \cdot in}{\phi_w \cdot Coeff_1\, C_1 \cdot L_{plate2} \cdot kip}\right) = 2$$

$$minweldsize := \frac{D_{min1}}{16} = \frac{1}{8}$$

$$Check_{weld} := \begin{cases} \text{"OK"} & \text{if } D_1 \geq D_{min1} \wedge D_1 \geq Min_{weldsize} \wedge D_1 \leq Max_{weldsize} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{weld} = \text{"OK"}$ $Check_{weld} = \text{"OK"}$

$$\phi Rn_{weld1} := \phi_w \cdot Coeff_1\, ksi \cdot in \cdot C_1 \cdot D_1 \cdot L_{plate2} = 517.27 \cdot kip$$

$$Check_{weld1} := \begin{cases} \text{"OK"} & \text{if } \phi Rn_{weld1} \geq \phi P_n \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{weld1} = \text{"OK"}$

Gusset Plate to Pole Punching Shear Check (max per unit length): (AISC 15th Ed., Section J4.2)

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$\phi_{sy} := 1.0$

$\phi_{sr} := 0.75$

$$ecc_1 := w_{plate} + OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 11.63 \cdot in$$

$M_1 := \phi P_n \cdot ecc_1 = 1710.62 \cdot kip \cdot in$

$$S_1 := \frac{t_{plate} \cdot L_{plate1}^{\,2}}{6} = 403.33 \cdot in^3$$

$$f_v := \frac{M_1}{S_1} \cdot t_{plate} \cdot 1in = 5.3 \cdot kip$$

AISC 15th Ed., Equation J4-3:

$\phi F_{sy} := \phi_{sy} \cdot 0.6 \cdot Fy_{pole} \cdot 2 \cdot t_{pole} \cdot 1in = 29.25 \cdot kip$

AISC 15th Ed., Equation J4-4:

$\phi F_{sr} := \phi_{sr} \cdot 0.6 \cdot Fu_{pole} \cdot 2 \cdot t_{pole} \cdot 1in = 27 \cdot kip$

$$\phi F_{vw} := \min\left(\phi F_{sy}, \phi F_{sr}\right) = 27 \cdot kip$$

$$Check_{PS1} := \begin{cases} \text{"OK"} & \text{if } \phi F_v \geq f_v \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{PS1} = \text{"OK"}$

Gusset Plate to HSS Punching Shear Check (max per unit length): (AISC 15th Ed., Section J4.2)

Assume the worst-case installation scenario where the rod is positioned directly against the far side of the HSS.

$$ecc_2 := OD_{HSS} - t_{HSS} - \frac{D_{new}}{2} = 3.38 \cdot in$$

$$M_2 := \phi P_n \cdot ecc_2 = 496.63 \cdot kip \cdot in$$

$$S_2 := \frac{t_{plate} \cdot L_{plate2}^2}{6} = 270 \cdot in^3$$

$$f_v := \frac{M_2}{S_2} \cdot t_{plate} \cdot 1in = 2.3 \cdot kip$$

AISC 15th Ed., Equation J4-3:

$$\phi F_{vsy} := \phi_{sy} \cdot 0.6 \cdot F_{y\_HSS} \cdot 2 \cdot t_{HSS} \cdot 1in = 27.6 \cdot kip$$

AISC 15th Ed., Equation J4-4:

$$\phi F_{vsr} := \phi_{sr} \cdot 0.6 \cdot F_{u\_HSS} \cdot 2 \cdot t_{HSS} \cdot 1in = 26.1 \cdot kip$$

$$\phi F_{vw} := \min\left(\phi F_{sy}, \phi F_{sr}\right) = 26.1 \cdot kip$$

$$Check_{PS2} := \begin{cases} \text{"OK"} & \text{if } \phi F_v \geq f_v \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

$Check_{PS2} = \text{"OK"}$

Embedment Depth Calculations

Projected Embedment Depth:	$L_{em} := 18 \cdot ft$	
Yield Strength of Rebar:	$f_y := 60ksi$	
Concrete Strength:	$f'_c := 4000psi$	
Transverse Reinforcement Index:	$k_{tr} := 0$	Can be taken as 0 for design per ACI 318-14
Epoxy Factor:	$\psi_e := 1$	
Rebar Size Factor:	$\psi_s := 1$	
Casting Position Factor:	$\psi_t := 1$	
Concrete Weight Factor:	$\lambda := 1\sqrt{psi}$	
Pier Diameter:	$D_{pier} := 7ft$	
Cover:	$c_c := 4in$	
Rebar Size:	$d_s := 11$	$d_b := \text{vlookup}(d_s, \text{Rebar}, 2) \cdot in = 1.41 \cdot in$
Tie Size:	$\text{Tie} := 5$	
Number of Vertical Rebar:	$n := 18$	

Development Length
(ACI 318-14 Chapter 25):

$$BC_{rebar} := D_{pier} - 2 \cdot c_c - \frac{\text{Tie} \cdot in}{4} - d_b = 73.34 \cdot in$$

$$S_{rebar} := \frac{\pi \cdot BC_{rebar}}{n} = 12.8 \cdot in$$

$$c_b := \min\left(c_c + \frac{\text{Tie}}{8} in + \frac{d_b}{2}, S_{rebar} \cdot 0.5\right) = 5.33 \cdot in$$

ACI 318-14, Equation 25.4.2.3a:

$$l_d := \left[\frac{3}{40} \cdot \frac{f_y}{\lambda \cdot \sqrt{f'_c}} \cdot \frac{\psi_t \cdot \psi_e \cdot \psi_s}{\min\left[\left(\frac{c_b + k_{tr}}{d_b}\right), 2.5\right]}\right] \cdot d_b = 40.13 \cdot in$$

Calculate Max Distance Between Rebar and New Anchor Rods:

$$A := \frac{1}{2}\cdot S_{rebar} = 6.4\cdot in$$

$$B := \frac{BC_{rebar}}{2} - \frac{BC_{new}}{2} = 1.12\cdot in$$

$$G := \sqrt{A^2 + B^2} = 6.497\cdot in$$

$$l'_d := l_d + \frac{G}{1.5} + 3in = 3.96\,ft$$

Epoxy Development Length:

Bond Strength:

Epoxy := Hilti Hit Re 500

$$\phi_{bond} := 0.65$$

$$S_b := \begin{cases} S_{bh} & \text{if Epoxy} = 0 \\ S_{bA} & \text{otherwise} \end{cases}$$

$$S_b = 1037\,psi$$

$$L_{be} := \frac{\phi P_n}{\pi\cdot D_{new}\cdot S_b\cdot \phi_{bond}} = 30.88\cdot in$$

Required Embedment Length:

$$L_{min} := \max\left(L_{be} + 12in, l'_d + 0.25\cdot L_{be}\right) = 4.6\,ft$$

$$L_{min} := ceil\left(\frac{L_{min}}{0.5ft}\right)\cdot 0.5ft$$

$$L_{min} = 5\,ft$$

$$Check := \begin{cases} \text{"OK"} & \text{if } L_{min} \le L_{em} \\ \text{"N/G"} & \text{otherwise} \end{cases}$$

Check = "OK"

Anchor Rod Pullout Test:

$\phi_p := 0.75$

Is this a CA DSA site?

$$\text{Pullout} := \begin{cases} \dfrac{\phi_p \cdot Fu_{rod} \cdot A_{new}}{1.6} & \text{if } CA = 0 \\ \left(0.8 \cdot Fy_{rod} \cdot A_{new}\right) & \text{otherwise} \end{cases} = 152 \cdot kip$$

Drilled Pier Foundation

BU # :	876401
Site Name:	TOWN OF PLAINFIEL
Order Number:	471523 Rev.0

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	4209	
Axial Force (kips)	63	
Shear Force (kips)	41	

Material Properties		
Concrete Strength, f'c:	4	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	26.5	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 18' below grade		
Pier Diameter	7	ft
Rebar Quantity	18	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	
Rebar Quantity	9	
Rebar Size	18	
Rebar Cage Diameter	71.1	in
Pier Section 2		
From 18' below grade to 26.5' below grade		
Pier Diameter	7	ft
Rebar Quantity	18	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	7.64	-
Soil Safety Factor	4.15	-
Max Moment (kip-ft)	4480.02	-
Rating*	*30.6%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	648.85	-
End Bearing (kips)	461.81	-
Weight of Concrete (kips)	187.03	-
Total Capacity (kips)	1110.67	-
Axial (kips)	250.03	-
Rating*	*21.4%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	18.51	-
Critical Moment (kip-ft)	2620.55	-
Critical Moment Capacity	4681.20	-
Rating*	*53.3%*	-

Soil Interaction Rating*	**30.6%**
Structural Foundation Rating*	**53.3%**

Check Limitation	
Apply TIA-222-H Section 15.5:	☑

*Rating per TIA-222-H Section 15.5

Soil Profile

Groundwater Depth	n/a	ft	# of Layers: 4

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	V_{soil} (pcf)	$V_{concrete}$ (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	3.5	3.5	115	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.5	6	2.5	115	150		32	0.659	0.659				19	Cohesionless
3	6	10	4	120	150		38	1.040	1.040				36	Cohesionless
4	10	26.5	16.5	125	150		43	2.032	2.032			16	60	Cohesionless

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AMERICAN SOCIETY OF CIVIL ENGINEERS

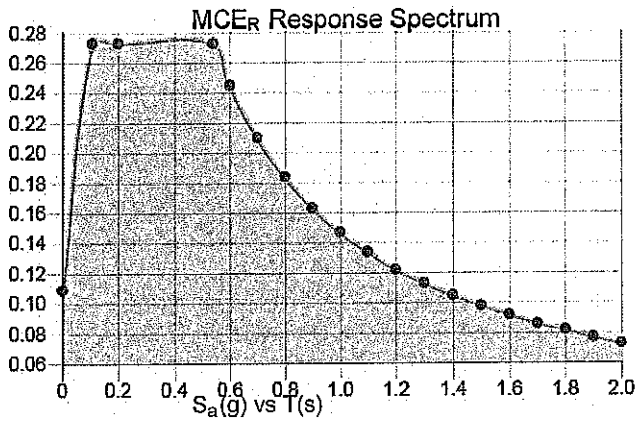
Seismic

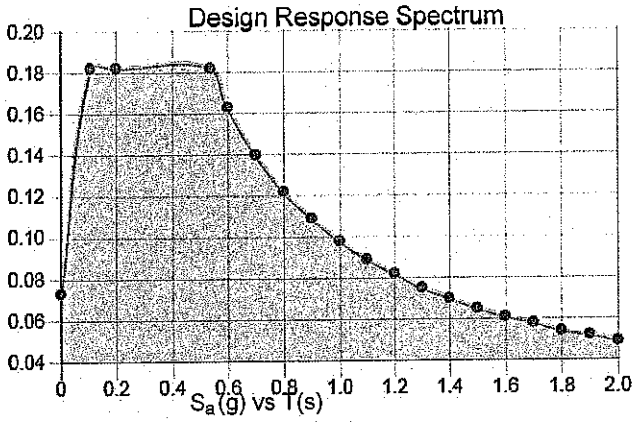
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.170	S_{DS} :	0.182
S_1 :	0.061	S_{D1} :	0.098
F_a :	1.600	T_L :	6.000
F_v :	2.400	PGA :	0.085
S_{MS} :	0.273	PGA_M :	0.137
S_{M1} :	0.147	F_{PGA} :	1.600
		I_e :	1

Seismic Design Category B





Data Accessed: Tue Dec 11 2018

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.

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Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Dec 11 2018

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.

Date: January 16, 2019

CLS ENGINEERING PLLC

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Engineering@clsengineeringpllc.com

Charles McGuirt
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6607

Subject:	**Mount Modification Report**	
Carrier Designation:	**Verizon Equipment Change-Out**	
	Carrier Site Number:	NG71936
	Carrier Site Name:	Plainfield N 2 CT
Crown Castle Designation:	**Crown Castle BU Number:**	876401
	Crown Castle Site Name:	Town of Plainfield/SSUSA
	Crown Castle JDE Job Number:	548522
	Crown Castle Order Number:	471523, Rev. 0
Engineering Firm Designation:	**CLS Engineering PLLC Project #:**	42284-NG71936-02-MOD
Site Data:	**47-51 Unity Street, Plainfield, CT 06374, Windham County**	
	Latitude: 41° 42' 54.49" Longitude: -71° 53' 46.73"	
Structure Information:	**Tower Height & Type:**	160 ft Monopole
	Mount Elevation:	125 ft
	Mount Width & Type:	12.5 ft Low Profile Platform

Dear Charles McGuirt,

CLS Engineering PLLC is pleased to submit this **"Mount Modification Report"** to determine the structural integrity of Verizon's antenna mounting system with the proposed appurtenance and equipment addition on the above mentioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

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:

Low Profile Platform **Sufficient**

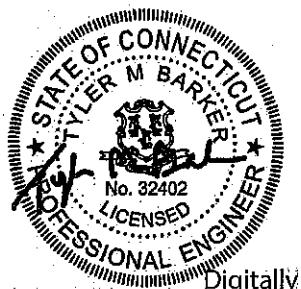
***Sufficient upon completion of the changes listed in the 'Conclusion and Recommendations' section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 135 mph as required by the 2018 Connecticut State Building Codes. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: A.J. Ingalls, E.I.

Respectfully Submitted by:

Tyler M. Barker, P.E.
Director of Engineering



Tyler M. Barker
CLS Engineering, PLLC
Director of Engineering
PE # 32402 Exp. 1/31/2019
COA # PEC.001833 Exp. 8/14/2019

Digitally signed by Tyler M. Barker
Date: 2019.01.17 17:34:34 -05'00'

TABLE OF CONTENTS

1. INTRODUCTION

The proposed equipment is to be mounted to the existing Low Profile Platform. This proposed mounting configuration was analyzed using RISA-3D, a commercially available finite element analysis software package. A selection of input and output from our analysis is attached to the end of this report.

2. ANALYSIS CRITERIA

STANDARD	2015 IBC / 2018 Connecticut State Building Codes / TIA-222-H
BASIC WIND SPEED	135 mph, V_{ult} (3-Second Gust)
BASIC WIND SPEED W/ ICE	50 mph (3-Second Gust) w/ 1.5" Radial Ice (Escalating)
EXPOSURE CATEGORY	C
MAX. TOPOGRAPHIC FACTOR,	1.00
RISK CATEGORY	II
MAINTENANCE LIVE LOAD	L_M: 500 lb

Table 1 - Final Equipment Configuration

ELEVATION (ft)		ANTENNAS	
MOUNT	RAD.	#	NAME
125.0	127.0	3	Amphenol QUAD656C0000X
		6	Commscope SBNHH-1D65B
		3	Alcatel Lucent B66A RRH4X45
		2	RFS Celwave DB-T1-6Z-8AB-0Z
		3	Alcatel Lucent B25 RRH4X30
		3	Alcatel Lucent B13 RRH 4X30
		3	Nokia AIRSCALE RRH 4T4R B5 160W

3. ANALYSIS PROCEDURE

Table 2 - Documents Provided

STRUCTURAL DATA	Site Photos, dated September 5, 2018
PREVIOUS ANALYSES	Mount Analysis by CLS Engineering PLLC, Project #42284-NG71936-01-MA, dated December 28, 2018
LOADING DATA	Crown Castle Order ID #471523, Rev. 0, dated December 4, 2018

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

4. RESULTS SUMMARY

Table 3 - Mount Component Stresses vs. Capacity

COMPONENT	PEAK USAGE	RESULT
Collar Reactions	83%	Pass
Grating Support	69%	Pass
Mount Pipes	69%	Pass
Support Rail	48%	Pass
Connections	38%	Pass
Stand-Off Horizontals	35%	Pass
Platform Base	32%	Pass

Structure Rating (max from all components) =	83%

Notes:

1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.

4.1 Conclusion and Recommendations

According to our structural analysis, the mounts have been found to **PASS PENDING MODIFICATIONS.** The mounting configuration considered in this analysis will be capable of supporting the referenced loading pursuant to referenced standards once the referenced modifications are installed.

This analysis incorporates modifications per CLS Engineering PLLC, dated January 17, 2019.

- **Install (1) proposed Site Pro 1 PRK-1245 as specified. Field-cut proposed angles as required. Maintain minimum bolt edge distance.**
- **Install Site Pro 1 HRK12-HD Support Rail Kit at 3'-0" above the existing platform face horizontal pipe. Connect to all existing mount pipes using Site Pro 1 SCX2 Crossover Plate included in the support rail kit. Cut support rail pipes to length as needed.**
- **Relocate equipment, as required, to facilitate installation of proposed modifications on mount.**

5. ASSUMPTIONS AND CONDITIONS

This analysis is inclusive of the antenna supporting frames/mounts and all recorded connections that will support the equipment listed in this report. It considers only the theoretical capacity of structural components and it is not a condition assessment. The validity of the analysis may be dependent on the accuracy of structural information supplied by others. The client is responsible for verifying this information. If any provided information is revised after completion of this analysis, CLS Engineering PLLC should be notified immediately to revise results.

This analysis assumes the following:

1. The tower or other superstructure and mounts (if existing) were properly constructed as per the original design and have been properly maintained in accordance with applicable code standards.
2. Member sizes and strengths are accurate as supplied or are assumed as stated in the calculations.
3. In the absence of sufficient design information, all welds and connections are assumed to develop at least the capacity of the connected member, unless otherwise stated in this analysis.
4. All prior structural modifications, if any, are assumed to be correctly installed and fully effective.
5. The loading configuration is complete and accurate as supplied and/or as modeled in the previous analysis. All appurtenances are assumed to be properly installed and supported as per manufacturer requirements.
6. Some conservative assumptions may be used regarding appurtenances and their projected areas based on careful interpretation of data supplied, previous experience and standard industry practice.

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of the report. All opinions and conclusions contained herein are subject to revision based upon receipt of new or updated information. All services are provided exercising a level of care and diligence equivalent to the standard of our profession. No warranty or guarantee, either expressed or implied, is offered. All services are confidential in nature and this report will not be released to any other party without the client's consent. The use of this analysis is limited to the expressed purpose for which it was commissioned and it may not be reused, copied or disseminated for any other purpose without consent from CLS Engineering PLLC.

All services were performed, results obtained and recommendations made in accordance with generally accepted engineering principles and practices. CLS Engineering PLLC is not responsible for the conclusions, opinions or recommendations made by others based on the information supplied in this analysis.

It is not possible to have the fully detailed information necessary to perform a complete and thorough analysis of every structural sub-component of an existing structure. The structural analysis by CLS Engineering PLLC verifies the adequacy of the primary members of the structure. CLS Engineering PLLC provides a limited scope of service in that we cannot verify the adequacy of every weld, bolt, gusset, etc.

APPENDIX A

SOFTWARE INPUT CALCULATIONS

Wind & Ice Loading			
Nominal Mount Elevation (AGL), z_{mount}	125 ft	K_s	0.90
Nominal Rad Elevation (AGL), z_{rad}	127 ft	K_z	0.95
TIA Standard	H	K_t	1.33
Basic Wind Speed, V_{ult} (bare)	135 mph	K_d	1.00
Basic Wind Speed, V (ice)	50 mph	K_e	1.00
Design Ice Thickness, t_i	1 1/2 in	t_z	1.71 in
Exposure Category	C	G_h	1.00
Risk Category	II	q_z (bare)	58.3 psf
Seismic Response Coeff., C_s	-	q_z (ice)	8.0 psf

Live Loading	
At Mount Pipes, L_m	500 lb
Joint Labels Considered	m1
	m2
	m3
	m4

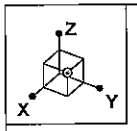
Member Distributed Loading				
Section Set Label	Shape Label	F_A (lb/ft) Bare	F_A (lb/ft) Ice	Ice Wt. (lb/ft)
Offsett Tube	HSS4X4X4	35.00	2.83	14.25
Offset End Plate	0.5 x 6 Plate	52.50	6.80	12.25
Offset Side Plate	0.38 X 6 Plate	52.50	6.80	12.09
Platform Horizontal Pipe	PIPE_3.0	18.37	4.99	10.92
Grating Angle	L2x2x3	17.50	2.65	8.67
Mount Pipe	PIPE_2.0	12.47	4.18	8.56
MOD PRK	L2.5x2.5x3	21.87	2.69	10.01
MOD Support Rail	PIPE_2.0	12.47	4.18	8.56
MOD SR Conn Plate	PL 6x0.375	52.50	6.80	12.08
MOD SR Conn Angle	L2.5x2.5x4	21.87	2.69	10.01
MOD SR Bracing	PIPE_2.0	12.47	4.18	8.56

Appurtenances

Appurtenance Model	Status	Azimuth Offset (°, T)	Rad Elev Override (ft)	Swap Width & Depth	Area Factor Front	Area Factor Side	Qty. per Azimuth 0°	Qty. per Azimuth 120°	Qty. per Azimuth 240°	Total Qty. Override	0° Joints 1	0° Joints 2	120° Joints 1	120° Joints 2	240° Joints 1	240° Joints 2	Height (in)	Width (in)	Depth (in)	Weight (Bare) (lb)	Shape	Weight of Ice (lb)	EPA_A (Bare) (ft^2) N	EPA_A (Bare) (ft^2) T	EPA_A (Ice) (ft^2) N	EPA_A (Ice) (ft^2) T	F_A (Bare) (lb) N	F_A (Bare) (lb) T	F_A (Ice) (lb) N	F_A (Ice) (lb) T
QUAD656C0000X				☐			1	1	1	3	a1	a2	a3	a4	a5	a6	74.4	20.5	7.2	54	Flat	285.99	13.24	5.82	15.96	8.11	697.46	296.09	115.28	58.58
SBNHH-1D65B				☐			1	1	1	3	a7	a8	a9	a10	a11	a12	72	11.9	7.1	40.6	Flat	171.82	8.08	5.34	10.50	7.75	425.53	281.36	75.88	56.03
SBNHH-1D65B				☐			1	1	1	3	a13	a14	a15	a16	a17	a18	72	11.9	7.1	40.6	Flat	171.82	8.08	5.34	10.50	7.75	425.53	281.36	75.88	56.03
B13 RRH 4X30				☑	0.5		1	2		3	r4		r5	r6			20.9	11.8	7.5	55.6	Flat	59.30	0.66	2.06	1.11	3.09	34.77	108.25	8.01	22.32
B25 RRH4X30				☑	0.5	0.5		1	2	3			r10		r11	r12	21.2	12	7.2	63	Flat	59.50	0.65	1.06	1.09	1.58	34.05	55.83	7.89	11.44
B66A RRH4X45				☑	0.5		1	1	1	3	r7		r8		r9		26.8	11.8	7.2	66.5	Flat	69.08	0.81	2.64	1.31	3.71	42.40	133.63	9.44	26.81
AIRSCALE RRH 4T4R B5 160W				☑	0.5		2	1		3	r1	r2	r3				13.9	11.6	6.5	35.27	Flat	38.77	0.36	1.29	0.69	2.10	18.97	67.72	5.00	15.15
DB-T1-6Z-8AB-0Z				☐						2							24	24	10	44	Flat	140.94	4.80	2.00	6.27	3.07	252.83	105.34	45.31	22.19

APPENDIX B

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

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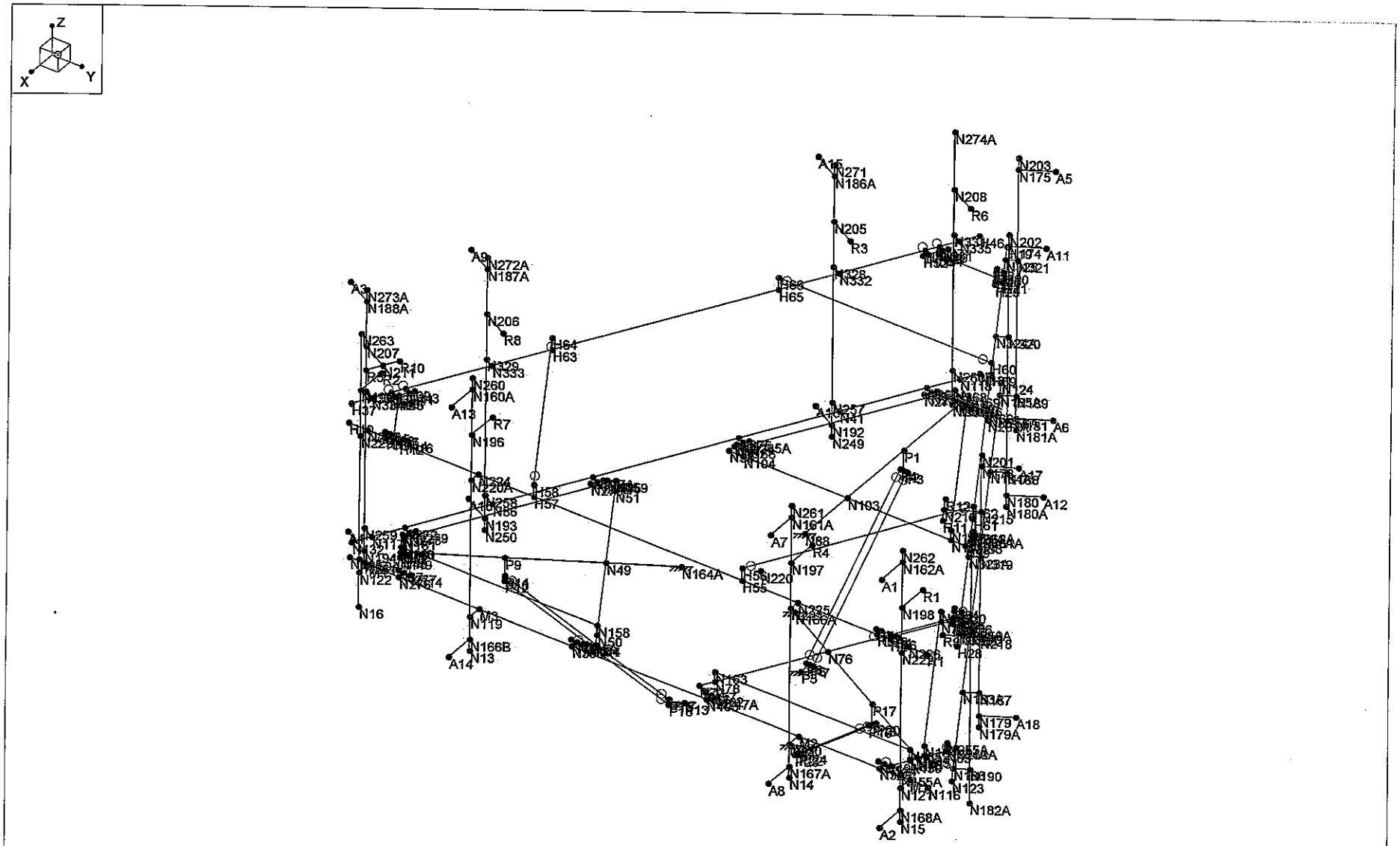

CLS	42284-NG71936-Plainfield N 2 CT	SK - 2
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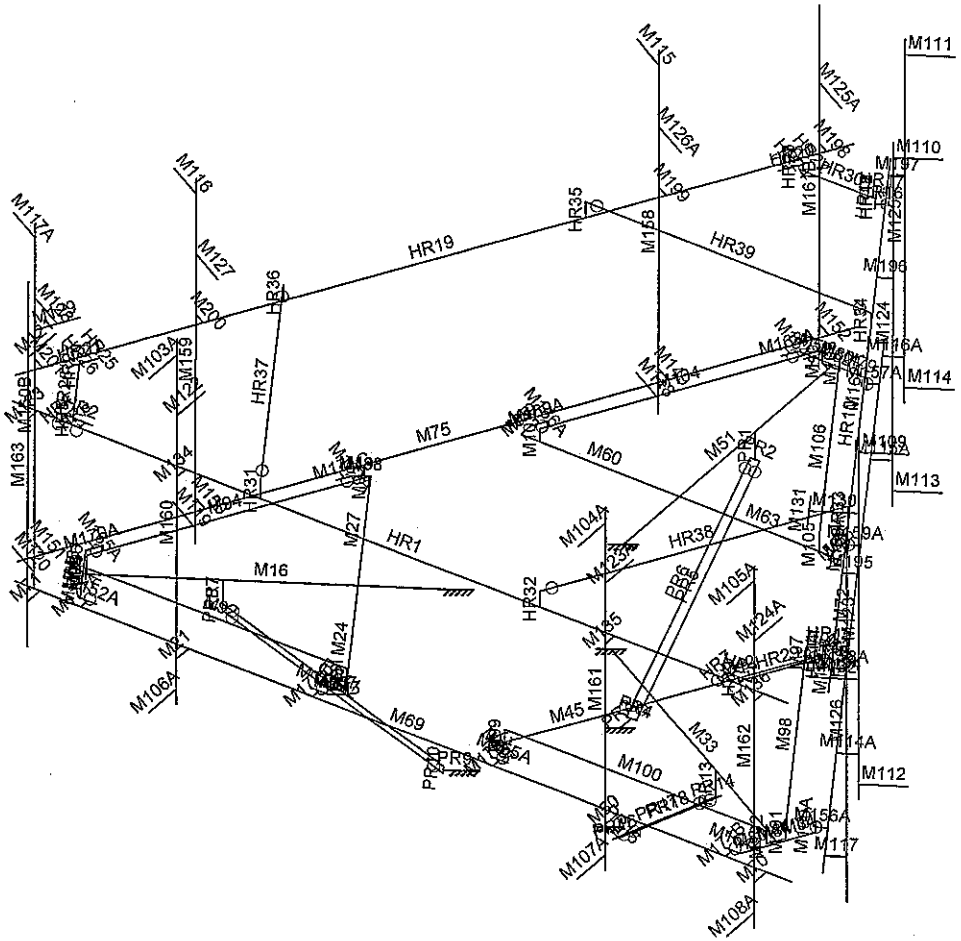

Envelope Only Solution

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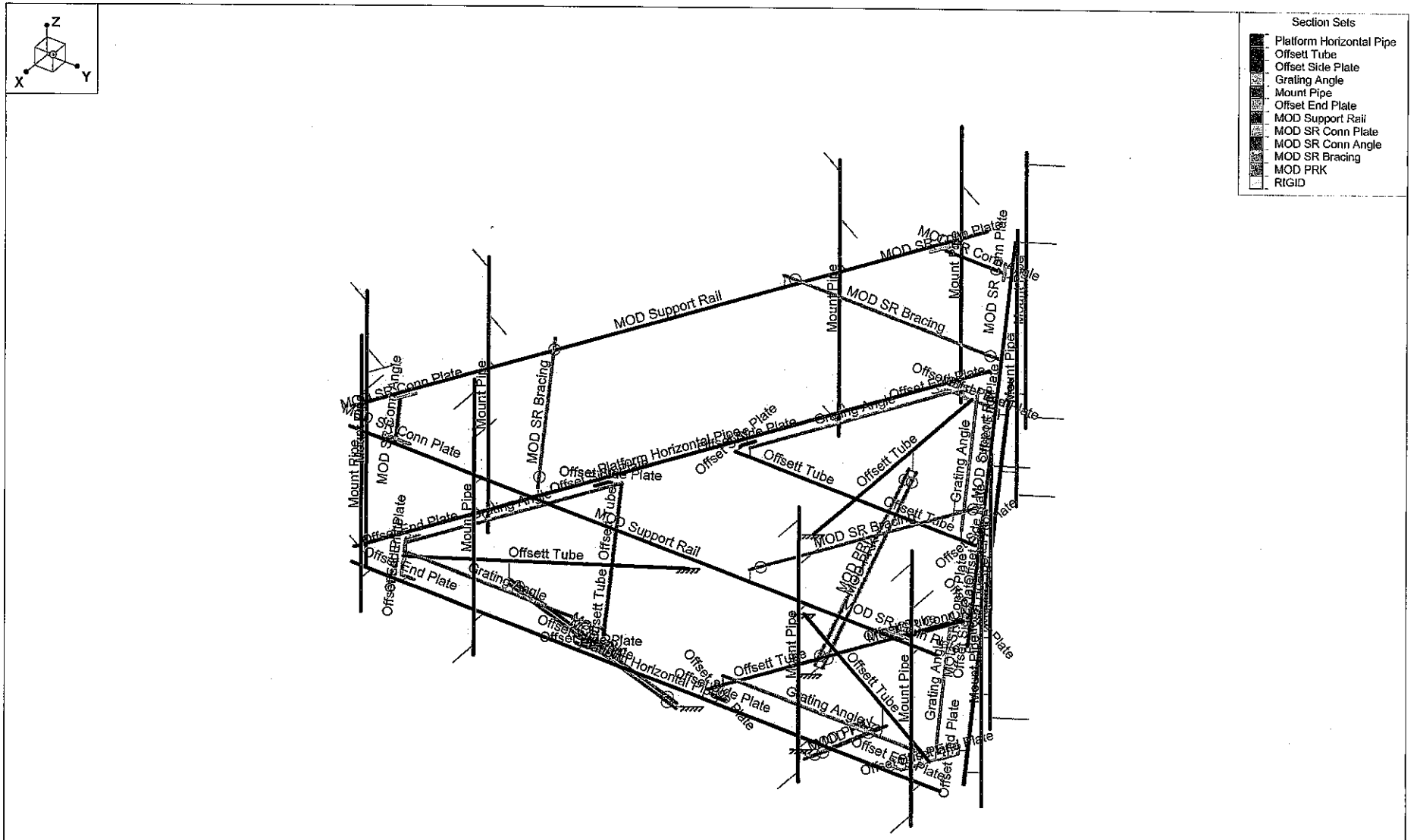

Envelope Only Solution

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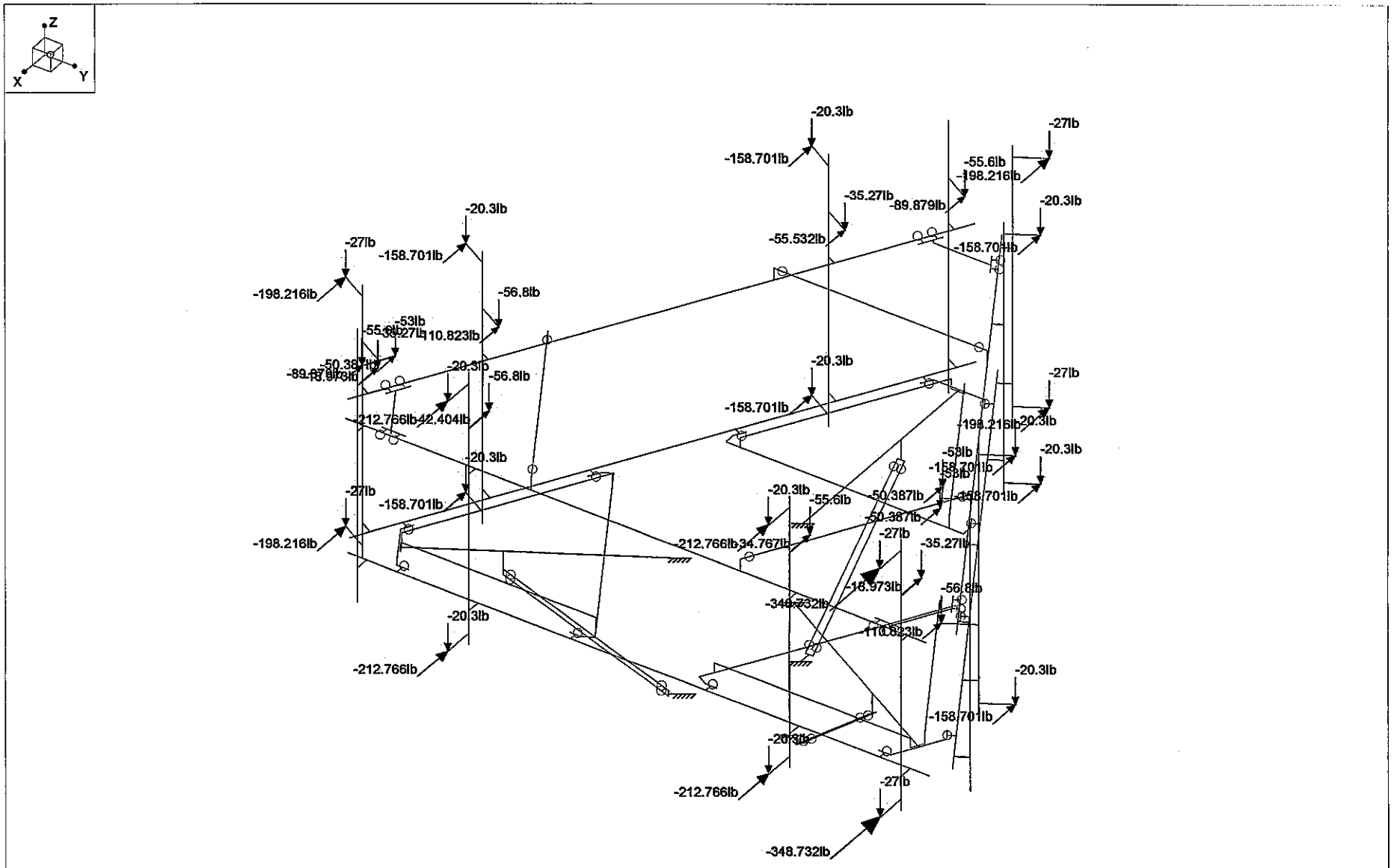
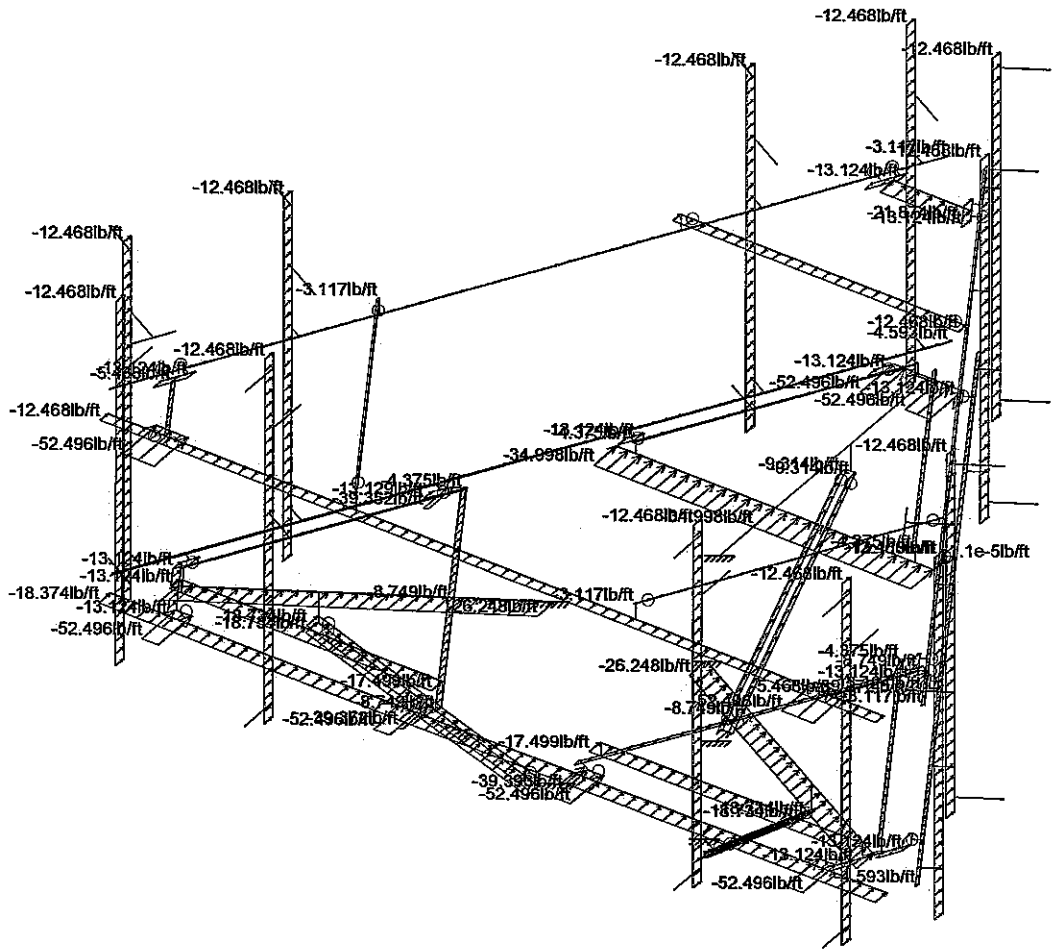


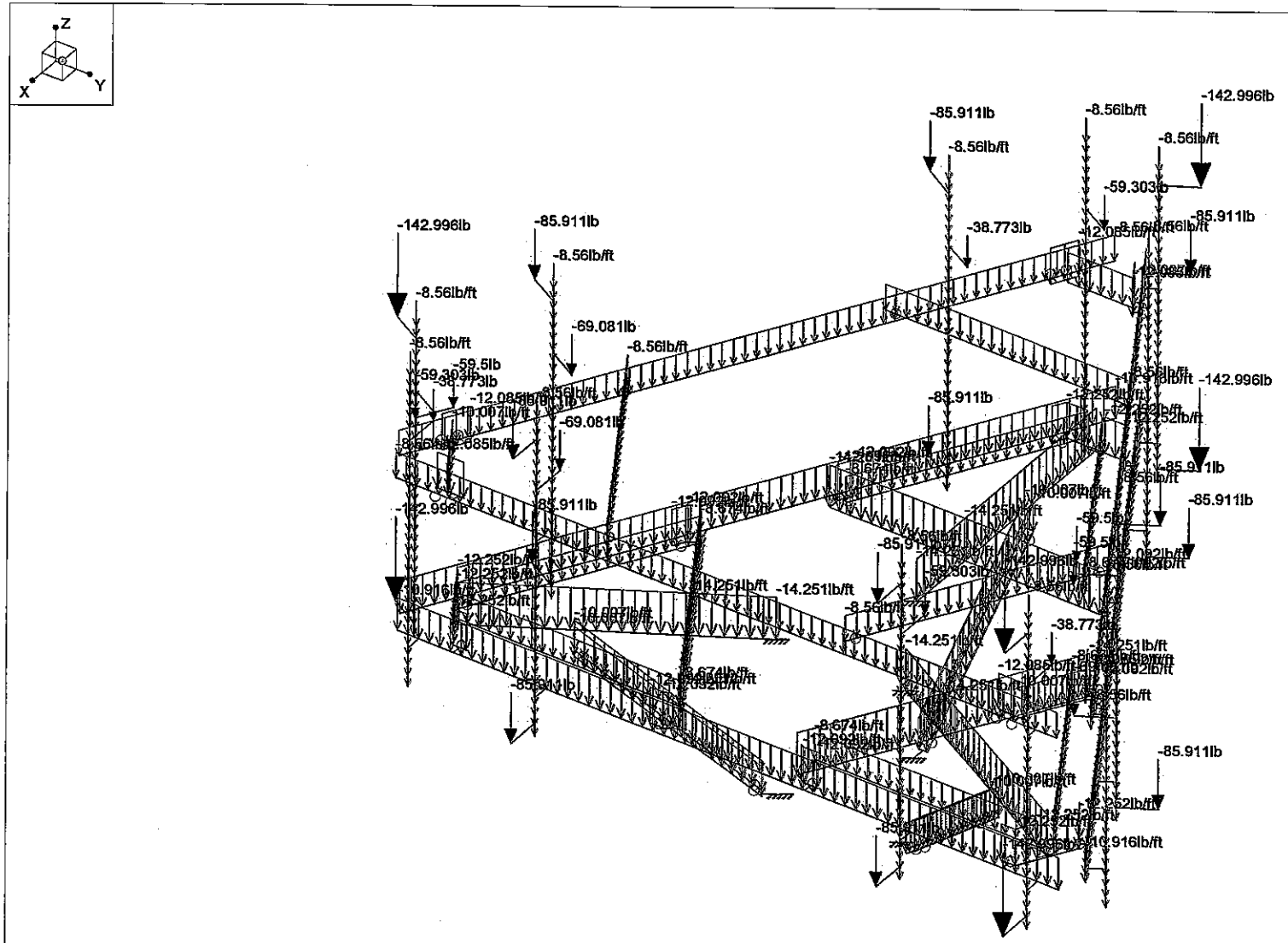
Loads: LC 1, DISPLAY (1.0D + 1.0W_0°)
Envelope Only Solution

CLS	42284-NG71936-Plainfield N 2 CT	SK - 5
AJI		Jan 16, 2019 at 4:04 PM
42284-NG71936-02-MOD	Joint Loads - Dead and Normal Wind	42284-NG71936-02-MOD.r3d



Loads: BLC 4, Structure Wind 0°
Envelope Only Solution

CLS	42284-NG71936-Plainfield N 2 CT	SK - 6
AJI		Jan 16, 2019 at 4:04 PM
42284-NG71936-02-MOD	Distributed Load - Normal Wind	42284-NG71936-02-MOD.r3d



Loads: BLC 2, Ice Dead
Envelope Only Solution

CLS	42284-NG71936-Plainfield N 2 CT	SK - 7
AJI	Ice Dead Loads	Jan 16, 2019 at 4:05 PM
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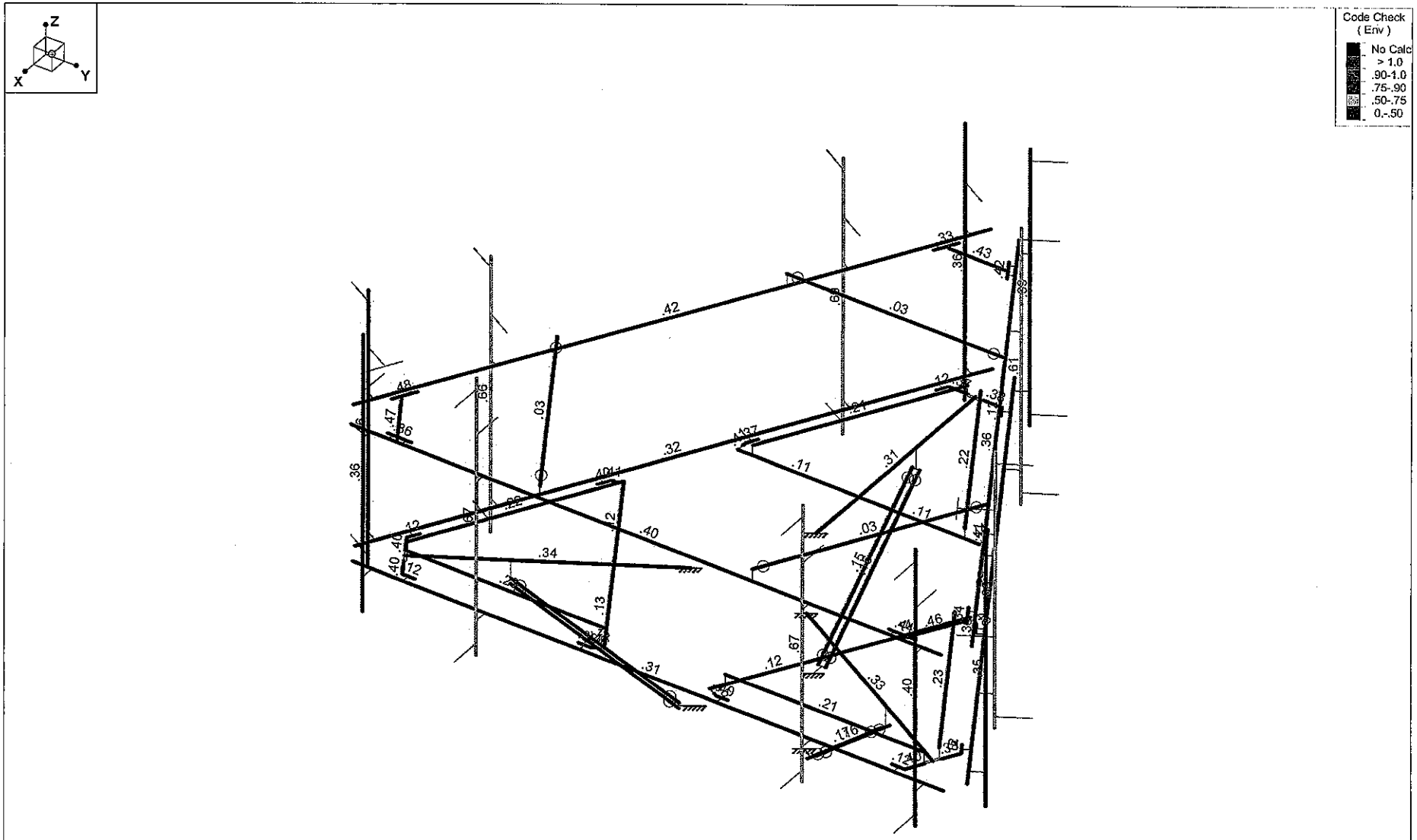

Member Code Checks Displayed (Enveloped)
Envelope Only Solution

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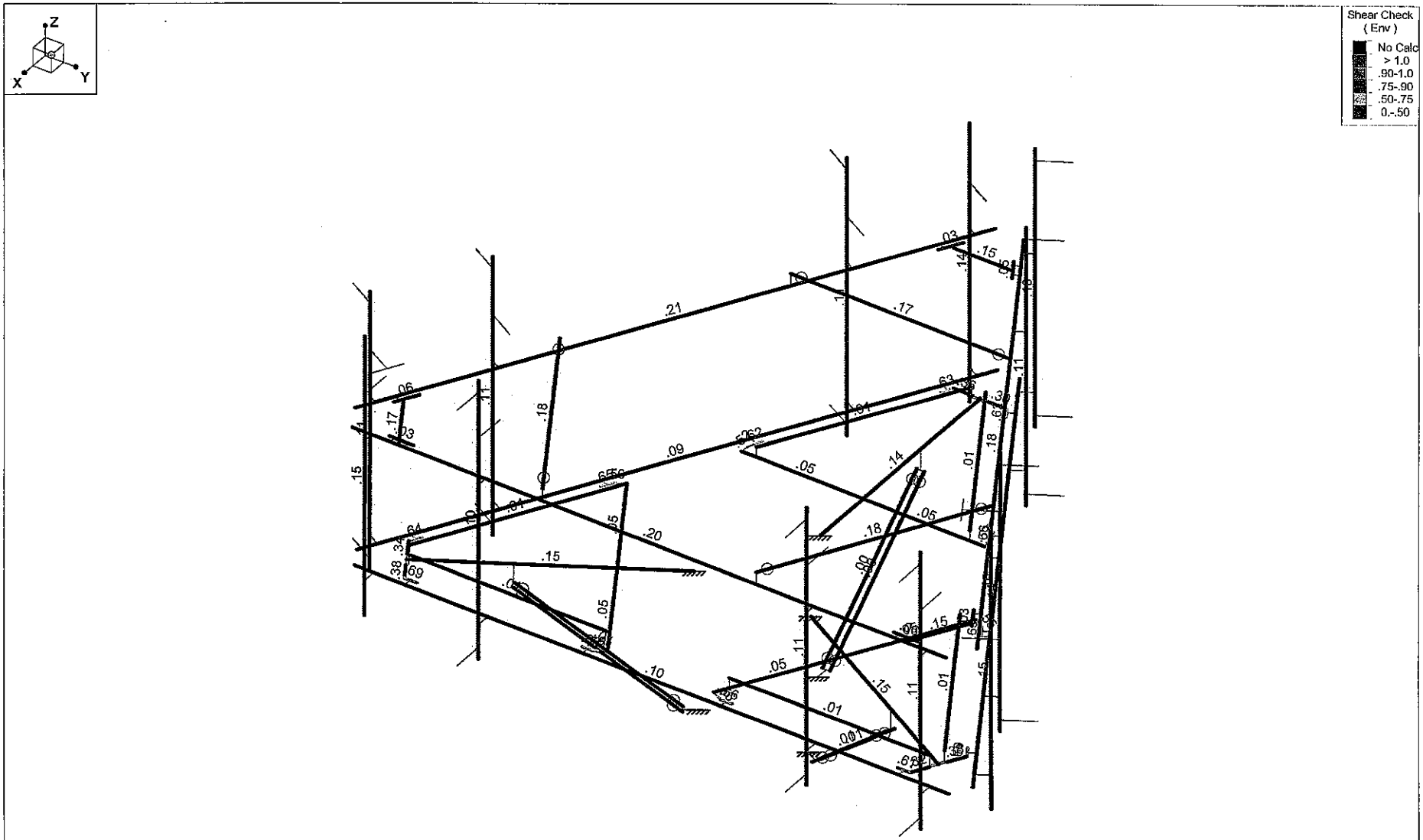

Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

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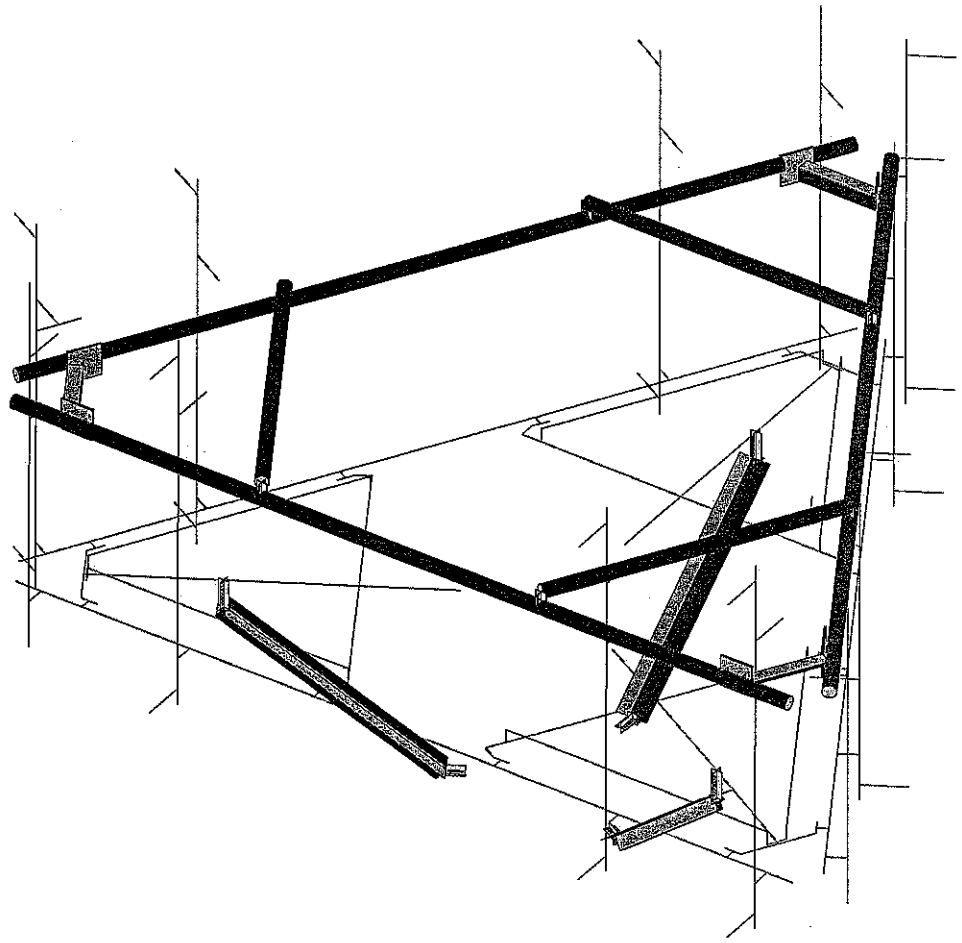

Envelope Only Solution

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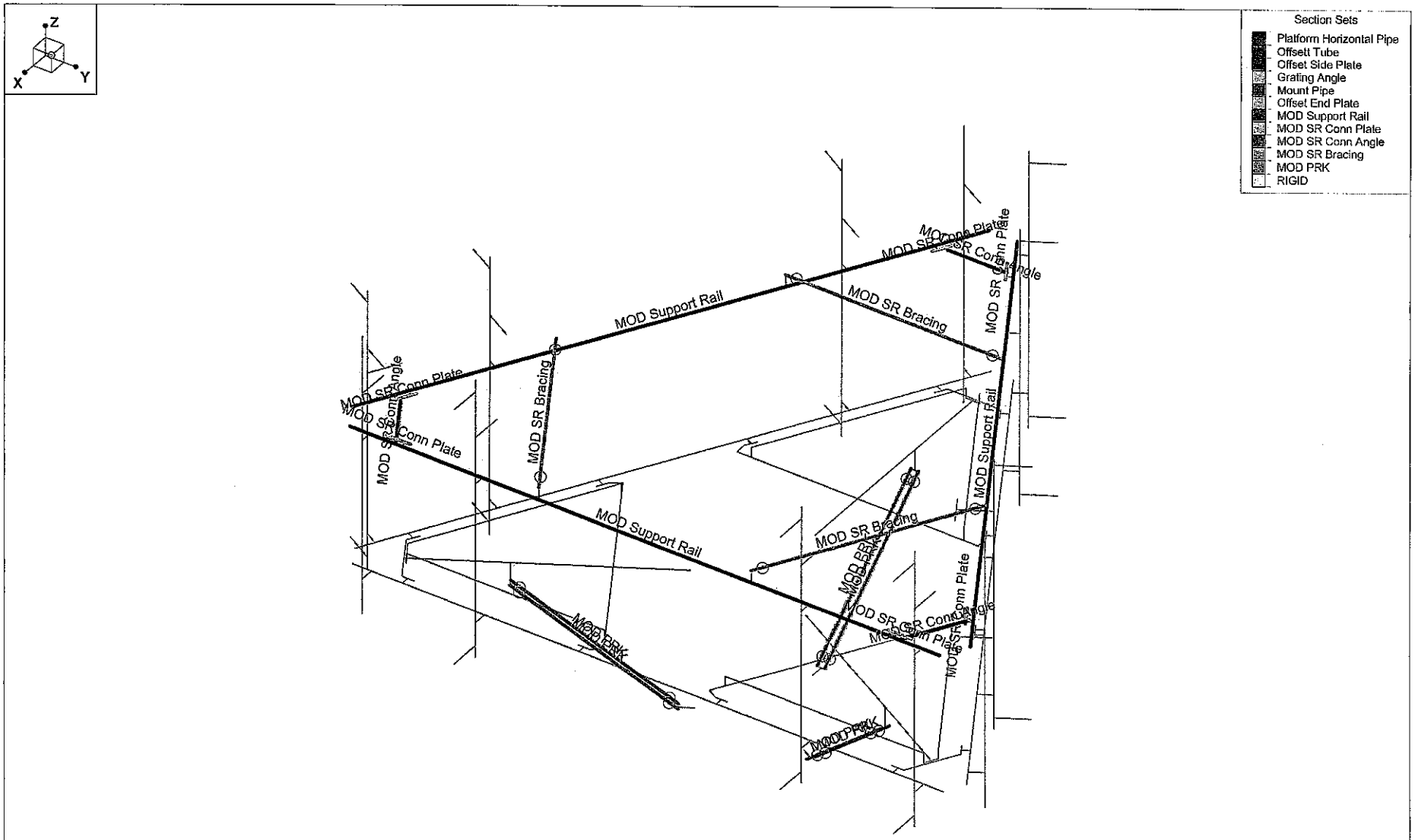

Envelope Only Solution

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APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead	DL			-1	30				
2	Ice Dead	RL				30		75		
4	Structure Wind 0°	None						73		
5	Structure Wind 30°	None						119		
6	Structure Wind 45°	None						150		
7	Structure Wind 60°	None						146		
8	Structure Wind 90°	None						60		
9	Structure Wind 120°	None						146		
10	Structure Wind 135°	None						150		
11	Structure Wind 150°	None						119		
12	Structure Wind w/ Ice..	None						73		
13	Structure Wind w/ Ice..	None						122		
14	Structure Wind w/ Ice..	None						150		
15	Structure Wind w/ Ice..	None						146		
16	Structure Wind w/ Ice..	None						61		
17	Structure Wind w/ Ice..	None						146		
18	Structure Wind w/ Ice..	None						150		
19	Structure Wind w/ Ice..	None						122		
20	Antenna Wind 0°	None				30				
21	Antenna Wind 30°	None				60				
22	Antenna Wind 45°	None				60				
23	Antenna Wind 60°	None				60				
24	Antenna Wind 90°	None				30				
25	Antenna Wind 120°	None				60				
26	Antenna Wind 135°	None				60				
27	Antenna Wind 150°	None				60				
28	Antenna Wind w/ Ice 0°	None				30				
29	Antenna Wind w/ Ice ...	None				60				
30	Antenna Wind w/ Ice ...	None				60				
31	Antenna Wind w/ Ice ...	None				60				
32	Antenna Wind w/ Ice ...	None				30				
33	Antenna Wind w/ Ice ...	None				60				
34	Antenna Wind w/ Ice ...	None				60				
35	Antenna Wind w/ Ice ...	None				60				
39	Maintenance Live 500...	OL1				1				
40	Maintenance Live 500...	OL2				1				
41	Maintenance Live 500...	OL3				1				
42	Maintenance Live 500...	OL4				1				

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	DISPLAY ...	Yes	Y		DL	1	20	1																
2	1.4D	Yes	Y		DL	1.4																		
3	1.2D + 1.0...	Yes	Y		DL	1.2	4	1	20	1														
4	1.2D + 1.0...	Yes	Y		DL	1.2	5	1	21	1														
5	1.2D + 1.0...	Yes	Y		DL	1.2	6	1	22	1														
6	1.2D + 1.0...	Yes	Y		DL	1.2	7	1	23	1														
7	1.2D + 1.0...	Yes	Y		DL	1.2	8	1	24	1														
8	1.2D + 1.0...	Yes	Y		DL	1.2	9	1	25	1														

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
9	1.2D + 1.0..	Yes	Y		DL	1.2	10	1	26	1														
10	1.2D + 1.0..	Yes	Y		DL	1.2	11	1	27	1														
11	1.2D + 1.0..	Yes	Y		DL	1.2	4	-1	20	-1														
12	1.2D + 1.0..	Yes	Y		DL	1.2	5	-1	21	-1														
13	1.2D + 1.0..	Yes	Y		DL	1.2	6	-1	22	-1														
14	1.2D + 1.0..	Yes	Y		DL	1.2	7	-1	23	-1														
15	1.2D + 1.0..	Yes	Y		DL	1.2	8	-1	24	-1														
16	1.2D + 1.0..	Yes	Y		DL	1.2	9	-1	25	-1														
17	1.2D + 1.0..	Yes	Y		DL	1.2	10	-1	26	-1														
18	1.2D + 1.0..	Yes	Y		DL	1.2	11	-1	27	-1														
19	1.2D + 1.0..	Yes	Y		DL	1.2	12	1	28	1	RL	1												
20	1.2D + 1.0..	Yes	Y		DL	1.2	13	1	29	1	RL	1												
21	1.2D + 1.0..	Yes	Y		DL	1.2	14	1	30	1	RL	1												
22	1.2D + 1.0..	Yes	Y		DL	1.2	15	1	31	1	RL	1												
23	1.2D + 1.0..	Yes	Y		DL	1.2	16	1	32	1	RL	1												
24	1.2D + 1.0..	Yes	Y		DL	1.2	17	1	33	1	RL	1												
25	1.2D + 1.0..	Yes	Y		DL	1.2	18	1	34	1	RL	1												
26	1.2D + 1.0..	Yes	Y		DL	1.2	19	1	35	1	RL	1												
27	1.2D + 1.0..	Yes	Y		DL	1.2	12	-1	28	-1	RL	1												
28	1.2D + 1.0..	Yes	Y		DL	1.2	13	-1	29	-1	RL	1												
29	1.2D + 1.0..	Yes	Y		DL	1.2	14	-1	30	-1	RL	1												
30	1.2D + 1.0..	Yes	Y		DL	1.2	15	-1	31	-1	RL	1												
31	1.2D + 1.0..	Yes	Y		DL	1.2	16	-1	32	-1	RL	1												
32	1.2D + 1.0..	Yes	Y		DL	1.2	17	-1	33	-1	RL	1												
33	1.2D + 1.0..	Yes	Y		DL	1.2	18	-1	34	-1	RL	1												
34	1.2D + 1.0..	Yes	Y		DL	1.2	19	-1	35	-1	RL	1												
35	1.2D + 1.5..	Yes	Y		DL	1.2	4	.052	20	.052	OL1	1.5												
36	1.2D + 1.5..	Yes	Y		DL	1.2	5	.052	21	.052	OL1	1.5												
37	1.2D + 1.5..	Yes	Y		DL	1.2	6	.052	22	.052	OL1	1.5												
38	1.2D + 1.5..	Yes	Y		DL	1.2	7	.052	23	.052	OL1	1.5												
39	1.2D + 1.5..	Yes	Y		DL	1.2	8	.052	24	.052	OL1	1.5												
40	1.2D + 1.5..	Yes	Y		DL	1.2	9	.052	25	.052	OL1	1.5												
41	1.2D + 1.5..	Yes	Y		DL	1.2	10	.052	26	.052	OL1	1.5												
42	1.2D + 1.5..	Yes	Y		DL	1.2	11	.052	27	.052	OL1	1.5												
43	1.2D + 1.5..	Yes	Y		DL	1.2	4	-.052	20	-.052	OL1	1.5												
44	1.2D + 1.5..	Yes	Y		DL	1.2	5	-.052	21	-.052	OL1	1.5												
45	1.2D + 1.5..	Yes	Y		DL	1.2	6	-.052	22	-.052	OL1	1.5												
46	1.2D + 1.5..	Yes	Y		DL	1.2	7	-.052	23	-.052	OL1	1.5												
47	1.2D + 1.5..	Yes	Y		DL	1.2	8	-.052	24	-.052	OL1	1.5												
48	1.2D + 1.5..	Yes	Y		DL	1.2	9	-.052	25	-.052	OL1	1.5												
49	1.2D + 1.5..	Yes	Y		DL	1.2	10	-.052	26	-.052	OL1	1.5												
50	1.2D + 1.5..	Yes	Y		DL	1.2	11	-.052	27	-.052	OL1	1.5												
51	1.2D + 1.5..	Yes	Y		DL	1.2	4	.052	20	.052	OL2	1.5												
52	1.2D + 1.5..	Yes	Y		DL	1.2	5	.052	21	.052	OL2	1.5												
53	1.2D + 1.5..	Yes	Y		DL	1.2	6	.052	22	.052	OL2	1.5												
54	1.2D + 1.5..	Yes	Y		DL	1.2	7	.052	23	.052	OL2	1.5												
55	1.2D + 1.5..	Yes	Y		DL	1.2	8	.052	24	.052	OL2	1.5												
56	1.2D + 1.5..	Yes	Y		DL	1.2	9	.052	25	.052	OL2	1.5												
57	1.2D + 1.5..	Yes	Y		DL	1.2	10	.052	26	.052	OL2	1.5												
58	1.2D + 1.5..	Yes	Y		DL	1.2	11	.052	27	.052	OL2	1.5												
59	1.2D + 1.5..	Yes	Y		DL	1.2	4	-.052	20	-.052	OL2	1.5												
60	1.2D + 1.5..	Yes	Y		DL	1.2	5	-.052	21	-.052	OL2	1.5												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..
61	1.2D + 1.5..	Yes	Y		DL	1.2	6	-.052	22	-.052	OL2	1.5														
62	1.2D + 1.5..	Yes	Y		DL	1.2	7	-.052	23	-.052	OL2	1.5														
63	1.2D + 1.5..	Yes	Y		DL	1.2	8	-.052	24	-.052	OL2	1.5														
64	1.2D + 1.5..	Yes	Y		DL	1.2	9	-.052	25	-.052	OL2	1.5														
65	1.2D + 1.5..	Yes	Y		DL	1.2	10	-.052	26	-.052	OL2	1.5														
66	1.2D + 1.5..	Yes	Y		DL	1.2	11	-.052	27	-.052	OL2	1.5														
67	1.2D + 1.5..	Yes	Y		DL	1.2	4	.052	20	.052	OL3	1.5														
68	1.2D + 1.5..	Yes	Y		DL	1.2	5	.052	21	.052	OL3	1.5														
69	1.2D + 1.5..	Yes	Y		DL	1.2	6	.052	22	.052	OL3	1.5														
70	1.2D + 1.5..	Yes	Y		DL	1.2	7	.052	23	.052	OL3	1.5														
71	1.2D + 1.5..	Yes	Y		DL	1.2	8	.052	24	.052	OL3	1.5														
72	1.2D + 1.5..	Yes	Y		DL	1.2	9	.052	25	.052	OL3	1.5														
73	1.2D + 1.5..	Yes	Y		DL	1.2	10	.052	26	.052	OL3	1.5														
74	1.2D + 1.5..	Yes	Y		DL	1.2	11	.052	27	.052	OL3	1.5														
75	1.2D + 1.5..	Yes	Y		DL	1.2	4	-.052	20	-.052	OL3	1.5														
76	1.2D + 1.5..	Yes	Y		DL	1.2	5	-.052	21	-.052	OL3	1.5														
77	1.2D + 1.5..	Yes	Y		DL	1.2	6	-.052	22	-.052	OL3	1.5														
78	1.2D + 1.5..	Yes	Y		DL	1.2	7	-.052	23	-.052	OL3	1.5														
79	1.2D + 1.5..	Yes	Y		DL	1.2	8	-.052	24	-.052	OL3	1.5														
80	1.2D + 1.5..	Yes	Y		DL	1.2	9	-.052	25	-.052	OL3	1.5														
81	1.2D + 1.5..	Yes	Y		DL	1.2	10	-.052	26	-.052	OL3	1.5														
82	1.2D + 1.5..	Yes	Y		DL	1.2	11	-.052	27	-.052	OL3	1.5														
83	1.2D + 1.5..	Yes	Y		DL	1.2	4	.052	20	.052	OL4	1.5														
84	1.2D + 1.5..	Yes	Y		DL	1.2	5	.052	21	.052	OL4	1.5														
85	1.2D + 1.5..	Yes	Y		DL	1.2	6	.052	22	.052	OL4	1.5														
86	1.2D + 1.5..	Yes	Y		DL	1.2	7	.052	23	.052	OL4	1.5														
87	1.2D + 1.5..	Yes	Y		DL	1.2	8	.052	24	.052	OL4	1.5														
88	1.2D + 1.5..	Yes	Y		DL	1.2	9	.052	25	.052	OL4	1.5														
89	1.2D + 1.5..	Yes	Y		DL	1.2	10	.052	26	.052	OL4	1.5														
90	1.2D + 1.5..	Yes	Y		DL	1.2	11	.052	27	.052	OL4	1.5														
91	1.2D + 1.5..	Yes	Y		DL	1.2	4	-.052	20	-.052	OL4	1.5														
92	1.2D + 1.5..	Yes	Y		DL	1.2	5	-.052	21	-.052	OL4	1.5														
93	1.2D + 1.5..	Yes	Y		DL	1.2	6	-.052	22	-.052	OL4	1.5														
94	1.2D + 1.5..	Yes	Y		DL	1.2	7	-.052	23	-.052	OL4	1.5														
95	1.2D + 1.5..	Yes	Y		DL	1.2	8	-.052	24	-.052	OL4	1.5														
96	1.2D + 1.5..	Yes	Y		DL	1.2	9	-.052	25	-.052	OL4	1.5														
97	1.2D + 1.5..	Yes	Y		DL	1.2	10	-.052	26	-.052	OL4	1.5														
98	1.2D + 1.5..	Yes	Y		DL	1.2	11	-.052	27	-.052	OL4	1.5														

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E..	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Platform Horizonta..	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2	Offsett Tube	HSS4X4X4	Beam	None	A36 Gr.36	Typical	3.37	7.8	7.8	12.8
3	Offset Side Plate	0.38 X 6 Plate	Beam	None	A36 Gr.36	Typical	2.28	.027	6.84	.105
4	Grating Angle	L2x2x3	Beam	None	A36 Gr.36	Typical	.722	.271	.271	.009
5	Mount Pipe	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	Offset End Plate	0.5 x 6 Plate	Beam	None	A36 Gr.36	Typical	3	.063	9	.237
7	MOD Support Rail	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
8	MOD SR Conn Pl..	PL 6x0.375	Beam	None	A36 Gr.36	Typical	2.25	.026	6.75	.101
9	MOD SR Conn An..	L2.5x2.5x4	Beam	None	A36 Gr.36	Typical	1.19	.692	.692	.026
10	MOD SR Bracing	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
11	MOD PRK	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical	.901	.535	.535	.011

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M16	Offsett Tube	60.538									Lateral
2	M17	Offset End ...	4.688			Lbyy						Lateral
3	M19	Offset Side ...	.875			Lbyy						Lateral
4	M23	Offset Side ...	.875			Lbyy						Lateral
5	M24	Offsett Tube	30.688			Lbyy						Lateral
6	M27	Offsett Tube	30.687			Lbyy						Lateral
7	M33	Offsett Tube	60.538									Lateral
8	M34	Offset End ...	4.688			Lbyy						Lateral
9	M37	Offset Side ...	.875			Lbyy						Lateral
10	M41	Offset Side ...	.875			Lbyy						Lateral
11	M42	Offsett Tube	30.688			Lbyy						Lateral
12	M45	Offsett Tube	30.687			Lbyy						Lateral
13	M51	Offsett Tube	60.538									Lateral
14	M52	Offset End ...	4.688			Lbyy						Lateral
15	M55	Offset Side ...	.875			Lbyy						Lateral
16	M59	Offset Side ...	.875			Lbyy						Lateral
17	M60	Offsett Tube	30.688			Lbyy						Lateral
18	M63	Offsett Tube	30.687			Lbyy						Lateral
19	M69	Platform Ho...	150			Lbyy						Lateral
20	M72	Platform Ho...	150			Lbyy						Lateral
21	M75	Platform Ho...	150			Lbyy						Lateral
22	M79	Offset End ...	4.688			Lbyy						Lateral
23	M81	Offset End ...	4.688			Lbyy						Lateral
24	M83	Offset End ...	4.688			Lbyy						Lateral
25	M92	Grating Angle	50.542			Lbyy						Lateral
26	M94	Grating Angle	50.542			Lbyy						Lateral
27	M98	Grating Angle	50.542			Lbyy						Lateral
28	M100	Grating Angle	50.542			Lbyy						Lateral
29	M104	Grating Angle	50.542			Lbyy						Lateral
30	M106	Grating Angle	50.542			Lbyy						Lateral
31	M160	Mount Pipe	72			Lbyy						Lateral
32	M161	Mount Pipe	72			Lbyy						Lateral
33	M162	Mount Pipe	72			Lbyy						Lateral
34	M163	Mount Pipe	72			Lbyy						Lateral
35	M152A	Offset End ...	3.122			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
36	M153A	Offset Side ...	3			Lbyy						Lateral
37	M154A	Offset End ...	3.122			Lbyy						Lateral
38	M155A	Offset Side ...	3			Lbyy						Lateral
39	M160A	Offset End ...	3.122			Lbyy						Lateral
40	M161A	Offset Side ...	3			Lbyy						Lateral
41	M162A	Offset End ...	3.122			Lbyy						Lateral
42	M163A	Offset Side ...	3			Lbyy						Lateral
43	M168A	Offset End ...	3.122			Lbyy						Lateral
44	M169A	Offset Side ...	3			Lbyy						Lateral
45	M170A	Offset End ...	3.122			Lbyy						Lateral
46	M171C	Offset Side ...	3			Lbyy						Lateral
47	M123	Mount Pipe	72			Lbyy						Lateral
48	M124	Mount Pipe	72			Lbyy						Lateral
49	M125	Mount Pipe	72			Lbyy						Lateral
50	M126	Mount Pipe	72			Lbyy						Lateral
51	M158	Mount Pipe	72			Lbyy						Lateral
52	M159	Mount Pipe	72			Lbyy						Lateral
53	M160B	Mount Pipe	72			Lbyy						Lateral
54	M161B	Mount Pipe	72			Lbyy						Lateral
55	PR5	MOD PRK	46.932									Lateral
56	PR6	MOD PRK	46.932									Lateral
57	PR11	MOD PRK	46.932									Lateral
58	PR12	MOD PRK	46.932									Lateral
59	PR17	MOD PRK	46.932									Lateral
60	PR18	MOD PRK	46.932									Lateral
61	HR1	MOD Supp...	150	44	82.8							Lateral
62	HR2	MOD SR C...	6									Lateral
63	HR3	MOD SR C...	6									Lateral
64	HR10	MOD Supp...	150	44	82.8							Lateral
65	HR11	MOD SR C...	6									Lateral
66	HR12	MOD SR C...	6									Lateral
67	HR19	MOD Supp...	150	44	82.8							Lateral
68	HR20	MOD SR C...	6									Lateral
69	HR21	MOD SR C...	6									Lateral
70	HR28	MOD SR C...	14.975									Lateral
71	HR29	MOD SR C...	14.975									Lateral
72	HR30	MOD SR C...	14.975									Lateral
73	HR37	MOD SR Br...	55.226									Lateral
74	HR38	MOD SR Br...	55.226									Lateral
75	HR39	MOD SR Br...	55.226									Lateral

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N164A	max	2746.844	6	6223.662	14	1186.109	6	1108.917	12	1124.307	16	2405.385	17
2		min	-3676.389	14	-4619.373	6	-1149.724	14	-1252.117	4	-1063.535	8	-2385.475	9
3	N166A	max	2466.54	16	4659.028	16	1167.599	16	1198.104	18	1093.65	6	2270.831	12
4		min	-3317.321	8	-6150.119	8	-1049.412	8	-1009.518	10	-1106.884	14	-2247.313	4
5	N88	max	6773.907	3	1285.313	15	1156.862	11	1014.724	7	1235.828	11	2119.643	7
6		min	-5455.076	11	-1272.228	7	-1040.689	3	-1058.137	15	-1083.838	3	-2127.778	15
7	P13	max	1863.044	30	1287.77	6	3267.353	30	309.463	6	193.64	6	143.55	18

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
8		min	-743.165	6	-3225.815	30	-1297.147	6	-806.386	30	-453.627	14	-127.893	10
9	P21	max	1775.351	24	3075.673	24	3117.592	24	756.103	24	166.166	16	131.606	12
10		min	-718.361	16	-1243.052	16	-1253.125	16	-311.028	16	-444.036	24	-131.591	4
11	P5	max	1630.146	11	84.612	15	2888.61	3	87.367	7	812.422	3	125.208	7
12		min	-3300.788	3	-84.628	7	-1420.559	11	-89.559	15	-399.532	11	-127.706	15
13	Totals:	max	7289.377	3	7329.854	15	7798.688	20						
14		min	-7289.38	11	-7329.859	7	2276.303	1						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [...	phi*Pnt [l...	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	M158	PIPE_2.0	.692	62.526	5	.106	62.526		13	20866.733	32130	1871.625	1871.625	2...	H1-1b
2	M160	PIPE_2.0	.670	62.526	7	.102	62.526		7	20866.733	32130	1871.625	1871.625	2...	H1-1b
3	M161	PIPE_2.0	.666	62.526	15	.113	62.526		14	20866.733	32130	1871.625	1871.625	2...	H1-1b
4	M159	PIPE_2.0	.664	62.526	4	.109	62.526		4	20866.733	32130	1871.625	1871.625	2...	H1-1b
5	M123	PIPE_2.0	.659	62.526	11	.141	62.526		10	20866.733	32130	1871.625	1871.625	2...	H1-1b
6	M124	PIPE_2.0	.606	62.526	18	.106	62.526		17	20866.733	32130	1871.625	1871.625	2...	H1-1b
7	HR21	PL 6x0.375	.478	3.789	9	.058	3.789	z	8	61760.985	72900	569.7	9112.5	1...	H1-1b
8	HR28	L2.5x2.5x4	.473	0	8	.174	14.975	y	9	36645.617	38556	1113.554	2537.388	2...	H2-1
9	M160B	PIPE_2.0	.462	26.526	8	.106	62.526		3	20866.733	32130	1871.625	1871.625	2...	H1-1b
10	HR29	L2.5x2.5x4	.455	0	11	.152	0	y	4	36645.617	38556	1113.554	2537.388	2...	H2-1
11	M37	0.38 X 6 Plate	.447	.875	17	.559	.875	y	11	73624.978	73872	584.82	9234	1...	H1-1b
12	HR3	PL 6x0.375	.442	3.789	11	.056	3.789	z	11	61760.985	72900	569.7	9112.5	1...	H1-1b
13	M55	0.38 X 6 Plate	.436	.875	12	.572	.875	y	5	73624.978	73872	584.82	9234	1...	H1-1b
14	HR30	L2.5x2.5x4	.430	0	6	.149	0	y	7	36645.617	38556	1113.554	2537.388	2.2	H2-1
15	HR19	PIPE_2.0	.420	142....	4	.214	138....		9	18155.149	32130	1871.625	1871.625	1...	H1-1b
16	HR12	PL 6x0.375	.417	3.789	6	.052	3.789	z	6	61760.985	72900	569.7	8948.621	1...	H1-1b
17	M19	0.38 X 6 Plate	.411	.875	7	.555	0	y	15	73624.978	73872	584.82	9234	1...	H1-1b
18	M163A	0.38 X 6 Plate	.409	1.5	12	.663	3	y	5	71020.258	73872	584.82	9234	3...	H1-1b
19	M59	0.38 X 6 Plate	.408	.875	10	.525	.875	y	16	73624.978	73872	584.82	9234	1...	H1-1b
20	M23	0.38 X 6 Plate	.407	.875	4	.552	.875	y	11	73624.978	73872	584.82	9234	1...	H1-1b
21	M162	PIPE_2.0	.402	26.526	3	.108	62.526		14	20866.733	32130	1871.625	1871.625	2...	H1-1b
22	M17	0.5 x 6 Plate	.402	4.688	13	.376	0	y	10	91950.093	97200	1012.5	12150	1...	H1-1b
23	M155A	0.38 X 6 Plate	.400	1.5	18	.660	3	y	11	71020.258	73872	584.82	9234	3...	H1-1b
24	M41	0.38 X 6 Plate	.398	.875	15	.551	.875	y	14	73624.978	73872	584.82	9234	1...	H1-1b
25	M171C	0.38 X 6 Plate	.398	1.5	7	.648	3	y	16	71020.258	73872	584.82	9234	3...	H1-1b
26	M81	0.5 x 6 Plate	.397	0	14	.339	0	y	10	91950.093	97200	1012.5	12150	1...	H1-1b
27	HR1	PIPE_2.0	.397	142....	15	.195	138....		11	18155.149	32130	1871.625	1871.625	1...	H1-1b
28	M83	0.5 x 6 Plate	.395	0	9	.319	0	y	4	91950.093	97200	1012.5	12150	1...	H1-1b
29	M125	PIPE_2.0	.391	26.526	6	.097	62.526		8	20866.733	32130	1871.625	1871.625	2...	H1-1b
30	M79	0.5 x 6 Plate	.382	0	4	.303	0	y	15	91950.093	97200	1012.5	12150	1...	H1-1b
31	M34	0.5 x 6 Plate	.378	4.688	7	.384	4.688	y	12	91950.093	97200	1012.5	12150	1...	H1-1b
32	M153A	0.38 X 6 Plate	.378	1.5	5	.657	3	y	11	71019.885	73872	584.82	9234	3...	H1-1b
33	M161A	0.38 X 6 Plate	.377	1.5	15	.653	3	y	6	71019.885	73872	584.82	9234	3...	H1-1b
34	M52	0.5 x 6 Plate	.372	4.688	3	.359	4.688	y	7	91950.093	97200	1012.5	12150	1...	H1-1b
35	M169A	0.38 X 6 Plate	.366	1.5	10	.621	3	y	16	71019.885	73872	584.82	9234	3...	H1-1b
36	HR2	PL 6x0.375	.362	2.368	17	.032	4.579	z	17	61760.985	72900	569.7	9112.5	1...	H1-1b
37	M161B	PIPE_2.0	.362	62.526	5	.142	62.526		14	20866.733	32130	1871.625	1871.625	2...	H1-1b
38	HR10	PIPE_2.0	.359	142....	10	.183	11.842		14	18155.149	32130	1871.625	1871.625	1...	H1-1b
39	M163	PIPE_2.0	.357	62.526	15	.151	62.526		8	20866.733	32130	1871.625	1871.625	2...	H1-1b
40	M126	PIPE_2.0	.348	62.526	11	.154	62.526		11	20866.733	32130	1871.625	1871.625	2...	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [...	phi*Pnt [l...	phi*Mn y...	phi*Mn z...	Cb	Eqn
41	M16	HSS4X4X4	.345	38.234	14	.154	0	z	18	100455....	109188	12663	12663	1...	H1-1b
42	HR11	PL 6x0.375	.338	2.368	11	.029	4.579	z	11	61760.985	72900	569.7	9112.5	1...	H1-1b
43	HR20	PL 6x0.375	.331	2.368	6	.029	2.211	z	7	61760.985	72900	569.7	9112.5	1...	H1-1b
44	M33	HSS4X4X4	.328	38.234	8	.151	0	z	4	100455....	109188	12663	12663	1...	H1-1b
45	M75	PIPE_3.0	.316	114....	4	.093	94.737		18	28250.554	65205	5748.75	5748.75	1...	H1-1b
46	M69	PIPE_3.0	.314	114....	15	.101	55.263		9	28250.554	65205	5748.75	5748.75	1...	H1-1b
47	M51	HSS4X4X4	.312	38.234	3	.142	0	z	15	100455....	109188	12663	12663	1...	H1-1b
48	M72	PIPE_3.0	.295	35.526	18	.099	55.263		4	28250.554	65205	5748.75	5748.75	1...	H1-1b
49	M92	L2x2x3	.232	50.542	13	.009	0	z	12	9618.888	23392.8	557.717	1191.065	1...	H2-1
50	M98	L2x2x3	.229	50.542	7	.009	0	z	7	9618.888	23392.8	557.717	1182.257	1...	H2-1
51	M106	L2x2x3	.221	0	5	.010	0	y	5	9618.956	23392.8	557.717	1154.72	1...	H2-1
52	M94	L2x2x3	.217	0	15	.010	0	y	15	9618.956	23392.8	557.717	1159.864	1...	H2-1
53	M100	L2x2x3	.214	0	10	.010	0	y	10	9618.956	23392.8	557.717	1167.635	1...	H2-1
54	M104	L2x2x3	.211	50.542	18	.010	0	z	17	9618.888	23392.8	557.717	1178.327	1...	H2-1
55	PR11	L2.5x2.5x3	.179	23.466	31	.005	46.932	z	18	17577.502	29192.4	872.574	1761.795	1...	H2-1
56	PR17	L2.5x2.5x3	.168	23.466	11	.005	0	z	5	17577.502	29192.4	872.574	1761.795	1...	H2-1
57	PR18	L2.5x2.5x3	.164	23.466	6	.005	46.932	y	5	17577.502	29192.4	872.574	1761.795	1...	H2-1
58	PR5	L2.5x2.5x3	.164	23.466	6	.005	0	z	15	17577.502	29192.4	872.574	1761.795	1...	H2-1
59	PR12	L2.5x2.5x3	.162	23.466	13	.005	46.932	y	18	17577.502	29192.4	872.574	1761.795	1...	H2-1
60	PR6	L2.5x2.5x3	.150	23.466	3	.005	0	y	15	17577.502	29192.4	872.574	1761.795	1...	H2-1
61	M42	HSS4X4X4	.135	30.688	23	.051	3.23	z	7	106874....	109188	12663	12663	1...	H1-1b
62	M24	HSS4X4X4	.130	30.688	28	.049	3.23	z	12	106874....	109188	12663	12663	1...	H1-1b
63	M152A	0.5 x 6 Plate	.124	0	13	.694	0	y	11	94834.571	97200	1012.5	12150	3...	H1-1b
64	M27	HSS4X4X4	.123	0	6	.052	27.457	z	15	106874....	109188	12663	12663	2...	H1-1b
65	M170A	0.5 x 6 Plate	.122	1.479	6	.638	0	y	16	94834.571	97200	1012.5	12150	3...	H1-1b
66	M154A	0.5 x 6 Plate	.122	0	9	.615	0	y	11	94834.571	97200	1012.5	12150	3...	H1-1b
67	M45	HSS4X4X4	.122	0	16	.051	27.457	z	10	106874....	109188	12663	12663	2...	H1-1b
68	M162A	0.5 x 6 Plate	.122	0	12	.619	0	y	6	94834.571	97200	1012.5	12150	3...	H1-1b
69	M160A	0.5 x 6 Plate	.117	0	8	.692	0	y	5	94834.571	97200	1012.5	12150	3...	H1-1b
70	M168A	0.5 x 6 Plate	.116	1.479	11	.630	1.479	y	15	94834.571	97200	1012.5	12150	3...	H1-1b
71	M60	HSS4X4X4	.114	30.688	34	.048	3.23	z	18	106874....	109188	12663	12663	1...	H1-1b
72	M63	HSS4X4X4	.113	0	11	.052	27.457	z	5	106874....	109188	12663	12663	2...	H1-1b
73	HR38	PIPE_2.0	.028	27.613	16	.180	0		12	24924.481	32130	1871.625	1871.625	1...	H1-1b
74	HR39	PIPE_2.0	.027	27.613	11	.173	0		7	24924.481	32130	1871.625	1871.625	1...	H1-1b
75	HR37	PIPE_2.0	.027	27.613	6	.182	0		18	24924.481	32130	1871.625	1871.625	1...	H1-1b

APPENDIX D

ADDITIONAL CALCULATIONS

CLS Group
Bolt Strength Check
AISC 14th Edition (360-10)

Member/Node Number	Load Comb.	Tensile Load, T_u (kips)	Shear Load, V_u (kips)	Bolt Diameter (in)	Number of Bolts	Shear Planes per Bolt	Bolt Tensile Strength, F_{nt} (ksi)	Bolt Shear Strength, F_{nv} (ksi)	Connected Member Thickness (in)	Connected Member Edge Clear Distance (in)	Connected Member Ultimate Strength, F_u (ksi)	Bolt Tensile Usage	Bolt Shear Usage	Member Bearing Usage
HR26	8	2.526	0.699	0.5	1	1	45	27	0.375	0.75	58	38%	18%	5%
M201	16	0.629	0.669	0.5	2	1	45	27	0.375	0.75	58	5%	8%	2%
PR7	14	3.199	3.761	0.5	4	2	90	54	0.375	0.75	58	6%	6%	2%

APPENDIX E

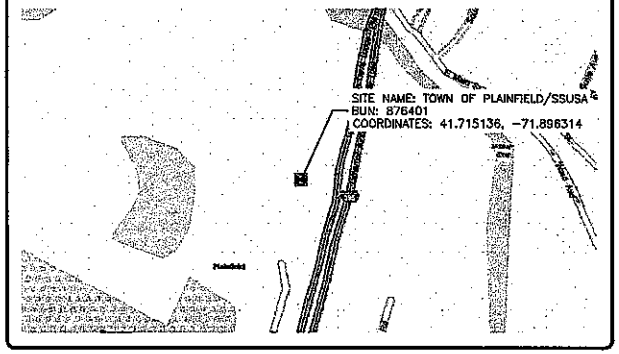
MOUNT MODIFICATION DESIGN DRAWINGS (MDD) / SUPPLEMENTAL DRAWINGS

verizonwireless

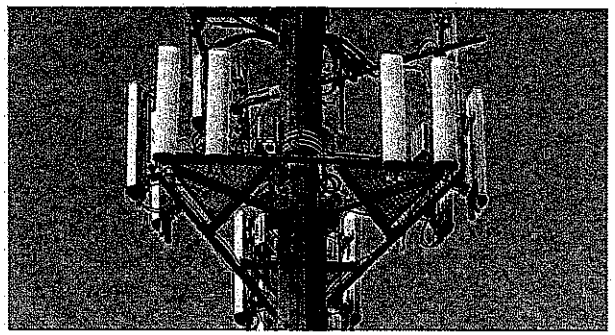
180 WASHINGTON VALLEY ROAD
BEDMINSTER, NJ 07921

CARRIER SITE NAME | NUMBER:	**PLAINFIELD N 2 CT | NG71936**
BUN | ORDER ID #:	**876401 | 471523 REV. #0**
CROWN CASTLE SITE NAME:	**TOWN OF PLAINFIELD/SSUSA**
STRUCTURE TYPE:	**160'-0" MONOPOLE**
PROJECT SCOPE:	**MOUNT REINFORCEMENT**

LOCATION MAP



STRUCTURE ELEVATION PHOTO



DRAWING INDEX

SHEET	SHEET DESCRIPTION	REV
T-1	TITLE SHEET & DRAWING INDEX	0
GN-1	STRUCTURAL NOTES	0
IN-1	MODIFICATION INSPECTION NOTES	0
S-1	MOUNT VIEWS & MODIFICATION SCHEDULE	0
S-2	MODIFICATION DETAIL VIEWS	0

SCOPE OF WORK

1. THIS MODIFICATION PLAN HAS BEEN DESIGNED UTILIZING THE STRUCTURAL ANALYSIS BY CLS GROUP, REPORT #42284-NG71936-02-MOD, DATED JANUARY 16, 2019.
2. FULL MODIFICATION SCHEDULE CAN BE FOUND ON S-1.
3. CONTRACTOR SHALL SCHEDULE A SITE VISIT TO CONFIRM ALL EXISTING STRUCTURE DIMENSIONS, SITE CONSTRAINTS, PROPOSED REINFORCING DIMENSIONS, THE CLEARANCES OF THE PROPOSED REINFORCING, EXISTING FOUNDATION INFORMATION, EXISTING SITE UTILITIES, AND ALL OTHER INFORMATION NECESSARY TO PERFORM THE WORK ON THESE DRAWINGS IN ORDER TO ELIMINATE THE RISK OF RFIS ONCE CONSTRUCTION AND FABRICATION HAVE BEGUN. THE CONTRACTOR SHALL NOT BEGIN FABRICATION OR CONSTRUCTION PRIOR TO PERFORMING THIS SITE VISIT AND VALIDATING THE INFORMATION ON THESE DRAWINGS AND ANY ADDITIONAL INFORMATION THE CONTRACTOR NEEDS TO PERFORM THE WORK.
4. THE CONTRACTOR SHALL PERFORM THIS PRE-CONSTRUCTION WORK AND REPORT ALL DISCREPANCIES TO THE CUSTOMER AND THE ENGINEER OF RECORD OR BE LIABLE FOR THE LABOR & MATERIALS FOR DISCREPANCIES NOT CAUGHT BY THE CONTRACTOR'S DUE DILIGENCE SITE VISIT.

DRIVING DIRECTIONS

FROM BRADLEY INTERNATIONAL AIRPORT

DEPART BRADLEY INT AIRPORT TOWARD BRADLEY FIELD CONNECTOR. IN 0.4 MILES KEEP RIGHT ONTO BRADLEY FIELD CONNECTOR. IN 0.9 MILES ROAD NAME CHANGES TO CT-20 E. IN 3.2 MILES TAKE RAMP RIGHT FOR I-91 SOUTH TOWARD HARTFORD. IN 9.7 MILES AT EXIT 30, TAKE RAMP LEFT FOR I-84 EAST TOWARD E. HARTFORD/NEW LONDON. IN 0.7 MILES ATE EXIT 55, TAKE RAMP RIGHT FOR CT-2 EAST TOWARDS NEW LONDON/NORWICH. IN 36.5 MILES AT EXIT 28N, TAKE RAMP RIGHT FOR I-395 NORTH TOWARD PROVIDENCE. IN 15.9 MILES AT EXIT 29, TAKE RAMP RIGHT FOR CT-14A WEST TOWARD PLAINFIELD. IN 0.2 MILES TURN LEFT ONTO CT-14A/PLAINSFIELD PIKE RD. IN 0.4 MILES TURN RIGHT ONTO CT-12/NORWICH RD. IN 2.0 MILES TURN RIGHT ONTO PLAINFIELD RD. IN 0.4 MILES TURN LEFT ONTO UNITY ST. IN 0.3 MILES ARRIVE AT SITE UP AHEAD.

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT OR ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR THE SAME.

PROJECT TEAM

ENGINEER/ARCHITECT:
CLS ENGINEERING, PLLC.
319 CHAPANOKE ROAD, SUITE 118
RALEIGH, NC 27603
(405) 348-5460

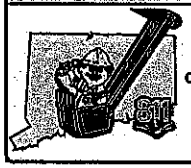
APPLICANT/CUSTOMER:
VERIZON WIRELESS
180 WASHINGTON VALLEY ROAD
BEDMINSTER, NJ 07921

STRUCTURE OWNER:
CROWN CASTLE
2000 CORPORATE DRIVE
CANONSBURG, PA 15317

OWNER SITE NAME:
TOWN OF PLAINFIELD/SSUSA

BUN:
876401

ONE CALL



CALL CONNECTICUT ONE-CALL
3 DAYS BEFORE YOU DIG
811 OR 1-800-922-4455

PROJECT INFORMATION

STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	160'-0"
LATITUDE:	41.715136 (NAD 83)
LONGITUDE:	-71.896314 (NAD 83)
ADDRESS:	876401- TOWN OF PLAINFIELD/SSUSA
	47-51 UNITY STREET
	PLAINFIELD, CT 06374
COUNTY:	WINDHAM
CODE JURISDICTION:	TOWN OF PLAINFIELD
GROUND ELEVATION:	219' AMSL

CODE COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

STRUCTURAL CODE:	IBC 2015
DESIGN STANDARD:	TIA-222-H

verizonwireless
180 WASHINGTON VALLEY ROAD
BEDMINSTER, NJ 07921

CROWN CASTLE

CLS Group
a telamon company
319 CHAPANOKE RD, SUITE 118
RALEIGH, NC 27603
PH: (405)348-5460 FAX: (405)341-4625
CLS PROJECT ID: 42284-876401-471523
COA# PEC.001633 EXP: 8/14/2019

REVISIONS

REV.	DATE	DESCRIPTION	INITIALS
A	1/17/19	PRELIMINARY ISSUE	MJA
0	1/17/19	FOR CONSTRUCTION	MJA

NOT FOR CONSTRUCTION UNLESS LABELED AS CONSTRUCTION SET

STATE OF CONNECTICUT
TYLER M BARKER
No. 32402
LICENSED PROFESSIONAL ENGINEER

Tyler M. Barker
CLS Engineering, PLLC
Director of Engineering
PE # 32402 Exp. 1/31/2019
COA # PEC.001633 Exp. 8/14/2019

1/17/2019

PE# 32402 EXP: 1/31/2019

PLAINFIELD N 2 CT
CARRIER SITE NUMBER: NG71936
BUN: 876401
47-51 UNITY STREET
PLAINFIELD, CT 06374

SHEET TITLE
TITLE SHEET & DRAWING INDEX

SHEET NUMBER
T-1

GENERAL NOTES

1. THESE MODIFICATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF TIA/EIA-222, ASCE 7, AWS, ACI, AND AISC. MATERIALS AND SERVICES PROVIDED BY THE CONTRACTOR SHALL CONFORM TO THE ABOVE-MENTIONED CODES AND THE CONTRACT SPECIFICATIONS.
2. ALL MATERIALS UTILIZED FOR THIS PROJECT MUST BE NEW AND FREE OF ANY DEFECTS.
3. ALL PRODUCT OR MATERIAL SUBSTITUTIONS PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER SUITABLE TO DETERMINE IF SUBSTITUTE IS ACCEPTABLE 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.
4. PROVIDE STRUCTURAL STEEL SHOP DRAWING(S) TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO FABRICATION.
5. UNLESS NOTED OTHERWISE, ALL NEW MEMBERS AND REINFORCING SHALL MAINTAIN THE EXISTING MEMBER WORK LINES AND NOT INTRODUCE ECCENTRICITIES INTO THE STRUCTURE.
6. ANY CONTRACTOR-CAUSED DAMAGE TO PROPERTY OF THE LAND OWNER, PROPERTY OF THE STRUCTURE OWNER, PROPERTY OF THE CUSTOMER, SITE FENCING OR GATES, ANY AND ALL UTILITY AND/OR SERVICE LINES, SHOWN OR NOT SHOWN ON THE PLANS, SHALL BE REPAIRED OR REPLACED AT THE SOLE COST OF THE CONTRACTOR AND SHALL BE ACCOMPLISHED BY THE CONTRACTOR OR SUBCONTRACTOR AS APPROVED BY THE ENGINEER OF RECORD AND LAND OWNER. DAMAGE TO EQUIPMENT OR PROPERTY OF ANY KIND BELONGING TO OTHER COMPANIES (BESIDES THE INDICATED CUSTOMER) SHALL BE ADDRESSED BY THE CONTRACTOR WITH THE COMPANIES THAT OWN THE DAMAGED ITEMS.

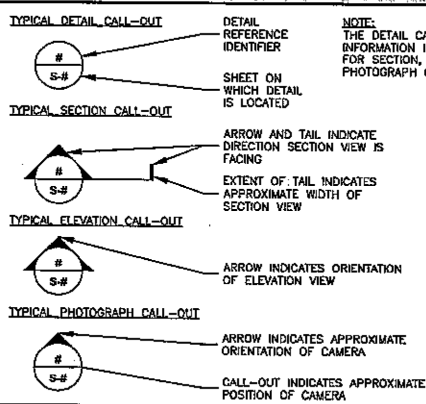
STRUCTURAL STEEL NOTES

1. STRUCTURAL STEEL SHALL COMPLY WITH THE FOLLOWING SPECIFICATIONS:
   - A. STRUCTURAL STEEL SHAPES, PLATES AND BARS (EXCEPT W-SHAPES)- ASTM A36, Fy=36 KSI
   - B. PIPES – ASTM A53, GRADE B, Fy=35 KSI
   - C. HSS-SHAPES – ASTM A500, GRADE B, Fy=42 KSI (ROUND)
     Fy=46 KSI (SQUARE & RECTANGULAR)
   - D. ANCHOR & ALL-THREAD RODS – ASTM F1554, GRADE 55
   - E. STRUCTURAL BOLTS 1/2"ø AND LARGER – ASTM A325
   - F. STRUCTURAL BOLTS SMALLER THAN 1/2"ø – DIMENSIONS: ASME B18.2.1
     MATERIAL: SAE J429 GRADE 5 | THREADING: ASME B1.1, UNC, CLASS 2A | FINISH: HOT-DIP GALVANIZED OR ZINC-PLATED
   - G. SHEET METAL SCREWS – DIMENSIONS: ASME B18.6.3
     MATERIAL: SAE J933 | FINISH: HOT-DIP GALVANIZED OR ZINC-PLATED
   - H. NUTS FOR BOLTS/ALL-THREAD – ASTM A563 (THREADING TO MATCH BOLT)
   - I. WASHERS FOR BOLTS/ALL-THREAD – ASTM F436
   - J. W & WT SHAPES – ASTM A36, Fy=36 KSI
     ALTERNATE SPEC: ASTM A992 (IF OTHER SPEC IS UNAVAILABLE)
2. STRUCTURAL BOLTS SHALL CONFORM TO THIS NOTE. ALL BOLT HOLES SHALL BE STANDARD SIZE BOLT HOLES PER AISC 360, UNLESS OTHERWISE NOTED. ALL HOLES SHALL BE SHOP DRILLED OR SUB-PUNCHED AND REAMED. BURNING OF HOLES IS NOT PERMITTED. WHERE SLOTTED OR OVERSIZE HOLES ARE SPECIFIED ON THE DRAWINGS, EXTRA-THICK ASTM F436 PLATE WASHERS SHALL BE USED (5/16" MINIMUM THICKNESS) WITH A DIAMETER SUITABLE TO COVER THE EXTENTS OF THE SLOT OR HOLE. BOLTS SHALL BE HEAVY-HEX WHERE AVAILABLE IN THE SIZE AND GRADE SPECIFIED, OTHERWISE BOLTS SHALL BE HEX HEAD CAP SCREWS.
3. ALL STEEL HARDWARE, INCLUDING ADHESIVE OR EMBEDDED ANCHOR BOLTS AND THEIR ACCESSORIES, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 (EXCEPT BOLTS SMALLER THAN 1/2" SHALL CONFORM TO FE/ZN 3 AT PER ASTM F1941 WHERE HOT-DIP GALVANIZED BOLTS ARE NOT AVAILABLE). ALL STEEL MEMBERS, INCLUDING WELDMENTS, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123. REPAIR DAMAGE TO GALVANIZED COATINGS USING ASTM A780 PROCEDURES WITH A ZINC RICH PAINT (SUCH AS ZRC GALVILITE) FOR GALVANIZING DAMAGED BY HANDLING, TRANSPORTING, CUTTING, WELDING, OR BOLTING. DO NOT HEAT SURFACES TO WHICH REPAIR PAINT HAS BEEN APPLIED. CALL OUT HOLES REQUIRED FOR HOT-DIP GALVANIZING ON SHOP DRAWINGS.
4. WELDING SHALL BE IN ACCORDANCE WITH AWS D1.1 "STRUCTURAL WELDING CODE – STEEL". WELD ELECTRODES SHALL BE E70XX. UNLESS OTHERWISE NOTED, PROVIDE CONTINUOUS FILLET WELDS WITH MINIMUM SIZE OF 3/16 INCH OR OF A SIZE EQUAL TO THE THICKNESS OF THE THINNER MATERIAL BEING JOINED (WHICHEVER IS LESS). FOR ACUTE OR OBTUSE JOINT ANGLES, THE FILLET WELD LEG SIZE SHALL BE ADJUSTED AS REQUIRED TO MAINTAIN THE EFFECTIVE THROAT OF A 3/16 INCH FILLET WELD IN A 90° JOINT. ALL WELD SIZES SHOWN IN INCHES.
5. PRIOR TO WELDING, THE CONTRACTOR SHALL SUBMIT CERTIFICATION FOR EACH WELDER STATING THE TYPE OF WELDING AND POSITIONS QUALIFIED FOR, THE CODE AND PROCEDURE QUALIFIED UNDER, DATE QUALIFIED, AND THE FIRM AND INDIVIDUAL CERTIFYING THE QUALIFICATION TESTS. THIS INFORMATION SHALL BE SUBMITTED TO THE MODIFICATION INSPECTOR (SEE SHEET S-003) AS WELL AS ANY THIRD-PARTY CERTIFIED WELD INSPECTOR (CWI).
6. MEMBERS SHALL BE SHOP-FABRICATED AND WELDED TO THE EXTENT PRACTICABLE IN ORDER TO REDUCE FIELD INSTALLATION COSTS.

CONTRACTOR NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, ALL CONTRACTORS AND SUBCONTRACTORS MUST ACKNOWLEDGE IN WRITING TO STRUCTURE OWNER THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW STRUCTURE OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND STRUCTURE/TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED MODIFICATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGEMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR STRUCTURE OWNER ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM ANY SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO THE STRUCTURE OWNER.
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, THE ENGINEER OF RECORD SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.
3. THE CONTRACTOR SHALL SOLICIT AND HIRE THE SERVICES OF A QUALIFIED MODIFICATION INSPECTOR PRIOR TO BEGINNING CONSTRUCTION. THE MODIFICATION INSPECTOR MAY BE AN EMPLOYEE OF THE CONTRACTOR'S FIRM, HOWEVER THE INSPECTOR'S ONLY DUTIES SHALL BE INSPECTION, TESTING, AND REPORT CREATION AS REQUIRED ON THE "MODIFICATION INSPECTION NOTES" SHEET. THE INSPECTOR SHALL BE QUALIFIED AS A REGISTERED PROFESSIONAL ENGINEER (PE) OR AS AN ENGINEERING INTERN (EI) OR ENGINEER IN TRAINING (EIT) UNDER THE SUPERVISION OF A REGISTERED PROFESSIONAL ENGINEER (PE). IT IS ALSO ACCEPTABLE FOR THE CONTRACTOR TO SUBCONTRACT THE MODIFICATION INSPECTOR DUTIES TO A THIRD PARTY FIRM MEETING THE ABOVE REQUIREMENTS.
4. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD AND TOWER OWNER OF THE PLANNED CONSTRUCTION & INSPECTION SCHEDULE, AS WELL AS ANY CHANGES TO THE SCHEDULE, WITHIN TWO BUSINESS DAYS OF THE COMPLETION OF THE SCHEDULE OR SCHEDULE REVISION BOTH PRIOR TO BEGINNING CONSTRUCTION AND DURING CONSTRUCTION AS THE SCHEDULE CHANGES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD WHEN PHASES OF CONSTRUCTION HAVE BEEN MOVED UP AND SHALL GIVE THE ENGINEER ADEQUATE NOTICE SO THAT THE ENGINEER OF RECORD MAY, AT THEIR DISCRETION, INSPECT PORTIONS OF THE WORK THAT ARE DEEMED CRITICAL TO THE INTEGRITY OF THE STRUCTURE. FAILURE TO PROVIDE THIS NOTICE MAY RESULT IN REJECTION OF THE CONTRACTOR'S WORK. THE CONTRACTOR SHALL ALSO NOTIFY THE ENGINEER OF RECORD AND THE STRUCTURE OWNER WHEN THE WORK HAS BEEN COMPLETED WITHIN 2 BUSINESS DAYS OF THE COMPLETION OF THE WORK AND ASSOCIATED MODIFICATION INSPECTIONS & TESTING.
5. IT IS ASSUMED THAT ANY STRUCTURAL MODIFICATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE STRUCTURE OWNER AND ENGINEER INCLUDING BUT NOT LIMITED TO TOWER CLIMBER AND RESCUE CLIMBER CERTIFICATIONS, QUALIFIED WELDER CERTIFICATES, CERTIFIED WELDING INSPECTOR CREDENTIALS, ET CETERA.
6. 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.
7. CONTRACTOR SHALL WORK WITHIN THE LIMITS OF THE STRUCTURE 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.

SYMBOLS AND CALL-OUTS



NOTE:
THE DETAIL CALL-OUT INFORMATION IS THE SAME FOR SECTION, ELEVATION, AND PHOTOGRAPH CALL-OUTS

STANDARD ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	LONG	LONGITUDINAL
ARCH	ARCHITECT, -URAL	MAS	MASONRY
BLDG	BUILDING	MATL	MATERIAL
BOD	BOTTOM OF DECK	MAX	MAXIMUM
BOT	BOTTOM	MECH	MECHANICAL
BRCG	BRACING	MFR	MANUFACTURER
BRDG	BRIDGING	MIN	MINIMUM
C	CHANNEL	MOD	MODIFICATION
CL	CENTER LINE	MPH	MILES PER HOUR
CLR	CLEAR	MRI	MEAN RECURRENCE INTERVAL
CMU	CONCRETE MASONRY UNIT	#	NUMBER
CONC	CONCRETE	NTS	NOT TO SCALE
CONT	CONTINUOUS	OC	ON CENTER
DIA (OR) ø	DIAMETER	OPH	OPPOSITE HAND
DWGS	DRAWINGS	OPNG	OPENING
EA	EACH	PC	PIECE
EL	ELEVATION	PL	PLATE
EQ, EQUIV	EQUAL, EQUIVALENT	PSF	POUNDS PER SQUARE FOOT
EW	EACH WAY	PSI	POUNDS PER SQUARE INCH
EXIST	EXISTING	REF	REFERENCE
' OR FT	FEET (DIMENSION)	REINF	REINFORCE/REINFORCEMENT
f'c	COMPRESSIVE STRESS	REQD	REQUIRED
FDN	FOUNDATION	REV	REVISION
FTG	FOOTING	SF	SQUARE FEET
GALV	GALVANIZED	SIM	SIMILAR
HORIZ	HORIZONTAL	SR	SOLID ROUND (SHAPE)
HSS	HOLLOW STRUCTURAL SHAPES	STD	STANDARD
		T&B	TOP AND BOTTOM
KIP	KILOPOUNDS (1000 LBS PER UNIT)	THK	THICKNESS
		TOF	TOP OF FOOTING
KSI	KIPS PER SQUARE INCH	TOM	TOP OF MASONRY
" OR IN	INCH	TOS	TOP OF STEEL
L	ANGLE	TYP	TYPICAL
LB	POUND	UON	UNLESS OTHERWISE NOTED
LLH	LONG LEG HORIZONTAL	VERT	VERTICAL
LLV	LONG LEG VERTICAL	W/	WITH

BOLT TIGHTENING PROCEDURE

1. TIGHTEN BOLTS BY AISC "TURN OF THE NUT" METHOD USING THE CHART BELOW:
   BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETERS:
   +1/3 TURN BEYOND SNUG TIGHT
   BOLT LENGTHS OVER FOUR AND UP TO EIGHT DIAMETERS:
   +1/2 TURN BEYOND SNUG TIGHT
   BOLT LENGTHS OVER EIGHT AND UP TO TWELVE DIAMETERS:
   +2/3 TURN BEYOND SNUG TIGHT
2. SPLICE BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8(d)(1) OF THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS AS FOLLOWS:

   "FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND BE TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8(d)(1) THROUGH 8(d)(4).

   8(d)(1) TURN-OF-THE-NUT TIGHTENING.
   BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION. SNUG TIGHT IS DEFINED AS THE TIGHTNESS THAT EXISTS WHEN THE PLIES OF A JOINT ARE IN FIRM CONTACT. THIS MAY BE OBTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A MAN USING AN ORDINARY SPUD WRENCH. SNUG TIGHTENING SHALL PROGRESS SYSTEMATICALLY...UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION, ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE. DURING THE TIGHTENING OPERATION, THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.

BEFORE ⅓ TURN AFTER ⅓ TURN

SECTION / ELEVATION / DETAIL VIEW CALLOUTS

TITLE — VIEW TITLE
SCALE: 1/16" = 1'-0" — SCALE USED FOR THIS VIEW
S-XXX — SHEET(S) ON WHICH VIEW IS CALLED OUT
— DETAIL REFERENCE IDENTIFIER

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CROWN CASTLE

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COA# PEC.001833 EXP. 8/14/2019

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NOT FOR CONSTRUCTION UNLESS LABELED AS CONSTRUCTION SET

STATE OF CONNECTICUT · TYLER M BARKER · No. 32402 · LICENSED · PROFESSIONAL ENGINEER

Tyler M. Barker
CLS Engineering, PLLC
Director of Engineering
PE # 32402 Exp. 1/31/2019
COA # PEC.001833 Exp. 8/14/2019

1/17/2019

PE# 32402 EXP: 1/31/2019

PLAINFIELD N 2 CT
CARRIER SITE NUMBER: NG71936
BUN: 876401
47-51 UNITY STREET
PLAINFIELD, CT 06374

SHEET TITLE
STRUCTURAL NOTES

SHEET NUMBER
GN-1

T:\CROWN CASTLE\42284 – CROWN MOUNT ANALYSES\876401\02 – MOD\CAD\42284-876401-471523.DWG – CLS PROJECT ID: 42284-876401-471523

PRE-CONSTRUCTION INSPECTION CHECKLIST

CONSTRUCTION AND/OR INSTALLATION INSPECTIONS REQUIRED FOR REPORT? (CHECK=YES, BLANK=NO)	INSPECTION REPORT ITEM
√	MODIFICATION INSPECTION CHECKLIST
√	SHOP DRAWINGS APPROVED BY ENGINEER OF RECORD (LATEST REVISION)
√	FABRICATION INSPECTION
	FABRICATOR'S CERTIFIED WELD INSPECTOR (CWI)
	FABRICATOR'S QUALIFIED PERSONNEL FOR WELDING
√	MATERIAL TEST REPORT(S) / MILL CERTIFICATE(S)
	FABRICATOR'S NON-DESTRUCTIVE TESTING (NDT) TECHNICIAN
√	PACKING SLIPS FOR STRUCTURAL MATERIALS

CONSTRUCTION INSPECTION CHECKLIST

CONSTRUCTION AND/OR INSTALLATION INSPECTIONS REQUIRED FOR REPORT? (CHECK=YES, BLANK=NO)	INSPECTION REPORT ITEM
√	CONSTRUCTION INSPECTIONS
	FOUNDATION INSPECTIONS
	CONCRETE COMPRESSIVE STRENGTH AND SLUMP TESTING RESULTS/CERTIFICATES
	ADHESIVE ANCHOR ROD(S) INSTALLATION INSPECTION
	BASE PLATE GROUT INSPECTION
	THIRD-PARTY CERTIFIED WELD INSPECTION (INCLUDING IBC SPECIAL INSPECTIONS)
	SOIL EXCAVATION - DENSITY TESTING, COMPACTION INSPECTION/VERIFICATION, USE OF SUITABLE FILL
√	GALVANIZING REPAIR MATERIAL PREPARATION, INSPECTION, & PAINT APPLICATION
	GUY WIRE (RE-)TENSION REPORT AND INSPECTION
√	PRIME CONTRACTOR'S AS-BUILT DOCUMENTS (SIGNED & DATED)

POST-CONSTRUCTION INSPECTION CHECKLIST

CONSTRUCTION AND/OR INSTALLATION INSPECTIONS REQUIRED FOR REPORT? (CHECK=YES, BLANK=NO)	INSPECTION REPORT ITEM
√	MODIFICATION INSPECTOR'S ISSUE LIST (INCLUDING CORRECTIVE ACTIONS TAKEN) AND/OR REDLINED RECORD DRAWINGS
	POST-INSTALLED ADHESIVE ANCHOR ROD PULL-OUT TESTING
√	PHOTOGRAPHS OF MODIFICATIONS (INCLUDE PHOTOS OF BOTH SIDES OF WELDED OR BOLTED CONNECTIONS, OF OVERALL AND DETAIL VIEWS OF INSTALLED MODIFICATIONS, AND BEFORE/AFTER PHOTOS OF ANY ISSUES IDENTIFIED BY THE INSPECTOR)

GENERAL NOTES

1. THE POST-MODIFICATION INSPECTION IS A VISUAL EXAMINATION OF STRUCTURE MODIFICATIONS AND A REVIEW OF ANY REQUIRED CONSTRUCTION INSPECTIONS, TESTING, AND OTHER DATA TO VERIFY THAT THE MODIFICATIONS ARE INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AS DESIGNED BY THE ENGINEER OF RECORD. THE CONTRACT DOCUMENTS INCLUDE THESE MODIFICATION DRAWINGS, ANY PROJECT SPECIFICATIONS REFERENCED TO IN THE PROJECT NOTES OR OTHERWISE PROVIDED WITH THE DRAWINGS, AND OTHER DOCUMENTS OR DRAWINGS PROVIDED WITH THE MODIFICATION DRAWINGS WITH THE INTENT THAT THEY BE USED AS A DESIGN AID OR GUIDELINE FOR CONSTRUCTION.
2. THE POST-MODIFICATION INSPECTION SHALL CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A QUALITATIVE REVIEW OF THE ENGINEERING ASPECTS OF THE DESIGN OR THE DESIGN DRAWINGS. THE MODIFICATION INSPECTOR IS NOT TAKING OWNERSHIP OF THE MODIFICATION DESIGN IN THE PERFORMANCE OF THEIR DUTIES. OWNERSHIP OF THE MODIFICATION DESIGN'S EFFECTIVENESS AND INTENT, AS WELL AS ALL ASSOCIATED RISK, LIES WITH THE ENGINEER OF RECORD AT ALL TIMES.
3. TO ENSURE THAT THE REQUIREMENTS OF THE POST-MODIFICATION INSPECTION ARE MET, IT IS ESSENTIAL THAT COORDINATION BETWEEN THE PRIME CONTRACTOR AND THE MODIFICATION INSPECTOR BEGIN AS SOON AS THE PROJECT IS FUNDED AND WORK ENTERS THE PLANNING STAGE. THE PRIME CONTRACTOR AND MODIFICATION INSPECTOR SHALL BE PROACTIVE IN IDENTIFYING CONSTRUCTION ISSUES AND COMMUNICATING THESE ISSUES TO EACH OTHER AND TO THE ENGINEER OF RECORD AND STRUCTURE OWNER & CUSTOMER, AS REQUIRED.

INSPECTION AND REPORT RECOMMENDATIONS

1. THE FOLLOWING ARE PROVIDED WITH THE INTENT OF ENHANCING THE EFFECTIVENESS OF THE MODIFICATION INSPECTION AND IMPROVING THE EFFICIENCY OF THE PROCESS OF COLLECTING AND COMPILING THE INFORMATION INTO A USABLE REPORT:

1.1. IT IS RECOMMENDED THAT THE PRIME CONTRACTOR PROVIDE THE MODIFICATION INSPECTOR AT LEAST 5 BUSINESS DAYS NOTICE FOR WHEN THE SITE WILL BE READY FOR THE MODIFICATION INSPECTION.
1.2. THE PRIME CONTRACTOR AND THE MODIFICATION INSPECTOR SHALL COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
1.3. THE PRIME CONTRACTOR AND MODIFICATION INSPECTOR SHALL BOTH BE PRESENT DURING THE INITIAL INSPECTION IN ORDER TO ALLOW FOR THE REMEDIATION OF DEFICIENCIES DURING THE INSPECTION, AS PRACTICABLE. IT MAY BE PREFERABLE TO KEEP WORK CREWS AND THEIR EQUIPMENT ON-SITE TO REMEDIATE DEFICIENCIES DURING INSPECTIONS.

INSPECTION RESCHEDULING AND CANCELLATION

1. IF THE PRIME CONTRACTOR AND MODIFICATION INSPECTOR HAVE AGREED UPON A TIME AND DATE FOR A GIVEN INSPECTION AND EITHER PARTY RESCHEDULES OR CANCELS THE INSPECTION, THE STRUCTURE OWNER SHALL NOT BE RESPONSIBLE FOR COSTS, FEES, LOST DEPOSITS, OR OTHER EXPENSES INCURRED BY THE PRIME CONTRACTOR, THEIR SUBCONTRACTOR(S), OR THE MODIFICATION INSPECTOR DUE TO THESE SCHEDULING CHANGES. EXCEPTIONS MAY BE MADE IN THE EVENT OF UNCONTROLLABLE SITUATIONS SUCH AS NATURAL DISASTERS, SEVERE WEATHER, OR OTHER CONDITIONS THAT COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

REMEDIATION OF FAILING INSPECTION

1. IN THE EVENT THAT ANY PORTION OF THE MODIFICATION WORK IS DETERMINED TO BE UNSATISFACTORY BY THE MODIFICATION INSPECTOR, THE PRIME CONTRACTOR SHALL WORK WITH THE MODIFICATION INSPECTOR TO CREATE A PLAN OF ACTION THAT WILL EITHER:

1.1. REPAIR THE DEFICIENT WORK TO SATISFACTORY CONDITION AND INCLUDE A SUBSEQUENT RE-INSPECTION OF THE WORK TO VERIFY THAT IT IS SATISFACTORY
1.2. OR, WITH THE PERMISSION OF THE STRUCTURE OWNER AND/OR CUSTOMER, THE PRIME CONTRACTOR MAY WORK WITH THE ENGINEER OF RECORD TO REVIEW THE AS-BUILT CONDITION OF THE MODIFICATION TO DETERMINE IF IT IS STRUCTURALLY ACCEPTABLE. IF THIS ACTION IS NOT ACCEPTABLE TO ANY PARTY, THE PRIME CONTRACTOR SHALL PROCEED TO REPAIR THE DEFICIENT WORK TO A SATISFACTORY CONDITION.

MODIFICATION INSPECTOR'S RESPONSIBILITIES

1. THE MODIFICATION INSPECTOR SHALL CONTACT THE PRIME CONTRACTOR AS SOON AS THEY HAVE RECEIVED A PURCHASE ORDER OR PAYMENT FOR THIS INSPECTION. THE MODIFICATION INSPECTOR SHALL REVIEW THE REQUIREMENTS OF THE INSPECTION CHECKLIST, SHALL WORK WITH THE PRIME CONTRACTOR TO DEVELOP A SCHEDULE OF NECESSARY ON-SITE INSPECTIONS, AND SHALL DISCUSS ANY SITE-SPECIFIC INSPECTION REQUIREMENTS OR OTHER CONCERNS.
2. THE MODIFICATION INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL PRIME CONTRACTOR INSPECTION AND TEST REPORTS (INCLUDING THOSE OF ASSIGNED SUB-CONTRACTORS), SHALL REVIEW THE REPORTS FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS, SHALL CONDUCT THE NECESSARY ON-SITE INSPECTIONS, AND SHALL COMPILE AND SUBMIT THE MODIFICATION INSPECTION REPORT.

PRIME CONTRACTOR'S RESPONSIBILITIES

1. THE PRIME CONTRACTOR SHALL CONTACT THE MODIFICATION INSPECTOR AS SOON AS THEY HAVE RECEIVED A PURCHASE ORDER OR PAYMENT FOR THE MODIFICATION INSTALLATION OR PROJECT. THE PRIME CONTRACTOR SHALL REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST, SHALL WORK WITH THE MODIFICATION INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, AND SHALL DISCUSS SPECIFIC INSPECTION AND TESTING REQUIREMENTS WITH THE MODIFICATION INSPECTOR IN DETAIL TO OBTAIN A FULL UNDERSTANDING OF THE REQUIRED INSPECTIONS AND TESTING.
2. THE PRIME CONTRACTOR SHALL PERFORM AND RECORD THE TESTING AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST.

PHOTOGRAPHY REQUIREMENTS

1. THE PRIME CONTRACTOR AND MODIFICATION INSPECTOR SHALL, BETWEEN THE EFFORTS OF BOTH PARTIES AND THEIR EMPLOYED PERSONNEL, PROVIDE PHOTOGRAPHS WITH THE INSPECTION REPORT TO INCLUDE THE FOLLOWING:
   a. GENERAL SITE PHOTOGRAPHS PRE-CONSTRUCTION
   b. MODIFICATION INSTALLATION PHOTOGRAPHS DURING CONSTRUCTION/ERECTION OPERATIONS AND INSPECTIONS
   b.1. RAW MATERIALS
   b.2. PHOTOS OF DETAILED WORK REQUIRED ON THE DRAWINGS (CONNECTIONS, WELDMENTS, FIELD-FABRICATED MEMBERS, ETC)
   b.3. WELD PREPARATION AND COMPLETED WELD INSPECTION (INCLUDING A FILLET WELD SIZE GAUGE, AS APPLICABLE)
   b.4. BOLT INSTALLATION AND TORQUE/PRETENSION.
   b.5. FINAL INSTALLED CONDITION (AFTER DEFICIENT CONDITIONS, IF ANY, ARE REMEDIATED).
   b.6. REPAIR OF SURFACE COATINGS (INCLUDING GALVANIZING AND/OR PAINT COATING)
   c. POST-MODIFICATION PHOTOGRAPHS OF THE SITE & WORK.
   d. PHOTOGRAPHS OF THE FINAL STATE OF THE SITE AT CONCLUSION OF THE WORK BY THE PRIME CONTRACTOR, ASSOCIATED SUBCONTRACTORS, AND THE MODIFICATION INSPECTOR.
   e. OTHER PHOTOS MAY BE INCLUDED AT PRIME CONTRACTOR & MODIFICATION INSPECTOR'S DISCRETION.

NOTE: PHOTOS OF MODIFICATIONS INSTALLED ON THE STRUCTURE ABOVE AN ELEVATION OF 20 FT SHALL REQUIRE PHOTOS TAKEN FROM THE STRUCTURE AS WELL AS OVERALL PHOTOGRAPHS OF THE MODIFICATIONS TAKEN FROM THE GROUND.

OWNER INSPECTIONS

1. THE STRUCTURE OWNER MAY CONDUCT INSPECTIONS TO VERIFY THE QUALITY AND COMPLETENESS OF THE PREVIOUSLY COMPLETED MODIFICATION INSPECTION REPORTS FOR THE MODIFICATION INSTALLATION WORK.
2. INSPECTIONS MAY BE COMPLETED BY A 3RD-PARTY FIRM OF THE STRUCTURE OWNER'S CHOOSING AFTER A MODIFICATION PROJECT IS COMPLETED AND A PASSING MODIFICATION INSPECTION REPORT IS ISSUED.

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CLS PROJECT ID: 42284-876401-471523
COA# PEC.001833 EXP. 8/14/2019

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STATE OF CONNECTICUT
TYLER M. BARKER
No. 32402
LICENSED
PROFESSIONAL ENGINEER

Tyler M. Barker
CLS Engineering, PLLC
Director of Engineering
PE # 32402 Exp. 01/31/2019
COA # PEC.001833 Exp. 8/14/2019

1/17/2019

PE# 32402 EXP: 1/31/2019

PLAINFIELD N 2 CT

CARRIER SITE NUMBER: NG71936

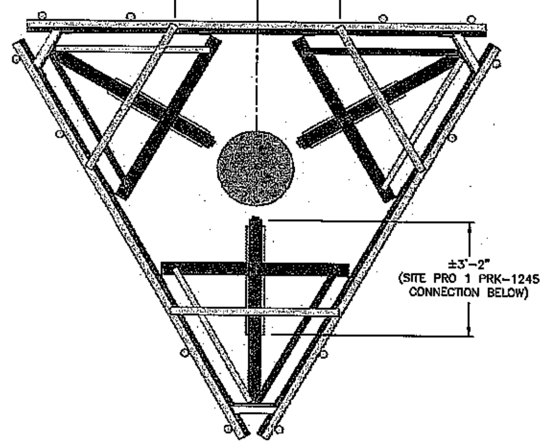
BUN: 876401

47-51 UNITY STREET
PLAINFIELD, CT 06374

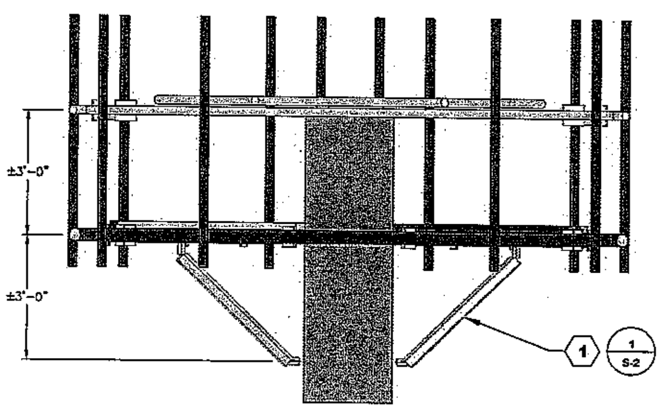
SHEET TITLE
MODIFICATION INSPECTION NOTES

SHEET NUMBER
IN-1

NOTE:
EXISTING MOUNT SHOWN IS REPRESENTATIVE TO ILLUSTRATE MODIFICATION AND MAY DIFFER SLIGHTLY ON SITE



2 MOUNT - PLAN VIEW
SCALE: N.T.S.



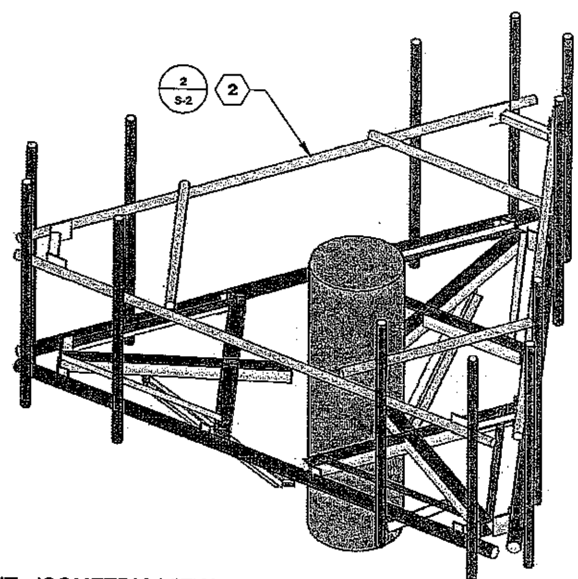
1 MOUNT - FRONT ELEVATION VIEW
SCALE: N.T.S.

CONSTRUCTION NOTES

1. SCOPE OF WORK MUST BE COMPLETED AT WIND SPEEDS < 20 MPH.
2. ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHOULD FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. FIELD CUT MEMBERS AS REQUIRED.
3. ALL HARDWARE FOR SITE PRO 1 PUCK CONNECTIONS TO SUPPORT RAIL PIPE SHOULD BE INSTALLED WITH "TURN OF THE NUT" METHOD (RE: GN-1).

MODIFICATION SCHEDULE

LABEL	ELEVATION	SCOPE	MATERIAL	NOTES
1	±125'-0"	INSTALL (1) PROPOSED SITE PRO 1 PRK-1245 AS SPECIFIED. FIELD-CUT PROPOSED ANGLES AS REQUIRED. MAINTAIN MINIMUM BOLT EDGE DISTANCE.	SITE PRO 1 PRK-1245	S-1 S-2
2	±125'-0"	INSTALL SITE PRO 1 HRK12-HD SUPPORT RAIL KIT AT 3'-0" ABOVE THE EXISTING PLATFORM FACE HORIZONTAL PIPE. CONNECT TO ALL EXISTING MOUNT PIPES USING SITE PRO 1 SCX2 CROSSOVER PLATE INCLUDED IN THE SUPPORT RAIL KIT.	SITE PRO 1 HRK12-HD	S-1 S-2
3	±125'-0"	RELOCATE EQUIPMENT, AS REQUIRED, TO FACILITATE INSTALLATION OF PROPOSED MODIFICATIONS ON MOUNT.	-	S-1



3 MOUNT - ISOMETRIC VIEW
SCALE: N.T.S.

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STATE OF CONNECTICUT
TYLER M BARKER
No. 32402
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Tyler M. Barker
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COA # PEC.001833 Exp. 8/14/2019

1/17/2019

PE# 32402 EXP: 1/31/2019

PLAINFIELD N 2 CT
CARRIER SITE NUMBER: NG71936
BUN: 876401
47-51 UNITY STREET
PLAINFIELD, CT 06374

SHEET TITLE
MOUNT VIEWS & MODIFICATION SCHEDULE

SHEET NUMBER
S-1

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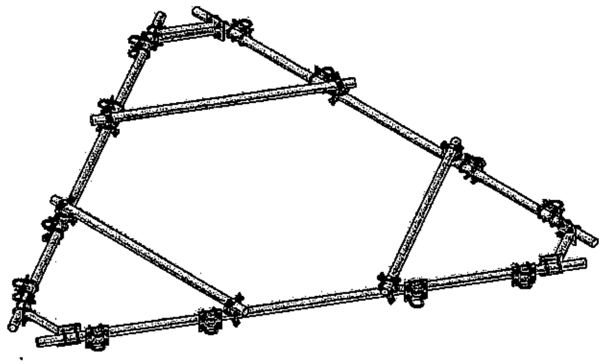
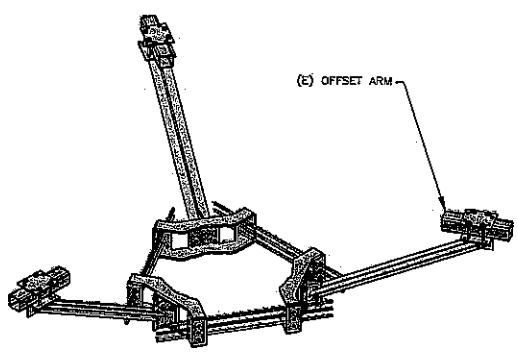


2 SITE PRO 1 HRK12-HD
SCALE: N.T.S.



NOTE:
FIELD-CUT PROPOSED ANGLES AS REQUIRED.
MAINTAIN MINIMUM BOLT EDGE DISTANCE.

1 SITE PRO 1 PRK-1245
SCALE: N.T.S.

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STATE OF CONNECTICUT ★ TYLER M BARKER ★ No. 32402 LICENSED PROFESSIONAL ENGINEER

Tyler M. Barker
CLS Engineering, PLLC
Director of Engineering
PE # 32402 Exp. 1/31/2019
COA # PEC.001833 Exp. 8/14/2019
1/17/2019

PE# 32402 EXP: 1/31/2019

PLAINFIELD N 2 CT
CARRIER SITE NUMBER: NG71936
BUN: 876401
47-51 UNITY STREET
PLAINFIELD, CT 06374

SHEET TITLE
MODIFICATION DETAIL VIEWS

SHEET NUMBER
S-2

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