



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

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### VIA ELECTRONIC MAIL

March 22, 2019

Anne Marie Zsamba  
Real Estate Specialist  
Crown Castle  
3 Corporate Park Drive, Suite 101  
Clifton Park, NY 12065

RE: **EM-AT&T-094-190221** – AT&T notice of intent to modify an existing telecommunications facility located at 123 Costello Road, Newington, Connecticut.

Dear Ms. Zsamba:

The Connecticut Siting Council (Council) is in receipt of your correspondence of March 21, 2019 submitted in response to the Council's March 4, 2019 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

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

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman  
Executive Director

MAB/IN/emr



## Robidoux, Evan

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**From:** Zsamba, Anne Marie <AnneMarie.Zsamba@crowncastle.com>  
**Sent:** Thursday, March 21, 2019 11:10 AM  
**To:** Robidoux, Evan  
**Cc:** CSC-DL Siting Council  
**Subject:** Response to Council Incomplete Letter for EM-AT&T-094-190221-CostelloRd-Newington  
**Attachments:** CSC AT&T 881364 Response to Notice of Incomplete 3.21.19.pdf  
**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Good morning,

Attached please find Crown's response to the Council's Notice of Incomplete letter dated March 4, 2019. Thank you.

### **ANNE MARIE ZSAMBA**

Real Estate Specialist  
T: (201) 236-9224  
F: (724) 416-6112

### **CROWN CASTLE**

3 Corporate Park Drive, Suite 101,  
Clifton Park, NY 12065  
[CrownCastle.com](http://CrownCastle.com)

**From:** Robidoux, Evan <[Evan.Robidoux@ct.gov](mailto:Evan.Robidoux@ct.gov)>  
**Sent:** Wednesday, March 6, 2019 9:15 AM  
**To:** Badawi, Nesmet (Contractor) <[Nesmet.Badawi.Contractor@crowncastle.com](mailto:Nesmet.Badawi.Contractor@crowncastle.com)>  
**Cc:** CSC-DL Siting Council <[Siting.Council@ct.gov](mailto:Siting.Council@ct.gov)>  
**Subject:** Council Incomplete Letter for EM-AT&T-094-190221-CostelloRd-Newington

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Please see the attached correspondence.

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

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

March 21, 2019

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

**RE: Notice of Exempt Modification for Crown Site BU: 881364**  
**AT&T Site ID: 10042331**  
**123 Costello Road, Newington, CT 06111**  
**Latitude: 41° 39' 18.72"/ Longitude: -72° 43' 17.19"**

Dear Ms. Bachman:

I am in receipt of the Council's Notice of Incomplete Letter dated March 4, 2019. Attached please find a revised structural analysis dated March 14, 2019. This revised report now reflects the 2018 Connecticut State Building Code, as well as, the incorporation of SitePro RMQP-12-H5 as indicated in the Mount Replacement Analysis. It is our hope that submission of this revised structural analysis will deem our application complete. Please confirm. Thank you kindly.

Sincerely,

Anne Marie Zsamba, Esq.  
Real Estate Specialist  
3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065  
(201) 236-9224  
annemarie.zsamba@crowncastle.com

Enclosure

Date: **March 14, 2019**

Heather Simeone  
Crown Castle  
3530 Toringdon Way Suite 300  
Charlotte, NC 28277

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

**Subject:** Structural Analysis Report

**Carrier Designation:** **AT&T Mobility Co-Locate**  
**Carrier Site Number:** 10042331  
**Carrier Site Name:** NEWINGTON SOUTH

**Crown Castle Designation:** **Crown Castle BU Number:** 881364  
**Crown Castle Site Name:** Newington  
**Crown Castle JDE Job Number:** 548703  
**Crown Castle Work Order Number:** 1710142  
**Crown Castle Order Number:** 471664 Rev. 0

**Engineering Firm Designation:** **Paul J. Ford and Company Project Number:** 37519-0951.001.7805

**Site Data:** **123 Costelo Road, Newington, Hartford County, CT**  
**Latitude 41° 39' 18.72", Longitude -72° 43' 17.19"**  
**145 Foot - Monopole Tower**

Dear Heather Simeone,

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

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

LC7: Proposed Equipment Configuration

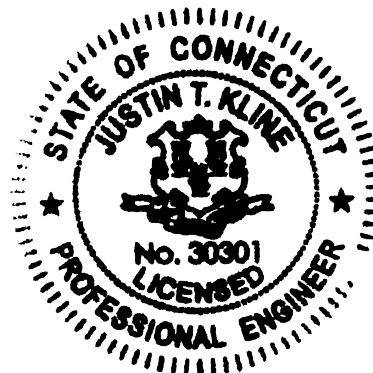
**Sufficient Capacity**

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

Respectfully submitted by:



Allen R Bonham, EI  
Structural Designer



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## 1) INTRODUCTION

This tower is a 145 ft Monopole tower designed by SUMMIT.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	125 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	2.0 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	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)
105.0	105.0	1	Site Pro	RMQP-12-H5	2 6 12	3/8 3/4 1 5/8
		3	cci antennas	OPA-65R-LCUU-H6		
		6	cci antennas	TPX-070821		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	ericsson	RRUS 8843 B2/B66A		
		3	kathrein	80010965		
		3	powerwave technologies	7770.00		
		6	powerwave technologies	LGP21401		
		3	quintel technology	QS66512-2		
		3	raycap	DC6-48-60-18-8F		

**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)
133.0	139.0	2	andrew	VHLP2.5-11	6 2	5/16 1/2
		1	dragonwave	HORIZON COMPACT		
		1	samsung telecommunications	WIMAX DAP HEAD		
	135.0	3	argus technologies	LLPX310R-V1 w/ Mount Pipe		
		1	dragonwave	HORIZON COMPACT		
		1	motorola	TIMING 2000		
		2	samsung telecommunications	WIMAX DAP HEAD		
	133.0	1	tower mounts	Platform Mount [LP 712-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
124.0	124.0	3	alcatel lucent	TD-RRH8x20-25	4	1 1/4
		3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
		3	rfs celwave	IBC1900BB-1		
		3	rfs celwave	IBC1900HG-2A		
		1	tower mounts	Platform Mount [LP 712-1]		
122.0	122.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	--	--
		1	tower mounts	Pipe Mount [PM 601-3]		
	118.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER		
114.0	116.0	1	lucent	KS24019-L112A	1 8	1/2 1 5/8
	115.0	6	andrew	SBNHH-1D65B w/ Mount Pipe		
		6	antel	BXA-80063/4CFx5 w/ Mount Pipe		
		2	rfs celwave	DB-T1-6Z-8AB-0Z		
		3	samsung	RFV01U-D1A		
		3	telecommunications	RFV01U-D2A		
	114.0	1	tower mounts	Platform Mount [LP 712-1]		
94.0	95.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	1 12	1 1/4 1 5/8
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
	94.0	1	tower mounts	Platform Mount [LP 712-1]		
87.0	87.0	3	kathrein	742 213	6	1 5/8
		1	tower mounts	Pipe Mount [PM 601-3]		
80.0	80.0	2	tower mounts	Side Arm Mount [SO 701-1]	--	--
77.0	77.0	1	symmetricom	58532A	1	1/2
		1	tower mounts	Side Arm Mount [SO 701-1]		

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, 08/10/1999	1425352	CCISITES

Document	Remarks	Reference	Source
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit/PJF, 5153/29299-105, 08/11/1999	1425473	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit, 5153, 08/10/1999	1425417	CCISITES
4-POST-MODIFICATION INSPECTION	ETS, 160020, 02/29/2016	6120832	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37515-0757.007.7700, 11/11/2015	5976614	CCISITES

### 3.1) Analysis Method

tnxTower (version 8.0.5.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

### 3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) Monopole was modified in conformance with the referenced modification drawings.
- 5) Mount modifications considered in the referenced document # 7830172 have been considered in this analysis.

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

## 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L1	145 - 140	Pole	TP24.923x24x0.1875	Pole	0.2%	Pass
L2	140 - 135	Pole	TP25.847x24.923x0.1875	Pole	1.5%	Pass
L3	135 - 130	Pole	TP26.77x25.847x0.1875	Pole	4.8%	Pass
L4	130 - 125	Pole	TP27.709x26.77x0.25	Pole	5.9%	Pass
L5	125 - 120	Pole	TP28.648x27.709x0.25	Pole	10.4%	Pass
L6	120 - 115	Pole	TP29.588x28.648x0.25	Pole	15.1%	Pass
L7	115 - 110	Pole	TP30.527x29.588x0.25	Pole	22.4%	Pass
L8	110 - 105	Pole	TP31.466x30.527x0.25	Pole	29.2%	Pass
L9	105 - 100	Pole	TP32.405x31.466x0.25	Pole	39.3%	Pass
L10	100 - 95	Pole	TP33.345x32.405x0.25	Pole	48.4%	Pass
L11	95 - 90	Pole	TP34.284x33.345x0.25	Pole	58.9%	Pass
L12	90 - 89.25	Pole	TP35.27x34.284x0.25	Pole	60.4%	Pass
L13	89.25 - 84.25	Pole	TP34.851x33.925x0.3125	Pole	53.6%	Pass
L14	84.25 - 79.25	Pole	TP35.777x34.851x0.3125	Pole	60.5%	Pass
L15	79.25 - 74.25	Pole	TP36.703x35.777x0.3125	Pole	67.0%	Pass
L16	74.25 - 69.25	Pole	TP37.629x36.703x0.3125	Pole	73.1%	Pass



Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L17	69.25 - 64.25	Pole	TP38.555x37.629x0.3125	Pole	78.9%	Pass
L18	64.25 - 59.25	Pole	TP39.482x38.555x0.3125	Pole	84.2%	Pass
L19	59.25 - 58.08	Pole	TP39.698x39.482x0.3125	Pole	85.5%	Pass
L20	58.08 - 57.83	Pole + Reinf.	TP39.745x39.698x0.4125	Reinf. 2 Tension Rupture	84.9%	Pass
L21	57.83 - 52.83	Pole + Reinf.	TP40.671x39.745x0.4188	Reinf. 2 Tension Rupture	89.8%	Pass
L22	52.83 - 49.5	Pole + Reinf.	TP42.26x40.671x0.4125	Reinf. 2 Tension Rupture	92.8%	Pass
L23	49.5 - 43.25	Pole + Reinf.	TP41.82x40.663x0.475	Reinf. 2 Tension Rupture	88.5%	Pass
L24	43.25 - 38.25	Pole + Reinf.	TP42.746x41.82x0.475	Reinf. 2 Tension Rupture	92.0%	Pass
L25	38.25 - 33.25	Pole + Reinf.	TP43.672x42.746x0.475	Reinf. 2 Tension Rupture	95.3%	Pass
L26	33.25 - 31.25	Pole + Reinf.	TP44.042x43.672x0.475	Reinf. 2 Tension Rupture	96.6%	Pass
L27	31.25 - 31	Pole + Reinf.	TP44.089x44.042x0.5375	Reinf. 1 Compression	76.1%	Pass
L28	31 - 26	Pole + Reinf.	TP45.015x44.089x0.5375	Reinf. 1 Compression	78.7%	Pass
L29	26 - 21	Pole + Reinf.	TP45.941x45.015x0.525	Reinf. 1 Compression	81.1%	Pass
L30	21 - 16	Pole + Reinf.	TP46.867x45.941x0.525	Reinf. 1 Compression	83.3%	Pass
L31	16 - 11	Pole + Reinf.	TP47.793x46.867x0.525	Reinf. 1 Compression	85.4%	Pass
L32	11 - 6	Pole + Reinf.	TP48.719x47.793x0.5188	Reinf. 1 Compression	87.4%	Pass
L33	6 - 4.75	Pole + Reinf.	TP48.95x48.719x0.5188	Reinf. 1 Compression	87.9%	Pass
L34	4.75 - 4.5	Pole + Reinf.	TP48.997x48.95x0.6125	Reinf. 3 Connection	86.9%	Pass
L35	4.5 - 0	Pole + Reinf.	TP49.83x48.997x0.6	Reinf. 3 Connection	88.6%	Pass
					Summary	
				Pole	85.5%	Pass
				Reinforcement	96.6%	Pass

**Table 5 - Tower Component Stresses vs. Capacity – LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	90.7	Pass
1	Base Plate	0	81.3	Pass
1	Base Foundation Structural Steel	0	65.3	Pass
1	Base Foundation Soil Interaction	0	64.1	Pass
1	Flange Bolts	130	7.2	Pass
1	Flange Plate	130	2.1	Pass

<b>Structure Rating (max from all components) =</b>	<b>96.6%</b>
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Notes:

- All structural ratings are per TIA-222-H Section 15.5
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

#### 4.1) Recommendations

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

## 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:

- 6) Tower is located in Hartford County, Connecticut.
- 7) Tower base elevation above sea level: 141.0000 ft.
- 8) Basic wind speed of 125.0 mph.
- 9) Risk Category II.
- 10) Exposure Category C.
- 11) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- 12) Topographic Category: 1.
- 13) Crest Height: 0.0000 ft.
- 14) Nominal ice thickness of 2.0000 in.
- 15) Ice thickness is considered to increase with height.
- 16) Ice density of 56 pcf.
- 17) A wind speed of 50.0 mph is used in combination with ice.
- 18) Temperature drop of 50 °F.
- 19) Deflections calculated using a wind speed of 60.0 mph.
- 20) TIA-222-H Annex S..
- 21) A non-linear (P-delta) analysis was used.
- 22) Pressures are calculated at each section.
- 23) Stress ratio used in pole design is 1.05.
- 24) Tower analysis based on target reliabilities in accordance with Annex S.
- 25) Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .
- 26) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

### Options

- |  |   |  |
|--|---|--|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <br/> <li>Include Bolts In Member Capacity</li> <br/> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <br/> <li>Autocalc Torque Arm Areas</li> <br/> <li>Add IBC .6D+W Combination</li> <li>Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> <li>Ignore KL/ry For 60 Deg. Angle Legs</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-H Bracing Resist. Exemption</li> <li>Use TIA-222-H Tension Splice Exemption</li> <br/> <li style="text-align: center;"><b>Poles</b></li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> <li>Pole Without Linear Attachments</li> <li>Pole With Shroud Or No Appurtenances</li> <li>Outside and Inside Corner Radii Are Known</li> </ul> |
|--|---|--|

## 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	145.0000-140.0000	5.0000	0.00	18	24.0000	24.9233	0.1875	0.7500	A607-65 (65 ksi)
L2	140.0000-135.0000	5.0000	0.00	18	24.9233	25.8467	0.1875	0.7500	A607-65 (65 ksi)
L3	135.0000-130.0000	5.0000	0.00	18	25.8467	26.7700	0.1875	0.7500	A607-65 (65 ksi)
L4	130.0000-125.0000	5.0000	0.00	18	26.7700	27.7092	0.2500	1.0000	A607-65 (65 ksi)
L5	125.0000-120.0000	5.0000	0.00	18	27.7092	28.6485	0.2500	1.0000	A607-65 (65 ksi)
L6	120.0000-115.0000	5.0000	0.00	18	28.6485	29.5877	0.2500	1.0000	A607-65 (65 ksi)
L7	115.0000-110.0000	5.0000	0.00	18	29.5877	30.5269	0.2500	1.0000	A607-65 (65 ksi)
L8	110.0000-105.0000	5.0000	0.00	18	30.5269	31.4661	0.2500	1.0000	A607-65 (65 ksi)
L9	105.0000-100.0000	5.0000	0.00	18	31.4661	32.4054	0.2500	1.0000	A607-65 (65 ksi)
L10	100.0000-95.0000	5.0000	0.00	18	32.4054	33.3446	0.2500	1.0000	A607-65 (65 ksi)
L11	95.0000-90.0000	5.0000	0.00	18	33.3446	34.2838	0.2500	1.0000	A607-65 (65 ksi)
L12	90.0000-84.7500	5.2500	4.50	18	34.2838	35.2700	0.2500	1.0000	A607-65 (65 ksi)
L13	84.7500-84.2500	5.0000	0.00	18	33.9247	34.8508	0.3125	1.2500	A607-65 (65 ksi)
L14	84.2500-79.2500	5.0000	0.00	18	34.8508	35.7770	0.3125	1.2500	A607-65 (65 ksi)
L15	79.2500-74.2500	5.0000	0.00	18	35.7770	36.7031	0.3125	1.2500	A607-65 (65 ksi)
L16	74.2500-69.2500	5.0000	0.00	18	36.7031	37.6293	0.3125	1.2500	A607-65 (65 ksi)
L17	69.2500-64.2500	5.0000	0.00	18	37.6293	38.5554	0.3125	1.2500	A607-65 (65 ksi)
L18	64.2500-59.2500	5.0000	0.00	18	38.5554	39.4816	0.3125	1.2500	A607-65 (65 ksi)
L19	59.2500-58.0800	1.1700	0.00	18	39.4816	39.6983	0.3125	1.2500	A607-65 (65 ksi)
L20	58.0800-57.8300	0.2500	0.00	18	39.6983	39.7446	0.4125	1.6500	A607-65 (65 ksi)
L21	57.8300-52.8300	5.0000	0.00	18	39.7446	40.6707	0.4188	1.6750	A607-65 (65 ksi)
L22	52.8300-44.2500	8.5800	5.25	18	40.6707	42.2600	0.4125	1.6500	A607-65 (65 ksi)
L23	44.2500-43.2500	6.2500	0.00	18	40.6625	41.8200	0.4750	1.9000	A607-65 (65 ksi)
L24	43.2500-38.2500	5.0000	0.00	18	41.8200	42.7460	0.4750	1.9000	A607-65 (65 ksi)
L25	38.2500-33.2500	5.0000	0.00	18	42.7460	43.6720	0.4750	1.9000	A607-65 (65 ksi)
L26	33.2500-31.2500	2.0000	0.00	18	43.6720	44.0424	0.4750	1.9000	A607-65 (65 ksi)
L27	31.2500-31.0000	0.2500	0.00	18	44.0424	44.0887	0.5375	2.1500	A607-65 (65 ksi)
L28	31.0000-26.0000	5.0000	0.00	18	44.0887	45.0147	0.5375	2.1500	A607-65 (65 ksi)
L29	26.0000-21.0000	5.0000	0.00	18	45.0147	45.9408	0.5250	2.1000	A607-65 (65 ksi)
L30	21.0000-16.0000	5.0000	0.00	18	45.9408	46.8668	0.5250	2.1000	A607-65 (65 ksi)
L31	16.0000-11.0000	5.0000	0.00	18	46.8668	47.7928	0.5250	2.1000	A607-65 (65 ksi)
L32	11.0000-6.0000	5.0000	0.00	18	47.7928	48.7188	0.5188	2.0750	A607-65 (65 ksi)
L33	6.0000-4.7500	1.2500	0.00	18	48.7188	48.9503	0.5188	2.0750	A607-65 (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
L34	4.7500-4.5000	0.2500	0.00	18	48.9503	48.9966	0.6125	2.4500	A607-65 (65 ksi)
L35	4.5000-0.0000	4.5000		18	48.9966	49.8300	0.6000	2.4000	A607-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	24.3413	14.1714	1015.2211	8.4534	12.1920	83.2694	2031.7780	7.0871	3.8940	20.768
	25.2789	14.7209	1137.9555	8.7812	12.6611	89.8784	2277.4084	7.3619	4.0565	21.635
L2	25.2789	14.7209	1137.9555	8.7812	12.6611	89.8784	2277.4084	7.3619	4.0565	21.635
	26.2165	15.2704	1270.2034	9.1090	13.1301	96.7398	2542.0783	7.6367	4.2190	22.501
L3	26.2165	15.2704	1270.2034	9.1090	13.1301	96.7398	2542.0783	7.6367	4.2190	22.501
	27.1540	15.8199	1412.3200	9.4368	13.5992	103.8535	2826.4984	7.9115	4.3815	23.368
L4	27.1444	21.0436	1869.8421	9.4146	13.5992	137.4969	3742.1446	10.5238	4.2715	17.086
	28.0981	21.7889	2075.6269	9.7480	14.0763	147.4556	4153.9849	10.8965	4.4368	17.747
L5	28.0981	21.7889	2075.6269	9.7480	14.0763	147.4556	4153.9849	10.8965	4.4368	17.747
	29.0518	22.5342	2295.9817	10.0815	14.5534	157.7624	4594.9846	11.2692	4.6021	18.409
L6	29.0518	22.5342	2295.9817	10.0815	14.5534	157.7624	4594.9846	11.2692	4.6021	18.409
	30.0056	23.2794	2531.4052	10.4149	15.0305	168.4174	5066.1412	11.6419	4.7674	19.07
L7	30.0056	23.2794	2531.4052	10.4149	15.0305	168.4174	5066.1412	11.6419	4.7674	19.07
	30.9593	24.0247	2782.3955	10.7483	15.5077	179.4206	5568.4521	12.0146	4.9327	19.731
L8	30.9593	24.0247	2782.3955	10.7483	15.5077	179.4206	5568.4521	12.0146	4.9327	19.731
	31.9130	24.7700	3049.4511	11.0817	15.9848	190.7720	6102.9147	12.3874	5.0980	20.392
L9	31.9130	24.7700	3049.4511	11.0817	15.9848	190.7720	6102.9147	12.3874	5.0980	20.392
	32.8667	25.5153	3333.0703	11.4152	16.4619	202.4715	6670.5263	12.7601	5.2633	21.053
L10	32.8667	25.5153	3333.0703	11.4152	16.4619	202.4715	6670.5263	12.7601	5.2633	21.053
	33.8204	26.2606	3633.7515	11.7486	16.9390	214.5192	7272.2844	13.1328	5.4286	21.715
L11	33.8204	26.2606	3633.7515	11.7486	16.9390	214.5192	7272.2844	13.1328	5.4286	21.715
	34.7741	27.0058	3951.9931	12.0820	17.4162	226.9151	7909.1863	13.5055	5.5940	22.376
L12	34.7741	27.0058	3951.9931	12.0820	17.4162	226.9151	7909.1863	13.5055	5.5940	22.376
	35.7275	27.7884	4305.5913	12.4321	17.9172	240.3055	8616.8481	13.8968	5.7675	23.07
L13	35.2462	33.3391	4758.6642	11.9323	17.2337	276.1248	9523.5900	16.6727	5.4207	17.346
	35.3403	34.2577	5162.9606	12.2611	17.7042	291.6230	10332.714	17.1321	5.5837	17.868
L14	35.3403	34.2577	5162.9606	12.2611	17.7042	291.6230	10332.714	17.1321	5.5837	17.868
	36.2807	35.1763	5589.5314	12.5899	18.1747	307.5445	11186.417	17.5915	5.7467	18.39
L15	36.2807	35.1763	5589.5314	12.5899	18.1747	307.5445	11186.417	17.5915	5.7467	18.39
	37.2211	36.0950	6038.9738	12.9187	18.6452	323.8891	12085.893	18.0509	5.9098	18.911
L16	37.2211	36.0950	6038.9738	12.9187	18.6452	323.8891	12085.893	18.0509	5.9098	18.911
	38.1616	37.0136	6511.8851	13.2475	19.1157	340.6569	13032.338	18.5103	6.0728	19.433
L17	38.1616	37.0136	6511.8851	13.2475	19.1157	340.6569	13032.338	18.5103	6.0728	19.433
	39.1020	37.9322	7008.8626	13.5762	19.5862	357.8478	14026.947	18.9697	6.2358	19.954
L18	39.1020	37.9322	7008.8626	13.5762	19.5862	357.8478	14026.947	18.9697	6.2358	19.954
	40.0424	38.8508	7530.5036	13.9050	20.0566	375.4620	15070.916	19.4291	6.3988	20.476
L19	40.0424	38.8508	7530.5036	13.9050	20.0566	375.4620	15070.916	19.4291	6.3988	20.476
	40.2625	39.0658	7656.1927	13.9820	20.1667	379.6448	15322.459	19.5366	6.4369	20.598
L20	40.2471	51.4359	10029.391	13.9465	20.1667	497.3237	20071.979	25.7228	6.2609	15.178
	40.2941	51.4965	10064.898	13.9629	20.1903	498.5029	20143.041	25.7532	6.2690	15.198
L21	40.2931	52.2685	10212.527	13.9607	20.1903	505.8148	20438.492	26.1392	6.2580	14.945

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
	41.2335	53.4994	10951.184 4 9	14.2895	20.6607	530.0482	21916.779 7	26.7548	6.4210	15.334
L22	41.2345	52.7091	10792.760 3	14.2917	20.6607	522.3803	21599.721 9	26.3596	6.4320	15.593
	42.8483	54.7899	12122.072 6	14.8559	21.4681	564.6556	24260.095 7	27.4001	6.7118	16.271
L23	42.2038	60.5887	12362.632 3	14.2666	20.6565	598.4849	24741.531 7	30.3001	6.3206	13.307
	42.3919	62.3338	13461.931 3	14.6775	21.2446	633.6647	26941.576 1	31.1728	6.5243	13.735
L24	42.3919	62.3338	13461.931 3	14.6775	21.2446	633.6647	26941.576 1	31.1728	6.5243	13.735
	43.3322	63.7299	14386.867 7	15.0062	21.7150	662.5319	28792.665 9	31.8710	6.6873	14.079
L25	43.3322	63.7299	14386.867 7	15.0062	21.7150	662.5319	28792.665 9	31.8710	6.6873	14.079
	44.2725	65.1260	15353.229 1	15.3349	22.1854	692.0423	30726.660 5	32.5692	6.8503	14.422
L26	44.2725	65.1260	15353.229 1	15.3349	22.1854	692.0423	30726.660 5	32.5692	6.8503	14.422
	44.6486	65.6844	15751.576 0	15.4664	22.3736	704.0264	31523.878 4	32.8485	6.9155	14.559
L27	44.6389	74.2205	17747.552 5	15.4443	22.3736	793.2378	35518.457 7	37.1173	6.8055	12.661
	44.6860	74.2995	17804.276 8	15.4607	22.3971	794.9375	35631.980 9	37.1568	6.8136	12.676
L28	44.6860	74.2995	17804.276 8	15.4607	22.3971	794.9375	35631.980 9	37.1568	6.8136	12.676
	45.6263	75.8793	18964.288 3	15.7894	22.8675	829.3121	37953.530 3	37.9469	6.9766	12.98
L29	45.6282	74.1355	18538.880 2	15.7939	22.8675	810.7090	37102.154 3	37.0748	6.9986	13.331
	46.5685	75.6785	19720.747 2	16.1226	23.3379	845.0093	39467.443 4	37.8465	7.1616	13.641
L30	46.5685	75.6785	19720.747 2	16.1226	23.3379	845.0093	39467.443 4	37.8465	7.1616	13.641
	47.5088	77.2216	20951.805 9	16.4513	23.8083	880.0204	41931.180 8	38.6181	7.3246	13.952
L31	47.5088	77.2216	20951.805 9	16.4513	23.8083	880.0204	41931.180 8	38.6181	7.3246	13.952
	48.4491	78.7647	22233.059 6	16.7801	24.2787	915.7422	44495.373 9	39.3898	7.4875	14.262
L32	48.4500	77.8373	21977.095 8	16.7823	24.2787	905.1995	43983.109 5	38.9260	7.4985	14.455
	49.3903	79.3620	23294.029 5	17.1110	24.7491	941.2055	46618.709 9	39.6885	7.6615	14.769
L33	49.3903	79.3620	23294.029 5	17.1110	24.7491	941.2055	46618.709 9	39.6885	7.6615	14.769
	49.6254	79.7431	23631.284 5	17.1932	24.8667	950.3167	47293.663 7	39.8791	7.7023	14.848
L34	49.6109	93.9723	27740.280 5	17.1599	24.8667	1115.5573	55517.062 4	46.9951	7.5373	12.306
	49.6580	94.0623	27820.070 2	17.1764	24.8903	1117.7087	55676.746 8	47.0401	7.5454	12.319
L35	49.6599	92.1665	27273.441 0	17.1808	24.8903	1095.7472	54582.769 1	46.0920	7.5674	12.612
	50.5061	93.7536	28706.822 9	17.4766	25.3136	1134.0456	57451.419 0	46.8857	7.7141	12.857

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontal	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 145.0000- 140.0000				1	1	1			
L2 140.0000- 135.0000				1	1	1			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_r$	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
ft	ft <sup>2</sup>	in							
L3 135.0000-130.0000				1	1	1			
L4 130.0000-125.0000				1	1	1			
L5 125.0000-120.0000				1	1	1			
L6 120.0000-115.0000				1	1	1			
L7 115.0000-110.0000				1	1	1			
L8 110.0000-105.0000				1	1	1			
L9 105.0000-100.0000				1	1	1			
L10 100.0000-95.0000				1	1	1			
L11 95.0000-90.0000				1	1	1			
L12 90.0000-84.7500				1	1	1			
L13 84.7500-84.2500				1	1	1			
L14 84.2500-79.2500				1	1	1			
L15 79.2500-74.2500				1	1	1			
L16 74.2500-69.2500				1	1	1			
L17 69.2500-64.2500				1	1	1			
L18 64.2500-59.2500				1	1	1			
L19 59.2500-58.0800				1	1	1			
L20 58.0800-57.8300				1	1	1.10905			
L21 57.8300-52.8300				1	1	1.0847			
L22 52.8300-44.2500				1	1	1.09579			
L23 44.2500-43.2500				1	1	1.08016			
L24 43.2500-38.2500				1	1	1.07379			
L25 38.2500-33.2500				1	1	1.0677			
L26 33.2500-31.2500				1	1	1.06533			
L27 31.2500-31.0000				1	1	1.1293			
L28 31.0000-26.0000				1	1	1.12031			
L29 26.0000-21.0000				1	1	1.13785			
L30 21.0000-16.0000				1	1	1.12939			
L31 16.0000-11.0000				1	1	1.12125			
L32 11.0000-6.0000				1	1	1.1267			
L33 6.0000-4.7500				1	1	1.12477			
L34 4.7500-4.5000				1	1	0.954134			
L35 4.5000-0.0000				1	1	0.967856			

**Feed Line/Linear Appurtenances - Entered As Round Or Flat**

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

**Feed Line/Linear Appurtenances - Entered As Area**

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
ATCB-B01-005(5/16")	C	No	No	Inside Pole	133.0000 - 0.0000	6	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.07 0.07 0.07 0.07
FSJ4-50B(1/2)	C	No	No	Inside Pole	133.0000 - 0.0000	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.14 0.14 0.14 0.14
2" (Nominal) Conduit	C	No	No	Inside Pole	133.0000 - 0.0000	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.72 0.72 0.72 0.72
***									
HB114-1-08U4-M5J(1 1/4")	C	No	No	Inside Pole	124.0000 - 0.0000	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	1.08 1.08 1.08 1.08
HB114-21U3M12-XXXF(1-1/4)	C	No	No	Inside Pole	124.0000 - 0.0000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	1.22 1.22 1.22 1.22
***									
LDF4-50A(1/2)	C	No	No	Inside Pole	114.0000 - 0.0000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.15 0.15 0.15 0.15
HB158-1-08U8-S8J18( 1-5/8)	C	No	No	Inside Pole	114.0000 - 0.0000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	1.30 1.30 1.30 1.30
LDF7-50A(1-5/8)	C	No	No	Inside Pole	114.0000 - 0.0000	6	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.82 0.82 0.82 0.82
HB158-1-08U8-S8J18( 1-5/8)	C	No	No	CaAa (Out Of Face)	114.0000 - 0.0000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.1980 0.2980 0.3980 0.5980	1.30 2.81 4.94 11.02
***									
LCF158-50A(1-5/8)	C	No	No	Inside Pole	105.0000 - 0.0000	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.80 0.80 0.80 0.80
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	105.0000 - 0.0000	4	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.58 0.58 0.58 0.58
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	105.0000 - 0.0000	2	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.06 0.06 0.06

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>AA</sub> ft <sup>2</sup> /ft	Weight plf
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	105.0000 - 0.0000	2	2" Ice	0.0000	0.06
							No Ice	0.0000	0.58
							1/2" Ice	0.0000	0.58
							1" Ice	0.0000	0.58
2" (Nominal) Conduit	C	No	No	Inside Pole	105.0000 - 0.0000	1	2" Ice	0.0000	0.58
							No Ice	0.0000	0.72
							1/2" Ice	0.0000	0.72
							1" Ice	0.0000	0.72
2" (Nominal) Conduit	C	No	No	Inside Pole	105.0000 - 0.0000	1	2" Ice	0.0000	0.72
							No Ice	0.0000	0.72
							1/2" Ice	0.0000	0.72
							1" Ice	0.0000	0.72
***									
HJ7-50A(1-5/8")	C	No	No	Inside Pole	94.0000 - 0.0000	6	No Ice	0.0000	1.04
							1/2" Ice	0.0000	1.04
							1" Ice	0.0000	1.04
							2" Ice	0.0000	1.04
HJ7-50A(1-5/8")	C	No	No	CaAa (Out Of Face)	94.0000 - 0.0000	4	No Ice	0.0000	1.04
							1/2" Ice	0.0000	2.55
							1" Ice	0.0000	4.68
							2" Ice	0.0000	10.76
HJ7-50A(1-5/8")	C	No	No	CaAa (Out Of Face)	94.0000 - 0.0000	2	No Ice	0.1980	1.04
							1/2" Ice	0.2980	2.55
							1" Ice	0.3980	4.68
							2" Ice	0.5980	10.76
MLE Hybrid 3Power/6Fiber RL 2 10AWG(1-1/4")	C	No	No	CaAa (Out Of Face)	94.0000 - 0.0000	1	No Ice	0.0000	0.46
							1/2" Ice	0.0000	1.53
							1" Ice	0.0000	3.21
							2" Ice	0.0000	8.40
***									
AVA7-50(1-5/8)	C	No	No	Inside Pole	87.0000 - 0.0000	6	No Ice	0.0000	0.70
							1/2" Ice	0.0000	0.70
							1" Ice	0.0000	0.70
							2" Ice	0.0000	0.70
***									
LDF4-50A(1/2)	C	No	No	CaAa (Out Of Face)	77.0000 - 0.0000	1	No Ice	0.0000	0.15
							1/2" Ice	0.0000	0.84
							1" Ice	0.0000	2.14
							2" Ice	0.0000	6.56
***									
1 1/4" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	35.5000 - 0.0000	1	No Ice	0.2083	0.00
							1/2" Ice	0.3194	0.00
							1" Ice	0.4306	0.00
							2" Ice	0.6528	0.00
1" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	60.5800 - 35.5000	1	No Ice	0.1667	0.00
							1/2" Ice	0.2778	0.00
							1" Ice	0.3889	0.00
							2" Ice	0.6111	0.00
*****									
*****									

**Feed Line/Linear Appurtenances Section Areas**

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	145.0000-140.0000	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	0.00
L2	140.0000-135.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00



Tower Sectio n	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
		C	0.000	0.000	0.000	0.000	0.00
L3	135.0000-	A	0.000	0.000	0.000	0.000	0.00
	130.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.01
L4	130.0000-	A	0.000	0.000	0.000	0.000	0.00
	125.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.01
L5	125.0000-	A	0.000	0.000	0.000	0.000	0.00
	120.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L6	120.0000-	A	0.000	0.000	0.000	0.000	0.00
	115.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L7	115.0000-	A	0.000	0.000	0.000	0.000	0.00
	110.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.792	0.06
L8	110.0000-	A	0.000	0.000	0.000	0.000	0.00
	105.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.990	0.07
L9	105.0000-	A	0.000	0.000	0.000	0.000	0.00
	100.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.990	0.14
L10	100.0000-	A	0.000	0.000	0.000	0.000	0.00
	95.0000	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.990	0.14
L11	95.0000-90.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.574	0.20
L12	90.0000-84.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.119	0.23
L13	84.7500-84.2500	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	0.297	0.02
L14	84.2500-79.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.970	0.23
L15	79.2500-74.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.970	0.23
L16	74.2500-69.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.970	0.23
L17	69.2500-64.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.970	0.23
L18	64.2500-59.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.192	0.23
L19	59.2500-58.0800	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	0.890	0.05
L20	58.0800-57.8300	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	0.190	0.01
L21	57.8300-52.8300	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.803	0.23
L22	52.8300-44.2500	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	6.527	0.40
L23	44.2500-43.2500	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	0.761	0.05
L24	43.2500-38.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.803	0.23
L25	38.2500-33.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face	Weight
n	ft		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L26	33.2500-31.2500	C	0.000	0.000	0.000	3.897	0.23
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L27	31.2500-31.0000	C	0.000	0.000	0.000	1.605	0.09
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L28	31.0000-26.0000	C	0.000	0.000	0.000	0.201	0.01
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L29	26.0000-21.0000	C	0.000	0.000	0.000	4.012	0.23
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L30	21.0000-16.0000	C	0.000	0.000	0.000	4.012	0.23
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L31	16.0000-11.0000	C	0.000	0.000	0.000	4.012	0.23
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L32	11.0000-6.0000	C	0.000	0.000	0.000	4.012	0.23
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L33	6.0000-4.7500	C	0.000	0.000	0.000	4.012	0.23
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L34	4.7500-4.5000	C	0.000	0.000	0.000	1.003	0.06
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L35	4.5000-0.0000	C	0.000	0.000	0.000	0.201	0.01
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.610	0.21

**Feed Line/Linear Appurtenances Section Areas - With Ice**

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face	Weight
n	ft		in	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L1	145.0000-140.0000	A	1.968	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	0.00
L2	140.0000-135.0000	A	1.961	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	0.00
L3	135.0000-130.0000	A	1.954	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	0.01
L4	130.0000-125.0000	A	1.946	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	0.01
L5	125.0000-120.0000	A	1.938	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	0.03
L6	120.0000-115.0000	A	1.930	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	0.03
L7	115.0000-110.0000	A	1.922	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.329	0.10
L8	110.0000-105.0000	A	1.913	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.903	0.12
L9	105.0000-100.0000	A	1.904	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.894	0.19
L10	100.0000-95.0000	A	1.894	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L11	95.0000-90.0000	C	1.885	0.000	0.000	0.000	2.884	0.19
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L12	90.0000-84.7500	C	1.874	0.000	0.000	0.000	7.474	0.49
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L13	84.7500-84.2500	C	1.868	0.000	0.000	0.000	9.021	0.60
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L14	84.2500-79.2500	C	1.861	0.000	0.000	0.000	0.859	0.06
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L15	79.2500-74.2500	C	1.850	0.000	0.000	0.000	8.554	0.58
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L16	74.2500-69.2500	C	1.837	0.000	0.000	0.000	8.519	0.59
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L17	69.2500-64.2500	C	1.824	0.000	0.000	0.000	8.482	0.60
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L18	64.2500-59.2500	C	1.810	0.000	0.000	0.000	8.442	0.60
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L19	59.2500-58.0800	C	1.801	0.000	0.000	0.000	9.156	0.59
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L20	58.0800-57.8300	C	1.798	0.000	0.000	0.000	2.622	0.14
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L21	57.8300-52.8300	C	1.790	0.000	0.000	0.000	0.560	0.03
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L22	52.8300-44.2500	C	1.767	0.000	0.000	0.000	11.163	0.59
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L23	44.2500-43.2500	C	1.749	0.000	0.000	0.000	18.991	1.00
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L24	43.2500-38.2500	C	1.736	0.000	0.000	0.000	2.213	0.12
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L25	38.2500-33.2500	C	1.714	0.000	0.000	0.000	10.941	0.57
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L26	33.2500-31.2500	C	1.696	0.000	0.000	0.000	10.942	0.57
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L27	31.2500-31.0000	C	1.690	0.000	0.000	0.000	4.394	0.23
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L28	31.0000-26.0000	C	1.675	0.000	0.000	0.000	0.548	0.03
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L29	26.0000-21.0000	C	1.643	0.000	0.000	0.000	10.899	0.56
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L30	21.0000-16.0000	C	1.604	0.000	0.000	0.000	10.767	0.55
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L31	16.0000-11.0000	C	1.555	0.000	0.000	0.000	10.607	0.54
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L32	11.0000-6.0000	C	1.484	0.000	0.000	0.000	10.403	0.53
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L33	6.0000-4.7500	C	1.418	0.000	0.000	0.000	10.113	0.51
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L34	4.7500-4.5000	C	1.397	0.000	0.000	0.000	2.460	0.12
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
L35	4.5000-0.0000	C	1.299	0.000	0.000	0.000	0.488	0.02
		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	8.418	0.41

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$ in	$CP_z$ in	$CP_x$ Ice in	$CP_z$ Ice in
L1	145.0000-140.0000	0.0000	0.0000	0.0000	0.0000
L2	140.0000-135.0000	0.0000	0.0000	0.0000	0.0000
L3	135.0000-130.0000	0.0000	0.0000	0.0000	0.0000
L4	130.0000-125.0000	0.0000	0.0000	0.0000	0.0000
L5	125.0000-120.0000	0.0000	0.0000	0.0000	0.0000
L6	120.0000-115.0000	0.0000	0.0000	0.0000	0.0000
L7	115.0000-110.0000	-1.0275	0.5932	-1.5602	0.9008
L8	110.0000-105.0000	-1.2593	0.7270	-1.8975	1.0955
L9	105.0000-100.0000	-1.2627	0.7290	-1.9063	1.1006
L10	100.0000-95.0000	-1.2660	0.7309	-1.9142	1.1052
L11	95.0000-90.0000	-2.9027	1.6759	-4.1354	2.3876
L12	90.0000-84.7500	-3.2647	1.8849	-4.6037	2.6580
L13	84.7500-84.2500	-3.2660	1.8856	-4.6059	2.6592
L14	84.2500-79.2500	-3.2762	1.8915	-4.6187	2.6666
L15	79.2500-74.2500	-3.2941	1.9019	-4.6508	2.6852
L16	74.2500-69.2500	-3.3113	1.9118	-4.6803	2.7022
L17	69.2500-64.2500	-3.3279	1.9214	-4.7072	2.7177
L18	64.2500-59.2500	-3.5433	2.0457	-5.0341	2.9065
L19	59.2500-58.0800	-4.0709	2.3503	-5.8068	3.3525
L20	58.0800-57.8300	-4.0752	2.3528	-5.8130	3.3561
L21	57.8300-52.8300	-4.0870	2.3596	-5.8302	3.3661
L22	52.8300-44.2500	-4.1160	2.3764	-5.8694	3.3887
L23	44.2500-43.2500	-4.1227	2.3802	-5.8842	3.3972
L24	43.2500-38.2500	-4.1350	2.3873	-5.8731	3.3908
L25	38.2500-33.2500	-4.2348	2.4450	-5.9246	3.4206
L26	33.2500-31.2500	-4.3447	2.5084	-5.9753	3.4498
L27	31.2500-31.0000	-4.3501	2.5115	-5.9782	3.4515
L28	31.0000-26.0000	-4.3609	2.5178	-5.9812	3.4532
L29	26.0000-21.0000	-4.3808	2.5292	-5.9795	3.4523
L30	21.0000-16.0000	-4.4002	2.5404	-5.9650	3.4439
L31	16.0000-11.0000	-4.4190	2.5513	-5.9309	3.4242
L32	11.0000-6.0000	-4.4372	2.5618	-5.8607	3.3837
L33	6.0000-4.7500	-4.4483	2.5682	-5.7783	3.3361
L34	4.7500-4.5000	-4.4520	2.5703	-5.7507	3.3202
L35	4.5000-0.0000	-4.4601	2.5750	-5.6067	3.2370

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 <sub>a</sub> No Ice	K <sub>a</sub> Ice
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### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K	
LLPX310R-V1 w/ Mount Pipe	A	From Leg	4.0000	0.000	133.0000	No Ice	4.5378	2.9834	0.05
			0.00			1/2"	4.8914	3.5263	0.08
			2.00			Ice	5.2539	4.0859	0.13
						1" Ice	6.0062	5.2357	0.23
						2" Ice			
LLPX310R-V1 w/ Mount Pipe	B	From Leg	4.0000	0.000	133.0000	No Ice	4.5378	2.9834	0.05
			0.00			1/2"	4.8914	3.5263	0.08
			2.00			Ice	5.2539	4.0859	0.13
						1" Ice	6.0062	5.2357	0.23
						2" Ice			
LLPX310R-V1 w/ Mount Pipe	C	From Leg	4.0000	0.000	133.0000	No Ice	4.5378	2.9834	0.05
			0.00			1/2"	4.8914	3.5263	0.08
			2.00			Ice	5.2539	4.0859	0.13
						1" Ice	6.0062	5.2357	0.23
						2" Ice			
TIMING 2000	A	From Leg	4.0000	0.000	133.0000	No Ice	0.1079	0.1079	0.00
			0.00			1/2"	0.1518	0.1518	0.00
			2.00			Ice	0.2031	0.2031	0.01
						1" Ice	0.3280	0.3280	0.01
						2" Ice			
WIMAX DAP HEAD	A	From Leg	4.0000	0.000	133.0000	No Ice	1.5467	0.6840	0.03
			0.00			1/2"	1.7037	0.7999	0.04
			2.00			Ice	1.8681	0.9228	0.06
						1" Ice	2.2193	1.1926	0.09
						2" Ice			
WIMAX DAP HEAD	B	From Leg	4.0000	0.000	133.0000	No Ice	1.5467	0.6840	0.03
			0.00			1/2"	1.7037	0.7999	0.04
			6.00			Ice	1.8681	0.9228	0.06
						1" Ice	2.2193	1.1926	0.09
						2" Ice			
WIMAX DAP HEAD	C	From Leg	4.0000	0.000	133.0000	No Ice	1.5467	0.6840	0.03
			0.00			1/2"	1.7037	0.7999	0.04
			2.00			Ice	1.8681	0.9228	0.06
						1" Ice	2.2193	1.1926	0.09
						2" Ice			
HORIZON COMPACT	A	From Leg	4.0000	0.000	133.0000	No Ice	0.7208	0.3681	0.01
			0.00			1/2"	0.8278	0.4499	0.02
			6.00			Ice	0.9422	0.5391	0.03
						1" Ice	1.1933	0.7396	0.05
						2" Ice			
HORIZON COMPACT	B	From Leg	4.0000	0.000	133.0000	No Ice	0.7208	0.3681	0.01
			0.00			1/2"	0.8278	0.4499	0.02
			2.00			Ice	0.9422	0.5391	0.03
						1" Ice	1.1933	0.7396	0.05
						2" Ice			
(3) 2.375" OD x 5' Mount Pipe	A	From Leg	4.0000	0.000	133.0000	No Ice	1.1875	1.1875	0.02
			0.00			1/2"	1.4956	1.4956	0.03
			0.00			Ice	1.8071	1.8071	0.04
						1" Ice	2.4580	2.4580	0.08
						2" Ice			
(3) 2.375" OD x 5' Mount Pipe	B	From Leg	4.0000	0.000	133.0000	No Ice	1.1875	1.1875	0.02
			0.00			1/2"	1.4956	1.4956	0.03
			0.00			Ice	1.8071	1.8071	0.04
						1" Ice			
						2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
(3) 2.375" OD x 5' Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	133.0000	1" Ice	2.4580	2.4580	0.08
						2" Ice			
						No Ice	1.1875	1.1875	0.02
						1/2" Ice	1.4956	1.4956	0.03
						Ice	1.8071	1.8071	0.04
Platform Mount [LP 712-1]	C	None		0.000	133.0000	1" Ice	2.4580	2.4580	0.08
						2" Ice			
						No Ice	24.5300	24.5300	1.34
						1/2" Ice	29.9400	29.9400	1.65
						Ice	35.3500	35.3500	1.96
*** APXVSP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice	2.4580	2.4580	0.08
						2" Ice			
						No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
						Ice	9.3462	9.0212	0.23
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice	10.4181	10.8440	0.41
						2" Ice			
						No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
						Ice	9.3462	9.0212	0.23
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice	10.4181	10.8440	0.41
						2" Ice			
						No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
						Ice	9.3462	9.0212	0.23
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice	10.4181	10.8440	0.41
						2" Ice			
						No Ice	6.5799	4.9591	0.08
						1/2" Ice	7.0306	5.7544	0.13
						Ice	7.4733	6.4723	0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice	8.3846	7.9407	0.34
						2" Ice			
						No Ice	6.5799	4.9591	0.08
						1/2" Ice	7.0306	5.7544	0.13
						Ice	7.4733	6.4723	0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice	8.3846	7.9407	0.34
						2" Ice			
						No Ice	6.5799	4.9591	0.08
						1/2" Ice	7.0306	5.7544	0.13
						Ice	7.4733	6.4723	0.19
TD-RRH8x20-25	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice	8.3846	7.9407	0.34
						2" Ice			
						No Ice	4.0455	1.5345	0.07
						1/2" Ice	4.2975	1.7142	0.10
						Ice	4.5570	1.9008	0.13
TD-RRH8x20-25	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice	5.0981	2.2951	0.20
						2" Ice			
						No Ice	4.0455	1.5345	0.07
						1/2" Ice	4.2975	1.7142	0.10
						Ice	4.5570	1.9008	0.13
TD-RRH8x20-25	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice	5.0981	2.2951	0.20
						2" Ice			
						No Ice	4.0455	1.5345	0.07
						1/2" Ice	4.2975	1.7142	0.10
						Ice	4.5570	1.9008	0.13
IBC1900HG-2A	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	1" Ice	5.0981	2.2951	0.20
						2" Ice			
						No Ice	0.9660	0.4635	0.02
						1/2" Ice	1.0908	0.5576	0.03
						Ice	1.2230	0.6599	0.04
IBC1900HG-2A	B	From Leg	4.0000 0.00	0.000	124.0000	1" Ice	1.5097	0.8927	0.06
						2" Ice			
						No Ice	0.9660	0.4635	0.02
						1/2" Ice	1.0908	0.5576	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			0.00			Ice 1.2230	0.6599	0.04
						1" Ice 1.5097	0.8927	0.06
						2" Ice		
IBC1900HG-2A	C	From Leg	4.0000	0.000	124.0000	No Ice 0.9660	0.4635	0.02
			0.00			1/2" 1.0908	0.5576	0.03
			0.00			Ice 1.2230	0.6599	0.04
						1" Ice 1.5097	0.8927	0.06
						2" Ice		
IBC1900BB-1	A	From Leg	4.0000	0.000	124.0000	No Ice 0.9660	0.4635	0.02
			0.00			1/2" 1.0908	0.5576	0.03
			0.00			Ice 1.2230	0.6599	0.04
						1" Ice 1.5097	0.8927	0.06
						2" Ice		
IBC1900BB-1	B	From Leg	4.0000	0.000	124.0000	No Ice 0.9660	0.4635	0.02
			0.00			1/2" 1.0908	0.5576	0.03
			0.00			Ice 1.2230	0.6599	0.04
						1" Ice 1.5097	0.8927	0.06
						2" Ice		
IBC1900BB-1	C	From Leg	4.0000	0.000	124.0000	No Ice 0.9660	0.4635	0.02
			0.00			1/2" 1.0908	0.5576	0.03
			0.00			Ice 1.2230	0.6599	0.04
						1" Ice 1.5097	0.8927	0.06
						2" Ice		
2.375" OD x 5' Mount Pipe	A	From Leg	4.0000	0.000	124.0000	No Ice 1.1875	1.1875	0.02
			0.00			1/2" 1.4956	1.4956	0.03
			0.00			Ice 1.8071	1.8071	0.04
						1" Ice 2.4580	2.4580	0.08
						2" Ice		
2.375" OD x 5' Mount Pipe	B	From Leg	4.0000	0.000	124.0000	No Ice 1.1875	1.1875	0.02
			0.00			1/2" 1.4956	1.4956	0.03
			0.00			Ice 1.8071	1.8071	0.04
						1" Ice 2.4580	2.4580	0.08
						2" Ice		
2.375" OD x 5' Mount Pipe	C	From Leg	4.0000	0.000	124.0000	No Ice 1.1875	1.1875	0.02
			0.00			1/2" 1.4956	1.4956	0.03
			0.00			Ice 1.8071	1.8071	0.04
						1" Ice 2.4580	2.4580	0.08
						2" Ice		
Platform Mount [LP 712-1]	C	None		0.000	124.0000	No Ice 24.5300	24.5300	1.34
						1/2" 29.9400	29.9400	1.65
						Ice 35.3500	35.3500	1.96
						1" Ice 46.1700	46.1700	2.58
						2" Ice		
***								
800MHz 2X50W RRH W/FILTER	A	From Leg	1.0000	0.000	122.0000	No Ice 2.0583	1.9317	0.06
			0.00			1/2" 2.2398	2.1087	0.09
			-4.00			Ice 2.4287	2.2931	0.11
						1" Ice 2.8287	2.6843	0.17
						2" Ice		
800MHz 2X50W RRH W/FILTER	B	From Leg	1.0000	0.000	122.0000	No Ice 2.0583	1.9317	0.06
			0.00			1/2" 2.2398	2.1087	0.09
			-4.00			Ice 2.4287	2.2931	0.11
						1" Ice 2.8287	2.6843	0.17
						2" Ice		
800MHz 2X50W RRH W/FILTER	C	From Leg	1.0000	0.000	122.0000	No Ice 2.0583	1.9317	0.06
			0.00			1/2" 2.2398	2.1087	0.09
			-4.00			Ice 2.4287	2.2931	0.11
						1" Ice 2.8287	2.6843	0.17
						2" Ice		
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.0000	0.000	122.0000	No Ice 2.3218	2.2381	0.06
			0.00			1/2" 2.5266	2.4407	0.08
			0.00			Ice 2.7388	2.6507	0.11
						1" Ice 3.1855	3.0929	0.17
						2" Ice		
PCS 1900MHz 4x45W-	B	From Leg	1.0000	0.000	122.0000	No Ice 2.3218	2.2381	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
65MHz			0.00 0.00			1/2" Ice 1" Ice 2" Ice	2.5266 2.7388 3.1855 3.0929	2.4407 2.6507 3.0929 0.17	0.08 0.11 0.17
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.0000 0.00 0.00	0.000	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.3218 2.5266 2.7388 3.1855	2.2381 2.4407 2.6507 3.0929	0.06 0.08 0.11 0.17
Pipe Mount [PM 601-3]	C	None		0.000	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.3900 5.4800 6.5700 8.7500	4.3900 5.4800 6.5700 8.7500	0.20 0.24 0.28 0.36
***									
BXA-80063/4CFx5 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.000	114.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.9453 5.3243 5.7120 6.5142	3.6158 4.2169 4.8343 6.1053	0.03 0.07 0.12 0.23
BXA-80063/4CFx5 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.000	114.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.9453 5.3243 5.7120 6.5142	3.6158 4.2169 4.8343 6.1053	0.03 0.07 0.12 0.23
BXA-80063/4CFx5 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.000	114.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.9453 5.3243 5.7120 6.5142	3.6158 4.2169 4.8343 6.1053	0.03 0.07 0.12 0.23
BXA-80063/4CFx5 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.000	114.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.9453 5.3243 5.7120 6.5142	3.6158 4.2169 4.8343 6.1053	0.03 0.07 0.12 0.23
BXA-80063/4CFx5 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.000	114.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.9453 5.3243 5.7120 6.5142	3.6158 4.2169 4.8343 6.1053	0.03 0.07 0.12 0.23
BXA-80063/4CFx5 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.000	114.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.9453 5.3243 5.7120 6.5142	3.6158 4.2169 4.8343 6.1053	0.03 0.07 0.12 0.23
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.000	114.0000	No Ice 1/2" Ice 1" Ice 2" Ice	8.4186 8.9558 9.4801 10.5534	7.4197 8.4535 9.3468 11.1834	0.08 0.15 0.23 0.42
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.000	114.0000	No Ice 1/2" Ice 1" Ice 2" Ice	8.4186 8.9558 9.4801 10.5534	7.4197 8.4535 9.3468 11.1834	0.08 0.15 0.23 0.42
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.000	114.0000	No Ice 1/2" Ice 1" Ice 2" Ice	8.4186 8.9558 9.4801 10.5534	7.4197 8.4535 9.3468 11.1834	0.08 0.15 0.23 0.42
KS24019-L112A	B	From Leg	4.0000 0.00 2.00	0.000	114.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.1407 0.1979 0.2621 0.4148	0.1407 0.1979 0.2621 0.4148	0.01 0.01 0.01 0.02



Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
DB-T1-6Z-8AB-0Z	B	From Leg	4.0000	0.000	114.0000	No Ice	4.8000	2.0000	0.04
			0.00			1/2"	5.0704	2.1926	0.08
			1.00			Ice	5.3481	2.3926	0.12
						1" Ice	5.9259	2.8148	0.21
DB-T1-6Z-8AB-0Z	A	From Leg	4.0000	0.000	114.0000	No Ice	4.8000	2.0000	0.04
			0.00			1/2"	5.0704	2.1926	0.08
			1.00			Ice	5.3481	2.3926	0.12
						1" Ice	5.9259	2.8148	0.21
(2) RFV01U-D2A	A	From Leg	4.0000	0.000	114.0000	No Ice	1.8750	1.0125	0.07
			0.00			1/2"	2.0454	1.1445	0.09
			1.00			Ice	2.2231	1.2840	0.11
						1" Ice	2.6009	1.5851	0.15
RFV01U-D2A	B	From Leg	4.0000	0.000	114.0000	No Ice	1.8750	1.0125	0.07
			0.00			1/2"	2.0454	1.1445	0.09
			1.00			Ice	2.2231	1.2840	0.11
						1" Ice	2.6009	1.5851	0.15
RFV01U-D1A	B	From Leg	4.0000	0.000	114.0000	No Ice	1.8750	1.2500	0.08
			0.00			1/2"	2.0454	1.3926	0.10
			1.00			Ice	2.2231	1.5426	0.12
						1" Ice	2.6009	1.8648	0.18
(2) RFV01U-D1A	C	From Leg	4.0000	0.000	114.0000	No Ice	1.8750	1.2500	0.08
			0.00			1/2"	2.0454	1.3926	0.10
			1.00			Ice	2.2231	1.5426	0.12
						1" Ice	2.6009	1.8648	0.18
Platform Mount [LP 712-1]	C	None		0.000	114.0000	No Ice	24.5300	24.5300	1.34
						1/2"	29.9400	29.9400	1.65
						Ice	35.3500	35.3500	1.96
						1" Ice	46.1700	46.1700	2.58
Miscellaneous [NA 509-3]	C	None		0.000	114.0000	No Ice	11.8400	11.8400	0.28
						1/2"	16.9600	16.9600	0.30
						Ice	22.0800	22.0800	0.32
						1" Ice	32.3200	32.3200	0.36
Miscellaneous [NA 510-1]	C	None		0.000	114.0000	No Ice	6.0000	6.0000	0.26
						1/2"	8.5000	8.5000	0.34
						Ice	11.0000	11.0000	0.42
						1" Ice	16.0000	16.0000	0.59
***									
*****									
7770.00	A	From Leg	4.0000	0.000	105.0000	No Ice	5.5085	2.9282	0.04
			0.00			1/2"	5.8673	3.2730	0.07
			0.00			Ice	6.2332	3.6252	0.11
						1" Ice	6.9859	4.3517	0.20
7770.00	B	From Leg	4.0000	0.000	105.0000	No Ice	5.5085	2.9282	0.04
			0.00			1/2"	5.8673	3.2730	0.07
			0.00			Ice	6.2332	3.6252	0.11
						1" Ice	6.9859	4.3517	0.20
7770.00	C	From Leg	4.0000	0.000	105.0000	No Ice	5.5085	2.9282	0.04
			0.00			1/2"	5.8673	3.2730	0.07
			0.00			Ice	6.2332	3.6252	0.11
						1" Ice	6.9859	4.3517	0.20
OPA-65R-LCUU-H6	A	From Leg	4.0000	0.000	105.0000	No Ice	9.6578	6.4500	0.07
			0.00			1/2"	10.1285	6.9134	0.13
			0.00			Ice	10.6062	7.3843	0.20

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AA</sub> <sub>Front</sub>	C <sub>AA</sub> <sub>Side</sub>	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
OPA-65R-LCUU-H6	B	From Leg	4.0000	0.000	105.0000		1" Ice	11.5826	8.3078	0.36
							2" Ice			
							No Ice	9.6578	6.4500	0.07
							1/2" Ice	10.1285	6.9134	0.13
OPA-65R-LCUU-H6	C	From Leg	4.0000	0.000	105.0000		1" Ice	10.6062	7.3843	0.20
							2" Ice	11.5826	8.3078	0.36
							No Ice	9.6578	6.4500	0.07
							1/2" Ice	10.1285	6.9134	0.13
80010965	A	From Leg	4.0000	0.000	105.0000		Ice	10.6062	7.3843	0.20
							1" Ice	11.5826	8.3078	0.36
							2" Ice			
							No Ice	13.8138	5.8333	0.10
80010965	B	From Leg	4.0000	0.000	105.0000		1/2" Ice	14.3472	6.3236	0.17
							Ice	14.8877	6.8214	0.26
							1" Ice	15.9896	7.8391	0.45
							2" Ice			
80010965	C	From Leg	4.0000	0.000	105.0000		No Ice	13.8138	5.8333	0.10
							1/2" Ice	14.3472	6.3236	0.17
							Ice	14.8877	6.8214	0.26
							1" Ice	15.9896	7.8391	0.45
QS66512-2	A	From Leg	4.0000	0.000	105.0000		2" Ice			
							No Ice	8.3708	8.4625	0.14
							1/2" Ice	8.9314	9.6573	0.21
							Ice	9.4571	10.5478	0.30
QS66512-2	B	From Leg	4.0000	0.000	105.0000		1" Ice	10.5310	12.3523	0.49
							2" Ice			
							No Ice	8.3708	8.4625	0.14
							1/2" Ice	8.9314	9.6573	0.21
QS66512-2	C	From Leg	4.0000	0.000	105.0000		Ice	9.4571	10.5478	0.30
							1" Ice	10.5310	12.3523	0.49
							2" Ice			
							No Ice	8.3708	8.4625	0.14
RRUS 4478 B14	A	From Leg	4.0000	0.000	105.0000		1/2" Ice	8.9314	9.6573	0.21
							Ice	9.4571	10.5478	0.30
							1" Ice	10.5310	12.3523	0.49
							2" Ice			
RRUS 4478 B14	B	From Leg	4.0000	0.000	105.0000		No Ice	1.8425	1.0588	0.06
							1/2" Ice	2.0123	1.1969	0.08
							Ice	2.1895	1.3425	0.09
							1" Ice	2.5662	1.6558	0.14
RRUS 4478 B14	C	From Leg	4.0000	0.000	105.0000		2" Ice			
							No Ice	1.8425	1.0588	0.06
							1/2" Ice	2.0123	1.1969	0.08
							Ice	2.1895	1.3425	0.09
(2) DC6-48-60-18-8F	A	From Leg	4.0000	0.000	105.0000		1" Ice	2.5662	1.6558	0.14
							2" Ice			
							No Ice	1.2117	1.2117	0.03
							1/2" Ice	1.8924	1.8924	0.05
(2) LGP21401	A	From Leg	4.0000	0.000	105.0000		Ice	2.1051	2.1051	0.08
							1" Ice	2.5703	2.5703	0.14
							2" Ice			
							No Ice	1.1040	0.3471	0.01
							1/2" Ice	1.2388	0.4422	0.02
							Ice	1.3810	0.5444	0.03

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
(2) LGP21401	B	From Leg	4.0000	0.00	0.00	105.0000	1" Ice	1.6877	0.7696	0.05
							2" Ice			
							No Ice	1.1040	0.3471	0.01
							1/2" Ice	1.2388	0.4422	0.02
(2) LGP21401	C	From Leg	4.0000	0.00	0.00	105.0000	1" Ice	1.3810	0.5444	0.03
							2" Ice			
							No Ice	1.1040	0.3471	0.01
							1/2" Ice	1.2388	0.4422	0.02
(2) TPX-070821	A	From Leg	4.0000	0.00	0.00	105.0000	1" Ice	1.6877	0.7696	0.05
							2" Ice			
							No Ice	0.4688	0.1009	0.01
							1/2" Ice	0.5585	0.1471	0.01
(2) TPX-070821	B	From Leg	4.0000	0.00	0.00	105.0000	Ice	0.6556	0.2020	0.02
							1" Ice	0.8721	0.3340	0.03
							2" Ice			
							No Ice	0.4688	0.1009	0.01
(2) TPX-070821	C	From Leg	4.0000	0.00	0.00	105.0000	1/2" Ice	0.5585	0.1471	0.01
							Ice	0.6556	0.2020	0.02
							1" Ice	0.8721	0.3340	0.03
							2" Ice			
RRUS 32	A	From Leg	4.0000	0.00	0.00	105.0000	No Ice	2.8571	1.7766	0.06
							1/2" Ice	3.0830	1.9677	0.08
							Ice	3.3163	2.1658	0.10
							1" Ice	3.8052	2.5829	0.16
RRUS 32	B	From Leg	4.0000	0.00	0.00	105.0000	2" Ice			
							No Ice	2.8571	1.7766	0.06
							1/2" Ice	3.0830	1.9677	0.08
							Ice	3.3163	2.1658	0.10
RRUS 32	C	From Leg	4.0000	0.00	0.00	105.0000	1" Ice	3.8052	2.5829	0.16
							2" Ice			
							No Ice	2.8571	1.7766	0.06
							1/2" Ice	3.0830	1.9677	0.08
DC6-48-60-18-8F	A	From Leg	4.0000	0.00	0.00	105.0000	Ice	3.3163	2.1658	0.10
							1" Ice	3.8052	2.5829	0.16
							2" Ice			
							No Ice	1.2117	1.2117	0.03
RRUS 4449 B5/B12	A	From Leg	4.0000	0.00	0.00	105.0000	1/2" Ice	1.8924	1.8924	0.05
							Ice	2.1051	2.1051	0.08
							1" Ice	2.5703	2.5703	0.14
							2" Ice			
RRUS 4449 B5/B12	B	From Leg	4.0000	0.00	0.00	105.0000	No Ice	1.9675	1.4081	0.07
							1/2" Ice	2.1439	1.5637	0.09
							Ice	2.3278	1.7267	0.11
							1" Ice	2.7177	2.0749	0.16
RRUS 4449 B5/B12	C	From Leg	4.0000	0.00	0.00	105.0000	2" Ice			
							No Ice	1.9675	1.4081	0.07
							1/2" Ice	2.1439	1.5637	0.09
							Ice	2.3278	1.7267	0.11
RRUS 8843 B2/B66A	A	From Leg	4.0000	0.00	0.00	105.0000	1" Ice	2.7177	2.0749	0.16
							2" Ice			
							No Ice	1.9675	1.4081	0.07
							1/2" Ice	2.1439	1.5637	0.09
RRUS 8843 B2/B66A	A	From Leg	4.0000	0.00	0.00	105.0000	Ice	2.3278	1.7267	0.11
							1" Ice	2.7177	2.0749	0.16
							2" Ice			
RRUS 8843 B2/B66A	A	From Leg	4.0000	0.00	0.00	105.0000	No Ice	1.6390	1.3534	0.07
							1/2" Ice	1.7988	1.5005	0.09
							Ice	1.9660	1.6549	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
RRUS 8843 B2/B66A	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice	2.3227	1.9860	0.16
						2" Ice			
						No Ice	1.6390	1.3534	0.07
						1/2" Ice	1.7988	1.5005	0.09
						Ice	1.9660	1.6549	0.11
RRUS 8843 B2/B66A	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	1" Ice	2.3227	1.9860	0.16
						2" Ice			
						No Ice	1.6390	1.3534	0.07
						1/2" Ice	1.7988	1.5005	0.09
						Ice	1.9660	1.6549	0.11
Platform Mount [LP 305-1]	C	None		0.000	105.0000	1" Ice	2.3227	1.9860	0.16
						2" Ice			
						No Ice	18.0100	18.0100	1.12
						1/2" Ice	23.3300	23.3300	1.35
Miscellaneous [NA 510-1]	C	None		0.000	105.0000	Ice	28.6500	28.6500	1.58
						1" Ice	39.2900	39.2900	2.05
						2" Ice			
						No Ice	6.0000	6.0000	0.26
						1/2" Ice	8.5000	8.5000	0.34
Site Pro RMQP-12-H5	C	None		0.000	105.0000	Ice	11.0000	11.0000	0.42
						1" Ice	16.0000	16.0000	0.59
						2" Ice			
						No Ice	0.0000	0.0000	0.00
						1/2" Ice	0.0000	0.0000	0.00
(4) 10' x 2.375" Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	Ice	0.0000	0.0000	0.00
						1" Ice	0.0000	0.0000	0.00
						2" Ice			
						No Ice	2.3750	2.3750	0.08
						1/2" Ice	3.4031	3.4031	0.10
(4) 10' x 2.375" Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	Ice	4.4479	4.4479	0.12
						1" Ice	5.9106	5.9106	0.19
						2" Ice			
						No Ice	2.3750	2.3750	0.08
						1/2" Ice	3.4031	3.4031	0.10
(4) 10' x 2.375" Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	Ice	4.4479	4.4479	0.12
						1" Ice	5.9106	5.9106	0.19
						2" Ice			
						No Ice	2.3750	2.3750	0.08
						1/2" Ice	3.4031	3.4031	0.10
***									
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.000	94.0000	Ice	7.2032	7.1208	0.23
						1" Ice	8.1062	8.5791	0.38
						2" Ice			
						No Ice	6.3186	5.6334	0.11
						1/2" Ice	6.7646	6.4160	0.17
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.000	94.0000	Ice	7.2032	7.1208	0.23
						1" Ice	8.1062	8.5791	0.38
						2" Ice			
						No Ice	6.3186	5.6334	0.11
						1/2" Ice	6.7646	6.4160	0.17
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.000	94.0000	Ice	7.2032	7.1208	0.23
						1" Ice	8.1062	8.5791	0.38
						2" Ice			
						No Ice	6.3186	5.6334	0.11
						1/2" Ice	6.7646	6.4160	0.17
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.000	94.0000	Ice	7.6475	7.5828	0.28
						1" Ice	8.5651	9.0629	0.44
						2" Ice			
						No Ice	6.7474	6.0700	0.15
						1/2" Ice	7.2017	6.8671	0.21
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.0000 0.00	0.000	94.0000	Ice	7.6475	7.5828	0.28
						1" Ice	8.5651	9.0629	0.44

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			1.00			Ice 7.6475	7.5828	0.28
						1" Ice 8.5651	9.0629	0.44
						2" Ice		
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.000	94.0000	No Ice 6.7474 1/2" 7.2017 Ice 7.6475	6.0700 6.8671 7.5828	0.15 0.21 0.28
						1" Ice 8.5651	9.0629	0.44
						2" Ice		
KRY 112 144/1	A	From Leg	4.0000 0.00 1.00	0.000	94.0000	No Ice 0.3500 1/2" 0.4259 Ice 0.5093	0.1750 0.2343 0.3009	0.01 0.01 0.02
						1" Ice 0.6981	0.4565	0.03
						2" Ice		
KRY 112 144/1	B	From Leg	4.0000 0.00 1.00	0.000	94.0000	No Ice 0.3500 1/2" 0.4259 Ice 0.5093	0.1750 0.2343 0.3009	0.01 0.01 0.02
						1" Ice 0.6981	0.4565	0.03
						2" Ice		
KRY 112 144/1	C	From Leg	4.0000 0.00 1.00	0.000	94.0000	No Ice 0.3500 1/2" 0.4259 Ice 0.5093	0.1750 0.2343 0.3009	0.01 0.01 0.02
						1" Ice 0.6981	0.4565	0.03
						2" Ice		
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.000	94.0000	No Ice 20.4801 1/2" 21.2306 Ice 21.9900	11.0240 12.5496 14.0992	0.16 0.30 0.44
						1" Ice 23.4441	16.4509	0.78
						2" Ice		
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.000	94.0000	No Ice 20.4801 1/2" 21.2306 Ice 21.9900	11.0240 12.5496 14.0992	0.16 0.30 0.44
						1" Ice 23.4441	16.4509	0.78
						2" Ice		
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.000	94.0000	No Ice 20.4801 1/2" 21.2306 Ice 21.9900	11.0240 12.5496 14.0992	0.16 0.30 0.44
						1" Ice 23.4441	16.4509	0.78
						2" Ice		
RADIO 4449 B12/B71	A	From Leg	4.0000 0.00 1.00	0.000	94.0000	No Ice 1.6500 1/2" 1.8104 Ice 1.9781	1.1625 1.3012 1.4473	0.07 0.09 0.11
						1" Ice 2.3359	1.7618	0.16
						2" Ice		
RADIO 4449 B12/B71	B	From Leg	4.0000 0.00 1.00	0.000	94.0000	No Ice 1.6500 1/2" 1.8104 Ice 1.9781	1.1625 1.3012 1.4473	0.07 0.09 0.11
						1" Ice 2.3359	1.7618	0.16
						2" Ice		
RADIO 4449 B12/B71	C	From Leg	4.0000 0.00 1.00	0.000	94.0000	No Ice 1.6500 1/2" 1.8104 Ice 1.9781	1.1625 1.3012 1.4473	0.07 0.09 0.11
						1" Ice 2.3359	1.7618	0.16
						2" Ice		
2.375" OD x 5' Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	94.0000	No Ice 1.1875 1/2" 1.4956 Ice 1.8071	1.1875 1.4956 1.8071	0.02 0.03 0.04
						1" Ice 2.4580	2.4580	0.08
						2" Ice		
2.375" OD x 5' Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	94.0000	No Ice 1.1875 1/2" 1.4956 Ice 1.8071	1.1875 1.4956 1.8071	0.02 0.03 0.04
						1" Ice 2.4580	2.4580	0.08
						2" Ice		
2.375" OD x 5' Mount Pipe	C	From Leg	4.0000 0.00	0.000	94.0000	No Ice 1.1875 1/2" 1.4956	1.1875 1.4956	0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			0.00			Ice 1.8071	1.8071	0.04
						1" Ice 2.4580	2.4580	0.08
						2" Ice		
Platform Mount [LP 712-1]	C	None		0.000	94.0000	No Ice 24.5300	24.5300	1.34
						1/2" 29.9400	29.9400	1.65
						Ice 35.3500	35.3500	1.96
						1" Ice 46.1700	46.1700	2.58
						2" Ice		
***								
742 213	A	From Leg	1.0000 0.00 0.00	0.000	87.0000	No Ice 5.1354	2.8687	0.02
						1/2" 5.6089	3.4832	0.05
						Ice 6.0897	3.9457	0.08
						1" Ice 7.0737	4.8929	0.16
						2" Ice		
742 213	B	From Leg	1.0000 0.00 0.00	0.000	87.0000	No Ice 5.1354	2.8687	0.02
						1/2" 5.6089	3.4832	0.05
						Ice 6.0897	3.9457	0.08
						1" Ice 7.0737	4.8929	0.16
						2" Ice		
742 213	C	From Leg	1.0000 0.00 0.00	0.000	87.0000	No Ice 5.1354	2.8687	0.02
						1/2" 5.6089	3.4832	0.05
						Ice 6.0897	3.9457	0.08
						1" Ice 7.0737	4.8929	0.16
						2" Ice		
Pipe Mount [PM 601-3]	C	None		0.000	87.0000	No Ice 4.3900	4.3900	0.20
						1/2" 5.4800	5.4800	0.24
						Ice 6.5700	6.5700	0.28
						1" Ice 8.7500	8.7500	0.36
						2" Ice		
***								
Side Arm Mount [SO 701-1]	A	None		0.000	80.0000	No Ice 0.8500	1.6700	0.07
						1/2" 1.1400	2.3400	0.08
						Ice 1.4300	3.0100	0.09
						1" Ice 2.0100	4.3500	0.12
						2" Ice		
Side Arm Mount [SO 701-1]	B	None		0.000	80.0000	No Ice 0.8500	1.6700	0.07
						1/2" 1.1400	2.3400	0.08
						Ice 1.4300	3.0100	0.09
						1" Ice 2.0100	4.3500	0.12
						2" Ice		
***								
Side Arm Mount [SO 701-1]	C	None		0.000	77.0000	No Ice 0.8500	1.6700	0.07
						1/2" 1.1400	2.3400	0.08
						Ice 1.4300	3.0100	0.09
						1" Ice 2.0100	4.3500	0.12
						2" Ice		
58532A	C	From Leg	3.0000 0.00 0.00	0.000	77.0000	No Ice 0.1893	0.1893	0.00
						1/2" 0.2483	0.2483	0.00
						Ice 0.3147	0.3147	0.01
						1" Ice 0.4698	0.4698	0.02
						2" Ice		
***								

**Dishes**

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz	Lateral Vert						
				ft	ft	°	ft	ft	ft <sup>2</sup>	K	
VHLP2.5-11	A	Paraboloid w/Shroud (HP)	From Leg	4.0000	13.000	133.0000	2.9167	No Ice	6.6800	0.05	
				0.00	6.00				1/2" Ice	7.0700	0.08
				6.00					1" Ice	7.4600	0.12
									2" Ice	8.2300	0.19
VHLP2.5-11	B	Paraboloid w/Shroud (HP)	From Leg	4.0000	83.000	133.0000	2.9167	No Ice	6.6800	0.05	
				0.00	6.00				1/2" Ice	7.0700	0.08
				6.00					1" Ice	7.4600	0.12
									2" Ice	8.2300	0.19

### Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 145.0000-140.0000	142.4843	1.364	49	10.338	A	0.000	10.338	10.338	100.00	0.000	0.000
					B	0.000	10.338	100.00	0.000	0.000	
					C	0.000	10.338	100.00	0.000	0.000	
L2 140.0000-135.0000	137.4848	1.353	49	10.728	A	0.000	10.728	10.728	100.00	0.000	0.000
					B	0.000	10.728	100.00	0.000	0.000	
					C	0.000	10.728	100.00	0.000	0.000	
L3 135.0000-130.0000	132.4854	1.343	48	11.119	A	0.000	11.119	11.119	100.00	0.000	0.000
					B	0.000	11.119	100.00	0.000	0.000	
					C	0.000	11.119	100.00	0.000	0.000	
L4 130.0000-125.0000	127.4856	1.332	48	11.509	A	0.000	11.509	11.509	100.00	0.000	0.000
					B	0.000	11.509	100.00	0.000	0.000	
					C	0.000	11.509	100.00	0.000	0.000	
L5 125.0000-120.0000	122.4861	1.321	47	11.906	A	0.000	11.906	11.906	100.00	0.000	0.000
					B	0.000	11.906	100.00	0.000	0.000	
					C	0.000	11.906	100.00	0.000	0.000	
L6 120.0000-115.0000	117.4866	1.309	47	12.304	A	0.000	12.304	12.304	100.00	0.000	0.000
					B	0.000	12.304	100.00	0.000	0.000	
					C	0.000	12.304	100.00	0.000	0.000	
L7 115.0000-110.0000	112.4870	1.297	47	12.701	A	0.000	12.701	12.701	100.00	0.000	0.000
					B	0.000	12.701	100.00	0.000	0.000	
					C	0.000	12.701	100.00	0.000	0.792	
L8 110.0000-105.0000	107.4874	1.285	46	13.098	A	0.000	13.098	13.098	100.00	0.000	0.000
					B	0.000	13.098	100.00	0.000	0.000	
					C	0.000	13.098	100.00	0.000	0.990	
L9 105.0000-100.0000	102.4877	1.272	46	13.496	A	0.000	13.496	13.496	100.00	0.000	0.000
					B	0.000	13.496	100.00	0.000	0.000	
					C	0.000	13.496	100.00	0.000	0.990	
L10 100.0000-95.0000	97.4881	1.259	45	13.893	A	0.000	13.893	13.893	100.00	0.000	0.000
					B	0.000	13.893	100.00	0.000	0.000	
					C	0.000	13.893	100.00	0.000	0.990	
L11 95.0000-90.0000	92.4884	1.245	45	14.291	A	0.000	14.291	14.291	100.00	0.000	0.000
					B	0.000	14.291	100.00	0.000	0.000	
					C	0.000	14.291	100.00	0.000	2.574	
L12 90.0000-84.7500	87.3626	1.23	44	15.433	A	0.000	15.433	15.433	100.00	0.000	0.000
					B	0.000	15.433	100.00	0.000	0.000	
					C	0.000	15.433	100.00	0.000	3.119	
L13 84.7500-84.2500	84.4999	1.222	44	1.471	A	0.000	1.471	1.471	100.00	0.000	0.000
					B	0.000	1.471	100.00	0.000	0.000	
					C	0.000	1.471	100.00	0.000	0.297	
L14 84.2500-79.2500	81.7391	1.213	44	14.921	A	0.000	14.921	14.921	100.00	0.000	0.000
					B	0.000	14.921	100.00	0.000	0.000	
					C	0.000	14.921	100.00	0.000	2.970	
L15 79.2500-74.2500	76.7394	1.197	43	15.313	A	0.000	15.313	15.313	100.00	0.000	0.000
					B	0.000	15.313	100.00	0.000	0.000	
					C	0.000	15.313	100.00	0.000	2.970	
L16 74.2500-	71.7396	1.18	42	15.705	A	0.000	15.705	15.705	100.00	0.000	0.000

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
69.2500					B	0.000	15.705		100.00	0.000	0.000
					C	0.000	15.705		100.00	0.000	2.970
L17 69.2500- 64.2500	66.7399	1.162	42	16.097	A	0.000	16.097	16.097	100.00	0.000	0.000
					B	0.000	16.097		100.00	0.000	0.000
					C	0.000	16.097		100.00	0.000	2.970
L18 64.2500- 59.2500	61.7401	1.143	41	16.488	A	0.000	16.488	16.488	100.00	0.000	0.000
					B	0.000	16.488		100.00	0.000	0.000
					C	0.000	16.488		100.00	0.000	3.192
L19 59.2500- 58.0800	58.6645	1.131	41	3.915	A	0.000	3.915	3.915	100.00	0.000	0.000
					B	0.000	3.915		100.00	0.000	0.000
					C	0.000	3.915		100.00	0.000	0.890
L20 58.0800- 57.8300	57.9550	1.128	41	0.839	A	0.000	0.839	0.839	100.00	0.000	0.000
					B	0.000	0.839		100.00	0.000	0.000
					C	0.000	0.839		100.00	0.000	0.190
L21 57.8300- 52.8300	55.3204	1.117	40	16.985	A	0.000	16.985	16.985	100.00	0.000	0.000
					B	0.000	16.985		100.00	0.000	0.000
					C	0.000	16.985		100.00	0.000	3.803
L22 52.8300- 44.2500	48.5126	1.087	39	30.060	A	0.000	30.060	30.060	100.00	0.000	0.000
					B	0.000	30.060		100.00	0.000	0.000
					C	0.000	30.060		100.00	0.000	6.527
L23 44.2500- 43.2500	43.7496	1.063	38	3.525	A	0.000	3.525	3.525	100.00	0.000	0.000
					B	0.000	3.525		100.00	0.000	0.000
					C	0.000	3.525		100.00	0.000	0.761
L24 43.2500- 38.2500	40.7409	1.048	38	17.859	A	0.000	17.859	17.859	100.00	0.000	0.000
					B	0.000	17.859		100.00	0.000	0.000
					C	0.000	17.859		100.00	0.000	3.803
L25 38.2500- 33.2500	35.7411	1.019	37	18.251	A	0.000	18.251	18.251	100.00	0.000	0.000
					B	0.000	18.251		100.00	0.000	0.000
					C	0.000	18.251		100.00	0.000	3.897
L26 33.2500- 31.2500	32.2486	0.997	36	7.410	A	0.000	7.410	7.410	100.00	0.000	0.000
					B	0.000	7.410		100.00	0.000	0.000
					C	0.000	7.410		100.00	0.000	1.605
L27 31.2500- 31.0000	31.1250	0.99	36	0.930	A	0.000	0.930	0.930	100.00	0.000	0.000
					B	0.000	0.930		100.00	0.000	0.000
					C	0.000	0.930		100.00	0.000	0.201
L28 31.0000- 26.0000	28.4913	0.972	35	18.815	A	0.000	18.815	18.815	100.00	0.000	0.000
					B	0.000	18.815		100.00	0.000	0.000
					C	0.000	18.815		100.00	0.000	4.012
L29 26.0000- 21.0000	23.4915	0.933	34	19.208	A	0.000	19.208	19.208	100.00	0.000	0.000
					B	0.000	19.208		100.00	0.000	0.000
					C	0.000	19.208		100.00	0.000	4.012
L30 21.0000- 16.0000	18.4917	0.887	32	19.599	A	0.000	19.599	19.599	100.00	0.000	0.000
					B	0.000	19.599		100.00	0.000	0.000
					C	0.000	19.599		100.00	0.000	4.012
L31 16.0000- 11.0000	13.4918	0.85	31	19.991	A	0.000	19.991	19.991	100.00	0.000	0.000
					B	0.000	19.991		100.00	0.000	0.000
					C	0.000	19.991		100.00	0.000	4.012
L32 11.0000- 6.0000	8.4920	0.85	31	20.383	A	0.000	20.383	20.383	100.00	0.000	0.000
					B	0.000	20.383		100.00	0.000	0.000
					C	0.000	20.383		100.00	0.000	4.012
L33 6.0000- 4.7500	5.3745	0.85	31	5.157	A	0.000	5.157	5.157	100.00	0.000	0.000
					B	0.000	5.157		100.00	0.000	0.000
					C	0.000	5.157		100.00	0.000	1.003
L34 4.7500- 4.5000	4.6250	0.85	31	1.034	A	0.000	1.034	1.034	100.00	0.000	0.000
					B	0.000	1.034		100.00	0.000	0.000
					C	0.000	1.034		100.00	0.000	0.201
L35 4.5000- 0.0000	2.2437	0.85	31	18.781	A	0.000	18.781	18.781	100.00	0.000	0.000
					B	0.000	18.781		100.00	0.000	0.000
					C	0.000	18.781		100.00	0.000	3.610

**Tower Pressure - With Ice**

**G<sub>H</sub> = 1.100**



Section Elevation ft	z ft	K <sub>z</sub>	q <sub>z</sub> psf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>
L1 145.0000- 140.0000	142.4843	1.364	8	1.9678	11.977	A	0.000	11.977	11.977	100.00	0.000	0.000
						B	0.000	11.977		100.00	0.000	0.000
						C	0.000	11.977		100.00	0.000	0.000
L2 140.0000- 135.0000	137.4848	1.353	8	1.9608	12.362	A	0.000	12.362	12.362	100.00	0.000	0.000
						B	0.000	12.362		100.00	0.000	0.000
						C	0.000	12.362		100.00	0.000	0.000
L3 135.0000- 130.0000	132.4854	1.343	8	1.9535	12.747	A	0.000	12.747	12.747	100.00	0.000	0.000
						B	0.000	12.747		100.00	0.000	0.000
						C	0.000	12.747		100.00	0.000	0.000
L4 130.0000- 125.0000	127.4856	1.332	8	1.9460	13.131	A	0.000	13.131	13.131	100.00	0.000	0.000
						B	0.000	13.131		100.00	0.000	0.000
						C	0.000	13.131		100.00	0.000	0.000
L5 125.0000- 120.0000	122.4861	1.321	8	1.9382	13.521	A	0.000	13.521	13.521	100.00	0.000	0.000
						B	0.000	13.521		100.00	0.000	0.000
						C	0.000	13.521		100.00	0.000	0.000
L6 120.0000- 115.0000	117.4866	1.309	8	1.9302	13.912	A	0.000	13.912	13.912	100.00	0.000	0.000
						B	0.000	13.912		100.00	0.000	0.000
						C	0.000	13.912		100.00	0.000	0.000
L7 115.0000- 110.0000	112.4870	1.297	7	1.9218	14.303	A	0.000	14.303	14.303	100.00	0.000	0.000
						B	0.000	14.303		100.00	0.000	0.000
						C	0.000	14.303		100.00	0.000	2.329
L8 110.0000- 105.0000	107.4874	1.285	7	1.9131	14.693	A	0.000	14.693	14.693	100.00	0.000	0.000
						B	0.000	14.693		100.00	0.000	0.000
						C	0.000	14.693		100.00	0.000	2.903
L9 105.0000- 100.0000	102.4877	1.272	7	1.9040	15.082	A	0.000	15.082	15.082	100.00	0.000	0.000
						B	0.000	15.082		100.00	0.000	0.000
						C	0.000	15.082		100.00	0.000	2.894
L10 100.0000- 95.0000	97.4881	1.259	7	1.8945	15.472	A	0.000	15.472	15.472	100.00	0.000	0.000
						B	0.000	15.472		100.00	0.000	0.000
						C	0.000	15.472		100.00	0.000	2.884
L11 95.0000- 90.0000	92.4884	1.245	7	1.8845	15.861	A	0.000	15.861	15.861	100.00	0.000	0.000
						B	0.000	15.861		100.00	0.000	0.000
						C	0.000	15.861		100.00	0.000	7.474
L12 90.0000- 84.7500	87.3626	1.23	7	1.8738	17.072	A	0.000	17.072	17.072	100.00	0.000	0.000
						B	0.000	17.072		100.00	0.000	0.000
						C	0.000	17.072		100.00	0.000	9.021
L13 84.7500- 84.2500	84.4999	1.222	7	1.8676	1.627	A	0.000	1.627	1.627	100.00	0.000	0.000
						B	0.000	1.627		100.00	0.000	0.000
						C	0.000	1.627		100.00	0.000	0.859
L14 84.2500- 79.2500	81.7391	1.213	7	1.8614	16.472	A	0.000	16.472	16.472	100.00	0.000	0.000
						B	0.000	16.472		100.00	0.000	0.000
						C	0.000	16.472		100.00	0.000	8.554
L15 79.2500- 74.2500	76.7394	1.197	7	1.8497	16.854	A	0.000	16.854	16.854	100.00	0.000	0.000
						B	0.000	16.854		100.00	0.000	0.000
						C	0.000	16.854		100.00	0.000	8.519
L16 74.2500- 69.2500	71.7396	1.18	7	1.8373	17.236	A	0.000	17.236	17.236	100.00	0.000	0.000
						B	0.000	17.236		100.00	0.000	0.000
						C	0.000	17.236		100.00	0.000	8.482
L17 69.2500- 64.2500	66.7399	1.162	7	1.8240	17.617	A	0.000	17.617	17.617	100.00	0.000	0.000
						B	0.000	17.617		100.00	0.000	0.000
						C	0.000	17.617		100.00	0.000	8.442
L18 64.2500- 59.2500	61.7401	1.143	7	1.8099	17.997	A	0.000	17.997	17.997	100.00	0.000	0.000
						B	0.000	17.997		100.00	0.000	0.000
						C	0.000	17.997		100.00	0.000	9.156
L19 59.2500- 58.0800	58.6645	1.131	7	1.8007	4.266	A	0.000	4.266	4.266	100.00	0.000	0.000
						B	0.000	4.266		100.00	0.000	0.000
						C	0.000	4.266		100.00	0.000	2.622
L20 58.0800- 57.8300	57.9550	1.128	6	1.7985	0.914	A	0.000	0.914	0.914	100.00	0.000	0.000
						B	0.000	0.914		100.00	0.000	0.000
						C	0.000	0.914		100.00	0.000	0.560
L21 57.8300- 52.8300	55.3204	1.117	6	1.7901	18.477	A	0.000	18.477	18.477	100.00	0.000	0.000
						B	0.000	18.477		100.00	0.000	0.000
						C	0.000	18.477		100.00	0.000	11.163
L22 52.8300- 44.2500	48.5126	1.087	6	1.7668	32.586	A	0.000	32.586	32.586	100.00	0.000	0.000
						B	0.000	32.586		100.00	0.000	0.000
						C	0.000	32.586		100.00	0.000	18.991
L23 44.2500- 43.2500	43.7496	1.063	6	1.7486	3.819	A	0.000	3.819	3.819	100.00	0.000	0.000
						B	0.000	3.819		100.00	0.000	0.000

Section Elevation ft	z ft	K <sub>z</sub>	q <sub>z</sub> psf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
L24 43.2500-38.2500	40.7409	1.048	6	1.7362	19.306	C	0.000	3.819	19.306	100.00	0.000	2.213
						A	0.000	19.306		100.00	0.000	0.000
						B	0.000	19.306		100.00	0.000	0.000
L25 38.2500-33.2500	35.7411	1.019	6	1.7136	19.679	C	0.000	19.306	19.679	100.00	0.000	10.941
						A	0.000	19.679		100.00	0.000	0.000
						B	0.000	19.679		100.00	0.000	0.000
L26 33.2500-31.2500	32.2486	0.997	6	1.6961	7.975	C	0.000	7.975	7.975	100.00	0.000	10.942
						A	0.000	7.975		100.00	0.000	0.000
						B	0.000	7.975		100.00	0.000	0.000
L27 31.2500-31.0000	31.1250	0.99	6	1.6901	1.001	C	0.000	7.975	1.001	100.00	0.000	4.394
						A	0.000	1.001		100.00	0.000	0.000
						B	0.000	1.001		100.00	0.000	0.000
L28 31.0000-26.0000	28.4913	0.972	6	1.6752	20.211	C	0.000	1.001	20.211	100.00	0.000	0.548
						A	0.000	20.211		100.00	0.000	0.000
						B	0.000	20.211		100.00	0.000	0.000
L29 26.0000-21.0000	23.4915	0.933	5	1.6432	20.577	C	0.000	20.211	20.577	100.00	0.000	10.899
						A	0.000	20.577		100.00	0.000	0.000
						B	0.000	20.577		100.00	0.000	0.000
L30 21.0000-16.0000	18.4917	0.887	5	1.6043	20.936	C	0.000	20.577	20.936	100.00	0.000	10.767
						A	0.000	20.936		100.00	0.000	0.000
						B	0.000	20.936		100.00	0.000	0.000
L31 16.0000-11.0000	13.4918	0.85	5	1.5545	21.287	C	0.000	20.936	21.287	100.00	0.000	10.607
						A	0.000	21.287		100.00	0.000	0.000
						B	0.000	21.287		100.00	0.000	0.000
L32 11.0000-6.0000	8.4920	0.85	5	1.4842	21.620	C	0.000	21.287	21.620	100.00	0.000	10.403
						A	0.000	21.620		100.00	0.000	0.000
						B	0.000	21.620		100.00	0.000	0.000
L33 6.0000-4.7500	5.3745	0.85	5	1.4179	5.452	C	0.000	21.620	5.452	100.00	0.000	10.113
						A	0.000	5.452		100.00	0.000	0.000
						B	0.000	5.452		100.00	0.000	0.000
L34 4.7500-4.5000	4.6250	0.85	5	1.3967	1.092	C	0.000	5.452	1.092	100.00	0.000	2.460
						A	0.000	1.092		100.00	0.000	0.000
						B	0.000	1.092		100.00	0.000	0.000
L35 4.5000-0.0000	2.2437	0.85	5	1.2993	19.756	C	0.000	1.092	19.756	100.00	0.000	0.488
						A	0.000	19.756		100.00	0.000	0.000
						B	0.000	19.756		100.00	0.000	0.000
						C	0.000	19.756		100.00	0.000	8.418

### Tower Pressure - Service

**G<sub>H</sub> = 1.100**

Section Elevation ft	z ft	K <sub>z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
L1 145.0000-140.0000	142.4843	1.364	11	10.338	A	0.000	10.338	10.338	100.00	0.000	0.000
					B	0.000	10.338		100.00	0.000	0.000
					C	0.000	10.338		100.00	0.000	0.000
L2 140.0000-135.0000	137.4848	1.353	11	10.728	A	0.000	10.728	10.728	100.00	0.000	0.000
					B	0.000	10.728		100.00	0.000	0.000
					C	0.000	10.728		100.00	0.000	0.000
L3 135.0000-130.0000	132.4854	1.343	10	11.119	A	0.000	11.119	11.119	100.00	0.000	0.000
					B	0.000	11.119		100.00	0.000	0.000
					C	0.000	11.119		100.00	0.000	0.000
L4 130.0000-125.0000	127.4856	1.332	10	11.509	A	0.000	11.509	11.509	100.00	0.000	0.000
					B	0.000	11.509		100.00	0.000	0.000
					C	0.000	11.509		100.00	0.000	0.000
L5 125.0000-120.0000	122.4861	1.321	10	11.906	A	0.000	11.906	11.906	100.00	0.000	0.000
					B	0.000	11.906		100.00	0.000	0.000
					C	0.000	11.906		100.00	0.000	0.000
L6 120.0000-115.0000	117.4866	1.309	10	12.304	A	0.000	12.304	12.304	100.00	0.000	0.000
					B	0.000	12.304		100.00	0.000	0.000
					C	0.000	12.304		100.00	0.000	0.000

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L7 115.0000- 110.0000	112.4870	1.297	10	12.701	C	0.000	12.304		100.00	0.000	0.000
					A	0.000	12.701	12.701	100.00	0.000	0.000
					B	0.000	12.701		100.00	0.000	0.000
					C	0.000	12.701		100.00	0.000	0.792
L8 110.0000- 105.0000	107.4874	1.285	10	13.098	A	0.000	13.098	13.098	100.00	0.000	0.000
					B	0.000	13.098		100.00	0.000	0.000
					C	0.000	13.098		100.00	0.000	0.990
L9 105.0000- 100.0000	102.4877	1.272	10	13.496	A	0.000	13.496	13.496	100.00	0.000	0.000
					B	0.000	13.496		100.00	0.000	0.000
					C	0.000	13.496		100.00	0.000	0.990
L10 100.0000- 95.0000	97.4881	1.259	10	13.893	A	0.000	13.893	13.893	100.00	0.000	0.000
					B	0.000	13.893		100.00	0.000	0.000
					C	0.000	13.893		100.00	0.000	0.990
L11 95.0000- 90.0000	92.4884	1.245	10	14.291	A	0.000	14.291	14.291	100.00	0.000	0.000
					B	0.000	14.291		100.00	0.000	0.000
					C	0.000	14.291		100.00	0.000	2.574
L12 90.0000- 84.7500	87.3626	1.23	10	15.433	A	0.000	15.433	15.433	100.00	0.000	0.000
					B	0.000	15.433		100.00	0.000	0.000
					C	0.000	15.433		100.00	0.000	3.119
L13 84.7500- 84.2500	84.4999	1.222	10	1.471	A	0.000	1.471	1.471	100.00	0.000	0.000
					B	0.000	1.471		100.00	0.000	0.000
					C	0.000	1.471		100.00	0.000	0.297
L14 84.2500- 79.2500	81.7391	1.213	9	14.921	A	0.000	14.921	14.921	100.00	0.000	0.000
					B	0.000	14.921		100.00	0.000	0.000
					C	0.000	14.921		100.00	0.000	2.970
L15 79.2500- 74.2500	76.7394	1.197	9	15.313	A	0.000	15.313	15.313	100.00	0.000	0.000
					B	0.000	15.313		100.00	0.000	0.000
					C	0.000	15.313		100.00	0.000	2.970
L16 74.2500- 69.2500	71.7396	1.18	9	15.705	A	0.000	15.705	15.705	100.00	0.000	0.000
					B	0.000	15.705		100.00	0.000	0.000
					C	0.000	15.705		100.00	0.000	2.970
L17 69.2500- 64.2500	66.7399	1.162	9	16.097	A	0.000	16.097	16.097	100.00	0.000	0.000
					B	0.000	16.097		100.00	0.000	0.000
					C	0.000	16.097		100.00	0.000	2.970
L18 64.2500- 59.2500	61.7401	1.143	9	16.488	A	0.000	16.488	16.488	100.00	0.000	0.000
					B	0.000	16.488		100.00	0.000	0.000
					C	0.000	16.488		100.00	0.000	3.192
L19 59.2500- 58.0800	58.6645	1.131	9	3.915	A	0.000	3.915	3.915	100.00	0.000	0.000
					B	0.000	3.915		100.00	0.000	0.000
					C	0.000	3.915		100.00	0.000	0.890
L20 58.0800- 57.8300	57.9550	1.128	9	0.839	A	0.000	0.839	0.839	100.00	0.000	0.000
					B	0.000	0.839		100.00	0.000	0.000
					C	0.000	0.839		100.00	0.000	0.190
L21 57.8300- 52.8300	55.3204	1.117	9	16.985	A	0.000	16.985	16.985	100.00	0.000	0.000
					B	0.000	16.985		100.00	0.000	0.000
					C	0.000	16.985		100.00	0.000	3.803
L22 52.8300- 44.2500	48.5126	1.087	8	30.060	A	0.000	30.060	30.060	100.00	0.000	0.000
					B	0.000	30.060		100.00	0.000	0.000
					C	0.000	30.060		100.00	0.000	6.527
L23 44.2500- 43.2500	43.7496	1.063	8	3.525	A	0.000	3.525	3.525	100.00	0.000	0.000
					B	0.000	3.525		100.00	0.000	0.000
					C	0.000	3.525		100.00	0.000	0.761
L24 43.2500- 38.2500	40.7409	1.048	8	17.859	A	0.000	17.859	17.859	100.00	0.000	0.000
					B	0.000	17.859		100.00	0.000	0.000
					C	0.000	17.859		100.00	0.000	3.803
L25 38.2500- 33.2500	35.7411	1.019	8	18.251	A	0.000	18.251	18.251	100.00	0.000	0.000
					B	0.000	18.251		100.00	0.000	0.000
					C	0.000	18.251		100.00	0.000	3.897
L26 33.2500- 31.2500	32.2486	0.997	8	7.410	A	0.000	7.410	7.410	100.00	0.000	0.000
					B	0.000	7.410		100.00	0.000	0.000
					C	0.000	7.410		100.00	0.000	1.605
L27 31.2500- 31.0000	31.1250	0.99	8	0.930	A	0.000	0.930	0.930	100.00	0.000	0.000
					B	0.000	0.930		100.00	0.000	0.000
					C	0.000	0.930		100.00	0.000	0.201
L28 31.0000- 26.0000	28.4913	0.972	8	18.815	A	0.000	18.815	18.815	100.00	0.000	0.000
					B	0.000	18.815		100.00	0.000	0.000
					C	0.000	18.815		100.00	0.000	4.012
L29 26.0000- 23.4915	23.4915	0.933	7	19.208	A	0.000	19.208	19.208	100.00	0.000	0.000

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>
21.0000					B	0.000	19.208		100.00	0.000	0.000
L30 21.0000- 16.0000	18.4917	0.887	7	19.599	C A B C	0.000 0.000 0.000 0.000	19.208 19.599 19.599 19.599	19.599	100.00 100.00 100.00 100.00	0.000 0.000 0.000 0.000	4.012 0.000 0.000 4.012
L31 16.0000- 11.0000	13.4918	0.85	7	19.991	A B C	0.000 0.000 0.000	19.991 19.991 19.991	19.991	100.00 100.00 100.00	0.000 0.000 0.000	0.000 0.000 4.012
L32 11.0000- 6.0000	8.4920	0.85	7	20.383	A B C	0.000 0.000 0.000	20.383 20.383 20.383	20.383	100.00 100.00 100.00	0.000 0.000 0.000	0.000 0.000 4.012
L33 6.0000- 4.7500	5.3745	0.85	7	5.157	A B C	0.000 0.000 0.000	5.157 5.157 5.157	5.157	100.00 100.00 100.00	0.000 0.000 0.000	0.000 0.000 1.003
L34 4.7500- 4.5000	4.6250	0.85	7	1.034	A B C	0.000 0.000 0.000	1.034 1.034 1.034	1.034	100.00 100.00 100.00	0.000 0.000 0.000	0.000 0.000 0.201
L35 4.5000- 0.0000	2.2437	0.85	7	18.781	A B C	0.000 0.000 0.000	18.781 18.781 18.781	18.781	100.00 100.00 100.00	0.000 0.000 0.000	0.000 0.000 3.610

## 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+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service

Comb. No.	Description
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	145 - 140	Pole	Max Tension	8	0.00	0.00	-0.00
			Max. Compression	26	-0.62	-0.00	0.00
			Max. Mx	20	-0.25	1.08	-0.00
			Max. My	2	-0.25	-0.00	1.08
			Max. Vy	20	-0.43	1.08	-0.00
			Max. Vx	14	0.43	-0.00	-1.08
L2	140 - 135	Pole	Max. Torque	8			-0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-1.65	-0.86	0.50
			Max. Mx	8	-0.59	-6.60	1.29
			Max. My	2	-0.56	-0.66	7.70
			Max. Vy	8	1.38	-6.60	1.29
L3	135 - 130	Pole	Max. Vx	14	1.68	0.44	-7.39
			Max. Torque	2			-2.07
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-6.95	-1.08	0.70
			Max. Mx	8	-2.74	-24.51	2.64
			Max. My	2	-2.70	-1.37	27.15
L4	130 - 125	Pole	Max. Vy	8	4.57	-24.51	2.64
			Max. Vx	14	4.89	1.02	-26.77
			Max. Torque	2			-2.14
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-7.75	-1.09	0.70
			Max. Mx	8	-3.15	-48.57	4.03
L5	125 - 120	Pole	Max. My	2	-3.11	-2.10	52.78
			Max. Vy	8	5.05	-48.57	4.03
			Max. Vx	14	5.37	1.70	-52.41
			Max. Torque	2			-2.14
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-16.43	-1.09	0.71
L6	120 - 115	Pole	Max. Mx	8	-6.46	-91.40	5.43
			Max. My	2	-6.41	-2.84	97.20
			Max. Vy	8	10.29	-91.40	5.43
			Max. Vx	2	-10.61	-2.84	97.20
			Max. Torque	2			-2.14
			Max Tension	1	0.00	0.00	0.00
L7	115 - 110	Pole	Max. Compression	26	-17.30	-1.09	0.71
			Max. Mx	8	-6.94	-144.09	6.84
			Max. My	2	-6.89	-3.59	151.51
			Max. Vy	8	10.79	-144.09	6.84
			Max. Vx	2	-11.11	-3.59	151.51
			Max. Torque	2			-2.14
L8	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.54	-1.99	1.02
			Max. Mx	8	-10.58	-227.79	8.00
			Max. My	2	-10.51	-4.22	237.03
			Max. Vy	8	17.48	-227.79	8.00
			Max. Vx	2	-17.88	-4.22	237.03
L8	110 - 105	Pole	Max. Torque	2			-2.48
			Max Tension	1	0.00	0.00	0.00
L8	110 - 105	Pole	Max. Compression	26	-28.56	-1.92	1.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L9	105 - 100	Pole	Max. Mx	8	-11.15	-316.57	9.16
			Max. My	2	-11.08	-4.70	327.81
			Max. Vy	8	18.04	-316.57	9.16
			Max. Vx	2	-18.44	-4.70	327.81
			Max. Torque	2			-2.46
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.37	-1.85	3.19
			Max. Mx	8	-16.38	-448.31	10.85
			Max. My	2	-16.30	-5.19	462.16
			Max. Vy	8	26.64	-448.31	10.85
L10	100 - 95	Pole	Max. Vx	2	-27.04	-5.19	462.16
			Max. Torque	24			-2.77
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.52	-1.78	3.16
			Max. Mx	8	-17.13	-582.82	12.03
			Max. My	2	-17.06	-5.68	598.71
			Max. Vy	8	27.19	-582.82	12.03
			Max. Vx	2	-27.59	-5.68	598.71
			Max. Torque	24			-2.71
			Max Tension	1	0.00	0.00	0.00
L11	95 - 90	Pole	Max. Compression	26	-53.43	-1.38	2.92
			Max. Mx	8	-21.03	-744.54	13.19
			Max. My	2	-20.96	-6.13	762.49
			Max. Vy	8	33.00	-744.54	13.19
			Max. Vx	2	-33.41	-6.13	762.49
			Max. Torque	24			-2.65
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.67	-1.31	2.88
			Max. Mx	8	-21.18	-769.31	13.37
			Max. My	2	-21.10	-6.20	787.58
L12	90 - 84.75	Pole	Max. Vy	8	33.10	-769.31	13.37
			Max. Vx	2	-33.50	-6.20	787.58
			Max. Torque	24			-2.46
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.13	-0.81	2.59
			Max. Mx	8	-22.92	-938.43	14.53
			Max. My	2	-22.85	-6.64	958.78
			Max. Vy	8	34.52	-938.43	14.53
			Max. Vx	2	-34.93	-6.64	958.78
			Max. Torque	24			-2.24
L13	84.75 - 84.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.15	-0.28	2.30
			Max. Mx	8	-24.15	-1112.60	15.69
			Max. My	2	-24.08	-7.08	1135.03
			Max. Vy	8	35.32	-1112.60	15.69
			Max. Vx	2	-35.73	-7.08	1135.03
			Max. Torque	24			-2.22
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.10	0.34	1.95
			Max. Mx	8	-25.36	-1290.84	16.84
L14	84.25 - 79.25	Pole	Max. My	2	-25.30	-7.51	1315.34
			Max. Vy	8	36.02	-1290.84	16.84
			Max. Vx	2	-36.43	-7.51	1315.34
			Max. Torque	24			-2.01
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.93	0.90	1.62
			Max. Mx	8	-26.53	-1472.30	17.99
			Max. My	2	-26.48	-7.94	1498.87
			Max. Vy	8	36.62	-1472.30	17.99
			Max. Vx	2	-37.03	-7.94	1498.87
L15	79.25 - 74.25	Pole	Max. Torque	24			-2.01
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.79	1.47	1.29
			Max. Mx	8	-27.75	-1656.70	19.13
			Max. My	2			
			Max. Vy	8			
			Max. Vx	2			
			Max. Torque	24			
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26			
L16	74.25 - 69.25	Pole	Max. Mx	8			
			Max. My	2			
			Max. Vy	8			
			Max. Vx	2			
			Max. Torque	24			
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26			
			Max. Mx	8			
			Max. My	2			
			Max. Vy	8			
L17	69.25 - 64.25	Pole	Max. Vx	2			
			Max. Torque	24			
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26			
			Max. Mx	8			
			Max. My	2			
			Max. Vy	8			
			Max. Vx	2			
			Max. Torque	24			
			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
L18	64.25 - 59.25	Pole	Max. My	2	-27.69	-8.36	1685.33
			Max. Vy	8	37.20	-1656.70	19.13
			Max. Vx	2	-37.61	-8.36	1685.33
			Max. Torque	24			-1.55
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.67	2.04	0.95
			Max. Mx	8	-28.99	-1843.98	20.26
			Max. My	2	-28.95	-8.77	1874.67
			Max. Vy	8	37.78	-1843.98	20.26
			Max. Vx	14	38.18	8.26	-1873.65
L19	59.25 - 58.08	Pole	Max. Torque	24			-1.33
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.11	2.18	0.87
			Max. Mx	8	-29.29	-1888.22	20.52
			Max. My	2	-29.24	-8.87	1919.39
			Max. Vy	8	37.92	-1888.22	20.52
			Max. Vx	14	38.32	8.38	-1918.39
			Max. Torque	24			-1.10
			Max Tension	1	0.00	0.00	0.00
			L20	58.08 - 57.83	Pole	Max. Compression	26
Max. Mx	8	-29.39				-1897.70	20.58
Max. My	2	-29.34				-8.89	1928.97
Max. Vy	8	37.97				-1897.70	20.58
Max. Vx	2	-38.35				-8.89	1928.97
Max. Torque	24						-1.03
Max Tension	1	0.00				0.00	0.00
Max. Compression	26	-69.50				2.79	0.51
Max. Mx	8	-30.97				-2088.86	21.70
Max. My	2	-30.92				-9.30	2122.18
L21	57.83 - 52.83	Pole	Max. Vy	8	38.58	-2088.86	21.70
			Max. Vx	14	38.99	8.90	-2121.26
			Max. Torque	24			-1.02
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.02	3.19	0.27
			Max. Mx	8	-32.04	-2217.92	22.44
			Max. My	2	-32.01	-9.57	2252.60
			Max. Vy	8	38.99	-2217.92	22.44
			Max. Vx	14	39.40	9.24	-2251.74
			Max. Torque	24			-0.74
L22	52.83 - 44.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.85	3.93	-0.17
			Max. Mx	8	-35.46	-2464.33	23.84
			Max. My	2	-35.42	-10.07	2501.57
			Max. Vy	8	39.90	-2464.33	23.84
			Max. Vx	14	40.30	9.87	-2500.81
			Max. Torque	33			-0.62
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-78.33	4.53	-0.52
			Max. Mx	8	-37.27	-2665.14	24.95
L23	44.25 - 43.25	Pole	Max. My	2	-37.24	-10.47	2704.41
			Max. Vy	8	40.49	-2665.14	24.95
			Max. Vx	14	40.89	10.37	-2703.75
			Max. Torque	15			-0.78
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-80.82	5.12	-0.87
			Max. Mx	8	-39.12	-2868.83	26.05
			Max. My	2	-39.09	-10.87	2910.13
			Max. Vy	8	41.06	-2868.83	26.05
			Max. Vx	14	41.46	10.87	-2909.56
L24	43.25 - 38.25	Pole	Max. Torque	13			-1.05
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-80.82	5.12	-0.87
			Max. Mx	8	-39.12	-2868.83	26.05
			Max. My	2	-39.09	-10.87	2910.13
			Max. Vy	8	41.06	-2868.83	26.05
			Max. Vx	14	41.46	10.87	-2909.56
			Max. Torque	13			-1.05
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-80.82	5.12	-0.87
L25	38.25 - 33.25	Pole	Max. Mx	8	-39.12	-2868.83	26.05
			Max. My	2	-39.09	-10.87	2910.13
			Max. Vy	8	41.06	-2868.83	26.05
			Max. Vx	14	41.46	10.87	-2909.56
			Max. Torque	13			-1.05
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-80.82	5.12	-0.87
			Max. Mx	8	-39.12	-2868.83	26.05
			Max. My	2	-39.09	-10.87	2910.13
			Max. Vy	8	41.06	-2868.83	26.05
L26	33.25 -	Pole	Max. Vx	14	41.46	10.87	-2909.56
			Max. Torque	13			-1.05
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-80.82	5.12	-0.87
			Max. Mx	8	-39.12	-2868.83	26.05
			Max. My	2	-39.09	-10.87	2910.13
			Max. Vy	8	41.06	-2868.83	26.05
			Max. Vx	14	41.46	10.87	-2909.56
			Max. Torque	13			-1.05
			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
	31.25		Max. Compression	26	-81.83	5.36	-1.01
			Max. Mx	8	-39.87	-2951.10	26.49
			Max. My	2	-39.85	-11.02	2993.21
			Max. Vy	8	41.28	-2951.10	26.49
			Max. Vx	14	41.68	11.07	-2992.67
			Max. Torque	13			-1.17
L27	31.25 - 31	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-81.97	5.40	-1.03
			Max. Mx	8	-39.99	-2961.41	26.55
			Max. My	2	-39.97	-11.04	3003.63
			Max. Vy	8	41.33	-2961.41	26.55
			Max. Vx	14	41.71	11.10	-3003.09
			Max. Torque	13			-1.18
L28	31 - 26	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.77	5.99	-1.38
			Max. Mx	8	-42.13	-3169.16	27.64
			Max. My	2	-42.11	-11.43	3213.40
			Max. Vy	8	41.86	-3169.16	27.64
			Max. Vx	14	42.26	11.60	-3212.95
			Max. Torque	13			-1.47
L29	26 - 21	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-87.58	6.59	-1.74
			Max. Mx	8	-44.31	-3379.61	28.73
			Max. My	2	-44.30	-11.81	3425.86
			Max. Vy	8	42.39	-3379.61	28.73
			Max. Vx	14	42.78	12.10	-3425.51
			Max. Torque	13			-1.75
L30	21 - 16	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-90.41	7.19	-2.09
			Max. Mx	8	-46.52	-3592.56	29.80
			Max. My	2	-46.51	-12.19	3640.80
			Max. Vy	8	42.87	-3592.56	29.80
			Max. Vx	14	43.26	12.60	-3640.55
			Max. Torque	13			-2.02
L31	16 - 11	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-93.23	7.77	-2.43
			Max. Mx	8	-48.76	-3807.82	30.88
			Max. My	2	-48.75	-12.56	3858.05
			Max. Vy	8	43.31	-3807.82	30.88
			Max. Vx	14	43.70	13.10	-3857.90
			Max. Torque	13			-2.28
L32	11 - 6	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-96.05	8.33	-2.77
			Max. Mx	8	-51.03	-4025.27	31.94
			Max. My	2	-51.03	-12.93	4077.48
			Max. Vy	8	43.75	-4025.27	31.94
			Max. Vx	14	44.13	13.60	-4077.43
			Max. Torque	13			-2.55
L33	6 - 4.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-96.75	8.47	-2.85
			Max. Mx	8	-51.60	-4079.97	32.20
			Max. My	2	-51.59	-13.02	4132.68
			Max. Vy	8	43.86	-4079.97	32.20
			Max. Vx	14	44.25	13.72	-4132.65
			Max. Torque	13			-2.62
L34	4.75 - 4.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-96.89	8.50	-2.86
			Max. Mx	8	-51.73	-4090.93	32.25
			Max. My	2	-51.73	-13.04	4143.73
			Max. Vy	8	43.87	-4090.93	32.25
			Max. Vx	14	44.25	13.75	-4143.71
			Max. Torque	13			-2.64
L35	4.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-99.37	8.94	-3.12
			Max. Mx	8	-53.77	-4289.11	33.20
			Max. My	14	-53.77	14.19	-4343.75
			Max. Vy	8	44.29	-4289.11	33.20
			Max. Vx	14	44.67	14.19	-4343.75



Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	13			-2.89

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	99.37	-0.00	-0.00
	Max. H <sub>x</sub>	20	53.78	44.25	-0.16
	Max. H <sub>z</sub>	3	40.34	-0.09	44.65
	Max. M <sub>x</sub>	2	4343.69	-0.09	44.65
	Max. M <sub>z</sub>	8	4289.11	-44.26	0.22
	Max. Torsion	23	2.33	38.27	22.33
	Min. Vert	15	40.34	0.08	-44.65
	Min. H <sub>x</sub>	9	40.34	-44.26	0.22
	Min. H <sub>z</sub>	14	53.78	0.08	-44.65
	Min. M <sub>x</sub>	14	-4343.75	0.08	-44.65
	Min. M <sub>z</sub>	20	-4289.05	44.25	-0.16
	Min. Torsion	13	-2.89	-21.95	-38.75

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	44.82	0.00	0.00	0.03	0.75	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	53.78	0.09	-44.65	-4343.69	-13.37	-1.91
0.9 Dead+1.0 Wind 0 deg - No Ice	40.34	0.09	-44.65	-4302.32	-13.42	-1.92
1.2 Dead+1.0 Wind 30 deg - No Ice	53.78	22.16	-38.69	-3766.00	-2149.51	-1.08
0.9 Dead+1.0 Wind 30 deg - No Ice	40.34	22.16	-38.69	-3730.07	-2129.26	-1.08
1.2 Dead+1.0 Wind 60 deg - No Ice	53.78	38.31	-22.51	-2200.22	-3711.18	0.50
0.9 Dead+1.0 Wind 60 deg - No Ice	40.34	38.31	-22.51	-2179.16	-3676.10	0.51
1.2 Dead+1.0 Wind 90 deg - No Ice	53.78	44.26	-0.22	-33.20	-4289.11	1.69
0.9 Dead+1.0 Wind 90 deg - No Ice	40.34	44.26	-0.22	-32.79	-4248.66	1.70
1.2 Dead+1.0 Wind 120 deg - No Ice	53.78	38.24	22.39	2180.60	-3700.08	2.33
0.9 Dead+1.0 Wind 120 deg - No Ice	40.34	38.24	22.39	2159.79	-3665.14	2.35
1.2 Dead+1.0 Wind 150 deg - No Ice	53.78	21.95	38.75	3773.46	-2116.88	2.87
0.9 Dead+1.0 Wind 150 deg - No Ice	40.34	21.95	38.75	3737.45	-2097.03	2.89
1.2 Dead+1.0 Wind 180 deg - No Ice	53.78	-0.08	44.65	4343.75	14.19	2.60
0.9 Dead+1.0 Wind 180 deg - No Ice	40.34	-0.08	44.65	4302.25	13.80	2.62
1.2 Dead+1.0 Wind 210 deg - No Ice	53.78	-22.15	38.70	3767.24	2150.23	1.56
0.9 Dead+1.0 Wind 210 deg - No Ice	40.34	-22.15	38.70	3731.29	2129.54	1.56
1.2 Dead+1.0 Wind 240 deg - No Ice	53.78	-38.28	22.52	2201.52	3708.89	-0.20
0.9 Dead+1.0 Wind 240 deg - No Ice	40.34	-38.28	22.52	2180.45	3673.40	-0.21

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
- No Ice						
1.2 Dead+1.0 Wind 270 deg	53.78	-44.25	0.16	24.06	4289.05	-1.59
- No Ice						
0.9 Dead+1.0 Wind 270 deg	40.34	-44.25	0.16	23.77	4247.95	-1.61
- No Ice						
1.2 Dead+1.0 Wind 300 deg	53.78	-38.27	-22.33	-2171.68	3706.66	-2.31
- No Ice						
0.9 Dead+1.0 Wind 300 deg	40.34	-38.27	-22.33	-2150.96	3671.20	-2.33
- No Ice						
1.2 Dead+1.0 Wind 330 deg	53.78	-21.92	-38.74	-3772.14	2113.73	-2.20
- No Ice						
0.9 Dead+1.0 Wind 330 deg	40.34	-21.92	-38.74	-3736.13	2093.48	-2.22
- No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	99.37	0.00	0.00	3.12	8.94	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	99.37	0.02	-13.24	-1330.69	6.69	-1.36
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	99.37	6.59	-11.47	-1152.74	-652.57	-0.86
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	99.37	11.39	-6.66	-669.52	-1134.80	-0.03
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	99.37	13.16	-0.04	-3.67	-1312.78	0.75
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	99.37	11.38	6.63	671.88	-1132.70	1.31
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	99.37	6.55	11.48	1160.59	-646.15	1.63
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	99.37	-0.01	13.24	1336.77	11.99	1.50
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	99.37	-6.58	11.47	1159.07	671.23	0.95
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	99.37	-11.39	6.66	675.86	1152.83	0.09
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	99.37	-13.16	0.03	7.83	1331.23	-0.73
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	99.37	-11.39	-6.62	-663.95	1152.58	-1.31
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	99.37	-6.54	-11.48	-1154.24	664.00	-1.49
Dead+Wind 0 deg - Service	44.82	0.02	-9.69	-937.81	-2.32	-0.41
Dead+Wind 30 deg - Service	44.82	4.81	-8.40	-813.11	-463.55	-0.23
Dead+Wind 60 deg - Service	44.82	8.31	-4.88	-475.03	-800.72	0.11
Dead+Wind 90 deg - Service	44.82	9.60	-0.05	-7.15	-925.49	0.37
Dead+Wind 120 deg - Service	44.82	8.30	4.86	470.81	-798.31	0.51
Dead+Wind 150 deg - Service	44.82	4.76	8.41	814.73	-456.50	0.63
Dead+Wind 180 deg - Service	44.82	-0.02	9.69	937.84	3.62	0.57
Dead+Wind 210 deg - Service	44.82	-4.81	8.40	813.40	464.83	0.34
Dead+Wind 240 deg - Service	44.82	-8.31	4.89	475.33	801.35	-0.05
Dead+Wind 270 deg - Service	44.82	-9.60	0.03	5.20	926.55	-0.35
Dead+Wind 300 deg - Service	44.82	-8.30	-4.85	-468.86	800.85	-0.50
Dead+Wind 330 deg - Service	44.82	-4.76	-8.41	-814.43	456.94	-0.47

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-44.82	0.00	0.00	44.82	0.00	0.000%
2	0.09	-53.78	-44.65	-0.09	53.78	44.65	0.002%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
3	0.09	-40.34	-44.65	-0.09	40.34	44.65	0.002%
4	22.16	-53.78	-38.69	-22.16	53.78	38.69	0.000%
5	22.16	-40.34	-38.69	-22.16	40.34	38.69	0.000%
6	38.31	-53.78	-22.51	-38.31	53.78	22.51	0.000%
7	38.31	-40.34	-22.51	-38.31	40.34	22.51	0.000%
8	44.27	-53.78	-0.22	-44.26	53.78	0.22	0.005%
9	44.27	-40.34	-0.22	-44.26	40.34	0.22	0.004%
10	38.24	-53.78	22.39	-38.24	53.78	-22.39	0.000%
11	38.24	-40.34	22.39	-38.24	40.34	-22.39	0.000%
12	21.95	-53.78	38.75	-21.95	53.78	-38.75	0.000%
13	21.95	-40.34	38.75	-21.95	40.34	-38.75	0.000%
14	-0.08	-53.78	44.65	0.08	53.78	-44.65	0.002%
15	-0.08	-40.34	44.65	0.08	40.34	-44.65	0.004%
16	-22.15	-53.78	38.70	22.15	53.78	-38.70	0.000%
17	-22.15	-40.34	38.70	22.15	40.34	-38.70	0.000%
18	-38.28	-53.78	22.52	38.28	53.78	-22.52	0.000%
19	-38.28	-40.34	22.52	38.28	40.34	-22.52	0.000%
20	-44.25	-53.78	0.16	44.25	53.78	-0.16	0.002%
21	-44.25	-40.34	0.16	44.25	40.34	-0.16	0.004%
22	-38.27	-53.78	-22.33	38.27	53.78	22.33	0.000%
23	-38.27	-40.34	-22.33	38.27	40.34	22.33	0.000%
24	-21.92	-53.78	-38.74	21.92	53.78	38.74	0.000%
25	-21.92	-40.34	-38.74	21.92	40.34	38.74	0.000%
26	0.00	-99.37	0.00	-0.00	99.37	-0.00	0.001%
27	0.02	-99.37	-13.24	-0.02	99.37	13.24	0.000%
28	6.59	-99.37	-11.47	-6.59	99.37	11.47	0.000%
29	11.39	-99.37	-6.66	-11.39	99.37	6.66	0.000%
30	13.16	-99.37	-0.04	-13.16	99.37	0.04	0.000%
31	11.38	-99.37	6.63	-11.38	99.37	-6.63	0.000%
32	6.55	-99.37	11.48	-6.55	99.37	-11.48	0.000%
33	-0.01	-99.37	13.24	0.01	99.37	-13.24	0.000%
34	-6.58	-99.37	11.47	6.58	99.37	-11.47	0.000%
35	-11.39	-99.37	6.66	11.39	99.37	-6.66	0.000%
36	-13.16	-99.37	0.03	13.16	99.37	-0.03	0.000%
37	-11.39	-99.37	-6.62	11.39	99.37	6.62	0.000%
38	-6.54	-99.37	-11.48	6.54	99.37	11.48	0.000%
39	0.02	-44.82	-9.69	-0.02	44.82	9.69	0.003%
40	4.81	-44.82	-8.40	-4.81	44.82	8.40	0.001%
41	8.31	-44.82	-4.88	-8.31	44.82	4.88	0.001%
42	9.61	-44.82	-0.05	-9.60	44.82	0.05	0.003%
43	8.30	-44.82	4.86	-8.30	44.82	-4.86	0.001%
44	4.76	-44.82	8.41	-4.76	44.82	-8.41	0.001%
45	-0.02	-44.82	9.69	0.02	44.82	-9.69	0.003%
46	-4.81	-44.82	8.40	4.81	44.82	-8.40	0.001%
47	-8.31	-44.82	4.89	8.31	44.82	-4.89	0.001%
48	-9.60	-44.82	0.03	9.60	44.82	-0.03	0.003%
49	-8.31	-44.82	-4.85	8.30	44.82	4.85	0.001%
50	-4.76	-44.82	-8.41	4.76	44.82	8.41	0.001%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	16	0.00000001	0.00000000
2	Yes	17	0.00002650	0.00011354
3	Yes	17	0.00001771	0.00008351
4	Yes	22	0.00000001	0.00008086
5	Yes	21	0.00000001	0.00012271
6	Yes	22	0.00000001	0.00008039
7	Yes	21	0.00000001	0.00012200
8	Yes	16	0.00005543	0.00014622
9	Yes	16	0.00003759	0.00010058
10	Yes	22	0.00000001	0.00007939
11	Yes	21	0.00000001	0.00012064
12	Yes	22	0.00000001	0.00007893

13	Yes	21	0.00000001	0.00011980
14	Yes	17	0.00002650	0.00009704
15	Yes	16	0.00003750	0.00014220
16	Yes	22	0.00000001	0.00008061
17	Yes	21	0.00000001	0.00012236
18	Yes	22	0.00000001	0.00008094
19	Yes	21	0.00000001	0.00012294
20	Yes	17	0.00002656	0.00009023
21	Yes	16	0.00003759	0.00013160
22	Yes	22	0.00000001	0.00007920
23	Yes	21	0.00000001	0.00012027
24	Yes	22	0.00000001	0.00007839
25	Yes	21	0.00000001	0.00011901
26	Yes	6	0.00000001	0.00007211
27	Yes	20	0.00000001	0.00010532
28	Yes	20	0.00000001	0.00012662
29	Yes	20	0.00000001	0.00012670
30	Yes	20	0.00000001	0.00010359
31	Yes	20	0.00000001	0.00012599
32	Yes	20	0.00000001	0.00012556
33	Yes	20	0.00000001	0.00010506
34	Yes	20	0.00000001	0.00012798
35	Yes	20	0.00000001	0.00012739
36	Yes	20	0.00000001	0.00010436
37	Yes	20	0.00000001	0.00012666
38	Yes	20	0.00000001	0.00012751
39	Yes	15	0.00009465	0.00005726
40	Yes	16	0.00000001	0.00010589
41	Yes	16	0.00000001	0.00010257
42	Yes	15	0.00009465	0.00005287
43	Yes	16	0.00000001	0.00010263
44	Yes	16	0.00000001	0.00010170
45	Yes	15	0.00009464	0.00005597
46	Yes	16	0.00000001	0.00010479
47	Yes	16	0.00000001	0.00010522
48	Yes	15	0.00009464	0.00005327
49	Yes	16	0.00000001	0.00010252
50	Yes	16	0.00000001	0.00010038

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 140	22.83	39	1.237	0.004
L2	140 - 135	21.53	39	1.237	0.004
L3	135 - 130	20.24	39	1.236	0.004
L4	130 - 125	18.95	39	1.232	0.003
L5	125 - 120	17.66	39	1.226	0.003
L6	120 - 115	16.38	39	1.216	0.002
L7	115 - 110	15.11	39	1.200	0.002
L8	110 - 105	13.87	39	1.178	0.002
L9	105 - 100	12.65	39	1.148	0.001
L10	100 - 95	11.47	39	1.110	0.001
L11	95 - 90	10.33	39	1.063	0.001
L12	90 - 84.75	9.24	39	1.008	0.001
L13	89.25 - 84.25	9.09	39	0.999	0.001
L14	84.25 - 79.25	8.05	39	0.967	0.000
L15	79.25 - 74.25	7.07	39	0.907	0.000
L16	74.25 - 69.25	6.16	39	0.843	0.000
L17	69.25 - 64.25	5.31	39	0.774	0.000
L18	64.25 - 59.25	4.54	39	0.702	0.000
L19	59.25 - 58.08	3.84	39	0.627	0.000
L20	58.08 - 57.83	3.69	39	0.609	0.000
L21	57.83 - 52.83	3.66	39	0.606	0.000
L22	52.83 - 44.25	3.05	39	0.547	0.000
L23	49.5 - 43.25	2.69	39	0.507	0.000
L24	43.25 - 38.25	2.05	39	0.464	0.000

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L25	38.25 - 33.25	1.59	39	0.407	0.000
L26	33.25 - 31.25	1.19	39	0.349	0.000
L27	31.25 - 31	1.05	39	0.326	0.000
L28	31 - 26	1.04	39	0.323	0.000
L29	26 - 21	0.72	39	0.271	0.000
L30	21 - 16	0.47	39	0.218	0.000
L31	16 - 11	0.27	39	0.165	0.000
L32	11 - 6	0.12	39	0.111	0.000
L33	6 - 4.75	0.04	45	0.058	0.000
L34	4.75 - 4.5	0.02	45	0.044	0.000
L35	4.5 - 0	0.02	45	0.042	0.000

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.0000	VHLP2.5-11	39	21.28	1.237	0.004	390660
133.0000	LLPX310R-V1 w/ Mount Pipe	39	19.72	1.235	0.004	84666
124.0000	APXVSP18-C-A20 w/ Mount Pipe	39	17.40	1.224	0.003	31837
122.0000	800MHz 2X50W RRH W/FILTER	39	16.89	1.221	0.003	26156
114.0000	BXA-80063/4CFx5 w/ Mount Pipe	39	14.86	1.196	0.002	14169
105.0000	7770.00	39	12.65	1.148	0.001	8509
94.0000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	39	10.11	1.053	0.001	5459
87.0000	742 213	39	8.62	0.982	0.000	7207
80.0000	Side Arm Mount [SO 701-1]	39	7.22	0.918	0.000	4717
77.0000	Side Arm Mount [SO 701-1]	39	6.65	0.878	0.000	4403

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 140	105.67	2	5.730	0.019
L2	140 - 135	99.68	2	5.730	0.019
L3	135 - 130	93.69	2	5.725	0.016
L4	130 - 125	87.71	2	5.709	0.013
L5	125 - 120	81.75	2	5.680	0.012
L6	120 - 115	75.84	2	5.633	0.010
L7	115 - 110	69.99	2	5.560	0.008
L8	110 - 105	64.22	2	5.457	0.007
L9	105 - 100	58.59	2	5.319	0.005
L10	100 - 95	53.11	2	5.144	0.004
L11	95 - 90	47.84	2	4.927	0.003
L12	90 - 84.75	42.82	2	4.673	0.002
L13	89.25 - 84.25	42.09	2	4.631	0.002
L14	84.25 - 79.25	37.31	2	4.483	0.002
L15	79.25 - 74.25	32.77	2	4.206	0.002
L16	74.25 - 69.25	28.52	2	3.907	0.001
L17	69.25 - 64.25	24.60	2	3.588	0.001
L18	64.25 - 59.25	21.02	2	3.253	0.001
L19	59.25 - 58.08	17.79	2	2.904	0.001
L20	58.08 - 57.83	17.09	2	2.822	0.001
L21	57.83 - 52.83	16.94	2	2.808	0.001
L22	52.83 - 44.25	14.15	2	2.536	0.001
L23	49.5 - 43.25	12.44	2	2.348	0.001
L24	43.25 - 38.25	9.48	2	2.152	0.001
L25	38.25 - 33.25	7.37	2	1.886	0.001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L26	33.25 - 31.25	5.53	2	1.618	0.001
L27	31.25 - 31	4.88	2	1.510	0.001
L28	31 - 26	4.80	2	1.498	0.001
L29	26 - 21	3.36	2	1.257	0.001
L30	21 - 16	2.17	2	1.010	0.001
L31	16 - 11	1.24	2	0.763	0.001
L32	11 - 6	0.57	2	0.516	0.000
L33	6 - 4.75	0.16	14	0.266	0.000
L34	4.75 - 4.5	0.10	14	0.205	0.000
L35	4.5 - 0	0.09	14	0.194	0.000

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.0000	VHLP2.5-11	2	98.48	5.730	0.018	97759
133.0000	LLPX310R-V1 w/ Mount Pipe	2	91.29	5.720	0.015	19838
124.0000	APXVSPP18-C-A20 w/ Mount Pipe	2	80.57	5.672	0.011	7115
122.0000	800MHz 2X50W RRH W/FILTER	2	78.20	5.655	0.011	5822
114.0000	BXA-80063/4CFx5 w/ Mount Pipe	2	68.82	5.542	0.008	3129
105.0000	7770.00	2	58.59	5.319	0.005	1872
94.0000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	2	46.82	4.880	0.003	1197
87.0000	742 213	2	39.92	4.553	0.002	1576
80.0000	Side Arm Mount [SO 701-1]	2	33.43	4.254	0.002	1029
77.0000	Side Arm Mount [SO 701-1]	2	30.82	4.070	0.001	959

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KI/r	A in <sup>2</sup>	P <sub>u</sub> K
L1	145 - 140 (1)	TP24.9233x24x0.1875	5.0000	0.0000	0.0	14.720 9	-0.25
L2	140 - 135 (2)	TP25.8467x24.9233x0.1875	5.0000	0.0000	0.0	15.270 4	-0.56
L3	135 - 130 (3)	TP26.77x25.8467x0.1875	5.0000	0.0000	0.0	15.819 9	-2.70
L4	130 - 125 (4)	TP27.7092x26.77x0.25	5.0000	0.0000	0.0	21.788 9	-3.11
L5	125 - 120 (5)	TP28.6485x27.7092x0.25	5.0000	0.0000	0.0	22.534 2	-6.42
L6	120 - 115 (6)	TP29.5877x28.6485x0.25	5.0000	0.0000	0.0	23.279 4	-6.89
L7	115 - 110 (7)	TP30.5269x29.5877x0.25	5.0000	0.0000	0.0	24.024 7	-10.51
L8	110 - 105 (8)	TP31.4661x30.5269x0.25	5.0000	0.0000	0.0	24.770 0	-11.08
L9	105 - 100 (9)	TP32.4054x31.4661x0.25	5.0000	0.0000	0.0	25.515 3	-16.30
L10	100 - 95 (10)	TP33.3446x32.4054x0.25	5.0000	0.0000	0.0	26.260 6	-17.06
L11	95 - 90 (11)	TP34.2838x33.3446x0.25	5.0000	0.0000	0.0	27.005 8	-20.96

Section No.	Elevation ft	Size	L ft	$L_u$ ft	$Kl/r$	A $in^2$	$P_u$ K
L12	90 - 84.75 (12)	TP35.27x34.2838x0.25	5.2500	0.0000	0.0	27.117 6	-21.10
L13	84.75 - 84.25 (13)	TP34.8508x33.9247x0.31 25	5.0000	0.0000	0.0	34.257 7	-22.85
L14	84.25 - 79.25 (14)	TP35.777x34.8508x0.312 5	5.0000	0.0000	0.0	35.176 3	-24.08
L15	79.25 - 74.25 (15)	TP36.7031x35.777x0.312 5	5.0000	0.0000	0.0	36.095 0	-25.30
L16	74.25 - 69.25 (16)	TP37.6293x36.7031x0.31 25	5.0000	0.0000	0.0	37.013 6	-26.48
L17	69.25 - 64.25 (17)	TP38.5554x37.6293x0.31 25	5.0000	0.0000	0.0	37.932 2	-27.69
L18	64.25 - 59.25 (18)	TP39.4816x38.5554x0.31 25	5.0000	0.0000	0.0	38.850 8	-28.95
L19	59.25 - 58.08 (19)	TP39.6983x39.4816x0.31 25	1.1700	0.0000	0.0	39.065 8	-29.24
L20	58.08 - 57.83 (20)	TP39.7446x39.6983x0.41 25	0.2500	0.0000	0.0	51.496 5	-29.34
L21	57.83 - 52.83 (21)	TP40.6707x39.7446x0.41 88	5.0000	0.0000	0.0	53.499 4	-30.92
L22	52.83 - 44.25 (22)	TP42.26x40.6707x0.4125	8.5800	0.0000	0.0	53.516 7	-32.01
L23	44.25 - 43.25 (23)	TP41.82x40.6625x0.475	6.2500	0.0000	0.0	62.333 8	-35.42
L24	43.25 - 38.25 (24)	TP42.746x41.82x0.475	5.0000	0.0000	0.0	63.729 9	-37.24
L25	38.25 - 33.25 (25)	TP43.672x42.746x0.475	5.0000	0.0000	0.0	65.126 0	-39.09
L26	33.25 - 31.25 (26)	TP44.0424x43.672x0.475	2.0000	0.0000	0.0	65.684 4	-39.85
L27	31.25 - 31 (27)	TP44.0887x44.0424x0.53 75	0.2500	0.0000	0.0	74.299 5	-39.97
L28	31 - 26 (28)	TP45.0147x44.0887x0.53 75	5.0000	0.0000	0.0	75.879 3	-42.11
L29	26 - 21 (29)	TP45.9408x45.0147x0.52 5	5.0000	0.0000	0.0	75.678 6	-44.30
L30	21 - 16 (30)	TP46.8668x45.9408x0.52 5	5.0000	0.0000	0.0	77.221 6	-46.51
L31	16 - 11 (31)	TP47.7928x46.8668x0.52 5	5.0000	0.0000	0.0	78.764 7	-48.75
L32	11 - 6 (32)	TP48.7188x47.7928x0.51 88	5.0000	0.0000	0.0	79.362 0	-51.03
L33	6 - 4.75 (33)	TP48.9503x48.7188x0.51 88	1.2500	0.0000	0.0	79.743 1	-51.59
L34	4.75 - 4.5 (34)	TP48.9966x48.9503x0.61 25	0.2500	0.0000	0.0	94.062 3	-51.73
L35	4.5 - 0 (35)	TP49.83x48.9966x0.6	4.5000	0.0000	0.0	93.753 6	-53.77

### Pole Bending Design Data

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft
L1	145 - 140 (1)	TP24.9233x24x0.1875	1.08
L2	140 - 135 (2)	TP25.8467x24.9233x0.18 75	7.86
L3	135 - 130 (3)	TP26.77x25.8467x0.1875	27.31
L4	130 - 125 (4)	TP27.7092x26.77x0.25	52.96
L5	125 - 120 (5)	TP28.6485x27.7092x0.25	97.40
L6	120 - 115 (6)	TP29.5877x28.6485x0.25	151.73
L7	115 - 110 (7)	TP30.5269x29.5877x0.25	237.07
L8	110 - 105 (8)	TP31.4661x30.5269x0.25	327.85
L9	105 - 100 (9)	TP32.4054x31.4661x0.25	462.19
L10	100 - 95 (10)	TP33.3446x32.4054x0.25	598.74

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft
L11	95 - 90 (11)	TP34.2838x33.3446x0.25	762.52
L12	90 - 84.75 (12)	TP35.27x34.2838x0.25	787.60
L13	84.75 - 84.25 (13)	TP34.8508x33.9247x0.31 25	958.80
L14	84.25 - 79.25 (14)	TP35.777x34.8508x0.312 5	1135.05
L15	79.25 - 74.25 (15)	TP36.7031x35.777x0.312 5	1315.36
L16	74.25 - 69.25 (16)	TP37.6293x36.7031x0.31 25	1498.89
L17	69.25 - 64.25 (17)	TP38.5554x37.6293x0.31 25	1685.35
L18	64.25 - 59.25 (18)	TP39.4816x38.5554x0.31 25	1874.69
L19	59.25 - 58.08 (19)	TP39.6983x39.4816x0.31 25	1919.41
L20	58.08 - 57.83 (20)	TP39.7446x39.6983x0.41 25	1928.99
L21	57.83 - 52.83 (21)	TP40.6707x39.7446x0.41 88	2122.20
L22	52.83 - 44.25 (22)	TP42.26x40.6707x0.4125	2252.62
L23	44.25 - 43.25 (23)	TP41.82x40.6625x0.475	2501.58
L24	43.25 - 38.25 (24)	TP42.746x41.82x0.475	2704.43
L25	38.25 - 33.25 (25)	TP43.672x42.746x0.475	2910.15
L26	33.25 - 31.25 (26)	TP44.0424x43.672x0.475	2993.22
L27	31.25 - 31 (27)	TP44.0887x44.0424x0.53 75	3003.64
L28	31 - 26 (28)	TP45.0147x44.0887x0.53 75	3213.42
L29	26 - 21 (29)	TP45.9408x45.0147x0.52 5	3425.88
L30	21 - 16 (30)	TP46.8668x45.9408x0.52 5	3640.82
L31	16 - 11 (31)	TP47.7928x46.8668x0.52 5	3858.07
L32	11 - 6 (32)	TP48.7188x47.7928x0.51 88	4077.50
L33	6 - 4.75 (33)	TP48.9503x48.7188x0.51 88	4132.67
L34	4.75 - 4.5 (34)	TP48.9966x48.9503x0.61 25	4143.73
L35	4.5 - 0 (35)	TP49.83x48.9966x0.6	4343.77

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K
L1	145 - 140 (1)	TP24.9233x24x0.1875	0.44
L2	140 - 135 (2)	TP25.8467x24.9233x0.18 75	1.69
L3	135 - 130 (3)	TP26.77x25.8467x0.1875	4.89
L4	130 - 125 (4)	TP27.7092x26.77x0.25	5.38
L5	125 - 120 (5)	TP28.6485x27.7092x0.25	10.62
L6	120 - 115 (6)	TP29.5877x28.6485x0.25	11.12
L7	115 - 110 (7)	TP30.5269x29.5877x0.25	17.88
L8	110 - 105 (8)	TP31.4661x30.5269x0.25	18.44
L9	105 - 100 (9)	TP32.4054x31.4661x0.25	27.04
L10	100 - 95 (10)	TP33.3446x32.4054x0.25	27.59



Section No.	Elevation ft	Size	Actual $V_u$ K
L11	95 - 90 (11)	TP34.2838x33.3446x0.25	33.41
L12	90 - 84.75 (12)	TP35.27x34.2838x0.25	33.50
L13	84.75 - 84.25 (13)	TP34.8508x33.9247x0.31 25	34.93
L14	84.25 - 79.25 (14)	TP35.777x34.8508x0.312 5	35.73
L15	79.25 - 74.25 (15)	TP36.7031x35.777x0.312 5	36.43
L16	74.25 - 69.25 (16)	TP37.6293x36.7031x0.31 25	37.03
L17	69.25 - 64.25 (17)	TP38.5554x37.6293x0.31 25	37.61
L18	64.25 - 59.25 (18)	TP39.4816x38.5554x0.31 25	38.18
L19	59.25 - 58.08 (19)	TP39.6983x39.4816x0.31 25	38.32
L20	58.08 - 57.83 (20)	TP39.7446x39.6983x0.41 25	38.35
L21	57.83 - 52.83 (21)	TP40.6707x39.7446x0.41 88	38.99
L22	52.83 - 44.25 (22)	TP42.26x40.6707x0.4125	39.40
L23	44.25 - 43.25 (23)	TP41.82x40.6625x0.475	40.30
L24	43.25 - 38.25 (24)	TP42.746x41.82x0.475	40.89
L25	38.25 - 33.25 (25)	TP43.672x42.746x0.475	41.46
L26	33.25 - 31.25 (26)	TP44.0424x43.672x0.475	41.68
L27	31.25 - 31 (27)	TP44.0887x44.0424x0.53 75	41.71
L28	31 - 26 (28)	TP45.0147x44.0887x0.53 75	42.26
L29	26 - 21 (29)	TP45.9408x45.0147x0.52 5	42.78
L30	21 - 16 (30)	TP46.8668x45.9408x0.52 5	43.26
L31	16 - 11 (31)	TP47.7928x46.8668x0.52 5	43.70
L32	11 - 6 (32)	TP48.7188x47.7928x0.51 88	44.13
L33	6 - 4.75 (33)	TP48.9503x48.7188x0.51 88	44.25
L34	4.75 - 4.5 (34)	TP48.9966x48.9503x0.61 25	44.25
L35	4.5 - 0 (35)	TP49.83x48.9966x0.6	44.67

## TNX Section Forces

Increment (ft):		TNX Output			
	5	Section Height (ft)	P <sub>u</sub> (K)	M <sub>ux</sub> (kip-ft)	V <sub>u</sub> (K)
1	145 - 140	0.25	1.08	0.44	
2	140 - 135	0.56	7.86	1.69	
3	135 - 130	2.70	27.31	4.89	
4	130 - 125	3.11	52.96	5.38	
5	125 - 120	6.42	97.40	10.62	
6	120 - 115	6.89	151.73	11.12	
7	115 - 110	10.51	237.07	17.88	
8	110 - 105	11.08	327.84	18.44	
9	105 - 100	16.30	462.19	27.04	
10	100 - 95	17.06	598.73	27.59	
11	95 - 90	20.96	762.52	33.41	
12	90 - 89.25	21.10	787.60	33.50	
13	89.25 - 84.25	22.85	958.80	34.93	
14	84.25 - 79.25	24.08	1135.05	35.73	
15	79.25 - 74.25	25.30	1315.36	36.43	
16	74.25 - 69.25	26.48	1498.89	37.03	
17	69.25 - 64.25	27.69	1685.35	37.61	
18	64.25 - 59.25	28.95	1874.69	38.18	
19	59.25 - 58.08	29.24	1919.41	38.32	
20	58.08 - 57.83	29.34	1928.99	38.35	
21	57.83 - 52.83	30.92	2122.20	38.99	
22	52.83 - 49.5	32.01	2252.62	39.40	
23	49.5 - 43.25	35.42	2501.59	40.30	
24	43.25 - 38.25	37.24	2704.43	40.89	
25	38.25 - 33.25	39.09	2910.15	41.46	
26	33.25 - 31.25	39.85	2993.23	41.68	
27	31.25 - 31	39.97	3003.65	41.71	
28	31 - 26	42.11	3213.42	42.26	
29	26 - 21	44.30	3425.88	42.78	
30	21 - 16	46.51	3640.82	43.26	
31	16 - 11	48.75	3858.07	43.70	
32	11 - 6	51.03	4077.50	44.13	
33	6 - 4.75	51.59	4132.70	44.25	
34	4.75 - 4.5	51.73	4143.75	44.25	
35	4.5 - 0	53.77	4343.78	44.67	

# Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
145 - 140	Pole	TP24.923x24x0.1875	Pole	0.2%	Pass
140 - 135	Pole	TP25.847x24.923x0.1875	Pole	1.5%	Pass
135 - 130	Pole	TP26.77x25.847x0.1875	Pole	4.8%	Pass
130 - 125	Pole	TP27.709x26.77x0.25	Pole	5.9%	Pass
125 - 120	Pole	TP28.648x27.709x0.25	Pole	10.4%	Pass
120 - 115	Pole	TP29.588x28.648x0.25	Pole	15.1%	Pass
115 - 110	Pole	TP30.527x29.588x0.25	Pole	22.4%	Pass
110 - 105	Pole	TP31.466x30.527x0.25	Pole	29.2%	Pass
105 - 100	Pole	TP32.405x31.466x0.25	Pole	39.3%	Pass
100 - 95	Pole	TP33.345x32.405x0.25	Pole	48.4%	Pass
95 - 90	Pole	TP34.284x33.345x0.25	Pole	58.9%	Pass
90 - 89.25	Pole	TP35.27x34.284x0.25	Pole	60.4%	Pass
89.25 - 84.25	Pole	TP34.851x33.925x0.3125	Pole	53.6%	Pass
84.25 - 79.25	Pole	TP35.777x34.851x0.3125	Pole	60.5%	Pass
79.25 - 74.25	Pole	TP36.703x35.777x0.3125	Pole	67.0%	Pass
74.25 - 69.25	Pole	TP37.629x36.703x0.3125	Pole	73.1%	Pass
69.25 - 64.25	Pole	TP38.555x37.629x0.3125	Pole	78.9%	Pass
64.25 - 59.25	Pole	TP39.482x38.555x0.3125	Pole	84.2%	Pass
59.25 - 58.08	Pole	TP39.698x39.482x0.3125	Pole	85.5%	Pass
58.08 - 57.83	Pole + Reinf.	TP39.745x39.698x0.4125	Reinf. 2 Tension Rupture	84.9%	Pass
57.83 - 52.83	Pole + Reinf.	TP40.671x39.745x0.4188	Reinf. 2 Tension Rupture	89.8%	Pass
52.83 - 49.5	Pole + Reinf.	TP42.26x40.671x0.4125	Reinf. 2 Tension Rupture	92.8%	Pass
49.5 - 43.25	Pole + Reinf.	TP41.82x40.663x0.475	Reinf. 2 Tension Rupture	88.5%	Pass
43.25 - 38.25	Pole + Reinf.	TP42.746x41.82x0.475	Reinf. 2 Tension Rupture	92.0%	Pass
38.25 - 33.25	Pole + Reinf.	TP43.672x42.746x0.475	Reinf. 2 Tension Rupture	95.3%	Pass
33.25 - 31.25	Pole + Reinf.	TP44.042x43.672x0.475	Reinf. 2 Tension Rupture	96.6%	Pass
31.25 - 31	Pole + Reinf.	TP44.089x44.042x0.5375	Reinf. 1 Compression	76.1%	Pass
31 - 26	Pole + Reinf.	TP45.015x44.089x0.5375	Reinf. 1 Compression	78.7%	Pass
26 - 21	Pole + Reinf.	TP45.941x45.015x0.525	Reinf. 1 Compression	81.1%	Pass
21 - 16	Pole + Reinf.	TP46.867x45.941x0.525	Reinf. 1 Compression	83.3%	Pass
16 - 11	Pole + Reinf.	TP47.793x46.867x0.525	Reinf. 1 Compression	85.4%	Pass
11 - 6	Pole + Reinf.	TP48.719x47.793x0.5188	Reinf. 1 Compression	87.4%	Pass
6 - 4.75	Pole + Reinf.	TP48.95x48.719x0.5188	Reinf. 1 Compression	87.9%	Pass
4.75 - 4.5	Pole + Reinf.	TP48.997x48.95x0.6125	Reinf. 3 Connection	86.9%	Pass
4.5 - 0	Pole + Reinf.	TP49.83x48.997x0.6	Reinf. 3 Connection	88.6%	Pass
				Summary	
			Pole	85.5%	Pass
			Reinforcement	96.6%	Pass
			Overall	96.6%	Pass

## Additional Calculations

Section Elevation (ft)	Moment of Inertia (in <sup>4</sup> )			Area (in <sup>2</sup> )			% Capacity*			
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3
145 - 140	1138	n/a	1138	14.72	n/a	14.72	0.2%			
140 - 135	1270	n/a	1270	15.27	n/a	15.27	1.5%			
135 - 130	1412	n/a	1412	15.82	n/a	15.82	4.8%			
130 - 125	2075	n/a	2075	21.79	n/a	21.79	5.9%			
125 - 120	2295	n/a	2295	22.53	n/a	22.53	10.4%			
120 - 115	2531	n/a	2531	23.28	n/a	23.28	15.1%			
115 - 110	2781	n/a	2781	24.02	n/a	24.02	22.4%			
110 - 105	3048	n/a	3048	24.77	n/a	24.77	29.2%			
105 - 100	3332	n/a	3332	25.51	n/a	25.51	39.3%			
100 - 95	3632	n/a	3632	26.26	n/a	26.26	48.4%			
95 - 90	3951	n/a	3951	27.00	n/a	27.00	58.9%			
90 - 89.25	4000	n/a	4000	27.12	n/a	27.12	60.4%			
89.25 - 84.25	5161	n/a	5161	34.26	n/a	34.26	53.6%			
84.25 - 79.25	5588	n/a	5588	35.18	n/a	35.18	60.5%			
79.25 - 74.25	6037	n/a	6037	36.09	n/a	36.09	67.0%			
74.25 - 69.25	6510	n/a	6510	37.01	n/a	37.01	73.1%			
69.25 - 64.25	7006	n/a	7006	37.93	n/a	37.93	78.9%			
64.25 - 59.25	7528	n/a	7528	38.85	n/a	38.85	84.2%			
59.25 - 58.08	7653	n/a	7653	39.06	n/a	39.06	85.5%			
58.08 - 57.83	7749	2376	10125	39.11	18.00	57.11	69.0%		84.9%	
57.83 - 52.83	8311	2678	10989	40.03	18.00	58.03	72.5%		89.8%	
52.83 - 49.5	8696	2758	11455	40.64	18.00	58.64	75.3%		92.8%	
49.5 - 43.25	10776	2849	13624	49.33	18.00	67.33	66.8%		88.5%	
43.25 - 38.25	11511	2974	14486	50.43	18.00	68.43	69.8%		92.0%	
38.25 - 33.25	12280	3102	15383	51.53	18.00	69.53	72.7%		95.3%	
33.25 - 31.25	12597	3155	15751	51.97	18.00	69.97	73.8%		96.6%	
31.25 - 31	12721	5200	17921	52.03	31.88	83.90	66.4%	76.1%		
31 - 26	13542	5414	18956	53.13	31.88	85.01	68.9%	78.7%		
26 - 21	14398	5632	20030	54.23	31.88	86.11	71.4%	81.1%		
21 - 16	15289	5855	21143	55.33	31.88	87.21	73.8%	83.3%		
16 - 11	16215	6082	22297	56.44	31.88	88.31	76.0%	85.4%		
11 - 6	17179	6314	23493	57.54	31.88	89.41	78.2%	87.4%		
6 - 4.75	17426	6372	23798	57.81	31.88	89.69	78.7%	87.9%		
4.75 - 4.5	17329	10355	27684	57.87	31.88	89.74	65.8%			86.9%
4.5 - 0	18234	10656	28891	58.86	31.88	90.74	67.6%			88.6%

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

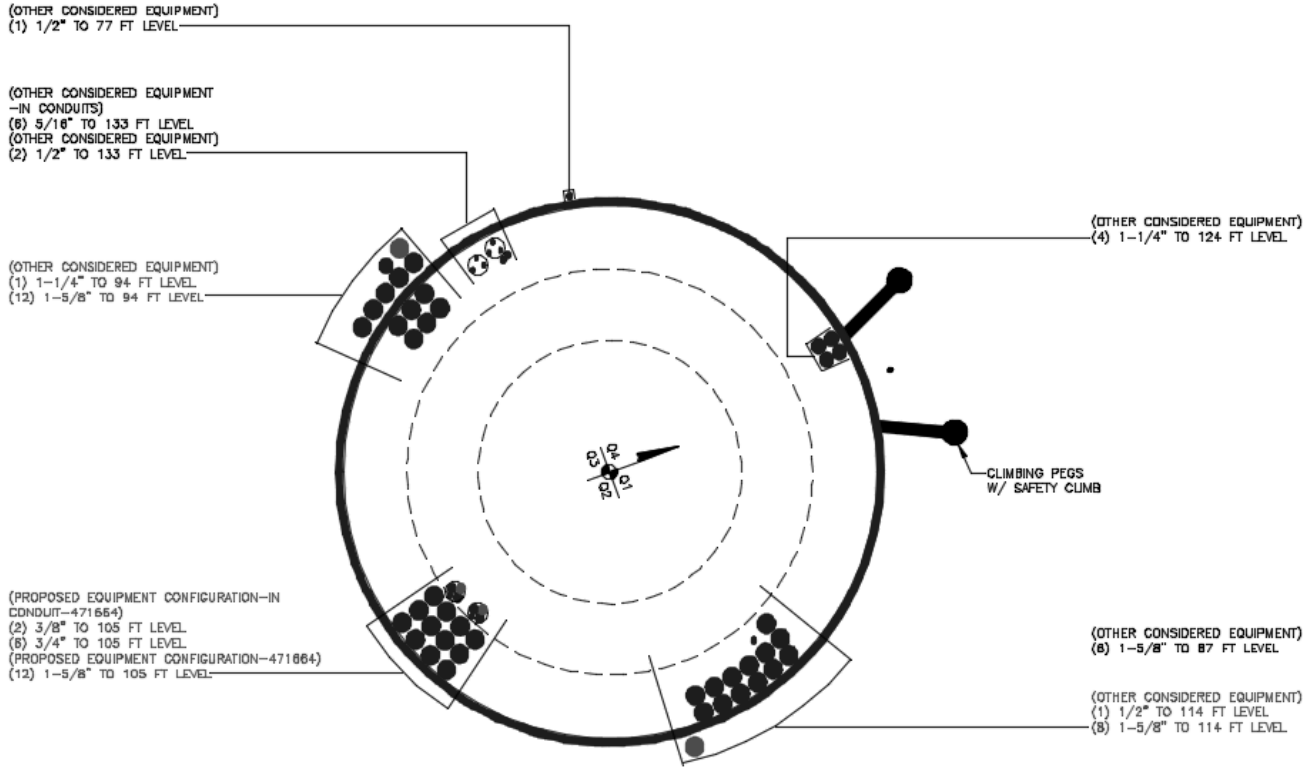


# TNX Geometry Input

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	145 - 140	5		18	24.000	24.923	0.1875	A607-65	1.000
2	140 - 135	5		18	24.923	25.847	0.1875	A607-65	1.000
3	135 - 130	5	0	18	25.847	26.770	0.1875	A607-65	1.000
4	130 - 125	5		18	26.770	27.709	0.25	A607-65	1.000
5	125 - 120	5		18	27.709	28.648	0.25	A607-65	1.000
6	120 - 115	5		18	28.648	29.588	0.25	A607-65	1.000
7	115 - 110	5		18	29.588	30.527	0.25	A607-65	1.000
8	110 - 105	5		18	30.527	31.466	0.25	A607-65	1.000
9	105 - 100	5		18	31.466	32.405	0.25	A607-65	1.000
10	100 - 95	5		18	32.405	33.345	0.25	A607-65	1.000
11	95 - 90	5		18	33.345	34.284	0.25	A607-65	1.000
12	90 - 89.25	5.25	4.5	18	34.284	35.270	0.25	A607-65	1.000
13	89.25 - 84.25	5		18	33.925	34.851	0.3125	A607-65	1.000
14	84.25 - 79.25	5		18	34.851	35.777	0.3125	A607-65	1.000
15	79.25 - 74.25	5		18	35.777	36.703	0.3125	A607-65	1.000
16	74.25 - 69.25	5		18	36.703	37.629	0.3125	A607-65	1.000
17	69.25 - 64.25	5		18	37.629	38.555	0.3125	A607-65	1.000
18	64.25 - 59.25	5		18	38.555	39.482	0.3125	A607-65	1.000
19	59.25 - 58.08	1.17		18	39.482	39.698	0.3125	A607-65	1.000
20	58.08 - 57.83	0.25		18	39.698	39.745	0.4125	A607-65	1.109
21	57.83 - 52.83	5		18	39.745	40.671	0.41875	A607-65	1.085
22	52.83 - 49.5	8.58	5.25	18	40.671	42.260	0.4125	A607-65	1.096
23	49.5 - 43.25	6.25		18	40.663	41.820	0.475	A607-65	1.080
24	43.25 - 38.25	5		18	41.820	42.746	0.475	A607-65	1.074
25	38.25 - 33.25	5		18	42.746	43.672	0.475	A607-65	1.068
26	33.25 - 31.25	2		18	43.672	44.042	0.475	A607-65	1.065
27	31.25 - 31	0.25		18	44.042	44.089	0.5375	A607-65	1.129
28	31 - 26	5		18	44.089	45.015	0.5375	A607-65	1.120
29	26 - 21	5		18	45.015	45.941	0.525	A607-65	1.138
30	21 - 16	5		18	45.941	46.867	0.525	A607-65	1.129
31	16 - 11	5		18	46.867	47.793	0.525	A607-65	1.121
32	11 - 6	5		18	47.793	48.719	0.51875	A607-65	1.127
33	6 - 4.75	1.25		18	48.719	48.950	0.51875	A607-65	1.125
34	4.75 - 4.5	0.25		18	48.950	48.997	0.6125	A607-65	0.954
35	4.5 - 0	4.5		18	48.997	49.830	0.6	A607-65	0.968

### APPENDIX B BASE LEVEL DRAWING

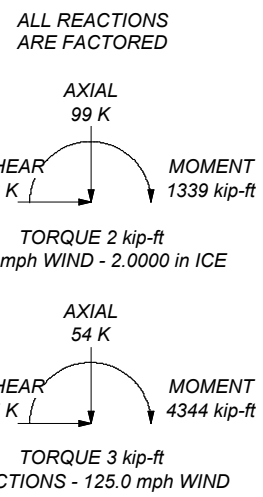
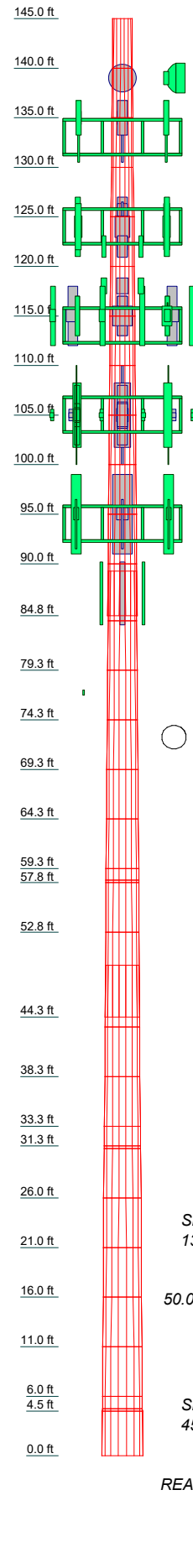


BUSINESS UNIT: 881364 TOWER ID: C\_BASELEVEL

**APPENDIX C**  
**ADDITIONAL CALCULATIONS**



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
2		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
3		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
4		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
5		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
6		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
7		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
8		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
9		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
10		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
11		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
12		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
13		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
14		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
15		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
16		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
17		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
18		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
19		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
20		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
21		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
22		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
23		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
24		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
25		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
26		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
27		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
28		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
29		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
30		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
31		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
32		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
33		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
34		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6
35		18	0.1875	4.5000	48.9408	49.8868	A607-65	24.6



**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125.0 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50.0 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TIA-222-H Annex S.

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

Job: **145 ft Monopole / Newington**  
 Project: **PJF 37519-0951.001.7805 / BU 881364**  
 Client: Crown Castle | Drawn by: Allen R. Bonham, EI | App'd:  
 Code: TIA-222-H | Date: 03/14/19 | Scale: NTS  
 Path: | Dwg No. E-1

# Monopole Flange Plate Connection

Elevation = 130 ft.

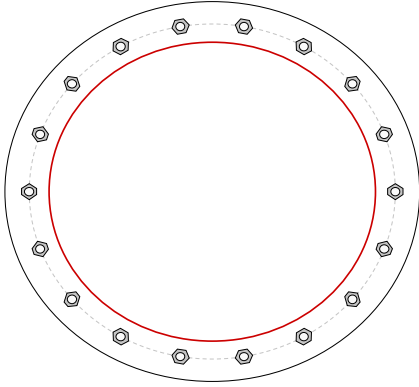


BU #	8881364
Site Name	Newington
Order #	
TIA-222 Revision	H

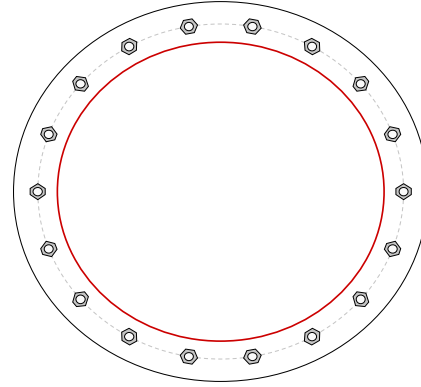
Applied Loads	
Moment (kip-ft)	27.31
Axial Force (kips)	2.70
Shear Force (kips)	4.89

\*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



### Connection Properties

#### Bolt Data

(18) 3/4"  $\phi$  bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 30" BC

#### Top Plate Data

34" OD x 1.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

#### Bottom Plate Data

34" OD x 1.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

#### Top Stiffener Data

N/A

#### Bottom Stiffener Data

N/A

#### Top Pole Data

26.77" x 0.1875" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

#### Bottom Pole Data

26.77" x 0.25" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

### Analysis Results

#### Bolt Capacity

Max Load (kips)	2.28
Allowable (kips)	30.06
Stress Rating:	7.2% <b>Pass</b>

#### Top Plate Capacity

Max Stress (ksi):	1.00	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	2.1%	<b>Pass</b>
Tension Side Stress Rating:	1.0%	<b>Pass</b>

#### Bottom Plate Capacity

Max Stress (ksi):	1.00	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	2.1%	<b>Pass</b>
Tension Side Stress Rating:	1.0%	<b>Pass</b>

# Monopole Base Plate Connection

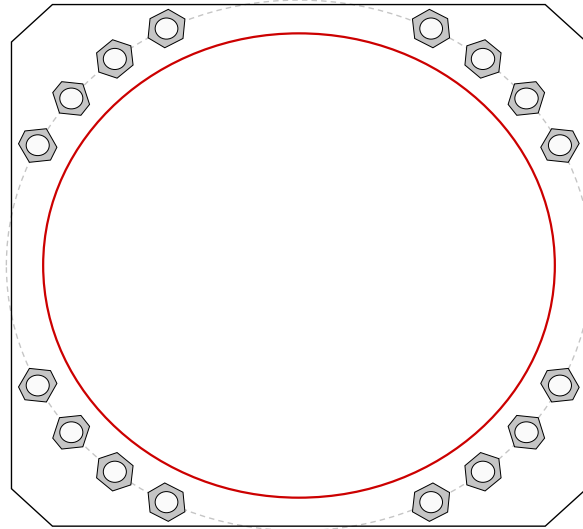


Site Info	
BU #	8881364
Site Name	Newington
Order #	

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$I_{ar}$ (in)	0.75

Applied Loads	
Moment (kip-ft)	4343.78
Axial Force (kips)	53.77
Shear Force (kips)	44.67

\*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
-----------------------	------------------

**Anchor Rod Data**  
 (16) 2-1/4"  $\phi$  bolts (A615-75 N;  $F_y=75$  ksi,  $F_u=100$  ksi) on 57" BC  
 Anchor Spacing: 6 in

**Base Plate Data**  
 56" OD x 3" Plate (A572-50;  $F_y=50$  ksi,  $F_u=65$  ksi)

**Stiffener Data**  
 N/A

**Pole Data**  
 49.83" x 0.375" 18-sided pole (A607-65;  $F_y=65$  ksi,  $F_u=80$  ksi)

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

$Pu_c = 231.83$	$\phi Pn_c = 243.75$	<b>Stress Rating</b>
$Vu = 2.79$	$\phi Vn = 73.13$	<b>90.7%</b>
$Mu = n/a$	$\phi Mn = n/a$	<b>Pass</b>

**Base Plate Summary**

Max Stress (ksi):	38.4	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	<b>81.3%</b>	<b>Pass</b>

## Drilled Pier Foundation

BU #:	881364
Site Name:	Newington
Order Number:	

TIA-222 Revison:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	4344	
Axial Force (kips)	54	
Shear Force (kips)	45	

Material Properties		
Concrete Strength, f <sub>c</sub> :	3	ksi
Rebar Strength, F <sub>y</sub> :	60	ksi

Pier Design Data		
Depth	25	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
<i>From 0.5' above grade to 25' below grade</i>		
Pier Diameter	7	ft
Rebar Quantity	28	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity	Compression	Uplift
D <sub>v=0</sub> (ft from TOC)	6.43	-
Soil Safety Factor	1.98	-
Max Moment (kip-ft)	4592.89	-
Rating*	64.1%	-
Soil Vertical Capacity	Compression	Uplift
Skin Friction (kips)	184.54	-
End Bearing (kips)	173.18	-
Weight of Concrete (kips)	133.42	-
Total Capacity (kips)	357.72	-
Axial (kips)	187.42	-
Rating*	49.9%	-
Reinforced Concrete Capacity	Compression	Uplift
Critical Depth (ft from TOC)	6.36	-
Critical Moment (kip-ft)	4592.83	-
Critical Moment Capacity	6701.33	-
Rating*	65.3%	-
<b>Soil Interaction Rating*</b>		<b>64.1%</b>
<b>Structural Foundation Rating*</b>		<b>65.3%</b>

\*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
	N/A <input type="checkbox"/>

Soil Profile			
Groundwater Depth	10	ft	# of Layers
			4

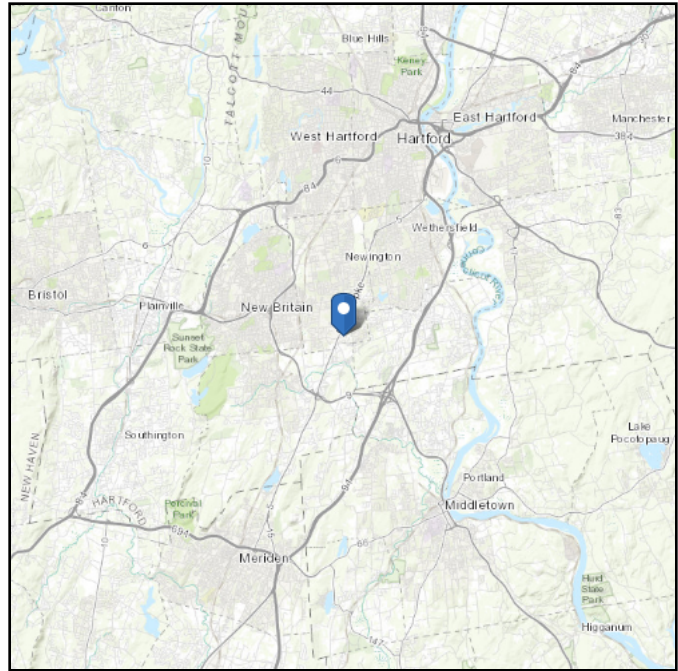
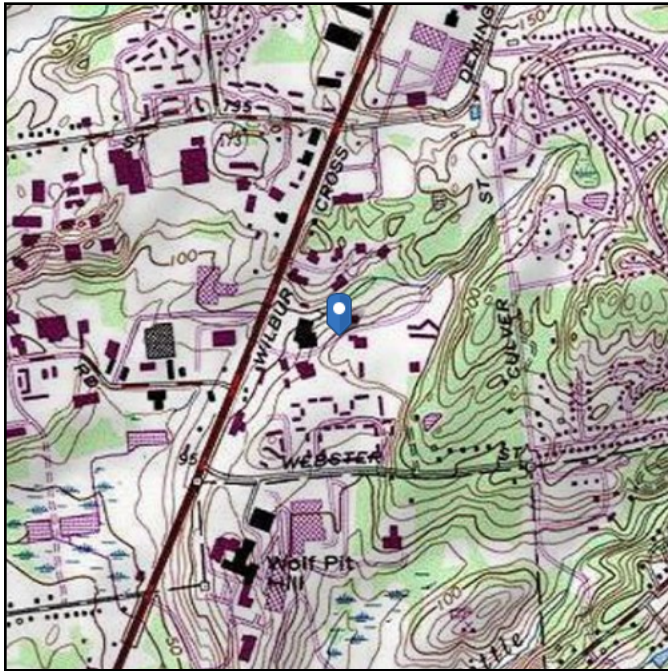
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ <sub>soil</sub> (pcf)	γ <sub>concrete</sub> (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	4	4	125	150			0.000	0.000					Cohesionless
2	4	10	6	125	150		34	0.467	0.467				7	Cohesionless
3	10	12	2	62.6	87.6		34	0.645	0.645				7	Cohesionless
4	12	25	13	62.6	87.6		30	0.546	0.546			6	5	Cohesionless

# ASCE 7 Hazards Report

**Address:**  
123 Costello Rd  
Newington, Connecticut  
06111

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

**Elevation:** 139.55 ft (NAVD 88)  
**Latitude:** 41.655875  
**Longitude:** -72.722286



## Wind

### Results:

Wind Speed:	123 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	93 Vmph
100-year MRI	100 Vmph

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

**Date Accessed:** Thu Mar 14 2019

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

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

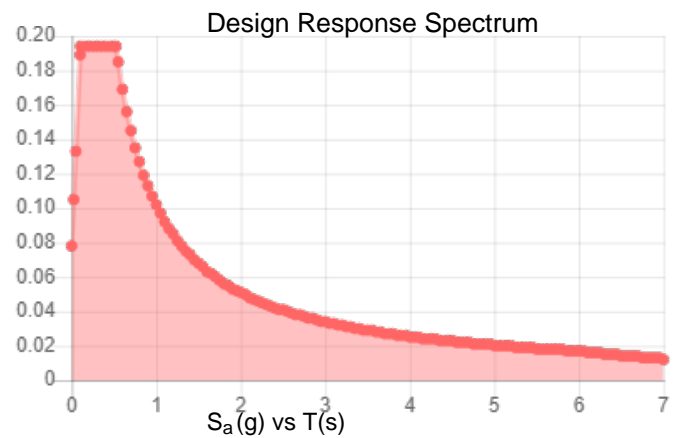
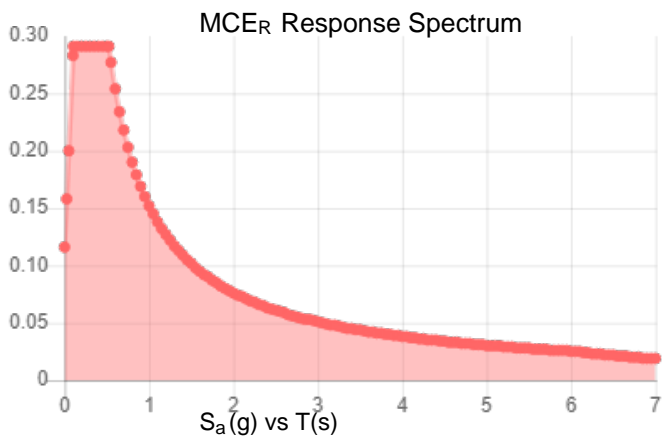
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_S$ :	0.182	$S_{DS}$ :	0.194
$S_1$ :	0.063	$S_{D1}$ :	0.102
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.092
$S_{MS}$ :	0.291	PGA <sub>M</sub> :	0.148
$S_{M1}$ :	0.152	F <sub>PGA</sub> :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Thu Mar 14 2019

**Date Source:**

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

## Ice

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### Results:

Ice Thickness: 1.00 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

**Date Accessed:** Thu Mar 14 2019

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

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

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