



December 30, 2014

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

**RE: T-Mobile-Exempt Modification - Crown Site BU: 823666
T-Mobile Site ID: CT11237C
Located at: 15 Pent Rd, Deep River, CT 06417**

Dear Ms. Bachman:

This letter is submitted on behalf of T-Mobile. T-Mobile is making modifications to certain existing sites in its Connecticut system in order to implement their 700MHz technology. Please accept this letter as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Richard Smith, First Selectman for Town of Deep River, and Stalsburg Express Inc., Property Owner.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **15 Pent Rd, Deep River, CT 06417**. **T-Mobile received the Connecticut Siting Council acknowledgement on November 3, 2014. However the proposed lines of coax will not fit inside of the monopole. T-Mobile now proposes to install the coax lines on the outside of the monopole.** Per email received on 12/22/14 I have enclosed a revised structural analysis showing sufficient capacity for the modification. No other changes are proposed to the last approval.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") § 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in the R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. T-Mobile's replacement antennas will be located at the same elevation on the existing tower.
2. There will be no proposed modifications to the ground and no extension of boundaries.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard.
5. A Structural Modification Report confirming that the tower and foundation can support T-Mobile's proposed modifications.

For the foregoing reasons, T-Mobile respectfully submits the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,



Jerry Feathers
Real Estate Specialist

Enclosure

cc: The Honorable Richard Smith
Town of Deep River
174 Main Street
Deep River, CT 06417

cc: Stalsburg Express Inc.
15 Pent Rd
Deep River, CT 06417

Feathers, Jerry (Contractor)

From: Mercier, Robert <Robert.Mercier@ct.gov>
Sent: Monday, December 22, 2014 1:22 PM
To: Feathers, Jerry (Contractor)
Cc: Bachman, Melanie
Subject: FW: Town of Deep River-CT11237C-Crown 823666.T-Mobile 700 MHz.exempt modification
Attachments: CT11237C.823666.T-Mobile 700 MHz.CSC filing.10.14.2014.pdf

Jerry,
I understand there is a slight change to the above exempt modification that was acknowledged by the Council on 11/3/14, specifically the reroute of the coax to the exterior of the monopole. Please submit a cover letter describing the reason for the change and a revised structural analysis to account for this change.
No other supporting documents are contemplated at this time. A filing fee is not required.

Thank you

From: Feathers, Jerry (Contractor) [<mailto:Jerry.Feathers.Contractor@crowncastle.com>]
Sent: Tuesday, October 14, 2014 1:37 PM
To: CSC-DL Siting Council
Cc: Richard, Mark; Tisi, Peter; Helton, Heather (Contractor)
Subject: Town of Deep River-CT11237C-Crown 823666.T-Mobile 700 MHz.exempt modification

Good Afternoon –
Attached Exempt Modification package was mailed today via FedEx for delivery on 10/15/14 for T-Mobile Site CT11237C located at 15 Pent Road, Deep River, CT. If you have any questions, please do not hesitate to contact me.
Sincerely

JERRY FEATHERS
Real Estate Specialist/ East Area
T:704-405-6549 M: 303-859-1341 F:724-416-6484

CROWN CASTLE
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
CrownCastle.com

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CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.govwww.ct.gov/csc

November 3, 2014

Jerry Feathers
Real Estate Specialist
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

RE: **EM-T-MOBILE-036-141015** – T-Mobile notice of intent to modify an existing telecommunications facility located at 15 Pent Road, Deep River, Connecticut.

Dear Mr. Feathers:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by T-Mobile shall be removed within 60 days of the date the antenna ceased to function;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated October 14, 2014. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.



This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,



Melanie A. Bachman
Acting Executive Director

MAB/RM/lm

c: The Honorable Richard H. Smith, First Selectman, Town of Deep River
Cathie Jefferson, Zoning Enforcement Officer, Town of Deep River
Stalsburg Express Inc.

Date: **December 23, 2014**

Darcy Tarr
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277



Subject: Structural Analysis Report

Carrier Designation: *T-Mobile Co-Locate*
Carrier Site Number: CT11237C

Crown Castle Designation: **Crown Castle BU Number:** 823666
Crown Castle Site Name: Deep River/Rt 9
Crown Castle JDE Job Number: 302454
Crown Castle Work Order Number: 984029
Crown Castle Application Number: 261532 Rev. 7

Engineering Firm Designation: **AW Solutions, Inc. Project Number:** 823666

Site Data: **15 Pent Rd., Deep River, Middlesex County, CT**
Latitude 41° 22' 22.17", Longitude -72° 26' 3.97"
178 Foot - Monopole Tower

Darcy Tarr,

AW Solutions, Inc. is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 741346, in accordance with application 261532, revision 7.

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: Installed + Reserved + Proposed Equipment

Sufficient Capacity

Note: See Table I and Table II for the proposed, reserved, and existing loading, respectively.

This analysis has been performed in accordance with the TIA-222-F standard and 2005 CT State Building Code based upon a wind speed of 85 mph fastest mile.

We at AW Solutions, Inc. appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Joseph Jimenez, EI / AL
Respectfully submitted by:



12/24/14

Alan Lockrem, PE
Director of Engineering

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1) INTRODUCTION

This tower is a 178 ft Monopole tower designed by PIROD MANUFACTURES INC. in August of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.62 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
178.0	177.0	3	commscope	ATBT-BOTTOM-24V	6	1-5/8	-
		3	commscope	LNx-6515DS-VTM w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
178.0	178.0	1	tower mounts	Platform Mount [LP 405-1]	6	1-5/8	1
		1	tower mounts	Side Arm Mount [SO 310-3]			
	177.0	3	allgon	7221.14 w/ Mount Pipe	-	-	3
		1	andrew	ETW190VS12UB	-	-	1
		3	andrew	ETW190VS12UB			
		3	ems wireless	RR90-17-02DP w/ Mount Pipe			
170.0	170.0	3	alcatel lucent	RRH2X40-AWS	1	1-5/8	2
		3	andrew	HBX-6517DS-VTM w/ Mount Pipe			
		3	andrew	LNx-6514DS-VTM w/ Mount Pipe			
		3	antel	BXA-171085-8BF-EDIN-0 w/ Mount Pipe	12	1-5/8	1
		3	antel	BXA-70063/6CF w/ Mount Pipe			
		1	rfs celwave	DB-B1-6C-8AB-0Z	-	-	2
		6	rfs celwave	FD9R6004/2C-3L	-	-	1
		1	tower mounts	Platform Mount [LP 303-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	160.0	1	commscope	SBNH-1D6565C w/ Mount Pipe	12	1-5/8	1
		6	ericsson	RRUS 11			
		2	kmw communications	AM-X-CD-17-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	219nn			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 303-1]			
150.0	150.0	3	kathrein	742 213	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 602-3]			

- Notes:
 1) Existing equipment
 2) Reserved equipment
 3) Equipment To Be Removed

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
-						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, PE	3585271	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PIROD	3845247	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PIROD	3585272	CCISITES
4-STRUCTURAL ANALYSIS	Pier Structural Engineering Corp.	5310832	CCISITES

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
- 5) Plate data was determined based on previous analysis. Document # 5310832

This analysis may be affected if any assumptions are not valid or have been made in error. AW Solutions, Inc. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	178 - 164.25	Pole	TP26x12.75x0.25	1	-4.13	946.29	13.7	Pass
L2	164.25 - 129.667	Pole	TP34.0625x22.6894x0.3125	2	-10.46	1680.35	53.1	Pass
L3	129.667 - 96	Pole	TP41.75x32.2749x0.375	3	-16.90	2487.22	62.8	Pass
L4	96 - 63.1667	Pole	TP49.0625x39.8209x0.375	4	-24.63	2928.79	73.1	Pass
L5	63.1667 - 31.1667	Pole	TP56.125x46.9571x0.375	5	-33.49	3355.12	79.3	Pass
L6	31.1667 - 0	Pole	TP62.9375x53.847x0.375	6	-45.47	3684.96	87.6	Pass
							Summary	
						Pole (L6)	87.6	Pass
						RATING =	87.6	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	78.2	Pass
1	Base Foundation	0	79.7	Pass

Structure Rating (max from all components) =	87.6%
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A
TNXTOWER OUTPUT

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 5/8" x 4' on 4' Pole	178	HBX-6517DS-VTM w/ Mount Pipe	170
RR90-17-02DP w/ Mount Pipe	178	HBX-6517DS-VTM w/ Mount Pipe	170
RR90-17-02DP w/ Mount Pipe	178	RRH2X40-AWS	170
RR90-17-02DP w/ Mount Pipe	178	RRH2X40-AWS	170
ETW190VS12UB	178	RRH2X40-AWS	170
ETW190VS12UB	178	DB-B1-6C-8AB-0Z	170
ETW190VS12UB	178	Platform Mount [LP 303-1]	170
LNX-6515DS-VTM w/ Mount Pipe	178	(2) 7770.00 w/ Mount Pipe	160
LNX-6515DS-VTM w/ Mount Pipe	178	(2) 7770.00 w/ Mount Pipe	160
LNX-6515DS-VTM w/ Mount Pipe	178	(2) 7770.00 w/ Mount Pipe	160
ATBT-BOTTOM-24V	178	AM-X-CD-17-65-00T-RET w/ Mount Pipe	160
ATBT-BOTTOM-24V	178	AM-X-CD-17-65-00T-RET w/ Mount Pipe	160
ATBT-BOTTOM-24V	178	AM-X-CD-17-65-00T-RET w/ Mount Pipe	160
Platform Mount [LP 405-1]	178	SBNH-1D6565C w/ Mount Pipe	160
Side Arm Mount [SO 310-3]	178	(2) 219nn	160
BXA-70063/6CF w/ Mount Pipe	170	(2) 219nn	160
BXA-70063/6CF w/ Mount Pipe	170	(2) 219nn	160
BXA-70063/6CF w/ Mount Pipe	170	(2) LGP21401	160
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	170	(2) LGP21401	160
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	170	(2) LGP21401	160
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	170	(2) RRUS 11	160
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	170	(2) RRUS 11	160
(2) FD9R6004/2C-3L	170	DC6-48-60-18-8F	160
(2) FD9R6004/2C-3L	170	Platform Mount [LP 303-1]	160
(2) FD9R6004/2C-3L	170	742 213	150
LNX-6514DS-VTM w/ Mount Pipe	170	742 213	150
LNX-6514DS-VTM w/ Mount Pipe	170	742 213	150
LNX-6514DS-VTM w/ Mount Pipe	170	Pipe Mount [PM 602-3]	150
HBX-6517DS-VTM w/ Mount Pipe	170		

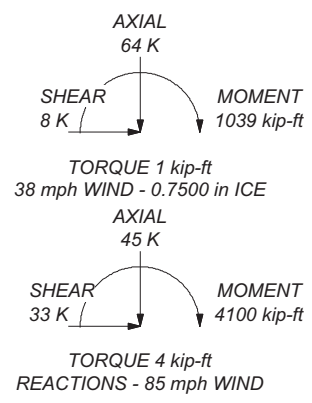
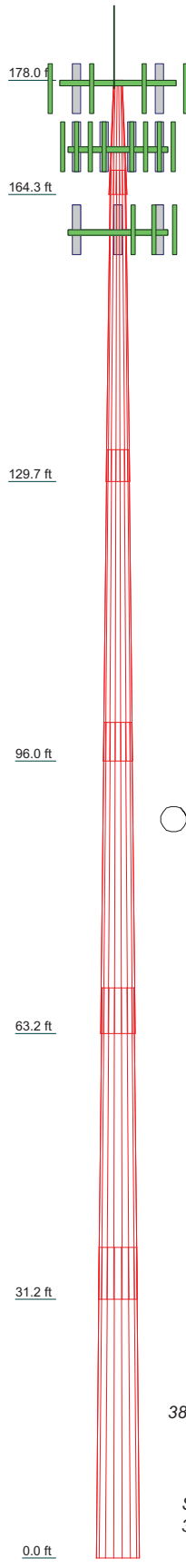
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 87.6%

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	139'	18	0.2500	2'11-1/32"	12.7500	26.0000		0.7
2	376"	18	0.3125	3'9-31/32"	22.6894	34.0625		3.6
3	376"	18	0.3750	4'8-1/32"	32.2749	41.7500	A572-65	5.6
4	376"	18	0.3750	5'6"	39.8209	49.0625		6.7
5	376"	18	0.3750	6'3"	46.9571	56.1250		7.8
6	375'-1/32"	18	0.3750	53.8470	62.9375			8.8
								33.1



<p>AW Solutions, Inc. 300 Crown Oak Centre Dr Longwood, FL 32750 Phone: (407) 260-0231 FAX: (407) 260-0749</p>	<p>Job: BU 823666</p> <p>Project: WO 984029</p>	<p>Client: CROWN CASTLE</p> <p>Code: TIA/EIA-222-F</p> <p>Path:</p>	<p>Drawn by: Joseph Jimenez</p> <p>Date: 12/24/14</p>	<p>App'd:</p> <p>Scale: NTS</p> <p>Dwg No. E-1</p>
	<p><small>R:\Central_Data\CROWN CASTLE\CRC - STRUCTURAL\BU823666 - W0984029\ENGINEERING\BU 823666 W0 984029.dwg</small></p>			

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- 1) Tower is located in Middlesex County, Connecticut.
- 2) Basic wind speed of 85 mph.
- 3) Nominal ice thickness of 0.7500 in.
- 4) Ice thickness is considered to increase with height.
- 5) Ice density of 56 pcf.
- 6) A wind speed of 38 mph is used in combination with ice.
- 7) Temperature drop of 50 °F.
- 8) Deflections calculated using a wind speed of 50 mph.
- 9) A non-linear (P-delta) analysis was used.
- 10) Pressures are calculated at each section.
- 11) Stress ratio used in pole design is 1.333.
- 12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys √ Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination	Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption	Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feedline Torque Include Angle Block Shear Check <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
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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	178'-164'3"	13'9"	2'11-1/32"	18	12.7500	26.0000	0.2500	1.0000	A572-65 (65 ksi)
L2	164'3"-129'8-1/32"	37'6"	3'9-31/32"	18	22.6894	34.0625	0.3125	1.2500	A572-65 (65 ksi)
L3	129'8-1/32"-96'	37'6"	4'8-1/32"	18	32.2749	41.7500	0.3750	1.5000	A572-65 (65 ksi)
L4	96'-63'2-1/32"	37'6"	5'6"	18	39.8209	49.0625	0.3750	1.5000	A572-65 (65 ksi)
L5	63'2-1/32"-31'2-1/32"	37'6"	6'3"	18	46.9571	56.1250	0.3750	1.5000	A572-65 (65 ksi)
L6	31'2-1/32"-0'	37'5-1/32"		18	53.8470	62.9375	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	12.9467	9.9187	195.8008	4.4375	6.4770	30.2302	391.8592	4.9603	1.8040	7.216
	26.4011	20.4326	1711.6544	9.1412	13.2080	129.5922	3425.5610	10.2183	4.1360	16.544
L2	23.9376	22.1951	1404.0863	7.9438	11.5262	121.8168	2810.0202	11.0996	3.4433	11.019
	34.5880	33.4758	4817.4335	11.9812	17.3038	278.4040	9641.2058	16.7411	5.4450	17.424
L3	33.7563	37.9689	4881.3984	11.3245	16.3957	297.7251	9769.2198	18.9880	5.0204	13.388
	42.3941	49.2466	10650.982	14.6881	21.2090	502.1916	21315.979	24.6280	6.6880	17.835
L4	41.6030	46.9505	9229.5502	14.0033	20.2290	456.2533	18471.244	23.4797	6.3485	16.929
	49.8194	57.9503	17355.137	17.2841	24.9238	696.3293	34733.111	28.9807	7.9750	21.267
L5	49.0468	55.4443	15199.586	16.5366	23.8542	637.1873	30419.172	27.7274	7.6044	20.279
	56.9908	66.3564	26056.150	19.7913	28.5115	913.8821	52146.586	33.1845	9.2180	24.581
L6	56.2196	63.6451	22990.857	18.9826	27.3543	840.4848	46011.967	31.8286	8.8171	23.512
	63.9084	74.4650	36822.894	22.2097	31.9722	1151.7142	73694.241	37.2396	10.4170	27.779

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in
L1 178'-164'3"				1	1	1		
L2 164'3"-129'8-1/32"				1	1	1		
L3 129'8-1/32"-96'				1	1	1		
L4 96'-63'2-1/32"				1	1	1		
L5 63'2-1/32"-31'2-1/32"				1	1	1		
L6 31'2-1/32"-0'				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf	
LDF7-50A(1-5/8")	C	No	Inside Pole	178' - 0'	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	178' - 0'	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	178' - 0'	5	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
**								
LDF7-50A(1-5/8")	A	No	Inside Pole	170' - 0'	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
HB158-1-08U8-S8J18(A	No	Inside Pole	170' - 0'	1	No Ice	0.00	1.30

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
1-5/8)						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30
**								
LDF7-50A(1-5/8")	A	No	Inside Pole	160' - 0'	7	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A(1-5/8") (shielded)	A	No	CaAa (Out Of Face)	160' - 0'	4	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	160' - 0'	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
**								
LDF7-50A(1-5/8")	B	No	Inside Pole	150' - 0'	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
Safety Line 5/8	C	No	CaAa (Out Of Face)	0' - 0'	1	No Ice	0.09	0.40
						1/2" Ice	0.19	1.24
						1" Ice	0.29	2.70
						2" Ice	0.49	7.44
						4" Ice	0.89	24.25

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	178'-164'3"	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.723	0.14
L2	164'3"-129'8-1/32"	A	0.000	0.000	0.000	6.006	0.58
		B	0.000	0.000	0.000	0.000	0.10
		C	0.000	0.000	0.000	6.848	0.34
L3	129'8-1/32"-96'	A	0.000	0.000	0.000	6.666	0.60
		B	0.000	0.000	0.000	0.000	0.17
		C	0.000	0.000	0.000	6.666	0.33
L4	96'-63'2-1/32"	A	0.000	0.000	0.000	6.501	0.58
		B	0.000	0.000	0.000	0.000	0.16
		C	0.000	0.000	0.000	6.501	0.32
L5	63'2-1/32"-31'2-1/32"	A	0.000	0.000	0.000	6.336	0.57
		B	0.000	0.000	0.000	0.000	0.16
		C	0.000	0.000	0.000	6.336	0.31
L6	31'2-1/32"-0'	A	0.000	0.000	0.000	6.171	0.55
		B	0.000	0.000	0.000	0.000	0.15
		C	0.000	0.000	0.000	6.171	0.31

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	178'-164'3"	A	0.913	0.000	0.000	0.000	0.000	0.06
		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 ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L2	164'3"-129'8-1/32"	C	0.897	0.000	0.000	0.000	5.234	0.41
		A		0.000	0.000	0.000	11.547	0.68
		B		0.000	0.000	0.000	0.000	0.10
		C		0.000	0.000	0.000	13.164	1.02
L3	129'8-1/32"-96'	A	0.869	0.000	0.000	0.000	12.703	0.70
		B		0.000	0.000	0.000	0.000	0.17
		C		0.000	0.000	0.000	12.703	0.98
L4	96'-63'2-1/32"	A	0.833	0.000	0.000	0.000	12.206	0.68
		B		0.000	0.000	0.000	0.000	0.16
		C		0.000	0.000	0.000	12.206	0.93
L5	63'2-1/32"-31'2-1/32"	A	0.783	0.000	0.000	0.000	11.669	0.66
		B		0.000	0.000	0.000	0.000	0.16
		C		0.000	0.000	0.000	11.669	0.88
L6	31'2-1/32"-0'	A	0.750	0.000	0.000	0.000	11.051	0.64
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	11.051	0.81

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	178'-164'3"	-0.2291	0.1323	-0.3718	0.2147
L2	164'3"-129'8-1/32"	-0.2227	-0.1020	-0.3633	-0.1664
L3	129'8-1/32"-96'	-0.2283	-0.1318	-0.3802	-0.2195
L4	96'-63'2-1/32"	-0.2327	-0.1343	-0.3905	-0.2254
L5	63'2-1/32"-31'2-1/32"	-0.2358	-0.1361	-0.3949	-0.2280
L6	31'2-1/32"-0'	-0.2381	-0.1375	-0.3936	-0.2272

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	

Lighting Rod 5/8" x 4' on 4' Pole	C	From Leg	0.00 0' 4'	0.0000	178'	No Ice	1.46	1.46	0.07
						1/2" Ice	2.13	2.13	0.09
						1" Ice	2.70	2.70	0.11
						2" Ice	3.80	3.80	0.17
						4" Ice	6.42	6.42	0.37
RR90-17-02DP w/ Mount Pipe	A	From Leg	6.00 0' -1'	0.0000	178'	No Ice	4.59	3.32	0.03
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.12
						2" Ice	6.59	6.23	0.22
						4" Ice	8.73	9.31	0.56
RR90-17-02DP w/ Mount Pipe	B	From Leg	6.00 0' -1'	0.0000	178'	No Ice	4.59	3.32	0.03
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.12
						2" Ice	6.59	6.23	0.22
						4" Ice	8.73	9.31	0.56
RR90-17-02DP w/ Mount Pipe	C	From Leg	6.00 0' -1'	0.0000	178'	No Ice	4.59	3.32	0.03
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.12
						2" Ice	6.59	6.23	0.22

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			Horz Lateral ft	Vert ft					
ETW190VS12UB	A	From Leg	4.00 0' -1'	0.0000	178'	1" Ice	6.59	6.23	0.22
						2" Ice	8.73	9.31	0.56
						4" Ice			
						No Ice	0.66	0.37	0.01
						1/2" Ice	0.78	0.46	0.02
						1" Ice	0.90	0.56	0.03
						2" Ice	1.17	0.80	0.04
ETW190VS12UB	B	From Leg	4.00 0' -1'	0.0000	178'	2" Ice	1.82	1.36	0.11
						4" Ice			
						No Ice	0.66	0.37	0.01
						1/2" Ice	0.78	0.46	0.02
						Ice	0.90	0.56	0.03
						1" Ice	1.17	0.80	0.04
						2" Ice	1.82	1.36	0.11
ETW190VS12UB	C	From Leg	4.00 0' -1'	0.0000	178'	4" Ice			
						No Ice	0.66	0.37	0.01
						1/2" Ice	0.78	0.46	0.02
						Ice	0.90	0.56	0.03
						1" Ice	1.17	0.80	0.04
						2" Ice	1.82	1.36	0.11
						4" Ice			
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0' -1'	0.0000	178'	No Ice	11.68	9.84	0.08
						1/2" Ice	12.40	11.37	0.17
						Ice	13.14	12.91	0.27
						1" Ice	14.60	15.27	0.51
						2" Ice	17.87	20.14	1.15
						4" Ice			
						No Ice	11.68	9.84	0.08
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0' -1'	0.0000	178'	1/2" Ice	12.40	11.37	0.17
						Ice	13.14	12.91	0.27
						1" Ice	14.60	15.27	0.51
						2" Ice	17.87	20.14	1.15
						4" Ice			
						No Ice	11.68	9.84	0.08
						1/2" Ice	12.40	11.37	0.17
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0' -1'	0.0000	178'	Ice	13.14	12.91	0.27
						1" Ice	14.60	15.27	0.51
						2" Ice	17.87	20.14	1.15
						4" Ice			
						No Ice	11.68	9.84	0.08
						1/2" Ice	12.40	11.37	0.17
						Ice	13.14	12.91	0.27
ATBT-BOTTOM-24V	A	From Leg	4.00 0' -1'	0.0000	178'	No Ice	0.12	0.08	0.00
						1/2" Ice	0.17	0.12	0.00
						Ice	0.23	0.17	0.01
						1" Ice	0.38	0.30	0.01
						2" Ice	0.77	0.67	0.04
						4" Ice			
						No Ice	0.12	0.08	0.00
ATBT-BOTTOM-24V	B	From Leg	4.00 0' -1'	0.0000	178'	1/2" Ice	0.17	0.12	0.00
						Ice	0.23	0.17	0.01
						1" Ice	0.38	0.30	0.01
						2" Ice	0.77	0.67	0.04
						4" Ice			
						No Ice	0.12	0.08	0.00
						1/2" Ice	0.17	0.12	0.00
ATBT-BOTTOM-24V	C	From Leg	4.00 0' -1'	0.0000	178'	Ice	0.23	0.17	0.01
						1" Ice	0.38	0.30	0.01
						2" Ice	0.77	0.67	0.04
						4" Ice			
						No Ice	0.12	0.08	0.00
						1/2" Ice	0.17	0.12	0.00
						Ice	0.23	0.17	0.01
Platform Mount [LP 405-1]	C	None		0.0000	178'	No Ice	20.80	20.80	1.80
						1/2" Ice	28.10	28.10	2.07
						Ice	35.40	35.40	2.33
						1" Ice	50.00	50.00	2.86
						2" Ice	79.20	79.20	3.93
						4" Ice			
						No Ice	20.80	20.80	1.80
Side Arm Mount [SO 310-3]	C	None		0.0000	178'	No Ice	6.70	6.70	0.17
						1/2" Ice	10.11	10.11	0.25

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
						Ice	13.52	13.52	0.34
						1" Ice	20.34	20.34	0.51
						2" Ice	33.98	33.98	0.85
						4" Ice			

BXA-70063/6CF w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	170'	No Ice	7.98	5.41	0.04
						1/2"	8.62	6.56	0.10
						Ice	9.23	7.42	0.17
						1" Ice	10.47	9.20	0.33
						2" Ice	13.08	12.95	0.79
						4" Ice			
BXA-70063/6CF w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	170'	No Ice	7.98	5.41	0.04
						1/2"	8.62	6.56	0.10
						Ice	9.23	7.42	0.17
						1" Ice	10.47	9.20	0.33
						2" Ice	13.08	12.95	0.79
						4" Ice			
BXA-70063/6CF w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	170'	No Ice	7.98	5.41	0.04
						1/2"	8.62	6.56	0.10
						Ice	9.23	7.42	0.17
						1" Ice	10.47	9.20	0.33
						2" Ice	13.08	12.95	0.79
						4" Ice			
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	170'	No Ice	3.16	3.33	0.03
						1/2"	3.53	3.94	0.06
						Ice	3.94	4.56	0.10
						1" Ice	4.83	5.86	0.19
						2" Ice	6.73	8.84	0.48
						4" Ice			
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	170'	No Ice	3.16	3.33	0.03
						1/2"	3.53	3.94	0.06
						Ice	3.94	4.56	0.10
						1" Ice	4.83	5.86	0.19
						2" Ice	6.73	8.84	0.48
						4" Ice			
BXA-171085-8BF-EDIN-2 w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	170'	No Ice	3.16	3.33	0.03
						1/2"	3.53	3.94	0.06
						Ice	3.94	4.56	0.10
						1" Ice	4.83	5.86	0.19
						2" Ice	6.73	8.84	0.48
						4" Ice			
(2) FD9R6004/2C-3L	A	From Leg	4.00 0' 0'	0.0000	170'	No Ice	0.37	0.08	0.00
						1/2"	0.45	0.14	0.01
						Ice	0.54	0.20	0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
(2) FD9R6004/2C-3L	B	From Leg	4.00 0' 0'	0.0000	170'	No Ice	0.37	0.08	0.00
						1/2"	0.45	0.14	0.01
						Ice	0.54	0.20	0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
(2) FD9R6004/2C-3L	C	From Leg	4.00 0' 0'	0.0000	170'	No Ice	0.37	0.08	0.00
						1/2"	0.45	0.14	0.01
						Ice	0.54	0.20	0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
LNx-6514DS-VTM w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	170'	No Ice	8.65	7.08	0.06
						1/2"	9.31	8.27	0.13
						Ice	9.93	9.18	0.21
						1" Ice	11.20	11.02	0.39
						2" Ice	13.87	15.06	0.90
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
LNX-6514DS-VTM w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	170'	No Ice	8.65	7.08	0.06
						1/2" Ice	9.31	8.27	0.13
						Ice	9.93	9.18	0.21
						1" Ice	11.20	11.02	0.39
						2" Ice	13.87	15.06	0.90
						4" Ice			
LNX-6514DS-VTM w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	170'	No Ice	8.65	7.08	0.06
						1/2" Ice	9.31	8.27	0.13
						Ice	9.93	9.18	0.21
						1" Ice	11.20	11.02	0.39
						2" Ice	13.87	15.06	0.90
						4" Ice			
HBX-6517DS-VTM w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	170'	No Ice	5.32	4.86	0.04
						1/2" Ice	5.82	5.95	0.08
						Ice	6.32	6.81	0.13
						1" Ice	7.33	8.57	0.26
						2" Ice	9.50	12.31	0.66
						4" Ice			
HBX-6517DS-VTM w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	170'	No Ice	5.32	4.86	0.04
						1/2" Ice	5.82	5.95	0.08
						Ice	6.32	6.81	0.13
						1" Ice	7.33	8.57	0.26
						2" Ice	9.50	12.31	0.66
						4" Ice			
HBX-6517DS-VTM w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	170'	No Ice	5.32	4.86	0.04
						1/2" Ice	5.82	5.95	0.08
						Ice	6.32	6.81	0.13
						1" Ice	7.33	8.57	0.26
						2" Ice	9.50	12.31	0.66
						4" Ice			
RRH2X40-AWS	A	From Leg	4.00 0' 0'	0.0000	170'	No Ice	2.52	1.59	0.04
						1/2" Ice	2.75	1.80	0.06
						Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
RRH2X40-AWS	B	From Leg	4.00 0' 0'	0.0000	170'	No Ice	2.52	1.59	0.04
						1/2" Ice	2.75	1.80	0.06
						Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
RRH2X40-AWS	C	From Leg	4.00 0' 0'	0.0000	170'	No Ice	2.52	1.59	0.04
						1/2" Ice	2.75	1.80	0.06
						Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
DB-B1-6C-8AB-OZ	B	From Leg	4.00 0' 0'	0.0000	170'	No Ice	5.60	2.33	0.04
						1/2" Ice	5.92	2.56	0.08
						Ice	6.24	2.79	0.12
						1" Ice	6.91	3.28	0.21
						2" Ice	8.37	4.37	0.45
						4" Ice			
Platform Mount [LP 303-1]	C	None		0.0000	170'	No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						Ice	23.08	23.08	1.71
						1" Ice	31.50	31.50	2.18
						2" Ice	48.34	48.34	3.10
						4" Ice			

(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	160'	No Ice	6.35	4.43	0.06
						1/2" Ice	6.95	5.37	0.11
						Ice	7.51	6.12	0.17
						1" Ice	8.65	7.66	0.30

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
						2" Ice	11.06	11.10	0.70	
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0'	0.0000	160'	4" Ice	6.35	4.43	0.06
							No Ice	6.95	5.37	0.11
							1/2" Ice	7.51	6.12	0.17
							1" Ice	8.65	7.66	0.30
							2" Ice	11.06	11.10	0.70
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0'	0.0000	160'	4" Ice	6.35	4.43	0.06
							No Ice	6.95	5.37	0.11
							1/2" Ice	7.51	6.12	0.17
							1" Ice	8.65	7.66	0.30
							2" Ice	11.06	11.10	0.70
AM-X-CD-17-65-00T-RET w/ Mount Pipe	C	From Leg	4.00	0'	0.0000	160'	4" Ice	11.55	8.94	0.09
							No Ice	12.27	10.45	0.18
							1/2" Ice	13.00	11.99	0.27
							1" Ice	14.45	14.31	0.50
							2" Ice	17.71	19.14	1.12
AM-X-CD-17-65-00T-RET w/ Mount Pipe	B	From Leg	4.00	0'	0.0000	160'	4" Ice	11.55	8.94	0.09
							No Ice	12.27	10.45	0.18
							1/2" Ice	13.00	11.99	0.27
							1" Ice	14.45	14.31	0.50
							2" Ice	17.71	19.14	1.12
SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.00	0'	0.0000	160'	4" Ice	11.68	9.84	0.09
							No Ice	12.40	11.37	0.18
							1/2" Ice	13.14	12.91	0.28
							1" Ice	14.60	15.27	0.52
							2" Ice	17.87	20.14	1.16
(2) 219nn	A	From Leg	4.00	0'	0.0000	160'	4" Ice	0.27	0.18	0.01
							No Ice	0.34	0.25	0.01
							1/2" Ice	0.43	0.32	0.01
							1" Ice	0.62	0.49	0.02
							2" Ice	1.10	0.94	0.07
(2) 219nn	B	From Leg	4.00	0'	0.0000	160'	4" Ice	0.27	0.18	0.01
							No Ice	0.34	0.25	0.01
							1/2" Ice	0.43	0.32	0.01
							1" Ice	0.62	0.49	0.02
							2" Ice	1.10	0.94	0.07
(2) 219nn	C	From Leg	4.00	0'	0.0000	160'	4" Ice	0.27	0.18	0.01
							No Ice	0.34	0.25	0.01
							1/2" Ice	0.43	0.32	0.01
							1" Ice	0.62	0.49	0.02
							2" Ice	1.10	0.94	0.07
(2) LGP21401	A	From Leg	4.00	0'	0.0000	160'	4" Ice	1.29	0.23	0.01
							No Ice	1.45	0.31	0.02
							1/2" Ice	1.61	0.40	0.03
							1" Ice	1.97	0.61	0.05
							2" Ice	2.79	1.12	0.14
(2) LGP21401	B	From Leg	4.00	0'	0.0000	160'	4" Ice	1.29	0.23	0.01
							No Ice	1.45	0.31	0.02
							1/2" Ice	1.61	0.40	0.03
							1" Ice	1.97	0.61	0.05
							2" Ice	2.79	1.12	0.14
(2) LGP21401	C	From Leg	4.00	0'	0.0000	160'	4" Ice	1.29	0.23	0.01
							No Ice	1.45	0.31	0.02
							1/2" Ice	1.61	0.40	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
(2) RRUS 11	A	From Leg	4.00 0' 0'	0.0000	160'	1" Ice	1.97	0.61	0.05
						2" Ice	2.79	1.12	0.14
						4" Ice			
						No Ice	3.25	1.37	0.05
						1/2" Ice	3.49	1.55	0.07
						Ice	3.74	1.74	0.10
(2) RRUS 11	B	From Leg	4.00 0' 0'	0.0000	160'	1" Ice	4.27	2.14	0.15
						2" Ice	5.43	3.04	0.31
						4" Ice			
						No Ice	3.25	1.37	0.05
						1/2" Ice	3.49	1.55	0.07
						Ice	3.74	1.74	0.10
(2) RRUS 11	C	From Leg	4.00 0' 0'	0.0000	160'	1" Ice	4.27	2.14	0.15
						2" Ice	5.43	3.04	0.31
						4" Ice			
						No Ice	3.25	1.37	0.05
						1/2" Ice	3.49	1.55	0.07
						Ice	3.74	1.74	0.10
DC6-48-60-18-8F	A	From Leg	4.00 0' 0'	0.0000	160'	1" Ice	4.27	2.14	0.15
						2" Ice	5.43	3.04	0.31
						4" Ice			
						No Ice	1.27	1.27	0.02
						1/2" Ice	1.46	1.46	0.04
						Ice	1.66	1.66	0.05
Platform Mount [LP 303-1]	C	None		0.0000	160'	1" Ice	2.09	2.09	0.10
						2" Ice	3.10	3.10	0.21
						4" Ice			
						No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						Ice	23.08	23.08	1.71
***** 742 213	A	From Leg	4.00 0' 0'	0.0000	150'	1" Ice	31.50	31.50	2.18
						2" Ice	48.34	48.34	3.10
						4" Ice			
						No Ice	5.14	2.87	0.02
						1/2" Ice	5.61	3.48	0.05
						Ice	6.09	3.95	0.08
742 213	B	From Leg	4.00 0' 0'	0.0000	150'	1" Ice	7.07	4.89	0.16
						2" Ice	9.13	6.88	0.39
						4" Ice			
						No Ice	5.14	2.87	0.02
						1/2" Ice	5.61	3.48	0.05
						Ice	6.09	3.95	0.08
742 213	C	From Leg	4.00 0' 0'	0.0000	150'	1" Ice	7.07	4.89	0.16
						2" Ice	9.13	6.88	0.39
						4" Ice			
						No Ice	5.14	2.87	0.02
						1/2" Ice	5.61	3.48	0.05
						Ice	6.09	3.95	0.08
Pipe Mount [PM 602-3]	C	None		0.0000	150'	1" Ice	7.07	4.89	0.16
						2" Ice	9.13	6.88	0.39
						4" Ice			
						No Ice	7.68	7.68	0.28
						1/2" Ice	9.50	9.50	0.35
						Ice	11.32	11.32	0.43
	1" Ice	14.96	14.96	0.58					
	2" Ice	22.24	22.24	0.87					
	4" Ice								

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	33.08					
Bracing Weight	0.00					
Total Member Self-Weight	33.08			-0.37	0.68	
Total Weight	45.49			-0.37	0.68	
Wind 0 deg - No Ice		-0.15	-32.89	-3948.84	25.73	2.00
Wind 30 deg - No Ice		16.23	-28.41	-3407.32	-1939.22	-0.12
Wind 60 deg - No Ice		28.27	-16.31	-1952.91	-3384.38	-2.21
Wind 90 deg - No Ice		32.73	0.15	24.69	-3922.52	-3.70
Wind 120 deg - No Ice		28.42	16.58	1995.57	-3409.43	-4.20
Wind 150 deg - No Ice		16.50	28.56	3431.64	-1982.62	-3.58
Wind 180 deg - No Ice		0.15	32.89	3948.11	-24.38	-2.00
Wind 210 deg - No Ice		-16.23	28.41	3406.59	1940.58	0.12
Wind 240 deg - No Ice		-28.27	16.31	1952.17	3385.73	2.21
Wind 270 deg - No Ice		-32.73	-0.15	-25.42	3923.87	3.70
Wind 300 deg - No Ice		-28.42	-16.58	-1996.30	3410.79	4.20
Wind 330 deg - No Ice		-16.50	-28.56	-3432.37	1983.97	3.58
Member Ice	7.75					
Total Weight Ice	62.56			0.09	4.43	
Wind 0 deg - Ice		-0.03	-7.91	-976.70	8.80	0.47
Wind 30 deg - Ice		3.92	-6.83	-843.65	-478.93	-0.09
Wind 60 deg - Ice		6.82	-3.93	-484.53	-837.14	-0.62
Wind 90 deg - Ice		7.89	0.03	4.45	-969.85	-0.99
Wind 120 deg - Ice		6.85	3.98	492.26	-841.50	-1.09
Wind 150 deg - Ice		3.97	6.86	848.19	-486.49	-0.90
Wind 180 deg - Ice		0.03	7.91	976.88	0.07	-0.47
Wind 210 deg - Ice		-3.92	6.83	843.83	487.80	0.09
Wind 240 deg - Ice		-6.82	3.93	484.70	846.01	0.62
Wind 270 deg - Ice		-7.89	-0.03	-4.28	978.72	0.99
Wind 300 deg - Ice		-6.85	-3.98	-492.09	850.37	1.09
Wind 330 deg - Ice		-3.97	-6.86	-848.02	495.36	0.90
Total Weight	45.49			-0.37	0.68	
Wind 0 deg - Service		-0.05	-11.38	-1367.14	8.01	0.69
Wind 30 deg - Service		5.62	-9.83	-1179.77	-671.90	-0.04
Wind 60 deg - Service		9.78	-5.64	-676.51	-1171.96	-0.76
Wind 90 deg - Service		11.32	0.05	7.78	-1358.17	-1.28
Wind 120 deg - Service		9.83	5.74	689.74	-1180.63	-1.45
Wind 150 deg - Service		5.71	9.88	1186.65	-686.92	-1.24
Wind 180 deg - Service		0.05	11.38	1365.36	-9.33	-0.69
Wind 210 deg - Service		-5.62	9.83	1177.98	670.59	0.04
Wind 240 deg - Service		-9.78	5.64	674.73	1170.64	0.76
Wind 270 deg - Service		-11.32	-0.05	-9.56	1356.85	1.28
Wind 300 deg - Service		-9.83	-5.74	-691.53	1179.31	1.45
Wind 330 deg - Service		-5.71	-9.88	-1188.44	685.60	1.24

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice

Comb. No.	Description
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	178 - 164.25	Pole	Max Tension	14	0.00	-0.00	-0.00
			Max. Compression	14	-8.82	-0.24	-0.40
			Max. Mx	5	-4.14	-58.75	-0.31
			Max. My	8	-4.14	-0.30	-58.57
			Max. Vy	5	9.62	-58.75	-0.31
			Max. Vx	2	-9.54	0.15	58.30
			Max. Torque	9			0.53
L2	164.25 - 129.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.85	-0.78	1.97
			Max. Mx	5	-10.49	-582.74	-4.29
			Max. My	2	-10.47	4.59	586.75
			Max. Vy	5	18.78	-582.74	-4.29
			Max. Vx	2	-18.95	4.59	586.75
			Max. Torque	12			-4.14
L3	129.667 - 96	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.35	0.26	1.57
			Max. Mx	5	-16.93	-1258.62	-9.51
			Max. My	2	-16.91	9.98	1268.34
			Max. Vy	11	-22.42	1258.14	10.84
			Max. Vx	2	-22.59	9.98	1268.34
			Max. Torque	12			-4.12
L4	96 - 63.1667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.17	1.46	1.11
			Max. Mx	11	-24.65	2033.58	15.90
			Max. My	2	-24.64	15.31	2048.87
			Max. Vy	11	-25.98	2033.58	15.90
			Max. Vx	2	-26.15	15.31	2048.87
			Max. Torque	12			-4.12
L5	63.1667 - 31.1667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-49.14	2.76	0.61
			Max. Mx	11	-33.50	2898.05	20.75
			Max. My	2	-33.50	20.52	2918.22
			Max. Vy	11	-29.21	2898.05	20.75

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L6	31.1667 - 0	Pole	Max. Vx	2	-29.38	20.52	2918.22
			Max. Torque	12			-4.11
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-63.66	4.43	-0.04
			Max. Mx	11	-45.48	4058.16	26.39
			Max. My	2	-45.48	26.71	4084.01
			Max. Vy	11	-32.75	4058.16	26.39
			Max. Vx	2	-32.91	26.71	4084.01
			Max. Torque	12			-4.10

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	25	63.66	6.85	3.98
	Max. H _x	11	45.49	32.73	0.15
	Max. H _z	2	45.49	0.15	32.89
	Max. M _x	2	4084.01	0.15	32.89
	Max. M _z	5	4056.80	-32.73	-0.15
	Max. Torsion	6	4.10	-28.42	-16.58
	Min. Vert	1	45.49	0.00	0.00
	Min. H _x	5	45.49	-32.73	-0.15
	Min. H _z	8	45.49	-0.15	-32.89
	Min. M _x	8	-4083.21	-0.15	-32.89
	Min. M _z	11	-4058.16	32.73	0.15
	Min. Torsion	12	-4.10	28.42	16.58

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overtuning Moment, M _x kip-ft	Overtuning Moment, M _z kip-ft	Torque kip-ft
Dead Only	45.49	0.00	0.00	-0.37	0.68	0.00
Dead+Wind 0 deg - No Ice	45.49	-0.15	-32.89	-4084.01	26.71	1.94
Dead+Wind 30 deg - No Ice	45.49	16.23	-28.41	-3523.98	-2005.54	-0.13
Dead+Wind 60 deg - No Ice	45.49	28.27	-16.31	-2019.73	-3500.25	-2.16
Dead+Wind 90 deg - No Ice	45.49	32.73	0.15	25.63	-4056.80	-3.62
Dead+Wind 120 deg - No Ice	45.49	28.42	16.58	2063.95	-3526.12	-4.10
Dead+Wind 150 deg - No Ice	45.49	16.50	28.56	3549.09	-2050.50	-3.49
Dead+Wind 180 deg - No Ice	45.49	0.15	32.89	4083.21	-25.31	-1.94
Dead+Wind 210 deg - No Ice	45.49	-16.23	28.41	3523.18	2006.90	0.13
Dead+Wind 240 deg - No Ice	45.49	-28.27	16.31	2018.95	3501.59	2.16
Dead+Wind 270 deg - No Ice	45.49	-32.73	-0.15	-26.39	4058.16	3.62
Dead+Wind 300 deg - No Ice	45.49	-28.42	-16.58	-2064.70	3527.51	4.10
Dead+Wind 330 deg - No Ice	45.49	-16.50	-28.56	-3549.86	2051.91	3.49
Dead+Ice+Temp	63.66	-0.00	-0.00	0.04	4.43	-0.00
Dead+Wind 0 deg+Ice+Temp	63.66	-0.03	-7.91	-1033.05	9.24	0.44
Dead+Wind 30 deg+Ice+Temp	63.66	3.92	-6.83	-892.33	-506.56	-0.09
Dead+Wind 60 deg+Ice+Temp	63.66	6.82	-3.93	-512.52	-885.41	-0.61
Dead+Wind 90 deg+Ice+Temp	63.66	7.89	0.03	4.61	-1025.77	-0.96
Dead+Wind 120 deg+Ice+Temp	63.66	6.85	3.98	520.49	-890.05	-1.05
Dead+Wind 150 deg+Ice+Temp	63.66	3.97	6.86	896.90	-514.61	-0.86
Dead+Wind 180 deg+Ice+Temp	63.66	0.03	7.91	1032.97	-0.05	-0.44

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 210 deg+Ice+Temp	63.66	-3.92	6.83	892.25	515.75	0.09
Dead+Wind 240 deg+Ice+Temp	63.66	-6.82	3.93	512.44	894.59	0.61
Dead+Wind 270 deg+Ice+Temp	63.66	-7.89	-0.03	-4.68	1034.96	0.96
Dead+Wind 300 deg+Ice+Temp	63.66	-6.85	-3.98	-520.57	899.24	1.05
Dead+Wind 330 deg+Ice+Temp	63.66	-3.97	-6.86	-896.98	523.80	0.86
Dead+Wind 0 deg - Service	45.49	-0.05	-11.38	-1415.05	9.69	0.68
Dead+Wind 30 deg - Service	45.49	5.62	-9.83	-1221.02	-694.30	-0.04
Dead+Wind 60 deg - Service	45.49	9.78	-5.64	-699.93	-1212.08	-0.76
Dead+Wind 90 deg - Service	45.49	11.32	0.05	8.61	-1404.89	-1.26
Dead+Wind 120 deg - Service	45.49	9.83	5.74	714.72	-1221.09	-1.43
Dead+Wind 150 deg - Service	45.49	5.71	9.88	1229.22	-709.91	-1.22
Dead+Wind 180 deg - Service	45.49	0.05	11.38	1414.23	-8.33	-0.68
Dead+Wind 210 deg - Service	45.49	-5.62	9.83	1220.21	695.66	0.04
Dead+Wind 240 deg - Service	45.49	-9.78	5.64	699.11	1213.43	0.76
Dead+Wind 270 deg - Service	45.49	-11.32	-0.05	-9.42	1406.25	1.26
Dead+Wind 300 deg - Service	45.49	-9.83	-5.74	-715.53	1222.44	1.43
Dead+Wind 330 deg - Service	45.49	-5.71	-9.88	-1230.03	711.27	1.22

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	-45.49	0.00	0.00	45.49	0.00	0.000%
2	-0.15	-45.49	-32.89	0.15	45.49	32.89	0.000%
3	16.23	-45.49	-28.41	-16.23	45.49	28.41	0.000%
4	28.27	-45.49	-16.31	-28.27	45.49	16.31	0.000%
5	32.73	-45.49	0.15	-32.73	45.49	-0.15	0.000%
6	28.42	-45.49	16.58	-28.42	45.49	-16.58	0.000%
7	16.50	-45.49	28.56	-16.50	45.49	-28.56	0.000%
8	0.15	-45.49	32.89	-0.15	45.49	-32.89	0.000%
9	-16.23	-45.49	28.41	16.23	45.49	-28.41	0.000%
10	-28.27	-45.49	16.31	28.27	45.49	-16.31	0.000%
11	-32.73	-45.49	-0.15	32.73	45.49	0.15	0.000%
12	-28.42	-45.49	-16.58	28.42	45.49	16.58	0.000%
13	-16.50	-45.49	-28.56	16.50	45.49	28.56	0.000%
14	0.00	-63.66	0.00	0.00	63.66	0.00	0.000%
15	-0.03	-63.66	-7.91	0.03	63.66	7.91	0.000%
16	3.92	-63.66	-6.83	-3.92	63.66	6.83	0.000%
17	6.82	-63.66	-3.93	-6.82	63.66	3.93	0.000%
18	7.89	-63.66	0.03	-7.89	63.66	-0.03	0.000%
19	6.85	-63.66	3.98	-6.85	63.66	-3.98	0.000%
20	3.97	-63.66	6.86	-3.97	63.66	-6.86	0.000%
21	0.03	-63.66	7.91	-0.03	63.66	-7.91	0.000%
22	-3.92	-63.66	6.83	3.92	63.66	-6.83	0.000%
23	-6.82	-63.66	3.93	6.82	63.66	-3.93	0.000%
24	-7.89	-63.66	-0.03	7.89	63.66	0.03	0.000%
25	-6.85	-63.66	-3.98	6.85	63.66	3.98	0.000%
26	-3.97	-63.66	-6.86	3.97	63.66	6.86	0.000%
27	-0.05	-45.49	-11.38	0.05	45.49	11.38	0.000%
28	5.62	-45.49	-9.83	-5.62	45.49	9.83	0.000%
29	9.78	-45.49	-5.64	-9.78	45.49	5.64	0.000%
30	11.32	-45.49	0.05	-11.32	45.49	-0.05	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
31	9.83	-45.49	5.74	-9.83	45.49	-5.74	0.000%
32	5.71	-45.49	9.88	-5.71	45.49	-9.88	0.000%
33	0.05	-45.49	11.38	-0.05	45.49	-11.38	0.000%
34	-5.62	-45.49	9.83	5.62	45.49	-9.83	0.000%
35	-9.78	-45.49	5.64	9.78	45.49	-5.64	0.000%
36	-11.32	-45.49	-0.05	11.32	45.49	0.05	0.000%
37	-9.83	-45.49	-5.74	9.83	45.49	5.74	0.000%
38	-5.71	-45.49	-9.88	5.71	45.49	9.88	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00004158
3	Yes	5	0.00000001	0.00095668
4	Yes	5	0.00000001	0.00098454
5	Yes	5	0.00000001	0.00007807
6	Yes	5	0.00000001	0.00093055
7	Yes	6	0.00000001	0.00004035
8	Yes	5	0.00000001	0.00007504
9	Yes	5	0.00000001	0.00095338
10	Yes	5	0.00000001	0.00092603
11	Yes	5	0.00000001	0.00011191
12	Yes	6	0.00000001	0.00004067
13	Yes	5	0.00000001	0.00093739
14	Yes	4	0.00000001	0.00000677
15	Yes	5	0.00000001	0.00030765
16	Yes	5	0.00000001	0.00036272
17	Yes	5	0.00000001	0.00036446
18	Yes	5	0.00000001	0.00030616
19	Yes	5	0.00000001	0.00036321
20	Yes	5	0.00000001	0.00036944
21	Yes	5	0.00000001	0.00030589
22	Yes	5	0.00000001	0.00036239
23	Yes	5	0.00000001	0.00036067
24	Yes	5	0.00000001	0.00030771
25	Yes	5	0.00000001	0.00037369
26	Yes	5	0.00000001	0.00036733
27	Yes	4	0.00000001	0.00025948
28	Yes	5	0.00000001	0.00007039
29	Yes	5	0.00000001	0.00007522
30	Yes	4	0.00000001	0.00040158
31	Yes	5	0.00000001	0.00006571
32	Yes	5	0.00000001	0.00008320
33	Yes	4	0.00000001	0.00030287
34	Yes	5	0.00000001	0.00006960
35	Yes	5	0.00000001	0.00006547
36	Yes	4	0.00000001	0.00044885
37	Yes	5	0.00000001	0.00008475
38	Yes	5	0.00000001	0.00006653

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	178 - 164.25	37.987	38	1.9133	0.0098
L2	167.167 - 129.667	33.677	38	1.8796	0.0099

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L3	133.5 - 96	21.385	38	1.5477	0.0050
L4	100.667 - 63.1667	12.021	38	1.1518	0.0026
L5	68.6667 - 31.1667	5.537	38	0.7604	0.0014
L6	37.4167 - 0	1.660	38	0.4003	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178'	Lighting Rod 5/8" x 4' on 4' Pole	38	37.987	1.9133	0.0098	21624
170'	BXA-70063/6CF w/ Mount Pipe	38	34.796	1.8915	0.0099	13586
160'	(2) 7770.00 w/ Mount Pipe	38	30.890	1.8342	0.0093	7949
150'	742 213	38	27.134	1.7413	0.0078	6167

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	178 - 164.25	109.344	13	5.5114	0.0282
L2	167.167 - 129.667	96.958	13	5.4140	0.0284
L3	133.5 - 96	61.615	13	4.4605	0.0142
L4	100.667 - 63.1667	34.658	13	3.3211	0.0075
L5	68.6667 - 31.1667	15.969	13	2.1932	0.0039
L6	37.4167 - 0	4.788	13	1.1549	0.0017

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178'	Lighting Rod 5/8" x 4' on 4' Pole	13	109.344	5.5114	0.0282	7664
170'	BXA-70063/6CF w/ Mount Pipe	13	100.175	5.4482	0.0286	4815
160'	(2) 7770.00 w/ Mount Pipe	13	88.948	5.2837	0.0267	2813
150'	742 213	13	78.151	5.0167	0.0224	2179

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P/P _a
L1	178 - 164.25	TP26x12.75x0.25	13'9"	0'	0.0	39.000	18.2024	-4.13	709.89	0.006

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P/P _a
L2	164.25 - 129.667 (2)	TP34.0625x22.6894x0.3125	37'6"	0'	0.0	39.000	32.3226	-10.46	1260.58	0.008
L3	129.667 - 96 (3)	TP41.75x32.2749x0.375	37'6"	0'	0.0	39.000	47.8431	-16.90	1865.88	0.009
L4	96 - 63.1667 (4)	TP49.0625x39.8209x0.375	37'6"	0'	0.0	39.000	56.3370	-24.63	2197.14	0.011
L5	63.1667 - 31.1667 (5)	TP56.125x46.9571x0.375	37'6"	0'	0.0	39.000	64.5378	-33.49	2516.97	0.013
L6	31.1667 - 0 (6)	TP62.9375x53.847x0.375	37'5-1/32"	0'	0.0	37.124	74.4650	-45.47	2764.41	0.016

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio f _{bx} /F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} /F _{by}
L1	178 - 164.25 (1)	TP26x12.75x0.25	58.94	6.885	39.000	0.177	0.00	0.000	39.000	0.000
L2	164.25 - 129.667 (2)	TP34.0625x22.6894x0.3125	589.76	27.275	39.000	0.699	0.00	0.000	39.000	0.000
L3	129.667 - 96 (3)	TP41.75x32.2749x0.375	1274.5	32.278	39.000	0.828	0.00	0.000	39.000	0.000
L4	96 - 63.1667 (4)	TP49.0625x39.8209x0.375	2058.2	37.540	39.000	0.963	0.00	0.000	39.000	0.000
L5	63.1667 - 31.1667 (5)	TP56.125x46.9571x0.375	2930.7	40.690	39.000	1.043	0.00	0.000	39.000	0.000
L6	31.1667 - 0 (6)	TP62.9375x53.847x0.375	4100.2	42.721	37.124	1.151	0.00	0.000	37.124	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f _v ksi	Allow. F _v ksi	Ratio f _v /F _v	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio f _{vt} /F _{vt}
L1	178 - 164.25 (1)	TP26x12.75x0.25	9.67	0.531	26.000	0.041	0.05	0.003	26.000	0.000
L2	164.25 - 129.667 (2)	TP34.0625x22.6894x0.3125	19.05	0.589	26.000	0.045	3.68	0.083	26.000	0.003
L3	129.667 - 96 (3)	TP41.75x32.2749x0.375	22.68	0.474	26.000	0.036	3.63	0.045	26.000	0.002
L4	96 - 63.1667 (4)	TP49.0625x39.8209x0.375	26.25	0.466	26.000	0.036	3.58	0.032	26.000	0.001
L5	63.1667 - 31.1667 (5)	TP56.125x46.9571x0.375	29.48	0.457	26.000	0.035	3.54	0.024	26.000	0.001
L6	31.1667 - 0 (6)	TP62.9375x53.847x0.375	33.00	0.443	26.000	0.034	3.49	0.018	26.000	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P/P _a	Ratio f _{bx} /F _{bx}	Ratio f _{by} /F _{by}	Ratio f _v /F _v	Ratio f _{vt} /F _{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	178 - 164.25 (1)	0.006	0.177	0.000	0.041	0.000	0.183	1.333	H1-3+VT ✓

Section No.	Elevation ft	Ratio P P_a	Ratio f_{bx} F_{bx}	Ratio f_{by} F_{by}	Ratio f_v F_v	Ratio f_{vt} F_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L2	164.25 - 129.667 (2)	0.008	0.699	0.000	0.045	0.003	0.708 ✓	1.333	H1-3+VT ✓
L3	129.667 - 96 (3)	0.009	0.828	0.000	0.036	0.002	0.837 ✓	1.333	H1-3+VT ✓
L4	96 - 63.1667 (4)	0.011	0.963	0.000	0.036	0.001	0.974 ✓	1.333	H1-3+VT ✓
L5	63.1667 - 31.1667 (5)	0.013	1.043	0.000	0.035	0.001	1.057 ✓	1.333	H1-3+VT ✓
L6	31.1667 - 0 (6)	0.016	1.151	0.000	0.034	0.001	1.168 ✓	1.333	H1-3+VT ✓

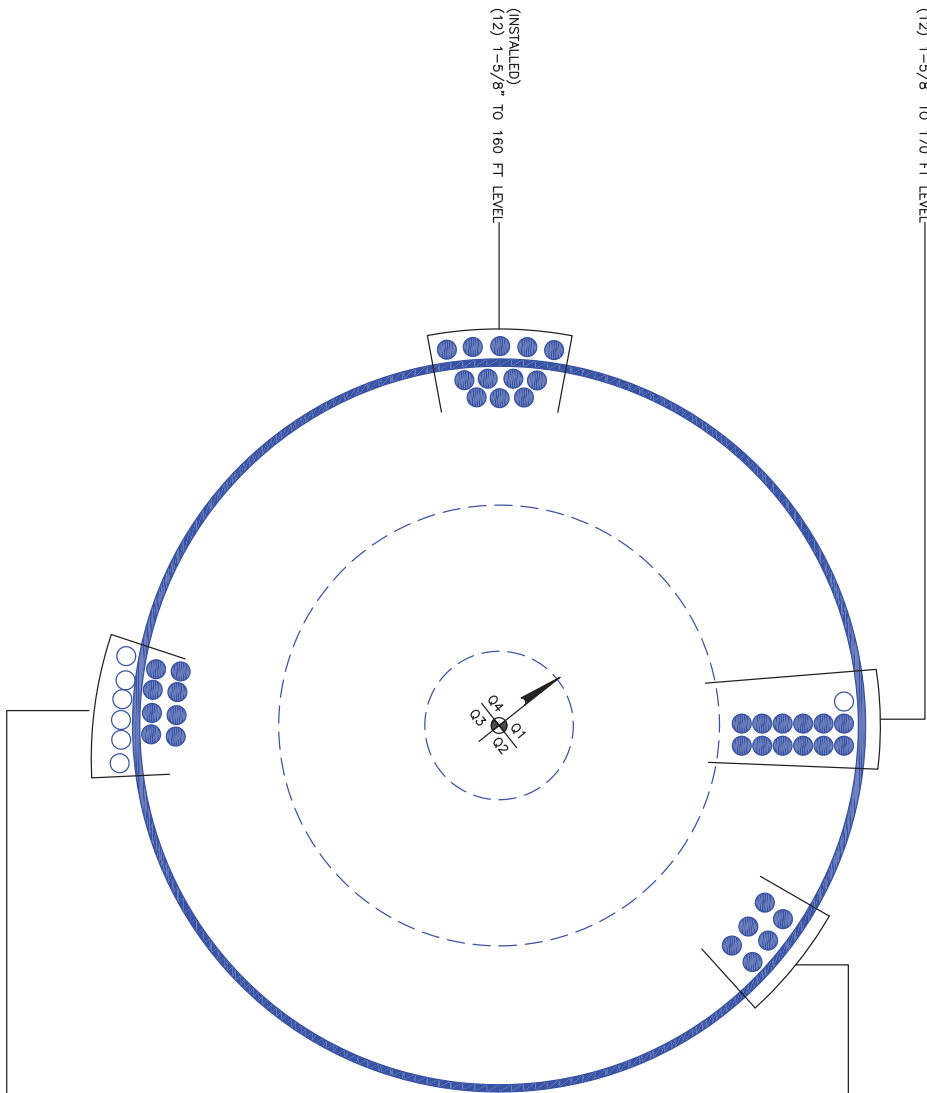
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF* P_{allow} K	% Capacity	Pass Fail	
L1	178 - 164.25	Pole	TP26x12.75x0.25	1	-4.13	946.29	13.7	Pass	
L2	164.25 - 129.667	Pole	TP34.0625x22.6894x0.3125	2	-10.46	1680.35	53.1	Pass	
L3	129.667 - 96	Pole	TP41.75x32.2749x0.375	3	-16.90	2487.22	62.8	Pass	
L4	96 - 63.1667	Pole	TP49.0625x39.8209x0.375	4	-24.63	2928.79	73.1	Pass	
L5	63.1667 - 31.1667	Pole	TP56.125x46.9571x0.375	5	-33.49	3355.12	79.3	Pass	
L6	31.1667 - 0	Pole	TP62.9375x53.847x0.375	6	-45.47	3684.96	87.6	Pass	
							Summary		
							Pole (L6)	87.6	Pass
							RATING =	87.6	Pass

APPENDIX B
BASE LEVEL DRAWING



(RESERVED)
(1) 1-5/8" TO 170 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 170 FT LEVEL



(INSTALLED)
(6) 1-5/8" TO 150 FT LEVEL

(INSTALLED)
(12) 1-5/8" TO 160 FT LEVEL

(PROPOSED)
(6) 1-5/8" TO 178 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 178 FT LEVEL

BUSINESS UNIT: 823666 TOWER ID: C_BASELEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: 823666	
Site Name: Deep River/Rt 9	
App #: 261532 Rev 7	
Pole Manufacturer:	Pirod

Reactions

Moment:	4100	ft-kips
Axial:	45	kips
Shear:	33	kips

Anchor Rod Data

Qty:	45	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	68	in

If No stiffeners, Criteria:

AISC ASD

<-Only Applicable to Unstiffened Cases

Anchor Rod Results

Maximum Rod Tension: 63.3 Kips
 Allowable Tension: 81.0 Kips
 Anchor Rod Stress Ratio: 78.2% Pass

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	73	in
Thick:	1.375	in
Grade:	50	ksi
Single-Rod B-eff:	4.44	in

Base Plate Results

Base Plate Stress: Rohn/Pirod, OK
 Allowable Plate Stress: 50.0 ksi
 Base Plate Stress Ratio: Rohn/Pirod, OK

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
25.75

Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

N/A for Rohn / Pirod
 Horizontal Weld : N/A
 Vertical Weld: N/A
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: N/A
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: N/A
 Plate Comp. (AISC Bracket): N/A

Pole Results

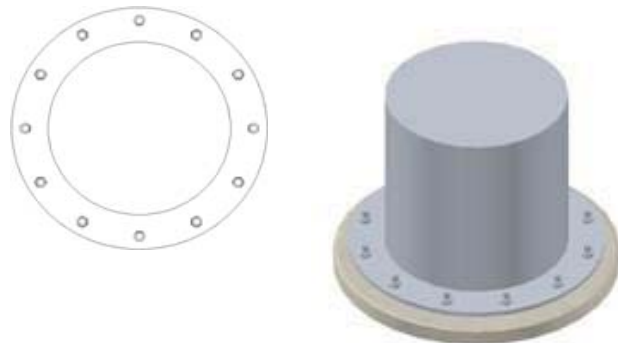
Pole Punching Shear Check: N/A

Pole Data

Diam:	62.9375	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333	
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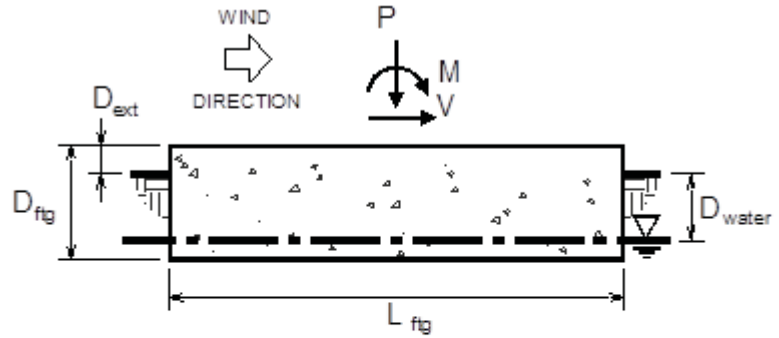


* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

1.0 FOUNDATION GEOMETRY & MATERIALS:

$L_{ftg} = 29 \text{ ft}$ $B_{ftg} = 29 \text{ ft}$
 $D_{ftg} = 4 \text{ ft}$ $D_{ext} = 0.5 \text{ ft}$ $D_{offset} = 0$
 $d = 44 \text{ in}$ $No_rebar = 32$ $Size_rebar = 8$
 $f_y = 60000 \cdot \text{psi}$ $f_c = 4000 \cdot \text{psi}$



SECTION

2.0 SOIL PARAMETERS:

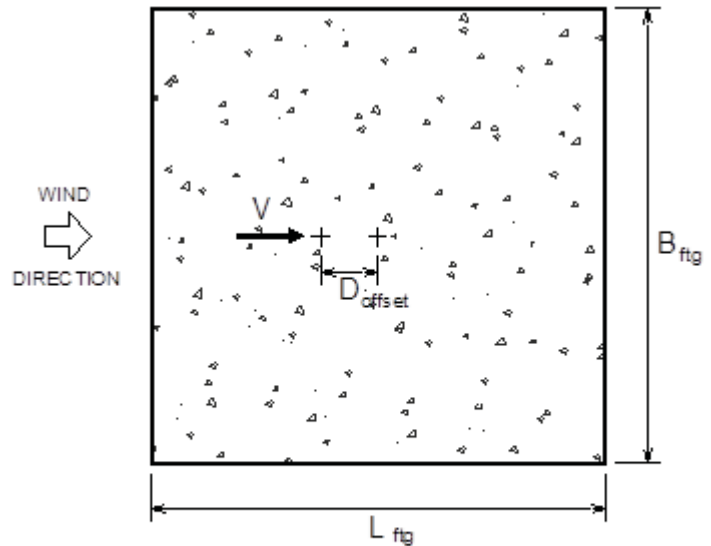
$\phi = 0 \cdot \text{deg}$ $K_p = 1.00$
 $\gamma_{soil} = 165 \cdot \text{pcf}$ $\mu = 0.2$ $c = 0 \cdot \text{psf}$

Groundwater = 99 ft
 $q_{brg,allow} := 12000 \cdot \text{psf}$

3.0 LOADS:

Load combinations based on TIA-222-G (1.2D + 1.6W):

$P = 45 \cdot \text{kip}$
 $V = 33 \cdot \text{kip}$
 $M = 4100 \cdot \text{kip} \cdot \text{ft}$



PLAN

4.0 ANALYSIS RESULTS:

4.1
 4.2
 4.3

BEARING:
OVERTURNING:
SLIDING:

APPLIED

$B_{app} = 3582 \cdot \text{psf}$
 $M_{app} = 4232 \cdot \text{kip} \cdot \text{ft}$
 $V_{app} = 33 \cdot \text{kip}$

CAPACITY

$B_{cap} = 12000 \cdot \text{psf}$
 $M_{cap} = 5313 \cdot \text{kip} \cdot \text{ft}$
 $V_{cap} = 83 \cdot \text{kip}$

CHECK

$B\% = 29.8\%$
 $M\% = 79.7\%$
 $V\% = 39.7\%$