HPC Wireless Services
22 Shelter Rock Lane
Danbury, CT, 06810
P.: 203.797.1112

HPC
WIRELESS SERVICES

January 10, 2014

VIA OVERNIGHT COURIER

Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051
Attn: Ms. Melanie Bachman, Acting Executive Director

Re: T-Mobile Northeast LLC – exempt modification
41 Manitock Hill Road, Waterford, Connecticut

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of T-Mobile Northeast LLC ("T-Mobile"). T-Mobile is making modifications to certain existing sites in its Connecticut system in order to implement LTE technology. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction that constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the First Selectman of the Town of Waterford.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at Manitock Hill Road in the Town of Waterford (coordinates 41°-21'-16.42" N, 72°-09'-3.38" W). Attached are a compound plan and elevation depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to T-Mobile's operations at the site.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 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 R.C.S.A. Section 16-50j-72(b)(2).

1. T-Mobile will replace six (6) of its six (6) existing panel antennas with new antennas at a center line of approximately 119'. Three (3) of six (6) existing TMAs will

be removed. A hybrid cable will be run from the equipment to the antenna along the existing coaxial cable run. The proposed modifications will not extend the height of the approximately 136' structure.

2. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

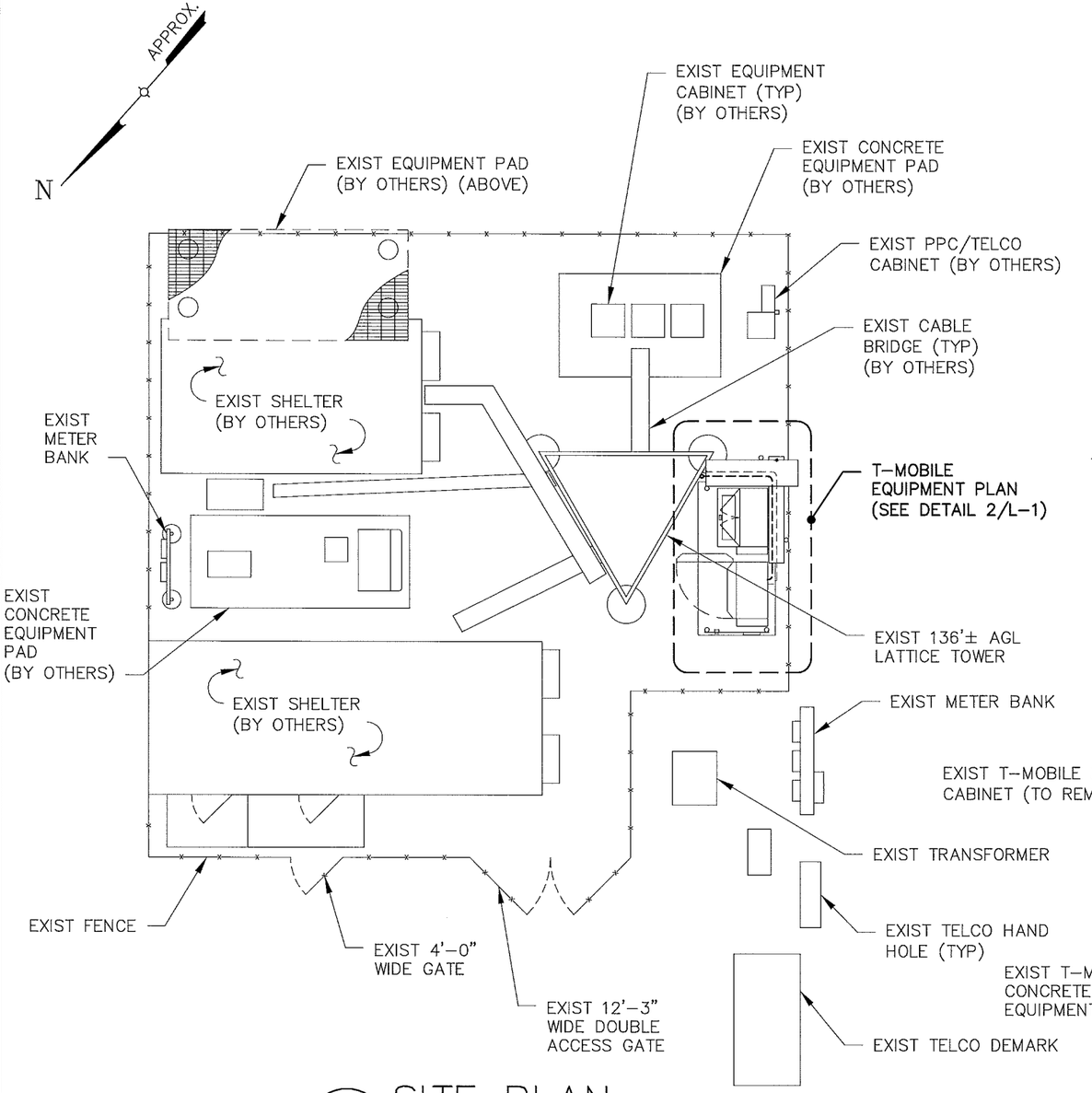
3. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached report prepared by EBI Consulting, T-Mobile's operations at the site will result in a power density of approximately 0.816%; the combined site operations will result in a total power density of approximately 74.316%.

Please feel free to contact me by phone at (617) 281-0084 or by e-mail at agiannaras@hpcwireless.com with questions concerning this matter. Thank you for your consideration.

Respectfully yours,

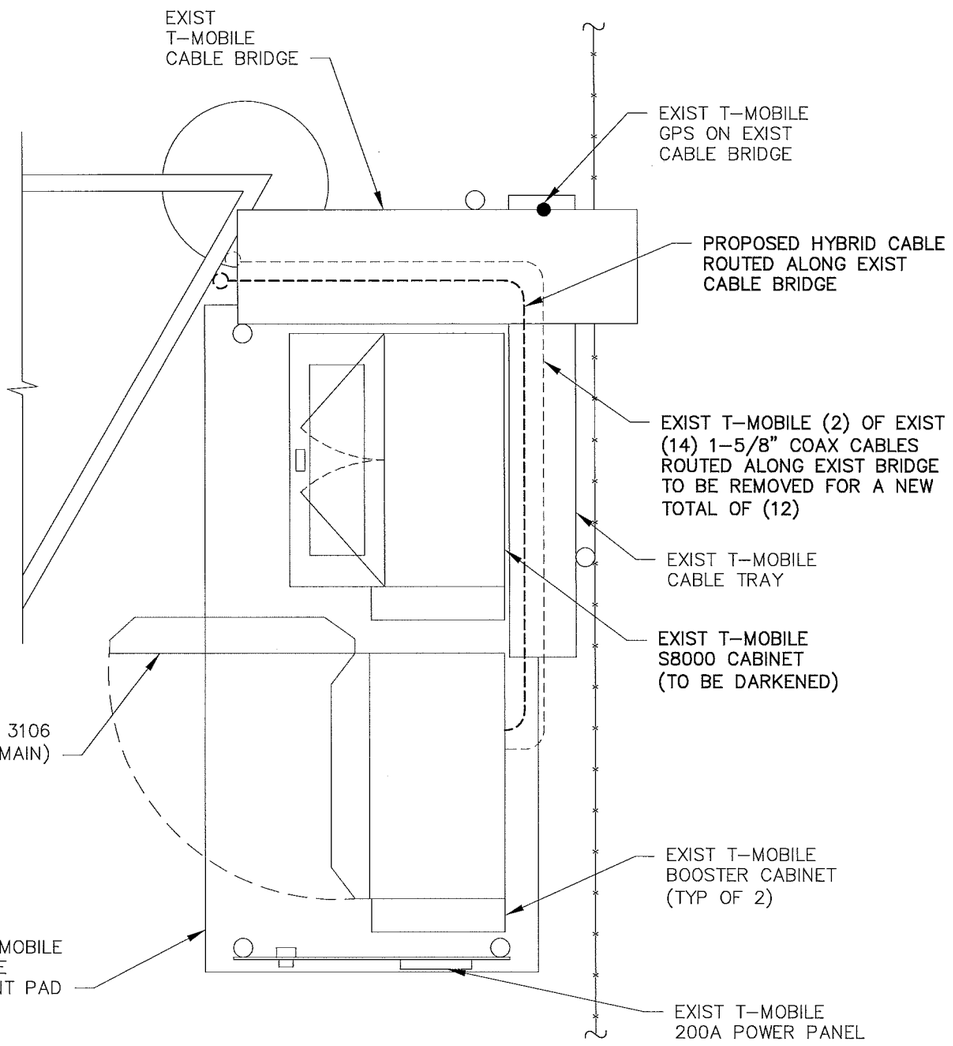
Alex Giannaras

cc: Honorable Daniel M. Steward, First Selectman, Town of Waterford
Crown Castle (underlying property owner)



1/L-1 SITE PLAN

SCALE: 3/32" = 1'-0"



2/L-1 EQUIPMENT PLAN

SCALE: 3/8" = 1'-0"

STRUCTURAL NOTE:
EXIST MOUNTS AND LATTICE TOWER TO BE VERIFIED FOR STRUCTURAL SUITABILITY OF PROPOSED INSTALLATION BY A STATE LICENSED P.E.

CONFIGURATION
2C

0 1 2 3
ORIGINAL SIZE IN INCHES

TECTONIC
• PLANNING • SURVEYING
• ENGINEERING • CONSTRUCTION MANAGEMENT
TECTONIC Engineering & Surveying Consultants P.C.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703

T-Mobile
NORTHEAST LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

APPROVALS
T-MOBILE
LANDLORD
RF
CONSTRUCTION

PROJECT NUMBER	DESIGNED BY
6644.CT11381C	JQ

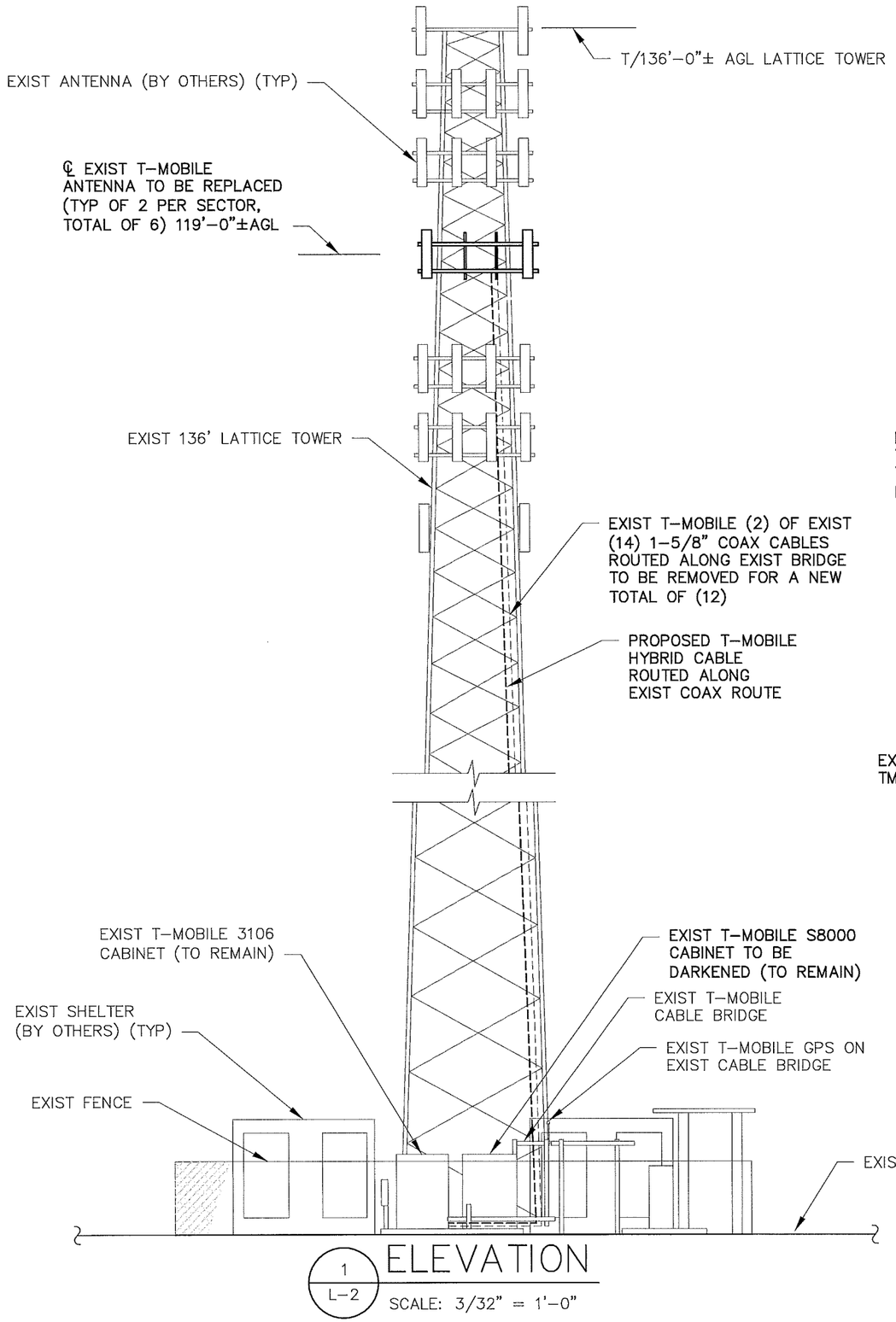
REV	DATE	REVISION	DRAWN BY
0	12/12/13	FOR COMMENT	AKS
1	1/10/14	PER COMMENTS	AKS

ISSUED BY | DATE

SITE INFORMATION
CT11381C
WATERFORD SOUTH/
RT 1
41 ROCKBRIDGE ROAD
WATERFORD, CT 06385

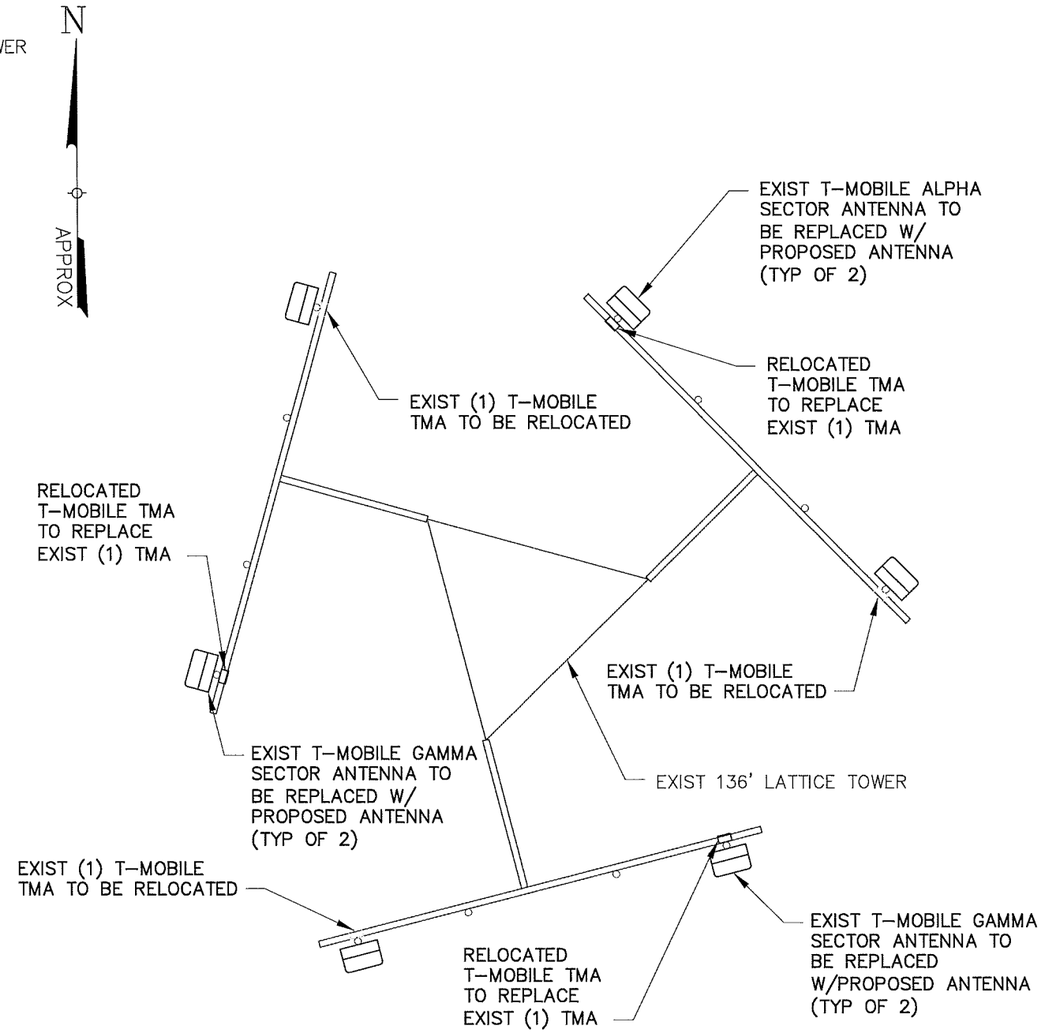
SHEET TITLE
SITE PLAN &
EQUIPMENT PLAN

SHEET NUMBER
L-1



1 L–2 ELEVATION

SCALE: 3/32" = 1'–0"



2 L–2 ANTENNA PLAN

SCALE: 1/4" = 1'–0"

CONFIGURATION

2C

0 1 2 3

ORIGINAL SIZE IN INCHES

TECTONIC

• PLANNING • ENGINEERING • SURVEYING • CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Surveying Consultants P.C.

1279 Route 300
Newburgh, NY 12550
Phone: (845) 567–6656
Fax: (845) 567–8703

T-Mobile NORTHEAST LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

APPROVALS

T–MOBILE _____
LANDLORD _____
RF _____
CONSTRUCTION _____

PROJECT NUMBER	DESIGNED BY
6644.CT11381C	JQ

REV	DATE	REVISION	DRAWN BY
0	12/12/13	FOR COMMENT	AKS
1	1/10/14	PER COMMENTS	AKS

ISSUED BY _____ DATE _____

SITE INFORMATION

CT11381C
WATERFORD SOUTH/
RT 1
41 ROCKBRIDGE ROAD
WATERFORD, CT 06385

SHEET TITLE

ELEVATION &
ANTENNA PLAN

SHEET NUMBER

L–2

Date: **December 16, 2013**

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

Tower Engineering Professionals
3703 Junction Blvd.
Raleigh, NC 27603
(919) 661-6351
crown@tepgroup.net

Subject: Structural Analysis Report

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11381C
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876338
	Crown Castle Site Name:	Waterford
	Crown Castle JDE Job Number:	252703
	Crown Castle Work Order Number:	685049
	Crown Castle Application Number:	207069 Rev. 1
Engineering Firm Designation:	**TEP Project Number:**	25598.12558
Site Data:	**41 Manitock Hill Road, Waterford, New London County, CT 06385** **Latitude *41° 21' 16.42"*, Longitude *-72° 9' 3.38"*** **136 Foot - Self Support Tower**	

Dear Charles McGuirt,

Tower Engineering Professionals 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 600635 in accordance with application 207069, revision 1.

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: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, ASCE 7-05 Minimum Design Loads for Buildings and Other Structures and the 2005 Connecticut State Building Code based upon a wind speed of 85 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Tables 1 and 2 and the attached drawing for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* 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: Jessica E. Jones, E.I. / OAS

Respectfully submitted by:

William H. Martin, P.E., S.E.

STATE OF CONNECTICUT
WILLIAM H. MARTIN
0029484
LICENSED PROFESSIONAL ENGINEER
12/16/13

Electronic Copy

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 136-ft self-support tower designed by Pirod, Inc. in February of 1999. The tower was originally designed for a wind speed of 90 mph per EIA/TIA-222-F for the appurtenances listed in Table 3. The tower has been modified per reinforcement drawings prepared by Vertical Structures, Inc. in September of 2008. TEP did not visit the site. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and ASCE 7-05 Minimum Design Loads for Buildings and Other Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch escalating 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
117.0	119.0	3	Ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1	1-5/8	1
		3	Ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	Ericsson	KRY 112 144/1			

Notes:
1) See "Appendix B – Base Level Drawing" for assumed feed line configuration.

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
136.0	137.0	3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	1
		3	RFS Celwave	IBC1900BB-1			
		3	RFS Celwave	IBC1900HG-2A			
	136.0	1	Tower Mounts	Platform Mount [LP 405-1]			
134.0	133.0	3	Alcatel Lucent	TME-800MHz 2x50W RRH W/Filter	-	-	1
		3	Alcatel Lucent	TME-1900MHz RRH (65MHz)			
127.0	127.0	12	Decibel	DB844H90E-XY w/ Mount Pipe	12	1-1/4	1
		1	Tower Mounts	Sector Mount [SM 411-3]			
117.0	119.0	3	EMS Wireless	RR90-17-02DP w/ Mount Pipe	2	1-5/8	2
		3	RFS Celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe			
		6	RFS Celwave	ATMAA1412D-1A20			
	117.0	1	Tower Mounts	Sector Mount [SM 411-3]	12	1-5/8	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
107.0	107.0	3	Alcatel Lucent	RRH2x40-AWS	1	1-5/8	3
		3	Antel	BXA-171063/12CF			
		3	Antel	BXA-80063/4CF			
		6	RFS Celwave	FD9R6004/2C-3L			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		3	Antel	BXA-185063/8CF	12	1-5/8	1
		3	Antel	BXA-70063/6CF			
		1	Tower Mounts	Sector Mount [SM 307-3]			
97.0	97.0	3	Ericsson	RRUS-11	-	-	3
		1	Andrew	SBNH-1D6565C w/ Mount Pipe	1 2 6	3/8 5/8 1-5/8	1
		3	Ericsson	RRUS-11			
		1	KMW Communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe			
		1	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	Powerwave Technologies	7770.00 w/Mount Pipe			
		6	Powerwave Technologies	LGP21401			
		1	Raycap	DC6-48-60-18-8F			
		1	Tower Mounts	Sector Mount			
87.0	89.0	3	Kathrein	800 10504 w/ Mount Pipe	6	7/8	1
		3	Kathrein	860 10118			
	87.0	1	Tower Mounts	Sector Mount [SM 104-3]			
80.0	81.0	1	Unknown	GPS	1	1/2	1
	80.0	1	Tower Mounts	Side Arm Mount [SO 701-1]			
72.0	72.0	2	Unknown	GPS_A	2	1/2	1
		2	Tower Mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing equipment
2) Existing equipment; to be removed
3) Reserved equipment

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)
136.0	136.0	12	Allgon	7184.05	12	1-5/8
127.0	127.0	12	Swedcom	ALP9212	12	1-5/8
117.0	117.0	12	Swedcom	ALP9212	12	1-5/8
102.0	102.0	2	Decibel	DB810	2	1-5/8
80.0	80.0	2	Generic	GPS	2	1/2

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Report	SEA Consultants, Inc.	2035622	CCISites
Foundation Drawings	Pirod, Inc.	2068030	CCISites
Manufacturer Drawings	Pirod, Inc.	1441523	CCISites
Reinforcement Drawing	Vertical Structures, Inc.	2125417	CCISites
Post Modification Inspection	Vertical Structures, Inc.	2376132	CCISites
Previous Structural Analysis	Tower Engineering Professionals	3998297	CCISites

3.1) Analysis Method

tnxTower (version 6.1.3.1), 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) The tower and foundation were built in accordance with the manufacturer's specifications.
2) The tower and foundation 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 "Appendix B – Base Level Drawing".
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by the standard.
5) All tower components are in sufficient condition to carry their full design capacity.
6) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
7) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals 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
T1	136 - 132.917	Leg	1 1/2	2	-1.32	31.18	4.2	Pass
T2	132.917 - 130	Leg	1 1/2	14	-4.53	46.64	9.7	Pass
T3	130 - 110	Leg	2	29	-37.91	97.16	39.0	Pass
T4	110 - 94.9434	Leg	2 1/4	87	-74.98	128.95	58.1	Pass
T5	94.9434 - 92.5938	Leg	2 1/4	129	-82.63	146.94	56.2	Pass
T6	92.5938 - 90	Leg	2 1/4	141	-94.23	149.11	63.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_{allow} (K)	% Capacity	Pass / Fail
T7	90 - 80	Leg	Pirod 105244 w/ 1 1/4" Reinforcement	Note 1	Note 1	Note 1	52.5	Pass
T8	80 - 60	Leg	Pirod 105217	165	-145.42	184.67	78.7	Pass
T9	60 - 40	Leg	Pirod 105218	180	-181.82	258.24	70.4	Pass
T10	40 - 20	Leg	Pirod 105218	195	-213.20	258.24	82.6	Pass
T11	20 - 0	Leg	Pirod 105219	210	-241.76	343.62	70.4	Pass
T1	136 - 132.917	Diagonal	3/4	8	-1.11	4.12	27.0	Pass
T2	132.917 - 130	Diagonal	3/4	22	-1.15	5.22	22.1	Pass
T3	130 - 110	Diagonal	7/8	40	-3.54	8.16	43.4	Pass
T4	110 - 94.9434	Diagonal	1	96	-5.06	12.34	41.0	Pass
T5	94.9434 - 92.5938	Diagonal	1	134	-5.22	12.09	43.1	Pass
T6	92.5938 - 90	Diagonal	1	149	-5.71	12.50	45.6	Pass
T7	90 - 80	Diagonal	L3x3x3/16	161	-7.52	17.49	43.0 76.0 (b)	Pass
T8	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	167	-7.04	9.65	73.0	Pass
T9	60 - 40	Diagonal	L3x3x3/16	182	-6.61	13.37	49.4 57.4 (b)	Pass
T10	40 - 20	Diagonal	L3x3x3/16	197	-6.54	10.67	61.3	Pass
T11	20 - 0	Diagonal	L3x3x5/16	211	-8.11	14.01	57.9	Pass
T5	94.9434 - 92.5938	Secondary Horizontal	1 1/2	137	-1.43	31.48	4.5	Pass
T6	92.5938 - 90	Secondary Horizontal	1 1/2	152	-1.63	30.78	5.3	Pass
T1	136 - 132.917	Top Girt	3 x 3/8	4	-0.75	1.21	62.0	Pass
T2	132.917 - 130	Top Girt	7/8	18	-0.13	5.41	2.3	Pass
T3	130 - 110	Top Girt	7/8	33	-0.50	5.46	9.1	Pass
T4	110 - 94.9434	Top Girt	1	90	-1.24	7.36	16.8	Pass
T2	132.917 - 130	Bottom Girt	7/8	21	-0.47	5.41	8.7	Pass
T3	130 - 110	Bottom Girt	7/8	34	-1.62	4.33	37.4	Pass
T6	92.5938 - 90	Bottom Girt	1	142	-0.78	6.02	13.0	Pass
							Summary	
						Leg (T10)	82.6	Pass
						Diagonal (T7)	76.0	Pass
						Secondary Horizontal (T6)	5.3	Pass
						Top Girt (T1)	62.0	Pass
						Bottom Girt (T3)	37.4	Pass
						Bolt Checks	76.0	Pass
						Rating =	**82.6**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
-	Anchor Rods	-	53.6	Pass
1	Base Foundation Soil Interaction	-	86.5	Pass
1	Base Foundation Structural	-	31.5	Pass

Structure Rating (max from all components) =	86.5%

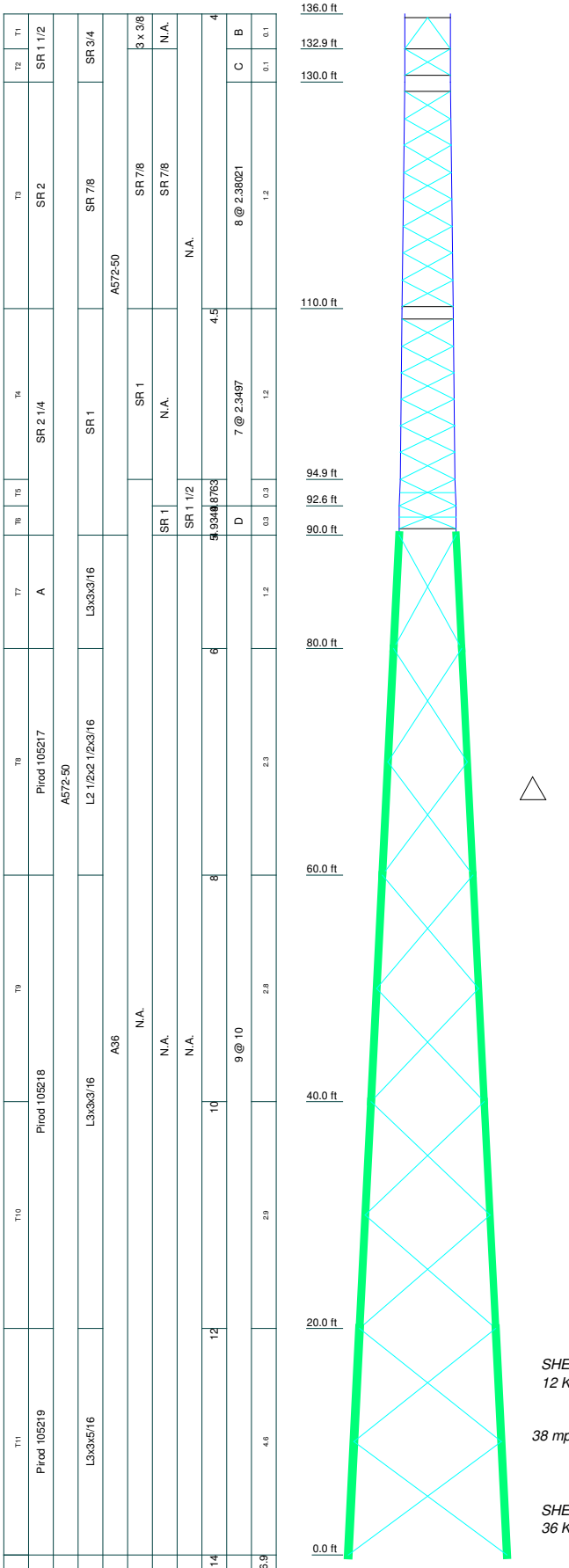
Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

4.1) Recommendations

1) If the load differs from that described in Tables 1 and 2 of this report, "Appendix B – Base Level Drawing" or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The tower and its foundation have sufficient capacity to carry the existing and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe	136	BXA-171063/12CF	107
APXVSPP18-C-A20 w/ Mount Pipe	136	BXA-171063/12CF	107
APXVSPP18-C-A20 w/ Mount Pipe	136	BXA-171063/12CF	107
IBC1900BB-1	136	(2) FD9R6004/2C-3L	107
IBC1900BB-1	136	(2) FD9R6004/2C-3L	107
IBC1900BB-1	136	(2) FD9R6004/2C-3L	107
IBC1900HG-2A	136	RRH2x40-AWS	107
IBC1900HG-2A	136	RRH2x40-AWS	107
IBC1900HG-2A	136	RRH2x40-AWS	107
Platform Mount [LP 405-1]	136	DB-T1-6Z-8AB-0Z	107
TME-800MHz 2X50W RRH W/FILTER	134	Sector Mount [SM 307-3]	107
TME-800MHz 2X50W RRH W/FILTER	134	AM-X-CD-16-65-00T-RET w/ Mount Pipe	97
TME-800MHz 2X50W RRH W/FILTER	134	AM-X-CD-14-65-00T-RET w/ Mount Pipe	97
1900MHz RRH (65MHz)	134	SBNH-1D6565C w/ Mount Pipe	97
1900MHz RRH (65MHz)	134	7770.00 w/Mount Pipe	97
1900MHz RRH (65MHz)	134	7770.00 w/Mount Pipe	97
(4) DB844H90E-XY w/ Mount Pipe	127	7770.00 w/Mount Pipe	97
(4) DB844H90E-XY w/ Mount Pipe	127	(2) LGP21401	97
(4) DB844H90E-XY w/ Mount Pipe	127	(2) LGP21401	97
HSS 4" x 4" x 4-ft Horizontal	127	(2) LGP21401	97
HSS 4" x 4" x 4-ft Horizontal	127	(2) RRUS-11	97
HSS 4" x 4" x 4-ft Horizontal	127	(2) RRUS-11	97
HSS 4" x 4" x 4-ft Horizontal	127	(2) RRUS-11	97
HSS 4" x 4" x 4-ft Horizontal	127	DC6-48-60-18-8F	97
HSS 4" x 4" x 4-ft Horizontal	127	2.4" x 4 Pipe Horiz	97
Sector Mount [SM 411-3]	127	2.4" x 4 Pipe Horiz	97
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	117	2.4" x 4 Pipe Horiz	97
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	117	Pipe Mount [PM 601-3]	97
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	117	800 10504 w/ Mount Pipe	87
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	117	800 10504 w/ Mount Pipe	87
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	117	800 10504 w/ Mount Pipe	87
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	117	860 10118	87
KRY 112 144/1	117	860 10118	87
KRY 112 144/1	117	860 10118	87
KRY 112 144/1	117	2.4" x 6-ft pipe	87
Sector Mount [SM 411-3]	117	2.4" x 6-ft pipe	87
BXA-80063/4CF	107	2.4" x 6-ft pipe	87
BXA-80063/4CF	107	Sector Mount [SM 104-3]	87
BXA-80063/4CF	107	GPS	80
BXA-70063/6CF	107	Side Arm Mount [SO 701-1]	80
BXA-70063/6CF	107	GPS_A	72
BXA-70063/6CF	107	GPS_A	72
BXA-185063/8CF	107	Side Arm Mount [SO 701-1]	72
BXA-185063/8CF	107	Side Arm Mount [SO 701-1]	72
BXA-185063/8CF	107		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105244 w/ 1 1/4" Reinforcement	C	1 @ 2.375
B	1 @ 2.70833	D	1 @ 2.01042

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in New London 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: 82.6%

MAX. CORNER REACTIONS AT BASE:
DOWN: 251 K
SHEAR: 25 K

UPLIFT: -224 K
SHEAR: 22 K

AXIAL
75 K
SHEAR 12 K *MOMENT 916 kip-ft*

TORQUE 1 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL
36 K
SHEAR 36 K *MOMENT 2899 kip-ft*

TORQUE 4 kip-ft
REACTIONS - 85 mph WIND

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Job: **Waterford (BU# 876338)**			
Project: **TEP No. 25598.12558**			
Client: Crown Castle	Drawn by: osaleh	App'd:	
Code: TIA/EIA-222-F	Date: 12/16/13	Scale: NTS	
Path: \\tep-vm-file01\Towers\25598\12558_SA - 876338 - Waterford\tnxTower\876338_LC7.eri		Dwg No. E-1	

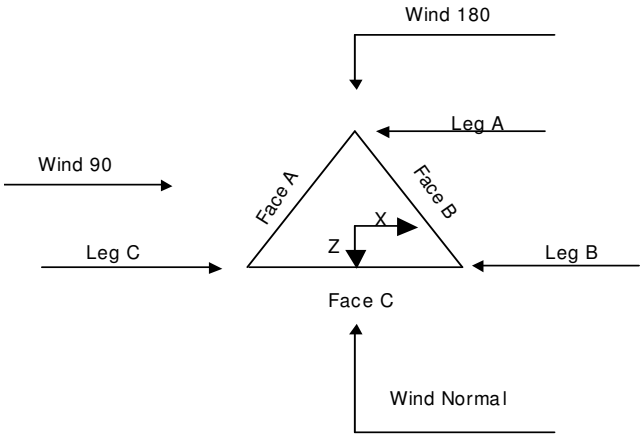
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 136.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and 14.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56.00 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate	√	Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r	√	SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension	√	All Leg Panels Have Same Allowable
√	Escalate Ice	√	Bypass Mast Stability Checks	√	Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.	√	Include Angle Block Shear Check
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends		Include Shear-Torsion Interaction
√	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination		Use TIA-222-G Tension Splice Capacity Exemption		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	136.00-132.92			4.00	1	3.08
T2	132.92-130.00			4.00	1	2.92
T3	130.00-110.00			4.00	1	20.00
T4	110.00-94.94			4.50	1	15.06
T5	94.94-92.59			4.88	1	2.35
T6	92.59-90.00			4.93	1	2.59
T7	90.00-80.00			5.00	1	10.00
T8	80.00-60.00			6.00	1	20.00
T9	60.00-40.00			8.00	1	20.00
T10	40.00-20.00			10.00	1	20.00
T11	20.00-0.00			12.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	136.00-132.92	2.71	K Brace Down	No	Yes	4.5000	0.0000
T2	132.92-130.00	2.38	X Brace	No	No	0.0000	6.5000
T3	130.00-110.00	2.38	X Brace	No	No	10.0000	1.5000
T4	110.00-94.94	2.35	X Brace	No	No	11.5000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T5	94.94-92.59	2.35	X Brace	No	Yes	0.0000	0.0000
T6	92.59-90.00	2.01	X Brace	No	Yes	0.0000	7.0000
T7	90.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T8	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T9	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T10	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T11	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 136.00-132.92	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 132.92-130.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 130.00-110.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110.00-94.94	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T5 94.94-92.59	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T6 92.59-90.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T7 90.00-80.00	Truss Leg	Pirod 105244 w/ 1 1/4" Reinforcement	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 80.00-60.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 60.00-40.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T10 40.00-20.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T11 20.00-0.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 136.00-132.92	Flat Bar	3 x 3/8	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T2 132.92-130.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 130.00-110.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110.00-94.94	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T6 92.59-90.00	Solid Round		A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 136.00-132.92	None	Solid Round		A572-50 (50 ksi)	Flat Bar	3 x 3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T5 94.94-92.59	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T6 92.59-90.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 136.00-132.92	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 132.92-130.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 130.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 110.00-94.94	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 94.94-92.59	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 92.59-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 90.00-80.00	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T8 80.00-60.00	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T9 60.00-40.00	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T10 40.00-20.00	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000
T11 20.00-0.00	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
136.00-132.92				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
132.92-130.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
130.00-110.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
110.00-94.94				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
94.94-92.59				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
92.59-90.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
90.00-80.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals
T7	1	0.5	0.7	1	0.5	0.85
90.00-80.00						
T8	1	0.5	0.7	1	0.5	0.85
80.00-60.00						
T9	1	0.5	0.7	1	0.5	0.85
60.00-40.00						
T10	1	0.5	0.7	1	0.5	0.85
40.00-20.00						
T11	1	0.5	0.76	1	0.5	0.85
20.00-0.00						

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 136.00-132.92	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 132.92-130.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 130.00-110.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 110.00-94.94	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 94.94-92.59	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 92.59-90.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 90.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T11 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 136.00-132.92	Sleeve DS	0.6250 A325N	0	1.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T2 132.92-130.00	Sleeve DS	0.6250 A325N	0	1.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T3 130.00-110.00	Sleeve DS	0.7500 A325N	0	1.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 110.00-94.94	Sleeve DS	0.7500 A325N	0	1.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 94.94-92.59	Flange	1.0000 A325N	0	1.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 92.59-90.00	Flange	1.0000 A325N	6	1.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 90.00-80.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 80.00-60.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 60.00-40.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 40.00-20.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 20.00-0.00	Flange	1.2500 A687	6	1.2500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF4-50A(1/2") *	A	No	Ar (Leg)	72.00 - 0.00	0.0000	0.15	2	2	0.5000	0.6300		0.00
LDF6-50A(1-1/4")	A	No	Ar (Leg)	127.00 - 0.00	0.0000	0.1	12	7	0.5000 1.5000	1.5500		0.00
T-Brackets (Af) *	A	No	Af (Leg)	127.00 - 0.00	0.0000	0.1	1	1	1.0000	1.0000	4.0000	0.01
LDF7-50A(1-5/8")	B	No	Ar (Leg)	97.00 - 0.00	0.0000	0.1	9	6	0.5000	1.9800		0.00
HB114-1-08U4-M5J(1 1/4")	B	No	Ar (Leg)	136.00 - 97.00	0.0000	0.05	3	3	0.5000	1.5400		0.00
T-Brackets (Af) *	B	No	Af (Leg)	136.00 - 0.00	0.0000	0.1	1	1	1.0000	1.0000	4.0000	0.01
LDF7-50A(1-5/8") *	B	No	Ar (Leg)	107.00 - 0.00	0.0000	0.15	13	8	0.5000	1.9800		0.00
FB-L98-002-XXX(3/8)	B	No	Ar (Leg)	97.00 - 0.00	0.0000	0.1	1	1	0.3937	0.3937		0.00
WR-VG82ST-BRDA(5/8") *	B	No	Ar (Leg)	97.00 - 0.00	0.0000	0.12	2	2	0.5000	0.6450		0.00
FLC 12-50J(1/2") *	B	No	Ar (Leg)	80.00 - 0.00	0.0000	0.05	1	1	0.5000	0.6400		0.00
LDF7-50A(1-5/8")	C	No	Ar (Leg)	117.00 - 0.00	0.0000	0.1	13	7	0.5000	1.9800		0.00
T-Brackets (Af) *	C	No	Af (Leg)	117.00 - 0.00	0.0000	0.1	1	1	1.0000	1.0000	4.0000	0.01
FXL 780 PE(7/8)	A	Yes	Ar (CfAe)	87.00 - 0.00	0.0000	-0.1	6	6	1.5000 0.5000	1.0900		0.00
Feedline Ladder (Af)	A	Yes	Af (CfAe)	87.00 - 0.00	0.0000	0	1	1	3.0000	3.0000	12.0000	0.01
Safety Line 3/8	C	Yes	Ar (CfAe)	136.00 - 0.00	0.0000	0.5	1	1	0.3750	0.3750		0.00
Ladder Rung SR 3/4 (48"w 26"s)	C	Yes	Ar (CfAe)	136.00 - 90.00	0.0000	0	1	1	1.3500	1.3500		0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	136.00-132.92	A	0.000	0.000	0.000	0.000	0.00
		B	1.187	0.257	0.000	0.000	0.04
		C	1.630	0.257	0.000	0.000	0.01
T2	132.92-130.00	A	0.000	0.000	0.000	0.000	0.00
		B	1.123	0.243	0.000	0.000	0.03
		C	1.542	0.243	0.000	0.000	0.01

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T3	130.00-110.00	A	23.456	2.000	0.000	0.000	0.28
		B	23.071	3.083	0.000	0.000	0.23
		C	18.660	2.250	0.000	0.000	0.19
T4	110.00-94.94	A	31.004	2.509	0.000	0.000	0.25
		B	36.858	2.509	0.000	0.000	0.31
		C	42.799	2.509	0.000	0.000	0.33
T5	94.94-92.59	A	4.838	0.392	0.000	0.000	0.04
		B	7.882	0.392	0.000	0.000	0.06
		C	8.809	0.392	0.000	0.000	0.05
T6	92.59-90.00	A	5.341	0.432	0.000	0.000	0.04
		B	8.701	0.432	0.000	0.000	0.07
		C	9.724	0.432	0.000	0.000	0.06
T7	90.00-80.00	A	24.407	3.417	0.000	0.000	0.23
		B	33.545	1.667	0.000	0.000	0.27
		C	36.366	1.667	0.000	0.000	0.19
T8	80.00-60.00	A	53.343	8.333	0.000	0.000	0.53
		B	69.416	3.333	0.000	0.000	0.55
		C	73.798	3.333	0.000	0.000	0.39
T9	60.00-40.00	A	54.183	8.333	0.000	0.000	0.53
		B	70.256	3.333	0.000	0.000	0.55
		C	73.798	3.333	0.000	0.000	0.39
T10	40.00-20.00	A	54.183	8.333	0.000	0.000	0.53
		B	70.256	3.333	0.000	0.000	0.55
		C	73.798	3.333	0.000	0.000	0.39
T11	20.00-0.00	A	54.183	8.333	0.000	0.000	0.53
		B	70.256	3.333	0.000	0.000	0.55
		C	73.798	3.333	0.000	0.000	0.39

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	136.00-132.92	A	0.888	0.000	0.000	0.000	0.000	0.00
		B		0.852	1.609	0.000	0.000	0.06
		C		2.207	1.609	0.000	0.000	0.02
T2	132.92-130.00	A	0.885	0.000	0.000	0.000	0.000	0.00
		B		0.805	1.522	0.000	0.000	0.06
		C		2.085	1.522	0.000	0.000	0.02
T3	130.00-110.00	A	0.876	6.854	30.440	0.000	0.000	0.80
		B		10.162	30.908	0.000	0.000	0.41
		C		16.375	20.357	0.000	0.000	0.46
T4	110.00-94.94	A	0.859	8.742	39.487	0.000	0.000	0.71
		B		12.748	45.000	0.000	0.000	0.80
		C		19.764	48.238	0.000	0.000	0.80
T5	94.94-92.59	A	0.850	1.357	6.158	0.000	0.000	0.11
		B		2.947	9.295	0.000	0.000	0.18
		C		4.035	9.801	0.000	0.000	0.12
T6	92.59-90.00	A	0.847	1.496	6.796	0.000	0.000	0.12
		B		3.247	10.259	0.000	0.000	0.20
		C		4.446	10.817	0.000	0.000	0.14
T7	90.00-80.00	A	0.840	7.358	36.141	0.000	0.000	0.67
		B		12.459	39.538	0.000	0.000	0.78
		C		14.530	41.688	0.000	0.000	0.48
T8	80.00-60.00	A	0.821	18.180	81.819	0.000	0.000	1.53
		B		30.669	80.120	0.000	0.000	1.58
		C		32.475	83.290	0.000	0.000	0.95
T9	60.00-40.00	A	0.788	19.261	82.356	0.000	0.000	1.52

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		31.426	80.729	0.000	0.000	1.55
		C		31.718	83.145	0.000	0.000	0.93
T10	40.00-20.00	A	0.750	18.750	82.100	0.000	0.000	1.33
		B		30.531	80.558	0.000	0.000	1.51
		C		30.823	82.975	0.000	0.000	0.91
T11	20.00-0.00	A	0.750	18.750	82.100	0.000	0.000	1.33
		B		30.531	80.558	0.000	0.000	1.51
		C		30.823	82.975	0.000	0.000	0.91

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	136.00-132.92	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.015	0.221	0.036	0.110
T2	132.92-130.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.042	0.408	0.000	0.000
T3	130.00-110.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.213	1.939	0.000	0.000
T4	110.00-94.94	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.173	1.405	0.000	0.000
T5	94.94-92.59	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.045	0.327	0.000	0.000
T6	92.59-90.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.056	0.416	0.000	0.000
T7	90.00-80.00	A	0.000	0.691	0.577	1.233
		B	0.000	0.000	0.000	0.000
		C	0.000	0.099	0.032	0.178
T8	80.00-60.00	A	0.000	1.622	1.159	2.469
		B	0.000	0.000	0.000	0.000
		C	0.000	0.161	0.046	0.245
T9	60.00-40.00	A	0.000	1.324	1.191	2.520
		B	0.000	0.000	0.000	0.000
		C	0.000	0.128	0.047	0.244
T10	40.00-20.00	A	0.000	1.130	1.076	2.259
		B	0.000	0.000	0.000	0.000
		C	0.000	0.106	0.042	0.211
T11	20.00-0.00	A	0.000	1.054	1.004	2.108
		B	0.000	0.000	0.000	0.000
		C	0.000	0.099	0.039	0.197

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	136.00-132.92	2.9906	2.4300	1.2202	1.7418
T2	132.92-130.00	3.1640	2.5847	1.1245	1.4750
T3	130.00-110.00	0.0903	-1.2507	-0.2600	-0.6786
T4	110.00-94.94	0.6680	1.3245	0.2081	0.9521
T5	94.94-92.59	2.1566	2.0129	1.4234	1.4510
T6	92.59-90.00	2.1384	1.9911	1.4032	1.3998
T7	90.00-80.00	1.3208	1.5118	0.6378	1.0489
T8	80.00-60.00	1.4296	1.7053	0.6551	1.2134
T9	60.00-40.00	1.7615	1.9863	0.8042	1.4448
T10	40.00-20.00	2.1149	2.3929	0.9505	1.7528
T11	20.00-0.00	2.4111	2.7336	1.0597	1.9823

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 1.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 1.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 1.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
IBC1900BB-1	A	From Centroid-Face	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.13 1.27 1.43 1.76 2.53	0.53 0.65 0.77 1.04 1.69	0.02 0.03 0.04 0.06 0.15
IBC1900BB-1	B	From Centroid-Face	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.13 1.27 1.43 1.76 2.53	0.53 0.65 0.77 1.04 1.69	0.02 0.03 0.04 0.06 0.15
IBC1900BB-1	C	From Centroid-Face	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.13 1.27 1.43 1.76 2.53	0.53 0.65 0.77 1.04 1.69	0.02 0.03 0.04 0.06 0.15
IBC1900HG-2A	A	From Centroid-Face	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.13 1.27 1.43 1.76 2.53	0.53 0.65 0.77 1.04 1.69	0.02 0.03 0.04 0.06 0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
IBC1900HG-2A	B	From Centroid-Face	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.13 1.27 1.43 1.76 2.53	0.53 0.65 0.77 1.04 1.69	0.02 0.03 0.04 0.06 0.15
IBC1900HG-2A	C	From Centroid-Face	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.13 1.27 1.43 1.76 2.53	0.53 0.65 0.77 1.04 1.69	0.02 0.03 0.04 0.06 0.15
Platform Mount [LP 405-1]	C	None		0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	20.80 28.10 35.40 50.00 79.20	20.80 28.10 35.40 50.00 79.20	1.80 2.07 2.33 2.86 3.93
*									
TME-800MHz 2X50W RRH W/FILTER	A	From Face	1.00 0.00 -1.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
TME-800MHz 2X50W RRH W/FILTER	B	From Face	1.00 0.00 -1.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
TME-800MHz 2X50W RRH W/FILTER	C	From Face	1.00 0.00 -1.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
1900MHz RRH (65MHz)	A	From Face	1.00 0.00 -1.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
1900MHz RRH (65MHz)	B	From Face	1.00 0.00 -1.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
1900MHz RRH (65MHz)	C	From Face	1.00 0.00 -1.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
**									
(4) DB844H90E-XY w/ Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56
(4) DB844H90E-XY w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(4) DB844H90E-XY w/ Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56
HSS 4" x 4" x 4-ft Horizontal	A	From Face	0.00 0.00 0.00	1.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.09 2.39 2.69 3.29 4.49	0.16 0.21 0.28 0.43 0.85	0.04 0.05 0.07 0.12 0.27
HSS 4" x 4" x 4-ft Horizontal	A	From Face	0.00 0.00 0.00	-1.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.09 2.39 2.69 3.29 4.49	0.16 0.21 0.28 0.43 0.85	0.04 0.05 0.07 0.12 0.27
HSS 4" x 4" x 4-ft Horizontal	B	From Face	0.00 0.00 0.00	1.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.09 2.39 2.69 3.29 4.49	0.16 0.21 0.28 0.43 0.85	0.04 0.05 0.07 0.12 0.27
HSS 4" x 4" x 4-ft Horizontal	B	From Face	0.00 0.00 0.00	-1.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.09 2.39 2.69 3.29 4.49	0.16 0.21 0.28 0.43 0.85	0.04 0.05 0.07 0.12 0.27
HSS 4" x 4" x 4-ft Horizontal	C	From Face	0.00 0.00 0.00	1.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.09 2.39 2.69 3.29 4.49	0.16 0.21 0.28 0.43 0.85	0.04 0.05 0.07 0.12 0.27
HSS 4" x 4" x 4-ft Horizontal	C	From Face	0.00 0.00 0.00	-1.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.09 2.39 2.69 3.29 4.49	0.16 0.21 0.28 0.43 0.85	0.04 0.05 0.07 0.12 0.27
Sector Mount [SM 411-3]	C	None		0.0000	127.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	21.88 30.68 39.48 57.08 92.28	21.88 30.68 39.48 57.08 92.28	1.07 1.48 1.90 2.73 4.40
*									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A	A	From Leg	4.00	0.0000	117.00	No Ice	6.83	5.64	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
B2P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			2.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A	B	From Leg	4.00	0.0000	117.00	No Ice	6.83	5.64	0.11
B2P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			2.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A	C	From Leg	4.00	0.0000	117.00	No Ice	6.83	5.64	0.11
B2P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			2.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
KRY 112 144/1	A	From Leg	4.00	0.0000	117.00	No Ice	0.41	0.19	0.01
			0.00			1/2" Ice	0.50	0.26	0.01
			2.00			1" Ice	0.60	0.33	0.02
						2" Ice	0.82	0.51	0.03
						4" Ice	1.36	0.97	0.08
KRY 112 144/1	B	From Leg	4.00	0.0000	117.00	No Ice	0.41	0.19	0.01
			0.00			1/2" Ice	0.50	0.26	0.01
			2.00			1" Ice	0.60	0.33	0.02
						2" Ice	0.82	0.51	0.03
						4" Ice	1.36	0.97	0.08
KRY 112 144/1	C	From Leg	4.00	0.0000	117.00	No Ice	0.41	0.19	0.01
			0.00			1/2" Ice	0.50	0.26	0.01
			2.00			1" Ice	0.60	0.33	0.02
						2" Ice	0.82	0.51	0.03
						4" Ice	1.36	0.97	0.08
Sector Mount [SM 411-3]	C	None		0.0000	117.00	No Ice	21.88	21.88	1.07
						1/2" Ice	30.68	30.68	1.48
						1" Ice	39.48	39.48	1.90
						2" Ice	57.08	57.08	2.73
						4" Ice	92.28	92.28	4.40
*									
BXA-80063/4CF	A	From Leg	4.00	0.0000	107.00	No Ice	5.16	2.25	0.01
			0.00			1/2" Ice	5.55	2.55	0.04
			0.00			1" Ice	5.94	2.85	0.07
						2" Ice	6.75	3.49	0.15
						4" Ice	8.48	5.04	0.36
BXA-80063/4CF	B	From Leg	4.00	0.0000	107.00	No Ice	5.16	2.25	0.01
			0.00			1/2" Ice	5.55	2.55	0.04
			0.00			1" Ice	5.94	2.85	0.07
						2" Ice	6.75	3.49	0.15
						4" Ice	8.48	5.04	0.36
BXA-80063/4CF	C	From Leg	4.00	0.0000	107.00	No Ice	5.16	2.25	0.01
			0.00			1/2" Ice	5.55	2.55	0.04
			0.00			1" Ice	5.94	2.85	0.07
						2" Ice	6.75	3.49	0.15
						4" Ice	8.48	5.04	0.36
BXA-70063/6CF	A	From Leg	4.00	0.0000	107.00	No Ice	7.73	3.76	0.02
			0.00			1/2" Ice	8.27	4.19	0.06
			0.00			1" Ice	8.81	4.63	0.10
						2" Ice	9.93	5.53	0.22
						4" Ice	12.27	7.43	0.52
BXA-70063/6CF	B	From Leg	4.00	0.0000	107.00	No Ice	7.73	3.76	0.02
			0.00			1/2" Ice	8.27	4.19	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Offsets: ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
				0.00				1" Ice	8.81	4.63	0.10
								2" Ice	9.93	5.53	0.22
								4" Ice	12.27	7.43	0.52
BXA-70063/6CF	C	From Leg	4.00			0.0000	107.00	No Ice	7.73	3.76	0.02
			0.00					1/2" Ice	8.27	4.19	0.06
			0.00					1" Ice	8.81	4.63	0.10
								2" Ice	9.93	5.53	0.22
								4" Ice	12.27	7.43	0.52
BXA-185063/8CF	A	From Leg	4.00			0.0000	107.00	No Ice	2.94	1.79	0.01
			0.00					1/2" Ice	3.26	2.09	0.03
			0.00					1" Ice	3.60	2.40	0.05
								2" Ice	4.36	3.04	0.10
								4" Ice	5.99	4.46	0.27
BXA-185063/8CF	B	From Leg	4.00			0.0000	107.00	No Ice	2.94	1.79	0.01
			0.00					1/2" Ice	3.26	2.09	0.03
			0.00					1" Ice	3.60	2.40	0.05
								2" Ice	4.36	3.04	0.10
								4" Ice	5.99	4.46	0.27
BXA-185063/8CF	C	From Leg	4.00			0.0000	107.00	No Ice	2.94	1.79	0.01
			0.00					1/2" Ice	3.26	2.09	0.03
			0.00					1" Ice	3.60	2.40	0.05
								2" Ice	4.36	3.04	0.10
								4" Ice	5.99	4.46	0.27
BXA-171063/12CF	A	From Leg	4.00			0.0000	107.00	No Ice	4.79	3.62	0.02
			0.00					1/2" Ice	5.24	4.06	0.04
			0.00					1" Ice	5.70	4.50	0.08
								2" Ice	6.64	5.42	0.16
								4" Ice	8.64	7.34	0.40
BXA-171063/12CF	B	From Leg	4.00			0.0000	107.00	No Ice	4.79	3.62	0.02
			0.00					1/2" Ice	5.24	4.06	0.04
			0.00					1" Ice	5.70	4.50	0.08
								2" Ice	6.64	5.42	0.16
								4" Ice	8.64	7.34	0.40
BXA-171063/12CF	C	From Leg	4.00			0.0000	107.00	No Ice	4.79	3.62	0.02
			0.00					1/2" Ice	5.24	4.06	0.04
			0.00					1" Ice	5.70	4.50	0.08
								2" Ice	6.64	5.42	0.16
								4" Ice	8.64	7.34	0.40
(2) FD9R6004/2C-3L	A	From Leg	4.00			0.0000	107.00	No Ice	0.37	0.08	0.00
			0.00					1/2" Ice	0.45	0.14	0.01
			0.00					1" Ice	0.54	0.20	0.01
								2" Ice	0.75	0.34	0.02
								4" Ice	1.28	0.74	0.06
(2) FD9R6004/2C-3L	B	From Leg	4.00			0.0000	107.00	No Ice	0.37	0.08	0.00
			0.00					1/2" Ice	0.45	0.14	0.01
			0.00					1" Ice	0.54	0.20	0.01
								2" Ice	0.75	0.34	0.02
								4" Ice	1.28	0.74	0.06
(2) FD9R6004/2C-3L	C	From Leg	4.00			0.0000	107.00	No Ice	0.37	0.08	0.00
			0.00					1/2" Ice	0.45	0.14	0.01
			0.00					1" Ice	0.54	0.20	0.01
								2" Ice	0.75	0.34	0.02
								4" Ice	1.28	0.74	0.06
RRH2x40-AWS	A	From Leg	4.00			0.0000	107.00	No Ice	2.52	1.59	0.04
			0.00					1/2" Ice	2.75	1.80	0.06
			0.00					1" Ice	2.99	2.01	0.08
								2" Ice	3.50	2.46	0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	4.61	3.48	0.28
RRH2x40-AWS	B	From Leg	4.00 0.00 0.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2x40-AWS	C	From Leg	4.00 0.00 0.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 0.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
Sector Mount [SM 307-3]	C	None		0.0000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	26.22 36.28 46.34 66.46 106.70	26.22 36.28 46.34 66.46 106.70	1.62 2.15 2.68 3.73 5.85
*									
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
AM-X-CD-14-65-00T-RET w/ Mount Pipe	B	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.74 6.20 6.66 7.62 9.67	4.02 4.63 5.28 6.68 9.74	0.05 0.09 0.15 0.27 0.62
SBNH-1D6565C w/ Mount Pipe	C	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.69 12.42 13.16 14.63 17.92	9.85 11.38 12.94 15.31 20.19	0.10 0.19 0.29 0.52 1.17
7770.00 w/Mount Pipe	A	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.92 6.36 6.81 7.74 9.71	4.04 4.67 5.32 6.67 9.81	0.05 0.10 0.15 0.27 0.63
7770.00 w/Mount Pipe	B	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.92 6.36 6.81 7.74 9.71	4.04 4.67 5.32 6.67 9.81	0.05 0.10 0.15 0.27 0.63
7770.00 w/Mount Pipe	C	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.92 6.36 6.81 7.74 9.71	4.04 4.67 5.32 6.67 9.81	0.05 0.10 0.15 0.27 0.63
(2) LGP21401	A	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LGP21401	B	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	C	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) RRUS-11	A	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) RRUS-11	B	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) RRUS-11	C	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
DC6-48-60-18-8F	A	From Leg	2.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.27 1.46 1.66 2.09 3.10	1.27 1.46 1.66 2.09 3.10	0.02 0.04 0.05 0.10 0.21
2.4" x 4 Pipe Horiz	A	From Leg	1.50 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.12 1.45 1.79 2.50 4.01	0.06 0.09 0.14 0.25 0.58	0.01 0.02 0.04 0.07 0.20
2.4" x 4 Pipe Horiz	B	From Leg	1.50 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.12 1.45 1.79 2.50 4.01	0.06 0.09 0.14 0.25 0.58	0.01 0.02 0.04 0.07 0.20
2.4" x 4 Pipe Horiz	C	From Leg	1.50 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.12 1.45 1.79 2.50 4.01	0.06 0.09 0.14 0.25 0.58	0.01 0.02 0.04 0.07 0.20
Pipe Mount [PM 601-3]	C	None		0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
*									
800 10504 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
800 10504 w/ Mount Pipe	B	From Leg	4.00	0.0000	87.00	No Ice	3.59	3.18	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	4.01	3.91	0.07
			2.00			1" Ice	4.42	4.58	0.11
						2" Ice	5.34	5.98	0.21
						4" Ice	7.38	8.98	0.51
800 10504 w/ Mount Pipe	C	From Leg	4.00	0.0000	87.00	No Ice	3.59	3.18	0.04
			0.00			1/2" Ice	4.01	3.91	0.07
			2.00			1" Ice	4.42	4.58	0.11
						2" Ice	5.34	5.98	0.21
						4" Ice	7.38	8.98	0.51
860 10118	A	From Leg	4.00	0.0000	87.00	No Ice	0.04	0.14	0.00
			0.00			1/2" Ice	0.07	0.21	0.00
			2.00			1" Ice	0.11	0.28	0.01
						2" Ice	0.22	0.46	0.01
						4" Ice	0.54	0.91	0.05
860 10118	B	From Leg	4.00	0.0000	87.00	No Ice	0.04	0.14	0.00
			0.00			1/2" Ice	0.07	0.21	0.00
			2.00			1" Ice	0.11	0.28	0.01
						2" Ice	0.22	0.46	0.01
						4" Ice	0.54	0.91	0.05
860 10118	C	From Leg	4.00	0.0000	87.00	No Ice	0.04	0.14	0.00
			0.00			1/2" Ice	0.07	0.21	0.00
			2.00			1" Ice	0.11	0.28	0.01
						2" Ice	0.22	0.46	0.01
						4" Ice	0.54	0.91	0.05
2.4" x 6-ft pipe	A	From Leg	4.00	0.0000	87.00	No Ice	1.44	1.44	0.02
			0.00			1/2" Ice	1.93	1.93	0.03
			1.00			1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
						4" Ice	4.71	4.71	0.23
2.4" x 6-ft pipe	B	From Leg	4.00	0.0000	87.00	No Ice	1.44	1.44	0.02
			0.00			1/2" Ice	1.93	1.93	0.03
			1.00			1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
						4" Ice	4.71	4.71	0.23
2.4" x 6-ft pipe	C	From Leg	4.00	0.0000	87.00	No Ice	1.44	1.44	0.02
			0.00			1/2" Ice	1.93	1.93	0.03
			1.00			1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
						4" Ice	4.71	4.71	0.23
Sector Mount [SM 104-3]	C	None		0.0000	87.00	No Ice	30.02	30.02	0.95
						1/2" Ice	40.48	40.48	1.41
						1" Ice	50.94	50.94	1.86
						2" Ice	71.86	71.86	2.76
						4" Ice	113.70	113.70	4.57
*									
GPS	C	From Leg	3.00	0.0000	80.00	No Ice	0.17	0.17	0.00
			0.00			1/2" Ice	0.24	0.24	0.00
			1.00			1" Ice	0.31	0.31	0.00
						2" Ice	0.48	0.48	0.01
						4" Ice	0.92	0.92	0.05
Side Arm Mount [SO 701-1]	C	From Leg	1.50	0.0000	80.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
*									
GPS_A	B	From Leg	3.00	0.0000	72.00	No Ice	0.30	0.30	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	0.37	0.37	0.00
			0.00			1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
						4" Ice	1.15	1.15	0.08
GPS_A	C	From Leg	3.00	0.0000	72.00	No Ice	0.30	0.30	0.00
			0.00			1/2" Ice	0.37	0.37	0.00
			0.00			1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
						4" Ice	1.15	1.15	0.08
Side Arm Mount [SO 701-1]	B	From Leg	1.50	0.0000	72.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
Side Arm Mount [SO 701-1]	C	From Leg	1.50	0.0000	72.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
*									

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
Pirod 105244 w/ 1 1/4" Reinforcement	2261.8218	4388.8287	0.60	0.79	7.8535	15.2390	5.8293
Pirod 105217	2312.6169	5036.1403	0.60	0.96	8.0299	17.4866	5.3014
Pirod 105218	2441.6826	5107.8359	0.73	0.92	8.4781	17.7355	7.2158
Pirod 105218	2441.6826	4911.6957	0.73	0.85	8.4781	17.0545	7.2158
Pirod 105219	2634.3485	5405.4675	1.11	0.93	9.1470	18.7690	9.4248

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

Comb. No.	Description
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
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
T1	136 - 132.917	Leg	Max Tension	2	0.00	0.00	-0.00
			Max. Compression	19	-1.34	-0.02	-0.01
			Max. Mx	5	-0.90	-0.20	0.00
			Max. My	2	-0.92	0.00	0.20
			Max. Vy	5	0.54	-0.20	0.00
			Max. Vx	2	-0.54	0.00	0.20
		Diagonal	Max Tension	5	1.09	0.00	0.00
			Max. Compression	5	-1.11	0.00	0.00
			Max. Mx	16	0.28	0.00	0.00
			Max. My	10	-0.00	0.00	0.00
			Max. Vy	16	0.00	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
		Top Girt	Max Tension	4	0.76	-0.01	0.00
			Max. Compression	10	-0.75	-0.01	-0.00
			Max. Mx	21	-0.10	-0.01	0.00
			Max. My	9	-0.65	-0.01	-0.00
			Max. Vy	21	0.01	-0.01	0.00
			Max. Vx	8	0.00	-0.01	-0.00
T2	132.917 - 130	Leg	Max Tension	8	2.62	0.00	0.32
			Max. Compression	6	-4.53	-0.12	-0.07
			Max. Mx	11	-3.99	-0.32	0.01
			Max. My	2	-4.46	-0.01	-0.33
			Max. Vy	5	0.85	-0.14	-0.01
			Max. Vx	2	-0.87	0.00	0.14
		Diagonal	Max Tension	5	1.08	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	11	-1.15	0.00	0.00
			Max. Mx	20	0.26	-0.00	-0.00
			Max. My	10	-1.01	-0.00	-0.00
			Max. Vy	20	0.00	-0.00	-0.00
			Max. Vx	10	-0.00	-0.00	-0.00
		Top Girt	Max Tension	2	0.21	0.00	0.00
			Max. Compression	12	-0.13	0.00	0.00
			Max. Mx	14	0.06	0.01	0.00
			Max. My	10	-0.05	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	0.52	0.00	0.00
			Max. Compression	6	-0.47	0.00	0.00
			Max. Mx	14	0.05	0.01	0.00
			Max. My	4	-0.21	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	4	0.00	0.00	0.00
T3	130 - 110	Leg	Max Tension	4	32.39	1.21	0.00
			Max. Compression	6	-37.91	-0.88	-0.00
			Max. Mx	10	-37.78	-1.24	-0.00
			Max. My	11	-2.66	0.01	0.99
			Max. Vy	10	-2.85	-0.88	-0.00
			Max. Vx	11	2.29	0.01	0.70
		Diagonal	Max Tension	13	3.56	0.00	0.00
			Max. Compression	13	-3.54	0.00	0.00
			Max. Mx	3	1.97	-0.00	-0.00
			Max. My	13	-2.77	-0.00	0.00
			Max. Vy	18	-0.01	-0.00	0.00
			Max. Vx	13	-0.00	-0.00	0.00
		Top Girt	Max Tension	2	0.51	0.00	0.00
			Max. Compression	12	-0.50	0.00	0.00
			Max. Mx	14	-0.00	0.01	0.00
			Max. My	10	-0.26	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	1.60	0.00	0.00
			Max. Compression	2	-1.62	0.00	0.00
			Max. Mx	14	0.04	0.01	0.00
			Max. My	4	-0.69	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	4	0.00	0.00	0.00
T4	110 - 94.9434	Leg	Max Tension	8	66.28	-0.15	-0.01
			Max. Compression	2	-74.98	-0.03	0.00
			Max. Mx	10	-37.80	1.87	-0.00
			Max. My	11	-2.67	-0.00	-1.50
			Max. Vy	10	-2.87	1.87	-0.00
			Max. Vx	11	2.30	-0.00	-1.50
		Diagonal	Max Tension	9	5.04	0.00	0.00
			Max. Compression	9	-5.06	0.00	0.00
			Max. Mx	3	2.49	-0.01	-0.00
			Max. My	13	-4.04	-0.00	0.00
			Max. Vy	15	0.01	-0.01	-0.00
			Max. Vx	13	-0.00	-0.00	0.00
		Top Girt	Max Tension	10	1.32	0.00	0.00
			Max. Compression	12	-1.24	0.00	0.00
			Max. Mx	14	0.02	0.01	0.00
			Max. My	10	-0.72	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
T5	94.9434 - 92.5938	Leg	Max Tension	8	73.34	0.01	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	2	-82.63	0.05	-0.00
			Max. Mx	2	-82.60	0.27	0.00
			Max. My	3	-4.31	-0.02	-0.26
			Max. Vy	2	-0.26	0.27	0.00
			Max. Vx	3	0.24	-0.02	-0.26
		Diagonal	Max Tension	9	5.18	0.00	0.00
			Max. Compression	3	-5.22	0.00	0.00
			Max. Mx	2	4.24	-0.01	-0.00
			Max. My	11	-5.08	0.00	0.00
			Max. Vy	15	0.01	-0.01	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	2	1.43	0.00	0.00
			Max. Compression	2	-1.43	0.00	0.00
			Max. Mx	14	0.15	0.03	0.00
			Max. My	4	0.75	0.00	-0.00
			Max. Vy	14	-0.02	0.00	0.00
			Max. Vx	4	0.00	0.00	0.00
T6	92.5938 - 90	Leg	Max Tension	8	84.43	0.81	0.00
			Max. Compression	2	-94.23	3.25	0.01
			Max. Mx	2	-94.23	3.25	0.01
			Max. My	7	-4.75	0.03	-1.54
			Max. Vy	2	-7.03	3.25	0.01
			Max. Vx	7	3.04	0.03	-1.54
		Diagonal	Max Tension	9	5.59	0.00	0.00
			Max. Compression	3	-5.71	0.00	0.00
			Max. Mx	8	5.10	-0.01	-0.00
			Max. My	4	-4.64	-0.00	-0.00
			Max. Vy	15	0.01	-0.01	-0.00
			Max. Vx	4	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	2	1.63	0.00	0.00
			Max. Compression	2	-1.63	0.00	0.00
			Max. Mx	14	0.15	0.03	0.00
			Max. My	4	0.85	0.00	-0.00
			Max. Vy	14	-0.02	0.00	0.00
			Max. Vx	4	0.00	0.00	0.00
		Bottom Girt	Max Tension	8	0.84	0.00	0.00
			Max. Compression	2	-0.78	0.00	0.00
			Max. Mx	14	0.05	0.01	0.00
			Max. My	4	-0.42	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	4	0.00	0.00	0.00
T7	90 - 80	Leg	Max Tension	8	91.66	-3.09	-0.01
			Max. Compression	2	-101.54	4.48	-0.02
			Max. Mx	8	91.21	-5.00	0.02
			Max. My	3	-4.98	-0.25	-7.77
			Max. Vy	12	0.43	-4.98	-0.03
			Max. Vx	3	0.88	-0.25	-7.77
		Diagonal	Max Tension	8	6.89	0.11	-0.01
			Max. Compression	2	-7.52	0.00	0.00
			Max. Mx	8	6.84	0.11	0.01
			Max. My	3	-6.78	-0.08	0.04
			Max. Vy	8	0.02	0.11	0.01
			Max. Vx	3	-0.01	0.00	0.00
T8	80 - 60	Leg	Max Tension	8	132.16	-5.36	0.00
			Max. Compression	2	-145.42	5.80	-0.01
			Max. Mx	8	131.90	-5.83	0.01
			Max. My	3	-5.82	-0.25	-7.77
			Max. Vy	2	-0.21	5.48	-0.00
			Max. Vx	13	0.35	-0.25	7.72

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	11	7.09	0.00	0.00
			Max. Compression	5	-7.40	0.00	0.00
			Max. Mx	2	6.32	0.08	0.00
			Max. My	3	-6.79	-0.04	-0.01
			Max. Vy	19	-0.02	0.05	-0.01
			Max. Vx	25	-0.00	0.00	0.00
T9	60 - 40	Leg	Max Tension	8	164.97	-5.43	0.01
			Max. Compression	2	-181.82	5.40	-0.01
			Max. Mx	8	149.51	-5.83	0.01
			Max. My	9	-7.63	-0.00	5.38
			Max. Vy	12	-0.13	-5.81	0.01
			Max. Vx	9	0.13	-0.00	5.38
		Diagonal	Max Tension	5	6.45	0.00	0.00
			Max. Compression	5	-6.81	0.00	0.00
			Max. Mx	2	5.47	0.10	-0.00
			Max. My	17	-1.82	0.02	-0.01
			Max. Vy	21	0.03	0.05	-0.01
			Max. Vx	17	0.00	0.00	0.00
T10	40 - 20	Leg	Max Tension	8	192.90	-4.81	0.00
			Max. Compression	2	-213.20	6.70	-0.03
			Max. Mx	2	-213.20	6.70	-0.03
			Max. My	7	-9.50	-0.14	-5.84
			Max. Vy	25	0.47	-4.63	0.01
			Max. Vx	9	0.25	-0.14	5.84
		Diagonal	Max Tension	5	6.19	0.00	0.00
			Max. Compression	5	-6.54	0.00	0.00
			Max. Mx	2	5.22	0.09	-0.00
			Max. My	17	2.25	0.06	-0.01
			Max. Vy	21	0.03	0.06	-0.01
			Max. Vx	17	-0.00	0.00	0.00
T11	20 - 0	Leg	Max Tension	8	217.01	-5.04	0.01
			Max. Compression	2	-241.76	0.00	-0.00
			Max. Mx	2	-228.58	6.70	-0.03
			Max. My	9	-11.39	-0.34	8.90
			Max. Vy	25	-0.80	-4.63	0.01
			Max. Vx	9	0.98	-0.34	8.90
		Diagonal	Max Tension	4	7.40	0.00	0.00
			Max. Compression	10	-8.11	0.00	0.00
			Max. Mx	2	4.63	0.12	-0.01
			Max. My	9	-7.10	-0.01	0.01
			Max. Vy	21	0.05	0.11	0.01
			Max. Vx	17	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	250.29	21.43	-12.17
	Max. H_x	10	250.29	21.43	-12.17
	Max. H_z	4	-223.30	-19.46	11.04
	Min. Vert	4	-223.30	-19.46	11.04
	Min. H_x	4	-223.30	-19.46	11.04
	Min. H_z	10	250.29	21.43	-12.17
Leg B	Max. Vert	6	250.40	-21.39	-12.26
	Max. H_x	12	-223.38	19.42	11.13
	Max. H_z	12	-223.38	19.42	11.13

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg A	Min. Vert	12	-223.38	19.42	11.13
	Min. H_x	6	250.40	-21.39	-12.26
	Min. H_z	6	250.40	-21.39	-12.26
	Max. Vert	2	250.98	0.10	24.72
	Max. H_x	11	11.78	0.24	0.97
	Max. H_z	2	250.98	0.10	24.72
	Min. Vert	8	-224.43	-0.09	-22.46
	Min. H_x	6	-107.89	-0.30	-10.95
	Min. H_z	8	-224.43	-0.09	-22.46

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	35.74	0.00	0.00	1.82	-0.08	0.00
Dead+Wind 0 deg - No Ice	35.74	-0.01	-36.32	-2898.58	0.55	2.36
Dead+Wind 30 deg - No Ice	35.74	17.82	-31.00	-2486.49	-1428.91	3.70
Dead+Wind 60 deg - No Ice	35.74	30.72	-17.80	-1429.45	-2467.68	4.05
Dead+Wind 90 deg - No Ice	35.74	35.66	0.01	2.86	-2859.52	3.38
Dead+Wind 120 deg - No Ice	35.74	31.34	18.17	1452.58	-2500.13	1.84
Dead+Wind 150 deg - No Ice	35.74	17.84	31.00	2490.39	-1430.69	-0.25
Dead+Wind 180 deg - No Ice	35.74	0.01	35.62	2865.50	-0.73	-2.26
Dead+Wind 210 deg - No Ice	35.74	-17.82	30.99	2489.75	1429.41	-3.70
Dead+Wind 240 deg - No Ice	35.74	-31.33	18.15	1451.47	2499.32	-4.20
Dead+Wind 270 deg - No Ice	35.74	-35.66	-0.00	1.58	2859.35	-3.38
Dead+Wind 300 deg - No Ice	35.74	-30.73	-17.81	-1430.56	2468.16	-1.79
Dead+Wind 330 deg - No Ice	35.74	-17.83	-31.01	-2487.13	1429.85	0.25
Dead+Ice+Temp	75.29	-0.00	-0.00	4.23	-2.46	0.00
Dead+Wind 0 deg+Ice+Temp	75.29	-0.01	-12.05	-909.61	-1.97	0.28
Dead+Wind 30 deg+Ice+Temp	75.29	5.80	-10.08	-771.38	-448.32	0.67
Dead+Wind 60 deg+Ice+Temp	75.29	9.93	-5.75	-440.28	-770.06	0.89
Dead+Wind 90 deg+Ice+Temp	75.29	11.61	0.01	4.76	-895.07	0.90
Dead+Wind 120 deg+Ice+Temp	75.29	10.40	6.03	461.60	-791.30	0.68
Dead+Wind 150 deg+Ice+Temp	75.29	5.81	10.08	780.33	-449.23	0.23
Dead+Wind 180 deg+Ice+Temp	75.29	0.01	11.51	894.14	-2.98	-0.24
Dead+Wind 210 deg+Ice+Temp	75.29	-5.80	10.08	779.83	443.41	-0.67
Dead+Wind 240 deg+Ice+Temp	75.29	-10.40	6.02	460.73	785.84	-0.96
Dead+Wind 270 deg+Ice+Temp	75.29	-11.61	-0.01	3.76	890.12	-0.90
Dead+Wind 300 deg+Ice+Temp	75.29	-9.94	-5.76	-441.15	765.61	-0.65
Dead+Wind 330 deg+Ice+Temp	75.29	-5.81	-10.08	-771.88	444.24	-0.23
Dead+Wind 0 deg - Service	35.74	-0.00	-12.57	-1002.22	0.14	0.82
Dead+Wind 30 deg - Service	35.74	6.17	-10.73	-859.17	-494.58	1.27
Dead+Wind 60 deg - Service	35.74	10.63	-6.16	-493.49	-854.03	1.40
Dead+Wind 90 deg - Service	35.74	12.34	0.00	2.09	-989.54	1.18
Dead+Wind 120 deg - Service	35.74	10.85	6.29	504.04	-865.53	0.64
Dead+Wind 150 deg - Service	35.74	6.17	10.73	862.99	-495.04	-0.10
Dead+Wind 180 deg - Service	35.74	0.00	12.32	992.84	-0.30	-0.78
Dead+Wind 210 deg - Service	35.74	-6.17	10.73	862.77	494.50	-1.27
Dead+Wind 240 deg - Service	35.74	-10.84	6.28	503.66	865.15	-1.45
Dead+Wind 270 deg - Service	35.74	-12.34	-0.00	1.65	989.38	-1.18
Dead+Wind 300 deg - Service	35.74	-10.63	-6.16	-493.87	854.08	-0.62
Dead+Wind 330 deg - Service	35.74	-6.17	-10.73	-859.39	494.80	0.10

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-35.74	0.00	-0.00	35.74	-0.00	0.000%
2	-0.01	-35.74	-36.36	0.01	35.74	36.32	0.076%
3	17.84	-35.74	-31.02	-17.82	35.74	31.00	0.059%
4	30.75	-35.74	-17.82	-30.72	35.74	17.80	0.065%
5	35.69	-35.74	0.01	-35.66	35.74	-0.01	0.058%
6	31.37	-35.74	18.19	-31.34	35.74	-18.17	0.076%
7	17.85	-35.74	31.03	-17.84	35.74	-31.00	0.059%
8	0.01	-35.74	35.65	-0.01	35.74	-35.62	0.065%
9	-17.84	-35.74	31.02	17.82	35.74	-30.99	0.059%
10	-31.36	-35.74	18.17	31.33	35.74	-18.15	0.076%
11	-35.69	-35.74	-0.01	35.66	35.74	0.00	0.058%
12	-30.75	-35.74	-17.83	30.73	35.74	17.81	0.065%
13	-17.85	-35.74	-31.03	17.83	35.74	31.01	0.058%
14	0.00	-75.29	0.00	0.00	75.29	0.00	0.000%
15	-0.01	-75.29	-12.06	0.01	75.29	12.05	0.015%
16	5.80	-75.29	-10.09	-5.80	75.29	10.08	0.015%
17	9.94	-75.29	-5.75	-9.93	75.29	5.75	0.015%
18	11.62	-75.29	0.01	-11.61	75.29	-0.01	0.015%
19	10.41	-75.29	6.03	-10.40	75.29	-6.03	0.015%
20	5.81	-75.29	10.09	-5.81	75.29	-10.08	0.015%
21	0.01	-75.29	11.52	-0.01	75.29	-11.51	0.015%
22	-5.80	-75.29	10.09	5.80	75.29	-10.08	0.015%
23	-10.41	-75.29	6.02	10.40	75.29	-6.02	0.015%
24	-11.62	-75.29	-0.01	11.61	75.29	0.01	0.015%
25	-9.95	-75.29	-5.76	9.94	75.29	5.76	0.015%
26	-5.81	-75.29	-10.09	5.81	75.29	10.08	0.015%
27	-0.00	-35.74	-12.58	0.00	35.74	12.57	0.026%
28	6.17	-35.74	-10.73	-6.17	35.74	10.73	0.027%
29	10.64	-35.74	-6.17	-10.63	35.74	6.16	0.028%
30	12.35	-35.74	0.00	-12.34	35.74	-0.00	0.027%
31	10.85	-35.74	6.29	-10.85	35.74	-6.29	0.026%
32	6.18	-35.74	10.74	-6.17	35.74	-10.73	0.027%
33	0.00	-35.74	12.34	-0.00	35.74	-12.32	0.028%
34	-6.17	-35.74	10.73	6.17	35.74	-10.73	0.027%
35	-10.85	-35.74	6.29	10.84	35.74	-6.28	0.026%
36	-12.35	-35.74	-0.00	12.34	35.74	0.00	0.027%
37	-10.64	-35.74	-6.17	10.63	35.74	6.16	0.028%
38	-6.18	-35.74	-10.74	6.17	35.74	10.73	0.027%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00062694	0.00094310
3	Yes	6	0.00048564	0.00072763
4	Yes	6	0.00054104	0.00080928
5	Yes	6	0.00048581	0.00072781
6	Yes	5	0.00062738	0.00094333
7	Yes	6	0.00048630	0.00072869
8	Yes	6	0.00054119	0.00080971
9	Yes	6	0.00048639	0.00072888
10	Yes	5	0.00062736	0.00094359

11	Yes	6	0.00048583	0.00072795
12	Yes	6	0.00054091	0.00080947
13	Yes	6	0.00048554	0.00072754
14	Yes	4	0.00000001	0.00000001
15	Yes	7	0.00059434	0.00080882
16	Yes	7	0.00060672	0.00082352
17	Yes	7	0.00061874	0.00083881
18	Yes	7	0.00060649	0.00082344
19	Yes	7	0.00059400	0.00080899
20	Yes	7	0.00060620	0.00082400
21	Yes	7	0.00061821	0.00083944
22	Yes	7	0.00060629	0.00082386
23	Yes	7	0.00059397	0.00080861
24	Yes	7	0.00060646	0.00082315
25	Yes	7	0.00061863	0.00083859
26	Yes	7	0.00060660	0.00082337
27	Yes	6	0.00046214	0.00068074
28	Yes	6	0.00048325	0.00071102
29	Yes	6	0.00050330	0.00073985
30	Yes	6	0.00048329	0.00071100
31	Yes	6	0.00046224	0.00068087
32	Yes	6	0.00048340	0.00071158
33	Yes	6	0.00050320	0.00074040
34	Yes	6	0.00048342	0.00071175
35	Yes	6	0.00046218	0.00068106
36	Yes	6	0.00048321	0.00071118
37	Yes	6	0.00050315	0.00074000
38	Yes	6	0.00048314	0.00071103

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T6	92.5938	Leg	A325N	1.0000	6	14.07	34.48	0.408	1.333	Bolt Tension
T7	90	Leg	A325N	1.0000	6	15.28	34.56	0.442	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	6.89	6.80	1.014	1.333	Member Block Shear
T8	80	Leg	A325N	1.0000	6	22.03	34.56	0.637	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	7.09	7.75	0.915	1.333	Member Block Shear
T9	60	Leg	A325N	1.0000	6	27.50	34.56	0.796	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	6.45	8.43	0.765	1.333	Member Block Shear
T10	40	Leg	A325N	1.0000	6	32.15	34.56	0.930	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	6.19	8.43	0.735	1.333	Member Block Shear
T11	20	Leg	A687	1.2500	6	36.17	50.62	0.714	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	7.40	17.22	0.430	1.333	Member Block Shear

Compression Checks

Leg Design Data (Compression)

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 $\frac{P}{P_a}$
T1	136 - 132.917	1 1/2	3.08	2.71	86.7 K=1.00	17.646	1.7672	-1.32	31.18	0.042*
T2	132.917 - 130	1 1/2	2.92	2.38	76.0 K=1.00	19.800	1.7672	-4.53	34.99	0.130
T3	130 - 110	2	20.00	2.38	57.1 K=1.00	23.201	3.1416	-37.91	72.89	0.520
T4	110 - 94.9434	2 1/4	15.06	2.35	50.1 K=1.00	24.330	3.9761	-74.98	96.74	0.775
T5	94.9434 - 92.5938	2 1/4	2.35	1.18	25.2 K=1.00	27.724	3.9761	-82.63	110.23	0.750
T6	92.5938 - 90	2 1/4	2.59	1.01	21.6 K=1.00	28.133	3.9761	-94.23	111.86	0.842
T7	90 - 80	Pirod 105244 w/ 1 1/4" Reinforcement	10.02	10.02	36.1 K=1.00	26.370	5.8293	-101.54	153.72	0.661
T8	80 - 60	Pirod 105217	20.03	10.02	37.8 K=1.00	26.132	5.3014	-145.42	138.54	1.050
T9	60 - 40	Pirod 105218	20.03	10.02	32.4 K=1.00	26.848	7.2158	-181.82	193.73	0.939
T10	40 - 20	Pirod 105218	20.03	10.02	32.4 K=1.00	26.848	7.2158	-213.20	193.73	1.101
T11	20 - 0	Pirod 105219	20.03	10.02	28.4 K=1.00	27.351	9.4248	-241.76	257.78	0.938

* DL controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T7	90 - 80	0.5	1.47	98.6	13.154	0.1963	0.88	2.89	0.304
T8	80 - 60	0.5	1.47	98.8	13.124	0.1963	0.35	2.88	0.122
T9	60 - 40	0.5	1.46	98.0	13.227	0.1963	0.14	2.91	0.047
T10	40 - 20	0.5	1.46	98.0	13.227	0.1963	0.47	2.91	0.163
T11	20 - 0	0.625	1.45	84.4	18.113	0.3068	0.98	6.22	0.157

Diagonal Design Data (Compression)

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 $\frac{P}{P_a}$
T1	136 - 132.917	3/4	3.37	3.26	146.1 K=0.70	6.994	0.4418	-1.11	3.09	0.360
T2	132.917 - 130	3/4	4.65	2.25	129.8 K=0.90	8.865	0.4418	-1.15	3.92	0.294
T3	130 - 110	7/8	5.06	2.45	121.1 K=0.90	10.179	0.6013	-3.54	6.12	0.579
T4	110 - 94.9434	1	5.39	2.61	112.6	11.788	0.7854	-5.06	9.26	0.547

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 $\frac{P}{P_a}$
T5	94.9434 - 92.5938	1	5.44	2.63	K=0.90 113.7	11.551	0.7854	-5.22	9.07	0.575
T6	92.5938 - 90	1	5.35	2.59	K=0.90 111.8	11.942	0.7854	-5.71	9.38	0.608
T7	90 - 80	L3x3x3/16	11.42	5.02	K=0.90 105.9	12.036	1.0900	-7.52	13.12	0.573
T8	80 - 60	L2 1/2x2 1/2x3/16	12.50	5.63	K=1.05 136.4	8.025	0.9020	-7.04	7.24	0.973
T9	60 - 40	L3x3x3/16	13.80	6.33	K=1.00 127.4	9.200	1.0900	-6.61	10.03	0.659
T10	40 - 20	L3x3x3/16	15.24	7.08	K=1.00 142.6	7.345	1.0900	-6.54	8.01	0.817
T11	20 - 0	L3x3x5/16	16.80	7.81	K=1.00 159.0	5.905	1.7800	-8.11	10.51	0.772
					K=1.00					

Secondary Horizontal Design Data (Compression)

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 $\frac{P}{P_a}$
T5	94.9434 - 92.5938	1 1/2	4.91	4.72	105.7 K=0.70	13.363	1.7672	-1.43	23.61	0.061
T6	92.5938 - 90	1 1/2	4.96	4.77	106.9 K=0.70	13.067	1.7672	-1.63	23.09	0.071

Top Girt Design Data (Compression)

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 $\frac{P}{P_a}$
T1	136 - 132.917	3 x 3/8	4.00	3.88	429.5 K=1.00	0.809	1.1250	-0.75	0.91	0.827
		KL/R > 200 (C) - 4								
T2	132.917 - 130	7/8	4.00	3.88	148.8 K=0.70	6.744	0.6013	-0.13	4.06	0.031
T3	130 - 110	7/8	4.02	3.85	148.0 K=0.70	6.818	0.6013	-0.50	4.10	0.121
T4	110 - 94.9434	1	4.52	4.34	145.7 K=0.70	7.034	0.7854	-1.24	5.52	0.224

Bottom Girt Design Data (Compression)

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 $\frac{P}{P_a}$
T2	132.917 - 130	7/8	4.00	3.88	148.8 K=0.70	6.744	0.6013	-0.47	4.06	0.115

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 $\frac{P}{P_a}$
T3	130 - 110	7/8	4.50	4.33	166.3 K=0.70	5.401	0.6013	-1.62	3.25	0.499
T6	92.5938 - 90	1	4.99	4.80	161.2 K=0.70	5.746	0.7854	-0.78	4.51	0.173

Tension Checks

Leg Design Data (Tension)

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 $\frac{P}{P_a}$
T1	136 - 132.917	1 1/2	3.08	2.71	86.7	30.000	1.7672	0.00	53.01	0.000
T2	132.917 - 130	1 1/2	2.92	2.38	76.0	30.000	1.7672	2.62	53.01	0.049
T3	130 - 110	2	20.00	2.38	57.1	30.000	3.1416	32.39	94.25	0.344
T4	110 - 94.9434	2 1/4	15.06	2.35	50.1	30.000	3.9761	66.28	119.28	0.556
T5	94.9434 - 92.5938	2 1/4	2.35	1.18	25.2	30.000	3.9761	73.34	119.28	0.615
T6	92.5938 - 90	2 1/4	2.59	1.01	21.6	30.000	3.9761	84.43	119.28	0.708
T7	90 - 80	Pirod 105244 w/ 1 1/4" Reinforcement	10.02	10.02	36.1	30.000	5.8293	91.66	174.88	0.524
T8	80 - 60	Pirod 105217	20.03	10.02	37.8	30.000	5.3014	132.16	159.04	0.831
T9	60 - 40	Pirod 105218	20.03	10.02	32.4	30.000	7.2158	164.97	216.47	0.762
T10	40 - 20	Pirod 105218	20.03	10.02	32.4	30.000	7.2158	192.90	216.47	0.891
T11	20 - 0	Pirod 105219	20.03	10.02	28.4	30.000	9.4248	217.01	282.74	0.768

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T7	90 - 80	0.5	1.47	98.6	13.154	0.1963	0.88	2.89	0.304
T8	80 - 60	0.5	1.47	98.8	13.124	0.1963	0.35	2.88	0.122
T9	60 - 40	0.5	1.46	98.0	13.227	0.1963	0.14	2.91	0.047
T10	40 - 20	0.5	1.46	98.0	13.227	0.1963	0.47	2.91	0.163
T11	20 - 0	0.625	1.45	84.4	18.113	0.3068	0.98	6.22	0.157

Diagonal Design Data (Tension)

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 $\frac{P}{P_a}$
T1	136 - 132.917	3/4	3.37	3.26	208.7	30.000	0.4418	1.09	13.25	0.082
T2	132.917 - 130	3/4	4.65	2.25	144.2	30.000	0.4418	1.08	13.25	0.081
T3	130 - 110	7/8	5.06	2.45	134.6	30.000	0.6013	3.56	18.04	0.197
T4	110 - 94.9434	1	5.39	2.61	125.1	30.000	0.7854	5.04	23.56	0.214

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 $\frac{P}{P_a}$
T5	94.9434 - 92.5938	1	5.44	2.63	126.3	30.000	0.7854	5.18	23.56	0.220
T6	92.5938 - 90	1	5.35	2.59	124.2	30.000	0.7854	5.59	23.56	0.237
T7	90 - 80	L3x3x3/16	11.42	5.02	66.3	29.000	0.6593	6.89	19.12	0.360
T8	80 - 60	L2 1/2x2 1/2x3/16	11.93	5.38	86.2	29.000	0.5183	7.09	15.03	0.472
T9	60 - 40	L3x3x3/16	13.13	6.02	79.5	29.000	0.6593	6.45	19.12	0.337
T10	40 - 20	L3x3x3/16	14.50	6.73	88.6	29.000	0.6593	6.19	19.12	0.324
T11	20 - 0	L3x3x5/16	16.80	7.81	105.3	29.000	1.0127	7.40	29.37	0.252

Secondary Horizontal Design Data (Tension)

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 $\frac{P}{P_a}$
T5	94.9434 - 92.5938	1 1/2	4.91	4.72	151.0	30.000	1.7672	1.43	53.01	0.027
T6	92.5938 - 90	1 1/2	4.96	4.77	152.7	30.000	1.7672	1.63	53.01	0.031

Top Girt Design Data (Tension)

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 $\frac{P}{P_a}$
T1	136 - 132.917	3 x 3/8	4.00	3.88	429.5	21.600	1.1250	0.76	24.30	0.031
T2	132.917 - 130	7/8	4.00	3.88	212.6	30.000	0.6013	0.21	18.04	0.011
T3	130 - 110	7/8	4.02	3.85	211.4	30.000	0.6013	0.51	18.04	0.028
T4	110 - 94.9434	1	4.52	4.34	208.1	30.000	0.7854	1.32	23.56	0.056

Bottom Girt Design Data (Tension)

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 $\frac{P}{P_a}$
T2	132.917 - 130	7/8	4.00	3.88	212.6	30.000	0.6013	0.52	18.04	0.029
T3	130 - 110	7/8	4.50	4.33	237.5	30.000	0.6013	1.60	18.04	0.089
T6	92.5938 - 90	1	4.99	4.80	230.3	30.000	0.7854	0.84	23.56	0.036

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	136 - 132.917	Leg	1 1/2	2	-1.32	31.18	4.2	Pass
T2	132.917 - 130	Leg	1 1/2	14	-4.53	46.64	9.7	Pass
T3	130 - 110	Leg	2	29	-37.91	97.16	39.0	Pass

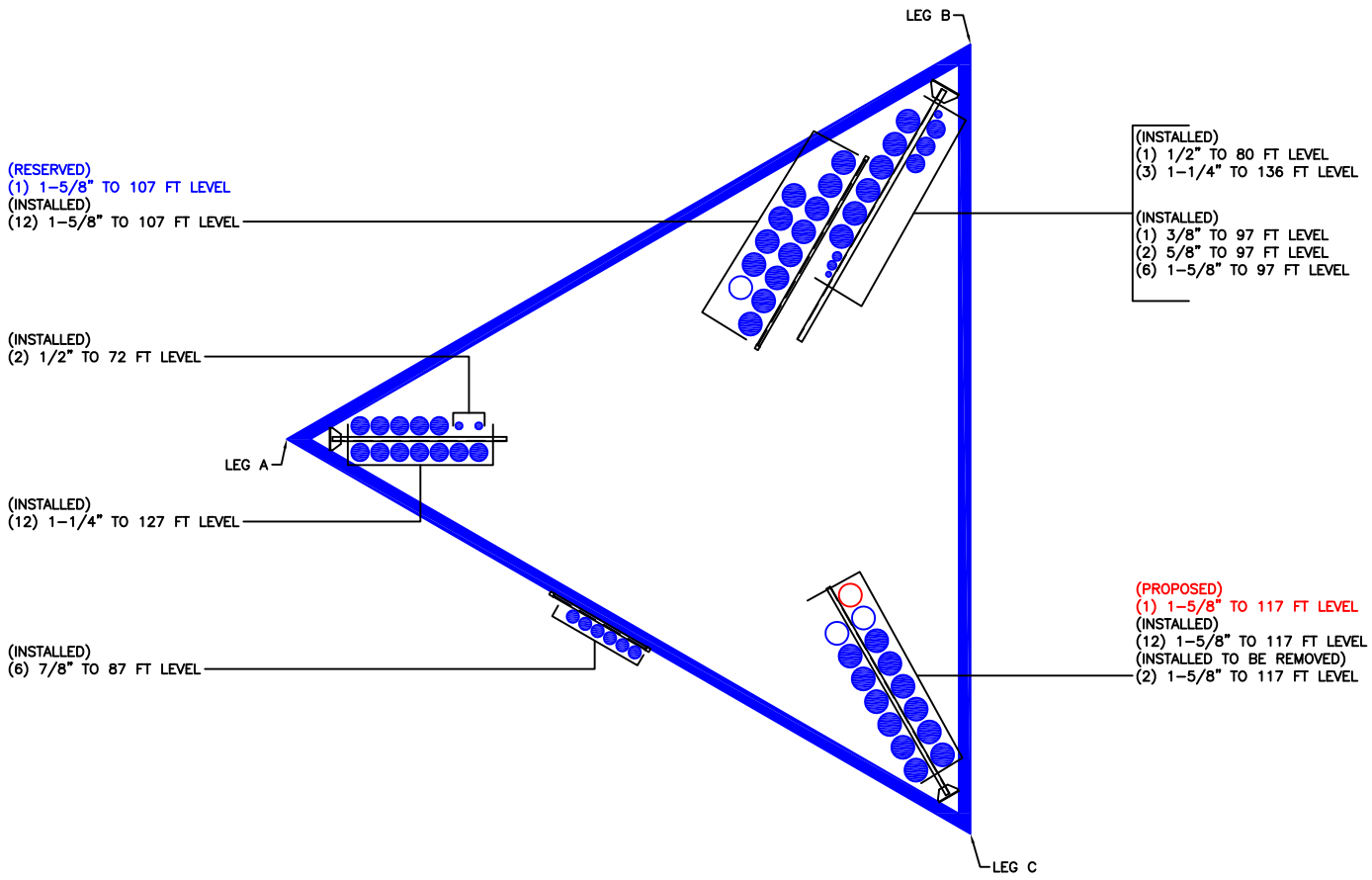
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
T4	110 - 94.9434	Leg	2 1/4	87	-74.98	128.95	58.1	Pass
T5	94.9434 - 92.5938	Leg	2 1/4	129	-82.63	146.94	56.2	Pass
T6	92.5938 - 90	Leg	2 1/4	141	-94.23	149.11	63.2	Pass
T7	90 - 80	Leg	Pirod 105244 w/ 1 1/4" Reinforcement	Note 1	Note 1	Note 1	52.5	Pass
T8	80 - 60	Leg	Pirod 105217	165	-145.42	184.67	78.7	Pass
T9	60 - 40	Leg	Pirod 105218	180	-181.82	258.24	70.4	Pass
T10	40 - 20	Leg	Pirod 105218	195	-213.20	258.24	82.6	Pass
T11	20 - 0	Leg	Pirod 105219	210	-241.76	343.62	70.4	Pass
T1	136 - 132.917	Diagonal	3/4	8	-1.11	4.12	27.0	Pass
T2	132.917 - 130	Diagonal	3/4	22	-1.15	5.22	22.1	Pass
T3	130 - 110	Diagonal	7/8	40	-3.54	8.16	43.4	Pass
T4	110 - 94.9434	Diagonal	1	96	-5.06	12.34	41.0	Pass
T5	94.9434 - 92.5938	Diagonal	1	134	-5.22	12.09	43.1	Pass
T6	92.5938 - 90	Diagonal	1	149	-5.71	12.50	45.6	Pass
T7	90 - 80	Diagonal	L3x3x3/16	161	-7.52	17.49	43.0 76.0 (b)	Pass
T8	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	167	-7.04	9.65	73.0	Pass
T9	60 - 40	Diagonal	L3x3x3/16	182	-6.61	13.37	49.4 57.4 (b)	Pass
T10	40 - 20	Diagonal	L3x3x3/16	197	-6.54	10.67	61.3	Pass
T11	20 - 0	Diagonal	L3x3x5/16	211	-8.11	14.01	57.9	Pass
T5	94.9434 - 92.5938	Secondary Horizontal	1 1/2	137	-1.43	31.48	4.5	Pass
T6	92.5938 - 90	Secondary Horizontal	1 1/2	152	-1.63	30.78	5.3	Pass
T1	136 - 132.917	Top Girt	3 x 3/8	4	-0.75	1.21	62.0	Pass
T2	132.917 - 130	Top Girt	7/8	18	-0.13	5.41	2.3	Pass
T3	130 - 110	Top Girt	7/8	33	-0.50	5.46	9.1	Pass
T4	110 - 94.9434	Top Girt	1	90	-1.24	7.36	16.8	Pass
T2	132.917 - 130	Bottom Girt	7/8	21	-0.47	5.41	8.7	Pass
T3	130 - 110	Bottom Girt	7/8	34	-1.62	4.33	37.4	Pass
T6	92.5938 - 90	Bottom Girt	1	142	-0.78	6.02	13.0	Pass
							Summary	
						Leg (T10)	82.6	Pass
						Diagonal (T7)	76.0	Pass
						Secondary Horizontal (T6)	5.3	Pass
						Top Girt (T1)	62.0	Pass
						Bottom Girt (T3)	37.4	Pass
						Bolt Checks	76.0	Pass
						RATING =	**82.6**	**Pass**

Notes:

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

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876338 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Project Name:	Waterford	**Engineer:**	JEJ
Project Number:	25598.12558	**Check:**	OAS
Client Site Number:	876338	**Date:**	12/16/13

PiRod Leg Splice Connections

Input - Properties

Elevation:	130	ft - elevation of leg splice connection
F_y:	50.00	ksi - yield stress of leg
F_u:	65.00	ksi - tensile stress of leg
D_t:	1.50	in - diameter of leg above splice
D_b:	2.00	in - diameter of leg below splice
d_{bolt}:	0.625	in - bolt diameter
Type:	A325-N	- bolt type (X - threads excluded, N - threads included)
n:	5	- number of bolts

Input - Loads

Code:	TIA-F	- select version of the TIA
T_u:	2.62	kips - maximum leg tension load
P_u:	4.53	kips - maximum leg compression load
ASIF:	1.33	- stress increase factor
U:	1.00	- shear lag coefficient
ϕ_t:	0.90	< = = DISREGARD
ϕ_t:	0.75	< = = DISREGARD
ϕ_b:	0.75	< = = DISREGARD

Leg Capacity:

1.5 inch diameter leg above splice

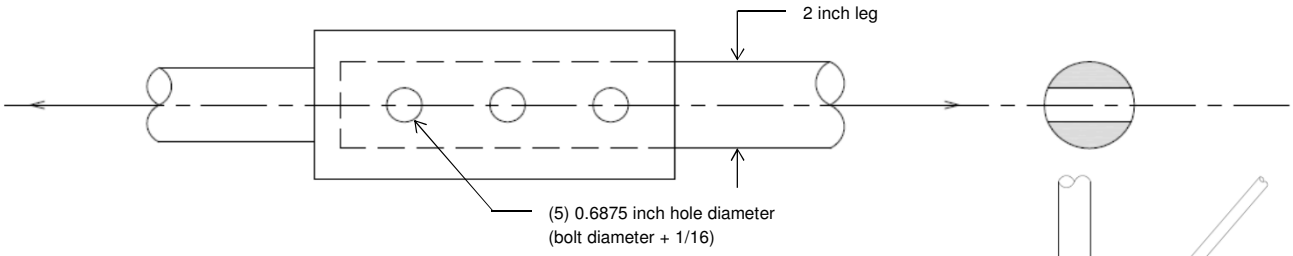
Gross Allowable Tension = ASIF(0.6)(Fy)(Ag) = 1.333(0.6)(50 ksi)(1.7671 in2) = **70.69** kips

2 inch diameter leg below splice

An = Net Area = (Db/2)^2(θ - sin(θ)) = 1.79 in^2

Gross Allowable Tension = ASIF(0.6)(Fy)(Ag) = 1.333(0.6)(50 ksi)(3.1416 in2) = 125.66 kips

Net Allowable Tension = ASIF(0.5)(U)(Fu)(An) = 1.333(0.5)(1)(65 ksi)(1.7942 in2) = **77.75** kips

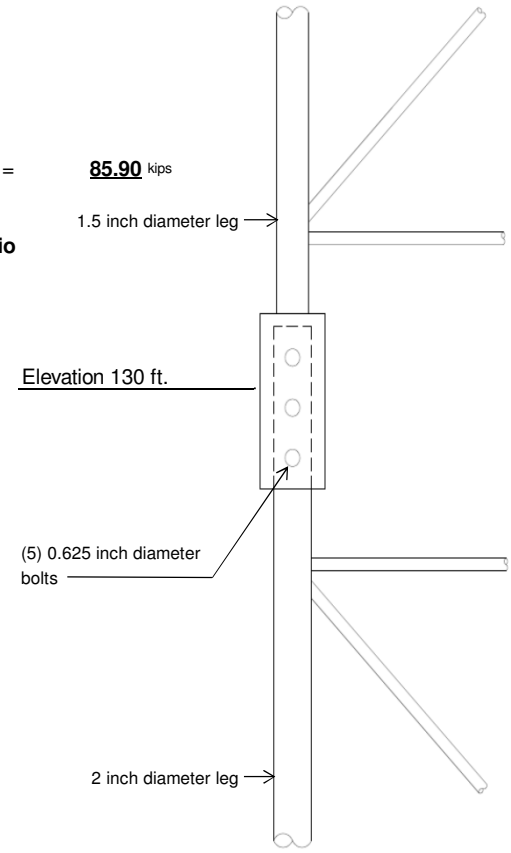


Bolt Capacity:

Allowable Load = (1.333)(21 ksi)(0.307 in2)(5)(2 shear planes) = **85.90** kips

Summary:

		Stress Ratio
Leg Above Tension:	**2.62 < 70.69 (Pass)**	3.7%
Leg Below Tension:	**2.62 < 77.75 (Pass)**	3.4%
Leg Compression:	**4.53 < 85.9 (Pass)**	**5.3%**
Leg Splice Bolts:	**4.53 < 85.9 (Pass)**	**5.3%**



Project Name:	Waterford	**Engineer:**	JEJ
Project Number:	25598.12558	**Check:**	OAS
Client Site Number:	876338	**Date:**	12/16/13

PiRod Leg Splice Connections

Input - Properties

Elevation:	110	ft - elevation of leg splice connection
F_y:	50.00	ksi - yield stress of leg
F_u:	65.00	ksi - tensile stress of leg
D_t:	2.00	in - diameter of leg above splice
D_b:	2.25	in - diameter of leg below splice
d_{bolt}:	0.750	in - bolt diameter
Type:	A325-N	- bolt type (X - threads excluded, N - threads included)
n:	5	- number of bolts

Input - Loads

Code:	TIA-F	- select version of the TIA
T_u:	32.39	kips - maximum leg tension load
P_u:	37.91	kips - maximum leg compression load
ASIF:	1.33	- stress increase factor
U:	1.00	- shear lag coefficient
ϕ_t:	0.90	< = = DISREGARD
ϕ_t:	0.75	< = = DISREGARD
ϕ_b:	0.75	< = = DISREGARD

Leg Capacity:

2 inch diameter leg above splice

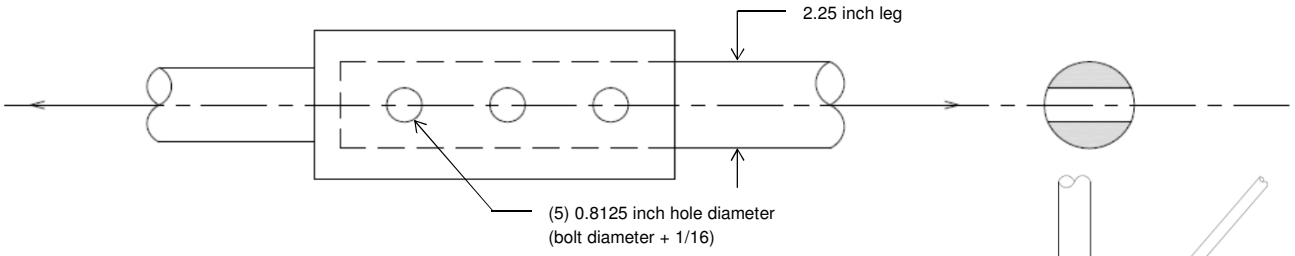
Gross Allowable Tension = ASIF(0.6)(Fy)(Ag) = 1.333(0.6)(50 ksi)(3.1416 in2) = **125.66** kips

2.25 inch diameter leg below splice

An = Net Area = (Db/2)^2(θ - sin(θ)) = 2.19 in^2

Gross Allowable Tension = ASIF(0.6)(Fy)(Ag) = 1.333(0.6)(50 ksi)(3.9761 in2) = 159.04 kips

Net Allowable Tension = ASIF(0.5)(U)(Fu)(An) = 1.333(0.5)(1)(65 ksi)(2.1885 in2) = **94.84** kips

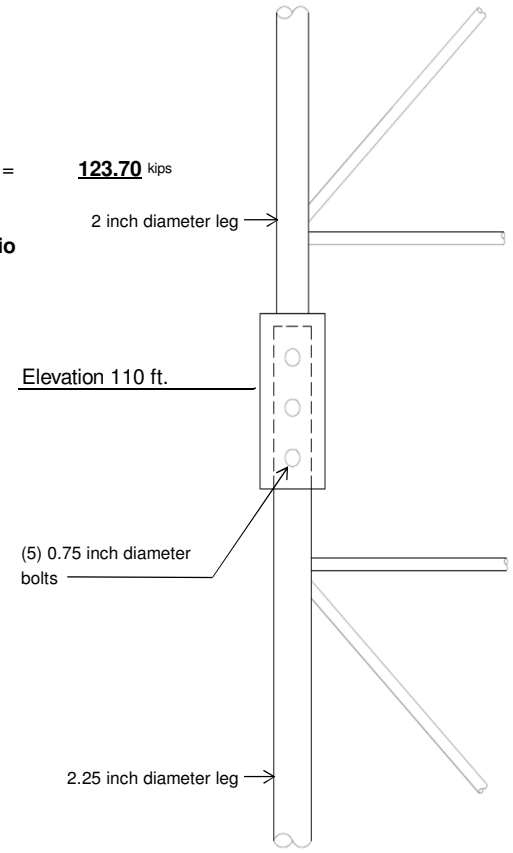


Bolt Capacity:

Allowable Load = (1.333)(21 ksi)(0.442 in2)(5)(2 shear planes) = **123.70** kips

Summary:

		Stress Ratio
Leg Above Tension:	**32.39 < 125.66 (Pass)**	25.8%
Leg Below Tension:	**32.39 < 94.84 (Pass)**	**34.2%**
Leg Compression:	**37.91 < 123.7 (Pass)**	30.6%
Leg Splice Bolts:	**37.91 < 123.7 (Pass)**	30.6%



TRUSS LEG PROPERTIES FOR PiROD SELF-SUPPORT TOWER:

Leg P/N	Elevation (ft)	Exisitng Solid Rod Leg Dia. (in)	Quantity	Area (in^2)	Proposed Rod Dia. (in)
105224	80-90	1.25	3	3.68	1.25

Elevation (ft)	Proposed Qty.	Additional Net Area (in^2)	Total Net Area (in^2)	Equivalent Dia. (in)
80-90	2	2.45	6.1356	1.6137

Leg Component Strength	
Leg (P/N)	105224
Elevation (ft)	80-90
Existing SR (in)	1.25
Existing Area (in^2)	1.23
Existing Circle (in)	13.86
Proposed Circle (in)	10.93
Solid Rod (in)	1.25
Proposed Net Area (in^2)	1.227
Proposed Gross Area (in^2)	1.227
Comp. Load (k)	101.54
Tension Load (k)	91.66
Total Net Area (in^2)	6.14
Total Gross Area (in^2)	6.14
Existing SR	
Unbraced Length	14.2
r	0.3125
KL/r	45.44
Cc	107.00
Fa (K)	40.98
Fb (K)	49.09
% Capacity	**49.56%**
Proposed Solid Rod	
Unbraced Length	14.2
r	0.3125
KL/r	45.44
Cc	107.00
Fa (K)	40.97
Fb (K)	49.08
% Capacity	**49.56%**
Leg Strength	
Unbraced Length	120
$r_{Built\text{-}Up\_net}$	3.997
$r_{Built\text{-}Up\_Gross}$	3.997
KL/r_o	30.02
$a/r_{Indv.\ Leg}$	45.44
$KL/r_{Built\text{-}Up}$	54.46
Cc	107.00
Fa	193.41
Ft	245.44
% Capacity	**52.50%**
Overall % Capacity	**52.50%**
Leg Bolts Capacity	
Number of Leg Bolts	6
Load per Leg Bolt from leg (k)	9.17
Load per Leg Bolt Rod leg (k)	9.16
Total load	18.33
Allowable Leg Bolt Capacity (k)	44.4
% Capacity	**41.29%**

TOWER ENGINEERING PROFESSIONALS

JOB: TEP# 25598.12558
SHEET #: 1 OF 2
CALCULATED BY: JEJ DATE 12/16/2013

Mat Foundation Design for Self Supporting Tower -TIA-222-F

Q_a, ALLOWABLE SOIL PRESS. (ksf)	4	F'c (ksi)	3
NET OR GROSS BEARING?	NET	F'y (ksi)	60
SOIL DENSITY (pcf)	125		
TOWER FACE WIDTH (ft.)	14.0		
Tower Eccentricity (ft)	2.02	Distance between tower centroid and the foundation centroid	

Base Reactions LC1: Maximum Wind		Base Reactions LC 2: Ice + Ice Wind	
M_u, MOMENT (k-ft)	2899.0	M, MOMENT (k-ft)	925.0
P_t, AXIAL (k)	36.0	P_t, AXIAL (k)	75.0
H, SHEAR (k)	36.0	H, SHEAR (k)	12.0

Try:	L (ft.)	B (ft.)	t (ft.)	Soil depth to TOP of mat (ft.)	Soil depth to BOT. of mat (ft.)	Pier dia./width (ft.)	Pier Height, h (ft.)	Pier Shape
	23	23	3.25	2.75	6	3.00	3.25	Round

Wf, WEIGHT OF FOUNDATION (k) =	268.2	Concrete Volume (cu ft)	66.2
Ws, WEIGHT OF SOIL (k) =	174.6		

CHECK BEARING CAPACITY:	LC1	LC2	
$P = P_t + Wf + Ws =$	478.8 k	517.8 k	
$e = (M_{ot} + P_t*e_t)/P =$	6.70 ft	2.41 ft	
L/6 =	3.83 ft	3.83 ft	
90 Axis: q_{max} =	2.14 ksf	0.84 ksf	
Diag. Axis: q_{max} =	3.19 ksf	1.10 ksf	**Capacity:** 79.7%

CHECK OVERTURNING SF:	LC1	LC2	
$M_{ot} = M+H*(t+h)$ =	3133.0 k-ft	1003.0 k-ft	
$M_{st}=P*(L/2-e_t)+(W_{f+S}*L/2)$ =	5433.2 k-ft	5802.9 k-ft	
$SF = M_{ot}/M_{st}$ =	1.73 > 1.5	5.79 > 1.5	**Capacity:** 86.50%

TOWER ENGINEERING PROFESSIONALS

JOB: TEP# 25598.12558
SHEET NUMBER: 2 OF 2
CALCULATED BY: JEJ DATE 12/16/2013

CHECK BEAM SHEAR

Vu = 245.0 k
φVc = 778.1 k Vc > Vu **O.K** **Capacity:** **31.48%**

CHECK PUNCHING SHEAR

Vu = 133.8 k
φVc = 1025.2 k Vc > Vu **O.K** **Capacity:** **13.05%**

CALCULATE REINFORCING REQUIRED

F'c = 3.0 ksi F'y = 60.0 ksi

Temp & Shrinkage Reinforcement, As, temp = 0.39 in^2/ft (ACI 318 Sec. 10.5.4)

BOTTOM REINFORCING

Bar Size= 9
Bar Spacing = 6.0 in.
d = 34.3 in.
Mu= -449.9 in-k/ft

φMn=0.9*As*Fy*(d-1/2*As*Fy/(0.85*b*F'c))

Solution: As,req = 0.24 in^2/ft
Check, As= 2.00 in^2/ft **Capacity:** **12.23%**

TOP REINFORCING

Bar Size= 9
Bar Spacing = 6.0 in.
d= 34.3 in.
Mu= 101.2 in-k/ft

φMn=0.9*As*Fy*d(1-0.59*As*Fy/(b*d*F'c))

Solution: As,req = 0.05 in^2/ft
Check, As= 2.00 in^2/ft **Capacity:** **2.74%**

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RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL
TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11381C

Waterford South / Route 1
41 Manitock Hill Road
Waterford, CT 06385

January 07, 2014

EBI Project Number: 69133145

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January 7, 2014

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Re: Emissions Values for Site: **CT11381C – Waterford South / Route 1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 41 Manitock Hill Road, Waterford, CT, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (µW/cm2). The number of µW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (µW/cm2). The general population exposure limit for the cellular band is 567 µW/cm2, and the general population exposure limit for the PCS band is 1000 µW/cm2. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 41 Manitock Hill Road, Waterford, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, the actual antenna pattern gain value in the direction of the sample area was used. For this report the sample point is a 6 foot person standing at the base of the tower

For all calculations, all equipment was calculated using the following assumptions:

1) 2 GSM channels (1935.000 MHz—to 1945.000 MHz) were considered for each sector of the proposed installation.
2) 2 UMTS channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation
3) 2 LTE channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation
4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
6) The antenna used in this modeling is the Ericsson AIR21 for LTE, UMTS and GSM. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.6 dBd gain value at its main lobe. Actual antenna gain values were used for all calculations as per the manufacturers specifications

7) The antenna mounting height centerline of the proposed antennas is **119 feet** above ground level (AGL)
8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT11381C - Waterford South / Route 1
Site Addresss	41 Manitock Hill Road, Waterford, CT 06385
Site Type	Self Support Tower

Sector 1

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	119	113	None	0	0	48.326044	1.3606	0.13606%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	119	113	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	119	113	1-5/8"	0	0	24.163022	0.6803	0.06803%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	119	113	1-5/8"	0	0	24.163022	0.6803	0.06803%
														Sector total Power Density Value:		0.272%	

Sector 2

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	119	113	None	0	0	48.326044	1.3606	0.13606%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	119	113	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	119	113	1-5/8"	0	0	24.163022	0.6803	0.06803%
28	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	119	113	1-5/8"	0	0	24.163022	0.6803	0.06803%
														Sector total Power Density Value:		0.272%	

Sector 3

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	119	113	None	0	0	48.326044	1.3606	0.13606%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	119	113	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	119	113	1-5/8"	0	0	24.163022	0.6803	0.06803%
28	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	119	113	1-5/8"	0	0	24.163022	0.6803	0.06803%
														Sector total Power Density Value:		0.272%	

Site Composite MPE %

Carrier	MPE %
T-Mobile	0.816%
Nextel	3.540%
Sprint	7.910%
Metro PCS	6.040%
AT&T	21.330%
Verizon Wireless	34.680%
Total Site MPE %	**74.316%**

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Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public exposure to RF Emissions.

The anticipated Maximum Composite contributions from the T-Mobile facility are **0.816% (0.272% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **74.316%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
RF Engineering Director

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