COHEN and WOLF P.C.
ATTORNEYS AT LAW

JULIE D. KOHLER

PLEASE REPLY TO: Bridgeport
WRITER'S DIRECT DIAL: (203) 337-4157
E-Mail Address: jkohler@cohenandwolf.com

September 12, 2014

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: Notice of Exempt Modification
Ochenkowski Towers LLC /T-Mobile co-location
Site ID CT11230A
88 Parsonage Hill Road, North Branford

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, Ohenkowski Towers LLC owns the existing three legged lattice telecommunications tower and related facility located at 88 Parsonage Hill Road, North Branford, Connecticut (Latitude: 41.36944 Longitude: -72.81028). T-Mobile intends to add three antennas and related equipment at this existing telecommunications facility in North Branford ("North Branford Facility"). Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Town Manager Michael T. Paulhus. The structure owners, Jean Szwabowski, J.J. Ochenkowski, Jr. and K.W. Ochenkowski, are the property owners.

The existing North Branford Facility consists of a 195 foot tall three-legged lattice tower.[1] T-Mobile plans to add three antennas and three RRUs at a centerline of 180 feet. (See the plans revised to September 10, 2014 attached hereto as Exhibit A). T-Mobile will also reuse existing coax cable. The existing North Branford Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated September 2, 2014 and attached hereto as Exhibit B.

The planned modifications to the North Branford Facility fall squarely within those

[1] While the online docket for the Connecticut Siting Council does not provide a docket or petition number for the approval of this structure, it does reference this structure in connection with notices of intent captioned EM-AT&T-099-020619, EM-VER-061-099-080-119-05052, and EM-VER-123-007-010-099-060308.

1115 Broad Street
P.O. Box 1821
Bridgeport, CT 06601-1821
Tel: (203) 368-0211
Fax: (203) 394-9901

158 Deer Hill Avenue
Danbury, CT 06810
Tel: (203) 792-2771
Fax: (203) 791-8149

320 Post Road West
Westport, CT 06880
Tel: (203) 222-1034
Fax: (203) 227-1373

657 Orange Center Road
Orange, CT 06477
Tel: (203) 298-4066
Fax: (203) 298-4068

activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modification will not increase the height of the tower. T-Mobile's proposed antennas and equipment will be installed at a centerline of 180 feet. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. The proposed modifications will not require an extension of the site boundaries. T-Mobile's equipment will be located entirely within the existing compound and leased area.

3. The proposed modification to the North Branford Facility will not increase the noise levels at the existing facility by six decibels or more.

4. The operation of the proposed antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated September 8, 2014, T-Mobile's operations would add 3.99% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 44.26% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

For the foregoing reasons, T-Mobile respectfully submits that the proposed antennas and equipment at the North Branford Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence construction approximately sixty days from the date of the Council's notice of acknowledgement.

Sincerely,

Julie D. Kohler, Esq.

cc: Town of North Branford, Town Manager Michael T. Paulhus
Jean Szwabowski, J.J. Ochenkowski, Jr. and K.W. Ochenkowski,
Sheldon Freincle, NSS

EXHIBIT A

ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITY COMPANIES.

KEY MAP
N.T.S.

1
LE-1

PROJECT : L700

CONFIGURATION

702CU

SUBMITTALS	
LE REV A	08.12.14
LE REV 0	08.13.14
LE REV 1	09.10.14

ATLANTIS GROUP
1340 Centre Street
Suite 212
Newton, MA 02459
Office: 617-965-0789
Fax: 617-213-5056

LEASE EXHIBIT

SITE NUMBER:
CT11230A

SITE NAME:
NORTH HAVEN / RT 17

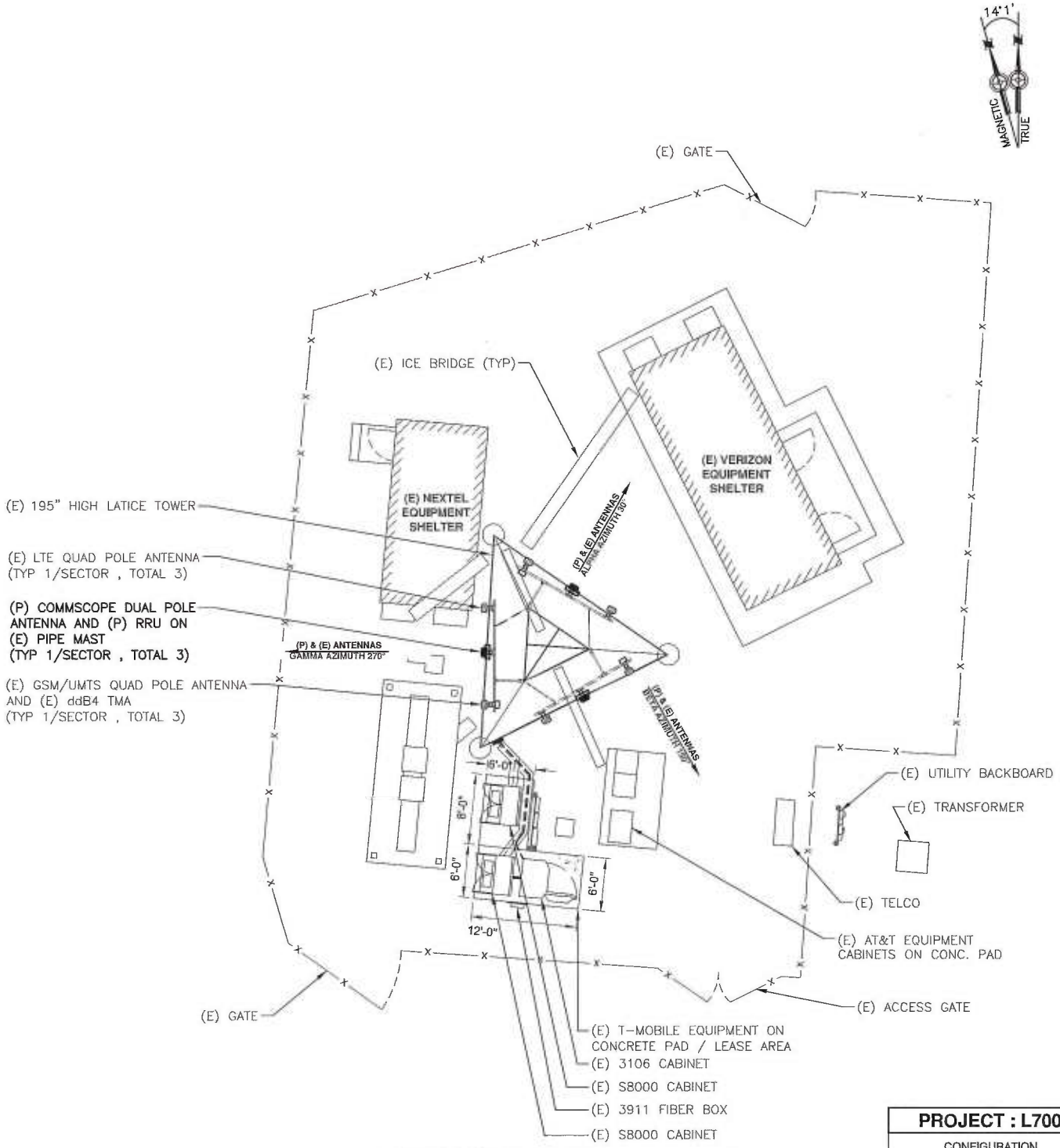
SITE ADDRESS:
88 PARSONAGE HILL RD.
NORTH BRANFORD, CT 06472

NORTHEAST SITE SOLUTIONS
54 MAIN STREET, UNIT 3
STURBRIDGE, MA 01566
(508) 434-5237

FOR

T-MOBILE NORTHEAST, LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX: (860) 692-7159

DRAWN BY: FG | CHECKED BY: SM



COMPOUND PLAN

SCALE: 1/16" = 1'-0" (8.5x11)

1
LE-2

PROJECT : L700

CONFIGURATION

702CU

SUBMITTALS	
LE REV A	08.12.14
LE REV 0	08.13.14
LE REV 1	09.10.14

ATLANTIS GROUP
1340 Centre Street
Suite 212
Newton, MA 02459
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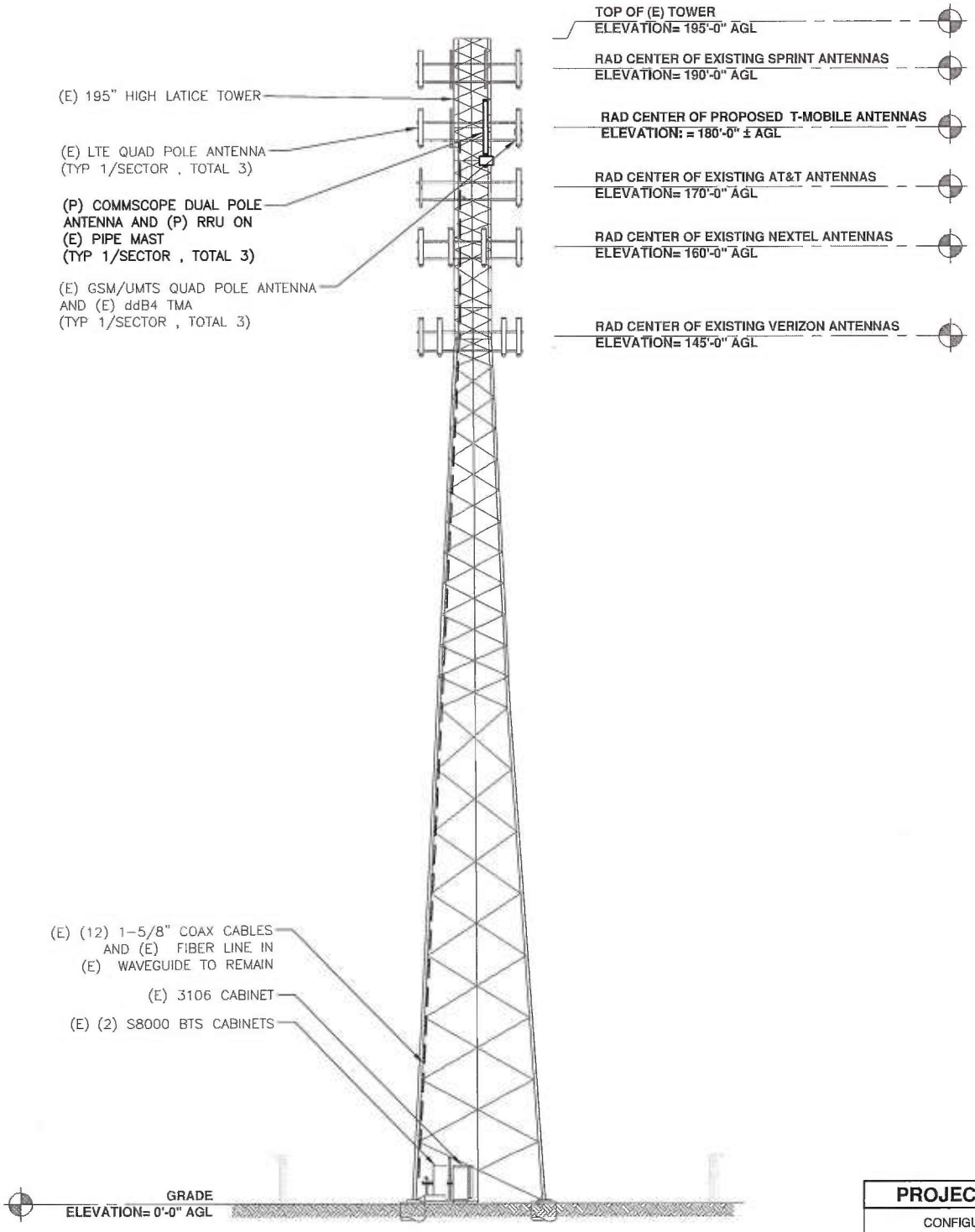

NORTH ELEVATION VIEW

SCALE: NOT TO SCALE

1
LE-3

PROJECT : L700

CONFIGURATION

702CU

SUBMITTALS	
LE REV A	08.12.14
LE REV 0	08.13.14
LE REV 1	09.10.14

ATLANTIS GROUP
1340 Centre Street
Suite 212
Newton, MA 02459
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LEASE EXHIBIT

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CT11230A

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NORTH HAVEN / RT 17

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NORTH BRANFORD, CT 06472

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54 MAIN STREET, UNIT 3
STURBRIDGE, MA 01566
(508) 434-5237

FOR

T-MOBILE NORTHEAST, LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX: (860) 692-7159

DRAWN BY: FG | CHECKED BY: SM

EXHIBIT B

STRUCTURAL ANALYSIS REPORT
SELF SUPPORT TOWER

Prepared For:

T-Mobile

35 Griffin Road South
Bloomfield, CT 06002

Tower Rating

Tower: Pass (86.7%)
Foundation: Pass (85.9%)

Sincerely,
Atlantis Group, Inc.
9-02-2014

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED
PROFESSIONAL ENGINEER

Ahmet Colakoglu, PE
CT Professional Engineer
License No: 27057

Site ID: CT11230A
Site Name: North Haven/Rt 17
88 Parsonage Hill Rd,
North Branford, CT 06472

September 2, 2014

Prepared By:

Atlantis Group, Inc.
1340 Centre Street, Suite 212
Newton, Massachusetts 02459
Phone: 617-965-0789, Fax: 617-213-5056

CONTENTS

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the existing 195 feet tall self-support tower, located at 88 Parsonage Hill Road, North Branford, CT 06472 for the additions and alterations proposed by T-Mobile.

The structural analysis of the site is based on the following documents provided to us:

1. Structural Analysis Report prepared by CENTEK ENGINEERING, dated 02/25/2014.
2. Existing and proposed antenna information provided by T-Mobile.

1.1 STRUCTURE

The structure is a 195 feet tall, triangular based self-support tower. Truss legs and solid rod legs are X-braced along its elevation. The tower is 5 feet wide at the top and 23.5 feet wide at the bottom. Please refer to the software output in Appendix A, for tower geometry, member sizes and other details.

2.0 PROPOSED CONFIGURATION

Antennas and Appurtenances:

Existing Configuration of T-MOBILE Appurtenances:

SECTOR	RAD CENTER (FT)	ANTENNA & TMA		MOUNT	FEED LINES
ALPHA	180	GSM/UMTS LTE TMA	(1) AIR21B2A/B4P (1) AIR21B4A/B2P (1) dd B4	(1) T- Frame Mount	(12) 1-5/8" Coax (1) 1-5/8" Fiber
BETA	180	GSM/UMTS LTE TMA	(1) AIR21B2A/B4P (1) AIR21B4A/B2P (1) dd B4	(1) T- Frame Mount	
GAMMA	180	GSM/UMTS LTE TMA	(1) AIR21B2A/B4P (1) AIR21B4A/B2P (1) dd B4	(1) T- Frame Mount	

Proposed and Final Configuration of T-MOBILE Appurtenances:

SECTOR	RAD CENTER (FT)	ANTENNA & TMA		MOUNT	FEED LINES
ALPHA	180	GSM/UMTS LTE LTE TMA RRU	(1) AIR21B2A/B4P (1) AIR21B4A/B2P (1) LNX-6515DS-VTM (1) dd B4 (1) RRUS11_B12	(1) T- Frame Mount	(12) 1-⅝" Coax (1) 1-⅝" Fiber
BETA	180	GSM/UMTS LTE LTE TMA RRU	(1) AIR21B2A/B4P (1) AIR21B4A/B2P (1) LNX-6515DS-VTM (1) dd B4 (1) RRUS11_B12	(1) T- Frame Mount	
GAMMA	180	GSM/UMTS LTE LTE TMA RRU	(1) AIR21B2A/B4P (1) AIR21B4A/B2P (1) LNX-6515DS-VTM (1) dd B4 (1) RRUS11_B12	(1) T- Frame Mount	

Existing and Remaining Appurtenances by Others:

RAD CENTER (FT)	ANTENNA & TMA	MOUNT	FEED LINES
190(Sprint)	(3) RFS APXVSPP18-C-A20 (3) 1900MHz4X45W RRH's (3) 800MHz 2X50W RRH's	15-ft triangular platform	(3) 1-1/4" Hybriflex
175 (AT&T)	(1) Raycap DC6-48-60-18-8F	1 leg mount	(1) fiber cable (2) dc control cables
173 (AT&T)	(2) Kathrein 800-10121 (3) KMW AM-X-CD-16-65-00T (6) Powerwave LGP21401TMA's (6) Ericsson RRUS-11	(3) 12-ft T-Frames	(6) 1-5/8" Coax
160 (Nextel)	(12) Andrew DB844H90E-XY	(3) 15-ft T-Frame	(12) 1-5/8" Coax
145(Verizon)	(3) Antel BXA-171085/8BF (6) Antel LPA-80080/4CF (3) Antel BXA-70063/6CF (6) RFS FD9R6004/2C-3L Diplexers	(3) 15-ft T-Frames	(12) 1-5/8" Coax
Sprint(80)	(1) GPS	2-ft standoff	(1) 1/2" Coax
Verizon(80)	(1) GPS	2-ft standoff	(1) 1/2" Coax

3.0 CODES AND LOADING

The tower was analyzed per ANSI/TIA-222-F as referenced by the 2005 Connecticut Building Code with 2009 Supplement, which is the adopted building code in the county. The following wind loading was used in compliance with the standard for New Haven County, CT.

- Basic wind speed 90 mph (W) without ice.
- Basic wind speed 38 mph (W_i) with 1/2" radial and escalating ice.

The following load combinations were used with wind blowing at 0°, 60° and 90° measured from a line normal to the face of the tower.

- D + W
- D + W_i + I

D: Dead Load
W_i: Wind Load with ice
W: Wind Load, without ice
I: Ice Gravity Load

4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

The analysis is based on the information provided to Atlantis Group and is assumed to be current and correct. Unless otherwise noted, the structure and the foundation system are assumed to be in good condition, free of defects and can achieve theoretical strength.

It is assumed that the structure has been maintained and shall be maintained during its service. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed and erected in accordance with the design documents. Atlantis Group will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance. Contractor should inspect the condition of the existing structure, mounts and connections and notify Atlantis Group for any discrepancies and deficiencies before proceeding with the construction.

The analysis does not include a qualification of the mounts attached on the structure or their connections. The analysis is performed to verify the capacity of the main structural members, which is the current practice in the tower industry.

The evaluation results presented in this report are only applicable for the previously mentioned existing and proposed additions and alterations. Any deviation of the proposed equipment and placement, etc., will require Atlantis Group to generate an additional structural evaluation.

5.0 ANALYSIS and ASSUMPTIONS

The tower was analyzed by utilizing tnxTower, a non-linear 3-Dimensional finite element software, a product of Tower Numerics, Inc. Software output for this analysis is provided in Appendix-A of this report.

6.0 RESULTS and CONCLUSION

Tower: The existing tower is found to have **adequate** structural capacity for the proposed loading by T-mobile. For the aforementioned load combinations and as a maximum, the tower bolts of the diagonals between 155-175 feet will be stressed to **86.7%** of its capacity. Maximum usage of tower leg is 59.5%.

After analyzing the mat foundation it was found to have adequate structural capacity at **85.9%** for the usage of the concrete with bending governs.

Reactions:

Maximums	Atlantis Analysis	Centek Structural Analysis
Leg Compression (kips)	338	326
Leg Uplift (kip)	283	271
Leg Shear (kips)	30	34
Total Moment (kip*ft)	6419	6176

Therefore, the proposed additions and alterations by T-Mobile can be implemented as intended with the conditions outlined in this report.

Should you have any questions or need any clarifications about this report, please contact Ahmet Colakoglu at (617) 965-0789.

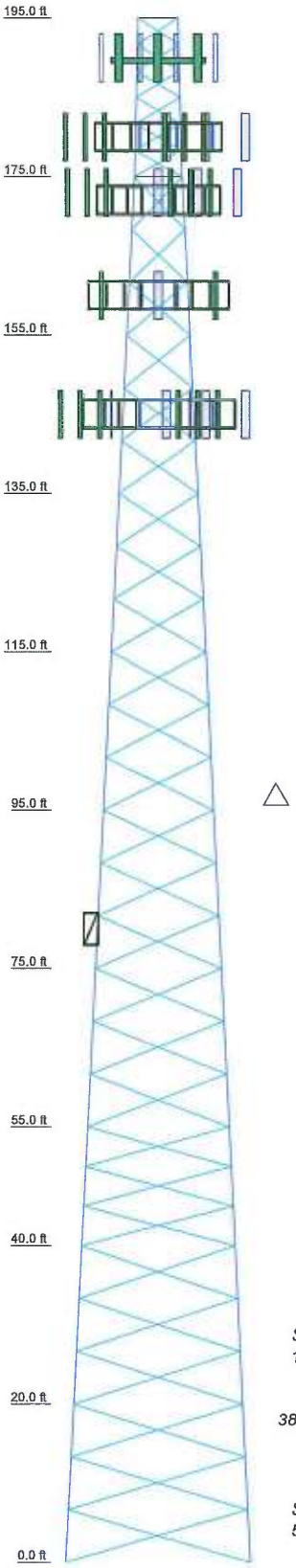
Sincerely,

Atlantis Group, Inc.
09/02/2014

Ahmet Colakoglu, PE
CT Professional Engineer
License No. 27057

APPENDIX A
CALCULATIONS

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	SR 5	SR 4 3/4			SR 4 1/2	SR 4 1/4		SR 4	SR 3 3/4	SR 3
Leg Grade	A572-50									
Diagonals	L4x4x3/8	L4x4x5/16		L4x4x1/4	L3 1/2x3 1/2x5/16	L3x3x3/8	L3x3x1/4	L2 1/2x2 1/2x5/16	L2 1/2x2 1/2x3/16	SR 1 1/4
Diagonal Grade	A36									
Top Girts	N.A.									SR 1 1/4
Bottom Girts	N.A.									SR 1 1/4
Face Width (ft)	23.5	21.5	19.5	18	16	14	12	10	8	6	5
# Panels @ (ft)	6 @ 6.66667			3 @ 5	18 @ 6.66667					6 @ 3.33333	
Weight (K)	48.8	8.1	6.8	5.0	5.8	5.4	4.8	4.0	3.6	2.8	2.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
15-ft Triangular Mount	190	AM-X-CD-16-65-00T-RET (72")	173
APXVSPP18-C-A20	190	AM-X-CD-16-65-00T-RET (72")	173
APXVSPP18-C-A20	190	AM-X-CD-16-65-00T-RET (72")	173
APXVSPP18-C-A20	190	Pirod 12' T-Frame Sector Mount (1)	172
FD-RRH 2x50 800	190	Pirod 12' T-Frame Sector Mount (1)	172
FD-RRH 2x50 800	190	Pirod 12' T-Frame Sector Mount (1)	172
FD-RRH 2x50 800	190	Pirod 15' T-Frame Sector Mount (1)	160
FD-RRH 2x50 1900	190	Pirod 15' T-Frame Sector Mount (1)	160
FD-RRH 2x50 1900	190	Pirod 15' T-Frame Sector Mount (1)	160
FD-RRH 2x50 1900	190	(4) DB844H90E-XY	160
Pirod 15' T-Frame Sector	180	(4) DB844H90E-XY	160
Pirod 15' T-Frame Sector	180	(4) DB844H90E-XY	160
Pirod 15' T-Frame Sector	180	Pirod 15' T-Frame Sector	145
(2) AIR21	180	Pirod 15' T-Frame Sector	145
(2) AIR21	180	Pirod 15' T-Frame Sector	145
(2) AIR21	180	LPA-80080-4CF	145
TMA	180	BXA-171085-8BF	145
TMA	180	BXA-70063/6CF	145
TMA	180	LPA-80080-4CF	145
LNX-6515DS-VTM	180	LPA-80080-4CF	145
LNX-6515DS-VTM	180	BXA-171085-8BF	145
LNX-6515DS-VTM	180	BXA-70063/6CF	145
RRUS 11 B12	180	LPA-80080-4CF	145
RRUS 11 B12	180	LPA-80080-4CF	145
RRUS 11 B12	180	BXA-171085-8BF	145
DC6-48-60-18-8F Surge Arrestor	175	BXA-70063/6CF	145
800 10121	173	LPA-80080-4CF	145
800 10121	173	(2) FDR9R6004/2C-3L Diplexer	145
800 10121	173	(2) FDR9R6004/2C-3L Diplexer	145
(2) LGP21401 TMA	173	(2) FDR9R6004/2C-3L Diplexer	145
(2) LGP21401 TMA	173	GPS	80
(2) LGP21401 TMA	173	2-ft Stand Off	80
(2) RRUS-11	173	GPS	80
(2) RRUS-11	173	2-ft Stand Off	80
(2) RRUS-11	173		

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 Haven County, Connecticut.
2. Tower designed for a 90 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: 86.7%

MAX. CORNER REACTIONS AT BASE:
DOWN: 338 K
SHEAR: 35 K

UPLIFT: -283 K
SHEAR: 30 K

AXIAL
116 K

SHEAR
14 K

MOMENT
1752 kip-ft

TORQUE 15 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL
68 K

SHEAR
57 K

MOMENT
6419 kip-ft

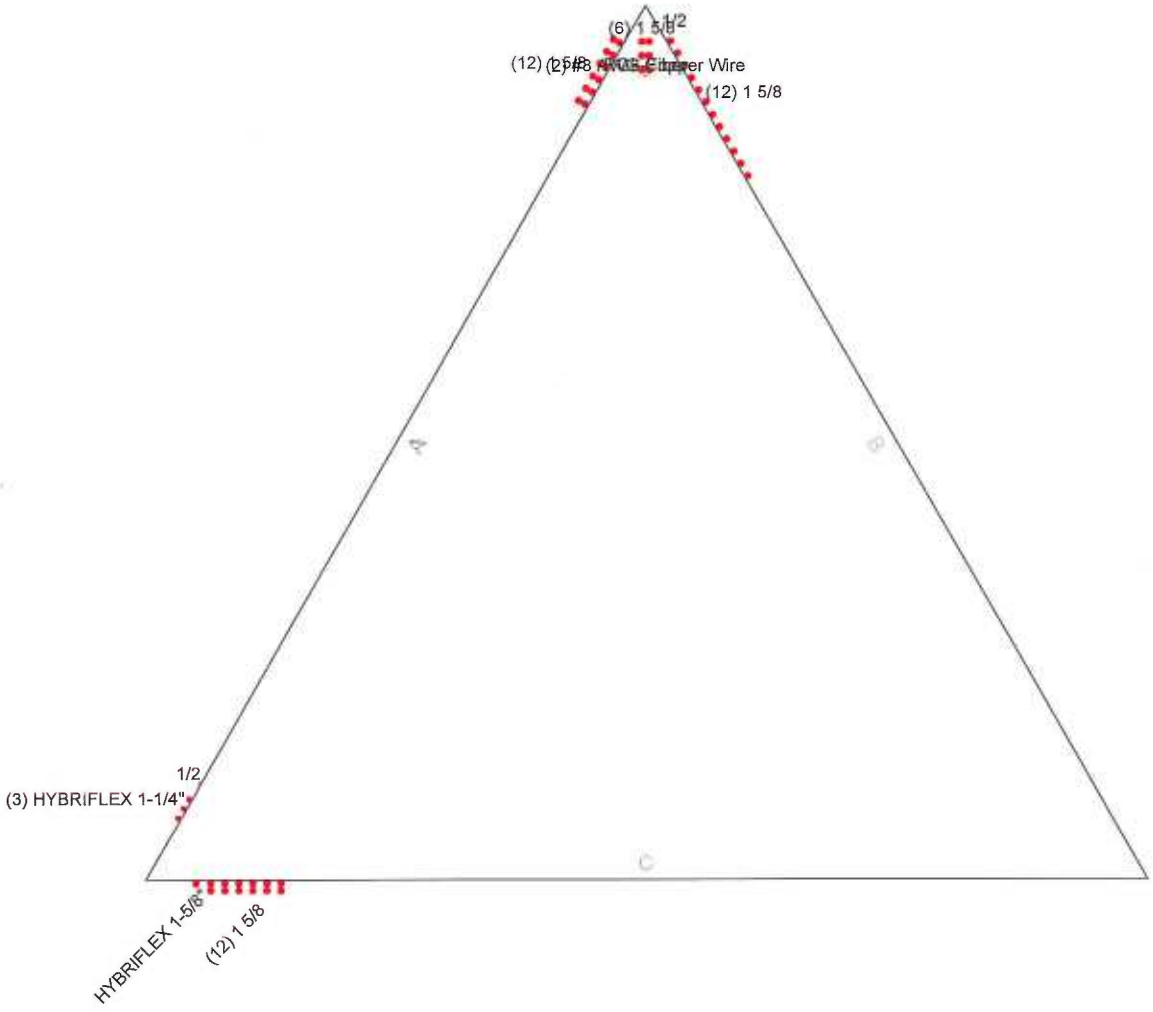
TORQUE 49 kip-ft
REACTIONS - 90 mph WIND

Atlantis Group
1340 Centre Street Suite 212
Newton, Ma 02459
Phone: 617-965-0789
FAX: 617-213-5056

Job: *CT11230A*			
Project: *CT11230A*			
Client: T-Mobile	Drawn by: Atlantis Group	App'd:	
Code: TIA/EIA-222-F	Date: 09/02/14	Scale: NTS	
Path: Z:\Projects\2014\17 - Atlantis\1417043 - CT11230A - (Lattice Tower)\TNX\CT11230A Final.eri		Dwg No. E-1	

Feed Line Plan

Round Flat App In Face App Out Face



Atlantis Group 1340 Centre Street Suite 212 Newton, Ma 02459 Phone: 617-965-0789 FAX: 617-213-5056	Job: ***CT11230A***		
	Project: ***CT11230A***		
	Client: T-Mobile	Drawn by: Atlantis Group	App'd:
	Code: TIA/EIA-222-F	Date: 09/02/14	Scale: NTS
	Path: Z:\Projects\2014\17 - Atlantis\1417043 - CT11230A - (Lattice Tower)\TNX\CT11230A Final.en		Dwg No. E-7

tnxTower	Job	Page
	CT11230A	1 of 36
Atlantis Group 1340 Centre Street Suite 212 Newton, Ma 02459 Phone: 617-965-0789 FAX: 617-213-5056	Project CT11230A	Date 17:25:04 09/02/14
	Client T-Mobile	Designed by Atlantis Group

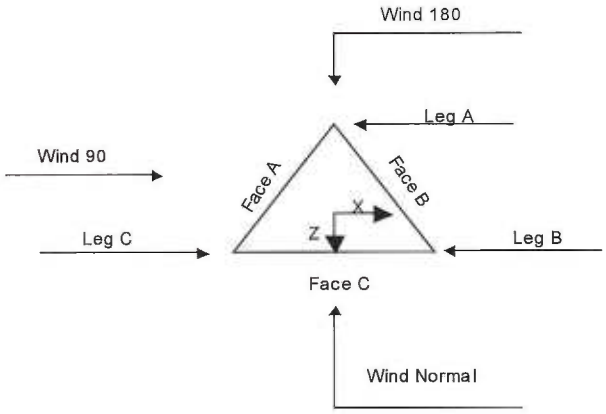
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 195.00 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 5.00 ft at the top and 23.50 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 Haven County, Connecticut.
Basic wind speed of 90 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 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	195.00-175.00			5.00	1	20.00
T2	175.00-155.00			6.00	1	20.00
T3	155.00-135.00			8.00	1	20.00
T4	135.00-115.00			10.00	1	20.00
T5	115.00-95.00			12.00	1	20.00
T6	95.00-75.00			14.00	1	20.00
T7	75.00-55.00			16.00	1	20.00
T8	55.00-40.00			18.00	1	15.00
T9	40.00-20.00			19.50	1	20.00
T10	20.00-0.00			21.50	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	195.00-175.00	3.33	X Brace	No	Yes	0.0000	0.0000
T2	175.00-155.00	6.67	X Brace	No	No	0.0000	0.0000
T3	155.00-135.00	6.67	X Brace	No	No	0.0000	0.0000
T4	135.00-115.00	6.67	X Brace	No	No	0.0000	0.0000
T5	115.00-95.00	6.67	X Brace	No	No	0.0000	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
T6	95.00-75.00	6.67	X Brace	No	No	0.0000	0.0000
T7	75.00-55.00	6.67	X Brace	No	No	0.0000	0.0000
T8	55.00-40.00	5.00	X Brace	No	No	0.0000	0.0000
T9	40.00-20.00	6.67	X Brace	No	No	0.0000	0.0000
T10	20.00-0.00	6.67	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 195.00-175.00	Solid Round	3	A572-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T2 175.00-155.00	Solid Round	3 3/4	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 155.00-135.00	Solid Round	4	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T4 135.00-115.00	Solid Round	4 1/4	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T5 115.00-95.00	Solid Round	4 1/4	A572-50 (50 ksi)	Single Angle	L3x3x3/8	A36 (36 ksi)
T6 95.00-75.00	Solid Round	4 1/2	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T7 75.00-55.00	Solid Round	4 3/4	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T8 55.00-40.00	Solid Round	4 3/4	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T9 40.00-20.00	Solid Round	4 3/4	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
T10 20.00-0.00	Solid Round	5	A572-50 (50 ksi)	Single Angle	L4x4x3/8	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 195.00-175.00	Solid Round	1 1/4	A36 (36 ksi)	Solid Round	1 1/4	A36 (36 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

Tower Elevation ft	Gusset Area (per face) ft²	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 195.00-175.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 175.00-155.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 155.00-135.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 135.00-115.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 115.00-95.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 95.00-75.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 75.00-55.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 55.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	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 195.00-175.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 175.00-155.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 155.00-135.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 135.00-115.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 115.00-95.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 95.00-75.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 75.00-55.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 55.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 20.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 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	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 195.00-175.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 175.00-155.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 155.00-135.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 135.00-115.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 115.00-95.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 95.00-75.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 75.00-55.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 55.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

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 195.00-175.00	Flange	1.1250 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 175.00-155.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 155.00-135.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 135.00-115.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 115.00-95.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 95.00-75.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 75.00-55.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 55.00-40.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 40.00-20.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 20.00-0.00	Flange	1.3750 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 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 plf
1 5/8	B	Yes	Ar (CfAe)	145.00 - 0.00	0.0000	-0.38	12	12	1.9800 0.0000	1.9800		1.04
1 5/8	A	Yes	Ar (CfAe)	160.00 - 0.00	0.0000	0.42	12	6	1.9800 0.0000	1.9800		1.04
1 5/8	A	No	Ar (Leg)	170.00 - 0.00	0.0000	0.05	6	3	1.9800 0.0000	1.9800		1.04
1 5/8	C	Yes	Ar (CfAe)	180.00 - 0.00	0.0000	0.4	12	6	1.9800 0.0000	1.9800		1.04
1/2	A	Yes	Ar (CfAe)	80.00 - 0.00	0.0000	-0.39	1	1	0.5800 0.0000	0.5800		0.25
1/2	B	Yes	Ar (CfAe)	80.00 - 0.00	0.0000	-0.47	1	1	0.5800 0.0000	0.5800		0.25
RG6-Fiber	A	No	Ar (Leg)	173.00 - 0.00	0.0000	0.07	1	1	0.5000 0.0000	0.5000		1.00
#8 AWG Copper Wire	A	No	Ar (Leg)	173.00 - 0.00	0.0000	0.07	2	1	0.2500 0.0000	0.1285		0.05
HYBRIFLEX 1-5/8"	C	Yes	Ar (CfAe)	180.00 - 0.00	0.0000	0.45	1	1	1.9800 0.0000	1.9800		1.90
HYBRIFLEX 1-1/4"	A	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	-0.42	3	3	1.5400 0.0000	1.5400		1.30

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	195.00-175.00	A	5.775	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.00
		C	5.775	0.000	0.000	0.000	0.07
T2	175.00-155.00	A	21.018	0.000	0.000	0.000	0.25
		B	8.368	0.000	0.000	0.000	0.00
		C	23.100	0.000	0.000	0.000	0.29
T3	155.00-135.00	A	38.447	0.000	0.000	0.000	0.47
		B	30.747	0.000	0.000	0.000	0.12
		C	23.100	0.000	0.000	0.000	0.29
T4	135.00-115.00	A	38.447	0.000	0.000	0.000	0.47
		B	50.547	0.000	0.000	0.000	0.25
		C	23.100	0.000	0.000	0.000	0.29
T5	115.00-95.00	A	38.447	0.000	0.000	0.000	0.47
		B	50.547	0.000	0.000	0.000	0.25
		C	23.100	0.000	0.000	0.000	0.29
T6	95.00-75.00	A	38.689	0.000	0.000	0.000	0.48
		B	50.789	0.000	0.000	0.000	0.25
		C	23.100	0.000	0.000	0.000	0.29
T7	75.00-55.00	A	39.414	0.000	0.000	0.000	0.48
		B	51.514	0.000	0.000	0.000	0.25
		C	23.100	0.000	0.000	0.000	0.29
T8	55.00-40.00	A	29.561	0.000	0.000	0.000	0.36
		B	38.636	0.000	0.000	0.000	0.19
		C	17.325	0.000	0.000	0.000	0.22
T9	40.00-20.00	A	39.414	0.000	0.000	0.000	0.48
		B	51.514	0.000	0.000	0.000	0.25
		C	23.100	0.000	0.000	0.000	0.29
T10	20.00-0.00	A	39.414	0.000	0.000	0.000	0.48
		B	51.514	0.000	0.000	0.000	0.25
		C	23.100	0.000	0.000	0.000	0.29

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	195.00-175.00	A	0.922	4.231	7.700	0.000	0.000	0.20
		B		0.000	0.000	0.000	0.000	0.00
		C		11.155	0.000	0.000	0.000	0.28
T2	175.00-155.00	A	0.910	35.748	10.267	0.000	0.000	0.99
		B		20.650	0.000	0.000	0.000	0.00
		C		44.328	0.000	0.000	0.000	1.12
T3	155.00-135.00	A	0.896	69.146	10.267	0.000	0.000	1.87
		B		63.593	0.000	0.000	0.000	0.50
		C		44.002	0.000	0.000	0.000	1.11
T4	135.00-115.00	A	0.880	68.513	10.267	0.000	0.000	1.84
		B		100.413	0.000	0.000	0.000	0.99
		C		43.633	0.000	0.000	0.000	1.09
T5	115.00-95.00	A	0.862	67.784	10.267	0.000	0.000	1.80
		B		99.380	0.000	0.000	0.000	0.97
		C		43.208	0.000	0.000	0.000	1.07
T6	95.00-75.00	A	0.840	67.863	10.267	0.000	0.000	1.77
		B		99.099	0.000	0.000	0.000	0.95
		C		42.704	0.000	0.000	0.000	1.04
T7	75.00-55.00	A	0.814	69.535	10.267	0.000	0.000	1.74
		B		100.328	0.000	0.000	0.000	0.95
		C		42.083	0.000	0.000	0.000	1.01
T8	55.00-40.00	A	0.784	51.175	7.700	0.000	0.000	1.26
		B		73.893	0.000	0.000	0.000	0.69
		C		31.036	0.000	0.000	0.000	0.73
T9	40.00-20.00	A	0.750	76.914	0.000	0.000	0.000	1.59
		B		96.514	0.000	0.000	0.000	0.88
		C		40.600	0.000	0.000	0.000	0.94
T10	20.00-0.00	A	0.750	76.914	0.000	0.000	0.000	1.59
		B		96.514	0.000	0.000	0.000	0.88
		C		40.600	0.000	0.000	0.000	0.94

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	195.00-175.00	A	0.483	2.469	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.483	2.308	0.000	0.000
T2	175.00-155.00	A	0.000	1.599	1.096	2.197
		B	0.000	0.000	0.000	0.000
		C	0.000	2.794	2.001	3.839
T3	155.00-135.00	A	0.000	2.989	2.142	4.171
		B	0.000	2.106	1.543	2.938
		C	0.000	2.457	1.800	3.428
T4	135.00-115.00	A	0.000	2.738	2.414	4.667
		B	0.000	3.852	3.476	6.565
		C	0.000	2.247	2.028	3.830
T5	115.00-95.00	A	0.000	2.555	2.319	4.448
		B	0.000	3.588	3.339	6.246
		C	0.000	2.093	1.948	3.644

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T6	95.00-75.00	A	0.000	2.445	2.657	5.094
		B	0.000	3.410	3.816	7.102
		C	0.000	1.964	2.213	4.090
T7	75.00-55.00	A	0.000	2.417	3.058	5.941
		B	0.000	3.314	4.358	8.146
		C	0.000	1.839	2.482	4.521
T8	55.00-40.00	A	0.000	2.210	2.946	5.640
		B	0.000	3.021	4.199	7.713
		C	0.000	1.678	2.391	4.283
T9	40.00-20.00	A	0.000	2.109	2.994	5.623
		B	0.000	2.882	4.266	7.684
		C	0.000	1.601	2.429	4.270
T10	20.00-0.00	A	0.000	2.091	2.969	5.577
		B	0.000	2.858	4.231	7.621
		C	0.000	1.588	2.409	4.235

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	195.00-175.00	-4.7794	2.8963	-3.1830	2.0604
T2	175.00-155.00	-8.4049	0.6396	-7.5959	-0.8982
T3	155.00-135.00	-7.5509	-10.5568	-6.8554	-12.1946
T4	135.00-115.00	-6.7698	-15.8846	-6.2456	-18.0424
T5	115.00-95.00	-7.7139	-18.0935	-7.1710	-20.5822
T6	95.00-75.00	-8.0328	-18.7893	-7.7750	-21.9862
T7	75.00-55.00	-8.3062	-19.1687	-8.5004	-23.0617
T8	55.00-40.00	-7.6078	-17.7076	-7.7903	-21.5030
T9	40.00-20.00	-9.3174	-21.4972	-10.9776	-25.2067
T10	20.00-0.00	-9.7468	-22.4862	-11.5665	-26.5526

Discrete Tower Loads

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
15-ft Triangular Mount	C	From Face	2.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	75.30 86.60 97.90 120.50 165.70	75.30 86.60 97.90 120.50 165.70	2.50 2.88 3.26 4.02 5.54
APXVSPP18-C-A20	A	From Face	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.46 12.66	5.28 5.74 6.20 7.12 8.96	0.06 0.11 0.16 0.26 0.46
APXVSPP18-C-A20	B	From Face	4.00	0.0000	190.00	No Ice	8.26	5.28	0.06

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	8.81	5.74	0.11
			0.00			1" Ice	9.36	6.20	0.16
						2" Ice	10.46	7.12	0.26
						4" Ice	12.66	8.96	0.46
APXVSPP18-C-A20	C	From Face	4.00	0.0000	190.00	No Ice	8.26	5.28	0.06
			0.00			1/2" Ice	8.81	5.74	0.11
			0.00			1" Ice	9.36	6.20	0.16
						2" Ice	10.46	7.12	0.26
						4" Ice	12.66	8.96	0.46
FD-RRH 2x50 800	A	From Face	4.00	0.0000	190.00	No Ice	2.40	2.25	0.06
			0.00			1/2" Ice	2.61	2.46	0.09
			0.00			1" Ice	2.82	2.67	0.12
						2" Ice	3.24	3.09	0.18
						4" Ice	4.08	3.93	0.30
FD-RRH 2x50 800	B	From Face	4.00	0.0000	190.00	No Ice	2.40	2.25	0.06
			0.00			1/2" Ice	2.61	2.46	0.09
			0.00			1" Ice	2.82	2.67	0.12
						2" Ice	3.24	3.09	0.18
						4" Ice	4.08	3.93	0.30
FD-RRH 2x50 800	C	From Face	4.00	0.0000	190.00	No Ice	2.40	2.25	0.06
			0.00			1/2" Ice	2.61	2.46	0.09
			0.00			1" Ice	2.82	2.67	0.12
						2" Ice	3.24	3.09	0.18
						4" Ice	4.08	3.93	0.30
FD-RRH 2x50 1900	A	From Face	4.00	0.0000	190.00	No Ice	2.71	2.78	0.06
			0.00			1/2" Ice	2.94	3.02	0.08
			0.00			1" Ice	3.17	3.26	0.10
						2" Ice	3.63	3.74	0.14
						4" Ice	4.55	4.70	0.22
FD-RRH 2x50 1900	B	From Face	4.00	0.0000	190.00	No Ice	2.71	2.78	0.06
			0.00			1/2" Ice	2.94	3.02	0.08
			0.00			1" Ice	3.17	3.26	0.10
						2" Ice	3.63	3.74	0.14
						4" Ice	4.55	4.70	0.22
FD-RRH 2x50 1900	C	From Face	4.00	0.0000	190.00	No Ice	2.71	2.78	0.06
			0.00			1/2" Ice	2.94	3.02	0.08
			0.00			1" Ice	3.17	3.26	0.10
						2" Ice	3.63	3.74	0.14
						4" Ice	4.55	4.70	0.22
Pirod 15' T-Frame Sector	A	From Leg	2.00	0.0000	180.00	No Ice	15.00	15.00	0.50
			0.00			1/2" Ice	20.60	20.60	0.65
			0.00			1" Ice	26.20	26.20	0.80
						2" Ice	37.40	37.40	1.10
						4" Ice	59.80	59.80	1.70
Pirod 15' T-Frame Sector	B	From Leg	2.00	0.0000	180.00	No Ice	15.00	15.00	0.50
			0.00			1/2" Ice	20.60	20.60	0.65
			0.00			1" Ice	26.20	26.20	0.80
						2" Ice	37.40	37.40	1.10
						4" Ice	59.80	59.80	1.70
Pirod 15' T-Frame Sector	C	From Leg	2.00	0.0000	180.00	No Ice	15.00	15.00	0.50
			0.00			1/2" Ice	20.60	20.60	0.65
			0.00			1" Ice	26.20	26.20	0.80
						2" Ice	37.40	37.40	1.10
						4" Ice	59.80	59.80	1.70
(2) AIR21	A	From Leg	4.00	0.0000	180.00	No Ice	6.53	4.36	0.08
			6.00			1/2" Ice	6.98	4.77	0.12
			0.00			1" Ice	7.43	5.18	0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	8.33	6.00	0.24
						4" Ice	10.13	7.64	0.40
(2) AIR21	B	From Leg	4.00 6.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.53 6.98 7.43 8.33 10.13	4.36 4.77 5.18 6.00 7.64	0.08 0.12 0.16 0.24 0.40
(2) AIR21	C	From Leg	4.00 6.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.53 6.98 7.43 8.33 10.13	4.36 4.77 5.18 6.00 7.64	0.08 0.12 0.16 0.24 0.40
TMA	A	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.31 1.45 1.73 2.29	0.39 0.48 0.57 0.75 1.11	0.01 0.02 0.03 0.05 0.09
TMA	B	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.31 1.45 1.73 2.29	0.39 0.48 0.57 0.75 1.11	0.01 0.02 0.03 0.05 0.09
TMA	C	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.31 1.45 1.73 2.29	0.39 0.48 0.57 0.75 1.11	0.01 0.02 0.03 0.05 0.09
LNX-6515DS-VTM	A	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.41 12.03 12.65 13.98 17.00	7.70 8.29 8.89 10.11 12.65	0.05 0.12 0.19 0.36 0.80
LNX-6515DS-VTM	B	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.41 12.03 12.65 13.98 17.00	7.70 8.29 8.89 10.11 12.65	0.05 0.12 0.19 0.36 0.80
LNX-6515DS-VTM	C	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.41 12.03 12.65 13.98 17.00	7.70 8.29 8.89 10.11 12.65	0.05 0.12 0.19 0.36 0.80
RRUS 11 B12	A	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	B	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	C	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31

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
Pirod 12' T-Frame Sector Mount (1)	A	From Leg	2.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.60 18.40 23.20 32.80 52.00	13.60 18.40 23.20 32.80 52.00	0.47 0.60 0.73 0.99 1.51
Pirod 12' T-Frame Sector Mount (1)	B	From Leg	2.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.60 18.40 23.20 32.80 52.00	13.60 18.40 23.20 32.80 52.00	0.47 0.60 0.73 0.99 1.51
Pirod 12' T-Frame Sector Mount (1)	C	From Leg	2.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.60 18.40 23.20 32.80 52.00	13.60 18.40 23.20 32.80 52.00	0.47 0.60 0.73 0.99 1.51
800 10121	A	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.46 5.88 6.30 7.14 8.82	3.29 3.64 3.99 4.69 6.09	0.05 0.08 0.11 0.17 0.29
800 10121	B	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.46 5.88 6.30 7.14 8.82	3.29 3.64 3.99 4.69 6.09	0.05 0.08 0.11 0.17 0.29
800 10121	C	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.46 5.88 6.30 7.14 8.82	3.29 3.64 3.99 4.69 6.09	0.05 0.08 0.11 0.17 0.29
(2) LGP21401 TMA	A	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.95 1.09 1.23 1.51 2.07	0.37 0.48 0.59 0.81 1.25	0.02 0.02 0.02 0.02 0.02
(2) LGP21401 TMA	B	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.95 1.09 1.23 1.51 2.07	0.37 0.48 0.59 0.81 1.25	0.02 0.02 0.02 0.02 0.02
(2) LGP21401 TMA	C	From Leg	4.00 5.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.95 1.09 1.23 1.51 2.07	0.37 0.48 0.59 0.81 1.25	0.02 0.02 0.02 0.02 0.02
DC6-48-60-18-8F Surge Arrestor	C	From Face	0.50 0.50 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.23 2.45 2.67 3.11 3.99	2.23 2.45 2.67 3.11 3.99	0.02 0.04 0.06 0.10 0.18
(2) RRUS-11	A	From Face	4.00 -2.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.99 3.23 3.47 3.95 4.91	1.25 1.41 1.57 1.89 2.53	0.05 0.07 0.09 0.13 0.21
(2) RRUS-11	B	From Face	4.00 -2.00	0.0000	173.00	No Ice 1/2" Ice	2.99 3.23	1.25 1.41	0.05 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	3.47	1.57	0.09
						2" Ice	3.95	1.89	0.13
						4" Ice	4.91	2.53	0.21
(2) RRUS-11	C	From Face	4.00 -2.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.99 3.23 3.47 3.95 4.91	1.25 1.41 1.57 1.89 2.53	0.05 0.07 0.09 0.13 0.21
AM-X-CD-16-65-00T-RET (72")	A	From Leg	4.00 -5.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.46 12.66	4.64 5.09 5.54 6.44 8.24	0.05 0.10 0.15 0.25 0.45
AM-X-CD-16-65-00T-RET (72")	B	From Leg	4.00 -5.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.46 12.66	4.64 5.09 5.54 6.44 8.24	0.05 0.10 0.15 0.25 0.45
AM-X-CD-16-65-00T-RET (72")	C	From Leg	4.00 -5.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.46 12.66	4.64 5.09 5.54 6.44 8.24	0.05 0.10 0.15 0.25 0.45
Pirod 15' T-Frame Sector Mount (1)	A	From Leg	2.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.00 20.60 26.20 37.40 59.80	15.00 20.60 26.20 37.40 59.80	0.50 0.65 0.80 1.10 1.70
Pirod 15' T-Frame Sector Mount (1)	B	From Leg	2.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.00 20.60 26.20 37.40 59.80	15.00 20.60 26.20 37.40 59.80	0.50 0.65 0.80 1.10 1.70
Pirod 15' T-Frame Sector Mount (1)	C	From Leg	2.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.00 20.60 26.20 37.40 59.80	15.00 20.60 26.20 37.40 59.80	0.50 0.65 0.80 1.10 1.70
(4) DB844H90E-XY	A	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.87 3.18 3.49 4.11 5.35	3.73 4.10 4.47 5.21 6.69	0.01 0.04 0.07 0.13 0.25
(4) DB844H90E-XY	B	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.87 3.18 3.49 4.11 5.35	3.73 4.10 4.47 5.21 6.69	0.01 0.04 0.07 0.13 0.25
(4) DB844H90E-XY	C	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.87 3.18 3.49 4.11 5.35	3.73 4.10 4.47 5.21 6.69	0.01 0.04 0.07 0.13 0.25
Pirod 15' T-Frame Sector	A	From Leg	2.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice	15.00 20.60 26.20 37.40	15.00 20.60 26.20 37.40	0.50 0.65 0.80 1.10

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	59.80	59.80	1.70
Pirod 15' T-Frame Sector	B	From Leg	2.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.00 20.60 26.20 37.40 59.80	15.00 20.60 26.20 37.40 59.80	0.50 0.65 0.80 1.10 1.70
Pirod 15' T-Frame Sector	C	From Leg	2.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.00 20.60 26.20 37.40 59.80	15.00 20.60 26.20 37.40 59.80	0.50 0.65 0.80 1.10 1.70
LPA-80080-4CF	A	From Leg	4.00 6.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.62 2.92 3.22 3.82 5.02	6.06 6.45 6.84 7.62 9.18	0.01 0.05 0.05 0.09 0.17
BXA-171085-8BF	A	From Leg	4.00 4.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.26 3.58 4.22 5.50	2.16 2.46 2.76 3.36 4.56	0.01 0.03 0.05 0.09 0.17
BXA-70063/6CF	A	From Leg	4.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.73 8.27 8.81 9.89 12.05	4.16 4.60 5.04 5.92 7.68	0.02 0.06 0.10 0.18 0.34
LPA-80080-4CF	A	From Leg	4.00 -6.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.62 2.92 3.22 3.82 5.02	6.06 6.45 6.84 7.62 9.18	0.01 0.03 0.05 0.09 0.17
LPA-80080-4CF	B	From Leg	4.00 6.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.62 2.92 3.22 3.82 5.02	6.06 6.45 6.84 7.62 9.18	0.01 0.05 0.05 0.09 0.17
BXA-171085-8BF	B	From Leg	4.00 4.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.26 3.58 4.22 5.50	2.16 2.46 2.76 3.36 4.56	0.01 0.03 0.05 0.09 0.17
BXA-70063/6CF	B	From Leg	4.00 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.73 8.27 8.81 9.89 12.05	4.16 4.60 5.04 5.92 7.68	0.02 0.06 0.10 0.18 0.34
LPA-80080-4CF	B	From Leg	4.00 -6.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.62 2.92 3.22 3.82 5.02	6.06 6.45 6.84 7.62 9.18	0.01 0.03 0.05 0.09 0.17
LPA-80080-4CF	C	From Leg	4.00 6.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.62 2.92 3.22 3.82 5.02	6.06 6.45 6.84 7.62 9.18	0.01 0.05 0.05 0.09 0.17
BXA-171085-8BF	C	From Leg	4.00	0.0000	145.00	No Ice	2.94	2.16	0.01

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
			4.00			1/2" Ice	3.26	2.46	0.03
			0.00			1" Ice	3.58	2.76	0.05
						2" Ice	4.22	3.36	0.09
						4" Ice	5.50	4.56	0.17
BXA-70063/6CF	C	From Leg	4.00	0.0000	145.00	No Ice	7.73	4.16	0.02
			0.00			1/2" Ice	8.27	4.60	0.06
			0.00			1" Ice	8.81	5.04	0.10
						2" Ice	9.89	5.92	0.18
						4" Ice	12.05	7.68	0.34
LPA-80080-4CF	C	From Leg	4.00	0.0000	145.00	No Ice	2.62	6.06	0.01
			-6.00			1/2" Ice	2.92	6.45	0.03
			0.00			1" Ice	3.22	6.84	0.05
						2" Ice	3.82	7.62	0.09
						4" Ice	5.02	9.18	0.17
(2) FDR9R6004/2C-3L Diplexer	A	From Leg	4.00	0.0000	145.00	No Ice	0.37	0.08	0.00
			-6.00			1/2" Ice	0.45	0.14	0.01
			0.00			1" Ice	0.53	0.20	0.01
						2" Ice	0.69	0.32	0.01
						4" Ice	1.01	0.56	0.01
(2) FDR9R6004/2C-3L Diplexer	B	From Leg	4.00	0.0000	145.00	No Ice	0.37	0.08	0.00
			-6.00			1/2" Ice	0.45	0.14	0.01
			0.00			1" Ice	0.53	0.20	0.01
						2" Ice	0.69	0.32	0.01
						4" Ice	1.01	0.56	0.01
(2) FDR9R6004/2C-3L Diplexer	C	From Leg	4.00	0.0000	145.00	No Ice	0.37	0.08	0.00
			-6.00			1/2" Ice	0.45	0.14	0.01
			0.00			1" Ice	0.53	0.20	0.01
						2" Ice	0.69	0.32	0.01
						4" Ice	1.01	0.56	0.01
GPS	C	From Leg	2.00	0.0000	80.00	No Ice	1.00	1.00	0.10
			0.00			1/2" Ice	1.50	1.50	0.10
			0.00			1" Ice	2.00	2.00	0.10
						2" Ice	3.00	3.00	0.10
						4" Ice	5.00	5.00	0.10
2-ft Stand Off	C	From Leg	1.00	0.0000	80.00	No Ice	1.07	1.07	0.02
			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
						2" Ice	3.27	3.27	0.06
						4" Ice	5.47	5.47	0.10
GPS	A	From Leg	2.00	0.0000	80.00	No Ice	1.00	1.00	0.10
			0.00			1/2" Ice	1.50	1.50	0.10
			0.00			1" Ice	2.00	2.00	0.10
						2" Ice	3.00	3.00	0.10
						4" Ice	5.00	5.00	0.10
2-ft Stand Off	A	From Leg	1.00	0.0000	80.00	No Ice	1.07	1.07	0.02
			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
						2" Ice	3.27	3.27	0.06
						4" Ice	5.47	5.47	0.10

Tower Pressures - No Ice

$G_H = 1.116$

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1	185.00	1.636	34	115.002	A	0.000	24.066	10.004	41.57	0.000	0.000
195.00-175.00					B	0.000	18.774		53.29	0.000	0.000
					C	0.000	24.066		41.57	0.000	0.000
T2	165.00	1.584	33	146.258	A	10.477	33.539	12.521	28.45	0.000	0.000
175.00-155.00					B	11.572	20.889		38.57	0.000	0.000
					C	9.572	35.621		27.71	0.000	0.000
T3	145.00	1.526	32	186.675	A	11.352	51.803	13.356	21.15	0.000	0.000
155.00-135.00					B	11.952	44.103		23.83	0.000	0.000
					C	11.695	36.456		27.74	0.000	0.000
T4	125.00	1.463	30	227.092	A	16.271	52.638	14.190	20.59	0.000	0.000
135.00-115.00					B	15.209	64.738		17.75	0.000	0.000
					C	16.657	37.290		26.30	0.000	0.000
T5	105.00	1.392	29	267.092	A	19.003	52.638	14.190	19.81	0.000	0.000
115.00-95.00					B	17.983	64.738		17.15	0.000	0.000
					C	19.374	37.290		25.04	0.000	0.000
T6 95.00-75.00	85.00	1.31	27	307.509	A	25.362	53.714	15.025	19.00	0.000	0.000
					B	24.203	65.814		16.69	0.000	0.000
					C	25.806	38.125		23.50	0.000	0.000
T7 75.00-55.00	65.00	1.214	25	347.927	A	32.624	55.274	15.860	18.04	0.000	0.000
					B	31.324	67.374		16.07	0.000	0.000
					C	33.200	38.960		21.98	0.000	0.000
T8 55.00-40.00	47.50	1.11	23	287.195	A	35.046	41.455	11.895	15.55	0.000	0.000
					B	33.794	50.530		14.11	0.000	0.000
					C	35.602	29.220		18.35	0.000	0.000
T9 40.00-20.00	30.00	1	21	417.927	A	39.290	55.274	15.860	16.77	0.000	0.000
					B	38.018	67.374		15.05	0.000	0.000
					C	39.855	38.960		20.12	0.000	0.000
T10 20.00-0.00	10.00	1	21	458.344	A	43.105	56.109	16.694	16.83	0.000	0.000
					B	41.843	68.209		15.17	0.000	0.000
					C	43.665	39.794		20.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.116$

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1	185.00	1.636	6	0.9224	118.077	A	7.700	39.629	16.156	34.13	0.000	0.000
195.00-175.00						B	0.000	37.867		42.66	0.000	0.000
						C	0.000	46.714		34.58	0.000	0.000
T2	165.00	1.584	6	0.9098	149.294	A	19.642	61.168	18.596	23.01	0.000	0.000
175.00-155.00						B	11.572	47.669		31.39	0.000	0.000
						C	7.733	68.553		24.38	0.000	0.000
T3	145.00	1.526	6	0.8958	189.665	A	19.590	95.165	19.337	16.85	0.000	0.000
155.00-135.00						B	10.556	90.495		19.14	0.000	0.000
						C	10.066	70.553		23.99	0.000	0.000
T4	125.00	1.463	5	0.8800	230.029	A	24.285	96.803	20.067	16.57	0.000	0.000
135.00-115.00						B	12.120	127.589		14.36	0.000	0.000
						C	14.855	72.414		22.99	0.000	0.000
T5 115.00-95.00	105.00	1.392	5	0.8618	269.968	A	27.141	97.424	19.945	16.01	0.000	0.000
						B	15.076	127.986		13.94	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	17.679	73.309		21.92	0.000	0.000
T6 95.00-75.00	85.00	1.31	5	0.8402	310.313	A	33.192	99.505	20.635	15.55	0.000	0.000
						B	20.917	129.777		13.69	0.000	0.000
						C	23.929	74.828		20.90	0.000	0.000
T7 75.00-55.00	65.00	1.214	4	0.8136	350.642	A	40.008	102.926	21.292	14.90	0.000	0.000
						B	27.536	132.821		13.28	0.000	0.000
						C	31.161	76.051		19.86	0.000	0.000
T8 55.00-40.00	47.50	1.11	4	0.7835	289.156	A	40.053	79.668	15.819	13.21	0.000	0.000
						B	30.280	101.575		12.00	0.000	0.000
						C	33.710	60.061		16.87	0.000	0.000
T9 40.00-20.00	30.00	1	4	0.7500	420.430	A	36.661	111.530	20.868	14.08	0.000	0.000
						B	34.600	130.357		12.65	0.000	0.000
						C	38.014	75.723		18.35	0.000	0.000
T10 20.00-0.00	10.00	1	4	0.7500	460.847	A	40.498	113.804	21.703	14.07	0.000	0.000
						B	38.453	132.637		12.68	0.000	0.000
						C	41.840	77.993		18.11	0.000	0.000

Tower Pressure - Service

$G_H = 1.116$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	185.00	1.636	10	115.002	A	0.000	24.066	10.004	41.57	0.000	0.000
195.00-175.00					B	0.000	18.774		53.29	0.000	0.000
					C	0.000	24.066		41.57	0.000	0.000
T2	165.00	1.584	10	146.258	A	10.477	33.539	12.521	28.45	0.000	0.000
175.00-155.00					B	11.572	20.889		38.57	0.000	0.000
					C	9.572	35.621		27.71	0.000	0.000
T3	145.00	1.526	10	186.675	A	11.352	51.803	13.356	21.15	0.000	0.000
155.00-135.00					B	11.952	44.103		23.83	0.000	0.000
					C	11.695	36.456		27.74	0.000	0.000
T4	125.00	1.463	9	227.092	A	16.271	52.638	14.190	20.59	0.000	0.000
135.00-115.00					B	15.209	64.738		17.75	0.000	0.000
					C	16.657	37.290		26.30	0.000	0.000
T5	105.00	1.392	9	267.092	A	19.003	52.638	14.190	19.81	0.000	0.000
115.00-95.00					B	17.983	64.738		17.15	0.000	0.000
					C	19.374	37.290		25.04	0.000	0.000
T6 95.00-75.00	85.00	1.31	8	307.509	A	25.362	53.714	15.025	19.00	0.000	0.000
					B	24.203	65.814		16.69	0.000	0.000
					C	25.806	38.125		23.50	0.000	0.000
T7 75.00-55.00	65.00	1.214	8	347.927	A	32.624	55.274	15.860	18.04	0.000	0.000
					B	31.324	67.374		16.07	0.000	0.000
					C	33.200	38.960		21.98	0.000	0.000
T8 55.00-40.00	47.50	1.11	7	287.195	A	35.046	41.455	11.895	15.55	0.000	0.000
					B	33.794	50.530		14.11	0.000	0.000
					C	35.602	29.220		18.35	0.000	0.000
T9 40.00-20.00	30.00	1	6	417.927	A	39.290	55.274	15.860	16.77	0.000	0.000
					B	38.018	67.374		15.05	0.000	0.000
					C	39.855	38.960		20.12	0.000	0.000
T10 20.00-0.00	10.00	1	6	458.344	A	43.105	56.109	16.694	16.83	0.000	0.000
					B	41.843	68.209		15.17	0.000	0.000
					C	43.665	39.794		20.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	1	1	14.255	1.38	69.21	C
195.00-175.00			B	0.163	2.723	0.584	1	1	10.956			
			C	0.209	2.565	0.592	1	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	1	1	31.143	2.63	131.58	C
175.00-155.00			B	0.222	2.524	0.595	1	1	24.004			
			C	0.309	2.272	0.619	1	1	31.610			
T3	0.89	3.57	A	0.338	2.199	0.628	1	1	43.904	3.41	170.44	A
155.00-135.00			B	0.3	2.295	0.616	1	1	39.119			
			C	0.258	2.414	0.604	1	1	33.711			
T4	1.01	4.04	A	0.303	2.287	0.617	1	1	48.747	4.12	206.06	B
135.00-115.00			B	0.352	2.167	0.633	1	1	56.202			
			C	0.238	2.475	0.599	1	1	38.986			
T5	1.01	4.79	A	0.268	2.384	0.607	1	1	50.938	4.24	212.19	B
115.00-95.00			B	0.31	2.27	0.619	1	1	58.050			
			C	0.212	2.556	0.593	1	1	41.486			
T6	1.01	5.35	A	0.257	2.416	0.604	1	1	57.790	4.53	226.68	B
95.00-75.00			B	0.293	2.316	0.614	1	1	64.593			
			C	0.208	2.57	0.592	1	1	48.378			
T7	1.02	5.79	A	0.253	2.43	0.603	1	1	65.929	4.76	238.15	B
75.00-55.00			B	0.284	2.34	0.611	1	1	72.492			
			C	0.207	2.571	0.592	1	1	56.262			
T8	0.77	5.02	A	0.266	2.389	0.606	1	1	60.176	3.85	256.57	B
55.00-40.00			B	0.294	2.313	0.614	1	1	64.818			
			C	0.226	2.512	0.596	1	1	53.016			
T9	1.02	6.79	A	0.226	2.511	0.596	1	1	72.240	4.42	221.01	B
40.00-20.00			B	0.252	2.431	0.602	1	1	78.606			
			C	0.189	2.635	0.588	1	1	62.768			
T10	1.02	8.13	A	0.216	2.542	0.594	1	1	76.428	4.72	236.09	B
20.00-0.00			B	0.24	2.468	0.599	1	1	82.728			
			C	0.182	2.657	0.587	1	1	67.021			
Sum Weight:	8.43	48.83						OTM	3202.89 kip-ft	38.08		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	0.8	1	14.255	1.38	69.21	C
195.00-175.00			B	0.163	2.723	0.584	0.8	1	10.956			
			C	0.209	2.565	0.592	0.8	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	0.8	1	29.048	2.47	123.61	C
175.00-155.00			B	0.222	2.524	0.595	0.8	1	21.689			
			C	0.309	2.272	0.619	0.8	1	29.696			
T3	0.89	3.57	A	0.338	2.199	0.628	0.8	1	41.633	3.23	161.63	A
155.00-135.00			B	0.3	2.295	0.616	0.8	1	36.728			
			C	0.258	2.414	0.604	0.8	1	31.372			
T4	1.01	4.04	A	0.303	2.287	0.617	0.8	1	45.492	3.90	194.90	B
135.00-115.00			B	0.352	2.167	0.633	0.8	1	53.160			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.238	2.475	0.599	0.8	1	35.655			
T5	1.01	4.79	A	0.268	2.384	0.607	0.8	1	47.138	3.98	199.04	B
115.00-95.00			B	0.31	2.27	0.619	0.8	1	54.454			
			C	0.212	2.556	0.593	0.8	1	37.611			
T6	1.01	5.35	A	0.257	2.416	0.604	0.8	1	52.718	4.19	209.69	B
95.00-75.00			B	0.293	2.316	0.614	0.8	1	59.752			
			C	0.208	2.57	0.592	0.8	1	43.217			
T7	1.02	5.79	A	0.253	2.43	0.603	0.8	1	59.404	4.35	217.57	B
75.00-55.00			B	0.284	2.34	0.611	0.8	1	66.227			
			C	0.207	2.571	0.592	0.8	1	49.622			
T8	0.77	5.02	A	0.266	2.389	0.606	0.8	1	53.167	3.45	229.81	B
55.00-40.00			B	0.294	2.313	0.614	0.8	1	58.059			
			C	0.226	2.512	0.596	0.8	1	45.896			
T9	1.02	6.79	A	0.226	2.511	0.596	0.8	1	64.382	3.99	199.63	B
40.00-20.00			B	0.252	2.431	0.602	0.8	1	71.002			
			C	0.189	2.635	0.588	0.8	1	54.797			
T10	1.02	8.13	A	0.216	2.542	0.594	0.8	1	67.807	4.24	212.21	B
20.00-0.00			B	0.24	2.468	0.599	0.8	1	74.359			
			C	0.182	2.657	0.587	0.8	1	58.288			
Sum Weight:	8.43	48.83						OTM	3003.24 kip-ft	35.20		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	0.85	1	14.255	1.38	69.21	C
195.00-175.00			B	0.163	2.723	0.584	0.85	1	10.956			
			C	0.209	2.565	0.592	0.85	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	0.85	1	29.571	2.51	125.60	C
175.00-155.00			B	0.222	2.524	0.595	0.85	1	22.268			
			C	0.309	2.272	0.619	0.85	1	30.174			
T3	0.89	3.57	A	0.338	2.199	0.628	0.85	1	42.201	3.28	163.83	A
155.00-135.00			B	0.3	2.295	0.616	0.85	1	37.326			
			C	0.258	2.414	0.604	0.85	1	31.957			
T4	1.01	4.04	A	0.303	2.287	0.617	0.85	1	46.306	3.95	197.69	B
135.00-115.00			B	0.352	2.167	0.633	0.85	1	53.920			
			C	0.238	2.475	0.599	0.85	1	36.488			
T5	1.01	4.79	A	0.268	2.384	0.607	0.85	1	48.088	4.05	202.33	B
115.00-95.00			B	0.31	2.27	0.619	0.85	1	55.353			
			C	0.212	2.556	0.593	0.85	1	38.580			
T6	1.01	5.35	A	0.257	2.416	0.604	0.85	1	53.986	4.28	213.94	B
95.00-75.00			B	0.293	2.316	0.614	0.85	1	60.963			
			C	0.208	2.57	0.592	0.85	1	44.507			
T7	1.02	5.79	A	0.253	2.43	0.603	0.85	1	61.035	4.45	222.72	B
75.00-55.00			B	0.284	2.34	0.611	0.85	1	67.793			
			C	0.207	2.571	0.592	0.85	1	51.282			
T8	0.77	5.02	A	0.266	2.389	0.606	0.85	1	54.919	3.55	236.50	B
55.00-40.00			B	0.294	2.313	0.614	0.85	1	59.749			
			C	0.226	2.512	0.596	0.85	1	47.676			
T9	1.02	6.79	A	0.226	2.511	0.596	0.85	1	66.346	4.10	204.97	B
40.00-20.00			B	0.252	2.431	0.602	0.85	1	72.903			
			C	0.189	2.635	0.588	0.85	1	56.790			
T10	1.02	8.13	A	0.216	2.542	0.594	0.85	1	69.962	4.36	218.18	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
20.00-0.00			B	0.24	2.468	0.599	0.85	1	76.451			
			C	0.182	2.657	0.587	0.85	1	60.471			
Sum Weight:	8.43	48.83						OTM	3053.15 kip-ft	35.92		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.48	3.46	A	0.401	2.062	0.652	1	1	33.536	0.47	23.34	A
195.00-175.00			B	0.321	2.242	0.622	1	1	23.570			
			C	0.396	2.073	0.65	1	1	30.356			
T2	2.11	3.94	A	0.541	1.852	0.719	1	1	63.648	0.77	38.50	A
175.00-155.00			B	0.397	2.07	0.65	1	1	42.572			
			C	0.511	1.886	0.703	1	1	55.937			
T3	3.48	4.84	A	0.605	1.801	0.757	1	1	91.601	1.04	51.92	A
155.00-135.00			B	0.533	1.861	0.715	1	1	75.239			
			C	0.425	2.017	0.662	1	1	56.783			
T4	3.91	5.59	A	0.526	1.868	0.711	1	1	93.144	1.18	59.09	B
135.00-115.00			B	0.607	1.8	0.758	1	1	108.848			
			C	0.379	2.106	0.643	1	1	61.447			
T5	3.83	6.47	A	0.461	1.955	0.679	1	1	93.251	1.14	56.90	B
115.00-95.00			B	0.53	1.864	0.713	1	1	106.358			
			C	0.337	2.202	0.628	1	1	63.712			
T6	3.76	7.35	A	0.428	2.012	0.663	1	1	99.189	1.15	57.30	B
95.00-75.00			B	0.486	1.919	0.69	1	1	110.498			
			C	0.318	2.249	0.622	1	1	70.445			
T7	3.70	8.12	A	0.408	2.049	0.655	1	1	107.398	1.15	57.64	B
75.00-55.00			B	0.457	1.962	0.677	1	1	117.412			
			C	0.306	2.281	0.618	1	1	78.136			
T8	2.68	7.29	A	0.414	2.037	0.657	1	1	92.428	0.89	59.28	B
55.00-40.00			B	0.456	1.964	0.676	1	1	98.949			
			C	0.324	2.233	0.624	1	1	71.166			
T9	3.40	9.24	A	0.352	2.166	0.633	1	1	107.300	1.02	51.08	B
40.00-20.00			B	0.392	2.079	0.649	1	1	119.138			
			C	0.271	2.377	0.607	1	1	84.003			
T10	3.40	10.78	A	0.335	2.207	0.627	1	1	111.872	1.08	54.03	B
20.00-0.00			B	0.371	2.124	0.64	1	1	123.380			
			C	0.26	2.408	0.604	1	1	88.985			
Sum Weight:	30.76	67.10						OTM	887.19 kip-ft	9.88		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.48	3.46	A	0.401	2.062	0.652	0.8	1	31.996	0.45	22.26	A

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
195.00-175.00			B	0.321	2.242	0.622	0.8	1	23.570			
			C	0.396	2.073	0.65	0.8	1	30.356			
T2	2.11	3.94	A	0.541	1.852	0.719	0.8	1	59.719	0.72	36.12	A
175.00-155.00			B	0.397	2.07	0.65	0.8	1	40.257			
			C	0.511	1.886	0.703	0.8	1	54.390			
T3	3.48	4.84	A	0.605	1.801	0.757	0.8	1	87.683	0.99	49.70	A
155.00-135.00			B	0.533	1.861	0.715	0.8	1	73.128			
			C	0.425	2.017	0.662	0.8	1	54.769			
T4	3.91	5.59	A	0.526	1.868	0.711	0.8	1	88.287	1.16	57.77	B
135.00-115.00			B	0.607	1.8	0.758	0.8	1	106.424			
			C	0.379	2.106	0.643	0.8	1	58.476			
T5	3.83	6.47	A	0.461	1.955	0.679	0.8	1	87.823	1.11	55.29	B
115.00-95.00			B	0.53	1.864	0.713	0.8	1	103.343			
			C	0.337	2.202	0.628	0.8	1	60.176			
T6	3.76	7.35	A	0.428	2.012	0.663	0.8	1	92.551	1.10	55.13	B
95.00-75.00			B	0.486	1.919	0.69	0.8	1	106.314			
			C	0.318	2.249	0.622	0.8	1	65.660			
T7	3.70	8.12	A	0.408	2.049	0.655	0.8	1	99.397	1.10	54.93	B
75.00-55.00			B	0.457	1.962	0.677	0.8	1	111.905			
			C	0.306	2.281	0.618	0.8	1	71.904			
T8	2.68	7.29	A	0.414	2.037	0.657	0.8	1	84.418	0.83	55.65	B
55.00-40.00			B	0.456	1.964	0.676	0.8	1	92.893			
			C	0.324	2.233	0.624	0.8	1	64.424			
T9	3.40	9.24	A	0.352	2.166	0.633	0.8	1	99.968	0.96	48.11	B
40.00-20.00			B	0.392	2.079	0.649	0.8	1	112.218			
			C	0.271	2.377	0.607	0.8	1	76.400			
T10	3.40	10.78	A	0.335	2.207	0.627	0.8	1	103.773	1.01	50.66	B
20.00-0.00			B	0.371	2.124	0.64	0.8	1	115.689			
			C	0.26	2.408	0.604	0.8	1	80.617			
Sum Weight:	30.76	67.10						OTM	850.03 kip-ft	9.43		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.48	3.46	A	0.401	2.062	0.652	0.85	1	32.381	0.45	22.53	A
195.00-175.00			B	0.321	2.242	0.622	0.85	1	23.570			
			C	0.396	2.073	0.65	0.85	1	30.356			
T2	2.11	3.94	A	0.541	1.852	0.719	0.85	1	60.702	0.73	36.71	A
175.00-155.00			B	0.397	2.07	0.65	0.85	1	40.836			
			C	0.511	1.886	0.703	0.85	1	54.777			
T3	3.48	4.84	A	0.605	1.801	0.757	0.85	1	88.663	1.01	50.25	A
155.00-135.00			B	0.533	1.861	0.715	0.85	1	73.656			
			C	0.425	2.017	0.662	0.85	1	55.273			
T4	3.91	5.59	A	0.526	1.868	0.711	0.85	1	89.501	1.16	58.10	B
135.00-115.00			B	0.607	1.8	0.758	0.85	1	107.030			
			C	0.379	2.106	0.643	0.85	1	59.218			
T5	3.83	6.47	A	0.461	1.955	0.679	0.85	1	89.180	1.11	55.69	B
115.00-95.00			B	0.53	1.864	0.713	0.85	1	104.097			
			C	0.337	2.202	0.628	0.85	1	61.060			
T6	3.76	7.35	A	0.428	2.012	0.663	0.85	1	94.211	1.11	55.68	B
95.00-75.00			B	0.486	1.919	0.69	0.85	1	107.360			
			C	0.318	2.249	0.622	0.85	1	66.856			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T7	3.70	8.12	A	0.408	2.049	0.655	0.85	1	101.397	1.11	55.61	B
75.00-55.00			B	0.457	1.962	0.677	0.85	1	113.281			
			C	0.306	2.281	0.618	0.85	1	73.462			
T8	2.68	7.29	A	0.414	2.037	0.657	0.85	1	86.420	0.85	56.56	B
55.00-40.00			B	0.456	1.964	0.676	0.85	1	94.407			
			C	0.324	2.233	0.624	0.85	1	66.109			
T9	3.40	9.24	A	0.352	2.166	0.633	0.85	1	101.801	0.98	48.85	B
40.00-20.00			B	0.392	2.079	0.649	0.85	1	113.948			
			C	0.271	2.377	0.607	0.85	1	78.301			
T10	3.40	10.78	A	0.335	2.207	0.627	0.85	1	105.798	1.03	51.50	B
20.00-0.00			B	0.371	2.124	0.64	0.85	1	117.612			
			C	0.26	2.408	0.604	0.85	1	82.709			
Sum Weight:	30.76	67.10						OTM	859.32 kip-ft	9.55		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	1	1	14.255	0.43	21.36	C
195.00-175.00			B	0.163	2.723	0.584	1	1	10.956			
			C	0.209	2.565	0.592	1	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	1	1	31.143	0.81	40.61	C
175.00-155.00			B	0.222	2.524	0.595	1	1	24.004			
			C	0.309	2.272	0.619	1	1	31.610			
T3	0.89	3.57	A	0.338	2.199	0.628	1	1	43.904	1.05	52.61	A
155.00-135.00			B	0.3	2.295	0.616	1	1	39.119			
			C	0.258	2.414	0.604	1	1	33.711			
T4	1.01	4.04	A	0.303	2.287	0.617	1	1	48.747	1.27	63.60	B
135.00-115.00			B	0.352	2.167	0.633	1	1	56.202			
			C	0.238	2.475	0.599	1	1	38.986			
T5	1.01	4.79	A	0.268	2.384	0.607	1	1	50.938	1.31	65.49	B
115.00-95.00			B	0.31	2.27	0.619	1	1	58.050			
			C	0.212	2.556	0.593	1	1	41.486			
T6	1.01	5.35	A	0.257	2.416	0.604	1	1	57.790	1.40	69.96	B
95.00-75.00			B	0.293	2.316	0.614	1	1	64.593			
			C	0.208	2.57	0.592	1	1	48.378			
T7	1.02	5.79	A	0.253	2.43	0.603	1	1	65.929	1.47	73.50	B
75.00-55.00			B	0.284	2.34	0.611	1	1	72.492			
			C	0.207	2.571	0.592	1	1	56.262			
T8	0.77	5.02	A	0.266	2.389	0.606	1	1	60.176	1.19	79.19	B
55.00-40.00			B	0.294	2.313	0.614	1	1	64.818			
			C	0.226	2.512	0.596	1	1	53.016			
T9	1.02	6.79	A	0.226	2.511	0.596	1	1	72.240	1.36	68.21	B
40.00-20.00			B	0.252	2.431	0.602	1	1	78.606			
			C	0.189	2.635	0.588	1	1	62.768			
T10	1.02	8.13	A	0.216	2.542	0.594	1	1	76.428	1.46	72.87	B
20.00-0.00			B	0.24	2.468	0.599	1	1	82.728			
			C	0.182	2.657	0.587	1	1	67.021			
Sum Weight:	8.43	48.83						OTM	988.55 kip-ft	11.75		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	0.8	1	14.255	0.43	21.36	C
195.00-175.00			B	0.163	2.723	0.584	0.8	1	10.956			
			C	0.209	2.565	0.592	0.8	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	0.8	1	29.048	0.76	38.15	C
175.00-155.00			B	0.222	2.524	0.595	0.8	1	21.689			
			C	0.309	2.272	0.619	0.8	1	29.696			
T3	0.89	3.57	A	0.338	2.199	0.628	0.8	1	41.633	1.00	49.89	A
155.00-135.00			B	0.3	2.295	0.616	0.8	1	36.728			
			C	0.258	2.414	0.604	0.8	1	31.372			
T4	1.01	4.04	A	0.303	2.287	0.617	0.8	1	45.492	1.20	60.16	B
135.00-115.00			B	0.352	2.167	0.633	0.8	1	53.160			
			C	0.238	2.475	0.599	0.8	1	35.655			
T5	1.01	4.79	A	0.268	2.384	0.607	0.8	1	47.138	1.23	61.43	B
115.00-95.00			B	0.31	2.27	0.619	0.8	1	54.454			
			C	0.212	2.556	0.593	0.8	1	37.611			
T6	1.01	5.35	A	0.257	2.416	0.604	0.8	1	52.718	1.29	64.72	B
95.00-75.00			B	0.293	2.316	0.614	0.8	1	59.752			
			C	0.208	2.57	0.592	0.8	1	43.217			
T7	1.02	5.79	A	0.253	2.43	0.603	0.8	1	59.404	1.34	67.15	B
75.00-55.00			B	0.284	2.34	0.611	0.8	1	66.227			
			C	0.207	2.571	0.592	0.8	1	49.622			
T8	0.77	5.02	A	0.266	2.389	0.606	0.8	1	53.167	1.06	70.93	B
55.00-40.00			B	0.294	2.313	0.614	0.8	1	58.059			
			C	0.226	2.512	0.596	0.8	1	45.896			
T9	1.02	6.79	A	0.226	2.511	0.596	0.8	1	64.382	1.23	61.61	B
40.00-20.00			B	0.252	2.431	0.602	0.8	1	71.002			
			C	0.189	2.635	0.588	0.8	1	54.797			
T10	1.02	8.13	A	0.216	2.542	0.594	0.8	1	67.807	1.31	65.50	B
20.00-0.00			B	0.24	2.468	0.599	0.8	1	74.359			
			C	0.182	2.657	0.587	0.8	1	58.288			
Sum Weight:	8.43	48.83						OTM	926.93 kip-ft	10.86		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.13	2.55	A	0.209	2.565	0.592	0.85	1	14.255	0.43	21.36	C
195.00-175.00			B	0.163	2.723	0.584	0.85	1	10.956			
			C	0.209	2.565	0.592	0.85	1	14.255			
T2	0.54	2.79	A	0.301	2.293	0.616	0.85	1	29.571	0.78	38.77	C
175.00-155.00			B	0.222	2.524	0.595	0.85	1	22.268			
			C	0.309	2.272	0.619	0.85	1	30.174			
T3	0.89	3.57	A	0.338	2.199	0.628	0.85	1	42.201	1.01	50.57	A
155.00-135.00			B	0.3	2.295	0.616	0.85	1	37.326			
			C	0.258	2.414	0.604	0.85	1	31.957			
T4	1.01	4.04	A	0.303	2.287	0.617	0.85	1	46.306	1.22	61.02	B
135.00-115.00			B	0.352	2.167	0.633	0.85	1	53.920			
			C	0.238	2.475	0.599	0.85	1	36.488			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T5	1.01	4.79	A	0.268	2.384	0.607	0.85	1	48.088	1.25	62.45	B
115.00-95.00			B	0.31	2.27	0.619	0.85	1	55.353			
			C	0.212	2.556	0.593	0.85	1	38.580			
T6	1.01	5.35	A	0.257	2.416	0.604	0.85	1	53.986	1.32	66.03	B
95.00-75.00			B	0.293	2.316	0.614	0.85	1	60.963			
			C	0.208	2.57	0.592	0.85	1	44.507			
T7	1.02	5.79	A	0.253	2.43	0.603	0.85	1	61.035	1.37	68.74	B
75.00-55.00			B	0.284	2.34	0.611	0.85	1	67.793			
			C	0.207	2.571	0.592	0.85	1	51.282			
T8	0.77	5.02	A	0.266	2.389	0.606	0.85	1	54.919	1.09	72.99	B
55.00-40.00			B	0.294	2.313	0.614	0.85	1	59.749			
			C	0.226	2.512	0.596	0.85	1	47.676			
T9	1.02	6.79	A	0.226	2.511	0.596	0.85	1	66.346	1.27	63.26	B
40.00-20.00			B	0.252	2.431	0.602	0.85	1	72.903			
			C	0.189	2.635	0.588	0.85	1	56.790			
T10	1.02	8.13	A	0.216	2.542	0.594	0.85	1	69.962	1.35	67.34	B
20.00-0.00			B	0.24	2.468	0.599	0.85	1	76.451			
			C	0.182	2.657	0.587	0.85	1	60.471			
Sum Weight:	8.43	48.83						OTM	942.33 kip-ft	11.09		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	29.31					
Bracing Weight	19.52					
Total Member Self-Weight	48.83			-18.17	21.02	
Total Weight	68.27			-18.17	21.02	
Wind 0 deg - No Ice		0.00	-56.72	-6399.18	21.02	-26.23
Wind 30 deg - No Ice		27.28	-47.25	-5414.62	-3094.62	-40.59
Wind 60 deg - No Ice		46.63	-26.92	-3108.85	-5332.20	-44.41
Wind 90 deg - No Ice		54.56	0.00	-18.17	-6210.26	-38.36
Wind 120 deg - No Ice		49.12	28.36	3172.33	-5505.10	-22.89
Wind 150 deg - No Ice		27.28	47.25	5378.27	-3094.62	2.23
Wind 180 deg - No Ice		0.00	53.84	6163.19	21.02	24.23
Wind 210 deg - No Ice		-27.28	47.25	5378.27	3136.65	40.59
Wind 240 deg - No Ice		-49.12	28.36	3172.33	5547.13	49.12
Wind 270 deg - No Ice		-54.56	0.00	-18.17	6252.29	38.36
Wind 300 deg - No Ice		-46.63	-26.92	-3108.85	5374.24	20.18
Wind 330 deg - No Ice		-27.28	-47.25	-5414.62	3136.65	-2.23
Member Ice	18.26					
Total Weight Ice	116.28			-89.12	69.17	
Wind 0 deg - Ice		0.00	-14.40	-1742.12	69.17	-6.80
Wind 30 deg - Ice		7.03	-12.18	-1496.52	-743.39	-11.91
Wind 60 deg - Ice		12.08	-6.98	-897.04	-1330.18	-13.88
Wind 90 deg - Ice		14.06	0.00	-89.12	-1555.96	-12.45
Wind 120 deg - Ice		12.47	7.20	737.38	-1362.37	-7.83
Wind 150 deg - Ice		7.03	12.18	1318.28	-743.39	-0.54
Wind 180 deg - Ice		0.00	13.95	1526.72	69.17	6.49
Wind 210 deg - Ice		-7.03	12.18	1318.28	881.74	11.91
Wind 240 deg - Ice		-12.47	7.20	737.38	1500.72	14.64
Wind 270 deg - Ice		-14.06	0.00	-89.12	1694.30	12.45
Wind 300 deg - Ice		-12.08	-6.98	-897.04	1468.53	7.39

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 330 deg - Ice		-7.03	-12.18	-1496.52	881.74	0.54
Total Weight	68.27			-18.17	21.02	
Wind 0 deg - Service		0.00	-17.51	-1961.26	1.13	-8.10
Wind 30 deg - Service		8.42	-14.58	-1657.38	-960.49	-12.53
Wind 60 deg - Service		14.39	-8.31	-945.73	-1651.10	-13.71
Wind 90 deg - Service		16.84	0.00	8.19	-1922.10	-11.84
Wind 120 deg - Service		15.16	8.75	992.91	-1704.46	-7.06
Wind 150 deg - Service		8.42	14.58	1673.76	-960.49	0.69
Wind 180 deg - Service		0.00	16.62	1916.02	1.13	7.48
Wind 210 deg - Service		-8.42	14.58	1673.76	962.75	12.53
Wind 240 deg - Service		-15.16	8.75	992.91	1706.72	15.16
Wind 270 deg - Service		-16.84	0.00	8.19	1924.36	11.84
Wind 300 deg - Service		-14.39	-8.31	-945.73	1653.36	6.23
Wind 330 deg - Service		-8.42	-14.58	-1657.38	962.75	-0.69

Load Combinations

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

Comb. No.	Description
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	195 - 175	Leg	Max Tension	8	15.14	-0.22	0.00
			Max. Compression	10	-19.41	0.47	-0.03
			Max. Mx	4	7.83	0.89	-0.01
			Max. My	12	-0.38	0.14	-1.34
			Max. Vy	8	-0.83	-0.49	-0.00
			Max. Vx	12	1.13	0.14	0.54
		Diagonal	Max Tension	5	4.66	0.00	0.00
			Max. Compression	5	-4.69	0.00	0.00
			Max. Mx	22	0.50	-0.01	0.00
			Max. My	11	-3.39	-0.00	-0.00
			Max. Vy	22	-0.01	-0.01	-0.00
			Max. Vx	11	0.00	-0.00	-0.00
		Top Girt	Max Tension	8	0.08	0.00	0.00
			Max. Compression	6	-0.11	0.00	0.00
			Max. Mx	14	-0.02	0.02	0.00
			Max. My	7	-0.02	0.00	-0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	7	0.00	0.00	0.00
		Bottom Girt	Max Tension	2	0.30	0.00	0.00
			Max. Compression	12	-0.32	0.00	0.00
			Max. Mx	14	-0.03	0.03	0.00
			Max. My	7	-0.01	0.00	-0.00
			Max. Vy	14	-0.02	0.00	0.00
			Max. Vx	7	0.00	0.00	0.00
T2	175 - 155	Leg	Max Tension	8	47.93	-0.50	-0.02
			Max. Compression	10	-56.67	0.41	0.00
			Max. Mx	4	21.51	1.16	0.03
			Max. My	13	-4.56	-0.04	-1.15
			Max. Vy	4	-0.85	-0.49	0.01
			Max. Vx	13	0.81	-0.01	0.38
		Diagonal	Max Tension	5	6.99	0.00	0.00
			Max. Compression	5	-7.08	0.00	0.00
			Max. Mx	21	1.19	0.02	-0.00
			Max. My	11	-6.50	0.00	0.02
			Max. Vy	21	0.02	0.02	-0.00
			Max. Vx	11	-0.00	0.00	0.00
T3	155 - 135	Leg	Max Tension	8	85.29	-0.81	-0.02
			Max. Compression	10	-99.25	-0.07	-0.05
			Max. Mx	4	69.85	1.34	0.03
			Max. My	5	-5.38	-0.03	-1.36
			Max. Vy	8	0.67	-0.81	-0.02
			Max. Vx	11	0.67	-0.03	-0.75
		Diagonal	Max Tension	5	7.82	0.00	0.00
			Max. Compression	5	-7.87	0.00	0.00
			Max. Mx	21	1.61	0.04	0.00
			Max. My	12	-6.81	0.01	0.01
			Max. Vy	21	0.03	0.04	0.00
			Max. Vx	12	-0.00	0.00	0.00
T4	135 - 115	Leg	Max Tension	8	121.49	-0.14	-0.02
			Max. Compression	10	-139.71	0.31	-0.05
			Max. Mx	6	-138.94	0.31	0.02
			Max. My	11	-8.15	-0.00	-0.29

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	8	0.10	-0.27	-0.02
			Max. Vx	10	0.10	-0.14	-0.17
		Diagonal	Max Tension	5	7.38	0.00	0.00
			Max. Compression	5	-7.43	0.00	0.00
			Max. Mx	25	1.51	0.06	-0.01
			Max. My	12	-6.31	0.01	0.01
			Max. Vy	25	0.04	0.06	-0.01
			Max. Vx	15	-0.00	0.00	0.00
T5	115 - 95	Leg	Max Tension	12	152.77	-0.20	-0.03
			Max. Compression	10	-175.91	0.18	-0.05
			Max. Mx	6	-150.98	0.31	0.02
			Max. My	11	-8.45	-0.00	-0.29
			Max. Vy	8	-0.07	-0.30	-0.03
			Max. Vx	10	-0.10	-0.16	-0.27
		Diagonal	Max Tension	3	7.52	0.00	0.00
			Max. Compression	3	-7.63	0.00	0.00
			Max. Mx	25	1.44	0.09	-0.01
			Max. My	23	-0.18	0.08	-0.01
			Max. Vy	25	0.05	0.09	-0.01
			Max. Vx	23	0.00	0.00	0.00
T6	95 - 75	Leg	Max Tension	12	181.87	-0.24	-0.03
			Max. Compression	10	-210.21	0.18	-0.05
			Max. Mx	8	181.38	-0.25	-0.03
			Max. My	11	-11.97	-0.01	-0.30
			Max. Vy	8	-0.09	-0.25	-0.03
			Max. Vx	10	-0.13	-0.13	-0.28
		Diagonal	Max Tension	3	8.18	0.00	0.00
			Max. Compression	3	-8.25	0.00	0.00
			Max. Mx	25	1.45	0.11	-0.01
			Max. My	23	-0.25	0.11	-0.02
			Max. Vy	25	0.06	0.11	-0.01
			Max. Vx	23	0.00	0.00	0.00
T7	75 - 55	Leg	Max Tension	12	209.49	-0.28	-0.03
			Max. Compression	10	-243.39	0.07	0.00
			Max. Mx	8	208.43	-0.29	-0.02
			Max. My	11	-14.59	-0.04	-0.36
			Max. Vy	8	-0.09	-0.29	-0.02
			Max. Vx	11	-0.12	-0.04	-0.36
		Diagonal	Max Tension	3	8.88	0.00	0.00
			Max. Compression	3	-8.99	0.00	0.00
			Max. Mx	25	1.40	0.14	-0.02
			Max. My	23	-0.01	0.13	-0.02
			Max. Vy	25	0.07	0.14	-0.02
			Max. Vx	23	0.00	0.00	0.00
T8	55 - 40	Leg	Max Tension	12	230.50	-0.10	-0.00
			Max. Compression	2	-269.50	0.56	0.05
			Max. Mx	21	31.67	-0.67	-0.01
			Max. My	11	-17.51	-0.01	-0.52
			Max. Vy	21	0.22	-0.67	-0.01
			Max. Vx	5	-0.13	-0.01	0.52
		Diagonal	Max Tension	3	9.19	0.00	0.00
			Max. Compression	3	-9.27	0.00	0.00
			Max. Mx	25	1.22	0.15	-0.02
			Max. My	17	-1.53	0.13	0.02
			Max. Vy	25	0.07	0.14	-0.02
			Max. Vx	17	-0.00	0.00	0.00
T9	40 - 20	Leg	Max Tension	12	255.21	-0.26	-0.02
			Max. Compression	2	-300.91	0.29	0.03
			Max. Mx	19	-101.32	2.03	0.01
			Max. My	11	-17.88	-0.01	-0.52
			Max. Vy	21	-0.49	-1.27	-0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	11	0.12	-0.03	-0.51
		Diagonal	Max Tension	9	10.05	0.00	0.00
			Max. Compression	9	-10.20	0.00	0.00
			Max. Mx	25	0.23	0.26	-0.03
			Max. My	17	-3.20	0.24	0.03
			Max. Vy	25	0.10	0.26	-0.03
			Max. Vx	17	-0.00	0.00	0.00
T10	20 - 0	Leg	Max Tension	12	279.76	-0.27	-0.03
			Max. Compression	2	-333.34	0.00	-0.00
			Max. Mx	19	-108.15	3.34	0.00
			Max. My	11	-22.35	-0.05	-0.61
			Max. Vy	21	-0.96	-3.05	-0.00
			Max. Vx	11	-0.16	-0.05	-0.61
		Diagonal	Max Tension	9	10.87	0.00	0.00
			Max. Compression	9	-11.09	0.00	0.00
			Max. Mx	25	-1.50	0.40	-0.04
			Max. My	17	-5.67	0.39	0.04
			Max. Vy	25	0.12	0.40	-0.04
			Max. Vx	17	-0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	337.71	29.68	-18.52
	Max. H_x	10	337.71	29.68	-18.52
	Max. H_z	4	-281.46	-25.37	15.91
	Min. Vert	4	-281.46	-25.37	15.91
	Min. H_x	4	-281.46	-25.37	15.91
	Min. H_z	10	337.71	29.68	-18.52
Leg B	Max. Vert	6	335.92	-29.98	-17.95
	Max. H_x	12	-283.26	25.69	15.41
	Max. H_z	12	-283.26	25.69	15.41
	Min. Vert	12	-283.26	25.69	15.41
	Min. H_x	6	335.92	-29.98	-17.95
	Min. H_z	6	335.92	-29.98	-17.95
Leg A	Max. Vert	2	338.15	-0.65	34.97
	Max. H_x	11	23.65	5.25	1.81
	Max. H_z	2	338.15	-0.65	34.97
	Min. Vert	8	-281.02	0.59	-29.92
	Min. H_x	5	23.65	-5.28	1.81
	Min. H_z	8	-281.02	0.59	-29.92

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	68.27	-0.00	0.00	-18.17	21.02	-0.00
Dead+Wind 0 deg - No Ice	68.27	0.00	-56.72	-6418.82	21.11	-26.30
Dead+Wind 30 deg - No Ice	68.27	27.28	-47.25	-5431.33	-3104.16	-40.65
Dead+Wind 60 deg - No Ice	68.27	46.63	-26.92	-3118.47	-5348.71	-44.44

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 90 deg - No Ice	68.27	54.56	0.00	-18.21	-6229.48	-38.35
Dead+Wind 120 deg - No Ice	68.27	49.12	28.36	3182.13	-5522.05	-22.86
Dead+Wind 150 deg - No Ice	68.27	27.28	47.25	5394.95	-3104.19	2.28
Dead+Wind 180 deg - No Ice	68.27	0.00	53.84	6182.32	21.11	24.29
Dead+Wind 210 deg - No Ice	68.27	-27.28	47.25	5394.92	3146.39	40.65
Dead+Wind 240 deg - No Ice	68.27	-49.12	28.36	3182.10	5564.22	49.16
Dead+Wind 270 deg - No Ice	68.27	-54.56	0.00	-18.20	6271.63	38.35
Dead+Wind 300 deg - No Ice	68.27	-46.63	-26.92	-3118.43	5390.87	20.16
Dead+Wind 330 deg - No Ice	68.27	-27.28	-47.25	-5431.29	3146.36	-2.28
Dead+Ice+Temp	116.28	0.00	0.00	-89.14	69.19	-0.00
Dead+Wind 0 deg+Ice+Temp	116.28	0.00	-14.40	-1750.72	69.48	-6.86
Dead+Wind 30 deg+Ice+Temp	116.28	7.03	-12.18	-1503.91	-747.18	-11.98
Dead+Wind 60 deg+Ice+Temp	116.28	12.08	-6.97	-901.43	-1336.95	-13.95
Dead+Wind 90 deg+Ice+Temp	116.28	14.06	0.00	-89.41	-1563.85	-12.50
Dead+Wind 120 deg+Ice+Temp	116.28	12.47	7.20	741.25	-1369.27	-7.85
Dead+Wind 150 deg+Ice+Temp	116.28	7.03	12.18	1325.10	-747.18	-0.51
Dead+Wind 180 deg+Ice+Temp	116.28	0.00	13.95	1534.61	69.50	6.54
Dead+Wind 210 deg+Ice+Temp	116.28	-7.03	12.18	1325.11	886.17	11.98
Dead+Wind 240 deg+Ice+Temp	116.28	-12.47	7.20	741.27	1508.25	14.70
Dead+Wind 270 deg+Ice+Temp	116.28	-14.06	0.00	-89.39	1702.83	12.50
Dead+Wind 300 deg+Ice+Temp	116.28	-12.08	-6.97	-901.41	1475.93	7.40
Dead+Wind 330 deg+Ice+Temp	116.28	-7.03	-12.18	-1503.90	886.15	0.51
Dead+Wind 0 deg - Service	68.27	0.00	-17.51	-1993.70	21.08	-8.12
Dead+Wind 30 deg - Service	68.27	8.42	-14.58	-1688.91	-943.52	-12.54
Dead+Wind 60 deg - Service	68.27	14.39	-8.31	-975.06	-1636.29	-13.72
Dead+Wind 90 deg - Service	68.27	16.84	0.00	-18.19	-1908.12	-11.84
Dead+Wind 120 deg - Service	68.27	15.16	8.75	969.57	-1689.78	-7.06
Dead+Wind 150 deg - Service	68.27	8.42	14.58	1652.55	-943.52	0.71
Dead+Wind 180 deg - Service	68.27	0.00	16.62	1895.57	21.08	7.50
Dead+Wind 210 deg - Service	68.27	-8.42	14.58	1652.55	985.67	12.54
Dead+Wind 240 deg - Service	68.27	-15.16	8.75	969.58	1731.92	15.17
Dead+Wind 270 deg - Service	68.27	-16.84	0.00	-18.18	1950.27	11.84
Dead+Wind 300 deg - Service	68.27	-14.39	-8.31	-975.05	1678.43	6.22
Dead+Wind 330 deg - Service	68.27	-8.42	-14.58	-1688.91	985.67	-0.71

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-68.27	0.00	0.00	68.27	-0.00	0.000%
2	0.00	-68.27	-56.72	-0.00	68.27	56.72	0.002%
3	27.28	-68.27	-47.25	-27.28	68.27	47.25	0.002%
4	46.63	-68.27	-26.92	-46.63	68.27	26.92	0.002%
5	54.56	-68.27	0.00	-54.56	68.27	-0.00	0.002%
6	49.12	-68.27	28.36	-49.12	68.27	-28.36	0.002%
7	27.28	-68.27	47.25	-27.28	68.27	-47.25	0.002%
8	0.00	-68.27	53.84	-0.00	68.27	-53.84	0.002%
9	-27.28	-68.27	47.25	27.28	68.27	-47.25	0.002%
10	-49.12	-68.27	28.36	49.12	68.27	-28.36	0.002%
11	-54.56	-68.27	0.00	54.56	68.27	-0.00	0.002%
12	-46.63	-68.27	-26.92	46.63	68.27	26.92	0.002%
13	-27.28	-68.27	-47.25	27.28	68.27	47.25	0.002%
14	0.00	-116.28	0.00	-0.00	116.28	-0.00	0.000%
15	0.00	-116.28	-14.40	-0.00	116.28	14.40	0.000%
16	7.03	-116.28	-12.18	-7.03	116.28	12.18	0.000%
17	12.08	-116.28	-6.98	-12.08	116.28	6.97	0.000%
18	14.06	-116.28	0.00	-14.06	116.28	-0.00	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
19	12.47	-116.28	7.20	-12.47	116.28	-7.20	0.000%
20	7.03	-116.28	12.18	-7.03	116.28	-12.18	0.000%
21	0.00	-116.28	13.95	-0.00	116.28	-13.95	0.000%
22	-7.03	-116.28	12.18	7.03	116.28	-12.18	0.000%
23	-12.47	-116.28	7.20	12.47	116.28	-7.20	0.000%
24	-14.06	-116.28	0.00	14.06	116.28	-0.00	0.000%
25	-12.08	-116.28	-6.98	12.08	116.28	6.97	0.000%
26	-7.03	-116.28	-12.18	7.03	116.28	12.18	0.000%
27	0.00	-68.27	-17.51	-0.00	68.27	17.51	0.001%
28	8.42	-68.27	-14.58	-8.42	68.27	14.58	0.001%
29	14.39	-68.27	-8.31	-14.39	68.27	8.31	0.001%
30	16.84	-68.27	0.00	-16.84	68.27	-0.00	0.001%
31	15.16	-68.27	8.75	-15.16	68.27	-8.75	0.001%
32	8.42	-68.27	14.58	-8.42	68.27	-14.58	0.001%
33	0.00	-68.27	16.62	-0.00	68.27	-16.62	0.001%
34	-8.42	-68.27	14.58	8.42	68.27	-14.58	0.001%
35	-15.16	-68.27	8.75	15.16	68.27	-8.75	0.001%
36	-16.84	-68.27	0.00	16.84	68.27	-0.00	0.001%
37	-14.39	-68.27	-8.31	14.39	68.27	8.31	0.001%
38	-8.42	-68.27	-14.58	8.42	68.27	14.58	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	8	0.00000001	0.00012438
3	Yes	8	0.00000001	0.00012825
4	Yes	8	0.00000001	0.00013198
5	Yes	8	0.00000001	0.00012857
6	Yes	8	0.00000001	0.00012465
7	Yes	8	0.00000001	0.00012852
8	Yes	8	0.00000001	0.00013208
9	Yes	8	0.00000001	0.00012845
10	Yes	8	0.00000001	0.00012464
11	Yes	8	0.00000001	0.00012855
12	Yes	8	0.00000001	0.00013197
13	Yes	8	0.00000001	0.00012830
14	Yes	6	0.00000001	0.00001402
15	Yes	9	0.00000001	0.00004741
16	Yes	9	0.00000001	0.00004718
17	Yes	9	0.00000001	0.00004707
18	Yes	9	0.00000001	0.00004665
19	Yes	9	0.00000001	0.00004648
20	Yes	9	0.00000001	0.00004664
21	Yes	9	0.00000001	0.00004711
22	Yes	9	0.00000001	0.00004732
23	Yes	9	0.00000001	0.00004760
24	Yes	9	0.00000001	0.00004784
25	Yes	9	0.00000001	0.00004802
26	Yes	9	0.00000001	0.00004771
27	Yes	8	0.00000001	0.00012163
28	Yes	8	0.00000001	0.00012275
29	Yes	8	0.00000001	0.00012398
30	Yes	8	0.00000001	0.00012313
31	Yes	8	0.00000001	0.00012219

32	Yes	8	0.00000001	0.00012344
33	Yes	8	0.00000001	0.00012454
34	Yes	8	0.00000001	0.00012347
35	Yes	8	0.00000001	0.00012231
36	Yes	8	0.00000001	0.00012330
37	Yes	8	0.00000001	0.00012415
38	Yes	8	0.00000001	0.00012289

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 175	3.184	35	0.1294	0.0323
T2	175 - 155	2.638	35	0.1253	0.0212
T3	155 - 135	2.100	35	0.1162	0.0147
T4	135 - 115	1.616	35	0.1025	0.0144
T5	115 - 95	1.191	35	0.0874	0.0146
T6	95 - 75	0.840	27	0.0703	0.0137
T7	75 - 55	0.554	27	0.0544	0.0119
T8	55 - 40	0.325	27	0.0399	0.0090
T9	40 - 20	0.184	27	0.0290	0.0059
T10	20 - 0	0.061	27	0.0138	0.0029

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.00	15-ft Triangular Mount	35	3.048	0.1286	0.0298	606440
180.00	Pirod 15' T-Frame Sector	35	2.775	0.1266	0.0242	202147
175.00	DC6-48-60-18-8F Surge Arrestor	35	2.638	0.1253	0.0212	184236
173.00	800 10121	35	2.584	0.1246	0.0202	238101
172.00	Pirod 12' T-Frame Sector Mount (1)	35	2.556	0.1243	0.0197	302515
160.00	Pirod 15' T-Frame Sector Mount (1)	35	2.231	0.1190	0.0152	87460
145.00	Pirod 15' T-Frame Sector	35	1.850	0.1097	0.0145	79018
80.00	GPS	27	0.620	0.0582	0.0124	77052

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 175	10.234	10	0.4108	0.1046
T2	175 - 155	8.497	10	0.4004	0.0687
T3	155 - 135	6.769	10	0.3731	0.0475
T4	135 - 115	5.214	10	0.3297	0.0467
T5	115 - 95	3.843	10	0.2815	0.0473
T6	95 - 75	2.710	2	0.2266	0.0444
T7	75 - 55	1.789	2	0.1753	0.0384
T8	55 - 40	1.051	2	0.1285	0.0292

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T9	40 - 20	0.594	2	0.0933	0.0192
T10	20 - 0	0.196	2	0.0445	0.0093

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.00	15-ft Triangular Mount	10	9.802	0.4090	0.0966	276426
180.00	Pirod 15' T-Frame Sector	10	8.934	0.4041	0.0785	92142
175.00	DC6-48-60-18-8F Surge Arrestor	10	8.497	0.4004	0.0687	88996
173.00	800 10121	10	8.322	0.3985	0.0655	134091
172.00	Pirod 12' T-Frame Sector Mount (1)	10	8.234	0.3976	0.0638	208679
160.00	Pirod 15' T-Frame Sector Mount (1)	10	7.190	0.3817	0.0494	28681
145.00	Pirod 15' T-Frame Sector	10	5.967	0.3525	0.0469	24945
80.00	GPS	2	2.000	0.1876	0.0401	23965

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
T1	195	Leg	A325N	1.1250	4	3.78	43.74	0.087 ✓	1.333	Bolt Tension
T2	175	Leg	A325N	1.1250	6	7.99	43.74	0.183 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	6.99	6.05	1.156 ✓	1.333	Member Block Shear
T3	155	Leg	A325N	1.1250	6	14.22	43.74	0.325 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	7.82	10.08	0.775 ✓	1.333	Member Block Shear
T4	135	Leg	A325N	1.1250	6	20.25	43.74	0.463 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	7.38	8.97	0.823 ✓	1.333	Member Block Shear
T5	115	Leg	A325N	1.1250	8	19.10	43.74	0.437 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	7.52	13.59	0.553 ✓	1.333	Member Block Shear
T6	95	Leg	A325N	1.1250	8	22.73	43.74	0.520 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	8.18	13.59	0.602 ✓	1.333	Member Block Shear
T7	75	Leg	A325N	1.1250	8	26.19	43.74	0.599 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	8.88	10.88	0.817 ✓	1.333	Member Bearing
T8	55	Leg	A325N	1.1250	8	28.81	43.74	0.659 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	9.19	10.88	0.845 ✓	1.333	Member Block Shear
T9	40	Leg	A325N	1.1250	8	31.90	43.74	0.729 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	10.05	13.59	0.739 ✓	1.333	Member Block Shear

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
T10	20	Leg	A325N	1.3750	8	34.97	65.34	0.535 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	11.09	16.49	0.672 ✔	1.333	Bolt 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 P / P_a
T1	195 - 175	3	20.01	3.33	53.4 K=1.00	23.819	7.0686	-19.41	168.37	0.115 ✔
T2	175 - 155	3 3/4	20.03	6.68	85.5 K=1.00	17.895	11.0447	-56.67	197.65	0.287 ✔
T3	155 - 135	4	20.03	6.68	80.1 K=1.00	18.986	12.5664	-99.25	238.58	0.416 ✔
T4	135 - 115	4 1/4	20.03	6.68	75.4 K=1.00	19.913	14.1863	-139.71	282.48	0.495 ✔
T5	115 - 95	4 1/4	20.03	6.68	75.4 K=1.00	19.913	14.1863	-175.91	282.48	0.623 ✔
T6	95 - 75	4 1/2	20.03	6.68	71.2 K=1.00	20.709	15.9043	-210.21	329.36	0.638 ✔
T7	75 - 55	4 3/4	20.03	6.68	67.5 K=1.00	21.400	17.7205	-243.39	379.22	0.642 ✔
T8	55 - 40	4 3/4	15.03	5.01	50.6 K=1.00	24.255	17.7205	-269.50	429.82	0.627 ✔
T9	40 - 20	4 3/4	20.03	6.68	67.5 K=1.00	21.400	17.7205	-300.91	379.22	0.794 ✔
T10	20 - 0	5	20.03	6.68	64.1 K=1.00	22.004	19.6350	-333.34	432.05	0.772 ✔

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 P / P_a
T1	195 - 175	1 1/4	6.79	3.30	114.0 K=0.90	11.120	1.2272	-4.69	13.65	0.344 ✔
T2	175 - 155	L2 1/2x2 1/2x3/16	10.16	4.94	119.9 K=1.00	10.299	0.9020	-7.08	9.29	0.762 ✔
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.72	140.4 K=1.00	7.576	1.4600	-7.87	11.06	0.712 ✔
T4	135 - 115	L3x3x1/4	13.44	6.56	132.9	8.455	1.4400	-7.18	12.18	0.590

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 $\frac{P}{P_a}$
					K=1.00					✔
T5	115 - 95	L3x3x3/8	15.21	7.43	151.8 K=1.00	6.481	2.1100	-7.63	13.67	0.558 ✔
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.32	144.8 K=1.00	7.125	2.0900	-8.25	14.89	0.554 ✔
T7	75 - 55	L4x4x1/4	18.88	9.24	139.5 K=1.00	7.674	1.9400	-8.99	14.89	0.604 ✔
T8	55 - 40	L4x4x1/4	19.89	9.70	146.5 K=1.00	6.962	1.9400	-9.27	13.51	0.687 ✔
T9	40 - 20	L4x4x5/16	22.19	10.90	165.3 K=1.00	5.464	2.4000	-10.20	13.11	0.777 ✔
T10	20 - 0	L4x4x3/8	24.11	11.84	180.4 K=1.00	4.591	2.8600	-11.09	13.13	0.844 ✔

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	195 - 175	1 1/4	5.00	4.75	127.7 K=0.70	9.160	1.2272	-0.11	11.24	0.010 ✔

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 $\frac{P}{P_a}$
T1	195 - 175	1 1/4	6.00	5.75	154.6 K=0.70	6.251	1.2272	-0.32	7.67	0.042 ✔

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	195 - 175	3	20.01	3.33	53.4	30.000	7.0686	15.14	212.06	0.071 ✔
T2	175 - 155	3 3/4	20.03	6.68	85.5	30.000	11.0447	47.93	331.34	0.145 ✔
T3	155 - 135	4	20.03	6.68	80.1	30.000	12.5664	85.29	376.99	0.226

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 $\frac{P}{P_a}$
T4	135 - 115	4 1/4	20.03	6.68	75.4	30.000	14.1863	121.49	425.59	0.285 ✔
T5	115 - 95	4 1/4	20.03	6.68	75.4	30.000	14.1863	152.77	425.59	0.359 ✔
T6	95 - 75	4 1/2	20.03	6.68	71.2	30.000	15.9043	181.87	477.13	0.381 ✔
T7	75 - 55	4 3/4	20.03	6.68	67.5	30.000	17.7205	209.49	531.62	0.394 ✔
T8	55 - 40	4 3/4	15.03	5.01	50.6	30.000	17.7205	230.50	531.62	0.434 ✔
T9	40 - 20	4 3/4	20.03	6.68	67.5	30.000	17.7205	255.21	531.62	0.480 ✔
T10	20 - 0	5	20.03	6.68	64.1	30.000	19.6350	279.76	589.05	0.475 ✔

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	195 - 175	1 1/4	6.79	3.30	126.7	21.600	1.2272	4.66	26.51	0.176 ✔
T2	175 - 155	L2 1/2x2 1/2x3/16	10.16	4.94	78.6	29.000	0.5359	6.99	15.54	0.450 ✔
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.72	92.6	29.000	0.8606	7.82	24.96	0.313 ✔
T4	135 - 115	L3x3x1/4	12.30	5.99	79.3	29.000	0.8925	7.38	25.88	0.285 ✔
T5	115 - 95	L3x3x3/8	15.21	7.43	99.8	29.000	1.2661	7.52	36.72	0.205 ✔
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.32	94.3	29.000	1.3038	8.18	37.81	0.216 ✔
T7	75 - 55	L4x4x1/4	18.88	9.24	90.3	29.000	1.2441	8.88	36.08	0.246 ✔
T8	55 - 40	L4x4x1/4	19.89	9.70	94.7	29.000	1.2441	9.19	36.08	0.255 ✔
T9	40 - 20	L4x4x5/16	22.19	10.90	107.1	29.000	1.5363	10.05	44.55	0.225 ✔
T10	20 - 0	L4x4x3/8	24.11	11.84	117.2	29.000	1.8286	10.87	53.03	0.205 ✔

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 $\frac{P}{P_a}$

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	195 - 175	1 1/4	5.00	4.75	182.4	21.600	1.2272	0.08	26.51	0.003 ✔

Bottom Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	195 - 175	1 1/4	6.00	5.75	220.8	21.600	1.2272	0.30	26.51	0.011 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	195 - 175	Leg	3	1	-19.41	224.43	8.7	Pass
		Diagonal	1 1/4	11	-4.69	18.19	25.8	Pass
		Top Girt	1 1/4	6	-0.11	14.98	0.7	Pass
		Bottom Girt	1 1/4	9	-0.32	10.23	3.2	Pass
T2	175 - 155	Leg	3 3/4	46	-56.67	263.47	21.5	Pass
		Diagonal	L2 1/2x2 1/2x3/16	50	-7.08	12.38	57.2	Pass
							86.7 (b)	
T3	155 - 135	Leg	4	67	-99.25	318.03	31.2	Pass
		Diagonal	L2 1/2x2 1/2x5/16	71	-7.87	14.74	53.4	Pass
							58.2 (b)	
T4	135 - 115	Leg	4 1/4	88	-139.71	376.55	37.1	Pass
		Diagonal	L3x3x1/4	95	-7.18	16.23	44.2	Pass
							61.7 (b)	
T5	115 - 95	Leg	4 1/4	109	-175.91	376.55	46.7	Pass
		Diagonal	L3x3x3/8	116	-7.63	18.23	41.9	Pass
T6	95 - 75	Leg	4 1/2	130	-210.21	439.04	47.9	Pass
		Diagonal	L3 1/2x3 1/2x5/16	137	-8.25	19.85	41.6	Pass
							45.1 (b)	
T7	75 - 55	Leg	4 3/4	151	-243.39	505.50	48.1	Pass
		Diagonal	L4x4x1/4	158	-8.99	19.84	45.3	Pass
							61.3 (b)	
T8	55 - 40	Leg	4 3/4	174	-269.50	572.94	47.0	Pass
							49.4 (b)	
		Diagonal	L4x4x1/4	179	-9.27	18.00	51.5	Pass
							63.4 (b)	
T9	40 - 20	Leg	4 3/4	195	-300.91	505.50	59.5	Pass
		Diagonal	L4x4x5/16	201	-10.20	17.48	58.3	Pass
T10	20 - 0	Leg	5	216	-333.34	575.93	57.9	Pass
		Diagonal	L4x4x3/8	222	-11.09	17.50	63.3	Pass
							Summary	
						Leg (T9)	59.5	Pass
						Diagonal (T2)	86.7	Pass
						Top Girt (T1)	0.7	Pass
						Bottom Girt (T1)	3.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						Bolt Checks	86.7	Pass
						RATING =	**86.7**	**Pass**

CALCULATION SHEET

FOUNDATION CALCULATIONS

$B := 23.5 \cdot ft$:Width of Tower

$P := 338.2kip$:Compression

$T := 134.9kip$:Tension

$V := 56.7 \cdot kip$:Shear

$e_{Tower} := 0ft$:Tower eccentricity on the slab

$P_{Tower} := P - 2 \cdot T = 68.4 \cdot kip$

$M_{Tower} := P \cdot \frac{2 \cdot B}{3} \cdot \sin\left(\frac{\pi}{3}\right) + 2T \cdot \frac{B}{3} \cdot \sin\left(\frac{\pi}{3}\right) = 6419 \cdot kip \cdot ft$

$Width_{mat} := 34ft$:Width of mat

$Length_{pier} := 4ft$ Height of pier

$Thick_{mat} := 2.5 \cdot ft$:Thickness of concrete

$Depth_{soil} := 3.5 \cdot ft$:Soil Above footing

$\gamma_{concrete} := 150pcf$:Concrete Weight

$\gamma_{soil} := 120 \cdot pcf$:Soil Weight

$Soil_{weight} := Width_{mat}^{2} \cdot Depth_{soil} \cdot \gamma_{soil} = 485.5 \cdot kip$

$Conc_{weight} := Width_{mat}^{2} \cdot Thick_{mat} \cdot \gamma_{concrete} = 434 \cdot kip$

$M_{Rs} := Soil_{weight} \cdot \frac{Width_{mat}}{2} = 8254 \cdot kip \cdot ft$

$M_{Rc} := Conc_{weight} \cdot \frac{Width_{mat}}{2} = 7370 \cdot kip \cdot ft$

CALCULATION SHEET

$$M_{Rr} := P \cdot \left(\frac{Width_{mat}}{2} - \frac{2B}{3} \cdot \sin\left(\frac{\pi}{3}\right) + e_{Tower} \right) = 1161 \cdot kip \cdot ft$$

$$Mresisteing := M_{Rs} + M_{Rc} + M_{Rr} = 16784 \cdot kip \cdot ft$$

$$M_{over} := 2 \cdot T \cdot \left(\frac{Width_{mat}}{2} + \frac{B}{3} \cdot \sin\left(\frac{\pi}{3}\right) + e_{Tower} \right) + V \cdot \left(Length_{pier} + Thick_{mat} \right) = 6785 \cdot kip \cdot ft$$

Slab Overturning Safety Factors (By Combination)

Overturning Safety Factors | Sliding Safety Factors

	LC	Slab	Mo-XX[k-ft]	Ms-XX[k-ft]	Mo-ZZ[k-ft]	Ms-ZZ[k-ft]	Ms-XX/Mo-XX	Ms-ZZ/Mo-ZZ
1	1	S1	4586.6	21372.74	6785.446	16784.144	4.66	2.474

$$M_{over} := M_{over} - M_{Rr} = 5625 \cdot kip \cdot ft$$

$$M_{res1} := \frac{M_{Rc}}{1.25} + \frac{M_{Rs}}{2.0} = 10023 \cdot kip \cdot ft$$

$$M_{res2} := \frac{M_{Rc}}{1.5} + \frac{M_{Rs}}{1.5} = 10416 \cdot kip \cdot ft$$

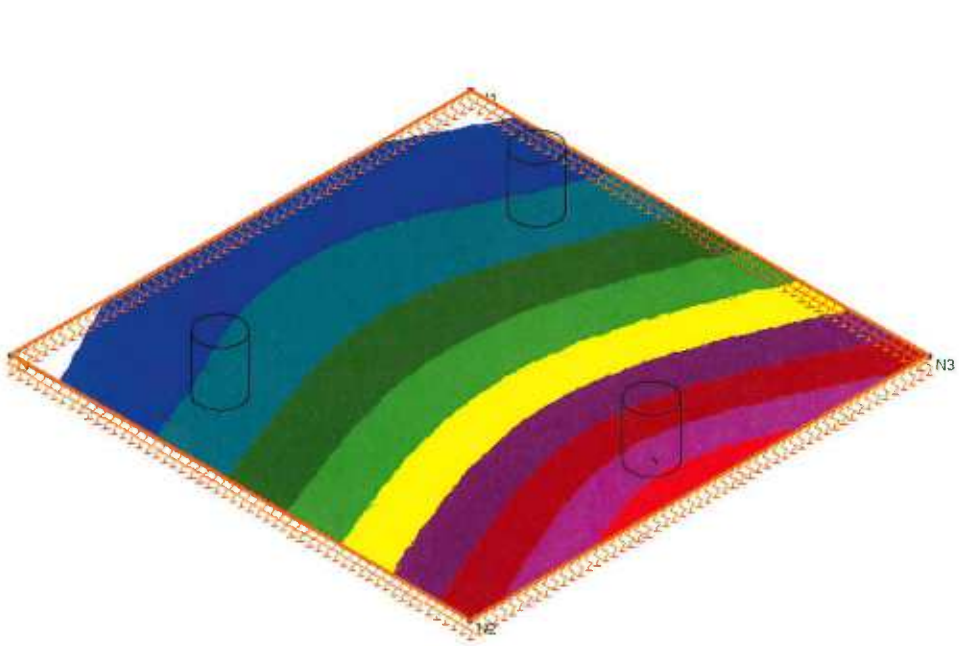
$$M_{res} := \min\left(M_{res1}, M_{res2}\right) = 10023 \cdot kip \cdot ft$$

$$SF := \frac{M_{res}}{M_{over}} = 1.782 \qquad >1 \Longrightarrow OK$$

$$Usage_{stability} := \frac{M_{over}}{M_{res}} = 56.1 \cdot \% \quad \textbf{<100\% .... OK in Overturning}$$

CALCULATION SHEET

MODEL MAT in RISA FOUNDATION

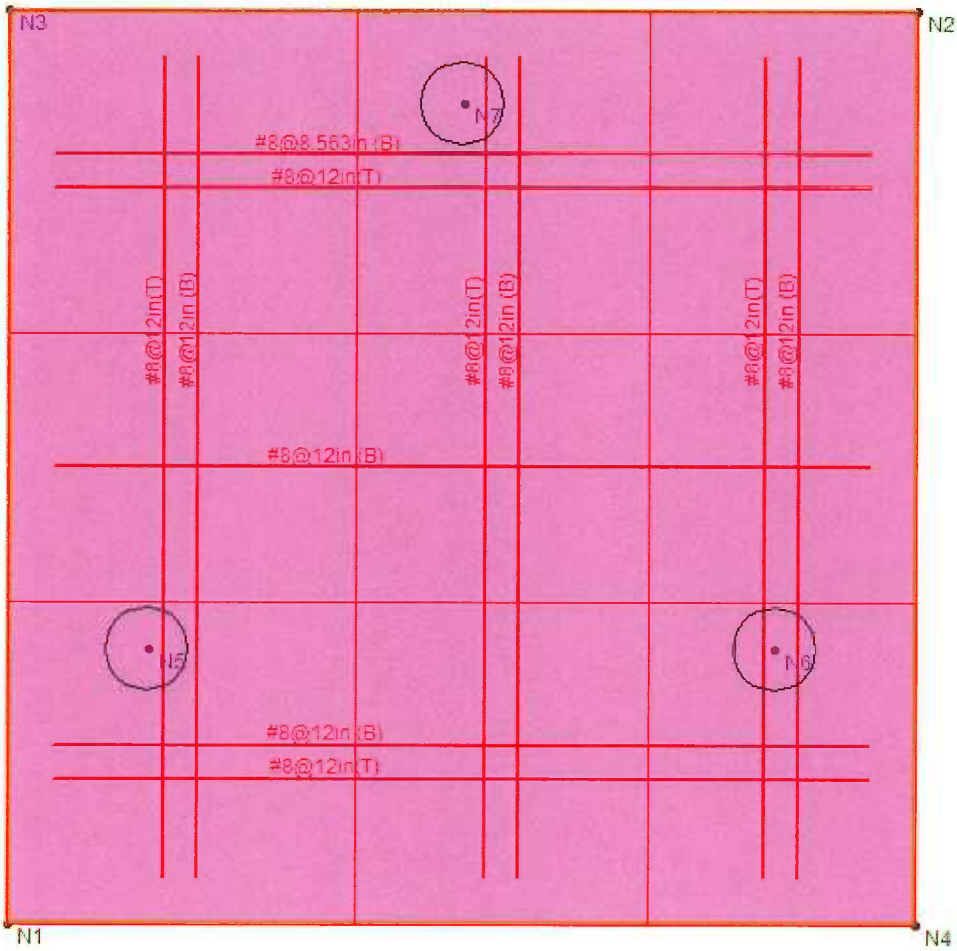


$\sigma_{max} := 2.291ksf$ Actual Bearing Pressure

$\sigma_{all} := 6ksf$ Allowabe Bearing Pressure

$Usage_{Bearing} := \frac{\sigma_{max}}{\sigma_{all}} - 38.18\%$ **<100% ..... OK in Bearing**

CALCULATION SHEET



Strip Reinforcing (Envelope)

Design Strip Results | Design Cut Results

	Label	UC Top	Top Bars	Governing Design Cut for...	UC Bot	Bot Bars/...	Governi...	UC Shear	Governin...
1	DS1	.501	#8@12in	DS1-X15	0	#8@12in	DS1-X1	.354	DS1-X15
2	DS2	.402	#8@12in	DS2-X30	.306	#8@12in	DS2-X46	.721	DS2-X44
3	DS3	.553	#8@12in	DS3-X15	0	#8@12in	DS3-X1	.436	DS3-X14
4	DS4	.076	#8@12in	DS4-X8	.358	#8@12in	DS4-X26	.275	DS4-X41
5	DS5	0		NA	.41	#8@12in	DS5-X26	.103	DS5-X13
6	DS6	.016	#8@12in	DS6-X47	.859	#8@8.563in	DS6-X25	.671	DS6-X26

$Usage_{conc} := 85.9\%$ Bending Governs

EXHIBIT C

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

T-Mobile Existing Facility

Site ID: CT11230A

North Haven / Rt 17
88 Parsonage Hill Road
North Branford, CT 06472

September 8, 2014

EBI Project Number: 62141310

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	44.26 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

September 8, 2014

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

Emissions Analysis for Site: **CT11230A – North Haven / Rt 17**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **88 Parsonage Hill Road, North Branford, 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 $\mu W/cm^2$ 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 ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is 467 $\mu W/cm^2$, and the general population exposure limit for the PCS and AWS bands is 1000 $\mu W/cm^2$. 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 **88 Parsonage Hill Road, North Branford, 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, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of 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 (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

2) **2** UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

5) 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.

6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **180 feet** above ground level (AGL).

9) 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 calculations were done with respect to uncontrolled / general public threshold limits.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	180	Height (AGL):	180	Height (AGL):	180
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A1 MPE%	0.55	Antenna B1 MPE%	0.55	Antenna C1 MPE%	0.55
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	180	Height (AGL):	180	Height (AGL):	180
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A2 MPE%	0.55	Antenna B2 MPE%	0.55	Antenna C2 MPE%	0.55
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	180	Height (AGL):	180	Height (AGL):	180
Frequency Bands	700 Mhz	Frequency Bands	700 Mhz	Frequency Bands	700 Mhz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	445.37	ERP (W):	445.37	ERP (W):	445.37
Antenna A3 MPE%	0.22	Antenna B3 MPE%	0.22	Antenna C3 MPE%	0.22

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**3.99**
Nextel	2.23 %
Motient	4.90 %
Sprint	4.80 %
AT&T	11.81 %
Verizon Wireless	16.53 %
Site Total MPE %:	**44.26 %**

T-Mobile Sector 1 Total:	1.33 %
T-Mobile Sector 2 Total:	1.33 %
T-Mobile Sector 3 Total:	1.33 %
Site Total:	44.26 %

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Summary

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

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	1.33 %
Sector 2:	1.33 %
Sector 3 :	1.33 %
T-Mobile Total:	3.99 %
Site Total:	44.26 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **44.26%** 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.

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