

**JULIE D. KOHLER**

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

March 4, 2014

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

**Re: Notice of Exempt Modification  
Crossroads Communication of Old Saybrook/T-Mobile co-location  
Site ID CT11335B  
156 Bokum Road, Old Saybrook**

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, Crossroads Communication of Old Saybrook owns the existing guyed telecommunications tower and related facility at 156 Bokum Road, Old Saybrook, Connecticut (Latitude: 41.32811799, Longitude: -72.3887685). T-Mobile intends to replace three existing antennas with three new antennas and related equipment at this existing telecommunications facility in Old Saybrook ("Old Saybrook 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 First Selectman Carl P. Fortuna Jr., and the property owners, Thanongchit and Bounthavy Sourignamath.

The existing Old Saybrook Facility consists of a 200 foot tall guyed tower.<sup>1</sup> T-Mobile plans to replace three existing antennas with three new antennas and add three TMAs (tower mounted amplifiers) at a centerline of 167 feet.<sup>2</sup> (See the plans revised to February 28, 2014 attached hereto as Exhibit A). T-Mobile will also install an equipment cabinet and reuse existing coax cables. The existing Old Saybrook Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated February 13, 2014 and attached hereto as Exhibit B.

<sup>1</sup> The online Connecticut Siting Council database does not include a docket or petition number for the approval of this structure, and therefore does not include limitations on the configuration of the antennas.

<sup>2</sup> T-Mobile also has antennas mounted at the 155 foot level but does not propose to modify that array.

March 4, 2014  
Site ID CT11335B  
Page 2

The planned modifications to the Old Saybrook Facility fall squarely within those 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 replacement and additional antennas will be installed at a centerline of 167 feet, merely replacing existing antennas located at the same 167 foot elevation. 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 or lease area, as depicted on Sheet 2 of Exhibit A. T-Mobile's equipment will be located entirely within the existing compound area.

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

4. The operation of the replacement 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 February 21, 2014, T-Mobile's operations would add 0.483% 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 25.773% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

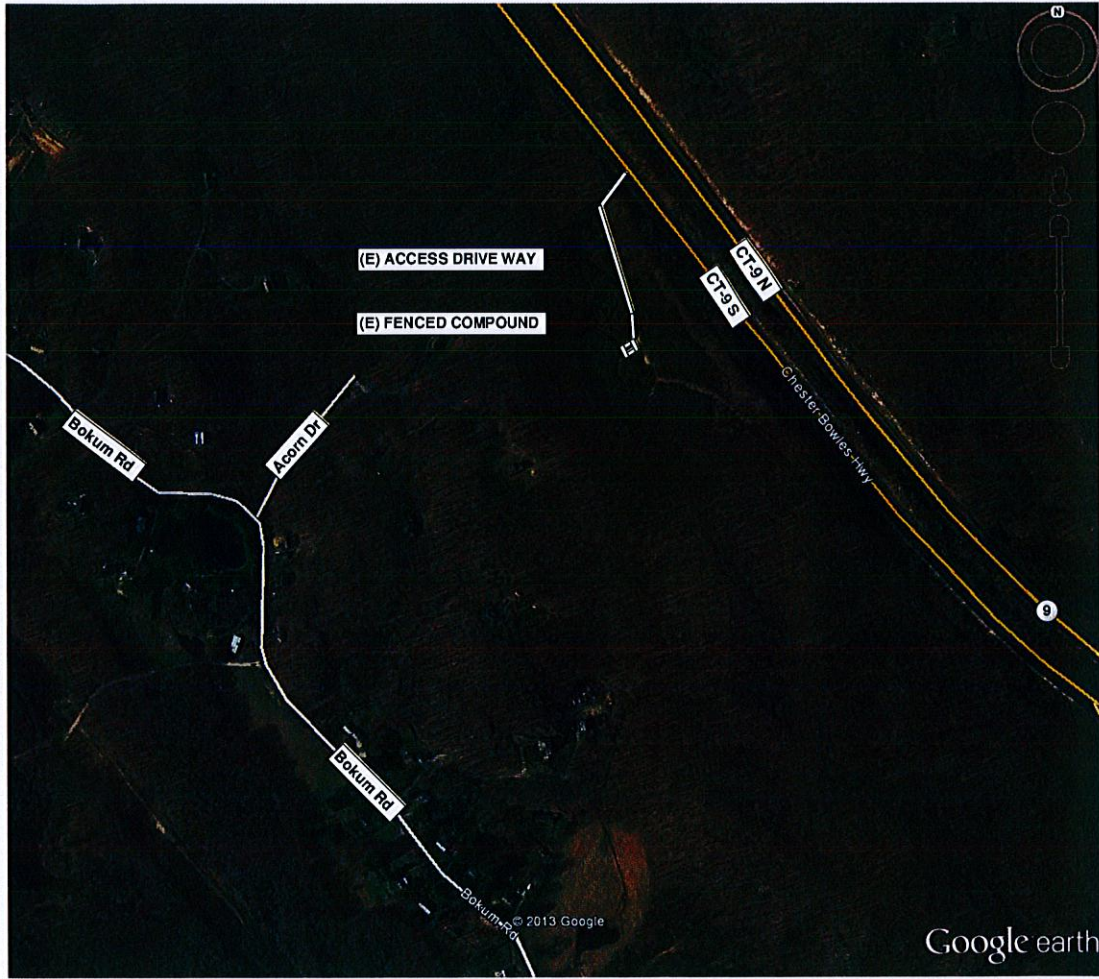
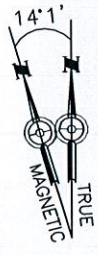
For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement antennas and equipment at the Old Saybrook Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence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

Sincerely,

  
Julie D. Kohler, Esq.

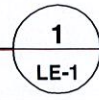
cc: Town of Old Saybrook, First Selectman Carl P. Fortuna Jr.  
Crossroads Communication of Old Saybrook  
Thanongchit and Bounthavy Sourignamath  
Sheldon Freinle, Northeast Site Solutions

# **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.

SITE MAP



CONFIGURATION

4B

SUBMITTALS	
LE REV A	02.10.14
LE REV 0	02.28.14

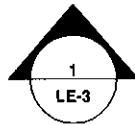
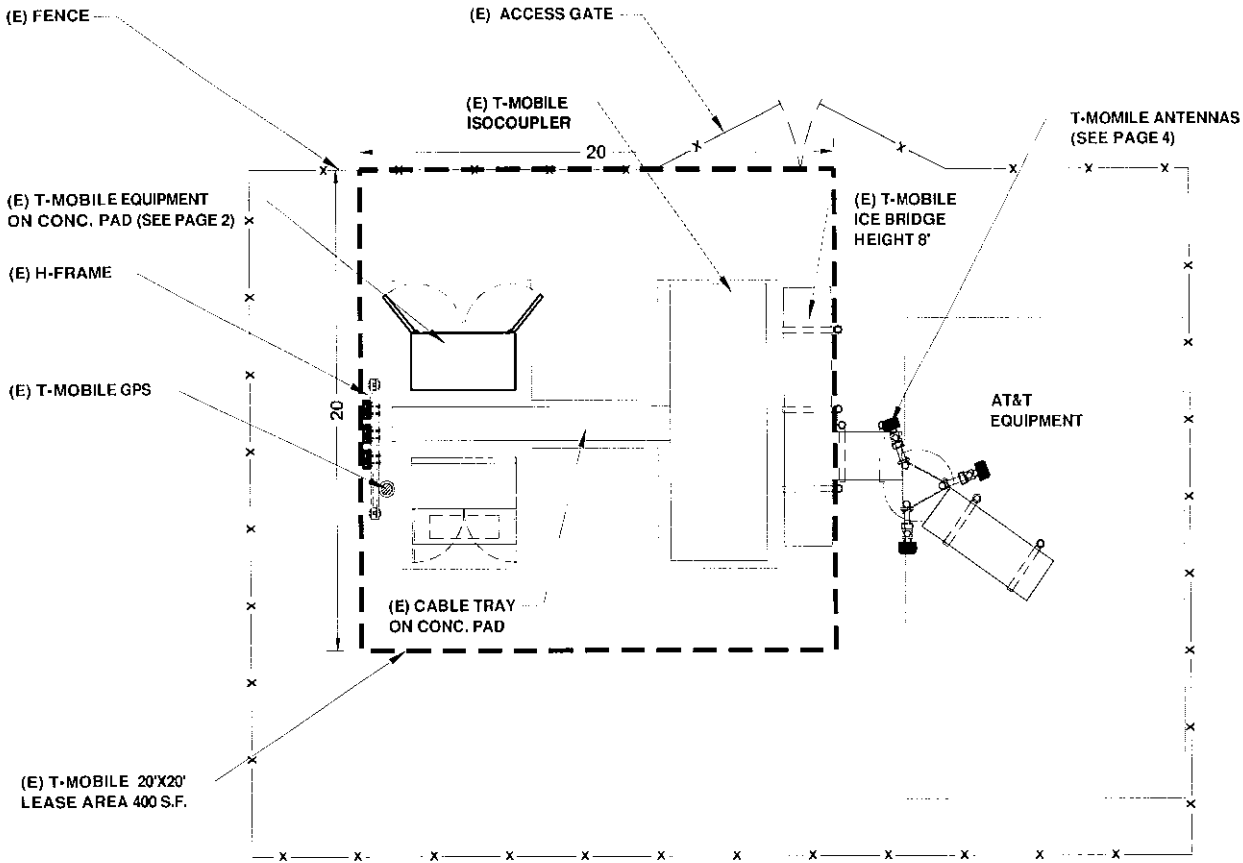
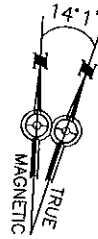
**ATLANTIS GROUP**  
 1340 Centre Street  
 Suite 212  
 Newton, MA 02459  
 Office: 617-965-0789  
 Fax: 617-213-5056

**LEASE EXHIBIT**  
 SITE NUMBER:  
 CT11335B  
 SITE NAME:  
 OLD SAYBROOK/RT 9  
 SITE ADDRESS:  
 156 BOKUM ROAD,  
 OLD SAYBROOK, CT, 06475

**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: MB

CHECKED BY: SM



**SITE PLAN**

SCALE: 1:8



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.

CONFIGURATION

**4B**

SUBMITTALS	
LE REV A	02.10.14
LE REV 0	02.28.14

**ATLANTIS GROUP**  
 1340 Centre Street  
 Suite 212  
 Newton, MA 02459  
 Office: 617-965-0789  
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 OFFICE: (860) 692-7100  
 FAX: (860) 692-7159

TOP OF TOWER  
ELEVATION= 200'-0" AGL

RAD CENTER OF T-MOBILE ANTENNAS  
ELEVATION: = 167'-0" ± AGL

RAD CENTER OF T-MOBILE ANTENNAS  
ELEVATION: = 155'-0" ± AGL

RAD CENTER OF AT&T ANTENNAS  
ELEVATION: = 145'-9" ± AGL

(P) GSM/UMTS/LTE QUAD POLE ANTENNA  
TO REPLACE  
(F) GSM DUAL POLE ANTENNA  
(TYP 1/SECTOR, 3/TOTAL)  
(P) ddB2/ddB4 TMA TO REPLACE  
(E) ddB2 TMA  
(TYP 1/SECTOR, 3/TOTAL)

(E) GSM DUAL POLE ANTENNA TO REMAIN  
(TYP 1/SECTOR, 3/TOTAL)

(F) (12) 7/8" COAX CABLES  
TO REMAIN

(F) 200' GUYED TOWER

(P) 6102 GSM/UMTS/LTE CABINET

(E) T-MOBILE CTS

(E) FRAME

(E) FENCE

(E) T-MOBILE  
SC ANTENNA

(E) CELL BR 301

**ELEVATION**

SCALE: 1:25

CONFIGURATION

**4B**

**SUBMITTALS**

LE REV A	02.10.14
LE REV 0	02.28.14

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Suite 212  
Newton, MA 02459  
Office: 617-965-0789  
Fax: 617-213-5056

**LEASE EXHIBIT**

SITE NUMBER:  
CT11335B

SITE NAME:  
OLD SAYBROOK/RT 9

SITE ADDRESS:  
156 BOKUM ROAD,  
OLD SAYBROOK, CT, 06475

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: MB

CHECKED BY: SM

PAGE 3 OF 5



# **EXHIBIT B**

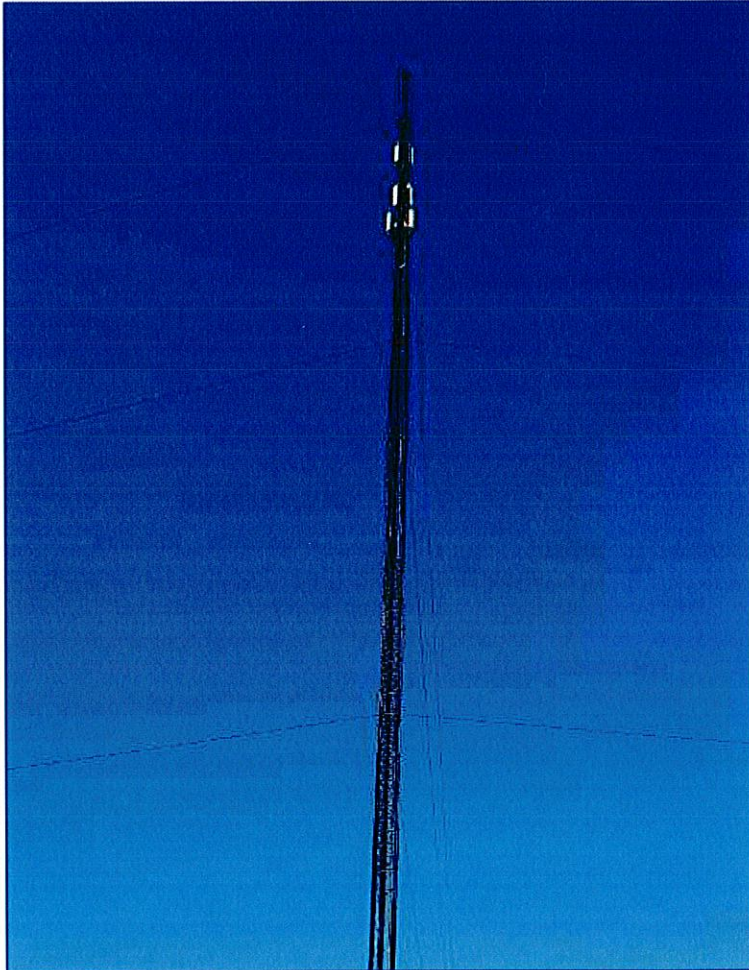


**STRUCTURAL ANALYSIS REPORT  
GUYED TOWER**



Prepared For:

**• • T • • Mobile •**  
35 Griffin Road South  
Bloomfield, CT 06002



**Tower Rating**

**Tower:** Pass (91.2%)  
**Foundation:** Pass

Sincerely,  
Atlantis Group, Inc.  
2-13-2014



Ahmet Colakoglu, PE  
CT Professional Engineer  
License No: 27057

**Site ID: CT11335B**  
**Site Name: Old Saybrook/RT 9**  
**156 Bokum Road,**  
**Old Saybrook, CT 06475**

Prepared By:  
Atlantis Group, Inc.  
1340 Centre Street, Suite 203  
Newton, Massachusetts 02459  
Phone: 617-965-0789, Fax: 617-965-0103  
February 13, 2014

**CONTENTS**

1.0 – SUBJECT AND REFERENCES

2.0 – PROPOSED ADDITION

3.0 - CODES AND LOADING

4.0 - STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

5.0 - ANALYSIS AND ASSUMPTIONS

6.0 – RESULTS AND CONCLUSION

**APPENDIX**

**A – CALCULATIONS**

## **1.0 SUBJECT AND REFERENCES**

The purpose of this analysis is to evaluate the structural capacity of the existing 200 feet high guyed tower, located at 156 Bokum Road, Old Saybrook, CT 06475, for the alteration and addition of wireless telecommunication appurtenances 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 Hudson Design Group LLC, dated 11/13/2013.
2. Structural Analysis Report and Tower Modification drawings prepared by Hudson Design Group LLC, Job Number 5391.01, dated 04/23/2013.
3. Existing and proposed antenna information provided by T-Mobile.

## **1.1 STRUCTURE**

The guyed tower is a 200 feet high, triangular based tower. Solid rod legs are K-braced with solid rod diagonals along the entire tower height. The tower is guyed at three (3) elevations above the grade line; 179.7 feet, 119.7 feet and 59.7 feet. All the guy wires are terminated at anchors 155 feet away from the tower base. During the analysis of the tower it has been assumed that the modifications recommended by Hudson Design Group LLC have taken place. Please refer to the tower elevation drawing in Appendix A, for details about the tower geometry, member sizes, etc.

## **2.0 PROPOSED CONFIGURATION**

### **Antennas and Appurtenances:**

The analysis is based on the following existing and proposed appurtenances:

**Existing Configuration of T-MOBILE Appurtenances:**

Sector	RAD Center (ft.)	Antenna & TMA		Mount	Feed Lines
Alpha	167	GSM Antenna TMA	(1) RR90-17-02DP (1) dd B2	Leg Mounted	(12) 7/8"
	155	GSM Antenna	(1) RR90-17-02DP	Leg Mounted	
Beta	167	GSM Antenna TMA	(1) RR90-17-02DP (1) dd B2	Leg Mounted	
	155	GSM Antenna	(1) RR90-17-02DP	Leg Mounted	
Gamma	167	GSM Antenna TMA	(1) RR90-17-02DP (1) dd B2	Leg Mounted	
	155	GSM Antenna	(1) RR90-17-02DP	Leg Mounted	

**Proposed Configuration of T-MOBILE Appurtenances:**

Sector	RAD Center (ft.)	Antenna & TMA		Mount	Feed Lines
Alpha	167	GSM/UMTS/LTE Antenna TMA	(1) APX16DWV-16DWVS-A20 (1) dd B4 & (1) ddB2	Leg Mounted	(12) 7/8"
	155	GSM Antenna	(1) RR90-17-02DP	Leg Mounted	
Beta	167	GSM/UMTS/LTE Antenna TMA	(1) APX16DWV-16DWVS-A20 (1) dd B4 & (1) ddB2	Leg Mounted	
	155	GSM Antenna	(1) RR90-17-02DP	Leg Mounted	
Gamma	167	GSM/UMTS/LTE Antenna TMA	(1) APX16DWV-16DWVS-A20 (1) dd B4 & (1) ddB2	Leg Mounted	
	155	GSM Antenna	(1) RR90-17-02DP	Leg Mounted	

**Existing and Remaining Appurtenances by Others:**

RAD Center (ft.) Carrier	Antenna & TMA	Mount	Feed Lines
145 AT&T	(1) SBNH-1D4545A (1) P65-17-XLH-RR (1) AM-X-CD-17-65 (3) DTMABP7819 TMAs	Leg Mounted	(6) 1 1/4" + (1) Fiber + (2) DC Power Cables

**3.0 CODES AND LOADING**

The tower was analyzed per ANSI/TIA-222-F as referenced by the 2005 Connecticut Building Code with 2011 Supplement, which is the adopted building code. The following wind loading was used in compliance with the standard for Middlesex County, CT.

- Basic wind speed 95 mph (W) without ice [fastest-mile speed equivalent to 115 mph 3-second gust].
- Basic wind speed 82.27 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 guyed tower.

- $D + D_g + W$
- $D + D_g + I + W_i + 1.0T_i$

D: Dead Load of structure and appurtenances, except guy wires

W: Wind Load, without ice

$W_i$ : Wind Load with ice

I: Ice Gravity Load

$D_g$ : Dead Load of guy assemblies

#### **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 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 tnx-Tower, 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

Based on an analysis per ANSI/TIA-222-F, the existing tower is found to have **adequate** structural capacity for the proposed changes by T-mobile. For the aforementioned load combinations and as a maximum, the tower guy wires at 179.7 feet AGL will be stressed to **91.2%** of capacity. Maximum usage of tower legs and bracing is 89.9% and 82.5%, respectively. The tower foundation system is found to have **adequate** structural strength.

### Reactions:

Maximums	Atlantis Analysis	Hudson Group Analysis
Base Shear (kips)	1.1	1.4
Base Compression (kips)	43.8	36.3
Anchor Shear (kips)	24.4	22.6
Anchor Uplift (kips)	18.3	16.5

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

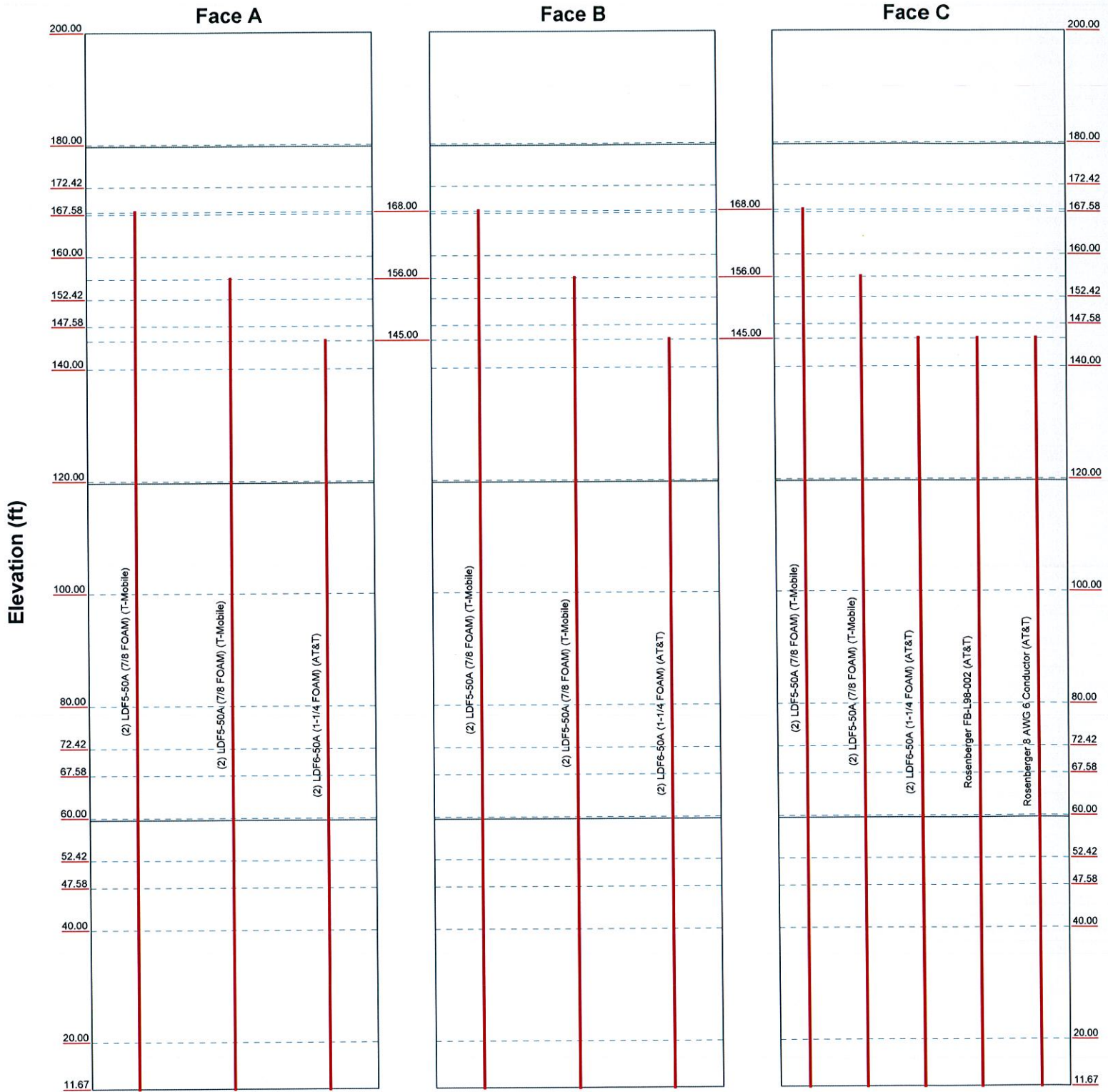
Should you have any questions or need any clarifications about this report, please contact Ahmet Colakoglu at (617) 965-0789.

Sincerely,  
 Atlantis Group, Inc.

**APPENDIX A  
CALCULATIONS**







<p><b>Atlantis Group, Inc</b>                  1340 Centre Street, Suite 203                  Newton, Massachusetts 02459                  Phone: 617-965-0789                  FAX: 617-965-0103</p>	Job: <b>1417010</b>
	Project: <b>CT11335B</b>
	Client: <b>T-Mobile</b>
	Code: <b>TIA/EIA-222-F</b>
	Path: <small>C:\Users\ybyru\Desktop\Destek Snow\ATLANTIS\trn\CT11335B Guyed Tower.dwg</small>
Drawn by: <b>Ahmet Colakoglu</b>	App'd:
Date: <b>02/13/14</b>	Scale: <b>N</b>
	Dwg No.

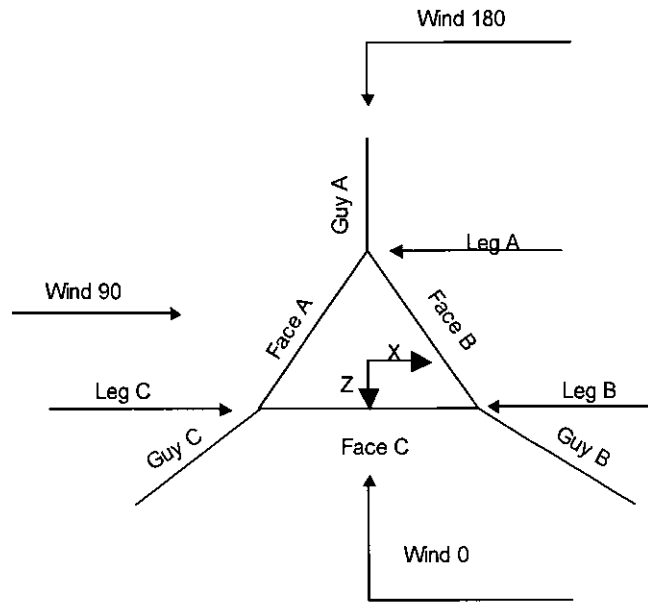
<b>tnxTower</b>  <i>Atlantis Group, Inc</i> 1340 Centre Street, Suite 203 Newton, Massachusetts 02459 Phone: 617-965-0789 FAX: 617-965-0103	Job	1417010	Page	1 of 42
	Project	CT11335B	Date	14:57:26 02/13/14
	Client	T-Mobile	Designed by	Ahmet Colakoglu

**Tower Input Data**

The main tower is a 3x guyed tower with an overall height of 200.00 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 1.50 ft at the top and tapered at the base.  
This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- Tower is located in Middlesex County, Connecticut.
- Basic wind speed of 95 mph.
- Nominal ice thickness of 0.5000 in.
- Ice density of 56 pcf.
- A wind speed of 82 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 50 mph.
- Pressures are calculated at each section.
- Safety factor used in guy design is 2.
- 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.



**Corner & Starmount Guyed Tower**

**Tower Section Geometry**

<b>tnxTower</b>  <b>Atlantis Group, Inc</b> 1340 Centre Street, Suite 203 Newton, Massachusetts 02459 Phone: 617-965-0789 FAX: 617-965-0103	Job	1417010	Page	2 of 42
	Project	CT11335B	Date	14:57:26 02/13/14
	Client	T-Mobile	Designed by	Ahmet Colakoglu

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	200.00-180.00			1.50	1	20.00
T2	180.00-172.42			1.50	1	7.58
T3	172.42-167.58			1.50	1	4.83
T4	167.58-160.00			1.50	1	7.58
T5	160.00-152.42			1.50	1	7.58
T6	152.42-147.58			1.50	1	4.83
T7	147.58-140.00			1.50	1	7.58
T8	140.00-120.00			1.50	1	20.00
T9	120.00-100.00			1.50	1	20.00
T10	100.00-80.00			1.50	1	20.00
T11	80.00-72.42			1.50	1	7.58
T12	72.42-67.58			1.50	1	4.83
T13	67.58-60.00			1.50	1	7.58
T14	60.00-52.42			1.50	1	7.58
T15	52.42-47.58			1.50	1	4.83
T16	47.58-40.00			1.50	1	7.58
T17	40.00-20.00			1.50	1	20.00
T18	20.00-11.67			1.50	1	8.33
T19	11.67-5.00			1.50	1	6.67
T20	5.00-0.00			1.50	1	5.00

### 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	200.00-180.00	1.21	K Brace Right	No	No	4.0000	4.0000
T2	180.00-172.42	1.21	K Brace Right	No	Yes	4.0000	0.0000
T3	172.42-167.58	1.21	K Brace Right	No	No	0.0000	0.0000
T4	167.58-160.00	1.21	K Brace Right	No	Yes	0.0000	4.0000
T5	160.00-152.42	1.21	K Brace Right	No	Yes	4.0000	0.0000
T6	152.42-147.58	1.21	K Brace Right	No	Yes	0.0000	0.0000
T7	147.58-140.00	1.21	K Brace Right	No	Yes	0.0000	4.0000
T8	140.00-120.00	1.21	K Brace Right	No	Yes	4.0000	4.0000
T9	120.00-100.00	1.21	K Brace Right	No	Yes	4.0000	4.0000
T10	100.00-80.00	1.21	K Brace Right	No	No	4.0000	4.0000
T11	80.00-72.42	1.21	K Brace Right	No	Yes	4.0000	0.0000
T12	72.42-67.58	1.21	K Brace Right	No	No	0.0000	0.0000
T13	67.58-60.00	1.21	K Brace Right	No	Yes	0.0000	4.0000
T14	60.00-52.42	1.21	K Brace Right	No	Yes	4.0000	0.0000
T15	52.42-47.58	1.21	K Brace Right	No	No	0.0000	0.0000
T16	47.58-40.00	1.21	K Brace Right	No	Yes	0.0000	4.0000
T17	40.00-20.00	1.21	K Brace Right	No	Yes	4.0000	4.0000
T18	20.00-11.67	1.33	K Brace Right	No	Yes	4.0000	0.0000
T19	11.67-5.00	1.33	K Brace Left	No	Yes	0.0000	0.0000
T20	5.00-0.00	1.25	K Brace Left	No	Yes	0.0000	0.0000

### Tower Section Geometry (cont'd)

<b>tnxTower</b>  <b>Atlantis Group, Inc</b> 1340 Centre Street, Suite 203 Newton, Massachusetts 02459 Phone: 617-965-0789 FAX: 617-965-0103	Job	1417010	Page	3 of 42
	Project	CT11335B	Date	14:57:26 02/13/14
	Client	T-Mobile	Designed by	Ahmet Colakoglu

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 200.00-180.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T2 180.00-172.42	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T3 172.42-167.58	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T4 167.58-160.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T5 160.00-152.42	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T6 152.42-147.58	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T7 147.58-140.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T8 140.00-120.00	Arbitrary Shape	1.25SR+half pipe	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T9 120.00-100.00	Arbitrary Shape	1.25SR+half pipe	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T10 100.00-80.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T11 80.00-72.42	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T12 72.42-67.58	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T13 67.58-60.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T14 60.00-52.42	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T15 52.42-47.58	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T16 47.58-40.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T17 40.00-20.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T18 20.00-11.67	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T19 11.67-5.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T20 5.00-0.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 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 200.00-180.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 180.00-172.42	Solid Round	7/8	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T4 167.58-160.00	Single Angle	L1 3/4x1 3/4x3/16	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T5 160.00-152.42	Solid Round	7/8	A36 (36 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T7 147.58-140.00	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)

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Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T8 140.00-120.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T9 120.00-100.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T10 100.00-80.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T11 80.00-72.42	Solid Round	7/8	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T13 67.58-60.00	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T14 60.00-52.42	Solid Round	7/8	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T16 47.58-40.00	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T17 40.00-20.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T18 20.00-11.67	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T19 11.67-5.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T20 5.00-0.00	Solid Round	7/8	A572-50 (50 ksi)	Flat Bar	1x1/2	A36 (36 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 200.00-180.00	1	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T2 180.00-172.42	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 172.42-167.58	1	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T4 167.58-160.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T5 160.00-152.42	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T6 152.42-147.58	1	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T7 147.58-140.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T8 140.00-120.00	1	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T9 120.00-100.00	1	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T10 100.00-80.00	1	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T11 80.00-72.42	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T12 72.42-67.58	1	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T13 67.58-60.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T14 60.00-52.42	None	Solid Round		A572-50	Single Angle	L1 3/4x1 3/4x3/16	A36

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Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T15 52.42-47.58	1	Solid Round	7/8	(50 ksi) A572-50	Solid Round		(36 ksi) A572-50
T16 47.58-40.00	None	Solid Round		(50 ksi) A572-50	Single Angle	L1 3/4x1 3/4x3/16	(50 ksi) A36
T17 40.00-20.00	1	Solid Round	7/8	(50 ksi) A572-50	Solid Round	1	(36 ksi) A572-50
T18 20.00-11.67	None	Solid Round		(50 ksi) A572-50	Solid Round	1	(50 ksi) A572-50
T19 11.67-5.00	None	Solid Round		(50 ksi) A572-50	Solid Round	1	(50 ksi) A572-50
T20 5.00-0.00	None	Solid Round		(50 ksi) A572-50	Solid Round	7/8	(50 ksi) A572-50

### Tower Section Geometry (cont'd)

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1	0.00	0.0000	A36	1	1	1	36.0000	36.0000
200.00-180.00			(36 ksi)					
T2	0.00	0.0000	A36	1	1	1	36.0000	36.0000
180.00-172.42			(36 ksi)					
T3	0.00	0.0000	A36	1	1	1	36.0000	36.0000
172.42-167.58			(36 ksi)					
T4	0.00	0.0000	A36	1	1	1	36.0000	36.0000
167.58-160.00			(36 ksi)					
T5	0.00	0.0000	A36	1	1	1	36.0000	36.0000
160.00-152.42			(36 ksi)					
T6	0.00	0.0000	A36	1	1	1	36.0000	36.0000
152.42-147.58			(36 ksi)					
T7	0.00	0.0000	A36	1	1	1	36.0000	36.0000
147.58-140.00			(36 ksi)					
T8	0.00	0.0000	A36	1	1	1	36.0000	36.0000
140.00-120.00			(36 ksi)					
T9	0.00	0.0000	A36	1	1	1	36.0000	36.0000
120.00-100.00			(36 ksi)					
T10	0.00	0.0000	A36	1	1	1	36.0000	36.0000
100.00-80.00			(36 ksi)					
T11	0.00	0.0000	A36	1	1	1	36.0000	36.0000
80.00-72.42			(36 ksi)					
T12	0.00	0.0000	A36	1	1	1	36.0000	36.0000
72.42-67.58			(36 ksi)					
T13	0.00	0.0000	A36	1	1	1	36.0000	36.0000
67.58-60.00			(36 ksi)					
T14	0.00	0.0000	A36	1	1	1	36.0000	36.0000
60.00-52.42			(36 ksi)					
T15	0.00	0.0000	A36	1	1	1	36.0000	36.0000
52.42-47.58			(36 ksi)					
T16	0.00	0.0000	A36	1	1	1	36.0000	36.0000
47.58-40.00			(36 ksi)					
T17	0.00	0.0000	A36	1	1	1	36.0000	36.0000
40.00-20.00			(36 ksi)					

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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
ft	ft <sup>2</sup>	in						
T18 20.00-11.67	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T19 11.67-5.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T20 5.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

### Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors <sup>1</sup>						
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 200.00-180.00	Yes	Yes	1	1	1	1	1	1	1	1
T2 180.00-172.42	Yes	Yes	1	1	1	1	1	1	1	1
T3 172.42-167.58	Yes	Yes	1	1	1	1	1	1	1	1
T4 167.58-160.00	Yes	Yes	1	1	1	1	1	1	1	1
T5 160.00-152.42	Yes	Yes	1	1	1	1	1	1	1	1
T6 152.42-147.58	Yes	Yes	1	1	1	1	1	1	1	1
T7 147.58-140.00	Yes	Yes	1	1	1	1	1	1	1	1
T8 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1
T9 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1
T10 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1
T11 80.00-72.42	Yes	Yes	1	1	1	1	1	1	1	1
T12 72.42-67.58	Yes	Yes	1	1	1	1	1	1	1	1
T13 67.58-60.00	Yes	Yes	1	1	1	1	1	1	1	1
T14 60.00-52.42	Yes	Yes	1	1	1	1	1	1	1	1
T15 52.42-47.58	Yes	Yes	1	1	1	1	1	1	1	1
T16 47.58-40.00	Yes	Yes	1	1	1	1	1	1	1	1
T17 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1
T18 20.00-11.67	Yes	Yes	1	1	1	1	1	1	1	1
T19 11.67-5.00	Yes	Yes	1	1	1	1	1	1	1	1
T20 5.00-0.00	Yes	Yes	0.2	1	1	1	1	1	1	1



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<sup>1</sup>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	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
200.00-180.00														
T2	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
180.00-172.42														
T3	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
172.42-167.58														
T4	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
167.58-160.00														
T5	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
160.00-152.42														
T6	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
152.42-147.58														
T7	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
147.58-140.00														
T8	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
140.00-120.00														
T9	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
120.00-100.00														
T10	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
100.00-80.00														
T11	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
80.00-72.42														
T12	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
72.42-67.58														
T13	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
67.58-60.00														
T14	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
60.00-52.42														
T15	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
52.42-47.58														
T16	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
47.58-40.00														
T17	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
40.00-20.00														
T18	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
20.00-11.67														
T19	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
11.67-5.00														
T20	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
5.00-0.00														

**Guy Data**

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Guy Elevation	Guy Grade	Guy Size	Initial Tension	%	Guy Modulus	Guy Weight	L <sub>n</sub>	Anchor Radius	Anchor Azimuth Adj.	Anchor Elevation	End Fitting Efficiency	
ft			lb		ksi	plf	ft	ft	°	ft	%	
179.667	EHS	A	7/16	2080.00	10%	21000	0.399	240.34	155.00	0.0000	-5.00	100%
		B	7/16	2080.00	10%	21000	0.399	236.52	155.00	0.0000	0.00	100%
		C	7/16	2080.00	10%	21000	0.399	229.03	155.00	0.0000	10.00	100%
119.667	EHS	A	9/16	3500.00	10%	21000	0.671	198.08	155.00	0.0000	-5.00	100%
		B	9/16	3500.00	10%	21000	0.671	194.97	155.00	0.0000	0.00	100%
		C	9/16	3500.00	10%	21000	0.671	189.01	155.00	0.0000	10.00	100%
59.6667	EHS	A	7/16	2080.00	10%	21000	0.399	167.01	155.00	0.0000	-5.00	100%
		B	7/16	2080.00	10%	21000	0.399	165.14	155.00	0.0000	0.00	100%
		C	7/16	2080.00	10%	21000	0.399	161.80	155.00	0.0000	10.00	100%

### Guy Data(cont'd)

Guy Elevation	Mount Type	Torque-Arm Spread	Torque-Arm Leg Angle	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
ft		ft	°				
179.667	Corner						
119.667	Corner						
59.6667	Corner						

### Guy Data (cont'd)

Guy Elevation	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
ft								
179.67	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	2x1/4
119.67	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	2x1/4
59.67	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	2x1/4

### Guy Data (cont'd)

Guy Elevation	Cable Weight A	Cable Weight B	Cable Weight C	Cable Weight D	Tower Intercept A	Tower Intercept B	Tower Intercept C	Tower Intercept D
ft	lb	lb	lb	lb	ft	ft	ft	ft
179.667	95.89	94.37	91.38		5.45	5.28	4.96	
					4.0 sec/pulse	4.0 sec/pulse	3.8 sec/pulse	
119.667	132.91	130.83	126.83		3.72	3.61	3.39	
					3.3 sec/pulse	3.3 sec/pulse	3.2 sec/pulse	
59.6667	66.64	65.89	64.56		2.66	2.60	2.50	
					2.8 sec/pulse	2.8 sec/pulse	2.7 sec/pulse	

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### Guy Data (cont'd)

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm		Pull Off		Diagonal	
			K <sub>x</sub>	K <sub>y</sub>	K <sub>x</sub>	K <sub>y</sub>	K <sub>x</sub>	K <sub>y</sub>
179.667	No	No			1	1	1	1
119.667	No	No			1	1	1	1
59.6667	No	No			1	1	1	1

### Guy Data (cont'd)

Guy Elevation ft	Torque-Arm				Pull Off				Diagonal			
	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U
179.667	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
119.667	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
59.6667	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

### Guy Pressures

Guy Elevation ft	Guy Location	z ft	q <sub>s</sub> psf	q <sub>i</sub> Ice psf	Ice Thickness in
179.667	A	87.33	31	23	0.5000
	B	89.83	31	23	0.5000
	C	94.83	31	23	0.5000
119.667	A	57.33	27	20	0.5000
	B	59.83	27	21	0.5000
	C	64.83	28	21	0.5000
59.6667	A	27.33	23	17	0.5000
	B	29.83	23	17	0.5000
	C	34.83	23	18	0.5000

### 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
LDF5-50A (7/8 FOAM) (T-Mobile)	A	No	Ar (Leg)	168.00 - 6.00	0.0000	0	2	1	0.0000 0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM) (T-Mobile)	B	No	Ar (Leg)	168.00 - 6.00	0.0000	0	2	1	0.0000 0.5000	1.0900		0.33
LDF5-50A	C	No	Ar (Leg)	168.00 - 6.00	0.0000	0	2	1	0.0000	1.0900		0.33

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Description	Face or Shield Leg	Allow	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(7/8 FOAM) (T-Mobile) LDF5-50A	A	No	Ar (Leg)	156.00 - 6.00	0.0000	-0.1	2	1	0.0000 0.5000	1.0900		0.33
(7/8 FOAM) (T-Mobile) LDF5-50A	B	No	Ar (Leg)	156.00 - 6.00	0.0000	-0.1	2	1	0.0000 0.5000	1.0900		0.33
(7/8 FOAM) (T-Mobile) LDF5-50A	C	No	Ar (Leg)	156.00 - 6.00	0.0000	-0.1	2	1	0.0000 0.5000	1.0900		0.33
(7/8 FOAM) (T-Mobile) LDF6-50A	A	No	Ar (Leg)	145.00 - 6.00	0.0000	-0.2	2	1	0.0000 0.5000	1.5500		0.66
(1-1/4 FOAM) (AT&T) LDF6-50A	B	No	Ar (Leg)	145.00 - 6.00	0.0000	-0.2	2	1	0.0000 0.5000	1.5500		0.66
(1-1/4 FOAM) (AT&T) LDF6-50A	C	No	Ar (Leg)	145.00 - 6.00	0.0000	-0.2	2	1	0.0000 0.5000	1.5500		0.66
Rosenberger FB-L98-002 (AT&T)	C	No	Ar (Leg)	145.00 - 6.00	0.0000	0	1	1	0.0000 0.3900	0.3900		0.10
Rosenberger 8 AWG 6 Conductor (AT&T)	C	No	Ar (Leg)	145.00 - 6.00	0.0000	0	1	1	0.0000 0.7950	0.7950		0.58

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A,A</sub> In Face ft <sup>2</sup>	C <sub>A,A</sub> Out Face ft <sup>2</sup>	Weight lb
T1	200.00-180.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	180.00-172.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T3	172.42-167.58	A	0.076	0.000	0.000	0.000	0.28
		B	0.076	0.000	0.000	0.000	0.28
		C	0.076	0.000	0.000	0.000	0.28
T4	167.58-160.00	A	1.378	0.000	0.000	0.000	5.00
		B	1.378	0.000	0.000	0.000	5.00
		C	1.378	0.000	0.000	0.000	5.00
T5	160.00-152.42	A	2.029	0.000	0.000	0.000	7.37
		B	2.029	0.000	0.000	0.000	7.37
		C	2.029	0.000	0.000	0.000	7.37
T6	152.42-147.58	A	1.756	0.000	0.000	0.000	6.38
		B	1.756	0.000	0.000	0.000	6.38
		C	1.756	0.000	0.000	0.000	6.38
T7	147.58-140.00	A	4.541	0.000	0.000	0.000	16.61
		B	4.047	0.000	0.000	0.000	16.61
		C	4.541	0.000	0.000	0.000	20.03
T8	140.00-120.00	A	14.408	0.000	0.000	0.000	52.80
		B	12.433	0.000	0.000	0.000	52.80
		C	14.408	0.000	0.000	0.000	66.48

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Tower Section	Tower Elevation ft	Face	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight lb
T9	120.00-100.00	A	14.408	0.000	0.000	0.000	52.80
		B	12.433	0.000	0.000	0.000	52.80
		C	14.408	0.000	0.000	0.000	66.48
T10	100.00-80.00	A	14.408	0.000	0.000	0.000	52.80
		B	12.433	0.000	0.000	0.000	52.80
		C	14.408	0.000	0.000	0.000	66.48
T11	80.00-72.42	A	5.463	0.000	0.000	0.000	20.02
		B	4.714	0.000	0.000	0.000	20.02
		C	5.463	0.000	0.000	0.000	25.21
T12	72.42-67.58	A	3.482	0.000	0.000	0.000	12.76
		B	3.005	0.000	0.000	0.000	12.76
		C	3.482	0.000	0.000	0.000	16.07
T13	67.58-60.00	A	5.463	0.000	0.000	0.000	20.02
		B	4.714	0.000	0.000	0.000	20.02
		C	5.463	0.000	0.000	0.000	25.21
T14	60.00-52.42	A	5.463	0.000	0.000	0.000	20.02
		B	4.714	0.000	0.000	0.000	20.02
		C	5.463	0.000	0.000	0.000	25.21
T15	52.42-47.58	A	3.482	0.000	0.000	0.000	12.76
		B	3.005	0.000	0.000	0.000	12.76
		C	3.482	0.000	0.000	0.000	16.07
T16	47.58-40.00	A	5.463	0.000	0.000	0.000	20.02
		B	4.714	0.000	0.000	0.000	20.02
		C	5.463	0.000	0.000	0.000	25.21
T17	40.00-20.00	A	14.408	0.000	0.000	0.000	52.80
		B	12.433	0.000	0.000	0.000	52.80
		C	14.408	0.000	0.000	0.000	66.48
T18	20.00-11.67	A	6.003	0.000	0.000	0.000	22.00
		B	5.181	0.000	0.000	0.000	22.00
		C	6.003	0.000	0.000	0.000	27.70
T19	11.67-5.00	A	4.082	0.000	0.000	0.000	14.96
		B	3.523	0.000	0.000	0.000	14.96
		C	4.082	0.000	0.000	0.000	18.84
T20	5.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

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

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight lb
T1	200.00-180.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	180.00-172.42	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T3	172.42-167.58	A	0.500	0.145	0.000	0.000	0.000	1.08
		B		0.145	0.000	0.000	0.000	1.08
		C		0.145	0.000	0.000	0.000	1.08
T4	167.58-160.00	A	0.500	2.642	0.000	0.000	0.000	19.74
		B		2.642	0.000	0.000	0.000	19.74
		C		2.642	0.000	0.000	0.000	19.74
T5	160.00-152.42	A	0.500	3.890	0.000	0.000	0.000	29.06
		B		3.890	0.000	0.000	0.000	29.06
		C		3.890	0.000	0.000	0.000	29.06
T6	152.42-147.58	A	0.500	3.367	0.000	0.000	0.000	25.16

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight lb
		B		3.367	0.000	0.000	0.000	25.16
		C		3.367	0.000	0.000	0.000	25.16
T7	147.58-140.00	A	0.500	8.735	0.000	0.000	0.000	58.59
		B		7.408	0.000	0.000	0.000	58.59
		C		8.735	0.000	0.000	0.000	68.69
T8	140.00-120.00	A	0.500	27.742	0.000	0.000	0.000	180.59
		B		22.433	0.000	0.000	0.000	180.59
		C		27.742	0.000	0.000	0.000	220.97
T9	120.00-100.00	A	0.500	27.742	0.000	0.000	0.000	180.59
		B		22.433	0.000	0.000	0.000	180.59
		C		27.742	0.000	0.000	0.000	220.97
T10	100.00-80.00	A	0.500	27.742	0.000	0.000	0.000	180.59
		B		22.433	0.000	0.000	0.000	180.59
		C		27.742	0.000	0.000	0.000	220.97
T11	80.00-72.42	A	0.500	10.519	0.000	0.000	0.000	68.47
		B		8.506	0.000	0.000	0.000	68.47
		C		10.519	0.000	0.000	0.000	83.78
T12	72.42-67.58	A	0.500	6.704	0.000	0.000	0.000	43.64
		B		5.421	0.000	0.000	0.000	43.64
		C		6.704	0.000	0.000	0.000	53.40
T13	67.58-60.00	A	0.500	10.519	0.000	0.000	0.000	68.47
		B		8.506	0.000	0.000	0.000	68.47
		C		10.519	0.000	0.000	0.000	83.78
T14	60.00-52.42	A	0.500	10.519	0.000	0.000	0.000	68.47
		B		8.506	0.000	0.000	0.000	68.47
		C		10.519	0.000	0.000	0.000	83.78
T15	52.42-47.58	A	0.500	6.704	0.000	0.000	0.000	43.64
		B		5.421	0.000	0.000	0.000	43.64
		C		6.704	0.000	0.000	0.000	53.40
T16	47.58-40.00	A	0.500	10.519	0.000	0.000	0.000	68.47
		B		8.506	0.000	0.000	0.000	68.47
		C		10.519	0.000	0.000	0.000	83.78
T17	40.00-20.00	A	0.500	27.742	0.000	0.000	0.000	180.59
		B		22.433	0.000	0.000	0.000	180.59
		C		27.742	0.000	0.000	0.000	220.97
T18	20.00-11.67	A	0.500	11.559	0.000	0.000	0.000	75.25
		B		9.347	0.000	0.000	0.000	75.25
		C		11.559	0.000	0.000	0.000	92.07
T19	11.67-5.00	A	0.500	7.860	0.000	0.000	0.000	51.17
		B		6.356	0.000	0.000	0.000	51.17
		C		7.860	0.000	0.000	0.000	62.61
T20	5.00-0.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$ in	$CP_z$ in	$CP_x$ Ice in	$CP_z$ Ice in
T1	200.00-180.00	0.0000	0.0000	0.0000	0.0000
T2	180.00-172.42	0.0000	0.0000	0.0000	0.0000
T3	172.42-167.58	0.0000	0.0000	0.0000	0.0000
T4	167.58-160.00	0.0000	0.0000	0.0000	0.0000
T5	160.00-152.42	0.0000	0.0000	0.0000	0.0000
T6	152.42-147.58	0.0000	0.0000	0.0000	0.0000
T7	147.58-140.00	-0.2001	0.1155	-0.2785	0.1608

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Section	Elevation	CP <sub>X</sub>	CP <sub>Z</sub>	CP <sub>X</sub> Ice	CP <sub>Z</sub> Ice
	ft	in	in	in	in
T8	140.00-120.00	-0.2678	0.1546	-0.3793	0.2190
T9	120.00-100.00	-0.2662	0.1537	-0.3782	0.2183
T10	100.00-80.00	-0.3005	0.1735	-0.4190	0.2419
T11	80.00-72.42	-0.2589	0.1495	-0.3708	0.2141
T12	72.42-67.58	-0.2980	0.1720	-0.4148	0.2395
T13	67.58-60.00	-0.2589	0.1495	-0.3708	0.2141
T14	60.00-52.42	-0.2551	0.1473	-0.3678	0.2124
T15	52.42-47.58	-0.2980	0.1720	-0.4148	0.2395
T16	47.58-40.00	-0.2589	0.1495	-0.3708	0.2141
T17	40.00-20.00	-0.2776	0.1603	-0.3859	0.2228
T18	20.00-11.67	-0.2827	0.1632	-0.3939	0.2274
T19	11.67-5.00	-0.2649	0.1529	-0.3677	0.2123
T20	5.00-0.00	0.0000	0.0000	0.0000	0.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>1</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>1</sub> Side ft <sup>2</sup>	Weight lb
RR90-17-02DP w/Mount Pipe (T-Mobile)	A	From Leg	1.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 5.57	3.64 4.70	43.55 84.46
dd B2 TMA (T-Mobile)	A	From Leg	1.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1.07	0.88 1.13	29.93 42.58
RR90-17-02DP w/Mount Pipe (T-Mobile)	B	From Leg	1.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 5.57	3.64 4.70	43.55 84.46
dd B2 TMA (T-Mobile)	B	From Leg	1.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1.07	0.88 1.13	29.93 42.58
RR90-17-02DP w/Mount Pipe (T-Mobile)	C	From Leg	1.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 5.57	3.64 4.70	43.55 84.46
dd B2 TMA (T-Mobile)	C	From Leg	1.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1.07	0.88 1.13	29.93 42.58
*****								
Andrew-Commscope SBNH-1D4545A w/pipe (AT&T)	A	From Leg	1.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 9.73	5.59 6.30	78.81 143.86
25.1"x11.1"x10.7"TMA (AT&T)	A	From Leg	0.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 2.95	2.61 2.85	60.00 83.13
P65-17-XLH-RR with Pipe (AT&T)	B	From Leg	1.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 12.42	8.94 10.45	102.85 184.99
25.1"x11.1"x10.7"TMA (AT&T)	B	From Leg	0.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 2.95	2.61 2.85	60.00 83.13
KMW AM-X-CD-17-65-00T-RET	C	From Leg	1.50 0.00	0.0000	145.00	No Ice 1/2" Ice 12.27	8.94 10.45	92.35 173.82

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Description	Face or Leg	Offset Type	Offsets: Horiz Lateral Vert	Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>1</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>1</sub> Side ft <sup>2</sup>	Weight lb	
w/2"D x 108"L Pipe (AT&T)			0.00						
25.1"x11.1"x10.7"TMA (AT&T)	C	From Leg	0.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice	2.71 2.95	2.61 2.85	60.00 83.13
***Proposed***									
RFS	A	From Leg	1.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	7.41 7.92	4.08 4.76	92.25 152.45
APX16DWV-16WVS-E-A20 (T-Mobile)									
dd B4 TMA (T-Mobile)	A	From Leg	0.50 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	0.64 0.82	0.52 0.71	22.43 31.59
RFS	B	From Leg	1.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	7.41 7.92	4.08 4.76	92.25 152.45
APX16DWV-16WVS-E-A20 (T-Mobile)									
dd B4 TMA (T-Mobile)	B	From Leg	0.50 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	0.64 0.82	0.52 0.71	22.43 31.59
RFS	C	From Leg	1.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	7.41 7.92	4.08 4.76	92.25 152.45
APX16DWV-16WVS-E-A20 (T-Mobile)									
dd B4 TMA (T-Mobile)	C	From Leg	0.50 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	0.64 0.82	0.52 0.71	22.43 31.59

## Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice+Guy
3	Dead+Wind 30 deg - No Ice+Guy
4	Dead+Wind 60 deg - No Ice+Guy
5	Dead+Wind 90 deg - No Ice+Guy
6	Dead+Wind 120 deg - No Ice+Guy
7	Dead+Wind 150 deg - No Ice+Guy
8	Dead+Wind 180 deg - No Ice+Guy
9	Dead+Wind 210 deg - No Ice+Guy
10	Dead+Wind 240 deg - No Ice+Guy
11	Dead+Wind 270 deg - No Ice+Guy
12	Dead+Wind 300 deg - No Ice+Guy
13	Dead+Wind 330 deg - No Ice+Guy
14	Dead+Ice+Temp+Guy
15	Dead+Wind 0 deg+Ice+Temp+Guy
16	Dead+Wind 30 deg+Ice+Temp+Guy
17	Dead+Wind 60 deg+Ice+Temp+Guy
18	Dead+Wind 90 deg+Ice+Temp+Guy
19	Dead+Wind 120 deg+Ice+Temp+Guy
20	Dead+Wind 150 deg+Ice+Temp+Guy
21	Dead+Wind 180 deg+Ice+Temp+Guy
22	Dead+Wind 210 deg+Ice+Temp+Guy



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Comb. No.	Description
23	Dead+Wind 240 deg+Ice+Temp+Guy
24	Dead+Wind 270 deg+Ice+Temp+Guy
25	Dead+Wind 300 deg+Ice+Temp+Guy
26	Dead+Wind 330 deg+Ice+Temp+Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	200 - 180	Leg	Max Tension	17	3795.73	56.99	-17.89
			Max. Compression	23	-4122.61	13.58	-7.52
			Max. Mx	18	3089.25	63.86	-5.85
			Max. My	21	3794.84	-13.34	58.11
			Max. Vy	18	243.16	-16.90	2.75
			Max. Vx	21	235.85	-3.81	-20.21
		Diagonal	Max Tension	20	507.80	0.00	0.00
			Max. Compression	26	-524.62	0.00	0.00
			Max. Mx	18	-519.26	0.63	0.00
			Max. My	26	-203.29	0.00	0.01
			Max. Vy	18	-1.31	0.00	0.00
			Max. Vx	26	-0.02	0.00	0.00
		Top Girt	Max Tension	17	6.61	0.00	0.00
			Max. Compression	19	-6.51	0.00	0.00
			Max. Mx	14	-0.01	0.81	0.00
			Max. My	26	-5.06	0.00	0.00
			Max. Vy	14	2.16	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	15	292.55	0.00	0.00
			Max. Compression	21	-231.46	0.00	0.00
			Max. Mx	14	14.24	0.81	0.00
			Max. My	26	288.36	0.00	0.00
			Max. Vy	14	2.16	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
Mid Girt	Max Tension	25	6.85	0.00	0.00		
	Max. Compression	19	-6.25	0.00	0.00		
	Max. Mx	14	0.37	0.81	0.00		
	Max. My	26	-4.97	0.00	0.00		
	Max. Vy	14	2.16	0.00	0.00		
	Max. Vx	26	0.00	0.00	0.00		
T2	180 - 172.417	Leg	Max Tension	10	7579.78	-6.76	2.03
			Max. Compression	21	-15833.00	-20.55	18.45
			Max. Mx	18	-3766.31	-98.51	11.40
			Max. My	21	3791.25	5.65	-99.47
			Max. Vy	18	245.69	-98.50	11.40
		Diagonal	Max. Vx	21	238.68	5.65	-99.47
			Max Tension	18	2273.97	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	24	-2383.29	0.00	0.00
			Max. Mx	16	1978.32	0.63	0.00
			Max. My	26	1085.52	0.00	0.01
			Max. Vy	16	1.31	0.00	0.00
			Max. Vx	26	-0.02	0.00	0.00
		Horizontal	Max Tension	21	274.24	0.00	0.00
			Max. Compression	21	-274.24	0.00	0.00
			Max. Mx	14	41.65	-1.08	0.00
			Max. My	26	252.59	0.00	-0.00
			Max. Vy	14	-2.89	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Bottom Girt	Max Tension	15	110.71	0.00	0.00
			Max. Compression	8	-26.16	0.00	0.00
			Max. Mx	23	110.62	-1.08	0.00
			Max. My	26	31.19	0.00	-0.00
			Max. Vy	23	-2.89	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Guy A	Bottom Tension	21	9309.20		
			Top Tension	21	9485.97		
			Top Cable Vert	21	7471.61		
			Top Cable Norm	21	5844.55		
			Top Cable Tan	21	0.14		
			Bot Cable Vert	21	-6905.55		
			Bot Cable Norm	21	6242.96		
			Bot Cable Tan	21	0.14		
		Guy B	Bottom Tension	25	9192.62		
			Top Tension	25	9364.68		
			Top Cable Vert	25	7295.80		
			Top Cable Norm	25	5871.00		
			Top Cable Tan	25	0.03		
			Bot Cable Vert	25	-6738.35		
			Bot Cable Norm	25	6252.91		
			Bot Cable Tan	25	0.03		
		Guy C	Bottom Tension	17	8991.56		
			Top Tension	17	9154.19		
			Top Cable Vert	17	6961.45		
			Top Cable Norm	17	5944.52		
			Top Cable Tan	17	0.08		
			Bot Cable Vert	17	-6422.45		
			Bot Cable Norm	17	6292.88		
			Bot Cable Tan	17	0.08		
		Top Guy Pull-Off	Max Tension	20	3368.46	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	978.87	0.81	0.00
			Max. My	26	2702.64	0.00	0.00
			Max. Vy	14	2.16	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T3	172.417 - 167.583	Leg	Max Tension	23	15241.44	-14.18	4.94
			Max. Compression	21	-23862.94	-23.21	12.08
			Max. Mx	26	-3862.17	-39.34	-12.82
			Max. My	22	-4123.48	8.84	40.60
			Max. Vy	25	90.02	9.54	-6.11
			Max. Vx	22	-97.10	-21.02	-13.93
		Diagonal	Max Tension	24	2031.05	0.00	0.00
			Max. Compression	18	-2091.81	0.00	0.00
			Max. Mx	16	1906.47	0.63	0.00
			Max. My	26	1015.35	0.00	0.01
			Max. Vy	16	-1.31	0.00	0.00
			Max. Vx	26	-0.02	0.00	0.00
		Mid Girt	Max Tension	22	166.96	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft	
T4	167.583 - 160	Leg	Max. Compression	11	-104.02	0.00	0.00	
			Max. Mx	14	17.58	0.81	0.00	
			Max. My	26	-57.83	0.00	0.00	
			Max. Vy	14	2.16	0.00	0.00	
			Max. Vx	26	0.00	0.00	0.00	
			Max Tension	15	22657.59	0.03	81.38	
			Max. Compression	21	-31575.27	-29.83	22.52	
			Max. Mx	24	-27778.47	99.14	-49.68	
			Max. My	15	-17578.60	24.60	100.30	
			Max. Vy	24	350.19	99.14	-49.68	
			Max. Vx	15	339.61	24.58	100.29	
			Diagonal	Max Tension	24	1463.85	0.00	0.00
				Max. Compression	18	-1564.14	0.00	0.00
				Max. Mx	16	1338.62	0.63	0.00
				Max. My	26	676.78	0.00	0.01
		Max. Vy		16	1.30	0.00	0.00	
		Max. Vx		26	-0.02	0.00	0.00	
		Horizontal	Max Tension	21	546.90	0.00	0.00	
			Max. Compression	21	-546.90	0.00	0.00	
			Max. Mx	17	-33.32	-1.08	0.00	
			Max. My	26	491.73	0.00	-0.00	
			Max. Vy	17	-2.89	0.00	0.00	
			Max. Vx	26	-0.00	0.00	0.00	
		Top Girt	Max Tension	22	241.85	0.00	0.00	
			Max. Compression	6	-177.74	0.00	0.00	
			Max. Mx	14	26.31	-1.08	0.00	
			Max. My	26	-93.67	0.00	-0.00	
			Max. Vy	14	-2.89	0.00	0.00	
			Max. Vx	26	-0.00	0.00	0.00	
		Bottom Girt	Max Tension	25	558.12	0.00	0.00	
Max. Compression	19		-483.53	0.00	0.00			
Max. Mx	17		-274.47	0.81	0.00			
Max. My	12		444.90	0.00	-0.00			
Max. Vy	17		2.16	0.00	0.00			
Max. Vx	12		0.00	0.00	0.00			
T5	160 - 152.417	Leg	Max Tension	15	25102.86	-13.84	-16.69	
			Max. Compression	21	-34093.92	56.61	23.69	
			Max. Mx	18	19719.09	139.55	-3.62	
			Max. My	21	9330.67	-10.21	136.16	
			Max. Vy	18	-342.66	25.67	7.05	
			Max. Vx	15	334.67	23.34	-12.59	
			Diagonal	Max Tension	24	1100.99	0.00	0.00
				Max. Compression	18	-1191.01	0.00	0.00
				Max. Mx	20	156.51	0.63	0.00
				Max. My	20	114.40	0.00	-0.01
				Max. Vy	20	1.31	0.00	0.00
				Max. Vx	20	0.02	0.00	0.00
			Horizontal	Max Tension	21	590.52	0.00	0.00
				Max. Compression	21	-590.52	0.00	0.00
				Max. Mx	24	106.97	-1.08	0.00
		Max. My		26	532.77	0.00	0.00	
		Max. Vy		24	-2.89	0.00	0.00	
		Max. Vx		26	0.00	0.00	0.00	
		Top Girt	Max Tension	19	454.95	0.00	0.00	
			Max. Compression	25	-490.03	0.00	0.00	
			Max. Mx	17	240.81	0.81	0.00	
			Max. My	20	101.27	0.00	0.00	
			Max. Vy	17	-2.16	0.00	0.00	
			Max. Vx	20	-0.00	0.00	0.00	
		Bottom Girt	Max Tension	15	199.82	0.00	0.00	
			Max. Compression	9	-75.17	0.00	0.00	

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft	
T6	152.417 - 147.583	Leg	Max. Mx	25	-52.37	-1.08	0.00	
			Max. My	20	12.36	0.00	0.00	
			Max. Vy	25	-2.89	0.00	0.00	
			Max. Vx	20	0.00	0.00	0.00	
			Max Tension	15	24755.22	13.07	-22.97	
			Max. Compression	21	-33781.76	56.18	22.03	
		Diagonal	Max. Mx	22	-30463.16	-63.96	0.49	
			Max. My	19	-19044.44	12.22	60.40	
			Max. Vy	21	-93.09	-56.30	22.21	
			Max. Vx	24	-88.78	-13.20	-52.64	
			Max Tension	19	562.57	0.00	0.00	
			Max. Compression	25	-744.73	0.00	0.00	
			Max. Mx	20	515.77	0.63	0.00	
			Max. My	20	-68.05	0.00	-0.01	
			Max. Vy	20	1.31	0.00	0.00	
			Max. Vx	20	0.02	0.00	0.00	
			Horizontal	Max Tension	21	585.12	0.00	0.00
				Max. Compression	21	-585.12	0.00	0.00
		Max. Mx		14	52.59	1.01	0.00	
		Max. My		26	528.85	0.00	-0.00	
		Max. Vy		14	-2.69	0.00	0.00	
		Max. Vx		26	0.00	0.00	0.00	
		Mid Girt	Max Tension	15	197.77	0.00	0.00	
			Max. Compression	9	-72.71	0.00	0.00	
			Max. Mx	14	41.10	0.81	0.00	
			Max. My	20	14.47	0.00	-0.00	
			Max. Vy	14	2.16	0.00	0.00	
			Max. Vx	20	-0.00	0.00	0.00	
T7	147.583 - 140	Leg	Max Tension	15	22918.59	11.10	-21.21	
			Max. Compression	21	-32001.95	54.78	24.26	
			Max. Mx	18	10063.94	283.71	-12.86	
			Max. My	21	-21877.04	-4.60	274.02	
			Max. Vy	24	-1028.81	66.64	-8.32	
			Max. Vx	21	1034.78	-28.65	-70.55	
		Diagonal	Max Tension	24	2963.19	0.00	0.00	
			Max. Compression	18	-3086.06	0.00	0.00	
			Max. Mx	20	2725.59	0.63	0.00	
			Max. My	20	-1414.23	0.00	-0.01	
			Max. Vy	20	1.32	0.00	0.00	
			Max. Vx	20	0.03	0.00	0.00	
		Horizontal	Max Tension	12	643.32	0.00	0.00	
			Max. Compression	6	-585.39	0.00	0.00	
			Max. Mx	14	60.15	1.01	0.00	
			Max. My	26	503.57	0.00	-0.00	
			Max. Vy	14	-2.69	0.00	0.00	
			Max. Vx	26	0.00	0.00	0.00	
		Top Girt	Max Tension	15	200.88	0.00	0.00	
			Max. Compression	9	-68.95	0.00	0.00	
			Max. Mx	14	41.86	-1.08	0.00	
			Max. My	20	27.58	0.00	0.00	
			Max. Vy	14	-2.89	0.00	0.00	
			Max. Vx	20	0.00	0.00	0.00	
		Bottom Girt	Max Tension	19	1202.27	0.00	0.00	
			Max. Compression	25	-1246.65	0.00	0.00	
			Max. Mx	14	17.20	0.81	0.00	
			Max. My	26	975.68	0.00	-0.00	
			Max. Vy	14	2.16	0.00	0.00	
			Max. Vx	26	-0.00	0.00	0.00	
T8	140 - 120	Leg	Max Tension	21	34603.03	548.90	-27.86	
			Max. Compression	23	-44876.30	98.01	46.60	

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	21	34603.03	548.90	-27.86
			Max. My	20	-8429.91	55.30	373.54
			Max. Vy	21	1966.94	-106.39	-18.32
			Max. Vx	20	1298.15	27.27	-58.74
		Diagonal	Max Tension	24	5242.83	0.00	0.00
			Max. Compression	18	-5351.34	0.00	0.00
			Max. Mx	20	2712.64	0.63	0.00
			Max. My	26	-1484.94	0.00	0.01
			Max. Vy	20	-1.32	0.00	0.00
			Max. Vx	26	-0.03	0.00	0.00
		Horizontal	Max Tension	23	777.28	0.00	0.00
			Max. Compression	23	-777.28	0.00	0.00
			Max. Mx	17	449.98	1.01	0.00
			Max. My	26	665.87	0.00	-0.00
			Max. Vy	17	-2.69	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Top Girt	Max Tension	25	1470.06	0.00	0.00
			Max. Compression	19	-1335.80	0.00	0.00
			Max. Mx	14	18.07	0.81	0.00
			Max. My	26	-1077.99	0.00	-0.00
			Max. Vy	14	2.16	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Bottom Girt	Max Tension	19	2308.75	0.00	0.00
			Max. Compression	25	-1879.80	0.00	0.00
			Max. Mx	14	74.02	0.81	0.00
			Max. My	26	2044.72	0.00	-0.00
			Max. Vy	14	2.16	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Mid Girt	Max Tension	15	130.09	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	52.54	0.81	0.00
			Max. My	26	25.53	0.00	-0.00
			Max. Vy	14	2.16	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T9	120 - 100	Leg	Max Tension	21	34599.70	-106.39	-18.32
			Max. Compression	23	-44880.04	684.14	53.73
			Max. Mx	21	34597.81	-770.85	-10.87
			Max. My	26	-8251.78	-87.85	515.42
			Max. Vy	21	1994.39	-770.85	-10.87
			Max. Vx	20	1296.14	-1.27	-490.38
		Diagonal	Max Tension	22	2577.44	0.00	0.00
			Max. Compression	16	-2863.70	0.00	0.00
			Max. Mx	22	-1096.33	0.63	0.00
			Max. My	26	240.81	0.00	0.01
			Max. Vy	22	-1.31	0.00	0.00
			Max. Vx	26	-0.02	0.00	0.00
		Horizontal	Max Tension	23	842.98	0.00	0.00
			Max. Compression	23	-777.35	0.00	0.00
			Max. Mx	17	485.30	1.01	0.00
			Max. My	26	671.09	0.00	-0.00
			Max. Vy	17	-2.69	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	17	789.75	0.00	0.00
			Max. Compression	23	-722.33	0.00	0.00
			Max. Mx	14	21.89	0.81	0.00
			Max. My	20	680.62	0.00	-0.00
			Max. Vy	14	2.16	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Mid Girt	Max Tension	26	231.35	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	99.72	0.81	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	20	190.76	0.00	-0.00
			Max. Vy	14	2.16	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Guy A	Bottom Tension	21	13879.00		
			Top Tension	21	14042.35		
			Top Cable Vert	21	8992.81		
			Top Cable Norm	21	10785.04		
			Top Cable Tan	21	0.39		
			Bot Cable Vert	21	-8516.30		
			Bot Cable Norm	21	10958.99		
			Bot Cable Tan	21	0.39		
		Guy B	Bottom Tension	25	13698.42		
			Top Tension	25	13855.26		
			Top Cable Vert	25	8657.15		
			Top Cable Norm	25	10817.67		
			Top Cable Tan	25	0.64		
			Bot Cable Vert	25	-8192.77		
			Bot Cable Norm	25	10978.40		
			Bot Cable Tan	25	0.64		
		Guy C	Bottom Tension	17	13390.14		
			Top Tension	17	13533.94		
			Top Cable Vert	17	8002.13		
			Top Cable Norm	17	10914.82		
			Top Cable Tan	17	0.21		
			Bot Cable Vert	17	-7563.34		
			Bot Cable Norm	17	11049.51		
			Bot Cable Tan	17	0.21		
		Top Guy Pull-Off	Max Tension	15	5709.55	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	687.64	0.81	0.00
			Max. My	26	3249.24	0.00	-0.00
			Max. Vy	17	2.16	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T10	100 - 80	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-15647.07	18.02	-101.84
			Max. Mx	18	-6445.31	141.13	-2.61
			Max. My	21	-6008.21	-44.22	128.73
			Max. Vy	18	-522.22	-32.62	25.22
			Max. Vx	21	-555.52	-23.08	-56.14
		Diagonal	Max Tension	16	1284.38	0.00	0.00
			Max. Compression	22	-1314.11	0.00	0.00
			Max. Mx	20	433.61	0.63	0.00
			Max. My	26	224.14	0.00	0.01
			Max. Vy	20	-1.30	0.00	0.00
			Max. Vx	26	-0.02	0.00	0.00
		Top Girt	Max Tension	23	660.42	0.00	0.00
			Max. Compression	17	-605.56	0.00	0.00
			Max. Mx	14	20.55	0.81	0.00
			Max. My	20	-524.10	0.00	-0.00
			Max. Vy	14	2.16	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Bottom Girt	Max Tension	18	355.94	0.00	0.00
			Max. Compression	24	-264.89	0.00	0.00
			Max. Mx	14	24.85	0.81	0.00
			Max. My	20	-210.51	0.00	-0.00
			Max. Vy	14	2.16	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Mid Girt	Max Tension	26	69.42	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	30.60	0.81	0.00
			Max. My	20	60.31	0.00	-0.00

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	Client	T-Mobile	Designed by	Ahmet Colakoglu

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T11	80 - 72.4167	Leg	Max. Vy	14	2.16	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	20	-14910.12	-1.36	-34.60
			Max. Mx	24	-11521.82	87.98	-25.64
			Max. My	26	-10644.54	36.65	81.78
		Diagonal	Max. Vy	18	270.04	-75.74	-5.45
			Max. Vx	15	-227.21	10.74	62.13
			Max Tension	24	873.84	0.00	0.00
			Max. Compression	18	-1153.98	0.00	0.00
			Max. Mx	22	549.16	0.63	0.00
			Max. My	26	109.21	0.00	0.01
		Horizontal	Max. Vy	22	1.30	0.00	0.00
			Max. Vx	26	-0.02	0.00	0.00
			Max Tension	20	258.25	0.00	0.00
			Max. Compression	20	-258.25	0.00	0.00
			Max. Mx	25	224.87	-1.08	0.00
			Max. My	20	258.25	0.00	0.00
		Top Girt	Max. Vy	25	-2.89	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
			Max Tension	24	363.93	0.00	0.00
			Max. Compression	19	-338.52	0.00	0.00
			Max. Mx	17	-126.18	0.81	0.00
			Max. My	20	302.49	0.00	-0.00
		Bottom Girt	Max. Vy	17	2.16	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
			Max Tension	25	146.53	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
Max. Mx	25		95.53	-1.08	0.00		
Max. My	20		142.43	0.00	0.00		
T12	72.4167 - 67.5833	Leg	Max. Vy	25	-2.89	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
			Max Tension	1	0.00	0.00	0.00
		Diagonal	Max. Compression	15	-19678.12	-29.89	27.29
			Max. Mx	22	-19059.68	41.00	5.95
			Max. My	26	-18069.28	0.92	45.35
			Max. Vy	20	-63.39	-40.89	8.86
			Max. Vx	25	67.80	2.86	43.39
			Max Tension	18	1250.66	0.00	0.00
		Mid Girt	Max. Compression	18	-1413.53	0.00	0.00
			Max. Mx	22	939.84	0.63	0.00
			Max. My	20	502.14	0.00	-0.01
Max. Vy	22		1.30	0.00	0.00		
Max. Vx	20		-0.02	0.00	0.00		
Max Tension	25		105.46	0.00	0.00		
T13	67.5833 - 60	Leg	Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	53.70	0.81	0.00
			Max. My	20	98.95	0.00	-0.00
		Diagonal	Max. Vy	14	2.16	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
			Max Tension	21	6885.57	-18.68	222.16
			Max. Compression	15	-30844.72	-41.29	32.47
			Max. Mx	18	4358.58	239.23	9.66
			Max. My	21	5817.64	-18.68	222.16
		Diagonal	Max. Vy	18	786.54	-22.69	8.73
			Max. Vx	21	769.35	-11.00	-34.04
			Max Tension	24	2256.32	0.00	0.00
Max. Compression	18		-2526.82	0.00	0.00		
Max. Mx	22		1183.25	0.63	0.00		
Max. My	26		620.63	0.00	0.01		

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	<b>Client</b> T-Mobile	<b>Designed by</b> Ahmet Colakoglu

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft	
T14	60 - 52.4167	Horizontal	Max. Vy	22	1.30	0.00	0.00	
			Max. Vx	26	-0.02	0.00	0.00	
			Max Tension	15	534.25	0.00	0.00	
			Max. Compression	15	-534.25	0.00	0.00	
			Max. Mx	20	200.05	-1.08	0.00	
			Max. My	26	499.72	0.00	0.00	
			Max. Vy	20	-2.89	0.00	0.00	
			Max. Vx	26	0.00	0.00	0.00	
			Top Girt	Max Tension	24	142.89	0.00	0.00
				Max. Compression	1	0.00	0.00	0.00
				Max. Mx	14	78.12	-1.08	0.00
				Max. My	20	139.19	0.00	0.00
		Max. Vy		14	-2.89	0.00	0.00	
		Max. Vx		20	0.00	0.00	0.00	
		Bottom Girt	Max Tension	19	1171.56	0.00	0.00	
			Max. Compression	25	-899.79	0.00	0.00	
			Max. Mx	14	59.29	0.81	0.00	
			Max. My	26	-800.05	0.00	-0.00	
			Max. Vy	14	2.16	0.00	0.00	
			Max. Vx	26	0.00	0.00	0.00	
			Leg	Max Tension	21	6883.69	-11.00	-34.04
				Max. Compression	15	-30846.56	-43.80	268.01
				Max. Mx	24	4511.69	309.51	-9.56
				Max. My	15	-2280.44	-19.58	294.82
				Max. Vy	18	789.42	-285.58	7.93
				Max. Vx	21	774.01	-3.56	-291.81
		Diagonal		Max Tension	22	2356.16	0.00	0.00
				Max. Compression	16	-2739.56	0.00	0.00
				Max. Mx	17	1596.02	0.63	0.00
				Max. My	26	-1169.22	0.00	0.01
				Max. Vy	17	-1.30	0.00	0.00
				Max. Vx	26	0.02	0.00	0.00
		Horizontal	Max Tension	15	534.28	0.00	0.00	
			Max. Compression	15	-534.28	0.00	0.00	
			Max. Mx	17	369.03	-1.08	0.00	
			Max. My	26	499.75	0.00	-0.00	
			Max. Vy	17	-2.89	0.00	0.00	
			Max. Vx	26	-0.00	0.00	0.00	
		Bottom Girt	Max Tension	25	162.82	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
			Max. Mx	14	92.29	-1.08	0.00	
			Max. My	26	107.25	0.00	-0.00	
Max. Vy	14		-2.89	0.00	0.00			
Max. Vx	26		-0.00	0.00	0.00			
Guy A	Bottom Tension	21	7824.12					
	Top Tension	21	7886.65					
	Top Cable Vert	21	3143.66					
	Top Cable Norm	21	7233.02					
	Top Cable Tan	21	0.49					
	Bot Cable Vert	21	-2917.43					
	Bot Cable Norm	21	7259.85					
	Bot Cable Tan	21	0.49					
	Guy B	Bottom Tension	25	7770.85				
		Top Tension	25	7828.55				
Top Cable Vert		25	2915.79					
Top Cable Norm		25	7265.28					
Top Cable Tan		25	0.66					
Bot Cable Vert		25	-2699.64					
Bot Cable Norm		25	7286.83					
Bot Cable Tan		25	0.66					
Guy C	Bottom Tension	17	7652.81					



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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft	
T15	52.4167 - 47.5833	Top Guy Pull-Off	Top Tension	17	7700.85			
			Top Cable Vert	17	2446.58			
			Top Cable Norm	17	7301.87			
			Top Cable Tan	17	0.16			
			Bot Cable Vert	17	-2248.54			
			Bot Cable Norm	17	7315.02			
			Bot Cable Tan	17	0.16			
			Max Tension	20	3943.01	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
			Max. Mx	14	1594.47	0.81	0.00	
			Max. My	26	3272.33	0.00	-0.00	
		Max. Vy	14	2.16	0.00	0.00		
		Max. Vx	26	0.00	0.00	0.00		
		Leg	Max Tension	1	0.00	0.00	0.00	
			Max. Compression	21	-17544.08	-37.42	23.12	
			Max. Mx	22	-16376.18	38.30	11.29	
			Max. My	24	-16272.14	1.24	-44.33	
			Max. Vy	18	-62.25	-36.56	3.40	
			Max. Vx	23	66.46	-0.13	-43.24	
			Diagonal	Max Tension	22	1940.71	0.00	0.00
				Max. Compression	22	-2117.94	0.00	0.00
				Max. Mx	17	1585.06	0.63	0.00
				Max. My	20	-887.34	0.00	-0.01
Max. Vy	17			-1.30	0.00	0.00		
Mid Girt	Max. Vx		20	0.02	0.00	0.00		
	Max Tension	25	134.90	0.00	0.00			
	Max. Compression	1	0.00	0.00	0.00			
	Max. Mx	14	64.30	0.81	0.00			
	Max. My	26	69.75	0.00	0.00			
T16	47.5833 - 40	Leg	Max. Vy	14	2.16	0.00	0.00	
			Max. Vx	26	0.00	0.00	0.00	
			Max Tension	23	655.50	145.98	-66.21	
			Max. Compression	21	-28490.23	-43.48	12.97	
			Max. Mx	24	-26096.37	182.52	-41.98	
			Max. My	15	-20114.89	20.41	187.71	
			Max. Vy	24	531.31	182.52	-41.98	
			Max. Vx	15	513.75	20.41	187.71	
			Diagonal	Max Tension	22	1568.22	0.00	0.00
				Max. Compression	16	-1894.20	0.00	0.00
				Max. Mx	16	1552.47	0.63	0.00
		Max. My		26	-945.06	0.00	0.01	
		Max. Vy		16	1.30	0.00	0.00	
		Horizontal	Max. Vx	26	0.02	0.00	0.00	
			Max Tension	21	493.47	0.00	0.00	
			Max. Compression	21	-493.47	0.00	0.00	
			Max. Mx	17	208.04	-1.08	0.00	
			Max. My	26	451.44	0.00	-0.00	
		Top Girt	Max. Vy	17	-2.89	0.00	0.00	
			Max. Vx	26	-0.00	0.00	0.00	
			Max Tension	22	179.82	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
			Max. Mx	14	93.29	-1.08	0.00	
Bottom Girt	Max. My	26	107.47	0.00	-0.00			
	Max. Vy	14	-2.89	0.00	0.00			
	Max. Vx	26	-0.00	0.00	0.00			
	Max Tension	17	807.61	0.00	0.00			
	Max. Compression	23	-642.15	0.00	0.00			
	Max. Mx	25	-325.68	0.81	0.00			
	Max. My	26	-531.30	0.00	0.00			
Max. Vy	25	2.16	0.00	0.00				

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T17	40 - 20	Leg	Max. Vx	26	0.00	0.00	0.00
			Max Tension	23	8385.77	-31.76	-20.28
			Max. Compression	21	-36435.25	87.42	16.03
			Max. Mx	24	-12174.66	-201.86	-12.74
			Max. My	21	-6033.66	1.28	206.67
			Max. Vy	24	532.03	5.65	-39.05
		Diagonal	Max. Vx	15	516.85	25.16	16.72
			Max Tension	16	1467.87	0.00	0.00
			Max. Compression	22	-1781.34	0.00	0.00
			Max. Mx	24	360.77	0.63	0.00
			Max. My	26	-283.32	0.00	0.01
			Max. Vy	24	-1.31	0.00	0.00
		Horizontal	Max. Vx	26	-0.02	0.00	0.00
			Max Tension	21	631.08	0.00	0.00
			Max. Compression	21	-631.08	0.00	0.00
			Max. Mx	17	105.60	1.01	0.00
			Max. My	26	574.60	0.00	-0.00
			Max. Vy	17	-2.69	0.00	0.00
		Top Girt	Max. Vx	26	0.00	0.00	0.00
			Max Tension	23	703.90	0.00	0.00
			Max. Compression	17	-635.54	0.00	0.00
			Max. Mx	25	399.42	0.81	0.00
			Max. My	26	615.01	0.00	0.00
			Max. Vy	25	2.16	0.00	0.00
		Bottom Girt	Max. Vx	26	0.00	0.00	0.00
			Max Tension	19	297.09	0.00	0.00
			Max. Compression	25	-218.13	0.00	0.00
			Max. Mx	14	51.05	0.81	0.00
			Max. My	20	-127.35	0.00	-0.00
			Max. Vy	14	2.16	0.00	0.00
		Mid Girt	Max. Vx	20	-0.00	0.00	0.00
			Max Tension	23	277.14	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
Max. Mx	17		88.00	0.81	0.00		
Max. My	20		180.47	0.00	-0.00		
Max. Vy	17		2.16	0.00	0.00		
T18	20 - 11.6667	Leg	Max. Vx	20	-0.00	0.00	0.00
			Max Tension	23	7035.94	-5.52	26.83
			Max. Compression	21	-35542.36	-42.64	-48.18
			Max. Mx	19	-24154.34	91.38	-3.70
			Max. My	22	-13225.09	-23.00	86.37
			Max. Vy	24	-191.61	63.11	-39.16
		Diagonal	Max. Vx	21	218.54	3.30	-24.25
			Max Tension	24	853.71	0.00	0.00
			Max. Compression	18	-1322.46	0.00	0.00
			Max. Mx	24	853.71	0.66	0.00
			Max. My	26	-685.07	0.00	0.01
			Max. Vy	24	-1.32	0.00	0.00
		Horizontal	Max. Vx	26	-0.03	0.00	0.00
			Max Tension	21	615.61	0.00	0.00
			Max. Compression	21	-615.61	0.00	0.00
			Max. Mx	17	105.80	1.01	0.00
			Max. My	26	562.34	0.00	-0.00
			Max. Vy	17	-2.69	0.00	0.00
Top Girt	Max. Vx	26	0.00	0.00	0.00		
	Max Tension	25	386.59	0.00	0.00		
	Max. Compression	19	-249.79	0.00	0.00		
	Max. Mx	14	41.06	0.81	0.00		
	Max. My	20	262.06	0.00	-0.00		
	Max. Vy	14	2.16	0.00	0.00		
			Max. Vx	20	-0.00	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T19	11.6667 - 5	Leg	Max Tension	23	532.65	11.97	44.87
			Max. Compression	21	-29051.76	81.19	10.12
			Max. Mx	26	-7404.36	119.04	8.04
			Max. My	26	-21463.06	-56.73	119.23
			Max. Vy	26	-143.12	119.04	8.04
			Max. Vx	26	-150.53	-56.73	119.23
		Diagonal	Max Tension	18	1412.91	0.00	0.00
			Max. Compression	24	-1822.84	0.00	0.00
			Max. Mx	22	1328.22	0.66	0.00
			Max. My	26	-1165.48	0.00	0.01
			Max. Vy	22	1.32	0.00	0.00
			Max. Vx	26	0.03	0.00	0.00
		Horizontal	Max Tension	21	503.19	0.00	0.00
			Max. Compression	21	-503.19	0.00	0.00
			Max. Mx	17	177.29	1.01	0.00
			Max. My	26	467.59	0.00	-0.00
			Max. Vy	17	-2.69	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Top Girt	Max Tension	22	242.54	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	126.59	0.81	0.00
			Max. My	26	141.80	0.00	-0.00
			Max. Vy	14	2.16	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T20	5 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-22199.25	-5.24	161.56
			Max. Mx	23	-7262.04	51.15	-77.87
			Max. My	20	-14454.09	1.47	235.03
			Max. Vy	26	-46.18	-5.56	88.22
			Max. Vx	20	-315.62	1.47	235.03
		Diagonal	Max Tension	1	0.00	0.00	0.00
			Max. Compression	20	-1711.55	0.00	0.00
			Max. Mx	24	-390.95	0.53	0.00
			Max. My	26	-444.52	0.00	0.01
			Max. Vy	24	-1.16	0.00	0.00
			Max. Vx	26	-0.03	0.00	0.00
		Horizontal	Max Tension	20	451.97	0.00	0.00
			Max. Compression	21	-388.77	0.00	0.00
			Max. Mx	14	184.40	0.46	0.00
			Max. My	26	370.07	0.00	-0.00
			Max. Vy	14	1.62	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Top Girt	Max Tension	25	2420.46	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	1140.60	0.81	0.00
			Max. My	26	1154.02	0.00	-0.00
			Max. Vy	17	2.16	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	22	43775.22	495.22	-911.72
	Max. H <sub>x</sub>	24	43496.56	1047.50	28.08
	Max. H <sub>z</sub>	15	42812.77	-6.89	1050.58

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Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Guy C @ 155 ft Elev 10 ft Azimuth 240 deg	Max. M <sub>x</sub>	1	0.00	-0.59	0.42
	Max. M <sub>y</sub>	1	0.00	-0.59	0.42
	Max. Torsion	26	106.35	544.89	903.80
	Min. Vert	1	21168.95	-0.59	0.42
	Min. H <sub>x</sub>	18	42719.56	-1073.06	30.48
	Min. H <sub>y</sub>	21	43307.10	-1.47	-1068.17
	Min. M <sub>x</sub>	1	0.00	-0.59	0.42
	Min. M <sub>y</sub>	1	0.00	-0.59	0.42
	Min. Torsion	20	-126.94	-506.16	-912.80
	Max. Vert	10	-565.27	-610.15	352.26
Guy B @ 155 ft Elev 0 ft Azimuth 120 deg	Max. H <sub>x</sub>	10	-565.27	-610.15	352.26
	Max. H <sub>y</sub>	17	-16234.33	-21354.17	12328.32
	Min. Vert	17	-16234.33	-21354.17	12328.32
	Min. H <sub>x</sub>	17	-16234.33	-21354.17	12328.32
	Min. H <sub>y</sub>	10	-565.27	-610.15	352.26
Guy A @ 155 ft Elev -5 ft Azimuth 0 deg	Max. Vert	6	-722.99	679.12	391.98
	Max. H <sub>x</sub>	25	-17630.76	21234.01	12257.92
	Max. H <sub>y</sub>	25	-17630.76	21234.01	12257.92
	Min. Vert	25	-17630.76	21234.01	12257.92
	Min. H <sub>x</sub>	6	-722.99	679.12	391.98
Guy A @ 155 ft Elev -5 ft Azimuth 0 deg	Min. H <sub>y</sub>	6	-722.99	679.12	391.98
	Max. Vert	2	-807.14	0.09	-824.30
	Max. H <sub>x</sub>	24	-9858.85	1073.40	-12784.46
	Max. H <sub>y</sub>	2	-807.14	0.09	-824.30
	Min. Vert	21	-18339.28	0.74	-24461.80
Guy A @ 155 ft Elev -5 ft Azimuth 0 deg	Min. H <sub>x</sub>	18	-10048.56	-1070.77	-12989.60
	Min. H <sub>y</sub>	21	-18339.28	0.74	-24461.80

### Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>y</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>y</sub> lb-ft	Torque lb-ft
Dead Only	21168.95	0.59	-0.42	0.00	0.00	3.83
Dead+Wind 0 deg - No Ice+Guy	27670.34	2.88	-731.87	0.00	0.00	-30.83
Dead+Wind 30 deg - No Ice+Guy	27258.97	382.17	-633.62	0.00	0.00	23.48
Dead+Wind 60 deg - No Ice+Guy	26699.95	654.30	-377.47	0.00	0.00	43.44
Dead+Wind 90 deg - No Ice+Guy	27307.07	739.63	-15.15	0.00	0.00	52.89
Dead+Wind 120 deg - No Ice+Guy	27860.34	634.33	360.92	0.00	0.00	80.07
Dead+Wind 150 deg - No Ice+Guy	27811.72	354.34	635.53	0.00	0.00	87.28
Dead+Wind 180 deg - No Ice+Guy	27269.97	-0.12	743.46	0.00	0.00	42.90
Dead+Wind 210 deg - No Ice+Guy	27997.58	-351.18	635.50	0.00	0.00	-12.01
Dead+Wind 240 deg - No Ice+Guy	28322.79	-627.61	361.22	0.00	0.00	-31.80

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Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
Ice+Guy						
Dead+Wind 270 deg - No	27815.58	-730.19	-13.86	0.00	0.00	-42.23
Ice+Guy						
Dead+Wind 300 deg - No	27080.37	-647.74	-372.63	0.00	0.00	-69.61
Ice+Guy						
Dead+Wind 330 deg - No	27583.04	-376.05	-627.99	0.00	0.00	-75.06
Ice+Guy						
Dead+Ice+Temp+Guy	31109.68	2.07	-1.65	0.00	0.00	6.32
Dead+Wind 0	42812.77	6.89	-1050.58	0.00	0.00	-54.51
deg+Ice+Temp+Guy						
Dead+Wind 30	42641.83	560.72	-916.98	0.00	0.00	14.94
deg+Ice+Temp+Guy						
Dead+Wind 60	42324.94	953.80	-550.67	0.00	0.00	31.72
deg+Ice+Temp+Guy						
Dead+Wind 90	42719.56	1073.06	-30.48	0.00	0.00	42.72
deg+Ice+Temp+Guy						
Dead+Wind 120	43087.30	907.72	510.79	0.00	0.00	96.52
deg+Ice+Temp+Guy						
Dead+Wind 150	43501.71	506.16	912.80	0.00	0.00	126.94
deg+Ice+Temp+Guy						
Dead+Wind 180	43307.10	1.47	1068.17	0.00	0.00	74.75
deg+Ice+Temp+Guy						
Dead+Wind 210	43775.22	-495.22	911.72	0.00	0.00	4.67
deg+Ice+Temp+Guy						
Dead+Wind 240	43728.25	-885.06	508.15	0.00	0.00	-12.35
deg+Ice+Temp+Guy						
Dead+Wind 270	43496.56	-1047.50	-28.08	0.00	0.00	-23.39
deg+Ice+Temp+Guy						
Dead+Wind 300	42979.32	-934.76	-538.82	0.00	0.00	-76.84
deg+Ice+Temp+Guy						
Dead+Wind 330	43148.27	-544.89	-903.80	0.00	0.00	-106.35
deg+Ice+Temp+Guy						
Dead+Wind 0 deg -	21420.71	0.89	-216.49	0.00	0.00	-8.01
Service+Guy						
Dead+Wind 30 deg -	21440.47	109.01	-187.39	0.00	0.00	11.81
Service+Guy						
Dead+Wind 60 deg -	21475.16	187.90	-108.49	0.00	0.00	18.40
Service+Guy						
Dead+Wind 90 deg -	21447.80	216.88	-0.83	0.00	0.00	21.25
Service+Guy						
Dead+Wind 120 deg -	21434.32	188.06	107.17	0.00	0.00	30.82
Service+Guy						
Dead+Wind 150 deg -	21470.52	108.45	185.98	0.00	0.00	33.04
Service+Guy						
Dead+Wind 180 deg -	21518.88	0.33	214.81	0.00	0.00	16.41
Service+Guy						
Dead+Wind 210 deg -	21495.07	-107.63	186.29	0.00	0.00	-3.59
Service+Guy						
Dead+Wind 240 deg -	21478.99	-186.88	107.73	0.00	0.00	-10.30
Service+Guy						
Dead+Wind 270 deg -	21490.50	-215.48	-0.07	0.00	0.00	-13.02
Service+Guy						
Dead+Wind 300 deg -	21509.72	-186.31	-107.75	0.00	0.00	-22.26
Service+Guy						
Dead+Wind 330 deg -	21458.70	-107.27	-186.94	0.00	0.00	-24.46
Service+Guy						

### Solution Summary

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-8159.72	0.00	-0.45	8159.73	0.62	0.009%
2	-11.37	-8257.55	-13402.19	11.31	8257.51	13400.61	0.010%
3	6619.79	-8137.84	-11508.80	-6620.06	8137.81	11507.39	0.009%
4	11446.07	-8022.00	-6629.28	-11447.06	8022.03	6630.41	0.010%
5	13243.63	-8144.92	5.86	-13242.62	8144.89	-4.96	0.009%
6	11566.09	-8270.45	6711.70	-11564.81	8270.41	-6710.86	0.010%
7	6636.75	-8166.81	11526.46	-6635.40	8166.78	-11525.85	0.010%
8	11.37	-8061.89	13273.18	-12.81	8061.91	-13274.07	0.011%
9	-6619.79	-8181.61	11508.80	6618.22	8181.58	-11508.16	0.011%
10	-11557.79	-8297.44	6693.78	11556.56	8297.41	-6693.04	0.009%
11	-13243.63	-8174.53	-5.86	13242.39	8174.49	6.90	0.010%
12	-11454.37	-8048.99	-6647.20	11454.22	8049.00	6648.74	0.010%
13	-6636.75	-8152.64	-11526.46	6636.93	8152.61	11524.96	0.010%
14	0.00	-14895.48	0.00	-0.83	14895.48	1.02	0.009%
15	-21.94	-15120.27	-20129.02	21.86	15120.22	20126.95	0.008%
16	9994.74	-14844.94	-17373.46	-9995.20	14844.91	17371.79	0.007%
17	17317.02	-14578.65	-10029.60	-17317.52	14578.65	10030.99	0.006%
18	19991.68	-14861.36	9.28	-19990.54	14861.33	-8.09	0.007%
19	17369.65	-15150.14	10085.31	-17367.96	15150.09	-10084.20	0.008%
20	10026.43	-14911.90	17409.79	-10024.42	14911.86	-17409.11	0.009%
21	21.94	-14670.69	20085.33	-24.26	14670.68	-20085.78	0.010%
22	-9994.74	-14946.02	17373.46	9992.90	14945.99	-17372.91	0.008%
23	-17354.86	-15212.31	10051.44	17353.22	15212.27	-10050.46	0.008%
24	-19991.68	-14929.60	-9.28	19990.36	14929.57	10.60	0.007%
25	-17331.81	-14640.82	-10063.47	17331.14	14640.83	10065.30	0.008%
26	-10026.43	-14879.07	-17409.79	10026.79	14879.03	17408.07	0.007%
27	-3.15	-8186.82	-3712.52	3.19	8186.82	3712.22	0.003%
28	1833.74	-8153.66	-3188.03	-1833.79	8153.66	3187.66	0.004%
29	3170.66	-8121.57	-1836.36	-3170.47	8121.57	1836.24	0.003%
30	3668.60	-8155.62	1.62	-3668.29	8155.62	-1.45	0.004%
31	3203.90	-8190.40	1859.20	-3203.60	8190.39	-1859.13	0.003%
32	1838.44	-8161.69	3192.93	-1838.10	8161.68	-3192.77	0.004%
33	3.15	-8132.62	3676.78	-3.19	8132.62	-3676.44	0.004%
34	-1833.74	-8165.79	3188.03	1833.36	8165.78	-3187.87	0.005%
35	-3201.60	-8197.87	1854.23	3201.30	8197.87	-1854.13	0.004%
36	-3668.60	-8163.82	-1.62	3668.27	8163.82	1.80	0.004%
37	-3172.96	-8129.05	-1841.33	3172.70	8129.05	1841.19	0.003%
38	-1838.44	-8157.76	-3192.93	1838.49	8157.76	3192.56	0.004%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	11	0.00000001	0.00011579
2	Yes	34	0.00013265	0.00006973
3	Yes	33	0.00013579	0.00006478
4	Yes	19	0.00013898	0.00009424
5	Yes	34	0.00012913	0.00006040
6	Yes	35	0.00012864	0.00006711
7	Yes	34	0.00012964	0.00006567
8	Yes	20	0.00014890	0.00007334
9	Yes	35	0.00014946	0.00007301
10	Yes	37	0.00011861	0.00006104
11	Yes	35	0.00014796	0.00007036
12	Yes	21	0.00014716	0.00006676

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13	Yes	33	0.00013474	0.00006775
14	Yes	12	0.00000001	0.00008204
15	Yes	36	0.00013867	0.00007425
16	Yes	36	0.00012920	0.00006175
17	Yes	20	0.00011344	0.00008756
18	Yes	37	0.00012406	0.00005811
19	Yes	37	0.00013425	0.00007129
20	Yes	36	0.00014617	0.00007445
21	Yes	21	0.00014353	0.00007466
22	Yes	38	0.00013439	0.00006603
23	Yes	39	0.00012474	0.00006512
24	Yes	38	0.00013535	0.00006461
25	Yes	23	0.00013245	0.00005390
26	Yes	36	0.00012357	0.00006248
27	Yes	16	0.00000001	0.00008214
28	Yes	16	0.00000001	0.00008565
29	Yes	16	0.00000001	0.00008263
30	Yes	16	0.00000001	0.00008626
31	Yes	16	0.00000001	0.00009736
32	Yes	16	0.00000001	0.00010246
33	Yes	16	0.00000001	0.00008468
34	Yes	16	0.00000001	0.00009211
35	Yes	16	0.00000001	0.00009176
36	Yes	16	0.00000001	0.00009029
37	Yes	16	0.00000001	0.00009781
38	Yes	16	0.00000001	0.00010415

**Maximum Tower Deflections - Service Wind**

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	200 - 180	0.971	33	0.2094	0.3773
T2	180 - 172.417	1.727	33	0.2196	0.3776
T3	172.417 - 167.583	2.027	33	0.1989	0.3788
T4	167.583 - 160	2.186	33	0.1614	0.3828
T5	160 - 152.417	2.339	33	0.0774	0.3900
T6	152.417 - 147.583	2.344	33	0.0491	0.3993
T7	147.583 - 140	2.261	33	0.1119	0.4033
T8	140 - 120	2.000	33	0.1948	0.3927
T9	120 - 100	1.096	33	0.1553	0.3514
T10	100 - 80	0.759	33	0.0402	0.3288
T11	80 - 72.4167	0.651	33	0.0237	0.3176
T12	72.4167 - 67.5833	0.613	33	0.0198	0.3165
T13	67.5833 - 60	0.594	33	0.0113	0.3130
T14	60 - 52.4167	0.588	33	0.0225	0.3023
T15	52.4167 - 47.5833	0.642	33	0.0452	0.2919
T16	47.5833 - 40	0.686	33	0.0440	0.2901
T17	40 - 20	0.738	33	0.0231	0.2832
T18	20 - 11.6667	0.588	33	0.0942	0.2694
T19	11.6667 - 5	0.382	33	0.1355	0.2661
T20	5 - 0	0.174	33	0.1558	0.2806

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

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
179.67	Guy	33	1.740	0.2193	0.3776	41256
170.00	dd B2 TMA	33	2.112	0.1824	0.3806	7068
167.00	RFS APX16DWV-16WVS-E-A20	33	2.203	0.1559	0.3833	5723
155.00	RR90-17-02DP w/Mount Pipe	33	2.360	0.0342	0.3960	4222
145.00	Andrew-Commscope SBNH-1D4545A w/pipe	33	2.188	0.1462	0.4016	4476
119.67	Guy	33	1.085	0.1530	0.3508	5414
59.67	Guy	33	0.589	0.0237	0.3018	9996

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	200 - 180	11.166	23	0.5629	1.0977
T2	180 - 172.417	13.456	23	0.5999	1.0987
T3	172.417 - 167.583	14.392	23	0.5326	1.1147
T4	167.583 - 160	14.862	23	0.4011	1.1327
T5	160 - 152.417	15.201	23	0.1050	1.1679
T6	152.417 - 147.583	14.923	23	0.4321	1.2084
T7	147.583 - 140	14.387	23	0.6861	1.2266
T8	140 - 120	13.008	23	1.0121	1.2223
T9	120 - 100	8.593	23	0.7778	1.1565
T10	100 - 80	6.949	23	0.2828	1.2021
T11	80 - 72.4167	6.057	23	0.2716	1.1927
T12	72.4167 - 67.5833	5.645	23	0.2510	1.1740
T13	67.5833 - 60	5.417	23	0.1934	1.1646
T14	60 - 52.4167	5.213	23	0.1018	1.1331
T15	52.4167 - 47.5833	5.406	23	0.2494	1.1288
T16	47.5833 - 40	5.602	23	0.2410	1.1263
T17	40 - 20	5.809	23	0.0999	1.1195
T18	20 - 11.6667	4.438	23	0.7337	1.0705
T19	11.6667 - 5	2.867	23	1.0247	1.0509
T20	5 - 0	1.300	23	1.1693	1.0654

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

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
179.67	Guy	23	13.498	0.5988	1.0991	15547
170.00	dd B2 TMA	23	14.647	0.4800	1.1231	1788
167.00	RFS APX16DWV-16WVS-E-A20	23	14.907	0.3773	1.1351	1440
155.00	RR90-17-02DP w/Mount Pipe	23	15.093	0.2588	1.1950	1017
145.00	Andrew-Commscope SBNH-1D4545A w/pipe	23	13.983	0.8113	1.2293	1113
119.67	Guy	23	8.540	0.7667	1.1560	1068
59.67	Guy	23	5.213	0.1074	1.1319	1477



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### Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T <sub>a</sub> lb	Required S.F.	Actual S.F.	
T2	179.67 (A) (939)	7/16 EHS	2080.00	20800.02	9485.97	10400.00	2.000	2.193	✓
	179.67 (B) (938)	7/16 EHS	2080.00	20800.02	9364.68	10400.00	2.000	2.221	✓
	179.67 (C) (937)	7/16 EHS	2080.00	20800.02	9154.19	10400.00	2.000	2.272	✓
T9	119.67 (A) (942)	9/16 EHS	3500.00	35000.04	14042.40	17500.00	2.000	2.492	✓
	119.67 (B) (941)	9/16 EHS	3500.00	35000.04	13855.30	17500.00	2.000	2.526	✓
	119.67 (C) (940)	9/16 EHS	3500.00	35000.04	13533.90	17500.00	2.000	2.586	✓
T14	59.67 (A) (945)	7/16 EHS	2080.00	20800.02	7886.65	10400.00	2.000	2.637	✓
	59.67 (B) (944)	7/16 EHS	2080.00	20800.02	7828.55	10400.00	2.000	2.657	✓
	59.67 (C) (943)	7/16 EHS	2080.00	20800.02	7700.85	10400.00	2.000	2.701	✓

### Compression Checks

### Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P/P <sub>a</sub>
T1	200 - 180	1 1/4	20.00	1.21	92.8 K=2.00	16.329	1.2272	-4122.61	20039.10	0.206
T2	180 - 172.417	1 1/4	7.58	1.21	46.4 K=1.00	24.902	1.2272	-15833.00	30559.10	0.518
T3	172.417 - 167.583	1 1/4	4.83	1.21	92.8 K=2.00	16.329	1.2272	-23862.90	20039.10	1.191
T4	167.583 - 160	1 1/4	7.58	1.21	46.4 K=1.00	24.902	1.2272	-31575.30	30559.10	1.033
T5	160 - 152.417	1 1/4	7.58	1.21	46.4 K=1.00	24.902	1.2272	-34093.90	30559.10	1.116
T6	152.417 - 147.583	1 1/4	4.83	1.21	46.4 K=1.00	24.902	1.2272	-33781.80	30559.10	1.105
T7	147.583 - 140	1 1/4	7.58	1.21	46.4 K=1.00	24.902	1.2272	-32002.00	30559.10	1.047
T8	140 - 120	1.25SR+half pipe	20.00	1.21	43.0 K=1.00	25.407	1.6133	-44876.30	40988.50	1.095
T9	120 - 100	1.25SR+half pipe	20.00	1.21	43.0 K=1.00	25.407	1.6133	-44877.50	40988.50	1.095
T10	100 - 80	1 1/4	20.00	1.21	92.8 K=2.00	16.329	1.2272	-15645.50	20039.10	0.781
T11	80 - 72.4167	1 1/4	7.58	1.21	46.4 K=1.00	24.902	1.2272	-14910.10	30559.10	0.488
T12	72.4167 -	1 1/4	4.83	1.21	92.8	16.329	1.2272	-19678.10	20039.10	0.982

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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P/P <sub>a</sub>
	67.5833				K=2.00					
T13	67.5833 - 60	1 1/4	7.58	1.21	46.4	24.902	1.2272	-30844.70	30559.10	1.009
					K=1.00					
T14	60 - 52.4167	1 1/4	7.58	1.21	46.4	24.902	1.2272	-30845.00	30559.10	1.009
					K=1.00					
T15	52.4167 - 47.5833	1 1/4	4.83	1.21	92.8	16.329	1.2272	-17544.10	20039.10	0.875
					K=2.00					
T16	47.5833 - 40	1 1/4	7.58	1.21	46.4	24.902	1.2272	-28490.20	30559.10	0.932
					K=1.00					
T17	40 - 20	1 1/4	20.00	1.21	46.4	24.902	1.2272	-36435.30	30559.10	1.192
					K=1.00					
T18	20 - 11.6667	1 1/4	8.33	1.33	51.2	24.163	1.2272	-35540.90	29651.90	1.199
					K=1.00					
T19	11.6667 - 5	1 1/4	6.67	1.33	51.2	24.163	1.2272	-29051.80	29651.90	0.980
					K=1.00					
T20	5 - 0	1 1/4	5.07	1.27	9.7	29.278	1.2272	-22199.20	35928.80	0.618
					K=0.20					

### Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P/P <sub>a</sub>
T1	200 - 180	5/8	1.93	1.79	96.4	15.538	0.3068	-524.62	4766.88	0.110
					K=0.70					
T2	180 - 172.417	5/8	1.93	1.79	96.4	15.538	0.3068	-2383.29	4766.88	0.500
					K=0.70					
T3	172.417 - 167.583	5/8	1.93	1.79	96.4	15.538	0.3068	-2091.81	4766.88	0.439
					K=0.70					
T4	167.583 - 160	5/8	1.93	1.79	96.4	15.538	0.3068	-1564.14	4766.88	0.328
					K=0.70					
T5	160 - 152.417	5/8	1.93	1.79	96.4	15.538	0.3068	-1191.01	4766.88	0.250
					K=0.70					
T6	152.417 - 147.583	5/8	1.93	1.79	96.4	15.538	0.3068	-744.73	4766.88	0.156
					K=0.70					
T7	147.583 - 140	5/8	1.93	1.79	96.4	15.538	0.3068	-3086.06	4766.88	0.647
					K=0.70					
T8	140 - 120	5/8	1.93	1.77	94.9	15.860	0.3068	-5351.34	4865.79	1.100
					K=0.70					
T9	120 - 100	5/8	1.93	1.77	94.9	15.860	0.3068	-2863.70	4865.79	0.589
					K=0.70					
T10	100 - 80	5/8	1.93	1.79	96.4	15.538	0.3068	-1314.11	4766.88	0.276
					K=0.70					
T11	80 - 72.4167	5/8	1.93	1.79	96.4	15.538	0.3068	-1153.98	4766.88	0.242
					K=0.70					
T12	72.4167 - 67.5833	5/8	1.93	1.79	96.4	15.538	0.3068	-1413.53	4766.88	0.297
					K=0.70					
T13	67.5833 - 60	5/8	1.93	1.79	96.4	15.538	0.3068	-2526.82	4766.88	0.530
					K=0.70					
T14	60 - 52.4167	5/8	1.93	1.79	96.4	15.538	0.3068	-2739.56	4766.88	0.575
					K=0.70					

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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P/P <sub>a</sub>
T15	52.4167 - 47.5833	5/8	1.93	1.79	K=0.70 96.4	15.538	0.3068	-2117.94	4766.88	0.444
T16	47.5833 - 40	5/8	1.93	1.79	K=0.70 96.4	15.538	0.3068	-1894.20	4766.88	0.397
T17	40 - 20	5/8	1.93	1.79	K=0.70 96.4	15.538	0.3068	-1781.34	4766.88	0.374
T18	20 - 11.6667	5/8	2.01	1.87	K=0.70 100.4	14.613	0.3068	-1322.46	4483.31	0.295
T19	11.6667 - 5	5/8	2.01	1.87	K=0.70 100.4	14.613	0.3068	-1822.84	4483.31	0.407
T20	5 - 0	5/8	1.38	1.12	K=0.70 82.3 K=0.95	18.558	0.3068	-1711.55	5693.67	0.301

### Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P/P <sub>a</sub>
T2	180 - 172.417	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	14.860	0.6211	-274.24	9229.49	0.030
T4	167.583 - 160	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	14.860	0.6211	-546.90	9229.49	0.059
T5	160 - 152.417	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	14.860	0.6211	-590.52	9229.49	0.064
T6	152.417 - 147.583	1	1.50	1.40	67.0 K=1.00	21.487	0.7854	-585.12	16875.80	0.035
T7	147.583 - 140	1	1.50	1.40	67.0 K=1.00	21.487	0.7854	-585.39	16875.80	0.035
T8	140 - 120	1	1.50	1.38	66.0 K=1.00	21.667	0.7854	-777.28	17017.30	0.046
T9	120 - 100	1	1.50	1.38	66.0 K=1.00	21.667	0.7854	-777.34	17017.30	0.046
T11	80 - 72.4167	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	14.860	0.6211	-258.25	9229.49	0.028
T13	67.5833 - 60	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	14.860	0.6211	-534.25	9229.49	0.058
T14	60 - 52.4167	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	14.860	0.6211	-534.28	9229.49	0.058
T16	47.5833 - 40	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	14.860	0.6211	-493.46	9229.49	0.053
T17	40 - 20	1	1.50	1.40	67.0 K=1.00	21.487	0.7854	-631.08	16875.80	0.037
T18	20 - 11.6667	1	1.50	1.40	67.0 K=1.00	21.487	0.7854	-615.61	16875.80	0.036
T19	11.6667 - 5	1	1.50	1.40	67.0 K=1.00	21.487	0.7854	-503.19	16875.80	0.030
T20	5 - 0	7/8	1.13	1.02	56.0 K=1.00	23.389	0.6013	-388.77	14064.00	0.028

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**Top Girt Design Data (Compression)**

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-6.51	11839.40	0.001
T4	167.583 - 160	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	18.122	0.6211	-177.74	11255.10	0.016
T5	160 - 152.417	7/8	1.50	1.40	76.6 K=1.00	15.732	0.6013	-490.03	9460.23	0.052
T7	147.583 - 140	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	14.860	0.6211	-68.95	9229.49	0.007
T8	140 - 120	7/8	1.50	1.38	75.4 K=1.00	19.911	0.6013	-1335.80	11972.70	0.112
T10	100 - 80	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-605.56	11839.40	0.051
T11	80 - 72.4167	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-338.52	11839.40	0.029
T17	40 - 20	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-635.54	11839.40	0.054
T18	20 - 11.6667	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-249.79	11839.40	0.021

**Bottom Girt Design Data (Compression)**

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-231.46	11839.40	0.020
T2	180 - 172.417	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	14.860	0.6211	-26.16	9229.49	0.003
T4	167.583 - 160	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-483.53	11839.40	0.041
T5	160 - 152.417	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	14.860	0.6211	-75.17	9229.49	0.008
T7	147.583 - 140	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-1246.65	11839.40	0.105
T8	140 - 120	7/8	1.50	1.38	75.4 K=1.00	19.911	0.6013	-1879.80	11972.70	0.157
T9	120 - 100	7/8	1.50	1.38	75.4 K=1.00	19.911	0.6013	-722.33	11972.70	0.060
T10	100 - 80	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-264.89	11839.40	0.022
T13	67.5833 - 60	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-899.79	11839.40	0.076
T16	47.5833 - 40	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-642.15	11839.40	0.054
T17	40 - 20	7/8	1.50	1.40	76.6	19.689	0.6013	-218.13	11839.40	0.018

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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio $\frac{P}{P_a}$
K=1.00										✓

### Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-6.25	11839.40	0.001
T3	172.417 - 167.583	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-104.02	11839.40	0.009
T6	152.417 - 147.583	7/8	1.50	1.40	76.6 K=1.00	19.689	0.6013	-72.71	11839.40	0.006

### Tension Checks

### Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	1 1/4	20.00	0.33	12.8	30.000	1.2272	3795.73	36815.50	0.103
T2	180 - 172.417	1 1/4	7.58	1.21	46.4	30.000	1.2272	7579.78	36815.50	0.206
T3	172.417 - 167.583	1 1/4	4.83	1.21	46.4	30.000	1.2272	15241.40	36815.50	0.414
T4	167.583 - 160	1 1/4	7.58	0.33	12.8	30.000	1.2272	22657.60	36815.50	0.615
T5	160 - 152.417	1 1/4	7.58	1.21	46.4	30.000	1.2272	25102.90	36815.50	0.682
T6	152.417 - 147.583	1 1/4	4.83	1.21	46.4	30.000	1.2272	24755.20	36815.50	0.672
T7	147.583 - 140	1 1/4	7.58	1.21	46.4	30.000	1.2272	22918.60	36815.50	0.623
T8	140 - 120	1.25SR+half pipe	20.00	0.33	11.9	30.000	1.6133	34603.00	48399.00	0.715
T9	120 - 100	1.25SR+half pipe	20.00	1.21	43.0	30.000	1.6133	34599.70	48399.00	0.715
T13	67.5833 - 60	1 1/4	7.58	0.33	12.8	30.000	1.2272	6885.57	36815.50	0.187
T14	60 - 52.4167	1 1/4	7.58	1.21	46.4	30.000	1.2272	6883.69	36815.50	0.187
T16	47.5833 - 40	1 1/4	7.58	0.33	12.8	30.000	1.2272	655.50	36815.50	0.018

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Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio $\frac{P}{P_a}$
T17	40 - 20	1 1/4	20.00	1.21	46.4	30.000	1.2272	8385.77	36815.50	0.228
T18	20 - 11.6667	1 1/4	8.33	1.33	51.2	30.000	1.2272	7035.94	36815.50	0.191
T19	11.6667 - 5	1 1/4	6.67	1.33	51.2	30.000	1.2272	532.65	36815.50	0.014

### Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>a</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	5/8	1.93	1.79	137.7	30.000	0.3068	507.80	9203.88	0.055
T2	180 - 172.417	5/8	1.93	1.79	137.7	30.000	0.3068	2273.97	9203.88	0.247
T3	172.417 - 167.583	5/8	1.93	1.79	137.7	30.000	0.3068	2031.05	9203.88	0.221
T4	167.583 - 160	5/8	1.93	1.79	137.7	30.000	0.3068	1463.85	9203.88	0.159
T5	160 - 152.417	5/8	1.93	1.79	137.7	30.000	0.3068	1100.99	9203.88	0.120
T6	152.417 - 147.583	5/8	1.93	1.79	137.7	30.000	0.3068	562.57	9203.88	0.061
T7	147.583 - 140	5/8	1.93	1.79	137.7	30.000	0.3068	2963.19	9203.88	0.322
T8	140 - 120	5/8	1.93	1.77	135.6	30.000	0.3068	5242.83	9203.88	0.570
T9	120 - 100	5/8	1.93	1.77	135.6	30.000	0.3068	2577.44	9203.88	0.280
T10	100 - 80	5/8	1.93	1.79	137.7	30.000	0.3068	1284.38	9203.88	0.140
T11	80 - 72.4167	5/8	1.93	1.79	137.7	30.000	0.3068	873.84	9203.88	0.095
T12	72.4167 - 67.5833	5/8	1.93	1.79	137.7	30.000	0.3068	1250.66	9203.88	0.136
T13	67.5833 - 60	5/8	1.93	1.79	137.7	30.000	0.3068	2256.32	9203.88	0.245
T14	60 - 52.4167	5/8	1.93	1.79	137.7	30.000	0.3068	2356.16	9203.88	0.256
T15	52.4167 - 47.5833	5/8	1.93	1.79	137.7	30.000	0.3068	1940.71	9203.88	0.211
T16	47.5833 - 40	5/8	1.93	1.79	137.7	30.000	0.3068	1568.22	9203.88	0.170
T17	40 - 20	5/8	1.93	1.79	137.7	30.000	0.3068	1467.87	9203.88	0.159
T18	20 - 11.6667	5/8	2.01	1.87	143.4	30.000	0.3068	853.71	9203.88	0.093
T19	11.6667 - 5	5/8	2.01	1.87	143.4	30.000	0.3068	1412.91	9203.88	0.154

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Section No.	Elevation	Size	L	L <sub>u</sub>	Kl/r	F <sub>a</sub>	A	Actual P	Allow. P <sub>a</sub>	Ratio P
	ft		ft	ft		ksi	in <sup>2</sup>	lb	lb	P <sub>a</sub>

### Horizontal Design Data (Tension)

Section No.	Elevation	Size	L	L <sub>u</sub>	Kl/r	F <sub>a</sub>	A	Actual P	Allow. P <sub>a</sub>	Ratio P
	ft		ft	ft		ksi	in <sup>2</sup>	lb	lb	P <sub>a</sub>
T2	180 - 172.417	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	274.24	13415.60	0.020
T4	167.583 - 160	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	546.90	13415.60	0.041
T5	160 - 152.417	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	590.52	13415.60	0.044
T6	152.417 - 147.583	1	1.50	1.40	67.0	30.000	0.7854	585.12	23561.90	0.025
T7	147.583 - 140	1	1.50	1.40	67.0	30.000	0.7854	643.32	23561.90	0.027
T8	140 - 120	1	1.50	1.38	66.0	30.000	0.7854	777.28	23561.90	0.033
T9	120 - 100	1	1.50	1.38	66.0	30.000	0.7854	842.98	23561.90	0.036
T11	80 - 72.4167	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	258.25	13415.60	0.019
T13	67.5833 - 60	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	534.25	13415.60	0.040
T14	60 - 52.4167	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	534.28	13415.60	0.040
T16	47.5833 - 40	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	493.46	13415.60	0.037
T17	40 - 20	1	1.50	1.40	67.0	30.000	0.7854	631.08	23561.90	0.027
T18	20 - 11.6667	1	1.50	1.40	67.0	30.000	0.7854	615.61	23561.90	0.026
T19	11.6667 - 5	1	1.50	1.40	67.0	30.000	0.7854	503.19	23561.90	0.021
T20	5 - 0	7/8	0.38	0.27	14.9	30.000	0.6013	451.97	18039.60	0.025

### Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L <sub>u</sub>	Kl/r	F <sub>a</sub>	A	Actual P	Allow. P <sub>a</sub>	Ratio P
	ft		ft	ft		ksi	in <sup>2</sup>	lb	lb	P <sub>a</sub>
T1	200 - 180	7/8	1.50	1.40	76.6	30.000	0.6013	6.61	18039.60	0.000
T4	167.583 - 160	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	32.500	0.4658	241.85	15139.20	0.016
T5	160 - 152.417	7/8	1.50	1.40	76.6	21.600	0.6013	454.95	12988.50	0.035

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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P P <sub>a</sub>
T7	147.583 - 140	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	200.88	13415.60	0.015
T8	140 - 120	7/8	1.50	1.38	75.4	30.000	0.6013	1470.06	18039.60	0.081
T10	100 - 80	7/8	1.50	1.40	76.6	30.000	0.6013	660.42	18039.60	0.037
T11	80 - 72.4167	7/8	1.50	1.40	76.6	30.000	0.6013	363.93	18039.60	0.020
T13	67.5833 - 60	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	142.89	13415.60	0.011
T16	47.5833 - 40	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	179.82	13415.60	0.013
T17	40 - 20	7/8	1.50	1.40	76.6	30.000	0.6013	703.90	18039.60	0.039
T18	20 - 11.6667	7/8	1.50	1.40	76.6	30.000	0.6013	386.59	18039.60	0.021
T19	11.6667 - 5	7/8	1.50	1.40	76.6	30.000	0.6013	242.54	18039.60	0.013
T20	5 - 0	7/8	1.50	1.40	76.6	30.000	0.6013	2420.46	18039.60	0.134

### Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio P P <sub>a</sub>
T1	200 - 180	7/8	1.50	1.40	76.6	30.000	0.6013	292.55	18039.60	0.016
T2	180 - 172.417	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	110.71	13415.60	0.008
T4	167.583 - 160	7/8	1.50	1.40	76.6	30.000	0.6013	558.12	18039.60	0.031
T5	160 - 152.417	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	199.82	13415.60	0.015
T7	147.583 - 140	7/8	1.50	1.40	76.6	30.000	0.6013	1202.27	18039.60	0.067
T8	140 - 120	7/8	1.50	1.38	75.4	30.000	0.6013	2308.75	18039.60	0.128
T9	120 - 100	7/8	1.50	1.38	75.4	30.000	0.6013	789.75	18039.60	0.044
T10	100 - 80	7/8	1.50	1.40	76.6	30.000	0.6013	355.94	18039.60	0.020
T11	80 - 72.4167	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	146.53	13415.60	0.011
T13	67.5833 - 60	7/8	1.50	1.40	76.6	30.000	0.6013	1171.56	18039.60	0.065
T14	60 - 52.4167	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	21.600	0.6211	162.82	13415.60	0.012
T16	47.5833 - 40	7/8	1.50	1.40	76.6	30.000	0.6013	807.61	18039.60	0.045



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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio $\frac{P}{P_a}$
T17	40 - 20	7/8	1.50	1.40	76.6	30.000	0.6013	297.09	18039.60	0.016

### Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio $\frac{P}{P_a}$
T1	200 - 180	7/8	1.50	1.40	76.6	30.000	0.6013	6.85	18039.60	0.000
T3	172.417 - 167.583	7/8	1.50	1.40	76.6	30.000	0.6013	166.96	18039.60	0.009
T6	152.417 - 147.583	7/8	1.50	1.40	76.6	30.000	0.6013	197.77	18039.60	0.011
T8	140 - 120	7/8	1.50	1.38	75.4	30.000	0.6013	130.09	18039.60	0.007
T9	120 - 100	7/8	1.50	1.38	75.4	30.000	0.6013	231.35	18039.60	0.013
T10	100 - 80	7/8	1.50	1.40	76.6	30.000	0.6013	69.42	18039.60	0.004
T12	72.4167 - 67.5833	7/8	1.50	1.40	76.6	30.000	0.6013	105.46	18039.60	0.006
T15	52.4167 - 47.5833	7/8	1.50	1.40	76.6	30.000	0.6013	134.90	18039.60	0.007
T17	40 - 20	7/8	1.50	1.40	76.6	30.000	0.6013	277.14	18039.60	0.015

### Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P lb	Allow. P <sub>a</sub> lb	Ratio $\frac{P}{P_a}$
T2	180 - 172.417	2x1/4	1.50	1.40	232.1	21.600	0.5000	3368.46	10800.00	0.312
T9	120 - 100	2x1/4	1.50	1.38	228.6	21.600	0.5000	5709.55	10800.00	0.529
T14	60 - 52.4167	2x1/4	1.50	1.40	232.1	21.600	0.5000	3943.01	10800.00	0.365

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail
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<b>tnxTower</b>  <b>Atlantis Group, Inc</b> 1340 Centre Street, Suite 203 Newton, Massachusetts 02459 Phone: 617-965-0789 FAX: 617-965-0103	<b>Job</b>	1417010	<b>Page</b>	40 of 42
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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail
T1	200 - 180	Leg	1 1/4	1	-4122.61	26712.12	15.4	Pass
T2	180 - 172.417	Leg	1 1/4	63	-15833.00	40735.28	38.9	Pass
T3	172.417 - 167.583	Leg	1 1/4	105	-23862.90	26712.12	89.3	Pass
T4	167.583 - 160	Leg	1 1/4	123	-31575.30	40735.28	77.5	Pass
T5	160 - 152.417	Leg	1 1/4	165	-34093.90	40735.28	83.7	Pass
T6	152.417 - 147.583	Leg	1 1/4	207	-33781.80	40735.28	82.9	Pass
T7	147.583 - 140	Leg	1 1/4	231	-32002.00	40735.28	78.6	Pass
T8	140 - 120	Leg	1.25SR+half pipe	271	-44876.30	54637.67	82.1	Pass
T9	120 - 100	Leg	1.25SR+half pipe	373	-44877.50	54637.67	82.1	Pass
T10	100 - 80	Leg	1 1/4	477	-15645.50	26712.12	58.6	Pass
T11	80 - 72.4167	Leg	1 1/4	536	-14910.10	40735.28	36.6	Pass
T12	72.4167 - 67.5833	Leg	1 1/4	579	-19678.10	26712.12	73.7	Pass
T13	67.5833 - 60	Leg	1 1/4	597	-30844.70	40735.28	75.7	Pass
T14	60 - 52.4167	Leg	1 1/4	639	-30845.00	40735.28	75.7	Pass
T15	52.4167 - 47.5833	Leg	1 1/4	681	-17544.10	26712.12	65.7	Pass
T16	47.5833 - 40	Leg	1 1/4	699	-28490.20	40735.28	69.9	Pass
T17	40 - 20	Leg	1 1/4	741	-36435.30	40735.28	89.4	Pass
T18	20 - 11.6667	Leg	1 1/4	843	-35540.90	39525.98	89.9	Pass
T19	11.6667 - 5	Leg	1 1/4	882	-29051.80	39525.98	73.5	Pass
T20	5 - 0	Leg	1 1/4	915	-22199.20	47893.09	46.4	Pass
T1	200 - 180	Diagonal	5/8	14	-524.62	6354.25	8.3	Pass
T2	180 - 172.417	Diagonal	5/8	94	-2383.29	6354.25	37.5	Pass
T3	172.417 - 167.583	Diagonal	5/8	118	-2091.81	6354.25	32.9	Pass
T4	167.583 - 160	Diagonal	5/8	160	-1564.14	6354.25	24.6	Pass
T5	160 - 152.417	Diagonal	5/8	202	-1191.01	6354.25	18.7	Pass
T6	152.417 - 147.583	Diagonal	5/8	212	-744.73	6354.25	11.7	Pass
T7	147.583 - 140	Diagonal	5/8	238	-3086.06	6354.25	48.6	Pass
T8	140 - 120	Diagonal	5/8	283	-5351.34	6486.10	82.5	Pass
T9	120 - 100	Diagonal	5/8	468	-2863.70	6486.10	44.2	Pass
T10	100 - 80	Diagonal	5/8	534	-1314.11	6354.25	20.7	Pass
T11	80 - 72.4167	Diagonal	5/8	544	-1153.98	6354.25	18.2	Pass
T12	72.4167 - 67.5833	Diagonal	5/8	583	-1413.53	6354.25	22.2	Pass
T13	67.5833 - 60	Diagonal	5/8	604	-2526.82	6354.25	39.8	Pass
T14	60 - 52.4167	Diagonal	5/8	672	-2739.56	6354.25	43.1	Pass
T15	52.4167 - 47.5833	Diagonal	5/8	696	-2117.94	6354.25	33.3	Pass
T16	47.5833 - 40	Diagonal	5/8	708	-1894.20	6354.25	29.8	Pass
T17	40 - 20	Diagonal	5/8	840	-1781.34	6354.25	28.0	Pass
T18	20 - 11.6667	Diagonal	5/8	847	-1322.46	5976.25	22.1	Pass
T19	11.6667 - 5	Diagonal	5/8	886	-1822.84	5976.25	30.5	Pass
T20	5 - 0	Diagonal	5/8	924	-1711.55	7589.66	22.6	Pass
T2	180 - 172.417	Horizontal	L1 3/4x1 3/4x3/16	74	-274.24	12302.91	2.2	Pass
T4	167.583 - 160	Horizontal	L1 3/4x1 3/4x3/16	134	-546.90	12302.91	4.4	Pass
T5	160 - 152.417	Horizontal	L1 3/4x1 3/4x3/16	182	-590.52	12302.91	4.8	Pass
T6	152.417 - 147.583	Horizontal	1	215	-585.12	22495.44	2.6	Pass
T7	147.583 - 140	Horizontal	1	259	-585.39	22495.44	2.6	Pass
T8	140 - 120	Horizontal	1	286	-777.28	22684.06	3.4	Pass
T9	120 - 100	Horizontal	1	388	-777.34	22684.06	3.4	Pass
T11	80 - 72.4167	Horizontal	L1 3/4x1 3/4x3/16	547	-258.25	12302.91	2.1	Pass
T13	67.5833 - 60	Horizontal	L1 3/4x1 3/4x3/16	609	-534.25	12302.91	4.3	Pass
T14	60 - 52.4167	Horizontal	L1 3/4x1 3/4x3/16	650	-534.28	12302.91	4.3	Pass
T16	47.5833 - 40	Horizontal	L1 3/4x1 3/4x3/16	710	-493.46	12302.91	4.0	Pass
T17	40 - 20	Horizontal	1	755	-631.08	22495.44	2.8	Pass



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	<b>Client</b> T-Mobile	<b>Designed by</b> Ahmet Colakoglu

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail
						Horizontal (T5)	4.8	Pass
						Top Girt (T20)	10.1	Pass
						Bottom Girt (T8)	11.8	Pass
						Mid Girt (T17)	1.2	Pass
						Guy A (T2)	91.2	Pass
						Guy B (T2)	90.0	Pass
						Guy C (T2)	88.0	Pass
						Top Guy Pull-Off (T9)	39.7	Pass
						<b>RATING =</b>	<b>91.2</b>	<b>Pass</b>

# **EXHIBIT C**



# EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11335B

Old Saybrook / Route 9  
156 Bokum Road  
Old Saybrook, CT 06475

**February 21, 2014**

**EBI Project Number: 62140699**



February 21, 2014

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

Re: Emissions Values for Site: **CT11335B - Old Saybrook / Route 9**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 156 Bokum Road, Old Saybrook, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  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 ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limit for the cellular band is  $567 \mu\text{W}/\text{cm}^2$ , and the general population exposure limit for the PCS band is  $1000 \mu\text{W}/\text{cm}^2$ . 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 156 Bokum Road, Old Saybrook, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, the actual antenna pattern gain value in the direction of the sample area was used. For this report the sample point is a 6 foot person standing at the base of the tower

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

- 1) 2 GSM channels (1935.000 MHz—to 1945.000 MHz) were considered for each sector of the proposed installation.
- 2) 2 UMTS channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation
- 3) 2 LTE channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation
- 4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
- 6) The antennas used in this modeling are the RFS APX16DWVS-16DWVS-A20 and the EMS RR90-17-02DP for LTE / UMTS and GSM respectively. This is based on feedback from the carrier with regards to anticipated antenna selection. These antennas have a 16.3 dBd and 14.4 dBd gain value respectively at their main lobe. Actual antenna gain values in the





direction of the analysis points were used for all calculations as per the manufacturer's specifications.

- 7) The antenna mounting height centerline of the proposed antennas is **167 and 155 feet** above ground level (AGL)
- 8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

1335B - Old Saybrook / Route 9  
 um Road, Old Saybrook, CT 06475  
 Guyed Tower

**Sector 1**

del	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
VVS-A20	Passive	AWS - 2100 MHz	LTE	60	2	120	-3.25	167	161	None	0	0	56.778151	0.787473	0.07875%
VVS-A20	Passive	AWS - 2100 MHz	UMTS	40	2	80	-3.25	167	161	None	0	0	37.852101	0.524982	0.05250%
DP	Passive	PCS - 1950 MHz	GSM	30	1	30	-5.15	155	149	1-5/8"	0	0	9.1647633	0.148407	0.01484%
DP	Passive	PCS - 1950 MHz	GSM	30	1	30	-5.15	155	149	1-5/8"	0	0	9.1647633	0.148407	0.01484%

Sector total Power Density Value: 0.161%

**Sector 2**

del	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
VVS-A20	Passive	AWS - 2100 MHz	LTE	60	2	120	-3.25	167	161	None	0	0	56.778151	0.787473	0.07875%
VVS-A20	Passive	AWS - 2100 MHz	UMTS	40	2	80	-3.25	167	161	None	0	0	37.852101	0.524982	0.05250%
DP	Passive	PCS - 1950 MHz	GSM	30	1	30	-5.15	155	149	1-5/8"	0	0	9.1647633	0.148407	0.01484%
DP	Passive	PCS - 1950 MHz	GSM	30	1	30	-5.15	155	149	1-5/8"	0	0	9.1647633	0.148407	0.01484%

Sector total Power Density Value: 0.161%

**Sector 3**

del	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
VVS-A20	Passive	AWS - 2100 MHz	LTE	60	2	120	-3.25	167	161	None	0	0	56.778151	0.787473	0.07875%
VVS-A20	Passive	AWS - 2100 MHz	UMTS	40	2	80	-3.25	167	161	None	0	0	37.852101	0.524982	0.05250%
DP	Passive	PCS - 1950 MHz	GSM	30	1	30	-5.15	155	149	1-5/8"	0	0	9.1647633	0.148407	0.01484%
DP	Passive	PCS - 1950 MHz	GSM	30	1	30	-5.15	155	149	1-5/8"	0	0	9.1647633	0.148407	0.01484%

Sector total Power Density Value: 0.161%

Site Composite MPE %	
Carrier	MPE %
T-Mobile	0.483%
Verizon Wireless	8.400%
AT&T	16.890%
<b>Total Site MPE %</b>	<b>25.773%</b>



## Summary

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

The anticipated Maximum Composite contributions from the T-Mobile facility are **0.483% (0.161% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **25.773%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

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

Scott Heffernan  
RF Engineering Director

### EBI Consulting

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