

JULIE D. KOHLER

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

March 3, 2015

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

**Re: Notice of Exempt Modification
Wireless Solutions/T-Mobile equipment upgrade
Site ID CT11048A
174 Boom Bridge Road North Stonington, Connecticut**

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, Wireless Solution owns the existing guyed lattice tower and related facility located at 174 Boom Bridge Road (a/k/a 273 or 227 Boom Bridge Road), North Stonington, Connecticut (Latitude: 41.42879694; Longitude: -71.8090772). T-Mobile intends to replace three (3) antennas and add three (3) RRUs (remote radio units) and related equipment at this existing telecommunications facility in North Stonington ("North Stonington 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, copies of this letter are being sent to the First Selectman, Nicholas H. Mullane, II, and the property owner, Lewis David Babcock LLC.

The existing North Stonington Facility consists of a 180 foot tall guyed tower.¹ T-Mobile plans to replace three (3) antennas and mount three (3) RRU's (remote radio units) at a centerline of 120 feet. T-Mobile will also reuse fiber cable. (See the plans revised to February 27, 2015 attached hereto as Exhibit A). The existing North Stonington Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated February 13, 2015 and attached hereto as Exhibit B.

The planned modifications to the North Stonington 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

¹ There are no Dockets or Petitions in the Connecticut Siting Council database for the approval of this Facility however this Facility has been the subject of several notices of intent, the most recent being EM-T-MOBILE-102-140305, EM-CING-102-130109, and EM-VER-102-120410.

March 3, 2015
Site ID CT11048A
Page 2

proposed modifications will be installed at a centerline of 120 feet, merely modifying existing antennas located at the same 120 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. No modifications are proposed within the existing compound area.

3 . The proposed modification to the North Stonington 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 25, 2015, T-Mobile's operations would add 8.97% 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 40.18% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

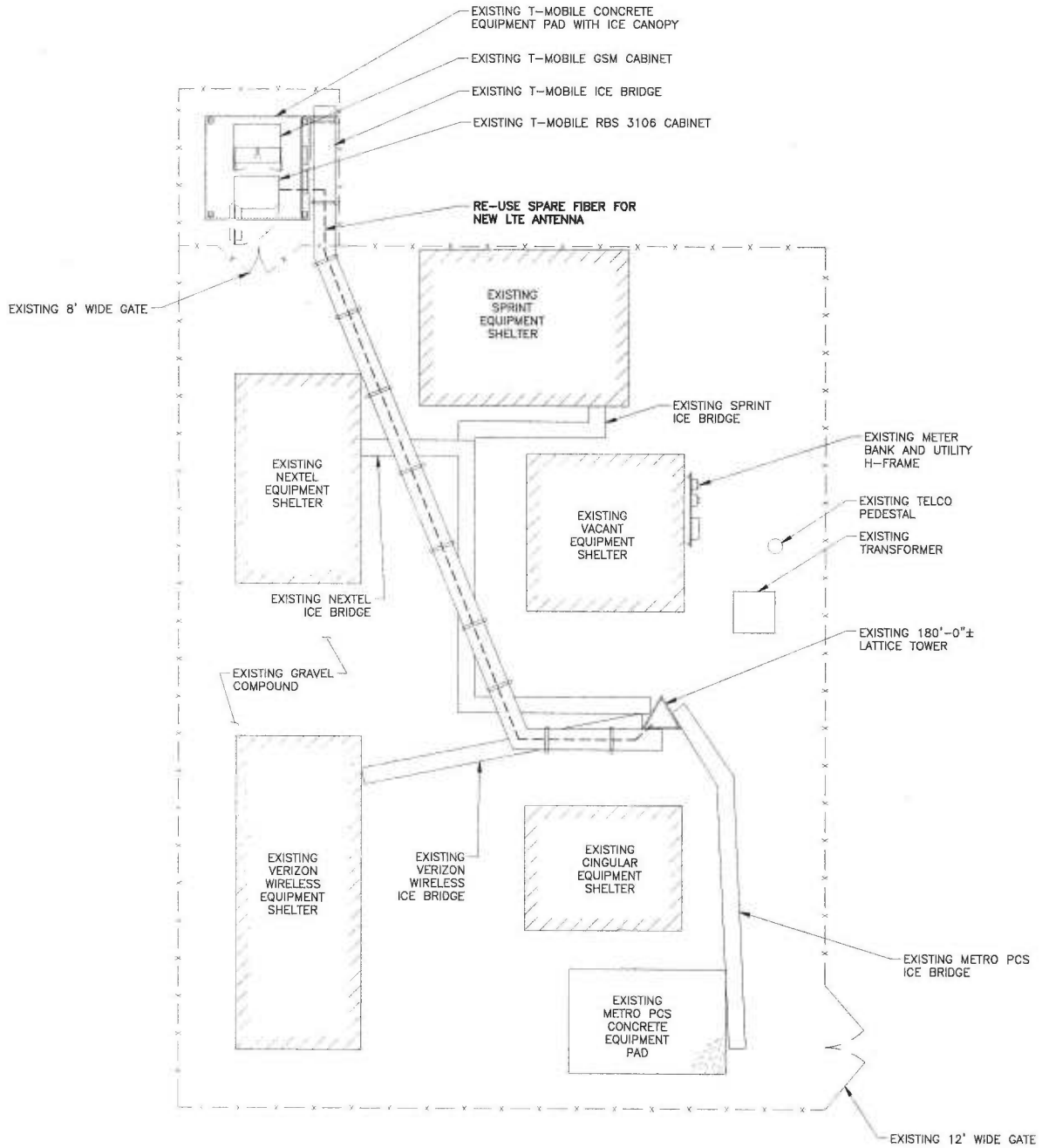
For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement antennas and additional equipment at the North Stonington Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile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

Sincerely,


Julie D. Kohler, Esq.

cc: North Stonington First Selectman, Nicholas H. Mullane, II
Wireless Solutions
Lewis David Babcock LLC
Jamie Ford, EBI Consulting

EXHIBIT A



CONFIGURATION
702CC



APPROX. NORTH

NOTE:
 ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE STRUCTURAL AND RF ENGINEERS.

SITE PLAN

SCALE: 1/16" = 1'-0"

PREPARED BY:
EBI Consulting
environmental | engineering | due diligence
 21 B Street | Burlington, MA 01803
 Tel: (781) 273-2500 | Fax: (781) 273-3311
 www.abiconsulting.com
 EBI JOB NO.:
 8115000090

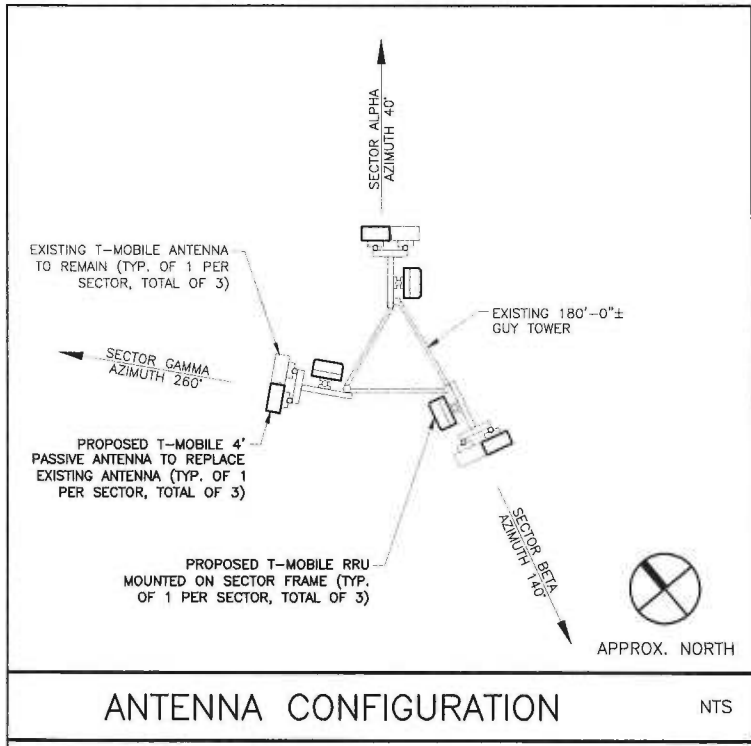
CLIENT:
T-Mobile Northeast, LLC
 35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002
 860.692.7100

SITE INFO:
**CT11048A
 NORTH
 STONINGTON /CDT1**
 174 BOOM BRIDGE ROAD
 NORTH STONINGTON, CT 06359

SUBMITTALS			
NO.	DATE	DESCRIPTION	BY
A	02/27/15	FOR REVIEW	SH

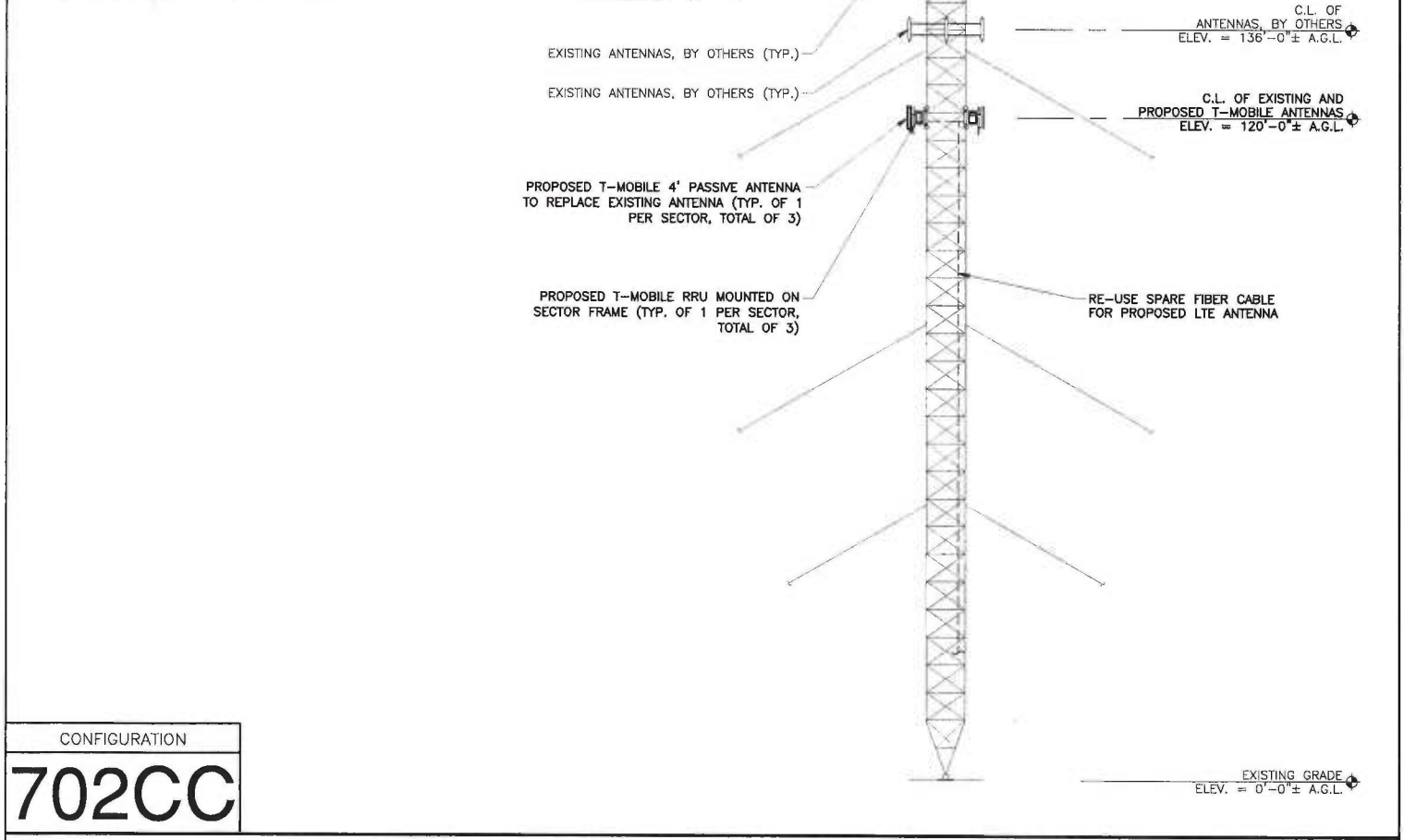
DRAWN BY: SH
 CHECKED BY: BB
 DATE: 02/20/15

SHEET NO:
LE-1



ANTENNA CONFIGURATION

NTS



TOWER ELEVATION

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

NOTE:
ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE STRUCTURAL AND RF ENGINEERS.

PREPARED BY: environmental engineering due diligence 21 B Street Burlington, MA 01803 Tel: (781) 273-2500 Fax: (781) 273-3311 www.ebiconsulting.com EBI JOB NO.: 8115000090		CLIENT: T-Mobile Northeast, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 860.692.7100		SITE INFO: CT11048A NORTH STONINGTON /CDT1 174 BOOM BRIDGE ROAD NORTH STONINGTON, CT 06359		SUBMITTALS <table border="1"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>SH</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>02/27/15</td> <td>FOR REVIEW</td> <td>SH</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			NO.	DATE	DESCRIPTION	BY	SH	A	02/27/15	FOR REVIEW	SH																	DRAWN BY: SHEET NO: LE-2 CHECKED BY: BB DATE: 02/20/15	
NO.	DATE	DESCRIPTION	BY	SH																															
A	02/27/15	FOR REVIEW	SH																																

EXHIBIT B

STRUCTURAL ANALYSIS REPORT

February 13, 2015

T-Mobile, USA
35 Griffin Rd
South Bloomfield, CT 06002
Attention: Mark Richard

Subject: Carrier: T-Mobile
Site Name: North Stonington / CDT_1
Site ID#: CT11048A
EBI Reference #: 81150090
Site Address: 174 Boom Bridge Road, North Stonington, CT 06359

Dear Mr. Richard:

In accordance with your request, EBI Consulting's structural engineers have reviewed the available documentation for the above site in order to assess its capability for supporting the structural loads from the proposed antennas, remote radio units, coaxial cables, and related equipment. This analysis is in accordance with the following design codes governing this project:

- International Building Code, 2003 with CT 2005, 2009, 2011, and 2013 amendments
- ASCE 7-05
- AISC Steel Construction Manual, 13th Edition
- ANSI/TIA-222-F

The following sources of information were considered in preparing this analysis:

- Existing Structural Analysis by Atlantis Group, Version 2, dated February 14, 2014
- Photographs from a site visit by EBI performed on January 21, 2015

The tower was analyzed for a wind speed of 85 mph without ice and with 1/2" radial ice at a reduced wind speed of 74 mph.

The analysis provided herein by EBI Consulting includes the following existing and proposed T-Mobile appurtenances, distributed among three sectors where applicable:

Centerline Elevation (ft)	Quantity	Manufacturer	Model	Feedline Quantity / Size	Feedline Location
** Existing equipment to remain **					
120	3	Ericsson	AIR21 B2A/B4P	(12) 1-5/8"	Leg A
120	3	-	ddB4 TMA	(1) 9x18 MLE	Leg A

Centerline Elevation (ft)	Quantity	Manufacturer	Model	Feedline Quantity / Size	Feedline Location
** Proposed equipment **					
120	3	Ericsson	KRC 118 057/1 AIR 21 B4A/B12P-8	-	-
120	3	Ericsson	RRUS11 B12	-	-

Notes:

1. For other carriers' equipment, see tower output in Appendix A
2. For feedline layout, see tower output in Appendix A

Summary of Results: (Refer to attached Appendix A for detailed analysis results)

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 2.5 X-STR	1	-28593.70	81085.72	35.3	Pass
		Diagonal	L2x2x1/4	14	-4918.61	21829.87	22.5	Pass
		Top Girt	L2x2x1/4	5	-453.89	16602.51	2.7	Pass
		Bottom Girt	L2x2x1/4	7	1571.81	21759.09	7.2	Pass
		Guy A@162.523	1/2	463	7914.88	13450.00	58.8	Pass
		Guy A@162.523	7/8	483	20584.20	39850.00	51.7	Pass
		Guy B@162.523	1/2	459	7800.70	13450.00	58.0	Pass
		Guy B@162.523	7/8	482	20569.30	39850.00	51.6	Pass
		Guy C@162.523	1/2	454	7948.70	13450.00	59.1	Pass
		Guy C@162.523	7/8	478	20631.30	39850.00	51.8	Pass
		Top Guy Pull-Off@162.523	2L2x2x1/4x3/8	480	6197.36	61084.72	11.0	Pass
		Torque Arm Top@162.523	C12x20.7	456	854.02	175348.14	36.5	Pass
		T2	160 - 140	Leg	ROHN 2.5 X-STR	58	-34034.70	81085.72
Diagonal	ROHN TSI.5x11 ga			113	-3637.41	14740.98	24.7	Pass
Top Girt	ROHN TSI.5x11 ga			61	1257.92	17475.90	7.2	Pass
Bottom Girt	ROHN TSI.5x11 ga			64	632.95	17475.90	3.6	Pass
T3	140 - 120	Leg	ROHN 2.5 X-STR	115	-50818.30	80229.13	63.3	Pass
		Diagonal	ROHN TSI.5x16 ga	153	-1999.17	7519.61	26.6	Pass
		Top Girt	ROHN TSI.5x16 ga	118	269.86	8826.21	3.1	Pass
		Bottom Girt	ROHN TSI.5x16 ga	121	583.09	8826.21	6.6	Pass
		Guy A@132.159	9/16	471	11364.80	17500.00	64.9	Pass
		Guy B@132.159	9/16	470	11431.10	17500.00	65.3	Pass
		Guy C@132.159	9/16	466	11450.40	17500.00	65.4	Pass
		Top Guy Pull-Off@132.159	4x3/8	467	4262.59	48737.81	9.0	Pass
T4	120 - 100	Leg	ROHN 2.5 X-STR	172	-51426.10	80215.27	64.1	Pass
		Diagonal	ROHN TSI.5x11 ga	181	-2749.79	14740.98	18.7	Pass
		Top Girt	ROHN TSI.5x11 ga	175	820.28	17475.90	4.7	Pass
		Bottom Girt	ROHN TSI.5x11 ga	178	740.66	17475.90	4.2	Pass
T5	100 - 80	Leg	ROHN 2.5 X-STR	231	-43839.70	79769.38	55.0	Pass
		Diagonal	ROHN TSI.5x16 ga	244	-3217.24	7519.61	42.8	Pass
		Top Girt	ROHN TSI.5x16 ga	234	673.17	8826.21	7.6	Pass
		Bottom Girt	ROHN TSI.5x16 ga	235	598.73	8826.21	6.8	Pass
		Guy A@82.5234	3/4	477	18272.50	29150.00	62.7	Pass
		Guy B@82.5234	3/4	476	18309.20	29150.00	62.8	Pass
		Guy C@82.5234	3/4	472	18297.60	29150.00	62.8	Pass
Top Guy Pull-Off@82.5234	2L2x2x1/4x3/8	473	7294.66	61084.72	12.5	Pass		
T6	80 - 60	Leg	ROHN 2.5 X-STR	288	-43864.90	81085.72	54.1	Pass
		Diagonal	ROHN TSI.5x11 ga	339	-2088.56	14740.98	14.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
T7	60 - 40	Top Girt	ROHN TSI.5x11 ga	290	1250.42	17475.90	7.2	Pass
		Bottom Girt	ROHN TSI.5x11 ga	294	608.91	17475.90	3.5	Pass
		Leg	ROHN 2.5 X-STR	345	-41541.90	66913.40	62.1	Pass
		Diagonal	ROHN TSI.5x16 ga	361	-3209.90	5363.77	59.8	Pass
		Top Girt	ROHN TSI.5x16 ga	348	-208.50	6238.39	3.3	Pass
		Bottom Girt	ROHN TSI.5x16 ga	349	-743.58	6238.39	11.9	Pass
		Guy A@49.75	1/2	489	8411.73	13450.00	62.5	Pass
		Guy B@49.75	1/2	488	8406.05	13450.00	62.5	Pass
		Guy C@49.75	1/2	484	8402.10	13450.00	62.5	Pass
		Top Guy Pull-Off@49.75	4x3/8	486	4518.74	48737.81	9.5	Pass
T8	40 - 20	Leg	ROHN 2.5 X-STR	378	-49892.20	66913.40	74.6	Pass
		Diagonal	ROHN TSI.5x16 ga	406	-2649.41	5363.77	49.4	Pass
		Top Girt	ROHN TSI.5x16 ga	379	-733.66	6238.39	11.8	Pass
T9	20 - 5	Bottom Girt	ROHN TSI.5x16 ga	383	-460.55	6238.39	7.4	Pass
		Leg	ROHN 2.5 X-STR	411	-49699.50	67325.56	73.8	Pass
T10	5 - 0	Diagonal	ROHN TSI.5x16 ga	420	-3257.60	5384.87	60.5	Pass
		Top Girt	ROHN TSI.5x16 ga	414	-616.58	6238.39	9.9	Pass
		Bottom Girt	L3x3x1/2	416	8179.92	68857.85	11.9	Pass
		Leg	ROHN 2.5 X-STR	438	-36448.90	59297.20	61.5	Pass
		Horizontal	L4x4x1/4	446	-104.89	52643.36	8.9	Pass
		Top Girt	L4x4x1/4	441	1796.83	41904.00	4.3	Pass
		Bottom Girt	L4x4x1/4	443	-1159.22	40373.20	44.0	Pass
Summary								
		Leg (T8)				74.6	Pass	
		Diagonal (T9)				60.5	Pass	
		Horizontal (T10)				8.9	Pass	
		Top Girt (T8)				11.8	Pass	
		Bottom Girt (T10)				44.0	Pass	
		Guy A (T3)				64.9	Pass	
		Guy B (T3)				65.3	Pass	
		Guy C (T3)				65.4	Pass	
		Top Guy				12.5	Pass	
		Pull-Off (T5)						
		Torque Arm				36.5	Pass	
		Top (T1)						
		Bolt Checks				66.2	Pass	
		RATING =				74.6	Pass	

The existing tower is structurally adequate to support the proposed loading. The maximum stress under the proposed conditions and configurations is **74.6%** of the tower capacity.

Foundation

A comparison of the design foundation reactions and the foundation reactions calculated in this analysis is tabulated below:

Reaction	Previous analysis by Atlantis Group (2/14/14) (TIA-222-F, kips)	Current Analysis (TIA-222-F, kips)	% of previous analysis
Mast axial	165.0	119.3	72.3%
Mast shear	2.7	2.3	86.2%

Reaction	Previous analysis by Atlantis Group (2/14/14) (TIA-222-F, kips)	Current Analysis (TIA-222-F, kips)	% of previous analysis
Inner Anchor uplift	20.6	15.4	74.6%
Inner Anchor shear	28.6	21.5	75.2%
Inner Anchor resultant	35.2	26.4	75.0%
Middle Anchor uplift	31.7	22.6	71.3%
Middle Anchor shear	30.5	21.9	71.8%
Middle Anchor resultant	44.0	31.5	71.6%
Outer Anchor uplift	14.6	10.5	71.7%
Outer Anchor shear	15.3	11.1	72.4%
Outer Anchor resultant	21.1	15.2	72.1%

All tower reactions are within the envelope of the design tower reactions. It is our opinion that the existing foundation design remains valid and therefore is structurally adequate to support the existing tower under the proposed equipment configuration to meet code requirements.

Limitations and Assumptions:

This report is based on the following:

1. The tower is properly installed and maintained.
2. All members are as specified in the original design documents and are in good condition.
3. All required members are in place.
4. All bolts are in place and are tightly fastened.
5. The tower is in plumb condition.
6. All member protective coatings are in good condition.
7. All tower members were properly designed, detailed, fabricated, and installed, and have been properly maintained since erection.
8. Foundations were properly designed and constructed to support original design loads.

EBI is not responsible for any modifications completed prior to or hereafter in which EBI is not or was not directly involved. Modifications include but are not limited to:

- A. Adding antennas
- B. Removing/replacing antennas
- C. Adding coaxial cables
- D. Extending the height of the tower

EBI hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with

that which is contained herein, or you are aware of any defects arising from the original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact EBI. EBI disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

The conclusion of this tower structural analysis is that the tower superstructure has adequate capacity for the proposed loading.

Please contact this office should you have any questions regarding this matter.




Sincerely,
February 13, 2015


Kelly Shanahan, E.I.T.
Project Engineer


Richard L. Peterman, P.E.
Project Engineer



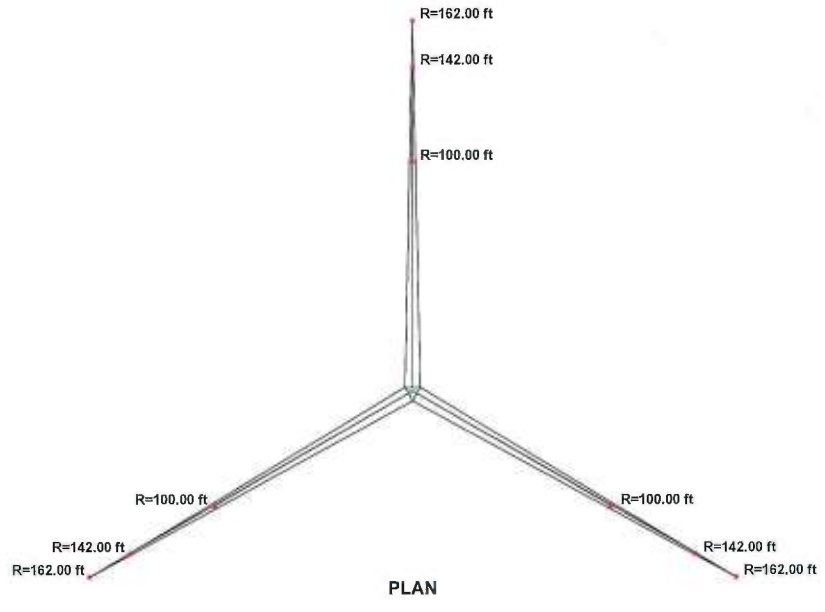
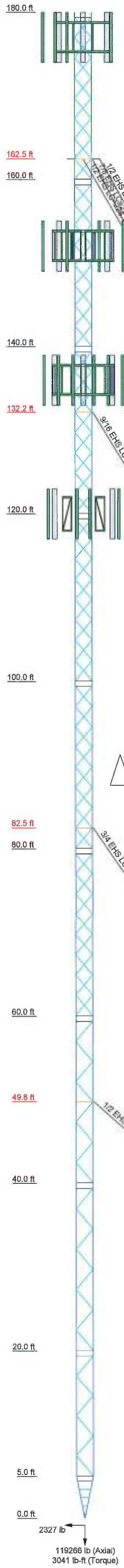
STRUCTURAL PHOTO LOG

<p>Photo 1: General view of the existing tower.</p>	 <p>01/21/2015</p>
<p>Photo 2: Close up view at proposed equipment</p>	 <p>01/21/2015</p>
<p>Photo 3: Close-up view of the tower base.</p>	 <p>01/21/2015</p>

Appendix A

Tower Analysis Results

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Legs					ROHN 2.5 X-STR					
Leg Grade					A572-50					
Diagonals	L2x2x1/4	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x16 ga	ROHN TS1.5x16 ga	N.A.
Diagonal Grade	A36									
Top Girts	L2x2x1/4	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x16 ga	ROHN TS1.5x16 ga	L4x4x1/4
Bottom Girts	L2x2x1/4	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x16 ga	ROHN TS1.5x16 ga	L4x4x1/4
Horizontals					N.A.					L3x3x1/2
Top Guy Pull-Offs	2L2x2x1/4x3/8	N.A.	4x3/8	N.A.	2L2x2x1/4x3/8	N.A.	4x3/8	N.A.		L4x4x1/4
Face Width (ft)	3.42									
# Panels @ (ft)					64 @ 2.40865				6 @ 2.37847	5 @ 1
Weight (lb)	1712.3	807.5	786.9	807.5	782.2	807.5	864.6	682.2	544.9	330.0



DESIGNED APPURTENANCE LOADING

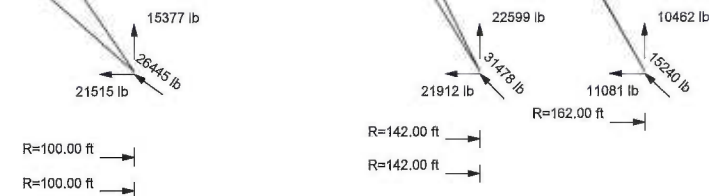
TYPE	ELEVATION	TYPE	ELEVATION
Rohn 6"x15" Boom Gate (3) (ATI)	177	Antel BXA 70063/6CF 4 w/ pipe (Verizon)	136
(2) Powerwave P65-17-XLH-RR w/ pipe mount (ATI)	177	BXA-171085-8BF-EDIN (Verizon)	136
Powerwave 7770 w/ pipe (ATI)	177	AmpenoAntel LPA-80080-4CF w/ pipe (Verizon)	136
(2) TMA DTMABP7819VG12A (ATI)	177	AmpenoAntel LPA-80080-4CF w/ pipe (Verizon)	136
Commscope SBNH-1D6565C w/ pipe mount (ATI)	177	(2) FRS FD9R6004 Diplexer (Verizon)	136
Powerwave P65-17-XLH-RR w/ pipe mount (ATI)	177	Pirol 15' T-Frame Sector Mount (1) (Verizon)	136
Powerwave 7770 w/ pipe (ATI)	177	Antel BXA 70063/6CF 4 w/ pipe (Verizon)	136
(2) TMA DTMABP7819VG12A (ATI)	177	BXA-171085-8BF-EDIN (Verizon)	136
DB874H120-SY w/ mount pipe (ATI)	177	AmpenoAntel LPA-80080-4CF w/ pipe (Verizon)	136
Powerwave 7770 w/ pipe (ATI)	177	AmpenoAntel LPA-80080-4CF w/ pipe (Verizon)	136
Powerwave P65-17-XLH-RR w/ pipe mount (ATI)	177	(2) FRS FD9R6004 Diplexer (Verizon)	136
(2) LGP21401 TMA (ATI)	177	AIR21 B4A/B2P with pipe (T-Mobile)	120
TMA DTMABP7819VG12A (ATI)	177	ddB4 TMA (T-Mobile)	120
DC surge arrestor (ATI)	177	AIR21 B4A/B2P with pipe (T-Mobile)	120
(2) Ericsson RRU (ATI)	177	ddB4 TMA (T-Mobile)	120
(2) Ericsson RRU (ATI)	177	AIR21 B4A/B2P with pipe (T-Mobile)	120
(2) Ericsson RRU (ATI)	177	ddB4 TMA (T-Mobile)	120
Pirol 15' T-Frame Sector Mount (1) (Sprint)	152	KRC 118 057/1 antenna (59") w/ pipe mount (T-Mobile)	120
(2) DB980H90E-M w/ Mount Pipe (Sprint)	152	KRC 118 057/1 antenna (59") w/ pipe mount (T-Mobile)	120
Pirol 15' T-Frame Sector Mount (1) (Sprint)	152	KRC 118 057/1 antenna (59") w/ pipe mount (T-Mobile)	120
(2) DB980H90E-M w/ Mount Pipe (Sprint)	152	RRUS11 B12 remote radio unit (T-Mobile)	120
Pirol 15' T-Frame Sector Mount (1) (Sprint)	152	RRUS11 B12 remote radio unit (T-Mobile)	120
(2) DB980H90E-M w/ Mount Pipe (Sprint)	152	RRUS11 B12 remote radio unit (T-Mobile)	120
Pirol 15' T-Frame Sector Mount (1) (Verizon)	136	Pirol 4' Side Mount Standoff (1) (T-Mobile)	120
Antel BXA 70063/6CF 4 w/ pipe (Verizon)	136	Pirol 4' Side Mount Standoff (1) (T-Mobile)	120
BXA-171085-8BF-EDIN (Verizon)	136	Pirol 4' Side Mount Standoff (1) (T-Mobile)	120
AmpenoAntel LPA-80080-4CF w/ pipe (Verizon)	136	1' standoff (Sprint)	98
AmpenoAntel LPA-80080-4CF w/ pipe (Verizon)	136	GPS (Sprint)	98
(2) FRS FD9R6004 Diplexer (Verizon)	136		
Pirol 15' T-Frame Sector Mount (1) (Verizon)	136		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	42 ksi modified for bearing on pipes	42 ksi	116 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

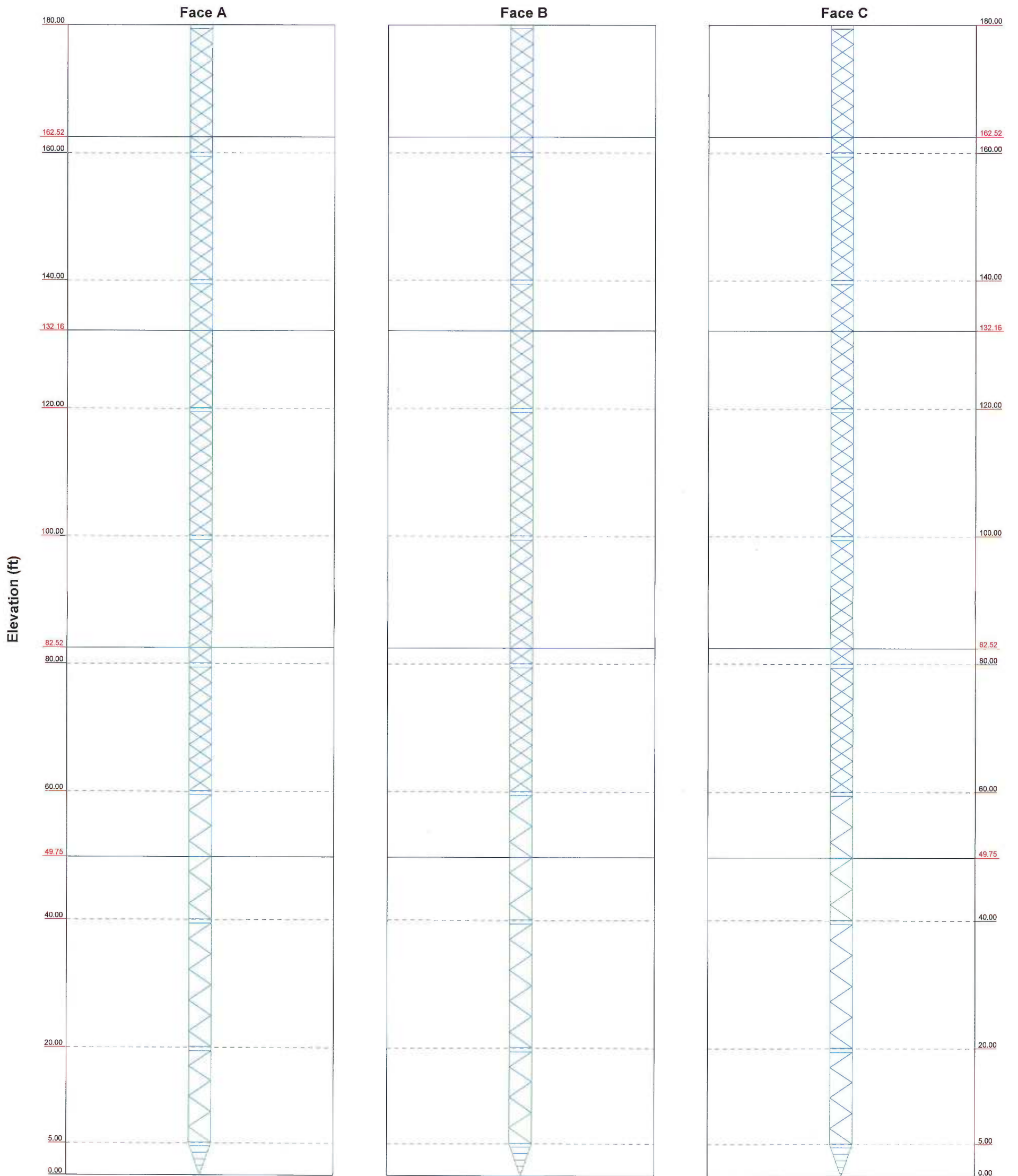
1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. Weld together tower sections have flange connections.
6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.



<p>EBI Consulting 21 B Street Burlington, MA 01803 Phone: (781) 425-5100 FAX: (781) 425-5141</p>	Job: CT11048
	Project: EBI Job # 81150090
	Client: T-Mobile
	Code: TIA/EIA-222-F
	Path: \\server\proj\proj\EBI\EBI Job # 81150090\EBI Job # 81150090.dwg
Drawn by: Kelly Shanahan	App'd:
Date: 02/13/15	Scale: NTS
	Dwg No. E-1

Stress Distribution Chart
0' - 180'

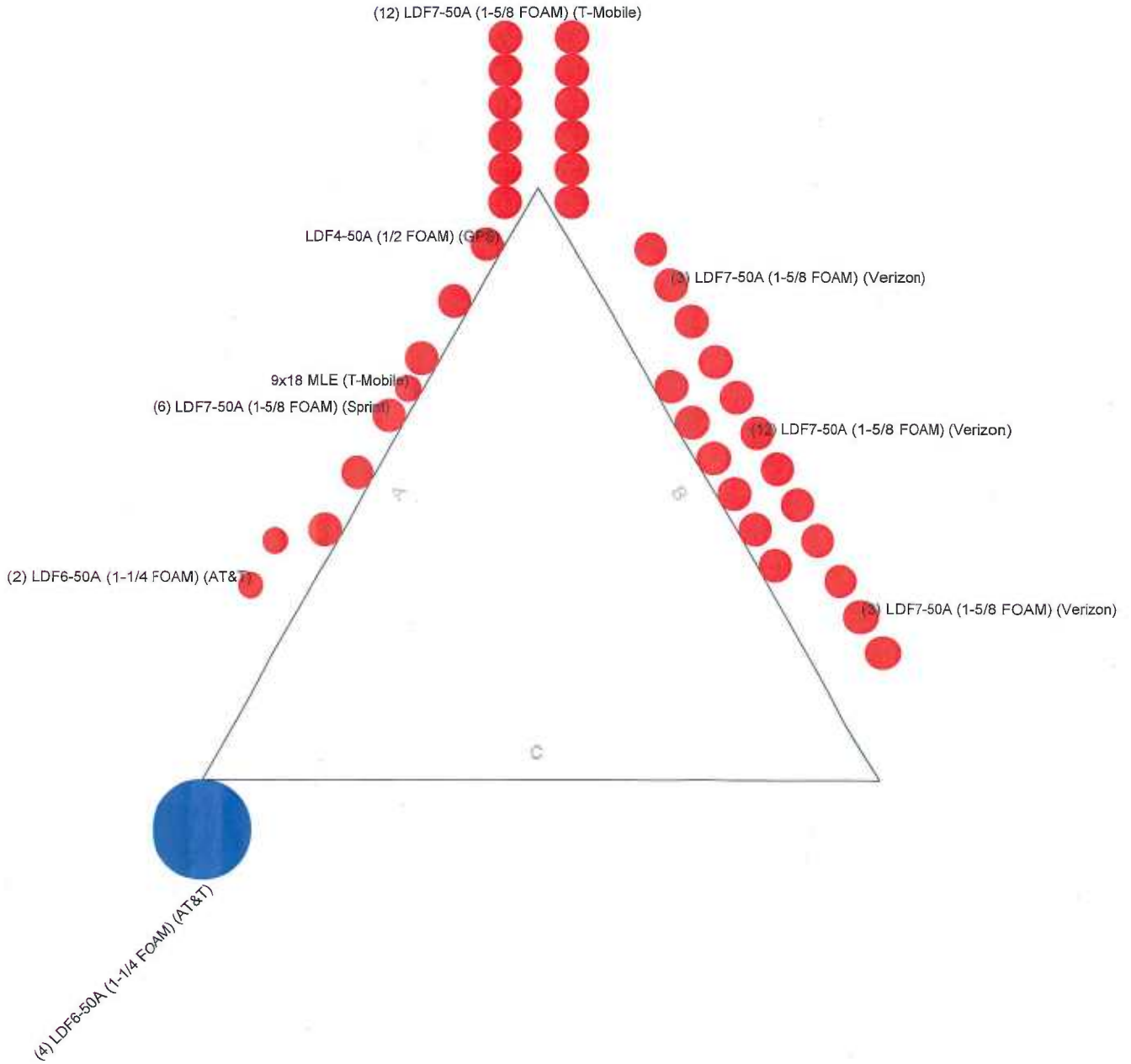
■ > 100%
 ■ 90%-100%
 ■ 75%-90%
 ■ 50%-75%
 ■ < 50% Overstress




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		Project: EBI Job # 81150090	
Client: T-Mobile	Drawn by: Kelly Shanahan	App'd:	
Code: TIA/EIA-222-F	Date: 02/13/15	Scale: NTS	
Path:		Dwg No. E-8	

Feed Line Plan

Round Flat App In Face App Out Face



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	Project: EBI Job # 81150090		
	Client: T-Mobile	Drawn by: Kelly Shanahan	App'd:
	Code: TIA/EIA-222-F	Date: 02/13/15	Scale: NTS
	Path:		Dwg No. E-7

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Tower Input Data

The main tower is a 3x guyed tower with an overall height of 180.00 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 3.42 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 New London County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 74 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

Weld together tower sections have flange connections..

Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..

Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..

Welds are fabricated with ER-70S-6 electrodes..

Pressures are calculated at each section.

Safety factor used in guy design is 2.

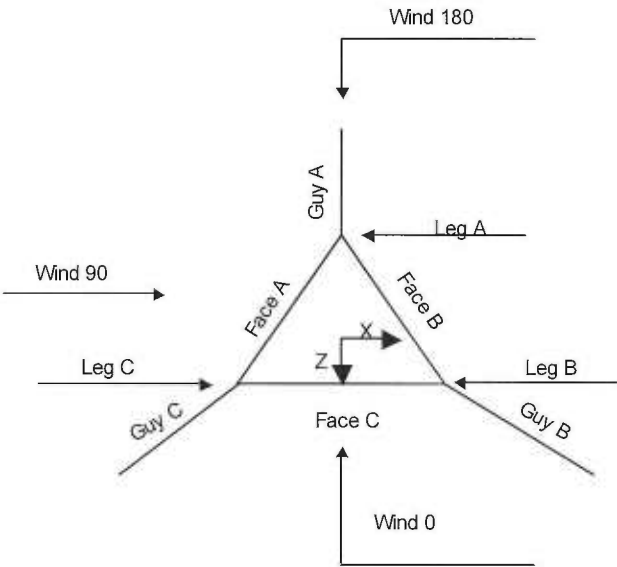
Stress ratio used in tower member design is 1.333.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

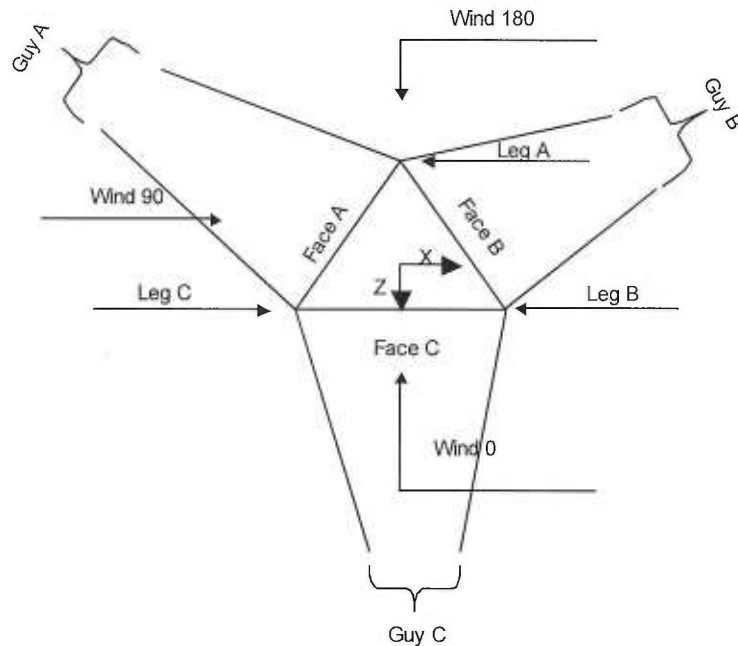
<ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination 	<ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption 	<ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA √ SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feedline Torque √ Include Angle Block Shear Check <li style="padding-left: 40px;">Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
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Corner & Starmount Guyed Tower

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Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180.00-160.00			3.42	1	20.00
T2	160.00-140.00			3.42	1	20.00
T3	140.00-120.00			3.42	1	20.00
T4	120.00-100.00			3.42	1	20.00
T5	100.00-80.00			3.42	1	20.00
T6	80.00-60.00			3.42	1	20.00
T7	60.00-40.00			3.42	1	20.00
T8	40.00-20.00			3.42	1	20.00
T9	20.00-5.00			3.42	1	15.00
T10	5.00-0.00			3.42	1	5.00

Tower Section Geometry (cont'd)

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Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.00-160.00	2.41	X Brace	No	No	7.3750	1.3750
T2	160.00-140.00	2.41	X Brace	No	No	7.3750	1.3750
T3	140.00-120.00	2.41	X Brace	No	No	7.3750	1.3750
T4	120.00-100.00	2.41	X Brace	No	No	7.3750	1.3750
T5	100.00-80.00	2.41	X Brace	No	No	7.3750	1.3750
T6	80.00-60.00	2.41	X Brace	No	No	7.3750	1.3750
T7	60.00-40.00	2.41	K Brace Right	No	No	7.3750	1.3750
T8	40.00-20.00	2.41	K Brace Right	No	No	7.3750	1.3750
T9	20.00-5.00	2.38	K Brace Right	No	No	7.3750	1.3750
T10	5.00-0.00	1.00	X Brace	No	Yes	6.0000	6.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-160.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T2 160.00-140.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	42 ksi modified for bearing on pipes (42 ksi)
T3 140.00-120.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	42 ksi modified for bearing on pipes (42 ksi)
T4 120.00-100.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	42 ksi modified for bearing on pipes (42 ksi)
T5 100.00-80.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	42 ksi modified for bearing on pipes (42 ksi)
T6 80.00-60.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	42 ksi modified for bearing on pipes (42 ksi)
T7 60.00-40.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	42 ksi modified for bearing on pipes (42 ksi)
T8 40.00-20.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	42 ksi modified for bearing on pipes (42 ksi)
T9 20.00-5.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	42 ksi modified for bearing on pipes (42 ksi)
T10 5.00-0.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe		A36 (36 ksi)

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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 180.00-160.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T2 160.00-140.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T3 140.00-120.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T4 120.00-100.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 100.00-80.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T6 80.00-60.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T7 60.00-40.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T8 40.00-20.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T9 20.00-5.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Single Angle	L3x3x1/2	A36 (36 ksi)
T10 5.00-0.00	Single Angle	L4x4x1/4	A36 (36 ksi)	Single Angle	L4x4x1/4	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
T10 5.00-0.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T10 5.00-0.00	Single Angle	L4x4x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry (cont'd)

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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	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
T1 180.00-160.00	1.21	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 160.00-140.00	1.21	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 140.00-120.00	1.21	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 120.00-100.00	1.21	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 100.00-80.00	1.21	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 80.00-60.00	1.21	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 60.00-40.00	0.74	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 40.00-20.00	0.74	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 20.00-5.00	0.60	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 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	K Factors ¹									
			Legs	X Brace Diags		K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace	
				X	Y							X
T1 180.00-160.00	No	No	1	1	1	1	1	1	1	1	1	1
T2 160.00-140.00	No	No	1	1	1	1	1	1	1	1	1	1
T3 140.00-120.00	No	No	1	1	1	1	1	1	1	1	1	1
T4 120.00-100.00	No	No	1	1	1	1	1	1	1	1	1	1
T5 100.00-80.00	No	No	1	1	1	1	1	1	1	1	1	1
T6 80.00-60.00	No	No	1	1	1	1	1	1	1	1	1	1
T7 60.00-40.00	No	No	1	1	1	1	1	1	1	1	1	1
T8 40.00-20.00	No	No	1	1	1	1	1	1	1	1	1	1
T9 20.00-5.00	No	No	1	1	1	1	1	1	1	1	1	1
T10 5.00-0.00	No	No	0.2	1	1	1	1	1	1	1	1	1

¹Note: 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.

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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 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 20.00-5.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 5.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.00-160.00	Flange	0.7500	0	0.6250	1	0.6250	1	0.6250	1	0.6250	0	0.6250	0	0.6250	0
T2 160.00-140.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
T3 140.00-120.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
T4 120.00-100.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
T5 100.00-80.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
T6 80.00-60.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
T7 60.00-40.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
T8 40.00-20.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
T9 20.00-5.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.6250	2	0.6250	0	0.6250	0	0.6250	0
T10 5.00-0.00	Flange	0.7500	4	0.5000	0	0.5000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0

Guy Data

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Guy Elevation	Guy Grade	Guy Size	Initial Tension	%	Guy Modulus	Guy Weight	L _u	Anchor Radius	Anchor Azimuth Adj.	Anchor Elevation	End Fitting Efficiency	
ft			lb		ksi	plf	ft	ft	°	ft	%	
162.523	EHS	A	1/2	2690.00	10%	21000	0.517	227.92	162.00	0.0000	0.00	100%
		B	1/2	2690.00	10%	21000	0.517	227.92	162.00	0.0000	0.00	100%
		C	1/2	2690.00	10%	21000	0.517	227.92	162.00	0.0000	0.00	100%
132.159	EHS	A	9/16	3500.00	10%	21000	0.671	192.38	142.00	0.0000	0.00	100%
		B	9/16	3500.00	10%	21000	0.671	192.38	142.00	0.0000	0.00	100%
		C	9/16	3500.00	10%	21000	0.671	192.38	142.00	0.0000	0.00	100%
82.5234	EHS	A	3/4	5830.00	10%	19000	1.155	128.02	100.00	0.0000	0.00	100%
		B	3/4	5830.00	10%	19000	1.155	128.02	100.00	0.0000	0.00	100%
		C	3/4	5830.00	10%	19000	1.155	128.02	100.00	0.0000	0.00	100%
162.523	EHS	A	7/8	7970.00	10%	19000	1.581	214.33	142.00	0.0000	0.00	100%
		B	7/8	7970.00	10%	19000	1.581	214.33	142.00	0.0000	0.00	100%
		C	7/8	7970.00	10%	19000	1.581	214.33	142.00	0.0000	0.00	100%
49.75	EHS	A	1/2	2690.00	10%	21000	0.517	109.83	100.00	0.0000	0.00	100%
		B	1/2	2690.00	10%	21000	0.517	109.83	100.00	0.0000	0.00	100%
		C	1/2	2690.00	10%	21000	0.517	109.83	100.00	0.0000	0.00	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	°				
162.523	Torque Arm	6.83	0.0000	Channel	A36 (36 ksi)	Channel	C12x20.7
132.159	Corner						
82.5234	Corner						
162.523	Corner						
49.75	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								
162.52	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Double Angle	
132.16	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	4x3/8
82.52	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Double Angle	2L2x2x1/4x3/8
162.52	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Double Angle	2L2x2x1/4x3/8
49.75	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	4x3/8

Guy Data (cont'd)

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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
162.523	117.84	117.84	117.84		4.92	4.92	4.92	
					3.8 sec/pulse	3.8 sec/pulse	3.8 sec/pulse	
132.159	129.09	129.09	129.09		3.51	3.51	3.51	
					3.2 sec/pulse	3.2 sec/pulse	3.2 sec/pulse	
82.5234	147.86	147.86	147.86		1.61	1.61	1.61	
					2.2 sec/pulse	2.2 sec/pulse	2.2 sec/pulse	
162.523	338.86	338.86	338.86		4.49	4.49	4.49	
					3.7 sec/pulse	3.7 sec/pulse	3.7 sec/pulse	
49.75	56.78	56.78	56.78		1.15	1.15	1.15	
					1.9 sec/pulse	1.9 sec/pulse	1.9 sec/pulse	

Guy Data (cont'd)

Guy Elevation	Calc K Single Angles	Calc K Solid Rounds	Torque Arm		Pull Off		Diagonal	
			K _x	K _y	K _x	K _y	K _x	K _y
162.523	No	No	1	1	1	1	1	1
132.159	No	No			1	1	1	1
82.5234	No	No			1	1	1	1
162.523	No	No			1	1	1	1
49.75	No	No			1	1	1	1

Guy Data (cont'd)

Guy Elevation	Torque-Arm				Pull Off				Diagonal			
	Bolt Size	Number	Net Width	U	Bolt Size	Number	Net Width	U	Bolt Size	Number	Net Width	U
ft	in		in		in		in		in		in	
162.523	0.0000	0	0.0000	1	0.6250	0	0.0000	0.75	0.6250	0	0.0000	0.75
	A325N				A325N				A325N			
132.159	0.6250	0	0.0000	0.75	0.6250	0	0.0000	0.75	0.6250	0	0.0000	0.75
	A325N				A325N				A325N			
82.5234	0.6250	0	0.0000	0.75	0.6250	0	0.0000	0.75	0.6250	0	0.0000	0.75
	A325N				A325N				A325N			
162.523	0.6250	0	0.0000	0.75	0.6250	0	0.0000	0.75	0.6250	0	0.0000	0.75
	A325N				A325N				A325N			
49.75	0.6250	0	0.0000	0.75	0.6250	0	0.0000	0.75	0.6250	0	0.0000	0.75
	A325N				A325N				A325N			

Guy Pressures

Guy Elevation	Guy Location	z	q _z	q _z Ice	Ice Thickness
ft		ft	psf	psf	in
162.523	A	81.26	24	18	0.5000
	B	81.26	24	18	0.5000

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Guy Elevation ft	Guy Location	z ft	q _z psf	q _z Ice psf	Ice Thickness in
132.159	C	81.26	24	18	0.5000
	A	66.08	23	17	0.5000
	B	66.08	23	17	0.5000
82.5234	C	66.08	23	17	0.5000
	A	41.26	20	15	0.5000
	B	41.26	20	15	0.5000
162.523	C	41.26	20	15	0.5000
	A	81.26	24	18	0.5000
	B	81.26	24	18	0.5000
49.75	C	81.26	24	18	0.5000
	A	24.88	18	14	0.5000
	B	24.88	18	14	0.5000
	C	24.88	18	14	0.5000

Guy-Tensioning Information

Temperature At Time Of Tensioning																	
Guy Elevation ft	H ft	V ft	0 F		20 F		40 F		60 F		80 F		100 F		120 F		
			Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	
162.523	A	160.06	162.52	3257	4.07	3066	4.32	2877	4.60	2690	4.92	2507	5.27	2327	5.68	2152	6.13
	B	160.06	162.52	3257	4.07	3066	4.32	2877	4.60	2690	4.92	2507	5.27	2327	5.68	2152	6.13
	C	160.06	162.52	3257	4.07	3066	4.32	2877	4.60	2690	4.92	2507	5.27	2327	5.68	2152	6.13
132.159	A	140.03	132.16	4303	2.86	4033	3.05	3765	3.26	3500	3.51	3239	3.79	2983	4.11	2733	4.48
	B	140.03	132.16	4303	2.86	4033	3.05	3765	3.26	3500	3.51	3239	3.79	2983	4.11	2733	4.48
	C	140.03	132.16	4303	2.86	4033	3.05	3765	3.26	3500	3.51	3239	3.79	2983	4.11	2733	4.48
82.5234	A	98.03	82.52	7254	1.30	6777	1.39	6302	1.49	5830	1.61	5362	1.75	4899	1.92	4443	2.11
	B	98.03	82.52	7254	1.30	6777	1.39	6302	1.49	5830	1.61	5362	1.75	4899	1.92	4443	2.11
	C	98.03	82.52	7254	1.30	6777	1.39	6302	1.49	5830	1.61	5362	1.75	4899	1.92	4443	2.11
162.523	A	140.03	162.52	9349	3.83	8886	4.03	8426	4.25	7970	4.49	7519	4.75	7074	5.05	6635	5.38
	B	140.03	162.52	9349	3.83	8886	4.03	8426	4.25	7970	4.49	7519	4.75	7074	5.05	6635	5.38
	C	140.03	162.52	9349	3.83	8886	4.03	8426	4.25	7970	4.49	7519	4.75	7074	5.05	6635	5.38
49.75	A	98.03	49.75	3645	0.85	3325	0.93	3006	1.03	2690	1.15	2377	1.31	2070	1.50	1773	1.75
	B	98.03	49.75	3645	0.85	3325	0.93	3006	1.03	2690	1.15	2377	1.31	2070	1.50	1773	1.75
	C	98.03	49.75	3645	0.85	3325	0.93	3006	1.03	2690	1.15	2377	1.31	2070	1.50	1773	1.75

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
LDF6-50A (1-1/4 FOAM) (AT&T)	A	Yes	Ar (CfAe)	8.00 - 177.00	2.5000	-0.18	2	2	1.5500	1.5500		0.66
LDF6-50A (1-1/4 FOAM) (AT&T)	C	Yes	Ar (CfAe)	136.00 - 177.00	0.0000	-0.18	12	6	1.0000 1.5500	1.5500		0.66
LDF7-50A (1-5/8 FOAM) (Sprint)	A	Yes	Ar (CfAe)	8.00 - 152.00	0.0000	0.15	6	6	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (Verizon)	B	Yes	Ar (CfAe)	8.00 - 136.00	0.0000	0	12	6	0.5000 1.0000	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (Verizon)	B	Yes	Ar (CfAe)	8.00 - 136.00	3.0000	-0.28	3	3	0.5000	1.9800		0.82
LDF7-50A	B	Yes	Ar (CfAe)	8.00 - 136.00	3.0000	0.28	3	3	0.5000	1.9800		0.82

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(1-5/8 FOAM) (Verizon) LDF7-50A	A	No	Ar (Leg)	8.00 - 120.00	0.0000	-0.1	12	6	0.0000	1.9800		0.82
(1-5/8 FOAM) (T-Mobile) LDF4-50A	A	Yes	Ar (CfAe)	8.00 - 98.00	0.0000	0.4	1	1	0.6300	0.6300		0.15
(1/2 FOAM) (GPS) 9x18 MLE (T-Mobile)	A	Yes	Ar (CfAe)	8.00 - 117.00	0.0000	0.15	1	1	1.5000 0.0000	1.5700		1.07

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C _{AA}	Weight
									ft ² /ft	plf
LDF6-50A (1-1/4 FOAM) (AT&T)	C	No	CaAa (In Face)	8.00 - 177.00	0.0000	0.5	4	No Ice 1/2" Ice	0.16 0.25	0.66 1.91

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
T1	180.00-160.00	A	4.392	0.000	0.000	0.000	22.44
		B	0.000	0.000	0.000	0.000	0.00
		C	13.175	0.000	10.540	0.000	179.52
T2	160.00-140.00	A	17.047	0.000	0.000	0.000	85.44
		B	0.000	0.000	0.000	0.000	0.00
		C	15.500	0.000	12.400	0.000	211.20
T3	140.00-120.00	A	24.967	0.000	0.000	0.000	124.80
		B	31.680	0.000	0.000	0.000	236.16
		C	3.100	0.000	12.400	0.000	84.48
T4	120.00-100.00	A	46.991	0.000	0.000	0.000	339.79
		B	59.400	0.000	0.000	0.000	295.20
		C	0.000	0.000	12.400	0.000	52.80
T5	100.00-80.00	A	48.328	0.000	0.000	0.000	345.70
		B	59.400	0.000	0.000	0.000	295.20
		C	0.000	0.000	12.400	0.000	52.80
T6	80.00-60.00	A	48.433	0.000	0.000	0.000	346.00
		B	59.400	0.000	0.000	0.000	295.20
		C	0.000	0.000	12.400	0.000	52.80
T7	60.00-40.00	A	48.433	0.000	0.000	0.000	346.00
		B	59.400	0.000	0.000	0.000	295.20
		C	0.000	0.000	12.400	0.000	52.80
T8	40.00-20.00	A	48.433	0.000	0.000	0.000	346.00
		B	59.400	0.000	0.000	0.000	295.20
		C	0.000	0.000	12.400	0.000	52.80
T9	20.00-5.00	A	29.060	0.000	0.000	0.000	207.60
		B	35.640	0.000	0.000	0.000	177.12
		C	0.000	0.000	7.440	0.000	31.68
T10	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

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Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight lb
		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 ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight lb
T1	180.00-160.00	A	0.500	7.225	0.000	0.000	0.000	65.02
		B		0.000	0.000	0.000	0.000	0.00
		C		3.612	18.063	17.340	0.000	612.39
T2	160.00-140.00	A	0.500	26.380	0.000	0.000	0.000	244.61
		B		0.000	0.000	0.000	0.000	0.00
		C		4.250	21.250	20.400	0.000	720.46
T3	140.00-120.00	A	0.500	38.300	0.000	0.000	0.000	356.68
		B		11.920	29.760	0.000	0.000	708.68
		C		0.850	4.250	20.400	0.000	266.48
T4	120.00-100.00	A	0.500	46.907	16.500	0.000	0.000	873.21
		B		19.867	53.700	0.000	0.000	885.85
		C		0.000	0.000	20.400	0.000	152.98
T5	100.00-80.00	A	0.500	49.995	16.500	0.000	0.000	895.33
		B		19.867	53.700	0.000	0.000	885.85
		C		0.000	0.000	20.400	0.000	152.98
T6	80.00-60.00	A	0.500	50.267	16.500	0.000	0.000	897.01
		B		19.867	53.700	0.000	0.000	885.85
		C		0.000	0.000	20.400	0.000	152.98
T7	60.00-40.00	A	0.500	50.267	16.500	0.000	0.000	897.01
		B		19.867	53.700	0.000	0.000	885.85
		C		0.000	0.000	20.400	0.000	152.98
T8	40.00-20.00	A	0.500	50.267	16.500	0.000	0.000	897.01
		B		19.867	53.700	0.000	0.000	885.85
		C		0.000	0.000	20.400	0.000	152.98
T9	20.00-5.00	A	0.500	30.160	9.900	0.000	0.000	538.21
		B		11.920	32.220	0.000	0.000	531.51
		C		0.000	0.000	12.240	0.000	91.79
T10	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 Shielding

Section	Elevation ft	Face	A_R ft ²	A_R Ice ft ²	A_F ft ²	A_F Ice ft ²
T1	180.00-160.00	A	0.000	0.679	0.826	1.359
		B	0.000	0.000	0.000	0.000
		C	0.000	2.038	2.478	4.077
T2	160.00-140.00	A	2.298	5.927	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.090	5.730	0.000	0.000
T3	140.00-120.00	A	3.366	8.765	0.416	0.638
		B	4.271	9.539	0.528	0.695
		C	0.418	1.167	0.052	0.085
T4	120.00-100.00	A	3.666	9.424	0.000	0.000
		B	5.339	11.706	0.000	0.000

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Section	Elevation	Face	A_R	$A_{R_{Ice}}$	A_F	$A_{F_{Ice}}$
	ft		ft ²	ft ²	ft ²	ft ²
T5	100.00-80.00	C	0.000	0.000	0.000	0.000
		A	3.846	10.305	0.238	0.375
		B	5.339	11.924	0.330	0.434
T6	80.00-60.00	C	0.000	0.000	0.000	0.000
		A	3.860	10.179	0.000	0.000
		B	5.339	11.706	0.000	0.000
T7	60.00-40.00	C	0.000	0.000	0.000	0.000
		A	2.109	5.750	0.477	0.755
		B	2.917	6.613	0.660	0.868
T8	40.00-20.00	C	0.000	0.000	0.000	0.000
		A	2.109	5.561	0.000	0.000
		B	2.917	6.396	0.000	0.000
T9	20.00-5.00	C	0.000	0.000	0.000	0.000
		A	1.189	3.287	0.286	0.453
		B	1.645	3.781	0.396	0.521
T10	5.00-0.00	C	0.000	0.000	0.000	0.000
		A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	$CP_{X_{Ice}}$	$CP_{Z_{Ice}}$
	ft	in	in	in	in
T1	180.00-160.00	-1.5328	2.1175	-1.8440	1.9172
T2	160.00-140.00	-2.2521	1.5178	-2.4784	1.3714
T3	140.00-120.00	-0.5612	-1.3398	-1.7967	-0.5547
T4	120.00-100.00	-0.1673	-4.2776	-1.4139	-2.4998
T5	100.00-80.00	-0.1971	-4.3052	-1.4354	-2.5830
T6	80.00-60.00	-0.1892	-4.3590	-1.4316	-2.6445
T7	60.00-40.00	-0.1418	-4.6615	-1.4117	-2.9953
T8	40.00-20.00	-0.1227	-4.7642	-1.4037	-3.0840
T9	20.00-5.00	-0.1287	-4.4111	-1.3237	-2.8369
T10	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	Azimuth Adjustment	Placement	$C_{AA_{Front}}$	$C_{AA_{Side}}$	Weight	
			ft ft ft	°	ft	ft ²	ft ²	lb	
Rohn 6'x15' Boom Gate (3) (AT&T)	A	None		0.0000	177.00	No Ice	53.20	40.00	1500.00
(2) Powerwave	A	From Leg	4.75	0.0000	177.00	1/2" Ice	63.30	45.00	1600.00
P65-17-XLH-RR w/ pipe mount (AT&T)			0.00			No Ice	11.47	9.10	116.32
			0.00			1/2" Ice	12.08	10.52	203.25
Powerwave 7770 w/ pipe	A	From Leg	4.75	0.0000	177.00	No Ice	6.16	4.48	67.33

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
(AT&T)			0.00			1/2" Ice 6.65	5.17	115.62
(2) TMA DTMABP7819VG12A (AT&T)	A	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 1.14 1/2" Ice 1.28	0.39 0.49	19.20 26.50
Commscope SBNH-1D6565C w/ pipe mount (AT&T)	B	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 11.45 1/2" Ice 12.06	10.00 11.42	111.32 202.06
Powerwave P65-17-XLH-RR w/ pipe mount (AT&T)	B	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 11.47 1/2" Ice 12.08	9.10 10.52	116.32 203.25
Powerwave 7770 w/ pipe (AT&T)	B	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 6.16 1/2" Ice 6.65	4.48 5.17	67.33 115.62
(2) TMA DTMABP7819VG12A (AT&T)	B	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 1.14 1/2" Ice 1.28	0.39 0.49	19.20 26.50
DB874H120-SY w/ mount pipe (AT&T)	C	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 5.84 1/2" Ice 6.29	3.67 4.28	32.25 74.03
(2) Powerwave 7770 w/ pipe (AT&T)	C	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 6.16 1/2" Ice 6.65	4.48 5.17	67.33 115.62
Powerwave P65-17-XLH-RR w/ pipe mount (AT&T)	C	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 11.47 1/2" Ice 12.08	9.10 10.52	116.32 203.25
(2) LGP21401 TMA (AT&T)	C	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 1.23 1/2" Ice 1.38	0.41 0.52	14.10 21.29
TMA DTMABP7819VG12A (AT&T)	C	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 1.14 1/2" Ice 1.28	0.39 0.49	19.20 26.50
DC surge arrester (AT&T)	C	From Leg	0.50 0.00 0.00	0.0000	177.00	No Ice 2.45 1/2" Ice 2.95	2.45 2.95	38.25 64.62
(2) Ericsson RRU (AT&T)	A	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 2.07 1/2" Ice 2.26	1.08 1.23	44.00 58.64
(2) Ericsson RRU (AT&T)	B	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 2.07 1/2" Ice 2.26	1.08 1.23	44.00 58.64
(2) Ericsson RRU (AT&T)	C	From Leg	4.75 0.00 0.00	0.0000	177.00	No Ice 2.07 1/2" Ice 2.26	1.08 1.23	44.00 58.64
*** ***								
Pirod 15' T-Frame Sector Mount (1) (Sprint)	A	From Leg	2.00 0.00 0.00	0.0000	152.00	No Ice 15.00 1/2" Ice 20.60	13.00 14.00	500.00 650.00
(2) DB980H90E-M w/Mount Pipe (Sprint)	A	From Leg	4.75 0.00 0.00	0.0000	152.00	No Ice 4.27 1/2" Ice 4.86	3.86 4.95	34.05 72.67
Pirod 15' T-Frame Sector Mount (1) (Sprint)	B	From Leg	2.00 0.00 0.00	0.0000	152.00	No Ice 15.00 1/2" Ice 20.60	13.00 14.00	500.00 650.00
(2) DB980H90E-M w/Mount Pipe	B	From Leg	4.75 0.00	0.0000	152.00	No Ice 4.27 1/2" Ice 4.86	3.86 4.95	34.05 72.67

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	Project EBI Job # 81150090	Date 17:00:23 02/13/15
	Client T-Mobile	Designed by Kelly Shanahan

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
(Sprint)			0.00						
Pirod 15' T-Frame Sector Mount (1)	C	From Leg	2.00	0.0000	152.00	No Ice	15.00	13.00	500.00
(Sprint)			0.00			1/2" Ice	20.60	14.00	650.00
(2) DB980H90E-M w/Mount Pipe	C	From Leg	4.75	0.0000	152.00	No Ice	4.27	3.86	34.05
(Sprint)			0.00			1/2" Ice	4.86	4.95	72.67
***			0.00						
Pirod 15' T-Frame Sector Mount (1)	A	From Leg	2.00	0.0000	136.00	No Ice	15.00	13.00	500.00
(Verizon)			0.00			1/2" Ice	20.60	14.00	650.00
Antel BXA 70063/6CF_4 w/ pipe	A	From Leg	4.00	0.0000	136.00	No Ice	7.93	6.84	66.27
(Verizon)			0.00			1/2" Ice	8.50	7.67	135.78
BXA-171085-8BF-EDIN	A	From Leg	4.00	0.0000	136.00	No Ice	3.41	3.58	32.40
(Verizon)			0.00			1/2" Ice	3.88	4.38	67.40
AmpenolAntel LPA-80080-4CF w/ pipe	A	From Leg	4.00	0.0000	136.00	No Ice	2.90	7.38	60.95
(Verizon)			6.00			1/2" Ice	3.27	8.09	108.13
AmpenolAntel LPA-80080-4CF w/ pipe	A	From Leg	4.00	0.0000	136.00	No Ice	2.90	7.38	60.95
(Verizon)			-6.00			1/2" Ice	3.27	8.09	108.13
(2) FRS FD9R6004 Diplexer	A	From Leg	4.00	0.0000	136.00	No Ice	0.37	0.08	2.60
(Verizon)			0.00			1/2" Ice	0.45	0.14	4.90
			0.00						
Pirod 15' T-Frame Sector Mount (1)	B	From Leg	2.00	0.0000	136.00	No Ice	15.00	13.00	500.00
(Verizon)			0.00			1/2" Ice	20.60	14.00	650.00
Antel BXA 70063/6CF_4 w/ pipe	B	From Leg	4.00	0.0000	136.00	No Ice	7.93	6.84	66.27
(Verizon)			0.00			1/2" Ice	8.50	7.67	135.78
BXA-171085-8BF-EDIN	B	From Leg	4.00	0.0000	136.00	No Ice	3.41	3.58	32.40
(Verizon)			0.00			1/2" Ice	3.88	4.38	67.40
			0.00						
AmpenolAntel LPA-80080-4CF w/ pipe	B	From Leg	4.00	0.0000	136.00	No Ice	2.90	7.38	60.95
(Verizon)			6.00			1/2" Ice	3.27	8.09	108.13
AmpenolAntel LPA-80080-4CF w/ pipe	B	From Leg	4.00	0.0000	136.00	No Ice	2.90	7.38	60.95
(Verizon)			-6.00			1/2" Ice	3.27	8.09	108.13
(2) FRS FD9R6004 Diplexer	B	From Leg	4.00	0.0000	136.00	No Ice	0.37	0.08	2.60
(Verizon)			0.00			1/2" Ice	0.45	0.14	4.90
			0.00						
Pirod 15' T-Frame Sector Mount (1)	C	From Leg	2.00	0.0000	136.00	No Ice	15.00	13.00	500.00
(Verizon)			0.00			1/2" Ice	20.60	14.00	650.00
Antel BXA 70063/6CF_4 w/ pipe	C	From Leg	4.00	0.0000	136.00	No Ice	7.93	6.84	66.27
(Verizon)			0.00			1/2" Ice	8.50	7.67	135.78
BXA-171085-8BF-EDIN	C	From Leg	4.00	0.0000	136.00	No Ice	3.41	3.58	32.40
(Verizon)			0.00			1/2" Ice	3.88	4.38	67.40
			0.00						
AmpenolAntel LPA-80080-4CF w/ pipe	C	From Leg	4.00	0.0000	136.00	No Ice	2.90	7.38	60.95
(Verizon)			6.00			1/2" Ice	3.27	8.09	108.13
AmpenolAntel	C	From Leg	4.00	0.0000	136.00	No Ice	2.90	7.38	60.95

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	Client T-Mobile	Designed by Kelly Shanahan

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
LPA-80080-4CF w/ pipe (Verizon)			-6.00 0.00		1/2" Ice	3.27	8.09	108.13
(2) FRS FD9R6004 Diplexer (Verizon)	C	From Leg	4.00 0.00 0.00	0.0000	136.00 No Ice 1/2" Ice	0.37 0.45	0.08 0.14	2.60 4.90
*** *** GPS (Sprint)	A	From Leg	1.00 0.00 0.00	0.0000	98.00 No Ice 1/2" Ice	0.34 0.51	0.34 0.51	6.08 11.71
1' standoff (Sprint)	A	From Leg	1.00 0.00 0.00	0.0000	98.00 No Ice 1/2" Ice	1.00 2.00	1.00 2.00	100.00 150.00
*** AIR21 B4A/B2P with pipe (T-Mobile)	A	From Leg	3.00 6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	6.87 7.38	6.29 7.05	134.62 201.01
ddB4 TMA (T-Mobile)	A	From Leg	3.00 6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	0.64 0.82	0.52 0.71	22.43 31.53
AIR21 B4A/B2P with pipe (T-Mobile)	B	From Leg	3.00 6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	6.87 7.38	6.29 7.05	134.62 201.01
ddB4 TMA (T-Mobile)	B	From Leg	3.00 6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	0.64 0.82	0.52 0.71	22.43 31.53
AIR21 B4A/B2P with pipe (T-Mobile)	C	From Leg	3.00 6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	6.87 7.38	6.29 7.05	134.62 201.01
ddB4 TMA (T-Mobile)	C	From Leg	3.00 6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	0.64 0.82	0.52 0.71	22.43 31.53
KRC 118 057/1 antenna (59") w/ pipe mount (T-Mobile)	A	From Leg	3.00 -6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	8.51 9.00	6.78 7.53	152.95 222.36
KRC 118 057/1 antenna (59") w/ pipe mount (T-Mobile)	B	From Leg	3.00 -6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	8.51 9.00	6.78 7.53	152.95 222.36
KRC 118 057/1 antenna (59") w/ pipe mount (T-Mobile)	C	From Leg	3.00 -6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	8.51 9.00	6.78 7.53	152.95 222.36
RRUS11 B12 remote radio unit (T-Mobile)	A	From Leg	3.00 -6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	3.31 3.55	1.36 1.54	51.00 71.87
RRUS11 B12 remote radio unit (T-Mobile)	B	From Leg	3.00 -6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	3.31 3.55	1.36 1.54	51.00 71.87
RRUS11 B12 remote radio unit (T-Mobile)	C	From Leg	3.00 -6.00 0.00	0.0000	120.00 No Ice 1/2" Ice	3.31 3.55	1.36 1.54	51.00 71.87
Pirod 4' Side Mount Standoff (1) (T-Mobile)	A	From Leg	2.00 0.00 0.00	0.0000	120.00 No Ice 1/2" Ice	2.72 4.91	2.72 4.91	50.00 89.00
Pirod 4' Side Mount Standoff (1) (T-Mobile)	B	From Leg	2.00 0.00 0.00	0.0000	120.00 No Ice 1/2" Ice	2.72 4.91	2.72 4.91	50.00 89.00
Pirod 4' Side Mount Standoff	C	From Leg	2.00	0.0000	120.00 No Ice	2.72	2.72	50.00

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	Client T-Mobile	Designed by Kelly Shanahan

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} _{Front} ft ²	C _{AA} _{Side} ft ²	Weight lb
(1) (T-Mobile)			0.00 0.00			1/2" Ice 4.91	4.91	89.00

Tower Pressures - No Ice

$$G_H = 1.121$$

Section Elevation ft	z ft	K _z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} _{In Face} ft ²	C _{AA} _{Out Face} ft ²
T1 180.00-160.00	170.00	1.597	30	73.192	A	13.249	13.975	9.583	35.20	0.000	0.000
					B	14.075	9.583	40.51	0.000	0.000	
					C	11.597	22.758	27.89	10.540	0.000	
T2 160.00-140.00	150.00	1.541	29	73.192	A	1.210	33.553	9.583	27.57	0.000	0.000
					B	1.210	18.805	47.88	0.000	0.000	
					C	1.210	32.215	28.67	12.400	0.000	
T3 140.00-120.00	130.00	1.48	27	73.192	A	1.934	40.405	9.583	22.63	0.000	0.000
					B	1.822	46.214	19.95	0.000	0.000	
					C	2.298	21.487	40.29	12.400	0.000	
T4 120.00-100.00	110.00	1.411	26	73.192	A	1.210	62.130	9.583	15.13	0.000	0.000
					B	1.210	72.866	12.94	0.000	0.000	
					C	1.210	18.805	47.88	12.400	0.000	
T5 100.00-80.00	90.00	1.332	25	73.192	A	1.542	63.287	9.583	14.78	0.000	0.000
					B	1.450	72.866	12.90	0.000	0.000	
					C	1.780	18.805	46.56	12.400	0.000	
T6 80.00-60.00	70.00	1.24	23	73.192	A	1.210	63.378	9.583	14.84	0.000	0.000
					B	1.210	72.866	12.94	0.000	0.000	
					C	1.210	18.805	47.88	12.400	0.000	
T7 60.00-40.00	50.00	1.126	21	73.192	A	1.403	60.946	9.583	15.37	0.000	0.000
					B	1.220	71.105	13.25	0.000	0.000	
					C	1.880	14.622	58.08	12.400	0.000	
T8 40.00-20.00	30.00	1	18	73.192	A	0.740	60.946	9.583	15.54	0.000	0.000
					B	0.740	71.105	13.34	0.000	0.000	
					C	0.740	14.622	62.39	12.400	0.000	
T9 20.00-5.00	12.50	1	18	54.894	A	1.169	38.610	7.188	18.07	0.000	0.000
					B	1.059	44.734	15.70	0.000	0.000	
					C	1.455	10.739	58.94	7.440	0.000	
T10 5.00-0.00	2.50	1	18	9.816	A	2.850	2.576	2.576	47.47	0.000	0.000
					B	2.850	2.576	47.47	0.000	0.000	
					C	2.850	2.576	47.47	0.000	0.000	

Tower Pressure - With Ice

$$G_H = 1.121$$

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Section Elevation	z	K _z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _{AA} _{In} Face	C _{AA} _{Out} Face
ft	ft		psf	in	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
T1 180.00-160.00	170.00	1.597	22	0.5000	74.858	A	12.716	26.078	12.917	33.30	0.000	0.000
						B	14.075	19.533		38.43	0.000	0.000
						C	28.061	21.107		26.27	17.340	0.000
T2 160.00-140.00	150.00	1.541	21	0.5000	74.858	A	1.210	48.922	12.917	25.77	0.000	0.000
						B	1.210	28.469		43.52	0.000	0.000
						C	22.460	26.989		26.12	20.400	0.000
T3 140.00-120.00	130.00	1.48	21	0.5000	74.858	A	1.712	58.289	12.917	21.53	0.000	0.000
						B	31.415	31.135		20.65	0.000	0.000
						C	6.515	28.437		36.96	20.400	0.000
T4 120.00-100.00	110.00	1.411	20	0.5000	74.858	A	17.710	65.953	12.917	15.44	0.000	0.000
						B	54.910	36.629		14.11	0.000	0.000
						C	1.210	28.469		43.52	20.400	0.000
T5 100.00-80.00	90.00	1.332	18	0.5000	74.858	A	17.905	68.444	12.917	14.96	0.000	0.000
						B	55.046	36.697		14.08	0.000	0.000
						C	1.780	28.754		42.30	20.400	0.000
T6 80.00-60.00	70.00	1.24	17	0.5000	74.858	A	17.710	68.557	12.917	14.97	0.000	0.000
						B	54.910	36.629		14.11	0.000	0.000
						C	1.210	28.469		43.52	20.400	0.000
T7 60.00-40.00	50.00	1.126	16	0.5000	74.858	A	17.625	66.259	12.917	15.40	0.000	0.000
						B	54.712	34.996		14.40	0.000	0.000
						C	1.880	21.742		54.68	20.400	0.000
T8 40.00-20.00	30.00	1	14	0.5000	74.858	A	17.240	66.163	12.917	15.49	0.000	0.000
						B	54.440	34.928		14.45	0.000	0.000
						C	0.740	21.457		58.19	20.400	0.000
T9 20.00-5.00	12.50	1	14	0.5000	56.144	A	10.902	42.894	9.688	18.01	0.000	0.000
						B	33.154	24.160		16.90	0.000	0.000
						C	1.455	16.021		55.43	12.240	0.000
T10 5.00-0.00	2.50	1	14	0.5000	10.256	A	2.850	4.184	3.472	49.36	0.000	0.000
						B	2.850	4.184		49.36	0.000	0.000
						C	2.850	4.184		49.36	0.000	0.000

Tower Pressure - Service

$$G_H = 1.121$$

Section Elevation	z	K _z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _{AA} _{In} Face	C _{AA} _{Out} Face
ft	ft		psf	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
T1 180.00-160.00	170.00	1.597	10	73.192	A	13.249	13.975	9.583	35.20	0.000	0.000
					B	14.075	9.583		40.51	0.000	0.000
					C	11.597	22.758		27.89	10.540	0.000
T2 160.00-140.00	150.00	1.541	10	73.192	A	1.210	33.553	9.583	27.57	0.000	0.000
					B	1.210	18.805		47.88	0.000	0.000
					C	1.210	32.215		28.67	12.400	0.000
T3 140.00-120.00	130.00	1.48	9	73.192	A	1.934	40.405	9.583	22.63	0.000	0.000
					B	1.822	46.214		19.95	0.000	0.000
					C	2.298	21.487		40.29	12.400	0.000
T4 120.00-100.00	110.00	1.411	9	73.192	A	1.210	62.130	9.583	15.13	0.000	0.000
					B	1.210	72.866		12.94	0.000	0.000
					C	1.210	18.805		47.88	12.400	0.000
T5 100.00-80.00	90.00	1.332	9	73.192	A	1.542	63.287	9.583	14.78	0.000	0.000
					B	1.450	72.866		12.90	0.000	0.000
					C	1.780	18.805		46.56	12.400	0.000
T6 80.00-60.00	70.00	1.24	8	73.192	A	1.210	63.378	9.583	14.84	0.000	0.000

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	Client T-Mobile	Designed by Kelly Shanahan

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _{AA} In Face	C _{AA} Out Face
ft	ft		psf	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
T7 60.00-40.00	50.00	1.126	7	73.192	B	1.210	72.866	9.583	12.94	0.000	0.000
					C	1.210	18.805		47.88	12.400	0.000
					A	1.403	60.946		15.37	0.000	0.000
T8 40.00-20.00	30.00	1	6	73.192	B	1.220	71.105	9.583	13.25	0.000	0.000
					C	1.880	14.622		58.08	12.400	0.000
					A	0.740	60.946		15.54	0.000	0.000
T9 20.00-5.00	12.50	1	6	54.894	B	0.740	71.105	7.188	13.34	0.000	0.000
					C	0.740	14.622		62.39	12.400	0.000
					A	1.169	38.610		18.07	0.000	0.000
T10 5.00-0.00	2.50	1	6	9.816	B	1.059	44.734	2.576	15.70	0.000	0.000
					C	1.455	10.739		58.94	7.440	0.000
					A	2.850	2.576		47.47	0.000	0.000
					B	2.850	2.576		47.47	0.000	0.000
					C	2.850	2.576		47.47	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T1 180.00-160.00	257.54	1232.12 TA 424.61	A	0.372	2.122	0.641	1	1	22.201	2094.50	104.73	C
			B	0.323	2.236	0.623	1	1	20.048			
			C	0.469	1.943	0.682	1	1	27.127			
T2 160.00-140.00	352.22	851.89	A	0.475	1.935	0.685	1	1	24.196	1891.98	94.60	A
			B	0.273	2.369	0.608	1	1	12.646			
			C	0.457	1.963	0.676	1	1	22.999			
T3 140.00-120.00	501.02	710.34	A	0.578	1.819	0.741	1	1	31.861	2472.16	123.61	B
			B	0.656	1.78	0.79	1	1	38.316			
			C	0.325	2.232	0.624	1	1	15.703			
T4 120.00-100.00	743.37	851.89	A	0.865	1.879	0.952	1	1	60.354	4280.73*	214.04	B
			B	1	2.1	1	1	1	74.076			
			C	0.273	2.369	0.608	1	1	12.646			
T5 100.00-80.00	749.28	723.61	A	0.886	1.904	0.97	1	1	62.938	4042.20*	202.11	B
			B	1	2.1	1	1	1	74.316			
			C	0.281	2.347	0.61	1	1	13.257			
T6 80.00-60.00	749.58	851.89	A	0.882	1.9	0.967	1	1	62.505	3762.13*	188.11	B
			B	1	2.1	1	1	1	74.076			
			C	0.273	2.369	0.608	1	1	12.646			
T7 60.00-40.00	727.99	620.58	A	0.852	1.864	0.94	1	1	58.697	3417.30*	170.87	B
			B	0.988	2.076	1	1	1	72.325			
			C	0.225	2.513	0.596	1	1	10.593			
T8 40.00-20.00	727.99	568.21	A	0.843	1.854	0.932	1	1	57.557	3034.76*	151.74	B
			B	0.982	2.063	1	1	1	71.845			
			C	0.21	2.563	0.592	1	1	9.403			
T9 20.00-5.00	443.96	517.30	A	0.725	1.78	0.838	1	1	33.516	1777.62	118.51	B
			B	0.834	1.845	0.925	1	1	42.435			
			C	0.222	2.524	0.595	1	1	7.847			
T10 5.00-0.00	0.00	292.99	A	0.553	1.841	0.726	1	1	4.720	180.12	36.02	C
			B	0.553	1.841	0.726	1	1	4.720			
			C	0.553	1.841	0.726	1	1	4.720			
Sum Weight:	5252.99	8074.48				*2A _B limit			26953.51			

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	Client T-Mobile	Designed by Kelly Shanahan

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T1 180.00-160.00	257.54	1232.12 TA 424.61	A	0.372	2.122	0.641	0.8	1	19.551	1945.26	97.26	C
			B	0.323	2.236	0.623	0.8	1	17.233			
			C	0.469	1.943	0.682	0.8	1	24.807			
T2 160.00-140.00	352.22	851.89	A	0.475	1.935	0.685	0.8	1	23.954	1877.01	93.85	A
			B	0.273	2.369	0.608	0.8	1	12.404			
			C	0.457	1.963	0.676	0.8	1	22.757			
T3 140.00-120.00	501.02	710.34	A	0.578	1.819	0.741	0.8	1	31.474	2452.26	122.61	B
			B	0.656	1.78	0.79	0.8	1	37.951			
			C	0.325	2.232	0.624	0.8	1	15.243			
T4 120.00-100.00	743.37	851.89	A	0.865	1.879	0.952	0.8	1	60.112	4280.73*	214.04	B
			B	1	2.1	1	0.8	1	73.834			
			C	0.273	2.369	0.608	0.8	1	12.404			
T5 100.00-80.00	749.28	723.61	A	0.886	1.904	0.97	0.8	1	62.630	4042.20*	202.11	B
			B	1	2.1	1	0.8	1	74.026			
			C	0.281	2.347	0.61	0.8	1	12.901			
T6 80.00-60.00	749.58	851.89	A	0.882	1.9	0.967	0.8	1	62.263	3762.13*	188.11	B
			B	1	2.1	1	0.8	1	73.834			
			C	0.273	2.369	0.608	0.8	1	12.404			
T7 60.00-40.00	727.99	620.58	A	0.852	1.864	0.94	0.8	1	58.416	3417.30*	170.87	B
			B	0.988	2.076	1	0.8	1	72.081			
			C	0.225	2.513	0.596	0.8	1	10.217			
T8 40.00-20.00	727.99	568.21	A	0.843	1.854	0.932	0.8	1	57.409	3034.76*	151.74	B
			B	0.982	2.063	1	0.8	1	71.697			
			C	0.21	2.563	0.592	0.8	1	9.255			
T9 20.00-5.00	443.96	517.30	A	0.725	1.78	0.838	0.8	1	33.283	1769.52	117.97	B
			B	0.834	1.845	0.925	0.8	1	42.223			
			C	0.222	2.524	0.595	0.8	1	7.556			
T10 5.00-0.00	0.00	292.99	A	0.553	1.841	0.726	0.8	1	4.150	158.37	31.67	C
			B	0.553	1.841	0.726	0.8	1	4.150			
			C	0.553	1.841	0.726	0.8	1	4.150			
Sum Weight:	5252.99	8074.48			*2A _E limit					26739.56		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T1 180.00-160.00	257.54	1232.12 TA 424.61	A	0.372	2.122	0.641	0.85	1	20.214	1982.57	99.13	C
			B	0.323	2.236	0.623	0.85	1	17.937			
			C	0.469	1.943	0.682	0.85	1	25.387			
T2 160.00-140.00	352.22	851.89	A	0.475	1.935	0.685	0.85	1	24.014	1880.76	94.04	A
			B	0.273	2.369	0.608	0.85	1	12.464			
			C	0.457	1.963	0.676	0.85	1	22.818			
T3 140.00-120.00	501.02	710.34	A	0.578	1.819	0.741	0.85	1	31.571	2457.24	122.86	B
			B	0.656	1.78	0.79	0.85	1	38.042			
			C	0.325	2.232	0.624	0.85	1	15.358			
T4 120.00-100.00	743.37	851.89	A	0.865	1.879	0.952	0.85	1	60.173	4280.73*	214.04	B
			B	1	2.1	1	0.85	1	73.895			
			C	0.273	2.369	0.608	0.85	1	12.464			
T5 100.00-80.00	749.28	723.61	A	0.886	1.904	0.97	0.85	1	62.707	4042.20*	202.11	B
			B	1	2.1	1	0.85	1	74.099			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T6 80.00-60.00	749.58	851.89	C	0.281	2.347	0.61	0.85	1	12.990	3762.13*	188.11	B
			A	0.882	1.9	0.967	0.85	1	62.324			
			B	1	2.1	1	0.85	1	73.895			
T7 60.00-40.00	727.99	620.58	C	0.273	2.369	0.608	0.85	1	12.464	3417.30*	170.87	B
			A	0.852	1.864	0.94	0.85	1	58.486			
			B	0.988	2.076	1	0.85	1	72.142			
T8 40.00-20.00	727.99	568.21	C	0.225	2.513	0.596	0.85	1	10.311	3034.76*	151.74	B
			A	0.843	1.854	0.932	0.85	1	57.446			
			B	0.982	2.063	1	0.85	1	71.734			
T9 20.00-5.00	443.96	517.30	C	0.21	2.563	0.592	0.85	1	9.292	1771.55	118.10	B
			A	0.725	1.78	0.838	0.85	1	33.341			
			B	0.834	1.845	0.925	0.85	1	42.276			
T10 5.00-0.00	0.00	292.99	C	0.222	2.524	0.595	0.85	1	7.628	163.81	32.76	C
			A	0.553	1.841	0.726	0.85	1	4.292			
			B	0.553	1.841	0.726	0.85	1	4.292			
Sum Weight:	5252.99	8074.48	C	0.553	1.841	0.726	0.85	1	4.292	26793.04		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T1 180.00-160.00	752.36	1816.21 TA 576.51	A	0.518	1.877	0.707	1	1	31.153	2408.17	120.41	C
			B	0.449	1.975	0.673	1	1	27.217			
			C	0.657	1.78	0.79	1	1	44.735			
T2 160.00-140.00	1040.02	1245.97	A	0.67	1.777	0.799	1	1	40.285	2358.28	117.91	C
			B	0.396	2.071	0.65	1	1	19.720			
			C	0.661	1.779	0.793	1	1	43.850			
T3 140.00-120.00	1406.80	1125.01	A	0.802	1.817	0.898	1	1	54.034	3028.76	151.44	B
			B	0.836	1.847	0.926	1	1	60.249			
			C	0.467	1.947	0.681	1	1	25.886			
T4 120.00-100.00	1986.99	1245.97	A	1	2.1	1	1	1	83.663	3283.66*	164.18	B
			B	1	2.1	1	1	1	91.539			
			C	0.396	2.071	0.65	1	1	19.720			
T5 100.00-80.00	2009.12	1149.32	A	1	2.1	1	1	1	86.349	3100.69*	155.03	B
			B	1	2.1	1	1	1	91.743			
			C	0.408	2.049	0.655	1	1	20.610			
T6 80.00-60.00	2010.80	1245.97	A	1	2.1	1	1	1	86.267	2885.85*	144.29	B
			B	1	2.1	1	1	1	91.539			
			C	0.396	2.071	0.65	1	1	19.720			
T7 60.00-40.00	1982.10	912.59	A	1	2.1	1	1	1	83.884	2621.34*	131.07	B
			B	1	2.1	1	1	1	89.707			
			C	0.316	2.255	0.621	1	1	15.377			
T8 40.00-20.00	1982.10	839.64	A	1	2.1	1	1	1	83.403	2327.90*	116.40	B
			B	1	2.1	1	1	1	89.368			
			C	0.297	2.305	0.615	1	1	13.933			
T9 20.00-5.00	1199.18	742.08	A	0.958	2.018	1	1	1	53.796	1745.93*	116.40	B
			B	1	2.1	1	1	1	57.314			
			C	0.311	2.266	0.619	1	1	11.379			
T10 5.00-0.00	0.00	415.84	A	0.686	1.776	0.81	1	1	6.239	172.27	34.45	C
			B	0.686	1.776	0.81	1	1	6.239			
			C	0.686	1.776	0.81	1	1	6.239			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
Sum Weight:	14369.48	11744.17			*2A _g limit					23932.85		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T1 180.00-160.00	752.36	1816.21	A	0.518	1.877	0.707	0.8	1	28.609	2160.09	108.00	C
		TA 576.51	B	0.449	1.975	0.673	0.8	1	24.402			
			C	0.657	1.78	0.79	0.8	1	39.123			
T2 160.00-140.00	1040.02	1245.97	A	0.67	1.777	0.799	0.8	1	40.043	2194.42	109.72	A
			B	0.396	2.071	0.65	0.8	1	19.478			
			C	0.661	1.779	0.793	0.8	1	39.358			
T3 140.00-120.00	1406.80	1125.01	A	0.802	1.817	0.898	0.8	1	53.692	2761.84	138.09	B
			B	0.836	1.847	0.926	0.8	1	53.966			
			C	0.467	1.947	0.681	0.8	1	24.583			
T4 120.00-100.00	1986.99	1245.97	A	1	2.1	1	0.8	1	80.121	3283.66*	164.18	B
			B	1	2.1	1	0.8	1	80.557			
			C	0.396	2.071	0.65	0.8	1	19.478			
T5 100.00-80.00	2009.12	1149.32	A	1	2.1	1	0.8	1	82.768	3100.69*	155.03	B
			B	1	2.1	1	0.8	1	80.734			
			C	0.408	2.049	0.655	0.8	1	20.254			
T6 80.00-60.00	2010.80	1245.97	A	1	2.1	1	0.8	1	82.725	2885.85*	144.29	B
			B	1	2.1	1	0.8	1	80.557			
			C	0.396	2.071	0.65	0.8	1	19.478			
T7 60.00-40.00	1982.10	912.59	A	1	2.1	1	0.8	1	80.359	2621.34*	131.07	B
			B	1	2.1	1	0.8	1	78.765			
			C	0.316	2.255	0.621	0.8	1	15.001			
T8 40.00-20.00	1982.10	839.64	A	1	2.1	1	0.8	1	79.955	2327.90*	116.40	B
			B	1	2.1	1	0.8	1	78.480			
			C	0.297	2.305	0.615	0.8	1	13.785			
T9 20.00-5.00	1199.18	742.08	A	0.958	2.018	1	0.8	1	51.615	1745.93*	116.40	B
			B	1	2.1	1	0.8	1	50.684			
			C	0.311	2.266	0.619	0.8	1	11.088			
T10 5.00-0.00	0.00	415.84	A	0.686	1.776	0.81	0.8	1	5.669	156.53	31.31	C
			B	0.686	1.776	0.81	0.8	1	5.669			
			C	0.686	1.776	0.81	0.8	1	5.669			
Sum Weight:	14369.48	11744.17			*2A _g limit					23238.25		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T1 180.00-160.00	752.36	1816.21	A	0.518	1.877	0.707	0.85	1	29.245	2222.11	111.11	C
		TA 576.51	B	0.449	1.975	0.673	0.85	1	25.105			
			C	0.657	1.78	0.79	0.85	1	40.526			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T2 160.00-140.00	1040.02	1245.97	A	0.67	1.777	0.799	0.85	1	40.103	2214.65	110.73	C
			B	0.396	2.071	0.65	0.85	1	19.538			
			C	0.661	1.779	0.793	0.85	1	40.481			
T3 140.00-120.00	1406.80	1125.01	A	0.802	1.817	0.898	0.85	1	53.777	2828.57	141.43	B
			B	0.836	1.847	0.926	0.85	1	55.537			
			C	0.467	1.947	0.681	0.85	1	24.908			
T4 120.00-100.00	1986.99	1245.97	A	1	2.1	1	0.85	1	81.006	3283.66*	164.18	B
			B	1	2.1	1	0.85	1	83.303			
			C	0.396	2.071	0.65	0.85	1	19.538			
T5 100.00-80.00	2009.12	1149.32	A	1	2.1	1	0.85	1	83.663	3100.69*	155.03	B
			B	1	2.1	1	0.85	1	83.486			
			C	0.408	2.049	0.655	0.85	1	20.343			
T6 80.00-60.00	2010.80	1245.97	A	1	2.1	1	0.85	1	83.611	2885.85*	144.29	B
			B	1	2.1	1	0.85	1	83.303			
			C	0.396	2.071	0.65	0.85	1	19.538			
T7 60.00-40.00	1982.10	912.59	A	1	2.1	1	0.85	1	81.240	2621.34*	131.07	B
			B	1	2.1	1	0.85	1	81.501			
			C	0.316	2.255	0.621	0.85	1	15.095			
T8 40.00-20.00	1982.10	839.64	A	1	2.1	1	0.85	1	80.817	2327.90*	116.40	B
			B	1	2.1	1	0.85	1	81.202			
			C	0.297	2.305	0.615	0.85	1	13.822			
T9 20.00-5.00	1199.18	742.08	A	0.958	2.018	1	0.85	1	52.161	1745.93*	116.40	B
			B	1	2.1	1	0.85	1	52.341			
			C	0.311	2.266	0.619	0.85	1	11.161			
T10 5.00-0.00	0.00	415.84	A	0.686	1.776	0.81	0.85	1	5.811	160.46	32.09	C
			B	0.686	1.776	0.81	0.85	1	5.811			
			C	0.686	1.776	0.81	0.85	1	5.811			
Sum Weight:	14369.48	11744.17								23391.17		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T1 180.00-160.00	257.54	1232.12 TA 424.61	A	0.372	2.122	0.641	1	1	22.201	724.74	36.24	C
			B	0.323	2.236	0.623	1	1	20.048			
			C	0.469	1.943	0.682	1	1	27.127			
T2 160.00-140.00	352.22	851.89	A	0.475	1.935	0.685	1	1	24.196	654.66	32.73	A
			B	0.273	2.369	0.608	1	1	12.646			
			C	0.457	1.963	0.676	1	1	22.999			
T3 140.00-120.00	501.02	710.34	A	0.578	1.819	0.741	1	1	31.861	855.42	42.77	B
			B	0.656	1.78	0.79	1	1	38.316			
			C	0.325	2.232	0.624	1	1	15.703			
T4 120.00-100.00	743.37	851.89	A	0.865	1.879	0.952	1	1	60.354	1481.22*	74.06	B
			B	1	2.1	1	1	1	74.076			
			C	0.273	2.369	0.608	1	1	12.646			
T5 100.00-80.00	749.28	723.61	A	0.886	1.904	0.97	1	1	62.938	1398.69*	69.93	B
			B	1	2.1	1	1	1	74.316			
			C	0.281	2.347	0.61	1	1	13.257			
T6 80.00-60.00	749.58	851.89	A	0.882	1.9	0.967	1	1	62.505	1301.78*	65.09	B
			B	1	2.1	1	1	1	74.076			
			C	0.273	2.369	0.608	1	1	12.646			
T7 60.00-40.00	727.99	620.58	A	0.852	1.864	0.94	1	1	58.697	1182.46*	59.12	B
			B	0.988	2.076	1	1	1	72.325			

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	Project EBI Job # 81150090	Date 17:00:23 02/13/15
	Client T-Mobile	Designed by Kelly Shanahan

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T8 40.00-20.00	727.99	568.21	C	0.225	2.513	0.596	1	1	10.593	1050.09*	52.50	B
			A	0.843	1.854	0.932	1	1	57.557			
			B	0.982	2.063	1	1	1	71.845			
T9 20.00-5.00	443.96	517.30	C	0.21	2.563	0.592	1	1	9.403	615.09	41.01	B
			A	0.725	1.78	0.838	1	1	33.516			
			B	0.834	1.845	0.925	1	1	42.435			
T10 5.00-0.00	0.00	292.99	C	0.222	2.524	0.595	1	1	7.847	62.33	12.47	C
			A	0.553	1.841	0.726	1	1	4.720			
			B	0.553	1.841	0.726	1	1	4.720			
Sum Weight:	5252.99	8074.48	C	0.553	1.841	0.726	1	1	4.720	9326.47		
					*2A _E limit							

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T1 180.00-160.00	257.54	1232.12 TA 424.61	A	0.372	2.122	0.641	0.8	1	19.551	673.10	33.66	C
			B	0.323	2.236	0.623	0.8	1	17.233			
			C	0.469	1.943	0.682	0.8	1	24.807			
T2 160.00-140.00	352.22	851.89	A	0.475	1.935	0.685	0.8	1	23.954	649.49	32.47	A
			B	0.273	2.369	0.608	0.8	1	12.404			
			C	0.457	1.963	0.676	0.8	1	22.757			
T3 140.00-120.00	501.02	710.34	A	0.578	1.819	0.741	0.8	1	31.474	848.53	42.43	B
			B	0.656	1.78	0.79	0.8	1	37.951			
			C	0.325	2.232	0.624	0.8	1	15.243			
T4 120.00-100.00	743.37	851.89	A	0.865	1.879	0.952	0.8	1	60.112	1481.22*	74.06	B
			B	1	2.1	1	0.8	1	73.834			
			C	0.273	2.369	0.608	0.8	1	12.404			
T5 100.00-80.00	749.28	723.61	A	0.886	1.904	0.97	0.8	1	62.630	1398.69*	69.93	B
			B	1	2.1	1	0.8	1	74.026			
			C	0.281	2.347	0.61	0.8	1	12.901			
T6 80.00-60.00	749.58	851.89	A	0.882	1.9	0.967	0.8	1	62.263	1301.78*	65.09	B
			B	1	2.1	1	0.8	1	73.834			
			C	0.273	2.369	0.608	0.8	1	12.404			
T7 60.00-40.00	727.99	620.58	A	0.852	1.864	0.94	0.8	1	58.416	1182.46*	59.12	B
			B	0.988	2.076	1	0.8	1	72.081			
			C	0.225	2.513	0.596	0.8	1	10.217			
T8 40.00-20.00	727.99	568.21	A	0.843	1.854	0.932	0.8	1	57.409	1050.09*	52.50	B
			B	0.982	2.063	1	0.8	1	71.697			
			C	0.21	2.563	0.592	0.8	1	9.255			
T9 20.00-5.00	443.96	517.30	A	0.725	1.78	0.838	0.8	1	33.283	612.29	40.82	B
			B	0.834	1.845	0.925	0.8	1	42.223			
			C	0.222	2.524	0.595	0.8	1	7.556			
T10 5.00-0.00	0.00	292.99	A	0.553	1.841	0.726	0.8	1	4.150	54.80	10.96	C
			B	0.553	1.841	0.726	0.8	1	4.150			
			C	0.553	1.841	0.726	0.8	1	4.150			
Sum Weight:	5252.99	8074.48	C		*2A _E limit					9252.44		

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Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
T1 180.00-160.00	257.54	1232.12 TA 424.61	A	0.372	2.122	0.641	0.85	1	20.214	686.01	34.30	C
			B	0.323	2.236	0.623	0.85	1	17.937			
			C	0.469	1.943	0.682	0.85	1	25.387			
T2 160.00-140.00	352.22	851.89	A	0.475	1.935	0.685	0.85	1	24.014	650.78	32.54	A
			B	0.273	2.369	0.608	0.85	1	12.464			
			C	0.457	1.963	0.676	0.85	1	22.818			
T3 140.00-120.00	501.02	710.34	A	0.578	1.819	0.741	0.85	1	31.571	850.26	42.51	B
			B	0.656	1.78	0.79	0.85	1	38.042			
			C	0.325	2.232	0.624	0.85	1	15.358			
T4 120.00-100.00	743.37	851.89	A	0.865	1.879	0.952	0.85	1	60.173	1481.22*	74.06	B
			B	1	2.1	1	0.85	1	73.895			
			C	0.273	2.369	0.608	0.85	1	12.464			
T5 100.00-80.00	749.28	723.61	A	0.886	1.904	0.97	0.85	1	62.707	1398.69*	69.93	B
			B	1	2.1	1	0.85	1	74.099			
			C	0.281	2.347	0.61	0.85	1	12.990			
T6 80.00-60.00	749.58	851.89	A	0.882	1.9	0.967	0.85	1	62.324	1301.78*	65.09	B
			B	1	2.1	1	0.85	1	73.895			
			C	0.273	2.369	0.608	0.85	1	12.464			
T7 60.00-40.00	727.99	620.58	A	0.852	1.864	0.94	0.85	1	58.486	1182.46*	59.12	B
			B	0.988	2.076	1	0.85	1	72.142			
			C	0.225	2.513	0.596	0.85	1	10.311			
T8 40.00-20.00	727.99	568.21	A	0.843	1.854	0.932	0.85	1	57.446	1050.09*	52.50	B
			B	0.982	2.063	1	0.85	1	71.734			
			C	0.21	2.563	0.592	0.85	1	9.292			
T9 20.00-5.00	443.96	517.30	A	0.725	1.78	0.838	0.85	1	33.341	612.99	40.87	B
			B	0.834	1.845	0.925	0.85	1	42.276			
			C	0.222	2.524	0.595	0.85	1	7.628			
T10 5.00-0.00	0.00	292.99	A	0.553	1.841	0.726	0.85	1	4.292	56.68	11.34	C
			B	0.553	1.841	0.726	0.85	1	4.292			
			C	0.553	1.841	0.726	0.85	1	4.292			
Sum Weight:	5252.99	8074.48								9270.95		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Torques
	lb	lb	lb	lb-ft
Leg Weight	4149.54			
Bracing Weight	3495.88			
Total Member Self-Weight	7645.42			
Gusset Weight	429.06			
Guy Weight	2724.80			
Total Weight	23648.52			
Wind 0 deg - No Ice		47.74	-39827.92	-913.67
Wind 30 deg - No Ice		19887.27	-34376.90	-4367.26
Wind 60 deg - No Ice		34351.69	-19848.33	-6669.94
Wind 90 deg - No Ice		39691.84	-47.74	-7181.74
Wind 120 deg - No Ice		34489.24	19872.62	-5747.78
Wind 150 deg - No Ice		19804.58	34329.16	-2814.47
Wind 180 deg - No Ice		-47.74	39613.97	890.78
Wind 210 deg - No Ice		-19887.27	34376.90	4367.26

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Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Torques
	lb	lb	lb	lb-ft
Wind 240 deg - No Ice		-34536.98	19955.31	6661.45
Wind 270 deg - No Ice		-39691.84	47.74	7181.74
Wind 300 deg - No Ice		-34303.95	-19765.64	5779.16
Wind 330 deg - No Ice		-19804.58	-34329.16	2814.47
Member Ice	3669.69			
Gusset Ice	150.84			
Guy Ice	2244.60			
Total Weight Ice	42029.84			
Wind 0 deg - Ice		41.10	-35178.87	-3136.87
Wind 30 deg - Ice		17366.31	-30017.24	-4244.88
Wind 60 deg - Ice		29905.80	-17277.73	-4299.78
Wind 90 deg - Ice		34661.43	-41.10	-3209.37
Wind 120 deg - Ice		30466.24	17553.85	-1179.02
Wind 150 deg - Ice		17295.12	29976.15	1035.52
Wind 180 deg - Ice		-41.10	34484.28	3024.94
Wind 210 deg - Ice		-17366.31	30017.24	4244.88
Wind 240 deg - Ice		-30507.33	17625.03	4315.88
Wind 270 deg - Ice		-34661.43	41.10	3209.37
Wind 300 deg - Ice		-29864.70	-17206.55	1274.84
Wind 330 deg - Ice		-17295.12	-29976.15	-1035.52
Total Weight	23648.52			
Wind 0 deg - Service		16.52	-13781.29	-316.15
Wind 30 deg - Service		6881.41	-11895.12	-1511.16
Wind 60 deg - Service		11886.40	-6867.93	-2307.94
Wind 90 deg - Service		13734.20	-16.52	-2485.03
Wind 120 deg - Service		11933.99	6876.34	-1988.85
Wind 150 deg - Service		6852.79	11878.60	-973.87
Wind 180 deg - Service		-16.52	13707.26	308.23
Wind 210 deg - Service		-6881.41	11895.12	1511.16
Wind 240 deg - Service		-11950.51	6904.95	2305.00
Wind 270 deg - Service		-13734.20	16.52	2485.03
Wind 300 deg - Service		-11869.88	-6839.32	1999.71
Wind 330 deg - Service		-6852.79	-11878.60	973.87

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

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Comb. No.	Description
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
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	180 - 160	Leg	Max Tension	4	24912.75	-22.53	18.05
			Max. Compression	10	-28593.71	750.28	-670.42
			Max. Mx	11	-14837.70	1030.06	-18.75
			Max. My	2	-26440.91	-29.31	986.49
			Max. Vy	11	2404.66	1030.06	-18.75
			Max. Vx	2	2454.38	-29.31	986.49
		Diagonal	Max Tension	5	2965.13	14.51	3.28
			Max. Compression	10	-4918.61	0.00	0.00
			Max. Mx	10	-4906.37	36.01	8.71
			Max. My	10	-4914.74	3.46	8.79
			Max. Vy	23	-21.22	35.24	6.53
			Max. Vx	10	4.22	0.00	0.00
		Top Girt	Max Tension	4	404.08	0.00	0.00
			Max. Compression	10	-453.89	0.00	0.00
			Max. Mx	14	-32.77	-7.50	0.00
			Max. My	5	347.35	0.00	0.00
			Max. Vy	14	8.77	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
		Bottom Girt	Max Tension	15	1571.81	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	738.64	-7.50	0.00
			Max. My	5	614.73	0.00	-0.00
			Max. Vy	14	8.77	0.00	0.00
			Max. Vx	5	0.00	0.00	0.00
		Guy A	Bottom Tension	21	7732.76		
			Top Tension	21	7914.88		
			Top Cable Vert	21	5812.65		
			Top Cable Norm	21	5371.99		
Top Cable Tan	21		5.26				
Bot Cable Vert	21		-5310.72				
Bot Cable Norm	21		5620.67				
Bot Cable Tan	21						

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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
		Guy A	Bot Cable Tan	21	5.19		
			Bottom Tension	21	20192.71		
			Top Tension	21	20584.15		
			Top Cable Vert	21	15828.75		
			Top Cable Norm	21	13158.95		
			Top Cable Tan	21	1.08		
			Bot Cable Vert	21	-15007.17		
			Bot Cable Norm	21	13510.39		
			Bot Cable Tan	21	1.08		
		Guy B	Bottom Tension	25	7618.56		
			Top Tension	25	7800.70		
			Top Cable Vert	25	5731.67		
			Top Cable Norm	25	5291.40		
			Top Cable Tan	25	4.90		
			Bot Cable Vert	25	-5229.73		
			Bot Cable Norm	25	5540.08		
			Bot Cable Tan	25	5.55		
		Guy B	Bottom Tension	25	20177.87		
			Top Tension	25	20569.31		
			Top Cable Vert	25	15817.51		
			Top Cable Norm	25	13149.25		
			Top Cable Tan	25	0.03		
			Bot Cable Vert	25	-14995.92		
			Bot Cable Norm	25	13500.69		
			Bot Cable Tan	25	0.03		
		Guy C	Bottom Tension	17	7766.59		
			Top Tension	17	7948.70		
			Top Cable Vert	17	5836.66		
			Top Cable Norm	17	5395.85		
			Top Cable Tan	17	5.27		
			Bot Cable Vert	17	-5334.72		
			Bot Cable Norm	17	5644.52		
			Bot Cable Tan	17	5.19		
		Guy C	Bottom Tension	17	20239.91		
			Top Tension	17	20631.34		
			Top Cable Vert	17	15864.32		
			Top Cable Norm	17	13189.98		
			Top Cable Tan	17	1.11		
			Bot Cable Vert	17	-15042.74		
			Bot Cable Norm	17	13541.41		
			Bot Cable Tan	17	1.11		
		Top Guy Pull-Off	Max Tension	17	6197.36	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	20	3168.13	13.86	0.00
			Max. My	5	4154.64	0.00	0.00
			Max. Vy	20	16.21	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
		Torque Arm Top	Max Tension	16	4856.07	-6824.49	-0.00
			Max. Compression	3	-1782.28	-14321.48	0.00
			Max. Mx	17	-2.85	-18699.41	-0.00
			Max. My	5	3479.96	-9997.11	-0.00
			Max. Vy	17	5523.71	-18699.41	-0.00
			Max. Vx	5	-0.00	-9997.11	-0.00
T2	160 - 140	Leg	Max Tension	2	1935.65	-3.79	415.77
			Max. Compression	17	-34034.66	33.38	111.82
			Max. Mx	18	-9626.75	773.23	-244.24
			Max. My	21	-8523.74	-74.25	876.94
			Max. Vy	11	2405.50	754.81	2.82
			Max. Vx	2	2460.41	-21.21	705.34
		Diagonal	Max Tension	3	3253.64	0.00	0.00
			Max. Compression	10	-3637.41	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	
T3	140 - 120	Top Girt	Max. Mx	17	-111.94	-19.49	3.03	
			Max. My	10	-3635.26	5.38	-5.78	
			Max. Vy	17	11.88	-19.49	3.03	
			Max. Vx	10	-2.77	0.00	0.00	
			Max Tension	21	1257.92	0.00	0.00	
			Max. Compression	10	-829.83	0.00	0.00	
		Bottom Girt	Max. Mx	14	253.50	4.37	0.00	
			Max. My	5	270.54	0.00	0.00	
			Max. Vy	14	5.12	0.00	0.00	
			Max. Vx	5	-0.00	0.00	0.00	
			Max Tension	15	632.95	0.00	0.00	
			Max. Compression	12	-25.06	0.00	0.00	
		Leg	Max. Mx	14	243.87	4.37	0.00	
			Max. My	5	181.48	0.00	0.00	
			Max. Vy	14	-5.12	0.00	0.00	
			Max. Vx	5	-0.00	0.00	0.00	
			Max Tension	2	14002.73	0.69	40.98	
			Max. Compression	17	-50818.33	279.36	-87.59	
			Max. Mx	5	-18406.74	575.75	-39.68	
			Max. My	8	-8605.80	45.29	570.51	
			Max. Vy	11	1180.73	152.59	88.08	
			Max. Vx	2	1185.64	-2.82	279.85	
			Diagonal	Max Tension	4	1919.49	0.00	0.00
				Max. Compression	4	-1999.17	0.00	0.00
				Max. Mx	17	-314.38	-15.47	3.11
				Max. My	10	-1947.49	5.12	-6.49
				Max. Vy	17	9.20	-15.47	3.11
				Max. Vx	10	-3.11	0.00	0.00
			Top Girt	Max Tension	8	269.86	0.00	0.00
				Max. Compression	10	-58.68	0.00	0.00
		Max. Mx		14	126.69	3.09	0.00	
		Max. My		5	126.25	0.00	0.00	
		Max. Vy		14	-3.62	0.00	0.00	
		Max. Vx		5	-0.00	0.00	0.00	
		Bottom Girt	Max Tension	2	583.09	0.00	0.00	
			Max. Compression	4	-197.45	0.00	0.00	
			Max. Mx	14	168.74	3.09	0.00	
			Max. My	17	337.00	0.00	0.00	
			Max. Vy	14	-3.62	0.00	0.00	
			Max. Vx	17	-0.00	0.00	0.00	
		Guy A	Bottom Tension	21	11191.47			
			Top Tension	21	11364.79			
Top Cable Vert	21		7947.43					
Top Cable Norm	21		8123.84					
Top Cable Tan	21		0.62					
Bot Cable Vert	21		-7498.27					
Bot Cable Norm	21		8308.12					
Bot Cable Tan	21		0.62					
Guy B	Bottom Tension		25	11257.76				
	Top Tension		25	11431.07				
	Top Cable Vert	25	7992.69					
	Top Cable Norm	25	8172.29					
	Top Cable Tan	25	0.45					
	Bot Cable Vert	25	-7543.53					
	Bot Cable Norm	25	8356.56					
	Bot Cable Tan	25	0.45					
	Guy C	Bottom Tension	17	11277.04				
		Top Tension	17	11450.35				
Top Cable Vert		17	8005.86					
Top Cable Norm		17	8186.38					
Top Cable Tan	17	1.08						

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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	120 - 100	Top Guy Pull-Off	Bot Cable Vert	17	-7556.70		
			Bot Cable Norm	17	8370.65		
			Bot Cable Tan	17	1.08		
			Max Tension	15	4262.59	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	2088.00	10.40	0.00
			Max. My	10	1849.90	0.00	0.00
			Max. Vy	14	-12.16	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
			Max Tension	2	14001.48	0.35	-54.19
			Max. Compression	25	-51426.42	-127.78	-195.64
			Max. Mx	11	-34483.00	-867.46	-69.16
		Max. My	8	-32905.33	-3.38	896.00	
		Max. Vy	11	-1844.71	-656.10	-61.57	
		Max. Vx	8	1925.74	-2.44	675.40	
		Diagonal	Max Tension	11	2206.92	0.00	0.00
			Max. Compression	11	-2749.79	0.00	0.00
			Max. Mx	5	-1370.22	26.86	5.61
			Max. My	6	-952.46	17.69	6.05
			Max. Vy	17	15.24	0.00	0.00
			Max. Vx	6	2.90	0.00	0.00
		Top Girt	Max Tension	15	820.28	0.00	0.00
			Max. Compression	12	-68.36	0.00	0.00
			Max. Mx	14	315.35	4.37	0.00
Max. My	17		578.68	0.00	0.00		
Max. Vy	14		-5.12	0.00	0.00		
Max. Vx	17		-0.00	0.00	0.00		
Bottom Girt	Max Tension	21	740.66	0.00	0.00		
	Max. Compression	1	0.00	0.00	0.00		
	Max. Mx	14	330.28	4.37	0.00		
	Max. My	18	368.84	0.00	-0.00		
	Max. Vy	14	-5.12	0.00	0.00		
	Max. Vx	18	-0.00	0.00	0.00		
T5	100 - 80	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	16	-43839.75	-120.44	157.58
			Max. Mx	11	-34482.78	-656.19	-61.67
			Max. My	8	-32906.92	-2.45	675.41
			Max. Vy	11	-1856.28	484.17	-18.54
			Max. Vx	8	1941.88	2.62	-516.37
		Diagonal	Max Tension	11	3136.05	0.00	0.00
			Max. Compression	11	-3217.24	0.00	0.00
			Max. Mx	24	908.76	-13.89	-0.60
			Max. My	12	-2482.73	5.95	-3.19
			Max. Vy	24	8.45	-13.89	-0.60
			Max. Vx	12	-1.53	0.00	0.00
		Top Girt	Max Tension	6	673.17	0.00	0.00
			Max. Compression	8	-297.05	0.00	0.00
			Max. Mx	14	188.62	3.09	0.00
			Max. My	18	216.24	0.00	-0.00
			Max. Vy	14	-3.62	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Bottom Girt	Max Tension	2	598.73	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	407.66	3.09	0.00
			Max. My	18	499.41	0.00	-0.00
			Max. Vy	14	-3.62	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
Guy A	Bottom Tension	7	18177.86				
	Top Tension	7	18272.51				
	Top Cable Vert	7	11819.60				
	Top Cable Norm	7	13934.91				

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	Client T-Mobile	Designed by Kelly Shanahan

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft	
T6	80 - 60	Guy B	Top Cable Tan	7	3.76			
			Bot Cable Vert	7	-11603.96			
			Bot Cable Norm	7	13991.99			
			Bot Cable Tan	7	83.21			
			Bottom Tension	13	18214.59			
			Top Tension	13	18309.24			
			Top Cable Vert	13	11843.14			
			Top Cable Norm	13	13963.10			
			Top Cable Tan	13	3.98			
			Bot Cable Vert	13	-11627.50			
			Bot Cable Norm	13	14020.18			
			Bot Cable Tan	13	83.43			
			Bottom Tension	3	18202.90			
			Top Tension	3	18297.55			
		Guy C	Top Cable Vert	3	11835.65			
			Top Cable Norm	3	13954.14			
			Top Cable Tan	3	4.68			
			Bot Cable Vert	3	-11620.01			
			Bot Cable Norm	3	14011.21			
			Bot Cable Tan	3	84.14			
			Top Guy Pull-Off	Max Tension	2	7294.66	0.00	0.00
				Max. Compression	1	0.00	0.00	0.00
				Max. Mx	14	3824.87	13.86	0.00
				Max. My	11	4571.67	0.00	-0.00
				Max. Vy	14	16.21	0.00	0.00
				Max. Vx	11	0.00	0.00	0.00
			Leg	Max Tension	1	0.00	0.00	0.00
		Max. Compression		16	-43864.92	207.67	-169.02	
		Max. Mx		5	-19890.58	611.56	-247.29	
		Max. My		8	-14095.36	5.43	707.85	
		Max. Vy		5	-1369.21	-229.52	81.12	
		Max. Vx		8	-1623.88	-2.35	-288.62	
		Diagonal		Max Tension	12	1414.67	0.00	0.00
				Max. Compression	13	-2088.56	-6.17	-1.61
				Max. Mx	24	-284.52	-25.73	0.60
				Max. My	6	-1960.74	16.84	2.26
				Max. Vy	24	14.87	-25.73	0.60
				Max. Vx	6	1.09	0.00	0.00
		Top Girt		Max Tension	17	1250.42	0.00	0.00
				Max. Compression	1	0.00	0.00	0.00
				Max. Mx	14	565.10	4.37	0.00
				Max. My	11	456.74	0.00	-0.00
				Max. Vy	14	-5.12	0.00	0.00
		Bottom Girt		Max. Vx	11	0.00	0.00	0.00
				Max Tension	15	608.92	0.00	0.00
				Max. Compression	1	0.00	0.00	0.00
				Max. Mx	14	421.91	4.37	0.00
Max. My	5		312.35	0.00	-0.00			
Leg	Max. Vy	14	-5.12	0.00	0.00			
	Max. Vx	5	0.00	0.00	0.00			
	Max Tension	1	0.00	0.00	0.00			
	Max. Compression	21	-42574.12	-214.93	-113.05			
	Max. Mx	5	-22670.72	-500.80	-24.26			
	Max. My	26	-35892.93	126.86	478.65			
	Max. Vy	11	1303.34	452.01	-190.64			
	Max. Vx	8	-1092.20	-223.48	-283.01			
	Diagonal	Max Tension	5	3090.80	0.00	0.00		
		Max. Compression	5	-3209.90	0.00	0.00		
		Max. Mx	26	50.42	3.79	0.00		
		Max. My	17	-246.07	0.00	0.03		
		Max. Vy	26	-3.63	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
		Top Girt	Max. Vx	17	-0.03	0.00	0.00
			Max Tension	2	204.77	0.00	0.00
			Max. Compression	11	-208.50	0.00	0.00
			Max. Mx	14	59.87	3.09	0.00
			Max. My	18	7.97	0.00	-0.00
			Max. Vy	14	-3.62	0.00	0.00
		Bottom Girt	Max. Vx	18	-0.00	0.00	0.00
			Max Tension	12	956.24	0.00	0.00
			Max. Compression	5	-743.58	0.00	0.00
			Max. Mx	14	41.67	3.09	0.00
			Max. My	5	-743.58	0.00	-0.00
			Max. Vy	14	-3.62	0.00	0.00
		Guy A	Max. Vx	5	0.00	0.00	0.00
			Bottom Tension	7	8386.19		
			Top Tension	7	8411.73		
			Top Cable Vert	7	3834.05		
			Top Cable Norm	7	7487.14		
			Top Cable Tan	7	1.37		
		Guy B	Bot Cable Vert	7	-3751.99		
			Bot Cable Norm	7	7499.97		
			Bot Cable Tan	7	34.79		
			Bottom Tension	13	8380.51		
			Top Tension	13	8406.05		
			Top Cable Vert	13	3831.49		
		Guy C	Top Cable Norm	13	7482.07		
			Top Cable Tan	13	1.43		
			Bot Cable Vert	13	-3749.43		
			Bot Cable Norm	13	7494.90		
			Bot Cable Tan	13	34.74		
			Bottom Tension	3	8376.56		
		Top Guy Pull-Off	Top Tension	3	8402.10		
			Top Cable Vert	3	3829.71		
			Top Cable Norm	3	7478.55		
			Top Cable Tan	3	1.05		
			Bot Cable Vert	3	-3747.65		
			Bot Cable Norm	3	7491.37		
		Leg	Bot Cable Tan	3	35.11		
			Max Tension	11	4518.75	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1967.51	10.40	0.00
			Max. My	5	3939.00	0.00	-0.00
			Max. Vy	14	-12.16	0.00	0.00
		Diagonal	Max. Vx	5	0.00	0.00	0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-49892.16	82.68	-41.16
			Max. Mx	11	-39904.48	-500.96	-150.58
			Max. My	8	-36908.31	-23.88	511.08
			Max. Vy	11	1307.87	302.56	-185.19
		Top Girt	Max. Vx	8	-1090.60	-192.60	-157.91
			Max Tension	11	2428.94	0.00	0.00
			Max. Compression	5	-2649.41	0.00	0.00
			Max. Mx	16	422.84	3.80	0.00
			Max. My	17	-493.74	0.00	0.03
			Max. Vy	16	-3.63	0.00	0.00
		Top Girt	Max. Vx	17	-0.02	0.00	0.00
			Max Tension	5	835.19	0.00	0.00
			Max. Compression	11	-733.66	0.00	0.00
			Max. Mx	14	110.03	3.09	0.00
			Max. My	5	835.17	0.00	-0.00
			Max. Vy	14	-3.62	0.00	0.00
			Max. Vx	5	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	
T9	20 - 5	Bottom Girt	Max Tension	10	627.09	0.00	0.00	
			Max. Compression	6	-460.55	0.00	0.00	
			Max. Mx	14	56.92	3.09	0.00	
			Max. My	5	-45.91	0.00	-0.00	
			Max. Vy	14	-3.62	0.00	0.00	
			Max. Vx	5	0.00	0.00	0.00	
		Leg	Max Tension	1	0.00	0.00	0.00	
			Max. Compression	21	-49699.50	-103.07	103.16	
			Max. Mx	24	-43060.25	1293.29	565.40	
			Max. My	21	-43770.33	-89.58	-1441.29	
			Max. Vy	25	-11770.43	1283.02	636.31	
			Max. Vx	21	13731.07	-89.58	-1441.29	
			Diagonal	Max Tension	6	2992.06	0.00	0.00
				Max. Compression	10	-3257.60	0.00	0.00
				Max. Mx	16	2110.97	3.78	0.00
				Max. My	23	506.78	0.00	-0.02
		Top Girt	Max. Vy	16	-3.63	0.00	0.00	
			Max. Vx	23	0.02	0.00	0.00	
			Max Tension	5	730.75	0.00	0.00	
			Max. Compression	10	-616.58	0.00	0.00	
Max. Mx	14		109.81	3.09	0.00			
T10	5 - 0	Bottom Girt	Max. My	5	138.66	0.00	-0.00	
			Max. Vy	14	-3.62	0.00	0.00	
			Max. Vx	5	0.00	0.00	0.00	
			Max Tension	24	8179.92	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
			Max. Mx	25	6913.56	-17.65	0.00	
		Leg	Max. My	5	5806.03	0.00	0.00	
			Max. Vy	25	20.64	0.00	0.00	
			Max. Vx	5	-0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
			Max. Compression	21	-47087.09	-2.03	101.85	
			Max. Mx	17	-45495.73	1464.78	-11.07	
			Max. My	5	-33056.01	-589.48	-1130.10	
			Max. Vy	17	3368.11	1464.78	-11.07	
Horizontal	Max. Vx	5	2361.27	-589.48	-1130.10			
	Max Tension	6	50.35	-534.90	-90.40			
	Max. Compression	24	-260.45	375.31	-3.19			
	Max. Mx	5	-42.10	998.66	-25.44			
	Max. My	10	-101.53	-499.82	-175.54			
	Max. Vy	5	-1700.91	998.66	-25.44			
Top Girt	Max. Vx	10	191.19	792.63	19.94			
	Max Tension	16	2263.68	336.11	-4.28			
	Max. Compression	1	0.00	0.00	0.00			
	Max. Mx	5	1476.67	616.80	-0.47			
	Max. My	5	1726.54	-154.44	-178.57			
Bottom Girt	Max. Vy	5	-326.23	616.80	-0.47			
	Max. Vx	5	-76.32	442.75	50.22			
	Max Tension	1	0.00	0.00	0.00			
	Max. Compression	24	-1512.15	98.56	-299.27			
	Max. Mx	5	-754.36	1417.16	-5.41			
	Max. My	10	-1323.54	-263.42	-367.35			
	Max. Vy	5	-6333.28	1401.34	-147.32			
	Max. Vx	10	1008.15	988.46	-22.64			

Maximum Reactions

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Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb	
Mast	Max. Vert	16	119266.46	-916.89	1409.50	
	Max. H _x	11	94019.96	2277.47	-20.62	
	Max. H _z	2	97027.26	6.14	2250.98	
	Max. M _x	1	0.00	4.94	-32.26	
	Max. M _z	1	0.00	4.94	-32.26	
	Max. Torsion	5	3040.63	-2268.38	-16.34	
	Min. Vert	1	74663.27	4.94	-32.26	
	Min. H _x	5	93982.65	-2268.38	-16.34	
	Min. H _z	8	87098.09	4.55	-2327.19	
	Min. M _x	1	0.00	4.94	-32.26	
	Min. M _z	1	0.00	4.94	-32.26	
	Min. Torsion	11	-3032.09	2277.47	-20.62	
	Guy C @ 162 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-755.34	-557.03	320.66
		Max. H _x	10	-755.34	-557.03	320.66
	Max. H _z	17	-10462.28	-9593.66	5544.84	
	Min. Vert	17	-10462.28	-9593.66	5544.84	
	Min. H _x	17	-10462.28	-9593.66	5544.84	
	Min. H _z	10	-755.34	-557.03	320.66	
Guy B @ 162 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-762.34	562.90	324.24	
	Max. H _x	25	-10432.62	9570.40	5526.15	
	Max. H _z	25	-10432.62	9570.40	5526.15	
	Min. Vert	25	-10432.62	9570.40	5526.15	
	Min. H _x	6	-762.34	562.90	324.24	
	Min. H _z	6	-762.34	562.90	324.24	
Guy A @ 162 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-757.30	-0.17	-644.65	
	Max. H _x	24	-7087.29	708.47	-7235.38	
	Max. H _z	2	-757.30	-0.17	-644.65	
	Min. Vert	21	-10439.52	4.59	-11058.09	
	Min. H _x	18	-7062.69	-708.37	-7211.00	
	Min. H _z	21	-10439.52	4.59	-11058.09	
Guy C @ 142 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-473.16	-314.42	181.46	
	Max. H _x	10	-473.16	-314.42	181.46	
	Max. H _z	17	-22599.44	-18975.31	10957.92	
	Min. Vert	17	-22599.44	-18975.31	10957.92	
	Min. H _x	17	-22599.44	-18975.31	10957.92	
	Min. H _z	10	-473.16	-314.42	181.46	
Guy B @ 142 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-479.30	318.98	184.11	
	Max. H _x	25	-22539.46	18928.69	10929.05	
	Max. H _z	25	-22539.46	18928.69	10929.05	
	Min. Vert	25	-22539.46	18928.69	10929.05	
	Min. H _x	6	-479.30	318.98	184.11	
	Min. H _z	6	-479.30	318.98	184.11	
Guy A @ 142 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-475.94	-0.01	-365.33	
	Max. H _x	24	-11380.29	720.92	-10926.71	
	Max. H _z	2	-475.94	-0.01	-365.33	
	Min. Vert	21	-22505.44	1.70	-21818.51	
	Min. H _x	18	-11329.92	-720.78	-10882.59	
	Min. H _z	21	-22505.44	1.70	-21818.51	
Guy C @ 100 ft	Max. Vert	10	-72.21	-138.34	79.80	

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Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Elev 0 ft Azimuth 240 deg	Max. H _x	10	-72.21	-138.34	79.80
	Max. H _z	3	-15367.66	-18562.16	10854.57
	Min. Vert	3	-15367.66	-18562.16	10854.57
	Min. H _x	5	-15358.01	-18664.58	10652.64
	Min. H _z	10	-72.21	-138.34	79.80
Guy B @ 100 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-72.07	138.15	79.69
	Max. H _x	11	-15353.75	18659.94	10650.07
	Max. H _z	13	-15376.93	18573.52	10859.88
	Min. Vert	13	-15376.93	18573.52	10859.88
	Min. H _x	6	-72.07	138.15	79.69
	Min. H _z	6	-72.07	138.15	79.69
Guy A @ 100 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-71.86	-0.01	-159.20
	Max. H _x	24	-7140.75	342.25	-10267.31
	Max. H _z	2	-71.86	-0.01	-159.20
	Min. Vert	7	-15355.95	-118.00	-21491.96
	Min. H _x	18	-7158.41	-342.41	-10292.26
	Min. H _z	7	-15355.95	-118.00	-21491.96

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
Dead Only	74663.27	-4.94	32.26	0.00	0.00	-5.09
Dead+Wind 0 deg - No Ice+Guy	97027.26	-6.14	-2250.98	0.00	0.00	-184.04
Dead+Wind 30 deg - No Ice+Guy	94051.62	1141.22	-1926.63	0.00	0.00	-1531.33
Dead+Wind 60 deg - No Ice+Guy	87182.05	1981.79	-1114.06	0.00	0.00	-2734.78
Dead+Wind 90 deg - No Ice+Guy	93982.65	2268.38	16.34	0.00	0.00	-3040.63
Dead+Wind 120 deg - No Ice+Guy	96913.34	1976.78	1172.97	0.00	0.00	-2414.76
Dead+Wind 150 deg - No Ice+Guy	93906.41	1121.61	2006.16	0.00	0.00	-1213.74
Dead+Wind 180 deg - No Ice+Guy	87098.09	-4.55	2327.19	0.00	0.00	193.40
Dead+Wind 210 deg - No Ice+Guy	94010.36	-1129.40	2007.55	0.00	0.00	1531.48
Dead+Wind 240 deg - No Ice+Guy	97048.78	-1984.12	1175.86	0.00	0.00	2591.36
Dead+Wind 270 deg - No Ice+Guy	94019.96	-2277.47	20.62	0.00	0.00	3032.09
Dead+Wind 300 deg - No Ice+Guy	87133.82	-1992.53	-1111.14	0.00	0.00	2533.12
Dead+Wind 330 deg - No Ice+Guy	93988.40	-1153.19	-1925.84	0.00	0.00	1206.49
Dead+Ice+Temp+Guy	101357.57	-16.19	84.73	0.00	0.00	-6.60
Dead+Wind 0 deg+Ice+Temp+Guy	117772.82	-17.79	-1680.96	0.00	0.00	-927.77

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Load Combination	Vertical lb	Shear _x lb	Shear _y lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _y lb-ft	Torque lb-ft
Dead+Wind 30	119266.46	916.89	-1409.50	0.00	0.00	-1355.67
deg+Ice+Temp+Guy						
Dead+Wind 60	119112.91	1569.19	-828.28	0.00	0.00	-1745.75
deg+Ice+Temp+Guy						
Dead+Wind 90	119140.43	1751.41	25.35	0.00	0.00	-1658.62
deg+Ice+Temp+Guy						
Dead+Wind 120	117581.46	1521.84	971.03	0.00	0.00	-816.65
deg+Ice+Temp+Guy						
Dead+Wind 150	119094.11	817.22	1644.01	0.00	0.00	221.86
deg+Ice+Temp+Guy						
Dead+Wind 180	119020.58	-16.80	1916.43	0.00	0.00	911.27
deg+Ice+Temp+Guy						
Dead+Wind 210	119117.15	-850.11	1646.17	0.00	0.00	1355.94
deg+Ice+Temp+Guy						
Dead+Wind 240	117619.88	-1554.07	974.45	0.00	0.00	1737.97
deg+Ice+Temp+Guy						
Dead+Wind 270	119125.91	-1784.51	29.82	0.00	0.00	1650.78
deg+Ice+Temp+Guy						
Dead+Wind 300	119056.97	-1603.48	-824.15	0.00	0.00	826.51
deg+Ice+Temp+Guy						
Dead+Wind 330	119230.92	-951.98	-1407.29	0.00	0.00	-228.93
deg+Ice+Temp+Guy						
Dead+Wind 0 deg - Service+Guy	75300.54	-5.26	-810.53	0.00	0.00	-65.29
Dead+Wind 30 deg - Service+Guy	75314.50	407.11	-688.98	0.00	0.00	-551.07
Dead+Wind 60 deg - Service+Guy	75379.14	708.65	-380.22	0.00	0.00	-936.65
Dead+Wind 90 deg - Service+Guy	75318.44	825.63	35.28	0.00	0.00	-1068.35
Dead+Wind 120 deg - Service+Guy	75300.66	725.29	453.35	0.00	0.00	-869.78
Dead+Wind 150 deg - Service+Guy	75310.27	413.62	749.54	0.00	0.00	-442.81
Dead+Wind 180 deg - Service+Guy	75370.81	-4.72	856.45	0.00	0.00	61.21
Dead+Wind 210 deg - Service+Guy	75310.51	-423.14	750.40	0.00	0.00	545.92
Dead+Wind 240 deg - Service+Guy	75300.49	-735.02	454.81	0.00	0.00	927.27
Dead+Wind 270 deg - Service+Guy	75317.47	-835.62	36.91	0.00	0.00	1063.07
Dead+Wind 300 deg - Service+Guy	75377.09	-718.91	-378.84	0.00	0.00	868.68
Dead+Wind 330 deg - Service+Guy	75313.36	-417.57	-688.19	0.00	0.00	437.64

Solution Summary

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	-23648.09	0.00	-0.02	23647.84	0.03	0.001%
2	47.74	-23846.11	-43216.71	-47.74	23846.01	43214.82	0.004%
3	21579.03	-23648.09	-37307.12	-21579.10	23647.97	37304.36	0.006%
4	37286.47	-23450.07	-21542.73	-37285.16	23450.03	21542.09	0.003%
5	43075.37	-23648.09	-47.74	-43073.08	23647.97	49.21	0.006%
6	37424.01	-23846.11	21567.01	-37422.40	23846.01	-21566.06	0.004%

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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	
7	21496.34	-23648.09	37259.38	-21493.94	23647.97	-37258.08	0.006%
8	-47.74	-23450.07	43002.76	47.84	23450.03	-43001.32	0.003%
9	-21579.03	-23648.09	37307.12	21576.61	23647.97	-37305.81	0.006%
10	-37471.76	-23846.11	21649.70	37470.13	23846.01	-21648.74	0.004%
11	-43075.37	-23648.09	47.74	43073.07	23647.97	-46.26	0.006%
12	-37238.73	-23450.07	-21460.04	37237.48	23450.03	21459.30	0.003%
13	-21496.34	-23648.09	-37259.38	21496.42	23647.97	37256.63	0.006%
14	-0.00	-42029.07	0.00	0.40	42028.99	-2.24	0.005%
15	41.10	-42424.41	-41832.89	-41.09	42424.31	41830.56	0.004%
16	20687.90	-42029.07	-35770.41	-20688.21	42028.97	35767.28	0.005%
17	35668.35	-41633.73	-20604.74	-35666.99	41633.69	20603.64	0.003%
18	41304.61	-42029.07	-41.10	-41302.17	42028.98	42.90	0.005%
19	36228.78	-42424.41	20880.85	-36226.82	42424.32	-20879.71	0.004%
20	20616.72	-42029.07	35729.31	-20613.95	42028.98	-35728.08	0.005%
21	-41.10	-41633.73	41138.30	41.17	41633.69	-41136.60	0.003%
22	-20687.90	-42029.07	35770.41	20685.14	42028.98	-35769.17	0.005%
23	-36269.88	-42424.41	20952.04	36267.92	42424.32	-20950.88	0.004%
24	-41304.61	-42029.07	41.10	41302.17	42028.98	-39.30	0.005%
25	-35627.25	-41633.73	-20533.56	35625.93	41633.69	20532.39	0.003%
26	-20616.72	-42029.07	-35729.31	20617.04	42028.97	35726.19	0.005%
27	16.52	-23716.61	-14953.88	-16.52	23716.61	14953.21	0.002%
28	7466.79	-23648.09	-12909.04	-7466.64	23648.08	12907.40	0.006%
29	12901.89	-23579.58	-7454.23	-12901.10	23579.57	7453.76	0.003%
30	14904.97	-23648.09	-16.52	-14903.51	23648.08	17.20	0.006%
31	12949.49	-23716.61	7462.63	-12948.93	23716.61	-7462.31	0.002%
32	7438.18	-23648.09	12892.52	-7436.86	23648.09	-12891.60	0.006%
33	-16.52	-23579.58	14879.85	16.53	23579.57	-14878.94	0.003%
34	-7466.79	-23648.09	12909.04	7465.50	23648.09	-12908.12	0.006%
35	-12966.01	-23716.61	7491.25	12965.45	23716.61	-7490.92	0.002%
36	-14904.97	-23648.09	16.52	14903.52	23648.09	-15.85	0.006%
37	-12885.37	-23579.58	-7425.62	12884.58	23579.57	7425.14	0.003%
38	-7438.18	-23648.09	-12892.52	7438.03	23648.08	12890.87	0.006%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	8	0.00000001	0.00002425
2	Yes	17	0.00000001	0.00007593
3	Yes	16	0.00009082	0.00012231
4	Yes	12	0.00000001	0.00011094
5	Yes	16	0.00000001	0.00013154
6	Yes	17	0.00000001	0.00007982
7	Yes	16	0.00000001	0.00012009
8	Yes	12	0.00000001	0.00009802
9	Yes	16	0.00000001	0.00012185
10	Yes	17	0.00000001	0.00008087
11	Yes	16	0.00000001	0.00013154
12	Yes	12	0.00000001	0.00010870
13	Yes	16	0.00000001	0.00012073
14	Yes	6	0.00000001	0.00009321
15	Yes	16	0.00000001	0.00009001
16	Yes	15	0.00011830	0.00012279
17	Yes	12	0.00000001	0.00010367
18	Yes	15	0.00011512	0.00012111
19	Yes	16	0.00000001	0.00008780

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20	Yes	15	0.00011522	0.00011722
21	Yes	12	0.00000001	0.00009871
22	Yes	15	0.00011474	0.00011843
23	Yes	16	0.00000001	0.00008992
24	Yes	15	0.00011482	0.00012044
25	Yes	12	0.00000001	0.00010064
26	Yes	15	0.00011852	0.00012106
27	Yes	11	0.00000001	0.00005357
28	Yes	10	0.00000001	0.00011544
29	Yes	10	0.00000001	0.00006782
30	Yes	10	0.00000001	0.00011431
31	Yes	11	0.00000001	0.00005275
32	Yes	10	0.00000001	0.00011249
33	Yes	10	0.00000001	0.00006549
34	Yes	10	0.00000001	0.00011108
35	Yes	11	0.00000001	0.00005226
36	Yes	10	0.00000001	0.00011338
37	Yes	10	0.00000001	0.00006768
38	Yes	10	0.00000001	0.00011583

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	1.301	33	0.0211	0.1455
T2	160 - 140	1.376	29	0.0581	0.1513
T3	140 - 120	1.607	29	0.0528	0.2024
T4	120 - 100	1.705	29	0.0118	0.3010
T5	100 - 80	1.490	29	0.0798	0.3437
T6	80 - 60	1.118	27	0.0662	0.3838
T7	60 - 40	0.905	31	0.0504	0.3914
T8	40 - 20	0.730	35	0.0504	0.3573
T9	20 - 5	0.467	35	0.0884	0.2576
T10	5 - 0	0.121	35	0.1114	0.1470

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	Rohn 6'x15' Boom Gate (3)	33	1.304	0.0274	0.1453	67991
162.52	Guy	29	1.356	0.0545	0.1490	19751
162.52	Guy	29	1.356	0.0545	0.1490	19751
152.00	Pirod 15' T-Frame Sector Mount (1)	29	1.461	0.0650	0.1639	47615
136.00	Pirod 15' T-Frame Sector Mount (1)	29	1.647	0.0403	0.2216	21662
132.16	Guy	29	1.677	0.0265	0.2418	18572
120.00	AIR21 B4A/B2P with pipe	29	1.705	0.0118	0.3010	13253
98.00	GPS	27	1.454	0.0830	0.3475	23776
82.52	Guy	27	1.160	0.0702	0.3796	20085
49.75	Guy	31	0.819	0.0466	0.3801	156117

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Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	5.362	21	0.1953	0.5105
T2	160 - 140	5.683	10	0.3019	0.5255
T3	140 - 120	6.999	2	0.2596	0.6543
T4	120 - 100	7.747	2	0.1422	0.9075
T5	100 - 80	7.288	2	0.3098	1.0159
T6	80 - 60	6.017	2	0.2614	1.1059
T7	60 - 40	4.947	2	0.2769	1.1249
T8	40 - 20	3.778	2	0.3169	1.0191
T9	20 - 5	2.222	6	0.4545	0.7376
T10	5 - 0	0.569	6	0.5295	0.4153

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	Rohn 6'x15' Boom Gate (3)	21	5.340	0.2140	0.5100	23670
162.52	Guy	10	5.544	0.2923	0.5197	6884
162.52	Guy	10	5.544	0.2923	0.5197	6884
152.00	Pirod 15' T-Frame Sector Mount (1)	10	6.191	0.3172	0.5568	19037
136.00	Pirod 15' T-Frame Sector Mount (1)	2	7.228	0.2104	0.7031	5174
132.16	Guy	2	7.416	0.1560	0.7549	4799
120.00	AIR21 B4A/B2P with pipe	2	7.747	0.1422	0.9075	3620
98.00	GPS	2	7.180	0.3131	1.0245	5622
82.52	Guy	2	6.177	0.2688	1.0963	6150
49.75	Guy	2	4.379	0.2877	1.0891	19029

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load Allowable	Allowable Ratio	Criteria	
T1	180	Diagonal	A325N	0.6250	1	4918.61	6442.72	0.763	✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	1	453.89	6442.72	0.070	✓	1.333	Bolt Shear
		Bottom Girt	A325N	0.6250	1	1571.81	6071.88	0.259	✓	1.333	Member Block Shear
T2	160	Leg	A325N	0.7500	4	483.91	19428.70	0.025	✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3637.41	4123.34	0.882	✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	1257.92	4123.34	0.305	✓	1.333	Bolt Shear
T3	140	Bottom Girt	A325N	0.5000	1	632.95	4123.34	0.154	✓	1.333	Bolt Shear
		Leg	A325N	0.7500	4	3500.68	19433.70	0.180	✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1999.17	4123.34	0.485	✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	269.86	2740.50	0.098	✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	583.09	2740.50	0.213	✓	1.333	Member Bearing

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Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load Allowable	Allowable Ratio	Criteria	
T4	120	Leg	A325N	0.7500	4	0.00	19430.00	0.000	✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2749.79	4123.34	0.667	✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	820.28	4123.34	0.199	✓	1.333	Bolt Shear
		Bottom Girt	A325N	0.5000	1	740.66	4123.34	0.180	✓	1.333	Bolt Shear
T5	100	Leg	A325N	0.7500	4	0.00	19434.50	0.000	✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3217.24	4123.34	0.780	✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	673.17	2740.50	0.246	✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	598.73	2740.50	0.218	✓	1.333	Member Bearing
T6	80	Leg	A325N	0.7500	4	0.00	19438.20	0.000	✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2088.56	4123.34	0.507	✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	1250.42	4123.34	0.303	✓	1.333	Bolt Shear
		Bottom Girt	A325N	0.5000	1	608.91	4123.34	0.148	✓	1.333	Bolt Shear
T7	60	Leg	A325N	0.7500	4	0.00	19436.40	0.000	✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3209.90	4123.34	0.778	✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	204.77	2740.50	0.075	✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	956.24	2740.50	0.349	✓	1.333	Member Bearing
T8	40	Leg	A325N	0.7500	4	0.00	19438.50	0.000	✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2649.41	4123.34	0.643	✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	835.19	2740.50	0.305	✓	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	627.09	2740.50	0.229	✓	1.333	Member Bearing
T9	20	Leg	A325N	0.7500	4	0.00	18361.30	0.000	✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3257.60	4123.34	0.790	✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	730.75	2740.50	0.267	✓	1.333	Member Bearing
		Bottom Girt	A325N	0.6250	2	4089.96	6442.72	0.635	✓	1.333	Bolt Shear
T10	5	Leg	A325N	0.7500	4	0.00	19394.30	0.000	✓	1.333	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T _a lb	Required S.F.	Actual S.F.
T1	162.52 (A) (462)	1/2 EHS	2690.00	26900.04	7658.46	13450.00	2.000	3.512 ✓
	162.52 (A) (463)	1/2 EHS	2690.00	26900.04	7914.88	13450.00	2.000	3.399 ✓
	162.52 (B) (458)	1/2 EHS	2690.00	26900.04	7762.95	13450.00	2.000	3.465 ✓
	162.52 (B) (459)	1/2 EHS	2690.00	26900.04	7800.70	13450.00	2.000	3.448 ✓
	162.52 (C) (454)	1/2 EHS	2690.00	26900.04	7948.70	13450.00	2.000	3.384 ✓

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Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
	162.52 (C) (455)	1/2 EHS	2690.00	26900.04	7656.76	13450.00	2.000	3.513 ✓
	162.52 (A) (483)	7/8 EHS	7970.00	79699.84	20584.20	39850.00	2.000	3.872 ✓
	162.52 (B) (482)	7/8 EHS	7970.00	79699.84	20569.30	39850.00	2.000	3.875 ✓
	162.52 (C) (478)	7/8 EHS	7970.00	79699.84	20631.30	39850.00	2.000	3.863 ✓
T3	132.16 (A) (471)	9/16 EHS	3500.00	35000.04	11364.80	17500.00	2.000	3.080 ✓
	132.16 (B) (470)	9/16 EHS	3500.00	35000.04	11431.10	17500.00	2.000	3.062 ✓
	132.16 (C) (466)	9/16 EHS	3500.00	35000.04	11450.40	17500.00	2.000	3.057 ✓
T5	82.52 (A) (477)	3/4 EHS	5830.00	58299.91	18272.50	29150.00	2.000	3.191 ✓
	82.52 (B) (476)	3/4 EHS	5830.00	58299.91	18309.20	29150.00	2.000	3.184 ✓
	82.52 (C) (472)	3/4 EHS	5830.00	58299.91	18297.60	29150.00	2.000	3.186 ✓
T7	49.75 (A) (489)	1/2 EHS	2690.00	26900.04	8411.73	13450.00	2.000	3.198 ✓
	49.75 (B) (488)	1/2 EHS	2690.00	26900.04	8406.05	13450.00	2.000	3.200 ✓
	49.75 (C) (484)	1/2 EHS	2690.00	26900.04	8402.10	13450.00	2.000	3.202 ✓

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in ²	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 2.5 X-STR	20.00	2.41	31.3 K=1.00	1.00	26.993	2.2535	-28593.70	60829.50	0.470 ✓
T2	160 - 140	ROHN 2.5 X-STR	20.00	2.41	31.3 K=1.00	1.00	26.993	2.2535	-34034.70	60829.50	0.560 ✓
T3	140 - 120	ROHN 2.5 X-STR	20.00	2.41	31.3 K=1.00	0.99	26.708	2.2535	-50818.30	60186.90	0.844 ✓
T4	120 - 100	ROHN 2.5 X-STR	20.00	2.41	31.3 K=1.00	0.99	26.703	2.2535	-51426.10	60176.50	0.855 ✓
T5	100 - 80	ROHN 2.5 X-STR	20.00	2.41	31.3 K=1.00	0.98	26.555	2.2535	-43839.70	59842.00	0.733 ✓
T6	80 - 60	ROHN 2.5 X-STR	20.00	2.41	31.3 K=1.00	1.00	26.993	2.2535	-43864.90	60829.50	0.721 ✓
T7	60 - 40	ROHN 2.5 X-STR	20.00	2.41	62.6 K=2.00	1.00	22.275	2.2535	-41541.90	50197.60	0.828 ✓
T8	40 - 20	ROHN 2.5 X-STR	20.00	2.41	62.6 K=2.00	1.00	22.275	2.2535	-49892.20	50197.60	0.994 ✓
T9	20 - 5	ROHN 2.5 X-STR	15.00	2.38	61.8 K=2.00	1.00	22.412	2.2535	-49699.50	50506.80	0.984 ✓
T10	5 - 0	ROHN 2.5 X-STR	5.38	1.08	2.8	0.88	26.313	2.2535	-36448.90	59297.20	0.615* ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	Mast Stability Index	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
K=0.20											
✓											

* DL controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T1	180 - 160	L2x2x1/4	4.18	1.95	59.7 K=1.00	17.459	0.9380	-4918.61	16376.50	0.300
T2	160 - 140	ROHN TS1.5x11 ga	4.18	1.95	47.7 K=1.00	21.256	0.5202	-3637.41	11058.50	0.329
T3	140 - 120	ROHN TS1.5x16 ga	4.18	1.95	45.7 K=1.00	21.470	0.2627	-1999.17	5641.12	0.354
T4	120 - 100	ROHN TS1.5x11 ga	4.18	1.95	47.7 K=1.00	21.256	0.5202	-2749.79	11058.50	0.249
T5	100 - 80	ROHN TS1.5x16 ga	4.18	1.95	45.7 K=1.00	21.470	0.2627	-3217.24	5641.12	0.570
T6	80 - 60	ROHN TS1.5x11 ga	4.18	1.95	47.7 K=1.00	21.256	0.5202	-2088.56	11058.50	0.189
T7	60 - 40	ROHN TS1.5x16 ga	4.18	3.89	91.5 K=1.00	15.314	0.2627	-3209.90	4023.83	0.798
T8	40 - 20	ROHN TS1.5x16 ga	4.18	3.89	91.5 K=1.00	15.314	0.2627	-2649.41	4023.83	0.658
T9	20 - 5	ROHN TS1.5x16 ga	4.17	3.87	91.1 K=1.00	15.374	0.2627	-3257.60	4039.66	0.806

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T10	5 - 0	L4x4x1/4	2.39	2.15	32.5 K=1.00	19.131	1.9400	-260.45	37113.40	0.007
✓										

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T1	180 - 160	L2x2x1/4	3.42	3.18	97.6	13.278	0.9380	-453.89	12455.00	0.036

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T2	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	K=1.00 77.9	17.365	0.5202	-829.83	9034.18	0.092
T3	140 - 120	ROHN TS1.5x16 ga	3.42	3.18	K=1.00 74.8	17.811	0.2627	-58.68	4679.96	0.013
T4	120 - 100	ROHN TS1.5x11 ga	3.42	3.18	K=1.00 77.9	17.365	0.5202	-68.36	9034.18	0.008
T5	100 - 80	ROHN TS1.5x16 ga	3.42	3.18	K=1.00 74.8	17.811	0.2627	-297.05	4679.96	0.063
T7	60 - 40	ROHN TS1.5x16 ga	3.42	3.18	K=1.00 74.8	17.811	0.2627	-208.50	4679.96	0.045
T8	40 - 20	ROHN TS1.5x16 ga	3.42	3.18	K=1.00 74.8	17.811	0.2627	-733.66	4679.96	0.157
T9	20 - 5	ROHN TS1.5x16 ga	3.42	3.18	K=1.00 74.8	17.811	0.2627	-616.58	4679.96	0.132

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T2	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	K=1.00 77.9	17.365	0.5202	-25.06	9034.18	0.003
T3	140 - 120	ROHN TS1.5x16 ga	3.42	3.18	K=1.00 74.8	17.811	0.2627	-197.45	4679.96	0.042
T7	60 - 40	ROHN TS1.5x16 ga	3.42	3.18	K=1.00 74.8	17.811	0.2627	-743.58	4679.96	0.159
T8	40 - 20	ROHN TS1.5x16 ga	3.42	3.18	K=1.00 74.8	17.811	0.2627	-460.55	4679.96	0.098
T10	5 - 0	L4x4x1/4	0.34	0.10	K=1.00 1.5	20.811	1.9400	-1159.22	40373.20	0.029*

* DL controls

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	2L2x2x1/4x3/8	3.42	3.18	K=1.00 62.7	32.500	1.4100	0.00	27720.70	0.000*
T3	140 - 120	2L 'a' > 18.3775 in - 479 4x3/8	3.42	3.18	K=1.00 352.6	32.500	1.1250	0.00	1802.16	0.000*
T5	100 - 80	2L2x2x1/4x3/8	3.42	3.18	K=1.00 62.7	32.500	1.4100	0.00	27720.70	0.000*
T7	60 - 40	2L 'a' > 18.3775 in - 473 4x3/8	3.42	3.18	K=1.00 352.6	32.500	1.1250	0.00	1802.16	0.000*

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
K=1.00										

* DL controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M _x lb-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M _y lb-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	180 - 160	2L2x2x1/4x3/8	13.86	-0.142	30.000	0.005	0.00	0.000	30.000	0.000
T3	140 - 120	4x3/8	10.40	-0.125	37.500	0.003	0.00	0.000	37.500	0.000
T5	100 - 80	2L2x2x1/4x3/8	13.86	-0.142	30.000	0.005	0.00	0.000	30.000	0.000
T7	60 - 40	4x3/8	10.40	-0.125	37.500	0.003	0.00	0.000	37.500	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	2L2x2x1/4x3/8	0.000	0.005	0.000	0.005* ✓	1.000	H1-3 ✓
T3	140 - 120	4x3/8	0.000	0.003	0.000	0.003* ✓	1.000	H1-3 ✓
T5	100 - 80	2L2x2x1/4x3/8	0.000	0.005	0.000	0.005* ✓	1.000	H1-3 ✓
T7	60 - 40	4x3/8	0.000	0.003	0.000	0.003* ✓	1.000	H1-3 ✓

* DL controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160 (456)	C12x20.7	3.41	3.30	102.6 K=1.00	12.652	6.0900	-285.77	77053.00	0.004
T1	180 - 160 (457)	C12x20.7	3.41	3.30	102.6 K=1.00	12.652	6.0900	-262.89	77053.00	0.003
T1	180 - 160 (460)	C12x20.7	3.41	3.30	102.6 K=1.00	12.652	6.0900	-119.67	77053.00	0.002
T1	180 - 160 (461)	C12x20.7	3.41	3.30	102.6 K=1.00	12.652	6.0900	-2.89	77053.00	0.000
T1	180 - 160 (464)	C12x20.7	3.41	3.30	102.6 K=1.00	12.652	6.0900	-145.82	77053.00	0.002
T1	180 - 160 (465)	C12x20.7	3.41	3.30	102.6 K=1.00	12.652	6.0900	-3.77	77053.00	0.000

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Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	180 - 160 (456)	C12x20.7	-18689.4 2	-10.431	21.600	0.483	-0.00	-0.000	21.600	0.000
T1	180 - 160 (457)	C12x20.7	-18663.5 8	-10.417	21.600	0.482	0.00	-0.000	21.600	0.000
T1	180 - 160 (460)	C12x20.7	-18642.7 5	-10.405	21.600	0.482	0.00	-0.000	21.600	0.000
T1	180 - 160 (461)	C12x20.7	-18699.4 2	-10.437	21.600	0.483	-0.00	-0.000	21.600	0.000
T1	180 - 160 (464)	C12x20.7	-18641.8 3	-10.405	21.600	0.482	0.00	-0.000	21.600	0.000
T1	180 - 160 (465)	C12x20.7	-18673.2 5	-10.422	21.600	0.483	0.00	-0.000	21.600	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160 (456)	C12x20.7	0.004	0.483	0.000	0.487	1.333	H1-3 ✓
T1	180 - 160 (457)	C12x20.7	0.003	0.482	0.000	0.486	1.333	H1-3 ✓
T1	180 - 160 (460)	C12x20.7	0.002	0.482	0.000	0.483	1.333	H1-3 ✓
T1	180 - 160 (461)	C12x20.7	0.000	0.483	0.000	0.483	1.333	H1-3 ✓
T1	180 - 160 (464)	C12x20.7	0.002	0.482	0.000	0.484	1.333	H1-3 ✓
T1	180 - 160 (465)	C12x20.7	0.000	0.483	0.000	0.483	1.333	H1-3 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 2.5 X-STR	20.00	2.41	31.3	30.000	2.2535	24912.70	67606.20	0.368
T2	160 - 140	ROHN 2.5 X-STR	20.00	2.41	31.3	30.000	2.2535	1935.65	67606.20	0.029
T3	140 - 120	ROHN 2.5 X-STR	20.00	2.41	31.3	30.000	2.2535	14002.70	67606.20	0.207

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T4	120 - 100	ROHN 2.5 X-STR	20.00	2.41	31.3	30.000	2.2535	14001.50	67606.20	0.207

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	L2x2x1/4	4.18	1.95	38.3	29.000	0.5629	2965.13	16323.40	0.182
T2	160 - 140	ROHN TS1.5x11 ga	4.18	1.95	47.7	25.200	0.5202	3253.64	13110.20	0.248
T3	140 - 120	ROHN TS1.5x16 ga	4.18	1.95	45.7	25.200	0.2627	1919.49	6621.31	0.290
T4	120 - 100	ROHN TS1.5x11 ga	4.18	1.95	47.7	25.200	0.5202	2206.92	13110.20	0.168
T5	100 - 80	ROHN TS1.5x16 ga	4.18	1.95	45.7	25.200	0.2627	3136.05	6621.31	0.474
T6	80 - 60	ROHN TS1.5x11 ga	4.18	1.95	47.7	25.200	0.5202	1414.67	13110.20	0.108
T7	60 - 40	ROHN TS1.5x16 ga	4.18	3.89	91.5	25.200	0.2627	3090.80	6621.31	0.467
T8	40 - 20	ROHN TS1.5x16 ga	4.18	3.89	91.5	25.200	0.2627	2428.94	6621.31	0.367
T9	20 - 5	ROHN TS1.5x16 ga	4.17	3.87	91.1	25.200	0.2627	2992.06	6621.31	0.452

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T10	5 - 0	L4x4x1/4	1.03	0.79	7.5	21.600	1.9400	50.35	41904.00	0.001

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	L2x2x1/4	3.42	3.18	62.7	29.000	0.5629	404.08	16323.40	0.025
T2	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9	25.200	0.5202	1257.92	13110.20	0.096

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T3	140 - 120	ROHN TS1.5x16 ga	3.42	3.18	74.8	25.200	0.2627	269.86	6621.31	0.041
T4	120 - 100	ROHN TS1.5x11 ga	3.42	3.18	77.9	25.200	0.5202	820.28	13110.20	0.063
T5	100 - 80	ROHN TS1.5x16 ga	3.42	3.18	74.8	25.200	0.2627	673.17	6621.31	0.102
T6	80 - 60	ROHN TS1.5x11 ga	3.42	3.18	77.9	25.200	0.5202	1250.42	13110.20	0.095
T7	60 - 40	ROHN TS1.5x16 ga	3.42	3.18	74.8	25.200	0.2627	204.77	6621.31	0.031
T8	40 - 20	ROHN TS1.5x16 ga	3.42	3.18	74.8	25.200	0.2627	835.19	6621.31	0.126
T9	20 - 5	ROHN TS1.5x16 ga	3.42	3.18	74.8	25.200	0.2627	730.75	6621.31	0.110
T10	5 - 0	L4x4x1/4	3.08	2.84	27.2	21.600	1.9400	1796.83	41904.00	0.043*

* DL controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	L2x2x1/4	3.42	3.18	62.7	29.000	0.5629	1571.81	16323.40	0.096
T2	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9	25.200	0.5202	632.95	13110.20	0.048
T3	140 - 120	ROHN TS1.5x16 ga	3.42	3.18	74.8	25.200	0.2627	583.09	6621.31	0.088
T4	120 - 100	ROHN TS1.5x11 ga	3.42	3.18	77.9	25.200	0.5202	740.66	13110.20	0.056
T5	100 - 80	ROHN TS1.5x16 ga	3.42	3.18	74.8	25.200	0.2627	598.73	6621.31	0.090
T6	80 - 60	ROHN TS1.5x11 ga	3.42	3.18	77.9	25.200	0.5202	608.91	13110.20	0.046
T7	60 - 40	ROHN TS1.5x16 ga	3.42	3.18	74.8	25.200	0.2627	956.24	6621.31	0.144
T8	40 - 20	ROHN TS1.5x16 ga	3.42	3.18	74.8	25.200	0.2627	627.09	6621.31	0.095
T9	20 - 5	L3x3x1/2	3.42	3.18	42.5	29.000	1.7813	8179.92	51656.30	0.158

Top Guy Pull-Off Design Data (Tension)

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Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	2L2x2x1/4x3/8 2L 'a' > 18.3775 in - 480	3.42	3.18	62.7	32.500	1.4100	6197.36	45825.00	0.135
T3	140 - 120	4x3/8	3.42	3.18	352.6	32.500	1.1250	4262.59	36562.50	0.117
T5	100 - 80	2L2x2x1/4x3/8 2L 'a' > 18.3775 in - 473	3.42	3.18	62.7	32.500	1.4100	7294.66	45825.00	0.159
T7	60 - 40	4x3/8	3.42	3.18	352.6	32.500	1.1250	4518.74	36562.50	0.124

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M _x lb-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M _y lb-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	180 - 160	2L2x2x1/4x3/8	13.86	0.337	30.000	0.011	0.00	0.000	30.000	0.000
T3	140 - 120	4x3/8	10.40	0.125	37.500	0.003	-0.00	0.000	37.500	0.000
T5	100 - 80	2L2x2x1/4x3/8	9.35	0.227	30.000	0.008	0.00	0.000	30.000	0.000
T7	60 - 40	4x3/8	7.46	0.090	37.500	0.002	0.00	0.000	37.500	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	2L2x2x1/4x3/8	0.135	0.011	0.000	0.146	1.333	H2-1 ✓
T3	140 - 120	4x3/8	0.117	0.003	0.000	0.120	1.333	H2-1 ✓
T5	100 - 80	2L2x2x1/4x3/8	0.159	0.008	0.000	0.167	1.333	H2-1 ✓
T7	60 - 40	4x3/8	0.124	0.002	0.000	0.126	1.333	H2-1 ✓

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160 (456)	C12x20.7	3.41	3.30	49.5	21.600	6.0900	854.02	131544.00	0.006
T1	180 - 160 (457)	C12x20.7	3.41	3.30	49.5	21.600	6.0900	890.17	131544.00	0.007
T1	180 - 160 (460)	C12x20.7	3.41	3.30	49.5	21.600	6.0900	895.18	131544.00	0.007
T1	180 - 160 (461)	C12x20.7	3.41	3.30	49.5	21.600	6.0900	1117.28	131544.00	0.008
T1	180 - 160 (464)	C12x20.7	3.41	3.30	49.5	21.600	6.0900	869.80	131544.00	0.007
T1	180 - 160 (465)	C12x20.7	3.41	3.30	49.5	21.600	6.0900	1131.21	131544.00	0.009

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Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	180 - 160 (456)	C12x20.7	-17847.0 0	9.961	21.600	0.461	-0.00	0.000	27.000	0.000
T1	180 - 160 (457)	C12x20.7	-17823.0 8	9.948	21.600	0.461	0.00	0.000	27.000	0.000
T1	180 - 160 (460)	C12x20.7	-17809.3 3	9.940	21.600	0.460	-0.00	0.000	27.000	0.000
T1	180 - 160 (461)	C12x20.7	-18001.3 3	10.047	21.600	0.465	-0.00	0.000	27.000	0.000
T1	180 - 160 (464)	C12x20.7	-17827.8 3	9.950	21.600	0.461	0.00	0.000	27.000	0.000
T1	180 - 160 (465)	C12x20.7	-18001.0 0	10.047	21.600	0.465	0.00	0.000	27.000	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160 (456)	C12x20.7	0.006	0.461	0.000	0.468	1.333	H2-1 ✓
T1	180 - 160 (457)	C12x20.7	0.007	0.461	0.000	0.467	1.333	H2-1 ✓
T1	180 - 160 (460)	C12x20.7	0.007	0.460	0.000	0.467	1.333	H2-1 ✓
T1	180 - 160 (461)	C12x20.7	0.008	0.465	0.000	0.474	1.333	H2-1 ✓
T1	180 - 160 (464)	C12x20.7	0.007	0.461	0.000	0.467	1.333	H2-1 ✓
T1	180 - 160 (465)	C12x20.7	0.009	0.465	0.000	0.474	1.333	H2-1 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 2.5 X-STR	1	-28593.70	81085.72	35.3	Pass
		Diagonal	L2x2x1/4	14	-4918.61	21829.87	22.5	Pass
		Top Girt	L2x2x1/4	5	-453.89	16602.51	2.7	Pass
		Bottom Girt	L2x2x1/4	7	1571.81	21759.09	7.2	Pass
		Guy A@162.523	1/2	463	7914.88	13450.00	58.8	Pass
		Guy A@162.523	7/8	483	20584.20	39850.00	51.7	Pass
		Guy B@162.523	1/2	459	7800.70	13450.00	58.0	Pass
		Guy B@162.523	7/8	482	20569.30	39850.00	51.6	Pass
		Guy C@162.523	1/2	454	7948.70	13450.00	59.1	Pass
		Guy C@162.523	7/8	478	20631.30	39850.00	51.8	Pass
		Top Guy	2L2x2x1/4x3/8	480	6197.36	61084.72	11.0	Pass
		Pull-Off@162.523						

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
		Torque Arm Top@162.523	C12x20.7	456	854.02	175348.14	36.5	Pass
T2	160 - 140	Leg	ROHN 2.5 X-STR	58	-34034.70	81085.72	42.0	Pass
		Diagonal	ROHN TS1.5x11 ga	113	-3637.41	14740.98	24.7	Pass
		Top Girt	ROHN TS1.5x11 ga	61	1257.92	17475.90	7.2	Pass
		Bottom Girt	ROHN TS1.5x11 ga	64	632.95	17475.90	3.6	Pass
T3	140 - 120	Leg	ROHN 2.5 X-STR	115	-50818.30	80229.13	63.3	Pass
		Diagonal	ROHN TS1.5x16 ga	153	-1999.17	7519.61	26.6	Pass
		Top Girt	ROHN TS1.5x16 ga	118	269.86	8826.21	3.1	Pass
		Bottom Girt	ROHN TS1.5x16 ga	121	583.09	8826.21	6.6	Pass
		Guy A@132.159	9/16	471	11364.80	17500.00	64.9	Pass
		Guy B@132.159	9/16	470	11431.10	17500.00	65.3	Pass
		Guy C@132.159	9/16	466	11450.40	17500.00	65.4	Pass
		Top Guy	4x3/8	467	4262.59	48737.81	9.0	Pass
		Pull-Off@132.159						
T4	120 - 100	Leg	ROHN 2.5 X-STR	172	-51426.10	80215.27	64.1	Pass
		Diagonal	ROHN TS1.5x11 ga	181	-2749.79	14740.98	18.7	Pass
		Top Girt	ROHN TS1.5x11 ga	175	820.28	17475.90	4.7	Pass
		Bottom Girt	ROHN TS1.5x11 ga	178	740.66	17475.90	4.2	Pass
T5	100 - 80	Leg	ROHN 2.5 X-STR	231	-43839.70	79769.38	55.0	Pass
		Diagonal	ROHN TS1.5x16 ga	244	-3217.24	7519.61	42.8	Pass
		Top Girt	ROHN TS1.5x16 ga	234	673.17	8826.21	7.6	Pass
		Bottom Girt	ROHN TS1.5x16 ga	235	598.73	8826.21	6.8	Pass
		Guy A@82.5234	3/4	477	18272.50	29150.00	62.7	Pass
		Guy B@82.5234	3/4	476	18309.20	29150.00	62.8	Pass
		Guy C@82.5234	3/4	472	18297.60	29150.00	62.8	Pass
		Top Guy	2L2x2x1/4x3/8	473	7294.66	61084.72	12.5	Pass
		Pull-Off@82.5234						
T6	80 - 60	Leg	ROHN 2.5 X-STR	288	-43864.90	81085.72	54.1	Pass
		Diagonal	ROHN TS1.5x11 ga	339	-2088.56	14740.98	14.2	Pass
		Top Girt	ROHN TS1.5x11 ga	290	1250.42	17475.90	7.2	Pass
		Bottom Girt	ROHN TS1.5x11 ga	294	608.91	17475.90	3.5	Pass
T7	60 - 40	Leg	ROHN 2.5 X-STR	345	-41541.90	66913.40	62.1	Pass
		Diagonal	ROHN TS1.5x16 ga	361	-3209.90	5363.77	59.8	Pass
		Top Girt	ROHN TS1.5x16 ga	348	-208.50	6238.39	3.3	Pass
		Bottom Girt	ROHN TS1.5x16 ga	349	-743.58	6238.39	11.9	Pass
		Guy A@49.75	1/2	489	8411.73	13450.00	62.5	Pass
		Guy B@49.75	1/2	488	8406.05	13450.00	62.5	Pass
		Guy C@49.75	1/2	484	8402.10	13450.00	62.5	Pass
		Top Guy	4x3/8	486	4518.74	48737.81	9.5	Pass
		Pull-Off@49.75						
T8	40 - 20	Leg	ROHN 2.5 X-STR	378	-49892.20	66913.40	74.6	Pass
		Diagonal	ROHN TS1.5x16 ga	406	-2649.41	5363.77	49.4	Pass
		Top Girt	ROHN TS1.5x16 ga	379	-733.66	6238.39	11.8	Pass
		Bottom Girt	ROHN TS1.5x16 ga	383	-460.55	6238.39	7.4	Pass
T9	20 - 5	Leg	ROHN 2.5 X-STR	411	-49699.50	67325.56	73.8	Pass
		Diagonal	ROHN TS1.5x16 ga	420	-3257.60	5384.87	60.5	Pass
		Top Girt	ROHN TS1.5x16 ga	414	-616.58	6238.39	9.9	Pass
		Bottom Girt	L3x3x1/2	416	8179.92	68857.85	11.9	Pass
T10	5 - 0	Leg	ROHN 2.5 X-STR	438	-36448.90	59297.20	61.5	Pass
		Horizontal	L4x4x1/4	446	-104.89	52643.36	8.9	Pass
		Top Girt	L4x4x1/4	441	1796.83	41904.00	4.3	Pass
		Bottom Girt	L4x4x1/4	443	-1159.22	40373.20	44.0	Pass

Summary

Leg (T8)	74.6	Pass
Diagonal (T9)	60.5	Pass
Horizontal (T10)	8.9	Pass
Top Girt (T8)	11.8	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
						Bottom Girt (T10)	44.0	Pass
						Guy A (T3)	64.9	Pass
						Guy B (T3)	65.3	Pass
						Guy C (T3)	65.4	Pass
						Top Guy Pull-Off (T5)	12.5	Pass
						Torque Arm Top (T1)	36.5	Pass
						Bolt Checks	66.2	Pass
						RATING =	74.6	Pass

EXHIBIT C

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

T-Mobile Existing Facility

Site ID: CT11048A

North Stonington / CDT_1
174 Boom Bridge Road
North Stonington, CT 06359

February 25, 2015

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	40.18 %

February 25, 2015

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

Emissions Analysis for Site: **CT11048A – North Stonington / CDT_1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **174 Boom Bridge Road, North Stonington, 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 700 MHz Band is $467 \mu\text{W}/\text{cm}^2$, and the general population exposure limit for the PCS and AWS bands 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 **174 Boom Bridge Road, North Stonington, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

- 1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel
- 2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.
- 5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

- 6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Ericsson AIR21 B4A/B12P-8** for 700 MHz and 2100 MHz (AWS) channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe. The **Ericsson AIR21 B4A/B12P-8** has a maximum gain of **13.6 dBd** at its main lobe for 700 MHz and **15.9 dBd** at its main lobe for 2100 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antenna mounting height centerline of the proposed antennas is **120 feet** above ground level (AGL).
- 9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	120	Height (AGL):	120	Height (AGL):	120
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	# PCS Channels:	4
Total TX Power:	180	Total TX Power:	180	# AWS Channels:	180
ERP (W):	7,002.81	ERP (W):	7,002.81	ERP (W):	7,002.81
Antenna A1 MPE%	1.94	Antenna B1 MPE%	1.94	Antenna C1 MPE%	1.94
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	13.6 dBd / 15.9 dBd	Gain:	13.6 dBd / 15.9 dBd	Gain:	13.6 dBd / 15.9 dBd
Height (AGL):	120	Height (AGL):	120	Height (AGL):	120
Frequency Bands	700 MHz / 2100 MHz (AWS)	Frequency Bands	700 MHz / 2100 MHz (AWS)	Frequency Bands	700 MHz / 2100 MHz (AWS)
Channel Count	3	Channel Count	3	Channel Count	3
Total TX Power:	90	Total TX Power:	90	Total TX Power:	90
ERP (W):	3,021.53	ERP (W):	3,021.53	ERP (W):	3,021.53
Antenna A2 MPE%	1.05	Antenna B2 MPE%	1.05	Antenna C2 MPE%	1.05

Site Composite MPE %	
Carrier	MPE %
T-Mobile	8.97
AT&T	10.61 %
Nextel	2.05 %
Sprint	1.54 %
Verizon Wireless	17.01 %
Site Total MPE %:	40.18 %

T-Mobile Sector 1 Total:	2.99 %
T-Mobile Sector 2 Total:	2.99 %
T-Mobile Sector 3 Total:	2.99 %
Site Total:	40.18 %

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	2.99 %
Sector 2:	2.99 %
Sector 3 :	2.99 %
T-Mobile Total:	8.97 %
Site Total:	40.18 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **40.18%** 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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