·T· · ·Mobile·

Please Reply To:
Sam Simons
35 Griffin Road South
Bloomfield, CT 06002
203-482-5156
Sam.Simons@T-Mobile.com

RECEIVED
MAY 14 2015
Connecticut Siting Council

May 13, 2015

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06501

Re: EM-TMOBILE-004-140903
T-Mobile Site ID CT11284A
81 Montevideo Road. Avon CT
Notice of Construction Completion

Dear Attorney Bachman:

The Connecticut Siting Council ("Council") acknowledged the above referenced T-Mobile Northeast LLC ("T-Mobile") notice of exempt modification on November 3, 2014. T-Mobile hereby notifies the Council that construction of the acknowledged modifications were complete as of December 28, 2014.

Please don't hesitate to contact me with any questions.

Sincerely,

Sam Simons

Samuel Simons, T-Mobile

cc: Mark Richard, T-Mobile

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

November 3, 2014

Julie D. Kohler, Esq.
Cohen and Wolf P.C.
1115 Broad Street
P.O. Box 1821
Bridgeport, CT 06601

RE: **EM-T-MOBILE-004-140903** – T-Mobile Northeast LLC notice of intent to modify an existing telecommunications facility located at 81 Montevideo Road, Avon, Connecticut.

Dear Attorney Kohler:

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

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

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated September 2, 2014 and additional information received on October 10, 2014 and October 23, 2014. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

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

Very truly yours,

Melanie A. Bachman
Acting Executive Director

MAB/RM/lm

c: The Honorable Mark W. Zacchio, Chairman, Town of Avon
Brandon Robertson, Town Manager, Town of Avon
Steven V. Kushner, Town Planner, Town of Avon
Message Center Management
Monte, LLC

COHEN and WOLF P.C.
ATTORNEYS AT LAW

EM-T-MOBILE-004-140903
(Second Revised Plan)

JULIE D. KOHLER

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

October 22, 2014

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

RECEIVED
OCT 23 2014
CONNECTICUT
SITING COUNCIL

Re: Notice of Exempt Modification
Message Center Management/T-Mobile co-location
Site ID CT11284A
81 Montevideo Road, Avon, CT

Dear Attorney Bachman:

On September 2, 2014 T-Mobile Northeast LLC ("T-Mobile") filed a notice of exempt modification for the above referenced site. Enclosed please find a revised plan dated 10/20/14 that reflects the addition of one antenna and one RRU (remote radio unit) at a centerline of 136 feet, consistent with the revised structural that was filed on October 9, 2014. Please accept these revisions to T-Mobile's request for exempt modification.

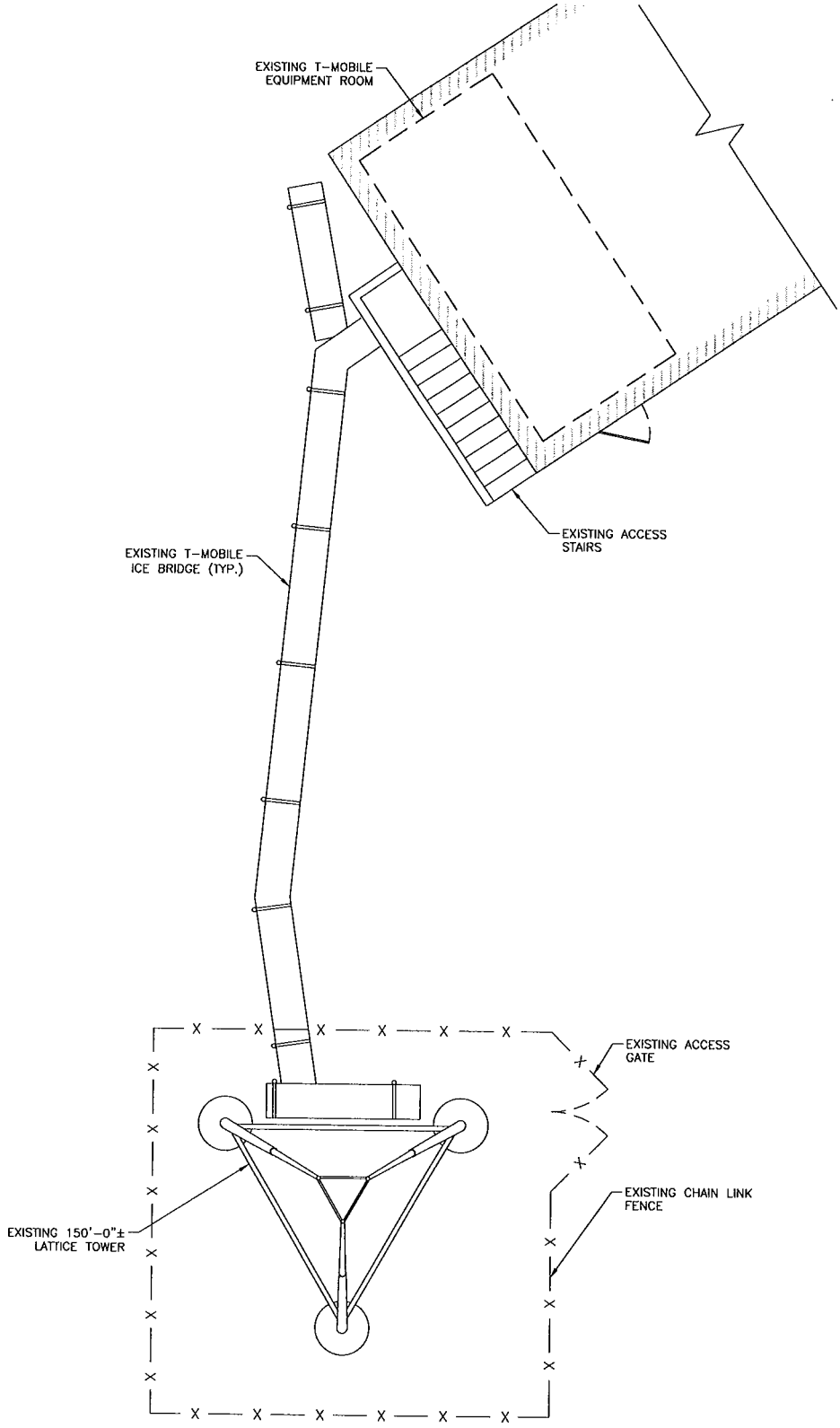
Please do not hesitate to let me know if you have any questions.

Sincerely,

Julie D. Kohler, Esq.

JDK/lcc

cc: Town of Avon, Town Manager Brandon Robertson
Message Center Management
Monte, LLC
Jamie Ford, EBI Consulting



CONFIGURATION
702CU

APPROX. NORTH

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

SITE PLAN

SCALE: 1:10

PREPARED BY:

EBI Consulting
environmental | engineering | due diligence
21 B Street | Burlington, MA 01803
Tel: (781) 273-2500 | Fax: (781) 273-3311
www.ebiconsulting.com

EBI JOB NO.: 81140810

CLIENT:

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

SITE INFO:

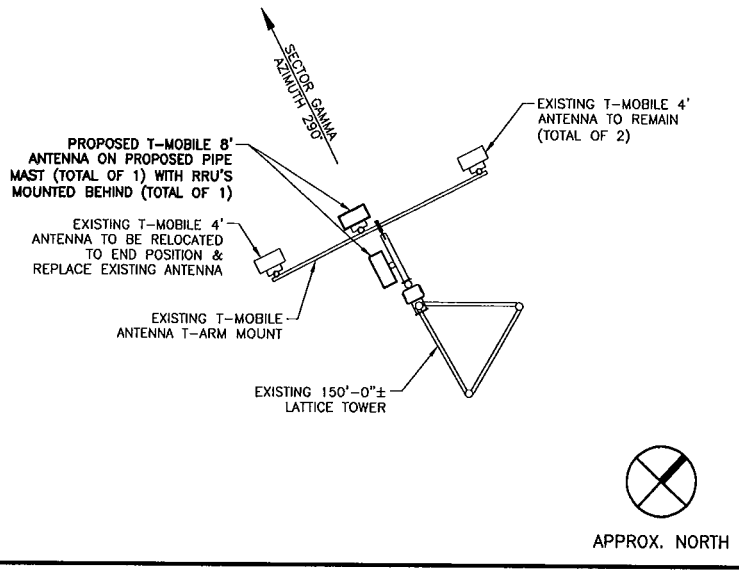
CT11284A
AVON_1
81 MONTEVIDEO ROAD
AVON, CT 06001

SUBMITTALS

NO.	DATE	DESCRIPTION	BY
A	08/04/14	FOR REVIEW	KO
B	10/20/14	REVISED PER RFDS	JM

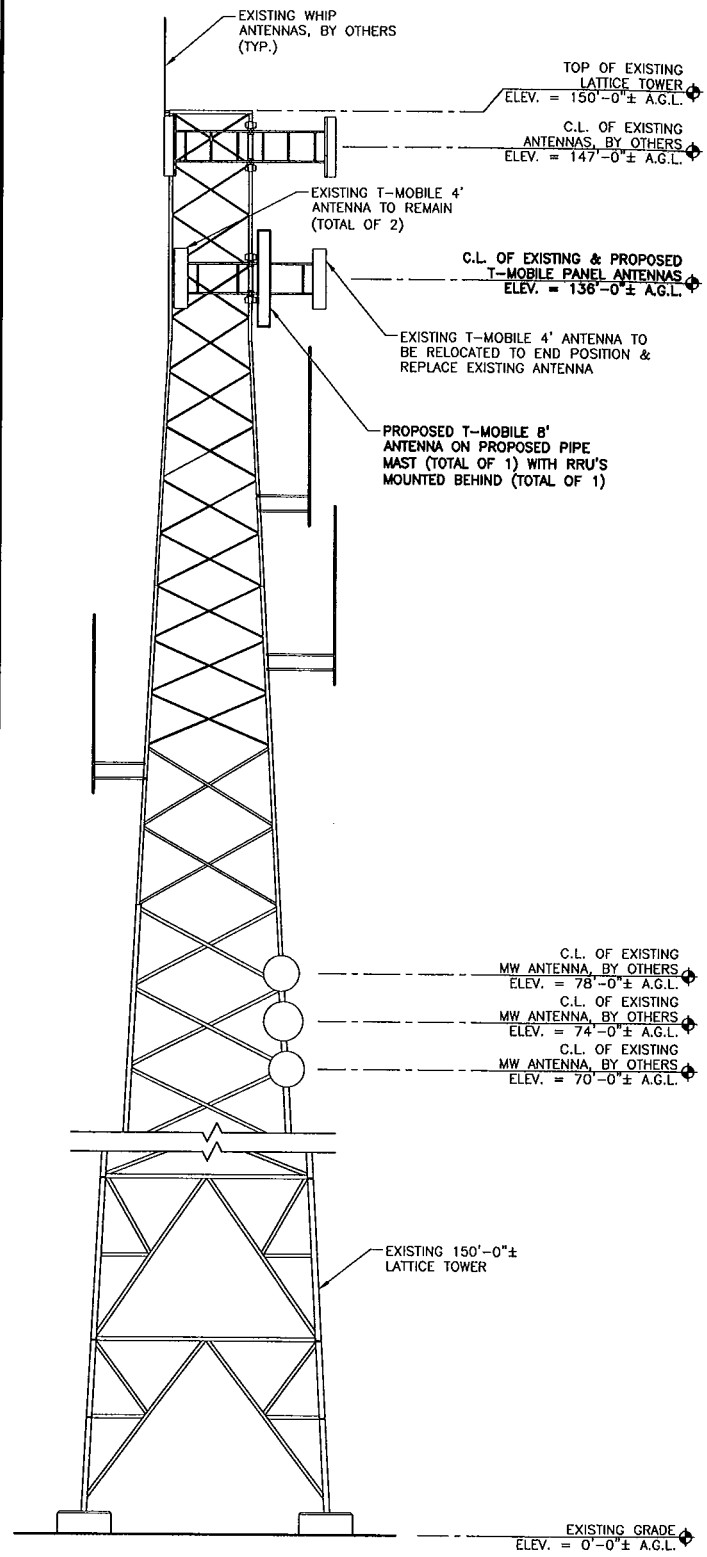
DRAWN BY: KO
CHECKED BY: PM
DATE: 08/04/14

SHEET NO: LE-1



ANTENNA CONFIGURATION

NTS



CONFIGURATION

702CU

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

TOWER ELEVATION

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

PREPARED BY:	CLIENT:	SITE INFO:
EBI Consulting environmental engineering	T-Mobile Northeast, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 860.692.7100	CT11284A AVON_1 81 MONTEVIDEO ROAD AVON, CT 06001
21 B Street | Burlington, MA 01803 Tel: (781) 273-2500 | Fax: (781) 273-3311 www.ebiconsulting.com		
EBI JOB NO.: 81140810		

SUBMITTALS

NO.	DATE	DESCRIPTION	BY
A	08/04/14	FOR REVIEW	KO
B	10/20/14	REVISED PER RFDS	JM

DRAWN BY: KO
CHECKED BY: PM
DATE: 08/04/14

SHEET NO: LE-2

COHEN and WOLF P.C.
ATTORNEYS AT LAW

EM-T-MOBILE-004-140903
(Additional Information)

JULIE D. KOHLER

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

October 9, 2014

RECEIVED
OCT 10 2014
CONNECTICUT SITING COUNCIL

ORIGINAL

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

Re: Notice of Exempt Modification
Message Center Management/T-Mobile co-location
Site ID CT11284A
81 Montevideo Road, Avon, CT

Dear Attorney Bachman:

On September 2, 2014 T-Mobile Northeast LLC ("T-Mobile") filed a notice of exempt modification for the above referenced site. At that time, T-Mobile provided a structural analysis dated August 15, 2014 (attached as Exhibit B) evidencing that the Avon Facility was structurally capable of supporting the modifications proposed by T-Mobile.

That structural has since been revised and its language clarified to specifically address the equipment additions proposed by T-Mobile. As a result, T-Mobile supplements its September 2, 2014 filing with the attached revised structural analysis, dated September 12, 2014 (provided as Exhibit B1). This revised structural analysis similarly concludes that the Avon Facility is structurally capable of supporting the modifications proposed by T-Mobile.

We would appreciate your review of this exempt modification request upon receipt of this correspondence.

Don't hesitate to let me know if you have any questions.

Sincerely,

Julie D. Kohler, Esq.

cc: Town of Avon, Town Manager Brandon Robertson
Message Center Management
Monte, LLC
Jamie Ford, EBI Consulting

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

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

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

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

EXHIBIT B

EBI Consulting
environmental | engineering | due diligence

21 B Street
Burlington, MA 01803
Tel: (781) 273- 2500
Fax: (781) 273- 3311
www.ebiconsulting.com

TOWER STRUCTURAL ANALYSIS REPORT

August 15, 2014

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

Subject: 700 MHz Upgrade Project
Site #: CT11284A
EBI Reference #: 81140810
Site Name: Avon_1
Address: 81 Montevideo Road, Avon, CT 06001

Dear Mr. Richard,

This letter is to confirm EBI's structural analysis of the existing self-supporting tower at the above listed site for its ability to support the proposed T-Mobile equipment upgrade. The intent of this analysis is to determine if the proposed modification of antennas will exceed the structural capacity of the existing tower.

EBI Consulting has prepared this structural analysis report of the 150.0 foot self-supporting tower for the additional loads imposed by the proposed antenna configuration by T-Mobile. This analysis has been performed in accordance with the 2005 CT State Building Code (including 2009, 2011, and 2013 Amendments) and ANSI/TIA/EIA-222 Revision F, with an 80 mph fastest-mile wind speed without ice, and a 69.3 mph fastest-mile wind speed with 0.5" radial ice. Information from the following sources was utilized in our analysis:

- Existing Structural Assessment Report prepared by Ramaker & Associates, Inc., Job No. 22984, dated July 14, 2014
- Photographs taken by EBI personnel from site visits on June 17, 2014 and July 25, 2014

By engineering analysis, the existing tower is capable of supporting the existing and proposed equipment, listed herein, without tower modifications. The tower under this configuration has a maximum usage of approximately 62.7%. This analysis did not provide for any future equipment or tower extensions.

The analysis provided herein by EBI Consulting includes the following existing and proposed equipment:

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Burlington, MA 01803
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Fax: (781) 273- 3311
www.ebiconsulting.com

Proposed equipment configuration:

Carrier	Elevation	Manufacturer	Model/Description	Quantity	Mount type	Coax
---	149′	---	4′ Lightning Rod	1	Leg	---
---	149′	---	8′ Omni	1	Leg	(1) 7/8″
Sprint	147′	RFS	APXVSPP18-C	3	(2) Sector Frames (1) Stand-off	(6) 1-OC-114 Power/Fiber Cables
		RFS	APXV9TM14-ALU-120	3		
		ALU	TD-RRH 8x20W	3		
	145′	ALU	1900 MHz 4x40W RRH	3		
		ALU	800 MHz 2x50W RRH	3		
T-Mobile	136′	Ericsson	AIR21 B2A/B4P	1	(1) Sector Frame	(4) 1 5/8″ (2) 1 ¼″ Hybriflex
		Ericsson	AIR21 B4A/B2P	1		
		Commscope	**LNX-6515DS-VTM**	**1**		
		---	**RRUS11 B12**	**1**		
---	121′	---	15′ Omni	1	(1) Stand-off	(1) 7/8″
---	117′	---	20′ Omni	1	(1) Stand-off	(1) 1 ¼″
---	108′	---	10′ Dipole	1	(1) Stand-off	(1) 7/8″
---	105′	---	8′ Omni	1	(1) Stand-off	(1) 1 ¼″
---	102′	---	8′ Omni	1	Leg	(1) ½″
---	98′	---	12′ Omni	1	(1) Stand-off	(1) 7/8″
---	84′	---	4′ Parabolic Dish	1	(1) Stand-off	(1) ¼″
---	78′	---	4′ Parabolic Dish	1	(1) Stand-off	(1) ¼″
---	74′	---	GPS	1	Leg	(1) ½″
---	72′	---	4′ Parabolic Dish	1	(1) Stand-off	(1) ¼″
---	67′	---	GPS	1	Leg	(1) ¼″
---	12′	---	GPS	1	Leg	(2) ½″

Note: Proposed equipment shown in bold.

Summary of Results: (Refer to attached TNX Tower Analysis 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	150 - 130	Leg	1 3/4	2	13705.70	53454.10	25.6	Pass
		Diagonal	7/8	17	-2394.39	5544.77	43.2	Pass
		Top Girt	1	6	-223.33	2879.79	7.8	Pass
		Bottom Girt	1	9	-1171.68	2879.79	40.7	Pass
		Mid Girt	1	12	-145.05	2879.79	5.0	Pass
T2	130 - 110	Leg	2	62	40246.00	67690.00	59.5	Pass
		Diagonal	7/8	77	-3506.41	5592.67	62.7	Pass
		Top Girt	1	66	-1273.86	2904.66	43.9	Pass
		Bottom Girt	1	69	-1626.26	2904.66	56.0	Pass
		Mid Girt	1	70	-140.37	2904.66	4.8	Pass
T3	110 - 90	Leg	2 1/4	122	-78873.30	129244.48	61.0	Pass
		Diagonal	1	138	-4115.21	9623.63	42.8	Pass
		Top Girt	1 1/4	126	-1538.35	7152.98	21.5	Pass

21 B Street
Burlington, MA 01803
Tel: (781) 273- 2500
Fax: (781) 273- 3311
www.ebiconsulting.com

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
		Bottom Girt	1 1/4	129	-1425.09	7152.98	19.9	Pass
		Mid Girt	1 1/4	132	-338.30	7152.98	4.7	Pass
T4	90 - 80	Leg	VAL-216415	182	-77413.40	184672.48	41.9	Pass
		Diagonal	L3x3x5/16	185	-5386.42	29033.94	18.6	Pass
							21.1 (b)	
T5	80 - 60	Leg	VAL-216413	191	-98032.50	184672.48	53.1	Pass
		Diagonal	L3x3x5/16	197	-4895.74	24773.80	19.8	Pass
							21.3 (b)	
T6	60 - 40	Leg	VAL-195557	206	-117482.00	258238.08	45.5	Pass
		Diagonal	L3x3x5/16	212	-4115.09	19986.33	20.6	Pass
T7	40 - 20	Leg	VAL-195557	221	-135880.00	258238.08	52.6	Pass
		Diagonal	L3x3x5/16	233	-4370.82	17753.03	24.6	Pass
T8	20 - 0	Leg	VAL-195557	236	-153366.00	258238.08	59.4	Pass
		Diagonal	L3x3x5/16	242	-5009.34	13041.66	38.4	Pass
							Summary	
						Leg (T3)	61.0	Pass
						Diagonal (T2)	62.7	Pass
						Top Girt (T2)	43.9	Pass
						Bottom Girt (T2)	56.0	Pass
						Mid Girt (T1)	5.0	Pass
						Bolt Checks	41.9	Pass
						RATING =	**62.7**	**Pass**

The maximum stress under the proposed conditions and configurations is **62.7%** of the tower capacity, governed by stresses in the tower legs. Therefore, **the tower has adequate structural capacity** to support the proposed equipment configurations.

Foundation:

The reactions at the base are as follows:

Reaction Type	Current analysis reactions (TIA-222-F)
Shear (k)	16.1
Uplift (k)	132.2
Compression (k)	156.5
Total moment (k-ft)	1755

Foundation and soils information was not available at the time of this analysis. Thus, evaluation of those elements was unable to be performed for determining their adequacy. EBI makes no claim on the foundation and soil adequacy for supporting the existing and proposed installations, neither written nor implied.

Limitations and Assumptions:

This report is based on the following assumptions:

EBI Consulting
environmental | engineering | due diligence

21 B Street
Burlington, MA 01803
Tel: (781) 273- 2500
Fax: (781) 273- 3311
www.ebiconsulting.com

1. 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. 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, constructed, and analyzed to support original and previous analysis design loads.

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

1. Adding antennas
2. Removing/replacing antennas
3. Adding or moving coaxial cables
4. 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, you should disregard this report and immediately contact EBI. EBI disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Please contact us at 781-273-2500 if you have any questions.

Sincerely yours,
EBI Consulting
August 15, 2014

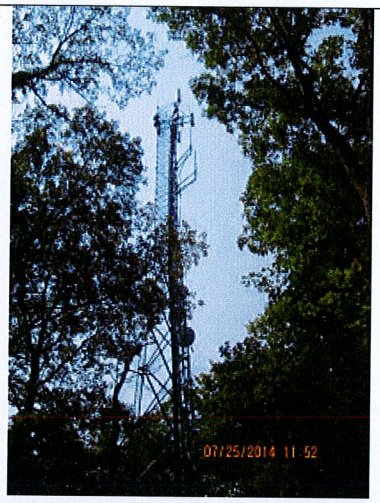
Richard L. Peterman, P.E.
Professional Engineer

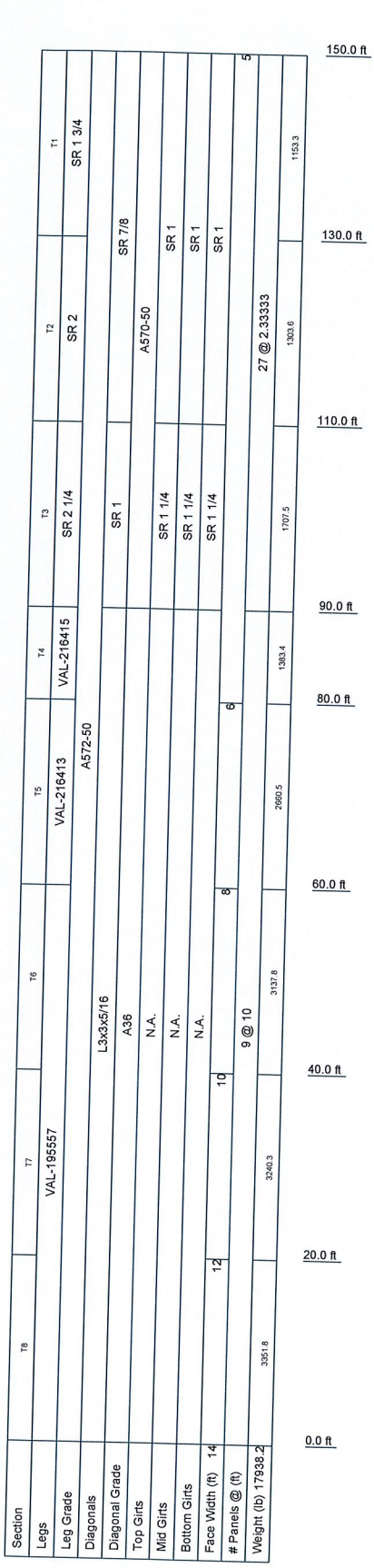
STATE OF CONNECTICUT
RICHARD L. PETERMAN
No. 30077
LICENSED
PROFESSIONAL ENGINEER

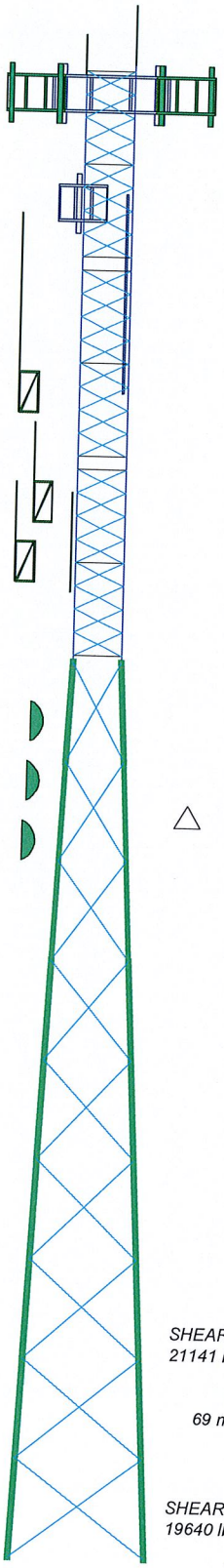
EBI Consulting
environmental | engineering | due diligence

21 B Street
Burlington, MA 01803
Tel: (781) 273- 2500
Fax: (781) 273- 3311
www.ebiconsulting.com

PHOTOGRAPH/ DOCUMENT LOG

Photo 1: Overall view of the existing self-supporting tower.	
Photo 2: Close-up of the existing T-Mobile antenna installation.	





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
2" Dia 8' Omni	149	AIR21 B2A/B4P w/ mount pipe (T-Mobile)	136
Lighting Rod 5/8" x 4'	149	AIR21 B4A/B2P w/ mount pipe (T-Mobile)	136
APXVSPP18-C-A20 w/ pipe mount (Sprint)	147	Commscope LNX-6515DS-VTM w/ mount pipe (T-Mobile)	136
APXVSPP18-C-A20 w/ pipe mount (Sprint)	147	RRUS11 B12 (T-Mobile)	136
APXVSPP18-C-A20 w/ pipe mount (Sprint)	147	Valmont 10' Frame (T-Mobile)	136
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	147	15' Omni	121
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	147	6' Side Arm Mount	121
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	147	20' Omni	117
PiROD 12' Lightweight T-Frame (Sprint)	147	6' Side Arm Mount	117
PiROD 12' Lightweight T-Frame (Sprint)	147	10' Dipole	108
2' Side Arm Mount (Sprint)	147	6' Side Arm Mount	108
TD-RRH 8x20 (Sprint)	147	8' Whip	105
TD-RRH 8x20 (Sprint)	147	4' Side Arm Mount	105
TD-RRH 8x20 (Sprint)	147	8' Omni	102
1900 MHz 4x40W RRH (Sprint)	145	6' Side Arm Mount	98
1900 MHz 4x40W RRH (Sprint)	145	12' Omni	98
1900 MHz 4x40W RRH (Sprint)	145	3' Side Arm Mount	84
800 MHz 2x50W RRH (Sprint)	145	4' Dish	84
800 MHz 2x50W RRH (Sprint)	145	3' Side Arm Mount	78
800 MHz 2x50W RRH (Sprint)	145	4' Dish	78
		GPS	74
		3' Side Arm Mount	72
		4' Dish	72
		GPS	67
		GPS	12

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi
A570-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 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.

MAX. CORNER REACTIONS AT BASE:
DOWN: 156532 lb
SHEAR: 12160 lb

UPLIFT: -132241 lb
SHEAR: 16125 lb

AXIAL
37595 lb

SHEAR
21141 lb

MOMENT
1755280 lb-ft

TORQUE 11462 lb-ft
69 mph WIND - 0.5000 in ICE

AXIAL
23574 lb

SHEAR
19640 lb

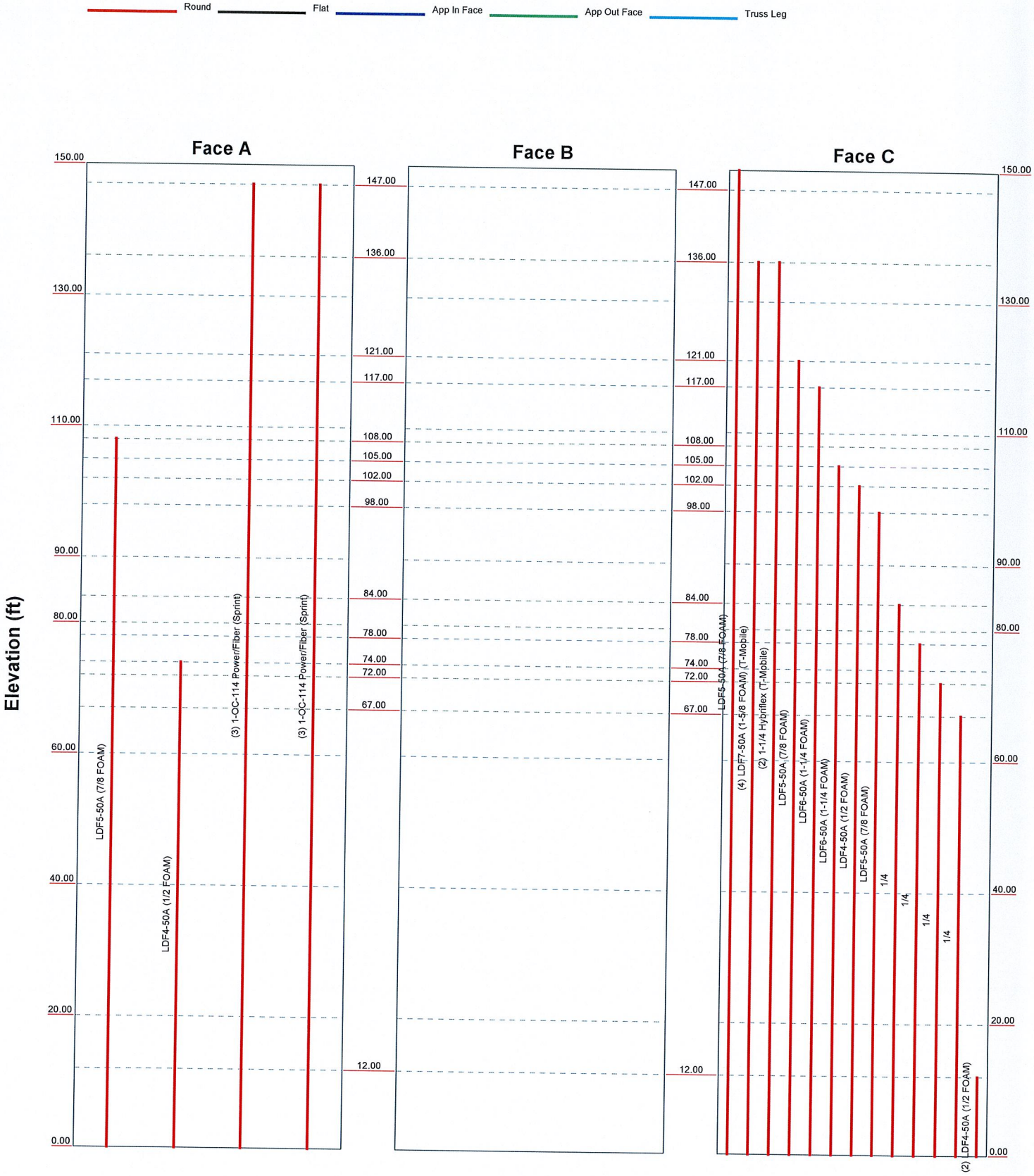
MOMENT
1647227 lb-ft

TORQUE 12877 lb-ft
REACTIONS - 80 mph WIND

EBI Consulting
21 B Street
Burlington, MA 01803
Phone: (781) 425-5100
FAX: (781) 425-5141

Job: CT11284A			
Project: 150' SST			
Client: T-Mobile	Drawn by: rpeterman		App'd:
Code: TIA/EIA-222-F	Date: 08/18/14		Scale: NTS
Path: C:\Users\rpeterman\Desktop\Temporary\TMO CT Turnkey\CT11284A (SST)\Structural\Calculations\CT11284A.tec			Dwg No. E-1

Feed Line Distribution Chart
0' - 150'

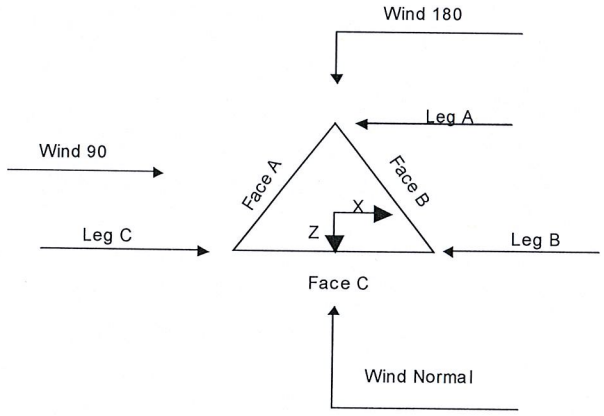


EBI Consulting 21 B Street Burlington, MA 01803 Phone: (781) 425-5100 FAX: (781) 425-5141	Job: *CT11284A*		
	Project: *150' SST*		
	Client: T-Mobile	Drawn by: rpeterman	App'd:
	Code: TIA/EIA-222-F	Date: 08/18/14	Scale: NTS
	Path:		Dwg No. E-7

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 14.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 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..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	150.00-130.00			5.00	1	20.00
T2	130.00-110.00			5.00	1	20.00
T3	110.00-90.00			5.00	1	20.00
T4	90.00-80.00			5.00	1	10.00
T5	80.00-60.00			6.00	1	20.00
T6	60.00-40.00			8.00	1	20.00
T7	40.00-20.00			10.00	1	20.00
T8	20.00-0.00			12.00	1	20.00

Tower Section Geometry *(cont'd)*

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	150.00-130.00	2.33	X Brace	No	No	8.0000	8.0000
T2	130.00-110.00	2.33	X Brace	No	No	8.0000	8.0000
T3	110.00-90.00	2.33	X Brace	No	No	8.0000	8.0000
T4	90.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T5	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T6	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T7	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T8	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 150.00-130.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A570-50 (50 ksi)
T2 130.00-110.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A570-50 (50 ksi)
T3 110.00-90.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A570-50 (50 ksi)
T4 90.00-80.00	Truss Leg	VAL-216415	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T5 80.00-60.00	Truss Leg	VAL-216413	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T6 60.00-40.00	Truss Leg	VAL-195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T7 40.00-20.00	Truss Leg	VAL-195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T8 20.00-0.00	Truss Leg	VAL-195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 150.00-130.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T2 130.00-110.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 110.00-90.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 150.00-130.00	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T2 130.00-110.00	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T3 110.00-90.00	1	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 150.00-130.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 130.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 110.00-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 90.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 150.00-130.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 130.00-110.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 110.00-90.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 90.00-80.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 80.00-60.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 60.00-40.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 40.00-20.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 20.00-0.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals
T4 90.00-80.00	1	0.5	0.85	1	0.5	0.85
T5 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T6 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T7 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T8 20.00-0.00	1	0.5	0.85	1	0.5	0.85

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 150.00-130.00	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 130.00-110.00	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 110.00-90.00	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 90.00-80.00	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
T5 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
T6 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
T7 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
T8 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 150.00-130.00	Sleeve DS	0.6250 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 130.00-110.00	Sleeve DS	0.7500 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 110.00-90.00	Flange	1.0000 A325N	6	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 90.00-80.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 80.00-60.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 60.00-40.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 40.00-20.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 20.00-0.00	Flange	1.0000 A687	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF5-50A (7/8 FOAM)	C	Yes	Ar (CfAe)	150.00 - 0.00	1	1	1.0900	1.0900		0.33
LDF7-50A (1-5/8 FOAM) (T-Mobile)	C	Yes	Ar (CfAe)	136.00 - 0.00	4	4	1.9800	1.9800		0.82
1-1/4 Hybriflex (T-Mobile)	C	Yes	Ar (CfAe)	136.00 - 0.00	2	2	1.5840	1.5840		1.61
LDF5-50A (7/8 FOAM)	C	Yes	Ar (CfAe)	121.00 - 0.00	1	1	1.0900	1.0900		0.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF6-50A (1-1/4 FOAM)	C	Yes	Ar (CfAe)	117.00 - 0.00	1	1	1.5500	1.5500		0.66
LDF5-50A (7/8 FOAM)	A	Yes	Ar (CfAe)	108.00 - 0.00	1	1	1.0900	1.0900		0.33
LDF6-50A (1-1/4 FOAM)	C	Yes	Ar (CfAe)	105.00 - 0.00	1	1	1.5500	1.5500		0.66
LDF4-50A (1/2 FOAM)	C	Yes	Ar (CfAe)	102.00 - 0.00	1	1	0.6300	0.6300		0.15
LDF5-50A (7/8 FOAM)	C	Yes	Ar (CfAe)	98.00 - 0.00	1	1	1.0900	1.0900		0.33
1/4	C	Yes	Ar (CfAe)	84.00 - 0.00	1	1	0.2900	0.2900		0.07
1/4	C	Yes	Ar (CfAe)	78.00 - 0.00	1	1	0.2900	0.2900		0.07
LDF4-50A (1/2 FOAM)	A	Yes	Ar (CfAe)	74.00 - 0.00	1	1	0.6300	0.6300		0.15
1/4	C	Yes	Ar (CfAe)	72.00 - 0.00	1	1	0.2900	0.2900		0.07
1/4	C	Yes	Ar (CfAe)	67.00 - 0.00	1	1	0.2900	0.2900		0.07
LDF4-50A (1/2 FOAM)	C	Yes	Ar (CfAe)	12.00 - 0.00	2	2	0.6300	0.6300		0.15
1-OC-114 Power/Fiber (Sprint)	A	Yes	Ar (CfAe)	147.00 - 0.00	3	3	1.5400	1.5400		1.00
1-OC-114 Power/Fiber (Sprint)	A	Yes	Ar (CfAe)	147.00 - 0.00	3	3	1.5400	1.5400		1.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	150.00-130.00	A	13.090	0.000	0.000	0.000	102.00
		B	0.000	0.000	0.000	0.000	0.00
		C	7.361	0.000	0.000	0.000	45.60
T2	130.00-110.00	A	15.400	0.000	0.000	0.000	120.00
		B	0.000	0.000	0.000	0.000	0.00
		C	22.200	0.000	0.000	0.000	144.85
T3	110.00-90.00	A	17.035	0.000	0.000	0.000	125.94
		B	0.000	0.000	0.000	0.000	0.00
		C	27.991	0.000	0.000	0.000	170.74
T4	90.00-80.00	A	8.608	0.000	0.000	0.000	63.30
		B	0.000	0.000	0.000	0.000	0.00
		C	15.170	0.000	0.000	0.000	89.88
T5	80.00-60.00	A	17.952	0.000	0.000	0.000	128.70
		B	0.000	0.000	0.000	0.000	0.00
		C	31.524	0.000	0.000	0.000	183.19
T6	60.00-40.00	A	18.267	0.000	0.000	0.000	129.60
		B	0.000	0.000	0.000	0.000	0.00
		C	32.080	0.000	0.000	0.000	184.80
T7	40.00-20.00	A	18.267	0.000	0.000	0.000	129.60
		B	0.000	0.000	0.000	0.000	0.00
		C	32.080	0.000	0.000	0.000	184.80
T8	20.00-0.00	A	18.267	0.000	0.000	0.000	129.60
		B	0.000	0.000	0.000	0.000	0.00
		C	33.340	0.000	0.000	0.000	188.40

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	150.00-130.00	A	0.500	21.590	0.000	0.000	0.000	229.11
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C		12.027	0.000	0.000	0.000	116.66
T2	130.00-110.00	A	0.500	25.400	0.000	0.000	0.000	269.54
		B		0.000	0.000	0.000	0.000	0.00
		C		35.367	0.000	0.000	0.000	355.84
T3	110.00-90.00	A	0.500	28.535	0.000	0.000	0.000	292.96
		B		0.000	0.000	0.000	0.000	0.00
		C		45.907	0.000	0.000	0.000	441.59
T4	90.00-80.00	A	0.500	14.442	0.000	0.000	0.000	147.78
		B		0.000	0.000	0.000	0.000	0.00
		C		25.503	0.000	0.000	0.000	238.96
T5	80.00-60.00	A	0.500	30.785	0.000	0.000	0.000	307.33
		B		0.000	0.000	0.000	0.000	0.00
		C		56.274	0.000	0.000	0.000	504.99
T6	60.00-40.00	A	0.500	31.600	0.000	0.000	0.000	312.37
		B		0.000	0.000	0.000	0.000	0.00
		C		58.747	0.000	0.000	0.000	517.70
T7	40.00-20.00	A	0.500	31.600	0.000	0.000	0.000	312.37
		B		0.000	0.000	0.000	0.000	0.00
		C		58.747	0.000	0.000	0.000	517.70
T8	20.00-0.00	A	0.500	31.600	0.000	0.000	0.000	312.37
		B		0.000	0.000	0.000	0.000	0.00
		C		60.377	1.260	0.000	0.000	537.71

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	150.00-130.00	A	1.006	3.518	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.566	1.960	0.000	0.000
T2	130.00-110.00	A	1.184	4.139	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.707	5.763	0.000	0.000
T3	110.00-90.00	A	1.519	5.001	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.497	8.046	0.000	0.000
T4	90.00-80.00	A	0.000	0.499	0.892	1.497
		B	0.000	0.000	0.000	0.000
		C	0.000	0.881	1.572	2.643
T5	80.00-60.00	A	0.000	0.898	1.571	2.693
		B	0.000	0.000	0.000	0.000
		C	0.000	1.641	2.758	4.923
T6	60.00-40.00	A	0.000	0.789	1.368	2.366
		B	0.000	0.000	0.000	0.000
		C	0.000	1.466	2.402	4.399
T7	40.00-20.00	A	0.000	0.713	1.236	2.138
		B	0.000	0.000	0.000	0.000
		C	0.000	1.325	2.170	3.974
T8	20.00-0.00	A	0.000	0.665	1.153	1.995
		B	0.000	0.000	0.000	0.000
		C	0.000	1.297	2.104	3.891

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
APXVSPP18-C-A20 w/ pipe mount (Sprint)	A	From Leg	0.00 2.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.26 8.81	5.44 5.98	60.65 113.03
APXVSPP18-C-A20 w/ pipe mount (Sprint)	B	From Leg	0.00 -6.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.26 8.81	5.44 5.98	60.65 113.03
APXVSPP18-C-A20 w/ pipe mount (Sprint)	B	From Leg	0.00 6.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.26 8.81	5.44 5.98	60.65 113.03
2" Dia 8' Omni	B	From Leg	0.00 0.00 4.00	0.0000	149.00	No Ice 1/2" Ice	2.00 3.03	2.00 3.03	5.00 18.00
Lighting Rod 5/8" x 4'	C	From Leg	0.00 0.00 2.00	0.0000	149.00	No Ice 1/2" Ice	0.25 0.66	0.25 0.66	31.00 33.82
AIR21 B2A/B4P w/ mount pipe (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	6.97 7.50	6.04 6.81	130.74 191.36
AIR21 B4A/B2P w/ mount pipe (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	6.97 7.50	6.04 6.81	130.74 191.36
Commscope LNX-6515DS-VTM w/ mount pipe (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	11.72 12.44	10.28 11.81	96.11 189.92
RRUS11 B12 (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	3.31 3.55	1.36 1.54	51.00 71.87
Valmont 10' Frame (T-Mobile)	A	From Face	1.50 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	13.80 18.42	3.75 5.95	275.00 388.66
15' Omni	C	From Leg	6.00 0.00 4.00	0.0000	121.00	No Ice 1/2" Ice	3.75 5.28	3.75 5.28	40.00 67.80
6' Side Arm Mount	C	From Leg	3.00 0.00 0.00	0.0000	121.00	No Ice 1/2" Ice	4.54 7.80	1.23 2.55	53.00 78.75
20' Omni	A	From Leg	6.00 0.00 10.00	0.0000	117.00	No Ice 1/2" Ice	5.00 7.03	5.00 7.03	55.00 100.00
6' Side Arm Mount	A	From Leg	3.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice	4.54 7.80	1.23 2.55	53.00 78.75
10' Dipole	A	From Leg	6.00 0.00 4.00	0.0000	108.00	No Ice 1/2" Ice	4.00 6.00	4.00 6.00	55.00 100.00
6' Side Arm Mount	A	From Leg	3.00 0.00 0.00	0.0000	108.00	No Ice 1/2" Ice	4.54 7.80	1.23 2.55	53.00 78.75
8' Whip	C	From Leg	4.00 0.00 4.00	0.0000	105.00	No Ice 1/2" Ice	1.36 2.26	1.36 2.26	44.00 56.00
4' Side Arm Mount	C	From Leg	2.00 0.00	0.0000	105.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	50.00 89.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
8' Omni	C	From Leg	0.00 0.50 0.00	0.0000	102.00	No Ice 1/2" Ice	2.20 3.03	2.20 3.03	30.00 46.30
12' Omni	C	From Leg	0.00 6.00 0.00	0.0000	98.00	No Ice 1/2" Ice	3.00 4.23	3.00 4.23	35.00 57.30
6' Side Arm Mount	C	From Leg	5.00 3.00 0.00	0.0000	98.00	No Ice 1/2" Ice	4.54 7.80	1.23 2.55	53.00 78.75
3' Side Arm Mount	C	From Leg	0.00 1.50 0.00	0.0000	84.00	No Ice 1/2" Ice	2.00 3.70	2.00 3.70	38.00 67.00
3' Side Arm Mount	C	From Leg	0.00 1.50 0.00	0.0000	78.00	No Ice 1/2" Ice	2.00 3.70	2.00 3.70	38.00 67.00
3' Side Arm Mount	C	From Leg	0.00 1.50 0.00	0.0000	72.00	No Ice 1/2" Ice	2.00 3.70	2.00 3.70	38.00 67.00
GPS	A	From Leg	0.00 0.50 0.00	0.0000	74.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.00 15.00
GPS	C	From Leg	0.00 0.50 0.00	0.0000	67.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.00 15.00
GPS	B	From Leg	0.00 0.50 0.00	0.0000	12.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.00 15.00
1900 MHz 4x40W RRH (Sprint)	A	From Leg	0.00 0.00 1.00	0.0000	145.00	No Ice 1/2" Ice	2.71 2.95	2.61 2.84	60.00 83.12
1900 MHz 4x40W RRH (Sprint)	B	From Leg	0.00 0.00 1.00	0.0000	145.00	No Ice 1/2" Ice	2.71 2.95	2.61 2.84	60.00 83.12
1900 MHz 4x40W RRH (Sprint)	C	From Leg	0.00 0.00 1.00	0.0000	145.00	No Ice 1/2" Ice	2.71 2.95	2.61 2.84	60.00 83.12
800 MHz 2x50W RRH (Sprint)	A	From Leg	0.00 0.00 -1.00	0.0000	145.00	No Ice 1/2" Ice	2.40 2.61	2.25 2.46	64.00 86.12
800 MHz 2x50W RRH (Sprint)	B	From Leg	0.00 0.00 -1.00	0.0000	145.00	No Ice 1/2" Ice	2.40 2.61	2.25 2.46	64.00 86.12
800 MHz 2x50W RRH (Sprint)	C	From Leg	0.00 0.00 -1.00	0.0000	145.00	No Ice 1/2" Ice	2.40 2.61	2.25 2.46	64.00 86.12
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	A	From Leg	0.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice	8.20 8.85	6.75 7.59	128.00 202.00
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	B	From Leg	0.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.20 8.85	6.75 7.59	128.00 202.00
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	C	From Leg	2.00 2.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.20 8.85	6.75 7.59	128.00 202.00
PiROD 12' Lightweight T-Frame	A	From Leg	0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	10.20 16.20	10.20 16.20	253.00 355.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Sprint)			0.00						
PiROD 12' Lightweight T-Frame (Sprint)	B	From Leg	0.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	10.20 16.20	10.20 16.20	253.00 355.00
2' Side Arm Mount (Sprint)	C	From Leg	1.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	2.00 3.70	2.00 3.70	38.00 67.00
TD-RRH 8x20 (Sprint)	A	From Leg	1.00 -0.50 0.00	0.0000	147.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	66.00 90.00
TD-RRH 8x20 (Sprint)	B	From Leg	1.00 -0.50 0.00	0.0000	147.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	66.00 90.00
TD-RRH 8x20 (Sprint)	C	From Leg	1.00 -0.50 0.00	0.0000	147.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	66.00 90.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
4' Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	Worst		84.00	4.00	No Ice 1/2" Ice	12.57 13.10	150.00 217.00
4' Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	Worst		78.00	4.00	No Ice 1/2" Ice	12.57 13.10	150.00 217.00
4' Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	Worst		72.00	4.00	No Ice 1/2" Ice	12.57 13.10	150.00 217.00

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight lb	Ice Weight lb	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
VAL-216415	1090.3344	1814.3549	644.58	218.88	7.5718	12.5997	5.3014
VAL-216413	2130.7479	3520.4599	589.86	443.34	7.3984	12.2238	5.3014
VAL-195557	2263.4687	3690.8612	718.59	458.46	7.8593	12.8155	7.2158
VAL-195557	2263.4687	3690.8612	718.59	458.46	7.8593	12.8155	7.2158
VAL-195557	2263.4687	3690.8612	718.59	458.46	7.8593	12.8155	7.2158

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	150	Leg	A325N	0.6250	5	2741.15	12885.40	0.213 ✔	1.333	Bolt DS
T2	130	Leg	A325N	0.7500	5	8049.20	18555.00	0.434 ✔	1.333	Bolt DS
T3	110	Leg	A325N	1.0000	6	12374.00	34539.80	0.358 ✔	1.333	Bolt Tension
T4	90	Leg	A325N	1.0000	6	12145.10	34557.10	0.351 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4772.13	16992.20	0.281 ✔	1.333	Member Bearing
T5	80	Leg	A325N	1.0000	6	14833.80	34557.50	0.429 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4816.23	16992.20	0.283 ✔	1.333	Member Bearing
T6	60	Leg	A325N	1.0000	6	17247.90	34557.50	0.499 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4138.83	16992.20	0.244 ✔	1.333	Member Bearing
T7	40	Leg	A325N	1.0000	6	19310.60	34557.10	0.559 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4607.16	16992.20	0.271 ✔	1.333	Member Bearing
T8	20	Leg	A687	1.0000	6	20999.00	38877.20	0.540 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	6799.88	16992.20	0.400 ✔	1.333	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
T1	150 - 130	1 3/4	20.00	2.33	64.0 K=1.00	22.023	2.4053	-15595.70	52971.60	0.294 ✔
T2	130 - 110	2	20.00	2.33	56.0 K=1.00	23.389	3.1416	-42444.20	73477.20	0.578 ✔
T3	110 - 90	2 1/4	20.00	2.33	49.8 K=1.00	24.385	3.9761	-78873.30	96957.60	0.813 ✔
T4	90 - 80	VAL-216415	10.02	10.02	37.8 K=1.00	26.132	5.3014	-77413.40	138539.00	0.559 ✔
T5	80 - 60	VAL-216413	20.03	10.02	37.8 K=1.00	26.132	5.3014	-98032.50	138539.00	0.708 ✔
T6	60 - 40	VAL-195557	20.03	10.02	32.4 K=1.00	26.848	7.2158	-117482.00	193727.00	0.606 ✔
T7	40 - 20	VAL-195557	20.03	10.02	32.4 K=1.00	26.848	7.2158	-135880.00	193727.00	0.701 ✔
T8	20 - 0	VAL-195557	20.03	10.02	32.4 K=1.00	26.848	7.2158	-153366.00	193727.00	0.792 ✔

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V lb	Allow. V_a lb	Stress Ratio
T4	90 - 80	0.5	1.47	120.0	10.366	0.1963	968.84	2278.10	0.425 ✓
T5	80 - 60	0.5	1.47	120.0	10.279	0.1963	961.34	2258.95	0.426 ✓
T6	60 - 40	0.5	1.46	119.0	10.423	0.1963	173.23	2290.46	0.076 ✓
T7	40 - 20	0.5	1.46	119.0	10.423	0.1963	502.64	2290.46	0.219 ✓
T8	20 - 0	0.5	1.46	119.0	10.423	0.1963	802.11	2290.46	0.350 ✓

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 $\frac{P}{P_a}$
T1	150 - 130	7/8	5.52	2.68	146.9 K=1.00	6.917	0.6013	-2394.39	4159.62	0.576 ✓
T2	130 - 110	7/8	5.52	2.67	146.3 K=1.00	6.977	0.6013	-3506.41	4195.55	0.836 ✓
T3	110 - 90	1	5.52	2.66	127.5 K=1.00	9.192	0.7854	-4115.21	7219.53	0.570 ✓
T4	90 - 80	L3x3x5/16	11.42	5.19	105.8 K=1.00	12.236	1.7800	-5386.42	21780.90	0.247 ✓
T5	80 - 60	L3x3x5/16	12.50	5.84	118.9 K=1.00	10.441	1.7800	-4895.74	18585.00	0.263 ✓
T6	60 - 40	L3x3x5/16	13.80	6.54	133.1 K=1.00	8.423	1.7800	-4115.09	14993.50	0.274 ✓
T7	40 - 20	L3x3x5/16	14.50	6.93	141.3 K=1.00	7.482	1.7800	-4370.82	13318.10	0.328 ✓
T8	20 - 0	L3x3x5/16	16.80	8.09	164.8 K=1.00	5.496	1.7800	-5009.34	9783.69	0.512 ✓

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 $\frac{P}{P_a}$
T1	150 - 130	1	5.00	4.85	233.0 K=1.00	2.751	0.7854	-223.33	2160.38	0.103 ✓
		KL/R > 200 (C) - 6								
T2	130 - 110	1	5.00	4.83	232.0 K=1.00	2.774	0.7854	-1273.86	2179.04	0.585 ✓
		KL/R > 200 (C) - 66								

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	110 - 90	1 1/4	5.00	4.81	184.8 K=1.00	4.373	1.2272	-1538.35	5366.08	0.287 ✔

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 $\frac{P}{P_a}$
T1	150 - 130	1	5.00	4.85	233.0 K=1.00	2.751	0.7854	-1171.68	2160.38	0.542 ✔
T2	130 - 110	KL/R > 200 (C) - 9 1	5.00	4.83	232.0 K=1.00	2.774	0.7854	-1626.26	2179.04	0.746 ✔
T3	110 - 90	KL/R > 200 (C) - 69 1 1/4	5.00	4.81	184.8 K=1.00	4.373	1.2272	-1425.09	5366.08	0.266 ✔

Mid 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 $\frac{P}{P_a}$
T1	150 - 130	1	5.00	4.85	233.0 K=1.00	2.751	0.7854	-145.05	2160.38	0.067 ✔
T2	130 - 110	KL/R > 200 (C) - 12 1	5.00	4.83	232.0 K=1.00	2.774	0.7854	-140.37	2179.04	0.064 ✔
T3	110 - 90	KL/R > 200 (C) - 70 1 1/4	5.00	4.81	184.8 K=1.00	4.373	1.2272	-338.30	5366.08	0.063 ✔

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	150 - 130	1 3/4	20.00	2.33	64.0	32.500	1.2339	13705.70	40100.60	0.342 ✔
T2	130 - 110	2	20.00	2.33	56.0	32.500	1.5625	40246.00	50780.20	0.793 ✔
T3	110 - 90	2 1/4	20.00	2.33	49.8	30.000	3.9761	74244.20	119282.00	0.622

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	90 - 80	VAL-216415	10.02	10.02	37.8	30.000	5.3014	72870.50	159043.00	0.458 ✓
T5	80 - 60	VAL-216413	20.03	10.02	37.8	30.000	5.3014	89002.80	159043.00	0.560 ✓
T6	60 - 40	VAL-195557	20.03	10.02	32.4	30.000	7.2158	103487.00	216475.00	0.478 ✓
T7	40 - 20	VAL-195557	20.03	10.02	32.4	30.000	7.2158	115863.00	216475.00	0.535 ✓
T8	20 - 0	VAL-195557	20.03	10.02	32.4	30.000	7.2158	125994.00	216475.00	0.582 ✓

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V lb	Allow. V_a lb	Stress Ratio
T4	90 - 80	0.5	1.47	120.0	10.366	0.1963	968.84	2278.10	0.425 ✓
T5	80 - 60	0.5	1.47	120.0	10.279	0.1963	961.34	2258.95	0.426 ✓
T6	60 - 40	0.5	1.46	119.0	10.423	0.1963	173.23	2290.46	0.076 ✓
T7	40 - 20	0.5	1.46	119.0	10.423	0.1963	502.64	2290.46	0.219 ✓
T8	20 - 0	0.5	1.46	119.0	10.423	0.1963	802.11	2290.46	0.350 ✓

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	150 - 130	7/8	5.52	2.68	146.9	30.000	0.6013	2406.71	18039.60	0.133 ✓
T2	130 - 110	7/8	5.52	2.67	146.3	30.000	0.6013	3547.43	18039.60	0.197 ✓
T3	110 - 90	1	5.52	2.66	127.5	30.000	0.7854	4058.68	23561.90	0.172 ✓
T4	90 - 80	L3x3x5/16	11.42	5.19	67.6	29.000	1.0127	4772.13	29369.30	0.162 ✓
T5	80 - 60	L3x3x5/16	11.93	5.59	72.8	29.000	1.0127	4816.23	29369.30	0.164 ✓
T6	60 - 40	L3x3x5/16	13.13	6.22	81.0	29.000	1.0127	4138.83	29369.30	0.141 ✓
T7	40 - 20	L3x3x5/16	15.24	7.29	94.9	29.000	1.0127	4607.16	29369.30	0.157 ✓

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 $\frac{P}{P_a}$
T8	20 - 0	L3x3x5/16	16.80	8.09	105.3	29.000	1.0127	6799.88	29369.30	0.232 ✔

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	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	201.65	23561.90	0.009 ✔
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	1307.68	23561.90	0.055 ✔
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	1626.21	36815.50	0.044 ✔

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	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	1149.86	23561.90	0.049 ✔
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	1576.05	23561.90	0.067 ✔
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	1535.09	36815.50	0.042 ✔

Mid 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	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	158.76	23561.90	0.007 ✔
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	165.73	23561.90	0.007 ✔
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	366.76	36815.50	0.010 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	150 - 130	Leg	1 3/4	2	13705.70	53454.10	25.6	Pass
		Diagonal	7/8	17	-2394.39	5544.77	43.2	Pass
		Top Girt	1	6	-223.33	2879.79	7.8	Pass
		Bottom Girt	1	9	-1171.68	2879.79	40.7	Pass
		Mid Girt	1	12	-145.05	2879.79	5.0	Pass
T2	130 - 110	Leg	2	62	40246.00	67690.00	59.5	Pass
		Diagonal	7/8	77	-3506.41	5592.67	62.7	Pass
		Top Girt	1	66	-1273.86	2904.66	43.9	Pass
		Bottom Girt	1	69	-1626.26	2904.66	56.0	Pass
		Mid Girt	1	70	-140.37	2904.66	4.8	Pass
T3	110 - 90	Leg	2 1/4	122	-78873.30	129244.48	61.0	Pass
		Diagonal	1	138	-4115.21	9623.63	42.8	Pass
		Top Girt	1 1/4	126	-1538.35	7152.98	21.5	Pass
		Bottom Girt	1 1/4	129	-1425.09	7152.98	19.9	Pass
		Mid Girt	1 1/4	132	-338.30	7152.98	4.7	Pass
T4	90 - 80	Leg	VAL-216415	182	-77413.40	184672.48	41.9	Pass
		Diagonal	L3x3x5/16	185	-5386.42	29033.94	18.6	Pass
							21.1 (b)	
T5	80 - 60	Leg	VAL-216413	191	-98032.50	184672.48	53.1	Pass
		Diagonal	L3x3x5/16	197	-4895.74	24773.80	19.8	Pass
							21.3 (b)	
T6	60 - 40	Leg	VAL-195557	206	-117482.00	258238.08	45.5	Pass
		Diagonal	L3x3x5/16	212	-4115.09	19986.33	20.6	Pass
T7	40 - 20	Leg	VAL-195557	221	-135880.00	258238.08	52.6	Pass
		Diagonal	L3x3x5/16	233	-4370.82	17753.03	24.6	Pass
T8	20 - 0	Leg	VAL-195557	236	-153366.00	258238.08	59.4	Pass
		Diagonal	L3x3x5/16	242	-5009.34	13041.66	38.4	Pass
							Summary	
						Leg (T3)	61.0	Pass
						Diagonal (T2)	62.7	Pass
						Top Girt (T2)	43.9	Pass
						Bottom Girt (T2)	56.0	Pass
						Mid Girt (T1)	5.0	Pass
						Bolt Checks	41.9	Pass
						RATING =	**62.7**	**Pass**

EXHIBIT B1

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TOWER STRUCTURAL ANALYSIS REPORT

September 12, 2014

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

Subject: 700 MHz Upgrade Project
Site #: CT11284A
EBI Reference #: 81140810
Site Name: Avon_1
Address: 81 Montevideo Road, Avon, CT 06001

Dear Mr. Richard,

This letter is to confirm EBI's structural analysis of the existing self-supporting tower at the above listed site for its ability to support the proposed T-Mobile equipment upgrade. The intent of this analysis is to determine if the proposed modification of antennas will exceed the structural capacity of the existing tower.

EBI Consulting has prepared this structural analysis report of the 150.0 foot self-supporting tower for the additional loads imposed by the proposed antenna configuration by T-Mobile. This analysis has been performed in accordance with the 2005 CT State Building Code (including 2009, 2011, and 2013 Amendments) and ANSI/TIA/EIA-222 Revision F, with an 80 mph fastest-mile wind speed without ice, and a 69.3 mph fastest-mile wind speed with 0.5" radial ice. Information from the following sources was utilized in our analysis:

- Existing Structural Assessment Report prepared by Ramaker & Associates, Inc., Job No. 22984, dated July 14, 2014
- Photographs taken by EBI personnel from site visits on June 17, 2014 and July 25, 2014

By engineering analysis, the existing tower and antenna mounting structures are capable of supporting the existing and proposed equipment, listed herein, without modifications. The tower under this configuration has a maximum usage of approximately 62.8%. This analysis did not provide for any future equipment or tower extensions.

The analysis provided herein by EBI Consulting includes the following existing and proposed equipment:

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Proposed equipment configuration:

Carrier	Elevation	Manufacturer	Model/Description	Quantity	Mount type	Coax
---	149′	---	4′ Lightning Rod	1	Leg	---
---	149′	---	8′ Omni	1	Leg	(1) 7/8″
Sprint	147′	RFS	APXVSPP18-C	3	(2) Sector Frames (1) Stand-off	(6) 1-OC-114 Power/Fiber Cables
		RFS	APXV9TM14-ALU-120	3		
		ALU	TD-RRH 8x20W	3		
	145′	ALU	1900 MHz 4x40W RRH	3		
		ALU	800 MHz 2x50W RRH	3		
T-Mobile	136′	Ericsson	AIR21 B2A/B4P	1	(1) Sector Frame	(5) 1 5/8″ (1) 1 ¼″ Hybriflex
		Ericsson	AIR21 B4A/B2P	1		
		Commscope	**LNX-6515DS-VTM**	**1**		
		---	**RRUS11 B12**	**1**		
---	121′	---	15′ Omni	1	(1) Stand-off	(1) 7/8″
---	117′	---	20′ Omni	1	(1) Stand-off	(1) 1 ¼″
---	108′	---	10′ Dipole	1	(1) Stand-off	(1) 7/8″
---	105′	---	8′ Omni	1	(1) Stand-off	(1) 1 ¼″
---	102′	---	8′ Omni	1	Leg	(1) ½″
---	98′	---	12′ Omni	1	(1) Stand-off	(1) 7/8″
---	84′	---	4′ Parabolic Dish	1	(1) Stand-off	(1) ¼″
---	78′	---	4′ Parabolic Dish	1	(1) Stand-off	(1) ¼″
---	74′	---	GPS	1	Leg	(1) ½″
---	72′	---	4′ Parabolic Dish	1	(1) Stand-off	(1) ¼″
---	67′	---	GPS	1	Leg	(1) ¼″
---	12′	---	GPS	1	Leg	(2) ½″

Note: Proposed equipment shown in bold.

Summary of Results: (Refer to attached TNX Tower Analysis 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	150 - 130	Leg	1 3/4	2	13707.60	53454.10	25.6	Pass
		Diagonal	7/8	17	-2394.42	5544.77	43.2	Pass
		Top Girt	1	6	-223.33	2879.79	7.8	Pass
		Bottom Girt	1	9	-1171.70	2879.79	40.7	Pass
		Mid Girt	1	12	-145.06	2879.79	5.0	Pass
T2	130 - 110	Leg	2	62	40295.40	67690.00	59.5	Pass
		Diagonal	7/8	77	-3513.66	5592.67	62.8	Pass
		Top Girt	1	66	-1273.92	2904.66	43.9	Pass
		Bottom Girt	1	69	-1630.10	2904.66	56.1	Pass
		Mid Girt	1	70	-140.60	2904.66	4.8	Pass
T3	110 - 90	Leg	2 1/4	122	-79018.60	129244.48	61.1	Pass
		Diagonal	1	138	-4128.98	9623.63	42.9	Pass
		Top Girt	1 1/4	126	-1542.33	7152.98	21.6	Pass
		Bottom Girt	1 1/4	129	-1428.76	7152.98	20.0	Pass
		Mid Girt	1 1/4	132	-338.82	7152.98	4.7	Pass
T4	90 - 80	Leg	VAL-216415	182	-77575.80	184672.48	42.0	Pass
		Diagonal	L3x3x5/16	185	-5396.15	29033.94	18.6	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
							21.1 (b)	
T5	80 - 60	Leg	VAL-216413	191	-98313.70	184672.48	53.2	Pass
		Diagonal	L3x3x5/16	197	-4915.79	24773.80	19.8	Pass
							21.3 (b)	
T6	60 - 40	Leg	VAL-195557	206	-117873.00	258238.08	45.6	Pass
		Diagonal	L3x3x5/16	212	-4136.52	19986.33	20.7	Pass
T7	40 - 20	Leg	VAL-195557	221	-136364.00	258238.08	52.8	Pass
		Diagonal	L3x3x5/16	233	-4392.12	17753.03	24.7	Pass
T8	20 - 0	Leg	VAL-195557	236	-153930.00	258238.08	59.6	Pass
		Diagonal	L3x3x5/16	242	-5030.54	13041.66	38.6	Pass
							Summary	
						Leg (T3)	61.1	Pass
						Diagonal (T2)	62.8	Pass
						Top Girt (T2)	43.9	Pass
						Bottom Girt (T2)	56.1	Pass
						Mid Girt (T1)	5.0	Pass
						Bolt Checks	42.1	Pass
						RATING =	**62.8**	**Pass**

The maximum stress under the proposed conditions and configurations is **62.8%** of the tower capacity, governed by stresses in the tower legs. Therefore, **the tower has adequate structural capacity** to support the proposed equipment configurations.

Foundation:

The reactions at the base are as follows:

Reaction Type	Current analysis reactions (TIA-222-F)
Shear (k)	16.2
Uplift (k)	132.8
Compression (k)	157.1
Total moment (k-ft)	1763

Foundation and soils information were not available at the time of this analysis. Thus, evaluation of those elements was unable to be performed for determining their adequacy. EBI makes no claim on the foundation and soil adequacy for supporting the existing and proposed installations, neither written nor implied.

Limitations and Assumptions:

This report is based on the following assumptions:

1. 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. Tower is in plumb condition.
6. All member protective coatings are in good condition.

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7. All tower members were properly designed, detailed, fabricated, and installed, and have been properly maintained since erection.
8. Foundations were properly designed, constructed, and analyzed to support original and previous analysis design loads.

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

1. Adding antennas
2. Removing/replacing antennas
3. Adding or moving coaxial cables
4. 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, you should disregard this report and immediately contact EBI. EBI disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Please contact us at 781-273-2500 if you have any questions.

Sincerely yours,
EBI Consulting
September 12, 2014

Richard L. Peterman, P.E.
Professional Engineer

STATE OF CONNECTICUT
RICHARD L. PETERMAN
No. 30077
LICENSED
PROFESSIONAL ENGINEER

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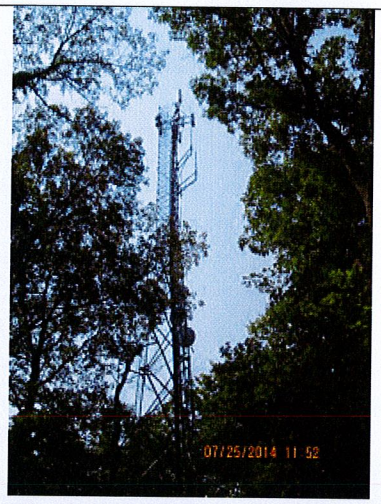
PHOTOGRAPH/ DOCUMENT LOG

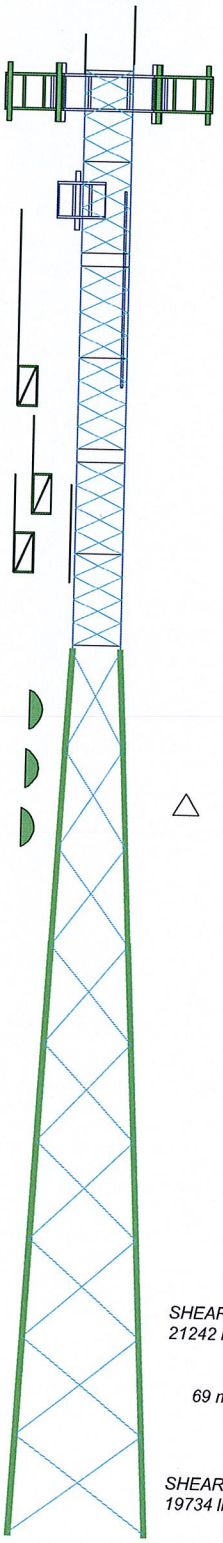
Photo 1: Overall view of the existing self-supporting tower.	
Photo 2: Close-up of the existing T-Mobile antenna installation.	

Section	T1	T2	T3	T4	T5	T6	T7	T8
Legs	SR 1 3/4	SR 2	SR 2 1/4	VAL-216415	VAL-216413		VAL-195557	
Leg Grade				A572-50				
Diagonals				L3x3x5/16				
Diagonal Grade				A36				
Top Girts		SR 7/8	SR 1					
Mid Girts		A570-50						
Bottom Girts			SR 1 1/4					
Face Width (ft)		SR 1	SR 1 1/4					14
# Panels @ (ft)					6	8	10	12
Weight (lb) 17938.2	1153.3	1303.6	1707.5	1353.4	2660.5	3137.8	3240.3	3351.8

27 @ 2.33333

9 @ 10

150.0 ft
130.0 ft
110.0 ft
90.0 ft
80.0 ft
60.0 ft
40.0 ft
20.0 ft
0.0 ft



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
2" Dia 8' Omni	149	AIR21 B2A/B4P w/ mount pipe (T-Mobile)	136
Lighting Rod 5/8" x 4'	149	AIR21 B4A/B2P w/ mount pipe (T-Mobile)	136
APXVSPP18-C-A20 w/ pipe mount (Sprint)	147	Commscope LNX-6515DS-VTM w/ mount pipe (T-Mobile)	136
APXVSPP18-C-A20 w/ pipe mount (Sprint)	147	RRUS11 B12 (T-Mobile)	136
APXVSPP18-C-A20 w/ pipe mount (Sprint)	147	Valmont 10' Frame (T-Mobile)	136
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	147	15' Omni	121
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	147	6' Side Arm Mount	121
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	147	20' Omni	117
PiROD 12' Lightweight T-Frame (Sprint)	147	6' Side Arm Mount	117
PiROD 12' Lightweight T-Frame (Sprint)	147	10' Dipole	108
2' Side Arm Mount (Sprint)	147	6' Side Arm Mount	108
TD-RRH 8x20 (Sprint)	147	8' Whip	105
TD-RRH 8x20 (Sprint)	147	4' Side Arm Mount	105
TD-RRH 8x20 (Sprint)	147	8' Omni	102
1900 MHz 4x40W RRH (Sprint)	145	6' Side Arm Mount	98
1900 MHz 4x40W RRH (Sprint)	145	12' Omni	98
1900 MHz 4x40W RRH (Sprint)	145	3' Side Arm Mount	84
800 MHz 2x50W RRH (Sprint)	145	4' Dish	84
800 MHz 2x50W RRH (Sprint)	145	3' Side Arm Mount	78
800 MHz 2x50W RRH (Sprint)	145	4' Dish	78
		GPS	74
		3' Side Arm Mount	72
		4' Dish	72
		GPS	67
		GPS	12

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi
A570-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 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.
9. TOWER RATING: 62.8%

MAX. CORNER REACTIONS AT BASE:
DOWN: 157121 lb
SHEAR: 12224 lb

UPLIFT: -132887 lb
SHEAR: 16194 lb

AXIAL
37521 lb

SHEAR
21242 lb

MOMENT
1762804 lb-ft

TORQUE 11462 lb-ft
69 mph WIND - 0.5000 in ICE

AXIAL
23466 lb

SHEAR
19734 lb

MOMENT
1654004 lb-ft

TORQUE 12877 lb-ft
REACTIONS - 80 mph WIND

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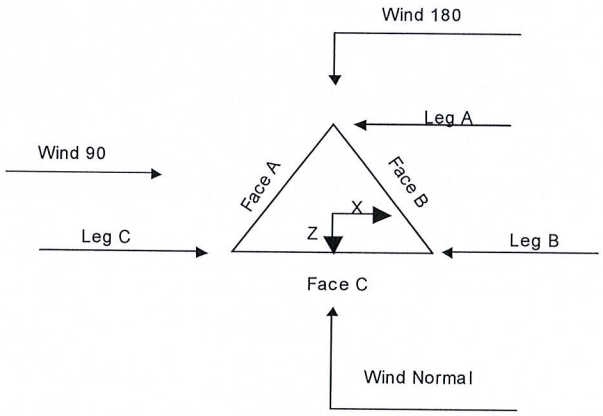
Job: CT11284A		
Project: 150' SST		
Client: T-Mobile	Drawn by: MHykes	App'd:
Code: TIA/EIA-222-F	Date: 09/12/14	Scale: NTS
Path: C:\Misc Jobs\ Turnkey TMO CT\CT11284A\Calculations\CT11284A.eri		Dwg No. E-1

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 14.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 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..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	150.00-130.00			5.00	1	20.00
T2	130.00-110.00			5.00	1	20.00
T3	110.00-90.00			5.00	1	20.00
T4	90.00-80.00			5.00	1	10.00
T5	80.00-60.00			6.00	1	20.00
T6	60.00-40.00			8.00	1	20.00
T7	40.00-20.00			10.00	1	20.00
T8	20.00-0.00			12.00	1	20.00

Tower Section Geometry *(cont'd)*

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	150.00-130.00	2.33	X Brace	No	No	8.0000	8.0000
T2	130.00-110.00	2.33	X Brace	No	No	8.0000	8.0000
T3	110.00-90.00	2.33	X Brace	No	No	8.0000	8.0000
T4	90.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T5	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T6	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T7	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T8	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 150.00-130.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A570-50 (50 ksi)
T2 130.00-110.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A570-50 (50 ksi)
T3 110.00-90.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A570-50 (50 ksi)
T4 90.00-80.00	Truss Leg	VAL-216415	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T5 80.00-60.00	Truss Leg	VAL-216413	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T6 60.00-40.00	Truss Leg	VAL-195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T7 40.00-20.00	Truss Leg	VAL-195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T8 20.00-0.00	Truss Leg	VAL-195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 150.00-130.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T2 130.00-110.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 110.00-90.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 150.00-130.00	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T2 130.00-110.00	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T3 110.00-90.00	1	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 150.00-130.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 130.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 110.00-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 90.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 150.00-130.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 130.00-110.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 110.00-90.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 90.00-80.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 80.00-60.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 60.00-40.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 40.00-20.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 20.00-0.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals
T4 90.00-80.00	1	0.5	0.85	1	0.5	0.85
T5 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T6 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T7 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T8 20.00-0.00	1	0.5	0.85	1	0.5	0.85

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 150.00-130.00	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 130.00-110.00	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 110.00-90.00	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 90.00-80.00	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
T5 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
T6 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
T7 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
T8 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 150.00-130.00	Sleeve DS	0.6250 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 130.00-110.00	Sleeve DS	0.7500 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 110.00-90.00	Flange	1.0000 A325N	6	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 90.00-80.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 80.00-60.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 60.00-40.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 40.00-20.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 20.00-0.00	Flange	1.0000 A687	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF5-50A (7/8 FOAM)	C	Yes	Ar (CfAe)	150.00 - 0.00	1	1	1.0900	1.0900		0.33
LDF7-50A (1-5/8 FOAM) (T-Mobile)	C	Yes	Ar (CfAe)	136.00 - 0.00	5	5	1.9800	1.9800		0.82
1-1/4 Hybriflex (T-Mobile)	C	Yes	Ar (CfAe)	136.00 - 0.00	1	1	1.5840	1.5840		1.61
LDF5-50A (7/8 FOAM)	C	Yes	Ar (CfAe)	121.00 - 0.00	1	1	1.0900	1.0900		0.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF6-50A (1-1/4 FOAM)	C	Yes	Ar (CfAe)	117.00 - 0.00	1	1	1.5500	1.5500		0.66
LDF5-50A (7/8 FOAM)	A	Yes	Ar (CfAe)	108.00 - 0.00	1	1	1.0900	1.0900		0.33
LDF6-50A (1-1/4 FOAM)	C	Yes	Ar (CfAe)	105.00 - 0.00	1	1	1.5500	1.5500		0.66
LDF4-50A (1/2 FOAM)	C	Yes	Ar (CfAe)	102.00 - 0.00	1	1	0.6300	0.6300		0.15
LDF5-50A (7/8 FOAM)	C	Yes	Ar (CfAe)	98.00 - 0.00	1	1	1.0900	1.0900		0.33
1/4	C	Yes	Ar (CfAe)	84.00 - 0.00	1	1	0.2900	0.2900		0.07
1/4	C	Yes	Ar (CfAe)	78.00 - 0.00	1	1	0.2900	0.2900		0.07
LDF4-50A (1/2 FOAM)	A	Yes	Ar (CfAe)	74.00 - 0.00	1	1	0.6300	0.6300		0.15
1/4	C	Yes	Ar (CfAe)	72.00 - 0.00	1	1	0.2900	0.2900		0.07
1/4	C	Yes	Ar (CfAe)	67.00 - 0.00	1	1	0.2900	0.2900		0.07
LDF4-50A (1/2 FOAM)	C	Yes	Ar (CfAe)	12.00 - 0.00	2	2	0.6300	0.6300		0.15
1-OC-114 Power/Fiber (Sprint)	A	Yes	Ar (CfAe)	147.00 - 0.00	3	3	1.5400	1.5400		1.00
1-OC-114 Power/Fiber (Sprint)	A	Yes	Ar (CfAe)	147.00 - 0.00	3	3	1.5400	1.5400		1.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	150.00-130.00	A	13.090	0.000	0.000	0.000	102.00
		B	0.000	0.000	0.000	0.000	0.00
		C	7.559	0.000	0.000	0.000	40.86
T2	130.00-110.00	A	15.400	0.000	0.000	0.000	120.00
		B	0.000	0.000	0.000	0.000	0.00
		C	22.860	0.000	0.000	0.000	129.05
T3	110.00-90.00	A	17.035	0.000	0.000	0.000	125.94
		B	0.000	0.000	0.000	0.000	0.00
		C	28.651	0.000	0.000	0.000	154.94
T4	90.00-80.00	A	8.608	0.000	0.000	0.000	63.30
		B	0.000	0.000	0.000	0.000	0.00
		C	15.500	0.000	0.000	0.000	81.98
T5	80.00-60.00	A	17.952	0.000	0.000	0.000	128.70
		B	0.000	0.000	0.000	0.000	0.00
		C	32.184	0.000	0.000	0.000	167.39
T6	60.00-40.00	A	18.267	0.000	0.000	0.000	129.60
		B	0.000	0.000	0.000	0.000	0.00
		C	32.740	0.000	0.000	0.000	169.00
T7	40.00-20.00	A	18.267	0.000	0.000	0.000	129.60
		B	0.000	0.000	0.000	0.000	0.00
		C	32.740	0.000	0.000	0.000	169.00
T8	20.00-0.00	A	18.267	0.000	0.000	0.000	129.60
		B	0.000	0.000	0.000	0.000	0.00
		C	34.000	0.000	0.000	0.000	172.60

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	150.00-130.00	A	0.500	21.590	0.000	0.000	0.000	229.11
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C		12.225	0.000	0.000	0.000	113.37
T2	130.00-110.00	A	0.500	25.400	0.000	0.000	0.000	269.54
		B		0.000	0.000	0.000	0.000	0.00
		C		36.027	0.000	0.000	0.000	344.88
T3	110.00-90.00	A	0.500	28.535	0.000	0.000	0.000	292.96
		B		0.000	0.000	0.000	0.000	0.00
		C		46.568	0.000	0.000	0.000	430.63
T4	90.00-80.00	A	0.500	14.442	0.000	0.000	0.000	147.78
		B		0.000	0.000	0.000	0.000	0.00
		C		25.833	0.000	0.000	0.000	233.47
T5	80.00-60.00	A	0.500	30.785	0.000	0.000	0.000	307.33
		B		0.000	0.000	0.000	0.000	0.00
		C		56.934	0.000	0.000	0.000	494.03
T6	60.00-40.00	A	0.500	31.600	0.000	0.000	0.000	312.37
		B		0.000	0.000	0.000	0.000	0.00
		C		59.407	0.000	0.000	0.000	506.74
T7	40.00-20.00	A	0.500	31.600	0.000	0.000	0.000	312.37
		B		0.000	0.000	0.000	0.000	0.00
		C		59.407	0.000	0.000	0.000	506.74
T8	20.00-0.00	A	0.500	31.600	0.000	0.000	0.000	312.37
		B		0.000	0.000	0.000	0.000	0.00
		C		61.037	1.260	0.000	0.000	526.75

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	150.00-130.00	A	1.006	3.518	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.581	1.992	0.000	0.000
T2	130.00-110.00	A	1.184	4.139	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.757	5.870	0.000	0.000
T3	110.00-90.00	A	1.519	5.001	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.555	8.162	0.000	0.000
T4	90.00-80.00	A	0.000	0.499	0.892	1.497
		B	0.000	0.000	0.000	0.000
		C	0.000	0.892	1.606	2.677
T5	80.00-60.00	A	0.000	0.898	1.571	2.693
		B	0.000	0.000	0.000	0.000
		C	0.000	1.660	2.816	4.981
T6	60.00-40.00	A	0.000	0.789	1.368	2.366
		B	0.000	0.000	0.000	0.000
		C	0.000	1.483	2.451	4.448
T7	40.00-20.00	A	0.000	0.713	1.236	2.138
		B	0.000	0.000	0.000	0.000
		C	0.000	1.339	2.215	4.018
T8	20.00-0.00	A	0.000	0.665	1.153	1.995
		B	0.000	0.000	0.000	0.000
		C	0.000	1.311	2.146	3.932

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
APXVSPP18-C-A20 w/ pipe mount (Sprint)	A	From Leg	0.00 2.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.26 8.81	5.44 5.98	60.65 113.03
APXVSPP18-C-A20 w/ pipe mount (Sprint)	B	From Leg	0.00 -6.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.26 8.81	5.44 5.98	60.65 113.03
APXVSPP18-C-A20 w/ pipe mount (Sprint)	B	From Leg	0.00 6.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.26 8.81	5.44 5.98	60.65 113.03
2" Dia 8' Omni	B	From Leg	0.00 0.00 4.00	0.0000	149.00	No Ice 1/2" Ice	2.00 3.03	2.00 3.03	5.00 18.00
Lighting Rod 5/8" x 4'	C	From Leg	0.00 0.00 2.00	0.0000	149.00	No Ice 1/2" Ice	0.25 0.66	0.25 0.66	31.00 33.82
AIR21 B2A/B4P w/ mount pipe (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	6.97 7.50	6.04 6.81	130.74 191.36
AIR21 B4A/B2P w/ mount pipe (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	6.97 7.50	6.04 6.81	130.74 191.36
Commscope LNX-6515DS-VTM w/ mount pipe (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	11.72 12.44	10.28 11.81	96.11 189.92
RRUS11 B12 (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	3.31 3.55	1.36 1.54	51.00 71.87
Valmont 10' Frame (T-Mobile)	A	From Face	1.50 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	13.80 18.42	3.75 5.95	275.00 388.66
15' Omni	C	From Leg	6.00 0.00 4.00	0.0000	121.00	No Ice 1/2" Ice	3.75 5.28	3.75 5.28	40.00 67.80
6' Side Arm Mount	C	From Leg	3.00 0.00 0.00	0.0000	121.00	No Ice 1/2" Ice	4.54 7.80	1.23 2.55	53.00 78.75
20' Omni	A	From Leg	6.00 0.00 10.00	0.0000	117.00	No Ice 1/2" Ice	5.00 7.03	5.00 7.03	55.00 100.00
6' Side Arm Mount	A	From Leg	3.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice	4.54 7.80	1.23 2.55	53.00 78.75
10' Dipole	A	From Leg	6.00 0.00 4.00	0.0000	108.00	No Ice 1/2" Ice	4.00 6.00	4.00 6.00	55.00 100.00
6' Side Arm Mount	A	From Leg	3.00 0.00 0.00	0.0000	108.00	No Ice 1/2" Ice	4.54 7.80	1.23 2.55	53.00 78.75
8' Whip	C	From Leg	4.00 0.00 4.00	0.0000	105.00	No Ice 1/2" Ice	1.36 2.26	1.36 2.26	44.00 56.00
4' Side Arm Mount	C	From Leg	2.00 0.00	0.0000	105.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	50.00 89.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00						
8' Omni	C	From Leg	0.50	0.0000	102.00	No Ice	2.20	2.20	30.00
			0.00			1/2" Ice	3.03	3.03	46.30
			0.00						
12' Omni	C	From Leg	6.00	0.0000	98.00	No Ice	3.00	3.00	35.00
			0.00			1/2" Ice	4.23	4.23	57.30
			5.00						
6' Side Arm Mount	C	From Leg	3.00	0.0000	98.00	No Ice	4.54	1.23	53.00
			0.00			1/2" Ice	7.80	2.55	78.75
			0.00						
3' Side Arm Mount	C	From Leg	1.50	0.0000	84.00	No Ice	2.00	2.00	38.00
			0.00			1/2" Ice	3.70	3.70	67.00
			0.00						
3' Side Arm Mount	C	From Leg	1.50	0.0000	78.00	No Ice	2.00	2.00	38.00
			0.00			1/2" Ice	3.70	3.70	67.00
			0.00						
3' Side Arm Mount	C	From Leg	1.50	0.0000	72.00	No Ice	2.00	2.00	38.00
			0.00			1/2" Ice	3.70	3.70	67.00
			0.00						
GPS	A	From Leg	0.50	0.0000	74.00	No Ice	1.00	1.00	10.00
			0.00			1/2" Ice	1.50	1.50	15.00
			0.00						
GPS	C	From Leg	0.50	0.0000	67.00	No Ice	1.00	1.00	10.00
			0.00			1/2" Ice	1.50	1.50	15.00
			0.00						
GPS	B	From Leg	0.50	0.0000	12.00	No Ice	1.00	1.00	10.00
			0.00			1/2" Ice	1.50	1.50	15.00
			0.00						
1900 MHz 4x40W RRH (Sprint)	A	From Leg	0.00	0.0000	145.00	No Ice	2.71	2.61	60.00
			1.00			1/2" Ice	2.95	2.84	83.12
			0.00						
1900 MHz 4x40W RRH (Sprint)	B	From Leg	0.00	0.0000	145.00	No Ice	2.71	2.61	60.00
			1.00			1/2" Ice	2.95	2.84	83.12
			0.00						
1900 MHz 4x40W RRH (Sprint)	C	From Leg	0.00	0.0000	145.00	No Ice	2.71	2.61	60.00
			1.00			1/2" Ice	2.95	2.84	83.12
			0.00						
800 MHz 2x50W RRH (Sprint)	A	From Leg	0.00	0.0000	145.00	No Ice	2.40	2.25	64.00
			-1.00			1/2" Ice	2.61	2.46	86.12
			0.00						
800 MHz 2x50W RRH (Sprint)	B	From Leg	0.00	0.0000	145.00	No Ice	2.40	2.25	64.00
			-1.00			1/2" Ice	2.61	2.46	86.12
			0.00						
800 MHz 2x50W RRH (Sprint)	C	From Leg	0.00	0.0000	145.00	No Ice	2.40	2.25	64.00
			-1.00			1/2" Ice	2.61	2.46	86.12
			0.00						
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	A	From Leg	0.00	0.0000	147.00	No Ice	8.20	6.75	128.00
			-2.00			1/2" Ice	8.85	7.59	202.00
			0.00						
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	B	From Leg	0.00	0.0000	147.00	No Ice	8.20	6.75	128.00
			0.00			1/2" Ice	8.85	7.59	202.00
			0.00						
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	C	From Leg	2.00	0.0000	147.00	No Ice	8.20	6.75	128.00
			2.00			1/2" Ice	8.85	7.59	202.00
			0.00						
PiROD 12' Lightweight T-Frame	A	From Leg	0.00	0.0000	147.00	No Ice	10.20	10.20	253.00
			0.00			1/2" Ice	16.20	16.20	355.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Sprint)			0.00						
PiROD 12' Lightweight T-Frame (Sprint)	B	From Leg	0.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	10.20 16.20	10.20 16.20	253.00 355.00
2' Side Arm Mount (Sprint)	C	From Leg	1.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	2.00 3.70	2.00 3.70	38.00 67.00
TD-RRH 8x20 (Sprint)	A	From Leg	1.00 -0.50 0.00	0.0000	147.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	66.00 90.00
TD-RRH 8x20 (Sprint)	B	From Leg	1.00 -0.50 0.00	0.0000	147.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	66.00 90.00
TD-RRH 8x20 (Sprint)	C	From Leg	1.00 -0.50 0.00	0.0000	147.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	66.00 90.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
4' Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	Worst		84.00	4.00	No Ice 1/2" Ice	12.57 13.10	150.00 217.00
4' Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	Worst		78.00	4.00	No Ice 1/2" Ice	12.57 13.10	150.00 217.00
4' Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	Worst		72.00	4.00	No Ice 1/2" Ice	12.57 13.10	150.00 217.00

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight lb	Ice Weight lb	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
VAL-216415	1090.3344	1814.3549	644.58	218.88	7.5718	12.5997	5.3014
VAL-216413	2130.7479	3520.4599	589.86	443.34	7.3984	12.2238	5.3014
VAL-195557	2263.4687	3690.8612	718.59	458.46	7.8593	12.8155	7.2158
VAL-195557	2263.4687	3690.8612	718.59	458.46	7.8593	12.8155	7.2158
VAL-195557	2263.4687	3690.8612	718.59	458.46	7.8593	12.8155	7.2158

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	150	Leg	A325N	0.6250	5	2741.52	12885.40	0.213 ✔	1.333	Bolt DS
T2	130	Leg	A325N	0.7500	5	8059.08	18555.00	0.434 ✔	1.333	Bolt DS
T3	110	Leg	A325N	1.0000	6	12403.50	34539.70	0.359 ✔	1.333	Bolt Tension
T4	90	Leg	A325N	1.0000	6	12175.20	34557.10	0.352 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4783.39	16992.20	0.282 ✔	1.333	Member Bearing
T5	80	Leg	A325N	1.0000	6	14885.40	34557.50	0.431 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4834.32	16992.20	0.285 ✔	1.333	Member Bearing
T6	60	Leg	A325N	1.0000	6	17319.10	34557.50	0.501 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4159.67	16992.20	0.245 ✔	1.333	Member Bearing
T7	40	Leg	A325N	1.0000	6	19399.00	34557.10	0.561 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4627.46	16992.20	0.272 ✔	1.333	Member Bearing
T8	20	Leg	A687	1.0000	6	21102.00	38877.20	0.543 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	6823.01	16992.20	0.402 ✔	1.333	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
T1	150 - 130	1 3/4	20.00	2.33	64.0 K=1.00	22.023	2.4053	-15595.00	52971.60	0.294 ✔
T2	130 - 110	2	20.00	2.33	56.0 K=1.00	23.389	3.1416	-42479.40	73477.20	0.578 ✔
T3	110 - 90	2 1/4	20.00	2.33	49.8 K=1.00	24.385	3.9761	-79018.60	96957.60	0.815 ✔
T4	90 - 80	VAL-216415	10.02	10.02	37.8 K=1.00	26.132	5.3014	-77575.80	138539.00	0.560 ✔
T5	80 - 60	VAL-216413	20.03	10.02	37.8 K=1.00	26.132	5.3014	-98313.70	138539.00	0.710 ✔
T6	60 - 40	VAL-195557	20.03	10.02	32.4 K=1.00	26.848	7.2158	-117873.00	193727.00	0.608 ✔
T7	40 - 20	VAL-195557	20.03	10.02	32.4 K=1.00	26.848	7.2158	-136364.00	193727.00	0.704 ✔
T8	20 - 0	VAL-195557	20.03	10.02	32.4 K=1.00	26.848	7.2158	-153930.00	193727.00	0.795 ✔

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V lb	Allow. V_a lb	Stress Ratio
T4	90 - 80	0.5	1.47	120.0	10.366	0.1963	969.90	2278.10	0.426 ✓
T5	80 - 60	0.5	1.47	120.0	10.279	0.1963	961.83	2258.95	0.426 ✓
T6	60 - 40	0.5	1.46	119.0	10.423	0.1963	173.30	2290.46	0.076 ✓
T7	40 - 20	0.5	1.46	119.0	10.423	0.1963	502.86	2290.46	0.220 ✓
T8	20 - 0	0.5	1.46	119.0	10.423	0.1963	802.95	2290.46	0.351 ✓

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 $\frac{P}{P_a}$
T1	150 - 130	7/8	5.52	2.68	146.9 K=1.00	6.917	0.6013	-2394.42	4159.62	0.576 ✓
T2	130 - 110	7/8	5.52	2.67	146.3 K=1.00	6.977	0.6013	-3513.66	4195.55	0.837 ✓
T3	110 - 90	1	5.52	2.66	127.5 K=1.00	9.192	0.7854	-4128.98	7219.53	0.572 ✓
T4	90 - 80	L3x3x5/16	11.42	5.19	105.8 K=1.00	12.236	1.7800	-5396.15	21780.90	0.248 ✓
T5	80 - 60	L3x3x5/16	12.50	5.84	118.9 K=1.00	10.441	1.7800	-4915.79	18585.00	0.265 ✓
T6	60 - 40	L3x3x5/16	13.80	6.54	133.1 K=1.00	8.423	1.7800	-4136.52	14993.50	0.276 ✓
T7	40 - 20	L3x3x5/16	14.50	6.93	141.3 K=1.00	7.482	1.7800	-4392.12	13318.10	0.330 ✓
T8	20 - 0	L3x3x5/16	16.80	8.09	164.8 K=1.00	5.496	1.7800	-5030.54	9783.69	0.514 ✓

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 $\frac{P}{P_a}$
T1	150 - 130	1 KL/R > 200 (C) - 6	5.00	4.85	233.0 K=1.00	2.751	0.7854	-223.33	2160.38	0.103 ✓
T2	130 - 110	1 KL/R > 200 (C) - 66	5.00	4.83	232.0 K=1.00	2.774	0.7854	-1273.92	2179.04	0.585 ✓

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	110 - 90	1 1/4	5.00	4.81	184.8 K=1.00	4.373	1.2272	-1542.33	5366.08	0.287 ✔

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 $\frac{P}{P_a}$
T1	150 - 130	1	5.00	4.85	233.0 K=1.00	2.751	0.7854	-1171.70	2160.38	0.542 ✔
T2	130 - 110	KL/R > 200 (C) - 9 1	5.00	4.83	232.0 K=1.00	2.774	0.7854	-1630.10	2179.04	0.748 ✔
T3	110 - 90	KL/R > 200 (C) - 69 1 1/4	5.00	4.81	184.8 K=1.00	4.373	1.2272	-1428.76	5366.08	0.266 ✔

Mid 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 $\frac{P}{P_a}$
T1	150 - 130	1	5.00	4.85	233.0 K=1.00	2.751	0.7854	-145.06	2160.38	0.067 ✔
T2	130 - 110	KL/R > 200 (C) - 12 1	5.00	4.83	232.0 K=1.00	2.774	0.7854	-140.60	2179.04	0.065 ✔
T3	110 - 90	KL/R > 200 (C) - 70 1 1/4	5.00	4.81	184.8 K=1.00	4.373	1.2272	-338.82	5366.08	0.063 ✔

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	150 - 130	1 3/4	20.00	2.33	64.0	32.500	1.2339	13707.60	40100.60	0.342 ✔
T2	130 - 110	2	20.00	2.33	56.0	32.500	1.5625	40295.40	50780.20	0.794 ✔
T3	110 - 90	2 1/4	20.00	2.33	49.8	30.000	3.9761	74421.10	119282.00	0.624

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	90 - 80	VAL-216415	10.02	10.02	37.8	30.000	5.3014	73051.30	159043.00	0.459 ✓
T5	80 - 60	VAL-216413	20.03	10.02	37.8	30.000	5.3014	89312.40	159043.00	0.562 ✓
T6	60 - 40	VAL-195557	20.03	10.02	32.4	30.000	7.2158	103915.00	216475.00	0.480 ✓
T7	40 - 20	VAL-195557	20.03	10.02	32.4	30.000	7.2158	116394.00	216475.00	0.538 ✓
T8	20 - 0	VAL-195557	20.03	10.02	32.4	30.000	7.2158	126612.00	216475.00	0.585 ✓

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V lb	Allow. V_a lb	Stress Ratio
T4	90 - 80	0.5	1.47	120.0	10.366	0.1963	969.90	2278.10	0.426 ✓
T5	80 - 60	0.5	1.47	120.0	10.279	0.1963	961.83	2258.95	0.426 ✓
T6	60 - 40	0.5	1.46	119.0	10.423	0.1963	173.30	2290.46	0.076 ✓
T7	40 - 20	0.5	1.46	119.0	10.423	0.1963	502.86	2290.46	0.220 ✓
T8	20 - 0	0.5	1.46	119.0	10.423	0.1963	802.95	2290.46	0.351 ✓

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	150 - 130	7/8	5.52	2.68	146.9	30.000	0.6013	2406.76	18039.60	0.133 ✓
T2	130 - 110	7/8	5.52	2.67	146.3	30.000	0.6013	3554.92	18039.60	0.197 ✓
T3	110 - 90	1	5.52	2.66	127.5	30.000	0.7854	4072.50	23561.90	0.173 ✓
T4	90 - 80	L3x3x5/16	11.42	5.19	67.6	29.000	1.0127	4783.39	29369.30	0.163 ✓
T5	80 - 60	L3x3x5/16	11.93	5.59	72.8	29.000	1.0127	4834.32	29369.30	0.165 ✓
T6	60 - 40	L3x3x5/16	13.13	6.22	81.0	29.000	1.0127	4159.67	29369.30	0.142 ✓
T7	40 - 20	L3x3x5/16	15.24	7.29	94.9	29.000	1.0127	4627.46	29369.30	0.158 ✓

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 $\frac{P}{P_a}$
T8	20 - 0	L3x3x5/16	16.80	8.09	105.3	29.000	1.0127	6823.01	29369.30	0.232 ✓

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	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	201.66	23561.90	0.009 ✓
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	1307.74	23561.90	0.056 ✓
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	1630.44	36815.50	0.044 ✓

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	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	1149.87	23561.90	0.049 ✓
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	1579.56	23561.90	0.067 ✓
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	1538.13	36815.50	0.042 ✓

Mid 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	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	158.76	23561.90	0.007 ✓
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	165.92	23561.90	0.007 ✓
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	366.99	36815.50	0.010 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	150 - 130	Leg	1 3/4	2	13707.60	53454.10	25.6	Pass
		Diagonal	7/8	17	-2394.42	5544.77	43.2	Pass
		Top Girt	1	6	-223.33	2879.79	7.8	Pass
		Bottom Girt	1	9	-1171.70	2879.79	40.7	Pass
		Mid Girt	1	12	-145.06	2879.79	5.0	Pass
T2	130 - 110	Leg	2	62	40295.40	67690.00	59.5	Pass
		Diagonal	7/8	77	-3513.66	5592.67	62.8	Pass
		Top Girt	1	66	-1273.92	2904.66	43.9	Pass
		Bottom Girt	1	69	-1630.10	2904.66	56.1	Pass
		Mid Girt	1	70	-140.60	2904.66	4.8	Pass
T3	110 - 90	Leg	2 1/4	122	-79018.60	129244.48	61.1	Pass
		Diagonal	1	138	-4128.98	9623.63	42.9	Pass
		Top Girt	1 1/4	126	-1542.33	7152.98	21.6	Pass
		Bottom Girt	1 1/4	129	-1428.76	7152.98	20.0	Pass
		Mid Girt	1 1/4	132	-338.82	7152.98	4.7	Pass
T4	90 - 80	Leg	VAL-216415	182	-77575.80	184672.48	42.0	Pass
		Diagonal	L3x3x5/16	185	-5396.15	29033.94	18.6	Pass
							21.1 (b)	
T5	80 - 60	Leg	VAL-216413	191	-98313.70	184672.48	53.2	Pass
		Diagonal	L3x3x5/16	197	-4915.79	24773.80	19.8	Pass
							21.3 (b)	
T6	60 - 40	Leg	VAL-195557	206	-117873.00	258238.08	45.6	Pass
		Diagonal	L3x3x5/16	212	-4136.52	19986.33	20.7	Pass
T7	40 - 20	Leg	VAL-195557	221	-136364.00	258238.08	52.8	Pass
		Diagonal	L3x3x5/16	233	-4392.12	17753.03	24.7	Pass
T8	20 - 0	Leg	VAL-195557	236	-153930.00	258238.08	59.6	Pass
		Diagonal	L3x3x5/16	242	-5030.54	13041.66	38.6	Pass
							Summary	
						Leg (T3)	61.1	Pass
						Diagonal (T2)	62.8	Pass
						Top Girt (T2)	43.9	Pass
						Bottom Girt (T2)	56.1	Pass
						Mid Girt (T1)	5.0	Pass
						Bolt Checks	42.1	Pass
						RATING =	**62.8**	**Pass**

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

September 3, 2014

The Honorable Mark W. Zacchio
Chairman
Town of Avon
60 West Main Street
Avon, CT 06001-3743

RE: **EM-T-MOBILE-004-140903** – T-Mobile Northeast LLC notice of intent to modify an existing telecommunications facility located at 81 Montevideo Road, Avon, Connecticut.

Dear Chairman Zacchio:

Pursuant to the Regulations of Connecticut State Agencies Section 16-50j-72, the Connecticut Siting Council (Council) is in receipt of a request to modify an existing telecommunications facility located in the Town of Avon.

In accordance with Section 16-50j-73 of the Regulations of Connecticut State Agencies, on September 2, 2014, written notice of the intent to modify the existing telecommunications facility was provided to the Council, the property owner of record and the chief elected official of the municipality in which the existing telecommunications facility is located.

Should you have any questions or comments regarding the above-referenced request, please feel free to call me at 860-827-2951 or submit written comments to the Council by September 17, 2014.

Thank you for your consideration.

Sincerely,

Melanie Bachman
Acting Executive Director

MB/RM/lm

c: Brandon Robertson, Town Manager, Town of Avon
Steven V. Kushner, Town Planner, Town of Avon

COHEN and WOLF P.C.
ATTORNEYS AT LAW

JULIE D. KOHLER

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

EM-T-MOBILE-004-140903

September 2, 2014

RECEIVED
SEP 03 2014
CONNECTICUT
SITING COUNCIL

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

ORIGINAL

Re: Notice of Exempt Modification
Message Center Management/T-Mobile co-location
Site ID CT11284A
81 Montevideo Road, Avon, CT

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, Message Center Management ("MCM") owns the existing lattice telecommunications tower and related facility at 81 Montevideo Road, Avon Connecticut (latitude 41.80333 / longitude 72.80111). T-Mobile intends to add three antennas and related equipment at this existing telecommunications facility in Avon ("Avon Facility"). Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Town Manager, Brandon Robertson and the property owner, Monte, LLC.

The existing Avon Facility consists of a 150 foot tall lattice structure.[1] T-Mobile plans to add three LTE antennas and three remote radio units ("RRU") mounted on pipe masts at a centerline of 136 feet. (See the plans revised to August 4, 2014 attached hereto as Exhibit A). The existing Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated August 15, 2014 and attached hereto as Exhibit B.

The planned modifications to the Avon Facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

---

[1] The online Connecticut Siting Council database does not provide a docket or petition number for the approval of this structure but does include several notices of intent, the most recent being EM-SPRINT-004-140731, EM-VER-004-131122, EM-SPRINT-004-130822, and TS-CING-004-130627.

1. The proposed modification will not increase the height of the tower. T-Mobile's antennas and RRUs will be installed at the 136 foot level. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. T-Mobile does not propose any equipment changes to the existing compound, as reflected on the attached site plan, and therefore will not require an extension of the site boundaries.

3. The proposed modification to the 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 August 22, 2014 T-Mobile's operations would add 2.34% 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 6.94% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

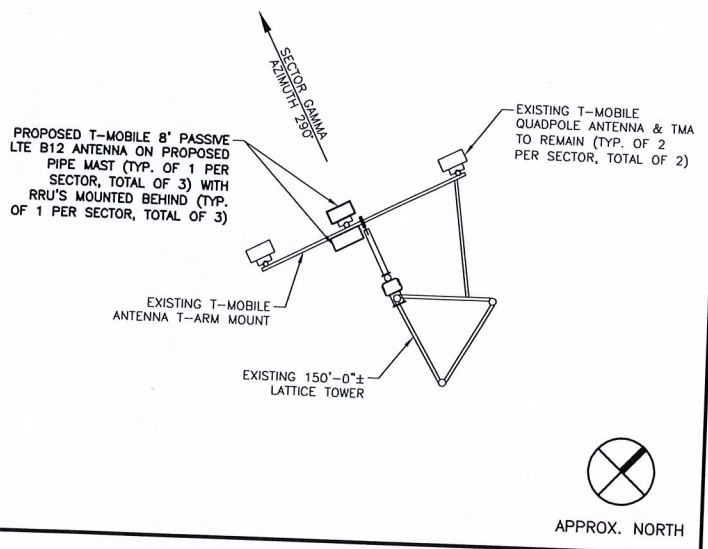
For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement antennas and equipment at the Avon Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Julie D. Kohler, Esq.

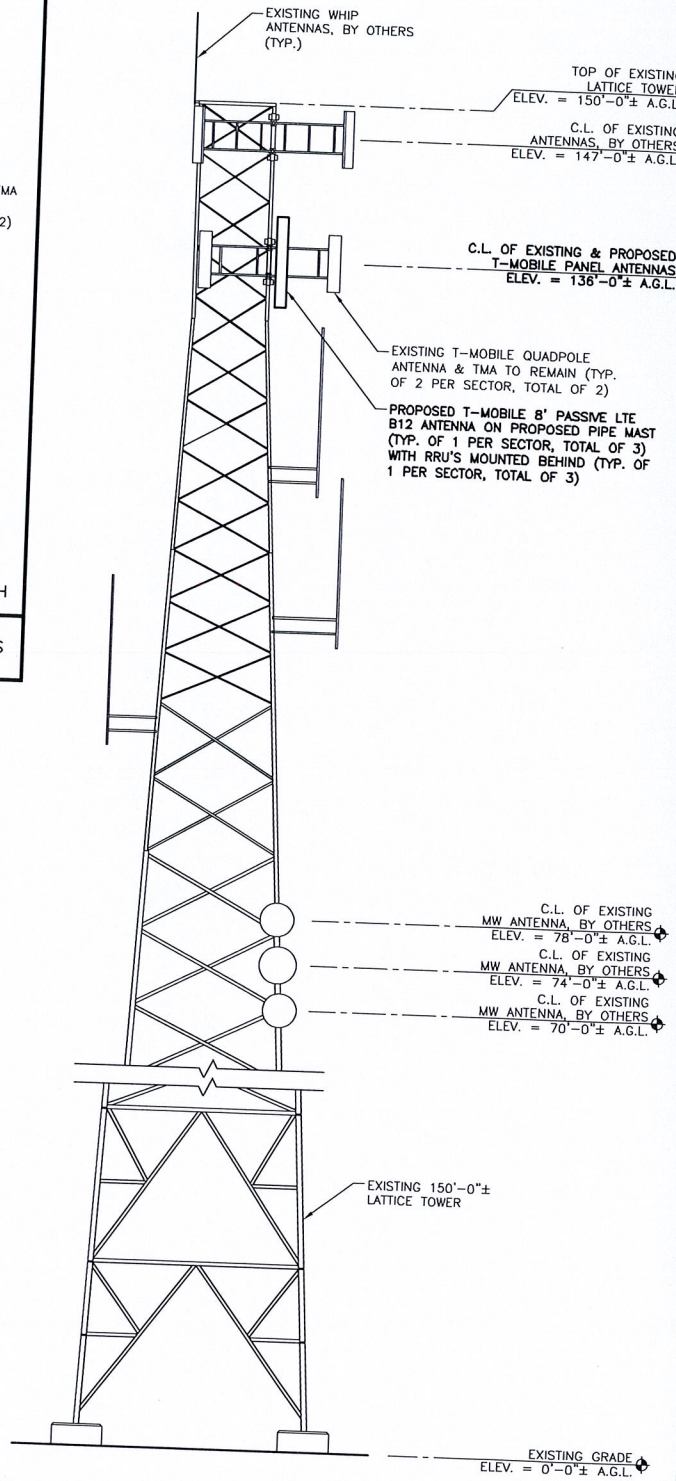
cc: Town of Avon, Town Manager Brandon Robertson
Message Center Management
Monte, LLC
Jamie Ford, EBI Consulting

EXHIBIT A



ANTENNA CONFIGURATION

NTS



CONFIGURATION

702CU

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

TOWER ELEVATION

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.ebiconsulting.com
EBI JOB NO.: 81140810

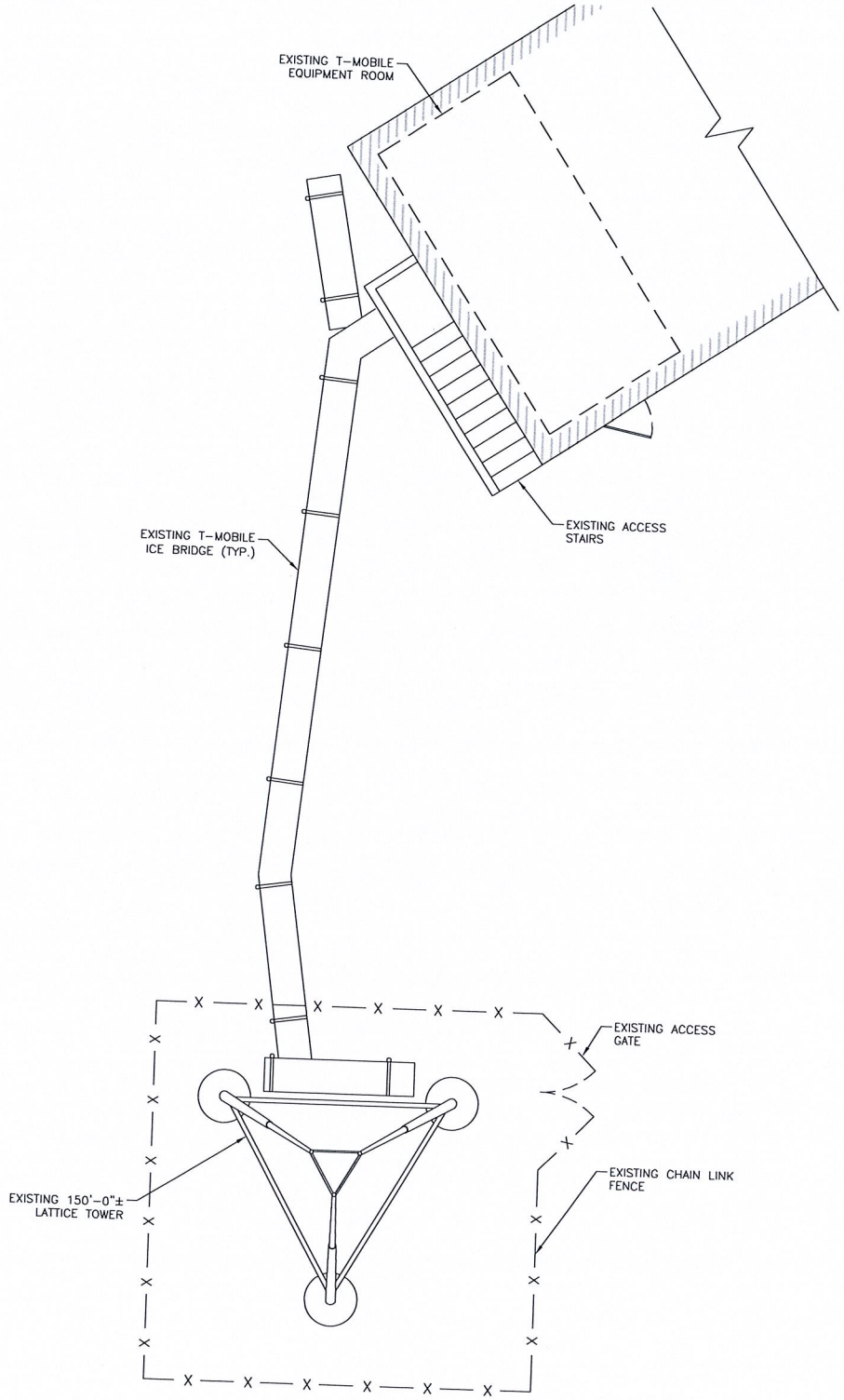
CLIENT:
T-Mobile Northeast, LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860.692.7100

SITE INFO:
CT11284A
AVON_1
81 MONTEVIDEO ROAD
AVON, CT 06001

SUBMITTALS

NO.	DATE	DESCRIPTION	BY
A	08/04/14	FOR REVIEW	KO

DRAWN BY: KO
CHECKED BY: PM
DATE: 08/04/14
SHEET NO: LE-2



CONFIGURATION

702CU

APPROX. NORTH

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

SITE PLAN

SCALE: 1:10

PREPARED BY:

EBI Consulting
environmental | engineering | due diligence
21 B Street | Burlington, MA 01803
Tel: (781) 273-2500 | Fax: (781) 273-3311
www.ebiconsulting.com

EBI JOB NO.: 81140810

CLIENT:

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

SITE INFO:

CT11284A
AVON_1
81 MONTEVIDEO ROAD
AVON, CT 06001

SUBMITTALS

NO.	DATE	DESCRIPTION	BY
A	08/04/14	FOR REVIEW	KO

DRAWN BY: KO

CHECKED BY: PM

DATE: 08/04/14

SHEET NO: LE-1

EXHIBIT B

EBI Consulting
environmental | engineering | due diligence

21 B Street
Burlington, MA 01803
Tel: (781) 273-2500
Fax: (781) 273-3311
www.ebiconsulting.com

TOWER STRUCTURAL ANALYSIS REPORT

August 15, 2014

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

Subject: 700 MHz Upgrade Project
Site #: CT11284A
EBI Reference #: 81140810
Site Name: Avon_1
Address: 81 Montevideo Road, Avon, CT 06001

Dear Mr. Richard,

This letter is to confirm EBI's structural analysis of the existing self-supporting tower at the above listed site for its ability to support the proposed T-Mobile equipment upgrade. The intent of this analysis is to determine if the proposed modification of antennas will exceed the structural capacity of the existing tower.

EBI Consulting has prepared this structural analysis report of the 150.0 foot self-supporting tower for the additional loads imposed by the proposed antenna configuration by T-Mobile. This analysis has been performed in accordance with the 2005 CT State Building Code (including 2009, 2011, and 2013 Amendments) and ANSI/TIA/EIA-222 Revision F, with an 80 mph fastest-mile wind speed without ice, and a 69.3 mph fastest-mile wind speed with 0.5" radial ice. Information from the following sources was utilized in our analysis:

- Existing Structural Assessment Report prepared by Ramaker & Associates, Inc., Job No. 22984, dated July 14, 2014
- Photographs taken by EBI personnel from site visits on June 17, 2014 and July 25, 2014

By engineering analysis, the existing tower is capable of supporting the existing and proposed equipment, listed herein, without tower modifications. The tower under this configuration has a maximum usage of approximately 62.7%. This analysis did not provide for any future equipment or tower extensions.

The analysis provided herein by EBI Consulting includes the following existing and proposed equipment:

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Burlington, MA 01803
Tel: (781) 273- 2500
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Proposed equipment configuration:

Carrier	Elevation	Manufacturer	Model/Description	Quantity	Mount type	Coax
---	149′	---	4′ Lightning Rod	1	Leg	---
---	149′	---	8′ Omni	1	Leg	(1) 7/8″
Sprint	147′	RFS	APXVSPP18-C	3	(2) Sector Frames (1) Stand-off	(6) 1-OC-114 Power/Fiber Cables
		RFS	APXV9TM14-ALU-120	3		
		ALU	TD-RRH 8x20W	3		
	145′	ALU	1900 MHz 4x40W RRH	3		
		ALU	800 MHz 2x50W RRH	3		
T-Mobile	136′	Ericsson	AIR21 B2A/B4P	1	(1) Sector Frame	(4) 1 5/8″ (2) 1 ¼″ Hybriflex
		Ericsson	AIR21 B4A/B2P	1		
		Commscope	**LNX-6515DS-VTM**	**1**		
		---	**RRUS11 B12**	**1**		
---	121′	---	15′ Omni	1	(1) Stand-off	(1) 7/8″
---	117′	---	20′ Omni	1	(1) Stand-off	(1) 1 ¼″
---	108′	---	10′ Dipole	1	(1) Stand-off	(1) 7/8″
---	105′	---	8′ Omni	1	(1) Stand-off	(1) 1 ¼″
---	102′	---	8′ Omni	1	Leg	(1) ½″
---	98′	---	12′ Omni	1	(1) Stand-off	(1) 7/8″
---	84′	---	4′ Parabolic Dish	1	(1) Stand-off	(1) ¼″
---	78′	---	4′ Parabolic Dish	1	(1) Stand-off	(1) ¼″
---	74′	---	GPS	1	Leg	(1) ½″
---	72′	---	4′ Parabolic Dish	1	(1) Stand-off	(1) ¼″
---	67′	---	GPS	1	Leg	(1) ¼″
---	12′	---	GPS	1	Leg	(2) ½″

Note: Proposed equipment shown in bold.

Summary of Results: (Refer to attached TNX Tower Analysis 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	150 - 130	Leg	1 3/4	2	13705.70	53454.10	25.6	Pass
		Diagonal	7/8	17	-2394.39	5544.77	43.2	Pass
		Top Girt	1	6	-223.33	2879.79	7.8	Pass
		Bottom Girt	1	9	-1171.68	2879.79	40.7	Pass
		Mid Girt	1	12	-145.05	2879.79	5.0	Pass
T2	130 - 110	Leg	2	62	40246.00	67690.00	59.5	Pass
		Diagonal	7/8	77	-3506.41	5592.67	62.7	Pass
		Top Girt	1	66	-1273.86	2904.66	43.9	Pass
		Bottom Girt	1	69	-1626.26	2904.66	56.0	Pass
		Mid Girt	1	70	-140.37	2904.66	4.8	Pass
T3	110 - 90	Leg	2 1/4	122	-78873.30	129244.48	61.0	Pass
		Diagonal	1	138	-4115.21	9623.63	42.8	Pass
		Top Girt	1 1/4	126	-1538.35	7152.98	21.5	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	1 1/4	129	-1425.09	7152.98	19.9	Pass
		Mid Girt	1 1/4	132	-338.30	7152.98	4.7	Pass
T4	90 - 80	Leg	VAL-216415	182	-77413.40	184672.48	41.9	Pass
		Diagonal	L3x3x5/16	185	-5386.42	29033.94	18.6	Pass
T5	80 - 60	Leg	VAL-216413	191	-98032.50	184672.48	21.1 (b) 53.1	Pass
		Diagonal	L3x3x5/16	197	-4895.74	24773.80	19.8	Pass
T6	60 - 40	Leg	VAL-195557	206	-117482.00	258238.08	21.3 (b) 45.5	Pass
		Diagonal	L3x3x5/16	212	-4115.09	19986.33	20.6	Pass
T7	40 - 20	Leg	VAL-195557	221	-135880.00	258238.08	52.6	Pass
		Diagonal	L3x3x5/16	233	-4370.82	17753.03	24.6	Pass
T8	20 - 0	Leg	VAL-195557	236	-153366.00	258238.08	59.4	Pass
		Diagonal	L3x3x5/16	242	-5009.34	13041.66	38.4	Pass
							Summary	
						Leg (T3)	61.0	Pass
						Diagonal (T2)	62.7	Pass
						Top Girt (T2)	43.9	Pass
						Bottom Girt (T2)	56.0	Pass
						Mid Girt (T1)	5.0	Pass
						Bolt Checks	41.9	Pass
						RATING =	**62.7**	**Pass**

The maximum stress under the proposed conditions and configurations is **62.7%** of the tower capacity, governed by stresses in the tower legs. Therefore, **the tower has adequate structural capacity** to support the proposed equipment configurations.

Foundation:

The reactions at the base are as follows:

Reaction Type	Current analysis reactions (TIA-222-F)
Shear (k)	16.1
Uplift (k)	132.2
Compression (k)	156.5
Total moment (k-ft)	1755

Foundation and soils information was not available at the time of this analysis. Thus, evaluation of those elements was unable to be performed for determining their adequacy. EBI makes no claim on the foundation and soil adequacy for supporting the existing and proposed installations, neither written nor implied.

Limitations and Assumptions:

This report is based on the following assumptions:

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1. 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. 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, constructed, and analyzed to support original and previous analysis design loads.

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

1. Adding antennas
2. Removing/replacing antennas
3. Adding or moving coaxial cables
4. 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, you should disregard this report and immediately contact EBI. EBI disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Please contact us at 781-273-2500 if you have any questions.

Sincerely yours,
EBI Consulting
August 15, 2014

Richard L. Peterman, P.E.
Professional Engineer

STATE OF CONNECTICUT
RICHARD L. PETERMAN
No. 30077
LICENSED
PROFESSIONAL ENGINEER

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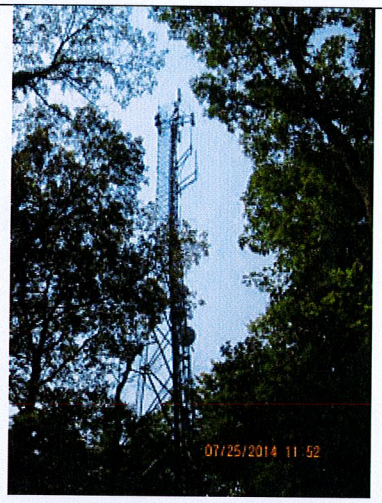
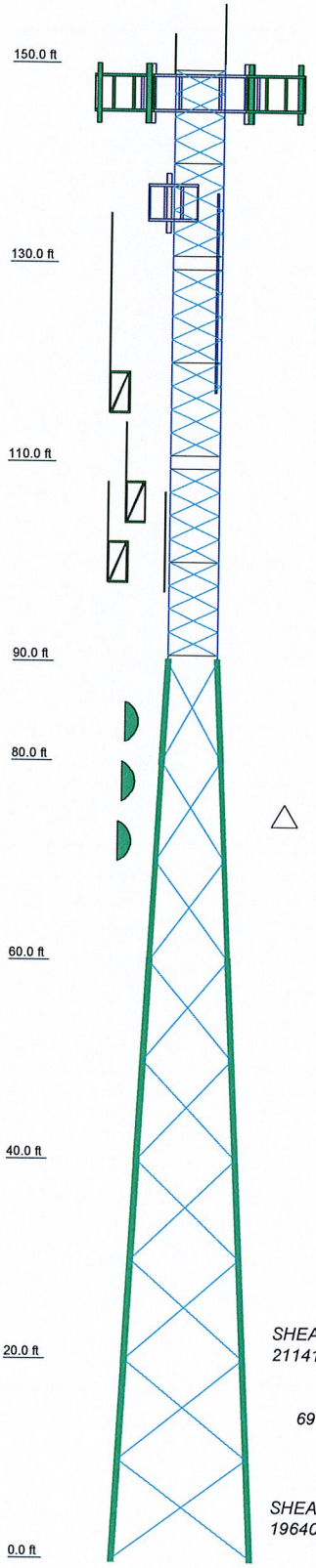
PHOTOGRAPH/ DOCUMENT LOG

Photo 1: Overall view of the existing self-supporting tower.	
Photo 2: Close-up of the existing T-Mobile antenna installation.	

Section	T1	T2	T3	T4	T5	T6	T7	T8
Legs	SR 1 3/4	SR 2	SR 2 1/4	VAL-216415	VAL-216413		VAL-195557	
Leg Grade				A572-50				
Diagonals						L3x3x5/16		
Diagonal Grade		SR 7/8	SR 1			A36		
Top Girts		A570-50				N.A.		
Mid Girts		SR 1	SR 1 1/4			N.A.		
Bottom Girts		SR 1	SR 1 1/4			N.A.		
Face Width (ft)		SR 1	SR 1 1/4		6	8	10	12
# Panels @ (ft)	5	27 @ 2.33333				9 @ 10		
Weight (lb) 17938.2	1153.3	1303.6	1707.5	1383.4	2660.5	3137.8	3240.3	3351.8



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
2" Dia 8' Omni	149	AIR21 B2A/B4P w/ mount pipe (T-Mobile)	136
Lighting Rod 5/8" x 4'	149	AIR21 B4A/B2P w/ mount pipe (T-Mobile)	136
APXVSPP18-C-A20 w/ pipe mount (Sprint)	147	Commscope LNX-6515DS-VTM w/ mount pipe (T-Mobile)	136
APXVSPP18-C-A20 w/ pipe mount (Sprint)	147	RRUS11 B12 (T-Mobile)	136
APXVSPP18-C-A20 w/ pipe mount (Sprint)	147	Valmont 10' Frame (T-Mobile)	136
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	147	15' Omni	121
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	147	6' Side Arm Mount	121
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	147	20' Omni	117
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	147	6' Side Arm Mount	117
PiROD 12' Lightweight T-Frame (Sprint)	147	10' Dipole	108
PiROD 12' Lightweight T-Frame (Sprint)	147	6' Side Arm Mount	108
2' Side Arm Mount (Sprint)	147	8' Whip	105
TD-RRH 8x20 (Sprint)	147	4' Side Arm Mount	105
TD-RRH 8x20 (Sprint)	147	8' Omni	102
TD-RRH 8x20 (Sprint)	147	6' Side Arm Mount	98
1900 MHz 4x40W RRH (Sprint)	145	12' Omni	98
1900 MHz 4x40W RRH (Sprint)	145	3' Side Arm Mount	84
1900 MHz 4x40W RRH (Sprint)	145	4' Dish	84
800 MHz 2x50W RRH (Sprint)	145	3' Side Arm Mount	78
800 MHz 2x50W RRH (Sprint)	145	4' Dish	78
800 MHz 2x50W RRH (Sprint)	145	GPS	74
		3' Side Arm Mount	72
		4' Dish	72
		GPS	67
		GPS	12

MATERIAL STRENGTH

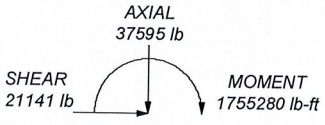
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi
A570-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

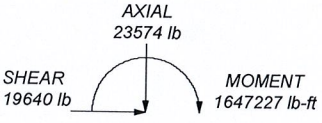
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. Weld together tower sections have flange connections.
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.

MAX. CORNER REACTIONS AT BASE:
DOWN: 156532 lb
SHEAR: 12160 lb

UPLIFT: -132241 lb
SHEAR: 16125 lb



TORQUE 11462 lb-ft
69 mph WIND - 0.5000 in ICE

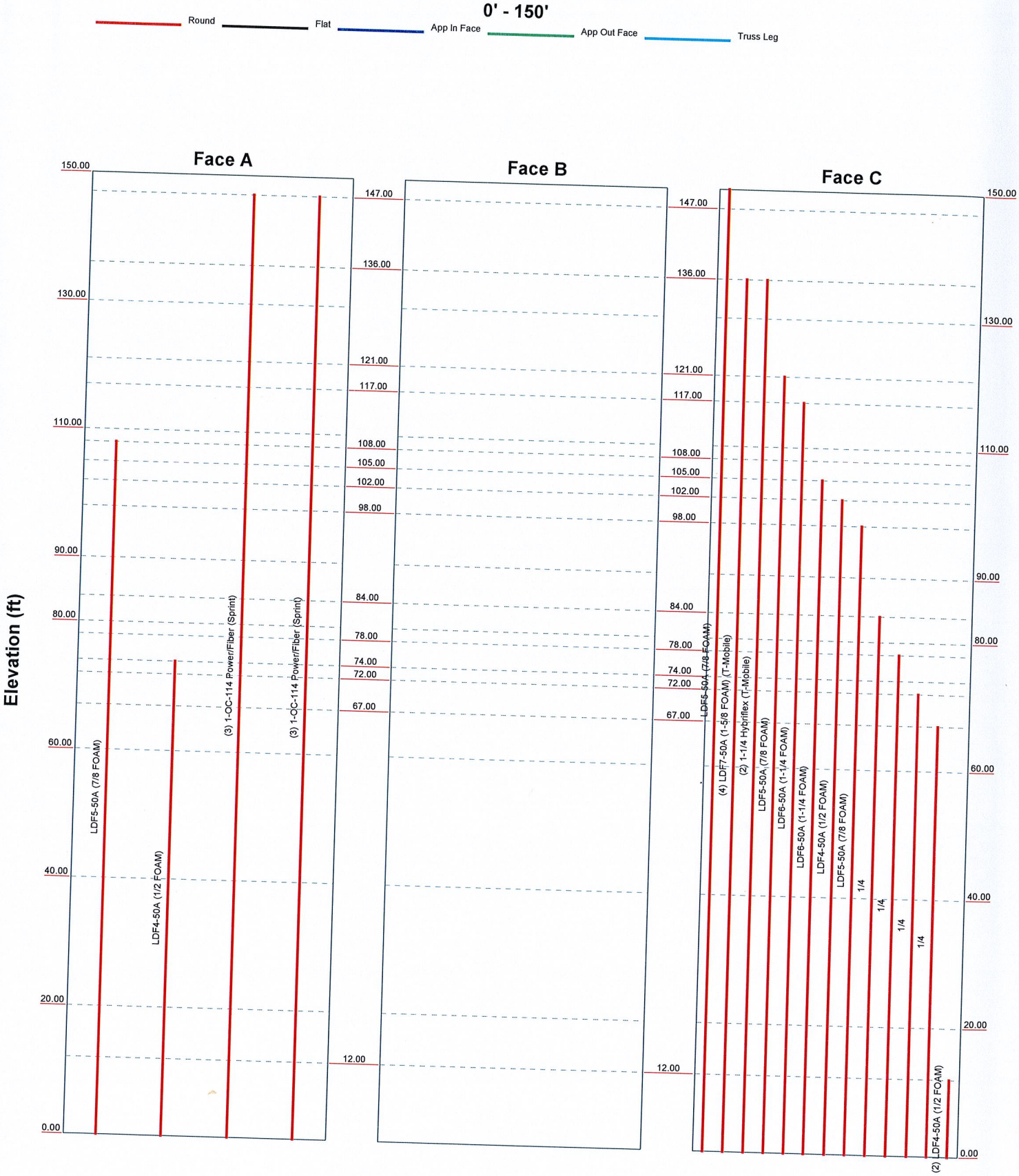


TORQUE 12877 lb-ft
REACTIONS - 80 mph WIND

EBI Consulting
21 B Street
Burlington, MA 01803
Phone: (781) 425-5100
FAX: (781) 425-5141

Job: **CT11284A**		
Project: **150' SST**		
Client: T-Mobile	Drawn by: rpeterman	App'd:
Code: TIA/EIA-222-F	Date: 08/18/14	Scale: NTS
Path: C:\Users\rpeterman\Desktop\Temporary\TMO CT Tv\Files\CT11284A (SST)\Structural\Calculations\CT11284A.tnx		Dwg No. E-1

Feed Line Distribution Chart
0' - 150'

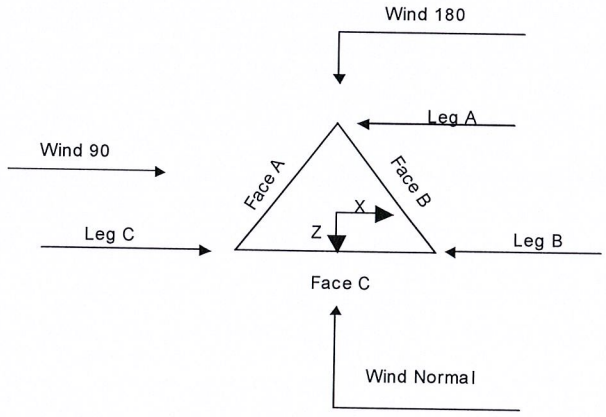


EBI Consulting 21 B Street Burlington, MA 01803 Phone: (781) 425-5100 FAX: (781) 425-5141	Job: **CT11284A**		
	Project: **150' SST**		
	Client: T-Mobile	Drawn by: rpeterman	App'd:
	Code: TIA/EIA-222-F	Date: 08/18/14	Scale: NTS
	Path: C:\Users\rpeterman\Desktop\Temporary\TMO CT Turnkey\CT11284A (SST)\Structural\Calculations\CT11284A.eri		Dwg No. E-7

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 14.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 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..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	150.00-130.00			5.00	1	20.00
T2	130.00-110.00			5.00	1	20.00
T3	110.00-90.00			5.00	1	20.00
T4	90.00-80.00			5.00	1	10.00
T5	80.00-60.00			6.00	1	20.00
T6	60.00-40.00			8.00	1	20.00
T7	40.00-20.00			10.00	1	20.00
T8	20.00-0.00			12.00	1	20.00

Tower Section Geometry *(cont'd)*

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	150.00-130.00	2.33	X Brace	No	No	8.0000	8.0000
T2	130.00-110.00	2.33	X Brace	No	No	8.0000	8.0000
T3	110.00-90.00	2.33	X Brace	No	No	8.0000	8.0000
T4	90.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T5	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T6	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T7	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T8	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 150.00-130.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A570-50 (50 ksi)
T2 130.00-110.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A570-50 (50 ksi)
T3 110.00-90.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A570-50 (50 ksi)
T4 90.00-80.00	Truss Leg	VAL-216415	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T5 80.00-60.00	Truss Leg	VAL-216413	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T6 60.00-40.00	Truss Leg	VAL-195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T7 40.00-20.00	Truss Leg	VAL-195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T8 20.00-0.00	Truss Leg	VAL-195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 150.00-130.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T2 130.00-110.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 110.00-90.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 150.00-130.00	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T2 130.00-110.00	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T3 110.00-90.00	1	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 150.00-130.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 130.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 110.00-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 90.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 150.00-130.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 130.00-110.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 110.00-90.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 90.00-80.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 80.00-60.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 60.00-40.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 40.00-20.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 20.00-0.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals
T4 90.00-80.00	1	0.5	0.85	1	0.5	0.85
T5 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T6 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T7 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T8 20.00-0.00	1	0.5	0.85	1	0.5	0.85

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 150.00-130.00	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 130.00-110.00	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 110.00-90.00	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 90.00-80.00	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
T5 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
T6 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
T7 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
T8 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 150.00-130.00	Sleeve DS	0.6250 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 130.00-110.00	Sleeve DS	0.7500 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 110.00-90.00	Flange	1.0000 A325N	6	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 90.00-80.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 80.00-60.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 60.00-40.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 40.00-20.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 20.00-0.00	Flange	1.0000 A687	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF5-50A (7/8 FOAM)	C	Yes	Ar (CfAe)	150.00 - 0.00	1	1	1.0900	1.0900		0.33
LDF7-50A (1-5/8 FOAM) (T-Mobile)	C	Yes	Ar (CfAe)	136.00 - 0.00	4	4	1.9800	1.9800		0.82
1-1/4 Hybriflex (T-Mobile)	C	Yes	Ar (CfAe)	136.00 - 0.00	2	2	1.5840	1.5840		1.61
LDF5-50A (7/8 FOAM)	C	Yes	Ar (CfAe)	121.00 - 0.00	1	1	1.0900	1.0900		0.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF6-50A (1-1/4 FOAM)	C	Yes	Ar (CfAe)	117.00 - 0.00	1	1	1.5500	1.5500		0.66
LDF5-50A (7/8 FOAM)	A	Yes	Ar (CfAe)	108.00 - 0.00	1	1	1.0900	1.0900		0.33
LDF6-50A (1-1/4 FOAM)	C	Yes	Ar (CfAe)	105.00 - 0.00	1	1	1.5500	1.5500		0.66
LDF4-50A (1/2 FOAM)	C	Yes	Ar (CfAe)	102.00 - 0.00	1	1	0.6300	0.6300		0.15
LDF5-50A (7/8 FOAM)	C	Yes	Ar (CfAe)	98.00 - 0.00	1	1	1.0900	1.0900		0.33
1/4	C	Yes	Ar (CfAe)	84.00 - 0.00	1	1	0.2900	0.2900		0.07
1/4	C	Yes	Ar (CfAe)	78.00 - 0.00	1	1	0.2900	0.2900		0.07
LDF4-50A (1/2 FOAM)	A	Yes	Ar (CfAe)	74.00 - 0.00	1	1	0.6300	0.6300		0.15
1/4	C	Yes	Ar (CfAe)	72.00 - 0.00	1	1	0.2900	0.2900		0.07
1/4	C	Yes	Ar (CfAe)	67.00 - 0.00	1	1	0.2900	0.2900		0.07
LDF4-50A (1/2 FOAM)	C	Yes	Ar (CfAe)	12.00 - 0.00	2	2	0.6300	0.6300		0.15
1-OC-114 Power/Fiber (Sprint)	A	Yes	Ar (CfAe)	147.00 - 0.00	3	3	1.5400	1.5400		1.00
1-OC-114 Power/Fiber (Sprint)	A	Yes	Ar (CfAe)	147.00 - 0.00	3	3	1.5400	1.5400		1.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	150.00-130.00	A	13.090	0.000	0.000	0.000	102.00
		B	0.000	0.000	0.000	0.000	0.00
		C	7.361	0.000	0.000	0.000	45.60
T2	130.00-110.00	A	15.400	0.000	0.000	0.000	120.00
		B	0.000	0.000	0.000	0.000	0.00
		C	22.200	0.000	0.000	0.000	144.85
T3	110.00-90.00	A	17.035	0.000	0.000	0.000	125.94
		B	0.000	0.000	0.000	0.000	0.00
		C	27.991	0.000	0.000	0.000	170.74
T4	90.00-80.00	A	8.608	0.000	0.000	0.000	63.30
		B	0.000	0.000	0.000	0.000	0.00
		C	15.170	0.000	0.000	0.000	89.88
T5	80.00-60.00	A	17.952	0.000	0.000	0.000	128.70
		B	0.000	0.000	0.000	0.000	0.00
		C	31.524	0.000	0.000	0.000	183.19
T6	60.00-40.00	A	18.267	0.000	0.000	0.000	129.60
		B	0.000	0.000	0.000	0.000	0.00
		C	32.080	0.000	0.000	0.000	184.80
T7	40.00-20.00	A	18.267	0.000	0.000	0.000	129.60
		B	0.000	0.000	0.000	0.000	0.00
		C	32.080	0.000	0.000	0.000	184.80
T8	20.00-0.00	A	18.267	0.000	0.000	0.000	129.60
		B	0.000	0.000	0.000	0.000	0.00
		C	33.340	0.000	0.000	0.000	188.40

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	150.00-130.00	A	0.500	21.590	0.000	0.000	0.000	229.11
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C		12.027	0.000	0.000	0.000	116.66
T2	130.00-110.00	A	0.500	25.400	0.000	0.000	0.000	269.54
		B		0.000	0.000	0.000	0.000	0.00
		C		35.367	0.000	0.000	0.000	355.84
T3	110.00-90.00	A	0.500	28.535	0.000	0.000	0.000	292.96
		B		0.000	0.000	0.000	0.000	0.00
		C		45.907	0.000	0.000	0.000	441.59
T4	90.00-80.00	A	0.500	14.442	0.000	0.000	0.000	147.78
		B		0.000	0.000	0.000	0.000	0.00
		C		25.503	0.000	0.000	0.000	238.96
T5	80.00-60.00	A	0.500	30.785	0.000	0.000	0.000	307.33
		B		0.000	0.000	0.000	0.000	0.00
		C		56.274	0.000	0.000	0.000	504.99
T6	60.00-40.00	A	0.500	31.600	0.000	0.000	0.000	312.37
		B		0.000	0.000	0.000	0.000	0.00
		C		58.747	0.000	0.000	0.000	517.70
T7	40.00-20.00	A	0.500	31.600	0.000	0.000	0.000	312.37
		B		0.000	0.000	0.000	0.000	0.00
		C		58.747	0.000	0.000	0.000	517.70
T8	20.00-0.00	A	0.500	31.600	0.000	0.000	0.000	312.37
		B		0.000	0.000	0.000	0.000	0.00
		C		60.377	1.260	0.000	0.000	537.71

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	150.00-130.00	A	1.006	3.518	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.566	1.960	0.000	0.000
T2	130.00-110.00	A	1.184	4.139	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.707	5.763	0.000	0.000
T3	110.00-90.00	A	1.519	5.001	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.497	8.046	0.000	0.000
T4	90.00-80.00	A	0.000	0.499	0.892	1.497
		B	0.000	0.000	0.000	0.000
		C	0.000	0.881	1.572	2.643
T5	80.00-60.00	A	0.000	0.898	1.571	2.693
		B	0.000	0.000	0.000	0.000
		C	0.000	1.641	2.758	4.923
T6	60.00-40.00	A	0.000	0.789	1.368	2.366
		B	0.000	0.000	0.000	0.000
		C	0.000	1.466	2.402	4.399
T7	40.00-20.00	A	0.000	0.713	1.236	2.138
		B	0.000	0.000	0.000	0.000
		C	0.000	1.325	2.170	3.974
T8	20.00-0.00	A	0.000	0.665	1.153	1.995
		B	0.000	0.000	0.000	0.000
		C	0.000	1.297	2.104	3.891

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
APXVSPP18-C-A20 w/ pipe mount (Sprint)	A	From Leg	0.00 2.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.26 8.81	5.44 5.98	60.65 113.03
APXVSPP18-C-A20 w/ pipe mount (Sprint)	B	From Leg	0.00 -6.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.26 8.81	5.44 5.98	60.65 113.03
APXVSPP18-C-A20 w/ pipe mount (Sprint)	B	From Leg	0.00 6.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.26 8.81	5.44 5.98	60.65 113.03
2" Dia 8' Omni	B	From Leg	0.00 0.00 4.00	0.0000	149.00	No Ice 1/2" Ice	2.00 3.03	2.00 3.03	5.00 18.00
Lighting Rod 5/8" x 4'	C	From Leg	0.00 0.00 2.00	0.0000	149.00	No Ice 1/2" Ice	0.25 0.66	0.25 0.66	31.00 33.82
AIR21 B2A/B4P w/ mount pipe (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	6.97 7.50	6.04 6.81	130.74 191.36
AIR21 B4A/B2P w/ mount pipe (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	6.97 7.50	6.04 6.81	130.74 191.36
Commscope LNX-6515DS-VTM w/ mount pipe (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	11.72 12.44	10.28 11.81	96.11 189.92
RRUS11 B12 (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	3.31 3.55	1.36 1.54	51.00 71.87
Valmont 10' Frame (T-Mobile)	A	From Face	1.50 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice	13.80 18.42	3.75 5.95	275.00 388.66
15' Omni	C	From Leg	6.00 0.00 4.00	0.0000	121.00	No Ice 1/2" Ice	3.75 5.28	3.75 5.28	40.00 67.80
6' Side Arm Mount	C	From Leg	3.00 0.00 0.00	0.0000	121.00	No Ice 1/2" Ice	4.54 7.80	1.23 2.55	53.00 78.75
20' Omni	A	From Leg	6.00 0.00 10.00	0.0000	117.00	No Ice 1/2" Ice	5.00 7.03	5.00 7.03	55.00 100.00
6' Side Arm Mount	A	From Leg	3.00 0.00 0.00	0.0000	117.00	No Ice 1/2" Ice	4.54 7.80	1.23 2.55	53.00 78.75
10' Dipole	A	From Leg	6.00 0.00 4.00	0.0000	108.00	No Ice 1/2" Ice	4.00 6.00	4.00 6.00	55.00 100.00
6' Side Arm Mount	A	From Leg	3.00 0.00 0.00	0.0000	108.00	No Ice 1/2" Ice	4.54 7.80	1.23 2.55	53.00 78.75
8' Whip	C	From Leg	4.00 0.00 4.00	0.0000	105.00	No Ice 1/2" Ice	1.36 2.26	1.36 2.26	44.00 56.00
4' Side Arm Mount	C	From Leg	2.00 0.00	0.0000	105.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	50.00 89.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
8' Omni	C	From Leg	0.00 0.50 0.00	0.0000	102.00	No Ice 1/2" Ice	2.20 3.03	2.20 3.03	30.00 46.30
12' Omni	C	From Leg	0.00 6.00 0.00	0.0000	98.00	No Ice 1/2" Ice	3.00 4.23	3.00 4.23	35.00 57.30
6' Side Arm Mount	C	From Leg	5.00 3.00 0.00	0.0000	98.00	No Ice 1/2" Ice	4.54 7.80	1.23 2.55	53.00 78.75
3' Side Arm Mount	C	From Leg	0.00 1.50 0.00	0.0000	84.00	No Ice 1/2" Ice	2.00 3.70	2.00 3.70	38.00 67.00
3' Side Arm Mount	C	From Leg	0.00 1.50 0.00	0.0000	78.00	No Ice 1/2" Ice	2.00 3.70	2.00 3.70	38.00 67.00
3' Side Arm Mount	C	From Leg	0.00 1.50 0.00	0.0000	72.00	No Ice 1/2" Ice	2.00 3.70	2.00 3.70	38.00 67.00
GPS	A	From Leg	0.00 0.50 0.00	0.0000	74.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.00 15.00
GPS	C	From Leg	0.00 0.50 0.00	0.0000	67.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.00 15.00
GPS	B	From Leg	0.00 0.50 0.00	0.0000	12.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.00 15.00
1900 MHz 4x40W RRH (Sprint)	A	From Leg	0.00 0.00 1.00	0.0000	145.00	No Ice 1/2" Ice	2.71 2.95	2.61 2.84	60.00 83.12
1900 MHz 4x40W RRH (Sprint)	B	From Leg	0.00 0.00 1.00	0.0000	145.00	No Ice 1/2" Ice	2.71 2.95	2.61 2.84	60.00 83.12
1900 MHz 4x40W RRH (Sprint)	C	From Leg	0.00 0.00 1.00	0.0000	145.00	No Ice 1/2" Ice	2.71 2.95	2.61 2.84	60.00 83.12
800 MHz 2x50W RRH (Sprint)	A	From Leg	0.00 0.00 -1.00	0.0000	145.00	No Ice 1/2" Ice	2.40 2.61	2.25 2.46	64.00 86.12
800 MHz 2x50W RRH (Sprint)	B	From Leg	0.00 0.00 -1.00	0.0000	145.00	No Ice 1/2" Ice	2.40 2.61	2.25 2.46	64.00 86.12
800 MHz 2x50W RRH (Sprint)	C	From Leg	0.00 0.00 -1.00	0.0000	145.00	No Ice 1/2" Ice	2.40 2.61	2.25 2.46	64.00 86.12
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	A	From Leg	0.00 0.00 -2.00	0.0000	147.00	No Ice 1/2" Ice	8.20 8.85	6.75 7.59	128.00 202.00
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	B	From Leg	0.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.20 8.85	6.75 7.59	128.00 202.00
APXV9TM14-ALU-120 w/ 3.5" mount pipe (Sprint)	C	From Leg	2.00 2.00 0.00	0.0000	147.00	No Ice 1/2" Ice	8.20 8.85	6.75 7.59	128.00 202.00
PiROD 12' Lightweight T-Frame	A	From Leg	0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	10.20 16.20	10.20 16.20	253.00 355.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Sprint)			0.00						
PiROD 12' Lightweight T-Frame (Sprint)	B	From Leg	0.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	10.20 16.20	10.20 16.20	253.00 355.00
2' Side Arm Mount (Sprint)	C	From Leg	1.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	2.00 3.70	2.00 3.70	38.00 67.00
TD-RRH 8x20 (Sprint)	A	From Leg	1.00 -0.50 0.00	0.0000	147.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	66.00 90.00
TD-RRH 8x20 (Sprint)	B	From Leg	1.00 -0.50 0.00	0.0000	147.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	66.00 90.00
TD-RRH 8x20 (Sprint)	C	From Leg	1.00 -0.50 0.00	0.0000	147.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	66.00 90.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
4' Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	Worst		84.00	4.00	No Ice 1/2" Ice	12.57 13.10	150.00 217.00
4' Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	Worst		78.00	4.00	No Ice 1/2" Ice	12.57 13.10	150.00 217.00
4' Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	Worst		72.00	4.00	No Ice 1/2" Ice	12.57 13.10	150.00 217.00

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight lb	Ice Weight lb	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
VAL-216415	1090.3344	1814.3549	644.58	218.88	7.5718	12.5997	5.3014
VAL-216413	2130.7479	3520.4599	589.86	443.34	7.3984	12.2238	5.3014
VAL-195557	2263.4687	3690.8612	718.59	458.46	7.8593	12.8155	7.2158
VAL-195557	2263.4687	3690.8612	718.59	458.46	7.8593	12.8155	7.2158
VAL-195557	2263.4687	3690.8612	718.59	458.46	7.8593	12.8155	7.2158

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	150	Leg	A325N	0.6250	5	2741.15	12885.40	0.213 ✔	1.333	Bolt DS
T2	130	Leg	A325N	0.7500	5	8049.20	18555.00	0.434 ✔	1.333	Bolt DS
T3	110	Leg	A325N	1.0000	6	12374.00	34539.80	0.358 ✔	1.333	Bolt Tension
T4	90	Leg	A325N	1.0000	6	12145.10	34557.10	0.351 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4772.13	16992.20	0.281 ✔	1.333	Member Bearing
T5	80	Leg	A325N	1.0000	6	14833.80	34557.50	0.429 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4816.23	16992.20	0.283 ✔	1.333	Member Bearing
T6	60	Leg	A325N	1.0000	6	17247.90	34557.50	0.499 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4138.83	16992.20	0.244 ✔	1.333	Member Bearing
T7	40	Leg	A325N	1.0000	6	19310.60	34557.10	0.559 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	4607.16	16992.20	0.271 ✔	1.333	Member Bearing
T8	20	Leg	A687	1.0000	6	20999.00	38877.20	0.540 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	6799.88	16992.20	0.400 ✔	1.333	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
T1	150 - 130	1 3/4	20.00	2.33	64.0 K=1.00	22.023	2.4053	-15595.70	52971.60	0.294 ✔
T2	130 - 110	2	20.00	2.33	56.0 K=1.00	23.389	3.1416	-42444.20	73477.20	0.578 ✔
T3	110 - 90	2 1/4	20.00	2.33	49.8 K=1.00	24.385	3.9761	-78873.30	96957.60	0.813 ✔
T4	90 - 80	VAL-216415	10.02	10.02	37.8 K=1.00	26.132	5.3014	-77413.40	138539.00	0.559 ✔
T5	80 - 60	VAL-216413	20.03	10.02	37.8 K=1.00	26.132	5.3014	-98032.50	138539.00	0.708 ✔
T6	60 - 40	VAL-195557	20.03	10.02	32.4 K=1.00	26.848	7.2158	-117482.00	193727.00	0.606 ✔
T7	40 - 20	VAL-195557	20.03	10.02	32.4 K=1.00	26.848	7.2158	-135880.00	193727.00	0.701 ✔
T8	20 - 0	VAL-195557	20.03	10.02	32.4 K=1.00	26.848	7.2158	-153366.00	193727.00	0.792 ✔

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V lb	Allow. V_a lb	Stress Ratio
T4	90 - 80	0.5	1.47	120.0	10.366	0.1963	968.84	2278.10	0.425 ✓
T5	80 - 60	0.5	1.47	120.0	10.279	0.1963	961.34	2258.95	0.426 ✓
T6	60 - 40	0.5	1.46	119.0	10.423	0.1963	173.23	2290.46	0.076 ✓
T7	40 - 20	0.5	1.46	119.0	10.423	0.1963	502.64	2290.46	0.219 ✓
T8	20 - 0	0.5	1.46	119.0	10.423	0.1963	802.11	2290.46	0.350 ✓

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 $\frac{P}{P_a}$
T1	150 - 130	7/8	5.52	2.68	146.9 K=1.00	6.917	0.6013	-2394.39	4159.62	0.576 ✓
T2	130 - 110	7/8	5.52	2.67	146.3 K=1.00	6.977	0.6013	-3506.41	4195.55	0.836 ✓
T3	110 - 90	1	5.52	2.66	127.5 K=1.00	9.192	0.7854	-4115.21	7219.53	0.570 ✓
T4	90 - 80	L3x3x5/16	11.42	5.19	105.8 K=1.00	12.236	1.7800	-5386.42	21780.90	0.247 ✓
T5	80 - 60	L3x3x5/16	12.50	5.84	118.9 K=1.00	10.441	1.7800	-4895.74	18585.00	0.263 ✓
T6	60 - 40	L3x3x5/16	13.80	6.54	133.1 K=1.00	8.423	1.7800	-4115.09	14993.50	0.274 ✓
T7	40 - 20	L3x3x5/16	14.50	6.93	141.3 K=1.00	7.482	1.7800	-4370.82	13318.10	0.328 ✓
T8	20 - 0	L3x3x5/16	16.80	8.09	164.8 K=1.00	5.496	1.7800	-5009.34	9783.69	0.512 ✓

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 $\frac{P}{P_a}$
T1	150 - 130	1	5.00	4.85	233.0 K=1.00	2.751	0.7854	-223.33	2160.38	0.103 ✓
T2	130 - 110	KL/R > 200 (C) - 6 1 KL/R > 200 (C) - 66	5.00	4.83	232.0 K=1.00	2.774	0.7854	-1273.86	2179.04	0.585 ✓

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	110 - 90	1 1/4	5.00	4.81	184.8 K=1.00	4.373	1.2272	-1538.35	5366.08	0.287 ✔

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 $\frac{P}{P_a}$
T1	150 - 130	1	5.00	4.85	233.0 K=1.00	2.751	0.7854	-1171.68	2160.38	0.542 ✔
T2	130 - 110	KL/R > 200 (C) - 9 1	5.00	4.83	232.0 K=1.00	2.774	0.7854	-1626.26	2179.04	0.746 ✔
T3	110 - 90	KL/R > 200 (C) - 69 1 1/4	5.00	4.81	184.8 K=1.00	4.373	1.2272	-1425.09	5366.08	0.266 ✔

Mid 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 $\frac{P}{P_a}$
T1	150 - 130	1	5.00	4.85	233.0 K=1.00	2.751	0.7854	-145.05	2160.38	0.067 ✔
T2	130 - 110	KL/R > 200 (C) - 12 1	5.00	4.83	232.0 K=1.00	2.774	0.7854	-140.37	2179.04	0.064 ✔
T3	110 - 90	KL/R > 200 (C) - 70 1 1/4	5.00	4.81	184.8 K=1.00	4.373	1.2272	-338.30	5366.08	0.063 ✔

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	150 - 130	1 3/4	20.00	2.33	64.0	32.500	1.2339	13705.70	40100.60	0.342 ✔
T2	130 - 110	2	20.00	2.33	56.0	32.500	1.5625	40246.00	50780.20	0.793 ✔
T3	110 - 90	2 1/4	20.00	2.33	49.8	30.000	3.9761	74244.20	119282.00	0.622

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	90 - 80	VAL-216415	10.02	10.02	37.8	30.000	5.3014	72870.50	159043.00	0.458 ✓
T5	80 - 60	VAL-216413	20.03	10.02	37.8	30.000	5.3014	89002.80	159043.00	0.560 ✓
T6	60 - 40	VAL-195557	20.03	10.02	32.4	30.000	7.2158	103487.00	216475.00	0.478 ✓
T7	40 - 20	VAL-195557	20.03	10.02	32.4	30.000	7.2158	115863.00	216475.00	0.535 ✓
T8	20 - 0	VAL-195557	20.03	10.02	32.4	30.000	7.2158	125994.00	216475.00	0.582 ✓

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V lb	Allow. V_a lb	Stress Ratio
T4	90 - 80	0.5	1.47	120.0	10.366	0.1963	968.84	2278.10	0.425 ✓
T5	80 - 60	0.5	1.47	120.0	10.279	0.1963	961.34	2258.95	0.426 ✓
T6	60 - 40	0.5	1.46	119.0	10.423	0.1963	173.23	2290.46	0.076 ✓
T7	40 - 20	0.5	1.46	119.0	10.423	0.1963	502.64	2290.46	0.219 ✓
T8	20 - 0	0.5	1.46	119.0	10.423	0.1963	802.11	2290.46	0.350 ✓

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	150 - 130	7/8	5.52	2.68	146.9	30.000	0.6013	2406.71	18039.60	0.133 ✓
T2	130 - 110	7/8	5.52	2.67	146.3	30.000	0.6013	3547.43	18039.60	0.197 ✓
T3	110 - 90	1	5.52	2.66	127.5	30.000	0.7854	4058.68	23561.90	0.172 ✓
T4	90 - 80	L3x3x5/16	11.42	5.19	67.6	29.000	1.0127	4772.13	29369.30	0.162 ✓
T5	80 - 60	L3x3x5/16	11.93	5.59	72.8	29.000	1.0127	4816.23	29369.30	0.164 ✓
T6	60 - 40	L3x3x5/16	13.13	6.22	81.0	29.000	1.0127	4138.83	29369.30	0.141 ✓
T7	40 - 20	L3x3x5/16	15.24	7.29	94.9	29.000	1.0127	4607.16	29369.30	0.157 ✓

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 $\frac{P}{P_a}$
T8	20 - 0	L3x3x5/16	16.80	8.09	105.3	29.000	1.0127	6799.88	29369.30	0.232 ✓

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	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	201.65	23561.90	0.009 ✓
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	1307.68	23561.90	0.055 ✓
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	1626.21	36815.50	0.044 ✓

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	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	1149.86	23561.90	0.049 ✓
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	1576.05	23561.90	0.067 ✓
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	1535.09	36815.50	0.042 ✓

Mid 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	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	158.76	23561.90	0.007 ✓
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	165.73	23561.90	0.007 ✓
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	366.76	36815.50	0.010 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	150 - 130	Leg	1 3/4	2	13705.70	53454.10	25.6	Pass
		Diagonal	7/8	17	-2394.39	5544.77	43.2	Pass
		Top Girt	1	6	-223.33	2879.79	7.8	Pass
		Bottom Girt	1	9	-1171.68	2879.79	40.7	Pass
		Mid Girt	1	12	-145.05	2879.79	5.0	Pass
T2	130 - 110	Leg	2	62	40246.00	67690.00	59.5	Pass
		Diagonal	7/8	77	-3506.41	5592.67	62.7	Pass
		Top Girt	1	66	-1273.86	2904.66	43.9	Pass
		Bottom Girt	1	69	-1626.26	2904.66	56.0	Pass
		Mid Girt	1	70	-140.37	2904.66	4.8	Pass
T3	110 - 90	Leg	2 1/4	122	-78873.30	129244.48	61.0	Pass
		Diagonal	1	138	-4115.21	9623.63	42.8	Pass
		Top Girt	1 1/4	126	-1538.35	7152.98	21.5	Pass
		Bottom Girt	1 1/4	129	-1425.09	7152.98	19.9	Pass
		Mid Girt	1 1/4	132	-338.30	7152.98	4.7	Pass
T4	90 - 80	Leg	VAL-216415	182	-77413.40	184672.48	41.9	Pass
		Diagonal	L3x3x5/16	185	-5386.42	29033.94	18.6	Pass
							21.1 (b)	
T5	80 - 60	Leg	VAL-216413	191	-98032.50	184672.48	53.1	Pass
		Diagonal	L3x3x5/16	197	-4895.74	24773.80	19.8	Pass
							21.3 (b)	
T6	60 - 40	Leg	VAL-195557	206	-117482.00	258238.08	45.5	Pass
		Diagonal	L3x3x5/16	212	-4115.09	19986.33	20.6	Pass
T7	40 - 20	Leg	VAL-195557	221	-135880.00	258238.08	52.6	Pass
		Diagonal	L3x3x5/16	233	-4370.82	17753.03	24.6	Pass
T8	20 - 0	Leg	VAL-195557	236	-153366.00	258238.08	59.4	Pass
		Diagonal	L3x3x5/16	242	-5009.34	13041.66	38.4	Pass
							Summary	
						Leg (T3)	61.0	Pass
						Diagonal (T2)	62.7	Pass
						Top Girt (T2)	43.9	Pass
						Bottom Girt (T2)	56.0	Pass
						Mid Girt (T1)	5.0	Pass
						Bolt Checks	41.9	Pass
						RATING =	**62.7**	**Pass**

EXHIBIT C

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11284A

Avon 1
81 Montevideo Road
Avon, CT 06001

August 22, 2014

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general public allowable limit:	**6.94 %**

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

EBI Consulting
environmental | engineering | due diligence

August 22, 2014

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

Emissions Analysis for Site: **CT11284A – Avon 1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **81 Montevideo Road, Avon, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (μW/cm2). The general population exposure limit for the 700 MHz Band is 567 μW/cm2, and the general population exposure limit for the PCS and AWS bands is 1000 μW/cm2. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **81 Montevideo Road, Avon, 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 the one proposed sector of this installation. These Channels have a transmit power of 30 Watts per Channel

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

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

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

5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

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

7) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-A1M** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.6 dBd** at its main lobe. The **Commscope LNX-6515DS-A1M** has a maximum gain of **15.5 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **136 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:		Make / Model:		Make / Model:	Ericsson AIR21 B4A/B2P
Gain:		Gain:		Gain:	15.6 dBd
Height (AGL):		Height (AGL):		Height (AGL):	136
Frequency Bands		Frequency Bands		Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count		Channel Count		# PCS Channels:	2
Total TX Power:		Total TX Power:		# AWS Channels:	60
ERP (W):		ERP (W):		ERP (W):	1,888.44
Antenna A1 MPE%		Antenna B1 MPE%		Antenna C1 MPE%	0.93
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:		Make / Model:		Make / Model:	Ericsson AIR21 B4A/B2P
Gain:		Gain:		Gain:	15.6 dBd
Height (AGL):		Height (AGL):		Height (AGL):	136
Frequency Bands		Frequency Bands		Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count		Channel Count		Channel Count	4
Total TX Power:		Total TX Power:		Total TX Power:	60
ERP (W):		ERP (W):		ERP (W):	1,888.44
Antenna A2 MPE%		Antenna B2 MPE%		Antenna C2 MPE%	0.93
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:		Make / Model:		Make / Model:	Commscope LNX-6515DS-A1M
Gain:		Gain:		Gain:	15.5 dBd
Height (AGL):		Height (AGL):		Height (AGL):	136
Frequency Bands		Frequency Bands		Frequency Bands	700 Mhz
Channel Count		Channel Count		Channel Count	1
Total TX Power:		Total TX Power:		Total TX Power:	30
ERP (W):		ERP (W):		ERP (W):	470.23
Antenna A3 MPE%		Antenna B3 MPE%		Antenna C3 MPE%	0.48

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**2.34**
Sprint	4.60 %
Site Total MPE %:	**6.94 %**

T-Mobile Sector 1 Total:	N/A
T-Mobile Sector 2 Total:	N/A
T-Mobile Sector 3 Total:	2.34 %
Site Total:	6.94 %

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:	N/A
Sector 2:	N/A
Sector 3 :	2.34 %
T-Mobile Total:	2.34 %
Site Total:	6.94 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **6.94%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

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