

JULIE D. KOHLER

PLEASE REPLY TO: Bridgeport

WRITER'S DIRECT DIAL: (203) 337-4157

E-Mail Address: jkohler@cohenandwolf.com

September 9, 2014

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

**Re: Notice of Exempt Modification
Town of Orange/T-Mobile co-location
Site ID CT11412A
525 Orange Center Road, Orange 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, the Town of Orange owns the existing telecommunications tower and related facility at 525 Orange Center Road, Orange Connecticut (latitude 41.27363, longitude -73.01188). T-Mobile intends to add three antennas and related equipment at this existing facility in Orange ("Orange Facility"). Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the First Selectman, James Zeoli. The Town of Orange is also the property owner.

The existing Orange Facility consists of a 160 foot tower. T-Mobile plans to add three antenna and three RRUs mounted on the tower at a centerline of 121 feet. T-Mobile will also install equipment cabinet mounted to a proposed H-frame within the existing compound area near the base of the tower and will reuse existing fiber and coax cable. (See the plans dated July 25, 2014 attached hereto as Exhibit A). The existing tower is structurally capable of supporting T-Mobile's proposed use, as indicated in the structural analysis dated August 18, 2014 and attached hereto as Exhibit B.

September 9, 2014
Site ID CT11412A
Page 2

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

1 . The proposed modification will not increase the height of the tower. T-Mobile's proposed antennas will be installed at the 121 foot level. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2 . The installation of the T-Mobile replacement equipment in the existing compound, as reflected on the attached site plan, will not require an extension of the site boundaries as indicated on Page 2 of Exhibit A. T-Mobile's proposed equipment will be located entirely within the existing compound area.

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 proposed antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a RF Exposure Analysis prepared by EBI dated September 5, 2014 T-Mobile's operations would add 8.81% 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 39.95% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

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

Sincerely,



Julie D. Kohler, Esq.

cc: First Selectman James Zeoli, Town of Orange
Sheldon Freinkle, Northeast Site Solutions

EXHIBIT A



KEY PLAN

N.T.S.

CONFIGURATION

702CU

SUBMITTALS

LE REV A	07.25.14

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

LEASE EXHIBIT

SITE NUMBER:
 CT11412A

SITE NAME:
 HIGH PLAINS COMMUNITY CENTER

SITE ADDRESS:
 525 ORANGE CENTER RD
 ORANGE, CT 06477

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

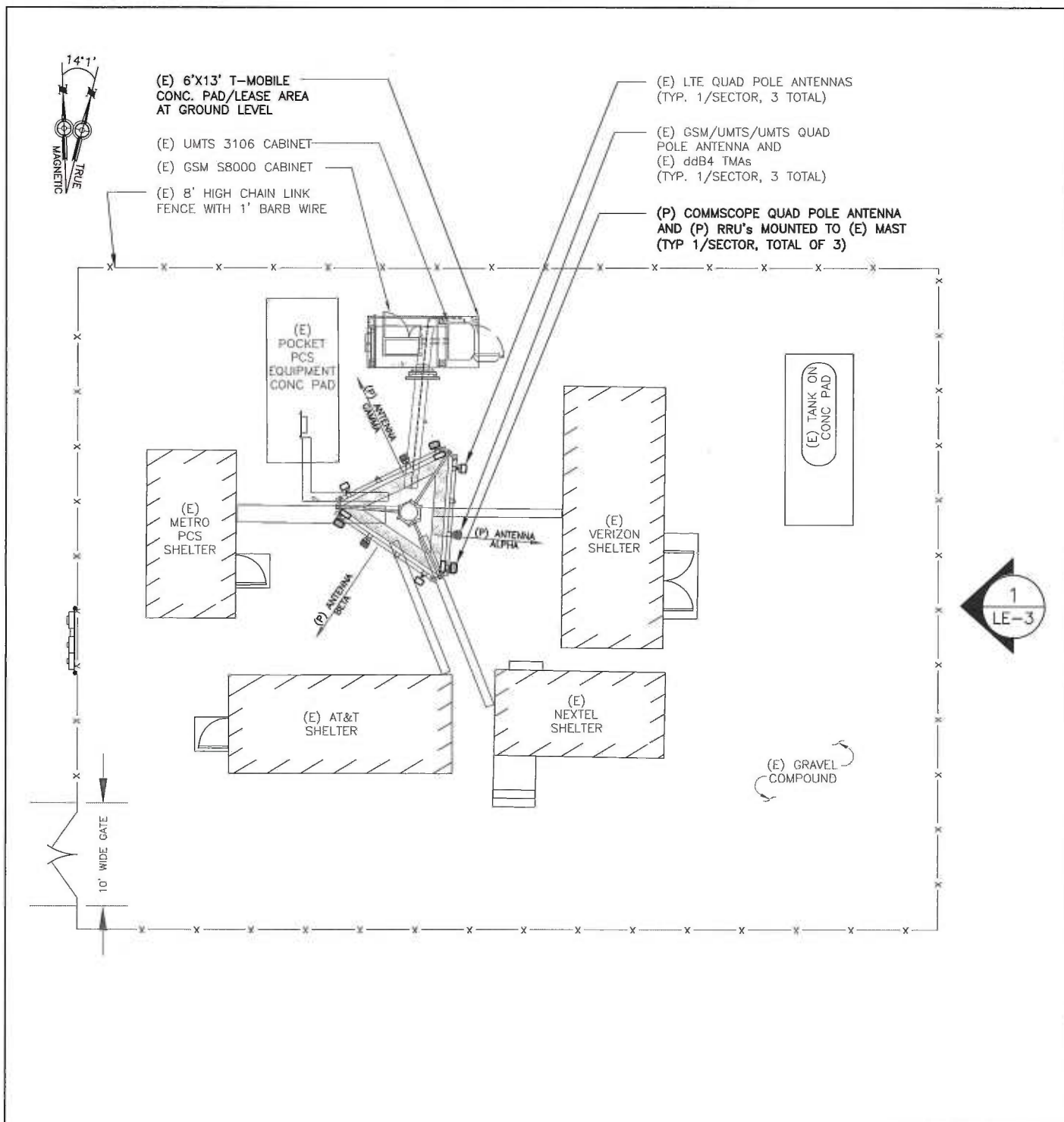
FOR
T-MOBILE NORTHEAST, LLC

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

DRAWN BY: EB

CHECKED BY: SM

PAGE 1 OF 3



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

SITE PLAN

SCALE: N.T.S.

1
LE-2

CONFIGURATION

702CU

SUBMITTALS

LE REV A	07.25.14

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

LEASE EXHIBIT

SITE NUMBER:
CT11412A

SITE NAME:
HIGH PLAINS COMMUNITY CENTER

SITE ADDRESS:
525 ORANGE CENTER RD
ORANGE, CT 06477

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

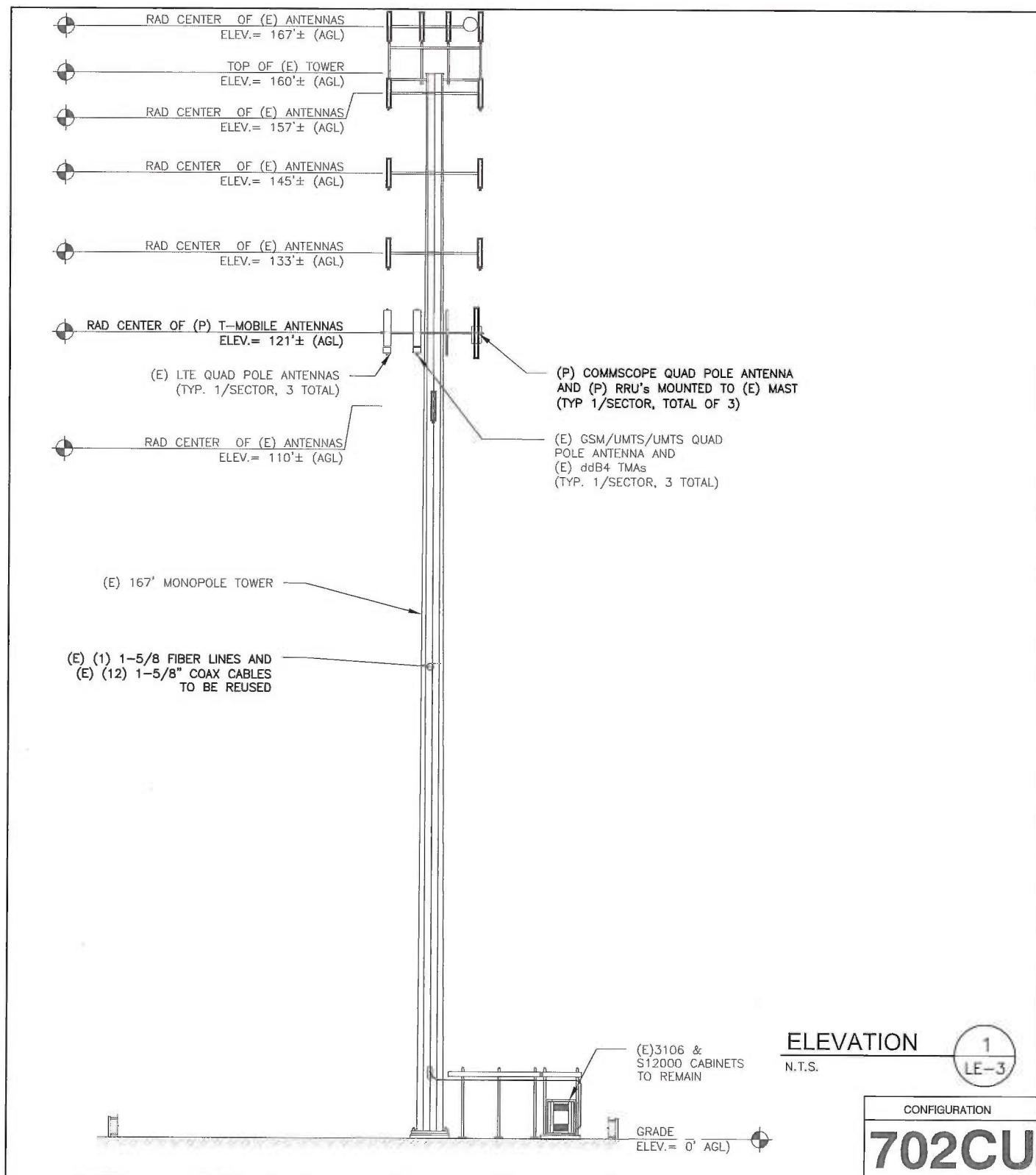
FOR
T-MOBILE NORTHEAST, LLC

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PAGE 2 OF 3



ELEVATION
N.T.S.

1
LE-3

CONFIGURATION

702CU

SUBMITTALS

LE REV A	07.25.14

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T-MOBILE NORTHEAST, LLC
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FAX: (860) 692-7159

DRAWN BY: EB

CHECKED BY: SM

PAGE 3 OF 3

EXHIBIT B

STRUCTURAL ANALYSIS REPORT MONOPOLE



Prepared For:



35 Griffin Road South
Bloomfield, CT 06002



Monopole Rating

Monopole: Pass (96.2 %)

Foundation: Pass

Sincerely,
Atlantis Group, Inc.
8-18-2014



Ahmet Colakoglu, PE
CT Professional Engineer
License No: 27057

Site ID: CT11412A
Site Name: High Plains Community Center
525 Orange Center Road,
Orange, CT 06477

August 18, 2014

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

CONTENTS

1.0 – SUBJECT AND REFERENCES

2.0 – PROPOSED ADDITION

3.0 - CODES AND LOADING

4.0 - STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

5.0 - ANALYSIS AND ASSUMPTIONS

6.0 – RESULTS AND CONCLUSION

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A – CALCULATIONS

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the existing 160 feet tall Valmont monopole, located at 525 Orange Center Road, Orange, CT 06477, for the additions and alterations proposed by T-Mobile.

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

1. Structural Analysis Report prepared by Armor Tower, dated 05/14/2010.
2. Structural Evaluation Letter by Atlantis Group, dated 05/18/2012.
3. Structural Analysis Report prepared by Infinigy dated 05/07/2014.
4. Existing and proposed antenna information provided by T-Mobile.

1.1 STRUCTURE

The structure is a 160' Valmont monopole consisting of slip-jointed 12-sided bent plate tubes. Flat-to-flat dimensions range from 1'-9" at the top to 5'-4" at the base. The monopole tower is attached to the foundation with a base plate and anchor bolts. It is formed by the following sections:

SECTION LENGTH (FEET)	LAP SPLICE (IN)	SHAFT THICKNESS (IN)	TOP DIAMETER (IN)	BOTTOM DIAMETER (IN)	YIELD STRENGTH (KSI)
34	0.00	0.1875	20.5300	29.5310	65
40	0.00	0.3125	29.5310	39.5156	65
49	0.00	0.3750	39.5156	52.0872	65
37	-	0.5000	52.0872	61.5800	65

2.0 PROPOSED CONFIGURATION

Antennas and Appurtenances:

Existing Configuration of T-Mobile Appurtenances:

SECTOR	RAD CENTER (FT)	ANTENNA & TMA		MOUNT	*FEED LINES
ALPHA	121	GSM/UMTS /LTE	(1) Ericsson AIR21 B2A/B4P (1) Ericsson AIR21 B4A/B2P (1) EMS RR90_17_02DP (1) dd B4 TMA	(1) Low Profile Platform	(4) 1-5/8"
BETA	121	GSM/UMTS /LTE	(1) Ericsson AIR21 B2A/B4P (1) Ericsson AIR21 B4A/B2P (1) EMS RR90_17_02DP (1) dd B4 TMA	(1) Low Profile Platform	(4) 1-5/8"
GAMMA	121	GSM/UMTS /LTE	(1) Ericsson AIR21 B2A/B4P (1) Ericsson AIR21 B4A/B2P (1) EMS RR90_17_02DP (1) dd B4 TMA	(1) Low Profile Platform	(4) 1-5/8"

*Feedlines Inside monopole shaft.

Proposed & Final Configuration of T-Mobile Appurtenances:

SECTOR	RAD CENTER (FT)	ANTENNA & TMA		MOUNT	*FEED LINES
ALPHA	121	GSM/UMTS /LTE	(1) Ericsson AIR21 B2A/B4P (1) Ericsson AIR21 B4A/B2P (1) Commscope SBNHH-1D65C (1) dd B4 TMA (1) RRUS11	(1) Low Profile Platform	(1) Existing 1-5/8" Fiber Cable + (12) Existing 1-5/8"
BETA	121	GSM/UMTS /LTE	(1) Ericsson AIR21 B2A/B4P (1) Ericsson AIR21 B4A/B2P (1) Commscope SBNHH-1D65C (1) dd B4 TMA (1) RRUS11	(1) Low Profile Platform	
GAMMA	121	GSM/UMTS /LTE	(1) Ericsson AIR21 B2A/B4P (1) Ericsson AIR21 B4A/B2P (1) Commscope SBNHH-1D65C (1) dd B4 TMA4 (1) RRUS11	(1) Low Profile Platform	

*Feedlines Inside monopole shaft.

Existing and Remaining Appurtenances by Others:

RAD CENTER (FT) CARRIER	ANTENNA & TMA	MOUNT	*FEED LINES
168.0 Nextel	(9) 48"x7"x6" Panels (3) 48"x12" Panels (3) RRH	Platform w/Handrails	(9) 1-5/8" (6) 5/8"
165.0	(1) Andrew VHLP2-11-DW1		(2) 5/8"
160.0	(3) Antel BXA-70063/6CF (6) Antel LPA-80060-6CF-EDIN-4		(12) 2"
156.5	(3) 17"x16"x7" TMA	Platform w/Handrails	(2) 3/4"
148.5 AT&T	(1) 12" OD x 24" Tall Cylinder		(1) 3/8" Fiber
147.5	(6) Powerwave RA21- 7770.00 (3) Powerwave P65-16-XLH-RR (6) 14" x 9" x 2 3/4" TMA		(12) 1-5/8"
136.0 Sprint	(3) APXVSPP 18-C-A20 (3) 800 MHz RRH w/ Notch Filter (3) 1900 MHz RRH (3) RFS APXVTM14-C-120 (3) Alcatel Lucent TD-RRHX20	Platform w/Handrails	(3) 1-1/4" Hybriflex (1) 1-1/4" Fiber
122.0	(6) Andrew RR90-17-02DP (6) RFS APX 16DWV-16WVS-C (6) 13" x 6.5"x3" TMA (6) Erricsson TMA 17-21-M	Platform w/Handrails	(18) 2"
115.5	Exalt FCC10	---	(2) 1/2"
113.0	(3) 72"x7" Panels	Pipe	(6) 2"
83.5	(1) GPS	Side Arm	(1) 5/8"

*Feedlines Inside monopole shaft.

3.0 CODES AND LOADING

The monopole was analyzed per ANSI/TIA-222-G as referenced by the 2005 Connecticut Building Code with 2013 Supplement, which is the adopted building code in the county. The following wind loading was used in compliance with the standard for New Haven County, CT.

- Basic wind speed 115 mph (W) without ice.
- Basic wind speed 50 mph (W_i) with 3/4" radial and escalating ice.

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

- $D + W$
- $D + W_i + I$

D: Dead Load of structure and appurtenances

W: Wind Load, without ice

W_i : Wind Load, with ice

I: Ice Gravity Load

4.0 **STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES**

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

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

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

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

5.0 **ANALYSIS and ASSUMPTIONS**

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

6.0 **RESULTS and CONCLUSION**

The existing monopole is found to have **adequate** structural capacity for the proposed loading by T-Mobile. For the aforementioned load combinations and as a maximum, the monopole shaft will be stressed to **96.2%** of capacity. The foundation is found to have **adequate** capacity for the proposed loading by T-Mobile.

Reactions:

Maximums	Infinigy Analysis	Atlantis Analysis
Base Shear (kips)	47.1	49.3
Base Compression (kip)	55.2	55.8
Base Moment (kip*ft)	5122.8	5441.99

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

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

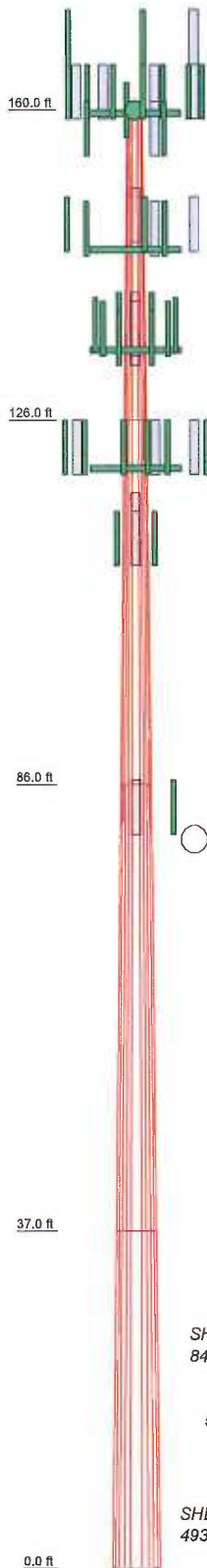
Sincerely,
Atlantis Group, Inc.
08-18-2014



Ahmet Colakoglu, PE
CT Professional Engineer
License No: 27057

APPENDIX A CALCULATIONS

Section	1	2	3	4	
Length (ft)	34.00	40.00	49.00	37.00	
Number of Sides	12	12	12	12	
Thickness (in)	0.1875	0.3125	0.3750	0.5000	
Top Dia (in)	20.5300	29.5310	39.5156	52.0872	
Bot Dia (in)	29.5310	39.5156	52.0872	61.5800	
Grade			A572-65		
Weight (lb)	1735.3	4685.6	9145.9	11419.1	26985.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Angle Platform W/ Handrails	160	APXVTM14-C-120	136
48"x12"x4" Panel	160	APXVTM14-C-120	136
48"x12"x4" Panel	160	APXVTM14-C-120	136
48"x12"x4" Panel	160	TD-RRH8X20	136
RRH	160	TD-RRH8X20	136
RRH	160	TD-RRH8X20	136
RRH	160	1900 MHz RRH	135
BXA-70063/6CF	160	1900 MHz RRH	135
BXA-70063/6CF	160	1900 MHz RRH	135
BXA-70063/6CF	160	APXVSPP-18-C-A20	134
LPA-80060-6CF-EDIN-4	160	APXVSPP-18-C-A20	134
LPA-80060-6CF-EDIN-4	160	APXVSPP-18-C-A20	134
LPA-80060-6CF-EDIN-4	160	Angle Platform W/ Handrails	134
LPA-80060-6CF-EDIN-4	160	SBNHH-1D65C	121
LPA-80060-6CF-EDIN-4	160	SBNHH-1D65C	121
LPA-80060-6CF-EDIN-4	160	dd B4 TMA	121
17"x16"x7" TMA	160	dd B4 TMA	121
17"x16"x7" TMA	160	dd B4 TMA	121
17"x16"x7" TMA	160	RRUS 11	121
VHLP2-11-2WH	160	RRUS 11	121
14"x9"x2.75" TMA	156	RRUS 11	121
14"x9"x2.75" TMA	156	Angle Platform W/ Handrails	121
14"x9"x2.75" TMA	156	ERICSSON AIR 21 B4A B2P	121
14"x9"x2.75" TMA	156	ERICSSON AIR 21 B4A B2P	121
14"x9"x2.75" TMA	156	ERICSSON AIR 21 B4A B2P	121
14"x9"x2.75" TMA	156	ERICSSON AIR 21 B2A B4P	121
12" ODx24" Tall Cylinder	148.5	ERICSSON AIR 21 B2A B4P	121
P65-16XLH-RR	145.5	ERICSSON AIR 21 B2A B4P	121
P65-16XLH-RR	145.5	SBNHH-1D65C	121
P65-16XLH-RR	145.5	ExploreAirRelaxxxFCC	115
RA21-7770.00	145	Antenna Pipe Mount	115
RA21-7770.00	145	72"x7" Panel	113
RA21-7770.00	145	Antenna Pipe Mount	113
RA21-7770.00	145	Antenna Pipe Mount	113
RA21-7770.00	145	Antenna Pipe Mount	113
RA21-7770.00	145	72"x7" Panel	113
Angle Platform W/ Handrails	145	72"x7" Panel	113
800 MHz w/ Notch Filter	137	GPS	83.5
800 MHz w/ Notch Filter	137	Pipe Side Arm	83.5
800 MHz w/ Notch Filter	137	Pipe Side Arm	83.5

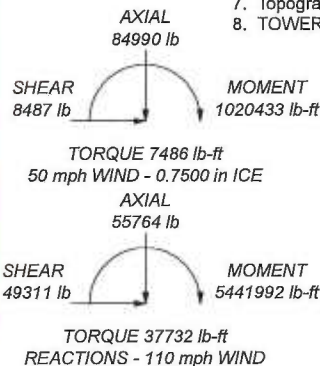
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 110 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 96.2%

ALL REACTIONS
ARE FACTORED



Atlantis Group		Job: CT11412A	
1340 Centre Street, Suite:212		Project: CT11412A	
Newton, MA 02459		Client: T-Mobile	Drawn by:
Phone: 617-965-0789		Code: TIA-222-G	Date: 08/18/14
FAX: 617-213-5056		Path:	App'd: NTS
		Dwg No. E-1	

tnxTower Atlantis Group 1340 Centre Street, Suite:212 Newton, MA 02459 Phone: 617-965-0789 FAX: 617-213-5056	Job	CT11412A	Page	1 of 17
	Project	CT11412A	Date	17:47:53 08/18/14
	Client	T-Mobile	Designed by	

Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in New Haven County, Connecticut.

Basic wind speed of 110 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.7500 in.

Custom ice parameters have been used.

* Ice thickness multiplier: 2.000.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

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

Options

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

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	160.00-126.00	34.00	0.00	12	20.5300	29.5310	0.1875	0.7500	A572-65 (65 ksi)
L2	126.00-86.00	40.00	0.00	12	29.5310	39.5156	0.3125	1.2500	A572-65 (65 ksi)

tnxTower Atlantis Group 1340 Centre Street, Suite 212 Newton, MA 02459 Phone: 617-965-0789 FAX: 617-213-5056	Job	CT11412A	Page	2 of 17
	Project	CT11412A	Date	17:47:53 08/18/14
	Client	T-Mobile	Designed by	

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	86.00-37.00	49.00	0.00	12	39.5156	52.0872	0.3750	1.5000	A572-65 (65 ksi)
L4	37.00-0.00	37.00		12	52.0872	61.5800	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	21.2542	12.2818	648.7182	7.2826	10.6345	61.0011	1314.4789	6.0447	4.9995	26.664
L2	30.5727	17.7161	1947.0578	10.5050	15.2971	127.2832	3945.2669	8.7193	7.4118	39.53
L3	40.9096	29.4011	3203.8014	10.4602	15.2971	209.4391	6491.7703	14.4703	7.0768	22.646
L4	53.9246	39.4481	7738.4339	14.0347	20.4691	378.0548	15680.1650	19.4152	9.7527	31.209
	40.9096	47.2623	9241.7779	14.0123	20.4691	451.4994	18726.3475	23.2611	9.5852	25.56
	53.9246	62.4425	21313.3704	18.5130	26.9812	789.9350	43186.6668	30.7323	12.9544	34.545
	63.7523	98.3388	46828.3560	21.8666	31.8984	1468.0453	94886.9451	48.3994	15.1634	30.327

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
L1 160.00-126.00				1	1	1		
L2 126.00-86.00				1	1	1		
L3 86.00-37.00				1	1	1		
L4 37.00-0.00				1	1	1		

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615
Anchor bolt size	2.2500 in
Number of bolts	24
Embedment length	24.0000 in
f _c	4 ksi
Grout space	2.0000 in
Base plate grade	A572-60
Base plate thickness	3.2500 in
Bolt circle diameter	69.8300 in
Outer diameter	75.8300 in
Inner diameter	60.0000 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
2" Coax	C	Surface Ar (CaAa)	122.00 - 0.00	1	1	0.000 0.000	2.0000		1.04
1/2"	C	Surface Ar (CaAa)	115.00 - 0.00	2	2	0.000 0.000	0.5800		0.25

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf

5/8"	C	No	Inside Pole	160.00 - 0.00	8	No Ice	0.00	0.40
						1/2" Ice	0.00	0.40
						1" Ice	0.00	0.40
2" Coax	C	No	Inside Pole	160.00 - 0.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
3/4"	C	No	Inside Pole	148.00 - 0.00	2	No Ice	0.00	0.38
						1/2" Ice	0.00	0.38
						1" Ice	0.00	0.38
3/8"	C	No	Inside Pole	148.00 - 0.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
1-5/8"	C	No	Inside Pole	148.00 - 0.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
2" Coax	C	No	Inside Pole	122.00 - 0.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
2" Coax	C	No	Inside Pole	122.00 - 0.00	5	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
2" Coax	C	No	Inside Pole	113.00 - 0.00	6	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
5/8"	C	No	Inside Pole	83.50 - 0.00	1	No Ice	0.00	0.40
						1/2" Ice	0.00	0.40
						1" Ice	0.00	0.40

1-1/4" Hybrid	C	No	Inside Pole	136.00 - 0.00	3	No Ice	0.00	0.83
						1/2" Ice	0.00	0.83
						1" Ice	0.00	0.83
1-1/4"	C	No	Inside Pole	136.00 - 0.00	1	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight lb
L1	160.00-126.00	A	0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight lb
L2	126.00-86.00	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	857.66
		A	0.000	0.000	0.000	0.000	0.00
L3	86.00-37.00	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	10.564	0.000	2142.90
		A	0.000	0.000	0.000	0.000	0.00
L4	37.00-0.00	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	15.484	0.000	2841.49
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	11.692	0.000	2146.37

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	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight lb
L1	160.00-126.00	A	1.736	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	857.66
L2	126.00-86.00	A	1.685	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	35.747	0.000	2573.90
L3	86.00-37.00	A	1.595	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	52.081	0.000	3429.22
L4	37.00-0.00	A	1.412	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	36.269	0.000	2515.77

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	160.00-126.00	0.0000	0.0000	0.0000	0.0000
L2	126.00-86.00	0.0000	0.3752	0.0000	0.9106
L3	86.00-37.00	0.0000	0.4376	0.0000	1.0874
L4	37.00-0.00	0.0000	0.4413	0.0000	1.0881

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L2	1	2" Coax	86.00 - 122.00	1.0000	1.0000
L2	2	1/2"	86.00 - 115.00	1.0000	1.0000
L3	1	2" Coax	37.00 - 86.00	1.0000	1.0000
L3	2	1/2"	37.00 - 86.00	1.0000	1.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L4	1	2" Coax	0.00 - 37.00	1.0000	1.0000
L4	2	1/2"	0.00 - 37.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
Angle Platform W/ Handrails	C	From Leg	3.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	36.00 41.50 54.00	42.40 48.40 54.40	2000.00 2450.00 2900.00
48"x12"x4" Panel	A	From Leg	4.00 6.50 8.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	5.60 5.60 6.40	2.09 2.39 2.69	60.00 88.55 121.44
48"x12"x4" Panel	B	From Leg	4.00 6.50 8.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	5.60 5.60 6.40	2.09 2.39 2.69	60.00 88.55 121.44
48"x12"x4" Panel	C	From Leg	4.00 6.50 8.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	5.60 5.60 6.40	2.09 2.39 2.69	60.00 88.55 121.44
RRH	A	From Leg	4.00 6.50 8.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	2.73 2.96 3.19	1.45 1.64 1.83	64.00 82.23 103.34
RRH	B	From Leg	4.00 6.50 8.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	2.73 2.96 3.19	1.45 1.64 1.83	64.00 82.23 103.34
RRH	C	From Leg	4.00 6.50 8.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	2.73 2.96 3.19	1.45 1.64 1.83	64.00 82.23 103.34
BXA-70063/6CF	A	From Leg	4.00 2.17 2.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	7.73 8.27 8.81	4.04 4.48 4.92	14.90 56.85 104.64
BXA-70063/6CF	B	From Leg	4.00 2.17 2.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	7.73 8.27 8.81	4.04 4.48 4.92	14.90 56.85 98.80
BXA-70063/6CF	C	From Leg	4.00 2.17 2.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	7.73 8.27 8.81	4.04 4.48 4.92	14.90 56.85 98.80
LPA-80060-6CF-EDIN-4	A	From Leg	4.00 6.50 2.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.52 6.98 7.44	6.75 7.23 7.71	22.50 72.12 121.74
LPA-80060-6CF-EDIN-4	A	From Leg	4.00 -6.50 2.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.52 6.98 7.44	6.75 7.23 7.71	22.50 72.12 121.74
LPA-80060-6CF-EDIN-4	B	From Leg	4.00 6.50 2.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.52 6.98 7.44	6.75 7.23 7.71	22.50 72.12 121.74
LPA-80060-6CF-EDIN-4	B	From Leg	4.00 -6.50 2.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.52 6.98 7.44	6.75 7.23 7.71	22.50 72.12 121.74
LPA-80060-6CF-EDIN-4	C	From Leg	4.00	0.0000	160.00	No Ice	6.52	6.75	22.50

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb	
LPA-80060-6CF-EDIN-4	C	From Leg	6.50	0.0000	160.00	1/2" Ice	6.98	72.12	
			2.00			1" Ice	7.44	121.74	
			4.00			No Ice	6.52	22.50	
			-6.50			1/2" Ice	6.98	72.12	
			0.00			1" Ice	7.44	121.74	
17"X16"X7" TMA	A	From Leg	4.00	0.0000	160.00	No Ice	2.64	30.00	
			-3.50			1/2" Ice	2.86	47.63	
			2.00			1" Ice	3.08	65.26	
17"X16"X7" TMA	B	From Leg	4.00	0.0000	160.00	No Ice	2.64	30.00	
			-3.50			1/2" Ice	2.86	47.63	
			2.00			1" Ice	3.08	65.26	
17"X16"X7" TMA	C	From Leg	4.00	0.0000	160.00	No Ice	2.64	30.00	
			-3.50			1/2" Ice	2.86	47.63	
			2.00			1" Ice	3.08	1.48	65.26

Angle Platform W/ Handrails	C	From Leg	3.00	0.0000	145.00	No Ice	36.00	42.40	2000.00
			0.00			1/2" Ice	41.50	48.40	2450.00
			0.00			1" Ice	47.00	54.40	2900.00
14"X9"X2.75" TMA	A	From Leg	4.00	0.0000	156.00	No Ice	1.23	0.37	15.00
			2.17			1/2" Ice	1.38	0.49	22.00
			2.00			1" Ice	1.53	0.61	29.00
14"X9"X2.75" TMA	A	From Leg	4.00	0.0000	156.00	No Ice	1.23	0.37	15.00
			2.17			1/2" Ice	1.38	0.49	22.00
			2.00			1" Ice	1.53	0.61	29.00
14"X9"X2.75" TMA	B	From Leg	4.00	0.0000	156.00	No Ice	1.23	0.37	15.00
			2.17			1/2" Ice	1.38	0.49	22.00
			2.00			1" Ice	1.53	0.61	29.00
14"X9"X2.75" TMA	B	From Leg	4.00	0.0000	156.00	No Ice	1.23	0.37	15.00
			2.17			1/2" Ice	1.38	0.49	22.00
			2.00			1" Ice	1.53	0.61	29.00
14"X9"X2.75" TMA	C	From Leg	4.00	0.0000	156.00	No Ice	1.23	0.37	15.00
			2.17			1/2" Ice	1.38	0.49	22.00
			2.00			1" Ice	1.53	0.61	29.00
14"X9"X2.75" TMA	C	From Leg	4.00	0.0000	156.00	No Ice	1.23	0.37	15.00
			2.17			1/2" Ice	1.38	0.49	22.00
			2.00			1" Ice	1.53	0.61	29.00
RA21-7770.00	A	From Leg	4.00	0.0000	145.00	No Ice	6.79	3.51	37.20
			2.17			1/2" Ice	7.28	3.90	74.52
			2.00			1" Ice	7.77	4.29	111.84
RA21-7770.00	A	From Leg	4.00	0.0000	145.00	No Ice	6.79	3.51	37.20
			2.17			1/2" Ice	7.28	3.90	74.52
			2.00			1" Ice	7.77	4.29	111.84
RA21-7770.00	B	From Leg	4.00	0.0000	145.00	No Ice	6.79	3.51	37.20
			2.17			1/2" Ice	7.28	3.90	74.52
			2.00			1" Ice	7.77	4.29	111.84
RA21-7770.00	B	From Leg	4.00	0.0000	145.00	No Ice	6.79	3.51	37.20
			2.17			1/2" Ice	7.28	3.90	74.52
			2.00			1" Ice	7.77	4.29	111.84
RA21-7770.00	C	From Leg	4.00	0.0000	145.00	No Ice	6.79	3.51	37.20
			2.17			1/2" Ice	7.28	3.90	74.52
			2.00			1" Ice	7.77	4.29	111.84
RA21-7770.00	C	From Leg	4.00	0.0000	145.00	No Ice	6.79	3.51	37.20
			2.17			1/2" Ice	7.28	3.90	74.52
			2.00			1" Ice	7.77	4.29	111.84
P65-16XLH-RR	A	From Leg	4.00	0.0000	145.50	No Ice	8.40	4.70	53.00
			6.50			1/2" Ice	8.95	5.15	100.28
			2.00			1" Ice	9.50	5.60	147.56

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
P65-16XLH-RR	B	From Leg	4.00 6.50 2.00	0.0000	145.50	No Ice 1/2" Ice 1" Ice	8.40 8.95 9.50	4.70 5.15 5.60	53.00 100.28 147.56
P65-16XLH-RR	C	From Leg	4.00 6.50 2.00	0.0000	145.50	No Ice 1/2" Ice 1" Ice	8.40 8.95 9.50	4.70 5.15 5.60	53.00 100.28 147.56
12" ODx24" Tall Cylinder	A	From Leg	0.00 0.00 0.00	0.0000	148.50	No Ice 1/2" Ice 1" Ice	1.60 1.81 2.02	1.60 1.81 2.02	20.00 39.57 59.14

Angle Platform W/ Handrails	C	From Leg	3.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	36.00 41.50 47.00	42.40 48.40 54.40	2000.00 2450.00 2900.00
APXVSPP-18-C-A20	A	From Leg	4.00 0.00 2.40	0.0000	134.00	No Ice 1/2" Ice 1" Ice	8.26 8.81 9.36	5.28 5.74 6.20	57.00 106.52 162.12
APXVSPP-18-C-A20	B	From Leg	4.00 0.00 2.40	0.0000	134.00	No Ice 1/2" Ice 1" Ice	8.26 8.81 9.36	5.28 5.74 6.20	57.00 106.52 156.04
APXVSPP-18-C-A20	C	From Leg	4.00 0.00 2.40	0.0000	134.00	No Ice 1/2" Ice 1" Ice	8.26 8.81 9.36	5.28 5.74 6.20	57.00 106.52 156.04
800 MHz w/ Notch Filter	A	From Leg	1.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	2.49 2.71 2.93	2.91 3.14 3.37	61.80 87.79 113.78
800 MHz w/ Notch Filter	B	From Leg	1.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	2.49 2.71 2.93	2.91 3.14 3.37	61.80 87.79 113.78
800 MHz w/ Notch Filter	C	From Leg	1.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	2.49 2.71 2.93	2.91 3.14 3.37	61.80 87.79 113.78
1900 MHz RRH	A	From Leg	1.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	2.73 2.96 3.19	1.45 1.64 1.83	44.09 62.32 80.55
1900 MHz RRH	B	From Leg	1.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	2.73 2.96 3.19	1.45 1.64 1.83	44.09 62.32 80.55
1900 MHz RRH	C	From Leg	1.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	2.73 2.96 3.19	1.45 1.64 1.83	44.09 62.32 80.55

ERICSSON AIR 21 B2A B4P	A	From Leg	4.00 6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	6.59 7.03 7.49	4.30 4.70 5.13	91.50 133.32 180.26
ERICSSON AIR 21 B2A B4P	B	From Leg	4.00 -6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	6.59 7.03 7.49	4.30 4.70 5.13	91.50 133.32 180.26
ERICSSON AIR 21 B2A B4P	C	From Leg	4.00 6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	6.59 7.03 7.49	4.30 4.70 5.13	91.50 133.32 180.26
ERICSSON AIR 21 B4A B2P	A	From Leg	4.00 -6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	6.58 7.02 7.47	4.29 4.69 5.12	91.50 133.25 180.12
ERICSSON AIR 21 B4A B2P	B	From Leg	4.00 6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	6.58 7.02 7.47	4.29 4.69 5.12	91.50 133.25 180.12

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
ERICSSON AIR 21 B4A B2P	C	From Leg	4.00 -6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	6.58 7.02 7.47	4.29 4.69 5.12	91.50 133.25 180.12
SBNHH-1D65C	A	From Leg	4.00 2.17 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	11.35 11.97 12.59	7.66 8.25 8.84	66.14 131.58 204.66
SBNHH-1D65C	B	From Leg	4.00 2.17 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	11.35 11.97 12.59	7.66 8.25 8.84	66.14 131.58 204.66
SBNHH-1D65C	C	From Leg	4.00 2.17 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	11.35 11.97 12.59	7.66 8.25 8.84	66.14 131.58 204.66
dd B4 TMA	A	From Leg	4.00 6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	0.64 0.82 1.00	0.52 0.71 0.91	22.43 31.59 42.44
dd B4 TMA	B	From Leg	4.00 6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	0.64 0.82 1.00	0.52 0.71 0.91	22.43 31.59 42.44
dd B4 TMA	C	From Leg	4.00 6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	0.64 0.82 1.00	0.52 0.71 0.91	22.43 31.59 42.44
RRUS 11	A	From Leg	4.00 6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	50.70 71.50 95.33
RRUS 11	B	From Leg	4.00 6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	50.70 71.50 95.33
RRUS 11	C	From Leg	4.00 6.50 2.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	50.70 71.50 95.33
Angle Platform W/ Handrails	C	From Leg	3.00 0.00 0.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice	36.00 41.50 47.00	42.40 48.40 54.40	2000.00 2450.00 2900.00

ExploreAirRelaxxxFCC	A	From Leg	0.00 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.82 0.95 1.08	0.38 0.49 0.60	15.00 20.40 25.80
Antenna Pipe Mount	A	From Leg	0.00 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.87 1.12 1.37	0.87 1.12 1.37	14.60 25.30 36.00

*									
Antenna Pipe Mount	A	From Leg	1.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	0.87 1.12 1.37	0.87 1.12 1.37	14.60 25.30 36.00
Antenna Pipe Mount	B	From Leg	1.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	0.87 1.12 1.37	0.87 1.12 1.37	14.60 25.30 36.00
Antenna Pipe Mount	C	From Leg	1.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	0.87 1.12 1.37	0.87 1.12 1.37	14.60 25.30 36.00
72"x7" Panel	A	From Leg	1.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	5.27 5.74 6.21	2.95 3.38 3.81	45.00 71.70 98.40
72"x7" Panel	B	From Leg	1.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	5.27 5.74 6.21	2.95 3.38 3.81	45.00 71.70 98.40

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
72"x7" Panel	C	From Leg	1.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	5.27 5.74 6.21	2.95 3.38 3.81	45.00 71.70 98.40

GPS	A	From Leg	3.00 0.00 0.00	0.0000	83.50	No Ice 1/2" Ice 1" Ice	0.50 0.63 0.76	0.50 0.63 0.76	10.00 15.96 21.92
Pipe Side Arm	A	From Leg	3.00 0.00 0.00	0.0000	83.50	No Ice 1/2" Ice 1" Ice	1.77 2.00 2.23	5.20 5.50 5.80	150.00 175.00 200.00
Pipe Side Arm	B	From Leg	3.00 0.00 0.00	0.0000	83.50	No Ice 1/2" Ice 1" Ice	1.77 2.00 2.23	5.20 5.50 5.80	150.00 175.00 200.00

APXVTM14-C-120	A	From Leg	3.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	6.53 6.96 7.39	3.38 3.72 4.06	52.90 90.49 128.08
APXVTM14-C-120	B	From Leg	3.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	6.53 6.96 7.39	3.38 3.72 4.06	52.90 90.49 128.08
APXVTM14-C-120	C	From Leg	3.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	6.53 6.96 7.39	3.38 3.72 4.06	52.90 90.49 128.08
TD-RRH8X20	A	From Leg	3.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	4.32 4.60 4.88	1.41 1.61 1.81	66.14 90.08 114.02
TD-RRH8X20	B	From Leg	3.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	4.32 4.60 4.88	1.41 1.61 1.81	66.14 90.08 114.02
TD-RRH8X20	C	From Leg	3.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	4.32 4.60 4.88	1.41 1.61 1.81	66.14 90.08 114.02

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight lb
VHLP2-11-2WH	C	Paraboloid w/o Radome	From Face	4.00 0.00 0.00	0.0000		160.00	2.17	No Ice 1/2" Ice 1" Ice	31.00 50.00 70.00

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Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	160 - 126	Pole	Max Tension	26	0.00	-0.73	0.48
			Max. Compression	26	-24743.30	43826.19	-25762.48
			Max. Mx	20	-10427.16	514612.50	-3893.98
			Max. My	14	-10301.49	13800.94	-521061.96
			Max. Vy	20	-21904.19	514612.50	-3893.98
			Max. Vx	2	-22709.78	34249.68	495225.04
L2	126 - 86	Pole	Max. Torque	12			-30248.77
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44364.02	61902.71	-36917.94
			Max. Mx	20	-22480.15	1735209.90	15258.32
			Max. My	14	-22367.05	-1060.56	-1773968.56
			Max. Vy	20	-34186.46	1735209.90	15258.32
L3	86 - 37	Pole	Max. Vx	2	-35208.53	70210.03	1741304.95
			Max. Torque	12			-39418.44
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64532.27	62819.12	-38708.84
			Max. Mx	20	-38510.94	3620601.59	43051.22
			Max. My	14	-38470.25	-28897.85	-3701294.21
L4	37 - 0	Pole	Max. Vy	20	-42450.50	3620601.59	43051.22
			Max. Vx	2	-43387.50	99077.11	3674012.75
			Max. Torque	12			-39185.24
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84989.75	63136.15	-39971.24
			Max. Mx	20	-55739.07	5293874.96	63447.41
			Max. My	14	-55738.10	-49523.96	-5405278.48
			Max. Vy	20	-48151.72	5293874.96	63447.41
			Max. Vx	2	-49075.56	119868.62	5381570.18
			Max. Torque	12			-37753.42

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	84989.75	-0.61	0.36
	Max. H _x	20	55764.22	48122.60	549.16
	Max. H _z	3	41823.16	551.73	49046.02
	Max. M _x	2	5381570.29	551.73	49045.96
	Max. M _z	8	5223502.13	-48122.60	-554.28
	Max. Torsion	24	37237.07	24494.94	42797.10
	Min. Vert	21	41823.15	48122.45	549.16
	Min. H _x	9	41823.16	-48122.67	-554.28
	Min. H _z	15	41823.16	-551.72	-48937.99
	Min. M _x	14	-5405278.44	-551.71	-48937.93
	Min. M _z	20	-5293874.93	48122.60	549.16
	Min. Torsion	12	-37732.01	-24586.80	-42626.98

Tower Mast Reaction Summary

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Load Combination	Vertical lb	Shear _x lb	Shear _y lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _y lb-ft	Torque lb-ft
Dead Only	46470.19	0.78	-0.46	17326.20	29274.66	-0.36
1.2 Dead+1.6 Wind 0 deg - No Ice	55764.22	-551.73	-49045.96	-5381570.29	119863.72	-32403.26
0.9 Dead+1.6 Wind 0 deg - No Ice	41823.16	-551.73	-49046.02	-5339393.94	109718.49	-32308.08
1.2 Dead+1.6 Wind 30 deg - No Ice	55764.22	23539.32	-42245.38	-4623561.46	-2513340.80	-18903.88
0.9 Dead+1.6 Wind 30 deg - No Ice	41823.16	23539.30	-42245.34	-4588083.11	-2500351.44	-18848.71
1.2 Dead+1.6 Wind 60 deg - No Ice	55764.22	41387.55	-24235.35	-2639093.84	-4474686.20	-22.16
0.9 Dead+1.6 Wind 60 deg - No Ice	41823.16	41387.51	-24235.33	-2621124.98	-4444398.73	-24.56
1.2 Dead+1.6 Wind 90 deg - No Ice	55764.22	48122.60	554.28	105971.80	-5223502.13	18857.68
0.9 Dead+1.6 Wind 90 deg - No Ice	41823.16	48122.67	554.28	99608.53	-5186588.13	18796.46
1.2 Dead+1.6 Wind 120 deg - No Ice	55764.22	41986.06	24931.52	2783914.53	-4566705.33	32702.18
0.9 Dead+1.6 Wind 120 deg - No Ice	41823.17	41986.08	24931.53	2753961.18	-4535499.15	32603.89
1.2 Dead+1.6 Wind 150 deg - No Ice	55764.22	24586.80	42626.98	4721017.90	-2675094.95	37732.01
0.9 Dead+1.6 Wind 150 deg - No Ice	41823.16	24586.77	42626.94	4674036.08	-2660456.34	37625.94
1.2 Dead+1.6 Wind 180 deg - No Ice	55764.22	551.71	48937.93	5405278.44	-49528.89	32430.31
0.9 Dead+1.6 Wind 180 deg - No Ice	41823.16	551.72	48937.99	5352320.89	-57956.87	32343.89
1.2 Dead+1.6 Wind 210 deg - No Ice	55764.22	-23631.19	42075.25	4636921.52	2599070.11	18432.15
0.9 Dead+1.6 Wind 210 deg - No Ice	41823.17	-23631.20	42075.27	4590782.57	2567336.11	18386.16
1.2 Dead+1.6 Wind 240 deg - No Ice	55764.22	-41434.33	23975.91	2637549.08	4552941.23	-292.45
0.9 Dead+1.6 Wind 240 deg - No Ice	41823.16	-41434.29	23975.89	2609066.72	4503986.96	-288.01
1.2 Dead+1.6 Wind 270 deg - No Ice	55764.22	-48122.60	-549.16	-63450.22	5293874.93	-18883.45
0.9 Dead+1.6 Wind 270 deg - No Ice	41823.15	-48122.45	-549.16	-68092.79	5238358.56	-18829.60
1.2 Dead+1.6 Wind 300 deg - No Ice	55764.22	-41939.27	-25190.96	-2785450.73	4629163.63	-32423.60
0.9 Dead+1.6 Wind 300 deg - No Ice	41823.16	-41939.23	-25190.93	-2766014.01	4579472.76	-32330.53
1.2 Dead+1.6 Wind 330 deg - No Ice	55764.22	-24494.94	-42797.10	-4707662.17	2730054.23	-37237.07
0.9 Dead+1.6 Wind 330 deg - No Ice	41823.17	-24494.95	-42797.12	-4671364.60	2697024.34	-37129.30
1.2 Dead+1.0 Ice+1.0 Temp	84989.75	0.61	-0.36	39971.24	63136.15	-2.42
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	84989.74	-86.76	-8445.88	-933998.36	76856.82	-6448.02
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	84989.75	4067.01	-7278.51	-798006.62	-398884.44	-3762.35
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	84989.75	7141.67	-4179.03	-440612.61	-752646.65	-19.08
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	84989.75	8298.91	87.21	53730.66	-887130.39	3730.32
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	84989.74	7236.21	4286.67	536864.77	-767611.21	6482.35
1.2 Dead+1.0 Wind 150	84989.74	4232.54	7337.27	886832.21	-425114.19	7486.11

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Load Combination	Vertical lb	Shear _x lb	Shear _y lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _y lb-ft	Torque lb-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 180	84989.74	86.93	8428.00	1010972.99	49600.86	6441.84
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 210	84989.74	-4081.94	7250.42	873224.60	527979.77	3670.60
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240	84989.74	-7149.18	4136.24	513273.78	880464.35	-42.67
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270	84989.74	-8298.72	-86.48	26475.07	1013612.76	-3734.70
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	84989.74	-7228.33	-4329.45	-464217.93	892735.58	-6434.17
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	84989.74	-4217.26	-7365.36	-811634.40	548946.87	-7407.26
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	46470.18	-91.74	-8159.59	-877778.39	43429.50	-5481.71
Dead+Wind 30 deg - Service	46470.18	3916.18	-7028.19	-752107.04	-392863.69	-3197.95
Dead+Wind 60 deg - Service	46470.18	6885.50	-4031.95	-423288.11	-717793.11	-6.93
Dead+Wind 90 deg - Service	46470.18	8006.00	92.18	31499.60	-841868.57	3186.32
Dead+Wind 120 deg - Service	46470.18	6985.07	4147.71	475226.21	-733110.41	5530.23
Dead+Wind 150 deg - Service	46470.18	4090.43	7091.62	796238.74	-419695.32	6381.96
Dead+Wind 180 deg - Service	46470.18	91.83	8141.56	909597.92	15373.41	5481.53
Dead+Wind 210 deg - Service	46470.18	-3931.37	6999.83	782213.16	454202.40	3111.67
Dead+Wind 240 deg - Service	46470.18	-6893.19	3988.73	450930.16	777887.72	-50.08
Dead+Wind 270 deg - Service	46470.18	-8005.91	-91.38	3443.34	900671.40	-3187.94
Dead+Wind 300 deg - Service	46470.18	-6977.20	-4190.92	-447583.51	790621.31	-5477.64
Dead+Wind 330 deg - Service	46470.18	-4075.06	-7119.97	-766132.12	475962.39	-6297.50

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-46470.19	0.00	-0.78	46470.19	0.46	0.002%
2	-551.72	-55764.23	-49046.14	551.73	55764.22	49045.96	0.000%
3	-551.72	-41823.17	-49046.14	551.73	41823.16	49046.02	0.000%
4	23539.35	-55764.23	-42245.43	-23539.32	55764.22	42245.38	0.000%
5	23539.35	-41823.17	-42245.43	-23539.30	41823.16	42245.34	0.000%
6	41387.60	-55764.23	-24235.38	-41387.55	55764.22	24235.35	0.000%
7	41387.60	-41823.17	-24235.38	-41387.51	41823.16	24235.33	0.000%
8	48122.78	-55764.23	554.28	-48122.60	55764.22	-554.28	0.000%
9	48122.78	-41823.17	554.28	-48122.67	41823.16	-554.28	0.000%
10	41986.11	-55764.23	24931.55	-41986.06	55764.22	-24931.52	0.000%
11	41986.11	-41823.17	24931.55	-41986.08	41823.17	-24931.53	0.000%
12	24586.83	-55764.23	42627.03	-24586.80	55764.22	-42626.98	0.000%
13	24586.83	-41823.17	42627.03	-24586.77	41823.16	-42626.94	0.000%
14	551.72	-55764.23	48938.11	-551.71	55764.22	-48937.93	0.000%
15	551.72	-41823.17	48938.11	-551.72	41823.16	-48937.99	0.000%
16	-23631.22	-55764.23	42075.31	23631.19	55764.22	-42075.25	0.000%
17	-23631.22	-41823.17	42075.31	23631.20	41823.17	-42075.27	0.000%
18	-41434.38	-55764.23	23975.94	41434.33	55764.22	-23975.91	0.000%
19	-41434.38	-41823.17	23975.94	41434.29	41823.16	-23975.89	0.000%
20	-48122.78	-55764.23	-549.17	48122.60	55764.22	549.16	0.000%
21	-48122.78	-41823.17	-549.17	48122.45	41823.15	549.16	0.001%
22	-41939.32	-55764.23	-25190.99	41939.27	55764.22	25190.96	0.000%
23	-41939.32	-41823.17	-25190.99	41939.23	41823.16	25190.93	0.000%
24	-24494.96	-55764.23	-42797.16	24494.94	55764.22	42797.10	0.000%
25	-24494.96	-41823.17	-42797.16	24494.95	41823.17	42797.12	0.000%
26	0.00	-84989.76	0.00	-0.61	84989.75	0.36	0.001%
27	-86.86	-84989.76	-8446.41	86.76	84989.74	8445.88	0.001%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
28	4067.20	-84989.76	-7278.96	-4067.01	84989.75	7278.51	0.001%
29	7142.06	-84989.76	-4179.26	-7141.67	84989.75	4179.03	0.001%
30	8299.38	-84989.76	87.28	-8298.91	84989.75	-87.21	0.001%
31	7236.61	-84989.76	4287.02	-7236.21	84989.74	-4286.67	0.001%
32	4232.75	-84989.76	7337.83	-4232.54	84989.74	-7337.27	0.001%
33	86.86	-84989.76	8428.64	-86.93	84989.74	-8428.00	0.001%
34	-4082.31	-84989.76	7250.97	4081.94	84989.74	-7250.42	0.001%
35	-7149.76	-84989.76	4136.58	7149.18	84989.74	-4136.24	0.001%
36	-8299.38	-84989.76	-86.44	8298.72	84989.74	86.48	0.001%
37	-7228.92	-84989.76	-4329.70	7228.33	84989.74	4329.45	0.001%
38	-4217.63	-84989.76	-7365.81	4217.26	84989.74	7365.36	0.001%
39	-91.79	-46470.19	-8160.13	91.74	46470.18	8159.59	0.001%
40	3916.40	-46470.19	-7028.66	-3916.18	46470.18	7028.19	0.001%
41	6885.93	-46470.19	-4032.20	-6885.50	46470.18	4031.95	0.001%
42	8006.51	-46470.19	92.22	-8006.00	46470.18	-92.18	0.001%
43	6985.51	-46470.19	4148.03	-6985.07	46470.18	-4147.71	0.001%
44	4090.68	-46470.19	7092.14	-4090.43	46470.18	-7091.62	0.001%
45	91.79	-46470.19	8142.16	-91.83	46470.18	-8141.56	0.001%
46	-3931.68	-46470.19	7000.35	3931.37	46470.18	-6999.83	0.001%
47	-6893.72	-46470.19	3989.04	6893.19	46470.18	-3988.73	0.001%
48	-8006.51	-46470.19	-91.37	8005.91	46470.18	91.38	0.001%
49	-6977.73	-46470.19	-4191.19	6977.20	46470.18	4190.92	0.001%
50	-4075.39	-46470.19	-7120.45	4075.06	46470.18	7119.97	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	10	0.00000001	0.00003429
2	Yes	16	0.00000001	0.00013391
3	Yes	16	0.00000001	0.00009620
4	Yes	17	0.00000001	0.00005756
5	Yes	16	0.00000001	0.00011414
6	Yes	17	0.00000001	0.00006815
7	Yes	16	0.00000001	0.00013476
8	Yes	16	0.00000001	0.00008041
9	Yes	16	0.00000001	0.00005815
10	Yes	17	0.00000001	0.00010612
11	Yes	17	0.00000001	0.00007504
12	Yes	17	0.00000001	0.00006810
13	Yes	16	0.00000001	0.00013583
14	Yes	16	0.00000001	0.00011707
15	Yes	16	0.00000001	0.00008389
16	Yes	17	0.00000001	0.00009230
17	Yes	17	0.00000001	0.00006392
18	Yes	17	0.00000001	0.00007537
19	Yes	16	0.00000001	0.00014488
20	Yes	16	0.00000001	0.00006474
21	Yes	15	0.00000001	0.00012574
22	Yes	17	0.00000001	0.00007233
23	Yes	16	0.00000001	0.00014241
24	Yes	17	0.00000001	0.00011628
25	Yes	17	0.00000001	0.00008175
26	Yes	12	0.00000001	0.00005210
27	Yes	14	0.00000001	0.00009085
28	Yes	14	0.00000001	0.00006331

tnxTower Atlantis Group 1340 Centre Street, Suite:212 Newton, MA 02459 Phone: 617-965-0789 FAX: 617-213-5056	Job	CT11412A	Page	15 of 17
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	Client	T-Mobile	Designed by	

29	Yes	14	0.00000001	0.00005757
30	Yes	14	0.00000001	0.00006389
31	Yes	14	0.00000001	0.00009684
32	Yes	14	0.00000001	0.00009814
33	Yes	14	0.00000001	0.00010876
34	Yes	14	0.00000001	0.00011388
35	Yes	14	0.00000001	0.00009913
36	Yes	14	0.00000001	0.00008852
37	Yes	14	0.00000001	0.00009962
38	Yes	14	0.00000001	0.00011774
39	Yes	13	0.00000001	0.00008442
40	Yes	13	0.00000001	0.00003660
41	Yes	13	0.00000001	0.00001951
42	Yes	13	0.00000001	0.00004981
43	Yes	13	0.00000001	0.00008506
44	Yes	13	0.00000001	0.00008111
45	Yes	13	0.00000001	0.00009111
46	Yes	13	0.00000001	0.00006604
47	Yes	13	0.00000001	0.00002952
48	Yes	13	0.00000001	0.00005796
49	Yes	13	0.00000001	0.00007059
50	Yes	13	0.00000001	0.00010370

Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension	Actual Allowable Ratio Bolt Compression	Actual Allowable Ratio Plate Stress	Actual Allowable Ratio Stiffener Stress	Controlling Condition	Ratio
in		in	lb	lb	ksi	ksi		
3.2500	24	2.2500	153541.61	158186.42	30.655		Bolt T	0.76
			201288.96	334139.67	54.000			✓
			0.76	0.47	0.57			

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u lb	φP _n lb	Ratio P _u /φP _n
L1	160 - 126 (1)	TP29.531x20.53x0.1875	34.00	160.00	182.8	17.7161	-10301.50	150962.00	0.068
L2	126 - 86 (2)	TP39.5156x29.531x0.3125	40.00	160.00	136.8	39.4481	-22325.70	599986.00	0.037
L3	86 - 37 (3)	TP52.0872x39.5156x0.375	49.00	160.00	103.7	62.4425	-38454.80	1652500.00	0.023
L4	37 - 0 (4)	TP61.58x52.0872x0.5	37.00	160.00	87.8	98.3388	-55737.70	3483280.00	0.016

Pole Bending Design Data

<i>tnxTower</i> <i>Atlantis Group</i> <i>1340 Centre Street, Suite:212</i> <i>Newton, MA 02459</i> <i>Phone: 617-965-0789</i> <i>FAX: 617-213-5056</i>	Job CT11412A	Page 17 of 17
	Project CT11412A	Date 17:47:53 08/18/14
	Client T-Mobile	Designed by

Program Version 6.0.0.8 - 9/7/2011 File://DESTEKFILESERVE/Users/Destek File Server/Documents/Destek/Projects/2013 and Older/17 - Atlantis/010170080 - TMO/080-CT11412A/2014/Calculation/RISA Tower/CT11412A Monopole .eri

BU:
 Site Name: CT11412A
 App Number:
 Work Order:



Monopole Drilled Pier

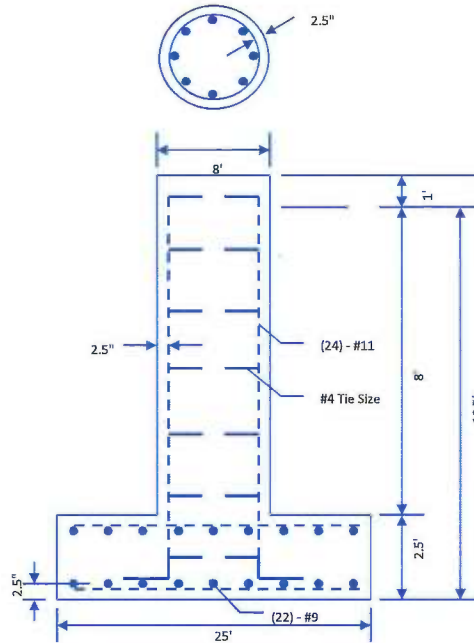
Input

Criteria
 TIA Revision: G
 ACI 318 Revision: 2008
 Seismic Category: B

Reactions
 Compression 55.8 kips
 Shear 49.311 kips
 Moment 5441.99 k-ft

Foundation Dimensions
 Pier Diameter: 8 ft
 Ext. above grade: 1 ft
 Depth below grade: 10.5 ft
 Pad Width: 25 ft
 Pad Thickness: 2.5 ft

Foundation Details
 Concrete Strength: 3000 psi
 Rebar Strength: 60 ksi
 Pier
 Rebar Quantity: 24
 Rebar Size: #11
 Tie Size: #4
 Clear Cover to Ties: 2.5 in
 Pad
 Rebar Quantity: 22
 Rebar Size: #9
 Clear Cover: 2.5 in



Soil Profile: g

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	12			125	0	32	0	0	16	

Analysis Results

Soil Checks

Bearing 3.66 ksf
 Bearing Capacity 12.00 ksf

Overturning 5441.99 k-ft
 Overturning Resistance 11485.94 k-ft

Soil Shear 49.31 kips
 Soil Shear Capacity 273.61 kips

RATING: 47.38%

Structural Checks

Pier
 Moment -843.49 k-ft
 Moment Capacity 6997.26 k-ft

Pad
 Moment 1713.93 k-ft
 Moment Capacity 2581.25 k-ft
 1-way Shear 578.38 kips
 1-way Shear Strength 663.91 kips
 2-way Shear 142.51 kips
 2-way Shear Strength 1709.40 kips

RATING: 87.12%

Overall Foundation Rating:

EXHIBIT C

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

T-Mobile Existing Facility

Site ID: CT11412A

High Plains Community Center
525 Orange Center Road
Orange, CT 06477

September 5, 2014

EBI Project Number: 62144479

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	39.95 %

September 5, 2014

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

Emissions Analysis for Site: **CT11412A – High Plains Community Center**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **525 Orange Center Road, Orange, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the 700 MHz Band is $467 \mu\text{W}/\text{cm}^2$, and the general population exposure limit for the PCS and AWS bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **525 Orange Center Road, Orange, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

- 6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope SBNHH-1D65C** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe. The **Commscope SBNHH-1D65C** has a maximum gain of **13.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antenna mounting height centerline of the proposed antennas is **121 feet** above ground level (AGL).
- 9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	121	Height (AGL):	121	Height (AGL):	121
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A1 MPE%	1.27	Antenna B1 MPE%	1.27	Antenna C1 MPE%	1.27
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	121	Height (AGL):	121	Height (AGL):	121
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A2 MPE%	1.27	Antenna B2 MPE%	1.27	Antenna C2 MPE%	1.27
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope SBNHH-1D65C	Make / Model:	Commscope SBNHH-1D65C	Make / Model:	Commscope SBNHH-1D65C
Gain:	13.6 dBd	Gain:	13.6 dBd	Gain:	13.6 dBd
Height (AGL):	121	Height (AGL):	121	Height (AGL):	121
Frequency Bands	700 Mhz	Frequency Bands	700 Mhz	Frequency Bands	700 Mhz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	405.54	ERP (W):	405.54	ERP (W):	405.54
Antenna A3 MPE%	0.40	Antenna B3 MPE%	0.40	Antenna C3 MPE%	0.40

Site Composite MPE%	
Carrier	MPE%
T-Mobile	8.81
AT&T	8.71 %
Verizon Wireless	17.63 %
Clearwire	0.67 %
Sprint	4.13 %
Site Total MPE %:	39.95 %

T-Mobile Sector 1 Total:	2.94 %
T-Mobile Sector 2 Total:	2.94 %
T-Mobile Sector 3 Total:	2.94 %
Site Total:	39.95 %

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	2.94 %
Sector 2:	2.94 %
Sector 3 :	2.94 %
T-Mobile Total:	8.81 %
Site Total:	39.95 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **39.95%** 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
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