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

March 11, 2014

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

Re: Notice of Exempt Modification
Red Wolf Broadcasting Corp./ T-Mobile co-location
Site ID CTNL058A
889A Colonel Ledyard Highway, Ledyard

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 Red Wolf Broadcasting Corporation owns the existing guyed telecommunications tower and related facility at 889A Colonel Ledyard Highway, Ledyard Connecticut (Latitude: 41.46196212/ Longitude: -72.02362389). T-Mobile intends to replace three antennas and add three antennas and related equipment at this existing telecommunications facility in Ledyard ("Ledyard 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 Mayor John Rodolico and the property owner, Red Wolf Broadcasting Corporation.

The existing Ledyard Facility consists of a 350 foot tall guyed tower.[1] T-Mobile plans to replace three antennas, add three antennas and replace three TMAs (tower mounted amplifiers) at a centerline of 185 feet. (See the plans revised to February 11, 2014 attached hereto as Exhibit A). T-Mobile will also add an equipment cabinet, install fiber and coax cable and reuse existing coax cable. The existing Ledyard Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated February 26, 2014 and attached hereto as Exhibit B.

[1] While the online docket for the Connecticut Siting Council does not provide a docket or petition number for the approval of this structure, it does reference this structure in connection with notices of intent, the most recent captioned EM-VER-072-121123.

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

1. The proposed modification will not increase the height of the tower. T-Mobile's replacement antennas will be installed at a centerline of 185, merely replacing existing antennas located at the same 185 elevation. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

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

3. The proposed modification to the Ledyard 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 March 7, 2014, T-Mobile's operations would add 0.511% 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 30.911% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

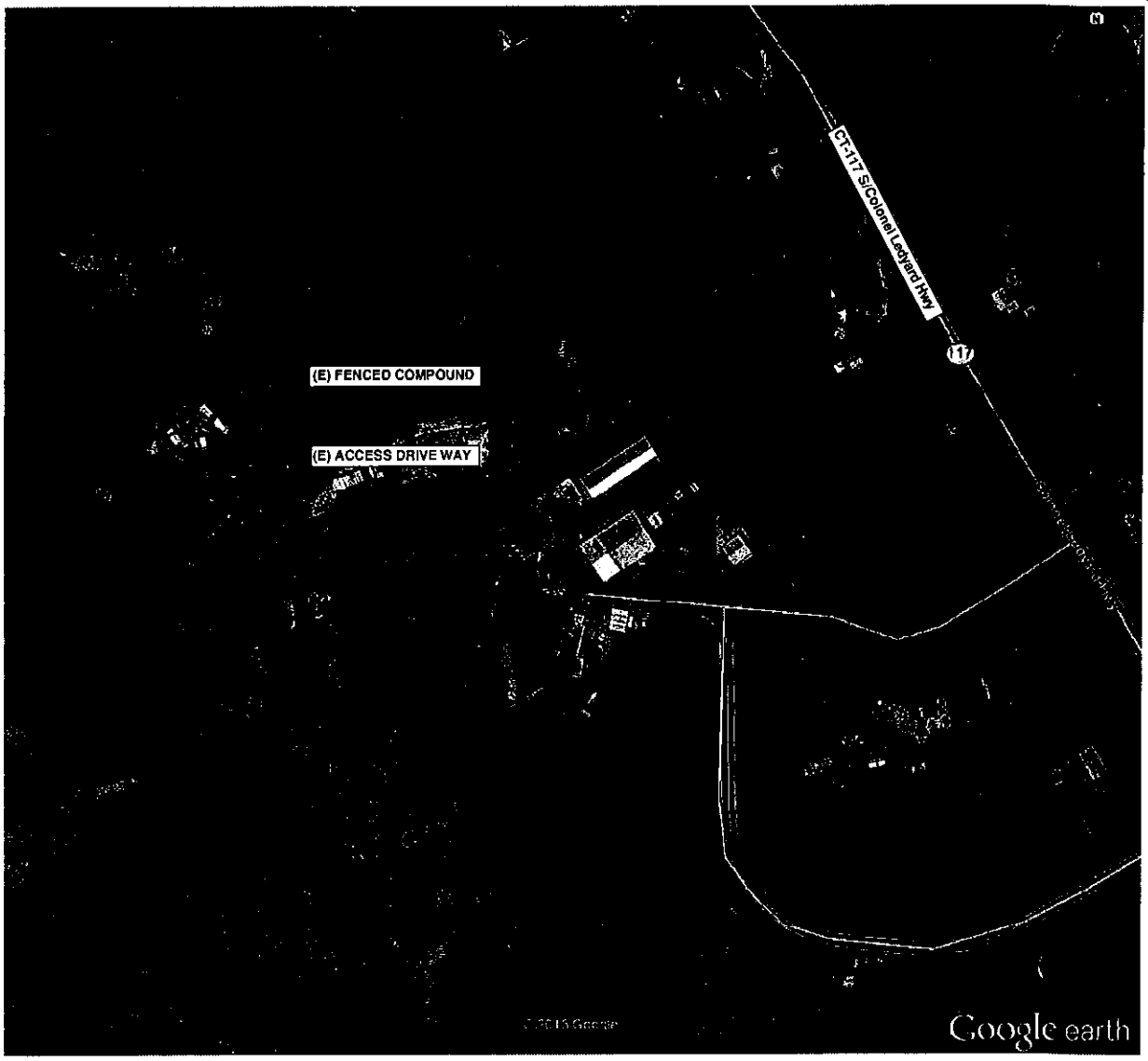
For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement antennas and equipment at the Ledyard Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence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

Sincerely,

Julie D. Kohler, Esq.

cc: Mayor John Rodolico
Red Wolf Broadcasting Corporation
Northeast Site Solutions, Sheldon J. Freincle

EXHIBIT A



SITE MAP

SCALE: N.T.S.

1
LE-1

CONFIGURATION

2C

SUBMITTALS	
LE REV A	02.11.14

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

LEASE EXHIBIT

SITE NUMBER:
CTNL058A

SITE NAME:
NL058/REDWOLF_ET

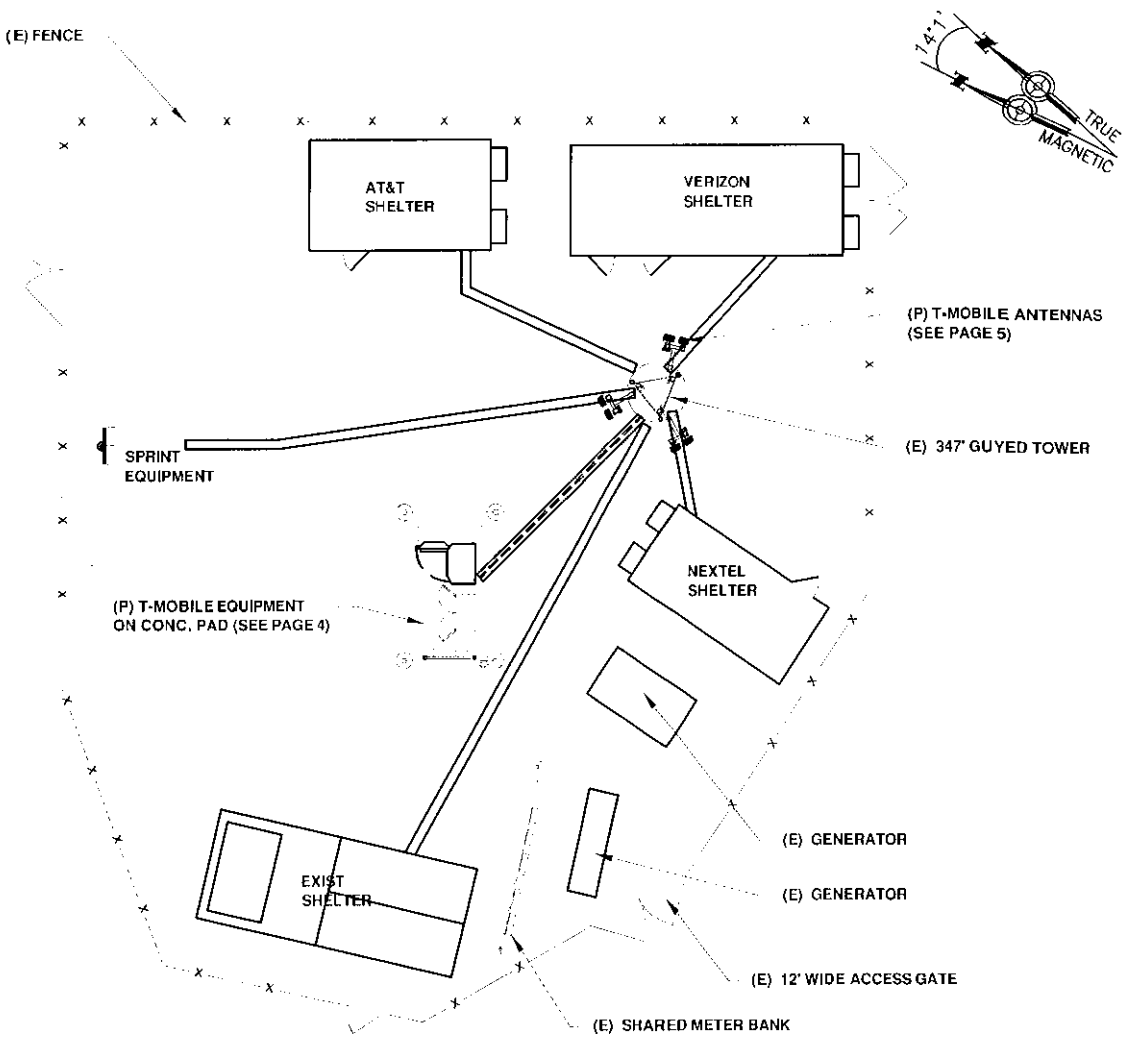
SITE ADDRESS:
889A COLONEL LEDYARD
HIGHWAY, LEDYARD,
CT, 06339

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

FOR

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

DRAWN BY: MB | CHECKED BY: SM



1
LE-3

COMPOUND LAYOUT PLAN 1 LE-2

SCALE: 1:20

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

CONFIGURATION

2C

SUBMITTALS	
LE REV A	02.11.14

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

LEASE EXHIBIT

SITE NUMBER:
CTNL058A

SITE NAME:
NL058/REDWOLF_ET

SITE ADDRESS:
889A COLONEL LEDYARD HIGHWAY, LEDYARD, CT, 06339

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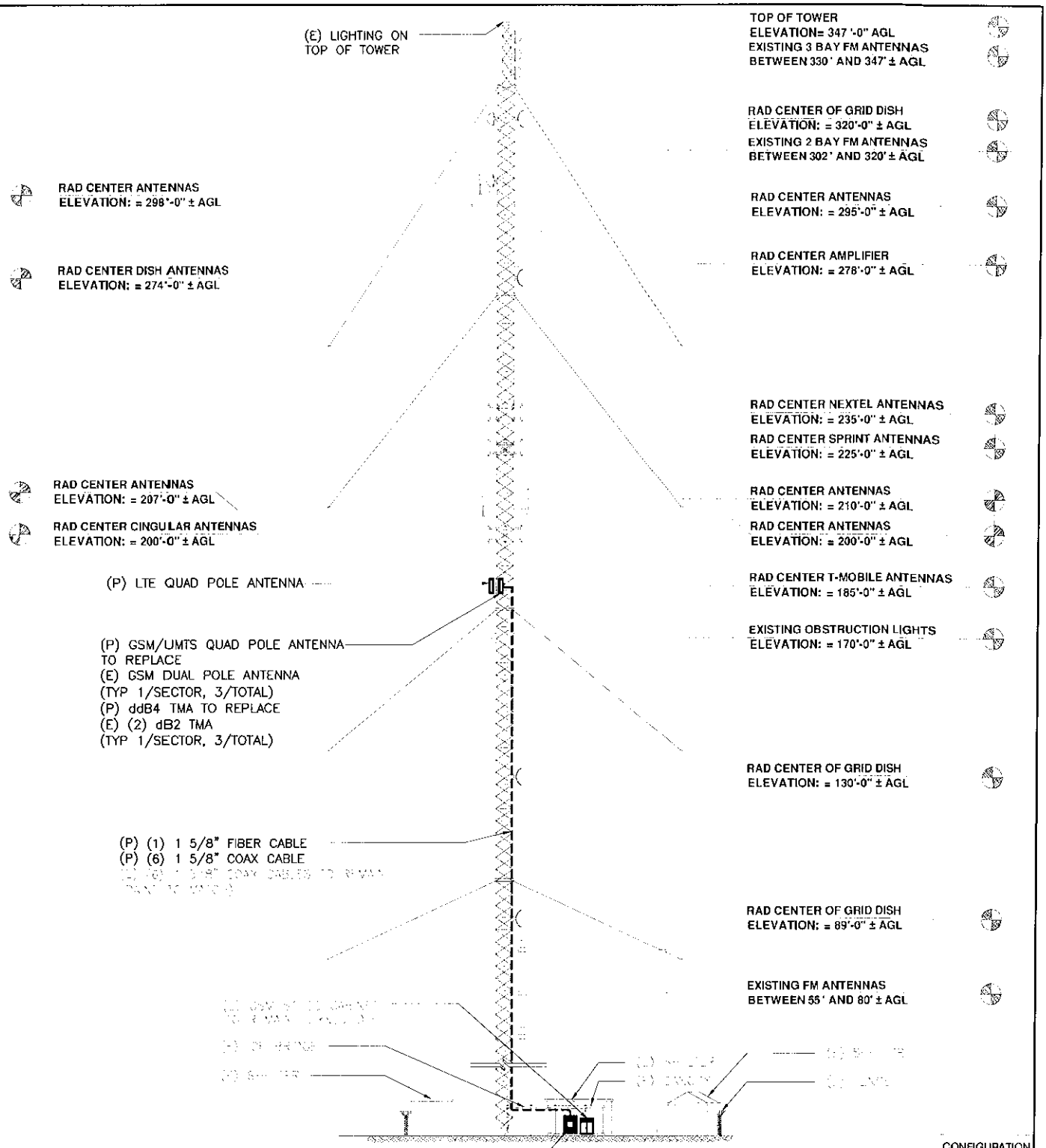

ELEVATION

SCALE: 1:40

CONFIGURATION

2C

SUBMITTALS		
LE REV A	02.11.14	

ATLANTIS GROUP
1340 Centre Street
Suite 212
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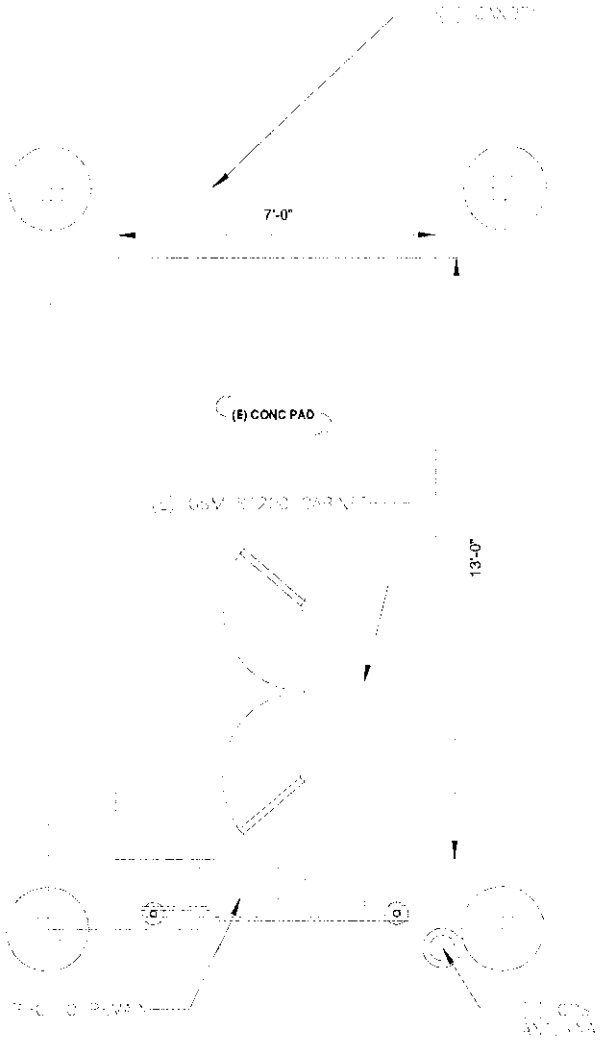
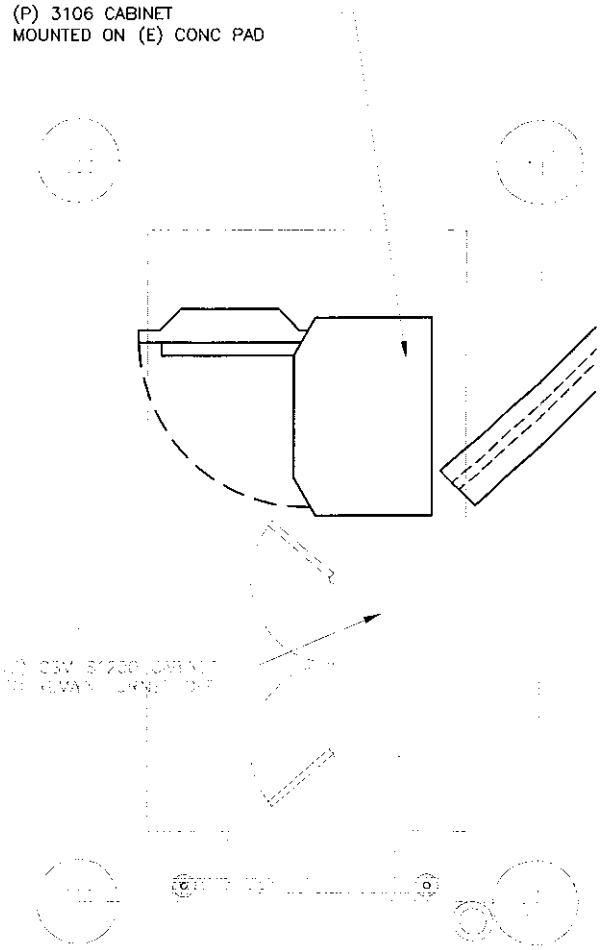


EQUIPMENT LAYOUT PLAN (BEFORE)

SCALE: 1/4" = 1'-0"



EQUIPMENT LAYOUT PLAN (AFTER)

SCALE: 1/4" = 1'-0"

CONFIGURATION

2C

SUBMITTALS	
LE REV A	02.11.14

ATLANTIS GROUP
1340 Centre Street
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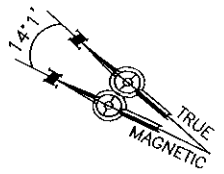
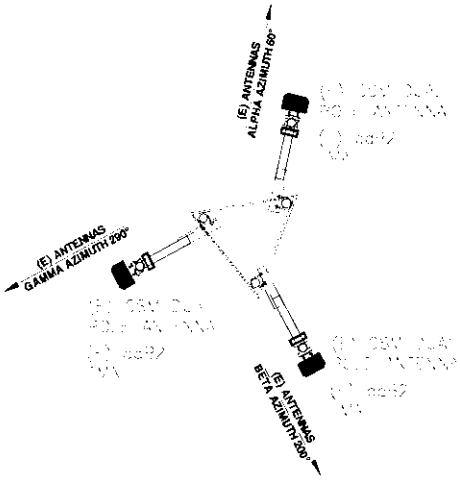
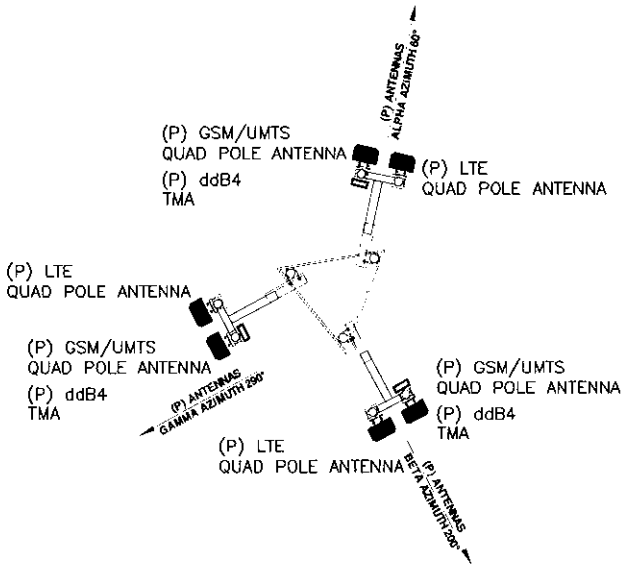




EXISTING ANTENNA CONFIGURATION



PROPOSED ANTENNA CONFIGURATION

CONFIGURATION

2C

SUBMITTALS	
LE REV A	02.11.14

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

LEASE EXHIBIT

SITE NUMBER:
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SITE NAME:
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(508) 434-5237

FOR

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

DRAWN BY: MB | CHECKED BY: SM

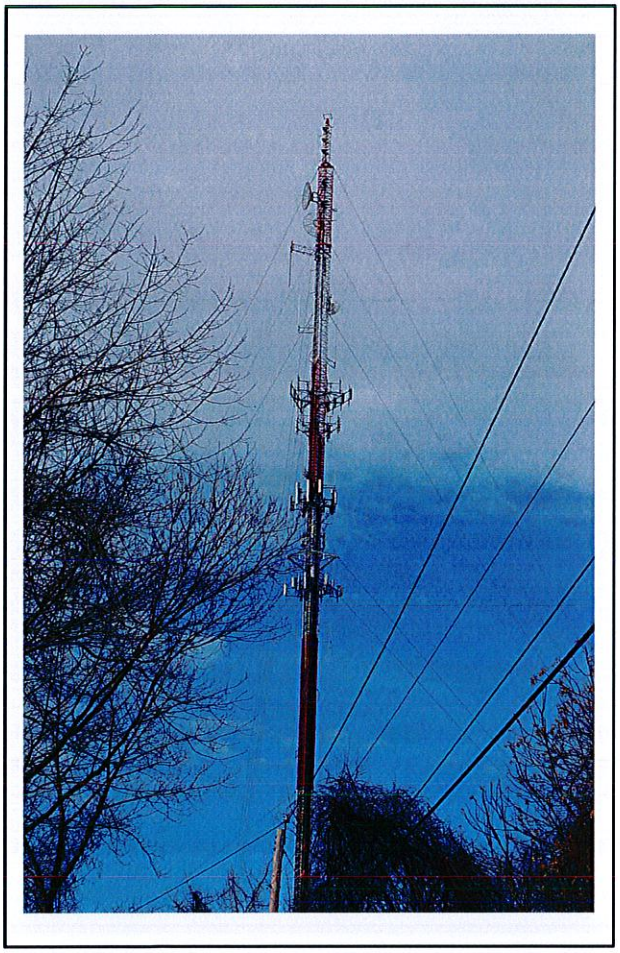
EXHIBIT B

STRUCTURAL ANALYSIS REPORT
GUYED TOWER

Prepared For:

T-Mobile

35 Griffin Road South
Bloomfield, CT 06002



Tower Rating

Tower:	**Pass (94.6 %)**
Foundation:	**Pass**

Atlantis Group, Inc.
2-26-2014

STATE OF CONNECTICUT
DANIEL V. KLEIN
No. 26725
LICENSED
PROFESSIONAL ENGINEER

02/28/2014

CT Professional Engineer
License No: 26725

Site ID: CTNL058A
Site Name: NL058/RedWolf_ET
889A Colonel Ledyard Hwy
Ledyard, CT 06339

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

CONTENTS

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the existing 350 feet high guyed tower, located at 889A Colonel Ledyard Highway, Ledyard, CT 06339, for the alteration and addition of wireless telecommunication appurtenances proposed by T-Mobile.

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

1. Structural Analysis Report prepared by Centek Engineering, Inc. for Verizon Wireless, Centek project No. 12001.C012, dated 01/25/2012.
2. Existing and proposed antenna information provided by T-Mobile.

1.1 STRUCTURE

The guyed tower is a 350 feet high, triangular tower manufactured by Pirod. Solid rod legs are X-braced the entire height of the tower with solid rod bracing. The tower is guyed at four (4) elevations at 100.3 feet, 178 feet, 132.2 feet, 269.6 feet and 329.5 feet above grade level. All guy wires are terminated at anchors 220 feet away from the tower. Please refer to the tower elevation drawing in Appendix A, for details about the tower geometry.

2.0 EXISTING AND PROPOSED CONFIGURATION

Antennas and Appurtenances:

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

Existing Configuration of T-MOBILE Appurtenances:

Sector	RAD Center (ft.)	Antenna & TMA		Mount	Feed Lines
Alpha	185	GSM Antenna TMA	(1) APX18-209014-C (2) dd B2	(1) Pipe Mount	(6) 1 5/8"
Beta	185	GSM Antenna TMA	(1) APX18-209014-C (2) dd B2	(1) Pipe Mount	
Gamma	185	GSM Antenna TMA	(1) APX18-209014-C (2) dd B2	(1) Pipe Mount	

Proposed Configuration of T-MOBILE Appurtenances:

Sector	RAD Center (ft.)	Antenna & TMA		Mount	Feed Lines
Alpha	185	GSM/UMTS Antenna LTE Antenna TMA	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P (1) dd B4	(1) Sector Mount	(12) 1 5/8" + (1) 1 5/8" Hybrid
Beta	185	GSM/UMTS Antenna LTE Antenna TMA	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P (1) dd B4	(1) Sector Mount	
Gamma	185	GSM/UMTS Antenna LTE Antenna TMA	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P (1) dd B4	(1) Sector Mount	

Existing and Remaining Appurtenances by Others:

RAD Center (ft.) Carrier	Antenna & TMA	Mount	Feed Lines
225 Nextel	(12) DB844H90E-XY	(3) Sector Mounts	(12) 1 5/8"
225 Sprint	(6) DB980H90E-M	(3) Sector Mounts	(6) 1 5/8"
200 AT&T	(6) DUO1417-8686 (3) 7770.00 (6) TMA (6) LGP21901 Diplexers	(3) Sector Mounts	(12) 1 5/8"
170 Verizon	(2) LPA-80080-4CF, (4) LPA-80063-4CF (3) BXA-171085-12CF (3) BXA-70063-6CF	(3) Sector Mounts	(12) 1 5/8"
339	LP-3E-Radomes	Directly to tower	(1) 1 5/8"
320	10' Dish	Standoff	(1) 1 5/8"
311	LP-3C-Radomes	Directly to tower	(1) 1 5/8"
310	10' Dish	Standoff	(1) 1 5/8"
295	(3) DB801KE-Y (1) PD220	(3) Side Arms	(3) 1 1/4" (1) 2 1/4"
275	6' Dish	Pipe Mount	(1) 1 1/4"
260	PD220	Side Arm	(1) 1 1/4"

250	PD220	Side Arm	(1) 1 1/4"
250	6' Dish	Directly to tower	none
207	PD1442	Side Arm	(1) 7/8"
205	PD1150	Side Arm	(1) 1/2"
150	10' Dipole	Directly to tower	(1) 1/2"
147	20' Omni	Side Arm	(1) 1 5/8"
130	6' Dish	Pipe Mount	(1) 1 5/8"
112	PR460	Directly to tower	(1) 7/8"
90	PR460	Directly to tower	(1) 7/8"
68	1105-3A Radome	Directly to tower	(1) 1 1/4"

3.0 CODES AND LOADING

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

- Basic wind speed 95 mph (W) without ice [fastest-mile speed equivalent to 115 mph 3-second gust].
- Basic wind speed 82.27 mph (W_i) with 1/2" radial and escalating ice.

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

- D + Dg + W
- D + Dg + I + W_i + 1.0Ti

D: Dead Load of structure and appurtenances, except guy wires
W: Wind Load, without ice
W_i: Wind Load with ice
I: Ice Gravity Load
Dg: Dead Load of guy assemblies

4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

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

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

Contractor should inspect the condition of the existing structure, mounts and connections and notify Atlantis Group for any discrepancies and deficiencies before proceeding with the construction.

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

5.0 ANALYSIS and ASSUMPTIONS

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

Tower member sizes, geometry and existing antenna loading are based on a structural analysis dated January 2012 and may not be up to date. We recommend a tower mapping to document that all information provided is accurate and that all members and connections are in good condition.

6.0 RESULTS and CONCLUSION

Based on an analysis per ANSI/TIA-222-F, the existing tower is found to have **adequate** structural capacity for the proposed changes by T-Mobile. For the aforementioned load combinations and as a maximum, the guy cables to 329' will be stressed to **94.6%** of capacity. Maximum usage of tower legs and bracing is 88% and 77%, respectively. According to foundation capacities from the 2012 analysis, the tower foundation system has adequate structural strength to support the proposed tower reactions.

Reactions:

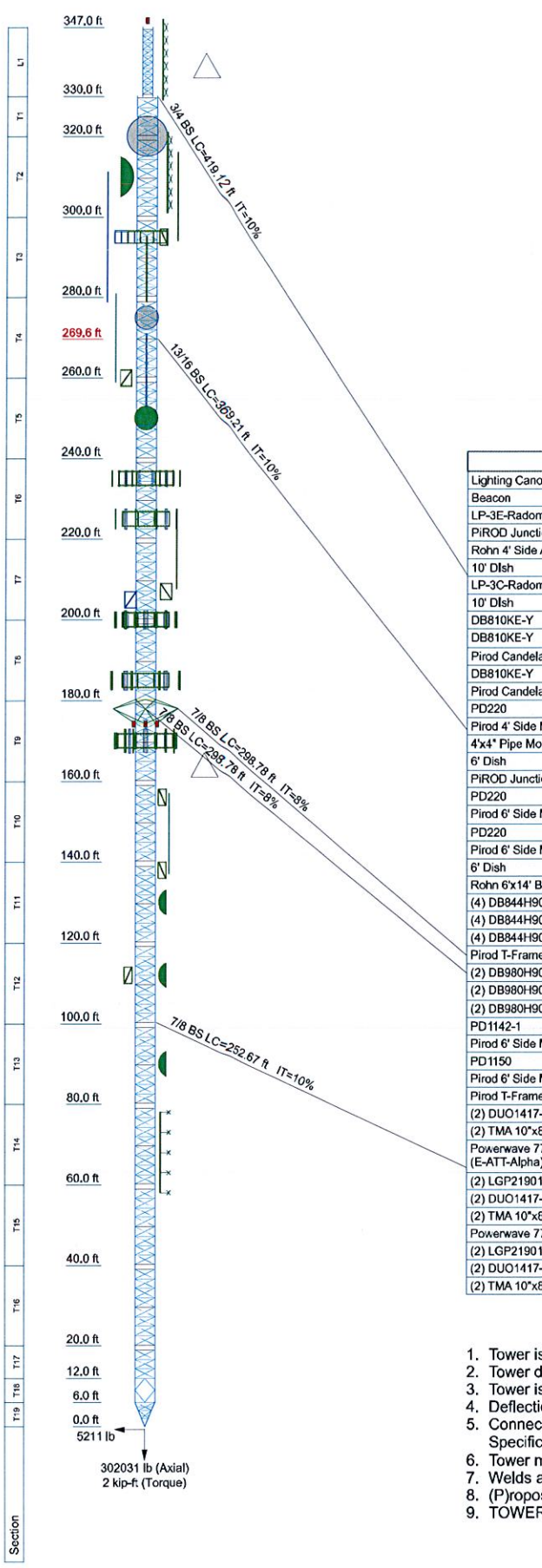
Maximums	Reaction	Allowable
Base Compression (kips)	298.0	381.9
Guy Anchor Horizontal (kips)	117.1	125.1
Guy Anchor Uplift (kips)	117.7	118.9

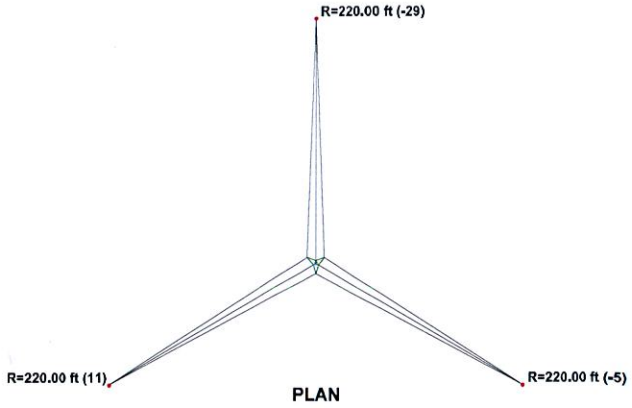
Therefore, the proposed additions and alterations by T-Mobile can be implemented with the conditions outlined in this report.

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

Sincerely,
Atlantis Group, Inc.

APPENDIX A
CALCULATIONS





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION
Lighting Canopy	350
Beacon	348
LP-3E-Radomes	339
PiROD Junction Box	330
Rohn 4' Side Arm	320
10' DIsh	320
LP-3C-Radomes	311
10' DIsh	310
DB810KE-Y	295
DB810KE-Y	295
Pirod Candelabra Arm (1)	295
DB810KE-Y	295
Pirod Candelabra Arm (1)	295
PD220	295
Pirod 4' Side Mount Standoff (1)	295
4'x4" Pipe Mount	275
6' Dish	275
PiROD Junction Box	260.25
PD220	260
Pirod 6' Side Mount Standoff (1)	260
PD220	250
Pirod 6' Side Mount Standoff (1)	250
6' Dish	250
Rohn 6'x14' Boom Gate (3)	235
(4) DB844H90E-XY (E-Nextel-Alpha)	235
(4) DB844H90E-XY (E-Nextel-Beta)	235
(4) DB844H90E-XY (E-Nextel-Gamma)	235
Pirod T-Frame Sector Mount (3)	225
(2) DB980H90E-M (E-Sprint-Alpha)	225
(2) DB980H90E-M (E-Sprint-Beta)	225
(2) DB980H90E-M (E-Sprint-Gamma)	225
PD1142-1	207
Pirod 6' Side Mount Standoff (1)	207
PD1150	205
Pirod 6' Side Mount Standoff (1)	205
Pirod T-Frame Sector Mount (3)	200
(2) DUO1417-8686 (E-ATT-Alpha)	200
(2) TMA 10"x8"x3" (E-ATT-Alpha)	200
Powerwave 7770.00 w. MtgPipe (E-ATT-Alpha)	200
(2) LGP21901 Diplexer (E-ATT-Alpha)	200
(2) DUO1417-8686 (E-ATT-Beta)	200
(2) TMA 10"x8"x3" (E-ATT-Beta)	200
Powerwave 7770.00 w. MtgPipe (E-ATT-Beta)	200
(2) LGP21901 Diplexer (E-ATT-Beta)	200
(2) DUO1417-8686 (E-ATT-Gamma)	200
(2) TMA 10"x8"x3" (E-ATT-Gamma)	200

TYPE	ELEVATION
Powerwave 7770.00 w. MtgPipe (E-ATT-Gamma)	200
(2) LGP21901 Diplexer (E-ATT-Gamma)	200
(3) Sector Mount (P-TMO)	185
(2) AIR21 B2A/B4P w. MtgPipe (P-TMO-Alpha)	185
AWS-PCS TMA (behind antenna) (P-TMO-Alpha)	185
(2) AIR21 B2A/B4P w. MtgPipe (P-TMO-Beta)	185
AWS-PCS TMA (behind antenna) (P-TMO-Beta)	185
(2) AIR21 B2A/B4P w. MtgPipe (P-TMO-Gamma)	185
AWS-PCS TMA (behind antenna) (P-TMO-Gamma)	185
Obstruction Light	173.5
Obstruction Light	173.5
PiROD Junction Box	173.5
Obstruction Light	173.5
Nudd 14' Boom (3)	170
(2) LPA-80080-4CF w. Mtg Pipe (E-VZW-Alpha)	170
BXA-171085-12CF w. Mtg Pipe (E-VZW-Alpha)	170
BXA-70063-6CF w. Mtg Pipe (E-VZW-Alpha)	170
(2) LPA-80063-4CF w. Mtg Pipe (E-VZW-Beta)	170
BXA-171085-12CF w. Mtg Pipe (E-VZW-Beta)	170
BXA-70063-6CF w. Mtg Pipe (E-VZW-Beta)	170
(2) LPA-80063-4CF w. Mtg Pipe (E-VZW-Gamma)	170
BXA-171085-12CF w. Mtg Pipe (E-VZW-Gamma)	170
BXA-70063-6CF w. Mtg Pipe (E-VZW-Gamma)	170
Pirod 4' Side Mount Standoff (1)	156
10' Dipole	150
20' x 3" Omni	147
Pirod 4' Side Mount Standoff (1)	138
6' Dish	130
PR-460	112
Pirod 4' Side Mount Standoff (1) (empty)	112
PR-460	90
PiROD Junction Box	86.75
1105-3A-Radomes	68

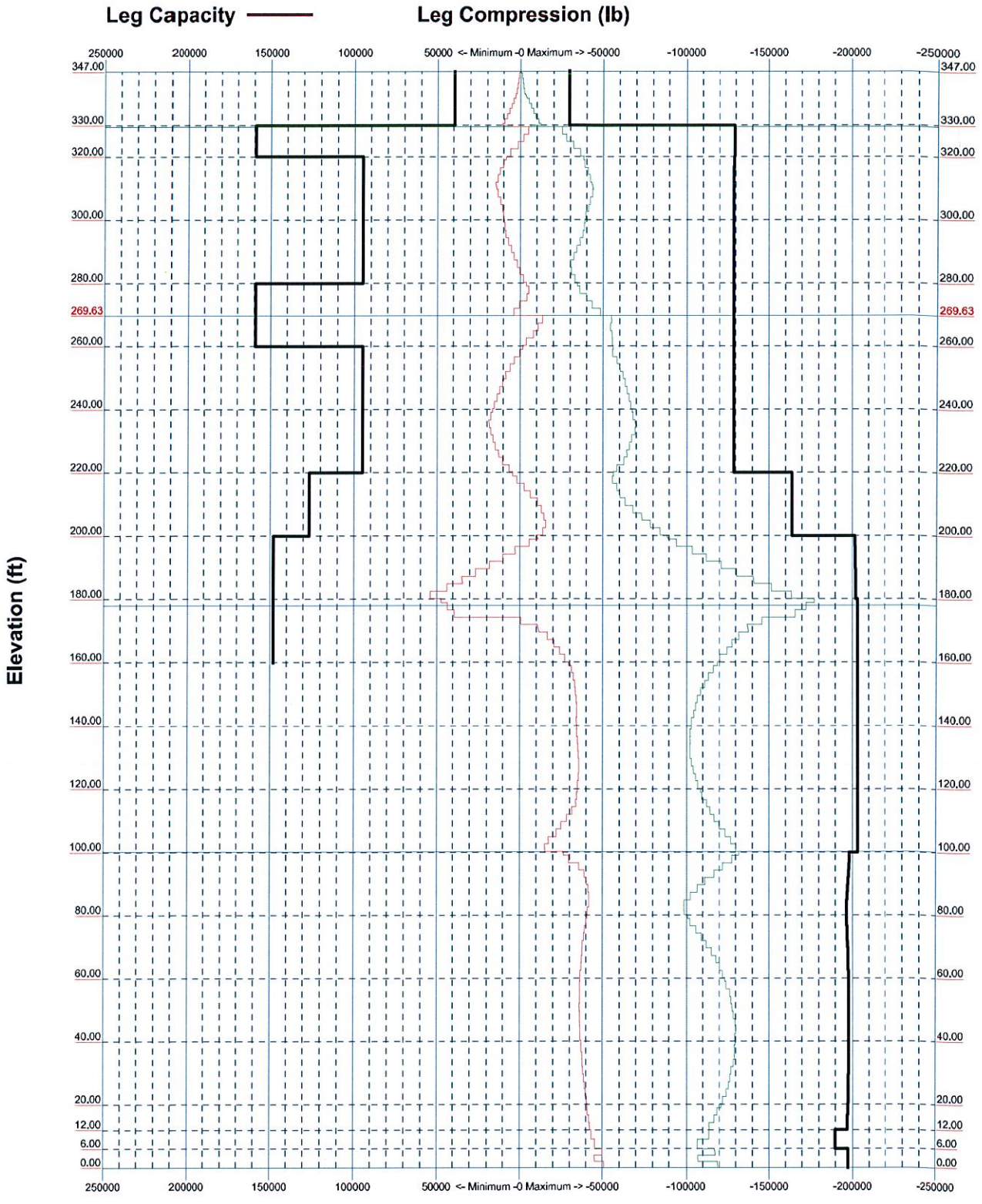
TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 95 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 82 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
6. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
7. Welds are fabricated with ER-70S-6 electrodes.
8. (P)roposed antenna loading for T-Mobile. All others are Existing.
9. TOWER RATING: 94.6%

ATLANTIS GROUP
Atlantis Group
1340 Centre St, Ste 212
Newton, MA 02459
Phone: (617) 965-0789
FAX: (617) 213-5056

Job: ***350' Guyed Tower Analysis***
Project: ***CTNL058A/Redwolf_ET***
Client: T-Mobile | Drawn by: DJH | App'd:
Code: TIA/EIA-222-F | Date: 02/27/14 | Scale: NTS
Path: Y:\Atlantis_Group\T-Mobile\CTNL058A 350GT\Feb2014 Analysis\tnx\350GT Ledyard.eri | Dwg No. E-1

TIA/EIA-222-F - 95 mph/82 mph 0.5000 in Ice



Atlantis Group
1340 Centre St, Ste 212
Newton, MA 02459
Phone: (617) 965-0789
FAX: (617) 213-5056

Job: **350' Guyed Tower Analysis**			
Project: ***CTNL058A/Redwolf_ET***			
Client: T-Mobile	Drawn by: DJH	App'd:	
Code: TIA/EIA-222-F	Date: 02/27/14	Scale: NTS	
Path: Y:\Atlantis_Group\T-Mobile\CTNL058A 350GT\Feb2014 Analysis\tnx\350GT Ledyard.eri		Dwg No. E-3	

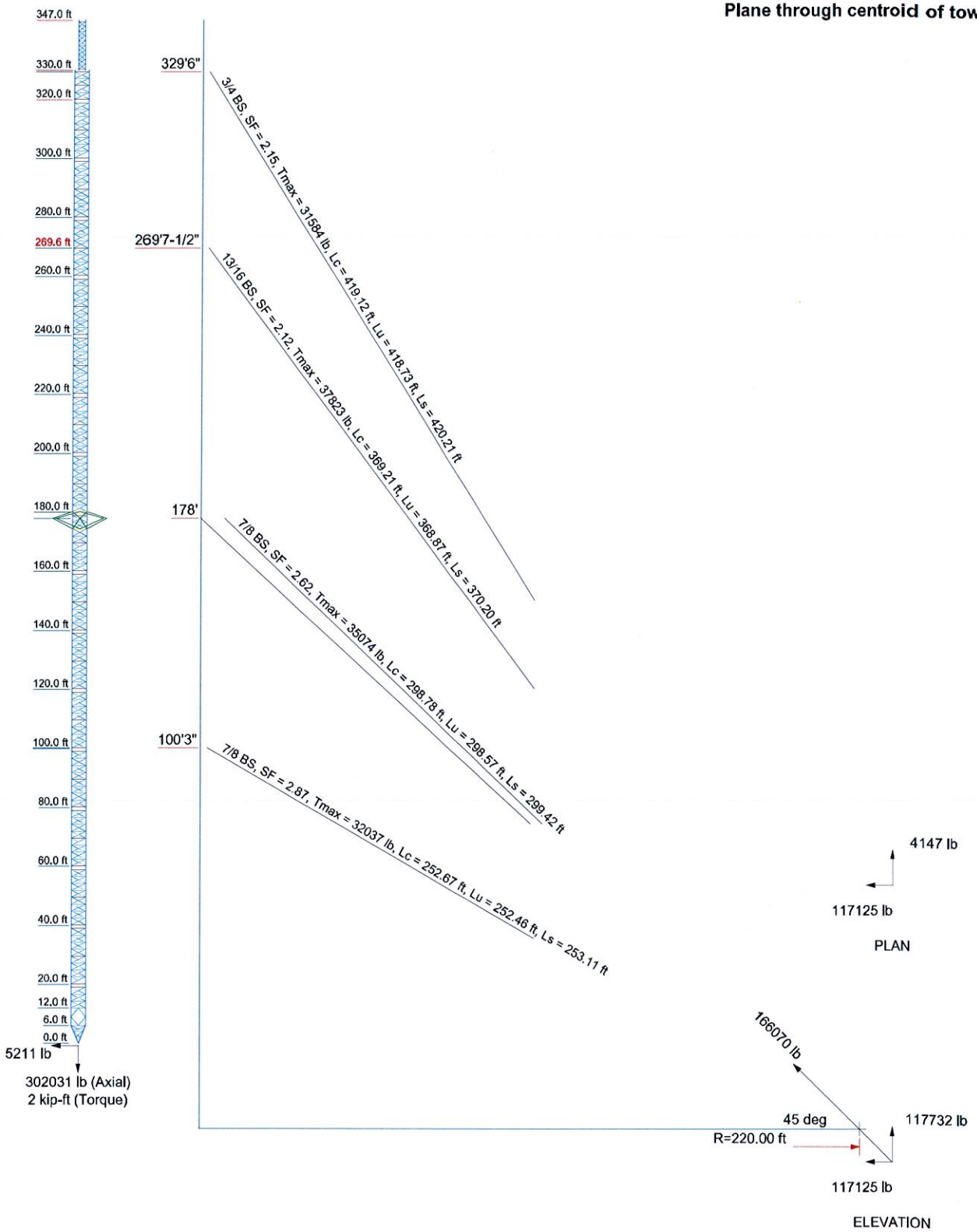
Guy Tensions and Tower Reactions

TIA/EIA-222-F - 95 mph/82 mph 0.5000 in Ice

Maximum Values

Anchor 'A'@220 ft Azimuth 0 deg Elev -29 ft

Plane through centroid of tower



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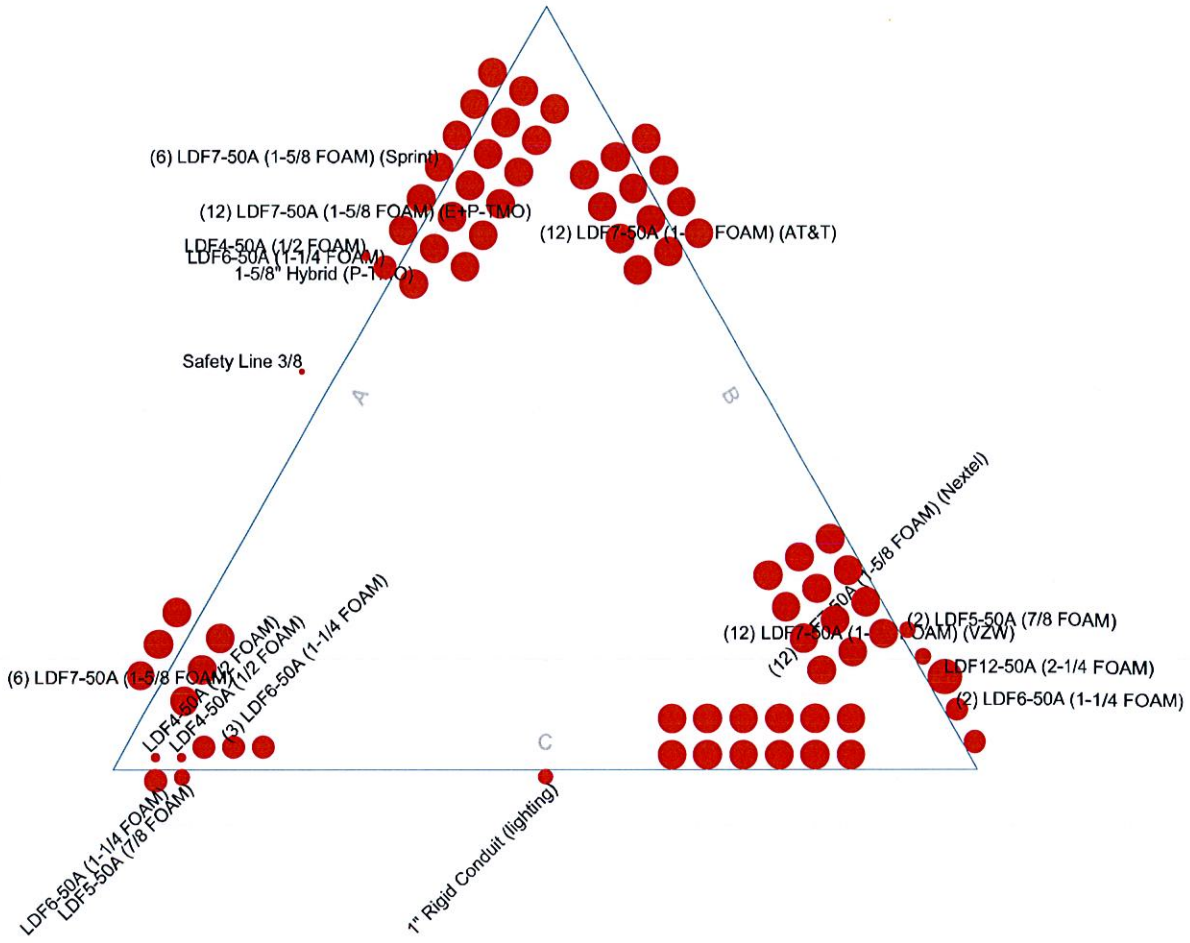
Job: *350' Guyed Tower Analysis*			
Project: *CTNL058A/Redwolf_ET*			
Client: T-Mobile	Drawn by: DJH	App'd:	
Code: TIA/EIA-222-F	Date: 02/27/14	Scale: NTS	
Path: Y:\Atlantis Group\T-Mobile\CTNL058A 350GT\Feb2014 Analysis\tnx\350GT Ledyard.eri		Dwg No. E-6	

Feed Line Plan

Round Flat App In Face App Out Face



ATLANTIS GROUP

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FAX: (617) 213-5056

Job: ***350' Guyed Tower Analysis***			
Project: ***CTNL058A/Redwolf_ET***			
Client: T-Mobile	Drawn by: DJH		App'd:
Code: TIA/EIA-222-F	Date: 02/27/14		Scale: NTS
Path: Y:\Atlantis_Group\T-Mobile\CTNL058A 350GT\Feb2014 Analysis\trx\350GT Ledyard.eri			Dwg No. E-7

tnxTower	Job	Page
	350' Guyed Tower Analysis	1 of 16
Atlantis Group 1340 Centre St, Ste 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-5056	Project CTNL058A/Redwolf_ET	Date 11:29:42 02/27/14
	Client T-Mobile	Designed by DJH

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice+Guy
3	Dead+Wind 30 deg - No Ice+Guy
4	Dead+Wind 60 deg - No Ice+Guy
5	Dead+Wind 90 deg - No Ice+Guy
6	Dead+Wind 120 deg - No Ice+Guy
7	Dead+Wind 150 deg - No Ice+Guy
8	Dead+Wind 180 deg - No Ice+Guy
9	Dead+Wind 210 deg - No Ice+Guy
10	Dead+Wind 240 deg - No Ice+Guy
11	Dead+Wind 270 deg - No Ice+Guy
12	Dead+Wind 300 deg - No Ice+Guy
13	Dead+Wind 330 deg - No Ice+Guy
14	Dead+Ice+Temp+Guy
15	Dead+Wind 0 deg+Ice+Temp+Guy
16	Dead+Wind 30 deg+Ice+Temp+Guy
17	Dead+Wind 60 deg+Ice+Temp+Guy
18	Dead+Wind 90 deg+Ice+Temp+Guy
19	Dead+Wind 120 deg+Ice+Temp+Guy
20	Dead+Wind 150 deg+Ice+Temp+Guy
21	Dead+Wind 180 deg+Ice+Temp+Guy
22	Dead+Wind 210 deg+Ice+Temp+Guy
23	Dead+Wind 240 deg+Ice+Temp+Guy
24	Dead+Wind 270 deg+Ice+Temp+Guy
25	Dead+Wind 300 deg+Ice+Temp+Guy
26	Dead+Wind 330 deg+Ice+Temp+Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	347 - 330	3.757	33	0.0353	0.2777
T1	330 - 320	3.754	33	0.0543	0.3959
T2	320 - 300	3.814	33	0.0508	0.4003
T3	300 - 280	3.876	33	0.0358	0.3485
T4	280 - 260	3.830	33	0.0303	0.3016
T5	260 - 240	3.754	33	0.0326	0.2424
T6	240 - 220	3.629	33	0.0581	0.1743
T7	220 - 200	3.304	33	0.0949	0.1049
T8	200 - 180	2.830	33	0.1060	0.0551
T9	180 - 160	2.379	33	0.0811	0.0268
T10	160 - 140	2.130	33	0.0606	0.0286

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T11	140 - 120	1.893	33	0.0594	0.0310
T12	120 - 100	1.636	33	0.0587	0.0468
T13	100 - 80	1.393	33	0.0457	0.0566
T14	80 - 60	1.254	33	0.0418	0.0655
T15	60 - 40	1.075	33	0.0557	0.0679
T16	40 - 20	0.803	33	0.0764	0.0615
T17	20 - 12	0.433	33	0.0948	0.0546
T18	12 - 6	0.261	33	0.0996	0.0511
T19	6 - 0	0.130	33	0.1018	0.0496

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
350.00	Lighting Canopy	33	3.757	0.0353	0.2777	49398
348.00	Beacon	33	3.757	0.0353	0.2777	49398
339.00	LP-3E-Radomes	33	3.743	0.0471	0.3453	30874
330.00	PiROD Junction Box	33	3.754	0.0543	0.3959	17424
329.50	Guy	33	3.756	0.0544	0.3973	17969
320.00	10' DIsh	33	3.814	0.0508	0.4003	45509
311.00	LP-3C-Radomes	33	3.858	0.0443	0.3803	34479
310.00	10' DIsh	33	3.861	0.0435	0.3775	34485
295.00	DB810KE-Y	33	3.872	0.0321	0.3358	46759
275.00	6' Dish	33	3.812	0.0307	0.2884	202697
269.63	Guy	33	3.792	0.0306	0.2728	165834
260.25	PiROD Junction Box	33	3.755	0.0325	0.2433	170874
260.00	PD220	33	3.754	0.0326	0.2424	180306
250.00	6' Dish	33	3.708	0.0423	0.2092	36140
235.00	Rohn 6'x14' Boom Gate (3)	33	3.568	0.0671	0.1562	19619
225.00	Pirod T-Frame Sector Mount (3)	33	3.404	0.0866	0.1209	23811
207.00	PD1142-1	33	3.005	0.1068	0.0704	53030
205.00	PD1150	33	2.955	0.1072	0.0658	62549
200.00	Pirod T-Frame Sector Mount (3)	33	2.830	0.1060	0.0551	138135
185.00	(3) Sector Mount	33	2.475	0.0886	0.0298	20223
178.00	Guy	33	2.346	0.0783	0.0262	17443
173.50	Obstruction Light	33	2.281	0.0724	0.0258	23954
170.00	Nudd 14' Boom (3)	33	2.238	0.0685	0.0262	34091
156.00	Pirod 4' Side Mount Standoff (1)	33	2.085	0.0591	0.0293	79924
150.00	10' Dipole	33	2.016	0.0584	0.0299	104372
147.00	20' x 3" Omni	33	1.979	0.0586	0.0300	123428
138.00	Pirod 4' Side Mount Standoff (1)	33	1.868	0.0597	0.0333	203635
130.00	6' Dish	33	1.767	0.0604	0.0405	183906
112.00	PR-460	33	1.530	0.0541	0.0509	80558
100.25	Guy	33	1.395	0.0458	0.0565	29328
90.00	PR-460	33	1.317	0.0415	0.0614	90869
86.75	PiROD Junction Box	33	1.297	0.0410	0.0629	397733
68.00	1105-3A-Radomes	33	1.157	0.0486	0.0681	52808

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T2	320	Leg	A325N	10	3830	18555	0.206 ✔	1.333	Bolt DS
T3	300	Leg	A325N	10	3895	18555	0.210 ✔	1.333	Bolt DS
T5	260	Leg	A325N	10	5585	18555	0.301 ✔	1.333	Bolt DS
T6	240	Leg	A325N	10	6742	18555	0.363 ✔	1.333	Bolt DS
T7	220	Leg	A325N	10	5609	18555	0.302 ✔	1.333	Bolt DS
T8	200	Leg	A325N	10	8940	25256	0.354 ✔	1.333	Bolt DS
T9	180	Leg	A325N	10	17756	25256	0.703 ✔	1.333	Bolt DS
T10	160	Leg	A325N	10	11854	25256	0.469 ✔	1.333	Bolt DS
T11	140	Leg	A325N	10	10301	25256	0.408 ✔	1.333	Bolt DS
T12	120	Leg	A325N	10	10858	25256	0.430 ✔	1.333	Bolt DS
T13	100	Leg	A325N	10	13185	25256	0.522 ✔	1.333	Bolt DS
T14	80	Leg	A325N	10	10073	25256	0.399 ✔	1.333	Bolt DS
T15	60	Leg	A325N	10	12314	25256	0.488 ✔	1.333	Bolt DS
T16	40	Leg	A325N	10	12959	25256	0.513 ✔	1.333	Bolt DS
T17	20	Leg	A325N	10	12069	25256	0.478 ✔	1.333	Bolt DS

Guy Design Data

Section No.	Elevation ft	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T1	329.50 (A) (1193)	6800	68000	31584	34000	2.000	2.153 ✔
	329.50 (B) (1192)	6800	68000	30189	34000	2.000	2.252 ✔
	329.50 (C) (1191)	6800	68000	31941	34000	2.000	2.129 ✔
T4	269.63 (A) (1196)	8000	80000	37823	40000	2.000	2.115 ✔
	269.63 (B) (1195)	8000	80000	36283	40000	2.000	2.205 ✔
	269.63 (C) (1194)	8000	80000	37162	40000	2.000	2.153 ✔
T9	178.00 (A) (1211)	7360	92000	34867	46000	2.000	2.639 ✔
	178.00 (A) (1212)	7360	92000	35074	46000	2.000	2.623 ✔
	178.00 (B) (1205)	7360	92000	33442	46000	2.000	2.751 ✔
	178.00 (B) (1206)	7360	92000	33316	46000	2.000	2.761 ✔
	178.00 (C) (1197)	7360	92000	32776	46000	2.000	2.807 ✔
	178.00 (C) (1198)	7360	92000	31550	46000	2.000	2.916 ✔
T12	100.25 (A) (1219)	9200	92000	32037	46000	2.000	2.872 ✔
	100.25 (B) (1218)	9200	92000	30773	46000	2.000	2.990 ✔
	100.25 (C) (1217)	9200	92000	29538	46000	2.000	3.115 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	17.00	1.60	61.4 K=1.00	1.00	22.470	1.2272	-12250	27575	0.444 ✓
T1	330 - 320	10.00	2.31	49.3 K=1.00	1.00	24.454	3.9761	-38298	97232	0.394 ✓
T2	320 - 300	20.00	2.34	50.0 K=1.00	1.00	24.351	3.9761	-44003	96820	0.454 ✓
T3	300 - 280	20.00	2.34	50.0 K=1.00	1.00	24.351	3.9761	-38954	96820	0.402 ✓
T4	280 - 260	20.00	2.34	50.0 K=1.00	1.00	24.351	3.9761	-55854	96820	0.577 ✓
T5	260 - 240	20.00	2.34	50.0 K=1.00	1.00	24.351	3.9761	-67415	96820	0.696 ✓
T6	240 - 220	20.00	2.34	50.0 K=1.00	1.00	24.351	3.9761	-69901	96820	0.722 ✓
T7	220 - 200	20.00	2.34	45.0 K=1.00	1.00	25.068	4.9087	-88576	123054	0.720 ✓
T8	200 - 180	20.00	2.34	40.9 K=1.00	0.99	25.558	5.9396	-177543	151803	1.170 ✓
T9	180 - 160	20.00	2.34	40.9 K=1.00	1.00	25.704	5.9396	-177561	152670	1.163 ✓
T10	160 - 140	20.00	2.34	40.9 K=1.00	1.00	25.704	5.9396	-118539	152670	0.776 ✓
T11	140 - 120	20.00	2.34	40.9 K=1.00	1.00	25.704	5.9396	-108559	152670	0.711 ✓
T12	120 - 100	20.00	2.34	40.9 K=1.00	1.00	25.704	5.9396	-131830	152670	0.863 ✓
T13	100 - 80	20.00	2.34	40.9 K=1.00	0.98	25.085	5.9396	-131849	148992	0.885 ✓
T14	80 - 60	20.00	2.34	40.9 K=1.00	0.97	24.986	5.9396	-123103	148409	0.829 ✓
T15	60 - 40	20.00	2.34	40.9 K=1.00	0.97	25.005	5.9396	-129846	148520	0.874 ✓
T16	40 - 20	20.00	2.34	40.9 K=1.00	0.97	25.001	5.9396	-129590	148497	0.873 ✓
T17	20 - 12	8.00	2.34	40.9 K=1.00	0.97	24.930	5.9396	-120689	148075	0.815 ✓
T18	12 - 6	6.00	3.00	52.4 K=1.00	1.00	23.978	5.9396	-113532	142419	0.797 ✓
T19	6 - 0	6.66	2.22	38.7 K=1.00	0.96	24.920	5.9396	-118682	148014	0.802 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	2.97	1.42	102.4 K=0.75	14.145	0.1963	-2268	2777	0.817 ✓

Section No.	Elevation ft	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	330 - 320	5.51	2.65	109.1 K=0.75	12.552	0.6013	-4324	7547	0.573 ✔
T2	320 - 300	5.52	2.66	109.3 K=0.75	12.492	0.6013	-6507	7511	0.866 ✔
T3	300 - 280	5.52	2.66	109.3 K=0.75	12.492	0.6013	-6604	7511	0.879 ✔
T4	280 - 260	5.52	2.66	109.3 K=0.75	12.492	0.6013	-6774	7511	0.902 ✔
T5	260 - 240	5.52	2.66	109.3 K=0.75	12.492	0.6013	-5230	7511	0.696 ✔
T6	240 - 220	5.52	2.66	109.3 K=0.75	12.492	0.6013	-6531	7511	0.870 ✔
T7	220 - 200	5.52	2.65	95.3 K=0.75	15.785	0.7854	-8455	12398	0.682 ✔
T8	200 - 180	5.52	2.63	87.8 K=0.87	17.411	1.2272	-10808	21367	0.506 ✔
T9	180 - 160	5.52	2.63	87.8 K=0.87	17.411	1.2272	-7535	21367	0.353 ✔
T10	160 - 140	5.52	2.63	94.8 K=0.75	15.878	0.7854	-4763	12470	0.382 ✔
T11	140 - 120	5.52	2.63	94.8 K=0.75	15.878	0.7854	-2898	12470	0.232 ✔
T12	120 - 100	5.52	2.63	94.8 K=0.75	15.878	0.7854	-3995	12470	0.320 ✔
T13	100 - 80	5.52	2.63	94.8 K=0.75	15.878	0.7854	-7066	12470	0.567 ✔
T14	80 - 60	5.52	2.63	94.8 K=0.75	15.878	0.7854	-5048	12470	0.405 ✔
T15	60 - 40	5.52	2.63	94.8 K=0.75	15.878	0.7854	-2450	12470	0.196 ✔
T16	40 - 20	5.52	2.63	94.8 K=0.75	15.878	0.7854	-3260	12470	0.261 ✔
T17	20 - 12	5.52	2.63	94.8 K=0.75	15.878	0.7854	-3643	12470	0.292 ✔
T18	12 - 6	3.91	3.73	100.2 K=0.70	14.669	1.2272	-4049	18002	0.225 ✔
T19	6 - 0	3.24	2.01	77.3 K=1.00	19.550	1.2272	-9820	23991	0.409 ✔

Horizontal Design Data (Compression)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	2.50	2.40	107.3 K=0.70	12.962	0.4418	-196	5727	0.034 ✔
T1	330 - 320	5.00	4.81	215.6 K=0.70	3.213	0.4418	-482	1419	0.340* ✔
T2	320 - 300	5.00	4.81	215.6 K=0.70	3.213	0.4418	-148	1419	0.104 ✔
T3	300 - 280	5.00	4.81	215.6 K=0.70	3.213	0.4418	-157	1419	0.111 ✔
T4	280 - 260	5.00	4.81	215.6 K=0.70	3.213	0.4418	-748	1419	0.527 ✔
T5	260 - 240	5.00	4.81	215.6 K=0.70	3.213	0.4418	-133	1419	0.094 ✔

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T6	240 - 220	5.00	4.81	215.6 K=0.70	3.213	0.4418	-263	1419	0.185 ✔
T7	220 - 200	5.00	4.79	214.7 K=0.70	3.241	0.4418	-20	1432	0.014 ✔
T8	200 - 180	5.00	4.77	213.7 K=0.70	3.269	0.4418	-185	1444	0.128 ✔
T12	120 - 100	5.00	4.77	213.7 K=0.70	3.269	0.4418	-705	1444	0.488 ✔
T18	12 - 6	5.00	2.39	132.2 K=1.00	8.543	4.5000	-2218	38443	0.058 ✔

* DL controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T19	6 - 0	4.00	3.77	84.5 K=0.35	18.105	0.4418	-2218	7998	0.277 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	2.50	2.40	107.3 K=0.70	12.962	0.4418	-166	5727	0.029 ✔
T2	320 - 300	5.00	4.81	161.7 K=0.70	5.711	0.7854	-628	4486	0.140 ✔
T3	300 - 280	5.00	4.81	161.7 K=0.70	5.711	0.7854	-692	4486	0.154 ✔
T4	280 - 260	5.00	4.81	161.7 K=0.70	5.711	0.7854	-1452	4486	0.324 ✔
T5	260 - 240	5.00	4.81	161.7 K=0.70	5.711	0.7854	-958	4486	0.214 ✔
T6	240 - 220	5.00	4.81	161.7 K=0.70	5.711	0.7854	-348	4486	0.078 ✔
T7	220 - 200	5.00	4.79	128.8 K=0.70	9.002	1.2272	-1529	11047	0.138 ✔
T8	200 - 180	5.00	4.77	106.9 K=0.70	13.076	1.7672	-2883	23107	0.125 ✔
T9	180 - 160	5.00	4.77	106.9 K=0.70	13.076	1.7672	-4795	23107	0.208 ✔
T10	160 - 140	5.00	4.77	128.2 K=0.70	9.080	1.2272	-1262	11143	0.113 ✔
T11	140 - 120	5.00	4.77	128.2 K=0.70	9.080	1.2272	-39	11143	0.003 ✔
T12	120 - 100	5.00	4.77	128.2 K=0.70	9.080	1.2272	-420	11143	0.038 ✔
T13	100 - 80	5.00	4.77	128.2 K=0.70	9.080	1.2272	-1250	11143	0.112 ✔

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T14	80 - 60	5.00	4.77	128.2 K=0.70	9.080	1.2272	-1156	11143	0.104 ✔
T15	60 - 40	5.00	4.77	128.2 K=0.70	9.080	1.2272	-89	11143	0.008 ✔
T17	20 - 12	5.00	4.77	128.2 K=0.70	9.080	1.2272	-185	11143	0.017 ✔

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	2.50	2.40	107.3 K=0.70	12.962	0.4418	-653	5727	0.114 ✔
T1	330 - 320	5.00	4.81	161.7 K=0.70	5.711	0.7854	-1293	4486	0.288 ✔
T2	320 - 300	5.00	4.81	161.7 K=0.70	5.711	0.7854	-824	4486	0.184 ✔
T3	300 - 280	5.00	4.81	161.7 K=0.70	5.711	0.7854	-1614	4486	0.360 ✔
T4	280 - 260	5.00	4.81	161.7 K=0.70	5.711	0.7854	-1230	4486	0.274 ✔
T5	260 - 240	5.00	4.81	161.7 K=0.70	5.711	0.7854	-693	4486	0.155 ✔
T6	240 - 220	5.00	4.81	161.7 K=0.70	5.711	0.7854	-1338	4486	0.298 ✔
T7	220 - 200	5.00	4.79	128.8 K=0.70	9.002	1.2272	-2444	11047	0.221 ✔
T9	180 - 160	5.00	4.77	106.9 K=0.70	13.076	1.7672	-932	23107	0.040 ✔
T11	140 - 120	5.00	4.77	128.2 K=0.70	9.080	1.2272	-519	11143	0.047 ✔
T13	100 - 80	5.00	4.77	128.2 K=0.70	9.080	1.2272	-1119	11143	0.100 ✔
T14	80 - 60	5.00	4.77	128.2 K=0.70	9.080	1.2272	-272	11143	0.024 ✔
T16	40 - 20	5.00	4.77	128.2 K=0.70	9.080	1.2272	-332	11143	0.030 ✔

Mid Girt Design Data (Compression)

Section No.	Elevation ft	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	330 - 320	5.00	4.81	161.7 K=0.70	5.711	0.7854	-101	4486	0.023 ✔
T2	320 - 300	5.00	4.81	161.7 K=0.70	5.711	0.7854	-411	4486	0.092 ✔
T3	300 - 280	5.00	4.81	161.7 K=0.70	5.711	0.7854	-4	4486	0.001 ✔
T5	260 - 240	5.00	4.81	161.7 K=0.70	5.711	0.7854	-65	4486	0.014 ✔

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T6	240 - 220	5.00	4.81	161.7 K=0.70	5.711	0.7854	-91	4486	0.020 ✔

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T18	12 - 6	2.50	2.50	112.0 K=0.70	11.905	0.4418	-2	5259	0.000 ✔

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	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	200 - 180	5.00	4.77	106.9 K=0.70	13.076	1.7672	-7735	23107	0.335 ✔

Bottom Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	180 - 160	5.00	4.77	106.9 K=0.70	13.076	1.7672	-17360	23107	0.751 ✔

Torque-Arm Bottom Design Data

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	180 - 160 (1201)	9.13	9.00	87.8 K=1.00	14.460	5.7200	-43964	82712	0.532 ✔
T9	180 - 160 (1202)	9.13	9.00	87.8 K=1.00	14.460	5.7200	-50175	82712	0.607 ✔
T9	180 - 160 (1209)	9.13	9.00	87.8 K=1.00	14.460	5.7200	-46233	82712	0.559 ✔
T9	180 - 160 (1210)	9.13	9.00	87.8 K=1.00	14.460	5.7200	-44371	82712	0.536 ✔
T9	180 - 160 (1215)	9.13	9.00	87.8 K=1.00	14.460	5.7200	-47825	82712	0.578 ✔
T9	180 - 160 (1216)	9.13	9.00	87.8 K=1.00	14.460	5.7200	-52477	82712	0.634 ✔

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	17.00	1.60	61.4	30.000	1.2272	10852	36816	0.295 ✔
T1	330 - 320	10.00	2.31	49.3	30.000	3.9761	8413	119282	0.071 ✔
T2	320 - 300	20.00	2.34	50.0	32.500	2.1885	15118	71126	0.213 ✔
T3	300 - 280	20.00	2.34	50.0	32.500	2.1885	9923	71126	0.140 ✔
T4	280 - 260	20.00	2.34	50.0	30.000	3.9761	3872	119282	0.032 ✔
T5	260 - 240	20.00	2.34	50.0	32.500	2.1885	16728	71126	0.235 ✔
T6	240 - 220	20.00	2.34	50.0	32.500	2.1885	19077	71126	0.268 ✔
T7	220 - 200	20.00	2.34	45.0	32.500	2.9138	4407	94700	0.047 ✔
T8	200 - 180	20.00	2.34	40.9	32.500	3.4123	54224	110900	0.489 ✔
T9	180 - 160	20.00	2.34	40.9	32.500	3.4123	47738	110900	0.430 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	2.97	1.42	136.5	30.000	0.1963	2210	5890	0.375 ✔
T1	330 - 320	5.51	2.65	145.4	30.000	0.6013	4375	18040	0.243 ✔
T2	320 - 300	5.52	2.66	145.8	30.000	0.6013	6269	18040	0.347 ✔
T3	300 - 280	5.52	2.66	145.8	30.000	0.6013	6319	18040	0.350 ✔
T4	280 - 260	5.52	2.66	145.8	30.000	0.6013	6372	18040	0.353 ✔
T5	260 - 240	5.52	2.66	145.8	30.000	0.6013	4594	18040	0.255 ✔
T6	240 - 220	5.52	2.66	145.8	30.000	0.6013	6270	18040	0.348 ✔
T7	220 - 200	5.52	2.65	127.0	30.000	0.7854	8201	23562	0.348 ✔
T8	200 - 180	5.52	2.63	101.2	30.000	1.2272	10463	36816	0.284 ✔
T9	180 - 160	5.52	2.63	101.2	30.000	1.2272	6784	36816	0.184 ✔
T10	160 - 140	5.52	2.63	126.5	30.000	0.7854	4051	23562	0.172 ✔
T11	140 - 120	5.52	2.63	126.5	30.000	0.7854	2242	23562	0.095 ✔
T12	120 - 100	5.52	2.63	126.5	30.000	0.7854	3427	23562	0.145 ✔
T13	100 - 80	5.52	2.63	126.5	30.000	0.7854	5821	23562	0.247 ✔

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
T14	80 - 60	5.52	2.63	126.5	30.000	0.7854	3606	23562	0.153 ✓
T15	60 - 40	5.52	2.63	126.5	30.000	0.7854	1367	23562	0.058 ✓
T16	40 - 20	5.52	2.63	126.5	30.000	0.7854	2041	23562	0.087 ✓
T17	20 - 12	5.52	2.63	126.5	30.000	0.7854	1700	23562	0.072 ✓
T18	12 - 6	3.91	3.73	143.1	30.000	1.2272	3836	36816	0.104 ✓

Horizontal Design Data (Tension)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
L1	347 - 330	2.50	2.40	153.3	30.000	0.4418	266	13254	0.020 ✓
T1	330 - 320	5.00	4.81	308.0	30.000	0.4418	393	13254	0.030 ✓
T2	320 - 300	5.00	4.81	308.0	30.000	0.4418	719	13254	0.054 ✓
T3	300 - 280	5.00	4.81	308.0	30.000	0.4418	770	13254	0.058 ✓
T4	280 - 260	5.00	4.81	308.0	30.000	0.4418	997	13254	0.075 ✓
T5	260 - 240	5.00	4.81	308.0	30.000	0.4418	1322	13254	0.100 ✓
T6	240 - 220	5.00	4.81	308.0	30.000	0.4418	1423	13254	0.107 ✓
T7	220 - 200	5.00	4.79	306.7	30.000	0.4418	1212	13254	0.091 ✓
T8	200 - 180	5.00	4.77	305.3	30.000	0.4418	1601	13254	0.121 ✓
T9	180 - 160	5.00	4.77	305.3	30.000	0.4418	2030	13254	0.153 ✓
T10	160 - 140	5.00	4.77	305.3	30.000	0.4418	1295	13254	0.098 ✓
T11	140 - 120	5.00	4.77	305.3	30.000	0.4418	1295	13254	0.098 ✓
T12	120 - 100	5.00	4.77	305.3	30.000	0.4418	1499	13254	0.113 ✓
T13	100 - 80	5.00	4.77	305.3	30.000	0.4418	1595	13254	0.120 ✓
T14	80 - 60	5.00	4.77	305.3	30.000	0.4418	1833	13254	0.138 ✓
T15	60 - 40	5.00	4.77	305.3	30.000	0.4418	1783	13254	0.134 ✓
T16	40 - 20	5.00	4.77	305.3	30.000	0.4418	1850	13254	0.140 ✓
T17	20 - 12	5.00	4.77	305.3	30.000	0.4418	1572	13254	0.119 ✓
T18	12 - 6	5.00	2.39	132.2	21.600	4.5000	30867	97200	0.318 ✓
T19	6 - 0	1.67	1.44	79.7	21.600	4.5000	8984	97200	0.092 ✓

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
T19	6 - 0	2.22	1.99	127.6	30.000	0.4418	2218	13254	0.167 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	2.50	2.40	153.3	30.000	0.4418	163	13254	0.012 ✓
T1	330 - 320	5.00	4.81	231.0	30.000	0.7854	7310	23562	0.310 ✓
T2	320 - 300	5.00	4.81	231.0	30.000	0.7854	687	23562	0.029 ✓
T3	300 - 280	5.00	4.81	231.0	30.000	0.7854	1055	23562	0.045 ✓
T4	280 - 260	5.00	4.81	231.0	30.000	0.7854	1928	23562	0.082 ✓
T5	260 - 240	5.00	4.81	231.0	30.000	0.7854	1410	23562	0.060 ✓
T6	240 - 220	5.00	4.81	231.0	30.000	0.7854	709	23562	0.030 ✓
T7	220 - 200	5.00	4.79	184.0	30.000	1.2272	2210	36816	0.060 ✓
T8	200 - 180	5.00	4.77	152.7	30.000	1.7672	3619	53014	0.068 ✓
T9	180 - 160	5.00	4.77	152.7	30.000	1.7672	4958	53014	0.094 ✓
T10	160 - 140	5.00	4.77	183.2	30.000	1.2272	1797	36816	0.049 ✓
T11	140 - 120	5.00	4.77	183.2	30.000	1.2272	875	36816	0.024 ✓
T12	120 - 100	5.00	4.77	183.2	30.000	1.2272	1523	36816	0.041 ✓
T13	100 - 80	5.00	4.77	183.2	30.000	1.2272	2938	36816	0.080 ✓
T14	80 - 60	5.00	4.77	183.2	30.000	1.2272	2020	36816	0.055 ✓
T15	60 - 40	5.00	4.77	183.2	30.000	1.2272	1149	36816	0.031 ✓
T16	40 - 20	5.00	4.77	183.2	30.000	1.2272	1355	36816	0.037 ✓
T17	20 - 12	5.00	4.77	183.2	30.000	1.2272	2044	36816	0.056 ✓

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	347 - 330	2.50	2.40	153.3	30.000	0.4418	753	13254	0.057 ✓
T1	330 - 320	5.00	4.81	231.0	30.000	0.7854	1513	23562	0.064 ✓
T2	320 - 300	5.00	4.81	231.0	30.000	0.7854	703	23562	0.030 ✓
T3	300 - 280	5.00	4.81	231.0	30.000	0.7854	1728	23562	0.073 ✓
T4	280 - 260	5.00	4.81	231.0	30.000	0.7854	1743	23562	0.074 ✓
T5	260 - 240	5.00	4.81	231.0	30.000	0.7854	1090	23562	0.046 ✓
T6	240 - 220	5.00	4.81	231.0	30.000	0.7854	1576	23562	0.067 ✓
T7	220 - 200	5.00	4.79	184.0	30.000	1.2272	2618	36816	0.071 ✓
T9	180 - 160	5.00	4.77	152.7	30.000	1.7672	2185	53014	0.041 ✓
T10	160 - 140	5.00	4.77	183.2	30.000	1.2272	1002	36816	0.027 ✓
T11	140 - 120	5.00	4.77	183.2	30.000	1.2272	1519	36816	0.041 ✓
T12	120 - 100	5.00	4.77	183.2	30.000	1.2272	14507	36816	0.394 ✓

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T13	100 - 80	5.00	4.77	183.2	30.000	1.2272	2440	36816	0.066 ✓
T14	80 - 60	5.00	4.77	183.2	30.000	1.2272	1658	36816	0.045 ✓
T15	60 - 40	5.00	4.77	183.2	30.000	1.2272	928	36816	0.025 ✓
T16	40 - 20	5.00	4.77	183.2	30.000	1.2272	1457	36816	0.040 ✓

Mid Girt Design Data (Tension)

Section No.	Elevation ft	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	330 - 320	5.00	4.81	231.0	30.000	0.7854	941	23562	0.040 ✓
T2	320 - 300	5.00	4.81	231.0	30.000	0.7854	811	23562	0.034 ✓
T3	300 - 280	5.00	4.81	231.0	30.000	0.7854	566	23562	0.024 ✓
T4	280 - 260	5.00	4.81	231.0	30.000	0.7854	9437	23562	0.401 ✓
T5	260 - 240	5.00	4.81	231.0	30.000	0.7854	1278	23562	0.054 ✓
T6	240 - 220	5.00	4.81	231.0	30.000	0.7854	1155	23562	0.049 ✓
T7	220 - 200	5.00	4.79	184.0	30.000	1.2272	971	36816	0.026 ✓
T8	200 - 180	5.00	4.77	152.7	30.000	1.7672	1662	53014	0.031 ✓
T9	180 - 160	5.00	4.77	152.7	30.000	1.7672	1649	53014	0.031 ✓
T10	160 - 140	5.00	4.77	183.2	30.000	1.2272	1295	36816	0.035 ✓
T11	140 - 120	5.00	4.77	183.2	30.000	1.2272	1367	36816	0.037 ✓
T12	120 - 100	5.00	4.77	183.2	30.000	1.2272	1573	36816	0.043 ✓
T13	100 - 80	5.00	4.77	183.2	30.000	1.2272	1498	36816	0.041 ✓
T14	80 - 60	5.00	4.77	183.2	30.000	1.2272	1799	36816	0.049 ✓
T15	60 - 40	5.00	4.77	183.2	30.000	1.2272	1952	36816	0.053 ✓
T16	40 - 20	5.00	4.77	183.2	30.000	1.2272	1921	36816	0.052 ✓

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T18	12 - 6	2.50	2.50	160.0	30.000	0.4418	8	13254	0.001 ✓

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	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	200 - 180	5.00	4.77	152.7	30.000	1.7672	16418	53014	0.310 ✓

Bottom Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	180 - 160	5.00	4.77	152.7	30.000	1.7672	12119	53014	0.229 ✓

Torque-Arm Top Design Data

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	180 - 160 (1199)	8.65	8.53	83.2	21.600	5.7200	31273	123552	0.253 ✓
T9	180 - 160 (1200)	8.65	8.53	83.2	21.600	5.7200	39508	123552	0.320 ✓
T9	180 - 160 (1207)	8.65	8.53	83.2	21.600	5.7200	32952	123552	0.267 ✓
T9	180 - 160 (1208)	8.65	8.53	83.2	21.600	5.7200	33329	123552	0.270 ✓
T9	180 - 160 (1213)	8.65	8.53	83.2	21.600	5.7200	32505	123552	0.263 ✓
T9	180 - 160 (1214)	8.65	8.53	83.2	21.600	5.7200	38471	123552	0.311 ✓

Torque-Arm Bottom Design Data

Section No.	Elevation ft	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	180 - 160 (1201)	9.13	9.00	87.8	21.600	5.7200	16145	123552	0.131 ✓
T9	180 - 160 (1202)	9.13	9.00	87.8	21.600	5.7200	15687	123552	0.127 ✓
T9	180 - 160 (1209)	9.13	9.00	87.8	21.600	5.7200	17230	123552	0.139 ✓
T9	180 - 160 (1210)	9.13	9.00	87.8	21.600	5.7200	16908	123552	0.137 ✓
T9	180 - 160 (1215)	9.13	9.00	87.8	21.600	5.7200	17259	123552	0.140 ✓
T9	180 - 160 (1216)	9.13	9.00	87.8	21.600	5.7200	16708	123552	0.135 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	347 - 330	Latticed Pole Leg	2	-12250	29406	41.7	Pass
L1	347 - 330	Latticed Pole Diagonal	13	-2268	2962	76.6	Pass
L1	347 - 330	Latticed Pole Horizontal	23	-196	6107	3.2	Pass
L1	347 - 330	Latticed Pole Top Girt	6	-166	6107	2.7	Pass
L1	347 - 330	Latticed Pole Bottom Girt	9	-653	6107	10.7	Pass
T1	330 - 320	Leg	79	-38298	129610	29.5	Pass
T2	320 - 300	Leg	117	-44003	129061	34.1	Pass
T3	300 - 280	Leg	185	-38954	129061	30.2	Pass
T4	280 - 260	Leg	250	-55854	129061	43.3	Pass
T5	260 - 240	Leg	317	-67415	129061	52.2	Pass
T6	240 - 220	Leg	383	-69901	129061	54.2	Pass
T7	220 - 200	Leg	448	-88576	164031	54.0	Pass
T8	200 - 180	Leg	514	-177543	202353	87.7	Pass
T9	180 - 160	Leg	580	-177561	203509	87.2	Pass
T10	160 - 140	Leg	646	-118539	203509	58.2	Pass
T11	140 - 120	Leg	712	-108559	203509	53.3	Pass
T12	120 - 100	Leg	778	-131830	203509	64.8	Pass
T13	100 - 80	Leg	844	-131849	198606	66.4	Pass
T14	80 - 60	Leg	911	-123103	197829	62.2	Pass
T15	60 - 40	Leg	977	-129846	197977	65.6	Pass
T16	40 - 20	Leg	1043	-129590	197946	65.5	Pass
T17	20 - 12	Leg	1109	-120689	197384	61.1	Pass
T18	12 - 6	Leg	1139	-113532	189845	59.8	Pass
T19	6 - 0	Leg	1166	-118682	197303	60.2	Pass
T1	330 - 320	Diagonal	109	-4324	10061	43.0	Pass
T2	320 - 300	Diagonal	177	-6507	10013	65.0	Pass
T3	300 - 280	Diagonal	197	-6604	10013	66.0	Pass
T4	280 - 260	Diagonal	311	-6774	10013	67.7	Pass
T5	260 - 240	Diagonal	377	-5230	10013	52.2	Pass
T6	240 - 220	Diagonal	397	-6531	10013	65.2	Pass
T7	220 - 200	Diagonal	463	-8455	16526	51.2	Pass
T8	200 - 180	Diagonal	575	-10808	28482	37.9	Pass
T9	180 - 160	Diagonal	625	-7535	28482	26.5	Pass
T10	160 - 140	Diagonal	707	-4763	16623	28.7	Pass
T11	140 - 120	Diagonal	728	-2898	16623	17.4	Pass
T12	120 - 100	Diagonal	801	-3995	16623	24.0	Pass
T13	100 - 80	Diagonal	903	-7066	16623	42.5	Pass
T14	80 - 60	Diagonal	969	-5048	16623	30.4	Pass
T15	60 - 40	Diagonal	1035	-2450	16623	14.7	Pass
T16	40 - 20	Diagonal	1053	-3260	16623	19.6	Pass
T17	20 - 12	Diagonal	1133	-3643	16623	21.9	Pass
T18	12 - 6	Diagonal	1144	-4049	23997	16.9	Pass
T19	6 - 0	Diagonal	1174	-9820	31980	30.7	Pass
T1	330 - 320	Horizontal	110	-482	1419	34.0	Pass
T2	320 - 300	Horizontal	176	-148	1892	7.8	Pass
T3	300 - 280	Horizontal	235	-157	1892	8.3	Pass
T4	280 - 260	Horizontal	294	-748	1892	39.5	Pass
T5	260 - 240	Horizontal	374	1322	17667	7.5	Pass
T6	240 - 220	Horizontal	433	-263	1892	13.9	Pass
T7	220 - 200	Horizontal	465	1212	17667	6.9	Pass
T8	200 - 180	Horizontal	572	-185	1925	9.6	Pass
T9	180 - 160	Horizontal	624	2030	17667	11.5	Pass
T10	160 - 140	Horizontal	704	1295	17667	7.3	Pass
T11	140 - 120	Horizontal	729	1295	17667	7.3	Pass
T12	120 - 100	Horizontal	795	-705	1925	36.6	Pass
T13	100 - 80	Horizontal	861	1595	17667	9.0	Pass
T14	80 - 60	Horizontal	968	1833	17667	10.4	Pass
T15	60 - 40	Horizontal	1034	1783	17667	10.1	Pass

Section No.	Elevation ft	Component Type	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T16	40 - 20	Horizontal	1059	1850	17667	10.5	Pass
T17	20 - 12	Horizontal	1121	1572	17667	8.9	Pass
T18	12 - 6	Horizontal	1143	30867	129568	23.8	Pass
T19	6 - 0	Horizontal	1169	8984	129568	6.9	Pass
T19	6 - 0	Secondary Horizontal	1189	-2218	10662	20.8	Pass
T1	330 - 320	Top Girt	84	7310	31408	23.3	Pass
T2	320 - 300	Top Girt	122	-628	5979	10.5	Pass
T3	300 - 280	Top Girt	187	-692	5979	11.6	Pass
T4	280 - 260	Top Girt	253	-1452	5979	24.3	Pass
T5	260 - 240	Top Girt	319	-958	5979	16.0	Pass
T6	240 - 220	Top Girt	385	-348	5979	5.8	Pass
T7	220 - 200	Top Girt	452	-1529	14725	10.4	Pass
T8	200 - 180	Top Girt	518	-2883	30801	9.4	Pass
T9	180 - 160	Top Girt	584	-4795	30801	15.6	Pass
T10	160 - 140	Top Girt	650	-1262	14854	8.5	Pass
T11	140 - 120	Top Girt	714	875	49075	1.8	Pass
T12	120 - 100	Top Girt	780	1523	49075	3.1	Pass
T13	100 - 80	Top Girt	848	-1250	14854	8.4	Pass
T14	80 - 60	Top Girt	914	-1156	14854	7.8	Pass
T15	60 - 40	Top Girt	978	1149	49075	2.3	Pass
T16	40 - 20	Top Girt	1044	1355	49075	2.8	Pass
T17	20 - 12	Top Girt	1110	2044	49075	4.2	Pass
T1	330 - 320	Bottom Girt	86	-1293	5979	21.6	Pass
T2	320 - 300	Bottom Girt	125	-824	5979	13.8	Pass
T3	300 - 280	Bottom Girt	191	-1614	5979	27.0	Pass
T4	280 - 260	Bottom Girt	256	-1230	5979	20.6	Pass
T5	260 - 240	Bottom Girt	322	-693	5979	11.6	Pass
T6	240 - 220	Bottom Girt	389	-1338	5979	22.4	Pass
T7	220 - 200	Bottom Girt	455	-2444	14725	16.6	Pass
T9	180 - 160	Bottom Girt	585	2185	70668	3.1	Pass
T10	160 - 140	Bottom Girt	651	1002	49075	2.0	Pass
T11	140 - 120	Bottom Girt	718	-519	14854	3.5	Pass
T12	120 - 100	Bottom Girt	784	14507	49075	29.6	Pass
T13	100 - 80	Bottom Girt	850	-1119	14854	7.5	Pass
T14	80 - 60	Bottom Girt	915	1658	49075	3.4	Pass
T15	60 - 40	Bottom Girt	981	928	49075	1.9	Pass
T16	40 - 20	Bottom Girt	1047	1457	49075	3.0	Pass
T1	330 - 320	Mid Girt	90	941	31408	3.0	Pass
T2	320 - 300	Mid Girt	127	-411	5979	6.9	Pass
T3	300 - 280	Mid Girt	192	566	31408	1.8	Pass
T4	280 - 260	Mid Girt	260	9437	31408	30.0	Pass
T5	260 - 240	Mid Girt	324	1278	31408	4.1	Pass
T6	240 - 220	Mid Girt	390	1155	31408	3.7	Pass
T7	220 - 200	Mid Girt	456	971	49075	2.0	Pass
T8	200 - 180	Mid Girt	522	1662	70668	2.4	Pass
T9	180 - 160	Mid Girt	588	1649	70668	2.3	Pass
T10	160 - 140	Mid Girt	654	1295	49075	2.6	Pass
T11	140 - 120	Mid Girt	720	1367	49075	2.8	Pass
T12	120 - 100	Mid Girt	786	1573	49075	3.2	Pass
T13	100 - 80	Mid Girt	852	1498	49075	3.1	Pass
T14	80 - 60	Mid Girt	918	1799	49075	3.7	Pass
T15	60 - 40	Mid Girt	984	1952	49075	4.0	Pass
T16	40 - 20	Mid Girt	1050	1921	49075	3.9	Pass
T18	12 - 6	Inner Bracing	1150	8	17667	0.0	Pass
T1	330 - 320	Guy A@329.5	1193	31584	34000	92.9	Pass
T4	280 - 260	Guy A@269.625	1196	37823	40000	94.6	Pass
T9	180 - 160	Guy A@178	1212	35074	46000	76.2	Pass
T12	120 - 100	Guy A@100.25	1219	32037	46000	69.6	Pass
T1	330 - 320	Guy B@329.5	1192	30189	34000	88.8	Pass
T4	280 - 260	Guy B@269.625	1195	36283	40000	90.7	Pass
T9	180 - 160	Guy B@178	1205	33442	46000	72.7	Pass

tnxTower	Job: 350' Guyed Tower Analysis	Page: 16 of 16
Atlantis Group 1340 Centre St, Ste 212 Newton, MA 02459 Phone: (617) 965-0789 FAX: (617) 213-5056	Project: CTNL058A/Redwolf_ET	Date: 11:29:42 02/27/14
	Client: T-Mobile	Designed by: DJH

Section No.	Elevation ft	Component Type	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T12	120 - 100	Guy B@100.25	1218	30773	46000	66.9	Pass
T1	330 - 320	Guy C@329.5	1191	31941	34000	93.9	Pass
T4	280 - 260	Guy C@269.625	1194	37162	40000	92.9	Pass
T9	180 - 160	Guy C@178	1197	32776	46000	71.3	Pass
T12	120 - 100	Guy C@100.25	1217	29538	46000	64.2	Pass
T8	200 - 180	Top Guy Pull-Off@178	519	-7735	30801	25.1	Pass
T9	180 - 160	Bottom Guy Pull-Off@178	1204	-17360	30801	56.4	Pass
T9	180 - 160	Torque Arm Top@178	1200	39508	164695	24.0	Pass
T9	180 - 160	Torque Arm Bottom@178	1216	-52477	110255	47.6	Pass
						Summary	
					Latticed Pole Leg (L1)	41.7	Pass
					Latticed Pole Diagonal (L1)	76.6	Pass
					Latticed Pole Horizontal (L1)	3.2	Pass
					Latticed Pole Top Girt (L1)	2.7	Pass
					Latticed Pole Bottom Girt (L1)	10.7	Pass
					Leg (T8)	87.7	Pass
					Diagonal (T4)	67.7	Pass
					Horizontal (T4)	39.5	Pass
					Secondary Horizontal (T19)	20.8	Pass
					Top Girt (T4)	24.3	Pass
					Bottom Girt (T12)	29.6	Pass
					Mid Girt (T4)	30.0	Pass
					Inner Bracing (T18)	0.0	Pass
					Guy A (T4)	94.6	Pass
					Guy B (T4)	90.7	Pass
					Guy C (T1)	93.9	Pass
					Top Guy Pull-Off (T8)	25.1	Pass
					Bottom Guy Pull-Off (T9)	56.4	Pass
					Torque Arm Top (T9)	24.0	Pass
					Torque Arm Bottom (T9)	47.6	Pass
					Bolt Checks	52.7	Pass
					RATING =	**94.6**	**Pass**

EXHIBIT C

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

T-Mobile Existing Facility

Site ID: CTNL058A

NL058 / Redwolf ET
889A Colonel Ledyard Highway
Ledyard, CT 06339

March 7, 2014

EBI Project Number: 62141151

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

EBI Consulting
environmental | engineering | due diligence

March 7, 2014

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

Re: Emissions Values for Site: **CTNL058A - NL058 / Redwolf ET**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 889A Colonel Ledyard Highway, Ledyard, 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 cellular 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 889A Colonel Ledyard Highway, Ledyard, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, the actual antenna pattern gain value in the direction of the sample area was used. For this report the sample point is a 6 foot person standing at the base of the tower

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

1) 2 GSM / UMTS channels (1935.000 MHz to 1945.000 MHz / 1983.000 MHz to 1984.000 MHz) were considered for each sector of the proposed installation.
2) 4 UMTS / LTE channels (2110.000 to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation
3) 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.
4) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
5) The antenna used in this modeling is the Ericsson AIR21 for LTE, UMTS and GSM. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.6 dBd gain value at its main lobe. Actual antenna gain values were used for all calculations as per the manufacturers specifications

6) The antenna mounting height centerline of the proposed antennas is **185 feet** above ground level (AGL)
7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

Site ID	CTNL058A - NL058 / Redwolf ET
Site Addresss	889A Colonel Ledyard Highway, Ledyard, CT 06339
Site Type	Guyed Tower

Sector 1

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	185	179	None	0	0	48.326044	0.542227	0.05422%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	185	179	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	185	179	None	0	0	24.163022	0.271114	0.02711%
1b	Ericsson	AIR21 B4A/B2P	Passive	AWS - 2100 MHz	UMTS	40	2	80	-3.95	185	114	None	0	0	32.217363	0.891223	0.08912%
														Sector total Power Density Value:		0.170%	

Sector 2

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	185	179	None	0	0	48.326044	0.542227	0.05422%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	185	179	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	185	179	None	0	0	24.163022	0.271114	0.02711%
1b	Ericsson	AIR21 B4A/B2P	Passive	AWS - 2100 MHz	UMTS	40	2	80	-3.95	185	114	None	0	0	32.217363	0.891223	0.08912%
														Sector total Power Density Value:		0.170%	

Sector 3

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	185	179	None	0	0	48.326044	0.542227	0.05422%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	185	179	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	185	179	None	0	0	24.163022	0.271114	0.02711%
1b	Ericsson	AIR21 B4A/B2P	Passive	AWS - 2100 MHz	UMTS	40	2	80	-3.95	185	114	None	0	0	32.217363	0.891223	0.08912%
														Sector total Power Density Value:		0.170%	

Site Composite MPE %	
Carrier	MPE %
T-Mobile	0.511%
Redwold - WERI	5.440%
Marcus	1.350%
Nextel	1.030%
Sprint	1.040%
Arch	0.830%
AT&T	10.060%
Verizon Wireless	10.650%
Total Site MPE %	**30.911%**

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Summary

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

The anticipated Maximum Composite contributions from the T-Mobile facility are **0.511% (0.170% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **30.911%** 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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