COHEN and WOLF P.C.
ATTORNEYS AT LAW

RACHEL A. SCHWARTZMAN

Please Reply To: Bridgeport
Writer's Direct Dial: (203) 337-4110
E-Mail: rschwartzman@cohenandwolf.com

September 8, 2014

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

Re: Notice of Exempt Modification
Wireless Solutions IV, LLC/T-Mobile co-location
T-Mobile Site ID CT11636A
72 Boggy Hole Road, Old Lyme, Connecticut

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, Wireless Solutions IV, LLC owns the existing monopole telecommunications tower and related facility at 72 Boggy Hole Road in Old Lyme (41.322153/-72.307466). T-Mobile proposes to install three (3) new antennas and related equipment at this existing telecommunications facility in Old Lyme ("Old Lyme 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 Selectwoman, Bonnie Reemsnyder, and the property owner, Michael Sanders.

The existing Old Lyme Facility consists of a 175-foot monopole tower.[1] T-Mobile plans to install three (3) antennas at a centerline of 175 feet. (See the plans revised to September 8, 2014 attached hereto as **Exhibit A**). T-Mobile will also mount three (3) remote radio units on the existing mast and install quad poles. The existing Old Lyme Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated August 28, 2014, and attached hereto as **Exhibit B**.

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

[1] The Old Lyme Facility was approved at a height of 175 feet (Docket No. 209), which is consistent with this filing.

1. The proposed modification will not increase the height of the tower. T-Mobile's existing antennas are at a centerline of 175 feet; the replacement antennas will be installed at the same 175 foot level. 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 on the site boundaries or lease area, as depicted on Sheet 2 of Exhibit A. T-Mobile's equipment will be located entirely within the existing compound area.

3. The proposed modification to the 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 September 4, 2014, T-Mobile's operations would add 4.23% 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 37.21% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as **Exhibit C.**

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

Sincerely,

Rachel Schwartzman

Rachel A. Schwartzman, Esq.

cc: First Selectwoman Bonnie Reemsnyder, Town of Old Lyme
Wireless Solutions IV, LLC
Michael Sanders
Sheldon J. Freincle, Northeast Site Solutions

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

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

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

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

EXHIBIT A

KEY PLAN

N.T.S.

CONFIGURATION

702CU

SUBMITTALS	
LE REV A	07.25.14
LE REV 0	09.08.14

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

LEASE EXHIBIT

SITE NUMBER:
CT11636A

SITE NAME:
WIRELESS SOLUTIONS OLD LYME

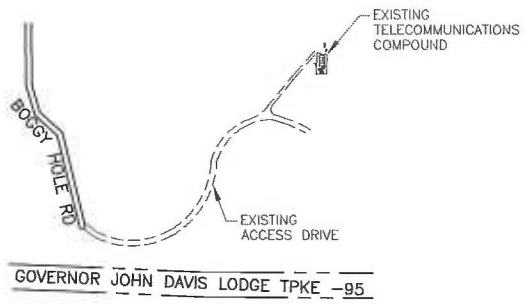
SITE ADDRESS:
72 BOGGY HOLE ROAD
OLD LYME, CT 06371

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

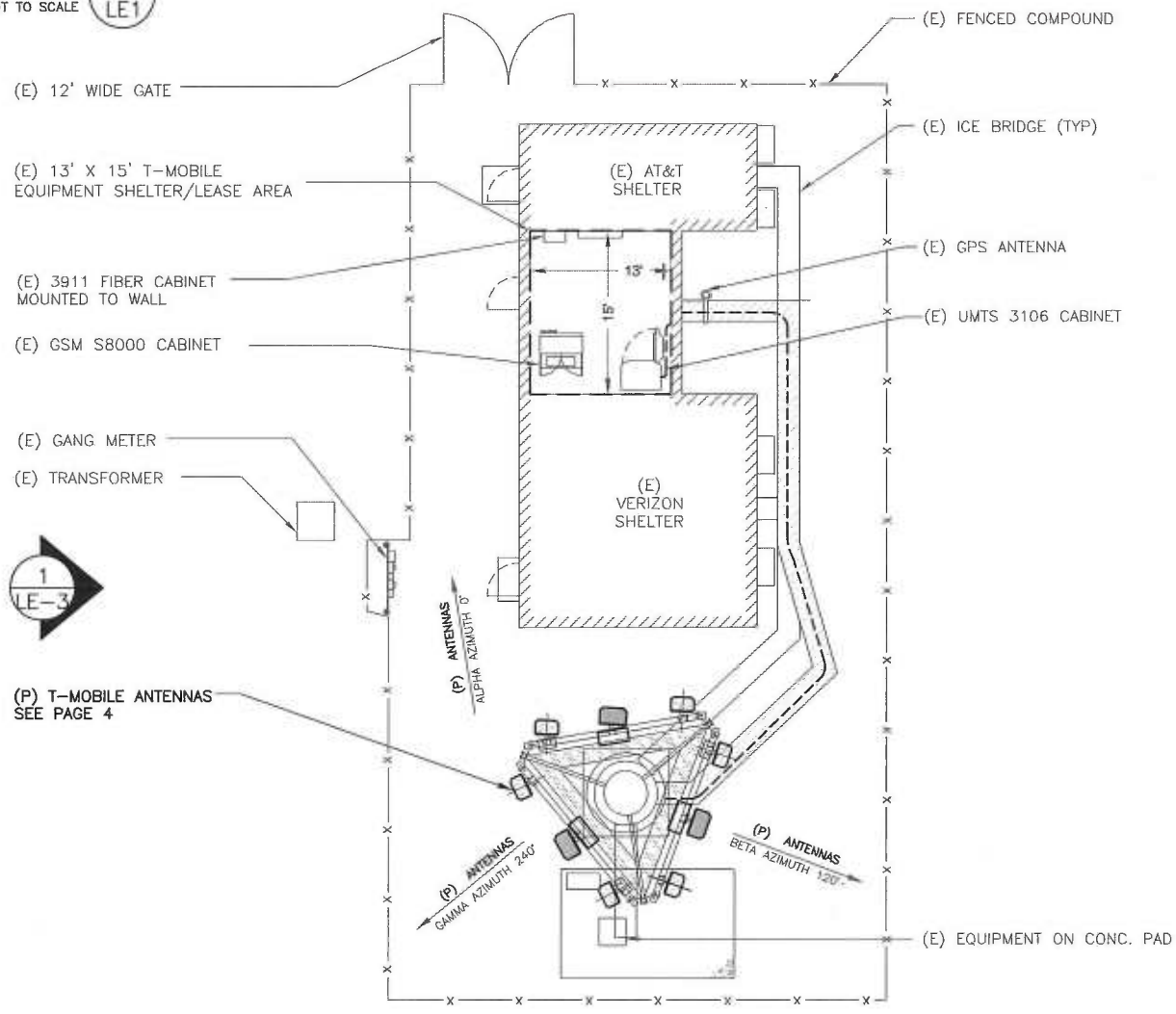
FOR

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



KEY PLAN (1 / LE1)
SCALE: NOT TO SCALE



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 (1 / LE-2)
SCALE: N.T.S.

CONFIGURATION
702CU

SUBMITTALS	
LE REV A	07.25.14
LE REV 0	09.08.14

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

LEASE EXHIBIT

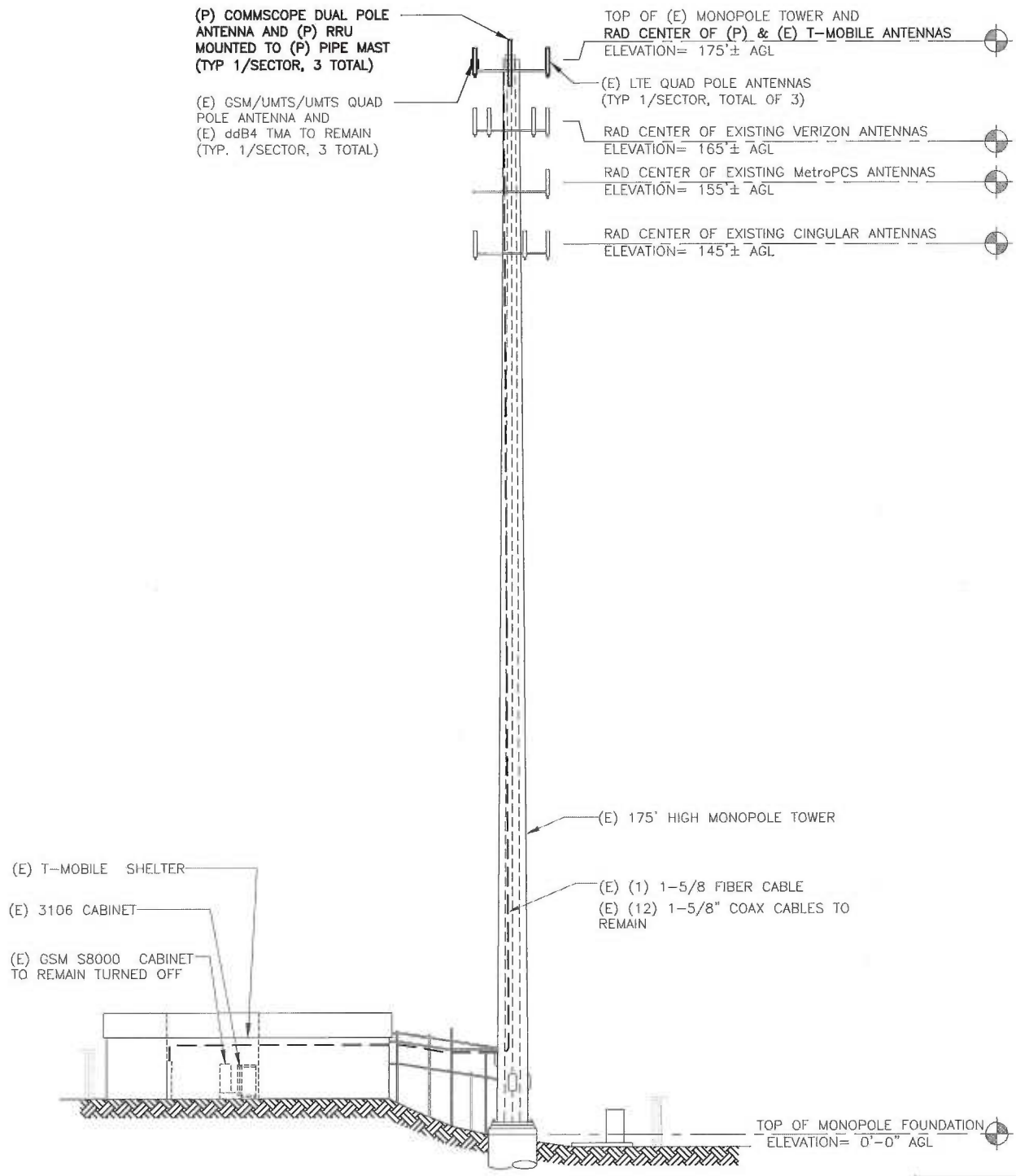
SITE NUMBER:
CT11636A

SITE NAME:
WIRELESS SOLUTIONS OLD LYME

SITE ADDRESS:
72 BOGGY HOLE ROAD
OLD LYME, CT 06371

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



ELEVATION
N.T.S.

1
LE-3

CONFIGURATION
702CU

SUBMITTALS	
LE REV A	07.25.14
LE REV 0	09.08.14

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

LEASE EXHIBIT

SITE NUMBER:
CT11636A

SITE NAME:
WIRELESS SOLUTIONS OLD LYME

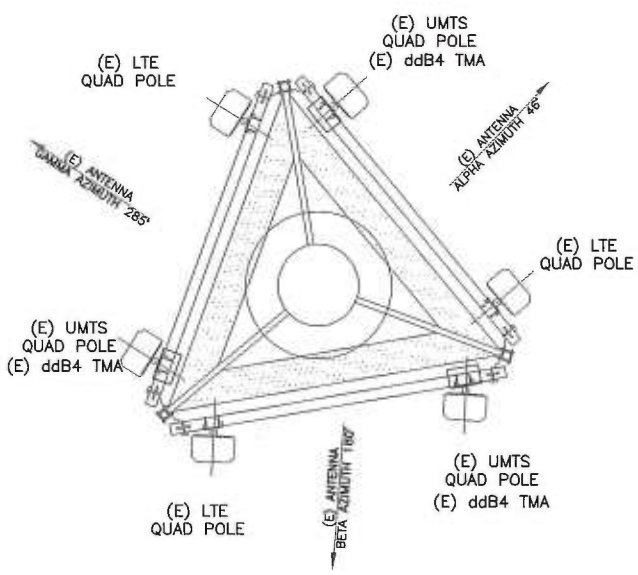
SITE ADDRESS:
72 BOGGY HOLE ROAD
OLD LYME, CT 06371

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

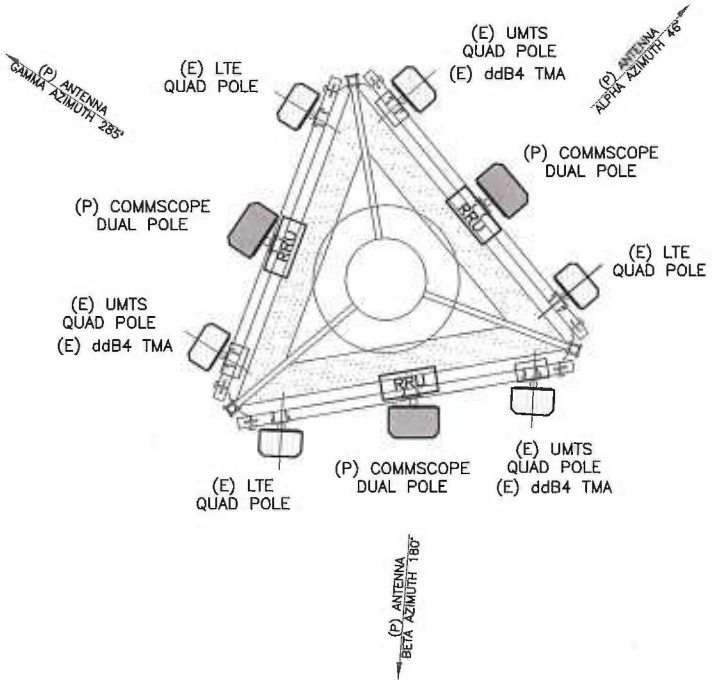
FOR

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



EXISTING ANTENNA CONFIGURATION



PROPOSED ANTENNA CONFIGURATION

CONFIGURATION

702CU

SUBMITTALS	
LE REV A	07.25.14
LE REV 0	09.08.14

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

LEASE EXHIBIT

SITE NUMBER:
CT11636A

SITE NAME:
WIRELESS SOLUTIONS OLD LYME

SITE ADDRESS:
72 BOGGY HOLE ROAD
OLD LYME, CT 06371

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

EXHIBIT B

STRUCTURAL ANALYSIS REPORT
MONOPOLE TOWER

Prepared For:

T-Mobile

35 Griffin Road South
Bloomfield, CT 06002

Tower Rating

Tower:	**Pass (99%)**
Foundation:	**Pass**

Atlantis Group, Inc.
8-28-2014

STATE OF CONNECTICUT
DMITRIY V. ALBUL
No. 26725
LICENSED PROFESSIONAL ENGINEER

08/28/2014

CT Professional Engineer
License No: 26725

Site ID: CT11636A
Site Name: Wireless Solutions
Old Lyme
72 Boggy Hole Rd,
Old Lyme, CT

Prepared By:
Atlantis Group, Inc.
1340 Centre Street, Suite 212
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 175 feet monopole tower, located at 72 Boggy Hole Rd, Old Lyme, CT, 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., Centek project No. 12001, dated September 21, 2012.
2. Structural Analysis Report by Atlantis Group dated February 2014.
3. Existing and proposed antenna information provided by T-Mobile.

1.1 STRUCTURE

The subject tower is a 175 foot monopole consisting of 5 polygon, tubular sections manufactured by Engineer Endeavors, Inc. Please refer to the tower elevation drawing in Appendix A for details about the tower geometry and analyzed antenna loading.

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	175	GSM/UMTS Antenna LTE Antenna TMA	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P (1) ddB4	Low Profile platform	(12) 1 5/8" + (1) 1 5/8" Hybrid cable
Beta		GSM/UMTS Antenna LTE Antenna TMA	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P (1) ddB4		
Gamma		GSM/UMTS Antenna LTE Antenna TMA	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P (1) ddB4		

Proposed Configuration of T-MOBILE Appurtenances:

Sector	RAD Center (ft.)	Antenna & TMA		Mount	Feed Lines
Alpha	175	GSM/UMTS Antenna LTE Antenna TMA Commscope Quad Pole RRU	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P (1) ddB4 (1) SBNHH-1D65C (1)RRUS-11	Low Profile platform	(12) 1 5/8" + (1) 1 5/8" Hybrid cable
Beta		GSM/UMTS Antenna LTE Antenna TMA Commscope Quad Pole RRU	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P (1) ddB4 (1) SBNHH-1D65C (1)RRUS-11		
Gamma		GSM/UMTS Antenna LTE Antenna TMA Commscope Quad Pole RRU	(1) AIR21 B2A/B4P (1) AIR21 B4A/B2P (1) ddB4 (1) SBNHH-1D65C (1)RRUS-11		

Note that the existing and proposed lines are to be installed inside the tower.

3.0 CODES AND LOADING

The tower was analyzed per ANSI/TIA-222-F as referenced by the 2005 Connecticut Building Code with 2013 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 90 mph (W) without ice [fastest-mile speed equivalent to 105 mph 3-second gust].
- Basic wind speed 78 mph (W_i) with 1/2" radial and escalating ice.
- The site is north of Interstate 95.

The following load combinations were used with wind blowing at 0°, 60° and 90°, measured from a line normal to the face of the 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 tnx-Tower, a non-linear 3-Dimensional finite element software, a product of Tower Numerics, Inc. Software output for this analysis is provided in Appendix-A of this report.

6.0 RESULTS and CONCLUSION

Based on an analysis per ANSI/TIA-222-F, the existing tower is found to have **adequate** structural capacity for the proposed changes by T-Mobile. For the aforementioned load combinations and as a maximum, the tower will be stressed to **99%** of capacity.
The tower foundation system was found to have **adequate** structural strength.

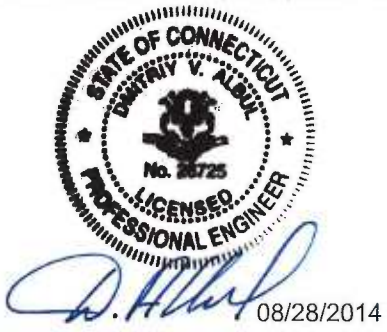
Reactions:

Maximums	Atlantis Analysis	Design
Base Shear (kips)	36.6	54.5
Overturning Moment (ft-kips)	4435	7558

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

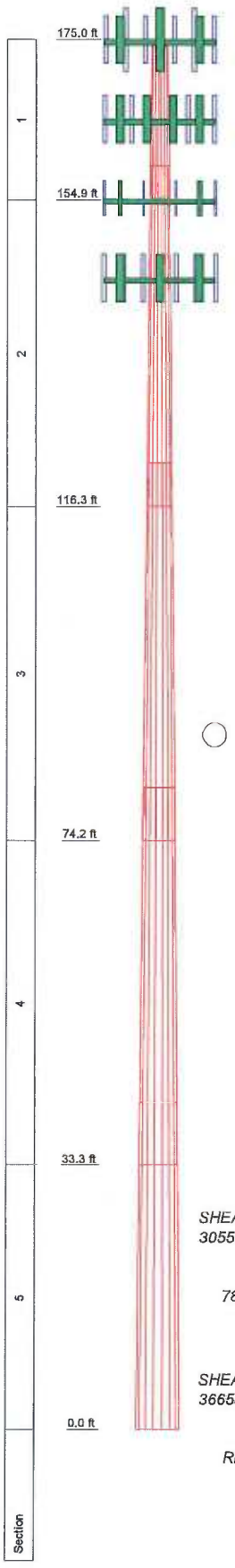
Should you have any questions or need any clarifications about this report, please contact us at (617) 965-0789.

Sincerely,
Atlantis Group, Inc.



APPENDIX A

CALCULATIONS



AXIAL
73039 lb

SHEAR
30555 lb

MOMENT
3794 kip-ft

TORQUE 2 kip-ft
78 mph WIND - 0.5000 in ICE

AXIAL
63959 lb

SHEAR
36653 lb

MOMENT
4435 kip-ft

TORQUE 1 kip-ft
REACTIONS - 90 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) Ericsson AIR21 w. Mtg Pipe (E-TMO-Alpha)	175	(2) LPA-80080-4CF-EDIN-x w. Mtg Pipe (VZW-Gamma)	165
(2) Ericsson AIR21 w. Mtg Pipe (E-TMO-Beta)	175	BXA-171063-8BF w. Mtg Pipe (VZW-Gamma)	165
(2) Ericsson AIR21 w. Mtg Pipe (E-TMO-Gamma)	175	BXA-70063-6CF w. MtgPipe (VZW-Gamma)	165
Ericsson KRY 112 71/x TMA (E-TMO-Alpha)	175	14' Lo-Profile Monopole (VZW)	165
Ericsson KRY 112 71/x TMA (E-TMO-Beta)	175	(2) APXV18-206516S-C w. MtgPipe (Metro-Alpha)	155
Ericsson KRY 112 71/x TMA (E-TMO-Gamma)	175	(2) APXV18-206516S-C w. MtgPipe (Metro-Beta)	155
SBNHH-1D65C w. Mtg Pipe (P-TMO-Alpha)	175	(2) APXV18-206516S-C w. MtgPipe (Metro-Gamma)	155
SBNHH-1D65C w. Mtg Pipe (P-TMO-Beta)	175	14' Lo-Profile Monopole (MetroPCS)	155
SBNHH-1D65C w. Mtg Pipe (P-TMO-Gamma)	175	(2) DUO1417-8686 w/Mount Pipe (ATT-Alpha)	145
Ericsson RRUS-11 (P-TMO-Alpha)	175	(2) DUO1417-8686 w/Mount Pipe (ATT-Beta)	145
Ericsson RRUS-11 (P-TMO-Beta)	175	(2) DUO1417-8686 w/Mount Pipe (ATT-Gamma)	145
Ericsson RRUS-11 (P-TMO-Gamma)	175	Powerwave 7770.00 w. MtgPipe (ATT-Alpha)	145
14' Lo-Profile Monopole (TMO)	175	Powerwave 7770.00 w. MtgPipe (ATT-Beta)	145
(2) LPA-80080-4CF-EDIN-x w. Mtg Pipe (VZW-Alpha)	165	Powerwave 7770.00 w. MtgPipe (ATT-Gamma)	145
BXA-171063-8BF w. Mtg Pipe (VZW-Alpha)	165	(2) CG1900w850 TMA (ATT-Alpha)	145
BXA-70063-6CF w. MtgPipe (VZW-Alpha)	165	(2) CG1900w850 TMA (ATT-Beta)	145
(2) LPA-80080-4CF-EDIN-x w. Mtg Pipe (VZW-Beta)	165	(2) CG1900w850 TMA (ATT-Gamma)	145
BXA-171063-8BF w. Mtg Pipe (VZW-Beta)	165	TT19-08BP111-001 TMA (ATT-Alpha)	145
BXA-70063-6CF w. MtgPipe (VZW-Beta)	165	TT19-08BP111-001 TMA (ATT-Beta)	145
		TT19-08BP111-001 TMA (ATT-Gamma)	145 - 142
		14' Lo-Profile Monopole (ATT)	145

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 78 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 60 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 TMO equipment. All others considered existing.
9. TOWER RATING: 99.8%

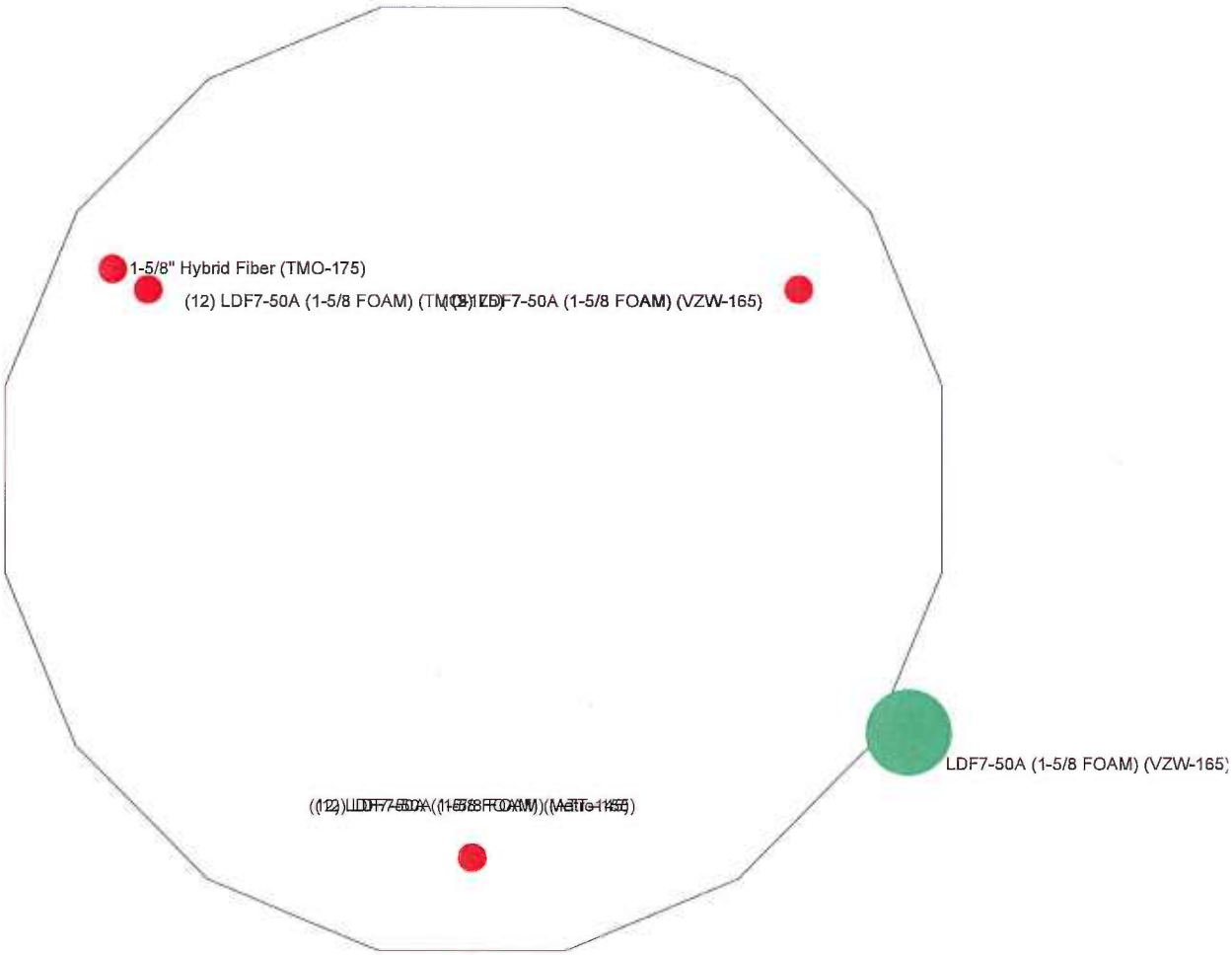
ATLANTIS GROUP

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

Job: ***175' EEI MONOPOLE ANALYSIS***		
Project: ***CT11636A - Old Lyme***		
Client: T-Mobile	Drawn by: PB	App'd:
Code: TIA/EIA-222-F	Date: 08/28/14	Scale: NTS
Path: Y:\Atlantis Group\T-Mobile\CT11636A\2014-08 Analysis\tnxCalcs\175MP.eri		Dwg No. E-1

Feed Line Plan

Round Flat App In Face App Out Face



Atlantis Group 1340 Centre St, Ste 212 Newton, MA 02459 Phone: (617)965-0789 FAX: (617)213-5056	Job: 175' EEI MONOPOLE ANALYSIS		
	Project: CT11636A - Old Lyme		
	Client: T-Mobile	Drawn by: PB	App'd:
	Code: TIA/EIA-222-F	Date: 08/28/14	Scale: NTS
	Path: Y:\Atlantis Group\T-Mobile\CT11636A\2014-08 Analysis\tnxCalcs\175MP.eri		Dwg No. E-7

ATLANTIS GROUP *Atlantis Group* *1340 Centre St, Suite 212* *Newton, MA 02459* *Phone: (617)965-0789* *FAX: (617)213-3123*	**Job** 175' EEI MONOPOLE ANALYSIS	**Page** 1 of 5
	Project CT11636A - Old Lyme	**Date** 08:32:37 08/28/14
	Client T-Mobile	**Designed by** PB

Load Combinations

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

Maximum Reactions

Location	*Condition*	*Gov. Load Comb.*	*Vertical lb*	*Horizontal, X lb*	*Horizontal, Z lb*
Pole	Max. Vert	21	73039.31	0.00	-30555.32
	Max. H_x	11	63958.97	36652.99	-0.00
	Max. H_z	2	63958.97	-0.00	36652.97
	Max. M_x	2	4432.00	-0.00	36652.97
	Max. M_z	5	4433.74	-36652.99	-0.00
	Max. Torsion	23	1.56	26461.70	-15277.66
	Min. Vert	1	63958.97	0.00	0.00
	Min. H_x	5	63958.97	-36652.99	-0.00
	Min. H_z	8	63958.97	-0.00	-36652.97

Atlantis Group
1340 Centre St, Suite 212
Newton, MA 02459
Phone: (617)965-0789
FAX: (617)213-3123

Location	*Condition*	*Gov. Load Comb.*	*Vertical lb*	*Horizontal, X lb*	*Horizontal, Z lb*
	Min. M_x	8	-4435.01	-0.00	-36652.97
	Min. M_z	11	-4433.30	36652.99	-0.00
	Min. Torsion	17	-1.56	-26461.70	15277.66

Tower Mast Reaction Summary

Load Combination	*Vertical lb*	*Shear$_x$ lb*	*Shear$_z$ lb*	*Overturning Moment, M_x kip-ft*	*Overturning Moment, M_z kip-ft*	*Torque kip-ft*
Dead Only	63958.97	0.00	0.00	1.45	-0.22	0.00
Dead+Wind 0 deg - No Ice	63958.97	0.00	-36652.97	-4432.00	-0.22	0.38
Dead+Wind 30 deg - No Ice	63958.97	18326.49	-31742.40	-3838.02	-2216.98	1.08
Dead+Wind 60 deg - No Ice	63958.97	31742.42	-18326.49	-2215.25	-3839.76	1.49
Dead+Wind 90 deg - No Ice	63958.97	36652.99	0.00	1.51	-4433.74	1.50
Dead+Wind 120 deg - No Ice	63958.97	31742.42	18326.49	2218.26	-3839.76	1.11
Dead+Wind 150 deg - No Ice	63958.97	18326.49	31742.40	3841.04	-2216.98	0.42
Dead+Wind 180 deg - No Ice	63958.97	0.00	36652.97	4435.01	-0.22	-0.38
Dead+Wind 210 deg - No Ice	63958.97	-18326.49	31742.40	3841.04	2216.54	-1.08
Dead+Wind 240 deg - No Ice	63958.97	-31742.42	18326.49	2218.26	3839.32	-1.49
Dead+Wind 270 deg - No Ice	63958.97	-36652.99	0.00	1.51	4433.30	-1.50
Dead+Wind 300 deg - No Ice	63958.97	-31742.42	-18326.49	-2215.25	3839.32	-1.11
Dead+Wind 330 deg - No Ice	63958.97	-18326.49	-31742.40	-3838.02	2216.54	-0.42
Dead+Ice+Temp	73039.31	0.00	0.00	2.18	-0.62	0.00
Dead+Wind 0 deg+Ice+Temp	73039.31	-0.00	-30555.32	-3789.45	-0.64	0.43
Dead+Wind 30 deg+Ice+Temp	73039.31	15277.67	-26461.69	-3281.45	-1896.51	1.15
Dead+Wind 60 deg+Ice+Temp	73039.31	26461.70	-15277.66	-1893.58	-3284.38	1.56
Dead+Wind 90 deg+Ice+Temp	73039.31	30555.34	-0.00	2.28	-3792.38	1.55
Dead+Wind 120 deg+Ice+Temp	73039.31	26461.70	15277.66	1898.15	-3284.38	1.12
Dead+Wind 150 deg+Ice+Temp	73039.31	15277.67	26461.69	3286.02	-1896.51	0.40
Dead+Wind 180 deg+Ice+Temp	73039.31	-0.00	30555.32	3794.01	-0.64	-0.43
Dead+Wind 210 deg+Ice+Temp	73039.31	-15277.67	26461.69	3286.02	1895.23	-1.15
Dead+Wind 240 deg+Ice+Temp	73039.31	-26461.70	15277.66	1898.15	3283.11	-1.56
Dead+Wind 270 deg+Ice+Temp	73039.31	-30555.34	-0.00	2.28	3791.10	-1.55
Dead+Wind 300 deg+Ice+Temp	73039.31	-26461.70	-15277.66	-1893.58	3283.11	-1.12
Dead+Wind 330 deg+Ice+Temp	73039.31	-15277.67	-26461.69	-3281.45	1895.23	-0.40
Dead+Wind 0 deg - Service	63958.97	0.00	-16290.21	-1969.70	-0.22	0.17
Dead+Wind 30 deg - Service	63958.97	8145.11	-14107.74	-1705.61	-985.83	0.48
Dead+Wind 60 deg - Service	63958.97	14107.74	-8145.11	-984.09	-1707.35	0.66
Dead+Wind 90 deg - Service	63958.97	16290.22	0.00	1.51	-1971.44	0.67
Dead+Wind 120 deg - Service	63958.97	14107.74	8145.11	987.12	-1707.35	0.49
Dead+Wind 150 deg - Service	63958.97	8145.11	14107.74	1708.63	-985.83	0.19
Dead+Wind 180 deg - Service	63958.97	0.00	16290.21	1972.72	-0.22	-0.17
Dead+Wind 210 deg - Service	63958.97	-8145.11	14107.74	1708.63	985.39	-0.48
Dead+Wind 240 deg - Service	63958.97	-14107.74	8145.11	987.12	1706.90	-0.66
Dead+Wind 270 deg - Service	63958.97	-16290.22	0.00	1.51	1970.99	-0.67
Dead+Wind 300 deg - Service	63958.97	-14107.74	-8145.11	-984.09	1706.90	-0.49
Dead+Wind 330 deg - Service	63958.97	-8145.11	-14107.74	-1705.61	985.39	-0.19

Maximum Tower Deflections - Service Wind

Atlantis Group	Job	Page
1340 Centre St, Suite 212 Newton, MA 02459 Phone: (617)965-0789 FAX: (617)213-3123	175' EEI MONOPOLE ANALYSIS	3 of 5
	Project CT11636A - Old Lyme	Date 08:32:37 08/28/14
	Client T-Mobile	Designed by PB

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 154.87	29.242	33	1.5722	0.0050
L2	159.12 - 116.289	24.106	33	1.4922	0.0025
L3	121.708 - 74.1693	13.618	33	1.1251	0.0010
L4	80.8281 - 33.3281	5.740	33	0.6895	0.0004
L5	41.1589 - 0	1.461	33	0.3191	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175'	(2) Ericsson AIR21 w. Mtg Pipe	33	29.242	1.5722	0.0050	24450
165'	(2) LPA-80080-4CF-EDIN-x w. Mtg PIpe	33	25.983	1.5263	0.0033	12225
155'	(2) APXV18-206516S-C w. MtgPipe	33	22.821	1.4632	0.0021	7237
145'	(2) DUO1417-8686 w/Mount Pipe	33	19.823	1.3764	0.0014	6315
143'6"	TT19-08BP111-001 TMA	33	19.389	1.3618	0.0014	6197
142'	TT19-08BP111-001 TMA	33	18.959	1.3469	0.0013	6083

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 154.87	65.650	8	3.5228	0.0112
L2	159.12 - 116.289	54.138	8	3.3489	0.0058
L3	121.708 - 74.1693	30.598	8	2.5274	0.0024
L4	80.8281 - 33.3281	12.901	8	1.5494	0.0010
L5	41.1589 - 0	3.284	8	0.7172	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175'	(2) Ericsson AIR21 w. Mtg Pipe	8	65.650	3.5228	0.0112	11112
165'	(2) LPA-80080-4CF-EDIN-x w. Mtg PIpe	8	58.345	3.4235	0.0076	5555
155'	(2) APXV18-206516S-C w. MtgPipe	8	51.256	3.2846	0.0048	3279
145'	(2) DUO1417-8686 w/Mount Pipe	8	44.529	3.0913	0.0033	2846
143'6"	TT19-08BP111-001 TMA	8	43.555	3.0586	0.0031	2791
142'	TT19-08BP111-001 TMA	8	42.591	3.0251	0.0030	2738

ATLANTIS GROUP *Atlantis Group* *1340 Centre St, Suite 212* *Newton, MA 02459* *Phone: (617)965-0789* *FAX: (617)213-3123*	**Job** 175' EEI MONOPOLE ANALYSIS	**Page** 4 of 5
	Project CT11636A - Old Lyme	**Date** 08:32:37 08/28/14
	Client T-Mobile	**Designed by** PB

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		
2.5000	32	2.2500	86701.87 131210.58 0.66	90698.67 217809.56 0.42	59.870 45.000 1.33		Plate	1.33 ✔

Compression Checks

Pole Design Data

Section No.	Elevation	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft	ft	ft		ksi	in^2	lb	lb	
L1	175 - 154.87 (1)	20'1-9/16"	175'	210.4	3.374	16.7330	-7186.34	56451.20	0.127
L2	154.87 - 116.289 (2)	42'9-31/32"	175'	159.0	5.905	44.2770	-14297.50	261473.00	0.055
L3	116.289 - 74.1693 (3)	47'6-15/32"	175'	126.2	9.373	74.3740	-26385.10	697074.00	0.038
L4	74.1693 - 33.3281 (4)	47'6"	175'	105.6	13.397	100.0340	-42493.80	1340150.00	0.032
L5	33.3281 - 0 (5)	41'1-29/32"	175'	90.4	18.191	129.8440	-63948.80	2362020.00	0.027

Pole Bending Design Data

Section No.	Elevation	Actual M_x	Actual f_{bx}	Allow. F_{bx}	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y	Actual f_{by}	Allow. F_{by}	Ratio $\frac{f_{by}}{F_{by}}$
	ft	kip-ft	ksi	ksi		kip-ft	ksi	ksi	
L1	175 - 154.87 (1)	113.91	-11.760	39.000	0.302	0.00	0.000	39.000	0.000
L2	154.87 - 116.289 (2)	817.92	-24.202	39.000	0.621	0.00	0.000	39.000	0.000
L3	116.289 - 74.1693 (3)	1835.89	-25.686	39.000	0.659	0.00	0.000	39.000	0.000
L4	74.1693 - 33.3281 (4)	3018.43	-26.246	39.000	0.673	0.00	0.000	39.000	0.000
L5	33.3281 - 0 (5)	4435.02	-25.420	39.000	0.652	0.00	0.000	39.000	0.000

Pole Interaction Design Data

ATLANTIS GROUP *Atlantis Group* *1340 Centre St, Suite 212* *Newton, MA 02459* *Phone: (617)965-0789* *FAX: (617)213-3123*	**Job** 175' EEI MONOPOLE ANALYSIS	**Page** 5 of 5
	Project CT11636A - Old Lyme	**Date** 08:32:37 08/28/14
	Client T-Mobile	**Designed by** PB

Section No.	*Elevation* *ft*	*Ratio* $\frac{P}{P_a}$	*Ratio* $\frac{f_{bx}}{F_{bx}}$	*Ratio* $\frac{f_{by}}{F_{by}}$	*Comb. Stress Ratio*	*Allow. Stress Ratio*	*Criteria*
L1	175 - 154.87 (1)	0.127	0.302	0.000	0.429 ✔	1.333	H1-3 ✔
L2	154.87 - 116.289 (2)	0.055	0.621	0.000	0.675 ✔	1.333	H1-3 ✔
L3	116.289 - 74.1693 (3)	0.038	0.659	0.000	0.696 ✔	1.333	H1-3 ✔
L4	74.1693 - 33.3281 (4)	0.032	0.673	0.000	0.705 ✔	1.333	H1-3 ✔
L5	33.3281 - 0 (5)	0.027	0.652	0.000	0.679 ✔	1.333	H1-3 ✔

Section Capacity Table

Section No.	*Elevation* *ft*	*Component Type*	*Critical Element*	*P* *lb*	*SF*P$_{allow}$* *lb*	*% Capacity*	*Pass Fail*
L1	175 - 154.87	Pole	1	-7186.34	75249.45	32.2	Pass
L2	154.87 - 116.289	Pole	2	-14297.50	348543.49	50.7	Pass
L3	116.289 - 74.1693	Pole	3	-26385.10	929199.60	52.2	Pass
L4	74.1693 - 33.3281	Pole	4	-42493.80	1786419.88	52.9	Pass
L5	33.3281 - 0	Pole	5	-63948.80	3148572.53	50.9	Pass
						Summary	
					Pole (L4)	52.9	Pass
					Base Plate	99.8	Pass
					RATING =	**99.8**	**Pass**

Check Foundations

Design OTM: 7803 ft-kip

Proposed OTM: 4435 ft-kip

Foundations are OK

EXHIBIT C

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11636A

Wireless Solutions Old Lyme
72 Boggy Hole Road
Old Lyme, CT 06371

September 4, 2014

EBI Project Number: 62140922

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	37.21 %

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

EBI Consulting
environmental | engineering | due diligence

September 4, 2014

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

Emissions Analysis for Site: **CT11636A – Wireless Solutions Old Lyme**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **72 Boggy Hole Road, Old Lyme, 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 $\mu W/cm^2$ 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 ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is 467 $\mu W/cm^2$, and the general population exposure limit for the PCS and AWS bands is 1000 $\mu W/cm^2$. 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 **72 Boggy Hole Road, Old Lyme, 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 LNX-6515DS-VTM** 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 LNX-6515DS-VTM** has a maximum gain of **14.6 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 **175 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.

EBI Consulting
environmental | engineering | due diligence

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):	175	Height (AGL):	175	Height (AGL):	175
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%	0.59	Antenna B1 MPE%	0.59	Antenna C1 MPE%	0.59
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):	175	Height (AGL):	175	Height (AGL):	175
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%	0.59	Antenna B2 MPE%	0.59	Antenna C2 MPE%	0.59
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	175	Height (AGL):	175	Height (AGL):	175
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):	445.37	ERP (W):	445.37	ERP (W):	445.37
Antenna A3 MPE%	0.23	Antenna B3 MPE%	0.23	Antenna C3 MPE%	0.23

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**4.23**
Nextel	3.27 %
AT&T	17.87 %
Verizon Wireless	11.84 %
Site Total MPE %:	**37.21 %**

T-Mobile Sector 1 Total:	1.41 %
T-Mobile Sector 2 Total:	1.41 %
T-Mobile Sector 3 Total:	1.41 %
Site Total:	37.21 %

EBI Consulting
environmental | engineering | due diligence

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:	1.41 %
Sector 2:	1.41 %
Sector 3 :	1.41 %
T-Mobile Total:	4.23 %
Site Total:	37.21 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **37.21%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803`