



March 6, 2015

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
45 Fargo Road, Waterford, CT 06385
N 41° 23' 21.62"
W 72° 10' 17.07"
T-Mobile Site #: CT11473A_L700

Dear Members of the Siting Council:

On behalf of T-Mobile, SBA Communications is submitting an exempt modification application to the Connecticut Siting Council for modification of existing equipment at a tower facility located at 45 Fargo Road, Waterford, CT 06385.

The 45 Fargo Road, Waterford, CT facility consists of a 183' Monopole Tower owned and operated by SBA Properties, LLC. In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located.

As part of T-Mobile's L700 project, T-Mobile desires to upgrade their equipment to meet the new standards of 4G technology. The new equipment will allow customers to download files and browse the internet at a high rate of speed while also allowing their phones to be compatible with the latest 4G technology.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in T-Mobile's operations at the site along with the required fee of \$625.

The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The overall height of the structure will be unaffected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than the new equipment cabinets.
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.
4. The changes in radio frequency power density will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, SBA Communications on behalf of T-Mobile, respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at 508.251.0720 x 3804 with any questions you may have concerning this matter.

Thank you,



Kri Pelletier
SBA Communications Corporation
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-0720 x 3804 + T
508-251-1755 + F
203-446-7700 + C
kpelletier@sbsite.com



T-Mobile

Equipment Modification

45 Fargo Road, Waterford, CT 06385

Site number CT11473A_L700

Tower Owner: SBA Properties, LLC

Equipment Configuration: Monopole

Current and/or approved:

- (3) Ericsson Air B2A B4P
- (3) Ericsson Air B4A B2P
- (3) Ericsson KRY112144/1
- (12) 1-5/8" Feedlines
- (1) 1-5/8" fiber

Planned Modifications:

- (3) Ericsson Air B2A B4P
- (3) Ericsson Air B4A B2P
- (3) Commscope LNX-6515DS
- (3) Ericsson KRY112144/1
- (3) Ericsson S11B12
- (12) 1-5/8" Feedlines
- (1) 1-5/8" fiber

Structural Information:

The attached structural analysis demonstrates that the tower and foundation will have adequate structural capacity to accommodate the proposed modifications.

Power Density:

The anticipated Maximum Composite contributions from the T-Mobile facility are 5.58% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 48.47% of the allowable FCC established general public limit sampled at the ground level.

Site Composite MPE%	
Carrier	MPE%
T-Mobile	5.58
Clearwire	0.70 %
Verizon Wireless	21.41 %
AT&T	20.78 %
Site Total MPE %:	48.47 %

March 6, 2015

Mr. Dan Steward, First Selectman
Town of Waterford
Town Hall
15 Rope Ferry Road
Waterford, CT 06385

RE: Telecommunications Facility @ 45 Fargo Road, Waterford, CT 06385

Dear Mr. Steward,

In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (R.C.S.A.) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review T-Mobile's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes T-Mobile's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at 508.251.0720 x 3804.

Thank you,



Kri Pelletier
SBA Communications Company
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-0720 x 3804 + T
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kpelletier@sbsite.com



March 6, 2015

Rudolph T. Chieka, Trustee
199 Niantic River Road
Waterford, CT 06385-1843

RE: Telecommunications Facility @ 45 Fargo Road, Waterford, CT 06385

Dear Mr. Chieka:

In order to accommodate technological changes and enhance system performance in the State of Connecticut, T-Mobile will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (R.C.S.A.) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review T-Mobile's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes T-Mobile's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at 508.251.0720 x 3804.

Thank you,

A handwritten signature in black ink, appearing to read "Kri Pelletier", is positioned above the typed name.

Kri Pelletier
SBA Communications Company
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-0720 x 3804 + T
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RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL
TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11473A

Waterford / Rt8 / Douglas
45 Fargo Road
Waterford, CT 06385

March 4, 2015

EBI Project Number: 6215001354

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	48.47 %

March 4, 2015

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

Emissions Analysis for Site: **CT11473A – Waterford / Rt8 / Douglas**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **45 Fargo Road, Waterford, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **45 Fargo Road, Waterford, 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 **153 feet** above ground level (AGL).
- 9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	153	Height (AGL):	153	Height (AGL):	153
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):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	0.78	Antenna B1 MPE%	0.78	Antenna C1 MPE%	0.78
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	153	Height (AGL):	153	Height (AGL):	153
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):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	0.78	Antenna B2 MPE%	0.78	Antenna C2 MPE%	0.78
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):	153	Height (AGL):	153	Height (AGL):	153
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):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.31	Antenna B3 MPE%	0.31	Antenna C3 MPE%	0.31

Site Composite MPE%	
Carrier	MPE%
T-Mobile	5.58
Clearwire	0.70 %
Verizon Wireless	21.41 %
AT&T	20.78 %
Site Total MPE %:	48.47 %

T-Mobile Sector 1 Total:	1.86 %
T-Mobile Sector 2 Total:	1.86 %
T-Mobile Sector 3 Total:	1.86 %
Site Total:	48.47 %

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:	1.86 %
Sector 2:	1.86 %
Sector 3 :	1.86 %
T-Mobile Total:	5.58 %
Site Total:	48.47 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **48.47%** 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



FDH Engineering, Inc., 6521 Meriden Drive Raleigh, NC 27616, Ph. 919.755.1012

**Structural Analysis for
SBA Network Services, Inc.**

183' Monopole Tower

**SBA Site Name: Waterford
SBA Site ID: CT01002-S-04
T-Mobile Site ID: CT11473A**

FDH Project Number 15BDTN1400

Analysis Results

Tower Components	98.0%	Sufficient
Foundation	59.3%	Sufficient

Prepared By:

David D. Vaughan, EI
Project Engineer

Reviewed By:

Dennis D. Abel, PE
Director of Structural Engineering
CT PE License No. 23247

FDH Engineering, Inc.
6521 Meriden Drive
Raleigh, NC 27616
(919) 755-1012
info@fdh-inc.com



02-23-2015

February 23, 2015

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut State Building Code

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EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Waterford, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F* and the *2005 Connecticut State Building Code (CSBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, foundation dimensions, and member sizes was obtained from:

- A. Nudd Corp. (Project No. 6637) Design of 183' Monopole dated May 7, 1999
- Semaan Engineering Solutions, Inc. (Site No. CT-4284) Structural Analysis and Modification Package for the Original Design Loads dated May 7, 2002
- FDH Engineering, Inc. (Project No. 10-08045E S2) Modification Drawings For A 183' Monopole Tower dated November 4, 2010
- FDH Engineering, Inc. (Project No. 10-08045E S2) Post Construction Inspection Report dated February 4, 2011
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 CSBC* is 85 mph without ice and 38 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from T-Mobile in place at 153 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 CSBC* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was constructed per the original design drawings (see Fred. A Nudd Corp. Project No. 6637) and assuming normal soil parameters per *TIA/EIA-222-F* standards, the foundation should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and *2005 CSBC* are met with the existing and proposed loading in place, we have the following recommendations:

1. The coax should be installed inside the monopole's shaft.
2. RRU/RRH Stipulation: the equipment may be installed in any arrangement as determined by the client.

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Feedlines ¹	Carrier	Mount Elevation (ft)	Mount Type
-	-	-	-	183	(1) Low Profile Platform
172	(6) Andrew HBXX-6517DS (4) Antel LPA-80080/4CF (3) Andrew LNX-6514DS (2) RFS APL866513 (1) Lucent KS24019 (3) Alcatel Lucent RRH2x60-AWS (3) Alcatel Lucent RRH2X60-PCS (2) RFS DB-T1-6Z-8AB-0Z	(18) 1-5/8" (2) 1-5/8" Hybriflex	Verizon	172	(1) Low Profile Platform
163 ²	(3) Argus LLPX310R (3) Samsung DAP Radio Heads	(3) 9/16" (3) 5/16"	Clearwire	162	(1) Low Profile Platform
153	(3) Ericsson Air B2A B4P (3) Ericsson Air B4A B2P (3) Ericsson KRY112144/1	(12) 1-5/8" (1) 1-5/8" Fiber	T-Mobile	152	(1) Low Profile Platform
143	(3) Powerwave 7770 (2) KMW AM-X-CD-16-65-00T (2) Andrew SBNH-1D6565C (2) Powerwave P65-17-XLH-RR (6) ADC Cleargain 850-1900 TMAs (6) Ericsson RRUS11 (3) Powerwave LGP13519 Diplexers (3) CSS DBC-750 Diplexers (1) Raycap DC6-48-60-18-8F Surge Arrestor	(12) 1-1/4" (2) 3/4" DC Power (1) 7/16" Fiber	New Cingular	143	(1) Low Profile Platform

1. Coax installed inside the pole's shaft unless otherwise noted.
2. Coax is installed inside (1) 3" conduit, inside the pole's shaft.

Proposed Carrier Final Loading:

Antenna Elevation (ft)	Description	Feedlines	Carrier	Mount Elevation (ft)	Mount Type
153	(3) Ericsson Air B2A B4P (3) Ericsson Air B4A B2P (3) Commscope LNX-6515DS (3) Ericsson KRY112144/1 (3) Ericsson S11B12	(12) 1-5/8" (1) 1-5/8" Fiber	T-Mobile	152	(1) Low Profile Platform

RESULTS

The following yield strength of steel for individual members was used for analysis:

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	76 ksi, 65 ksi, 63 ksi, and 56 ksi
Flange Plate	65 ksi
Base Plate	50 ksi
Anchor Bolts	105 ksi and 150 ksi

Table 3 displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
L1	183 - 180	Pole	TP24x24x0.281	1.4	Pass
L2	180 - 135	Pole	TP34.125x24x0.25	71.6	Pass
L3	135 - 130	Pole	TP35.25x34.125x0.5	40.9	Pass
L4	130 - 125	Pole	TP38.625x35.25x0.25	87.7	Pass
L4	125 - 115	Pole w/ Mods	TP38.625x35.25x0.25 w/ (3) C6x10.5 Channels	79.1	Pass
L5	115 - 91	Pole	TP44.025x38.625x0.3125	97.9	Pass
L6	91 - 85	Pole w/ Mods	TP45.375x44.025x0.625 w/ (6) C6x10.5 Channels	80.0	Pass
L7	85 - 81	Pole w/ Mods	TP46.275x45.375x0.3125 w/ (6) C6x10.5 Channels	84.3	Fail
L8	81 - 71	Pole w/ Mods	TP48.525x46.275x0.375 w/ (6) C6x10.5 Channels	78.2	Pass
L9	71 - 65	Pole w/ Mods	TP53.025x48.525x0.375 w/ (6) C6x10.5 Channels	79.5	Pass
L9	65 - 51	Pole	TP53.025x48.525x0.375	98.0	Pass
L10	51 - 48	Pole	TP53.7x53.025x0.375	83.4	Pass
L11	48 - 41	Pole	TP55.275x53.7x0.75	42.9	Pass
L12	41 - 0	Pole	TP64.5x55.275x0.375	97.1	Pass
		Anchor Bolts	(24) 2" Ø on 58" BC	61.4	Pass
		Anchor Bolts	(9) 1.375" Ø on 82" BC	70.7	Pass
		Base Plate	PL 1.50" thk x 64.5" Ø	90.6	Pass

*Capacities include a 1/3 allowable stress increase due to wind per TIA/EIA-222-F standards.

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis (TIA/EIA-222-F)*	Original Design (TIA/EIA-222-F)
Axial	54 k	---
Shear	40 k	39 k
Moment	5,245 k-ft	5,027 k-ft

*Foundation determined to be adequate per independent analysis using normal soil parameters per TIA/EIA-222-F standards.

GENERAL COMMENTS

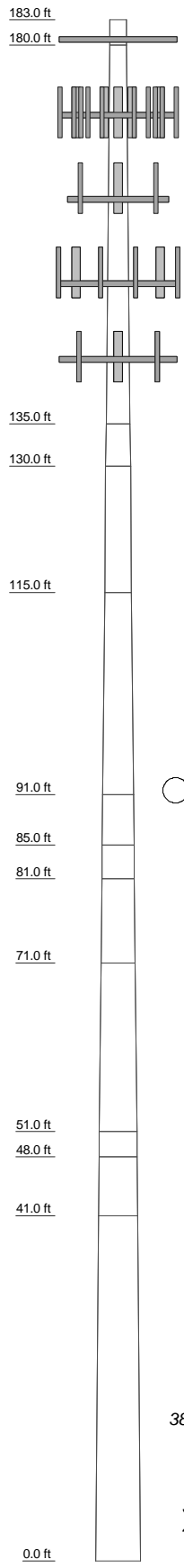
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

APPENDIX

Section	1	2	3	4	5	6	7	8	9	10	11	12	
Length (ft)	3.00	45.00	5.00	15.00	24.00	6.00	4.00	10.00	20.00	3.00	7.00	41.00	
Number of Sides	1	18	18	18	18	18	18	18	18	18	18	18	
Thickness (in)	0.2810	0.2500	0.5000	0.2500	0.3125	0.3125	0.3125	0.3750	0.3750	0.3750	0.7500	0.3750	
Top Dia (in)	24.0000	24.0000	34.1250	35.2500	38.6250	44.0250	45.3750	46.2750	48.5250	53.0250	53.7000	55.2750	
Bot Dia (in)	24.0000	34.1250	35.2500	38.6250	44.0250	45.3750	46.2750	48.5250	53.0250	53.7000	55.2750	64.5000	
Grade	A36	A572-65	A572-65	A572-65	A572-65	A572-65	A572-65	A572-65	A500M-63	A500M-63	Fy=75	Fy=75	
Weight (K)	0.2	3.5	0.9	1.5	3.3	1.8	0.6	1.9	4.1	0.6	3.0	9.9	31.4



DESIGNED APPURTENANCE LOADING

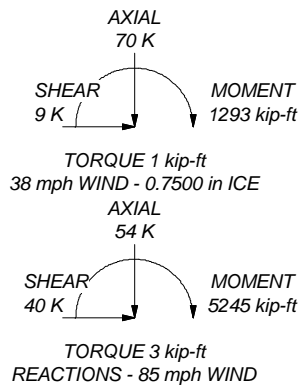
TYPE	ELEVATION	TYPE	ELEVATION
(4) Pipe Mount	181	AIR B4/B2P w/Mount Pipe	152
(4) Pipe Mount	181	LNx-6515DS w/ Mount Pipe	152
(4) Pipe Mount	181	LNx-6515DS w/ Mount Pipe	152
Low Profile Platform	181	LNx-6515DS w/ Mount Pipe	152
Low Profile Platform	172	S11B12	152
(2) HBXX-6517DS w/Mount Pipe	172	S11B12	152
(2) HBXX-6517DS w/Mount Pipe	172	S11B12	152
(2) HBXX-6517DS w/Mount Pipe	172	KRY 112 144/1	152
(2) LPA-80080/4CF W/Mount Pipe	172	KRY 112 144/1	152
LPA-80080/4CF W/Mount Pipe	172	KRY 112 144/1	152
LPA-80080/4CF W/Mount Pipe	172	Low Profile Platform	152
LNx-6514DS w/ Mount Pipe	172	7770.00 w/Mount Pipe	143
LNx-6514DS w/ Mount Pipe	172	7770.00 W/Mount Pipe	143
LNx-6514DS w/ Mount Pipe	172	7770.00 W/Mount Pipe	143
APL866513 w/ Mount Pipe	172	AM-X-CD-16-65-00T-RET w/ Mount Pipe	143
APL866513 w/ Mount Pipe	172	AM-X-CD-16-65-00T-RET w/ Mount Pipe	143
KS24019-L112A	172	AM-X-CD-16-65-00T-RET w/ Mount Pipe	143
RRH-2x60-AWS	172	SBNH-1D6565C w/Mount Pipe	143
RRH-2x60-AWS	172	SBNH-1D6565C w/Mount Pipe	143
RRH-2x60-AWS	172	SBNH-1D6565C w/Mount Pipe	143
RRH-2x60-PCS	172	P65-17-XLH-RR w/Mount Pipe	143
RRH-2x60-PCS	172	P65-17-XLH-RR w/Mount Pipe	143
RRH-2x60-PCS	172	P65-17-XLH-RR w/Mount Pipe	143
RRH-2x60-PCS	172	(2) ADC 850-1900 Dual Band TMAs	143
RRH-2x60-PCS	172	(2) ADC 850-1900 Dual Band TMAs	143
DB-T1-6Z-8AB-0Z	172	(2) ADC 850-1900 Dual Band TMAs	143
DB-T1-6Z-8AB-0Z	172	(2) ADC 850-1900 Dual Band TMAs	143
LLPX310R w/ Mount Pipe	162	(2) RRUS 11	143
LLPX310R W/ Mount Pipe	162	(2) RRUS 11	143
LLPX310R W/ Mount Pipe	162	(2) RRUS 11	143
DAP Radio Head	162	LGP 13519	143
DAP Radio Head	162	LGP 13519	143
DAP Radio Head	162	LGP 13519	143
Low Profile Platform	162	LGP 13519	143
AIR B2A/B4P w/Mount Pipe	152	DBC-750 Diplexer	143
AIR B2A/B4P w/Mount Pipe	152	DBC-750 Diplexer	143
AIR B2A/B4P w/Mount Pipe	152	DBC-750 Diplexer	143
AIR B2A/B4P w/Mount Pipe	152	DC6-48-60-18-8F Surge Arrestor	143
AIR B4A/B2P w/Mount Pipe	152	Low Profile Platform	143
AIR B4A/B2P w/Mount Pipe	152		


MATERIAL STRENGTH

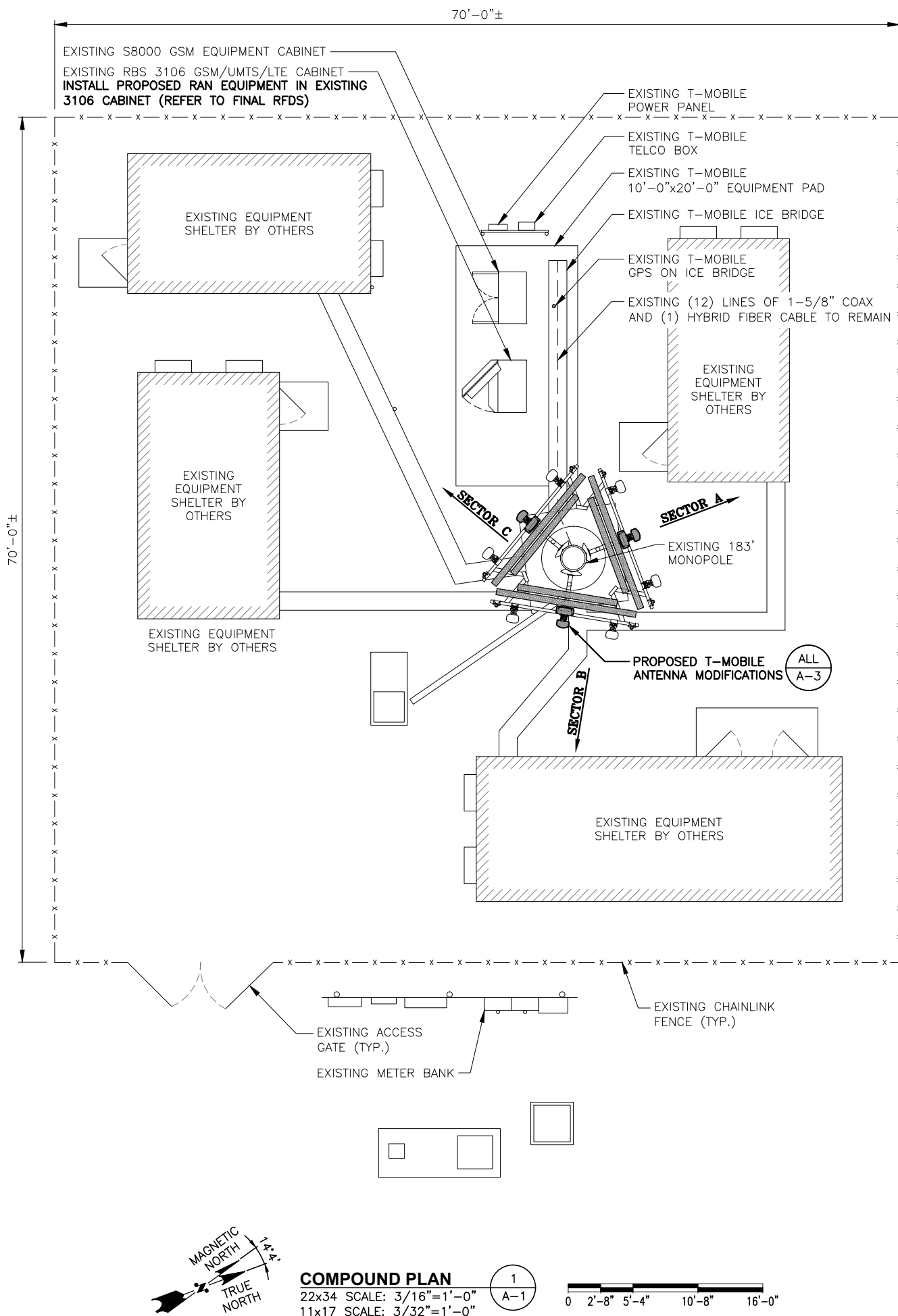
GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi	A500M-63	63 ksi	80 ksi
A572-65	65 ksi	80 ksi	Fy=75	75 ksi	90 ksi
Fy = 56 ksi	56 ksi	71 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.



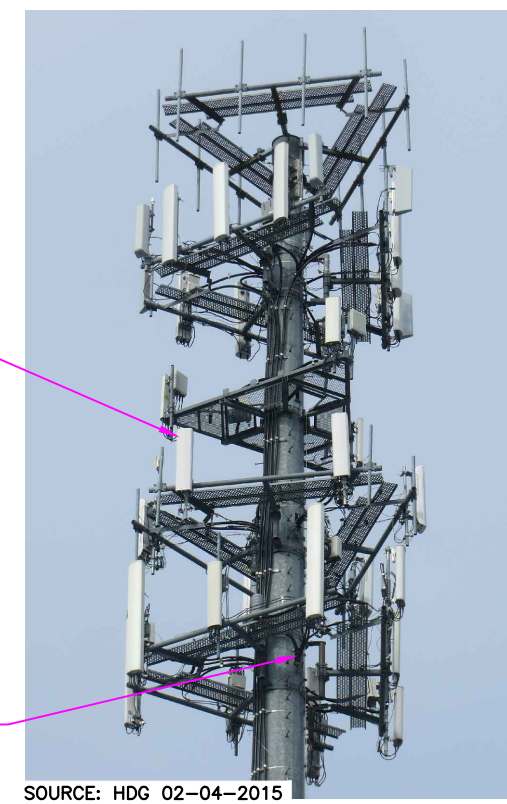
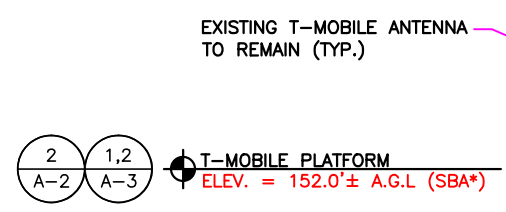
 <p>FDH Engineering, Inc. 6521 Meriden Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 919-755-1012 FAX: 919-755-1031</p>	Job: Waterford, CT01002-S		
	Project: 15BDTN1400		
	Client: SBA Network Services, Inc.	Drawn by: DVaughan	App'd:
	Code: TIA/EIA-222-F	Date: 02/23/15	Scale: NTS
Path:		Dwg No. E-1	



STRUCTURAL NOTES:

- ADDITIONAL TOWER MAPPING AND STRUCTURAL ANALYSIS ARE REQUIRED PRIOR TO CONSTRUCTION. DRAWINGS ARE SUBJECT TO CHANGE PENDING OUTCOME OF STRUCTURAL ANALYSIS.
- MOUNT ALL ANTENNAS, RRU'S, COAX, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS.

ANTENNA MOUNT STRUCTURAL ASSESSMENT REQUIREMENT:
ENGINEER OF RECORD HAS MADE A VISUAL ASSESSMENT ONLY AND DETERMINED THAT THE EXISTING ANTENNA MOUNT IS ADEQUATE TO ACCOMMODATE ADDITIONAL EQUIPMENT LOADS. STRUCTURAL DESIGNS AND DETAILS AS SHOWN HEREIN FOR STRUCTURAL MODIFICATIONS OF THE EXISTING ANTENNA MOUNT ARE PRELIMINARY ONLY AND FINAL CONSTRUCTION DETAILS ARE SUBJECT TO CHANGE PENDING THE COMPLETION OF AN ANTENNA MOUNT STRUCTURAL ASSESSMENT.



EXISTING PARTIAL ELEVATION PHOTO DETAIL (2 A-1)
SCALE: N.T.S.

EXISTING RBS 3106 GSM/UMTS/LTE CABINET
INSTALL PROPOSED RAN EQUIPMENT IN EXISTING 3106 CABINET (REFER TO FINAL RFDS)

EXISTING T-MOBILE GPS ON ICE CANOPY

EXISTING S8000 GSM EQUIPMENT CABINET

EXISTING T-MOBILE POWER PANEL

EXISTING T-MOBILE TELCO BOX



EXISTING EQUIPMENT PHOTO DETAIL (3 A-1)
SCALE: N.T.S.

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

SBA

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MARLBOROUGH, MA 01752 FAX: (508) 251-1755

Hudson Design Group

1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090 TEL: (978) 557-5553
N. ANDOVER, MA 01845 FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm

CHECKED BY: KB

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	02/10/15	ISSUED FOR CONSTRUCTION	JA

SITE NUMBER:
CT11473A

SITE NAME:
WATERFORD/ RT
85/ DOUGLAS

SITE ADDRESS:
45 FARGO ROAD
WATERFORD, CT 06385
NEW LONDON COUNTY

SHEET TITLE
COMPOUND &
ELEVATION PLAN

SHEET NUMBER
A-1

**T-MOBILE
NORTHEAST LLC**

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BLOOMFIELD, CT 06002
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Daniel P. Hamm

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NEW LONDON COUNTY

SHEET TITLE

EXISTING &
PROPOSED ANTENNA
PLANS

SHEET NUMBER

A-2

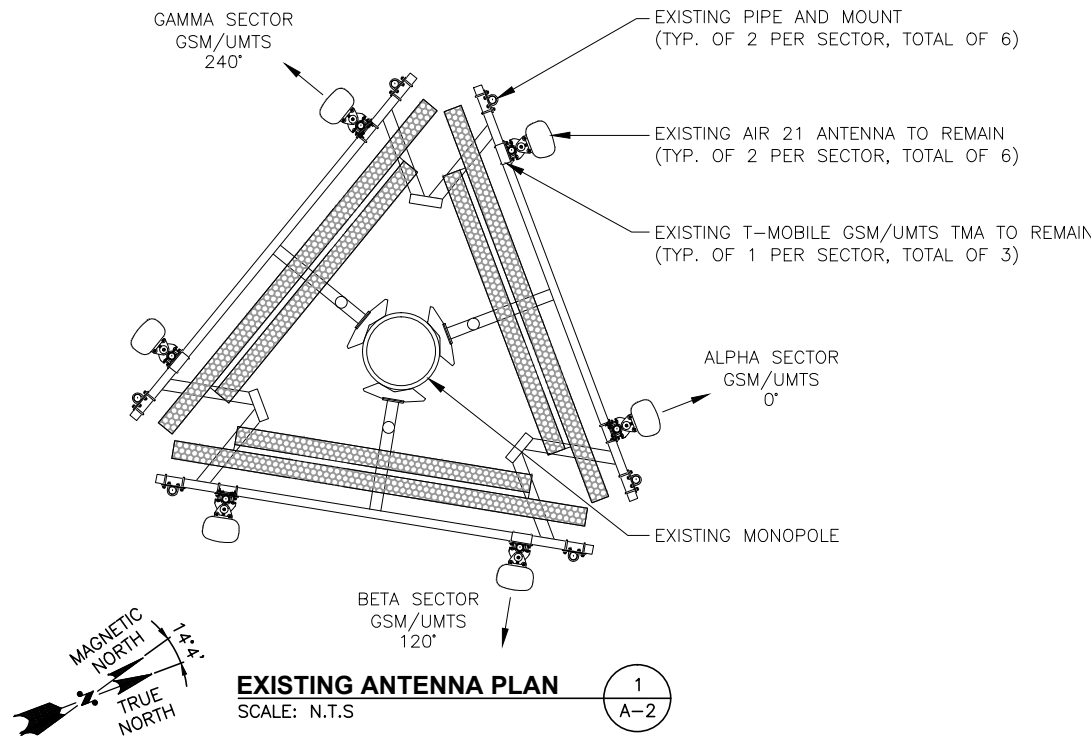
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SPECIAL WORK NOTE:
VERTICALLY CENTER ON EXISTING MOUNTING RAIL, THE PIPE MAST AND ANTENNA



1
A-3

3
A-3

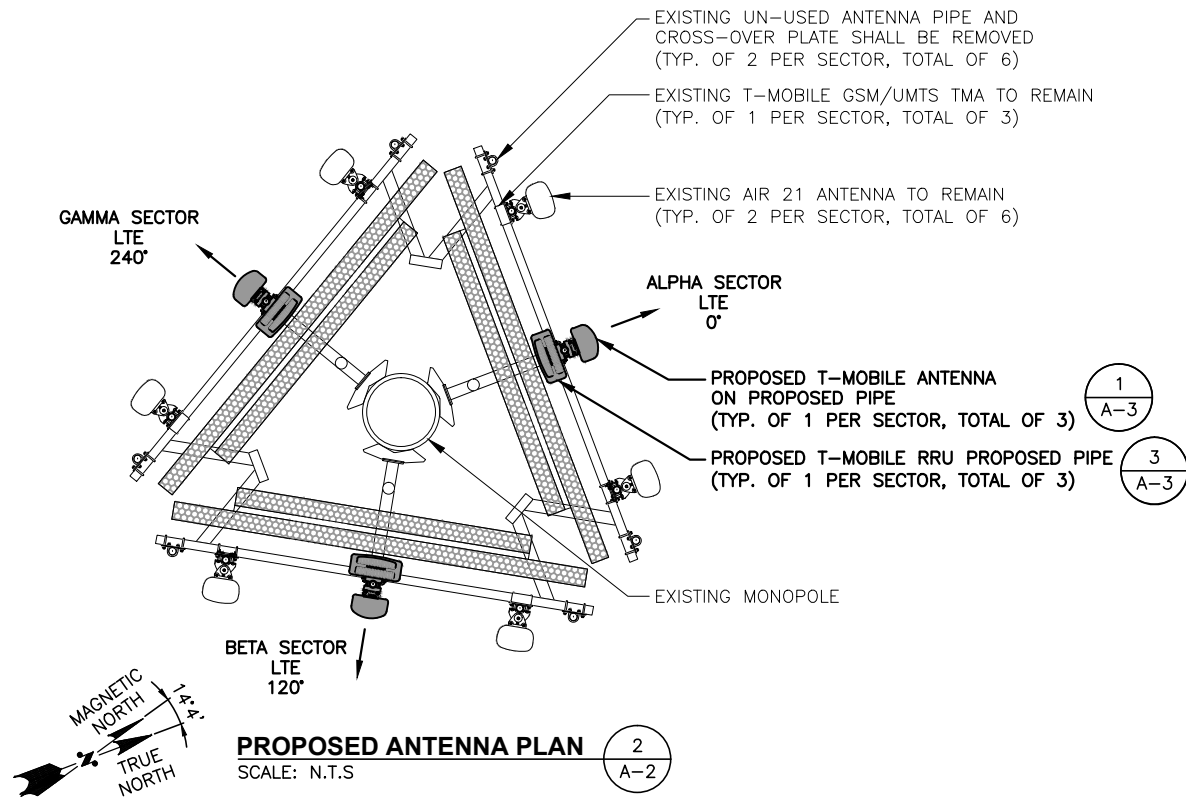
- PROPOSED T-MOBILE ANTENNA ON PROPOSED PIPE (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- PROPOSED T-MOBILE RRU ON PROPOSED PIPE (TYP. OF 1 PER SECTOR, TOTAL OF 3)



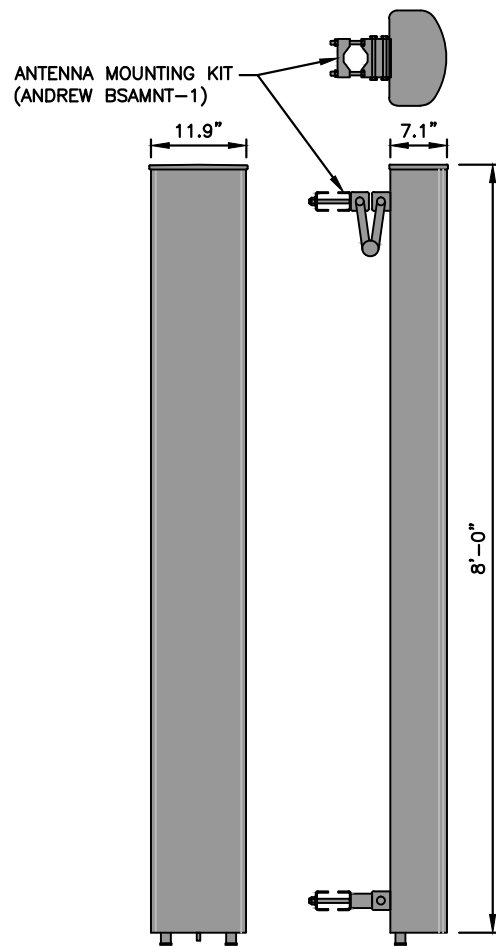
SOURCE: HDG 02-04-2015

PROPOSED ANTENNA PHOTO DETAIL
SCALE: N.T.S

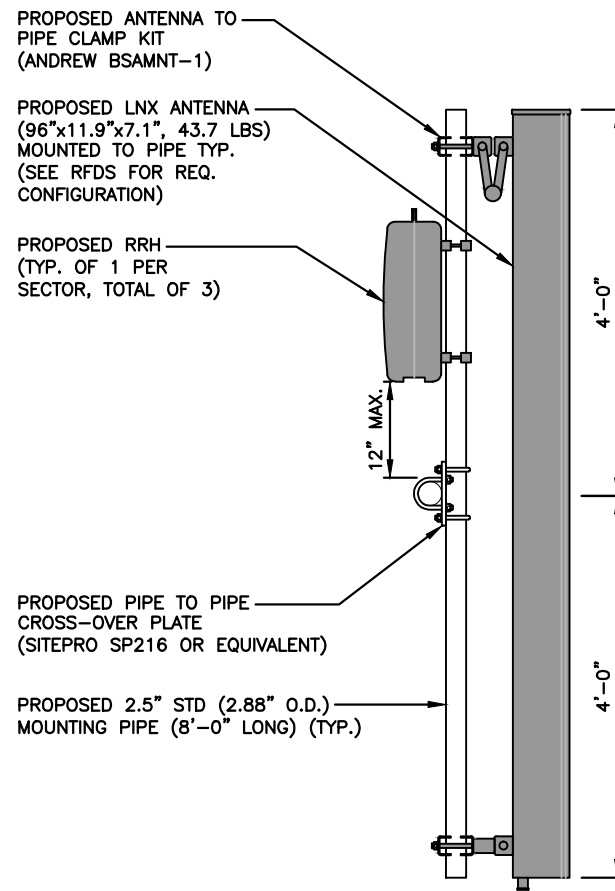
3
A-2



2
A-2



LNx ANTENNA DETAIL 1
SCALE: N.T.S. A-3

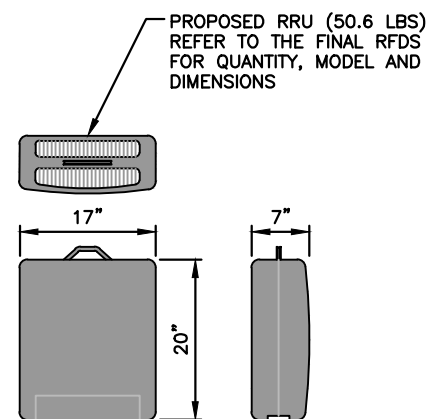


PROPOSED ANTENNA & RRU MOUNTING DETAIL 2
SCALE: N.T.S. A-3

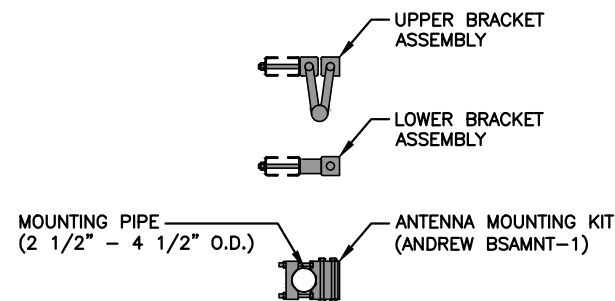
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SPECIAL WORK NOTE:
VERTICALLY CENTER ON EXISTING MOUNTING RAIL, THE PIPE MAST AND ANTENNA



PROPOSED RRU DETAIL 3
SCALE: N.T.S. A-3



ANTENNA MOUNTING BRACKET 4
SCALE: N.T.S. A-3

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