NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
420 Main Street, Unit 2
Sturbridge MA 01566

July 15, 2019

Ms. Melanie Bachman
Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Tower Share Application
641 Maple Hill Road, Naugatuck, CT 06770
Latitude: 41-29-17.24 N
Longitude: -73-01-12.73 W
T-Mobile Site Number: CTNH325A- NSD

Dear Ms. Bachman:

This letter and attachments are being re-submitted on behalf of T-Mobile Northeast LLC ("T-Mobile"). T-Mobile plans to install antennas and related equipment at the tower site located at 641 Maple Hill Road in Naugatuck, Connecticut. The existing monopole is owned by Tarpon Towers and was approved by the Borough of Naugatuck on February 14, 2019. The tower will be used by the Borough of Naugatuck emergency services, whose antennas will be located at the top of the tower.

T-Mobile is proposing to install four (4) 600/700MHz antennas, four (4) 1900/2100 MHz antennas, four (4) 2100 MHz antennas and twelve (12) remote radio units ('RRUs') at a centerline height of 167 feet on the existing 180-foot monopole tower. Three (3) hybrid cables and additional ancillary coax between the antennas & RRU's will also be installed on the tower. T-Mobile's equipment cabinets and one (1) Delta 25kW DC generator-250 gallon double walled self-contained tank with fuel sensor will be placed within T-Mobile's 260 sq. ft .lease area. The generator requires two (2) monthly 20-minute run cycles.

Included are plans by Proterra Design Group, dated March 12, 2019, attached as **Exhibit C**. Also included is the full structural analysis prepared by Destek Engineering for Proterra dated June 24, 2019, confirming the existing tower is structurally capable of supporting the proposed equipment, attached as **Exhibit D.**

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of T-Mobile's intent to share telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Honorable N. Wendell Hess III, Mayor, Borough of Naugatuck, Ed Carter, Zoning Enforcement Officer, Borough of Naugatuck. The Borough of Naugatuck is the property owner.

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the monopole tower is 180-feet; T- Mobile's proposed antennas will be located at a center line height of 167-feet.

2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached Radio Frequency Emissions Analysis Report prepared by EBI Consulting, dated February 4, 2019, the combined site operations will result in a total power density of 2.13% MPE as evidenced by **Exhibit E.**

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, T-Mobile respectfully indicates that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting T-Mobile's proposed loading. The structural analysis is included as **Exhibit D**.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this monopole tower in Naugatuck. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit T-Mobile to obtain a building permit for the proposed installation. Further, a Letter of Authorization from the tower owner is included as **Exhibit F**, authorizing T-Mobile to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of T-Mobile equipment at the 167-foot level of the existing 180-foot tower would have an insignificant visual impact on the area around the tower. T- Mobile's ground equipment would be installed within the existing facility compound. T-Mobile's shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by **Exhibit E,** the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. T-Mobile will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist T-Mobile with this tower sharing application.

E. Public Safety Concerns. As discussed above, the monopole tower is structurally capable of supporting T-Mobile's proposed loading. T-Mobile is not aware of any public safety concerns relative to the proposed sharing of the existing monopole tower. T-Mobile's intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Naugatuck.

Sincerely,

Hollis M. Redding
Mobile: 860-834-6964
Fax: 413-521-0558
Office: 35 Griffin Road South, Bloomfield, CT 06002
Email: hollis@northeastsitesolutions.com

Attachments

cc: Honorable N. Warren "Pete" Hess III, Mayor, Borough of Naugatuck
Ed Carter, Zoning Enforcement Officer, Borough of Naugatuck

Exhibit A

BOROUGH OF NAUGATUCK
LAND USE DEPARTMENT

Phone 203-720-7042
Fax 203-720-5026

229 Church St. 2nd Fl
Naugatuck, CT. 06770

ZONING COMPLIANCE PERMIT

#074-8610

PERMIT NO: 2018-133

DATE 10/9/2018 2/14/2019

Type of Permit:

180' ~~200~~' monopole (W)

Size: 60' x 60' Fenced Compound

_____ Addition $150/$60	_____ Detached Garage $75/$60	_____ Sign $75/$60
_____ Change of Use $75/$60	_____ Fence $25/$60	_____ Swimming Pool $75/$60
_____ Deck $75/$60	_____ Shed $75/$60	X Other Cell Tower municipal Tower

Old Use _____ New Use _____

DESCRIPTION OF PREMISES:

SingleFamily _____ **MultiFamily** _____ **Other** X **ZONE** R-15

PROPERTY OWNER: Borough of Naugatuck

ADDRESS: 641 Maple Hill Road **PHONE:** 203-623-3287

APPLICANT: Tarpon Towers II, LLC (Keith Coppins)

The applicant states that the proposed structure is not located within:

1. A wetlands or water course area;
2. 100 feet of a stream or wetlands area;
3. A stream encroachment area
4. A flood plain area.

X**Signature of Applicant** _____ Keith Coppins

I hereby certify that the information herein and the attached plot plan are accurate.

Applicable Zoning Regulation to apply: Conforms to all setbacks

Date Granted: 10/10/18 **Fee:** $75 + $60 **Variance #** _____

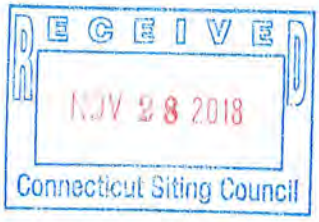
ZONING ENFORCMENT OFFICER: _____

This approval is subject to compliance (prior to occupancy) with the provisions of the zoning and subdivision regulations of the Borough of Naugatuck and as authorized under section 8 of the Connecticut General Statutes, as amended. This permit is based upon the plot plan submitted. Falsification, misrepresentation or omission shall constitute a violation of the borough regulations.

ck# 1125-75
ck # 11269

Phoenix Partnership

November 28, 2018



Via Electronic Mail

Ms. Melanie Bachman,
Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: **Municipal Tower**

641 Maple Hill Rd Naugatuck, CT

Dear Attorney Bachman:

Tarpon Towers II ("Tarpon") is in receipt of a building permit to install a 180 foot telecommunications tower on property owned by the Town of Naugatuck ("Naugatuck"), located at 641 Maple Hill Road Naugatuck, CT. This tower will house Naugatuck's municipal equipment, specifically emergency services antennas, at a height of 177 feet.

I bring this to your attention not only as notice of a municipal tower being erected at this site, but also to reconcile a previous technical report filing that Tarpon initially provided to Naugatuck for a site at a different address in this area.

Tarpon originally proposed a wireless telecommunication tower site on property located at 815 Maple Hill Rd, Naugatuck. This particular project contemplated T-Mobile as the anchor tenant. Tarpon submitted a technical report to Naugatuck on March 28, 2018 for a wireless telecommunication site on this property.

Tarpon and its representatives met with Naugatuck officials for the technical report meeting on April 16, 2018. During that meeting, Tarpon was asked if it would consider using a parcel of property owned by Naugatuck, located at 641 Maple Hill Road. Siting the proposed telecommunications facility on this town parcel provided significantly more benefit to Naugatuck than the initially identified private property. After reviewing the Town parcel for suitability, feasibility and technical viability, Tarpon entered into a contract with Naugatuck after the lease was approved at a Town Board meeting on June 5, 2018.

110 Washington Avenue North Haven, Connecticut 06473
Phone - 203-623-3287 Fax 203-234-6398

Tarpon discussed the new site location with T-Mobile and it has indicated the Town of Naugatuck site would provide necessary coverage and T-Mobile intends to file a tower sharing application with the CT Siting Council.

As of today's date, Tarpon has completed the tower and site design and is expecting the construction to begin imminently.

As always, please don't hesitate to contact me with any questions.

Regards,

Keith Coppins

cc: Mayor Peter Hess, Town of Naugatuck (*via electronic mail*)
Brett Buggeln, Tarpon Towers II (*via electronic mail*)

110 Washington Avenue North Haven, Connecticut 06473
Phone - 203-623-3287 Fax 203-234-6398

Exhibit B

Borough of Naugatuck, CT

Property Listing Report | Map Block Lot: Q-18E24 | Account: 074-8610

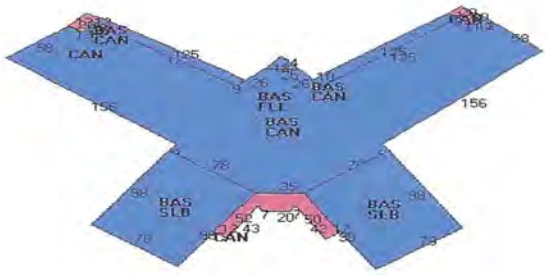
Property Information

Property Location	641 MAPLE HILL RD
Owner	BOROUGH OF NAUGATUCK
Co-Owner	MAPLE HILL SCHOOL
Mailing Address	229 CHURCH ST NAUGATUCK CT 06770
Land Use	902C GRADE SCH
Land Class	E
Zoning Code	
Census Tract	
Sub Lot	

Neighborhood	6
Acreage	14.32
Utilities	
Lot Setting/Desc	
Survey Map	
Additional Info	

Photo

Sketch



Primary Construction Details

Year Built	1990
Stories	1
Building Style	Schools-Public
Building Use	Comm/Ind
Building Condition	C
Floors	Vinyl
Total Rooms	

Bedrooms	
Full Bathrooms	0
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	Flat
Roof Cover	T+G/Rubber

Exterior Walls	Brick
Interior Walls	Drywall
Heating Type	Forced Hot Air
Heating Fuel	Gas
AC Type	None
Gross Bldg Area	106639
Total Living Area	86816

Report Created On 3/28/2019

Borough of Naugatuck, CT

Property Listing Report | Map Block Lot Q-18E24 | Account 074-8610

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	7700100	5390070
Extras	75540	52880
Outbuildings	52530	36790
Land	944700	661290
Total	8772870	6141030

Outbuilding and Extra Items

Type	Description
Shed Good	192 S.F.
Freight Elev	2 STOPS
Sprnklr Enclos	86800 S.F.
W/DOUBLE LIGHT	2 UNITS
W/TRIPLE LIGHT	1 UNITS
Lights (1)	7 UNITS
MERC VAP/FLU	2 UNITS
Paving Asphalt	25000 S.F.
CENTRAL AC	4450 S.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	52250	52250
Canopy	4540	0
Slab	15283	0
Lower Level,Finished	34566	34566
Total Area	106639	86816

Sales History

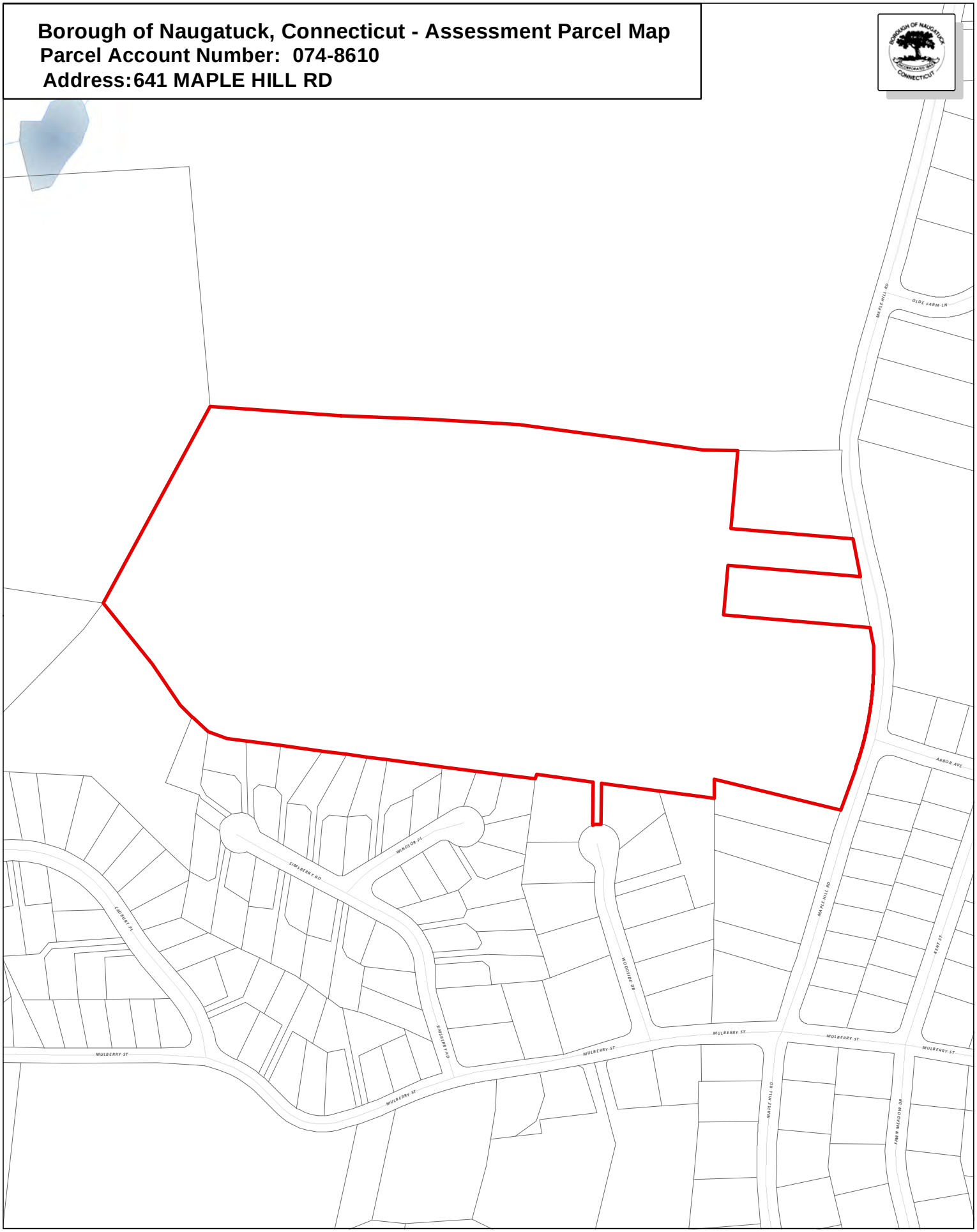
Owner of Record	Book/ Page	Sale Date	Sale Price
BOROUGH OF NAUGATUCK	327/ 90	1/27/1989	0

Report Created On 3/28/2019

Borough of Naugatuck, Connecticut - Assessment Parcel Map

Parcel Account Number: 074-8610

Address: 641 MAPLE HILL RD



0 75 150 225 300 Feet

Disclaimer: This map is for informational purposes only.
All information is subject to verification by any user.
The Borough of Naugatuck and its mapping contractors
assume no legal responsibility for the information contained herein.

Map Produced March 2017

Exhibit C

DRAWING INDEX

SHEET	DESCRIPTION	REVISION
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GN-1	GENERAL NOTES	1
A-1	COMPILED SITE PLAN	1
D-1	COMPOUND PLAN & ELEVATION	1
D-2	ANTENNA PLAN & DETAILS	1
D-3 & D-4	DETAILS	1
S-1	DETAILS	1
E-1 & E-2	ELECTRICAL & GROUNDING DETAILS	1

GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE NORTHEAST, LLC. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER & APPLICANT REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE LATEST T-MOBILE CONSTRUCTION GUIDELINES.
5. THIS SHEET WAS ORIGINALLY PRINTED TO ANSI D (22"X34") WITH 1" MARGINS. PRINTING TO ANSI B (11"X17") WILL RESULT IN A HALF-SCALE (1:2) SHEET SET WITH 1/2" MARGINS. CONFIRM ALL SCALED DISTANCES WITH GRAPHICAL SCALES SHOWN HEREIN.
6. NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.

   BUILDING CODE: 2018 CONNECTICUT STATE BUILDING CODE (IBC 2015) WITH AMENDMENTS

   ELECTRICAL CODE: NEC 2017 WITH AMENDMENTS
7. THE CONSTRUCTION SHOWN HEREIN MAY REQUIRE SPECIAL INSPECTIONS PER THE BUILDING CODE. APPLICANT/CONTRACTOR SHALL VERIFY WITH THE AUTHORITIES HAVING JURISDICTION (AHJ) PRIOR TO CONSTRUCTION AND ENGAGE THE INSPECTOR AND/OR APPROPRIATE 3RD PARTIES AS MAY BE REQUIRED.

SPECIAL CONSTRUCTION NOTES

1. TOWER OWNER SHALL PROVIDE GLOBAL STRUCTURAL STABILITY ANALYSIS OF EXISTING ANTENNA SUPPORT STRUCTURE. GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE TO FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS, RE-BUNDLING OF COAXIAL CABLES OR OTHER SPECIAL MODIFICATIONS AS OUTLINED THEREIN.
2. GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM TOWER OWNER-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.
3. PROTERRA DESIGN GROUP ASSUMES THAT THE MONOPOLE IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTION ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES.

T-Mobile

SITE NAME: CTNH325D (MAPLE HILL)
SITE NUMBER: CTNH325D
ADDRESS: 641 MAPLE HILL ROAD
NAUGATUCK, CT 06770

CONFIGURATION: 4Sec-6797DB2

VICINITY MAP

DIG SAFE SYSTEM
(MA, ME, NH, RI, VT):
1-888-344-7233
CALL BEFORE YOU DIG
(CT): 1-800-922-4455

UNDERGROUND SERVICE ALERT

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS
ANTENNA/RRU/TMA	
SECTOR A:	ACCESS NOT PERMITTED
SECTOR B:	ACCESS NOT PERMITTED
SECTOR C:	ACCESS NOT PERMITTED
SECTOR D:	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED*
	(*CAUTION: OSHA-APPROVED PORTABLE 8' STEP-LADDER REQUIRED)
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

PROJECT INFORMATION

SITE TYPE:	CO-LOCATION ON FUTURE WIRELESS COMMUNICATION FACILITY
SCOPE OF WORK:	PROPOSED T-MOBILE GROUND EQUIPMENT WITHIN 10'x26' LEASE AREA AND TOWER MOUNTED T-MOBILE EQUIPMENT ON FUTURE MONOPOLE
SITE NAME:	CTNH325D (MAPLE HILL)
SITE NUMBER:	CTNH325D
ZONING JURISDICTION:	BOROUGH OF NAUGATUCK / CONNECTICUT SITING COUNCIL
LATITUDE:	41° 29' 17.24"± N (RECORD 1A)
LONGITUDE:	73° 01' 12.73"± W (RECORD 1A)
DATUM:	NAD83 / NAVD88
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 SOUTH GRIFFIN ROAD BLOOMFIELD, CT 06002
TOWER OWNER:	TARPON TOWERS II, LLC 1001 3RD AVENUE WEST SUITE 420 BRADENTON, FL 34205
TOWER OWNER ID: TOWER OWNER NAME:	CT 1008 NAUGATUCK
SITE ENGINEER:	PROTERRA DESIGN GROUP, LLC 4 BAY ROAD BUILDING A, SUITE 200 HADLEY, MA 01035 TEL: (413) 320-4918

CONSTRUCTION REVISED

ProTerra DESIGN GROUP, LLC
4 Bay Road, Bldg A,
Suite 200
Hadley, MA 01035
Ph: (413) 320-4918

CONSULTANTS:

NO.	DATE	REVISIONS
0	02/26/19	ISSUED FOR CONSTRUCTION
1	03/12/19	CONSTRUCTION REVISED

TITLE: SITE NAME: CTNH325D (MAPLE HILL)
SITE NUMBER: CTNH325D
ADDRESS: 641 MAPLE HILL ROAD
NAUGATUCK, CT 06770

APPLICANT: T-MOBILE NORTHEAST LLC
35 SOUTH GRIFFIN ROAD
BLOOMFIELD, CT 06002

STAMP:

DATE:	02/13/19
DRAWN:	BM/PN
CHECK:	JMM/TEJ
SCALE:	SEE PLAN
JOB NO.:	------

SHEET TITLE:

TITLE SHEET

T-1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTNING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER SURCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – CENTERLINE COMMUNICATIONS
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T-MOBILE
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CUR\BS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
14. ANY NEW CONCRETE NEEDED FOR CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (FY = 36 KSI) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (FY = 35 KSI). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:
    SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

    SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

    AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

    AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), STEEL CONSTRUCTION MANUAL, 14TH EDITION;

    TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G, STRUCTURAL STANDARDS FOR STEEL

    ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BTCW	BARE TINNED SOLID COPPER WIRE	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
		MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW OR (P)	TYP	TYPICAL
		N.T.S.	NOT TO SCALE	VIF	VERIFY IN FIELD
EXISTING	EXISTING OR (E)	RAD	RADIATION CENTERLINE (ANTENNA)		
EGB	EQUIPMENT GROUND BAR	REF	REFERENCE		
EGR	EQUIPMENT GROUND RING				

ProTerra DESIGN GROUP, LLC
4 Bay Road, Bldg A,
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Hadley, MA 01035
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1	03/12/19	CONSTRUCTION REVISED

TITLE: SITE NAME: CTNH325D (MAPLE HILL)
SITE NUMBER: CTNH325D
ADDRESS: 641 MAPLE HILL ROAD
NAUGATUCK, CT 06770

APPLICANT: T-MOBILE NORTHEAST LLC
35 SOUTH GRIFFIN ROAD
BLOOMFIELD, CT 06002

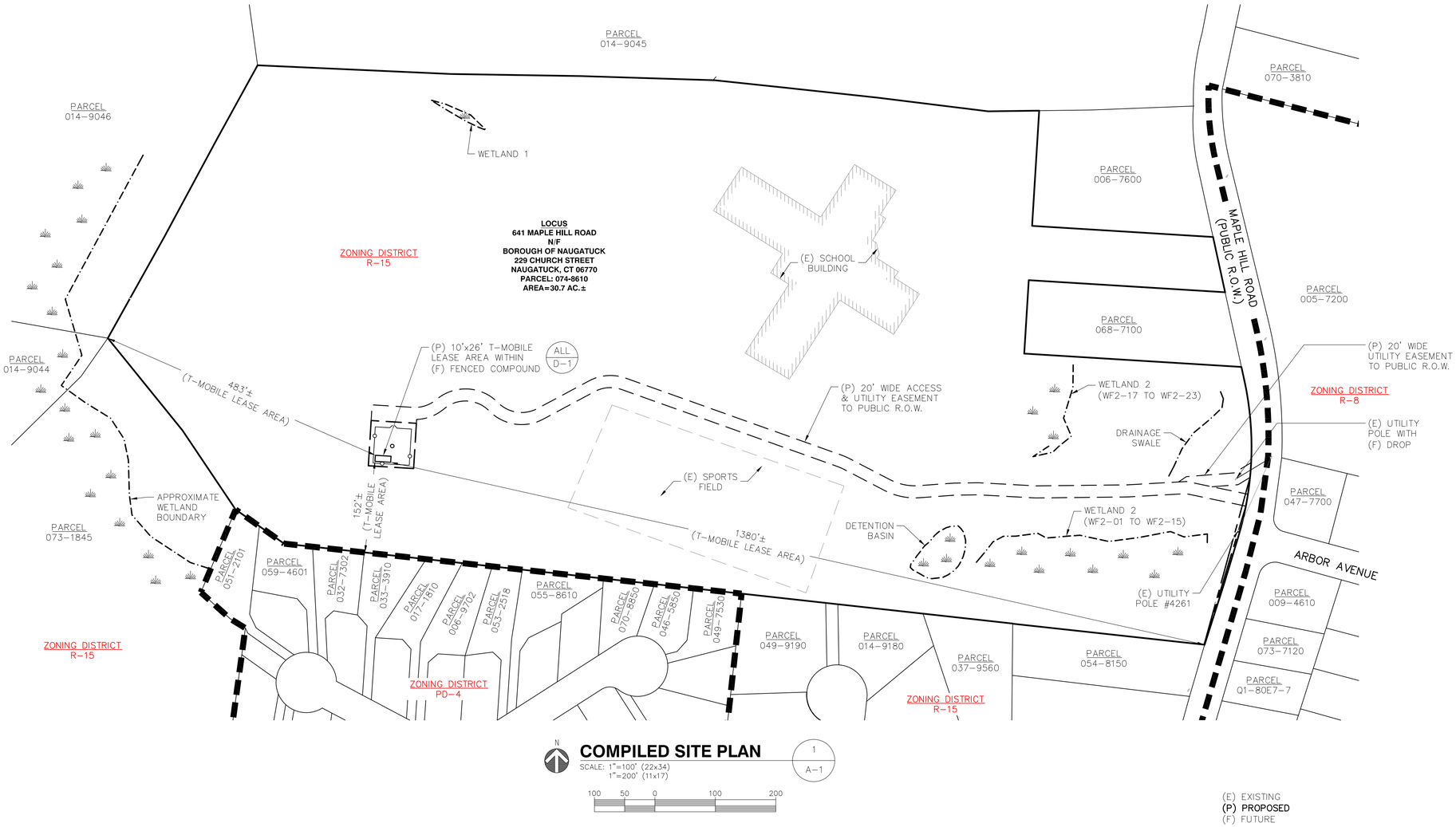
STAMP:

DATE: 02/13/19
DRAWN: BM/PN
CHECK: JMM/TEJ
SCALE: SEE PLAN
JOB NO.: ------

SHEET TITLE:

GENERAL NOTES

GN-1



COMPILED SITE PLAN

SCALE: 1"=100' (22x34)
1"=200' (11x17)

100 50 0 100 200

(E) EXISTING
(P) PROPOSED
(F) FUTURE

GENERAL NOTES

1. THE TYPE, DIMENSIONS, MOUNTING HARDWARE, AND POSITIONS OF ALL PROJECT OWNER'S EQUIPMENT ARE SHOWN IN ILLUSTRATIVE FASHION. ACTUAL HARDWARE DETAILS AND FINAL LOCATIONS MAY DIFFER SLIGHTLY FROM WHAT IS SHOWN.
2. THE PROJECT OWNER'S PCS FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. THE DESIGN OF THE TOWER, FOUNDATION AND ANTENNA MOUNTING HARDWARE WILL MEET THE ANSI/EIA/TIA-222-G STANDARDS FOR STRUCTURAL STEEL ANTENNA SUPPORTING STRUCTURES AND STATE BUILDING CODE REQUIREMENTS. DETAILED CONSTRUCTION DRAWINGS AND STRUCTURAL CALCULATIONS WILL BE PREPARED BY A REGISTERED PROFESSIONAL ENGINEER AND SUBMITTED WITH A BUILDING PERMIT APPLICATION FOR REVIEW AND APPROVAL BY THE LOCAL BUILDING CODE ENFORCEMENT OFFICIAL. PROTERRA IS NOT DESIGNING, BUILDING, INSPECTING, OR OTHERWISE INVOLVED WITH CONSTRUCTION OR MODIFICATION OF THE MONOPOLE AND IS THE RESPONSIBILITY OF THE TOWER OWNER.
4. ONCE THE FACILITY BECOMES FULLY OPERATIONAL, NORMAL AND ROUTINE MAINTENANCE BY TOWER OWNER'S AND CARRIER'S TECHNICIANS WILL BE PERFORMED. THE ESTIMATED VEHICULAR TRAFFIC GENERATED BY THESE VISITS IS PREDICTED TO BE LESS THAN THE TYPICAL TRAFFIC GENERATED BY A SINGLE-FAMILY DWELLING.

REFERENCES

PROPERTY & EXISTING FEATURES (DATA ACCUMULATION SURVEY) PERFORMED BY NORTHEAST SURVEY CONSULTANTS DATED OCTOBER 10, 2018. A PROPERTY LINE AND/OR BOUNDARY RETRACEMENT HAS NOT BEEN PERFORMED.

ZONING DISTRICTS – "ZONING MAP OF THE BOROUGH OF NAUGATUCK, CONNECTICUT" EFFECTIVE JULY 17, 2017

FLOODPLAIN – FLOOD INSURANCE RATE MAP (FIRM) MAP NUMBER 09009C0257H EFFECTIVE DATE DECEMBER 17, 2010 PREPARED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), US DEPARTMENT OF HOMELAND SECURITY. ENTIRE AREA SHOWN IS WITHIN ZONE "X" UNSHADED: AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL FLOOD CHANCE FLOODPLAIN.

TOWER OWNER CONSTRUCTION DRAWINGS PREPARED BY PROTERRA DESIGN GROUP, LLC DATED JANUARY 29, 2019.

ZONING SUMMARY

ZONING DISTRICT(S): RESIDENCE DISTRICT (R-15)

ASSESSOR'S ID#: 074-8610
(P) USE: COMMUNICATIONS TOWER

DIMENSION	PROVIDED	CONSTRAINT
LOT – AREA	30.7± ACRES	15,000 SF MIN.
LOT – FRONTAGE	565'±	95' MIN.
LOT – (E) & (P) IMPERVIOUS COVERAGE	13%±	20% MAX.
(P) T-MOBILE LEASE AREA – FRONT YARD	1380'±	30' MIN.
(P) T-MOBILE LEASE AREA – REAR YARD	483'±	30' MIN.
(P) T-MOBILE LEASE AREA – SIDE YARD	152'±	20' MIN.
(P) T-MOBILE LEASE AREA – HEIGHT	15'±	40' MAX.

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NAUGATUCK, CT 06770

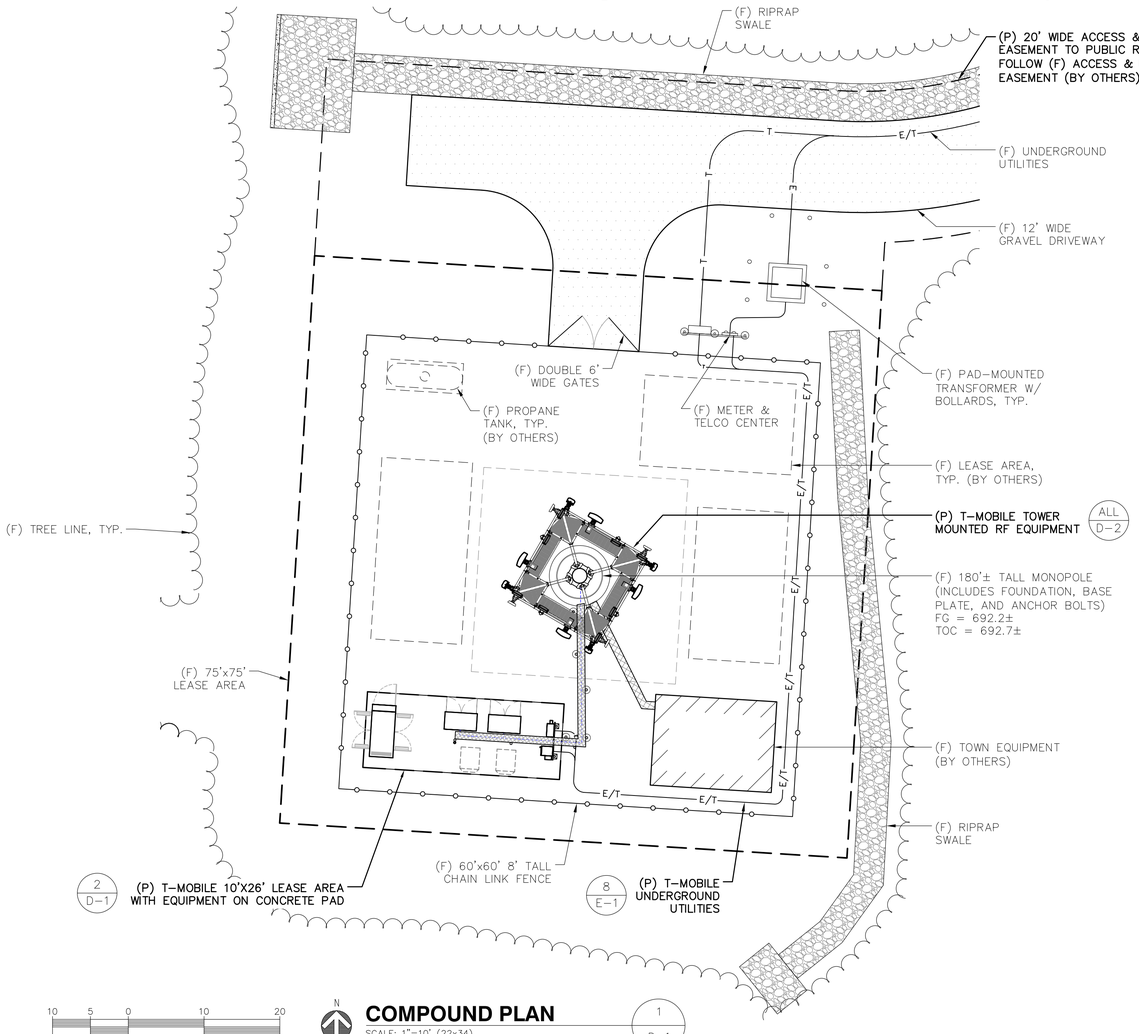
APPLICANT: T-MOBILE NORTHEAST LLC
35 SOUTH GRIFFIN ROAD
BLOOMFIELD, CT 06002

STAMP:

DATE: 02/13/19
DRAWN: BM/PN
CHECK: JMM/TEJ
SCALE: SEE PLAN
JOB NO.: ------
SHEET TITLE:

COMPILED SITE PLAN

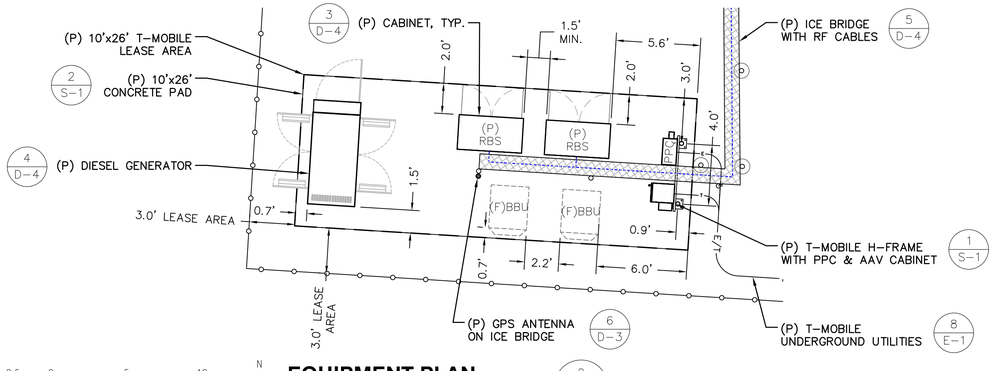
A-1



10 5 0 10 20

N **COMPOUND PLAN** 1 D-1

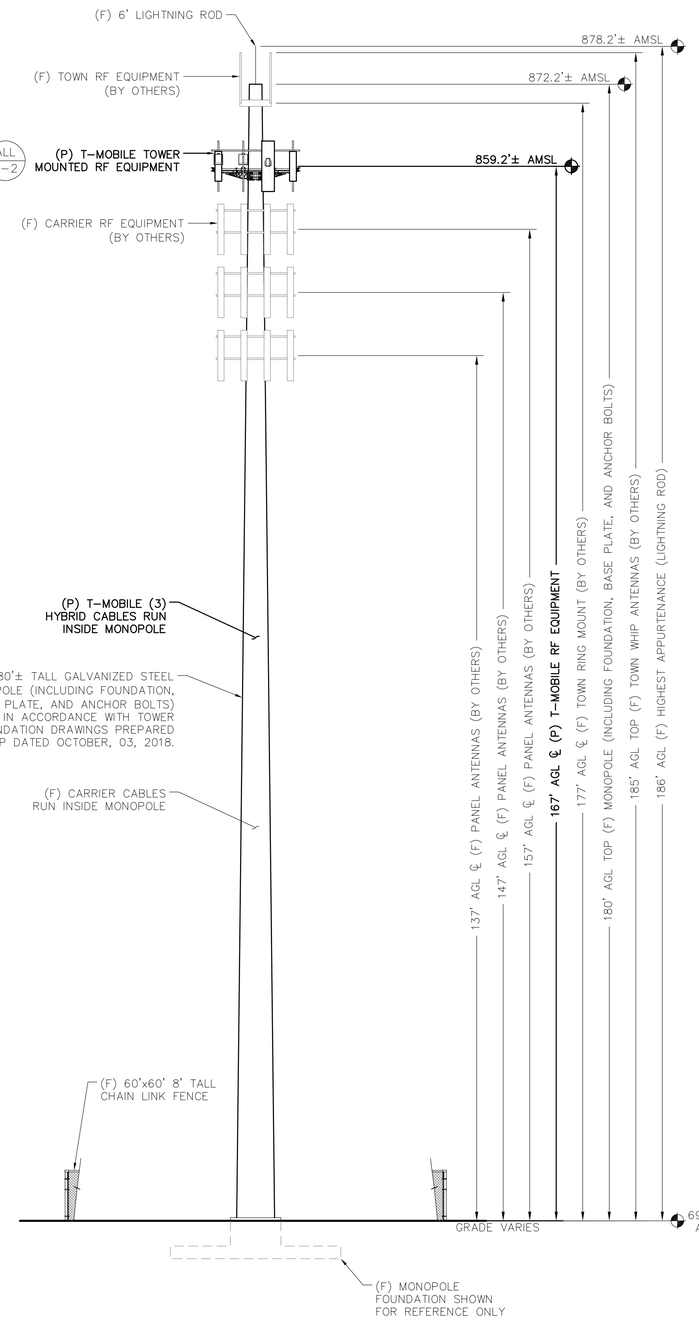
SCALE: 1"=10' (22x34)
1"=20' (11x17)



5 2.5 0 5 10

N **EQUIPMENT PLAN** 2 D-1

SCALE: 1"=5' (22x34)
1"=10' (11x17)



ELEVATION 3 D-1

SCALE: 1"=12' (22x34)
1"=24' (11x17)

12 6 0 12 24

(F) FUTURE – IMPROVEMENTS BY TARPON TOWERS II, LLC
(P) PROPOSED – IMPROVEMENTS BY T-MOBILE

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BLOOMFIELD, CT 06002

STAMP:

DATE:	02/13/19
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CHECK:	JMM/TEJ
SCALE:	SEE PLAN
JOB NO.:	------

SHEET TITLE:
COMPOUND PLAN AND ELEVATION

D-1

BASED UPON RFDS DATED OCTOBER 29, 2018

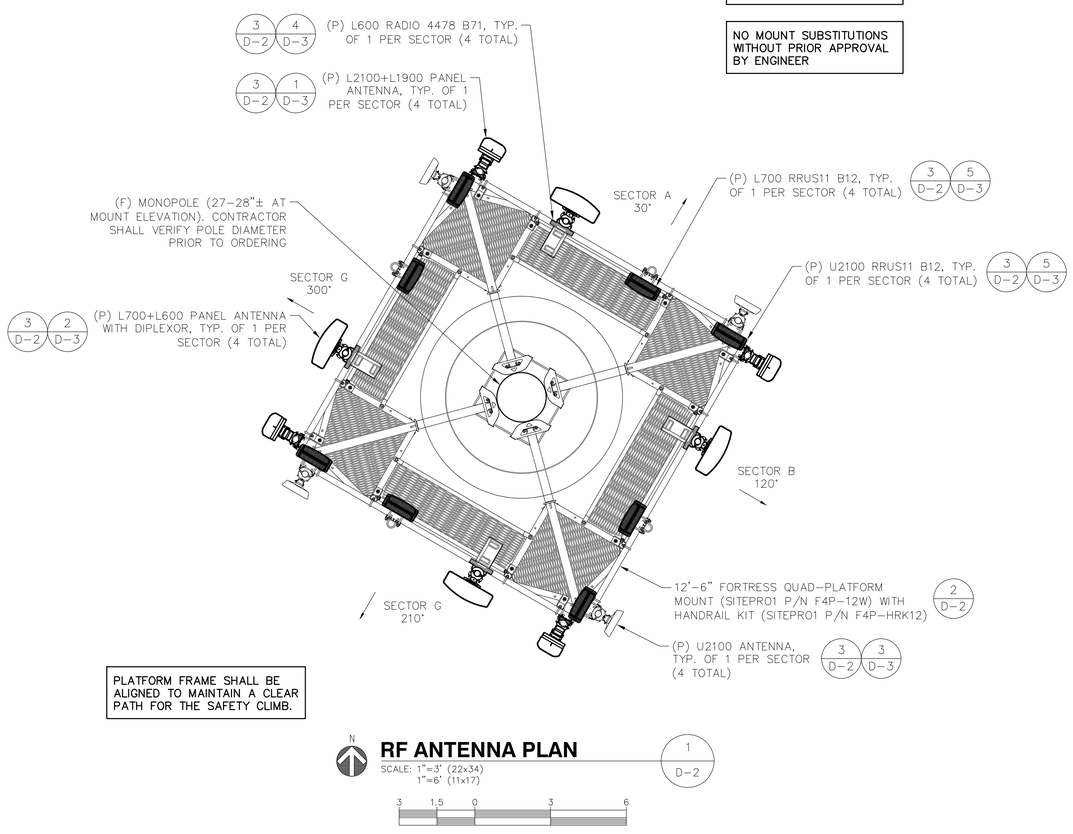
RF EQUIPMENT TABLE

SECTOR	PANEL ANTENNAS					FROM REMOTE RADIO UNIT				REMOTE RADIO UNIT		FROM GROUND EQUIPMENT	
	AZIMUTH	QTY.	MAKE & MODEL	RAD. CENTER (AGL)	DOWNTILT	COAX. QTY.	COAX SIZE	COAX LENGTH	RET QTY.	QTY.	MAKE & MODEL	HYBRID CABLE QTY.	HYBRID CABLE LENGTH
ALPHA	30°	1	ERICSSON AIR32_B66A_B2A	167.0'	0°M/2°E	–	–	–	–	–	–	(P) 3 (6x12 HCS)	275'±EA
		1	RFS-APXVAA24_43-U-A20	167.0'	0°M/2°E	6	1/2"ø	15'±	–	–	RRUS11 B12 RADIO 4478 B71		
		1	RFS-APX16DWV-16DWV-S-E-A20(QUAD)	167.0'	0°M/2°E	2	1/2"ø	15'±	–	–	RRUS11B4		
BETA	120°	1	ERICSSON AIR32_B66A_B2A	167.0'	0°M/2°E	–	–	–	–	–	–		
		1	RFS-APXVAA24_43-U-A20	167.0'	0°M/2°E	6	1/2"ø	15'±	–	–	RRUS11 B12 RADIO 4478 B71		
		1	RFS-APX16DWV-16DWV-S-E-A20(QUAD)	167.0'	0°M/2°E	2	1/2"ø	15'±	–	–	RRUS11B4		
DELTA	210°	1	ERICSSON AIR32_B66A_B2A	167.0'	0°M/2°E	–	–	–	–	–	–		
		1	RFS-APXVAA24_43-U-A20	167.0'	0°M/2°E	6	1/2"ø	15'±	–	–	RRUS11 B12 RADIO 4478 B71		
		1	RFS-APX16DWV-16DWV-S-E-A20(QUAD)	167.0'	0°M/2°E	2	1/2"ø	15'±	–	–	RRUS11B4		
GAMMA	300°	1	ERICSSON AIR32_B66A_B2A	167.0'	0°M/2°E	–	–	–	–	–	–		
		1	RFS-APXVAA24_43-U-A20	167.0'	0°M/2°E	6	1/2"ø	15'±	–	–	RRUS11 B12 RADIO 4478 B71		
		1	RFS-APX16DWV-16DWV-S-E-A20(QUAD)	167.0'	0°M/2°E	2	1/2"ø	15'±	–	–	RRUS11B4		
GPS	N/A	1	TBD	12'	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1/2"ø COAX	30'±

CONTRACTOR TO VERIFY PORT LOCATIONS AND NOTIFY ENGINEER PRIOR TO ORDERING PLATFORM.

CONTRACTOR TO VERIFY POLE DIAMETER AT MOUNTING ELEVATION PRIOR TO ORDERING PLATFORM.

NO MOUNT SUBSTITUTIONS WITHOUT PRIOR APPROVAL BY ENGINEER



PLATFORM FRAME SHALL BE ALIGNED TO MAINTAIN A CLEAR PATH FOR THE SAFETY CLIMB.

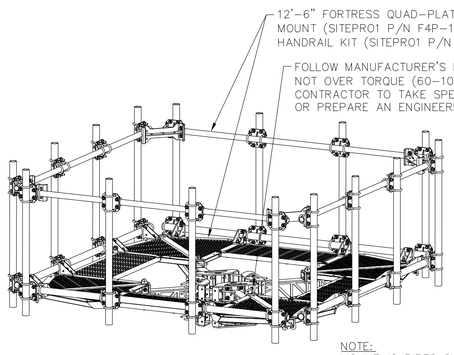
N

RF ANTENNA PLAN

SCALE: 1"=3' (22x34)
1"=6' (11x17)

(1/D-2)

3 1.5 0 3 6

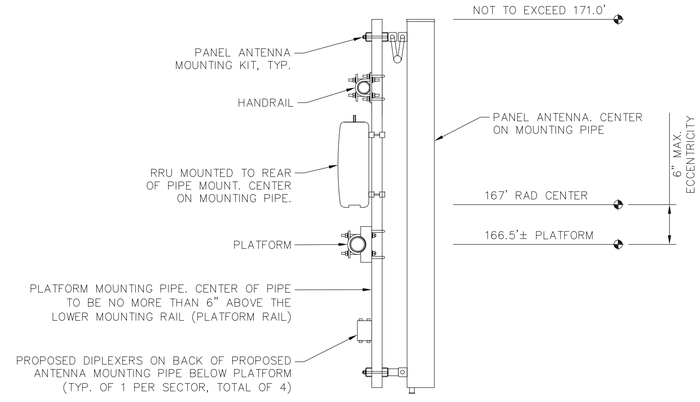


NOTE:
MOUNTING PIPES SHOWN FOR REFERENCE ONLY

SECTOR FRAME DETAIL

SCALE: NONE

(2/D-2)



TYPICAL MOUNTING ELEVATION

SCALE: NONE

(3/D-2)

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APPLICANT: T-MOBILE NORTHEAST LLC
35 SOUTH GRIFFIN ROAD
BLOOMFIELD, CT 06002

STAMP:

STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER
3-12-19

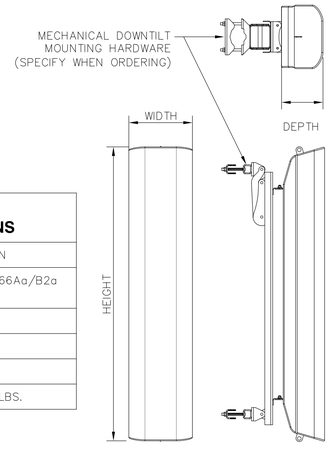
DATE: 02/13/19
DRAWN: BM/PN
CHECK: JMM/TEJ
SCALE: SEE PLAN
JOB NO.: ------

SHEET TITLE:

ANTENNA PLAN & DETAILS

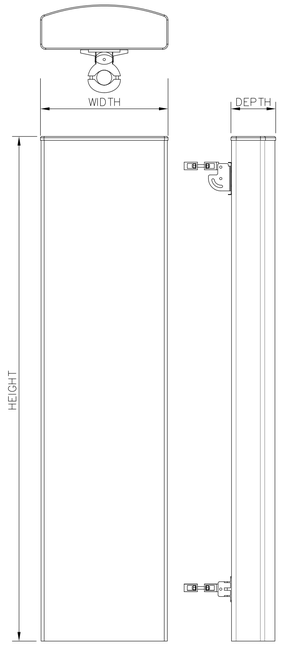
D-2

AIR ANTENNA SPECIFICATIONS	
MANUF.	ERICSSON
MODEL #	AIR32 B66Aa/B2a (Octa)
HEIGHT	56.6"
WIDTH	12.9"
DEPTH	8.7"
WEIGHT	132.2± LBS.



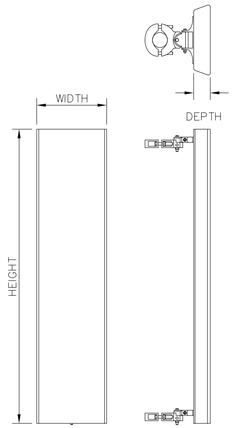
AIR32 ANTENNA DETAIL (1 / D-3)
SCALE: NONE

APX ANTENNA SPECIFICATIONS	
MANUF.	ANDREW
MODEL #	APXVAARR24_43-U-NA20
HEIGHT	95.9"
WIDTH	24.0"
DEPTH	8.7"
WEIGHT	128± LBS.



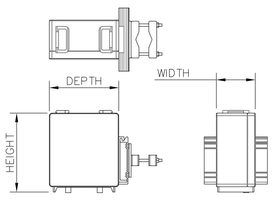
APX ANTENNA DETAIL (2 / D-3)
SCALE: NONE

U2100 ANTENNA SPECIFICATIONS	
MANUF.	RFS
MODEL #	APX16DWV-16DWV-S-E-A20 (Quad)
HEIGHT	55.9"
WIDTH	13"
DEPTH	3.15"
WEIGHT	40.7± LBS.



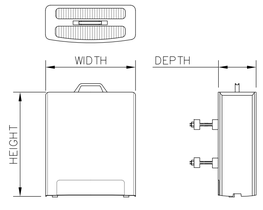
U2100 ANTENNA DETAIL (3 / D-3)
SCALE: N.T.S.

4478 SPECIFICATIONS	
MANUF.	ERICSSON
MODEL #	4478
HEIGHT	15"
WIDTH	7.4"
DEPTH	13.2"
WEIGHT	60± LBS.

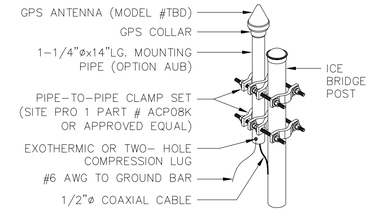


RRU DETAIL (4 / D-3)
SCALE: N.T.S.

RRUS11 SPECIFICATIONS	
MANUF.	ERICSSON
MODEL #	RRUS11 B4 & B12
HEIGHT	20.7"
WIDTH	17"
DEPTH	7"
WEIGHT	50.7± LBS.



RRU DETAIL (5 / D-3)
SCALE: N.T.S.



GPS DETAIL (6 / D-3)
SCALE: NONE

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SCALE: SEE PLAN
JOB NO.: ------

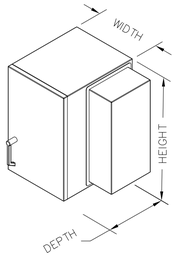
SHEET TITLE:

DETAILS

D-3

SSC SPECIFICATIONS

MANUF.	PURCELL
MODEL #	RAC24
HEIGHT	24.0" (37.1" WITH PLINTH)
WIDTH	25.4"
DEPTH	20.0"
WEIGHT	85± LBS. (EMPTY) 388± LBS. (MAX.)

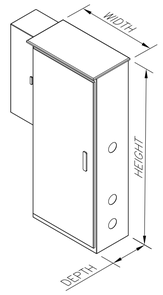


SITE SUPPORT CABINET (SSC) — 1 / D–4
SCALE: N.T.S.

PPC SPECIFICATIONS

MANUF.	DELTA
MODEL #	3799340400
HEIGHT	40"
WIDTH	20"
DEPTH	10"
WEIGHT	75± LBS.

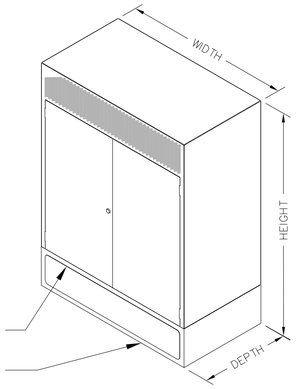
TO BE PROVIDED BY T–MOBILE
CONFIRM MODEL NUMBER WITH CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION



POWER PROTECTION CABINET (PPC)* — 2 / D–4
SCALE: NONE

RBS SPECIFICATIONS

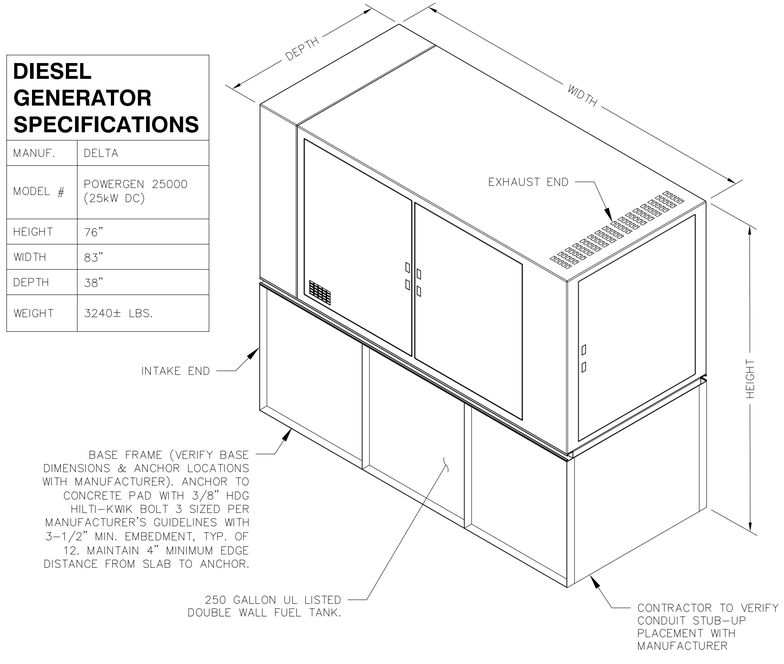
MANUF.	ERICSSON
MODEL #	RBS 6102
HEIGHT	57.1"
WIDTH	51.2"
DEPTH	27.6"
WEIGHT	728± LBS. W/O BATTERIES
MAX WEIGHT	~1600 LBS.



RBS 6102 — 3 / D–4
SCALE: N.T.S.

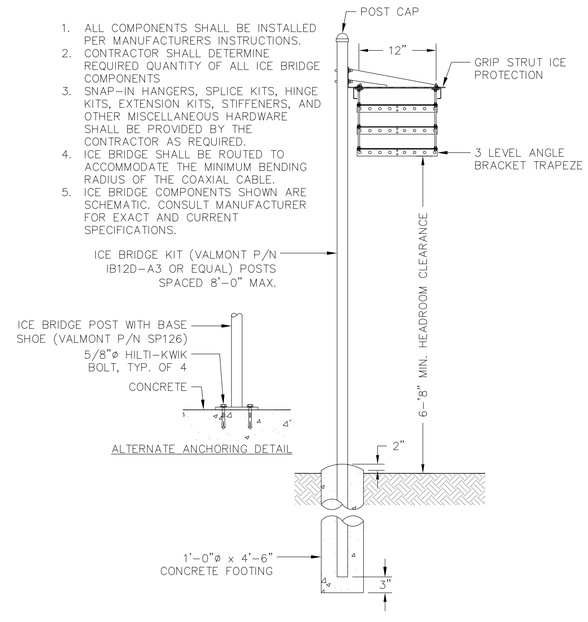
DIESEL GENERATOR SPECIFICATIONS

MANUF.	DELTA
MODEL #	POWERGEN 25000 (25kW DC)
HEIGHT	76"
WIDTH	83"
DEPTH	38"
WEIGHT	3240± LBS.



GENERATOR DETAL — 4 / D–4
SCALE: N.T.S.

1. ALL COMPONENTS SHALL BE INSTALLED PER MANUFACTURERS INSTRUCTIONS.
2. CONTRACTOR SHALL DETERMINE REQUIRED QUANTITY OF ALL ICE BRIDGE COMPONENTS
3. SNAP–IN HANGERS, SPLICE KITS, HINGE KITS, EXTENSION KITS, STIFFENERS, AND OTHER MISCELLANEOUS HARDWARE SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED.
4. ICE BRIDGE SHALL BE ROUTED TO ACCOMMODATE THE MINIMUM BENDING RADIUS OF THE COAXIAL CABLE.
5. ICE BRIDGE COMPONENTS SHOWN ARE SCHEMATIC. CONSULT MANUFACTURER FOR EXACT AND CURRENT SPECIFICATIONS.



ICE BRIDGE — 5 / D–4
SCALE: N.T.S.

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CONSULTANTS:

NO.	DATE	REVISIONS
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1	03/12/19	CONSTRUCTION REVISED

TITLE:
SITE NAME: CTNH325D (MAPLE HILL)
SITE NUMBER: CTNH325D
ADDRESS: 641 MAPLE HILL ROAD
NAUGATUCK, CT 06770

APPLICANT:
T–MOBILE NORTHEAST LLC
35 SOUTH GRIFFIN ROAD
BLOOMFIELD, CT 06002

STAMP:

DATE:	02/13/19
DRAWN:	BM/PN
CHECK:	JMM/TEJ
SCALE:	SEE PLAN
JOB NO.:	------

SHEET TITLE:

DETAILS

D-4

SITE CONCRETE & REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.

2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4500PSI) MAY BE USED. SLUMP SHALL BE 4"±1" AND ALL EXPOSED CONCRETE SHALL BE AIR ENTRAINMENT 5%±1%. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 318 CODE REQUIREMENTS

3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.

4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   - CONCRETE CAST AGAINST EARTH.....3 IN.
   - CONCRETE EXPOSED TO EARTH OR WEATHER:
     - #6 AND LARGER .....2 IN.
     - #5 AND SMALLER & WWF .....1½ IN.
   - CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
     - SLAB AND WALL .....¾ IN.
     - BEAMS AND COLUMNS .....1½ IN.

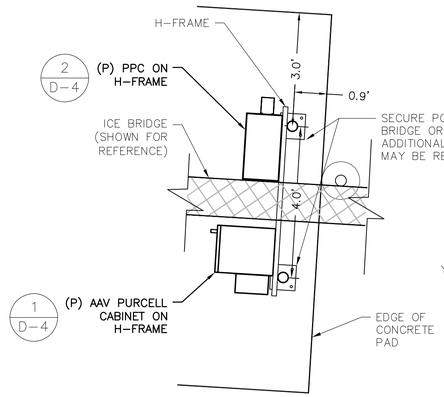
5. A CHAMFER ¾" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHORS/EPOXY SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO THE MANUFACTURERS RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY SIMPSON OR APPROVED EQUAL.

7. CONCRETE CYLINDER TESTS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (ACI 318-14 SECTION 26.12.2 – FREQUENCY OF TESTING) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER TO PROVIDE THE BUILDING OFFICIAL:
(A) RESULTS OF CONCRETE CYLINDER TEST PERFORMED AT THE SUPPLIERS PLANT.
(B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST BY AN INDEPENDENT TESTING AGENCY

8. AS AN ALTERNATIVE TO ITEM 7. TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.

9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS OR FOUNDATIONS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.



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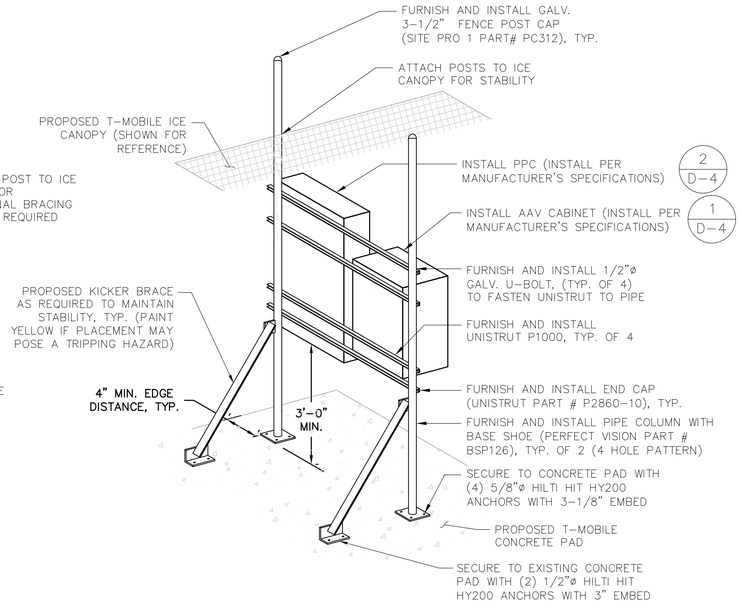
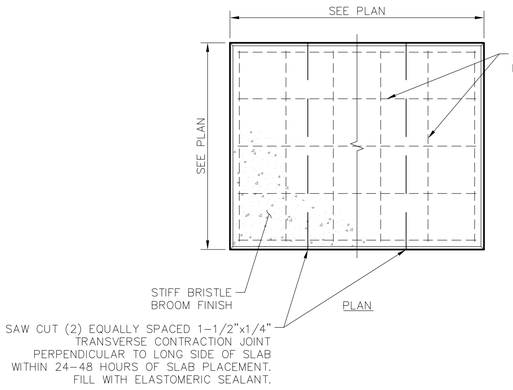
PLAN VIEW



PPC AND TELCO CABINET H-FRAME MOUNTING DETAIL

1 / S-1

SCALE: NONE

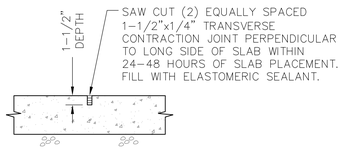


NOTES:
1. BEARING STRATA MEDIUM TO DENSE INSET GRANULAR MATERIAL OR COMPACTED FILL. 95% COMPACTION.
2. SUBGRADE AND FILL SHALL CONSIST OF CLEAN SOIL. NO DELETERIOUS MATERIALS OR ORGANICS TO BE USED.
3. CONCRETE FORM WORK SHALL BE CONSTRUCTED USING MINIMUM 2"x10" NOMINAL SIZE LUMBER. STRIP AND REMOVE UPON COMPLETION.
4. CONCRETE SHALL HAVE 4000PSI 28-DAY COMPRESSIVE STRENGTH WITH 5(±1)% AIR ENTRAINMENT, 4(±1)" SLUMP AND BRISTLE BROOM FINISH.
5. SEE CONCRETE NOTES ON GN-1.

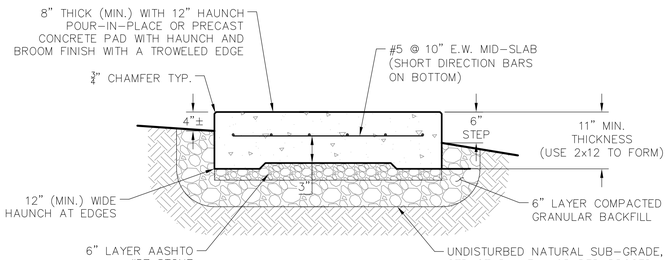
CONCRETE PAD

2 / S-1

SCALE: NONE



SAWN JOINT



SECTION

ProTerra DESIGN GROUP, LLC
4 Bay Road, Bldg A, Suite 200
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Ph:(413) 320-4918

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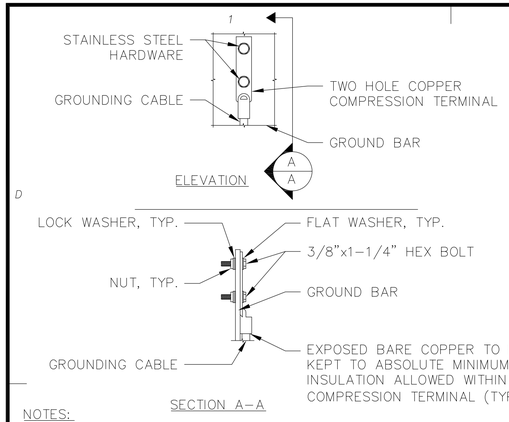
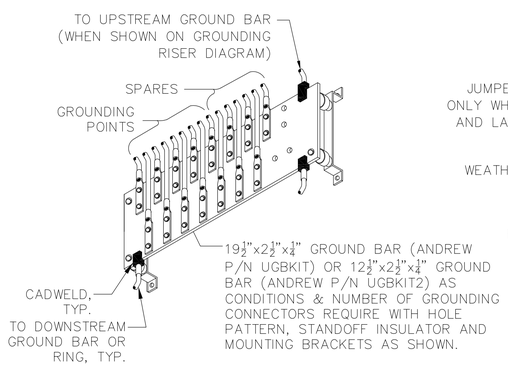


NOTES:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.

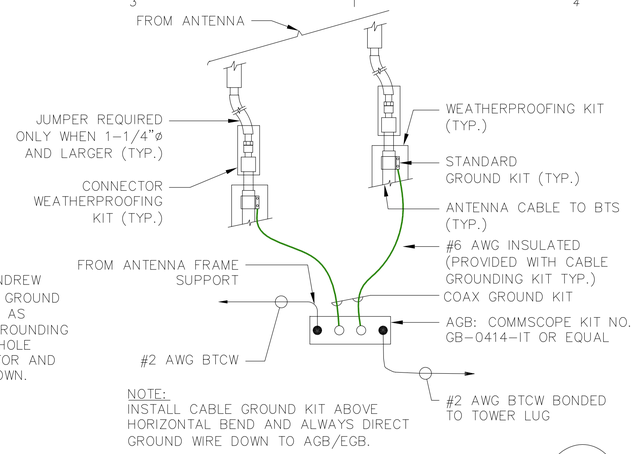
1 / E-1



COAX GROUND BAR (MGB)

SCALE: NONE

2 / E-1

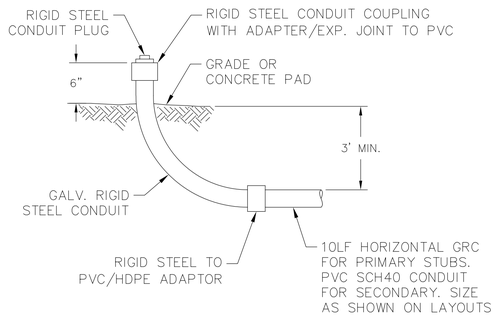


NOTE:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB.

TOWER TOP CABLE GROUNDING DETAIL

SCALE: N.T.S.

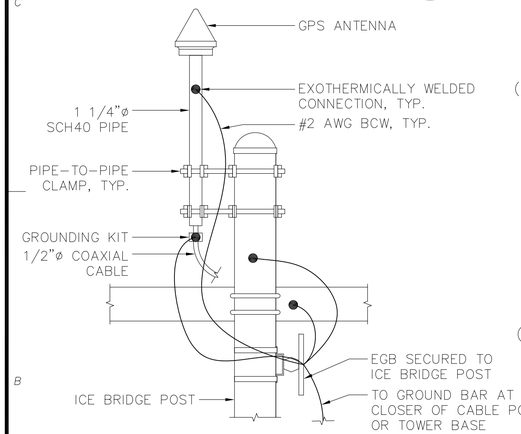
3 / E-1



CONDUIT STUB UP

SCALE: NONE

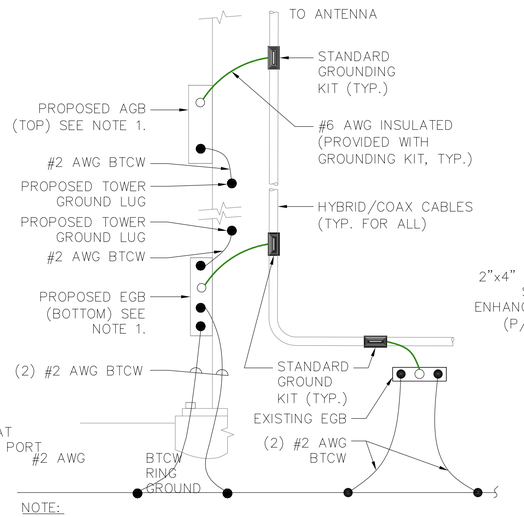
4 / E-1



GPS ANTENNA GROUNDING DETAIL

SCALE: N.T.S.

5 / E-1

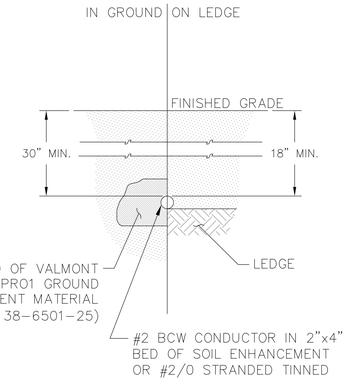


NOTE:
1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE ADDITIONAL AGB/EGB AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED

TOWER BOTTOM CABLE GROUNDING DETAIL

SCALE: N.T.S.

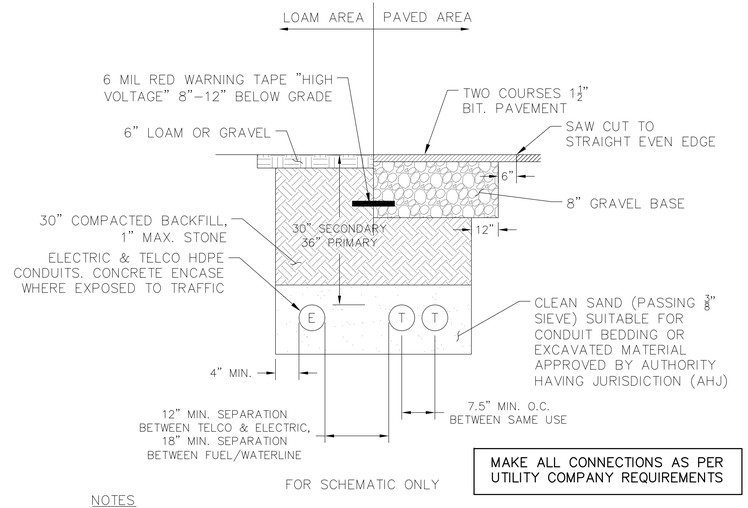
6 / E-1



SOIL ENHANCEMENT

SCALE: NONE

7 / E-1



FOR SCHEMATIC ONLY

MAKE ALL CONNECTIONS AS PER UTILITY COMPANY REQUIREMENTS

NOTES
1. MAKE ALL CONNECTIONS AS PER UTILITY COMPANY REQUIREMENTS.
2. VERIFY CONDUIT SIZE WITH UTILITY COMPANY.
3. CONTRACTOR SHALL FURNISH AND INSTALL AN APPROVED 2,500 POUND TEST TAPE IN EACH PRIMARY CONDUIT RUN OR PER UTILITY COMPANY REQUIREMENTS.

BURIED CONDUIT SECTION

SCALE: NONE

8 / E-1

ELECTRICAL LEGEND

A	AMPERE
V	VOLT
KWH	KILOWATT - HOUR
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
BTCW	BARE TINNED (SOLID) COPPER WIRE (#2 AWG, UNLESS NOTES OTHERWISE)
G	GROUND
⏚	GROUND
MGB	MASTER GROUND BAR ○ MECHANICAL CONNECTION ● CADWELD CONNECTION
AGB/EGB	EQUIPMENT GROUND BAR/ANTENNA GROUND BAR
G	GROUND COPPER WIRE, SIZE AS NOTED
	EXPOSED WIRING
	INSULATED GROUNDING CONDUCTOR (#6 AWG STRANDED, UNLESS NOTED OTHERWISE)
⊙	5/8"x10' COPPER CLAD STAINLESS STEEL GROUND ROD
	● EXOTHERMIC (CAD WELD) OR ○ MECHANICAL (COMPRESSION TYPE) CONNECTION
PPC	POWER PROTECTION CABINET
⊠	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

ELECTRICAL & GROUNDING NOTES:

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) 2017 AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION AS REQUIRED BY NEC.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
13. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
14. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
15. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
16. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN BTS UNIT).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LYGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
19. BOMD ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20. BOND ANTENNA EGB'S AND MGB TO WATER MAIN/GROUND RING.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

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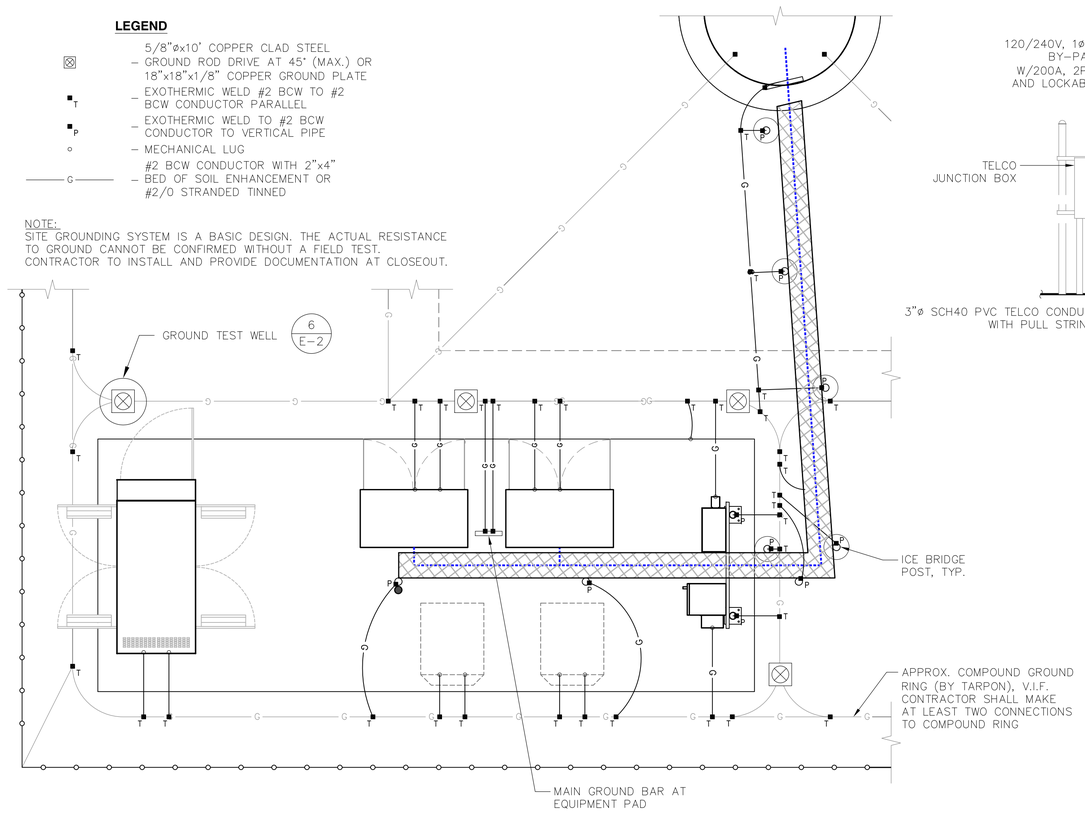
ELECTRICAL & GROUNDING DETAILS

E-1

LEGEND

- ⊠ — 5/8"ø x10' COPPER CLAD STEEL GROUND ROD DRIVE AT 45° (MAX.) OR 18"x18"x1/8" COPPER GROUND PLATE
- ■T — EXOTHERMIC WELD #2 BCW TO #2 BCW CONDUCTOR PARALLEL
- ■P — EXOTHERMIC WELD TO #2 BCW CONDUCTOR TO VERTICAL PIPE
- ○ — MECHANICAL LUG
- ——G—— — #2 BCW CONDUCTOR WITH 2"x4" BED OF SOIL ENHANCEMENT OR #2/0 STRANDED TINNED

NOTE:
SITE GROUNDING SYSTEM IS A BASIC DESIGN. THE ACTUAL RESISTANCE TO GROUND CANNOT BE CONFIRMED WITHOUT A FIELD TEST. CONTRACTOR TO INSTALL AND PROVIDE DOCUMENTATION AT CLOSEOUT.



GROUND EQUIPMENT GROUNDING SCHEMATIC

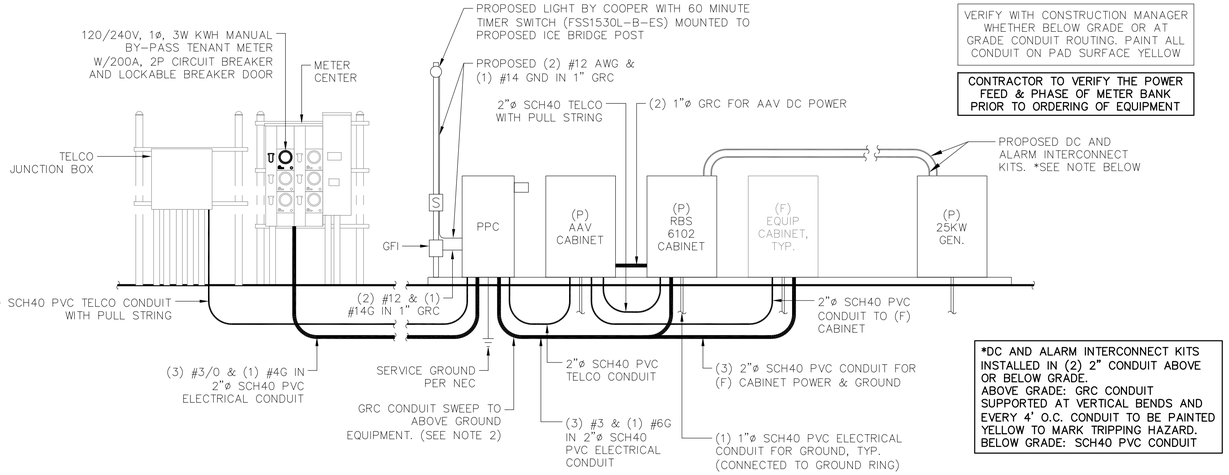
N

SCALE: 1"=3' (22x34)
1"=6' (11x17)

1
E-2

3 1.5 0 3 6

- ○ COMPRESSION CONNECTION
- • EXOTHERMIC CONNECTION
- #2 BCW
- #2
- #6



VERIFY WITH CONSTRUCTION MANAGER WHETHER BELOW GRADE OR AT GRADE CONDUIT ROUTING. PAINT ALL CONDUIT ON PAD SURFACE YELLOW

CONTRACTOR TO VERIFY THE POWER FEED & PHASE OF METER BANK PRIOR TO ORDERING OF EQUIPMENT

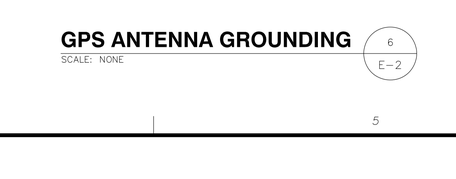
*DC AND ALARM INTERCONNECT KITS INSTALLED IN (2) 2" CONDUIT ABOVE OR BELOW GRADE.
ABOVE GRADE: GRC CONDUIT SUPPORTED AT VERTICAL BENDS AND EVERY 4' O.C. CONDUIT TO BE PAINTED YELLOW TO MARK TRIPPING HAZARD.
BELOW GRADE: SCH40 PVC CONDUIT

1. MAKE ALL CONNECTIONS AS PER UTILITY PURVEYOR'S & NEC REQUIREMENTS
2. CONDUIT SWEEPS TO ABOVE GROUND ELECTRICAL APPLIANCES SHALL BE GRC. SEE DETAIL 4/E-1.

UTILITY RISER SCHEMATIC

SCALE: NONE

2
E-2

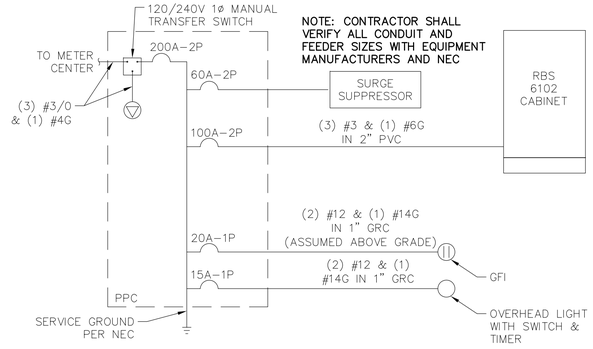


1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE SUPPLIED WITH KIT. COLD SHRINK SHALL NOT BE USED.
4. DISTANCE BETWEEN GROUND KITS SHALL BE NO MORE THAN 100 FEET.

CABLE GROUND KIT

SCALE: NONE

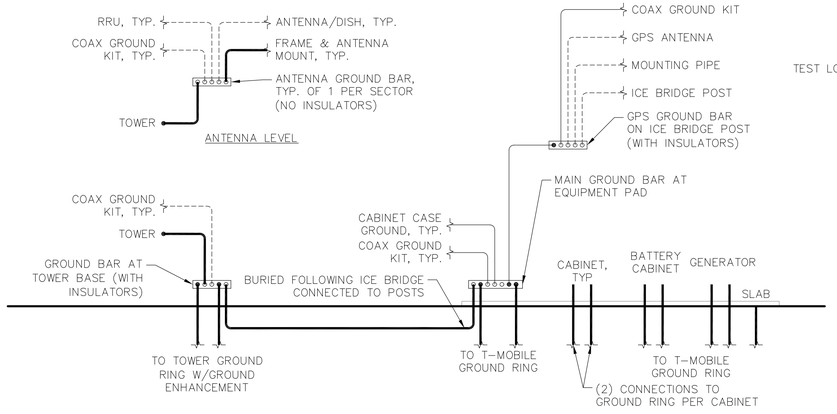
5
E-2



EQUIPMENT ONE-LINE SCHEMATIC

SCALE: 1"=15'

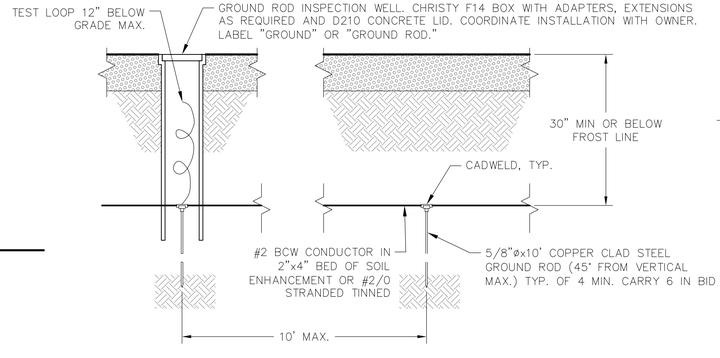
3
E-2



GROUNDING RISER DIAGRAM

SCALE: NONE

4
E-2



GPS ANTENNA GROUNDING

SCALE: NONE

6
E-2

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E-2

T··Mobile·

Engineering & Operations

Delta PowerGen 25000 Design Document

Diesel, DC, 25kW Model#PowerGen–25000 SKU#33658

PowerGen 25000

The following are responsible for this project document:

Kevin Smith SR. Engineer (770) 256-3594

Project Design Spec Revision	1.0	Last Date:8/8/2018	5/14/2018
Final doc URL (~Dnnnnn):			
Location	Use the InfoRouter Search (Advanced) putting the Document ID (nnnnnn without the D) to find the location of the master document.		
Template URL:	http://docs.eng.t-mobile.com/InfoRouter/docs/~D423750 Slightly updated 1/2011		

Table of Contents

1 Introduction / Project Summary

1.1 Purpose of Project

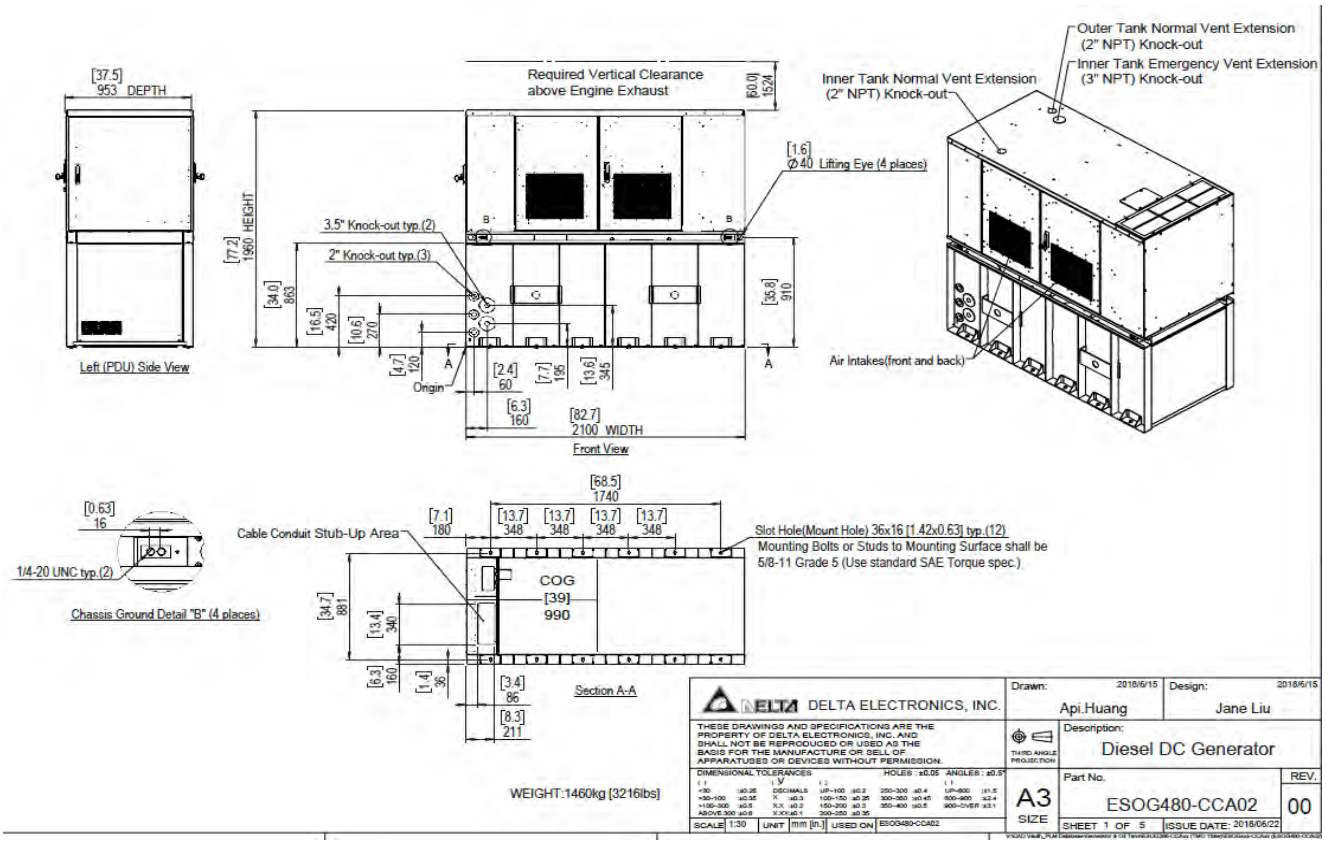
T-Mobile's nationwide cell site hardening plan is providing a refuelable backup power system capable of powering a site for a minimum of 48 hours before refueling is required. The purpose of this project is to give T-Mobile customers reliable service during power outages and provide a sufficient layer of coverage. This design document is for the Delta PowerGen 25000, which is a diesel DC generator with a capacity of 25kW.

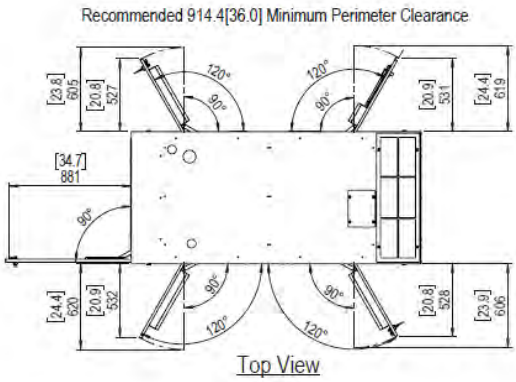
1.2 Feature Description

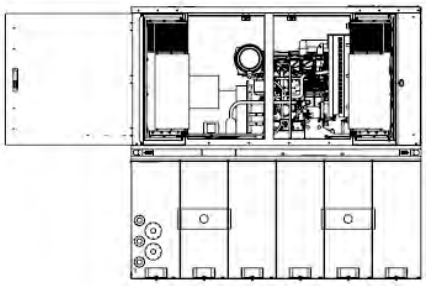
The 25kW Delta PowerGen diesel generator is one of the DC generators selected as part of the T-Mobile RFP in support of the nationwide cell site hardening plan. The 25kW has a Level 2 acoustic enclosure. It is equipped with telecom HE rectifiers like in the Delta Hp Large SSC, -48V DC bus powered battery charger of 12V engine battery, Status/alarming via telecom standard dry contacts, WEB GUI/SNMP, and OBD2 Port for GEOTAB monitoring.

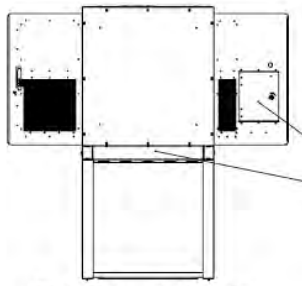
1.3 Dimensions

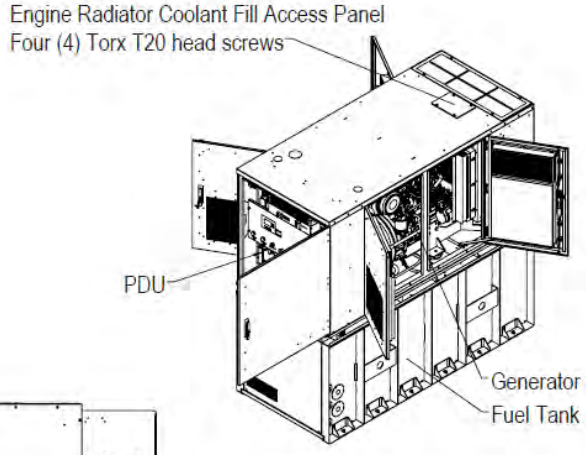
The dimensions of a level 2 Acoustic Enclosure in inches W83" x H78" x D38" (dimensions have been rounded up to the nearest inch)T-Mobile requires a 36-inch radius around the generator that will cover the hinged door and the panel style doors on the generator.

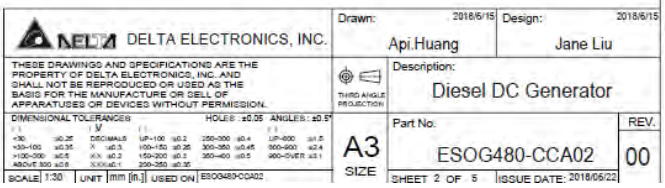

[37.5]
953 DEPTH
Left (PDU) Side View
Required Vertical Clearance
above Engine Exhaust
[60.0]
1524
[77.2]
1960 HEIGHT
3.5" Knock-out typ.(2)
2" Knock-out typ.(3)
[34.0]
863
[16.5]
420
[10.6]
270
[4.7]
120
Origin
[2.4]
60
[7.7]
195
[13.6]
345
[6.3]
160
[82.7]
2100 WIDTH
Front View
[35.8]
910
[1.6]
Ø40 Lifting Eye (4 places)
Outer Tank Normal Vent Extension
(2" NPT) Knock-out
Inner Tank Normal Vent Extension
(2" NPT) Knock-out
Inner Tank Emergency Vent Extension
(3" NPT) Knock-out
Air Intakes(front and back)
[0.63]
16
1/4-20 UNC typ.(2)
Chassis Ground Detail "B" (4 places)
[68.5]
1740
[7.1]
180
[13.7]
348
Cable Conduit Stub-Up Area
Slot Hole(Mount Hole) 36x16 [1.42x0.63] typ.(12)
Mounting Bolts or Studs to Mounting Surface shall be
5/8-11 Grade 5 (Use standard SAE Torque spec.)
COG
[39]
990
[34.7]
881
[13.4]
340
[6.3]
160
[1.4]
35
[3.4]
86
[8.3]
211
Section A-A
WEIGHT:1460kg [3216lbs]
DELTA ELECTRONICS, INC.
Drawn: 2018/6/15 Api.Huang
Design: 2018/6/15 Jane Liu
THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF DELTA ELECTRONICS, INC. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SELL OF APPARATUSES OR DEVICES WITHOUT PERMISSION.
THIRD ANGLE PROJECTION
Description:
Diesel DC Generator
DIMENSIONAL TOLERANCES
HOLES : ±0.05 ANGLES : ±0.5°
Part No.
REV.
A3 SIZE
ESOG480-CCA02
00
SCALE 1:30 UNIT mm [in.] USED ON ESOG480-CCA02
SHEET 1 OF 5
ISSUE DATE: 2018/06/22





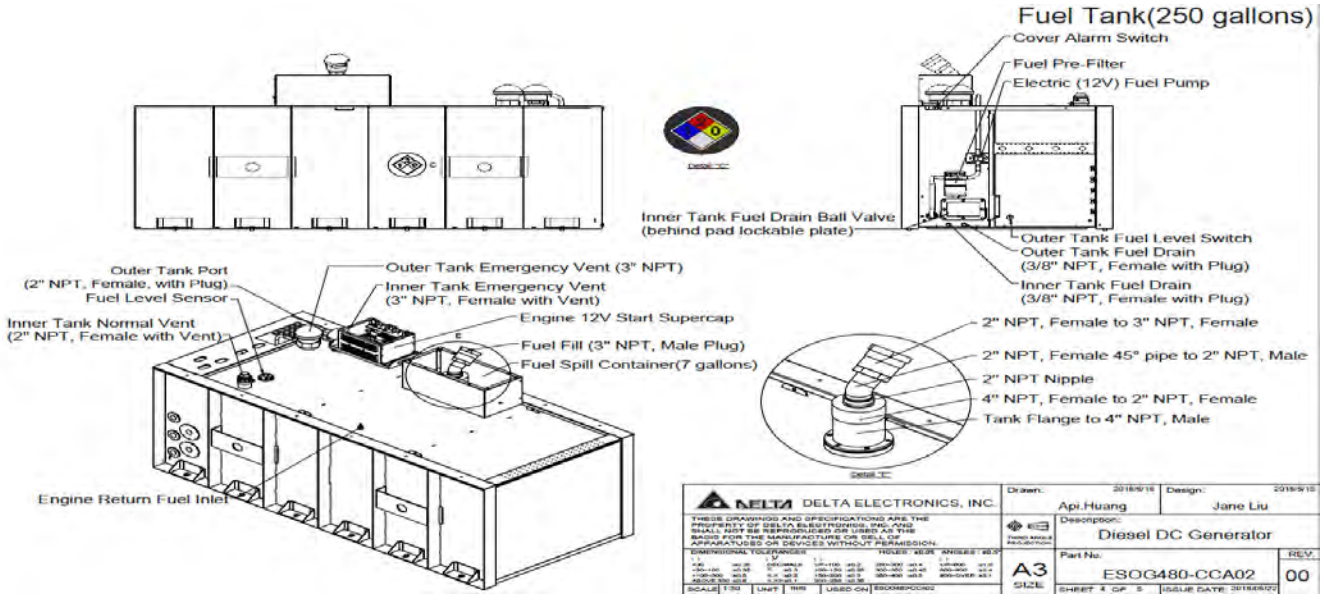






2 Fuel Tanks

The 25kW PowerGen has a 250 Gallon Double-Wall UL142 Base tank. Below is the Install drawing 25kW.

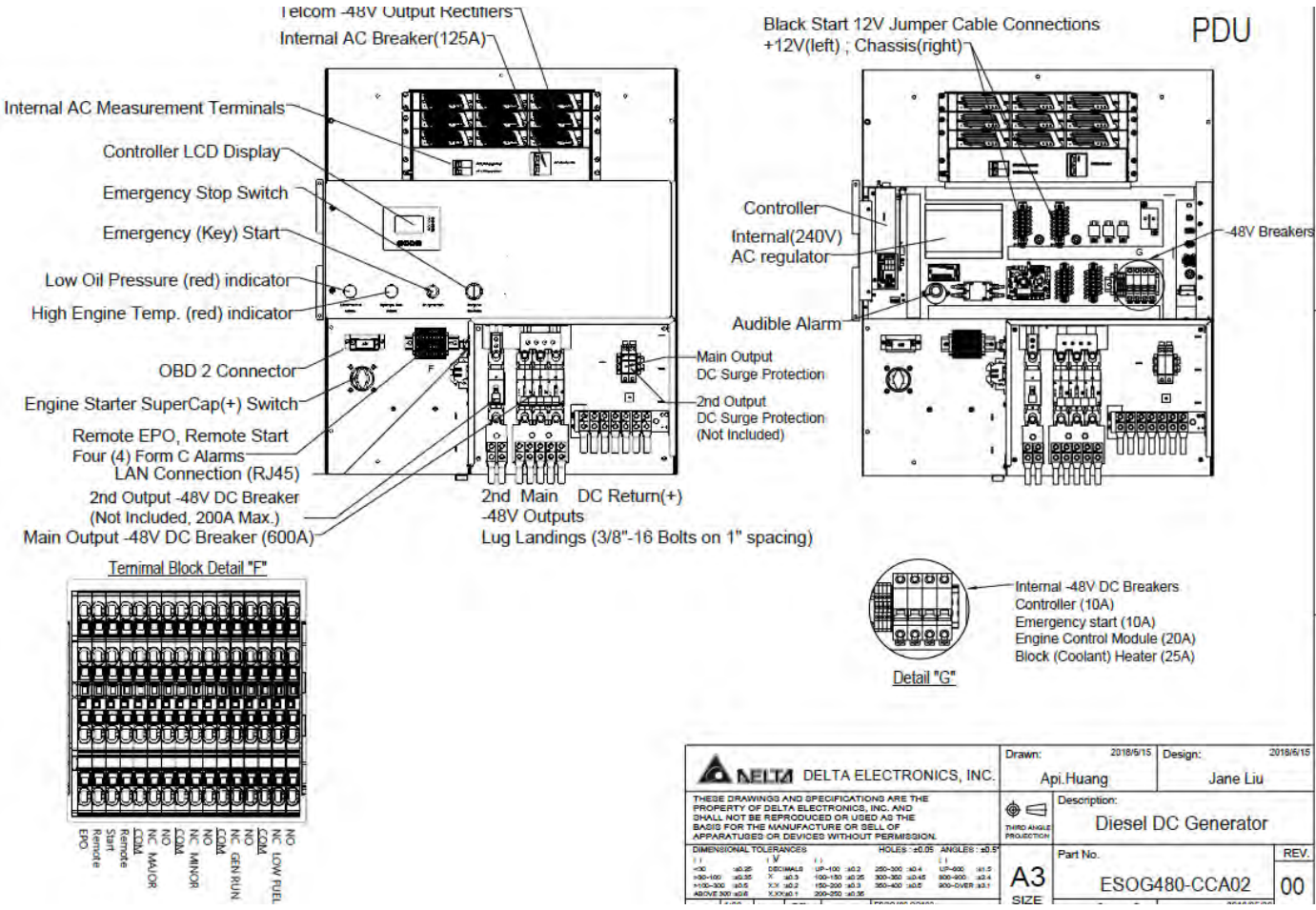


3 Controllers / Alarms

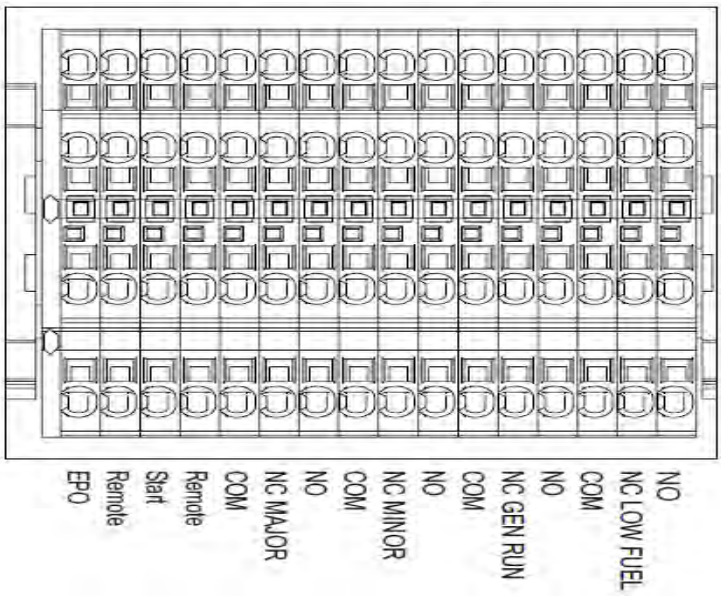
3.1 Interfaces and Alarming

The generator will be monitored by external alarms, conduit and cat five cables have to be installed from the PDU Terminal block F to the appropriate cell site equipment Nokia FSEB or FSEE or the Ericsson SAU. At a Nokia site, this connection is at the FSEB or an FSEE module. For the wiring diagram and instructions for the FSEB click the Link. (The FSEE is the Nokia module that will be replacing the FSEB. For details on the FSEE contact: HQNokiaCellsiteDesigns@T-Moblie.com)Ericsson sites will connect to the SAU module via OVP Expansion Kit for 8 External Alarms. Product number: UTOVP-ALM8EXP. For the wiring diagram and instructions for this click the link.

The PDU is where the Alarm interface is located on the Delta Generators.



Terminal Block Detail "F"



T-Mobile has four relays available from the Delta controller that are Low Fuel, Gen Run, Minor, Major. T- Mobile will utilize Normally Closed (NC) for alarms in terminal block F. Ericsson cabinets need to be equipped with the alarm expansion kit (UTOVP-ALM8EXP) to handle external alarms.

Terminal Block F	Nokia FSEB Alarm Connections 13-24	T-Mobile Standard Alarms
Terminal block F 2.Gen Run	NC 4110 grd 4111 pin 13	Generator Running
Terminal block F 4.Major	NC 4110 grd 4111 pin 14	Generator Alarm Critical
Terminal block F 3. Minor	NC 4110 grd 4111 pin 15	Generator Alarm NSI
Terminal block F 1. Low Fuel	NC 4110 grd 4111 pin 16	Low Fuel

Terminal Block F	Ericsson Alarm 8expConnections	T-Mobile Standard Alarms
Terminal block F 2.Gen Run	NC - A5	Generator Running
Terminal block F 4.Major	NC - A6	Generator Alarm Critical
Terminal block F 3. Minor	NC - A7	Generator Alarm NSI
Terminal block F 1. Low Fuel	NC - A8	Low Fuel

Ericsson UTOVP- ALM8EXP

UTOVP-ALM8EXP	OVP Expansion Kit for 8 External Alarms	Qty
Product no	**Denomination**	
UTOVP-ALM8EXP	OVP Expansion Kit for 8 External Alarms	1
NFD30234/08	OVERVOLTAGE ARRESTER/OVP-ALM 8	1
RPM777143/01200	CABLE WITH CONNECTOR/SIGNAL CABLE	2
66 block optional not included		

4 Regulatory Requirements

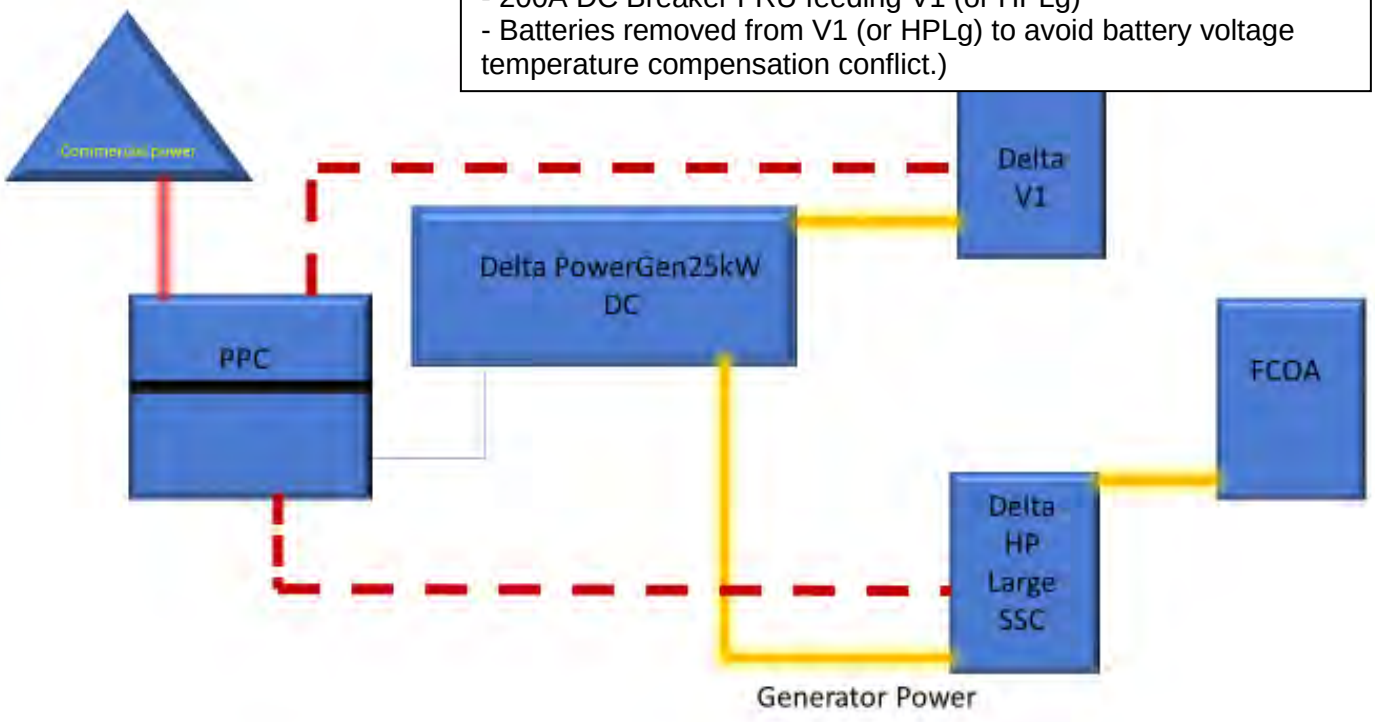
Level 2 Acoustic Enclosure provides a noise level of
65dBA. It is EPA certified and meets NFPA 99 and 110 requirements(NFPA National Fire Protection Association). The PowerGen25000 DC generator engine is a Perkins Tier 4 engine and meets the EPA standards.

5 Configuration / Diagrams

The physical configuration of this DC Generator is to connect the polar power 25kW generator directly to the DC bus of the SSC.

Compound Diagram:

PowerGen 25kW can connect to both V1 and HP Lg with:
- 200A DC Breaker FRU feeding V1 (or HPLg)
- Batteries removed from V1 (or HPLg) to avoid battery voltage temperature compensation conflict.)



6 Maintenance

T-Mobile is recommending preventive maintenance to be performed every 250 hours of run-time or every 12 months, whichever comes first.

T-Mobile requires this minimum service checklist for the generator engine:

- Check engine mounts and support. Tighten fasteners.
- Check all the engine hoses and clamps for proper fit, and any signs of cracking and fatigue from wear.
- Inspect all belts for signs of cracking and fatigue from wear and adjust for proper tension.
- Inspect the exhaust system for leaks, burns and wet stacking. Drain exhaust line and tighten any clamps and flange bolts.
- Inspect silencer and plumbing for leaks, cracks or any other signs of wear.
- Inspect the system for fuel, oil and coolant leaks and signs of corrosion.
- Replace water separator.
- Replace water filter/ conditioner.
- Check Anti-Freeze (Spector-Analysis).
- Check coolant level and add, if needed.
- Inspect radiator mounting for signs or wear and cracking.
- Inspect/ clean air filter and change per manufacturer specifications.
- Inspect air intakes and outlets and tighten clamps and brackets, if applicable.
- Replace fuel filter.
- Inspect the carburetor fuel injection system, fuel injection pump and choke, if equipped. Adjust to manufacturers specifications.
- Change engine oil, oil filter and record the date on the filter casing.
- Check engine heater operation, if equipped.

- Check and adjust the battery charger operations, and charge rate within the manufacturer's recommended operating specifications.
- Inspect the battery housing, hardware connections, and cables for corrosion and wear.
- Check the battery electrolyte levels and specific gravity levels.
- Load test generator battery.
- Check, adjust and record generator output voltage, as necessary.
- Check and record the alternator charge rate.
- During inspection run the generator for 30 minutes under load. During this time, and after the engine is at full operational speed and has reached engine operating temperature; determine and record the condition of all inspection points: oil pressure, water/ coolant temperature, Fuel pressure, generator gauge, indicator operations, generator battery.
- Check the engine timing and adjust to manufacturers specifications, if necessary.
- Inspect, adjust and record governor and frequency, if necessary.
- Verify that the low fuel alarm is operational and configured correctly to trigger when the fuel tank reaches 50% of fuel tank capacity.

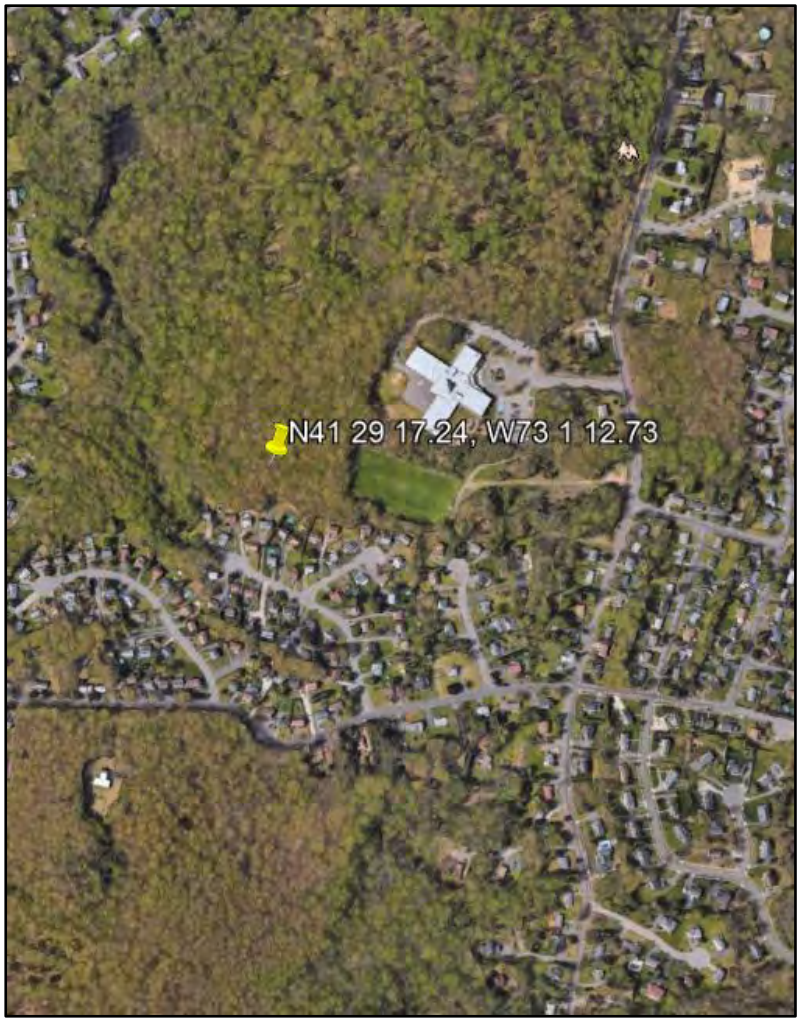
  Check fuel level and refuel the generator during the preventive/ corrective maintenance visit.

Exhibit D

STRUCTURAL ANALYSIS REPORT REV.2
MONOPOLE

Prepared For:

ProTerra Design Group, LLC
4 Bay Road, Building A Suite 200
Hadley, MA 01035



Structure Rating:	
Monopole:	**50.2% (Pass)**
Base Plate:	**39.1% (Pass)**
Anchor Bolts:	**46.0% (Pass)**
Foundation:	**38.7% (Pass)**

Sincerely,
Destek Engineering, LLC

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN 27057
LICENSED PROFESSIONAL ENGINEER

06-24-2019

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

T-Mobile Site Name: Maple Hill
T-Mobile Site Number: CTNH325D
641 Maple Hill Road
Naugatuck, CT 06770

Destek Job No: 1978001

June 24, 2019

CONTENTS

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Suite 100, Marietta, GA 30066 -Tel: (770) 693-0835

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the 180 ft. monopole located at 641 Maple Hill Road, Naugatuck, CT 06770 for the addition of wireless telecommunication appurtenances proposed by T-Mobile.

The structural analysis is based on the following documentation provided to Destek Engineering, LLC (Destek):

- Construction Drawing prepared by ProTerra Design Group, dated 03/12/2019.
- Structural Analysis Report prepared by TAAP, dated 03/28/2019.
- Geotechnical Report prepared by WELTI, dated 09/24/2018.
- Email from ProTerra, dated 06/12/2019.

1.1 STRUCTURE

The structure is a 180 ft. tall, 18-sided monopole, which is attached to the foundation with a base plate and anchor bolts. It is formed by the following sections:

Section Length (ft)	Lap Splice (ft)	Shaft Thickness (in)	Top Diameter (in)	Bottom Diameter (in)	Yield Strength (ksi)
50.00	4.75	0.1875	24.00	33.85	65
50.00	6.00	0.3125	32.54	42.38	65
46.75	7.00	0.3750	40.58	49.78	65
50.00	0.00	0.4375	47.65	57.50	65

2.0 EXISTING AND PROPOSED APPURTENANCES

The analysis is based on the following proposed appurtenances:

Proposed and Final Configuration of T-Mobile Appurtenances:

RAD CENTER (FT)	ANTENNA & TMA	COAX*	MOUNT
167.0	(4) Ericsson AIR32_B66A_B2A (4) RFS APXVAA24_43-U-A20 (4) RFS APX16DWV-16DWV-S-E-A20 (4) Ericsson RRUS11 B12 (4) Ericsson RRUS11 B4 (4) Ericsson Radio 4478 B71 (4) Microdata – 600/700 (8:4) Diplexer – MI – 5544A	(3) 6x12 HCS Hybrid Cable	(1) Sitepro1 F4P-12W Platform Mount w/ Sitepro1 F4P-HRK12 Handrail

***Feedlines located inside the monopole.**

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Appurtenances by Others:

Rad Center (ft.)	Antennas & Equipment	Coax*	Mounts
177	(2) dbSpectra DS1F03F36D-D – Omnis (2) dbSpectra DS4C06F36D-D – Omnis	(8) 7/8''	(4) Sitepro P/N MM03 Standoff Mount + (1) Sitepro P/N UQB4 Ring Mount

***Feedlines inside monopole**

3.0 CODES AND LOADING

This analysis has been performed in accordance with the 2018 Connecticut Building Code (2015 IBC) based upon an ultimate 3-second gust wind speed of 125 mph (Risk Category II) converted to a nominal 3-second gust wind speed of 97 mph per section 1609.3.1 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. The following loading criteria were used in the analysis:

- Basic wind speed of 97 mph without ice (V)
- Basic wind speed of 50 mph concurrent with the design ice thickness of ¾ " (V_i and t_i)
- Exposure Category B, Topographic Category 1

The following load combinations were used with wind blowing at 30^o intervals, measured from a line normal to the face of the monopole.

- $1.2D + 1.6W_o$
- $0.9D + 1.6W_o$
- $1.2D + 1.0D_i + 1.0W_i$

D: Dead Load of structure and appurtenances
W_o: Wind Load, without ice
W_i: Wind Load with ice
D_i: Weight of ice due to factored ice thickness

4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

The analysis is based on the information provided to Destek and is assumed to be current and correct. Unless otherwise noted, the structure is 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 lifespan. 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.

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1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

Destek will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance.

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

The analysis results presented in this report are only applicable for the previously mentioned existing and proposed appurtenances. Any deviation of the appurtenances and placement, etc., will require Destek to generate an additional structural analysis.

5.0 ANALYSIS AND ASSUMPTIONS

The monopole was analyzed by utilizing tnxTower, a non-linear, three-dimensional, finite element-analysis software package, 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-G, the tower is found to have **adequate** structural capacity for the proposed changes. As a maximum, the pole shaft from 130 ft. to 180ft. is stressed to **50.2%** of its structural capacity. The anchor bolts and base plate are stressed to **46.0%** and **39.1%** of their structural capacities, respectively. The existing foundation is found to have **adequate** structural capacity for the proposed changes. As a maximum, the foundation is stressed to **38.7%** of its structural capacity.

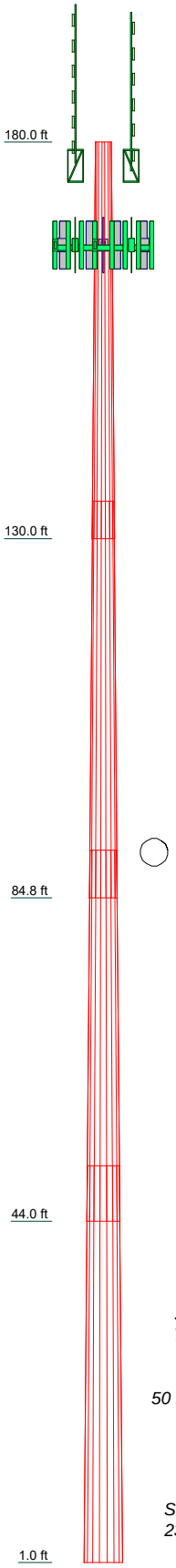
Therefore, the additions and alterations proposed by T-Mobile **can** be implemented as intended with the conditions outlined in this report.

Should you have any questions about this report or require any additional information, please contact Ahmet Colakoglu at (770) 693-0835 or acolakoglu@destekengineering.com

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

APPENDIX A
SOFTWARE OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	50.00	18	0.1875	4.75	24.0000	33.8500		2.9
2	50.00	18	0.3125	6.00	32.5393	42.3800		6.3
3	46.75	18	0.3750	7.00	40.5741	49.7800		8.5
4	50.00	18	0.4375		47.6516	57.5000		12.3
							A572-65	30.0



ALL REACTIONS ARE FACTORED

AXIAL 72 K

SHEAR 7 K

MOMENT 897 kip-ft

TORQUE 1 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 44 K

SHEAR 23 K

MOMENT 2797 kip-ft

TORQUE 3 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
dbspectra DS1F03F36D-D	177	(2) APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	167
dbspectra DS4C06F36D-D	177	(2) RRUS 11 B12	167
dbspectra DS1F03F36D-D	177	RRUS 11 B12	167
dbspectra DS4C06F36D-D	177	RRUS 11 B12	167
(2) 2.875" Dia x4' MP	177	(2) RRUS 11 B4	167
2.875" Dia x4' MP	177	RRUS 11 B4	167
2.875" Dia x4' MP	177	RRUS 11 B4	167
(2) Side Arm Mount [SO 701-1]	177	RADIO 4478 B71	167
Side Arm Mount [SO 701-1]	177	RADIO 4478 B71	167
Side Arm Mount [SO 701-1]	177	(2) RADIO 4478 B71	167
(2) AIR 32 B2a/B66Aa w/ Mount Pipe	167	Microdata 8:4 MI-5544	167
AIR 32 B2a/B66Aa w/ Mount Pipe	167	Microdata 8:4 MI-5544	167
AIR 32 B2a/B66Aa w/ Mount Pipe	167	(2) Microdata 8:4 MI-5544	167
(2) APXVAA24_43-U-A20 w/ Mount Pipe	167	F4P-HRK12	167
APXVAA24_43-U-A20 w/ Mount Pipe	167	Quad-Platform (F4P-HRK12)	167
APXVAA24_43-U-A20 w/ Mount Pipe	167	7'-P2x0.154	167
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	167	7'-P2x0.154	167
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	167	(2) 7'-P2x0.154	167

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 50.2%

Destek Engineering, LLC
1281 Kennestone Circle, Ste 100
Marietta, GA
Phone: (770) 693-0835
FAX:

Job: ***CTNH325D-Rev2***			
Project: ***1978001***			
Client: ProTerra Design Group LLC	Drawn by: Ahmet Colakoglu	App'd:	
Code: TIA-222-G	Date: 06/24/19	Scale: NTS	
Path: S:\Projects\2019\78 - ProTerra Design Group\001 - CTNH325D\TNX\Rev2\CTNH325D_rev.2.eri		Dwg No. E-1	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	180.00-130.00	50.00	4.75	18	24.0000	33.8500	0.1875	0.7500	A572-65 (65 ksi)
L2	130.00-84.75	50.00	6.00	18	32.5393	42.3800	0.3125	1.2500	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	84.75-44.00	46.75	7.00	18	40.5741	49.7800	0.3750	1.5000	(65 ksi) A572-65
L4	44.00-1.00	50.00		18	47.6516	57.5000	0.4375	1.7500	(65 ksi) A572-65

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.3413	14.1714	1015.2211	8.4534	12.1920	83.2694	2031.7780	7.0871	3.8940	20.768
	34.3433	20.0334	2868.0370	11.9502	17.1958	166.7871	5739.8478	10.0186	5.6276	30.014
L2	33.9423	31.9649	4194.1497	11.4405	16.5299	253.7305	8393.8181	15.9855	5.1769	16.566
	42.9856	41.7257	9328.9874	14.9340	21.5290	433.3211	18670.2500	20.8668	6.9089	22.108
L3	42.3419	47.8470	9768.4342	14.2707	20.6116	473.9279	19549.7219	23.9280	6.4810	17.283
	50.4901	58.8043	18133.7804	17.5388	25.2882	717.0835	36291.4216	29.4077	8.1013	21.603
L4	49.7192	65.5626	18464.4752	16.7610	24.2070	762.7742	36953.2464	32.7876	7.6167	17.41
	58.3195	79.2384	32596.7885	20.2572	29.2100	1115.9462	65236.4687	39.6267	9.3500	21.371

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 180.00-130.00				1	1	1			
L2 130.00-84.75				1	1	1			
L3 84.75-44.00				1	1	1			
L4 44.00-1.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
6x12 Hybrid	C	No	Yes	Inside Pole	167.00 - 1.00	3	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
LDF5-50A(7/8)	C	No	No	Inside Pole	177.00 - 1.00	8	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	180.00-130.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.23
L2	130.00-84.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.24
L3	84.75-44.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.22
L4	44.00-1.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.23

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	180.00-130.00	A	1.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.23
L2	130.00-84.75	A	1.687	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.24
L3	84.75-44.00	A	1.603	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.22
L4	44.00-1.00	A	1.441	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.23

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	180.00-130.00	0.0000	0.0000	0.0000	0.0000
L2	130.00-84.75	0.0000	0.0000	0.0000	0.0000
L3	84.75-44.00	0.0000	0.0000	0.0000	0.0000
L4	44.00-1.00	0.0000	0.0000	0.0000	0.0000

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
183ft									
177ft Naugatuk Town									
dbspectra DS1F03F36D-D	A	From Leg	3.00	0.0000	177.00	No Ice	6.69	6.69	0.06
			0.00			1/2" Ice	8.95	8.95	0.11
			9.30			1" Ice	11.23	11.23	0.17
dbspectra DS4C06F36D-D	A	From Leg	3.00	0.0000	177.00	No Ice	5.82	5.82	0.05
			0.00			1/2" Ice	7.79	7.79	0.09
			10.30			1" Ice	9.78	9.78	0.15
dbspectra DS1F03F36D-D	B	From Leg	3.00	0.0000	177.00	No Ice	6.69	6.69	0.06
			0.00			1/2" Ice	8.95	8.95	0.11
			9.30			1" Ice	11.23	11.23	0.17
dbspectra DS4C06F36D-D	C	From Leg	3.00	0.0000	177.00	No Ice	5.82	5.82	0.05
			0.00			1/2" Ice	7.79	7.79	0.09
			10.30			1" Ice	9.78	9.78	0.15
(2) 2.875" Dia x4' MP	A	From Leg	3.00	0.0000	177.00	No Ice	1.15	1.15	0.02
			0.00			1/2" Ice	1.55	1.55	0.03
			0.00			1" Ice	1.95	1.95	0.04
2.875" Dia x4' MP	B	From Leg	3.00	0.0000	177.00	No Ice	1.15	1.15	0.02
			0.00			1/2" Ice	1.55	1.55	0.03
			0.00			1" Ice	1.95	1.95	0.04
2.875" Dia x4' MP	C	From Leg	3.00	0.0000	177.00	No Ice	1.15	1.15	0.02
			0.00			1/2" Ice	1.55	1.55	0.03
			0.00			1" Ice	1.95	1.95	0.04
(2) Side Arm Mount [SO 701-1]	A	From Leg	3.00	0.0000	177.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
Side Arm Mount [SO 701-1]	B	From Leg	3.00	0.0000	177.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
Side Arm Mount [SO 701-1]	C	From Leg	3.00	0.0000	177.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
167ft									
(2) AIR 32 B2a/B66Aa w/ Mount Pipe	A	From Leg	3.00	0.0000	167.00	No Ice	6.75	6.07	0.15
			0.00			1/2" Ice	7.20	6.87	0.21
			0.00			1" Ice	7.65	7.58	0.28
AIR 32 B2a/B66Aa w/ Mount Pipe	B	From Leg	3.00	0.0000	167.00	No Ice	6.75	6.07	0.15
			0.00			1/2" Ice	7.20	6.87	0.21
			0.00			1" Ice	7.65	7.58	0.28
AIR 32 B2a/B66Aa w/ Mount Pipe	C	From Leg	3.00	0.0000	167.00	No Ice	6.75	6.07	0.15
			0.00			1/2" Ice	7.20	6.87	0.21
			0.00			1" Ice	7.65	7.58	0.28
(2) APXVAA24_43-U-A20 w/ Mount Pipe	A	From Leg	3.00	0.0000	167.00	No Ice	14.69	6.87	0.16
			0.00			1/2" Ice	15.46	7.55	0.28
			0.00			1" Ice	16.23	8.25	0.43
APXVAA24_43-U-A20 w/ Mount Pipe	B	From Leg	3.00	0.0000	167.00	No Ice	14.69	6.87	0.16
			0.00			1/2" Ice	15.46	7.55	0.28
			0.00			1" Ice	16.23	8.25	0.43
APXVAA24_43-U-A20 w/ Mount Pipe	C	From Leg	3.00	0.0000	167.00	No Ice	14.69	6.87	0.16
			0.00			1/2" Ice	15.46	7.55	0.28
			0.00			1" Ice	16.23	8.25	0.43
APX16DWV-16DWV-S-E-A	A	From Leg	3.00	0.0000	167.00	No Ice	6.29	2.76	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
20 w/ Mount Pipe			0.00				1/2" Ice	6.86	3.27	0.11
			0.00				1" Ice	7.45	3.79	0.16
APX16DWV-16DWV-S-E-A	B	From Leg	3.00		0.0000	167.00	No Ice	6.29	2.76	0.06
20 w/ Mount Pipe			0.00				1/2" Ice	6.86	3.27	0.11
			0.00				1" Ice	7.45	3.79	0.16
(2)	C	From Leg	3.00		0.0000	167.00	No Ice	6.29	2.76	0.06
APX16DWV-16DWV-S-E-A			0.00				1/2" Ice	6.86	3.27	0.11
20 w/ Mount Pipe			0.00				1" Ice	7.45	3.79	0.16
(2) RRUS 11 B12	A	From Leg	3.00		0.0000	167.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			0.00				1" Ice	3.26	1.48	0.10
RRUS 11 B12	B	From Leg	3.00		0.0000	167.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			0.00				1" Ice	3.26	1.48	0.10
RRUS 11 B12	C	From Leg	3.00		0.0000	167.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			0.00				1" Ice	3.26	1.48	0.10
(2) RRUS 11 B4	A	From Leg	3.00		0.0000	167.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			0.00				1" Ice	3.26	1.48	0.10
RRUS 11 B4	B	From Leg	3.00		0.0000	167.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			0.00				1" Ice	3.26	1.48	0.10
RRUS 11 B4	C	From Leg	3.00		0.0000	167.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			0.00				1" Ice	3.26	1.48	0.10
RADIO 4478 B71	A	From Leg	3.00		0.0000	167.00	No Ice	2.04	1.21	0.06
			0.00				1/2" Ice	2.22	1.36	0.07
			0.00				1" Ice	2.40	1.51	0.09
RADIO 4478 B71	B	From Leg	3.00		0.0000	167.00	No Ice	2.04	1.21	0.06
			0.00				1/2" Ice	2.22	1.36	0.07
			0.00				1" Ice	2.40	1.51	0.09
(2) RADIO 4478 B71	C	From Leg	3.00		0.0000	167.00	No Ice	2.04	1.21	0.06
			0.00				1/2" Ice	2.22	1.36	0.07
			0.00				1" Ice	2.40	1.51	0.09
Microdata 8:4 MI-5544	A	From Leg	3.00		0.0000	167.00	No Ice	0.62	0.45	0.02
			0.00				1/2" Ice	0.72	0.54	0.02
			0.00				1" Ice	0.84	0.65	0.03
Microdata 8:4 MI-5544	B	From Leg	3.00		0.0000	167.00	No Ice	0.62	0.45	0.02
			0.00				1/2" Ice	0.72	0.54	0.02
			0.00				1" Ice	0.84	0.65	0.03
(2) Microdata 8:4 MI-5544	C	From Leg	3.00		0.0000	167.00	No Ice	0.62	0.45	0.02
			0.00				1/2" Ice	0.72	0.54	0.02
			0.00				1" Ice	0.84	0.65	0.03
F4P-HRK12	C	None			0.0000	167.00	No Ice	7.57	7.57	0.51
							1/2" Ice	10.54	10.54	0.62
							1" Ice	13.63	13.63	0.77
Quad-Platform (F4P-HRK12)	C	None			0.0000	167.00	No Ice	51.77	51.77	2.64
							1/2" Ice	64.27	64.27	3.48
							1" Ice	76.77	76.77	4.64
7'-P2x0.154	A	From Leg	3.00		0.0000	167.00	No Ice	1.66	1.66	0.03
			0.00				1/2" Ice	2.39	2.39	0.04
			0.00				1" Ice	2.83	2.83	0.06
7'-P2x0.154	B	From Leg	3.00		0.0000	167.00	No Ice	1.66	1.66	0.03
			0.00				1/2" Ice	2.39	2.39	0.04
			0.00				1" Ice	2.83	2.83	0.06
(2) 7'-P2x0.154	C	From Leg	3.00		0.0000	167.00	No Ice	1.66	1.66	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	2.39	2.39	0.04
			0.00			1" Ice	2.83	2.83	0.06
157ft									
147ft									

Load Combinations

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

Comb. No.	Description
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	180 - 130	Pole	Max Tension	2	0.00	-0.00	-0.00
			Max. Compression	26	-24.33	1.98	7.21
			Max. Mx	20	-9.86	379.52	-0.22
			Max. My	2	-9.82	-1.76	391.62
			Max. Vy	20	-12.07	379.52	-0.22
			Max. Vx	2	-12.41	-1.76	391.62
			Max. Torque	9			3.18
L2	130 - 84.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.45	2.08	7.58
			Max. Mx	20	-17.15	992.18	-3.44
			Max. My	2	-17.13	-5.08	1019.06
			Max. Vy	20	-15.79	992.18	-3.44
			Max. Vx	2	-16.12	-5.08	1019.06
			Max. Torque	9			3.18
L3	84.75 - 44	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.46	2.12	7.72
			Max. Mx	20	-27.16	1688.28	-6.39
			Max. My	2	-27.15	-8.07	1728.44
			Max. Vy	20	-19.15	1688.28	-6.39
			Max. Vx	2	-19.49	-8.07	1728.44
			Max. Torque	9			3.17
L4	44 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.75	2.12	7.69
			Max. Mx	20	-44.31	2740.34	-10.08
			Max. My	2	-44.31	-11.76	2796.85
			Max. Vy	20	-22.83	2740.34	-10.08
			Max. Vx	2	-23.15	-11.76	2796.85
			Max. Torque	9			3.17

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	71.75	-0.00	-0.00
	Max. H_x	20	44.32	22.81	-0.07
	Max. H_z	3	33.24	-0.07	23.13
	Max. M_x	2	2796.85	-0.07	23.13
	Max. M_z	8	2738.87	-22.81	0.07
	Max. Torsion	9	3.17	-22.81	0.07
	Min. Vert	3	33.24	-0.07	23.13

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H_x	9	33.24	-22.81	0.07
	Min. H_z	15	33.24	0.07	-23.13
	Min. M_x	14	-2791.98	0.07	-23.13
	Min. M_z	20	-2740.34	22.81	-0.07
	Min. Torsion	21	-3.17	22.81	-0.07

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	36.93	0.00	0.00	-1.89	0.57	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	44.32	0.07	-23.13	-2796.85	-11.76	-0.65
0.9 Dead+1.6 Wind 0 deg - No Ice	33.24	0.07	-23.13	-2770.28	-11.83	-0.66
1.2 Dead+1.6 Wind 30 deg - No Ice	44.32	11.47	-20.07	-2429.05	-1379.92	-2.14
0.9 Dead+1.6 Wind 30 deg - No Ice	33.24	11.47	-20.07	-2405.75	-1367.25	-2.15
1.2 Dead+1.6 Wind 60 deg - No Ice	44.32	19.79	-11.63	-1410.68	-2378.17	-3.05
0.9 Dead+1.6 Wind 60 deg - No Ice	33.24	19.79	-11.63	-1396.90	-2356.24	-3.07
1.2 Dead+1.6 Wind 90 deg - No Ice	44.32	22.81	-0.07	-14.93	-2738.87	-3.15
0.9 Dead+1.6 Wind 90 deg - No Ice	33.24	22.81	-0.07	-14.15	-2713.64	-3.17
1.2 Dead+1.6 Wind 120 deg - No Ice	44.32	19.72	11.50	1384.19	-2365.69	-2.40
0.9 Dead+1.6 Wind 120 deg - No Ice	33.24	19.72	11.50	1371.91	-2343.87	-2.41
1.2 Dead+1.6 Wind 150 deg - No Ice	44.32	11.34	19.99	2411.71	-1358.27	-1.01
0.9 Dead+1.6 Wind 150 deg - No Ice	33.24	11.34	19.99	2389.86	-1345.85	-1.01
1.2 Dead+1.6 Wind 180 deg - No Ice	44.32	-0.07	23.13	2791.98	13.24	0.65
0.9 Dead+1.6 Wind 180 deg - No Ice	33.24	-0.07	23.13	2766.69	12.91	0.66
1.2 Dead+1.6 Wind 210 deg - No Ice	44.32	-11.47	20.07	2424.18	1381.38	2.14
0.9 Dead+1.6 Wind 210 deg - No Ice	33.24	-11.47	20.07	2402.20	1368.34	2.15
1.2 Dead+1.6 Wind 240 deg - No Ice	44.32	-19.79	11.63	1405.82	2379.63	3.05
0.9 Dead+1.6 Wind 240 deg - No Ice	33.24	-19.79	11.63	1393.31	2357.29	3.07
1.2 Dead+1.6 Wind 270 deg - No Ice	44.32	-22.81	0.07	10.08	2740.34	3.15
0.9 Dead+1.6 Wind 270 deg - No Ice	33.24	-22.81	0.07	10.58	2714.57	3.17
1.2 Dead+1.6 Wind 300 deg - No Ice	44.32	-19.72	-11.50	-1389.05	2367.18	2.40
0.9 Dead+1.6 Wind 300 deg - No Ice	33.24	-19.72	-11.50	-1375.49	2344.99	2.41
1.2 Dead+1.6 Wind 330 deg -	44.32	-11.34	-19.99	-2416.58	1359.76	1.01

Load Combination	Vertical K	Shear$_x$ K	Shear$_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
No Ice 0.9 Dead+1.6 Wind 330 deg -	33.24	-11.34	-19.99	-2393.42	1346.93	1.02
No Ice 1.2 Dead+1.0 Ice+1.0 Temp	71.75	0.00	0.00	-7.69	2.12	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	71.75	0.01	-7.22	-897.37	-0.18	-0.17
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	71.75	3.60	-6.26	-779.38	-440.88	-0.58
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	71.75	6.22	-3.62	-454.68	-762.87	-0.83
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	71.75	7.18	-0.01	-10.27	-879.87	-0.86
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	71.75	6.21	3.60	434.78	-760.52	-0.66
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	71.75	3.58	6.25	761.20	-436.81	-0.28
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	71.75	-0.01	7.22	881.55	4.53	0.17
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	71.75	-3.60	6.26	763.56	445.24	0.58
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	71.75	-6.22	3.62	438.86	767.23	0.83
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	71.75	-7.18	0.01	-5.56	884.22	0.86
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	71.75	-6.21	-3.60	-450.60	764.87	0.66
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	71.75	-3.58	-6.25	-777.03	441.16	0.29
Dead+Wind 0 deg - Service	36.93	0.02	-4.95	-596.67	-2.05	-0.14
Dead+Wind 30 deg - Service	36.93	2.45	-4.29	-518.33	-293.15	-0.46
Dead+Wind 60 deg - Service	36.93	4.23	-2.49	-301.65	-505.55	-0.66
Dead+Wind 90 deg - Service	36.93	4.88	-0.02	-4.68	-582.32	-0.68
Dead+Wind 120 deg - Service	36.93	4.22	2.46	293.00	-502.89	-0.52
Dead+Wind 150 deg - Service	36.93	2.43	4.28	511.63	-288.55	-0.22
Dead+Wind 180 deg - Service	36.93	-0.02	4.95	592.63	3.27	0.14
Dead+Wind 210 deg - Service	36.93	-2.45	4.29	514.29	294.38	0.46
Dead+Wind 240 deg - Service	36.93	-4.23	2.49	297.61	506.77	0.66
Dead+Wind 270 deg - Service	36.93	-4.88	0.02	0.64	583.54	0.68
Dead+Wind 300 deg - Service	36.93	-4.22	-2.46	-297.05	504.11	0.52
Dead+Wind 330 deg - Service	36.93	-2.43	-4.28	-515.68	289.77	0.22

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-36.93	0.00	-0.00	36.93	-0.00	0.001%
2	0.07	-44.32	-23.13	-0.07	44.32	23.13	0.005%
3	0.07	-33.24	-23.13	-0.07	33.24	23.13	0.005%
4	11.47	-44.32	-20.07	-11.47	44.32	20.07	0.000%
5	11.47	-33.24	-20.07	-11.47	33.24	20.07	0.001%
6	19.79	-44.32	-11.63	-19.79	44.32	11.63	0.000%
7	19.79	-33.24	-11.63	-19.79	33.24	11.63	0.000%
8	22.81	-44.32	-0.07	-22.81	44.32	0.07	0.002%
9	22.81	-33.24	-0.07	-22.81	33.24	0.07	0.002%
10	19.72	-44.32	11.50	-19.72	44.32	-11.50	0.000%
11	19.72	-33.24	11.50	-19.72	33.24	-11.50	0.001%
12	11.34	-44.32	19.99	-11.34	44.32	-19.99	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
13	11.34	-33.24	19.99	-11.34	33.24	-19.99	0.000%
14	-0.07	-44.32	23.13	0.07	44.32	-23.13	0.005%
15	-0.07	-33.24	23.13	0.07	33.24	-23.13	0.005%
16	-11.47	-44.32	20.07	11.47	44.32	-20.07	0.000%
17	-11.47	-33.24	20.07	11.47	33.24	-20.07	0.000%
18	-19.79	-44.32	11.63	19.79	44.32	-11.63	0.000%
19	-19.79	-33.24	11.63	19.79	33.24	-11.63	0.001%
20	-22.81	-44.32	0.07	22.81	44.32	-0.07	0.002%
21	-22.81	-33.24	0.07	22.81	33.24	-0.07	0.005%
22	-19.72	-44.32	-11.50	19.72	44.32	11.50	0.000%
23	-19.72	-33.24	-11.50	19.72	33.24	11.50	0.000%
24	-11.34	-44.32	-19.99	11.34	44.32	19.99	0.000%
25	-11.34	-33.24	-19.99	11.34	33.24	19.99	0.001%
26	0.00	-71.75	0.00	-0.00	71.75	-0.00	0.001%
27	0.01	-71.75	-7.22	-0.01	71.75	7.22	0.001%
28	3.60	-71.75	-6.26	-3.60	71.75	6.26	0.001%
29	6.22	-71.75	-3.62	-6.22	71.75	3.62	0.001%
30	7.18	-71.75	-0.01	-7.18	71.75	0.01	0.001%
31	6.21	-71.75	3.60	-6.21	71.75	-3.60	0.001%
32	3.58	-71.75	6.25	-3.58	71.75	-6.25	0.001%
33	-0.01	-71.75	7.22	0.01	71.75	-7.22	0.001%
34	-3.60	-71.75	6.26	3.60	71.75	-6.26	0.001%
35	-6.22	-71.75	3.62	6.22	71.75	-3.62	0.001%
36	-7.18	-71.75	0.01	7.18	71.75	-0.01	0.001%
37	-6.21	-71.75	-3.60	6.21	71.75	3.60	0.001%
38	-3.58	-71.75	-6.25	3.58	71.75	6.25	0.001%
39	0.02	-36.93	-4.95	-0.02	36.93	4.95	0.001%
40	2.45	-36.93	-4.29	-2.45	36.93	4.29	0.001%
41	4.23	-36.93	-2.49	-4.23	36.93	2.49	0.001%
42	4.88	-36.93	-0.02	-4.88	36.93	0.02	0.001%
43	4.22	-36.93	2.46	-4.22	36.93	-2.46	0.001%
44	2.43	-36.93	4.28	-2.43	36.93	-4.28	0.001%
45	-0.02	-36.93	4.95	0.02	36.93	-4.95	0.001%
46	-2.45	-36.93	4.29	2.45	36.93	-4.29	0.001%
47	-4.23	-36.93	2.49	4.23	36.93	-2.49	0.001%
48	-4.88	-36.93	0.02	4.88	36.93	-0.02	0.001%
49	-4.22	-36.93	-2.46	4.22	36.93	2.46	0.001%
50	-2.43	-36.93	-4.28	2.43	36.93	4.28	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000554
2	Yes	14	0.00008468	0.00009409
3	Yes	14	0.00005789	0.00008148
4	Yes	17	0.00000001	0.00008089
5	Yes	16	0.00000001	0.00014671
6	Yes	17	0.00000001	0.00009205
7	Yes	17	0.00000001	0.00007213
8	Yes	15	0.00003637	0.00008555
9	Yes	15	0.00000001	0.00007163
10	Yes	17	0.00000001	0.00007659
11	Yes	16	0.00000001	0.00013953
12	Yes	17	0.00000001	0.00008473
13	Yes	17	0.00000001	0.00006635

14	Yes	14	0.00008471	0.00010108
15	Yes	14	0.00005791	0.00008719
16	Yes	17	0.00000001	0.00009040
17	Yes	17	0.00000001	0.00007078
18	Yes	17	0.00000001	0.00007835
19	Yes	16	0.00000001	0.00014246
20	Yes	15	0.00003637	0.00007669
21	Yes	14	0.00005799	0.00014221
22	Yes	17	0.00000001	0.00008813
23	Yes	17	0.00000001	0.00006902
24	Yes	17	0.00000001	0.00008084
25	Yes	16	0.00000001	0.00014683
26	Yes	11	0.00000001	0.00002098
27	Yes	15	0.00012822	0.00010880
28	Yes	15	0.00012800	0.00012884
29	Yes	15	0.00012782	0.00013057
30	Yes	15	0.00012776	0.00010569
31	Yes	15	0.00012745	0.00012221
32	Yes	15	0.00012735	0.00012367
33	Yes	15	0.00012750	0.00010421
34	Yes	15	0.00012747	0.00012664
35	Yes	15	0.00012764	0.00012456
36	Yes	15	0.00012796	0.00010689
37	Yes	15	0.00012798	0.00013062
38	Yes	15	0.00012808	0.00012947
39	Yes	14	0.00000001	0.00002365
40	Yes	14	0.00000001	0.00001812
41	Yes	14	0.00000001	0.00002186
42	Yes	14	0.00000001	0.00002425
43	Yes	14	0.00000001	0.00001764
44	Yes	14	0.00000001	0.00001952
45	Yes	14	0.00000001	0.00002328
46	Yes	14	0.00000001	0.00002093
47	Yes	14	0.00000001	0.00001791
48	Yes	14	0.00000001	0.00002429
49	Yes	14	0.00000001	0.00002095
50	Yes	14	0.00000001	0.00001834

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		*°*	*°*
L1	180 - 130	19.161	39	0.9822	0.0079
L2	134.75 - 84.75	10.467	39	0.7741	0.0029
L3	90.75 - 44	4.552	39	0.4894	0.0012
L4	51 - 1	1.395	39	0.2542	0.0005

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	*°*	*°*	*ft*
177.00	dbspectra DS1F03F36D-D	39	18.547	0.9700	0.0075	66041
167.00	(2) AIR 32 B2a/B66Aa w/ Mount	39	16.515	0.9288	0.0063	25400

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
	Pipe					

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 130	89.491	2	4.5627	0.0371
L2	134.75 - 84.75	49.019	2	3.6209	0.0136
L3	90.75 - 44	21.338	2	2.2935	0.0055
L4	51 - 1	6.541	2	1.1919	0.0022

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	dbspectra DS1F03F36D-D	2	86.638	4.5082	0.0353	14546
167.00	(2) AIR 32 B2a/B66Aa w/ Mount Pipe	2	77.186	4.3239	0.0294	5593

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	180 - 130 (1)	TP33.85x24x0.1875	50.00	0.00	0.0	19.4765	-9.82	1176.75	0.008
L2	130 - 84.75 (2)	TP42.38x32.5393x0.3125	50.00	0.00	0.0	40.5544	-17.13	2780.47	0.006
L3	84.75 - 44 (3)	TP49.78x40.5741x0.375	46.75	0.00	0.0	57.1636	-27.15	3948.69	0.007
L4	44 - 1 (4)	TP57.5x47.6516x0.4375	50.00	0.00	0.0	79.2384	-44.31	5438.74	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	180 - 130 (1)	TP33.85x24x0.1875	391.63	793.60	0.493	0.00	793.60	0.000
L2	130 - 84.75 (2)	TP42.38x32.5393x0.3125	1019.08	2338.22	0.436	0.00	2338.22	0.000
L3	84.75 - 44 (3)	TP49.78x40.5741x0.375	1728.46	3899.86	0.443	0.00	3899.86	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L4	44 - 1 (4)	TP57.5x47.6516x0.4375	2796.88	6382.99	0.438	0.00	6382.99	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	180 - 130 (1)	TP33.85x24x0.1875	12.41	588.38	0.021	0.65	1590.51	0.000
L2	130 - 84.75 (2)	TP42.38x32.5393x0.3125	16.12	1390.24	0.012	0.65	4687.56	0.000
L3	84.75 - 44 (3)	TP49.78x40.5741x0.375	19.49	1974.34	0.010	0.65	7818.46	0.000
L4	44 - 1 (4)	TP57.5x47.6516x0.4375	23.15	2719.37	0.009	0.65	12796.42	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 130 (1)	0.008	0.493	0.000	0.021	0.000	0.502	1.000	4.8.2
L2	130 - 84.75 (2)	0.006	0.436	0.000	0.012	0.000	0.442	1.000	4.8.2
L3	84.75 - 44 (3)	0.007	0.443	0.000	0.010	0.000	0.450	1.000	4.8.2
L4	44 - 1 (4)	0.008	0.438	0.000	0.009	0.000	0.446	1.000	4.8.2

Section Capacity Table

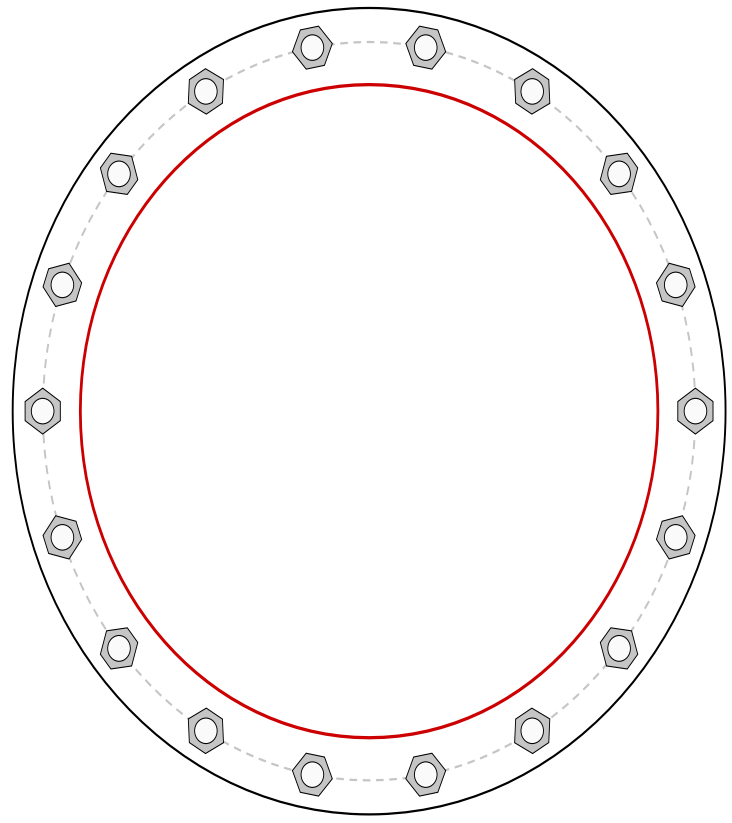
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	180 - 130	Pole	TP33.85x24x0.1875	1	-9.82	1176.75	50.2	Pass
L2	130 - 84.75	Pole	TP42.38x32.5393x0.3125	2	-17.13	2780.47	44.2	Pass
L3	84.75 - 44	Pole	TP49.78x40.5741x0.375	3	-27.15	3948.69	45.0	Pass
L4	44 - 1	Pole	TP57.5x47.6516x0.4375	4	-44.31	5438.74	44.6	Pass
							Summary	
						Pole (L1)	50.2	Pass
						RATING =	**50.2**	**Pass**

Monopole Base Plate Connection

Site Info	
BU #	
Site Name	CTNH325D-Rev2
Order #	

Analysis Considerations	
TIA-222 Revision	G
Grout Considered:	No
l_{ar} (in)	3
Eta Factor, η	0.5

Applied Loads	
Moment (kip-ft)	2796.87
Axial Force (kips)	44.31
Shear Force (kips)	23.15



Connection Properties

Anchor Rod Data

(18) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 65" BC

Base Plate Data

71" OD x 2.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Stiffener Data

N/A

Pole Data

57.5" x 0.4375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_c = 117.15	ϕPn_t = 260	**Stress Rating**
Vu = 1.29	ϕVn = n/a	**46.0%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	17.61	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	**39.1%**	**Pass**

Analysis Date: 6/24/2019

Pier and Pad Foundation

Site #:	CTNH325D-Rev2

TIA-222 Revision:	G
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	44	kips
Base Shear, Vu_comp:	23	kips
Moment, M_u:	2797	ft-kips
Tower Height, **H**:	180	ft
BP Dist. Above Fdn, bp_{dist}:	3	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	7.5	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	11	
Pier Rebar Quantity, **mc**:	42	
Pier Tie/Spiral Size, **St**:	5	
Pier Tie/Spiral Quantity, **mt**:	8	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	6	ft
Pad Width, **W**:	27	ft
Pad Thickness, **T**:	3.5	ft
Pad Rebar Size (Bottom), **Sp**:	11	
Pad Rebar Quantity (Bottom), **mp**:	26	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	4	ksi
Dry Concrete Density, δc:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	125	pcf
Ultimate Net Bearing, Qnet:	12.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	34	degrees
SPT Blow Count, N_{blows}:	20	
Base Friction, μ:		
Neglected Depth, **N**:	3.75	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	N/A	ft

<--Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Lateral (Sliding) (kips)	282.83	23.00	**8.1%**	**Pass**
Bearing Pressure (ksf)	9.56	1.71	**17.9%**	**Pass**
*Overturning (kip*ft)*	7622.13	2952.25	**38.7%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	10810.96	2866.00	**26.5%**	**Pass**
Pier Compression (kip)	35802.00	74.38	**0.2%**	**Pass**
*Pad Flexure (kip*ft)*	6530.64	970.69	**14.9%**	**Pass**
Pad Shear - 1-way (kips)	1133.75	135.28	**11.9%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.020	**10.7%**	**Pass**

Soil Rating:	**38.7%**
Structural Rating:	**26.5%**

Exhibit E

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: CTNH325D

Naugatuck
641 Maple Hill Road
Naugatuck, CT 06770

February 4, 2019

EBI Project Number: 6219000311

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	2.13 %

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

February 4, 2019

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

Emissions Analysis for Site: **CTNH325D – Naugatuck**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **641 Maple Hill Road, Naugatuck, 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 population 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 population 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 limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) frequency 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 **641 Maple Hill Road, Naugatuck, 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 for directional panel, 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) 1 UMTS channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

2) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 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) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) 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.

7) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

8) The antennas used in this modeling are the **Ericsson AIR32 B66A/B2A** & **RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels, the **RFS APXVAA24-43-U-A20** for 600 MHz and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

9) The antenna mounting height centerline of the proposed antennas is **167 feet** above ground level (AGL).

10) 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.

11) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C	Sector:	D
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	167 feet	Height (AGL):	167 feet	Height (AGL):	167 feet	Height (AGL):	167 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	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	Channel Count	4
Total TX Power(W):	200	Total TX Power(W):	200	Total TX Power(W):	200	Total TX Power(W):	200
ERP (W):	7,780.90	ERP (W):	7,780.90	ERP (W):	7,780.90	ERP (W):	7,780.90
Antenna A1 MPE%	**1.07**	Antenna B1 MPE%	**1.07**	Antenna C1 MPE%	**1.08**	Antenna D1 MPE%	**1.07**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	167 feet	Height (AGL):	167 feet	Height (AGL):	167 feet	Height (AGL):	167 feet
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	1	Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	40	Total TX Power(W):	40	Total TX Power(W):	40	Total TX Power(W):	40
ERP (W):	1,706.32	ERP (W):	1,706.32	ERP (W):	1,706.32	ERP (W):	1,706.32
Antenna A2 MPE%	**0.24**	Antenna B2 MPE%	**0.24**	Antenna C2 MPE%	**0.24**	Antenna D2 MPE%	**0.24**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAA24-43-U-A20	Make / Model:	RFS APXVAA24-43-U-A20	Make / Model:	RFS APXVAA24-43-U-A20	Make / Model:	RFS APXVAA24-43-U-A20
Gain:	13.05 / 13.35 dBd	Gain:	13.05 / 13.35 dBd	Gain:	13.05 / 13.35 dBd	Gain:	13.05 / 13.35 dBd
Height (AGL):	167 feet	Height (AGL):	167 feet	Height (AGL):	167 feet	Height (AGL):	167 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,479.78	ERP (W):	2,479.78	ERP (W):	2,479.78	ERP (W):	2,479.78
Antenna A3 MPE%	**0.82**	Antenna B3 MPE%	**0.82**	Antenna C3 MPE%	**0.82**	Antenna D3 MPE%	**0.82**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.13 %**
No Additional Carriers	**NA**
Site Total MPE %:	**2.13 %**

T-Mobile Sector A Total:	2.13 %
T-Mobile Sector B Total:	2.13 %
T-Mobile Sector C Total:	2.13 %
Site Total:	2.13 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	167	4.32	PCS - 1900 MHz	1000.00	0.42%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	167	6.47	AWS - 2100 MHz	1000.00	0.65%
T-Mobile AWS - 2100 MHz UMTS	1	1,706.32	167	2.37	AWS - 2100 MHz	1000.00	0.24%
T-Mobile 600 MHz LTE	2	807.35	167	2.24	600 MHz	400.00	0.56%
T-Mobile 700 MHz LTE	2	432.54	167	1.20	700 MHz	467.00	0.26%
						Total:	**2.13%**

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population 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 population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	2.13 %
Sector B:	2.13 %
Sector C:	2.13 %
T-Mobile Maximum MPE % (Per Sector):	2.13 %
Site Total:	2.13 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **2.13%** of the allowable FCC established general population 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.

Exhibit F

Exhibit F

TARPON TOWERS

March 6, 2019

T-Mobile Northeast LLC
ATTN: Mark Richard
35 Griffin Road South
Bloomfield, CT 06002

RE: T-Mobile proposed antenna and equipment installation at 641 Maple Hill Rd
Naugatuck, CT Municipal Tower
T-Mobile Site ID: CTNH325D
Tarpon Site I.D.: CT1008 Naugatuck

Dear Mr. Richard:

Tarpon Towers II, LLC, ("Tarpon"), as owner of the above mentioned tower site, hereby authorize T-Mobile Northeast LLC and/or its agents to apply for and obtain all necessary permits and approvals from all applicable State of Connecticut and Borough of Naugatuck agencies, commissions, boards and departments.

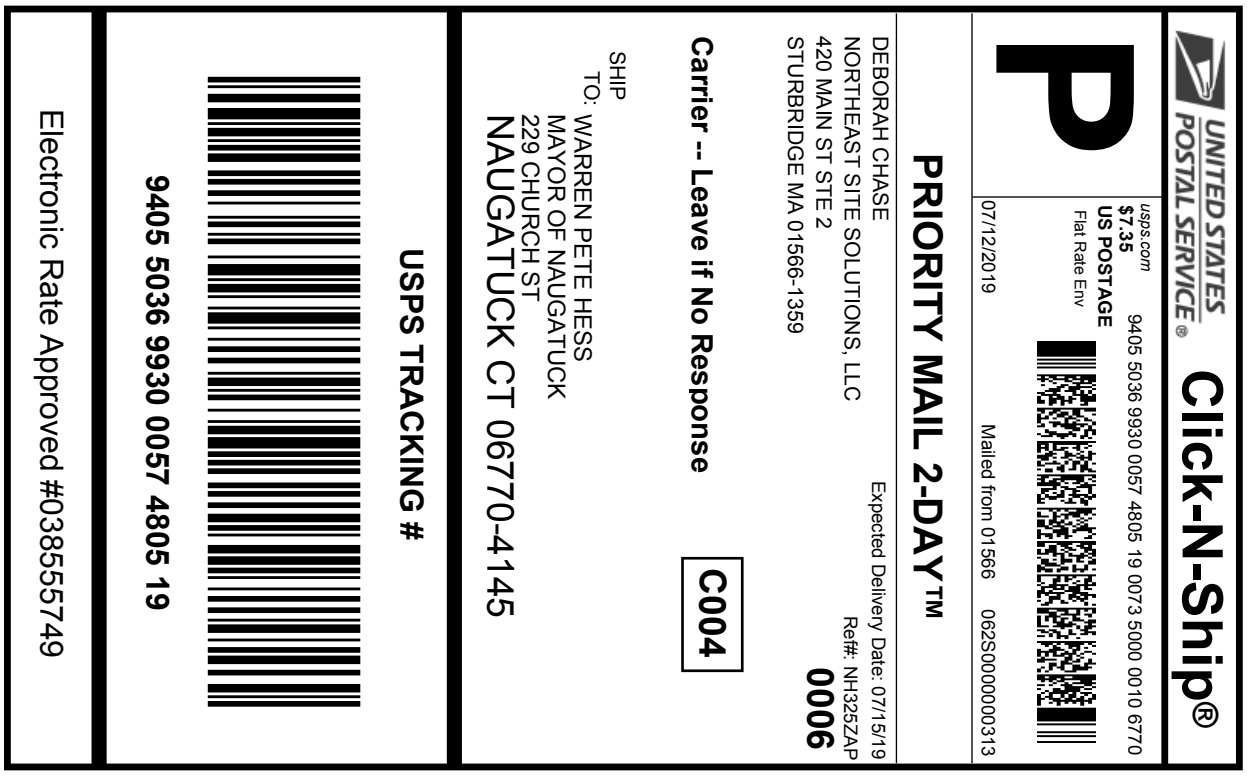
Should you have any questions please contact me at 941-757-5010 ext. 104.

Sincerely,

Brett Buggeln
Chief Operating Officer

1001 Third Ave West, Ste. 420
Bradenton, FL 34205

Exhibit F



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2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
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5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0057 4805 19

Trans. #:	468106907
Print Date:	07/12/2019
Ship Date:	07/12/2019
Expected Delivery Date:	07/15/2019

Priority Mail® Postage:	**$7.35**
Total	**$7.35**

From: DEBORAH CHASE Ref#: NH325ZAP
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: WARREN PETE HESS
MAYOR OF NAUGATUCK
229 CHURCH ST
NAUGATUCK CT 06770-4145

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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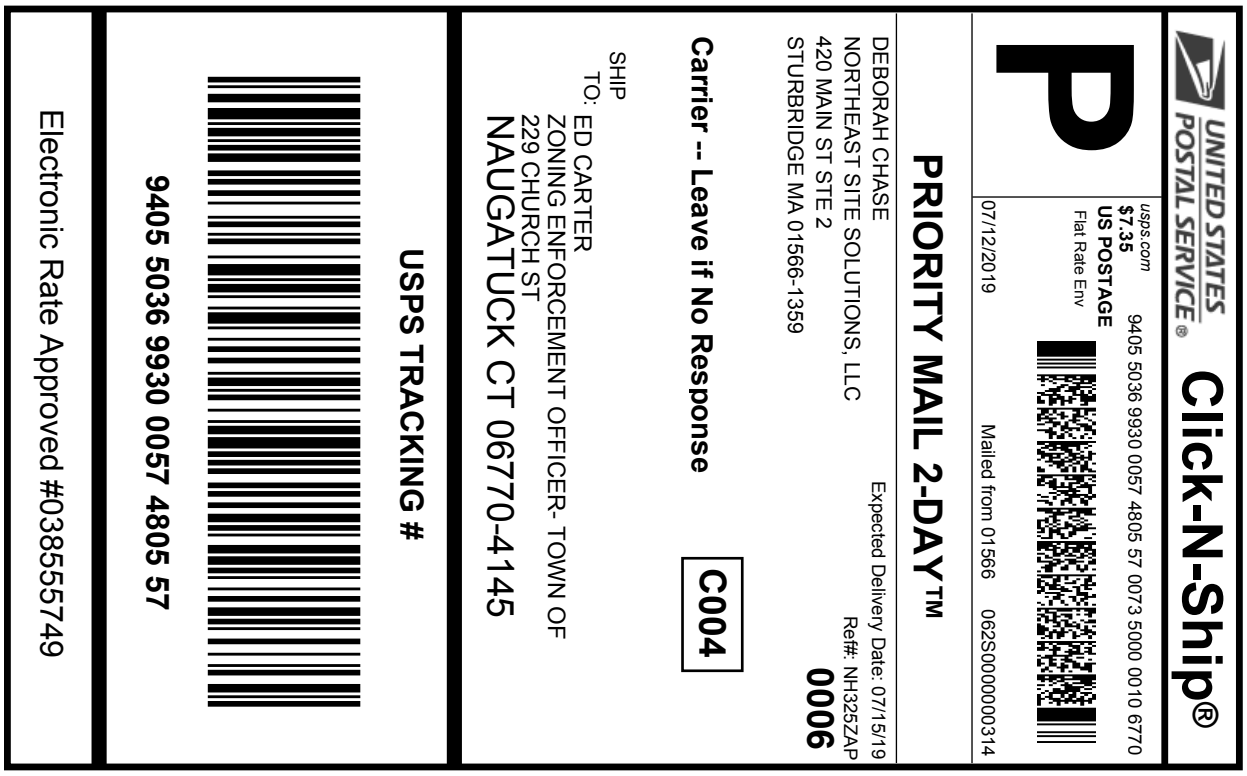

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2. **Place your label so it does not wrap around the edge of the package.**
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5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0057 4805 57

Trans. #:	468106907
Print Date:	07/12/2019
Ship Date:	07/12/2019
Expected Delivery Date:	07/15/2019

Priority Mail® Postage:	**$7.35**
Total	**$7.35**

From: DEBORAH CHASE Ref#: NH325ZAP
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: ED CARTER
ZONING ENFORCEMENT OFFICER- TOWN OF NAUGATUCK
229 CHURCH ST
NAUGATUCK CT 06770-4145

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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