Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

October 20, 2020

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

RE: Notice of Exempt Modification
Wildcat Hill Road, Harwinton, CT 06791
Latitude: 41.7569150000
Longitude: -73-0952340000
T-Mobile Site#: CT11358A – L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 96-foot level of the existing 100-foot guyed tower at Wildcat Hill Road, Harwinton, CT. The 100-foot guyed tower is owned and operated by Everest Infrastructure Partners. The property is owned by Southern New England Telephone Company. T-Mobile now intends to remove three (3) existing antennas and add three (3) new 600/700 MHz antennas. The new antennas will be installed at the same 96-foot level of the tower. Tower modifications are required to accommodate the proposed equipment, as detailed in the enclosed structural analysis from Malouf Engineering.

Planned Modifications:
Tower:

Remove
(6) 1-5/8" coax

Remove and Replace:
(3) LNX-6515DS (Remove) – (3) APXVAARR24_43-U-NA20 (Replace) 600/700 MHz

Install New:
(3) Radio 4449 B71+B12
(1) 1-3/8" Hybrid Cables

Existing to Remain:
(3) APXV18-206516S-C-A20 1900 MHz
(3) TMA
(6) 1-1/4" coax

Ground:
N/A

This tower facility was originally approved by the Connecticut Siting Council in Petition No. 79 dated February 23, 1982. This proposed modification complies with the original approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectman-Michael Criss, Elected Official, and Polly Redmond, Land Use Coordinator for the Town of Harwinton, as well as the tower owner and property owner.

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

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kyle Richers
Transcend Wireless
Cell: 908-447-4716
Email: krichers@transcendwireless.com

Attachments
cc: Michael Criss – Town of Harwinton First Selectman
Polly Redmond– Town of Harwinton Land Use Coordinator
Everest Infrastructure Partners – Tower Owner
Southern New England Telephone Company- Property Owner

View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a scheduled Pickup
   - Your driver will pickup your shipment(s) as usual.

   Customers without a scheduled Pickup
   - Schedule a Pickup on ups.com to have a UPS driver pickup all of your packages.
   - Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you, please visit the 'Locations' Quick link at ups.com.

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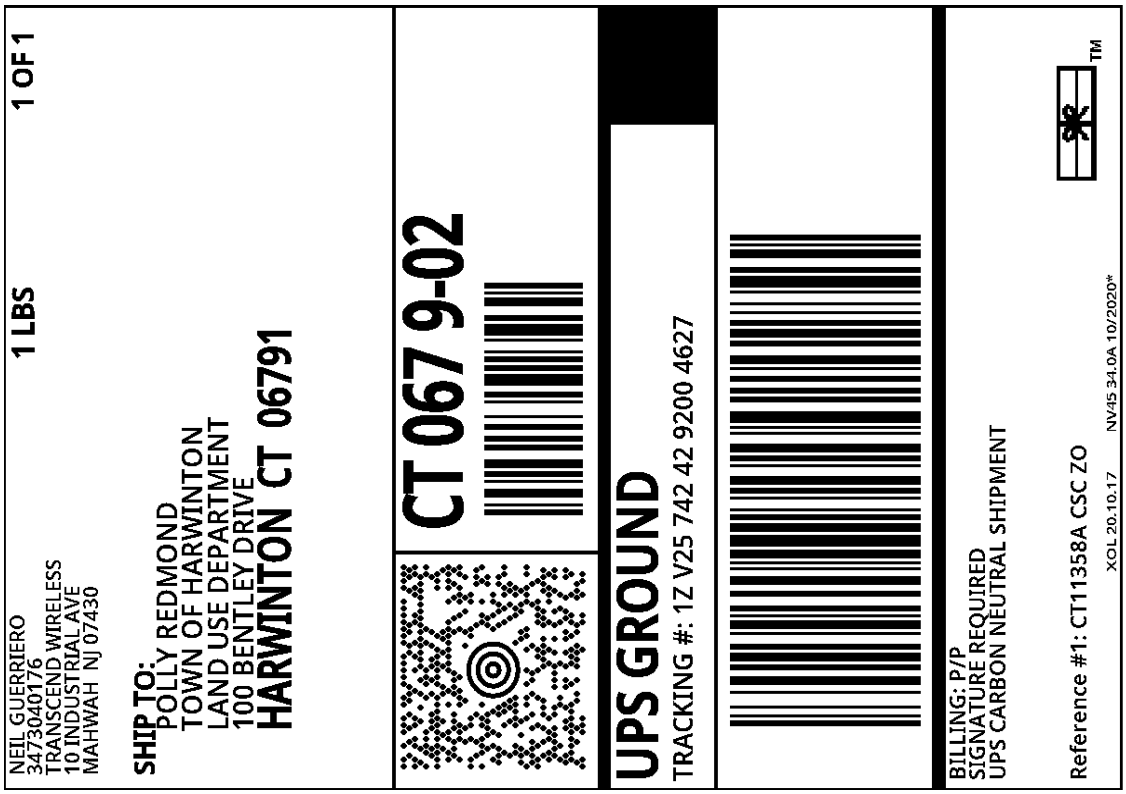

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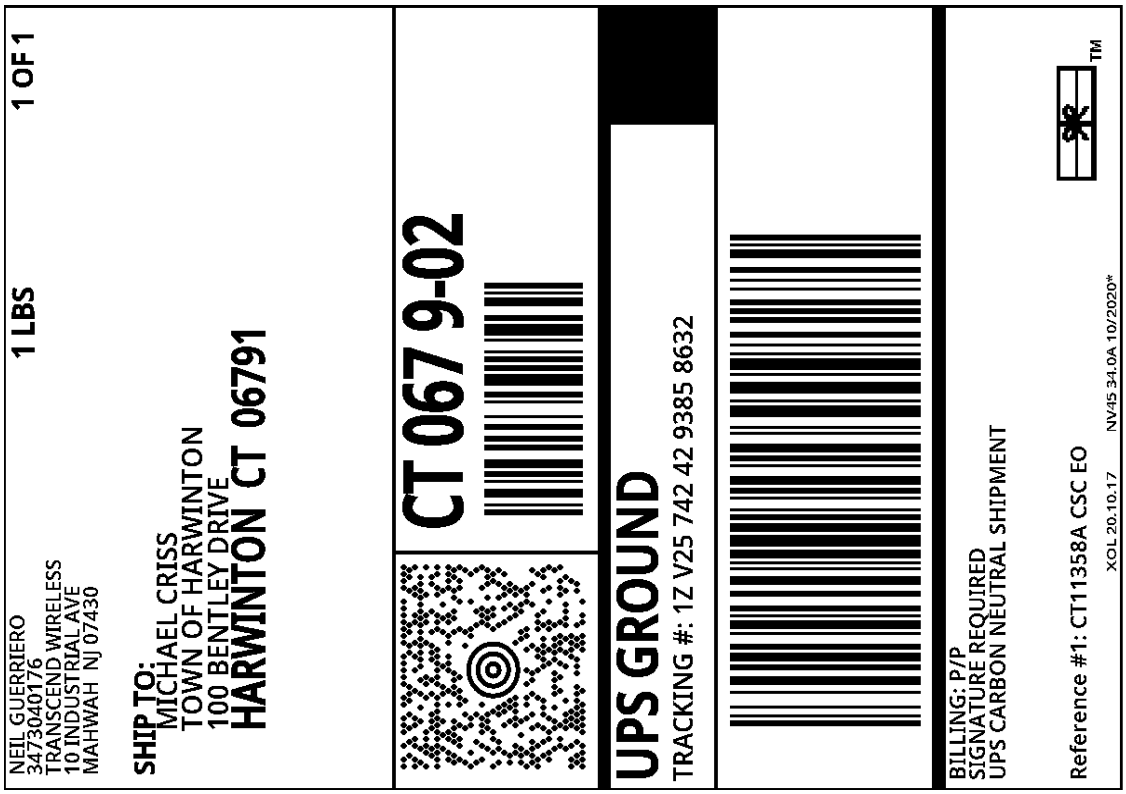

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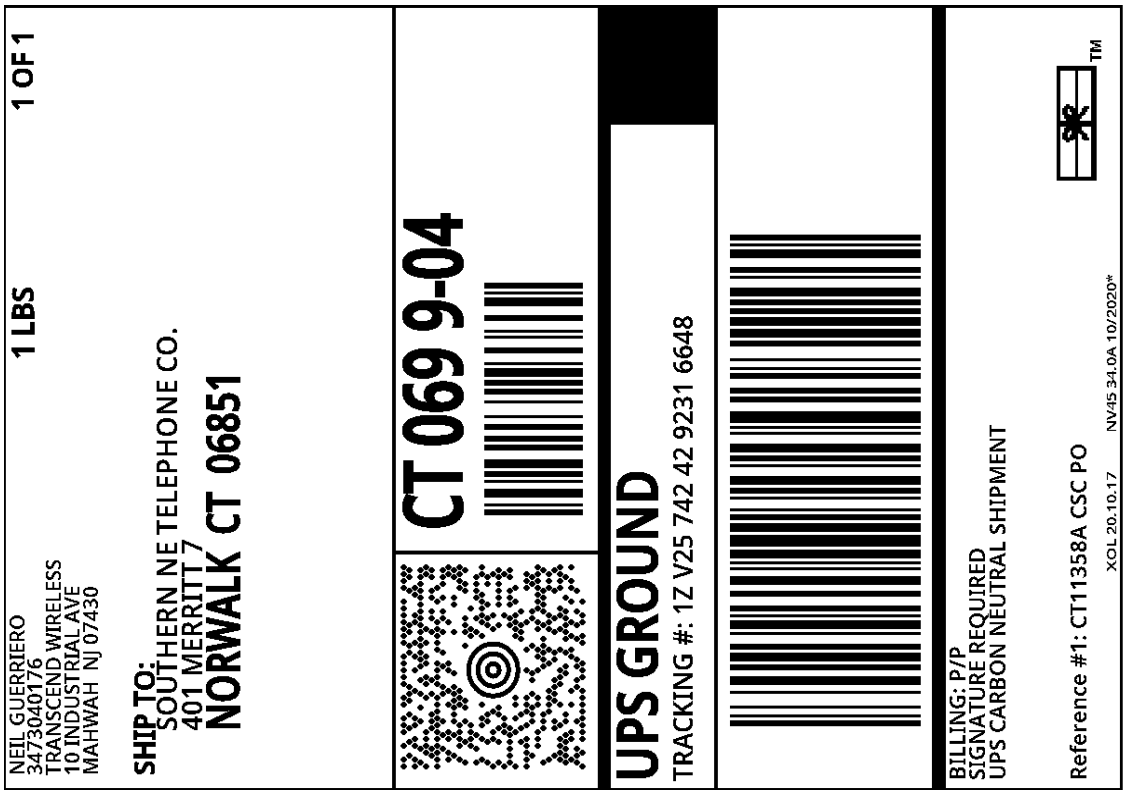

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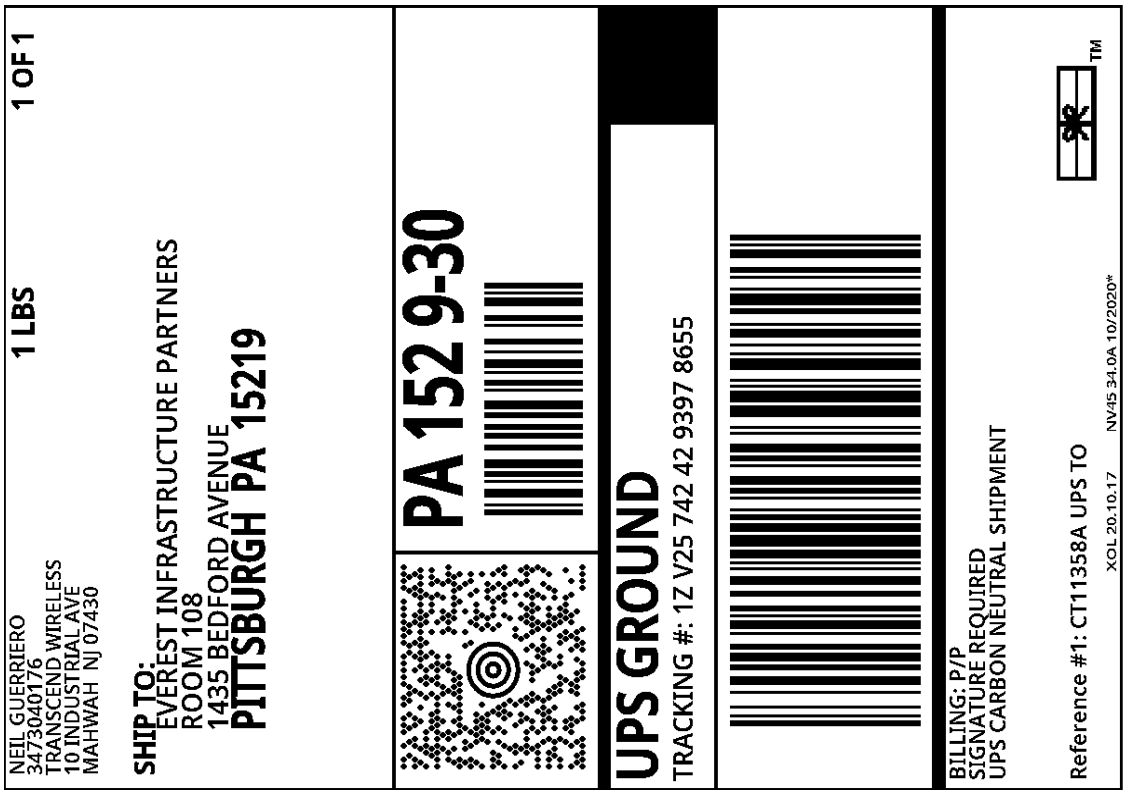


qPublic.net™ Town of Harwinton, CT

Summary

ParcelId	2678
Account Number	2619
Location Address	125 WILDCAT HILL RD
Map-Block-Lot	B5 /02 /0015
Use Class/Description	2-1 COMM LAND
Assessing Neighborhood	0001A
Census Tract	2984
Acreage	5.3
Utilities	

Owner

SOUTHERN N E TELEPHONE CO
401 MERRITT 7
NORWALK, CT 06851

Current Appraised Value

		2019	2018	2017
+	Building Value	$14,620	$14,620	$18,550
+	XF Value	$0	$0	$0
+	OB Value	$0	$0	$0
+	Land Value	$145,670	$145,670	$140,710
+	Special Land Value			
+	Total Appraised Value	$160,290	$160,290	$159,260
+	Net Appraised Value	$160,290	$160,290	$159,260
+	Current Assessment	$112,200	$112,200	$111,490

Assessment History

		2018	2017	2016	2015
+	Building Value	$10,230	$12,990	$12,990	$12,990
+	OB/Misc	$0	$0	$0	$0
+	Land	$101,970	$98,500	$98,500	$98,500
+	Total Assessment	$112,200	$111,490	$111,490	$111,490

Land

Use	Class	Zoning	Area	Value
2-1 COMM LAND	C	CR2	2 AC	$133,790
5-2 EX COMM	C		3.3 AC	$11,880

Commercial Building

Building #	1
Style	Warehouse
Actual Year Built	1988
Effective Year Built	1983
Gross Area	368
Stories	1
Grade	Average
Exterior Wall	Stucco/Masonry
Interior Wall	Drywall/Sheet
Wall Height	9
Units	1
Roof Cover	Rolled Compos
Roof Structure	Flat
Floor Type	Average
Heat Type	Solar Assisted
Heat Fuel	None
AC Type	NONE
Sprinkler	01
Construction	MASONRY
Plumbing	NONE
Comm Walls	0

Building Sub Areas

Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	368	368	368
	Totals	368	368	368

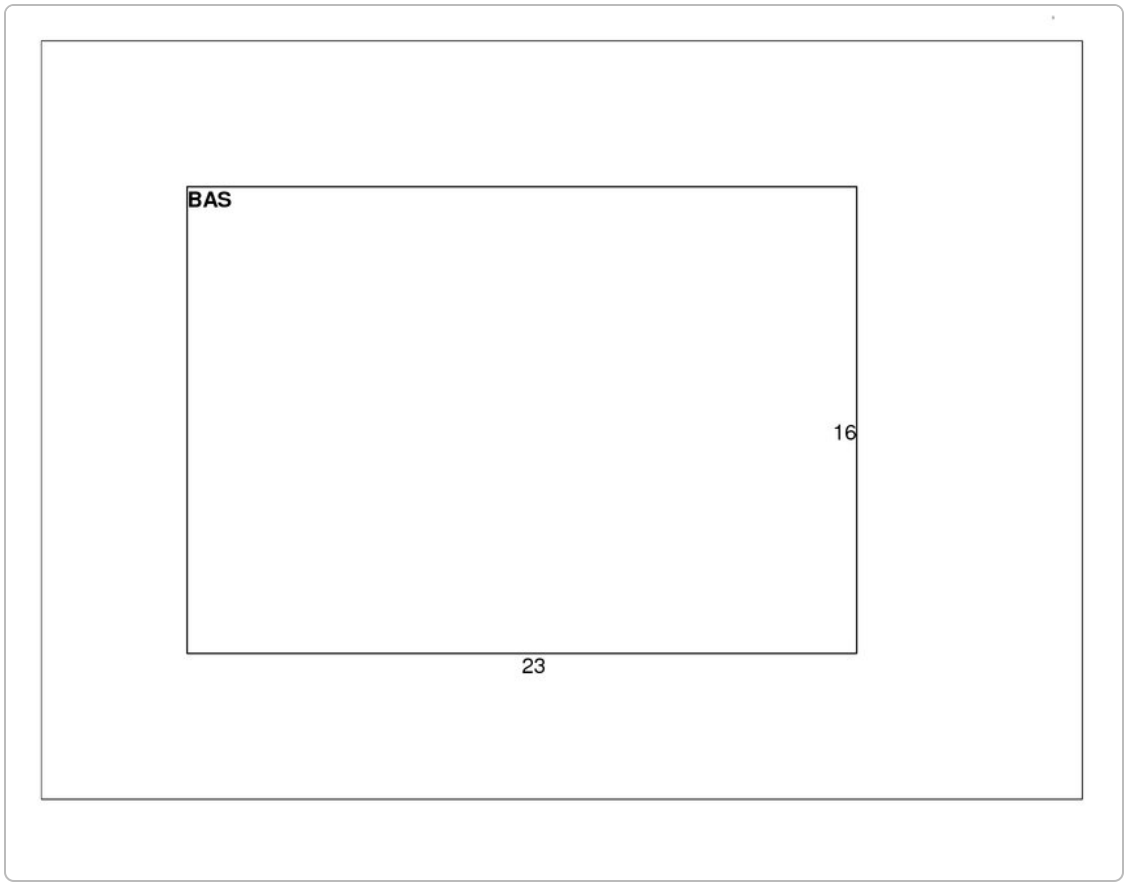
Sales History

Sales Date	Type of Document	Grantee	Vacant/Improved	Book/Page	Amount
		SOUTHERN N E TELEPHONE CO	Improved	0050/0546	$0

Permit Information

Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
CO	03-28-2018		CO ISSUED	$0		0		
	01-25-2018	EL	Electric	$1,200		100		
185E	01-25-2018		FUSE PANEL	$1,200		100		
174B	12-22-2016		3 ANTENNAS	$20,000		100		

Sketch



Photos

No data available for the following modules: Building Data, Out Buildings\Extra Features.

Developed by Schneider GEOSPATIAL

Last Data Upload: 10/19/2020, 8:15:23 PM

Version 2.3.91

March 24, 1982

Ms. Eva Thurman
Attorney
Southern New England
Telephone Company
227 Church Street
New Haven, Connecticut 06506

RE: Petition No. 79 - The Southern New England Telephone Company's 1982 microwave digital plan which consists of changes on the Bristol, Harwinton, Torrington microwave route.

Dear Ms. Thurman:

The Connecticut Siting Council at a meeting held on March 4, 1982 ruled that no Certificate of Environmental Compatibility and Public Need is required, pursuant to section 16-50k(a) of the General Statutes of Connecticut, for the proposed project regarding SNET's 1982 microwave plan which consist of (1) replacing one antenna with another at the Bristol Central Office in Bristol, (2) replacing three reflectors (periscopic antennae) with three antennae on the Harwinton microwave tower in Harwinton, and (3) replacing one antenna on roof at front of building and locating new antenna on roof at the rear of the building at the Torrington Central Office in Torrington.

This construction is to be exactly as specified in the above referenced Petition dated February 9, 1982. Please notify Council upon completion of construction.

This decision applies only to Petition No. 79 and is not applicable to any other tower facility, modification, or construction.

Yours very truly,

Gloria Dibble Pond
Chairperson

GDP:RVC:go

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

1 CENTRAL PARK PLAZA • NEW BRITAIN, CONN. 06051

PHONE: 827-2604

PETITION NO. 79
Field Review
February 23, 1982

Christopher S. Wood, Sarah M. Bates and Owen L. Clark met Jim Baily and Dick Tischel of Southern New England Telephone (SNET) to review the facilities involved with a petition for declaratory ruling filed by SNET. The petition asserts that the work involved will not have substantial adverse environmental effect, as described in 16-50 k(a), nor does it constitute new facilities or modifications to existing facilities, as defined in 16-50i.

The proposed project involves upgrading equipment on the Bristol, Harwinton, Torrington microwave route, and is similar to the project considered by the Council in Petition No. 67. The actual work, described in detail in the subject petition, essentially entails replacement of existing antenna with new, slightly larger, and more efficient equipment.

At the Bristol office, the existing antenna sits on the SNET office building roof, supported by a welded pipe frame structure. The new antenna dish will be 12 feet in diameter, compared to the 10 foot diameter existing dish. The support structure will be replaced by a new galvanized frame, equivalent in size.

The Bristol site is urban, surrounded by other buildings, both commerical and industrial, with houses and/or apartments in the vicinity.

At the Harwinton site, an existing 100 foot guyed tower now supports three periscopic antenna which reflect signals from antennas on the equipment building roof. These antennas will be removed along with the reflectors, and three new "drum" antennas will be mounted on the existing tower at approximately the same heights. The tower will not be altered, although it may need reinforcement.

The area around the Harwinton site is residential. The tower stands near the middle of a 400' x 500' lot which is surrounded by trees. Five houses have a view of the facility in winter, but likely would be completely screened in summer.

The Torrington site is very similar to that in Bristol, and the proposed work also would be done on the roof of the SNET building. Here an eight foot antenna dish would replace an existing five foot dish, but the facility would be relocated to the rear of the building and supported by a new steel structure. The overall height of the facility will increase perhaps seven feet. The development in the area is such that the facility's visability from off site will be minimal.

Other than the structure and antenna replacement discussed above, no additional construction or vegetation clearing at any of the sites will be required. The power density levels at all three sites, existing and with the new equipment, are listed in the petition. In all cases the levels at the antenna base fall as a result of the improved antenna technology. Levels at roof edge and the nearest building increase slightly at Bristol and Torrington because of more powerful radio equipment (5 watts instead of 1/2 watt).

At the Harwinton tower site all power levels would decline as a result of improved technology and reduction of scattered signals. The petition notes that all power levels are well below the strictest safety standards.

Christopher S. Wood
Executive Director

CSW:go

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

HARWINTON SNET_1
SITE ID: CT11358A
WILDCAT HILL ROAD
HARWINTON, CT 06791

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2018 CONNECTICUT FIRE SAFETY CODE, 2017 NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

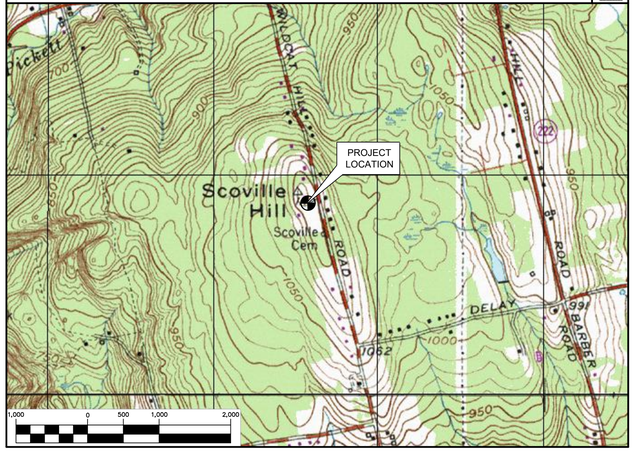
TO: WILDCAT HILL ROAD
HARWINTON, CT 06791

1.	TAKE DAY HILL RD TO CT-189 S	1.2 MI.
2.	HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD	0.6 MI.
3.	TURN LEFT ONTO DAY HILL RD	0.6 MI.
4.	CONTINUE ON CT-189 S. TAKE CT-185 W TO WILDCAT HILL RD IN HARWINTON	26.5 MI.
5.	TURN LEFT ONTO CT-189 S	2.5 MI.
6.	SLIGHT RIGHT ONTO BROWN ST	0.9 MI.
7.	TURN RIGHT ONTO CT-178 W	1.1 MI.
8.	TURN RIGHT ONTO CT-185 W	2.8 MI.
9.	TURN RIGHT ONTO HOPMEADOW ST	0.2 MI.
10.	TURN LEFT ONTO CANAL ST	0.2 MI.
11.	CONTINUE ONTO DEER PARK RD	1.3 MI.
12.	TURN LEFT ONTO CT-167 S/BUSHY HILL RD	0.8 MI.
13.	TURN RIGHT ONTO CANTON RD	0.1 MI.
14.	CONTINUE STRAIGHT ONTO WILDWOOD RD	0.8 MI.
15.	TURN LEFT ONTO NOTCH RD	0.3 MI.
16.	SLIGHT LEFT ONTO WASHBURN RD	1.0 MI.
17.	TURN LEFT ONTO LAWTON RD	0.3 MI.
18.	TURN RIGHT ONTO ALBANY TURNPIKE	0.4 MI.
19.	TURN LEFT ONTO DOWD AVE	0.9 MI.
20.	CONTINUE ONTO MAPLE AVE	0.8 MI.
21.	CONTINUE ONTO BRIDGE ST	0.4 MI.
22.	TURN LEFT ONTO CT-179 S/BURLINGTON AVE CONTINUE TO FOLLOW CT-179 S	2.0 MI.
23.	TURN RIGHT ONTO CT-4	8.1 MI.
24.	CONTINUE ONTO LITCHFIELD RD	1.6 MI.
25.	TURN LEFT ONTO WILDCAT HILL RD	

VICINITY MAP

SCALE: 1" = 1000'

NORTH



T-MOBILE RF CONFIGURATION

67D04G_1DP+1OP

PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
   - A. REMOVE THREE (3) EXISTING ANTENNAS, ONE (1) PER SECTOR
   - B. INSTALL THREE (3) NEW OCT-PORT ANTENNAS, ONE (1) PER SECTOR
   - C. INSTALL THREE (3) NEW RADIO REMOTE UNITS, ONE (1) PER SECTOR
   - D. INSTALL THREE (3) SECTOR FRAME STIFF ARM KITS
   - E. UPGRADE EXISTING 100 AMP TO 200 AMP MAIN
   - F. INSTALL (1) 6x12 HYBRID

PROJECT SUMMARY (STRUCTURAL)

INSTALL ALL TOWER MODIFICATIONS PER THE TOWER STRUCTURAL ANALYSIS REPORT AND MOD DRAWINGS PREPARED BY MALOUF ENGINEERING INTL., INC. DATED 08/19/19.

PROJECT INFORMATION

SITE NAME:	HARWINTON SNET_1
SITE ID:	CT11358A
SITE ADDRESS:	WILDCAT HILL ROAD HARWINTON, CT 06791
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	DAN REID (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (203) 592-8291
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-45'-24.9" N LONGITUDE: 73°-05'-42.67" W GROUND ELEVATION: 1000'± AMSL COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
N-1	DESIGN BASIS AND SITE NOTES	1
C-1	SITE LOCATION PLAN	1
C-2	COMPOUND PLAN AND TOWER ELEVATION	1
C-3	ANTENNA CONFIG. & ELEVATION	1
E-1	TYPICAL ELECTRICAL DETAILS	1
E-2	DETAILS	1

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	05/13/19	KAW/JR	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
1	10/16/20	RTS	TJR	CONSTRUCTION DRAWINGS - REVISED STRUCTURAL ANALYSIS

PROFESSIONAL ENGINEER SEAL

T-Mobile
Transcend Wireless

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
HARWINTON SNET_1
SITE ID: CT11358A
WILDCAT HILL ROAD
HARWINTON, CT 06791

DATE: 04/11/19
SCALE: AS NOTED
JOB NO. 19027.13

TITLE SHEET

T-1

Sheet No. 1 of 7

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:

- WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 90-100 MPH (3 SECOND GUST)
- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 93 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10) PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	05/13/19	KAW/JR	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
	10/16/20	RTS	TJR	CONSTRUCTION DRAWINGS - REVISED STRUCTURAL ANALYSIS

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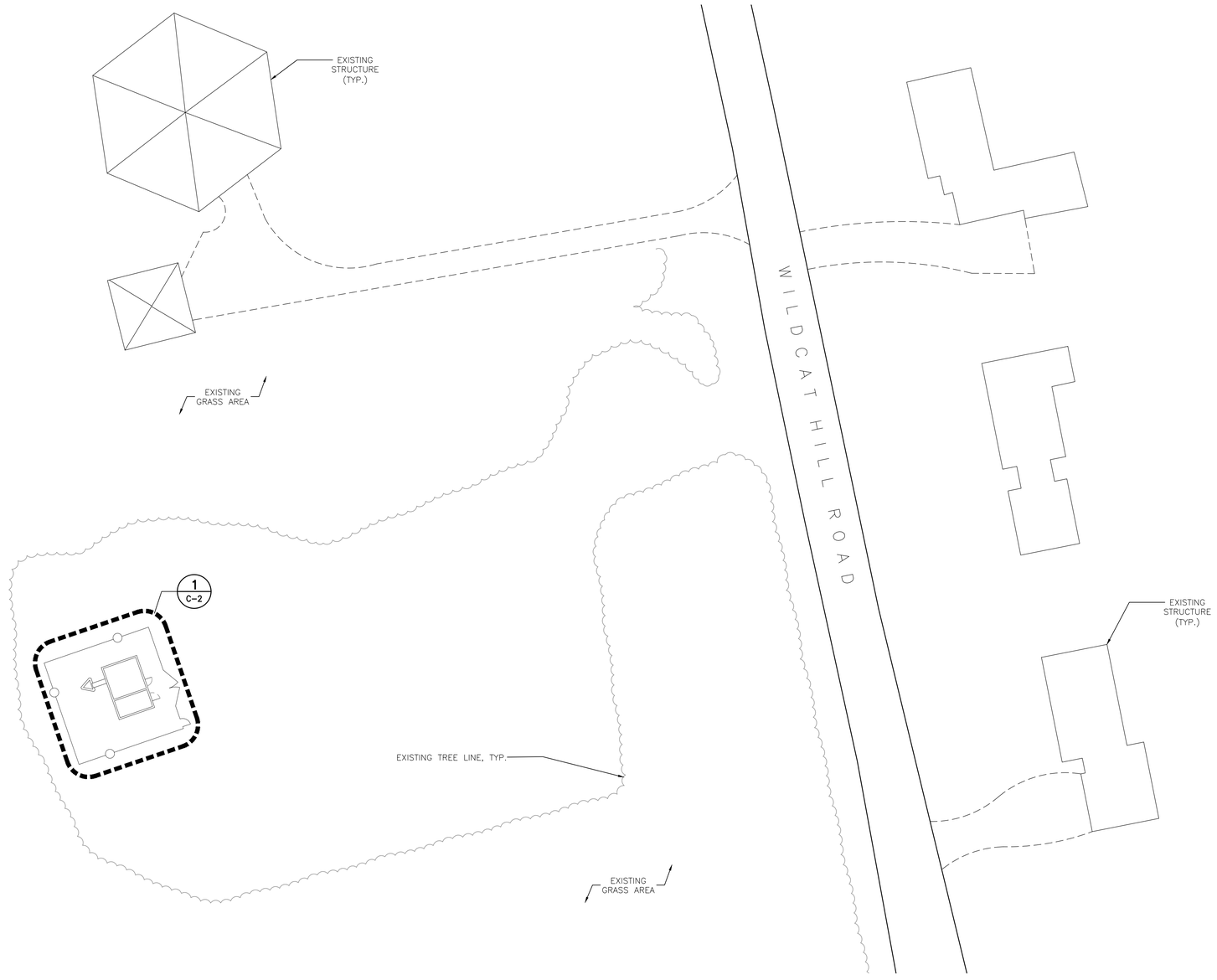
DESIGN BASIS AND SITE NOTES

N-1



1 / C-1 **SITE LOCATION PLAN**
SCALE: 1" = 40'

TRUE NORTH

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

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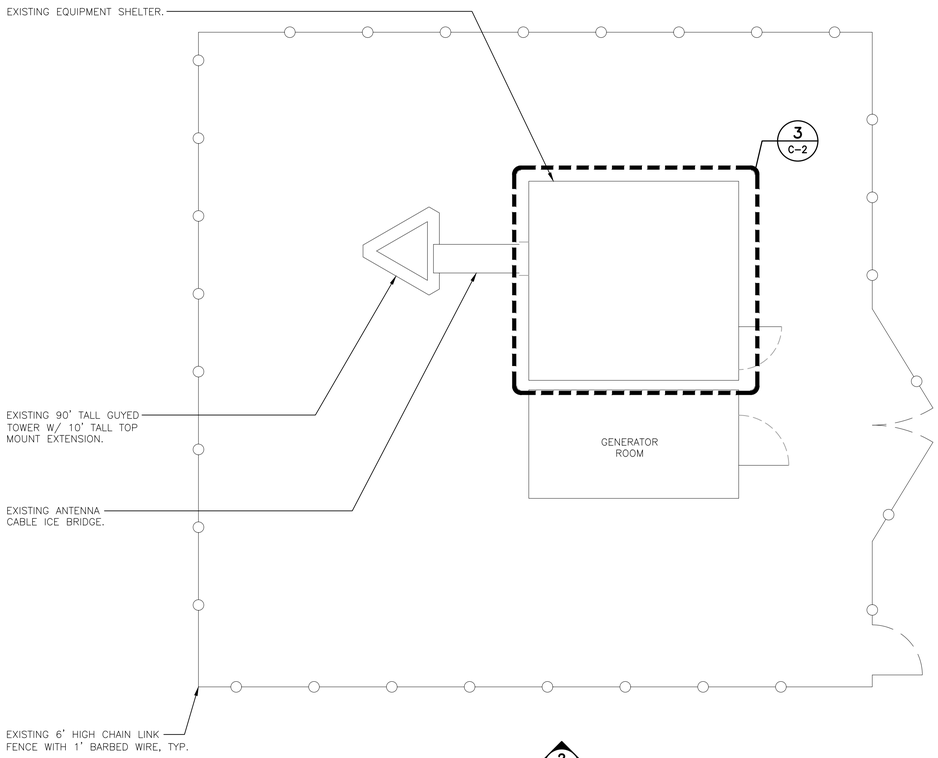
SITE LOCATION PLAN

C-1

Sheet No. 3 of 7



1 C-2 COMPOUND PLAN

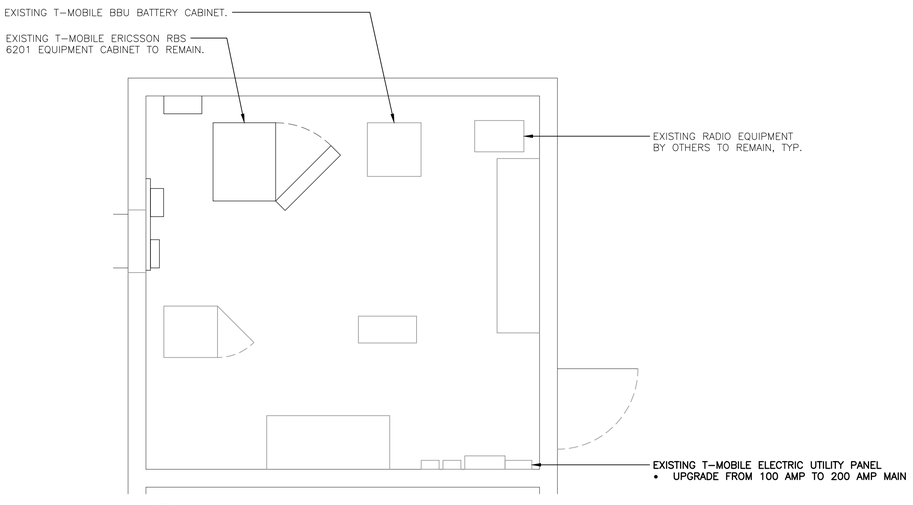
SCALE: 1' = 5'

TRUE NORTH

GRAPHIC SCALE

5 0 2.5 5 10 20

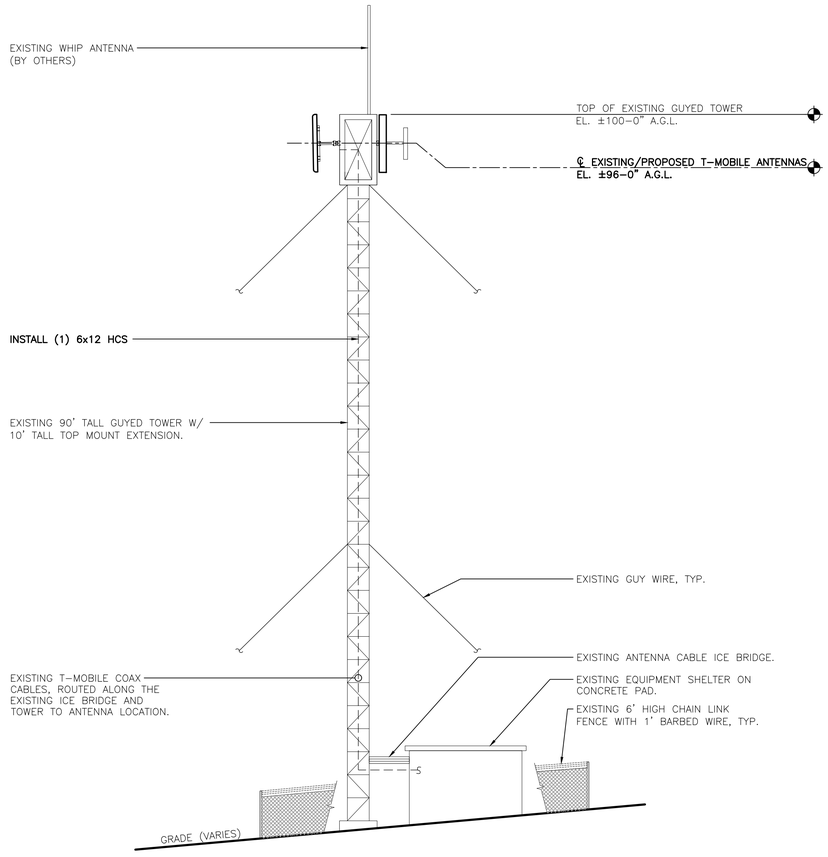
(IN FEET)
1 inch = 5 ft.



3 C-2 EQUIPMENT PLAN - PROPOSED

SCALE: 3/8" = 1'

TRUE NORTH



2 C-2 SOUTHEAST ELEVATION - PROPOSED

SCALE: 1" = 15'

GRAPHIC SCALE

15 0 7.5 15 30 60

(IN FEET)
1 inch = 15 ft.

STRUCTURAL COMPLIANCE

ANTENNA MOUNTS

A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY DEFICIENT AND WARRANTING MODIFICATION PRIOR TO INSTALLATION OF THE PROPOSED EQUIPMENT. FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) C-3 FOR ADDITIONAL DETAILS.

REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 19027.13) DATED 04/25/19 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY DEFICIENT AND WARRANTING MODIFICATION PRIOR TO INSTALLATION OF THE PROPOSED EQUIPMENT.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY MALOUF ENGINEERING INTL., INC. (PROJECT # CT05213G-19V1) DATED 08/19/19 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.

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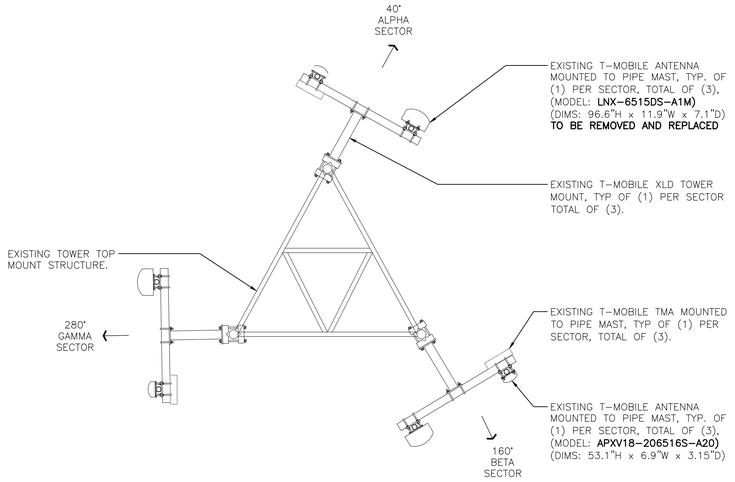
COMPOUND PLAN & TOWER ELEVATION

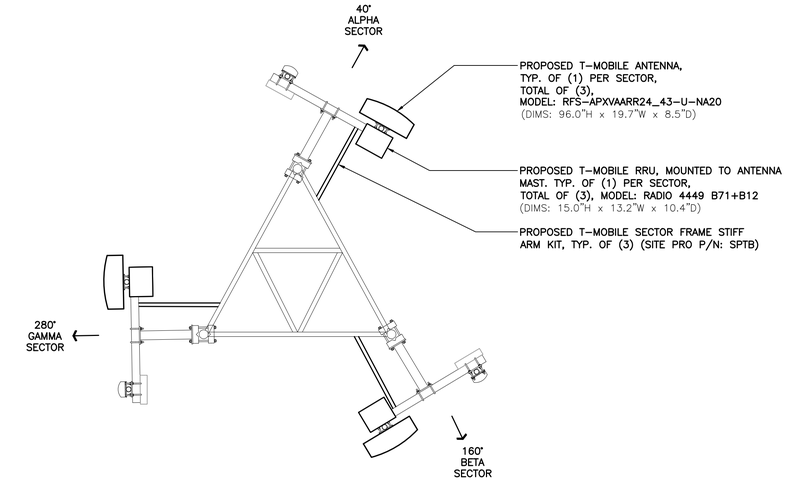
C-2

Sheet No. 4 of 7

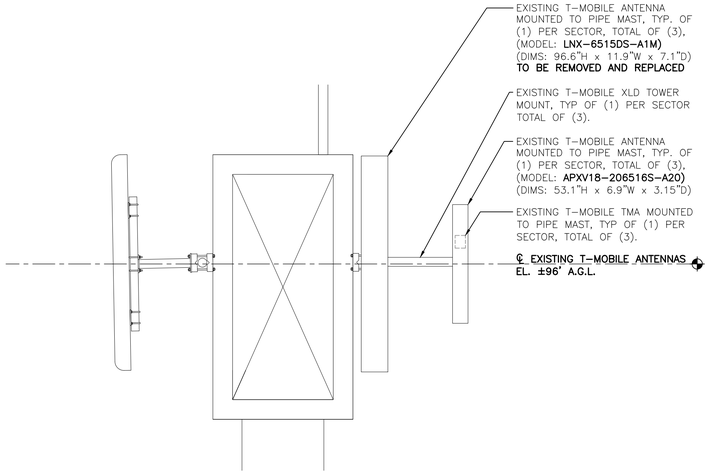
T-MOBILE RAN TEMPLATE:
67D04C
T-MOBILE RF CONFIGURATION:
67D04C_1DP+1OP



1 / C-3 **EXISTING ANTENNA MOUNTING CONFIGURATION**
SCALE: 3/8" = 1' **96' ELEVATION** NORTH

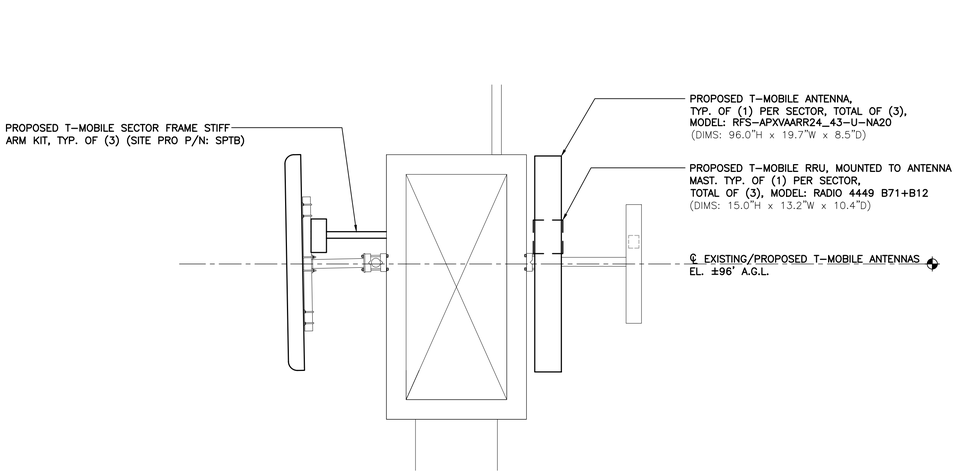


2 / C-3 **PROPOSED ANTENNA MOUNTING CONFIGURATION**
SCALE: 3/8" = 1' **96' ELEVATION** NORTH



TYPICAL SECTOR

3 / C-3 **ANTENNA ELEVATION - EXISTING**
SCALE: 3/8" = 1'



TYPICAL SECTOR

4 / C-3 **ANTENNA ELEVATION - PROPOSED**
SCALE: 3/8" = 1'

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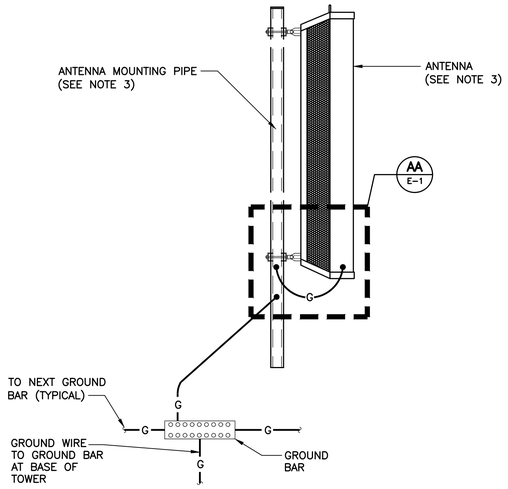
ANTENNA CONFIG. & ELEVATION

C-3

Sheet No. 5 of 7

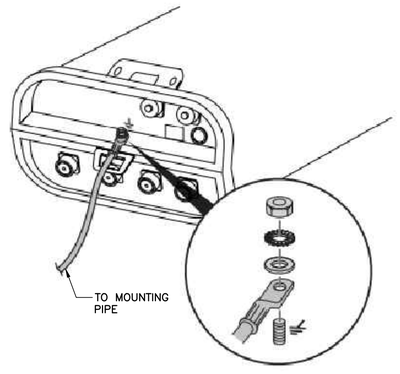


NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

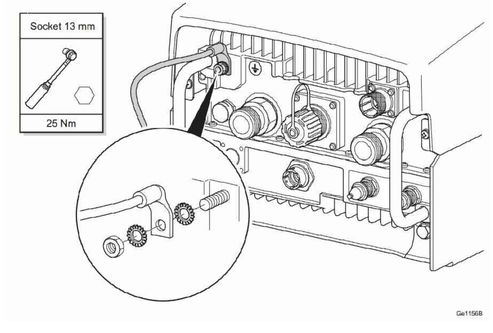
1 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NONE



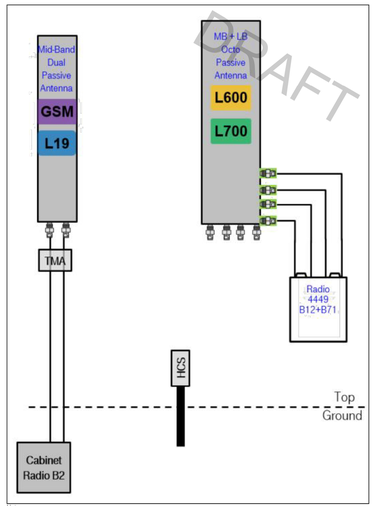
AA E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NONE



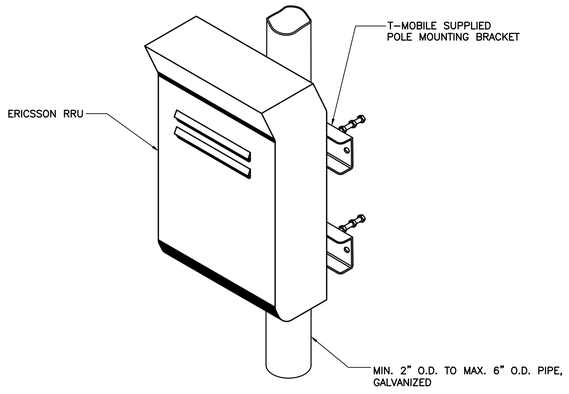
2 E-1 TYPICAL RRU GROUNDING DETAIL

NOT TO SCALE



3 E-1 PROPOSED PLUMBING DIAGRAM

SCALE: NONE



ISOMETRIC VIEW

NOTES:

1. T-MOBILE SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

4 E-1 TYPICAL RRUS MOUNTING DETAILS

SCALE: NOT TO SCALE

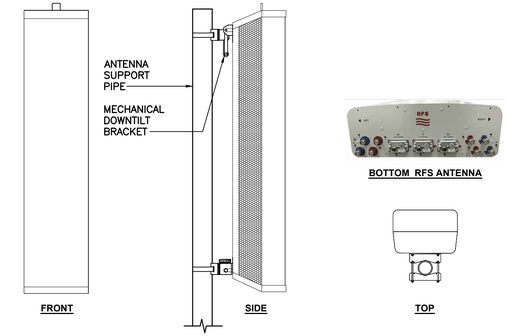
ISOMETRIC VIEW

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4449 B71B12	14.9"L x 13.2"W x 10.4"D	74 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 E-1 PROPOSED RRU DETAIL

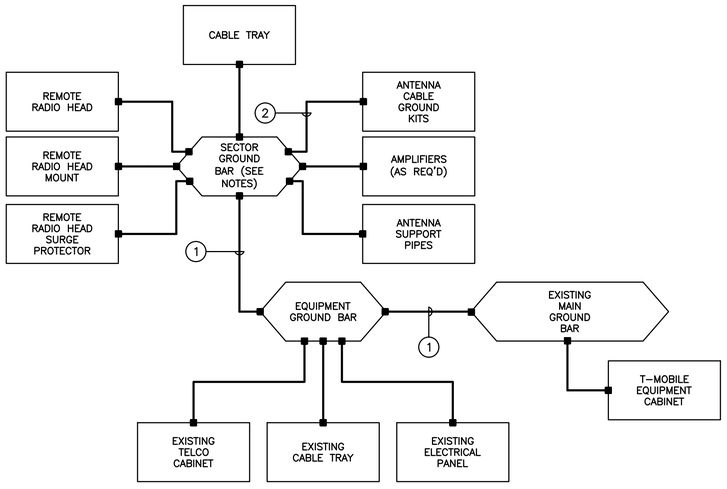
SCALE: NONE



ALPHA/BETA/GAMMA ANTENNA			
EQUIPMENT		DIMENSIONS	WEIGHT
MAKE: MODEL:	RFS APXVAARR24_43-U-NA20	95.9"L x 24.0"W x 8.7"D	153 LBS.

6 E-1 PROPOSED ANTENNA DETAIL

SCALE: NONE



GROUNDING SCHEMATIC NOTES

(1) #2 AWG

(2) #6 AWG

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
4. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
5. COORDINATE ALL ROOF MOUNTED EQUIPMENT WITH OWNER.
6. ALL ROOF MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
7. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

7 E-1 TYPICAL GROUNDING SCHEMATIC DETAIL

SCALE: NOT TO SCALE

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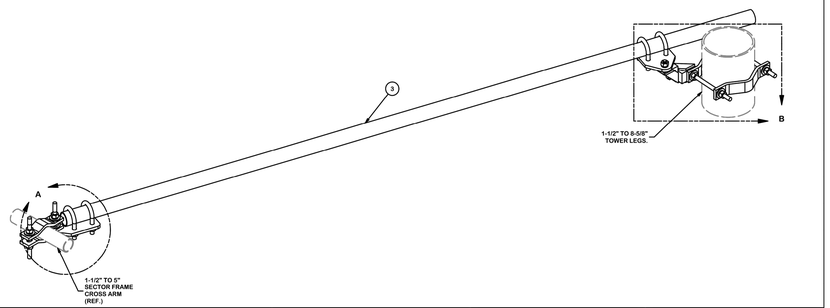
DETAILS

E-1

Sheet No. 6 of 7

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-SPTB	SLIDING PIPE TIE BACK PLATE	5 1/2 in	5.87	11.74
2	2	X-TBCA	TIE BACK CLIP ANGLE		2.08	4.16
3	1	P2126	2-3/8" OD X 126" SCH 40 GALVANIZED PIPE	126 in	40.75	40.75
4	2	MCP	CLAMP HALF 1/2" THICK, 11-5/8" LONG	12 1/16 in	3.59	7.19
5	4	DCP	1/2" THICK, 5-3/4" CNTER TO CENTER CLAMP HALF	8 1/8 in	2.42	9.68
6	2	G58R-12	5/8" x 12" THREADED ROD (HDG.)		1.05	2.09
7	4	G58R-8	5/8" x 8" THREADED ROD (HDG.)		0.70	2.79
8	4	X-UB5258	5/8" X 2-5/8" X 4-1/2" X 2" U-BOLT (HDG.)		1.00	4.00
9	4	G5804	5/8" x 4" HDG HEX BOLT GR5		0.44	1.78
10	2	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	0.54
11	10	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	0.70
12	18	G58LW	5/8" HDG LOCKWASHER		0.03	0.47
13	20	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	2.60
					TOTAL WT. #	88.49



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: SLIDING PIPE TIE BACK ASSEMBLY

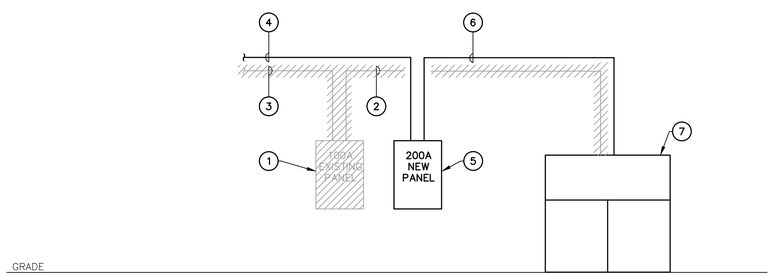
SITE PRO 1 — A valmont COMM — Engineering Support Team: 1-888-753-7446 — Locations: Rochester, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	SHEET
	CEK 10/19/2016		SPTB	5 OF 5
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 11/17/2016	SPTB

1 / E-2 **SITE PRO DETAIL**
SCALE: NONE

RISER DIAGRAM NOTES

1. EXISTING T-MOBILE 100A DISTRIBUTION PANEL TO BE REMOVED AND REPLACED.
2. CONDUITS AND CONDUCTORS SERVING EXISTING RADIO EQUIPMENT CABINETS TO BE REMOVED.
3. CONDUITS AND CONDUCTORS FEEDING EXISTING 100A PANEL TO BE REMOVED.
4. (3) #3/0 AWG, (1) #6 AWG GROUND, 2 1/2" CONDUIT CONNECTED TO SOURCE PREVIOUSLY FEEDING REMOVED 100A PANEL. MAXIMUM CIRCUIT LENGTH OF 200FT. VERIFY LOCATION IN FIELD. COORDINATE ANY REQUIRED UPGRADES WITH BUILDING OWNER AND LOCAL UTILITY COMPANY.
5. NEW 200A, 240V, SINGLE PHASE, 30 POSITION, NEMA 3R PANEL WITH COPPER BUS, BOLT ON CIRCUIT BREAKERS AND 200A/2P MAIN CIRCUIT BREAKER.
6. (3) #1/0 AWG, (1) #6 AWG GROUND, 2" CONDUIT CONNECTED TO NEW 125A/2P CIRCUIT BREAKER AND ROUTED TO EXISTING T-MOBILE RADIO CABINET.
7. EXISTING T-MOBILE RADIO CABINET TO REMAIN.



2 / E-2 **ELECTRICAL POWER RISER DIAGRAM**
NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	05/13/19	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
	10/16/20	RTS	TJR	CONSTRUCTION DRAWINGS – REVISED STRUCTURAL ANALYSIS

PROFESSIONAL ENGINEER SEAL

T-Mobile — Transcend Wireless

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
HARWINTON SNET_1
SITE ID: CT11358A
WILDCAT HILL ROAD
HARWINTON, CT 06791

DATE:	04/11/19
SCALE:	AS NOTED
JOB NO.	19027.13

DETAILS

E-2

Sheet No. 7 of 7

Post-Mod Rigorous Structural Analysis Report

T-Mobile - Harwinton SNET_1 Site #CT11358A

Owner: Everest Infrastructure - Wildcat Hill Site #701775

Harwinton, Connecticut

August 19, 2019

MEI PROJECT ID: CT05213G-19V1

MALOUF ENGINEERING INTL., INC.
STRUCTURAL CONSULTANTS

17950 PRESTON ROAD, SUITE 720 ▪ DALLAS, TEXAS 75252 ▪ TEL. 972 -783-2578 FAX 972-783-2583
www.maloufengineering.com

MALOUF ENGINEERING INTL., INC.

STRUCTURAL CONSULTANTS

August 19, 2019

Mr. Dan Reid
Transcend Wireless
Mahwah, NJ 04730

POST-MOD RIGOROUS STRUCTURAL ANALYSIS

Structure/Make/Model:	100 ft **Guyed Tower**		Trylon Manufacturing Co. / T MT-3604-100	
Client/Site Name/#:	**Transcend Wireless | T-Mobile**		**Harwinton SNET_1 #CT11358A**	
Owner/Site Name/#:	Everest Infrastructure		Wildcat Hill #701775	
MEI Project ID:	**CT05213G-19V0**			
Location:	Wildcat Hill Rd. Harwinton, Connecticut 06791		Litchfield County FCC #N/A	
	LAT	41-45-24.48 N	LON	73-05-42.72 W

EXECUTIVE SUMMARY:

Malouf Engineering Int'l (MEI), as requested, has performed a rigorous structural analysis of the above-mentioned structure to assess the impact of the changed condition as noted in Table 1.

Based on the stress analysis performed, the existing structure **is in conformance** with the Int'l Building Code (IBC) / ANSI/TIA-**222-G** Standard for the loading considered under the criteria listed and referenced in the report sections **after proper installation of the recommended structural strengthening modifications outlined** – tower rated at 84.9% - Horizontals.

The addition of the proposed changed condition as noted in Table 1 is structurally acceptable after proper installation of the proposed strengthening modifications. Please refer to modification drawings for details.

MEI appreciates the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or other projects, please contact us.

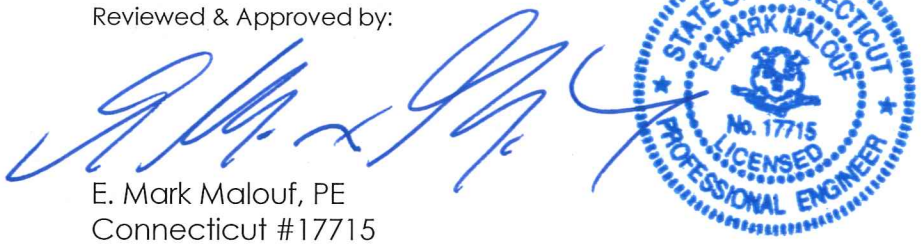
Respectfully submitted,

MALOUF ENGINEERING INT'L, INC.

Analysis performed by:

Krishna Manda, PE
Sr. Project Engineer

Reviewed & Approved by:



E. Mark Malouf, PE
Connecticut #17715
972-783-2578 ext. 106
mmalouf@maloufengineering.com

8/19/2019

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Separate Attachment:

Modification Design Drawings

1. INTRODUCTION & SCOPE

A rigorous structural analysis and modification design were performed by Malouf Engineering Int'l (MEI), as requested and authorized by Mr. Kyle Richers, Transcend Wireless, on behalf of T-Mobile, to determine the acceptance of the proposed changed conditions in conformance with the IBC / ANSI/TIA-222-G Standard, "*Structural Standard for Antenna Supporting Structures and Antennas*".

The scope of this independent analysis is to determine the overall stability and the adequacy of structural members, foundations, and member connections, as available and stated. This analysis considers the structure to have been properly installed and maintained with no structural defects. Installation procedures and related loading are not within the scope of this analysis and should be performed and evaluated by a competent person of the erection contractor.

The different report sections detail the applicable information used in this evaluation, relating to the tower data, the appurtenances configuration and the wind and ice loading considered.

2. SOURCE OF DATA

The following information has been used in this evaluation as source data that accurately represent the existing structure and the related appurtenances:

	Source	Information	Reference
STRUCTURE			
Tower	MEI Records	Previous Structural Analysis	ID CT05213G-17V0 Dated 07/19/2017
Foundation	MEI Records	Previous Structural Analysis	ID CT05213G-17V0 Dated 07/19/2017
Material Grade	Not available from supplied documents-Assumed based on typical towers of this type-refer to Appendix		
CURRENT APPURTENANCES			
	MEI Records	Previous Structural Analysis	ID CT05213G-17V0 Dated 07/19/2017
CHANGED CONDITION			
	Transcend Wireless Mr. Kyle Richers	T-Mobile Mount Analysis [Centek]	Project #19027.13 Dated 04/25/2019
		T-Mobile Colo Application	Dated 05/01/2019
		T-Mobile PDQ	Dated 04/25/2019

Background Information:

Based on available information, the following is known regarding this structure:

DESIGNER / FABRICATOR	Trylon Manufacturing Co. / T MT-3604-100
ORIGINAL DESIGN CRITERIA	TIA/EIA 222-Unknown
PRIOR STRUCTURAL MODIFICATIONS	Not Known

3. ANALYSIS CRITERIA

The structural analysis performed used the following criteria:

CODE / STANDARD	2018 CT Building Code / 2015 Int'l Building Code / ANSI/TIA-222-G-4 Standard	
LOADING CASES	*Full Wind*:	117 Mph ultimate gust [equiv. 91 Mph (3-sec gust)] w/No Radial Ice**
	Iced Case:	50 Mph + 0.75" Radial Ice
	Service:	60 Mph
	Seismic:	S_s = 0.183 / S_1 = 0.065 / Site Class: D – Stiff Soil
STRUCTURE CRITERIA	*Risk Category (Structural Class)*: Class II	
	Exposure Category: 'B' – *Topographic Category:* 1	

Appurtenances Configuration

The following appurtenances configuration is denoted by the *summation of Tables 1 & 2*:

Table 1: Tenant with Changed Condition Appurtenances Configuration

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size & Location
96	T-Mobile	3	APXVAARR24_43-U-NA20 Panel Ants.	[Existing Mounts]	1	1-3/8" (HCS 6x12) Hybrid Cable – (FZ)
		3	RADIO 4449 - B71/B12 Boxes			
Appurtenances to Remain						
96	T-Mobile	3	APXV18-206516S-A20 Panel Ants.	(3) Dual Stand-off Mounts w/ New Reinforcement	6	1 1/4" – (FZ)
		3	KRY 112 489/2 TMA Boxes			
Appurtenances to be Removed						
96	T-Mobile	3	LNX-6515DS-A1M Panel Antennas		6	1 5/8" – (FZ)

Table 2: Remaining Tenants Current and Reserved/Future Appurtenances

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size & Location
104.583		1	20ft Whip Antenna	1.33 ft Standoff w/ 10ft Pipe Mount	1	0.40" Black Cable – (FZ)
100.25		1	10ft Whip Antenna	2.5 ft Pipe Mount	1	1-5/8" – (FZ)
76.5				2ftx6ft Empty Face Mount		

Notes:

1. **As per 2015 IBC for ultimate 3-sec gust wind speed converted to nominal 3-sec gust wind speed as per Sect. 1609.3.1 as required to be used in ANSI/TIA-222-G Standard per exception 5 of Sect. 1609.1.1.
2. All elevations are measured from tower base.
3. Please note appurtenances not listed above are to be removed/not present as per data supplied.
4. (I) = Internal; (E) = External; (FZ) = Within Face Zone; (OFZ) = Outside Face Zone - as per TIA-222-G.
5. The above appurtenances represent MEI's understanding of the appurtenances configuration. If different than above, the analysis is invalid. Please contact MEI if any discrepancies are found.

4. ANALYSIS PROCEDURE

The subject structure is analyzed for feasibility of the installation of the proposed changed condition previously noted. The data records furnished were reviewed and a computer stress analysis was performed in accordance with the TIA-222 Standard provisions and with the agreed scope of work terms and the results of this analysis are reported.

Analysis Program

The computer program used to model the structure is a rigorous Finite Element Analysis program, tnxTower (ver. 8.05), a commercially available program by Tower Numerics Inc. The latticed structures members are modeled using beam/truss and cable members and the pole members using tubular beam elements. The structural parameters and geometry of the members are included in the model. The dead and temperature loads and the wind loads are internally calculated by the program for the different wind directions and then applied as external loads on the structure. Any applicable exemptions, as per Section 15.6 of the TIA-222-G Standard for existing structures originally designed in accordance with a previous revision of the TIA-222 Standard, have been taken.

Assumptions

This engineering study is based on the theoretical capacity of the members and is not a condition assessment of the structure. This analysis is based on information supplied, and therefore, its results are based on and as accurate as that supplied data. MEI has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural stress analysis:

- This existing tower is assumed, for the purpose of this analysis, to have been properly maintained and to be in good condition with no structural defects and with no deterioration to its member capacities ('as-new' condition).
- The tower member sizes and configuration are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated.
- The appurtenances configuration is as supplied and/or as stated in the report. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
- Some assumptions are made regarding antennas and mounts sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type & industry practice.
- Mounts/Platforms are considered adequate to support the loading. No actual analysis of the platform/mount itself is performed, with the analysis being limited to analyzing the structure.
- The soil parameters are as per data supplied or as assumed and stated in the calculations. Refer to the Appendix. If no data is available, the foundation system is assumed to support the structure with its new reactions.
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
- All guy cable assemblies, as applicable, are assumed to develop the rated breaking strength of the wire.
- All prior structural modifications, if any, are assumed to be as per data supplied/available, and to have been properly installed and to be fully effective.

If any of the above assumptions are not valid or have been made in error, this analysis results may be invalided, MEI should be contacted to review any contradictory information to determine its effect.

5. ANALYSIS RESULTS

The results of the structural stress analysis based on data available and with the previous listed criteria, indicated the following:

Note: The Wind loading controls over the Seismic loading as per TIA Section 2.7.

STRUCTURAL STRENGTHENING REQUIRED	
1	Reinforce existing Diagonal members by bolting a new angle forming back to back angles from Elev. 90 to 100ft ± (1 Bay total).
2	Reinforce existing Mid Horizontal members by bolting a new angle forming back to back angles from Elev. 95ft ± (1 Level total).
3	Reinforce existing Kicker angle members by bolting a new angle forming back to back angles from Elev. 86.7 to 90ft ± (1 Level total).
4	Locate coaxes as shown. Refer to Tx-Line Layout for details.
5	*Provide temporary bracing as required for stability of structure during reinforcement of members / replacement of bolts, as required. Replace one member / bolt at a time. All safety measures and precautions shall be taken as required by code.*
6	**Perform all Maintenance work as required & applicable to bring the structure into good operational condition.**
7	*Field determination/verification before any fabrication and installation is recommended.*

Prior to implementation of the changed conditions and modifications, the data designated on the design documents requiring field verification shall be validated. Rigging and temporary supports required for the erection/modification shall be determined, documented, furnished and installed by the erector/contractor accounting for the loads imposed on the structure due to the proposed construction method.

Table 3: Stress Analysis Results – AFTER PROPER INSTALLATION OF MODS

Component Type	Maximum Stress Ratio	Controlling Elev. (ft) / Component	Pass/Fail	Comment
GUY WIRES	41.9%	40	**Pass**	
LEGS	44.0%	20 - 16.6667	**Pass**	
DIAGONALS	54.3%	40 - 36.6667	**Pass**	
HORIZONTALS	**84.9%**	**40 - 36.6667**	**Pass**	Bolts Control
TORQUE ARM	45.2%	90 - 86.6667	**Pass**	Bolts Control
BASE FOUNDATION	29.7%	Download	**Pass**	
GUY ANCHORS	65.2%	Shear	**Pass**	

(Results Continued on Next Page)

Table 4: Serviceability Requirements – AFTER PROPER INSTALLATION OF MODS

	Maximum Value	TIA Requirement (10dB)	Pass/Fail	Comment
TWIST/SWAY	0.0595 Deg.	4 Deg. from Vert. or Horiz. Axis	**Pass**	
HORIZONTAL DISPLACEMENT	0.783 In./ 0.06% of Ht.	3.0% of Height	**Pass**	

Notes:
1. The Maximum Stress Ratio is the percentage that the maximum load in the member is relative to the allowable load as determined by Code requirements.
2. Refer to the Appendix 1 for more details on the member loads.
3. A maximum stress ratio between 100% and 105% may be considered as *Acceptable* according to industry standard practice.

6. FINDINGS & RECOMMENDATIONS

- Based on the rigorous stress analysis results, the subject structure is **rated at 84.9%** of its support capacity (controlling component: Horizontals) with the proposed changed condition considered after strengthening. Please refer to Table 3 and to Appendix 1 for more details of the analysis results.
- Based on the stress analysis performed, the existing structure **is in conformance** with the IBC / ANSI/TIA **222-G** Standard for the loading considered under the criteria listed and referenced in the report sections **after proper installation of the recommended structural strengthening modifications outlined**.
- ***The addition of the proposed changed condition as noted in Table 1 is structurally acceptable after proper installation of the proposed strengthening modifications.*** Please refer to modification drawings for details.
- This structure has limited additional support capacity for the appurtenances and loading criteria considered, after its modification. Therefore, no changes to the configuration considered should be made without performing a new proper evaluation.

Rigging and temporary supports required for the erection/modification shall be determined, documented, furnished and installed by the erector/contractor accounting for the loads imposed on the structure due to the proposed construction method.

7. REPORT DISCLAIMER

The engineering services rendered by **M**alouf **E**ngineering **I**nternational*,* Inc. *('MEI') in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size and capacity of its members. MEI does not analyze the fabrication, including welding and connection capacities, except as included in this Report.*

The analysis performed, and the conclusions contained herein are based on the assumption that the tower has been properly installed and maintained, including, but not limited to the following:

1. Proper alignment and plumbness.
2. Correct guy tensions, as applicable.
3. Correct bolt tightness or slip jacking of sleeved connections.
4. No significant deterioration or damage to any structural component.

Furthermore, the information and conclusions contained in this Report were determined by application of the current "state-of-the-art" engineering and analysis procedures and formulae. MALOUF ENGINEERING INTERNATIONAL, INC. assumes no obligation to revise any of the information or conclusions contained in this Report in the event that such engineering and analysis procedures and formulae are hereafter modified or revised. In addition, under no circumstances will MALOUF ENGINEERING INTERNATIONAL, INC. have any obligation or responsibility whatsoever for or on account of consequential or incidental damages sustained by any person, firm or organization as a result of any information or conclusions contained in the Report, and the maximum liability of MALOUF ENGINEERING INTERNATIONAL, INC., if any, pursuant to this Report shall be limited to the total funds actually received by MALOUF ENGINEERING INTERNATIONAL, INC. for preparation of this Report.

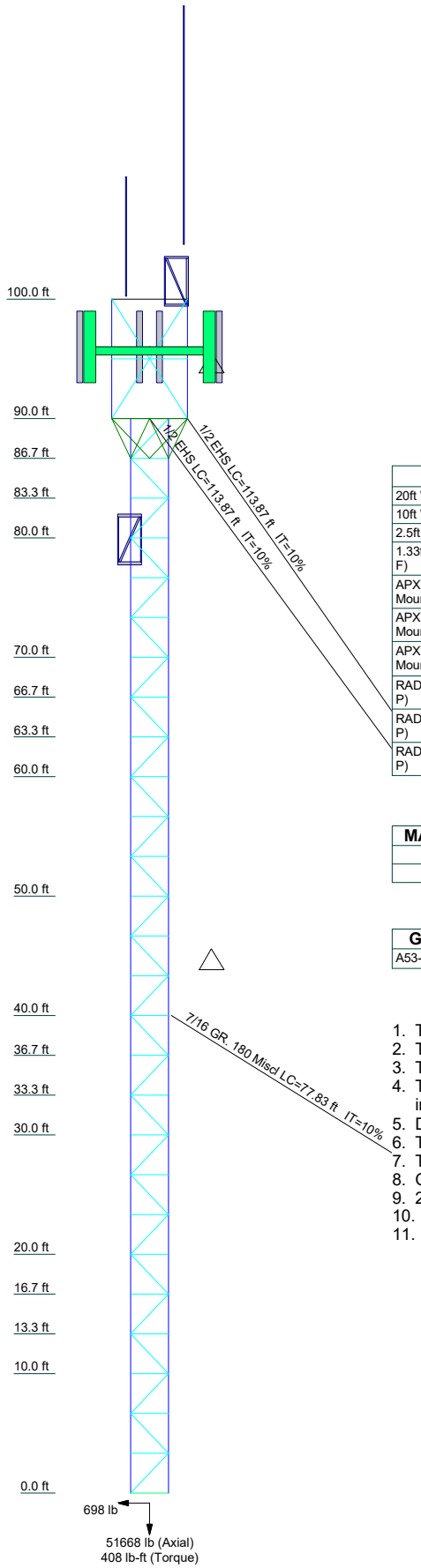
Customer has requested MALOUF ENGINEERING INTERNATIONAL, INC. to prepare and submit to Customer an engineering analysis with respect to the Subject Tower and has further requested MALOUF ENGINEERING INTERNATIONAL, INC. to make appropriate recommendations regarding suggested structural modifications and changes to the Subject Tower. In making such request of MALOUF ENGINEERING INTERNATIONAL, INC., Customer has informed MALOUF ENGINEERING INTERNATIONAL, INC. that Customer will make a determination as to whether or not to implement any of the changes or modifications which may be suggested by MALOUF ENGINEERING INTERNATIONAL, INC. and that Customer will have any such changes or modifications made by riggers, erectors and other subcontractors of Customer's choice. MALOUF ENGINEERING INTERNATIONAL, INC. shall have the right to rely upon the accuracy of the information supplied by the customer and shall not be held responsible for the Customer's misrepresentation or omission of relevant fact whether intentional or otherwise.

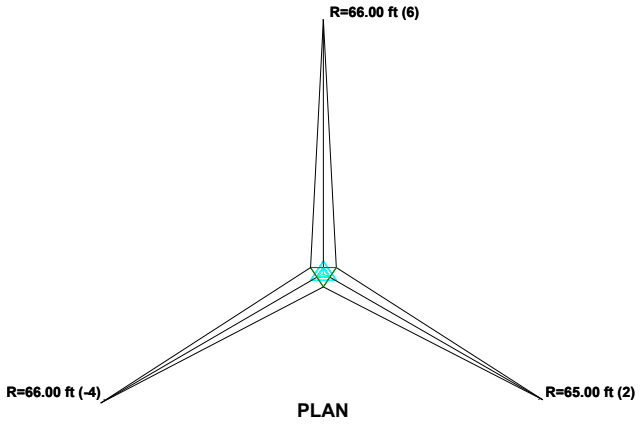
Customer hereby agrees and acknowledges that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability whatsoever to Customer or to others for any work or services performed by any persons other than MALOUF ENGINEERING INTERNATIONAL, INC. in connection with the implementation of services including but not limited to any services rendered for Customer or for others by riggers, erectors or other subcontractors. Customer acknowledges and agrees that any riggers, erectors or subcontractors retained or employed by Customer shall be solely responsible to Customer and to others for the quality of work performed by them and that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability or responsibility whatsoever as a result of any negligence or breach of contract by any such rigger, erector or subcontractor and that Customer and rigger, erector, or subcontractor will provide MALOUF ENGINEERING INTERNATIONAL, INC. with a Certificate of Insurance naming MALOUF ENGINEERING INTERNATIONAL, INC. as additional insured.

APPENDIX 1 - ANALYSIS PRINTOUT & GRAPHICS

AFTER NOTED MODIFICATIONS

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Horizontals	Sec. Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (lb)
L1	P 4.000 OD x 0.226	A53-B-35	A		L2x2x3/16	N.A.	D	6.25	1 @ 10	1088.9
T1						B				351.7
T2			L2x2x1/8			C				107.5
T3										87.3
T4			L1 1/2x1 1/2x1/8							243.4
T5										81.1
T6										81.1
T7										87.3
T8			L2x2x1/8							261.8
T9	BPL 6 x .25"	A36-32		A36-32	N.A.	L1 1/4x1 1/4x1/8	N.A.	3.125	27 @ 3.33333	261.8
T10										81.1
T11										81.1
T12										81.1
T13			L1 1/2x1 1/2x1/8							243.4
T14										81.1
T15										127.1
T16										127.1
T17										362.2
										3836.3





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20ft Whip Antenna (E / F)	104.583	APXV18-206516S-A20 w/ Pipe Mount (T-Mobile / P)	96
10ft Whip Antenna (E / F)	100.25	APXV18-206516S-A20 w/ Pipe Mount (T-Mobile / P)	96
2.5ft Pipe Mount (E / F)	99.25	APXV18-206516S-A20 w/ Pipe Mount (T-Mobile / P)	96
1.33ft Standoff w/ 10ft Pipe Mount (E / F)	98.5	Dual Stand-off Mount w/ New Reinforcement (T-Mobile / P)	96
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	96	Dual Stand-off Mount w/ New Reinforcement (T-Mobile / P)	96
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	96	Dual Stand-off Mount w/ New Reinforcement (T-Mobile / P)	96
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	96	KRY 112 489/2 TMA's (T-Mobile / E)	96
RADIO 4449 - B71 + B12 (T-Mobile / P)	96	KRY 112 489/2 TMA's (T-Mobile / E)	96
RADIO 4449 - B71 + B12 (T-Mobile / P)	96	KRY 112 489/2 TMA's (T-Mobile / E)	96
RADIO 4449 - B71 + B12 (T-Mobile / P)	96	Service Grating (E)	90
		2ft Empty Face Mount (E / F)	83.25 - 76.5

SYMBOL LIST

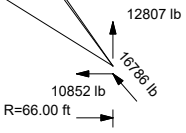
MARK	SIZE	MARK	SIZE
A	L2x1 1/2x1/8+L2x2x1/4+SP 1/4	C	L2 1/2x2 1/2x3/16
B	L3x2x1/4	D	L1 1/2x2x1/8+L2.5x2.5x1/4+SP 1/4

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A36-32	32 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 91 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. Owner - Everest Infrastructure - Wildcat Hill Tower #701775
9. 2018 CT Building Code / 2015 International Building Code
10. 117 Mph Ultimate Wind Speed / Risk Category 2
11. TOWER RATING: 84.9%

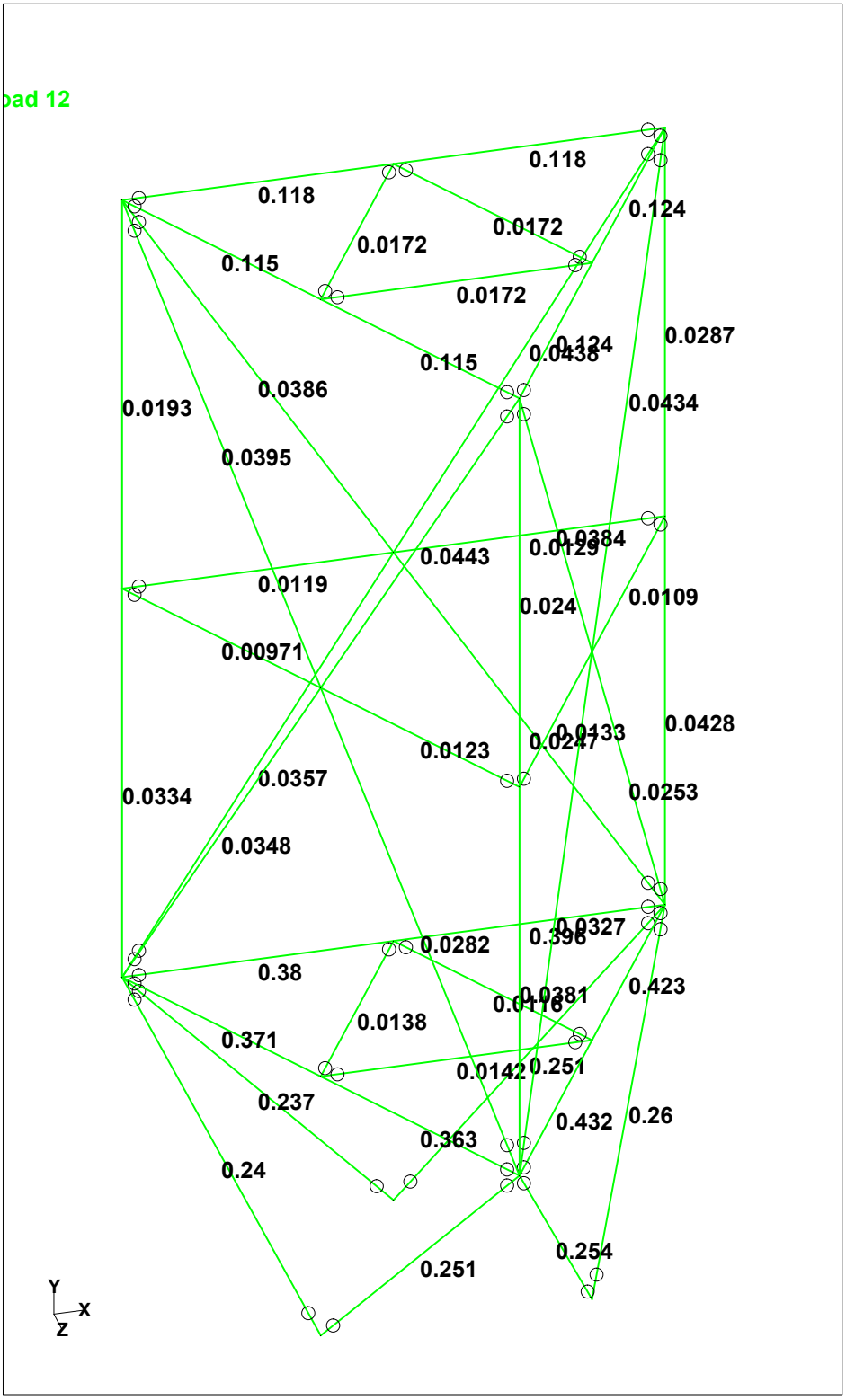


ALL REACTIONS ARE FACTORED

MALOUF ENGINEERING INTL., INC. STRUCTURAL CONSULTANTS
maloufengineering.com

Malouf Engineering Int'l Inc.
17950 Preston Road, STE 720
Dallas, Texas 75252
Phone: (972) 783 2578
FAX: (972) 783 2583

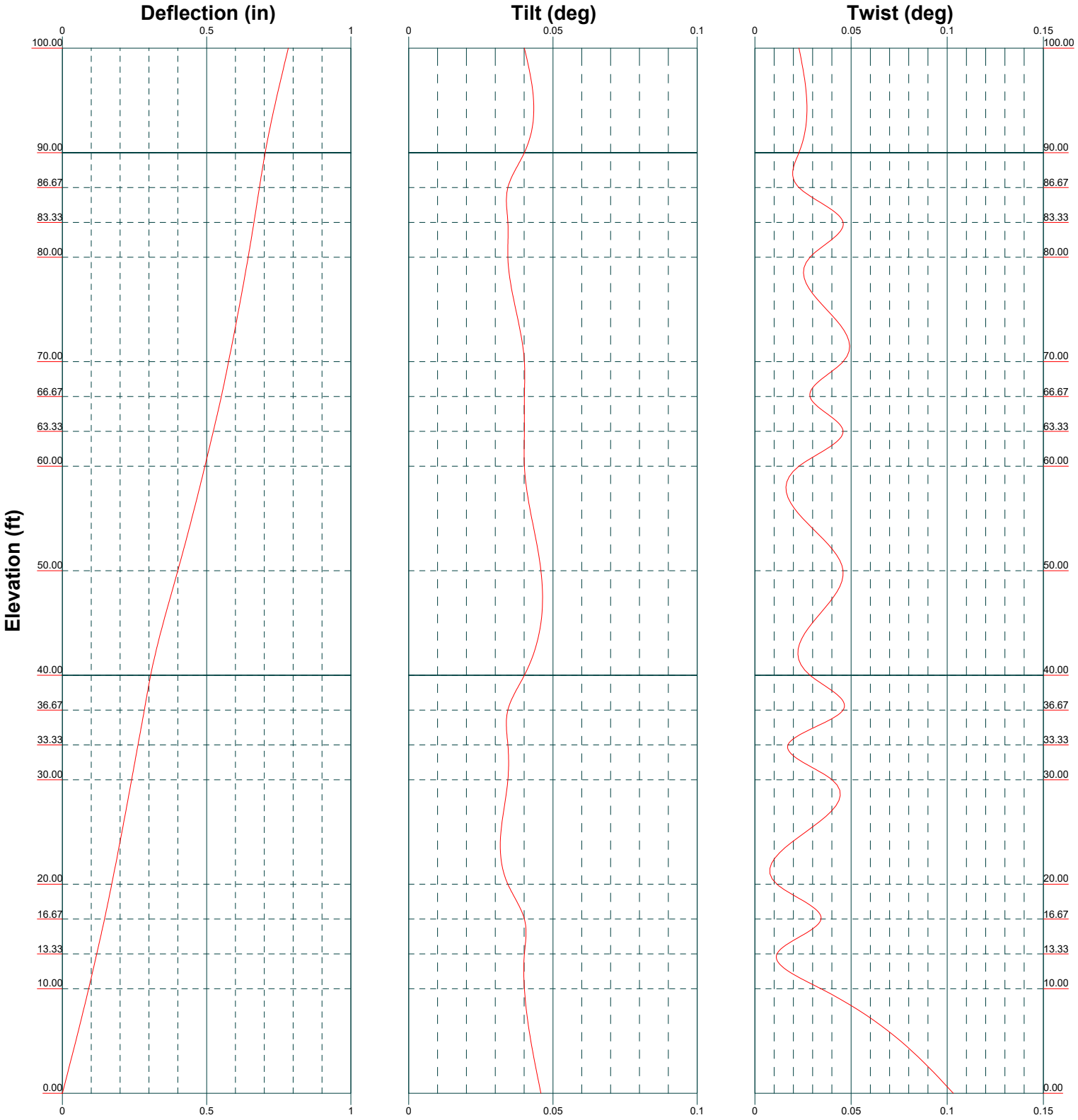
Job:	***90 ft GT - Harwinton SNET_1 Site #CT11358A***		
Project:	***CT05213G-19V1-RUN-I (Modification Analysis)***		
Client:	Transcend Wireless / T-Mobile	Drawn by: KM	App'd:
Code:	TIA-222-G	Date: 08/19/19	Scale: NTS
Path:			Dwg No. E-1



Combined Stress Ratios (Unity Check < 1.05 OK!)

TIA-222-G - Service - 60 mph

Maximum Values



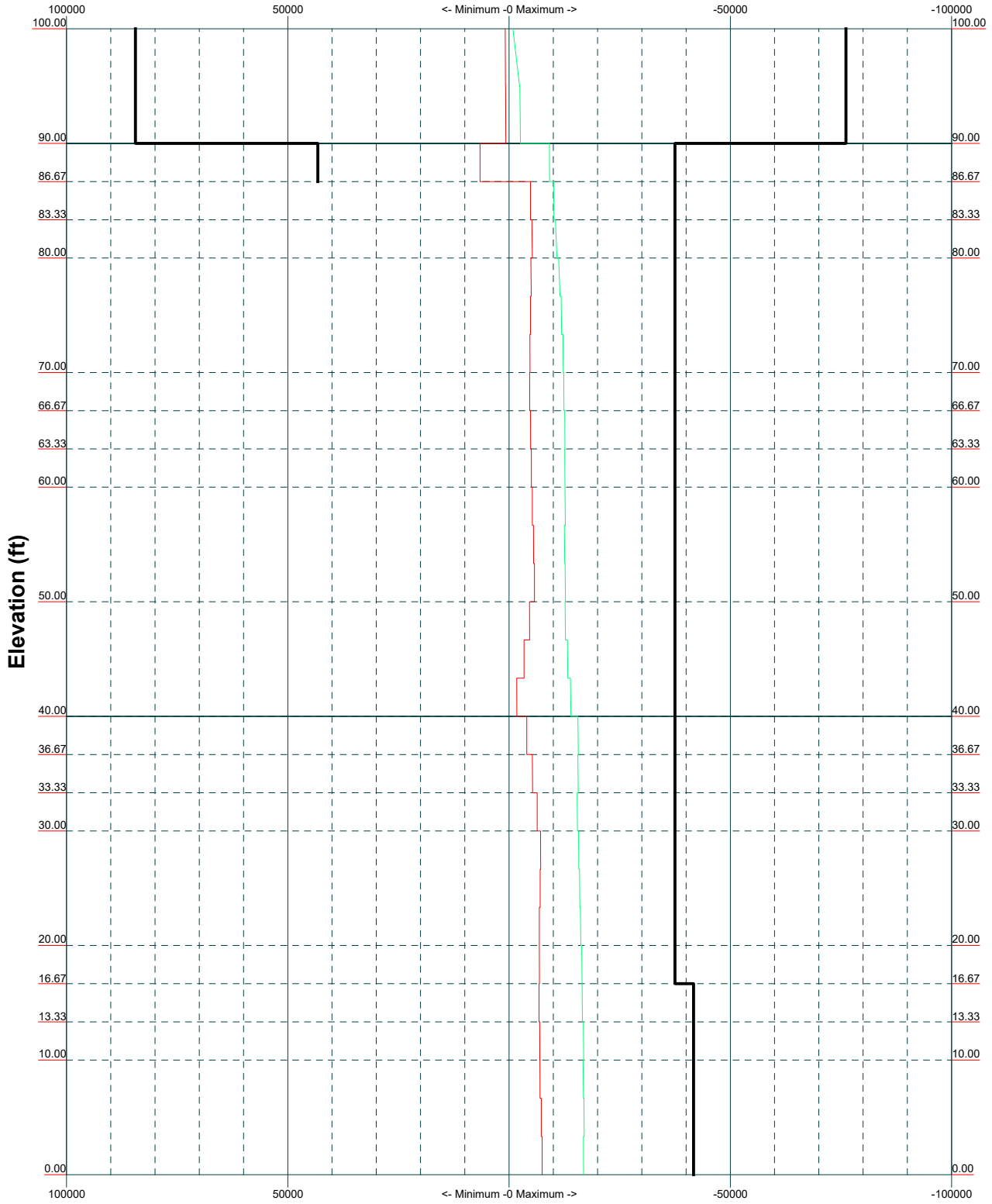
MALOUF ENGINEERING INTL., INC.
STRUCTURAL CONSULTANTS
maloufengineering.com

Malouf Engineering Int'l Inc.
17950 Preston Road, STE 720
Dallas, Texas 75252
Phone: (972) 783 2578
FAX: (972) 783 2583

Job:	***90 ft GT - Harwinton SNET_1 Site #CT11358***		
Project:	***CT05213G-19V1-RUN-I (Modification Analysis)***		
Client:	Transcend Wireless / T-Mobile	Drawn by: KM	App'd:
Code:	TIA-222-G	Date: 08/19/19	Scale: NTS
Path:			Dwg No. E-5

TIA-222-G - 91 mph/50 mph 0.7500 in Ice Exposure B

Leg Capacity ——— **Leg Compression (lb)**



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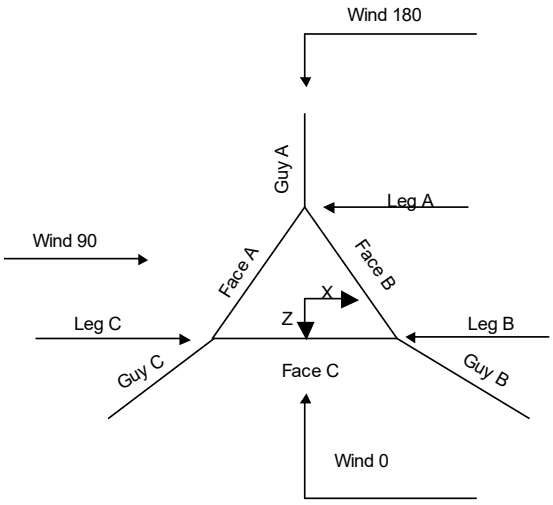
Job:	***90 ft GT - Harwinton SNET_1 Site #CT11358***		
Project:	***CT05213G-19V1-RUN-I (Modification Analysis)***		
Client:	Transcend Wireless / T-Mobile	Drawn by: KM	App'd:
Code:	TIA-222-G	Date: 08/19/19	Scale: NTS
Path:			Dwg No. E-3

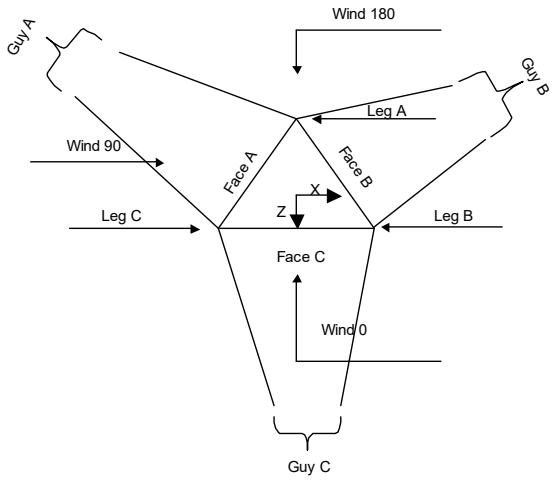
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 100.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.13 ft at the top and 3.13 ft at the base.
An index plate is provided at the 3 sided -tower connection.
There is a 3 sided latticed pole with a face width of 6.25 ft.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Litchfield County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 91 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 56.00 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.
Owner - Everest Infrastructure - Wildcat Hill Tower #701775.
2018 CT Building Code / 2015 International Building Code.
117 Mph Ultimate Wind Speed / Risk Category 2.
Pressures are calculated at each section.
Stress ratio used in latticed pole member design is 1.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.



Corner & Starmount Guyed Tower



Face Guyed

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Placement	#	Weight
	ft		plf
Climbing Ladder (E)	100.00 - 0.00	1	6.750
Safety Line 3/8 (E)	100.00 - 0.00	1	0.220
1 5/8 (E / F)	100.00 - 0.00	1	1.040
0.40" Black Cable	100.00 - 0.00	1	0.080

Description	Placement	#	Weight
	ft		plf
(E / F) 1 1/4 (T-Mobile / E / #2-7)	96.00 - 0.00	6	0.660
1-3/8" (HCS 6x12) Hybrid Cable (T-Mobile / P)	96.00 - 0.00	1	2.400

Discrete Tower Loads

Description	Placement	Weight
	ft	lb
10ft Whip Antenna (E / F)	100.25	20.000 36.001 57.966
2.5ft Pipe Mount (E / F)	99.25	25.000 37.500 50.000
20ft Whip Antenna (E / F)	104.58	30.000 69.464 119.052
1.33ft Standoff w/ 10ft Pipe Mount (E / F)	98.50	100.000 127.500 155.000
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	96.00	182.500 316.193 460.497
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	96.00	182.500 316.193 460.497
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	96.00	182.500 316.193 460.497
RADIO 4449 - B71 + B12 (T-Mobile / P)	96.00	74.000 90.087 108.793
RADIO 4449 - B71 + B12 (T-Mobile / P)	96.00	74.000 90.087 108.793
RADIO 4449 - B71 + B12 (T-Mobile / P)	96.00	74.000 90.087 108.793
APXV18-206516S-A20 w/ Pipe Mount (T-Mobile / P)	96.00	40.000 76.210 121.271
APXV18-206516S-A20 w/	96.00	40.000

Description	Placement	Weight
	ft	lb
Pipe Mount (T-Mobile / P)		76.210 121.271
APXV18-206516S-A20 w/ Pipe Mount (T-Mobile / P)	96.00	40.000 76.210 121.271
Dual Stand-off Mount w/ New Reinforcement (T-Mobile / P)	96.00	125.000 170.000 215.000
Dual Stand-off Mount w/ New Reinforcement (T-Mobile / P)	96.00	125.000 170.000 215.000
Dual Stand-off Mount w/ New Reinforcement (T-Mobile / P)	96.00	125.000 170.000 215.000
KRY 112 489/2 TMA's (T-Mobile / E)	96.00	15.430 20.503 27.136
KRY 112 489/2 TMA's (T-Mobile / E)	96.00	15.430 20.503 27.136
KRY 112 489/2 TMA's (T-Mobile / E)	96.00	15.430 20.503 27.136
Service Grating (E)	90.00	200.000 237.500 275.000
2ft Empty Face Mount (E / F)	83.25 - 76.50	325.000 435.000 545.000

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 90	0.783	28	0.0414	0.0251
T1	90 - 86.6667	0.703	28	0.0407	0.0246
T2	86.6667 - 83.3333	0.683	28	0.0357	0.0244
T3	83.3333 - 80	0.664	28	0.0347	0.0483
T4	80 - 70	0.644	28	0.0346	0.0291
T5	70 - 66.6667	0.576	27	0.0376	0.0476
T6	66.6667 - 63.3333	0.551	27	0.0394	0.0279
T7	63.3333 - 60	0.523	27	0.0410	0.0466
T8	60 - 50	0.494	27	0.0423	0.0250
T9	50 - 40	0.400	27	0.0439	0.0446
T10	40 - 36.6667	0.306	27	0.0379	0.0305
T11	36.6667 - 33.3333	0.284	27	0.0357	0.0452
T12	33.3333 - 30	0.262	27	0.0345	0.0186
T13	30 - 20	0.240	27	0.0339	0.0418
T14	20 - 16.6667	0.171	27	0.0359	0.0133
T15	16.6667 - 13.3333	0.146	27	0.0373	0.0366
T16	13.3333 - 10	0.119	27	0.0389	0.0099
T17	10 - 0	0.091	27	0.0403	0.0333

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
104.58	20ft Whip Antenna	28	0.783	0.0414	0.0251	53406
100.25	10ft Whip Antenna	28	0.783	0.0414	0.0251	53406
99.25	2.5ft Pipe Mount	28	0.776	0.0419	0.0259	53406
98.50	1.33ft Standoff w/ 10ft Pipe Mount	28	0.770	0.0423	0.0267	53406
96.00	APXVAARR24_43-U-NA20 w/ Pipe Mount	28	0.748	0.0434	0.0287	53406
90.00	Guy	28	0.703	0.0407	0.0246	39718
83.25	2ft Empty Face Mount	28	0.663	0.0347	0.0484	228373
79.88	2ft Empty Face Mount	28	0.643	0.0346	0.0284	111905
76.50	2ft Empty Face Mount	28	0.622	0.0347	0.0307	85781
40.00	Guy	27	0.306	0.0379	0.0305	29942

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 90	4.732	2	0.2306	0.1270
T1	90 - 86.6667	4.242	2	0.2275	0.1250
T2	86.6667 - 83.3333	4.102	2	0.2080	0.1249
T3	83.3333 - 80	3.966	2	0.2063	0.1525
T4	80 - 70	3.828	2	0.2084	0.1314
T5	70 - 66.6667	3.384	2	0.2268	0.1478
T6	66.6667 - 63.3333	3.224	2	0.2344	0.1218
T7	63.3333 - 60	3.056	2	0.2417	0.1412
T8	60 - 50	2.882	2	0.2479	0.1147
T9	50 - 40	2.338	2	0.2540	0.1284
T10	40 - 36.6667	1.800	2	0.2282	0.1010
T11	36.6667 - 33.3333	1.655	2	0.2180	0.1144
T12	33.3333 - 30	1.515	2	0.2115	0.0786
T13	30 - 20	1.376	2	0.2081	0.1009
T14	20 - 16.6667	0.953	2	0.2122	0.0512
T15	16.6667 - 13.3333	0.806	2	0.2164	0.0754
T16	13.3333 - 10	0.654	2	0.2213	0.0356
T17	10 - 0	0.497	2	0.2262	0.0696

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	100 - 90	Latticed Pole Leg	P 4.000 OD x 0.226	3	-2576.930	76135.203	3.4	Pass
L1	100 - 90	Latticed Pole Diagonal	L2x1 1/2x1/8+L2x2x1/4+SP 1/4	10	-2293.730	15584.600	14.7	Pass
L1	100 - 90	Latticed Pole Secondary Horizontal	L1 1/2x2x1/8+L2.5x2.5x1/4+SP 1/4	14	-788.074	25004.900	3.2 3.2 (b)	Pass
L1	100 - 90	Latticed Pole Top Girt	L2x2x3/16	5	160.671	19503.600	0.8 1.5 (b)	Pass
T1	90 - 86.6667	Leg	BPL 6 x .25"	18	-9151.390	37502.699	24.4	Pass
T2	86.6667 - 83.3333	Leg	BPL 6 x .25"	25	-10149.100	37502.699	27.1	Pass
T3	83.3333 - 80	Leg	BPL 6 x .25"	34	-10821.200	37502.699	28.9	Pass
T4	80 - 70	Leg	BPL 6 x .25"	45	-12251.200	37502.699	32.7	Pass
T5	70 - 66.6667	Leg	BPL 6 x .25"	66	-12419.000	37502.699	33.1	Pass
T6	66.6667 - 63.3333	Leg	BPL 6 x .25"	75	-12631.700	37502.699	33.7	Pass
T7	63.3333 - 60	Leg	BPL 6 x .25"	84	-12643.100	37502.699	33.7	Pass
T8	60 - 50	Leg	BPL 6 x .25"	91	-12757.500	37502.699	34.0	Pass
T9	50 - 40	Leg	BPL 6 x .25"	112	-13974.900	37502.699	37.3	Pass
T10	40 - 36.6667	Leg	BPL 6 x .25"	133	-15649.900	37502.699	41.7	Pass
T11	36.6667 - 33.3333	Leg	BPL 6 x .25"	142	-15627.000	37502.699	41.7	Pass
T12	33.3333 - 30	Leg	BPL 6 x .25"	151	-15470.700	37502.699	41.3	Pass
T13	30 - 20	Leg	BPL 6 x .25"	160	-16208.500	37502.699	43.2	Pass
T14	20 - 16.6667	Leg	BPL 6 x .25"	181	-16503.900	37502.699	44.0	Pass
T15	16.6667 - 13.3333	Leg	BPL 6 x .25"	190	-16599.400	41699.301	39.8	Pass
T16	13.3333 - 10	Leg	BPL 6 x .25"	199	-16868.699	41699.301	40.5	Pass
T17	10 - 0	Leg	BPL 6 x .25"	208	-16986.600	41699.301	40.7	Pass
T1	90 - 86.6667	Diagonal	L2x2x1/8	23	-2047.460	6248.810	32.8 37.9 (b)	Pass
T2	86.6667 -	Diagonal	L2x2x1/8	33	-1747.100	6248.810	28.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
	83.3333						30.9 (b)	
T3	83.3333 - 80	Diagonal	L2x2x1/8	42	-1499.300	6248.810	24.0	Pass
T4	80 - 70	Diagonal	L1 1/2x1 1/2x1/8	63	-977.100	2625.980	37.2	Pass
T5	70 - 66.6667	Diagonal	L1 1/2x1 1/2x1/8	72	-450.388	2625.980	17.2	Pass
T6	66.6667 - 63.3333	Diagonal	L1 1/2x1 1/2x1/8	80	-514.680	2625.980	19.6	Pass
T7	63.3333 - 60	Diagonal	L2x2x1/8	90	-754.337	6248.810	12.1	Pass
T8	60 - 50	Diagonal	L2x2x1/8	99	-1277.460	6248.810	20.4	Pass
T9	50 - 40	Diagonal	L2x2x1/8	120	-1789.840	6248.810	28.6	Pass
T10	40 - 36.6667	Diagonal	L1 1/2x1 1/2x1/8	139	-1425.990	2625.980	54.3	Pass
T11	36.6667 - 33.3333	Diagonal	L1 1/2x1 1/2x1/8	149	-1419.440	2625.980	54.1	Pass
T12	33.3333 - 30	Diagonal	L1 1/2x1 1/2x1/8	157	-1268.280	2625.980	48.3	Pass
T13	30 - 20	Diagonal	L1 1/2x1 1/2x1/8	179	-1149.490	2625.980	43.8	Pass
T14	20 - 16.6667	Diagonal	L1 1/2x1 1/2x1/8	187	-800.150	2625.980	30.5	Pass
T15	16.6667 - 13.3333	Diagonal	L1 1/2x1 1/2x1/8	198	-658.677	6371.930	10.3	Pass
T16	13.3333 - 10	Diagonal	L1 1/2x1 1/2x1/8	205	-644.349	6371.930	10.1	Pass
T17	10 - 0	Diagonal	L1 1/2x1 1/2x1/8	216	-1124.100	6371.930	17.6	Pass
T1	90 - 86.6667	Horizontal	L3x2x1/4	20	-158.507	21475.600	0.7	Pass
							2.0 (b)	
T2	86.6667 - 83.3333	Horizontal	L2 1/2x2 1/2x3/16	28	789.401	25604.500	3.1	Pass
							10.5 (b)	
T3	83.3333 - 80	Horizontal	L1 1/4x1 1/4x1/8	37	-187.429	3353.830	5.6	Pass
							9.8 (b)	
T4	80 - 70	Horizontal	L1 1/4x1 1/4x1/8	47	-212.197	3353.830	6.3	Pass
							12.9 (b)	
T5	70 - 66.6667	Horizontal	L1 1/4x1 1/4x1/8	69	-215.103	3353.830	6.4	Pass
							10.5 (b)	
T6	66.6667 - 63.3333	Horizontal	L1 1/4x1 1/4x1/8	77	-218.787	3353.830	6.5	Pass
							10.8 (b)	
T7	63.3333 - 60	Horizontal	L1 1/4x1 1/4x1/8	86	-218.985	3353.830	6.5	Pass
							11.1 (b)	
T8	60 - 50	Horizontal	L1 1/4x1 1/4x1/8	94	-220.966	3353.830	6.6	Pass
							12.0 (b)	
T9	50 - 40	Horizontal	L1 1/4x1 1/4x1/8	115	-242.052	3353.830	7.2	Pass
							12.0 (b)	
T10	40 - 36.6667	Horizontal	L1 1/4x1 1/4x1/8	137	2202.170	7136.720	30.9	Pass
							84.9 (b)	
T11	36.6667 - 33.3333	Horizontal	L1 1/4x1 1/4x1/8	145	-271.065	3353.830	8.1	Pass
							12.1 (b)	
T12	33.3333 - 30	Horizontal	L1 1/4x1 1/4x1/8	154	-270.668	3353.830	8.1	Pass
							13.1 (b)	
T13	30 - 20	Horizontal	L1 1/4x1 1/4x1/8	165	-280.740	3353.830	8.4	Pass
							14.0 (b)	
T14	20 - 16.6667	Horizontal	L1 1/4x1 1/4x1/8	184	-285.857	3353.830	8.5	Pass
							14.1 (b)	
T15	16.6667 - 13.3333	Horizontal	L1 1/4x1 1/4x1/8	193	-287.510	2879.810	10.0	Pass
							14.3 (b)	
T16	13.3333 - 10	Horizontal	L1 1/4x1 1/4x1/8	202	-292.174	2879.810	10.1	Pass
							14.4 (b)	
T17	10 - 0	Horizontal	L1 1/4x1 1/4x1/8	213	-294.216	2879.810	10.2	Pass
							15.1 (b)	
T1	90 - 86.6667	Guy A@90	1/2	242	6240.290	14526.000	43.0	Pass
T10	40 - 36.6667	Guy A@40	7/16 GR. 180	249	4212.440	10530.000	40.0	Pass
T1	90 - 86.6667	Guy B@90	1/2	236	6302.240	14526.000	43.4	Pass
T10	40 - 36.6667	Guy B@40	7/16 GR. 180	248	4237.080	10530.000	40.2	Pass
T1	90 - 86.6667	Guy C@90	1/2	229	6416.860	14526.000	44.2	Pass
T10	40 - 36.6667	Guy C@40	7/16 GR. 180	247	4413.070	10530.000	41.9	Pass
T1	90 - 86.6667	Torque Arm Top@90	L2x2x3/16	237	6203.980	20592.000	30.1	Pass
							39.0 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	90 - 86.6667	Torque Arm Bottom@90	L2x2x3/16 w L2.5x2.5x1/4 Formed T	239	-7181.380	37958.699	18.9 45.2 (b) Summary	Pass
							Latticed Pole Leg (L1) 3.4	Pass
							Latticed Pole Diagonal (L1) 14.7	Pass
							Latticed Pole Secondary Horizontal (L1) 3.2	Pass
							Latticed Pole Top Girt (L1) 1.5	Pass
							Leg (T14) 44.0	Pass
							Diagonal (T10) 54.3	Pass
							Horizontal (T10) 84.9	Pass
							Guy A (T1) 43.0	Pass
							Guy B (T1) 43.4	Pass
							Guy C (T1) 44.2	Pass
							Torque Arm Top (T1) 39.0	Pass
							Torque Arm Bottom (T1) 45.2	Pass
							Bolt Checks 84.9	Pass
							RATING = 84.9	**Pass**

APPENDIX 2 – SOURCE / CHANGED CONDITION

Everest Infrastructure
Colocation Application

Tower Equipment

List **ALL** equipment components installed on the tower or ground space area, including mounting apparatus, ice bridges, etc.

Tower Equipment				Equipment Status (mark with "x")			Equipment Dimensions				Azimuths	Equip. Centerline		Lines		
Component Type (Ant. type, RRU, mount, etc.)	Manufacturer	Model	# Units	Exist	New	To be Removed	Height (inches)	Width (inches)	Depth (inches)	Weight (lbs)	Degrees (a/b/c)	AGL (ft)	Leg (e.g. NE)	Type	# Units	Size
Antenna	RFS	APXV-18-206516	3	X			53.1	8.9	3.2	18.7	40/160/280	96'		Coax	6	1-1/4"
Antenna	Commscope	LNX-6515DS	3			X	96.4	11.9	7.1	43.7	40/160/280	96'		Coax	6	1-5/8"
Antenna	RFS	APXVAARR24_43	3		X		95.9	24.0	8.7	128.0	40/160/280	96'		Hybrid	1	1-3/8"
TMA	Ericsson	KRY 112	3	X			11.0	6.1	3.9	15.4	40/160/280	96'				
RRU	Ericsson	Radio 4449 B71B	3		X		14.9	13.2	9.3	74.0	40/160/280	96'				

Ground Equipment Equipment

List all equipment components installed in the compound or interior space not owned by the Tenant. Incude battery information even if in owned shelt

Ground Equipment				Equipment Status (mark with "x")			Equipment Dimensions				Equipment Details
Component	Manufacturer	Model	Quantity	Existing	New	To be Removed	Height (inches)	Width (inches)	Depth (inches)	Weight (lbs)	(e.g. generator KWs, battery type, operating requirements, etc.)

RAN Template:	A&L Template:	Power System Template:
67D04G	67D04G_1DP+1OP	Custom

CT11358A_L600_3.1_draft

Section 1 - Site Information

Site ID: CT11358A
Status: Draft
Version: 3.1
Project Type: L600
Approved: Not Approved
Approved By: Not Approved
Last Modified: 4/24/2019 4:35:49 PM
Last Modified By: GSM1900\AMurill9

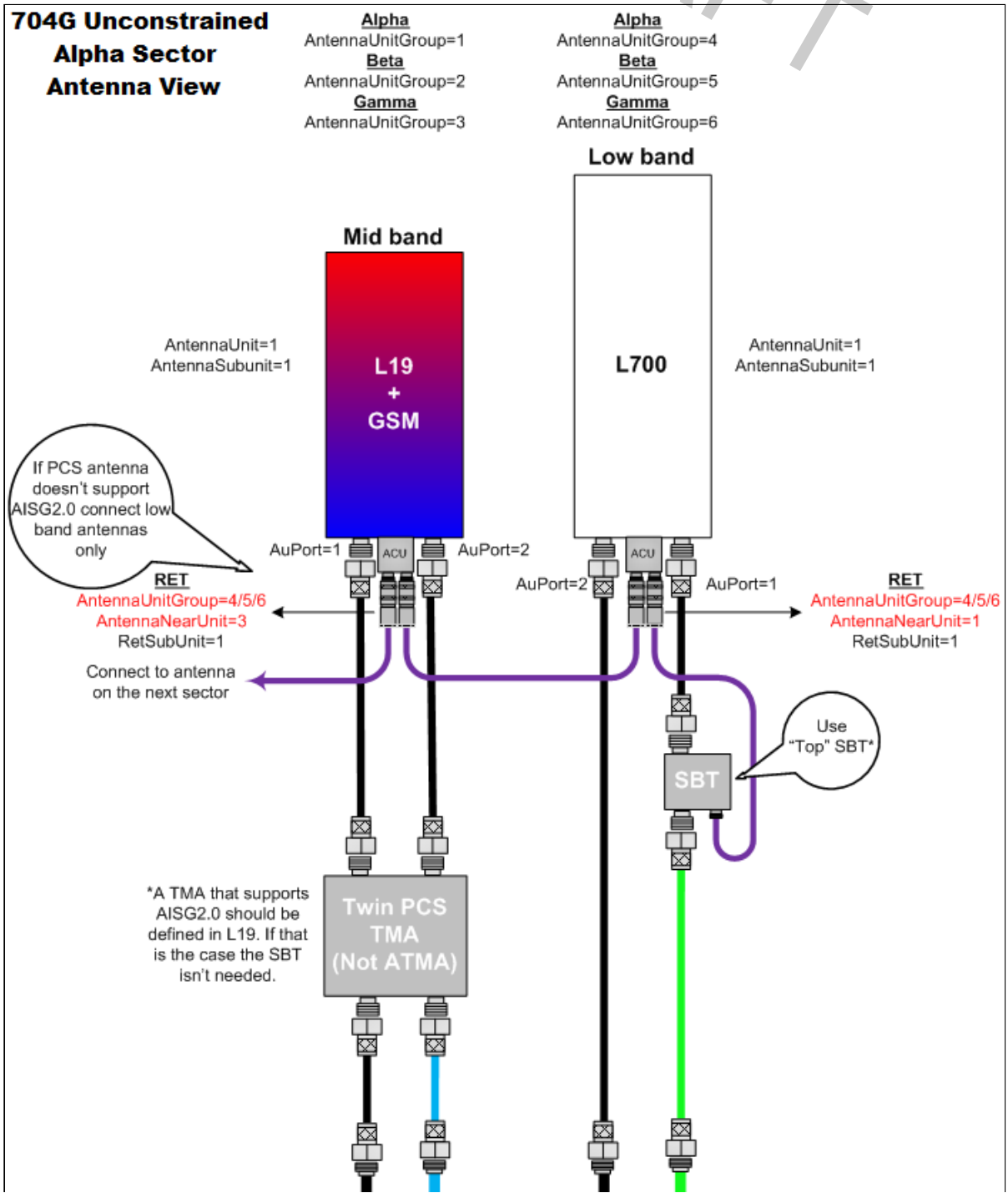
Site Name: Harwinton SNET_1
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2019
Market: CONNECTICUT
Vendor: Ericsson
Landlord: SNET LL

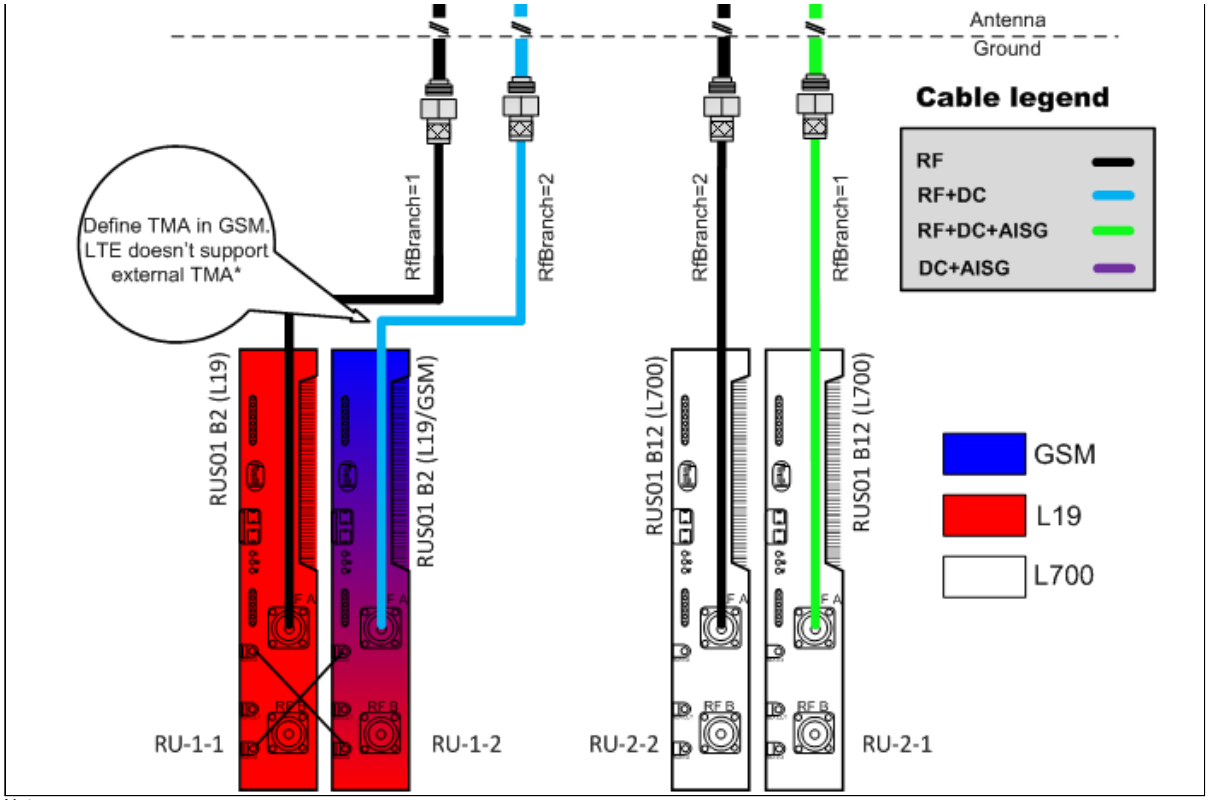
Latitude: 41.7569150000
Longitude: -73.0952340000
Address: Wildcat Hill Rd
City, State: Harwinton, CT
Region: NORTHEAST

RAN Template: 67D04G			AL Template: 67D04G_1DP+1OP	
Sector Count: 3	Antenna Count: 6	Coax Line Count: 6	TMA Count: 3	RRU Count: 3

Section 2 - Existing Template Images

AL_704G_Unconstrained.png

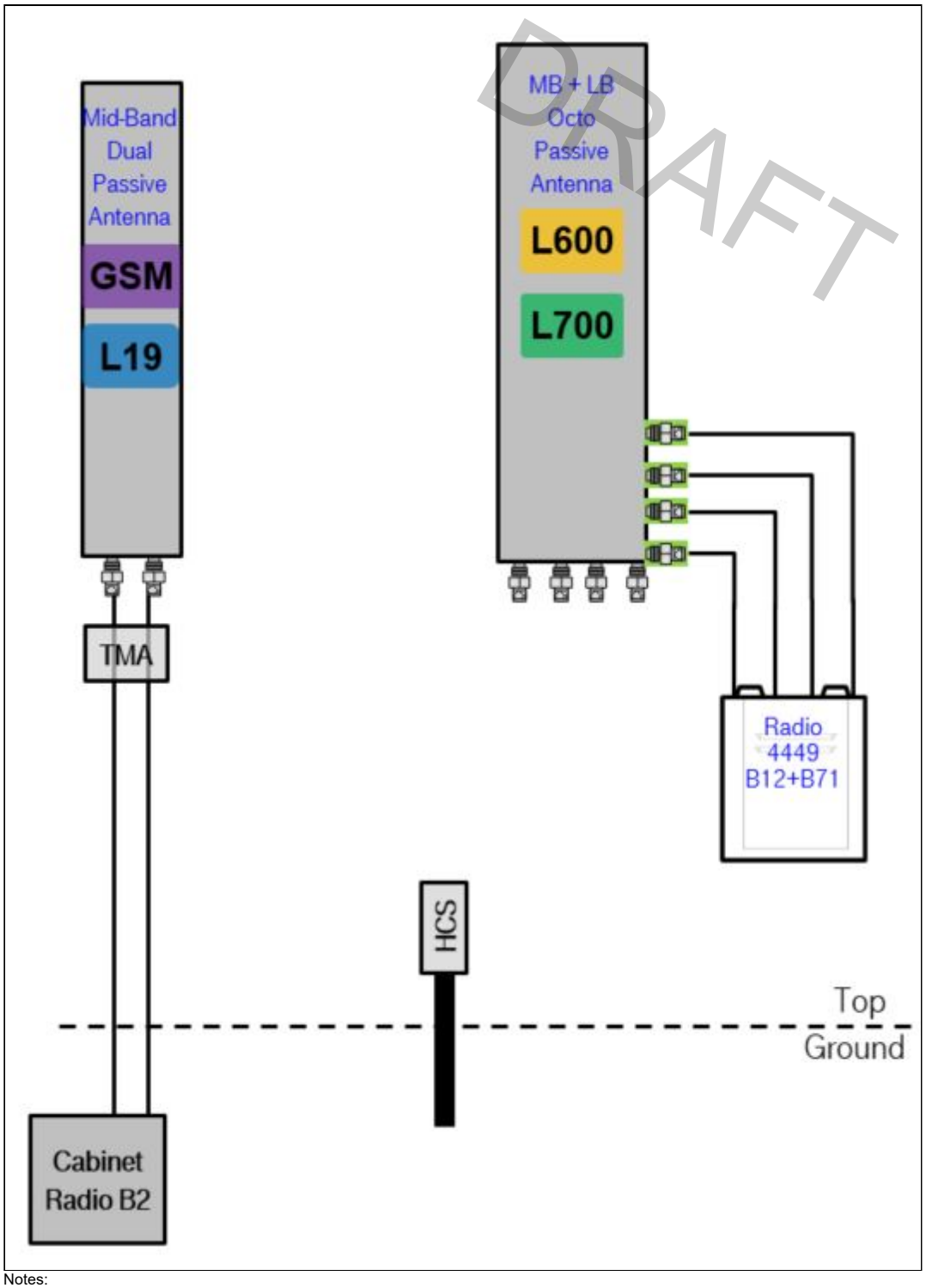



Antenna
Ground
Cable legend
RF
RF+DC
RF+DC+AISG
DC+AISG
Define TMA in GSM. LTE doesn't support external TMA*
RfBranch=1
RfBranch=2
RfBranch=2
RfBranch=1
RUS01 B2 (L19)
RUS01 B2 (L19/GSM)
RUS01 B12 (L700)
RUS01 B12 (L700)
GSM
L19
L700
RU-1-1
RU-1-2
RU-2-2
RU-2-1

Notes:

Section 3 - Proposed Template Images

Capture.JPG



Notes:

Section 4 - Siteplan Images

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RAN Template:	A&L Template:	Power System Template:
67D04G	67D04G_1DP+1OP	Custom

CT11358A_L600_3.1_draft

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 704G

Enclosure	1	2
Enclosure Type	RBS 6201 ODE	Battery Cabinet
Baseband	DUG20 (G1900); BB 5216 (L1900, L700)	
Radio	RUS01 B2 (x3) (G1900); RUS01 B2 (x3) (L1900); RUS01 B12 (x6) (L700)	

Proposed RAN Equipment

Template: 67D04G

Enclosure	1	2
Enclosure Type	RBS 6201 ODE	Battery Cabinet
Baseband	DUG20 (G1900); BB 5216 (L1900, L700, L600); BB 6630 (N600 (DARK))	
Hybrid Cable System	Ericsson 6x12 HCS *Select Length & AWG*	
Radio	RUS01 B2 (x3) (G1900); RUS01 B2 (x3) (L1900)	

RAN Scope of Work:

Add (1) BB 6630 for future 5G (N600 Dark).
Remove all (6) RUS01 B12 and install Dummy Plates.
Add (1) 6x12 HCS.

Existing: (12) Coaxial Lines Remove (6) Coaxial Lines.
Replace (3) LB Dual Port antennas with (3) LB+MB Octa Port 8' antennas. Remove (3) Smart Bias-Ts.
Add (3) Radio 4449 B71+B12s (L600/L700) to MB ports.

RAN Template:	A&L Template:	Power System Template:
67D04G	67D04G_1DP+1OP	Custom

CT11358A_L600_3.1_draft

Section 6 - A&L Equipment

Existing Template: 704G_Unconstrained
Proposed Template: 67D04G_1DP+1OP

Sector 1 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	**1**	**2**
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	Andrew - LNX-6515DS-A1M (Dual)
Azimuth	40	40
M. Tilt		
Height	96	96
Ports	**P1**	**P2**
Active Tech.	L1900, G1900	L700
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	1-1/4" Coax - 160 ft. **(x2)**	1-5/8" Coax - 160 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	
Diplexers / Combiners		
Radio		
Sector Equipment		Andrew Smart Bias T (At Antenna)

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:	Power System Template:
67D04G	67D04G_1DP+1OP	Custom

CT11358A_L600_3.1_draft

Sector 1 (Proposed) view from behind					
Coverage Type	A - Outdoor Macro				
Antenna	1	2			
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	40	40			
M. Tilt					
Height	96	96			
Ports	P1	P2	P3	P4	P5
Active Tech.	L1900 G1900	L700 L600	L700 L600		
Dark Tech.					
Restricted Tech.					
Decomm. Tech.					
E. Tilt	2	2	2		
Cables	1-1/4" Coax - 160 ft. **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs	Generic Twin Style 1A - PCS (AtAntenna)				
Diplexers / Combiners					
Radio		Radio 4449 B71+B12 (At Antenna)	SHARED Radio 4449 B71+B12 (At Antenna)		
Sector Equipment					

Unconnected Equipment:

Scope of Work:

Replace (1) LB Dual Port antenna in Position 2 with (1) LB+MB Octa Port 8' antenna. Remove (1) Smart Bias-T.
Add (1) Radio 4449 B71+B12 (L600/L700) to LB ports.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:	Power System Template:
67D04G	67D04G_1DP+1OP	Custom

CT11358A_L600_3.1_draft

Sector 2 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	1	2
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	Andrew - LNX-6515DS-A1M (Dual)
Azimuth	160	160
M. Tilt		
Height	96	96
Ports	P1	P2
Active Tech.	L1900 G1900	L700
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	1-1/4" Coax - 160 ft. **(x2)**	1-5/8" Coax - 160 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	
Diplexers / Combiners		
Radio		
Sector Equipment		Andrew Smart Bias T (At Antenna)

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:	Power System Template:
67D04G	67D04G_1DP+1OP	Custom

CT11358A_L600_3.1_draft

Sector 2 (Proposed) view from behind					
Coverage Type	A - Outdoor Macro				
Antenna	1	2			
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	160	160			
M. Tilt					
Height	96	96			
Ports	P1	P2	P3	P4	P5
Active Tech.	L1900 G1900	L700 L600	L700 L600		
Dark Tech.					
Restricted Tech.					
Decomm. Tech.					
E. Tilt	2	2	2		
Cables	1-1/4" Coax - 160 ft. **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs	Generic Twin Style 1A - PCS (AtAntenna)				
Diplexers / Combiners					
Radio		Radio 4449 B71+B12 (At Antenna)	SHARED Radio 4449 B71+B12 (At Antenna)		
Sector Equipment					

Unconnected Equipment:

Scope of Work:

Replace (1) LB Dual Port antenna in Position 2 with (1) LB+MB Octa Port 8' antenna. Remove (1) Smart Bias-T.
Add (1) Radio 4449 B71+B12 (L600/L700) to LB ports.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:	Power System Template:
67D04G	67D04G_1DP+1OP	Custom

CT11358A_L600_3.1_draft

Sector 3 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	1	2
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	Andrew - LNX-6515DS-A1M (Dual)
Azimuth	280	280
M. Tilt		
Height	96	96
Ports	P1	P2
Active Tech.	L1900 G1900	L700
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	1-1/4" Coax - 160 ft. **(x2)**	1-5/8" Coax - 160 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	
Diplexers / Combiners		
Radio		
Sector Equipment		Andrew Smart Bias T (At Antenna)

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:	Power System Template:
67D04G	67D04G_1DP+1OP	Custom

CT11358A_L600_3.1_draft

Sector 3 (Proposed) view from behind					
Coverage Type	A - Outdoor Macro				
Antenna	1	2			
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	280	280			
M. Tilt					
Height	96	96			
Ports	P1	P2	P3	P4	P5
Active Tech.	L1900 G1900	L700 L600	L700 L600		
Dark Tech.					
Restricted Tech.					
Decomm. Tech.					
E. Tilt	2	2	2		
Cables	1-1/4" Coax - 160 ft. **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs	Generic Twin Style 1A - PCS (AtAntenna)				
Diplexers / Combiners					
Radio		Radio 4449 B71+B12 (At Antenna)	SHARED Radio 4449 B71+B12 (At Antenna)		
Sector Equipment					

Unconnected Equipment:

Scope of Work:

Replace (1) LB Dual Port antenna in Position 2 with (1) LB+MB Octa Port 8' antenna. Remove (1) Smart Bias-T.
Add (1) Radio 4449 B71+B12 (L600/L700) to LB ports.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:	Power System Template:
67D04G	67D04G_1DP+1OP	Custom

CT11358A_L600_3.1_draft

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

----- This section is intentionally blank. -----

Proposed Power Systems Equipment

PROJECT TEAM

CLIENT:
DAN REID
TRANSCEND WIRELESS
DREID@TRANSCENDWIRELESS.COM
203-592-8291

CARRIER:
T-MOBILE
OWNER:
EVEREST INFRASTRUCTURE
(SITE: WILDCAT HILL #701775)

STRUCTURAL ENGINEER:
MALOUF ENGINEERING INTERNATIONAL, INC.
17950 PRESTON RD, SUITE 720
DALLAS, TX 75252

MEI CONTACT:
KRISHNA MANDA, PE
972-783-2578 X105
KMANDA@MALOUFENGINEERING.COM

PROJECT INFORMATION

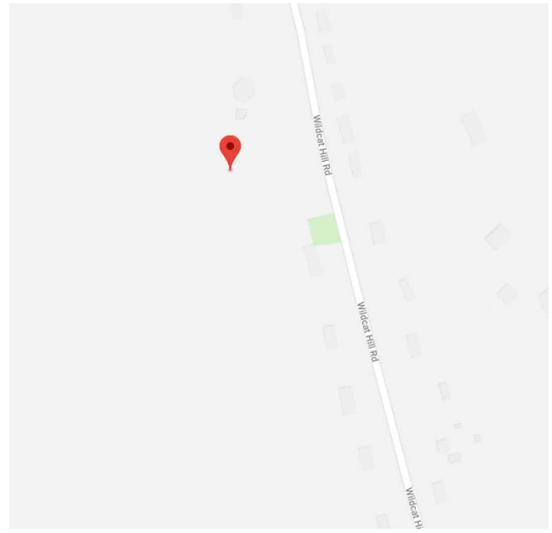
HARWINTON SNET_1
SITE #CT11358A
100 FT GUYED TOWER

WILDCAT HILL ROAD, HARWINTON, CT 06791
LAT: 41-45-24.48 N - LON: 73-05-42.72 W

DRAWING INDEX

STRUCTURE ELEVATION PHOTO

VICINITY MAP



CODE COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIAL INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

STRUCTURAL CODE:	2018 CTBC / 2015 IBC
DESIGN STANDARD:	ANSI/TIA-222-G-4

SCOPE OF WORK

1. THESE DRAWINGS INDICATE THE MAJOR OPERATIONS TO BE PERFORMED, BUT DO NOT SHOW EVERY FIELD CONDITION THAT MAY BE ENCOUNTERED. THEREFORE, PRIOR TO BIDDING AND TO BEGINNING OF WORK, THE CONTRACTOR SHALL GET FAMILIARIZED WITH THE WORK NOTED AND SHALL PERFORM A FIELD SITE VISIT TO SURVEY THE STRUCTURE FOR FIELD VERIFICATION / DETERMINATION OF REQUIRED WORK AND THE JOB SITE THOROUGHLY TO MINIMIZE FUTURE FIELD PROBLEMS.
2. THE MODIFICATION WORK SCHEDULE IS AS SHOWN ON SHEET S01 WITH THE FOLLOWING MAIN ITEMS:
   - REINFORCE EXISTING DIAGONAL MEMBERS BY BOLTING A NEW ANGLE FORMING BACK TO BACK ANGLES FROM ELEVATION 90 FT TO 100 FT± (1 BAY TOTAL).
   - REINFORCE EXISTING MID HORIZONTAL MEMBERS BY BOLTING A NEW ANGLE FORMING BACK TO BACK ANGLE FROM ELEVATION 95 FT± (1 LEVEL TOTAL).
   - REINFORCE EXISTING KICKER ANGLE MEMBERS BY BOLTING A NEW ANGLE FORMING BACK TO BACK ANGLES FROM ELEVATION 86.7 FT TO 90 FT± (1 LEVEL TOTAL).
   - LOCATE COAXES AS SHOWN. REFER TO TX-LINE LAYOUT FOR DETAILS.
   - PROVIDE TEMPORARY BRACING AS REQUIRED FOR STABILITY OF STRUCTURE DURING REINFORCEMENT / REPLACEMENT OF MEMBERS / BOLTS. REPLACE ONE MEMBER / BOLT AT A TIME. ALL SAFETY MEASURES AND PRECAUTIONS SHALL BE TAKEN AS REQUIRED BY CODE.
   - PERFORM ANY MAINTENANCE WORK AS REQUIRED AND APPLICABLE TO BRING THE STRUCTURE INTO GOOD OPERATIONAL CONDITION.
   - FIELD DETERMINATION / VERIFICATION BEFORE FABRICATION AND INSTALLATION IS STRONGLY RECOMMENDED.

MALOUF ENGINEERING INTERNATIONAL, INC.
STRUCTURAL CONSULTANTS
17950 PRESTON ROAD SUITE 720
DALLAS, TEXAS 75252-5635
972-783-2578 (fax: 2583)
www.maloufengineering.com

HARWINTON SNET_1 #CT11358A
100 FT GUYED TOWER
WILDCAT HILL ROAD, HARWINTON, CT 06791
LAT: 41-45-24.48 N - LON: 73-05-42.72 W

NO.	DATE	REVISIONS	DRAWN	ENG'D.	APP'D.
0	08/19/19	ISSUED FOR CONSTRUCTION	BDB	KMM	MM

STATE OF CONNECTICUT
MARK MALOUF
PE 27715
LICENSED
PROFESSIONAL ENGINEER
AUGUST 19, 2019

TRANSCEND WIRELESS / T-MOBILE

TITLE SHEET

MEI PROJECT ID	SHEET NUMBER	REV.
CT05213G-19V0	T01	0

GENERAL NOTES

1. STRUCTURAL MODIFICATIONS HAVE BEEN DESIGNED IN CONFORMANCE WITH THE NOTED BUILDING CODE & STANDARD. MATERIALS, FABRICATION, INSTALLATION, AND ALL OTHER SERVICES PROVIDED BY THE CONTRACTOR SHALL CONFORM TO THE NOTED CODES / STANDARDS AND THE CONTRACT SPECIFICATIONS.
2. SOURCE DATA REGARDING SUBJECT STRUCTURE HAVE BEEN OBTAINED FROM SUPPLIED / OBTAINED DOCUMENTS. ACTUAL SITE DIMENSIONS SHOULD BE DETERMINED / VERIFIED PRIOR TO FABRICATION OF ANY MATERIAL OR PROVISION FOR FIELD ADAPTATION SHOULD BE MADE. THIS DESIGN IS BEING PROVIDED WITHOUT A CONDITION ASSESSMENT BY THE ENGINEER. CONTRACTOR SHALL PERFORM A COMPLETE CONDITION ASSESSMENT PRIOR TO ORDERING ANY REINFORCING MATERIALS AND NOTIFY ENGINEER OF ANY CONDITION THAT WOULD AFFECT THE DESIGN OR THE WORK SPECIFIED. ANY CHANGES, DISCREPANCIES &/OR MODIFICATIONS THAT MAY BE REQUIRED DUE TO THE EXISTING CONDITIONS SHALL NEED TO BE RESOLVED BEFORE PROCEEDING WITH THE WORK.
3. ALL CONSTRUCTION WORK SHALL BE PERFORMED AND INSTALLED BY A CONTRACTOR WITH MIN. 5 YEARS EXPERIENCE IN SIMILAR WORK. ALL WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER IN ACCORDANCE WITH ACCEPTED CONSTRUCTION AND INDUSTRY PRACTICE.
4. CONTRACTOR SHALL PERFORM A SITE VISIT TO CONFIRM RELEVANT EXISTING STRUCTURE DIMENSIONS, PROPOSED REINFORCING DIMENSIONS, CLEARANCES AND DETERMINE ANY INTERFERENCES, SITE CONSTRAINTS, UTILITIES AND ALL OTHER INFORMATION NECESSARY TO PERFORM THE WORK. THE CONTRACTOR SHALL NOT START FABRICATION OR CONSTRUCTION PRIOR TO PERFORMING THIS SITE VISIT AND VALIDATING THE INFORMATION ON THESE DRAWINGS AND ANY ADDITIONAL INFORMATION REQUIRED TO BID AND TO SUCCESSFULLY PERFORM THE WORK.
5. MATERIAL QUANTITIES AND LENGTH ARE FOR BIDDING PURPOSE - CONTRACTOR TO BE RESPONSIBLE FOR REQUIRED QUANTITIES AND PROPER FIT AND CLEARANCES OF NEW MATERIAL.
6. ALL MATERIAL SPECIFIED MUST BE NEW AND FREE OF ANY DEFECTS. ANY MATERIAL SUBSTITUTIONS, INCLUDING BUT NOT LIMITED TO ALTERED SIZES AND/OR STRENGTHS, MUST BE APPROVED BY THE OWNER AND ENGINEER IN WRITING PRIOR TO FABRICATION / ORDERING / INSTALLATION. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE, REPAIR AND REPLACEMENT, SHALL BE NOTED. COSTS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING REVIEW & RE-DESIGN COSTS) SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. ALL PERMITS, LICENSES, APPROVALS, AND OTHER REQUIREMENTS FOR CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR OR AS DESIGNATED BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AMPLE NOTICE TO BUILDING INSPECTION DEPARTMENT TO SCHEDULE ANY REQUIRED INSPECTIONS.
8. CONTRACTOR, INCLUDING LOWER TIER CONTRACTORS, SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR MEANS AND METHODS OF CONSTRUCTION AND OF JOB SITE CONDITIONS DURING THE CONSTRUCTION WORK, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY AND INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
9. CONTRACTOR IS RESPONSIBLE FOR ENGAGING A MODIFICATION INSPECTOR AT THE TIME OF AWARD TO COORDINATE AN INSPECTION SCHEDULE AND ENSURE PROPER DOCUMENTATION IS RETAINED THROUGHOUT THE PROJECT. FOUNDATION WORK REQUIRES INSPECTION PRIOR TO THE CONCRETE POUR AND MAY INVOLVE A SEPARATE INSPECTION VISIT. REFER TO TABLE FOR MODIFICATION INSPECTION CHECKLIST. CONTACT ENGINEER TO OBTAIN PRICING TO COMPLETE FINAL AND/OR FOUNDATION INSPECTION SERVICES, IF NOT ALREADY COORDINATED WITH THE OWNER / CARRIER. INSTALLATION OF PROPOSED LOADING PRIOR TO COMPLETION OF POST MODIFICATION INSPECTION IS PROHIBITED WITHOUT PRIOR APPROVAL FROM OWNER AND ENGINEER OF RECORD.
10. EXISTING STRUCTURE IS ASSUMED TO BE IN GOOD CONDITION AND FREE FROM STRUCTURAL DEFECTS. AT MINIMUM ANSI/TIA-222 RECOMMENDED INSPECTIONS AND ALL MAINTENANCE TYPE & DEFICIENCY REPAIR WORK IS ASSUMED COMPLETED. INSPECTION & MAINTENANCE OF NEW REINFORCEMENTS SHALL BE IMPLEMENTED SUCH AS TO AVOID ANY DETERIORATION OR CORROSION OF REINFORCEMENT.
11. REFER TO OWNER REQUIREMENTS FOR NEW MEMBERS PAINT, OTHERWISE PAINT NEW MEMBERS WITH A FINISH COAT OF ACRYLIC PAINT TO MATCH EXISTING PAINT AT THAT ELEVATION.
12. ALL EXISTING PAINTED GALVANIZED SURFACES DAMAGED DURING REHAB WORK SHALL BE WIRE BRUSHED CLEAN, REPAIRED BY COLD GALVANIZING BRUSH APPLIED PAINT (ZRC OR EQUAL), AND REPAINTED TO MATCH THE EXISTING FINISH (AS APPLICABLE).

INSTALLATION NOTES

1. ALL INSTALLATION PROCEDURES, SAFEGUARDS AND MEANS AND METHODS OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ALL WORK SHALL FOLLOW SAFE WORK PRACTICES WITH APPROPRIATE FALL PROTECTION AND SHALL BE PERFORMED IN ACCORDANCE WITH ANSI/ASSE A10.48 AND ANSI/TIA-322 OR ANSI/TIA1019-A CONSTRUCTION STANDARDS, OSHA REQUIREMENTS, INDUSTRY PRACTICE AND NATE GUIDELINES. RIGGING PLANS SHALL BE PREPARED IN ACCORDANCE WITH NOTED STANDARDS. ALL ERECTION STRESSES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REVIEWED/PERFORMED BY A COMPETENT PROFESSIONAL EXPERIENCED IN SIMILAR WORK.
2. MINIMUM RECOMMENDED WEATHER CONDITION THAT INSURES A SAFE WORKING CONDITION SHOULD BE OBSERVED: WIND SPEED NOT TO EXCEED 10-15 MPH AT GROUND LEVEL, NO THUNDERSTORMS FORECASTED, AND WITH TOWER STEEL TEMPERATURE BETWEEN 20 F & 105 F. FOLLOW ALL APPLICABLE INDUSTRY AND OSHA SAFETY GUIDELINES.
3. CONTRACTOR SHALL WORK WITHIN THE LIMITS OF THE SITE COMPOUND/ OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION.
4. FAA / FCC FILING AND LIGHTING MAY BE REQUIRED. ALL GOVERNMENTAL REGULATORY DETERMINATIONS AND FILINGS ARE TO BE COMPLIED WITH AND SHALL BE BY OTHERS.
5. TOWER SHALL BE PROPERLY BRACED AND CARE SHALL BE TAKEN IN THE REMOVAL AND REPLACEMENT OF ANY TOWER MEMBER IN ACCORDANCE WITH RECOGNIZED INDUSTRY STANDARDS AND PROCEDURES.
6. ALL PRECAUTIONS AND EFFORTS SHALL BE TAKEN TO INSURE THE STRUCTURE STABILITY DURING THE MODIFICATIONS WORK. BRACING MEMBERS / FRAMES WITH CAPACITY MATCHING MEMBERS BEING WORKED ON SHALL BE REQUIRED AND USED. CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY GUYING, LOCAL AND GLOBAL SHORING OF THE STRUCTURE AND ALL SHORING OF SURROUNDING BUILDINGS, PADS, AND OTHER OUTDOOR SITE OBSTRUCTIONS.
7. IN AREAS TO BE MODIFIED, CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY REMOVING ANY COAXES, T-BRACKETS, MOUNTS, OR ANY OTHER APPURTENANCES INTERFERING WITH THE WORK. ALL APPURTENANCES MUST BE REPLACED AND/OR RESTORED TO ORIGINAL LOCATION. AS APPLICABLE, RE-WORK ATTACHMENTS THAT REQUIRE MODIFICATIONS TO PROPERLY FIT MODIFIED MEMBERS. THESE CUSTOMIZATIONS ARE TO BE DESIGNED BY OTHERS AND MAINTAIN ORIGINAL CAPACITY. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE OWNER / CARRIER IN WRITING.
8. CAULKING SHALL BE PROVIDED AROUND PERIMETER OF ALL MODIFICATION MEMBERS TO ENSURE COMPLETE SEAL BETWEEN EXISTING STRUCTURE AND REINFORCING MEMBERS IN FULL CONTACT WITH EXISTING STEEL. SEALANT IS TO BE EXTERIOR GRADE, PAINTABLE SILICONE CAULKING AS MANUFACTURED BY DOW OR EQUIVALENT.
9. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL ASSOCIATED HARDWARE SHALL NOT BE IMPEDED OR MODIFIED WITHOUT THE WRITTEN CONSENT OF THE OWNER.
10. ALL SAFETY EQUIPMENT SHALL BE INSPECTED ACCORDING TO ALL OSHA AND INDUSTRY SCHEDULED INTERVALS AND ALL INSPECTIONS SHALL BE DOCUMENTED PER APPLICABLE CODES AND STANDARDS.
11. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES. ALL BOLTS AT EVERY CONNECTION SHALL BE INSTALLED SNUG FIT UNTIL THE SECTION IS FULLY COMPACTED, AND THEN TIGHTENED ADDITIONALLY IN ACCORDANCE WITH THE AISC "TURN-OF-THE-NUT" METHOD. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.
12. BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETERS SHALL BE TENSIONED 1/3 TURN BEYOND SNUG FIT. BOLT LENGTHS OVER 4 DIAMETERS SHALL BE 1/2 TURN BEYOND SNUG TIGHT.
13. NO WELDING, TORCH CUTTING, OR OPEN FLAME OF ANY TYPE IS PERMITTED ON THIS STRUCTURE AND ON THIS CONSTRUCTION SITE UNLESS DIRECTLY SPECIFIED WITHIN THESE DRAWINGS.
14. ALL MANUFACTURERS HARDWARE AND ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED. DEVIATION FROM THE INSTRUCTIONS IS UNACCEPTABLE AND REQUIRES WRITTEN APPROVAL FROM THE ENGINEER.
15. FOR ANY STEEL MEMBER DAMAGED DURING MODS WORK AND AFTER ANY FIELD HOLE PUNCHING/DRILLING OR CUTTING HAS BEEN COMPLETED, WIRE BRUSH CLEAN THESE SURFACES AND REPAIR USING COLD GALVANIZING BRUSH APPLIED PAINT (TWO COATS OF ZRC OR EQUAL), AND REPAINT TO MATCH THE EXISTING FINISH (AS APPLICABLE).
16. UPON COMPLETION OF ALL WORK, THE SITE SHALL BE CLEANED OF ALL DEBRIS AS REQUIRED. ANY SURPLUS MATERIALS NOT REMOVED FROM THE SITE SHALL BE NEATLY STORED IN AN AREA DESIGNATED BY THE OWNER REPRESENTATIVE.

STEEL / FABRICATION NOTES

1. ALL STEEL FABRICATION AND INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL AND SPECIFICATIONS "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
2. THESE DRAWINGS SHOW RELATED DETAILS BUT ARE NOT SHOP DRAWINGS. SHOP DRAWINGS SHALL BE PREPARED IN ACCORDANCE WITH AISC DETAILING REQUIREMENTS. DIMENSIONAL TOLERANCES SHALL BE IN ACCORDANCE WITH THE AISC CODE OF STANDARD PRACTICE AND ASTM A7 REQUIREMENTS.
3. ALL NEW MEMBERS, UNLESS NOTED OTHERWISE, SHALL MAINTAIN THE EXISTING MEMBER WORK LINES AND NOT INTRODUCE ECCENTRICITIES INTO THE STRUCTURE.
4. ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL, AISC 360-10 LRFD.
5. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS AND BE IN ACCORDANCE WITH AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE-STEEL"(LATEST EDITION).
6. FOR ALL WELDING, UNLESS NOTED OTHERWISE, USE E70XX ELECTRODES FOR SMAW PROCESS AND E7XT-XX ELECTRODES FOR FCAW PROCESS.
7. FOR WELDING ON MONOPOLE SHAFTS, USE 80 KSI LOW HYDROGEN ELECTRODES. ELECTRODES SHALL BE APPROPRIATE FOR THE WELDING POSITION REQUIRED TO MAKE THE JOINT.
8. COOLING EFFECTS OF THE WELDED MATERIAL SHALL BE TAKEN INTO CONSIDERATION (I.E. EXPANSION OF HOT MATERIAL AND CONTRACTION OF COOLED MATERIAL).
9. ALL NEW STEEL SHALL BE HOT-DIPPED GALVANIZED PER ASTM A123, ASTM A153/A153M, OR ASTM A653 G90, AS APPLICABLE FOR FULL WEATHER PROTECTION. FOR HIGH STRENGTH STEEL FASTENERS WHERE HOT-DIPPED GALVANIZING IS NOT PERMITTED, DACROMET F1136 GRADE 3 COATING (OR ENGINEER APPROVED EQUIVALENT) SHALL BE USED.
10. PRIOR TO GALVANIZING, ALL FABRICATED STEEL SHALL BE THOROUGHLY SHOP INSPECTED AND QUANTITIES COUNTED ACCORDING TO THE BEST QUALITY CONTROL AND INSPECTION METHODS.
11. MATERIAL MAY BE CUT BY SHEARING, SAWING, OR CUTTING WITH A ROUTER OR GAS CUT. MATERIAL GREATER THAN 1/2" THICKNESS SHALL NOT BE SHEARED. THICK MATERIAL GREATER THAN 2" SHALL HAVE EDGES GRINDED PRIOR TO WELDING AND HAVE THE CHARPY V-NOTCH TEST CERTIFIED FOR ALL OF ITS THICKNESS.
12. CUT EDGES SHALL BE TRUE AND SMOOTH, AND FREE FROM EXCESSIVE BURRS AND RAGGED BREAKS. SHEARED EDGES OF THICK PLATES SHALL BE PLANED TO A DEPTH OF 1/4". RE-ENTRANT CUTS SHALL BE AVOIDED. IF USED, THEY SHALL BE FILLETED BY DRILLING PRIOR TO CUTTING.
13. ALL BOLTS SHALL HAVE WASHERS AND ANCO LOCKNUTS AND BE NEW HIGH STRENGTH GALVANIZED BOLTS AS NOTED BELOW.
14. ALL BOLT ASSEMBLIES FOR STRUCTURAL MEMBERS WILL REQUIRE LOCKING DEVICES TO BE INSTALLED IN CONFORMANCE WITH NOTED STANDARDS/SPECIFICATIONS.
15. THE FINISHED DIAMETER OF BOLT HOLES SHALL NOT BE MORE THAN 1/16" LARGER THAN THE NOMINAL BOLT DIAMETER AND SHALL NOT BE FLAME CUT THROUGH STEEL, UNLESS OTHERWISE NOTED.
16. ANY BOLT REMOVED FROM EXISTING TOWER STRUCTURE SHALL BE REPLACED WITH A NEW ASTM A325 HIGH STRENGTH BOLT OF EQUAL DIAMETER SIZE AND OF SUFFICIENT LENGTH TO EXCLUDE THE THREADS, UNLESS NOTED OTHERWISE.
17. ALL BOLT HOLES EDGE DISTANCES SHALL BE 1 1/2" UNLESS OTHERWISE NOTED.
18. FIELD PUNCH / DRILL HOLES AS REQUIRED FOR ACCURATE FIT OF MODIFICATION MEMBER.
19. NEW STEEL MATERIAL SHALL BE MILL CERTIFIED AND SHALL CONFORM TO THE FOLLOWING STEEL SPECIFICATIONS UNLESS NOTED OTHERWISE:

MATERIAL	ASTM SPECIFICATIONS
U-BOLTS	A193 B7, A449 OR SAE J429 (GR. 5 - 1/2" DIA. & GR. 8 - 5/8" DIA.)
BOLTS - 1/2" DIA. & GREATER	A325 TYPE X
BOLTS - 1/2" DIA.	SAE J429 GRADE 5 TYPE X
BOLTS - 3/8" DIA.	A307 OR SAE J429 GRADE 5
ANGLES, GUSSET, AND TAB PLATES	A36 (MIN. 36.0 KSI YIELD)

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NO.	DATE	REVISIONS	DRAWN	ENG'D.	APP'D.
0	08/19/19	ISSUED FOR CONSTRUCTION	BDB	KMM	MM

STATE OF CONNECTICUT
MARK MALOUF
No. 17715
LICENSED PROFESSIONAL ENGINEER
AUGUST 19, 2019

TRANSCEND WIRELESS / T-MOBILE
TECHNICAL SPECIFICATION NOTES

MEI PROJECT ID	SHEET NUMBER	REV.
CT05213G-19V0	T02	0

BOLT TIGHTENING PROCEDURE

1. TIGHTEN BOLTS BY AISC "TURN OF THE NUT" METHOD USING THE CHART BELOW:

   BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETERS:
   + 1/3 TURN BEYOND SNUG TIGHT

   BOLT LENGTHS OVER FOUR AND UP TO EIGHT DIAMETERS:
   + 1/2 TURN BEYOND SNUG TIGHT

2. ALL ONE-SIDED BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS

3. SPLICE BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8(D)(1) OF THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS AS FOLLOWS:

   "FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND BE TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8(D)(1) THROUGH 8(D)(4).

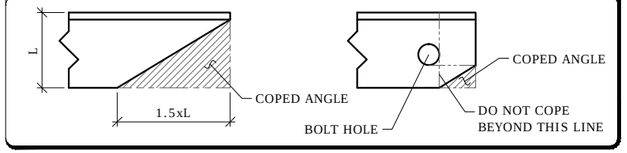
   8(D)(1) TURN-OF-THE-NUT TIGHTENING:

   BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION. SNUG TIGHT IS DEFINED AS THE TIGHTNESS THAT EXISTS WHEN THE PLIES OF A JOINT ARE IN FIRM CONTACT. THIS MAY BE OBTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A MAN USING AN ORDINARY SPUD WRENCH. SNUG TIGHTENING SHALL PROGRESS SYSTEMATICALLY...UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION, ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE. DURING THE TIGHTENING OPERATION, THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.

BEFORE 1/3 TURN

AFTER 1/3 TURN

ALLOWABLE ANGLE COPE

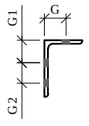


1. ALL DIMENSIONS REPRESENTED IN THE ABOVE TABLES ARE AISC MINIMUM REQUIREMENTS. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS IN FIELD AND NOTIFY ENGINEER IF DISTANCES ARE LESS THAN THOSE PROVIDED.

2. THE DIMENSIONS PROVIDED ARE MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS OR PROPOSED MEMBERS WITHIN THESE DRAWINGS MAY VARY FROM THE AISC MINIMUM REQUIREMENTS.

USUAL GAGES FOR ANGLES IN INCHES

LEG	8	7	6	5	4	3 1/2	3	2 1/2	2	1 3/4	1 1/2	1 3/8	1 1/4	1
G	4 1/2	4	3 1/2	3	2 1/2	2	1 3/4	1 3/8	1 1/8	1	7/8	7/8	3/4	5/8
G1	3	2 1/2	2 1/4	2										
G2	3	3	2 1/2	1 3/4										



POST-MODIFICATION INSPECTION NOTES

GENERAL

THE POST-MODIFICATION INSPECTION (PMI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS PERFORMED IN ACCORDANCE WITH THE MODIFICATION DESIGN DRAWINGS BY THE ENGINEER OF RECORD (EOR).

ALL PMI'S SHALL BE CONDUCTED BY A QUALIFIED TOWER INSPECTION VENDOR (QTIV) THAT IS APPROVED TO PERFORM ELEVATED WORK AND HAS QUALIFIED RELATED EXPERIENCE.

TO ENSURE THAT THE REQUIREMENTS OF THE PMI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE PMI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS APPROVAL IS RECEIVED TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO, AT A MINIMUM:
- REVIEW THE REQUIREMENTS OF THE PMI CHECKLIST
- WORK WITH THE PMI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE PMI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE PMI CHECKLIST.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A PMI REPORT:
- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE PMI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND PMI INSPECTOR ON-SITE DURING THE PMI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL PMI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE PMI CAREFULLY TO ENDURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE PMI INSPECTOR IS ON SITE.

CORRECTION OF FAILING PMI'S

IF THE POST-MODIFICATION INSTALLATION WOULD FAIL THE PMI ("FAILED MI"), THE GC SHALL WORK TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT PMI.
- OR, WITH OWNER'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

REQUIRED PHOTOS

BETWEEN THE GC AND THE PMI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE PMI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
  - PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION.
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
- FINAL IN-FIELD CONDITION

SPECIAL INSPECTION & PMI CHECKLIST

REQ'D	REPORT ITEM	BRIEF DESCRIPTION
	PRE-CONSTRUCTION	
X	MI CHECKLIST	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT
X	EOR APPROVED SHOP DRAWINGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE APPROVED SHOP DRAWINGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PREFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL CERT. REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTER ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	NDE REPORT OF MONOPOLE BASE PLATE	A NDE OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
	CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH ACI318 AND MANUFACTURERS REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	BASE PLATE GROUT VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT VERIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH MEI SPECS FOR INCLUSION IN THE MI REPORT.
N/A	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS. A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
N/A	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE AS PART OF PLUMB AND TENSION PROCEDURE FOR INCLUSION IN THE MI REPORT.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQ'D AND APPR'D BY THE ENGINEER OF RECORD DUE TO FIELD CONDITIONS.
	POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OF RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
N/A	POST INSTALLED ANCHOR ROD PULL-OUT TESTING	POST-INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH MANUF. REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
ADDITIONAL TESTING AND INSPECTIONS:		
NOTES: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT		

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HARWINTON SNET_1 #CT11358A
100 FT GUYED TOWER
WILDCAT HILL ROAD, HARWINTON, CT 06791
LAT: 41-45-24.48 N - LON: 73-05-42.72 W

T-Mobile

NO.	DATE	REVISIONS	DRAWN	ENG'D.	APP'D.
0	08/19/19	ISSUED FOR CONSTRUCTION	BDB	KMM	MM

STATE OF CONNECTICUT
MARK MALOUF
No. 17715
REGISTERED
PROFESSIONAL ENGINEER
AUGUST 19, 2019

TRANSCEND WIRELESS / T-MOBILE

TECH. SPEC. NOTES, POST-MOD INSPECTION, AND CHECKLIST

MEI PROJECT ID	SHEET NUMBER	REV.
CT05213G-19V0	T03	0

TOWER HEIGHT & TYPE:	100 FT GUYED TOWER
SITE NAME:	HARWINTON SNET_1 #CT11358A
SITE LOCATION:	LITCHFIELD COUNTY, HARWINTON, CN 06791
TOWER MANUF. / MODEL:	TRYLON MANUFACTURING CO. / T MT-3604-100
ORIGINAL DESIGN CRITERIA:	TIA/EIA-222-UNKNOWN
ANALYSIS CRITERIA:	ANSI/TIA-222-G-4 117 (91) / 50 MPH + 0.00"/0.75" ICE
SITE SPECIFICATIONS:	CLASS II / EXP. B / TOPO. 1 / Ss < 1.0

PLUMB AND TENSION ALL GUY WIRES IN ALL DIRECTIONS.
REFER 202 AND 203 FOR APPURTENACES SCHEDULE.
REFER 501 FOR GUY TENSION VARIATION TABLE.
REFER 502 FOR OVERALL GUY ANCHOR LAYOUT.
REFER 503 FOR SCHEMATIC TRANSMISSION LINE LAYOUT.
PERFORM MAINTENANCE WORK AS REQUIRED TO BRING STRUCTURE INTO GOOD OPERATIONAL CONDITION.

*NOTE:
REWORK ALL EXISTING APPURTENANCES OR Tx-LINES WHICH MAY INTERFERE WITH THE NEW STRENGTHENING MODIFICATIONS.

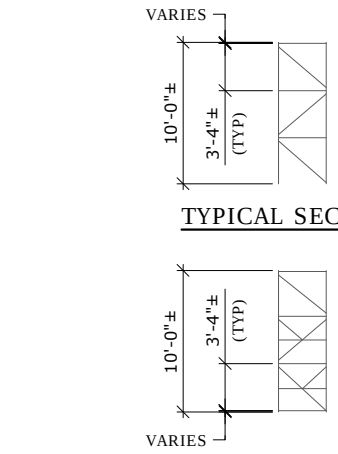
REFER SHEET T02 - T03 FOR TECH. SPEC. NOTES

MODIFICATION LEGEND

RANGE OF NEW KICKER ANGLE REINFORCEMENT

RANGE OF NEW DIAGONAL ANGLE REINFORCEMENT

RANGE OF NEW MID HORIZ. ANGLE REINFORCEMENT



TYPICAL SECTIONS

TYPICAL SECTIONS
(@ TOWER BASE)

TOWER X-SECTION

EXISTING MEMBER SCHEDULE

SECTION NUMBERS	NEW MEMBER SCHEDULE
LEGS	NEW MID HORIZ. ANGLE REINF.
36/35 KSI	
DIAGONALS	NEW DIAGONAL ANGLE REINFORCEMENT
36 KSI	
HORIZONTALS	
36 KSI	
TOP GIRTS	NEW KICKER ANGLE REINFORCEMENT
36 KSI	
BOTTOM GIRTS	
36 KSI	

101 **ELEVATION: 100 FT GUYED TOWER**
SCALE: 1" = 10'-0"

TRANSCEND WIRELESS / T-MOBILE

TOWER MODIFICATION SCHEDULE

MEI PROJECT ID: CT05213G-19V0 | SHEET NUMBER: S01 | REV.: 0

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ALL SCALES SHOWN ARE BASED ON DRAWING SIZE OF 11" x 17"

AUGUST 19, 2019

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REFER SHEET T02 - T03 FOR TECH. SPEC. NOTES

TOWER HEIGHT & TYPE:	100 FT GUYED TOWER
SITE NAME:	HARWINTON SNET_1 #CT11358A
SITE LOCATION:	LITCHFIELD COUNTY, HARWINTON, CN 06791
TOWER MANUF. / MODEL:	TRYLON MANUFACTURING CO. / T MT-3604-100
ORIGINAL DESIGN CRITERIA:	TIA/EIA-222-UNKNOWN
ANALYSIS CRITERIA:	ANSI/TIA-222-G-4 117 (91) / 50 MPH + 0.00"/0.75" ICE
SITE SPECIFICATIONS:	CLASS II / EXP. B / TOPO. 1 / Ss < 1.0

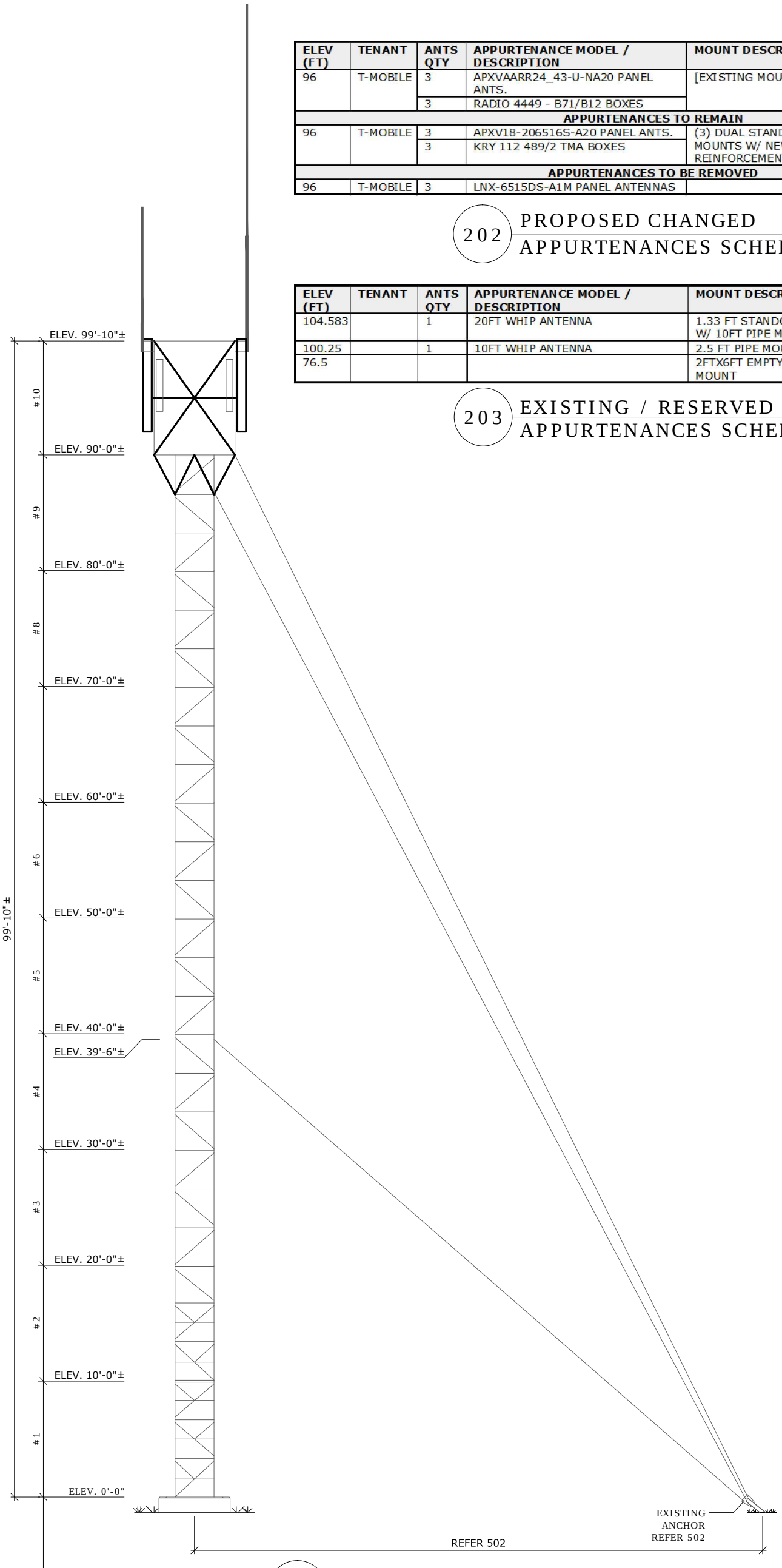
REFER 101 FOR TOWER MODIFICATION SCHEDULE.

ELEV (FT)	TENANT	ANTS QTY	APPURTENANCE MODEL / DESCRIPTION	MOUNT DESCRIPTION	LINES QTY	LINE SIZE & LOCATION
96	T-MOBILE	3	APXVAARR24_43-U-NA20 PANEL ANTS.	[EXISTING MOUNTS]	1	1-3/8" (HCS 6X12) HYBRID CABLE (FZ)
		3	RADIO 4449 - B71/B12 BOXES			
APPURTENANCES TO REMAIN						
96	T-MOBILE	3	APXV18-206516S-A20 PANEL ANTS.	(3) DUAL STAND-OFF MOUNTS W/ NEW REINFORCEMENT	6	1 1/4" – (FZ)
		3	KRY 112 489/2 TMA BOXES			
APPURTENANCES TO BE REMOVED						
96	T-MOBILE	3	LNX-6515DS-A1M PANEL ANTENNAS		6	1 5/8" – (FZ)

202 PROPOSED CHANGED APPURTENANCES SCHEDULE

ELEV (FT)	TENANT	ANTS QTY	APPURTENANCE MODEL / DESCRIPTION	MOUNT DESCRIPTION	LINES QTY	LINE SIZE & LOCATION
104.583		1	20FT WHIP ANTENNA	1.33 FT STANDOFF W/ 10FT PIPE MOUNT	1	0.40" BLACK CABLE – (FZ)
100.25		1	10FT WHIP ANTENNA	2.5 FT PIPE MOUNT	1	1-5/8" – (FZ)
76.5				2FTX6FT EMPTY FACE MOUNT		

203 EXISTING / RESERVED APPURTENANCES SCHEDULE



201 ELEVATION: 100 FT GUYED TOWER

SCALE: 1" = 10'-0"

TRANSCEND WIRELESS / T-MOBILE

TOWER APPURTENANCES SCHEDULE

MEI PROJECT ID: CT05213G-19V0 | SHEET NUMBER: S02 | REV.: 0

AUGUST 19, 2019

ALL SCALES SHOWN ARE BASED ON DRAWING SIZE OF 11" x 17"

NO.	DATE	REVISIONS
0	08/19/19	ISSUED FOR CONSTRUCTION

DRAWN: BDB | ENG'D: KMM | APP'D: MM

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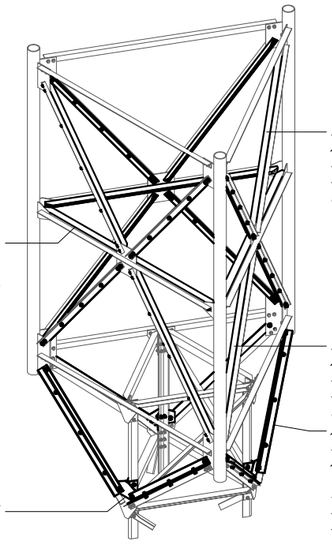


REINFORCE EXISTING DIAGONAL ANGLE WITH NEW ANGLE STITCH BOLTED ALONG ENTIRE MEMBER REFER TO 302, 304, AND 404 FOR DETAILS (TYPICAL ALL UPPER DIAGONALS)

REINFORCE EXISTING MID HORIZONTAL ANGLE WITH NEW ANGLE STITCH BOLTED ALONG ENTIRE MEMBER REFER TO 302, 303, AND 403 FOR DETAILS (TYPICAL 3X)

REINFORCE EXISTING DIAGONAL ANGLE WITH NEW ANGLE STITCH BOLTED ALONG ENTIRE MEMBER REFER TO 302, 304, AND 404 FOR DETAILS (TYPICAL ALL LOWER DIAGONALS)

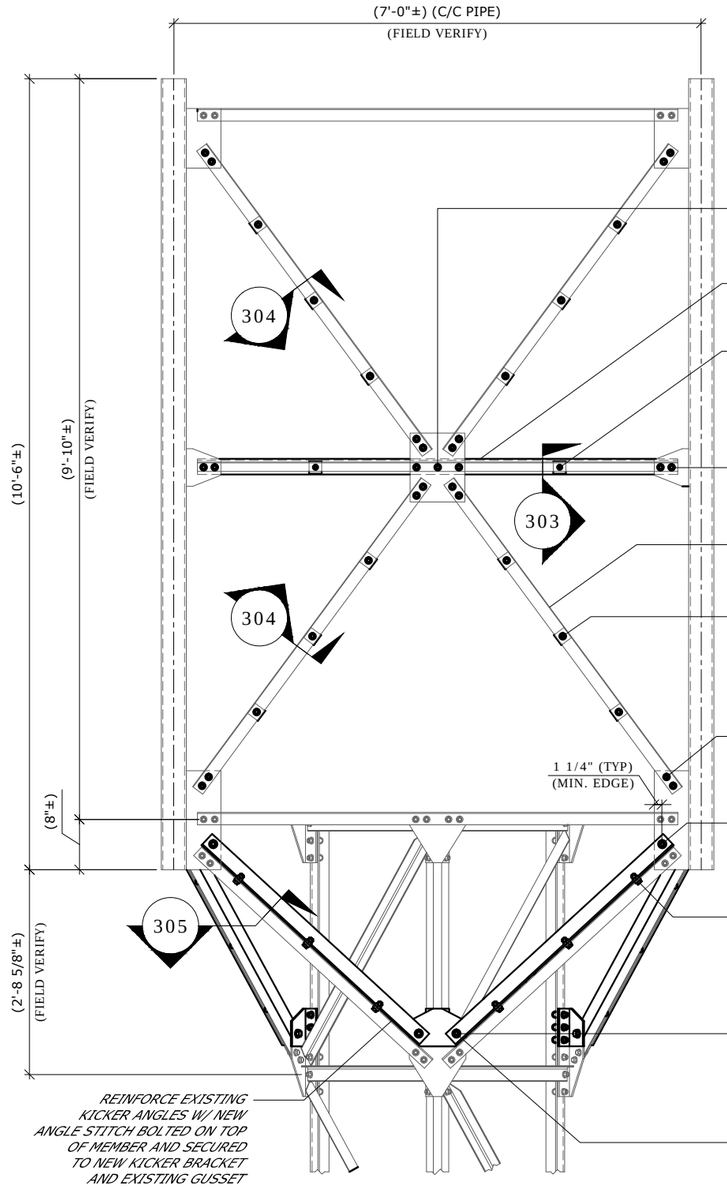
AFTER INSTALLING NEW KICKER BRACKETS, ADD NEW REINFORCEMENT ANGLE TO TOP OF EXISTING KICKER ANGLE, CUT FOR FIT AND SECURE ENDS. ONCE SECURED FIELD DRILL AND INSTALL STITCH BOLTS ALONG MEMBER. REFER TO 302, 305, AND 402 FOR DETAILS

INSTALL NEW KICKER BRACKET ABOVE EXISTING BRACKET AND SECURE W/ NEW BOLTS REFER TO 302 AND 401 FOR DETAILS (TYP 3X)

301 ISOMETRIC VIEW: NEW TOWER REINFORCEMENT

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

REFER SHEET T02 - T03 FOR TECH. SPEC. NOTES



NOTE:
LAYOUTS WERE CREATED FROM LIMITED MAPPING AND PHOTOS PROVIDED, FIELD VERIFICATION OF FIT OF ALL MEMBERS IS RECOMMENDED PRIOR TO INSTALLATION. IF ANY ISSUES ARE FOUND THAT INTERFERE WITH ASSEMBLY INSTALLATION DURING VERIFICATION PROCESS PLEASE CONTACT ENGINEER AND SUPPLY APPLICABLE INFORMATION W/ PHOTOS.

REPLACE BOLTS AT CENTER OF EXISTING HORIZONTAL W/ NEW LONGER 1/2" DIA. BOLTS W/ ANCO LOCKNUTS AND WASHERS. (TYPICAL EACH HORIZONTAL ANGLE)

REINFORCE EXISTING MID HORIZONTALS W/ NEW ANGLE STITCH BOLTED TO BACK OF MEMBER REFER TO 403 FOR DETAILS TYPICAL EACH HORIZONTAL ANGLE)

ONCE NEW REINFORCEMENT ANGLE IS SECURED FIELD DRILL (2) 7/16" DIA. HOLES ALONG ANGLE AND INSTALL NEW 3/8" DIA. STITCH BOLTS W/ ANCO LOCKNUTS AND WASHERS SPACER PLATE REQ'D AT EACH STITCH BOLT (PL 1/4" x 2" SQ. W/ 7/16" DIA. HOLE) (TYPICAL EACH HORIZONTAL ANGLE)

REPLACE BOLTS FIRST, ONE AT TIME, EACH END WITH NEW LONGER 1/2" DIA. BOLTS WITHOUT DISENGAGING MEMBER THEN ADD REINF. MEMBER W/ ANCO LOCKNUTS AND WASHERS. (TYPICAL EACH HORIZONTAL ANGLE)

REINFORCE EXISTING DIAGONALS W/ NEW ANGLE STITCH BOLTED TO BACK OF MEMBER REFER TO 404 FOR DETAILS TYPICAL EACH DIAGONAL ANGLE / U.N.O.)

ONCE NEW REINFORCEMENT ANGLE IS SECURED FIELD DRILL (3) 9/16" DIA. HOLES ALONG ANGLE AND INSTALL NEW 1/2" DIA. STITCH BOLTS W/ ANCO LOCKNUTS AND WASHERS SPACER PLATE REQ'D AT EACH STITCH BOLT (PL 1/4" x 2" SQ. W/ 9/16" DIA. HOLE) (TYPICAL EACH DIAGONAL ANGLE / U.N.O.)

REPLACE BOLTS FIRST, ONE AT TIME, EACH END WITH NEW LONGER 1/2" DIA. BOLTS WITHOUT DISENGAGING MEMBER THEN ADD REINF. MEMBER W/ ANCO LOCKNUTS AND WASHERS. (TYPICAL EACH DIAGONAL ANGLE)

FIELD DRILL 11/16" DIA. HOLE THRU NEW MEMBER AND EXISTING GUSSET AT THIS END ON GAGE OF ANGLE WITH MINIMUM EDGE DISTANCE ON PLATE AS SHOWN. SECURE W/ NEW 5/8" DIA. BOLT W/ ANCO LOCKNUTS AND WASHERS (TYPICAL)

ONCE NEW ANGLE IS SECURED FIELD DRILL (3) 9/16" DIA. HOLES FOR NEW 1/2" DIA. STITCH BOLTS W/ ANCO LOCKNUTS AND WASHERS. USE ADDITIONAL WASHERS AS REQ'D TO ENSURE BEARING BETWEEN MEMBERS. REFER TO 402 FOR SPACING AND DETAILS (TYPICAL EACH KICKER ANGLE / 6 REQ'D TOTAL)

INSTALL NEW KICKER BRACKET ABOVE EXISTING KICKER BRACKET. ALIGN EXTERIOR PLATES AND FIELD DRILL HOLES TO SECURE TO LEG. SECURE W/ NEW 1/2" DIA. BOLT WITH ANCO LOCKNUTS AND WASHERS (TYPICAL EACH LEG) REFER TO 401 FOR DETAILS

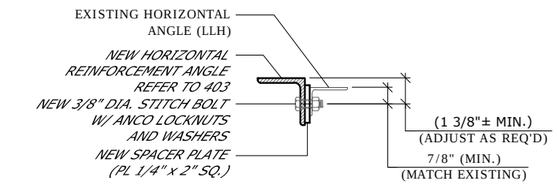
FIELD DRILL 11/16" DIA. HOLE THRU NEW MEMBER AND NEW KICKER BRACKET GUSSET AT THIS END ON GAGE OF ANGLE WITH MINIMUM EDGE DISTANCE ON PLATE AS SHOWN IN DETAIL 401. SECURE W/ NEW 5/8" DIA. BOLT W/ ANCO LOCKNUTS AND WASHERS (TYPICAL)

REINFORCE EXISTING KICKER ANGLES W/ NEW ANGLE STITCH BOLTED ON TOP OF MEMBER AND SECURED TO NEW KICKER BRACKET AND EXISTING GUSSET REFER TO 402 FOR DETAILS (TYPICAL EACH KICKER)

TYPICAL ALL THREE FACES

302 ELEVATION: NEW TOWER REINFORCEMENT

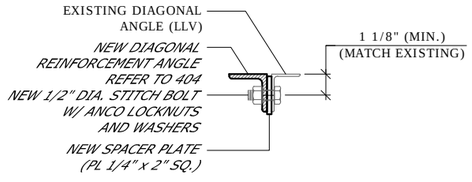
SCALE: 1/2" = 1'-0"



303 SECTION: HORIZ. ANGLE REINFORCMENT

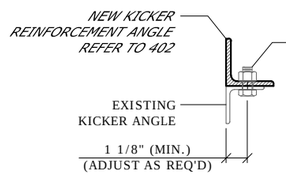
SCALE: 1 1/2" = 1'-0" (TYPICAL EACH ANGLE)

REINFORCEMENT INSTALLATION NOTES:
1. REPLACE EXISTING BOLTS W/ NEW BOLTS W/ ANCO LOCKNUTS AND WASHERS OF SAME DIAMETER.
2. TOWER BAY TO BE ADEQUATELY SUPPORTED W/ TEMPORARY BRACING PRIOR TO REMOVING ANY BOLTS / MEMBERS.
3. EXISTING BOLTS ARE TO BE REMOVED AND REPLACED ONE AT A TIME.
4. WIND SPEED SHOULD NOT TO EXCEED 5-10 MPH AT GROUND LEVEL AND NO THUNDERSTORMS FORECASTED IN ORDER TO ENSURE SAFE WORKING CONDITIONS.
5. TAKE ALL NECESSARY PRECAUTIONS TO RETAIN THE STRUCTURAL INTEGRITY AND STABILITY OF THE TOWER; EXERCISE ALL DUE CAUTION WHILE MODIFYING THE TOWER.
6. TOWER MODIFICATIONS ARE TO BE INSTALLED AND COMPLETED PRIOR TO INSTALLATION OF NEW ANTENNAS AND APPURTENANCES.



304 SECTION: DIAG. ANGLE REINFORCMENT

SCALE: 1 1/2" = 1'-0" (TYPICAL EACH ANGLE)



NOTE:
USE ADDITIONAL WASHERS AS REQ'D TO ENSURE BEARING BETWEEN MEMBERS.

305 SECTION: KICKER ANGLE REINFORCMENT

SCALE: 1 1/2" = 1'-0" (TYPICAL EACH KICKER)

REFER 101 FOR NEW AND EXISTING MEMBER SIZES AND SCHEDULES.

MALOUF ENGINEERING INTERNATIONAL, INC.
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HARWINTON SNET_1 #CT11358A
100 FT GUYED TOWER
WILDCAT HILL ROAD, HARWINTON, CT 06791
LAT: 41-45-24.48 N - LON: 73-05-42.72 W

T-Mobile

NO.	DATE	REVISIONS	DRAWN	ENG'D.	APP'D.
0	08/19/19	ISSUED FOR CONSTRUCTION	BDB	KMM	MM

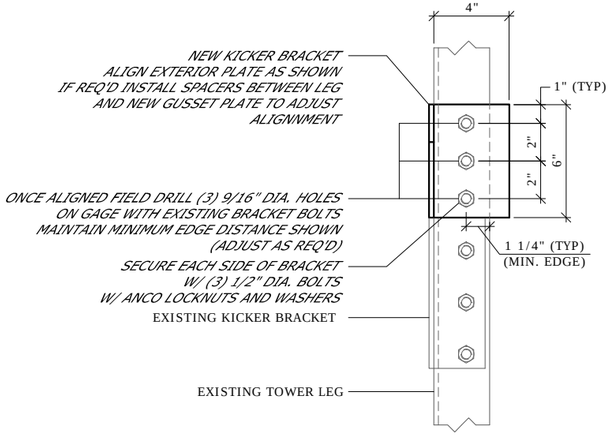
STATE OF CONNECTICUT
MARK MALOUF
No. 17715
LICENSED PROFESSIONAL ENGINEER
AUGUST 19, 2019

TRANSCEND WIRELESS / T-MOBILE

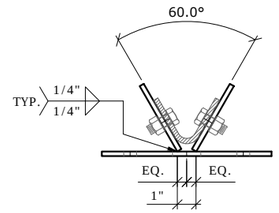
NEW TOWER REINFORCEMENT VIEWS

MEI PROJECT ID	SHEET NUMBER	REV.
CT05213G-19V0	S03	0

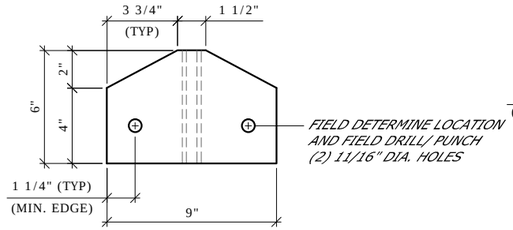
REFER SHEET T02 - T03 FOR TECH. SPEC. NOTES



NEW KICKER BRACKET
(ELEVATION)



NEW KICKER BRACKET
(PLAN VIEW)



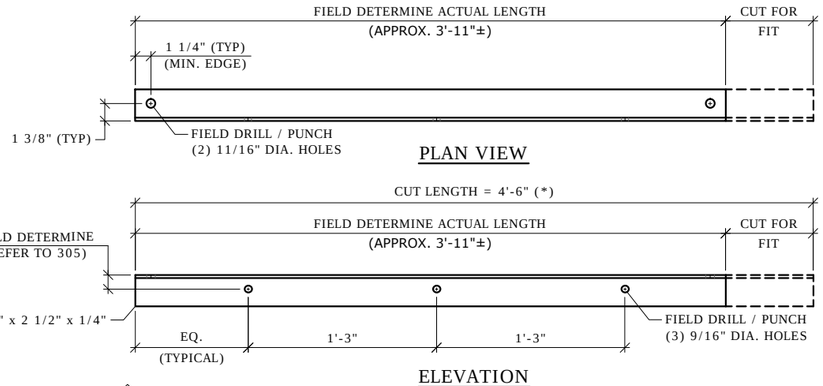
NEW KICKER ANGLE
GUSSET PLATE

401 DETAIL: NEW KICKER BRACKET ASSEMBLY

SCALE: 1 1/2" = 1'-0"

(3 REQ'D TOTAL)

(*) LENGTH APPROX. FOR BIDDING PURPOSES;
FIELD VERIFY / DETERMINE ACTUAL LENGTH.

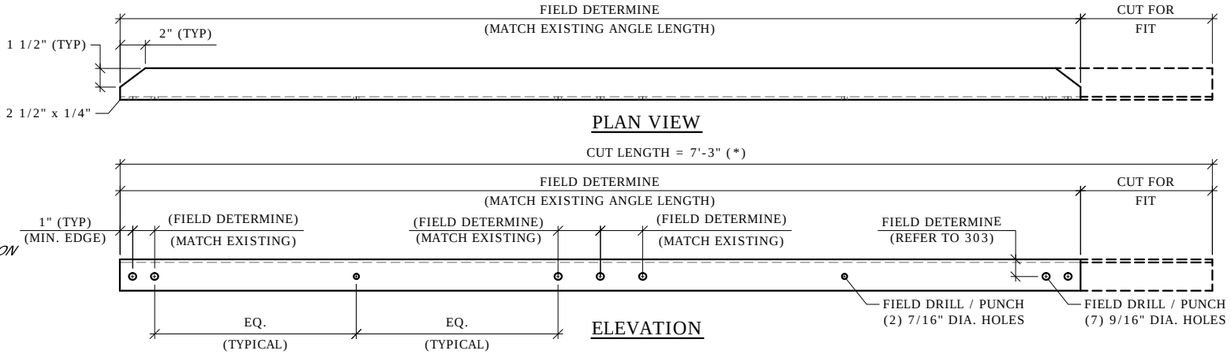


402 DETAIL: NEW KICKER REINFORCEMENT ANGLE

SCALE: 1" = 1'-0"

(6 REQ'D TOTAL)

(*) LENGTH APPROX. FOR BIDDING PURPOSES;
FIELD VERIFY / DETERMINE ACTUAL LENGTH.

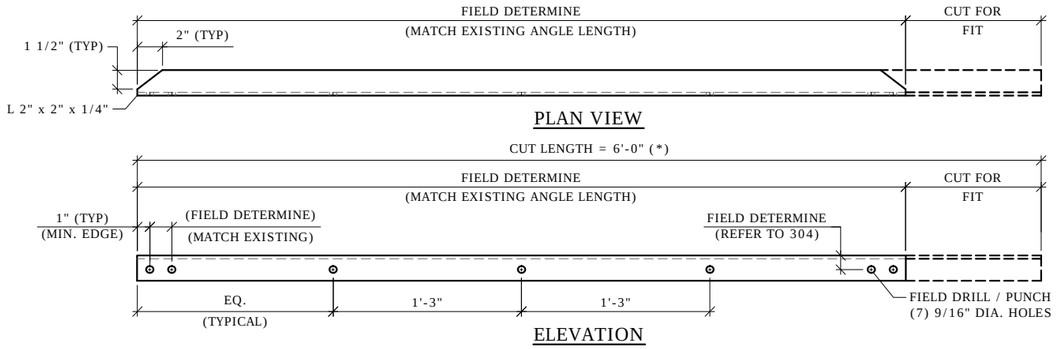


403 DETAIL: NEW HORIZONTAL REINFORCEMENT ANGLE

SCALE: 1" = 1'-0"

(3 REQ'D TOTAL)

(*) LENGTH APPROX. FOR BIDDING PURPOSES;
FIELD VERIFY / DETERMINE ACTUAL LENGTH.



404 DETAIL: NEW DIAGONAL REINFORCEMENT ANGLE

SCALE: 1" = 1'-0"

(12 REQ'D TOTAL)

NOTE:
LAYOUTS WERE CREATED FROM LIMITED MAPPING AND PHOTOS PROVIDED, FIELD VERIFICATION OF FIT OF ALL MEMBERS IS RECOMMENDED PRIOR TO INSTALLATION. IF ANY ISSUES ARE FOUND THAT INTERFERE WITH ASSEMBLY INSTALLATION DURING VERIFICATION PROCESS PLEASE CONTACT ENGINEER AND SUPPLY APPLICABLE INFORMATION W/ PHOTOS.

REFER 101 FOR NEW AND EXISTING MEMBER SIZES AND SCHEDULES.

MALOUF ENGINEERING INTERNATIONAL, INC.
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T-Mobile

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STATE OF CONNECTICUT
MARK MALOUF
LIC. NO. 17715
REGISTERED
PROFESSIONAL ENGINEER
AUGUST 19, 2019

TRANSCEND WIRELESS / T-MOBILE
NEW TOWER REINFORCEMENT DETAILS

MEI PROJECT ID	SHEET NUMBER	REV.
CT05213G-19V0	S04	0

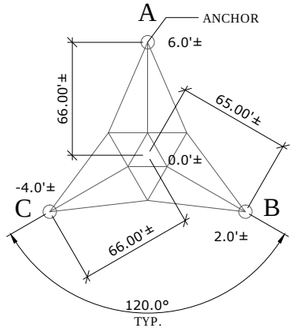
REFER SHEET T02 - T04 FOR TECH, SPEC, NOTES

						TEMPERATURE AT TIME OF TENSIONING								
						20 F	30 F	40 F	50 F	60 F	70 F	80 F	90 F	100 F
GUY ELEV. ft.	LEG	GUY GRADE	GUY SIZE in.	H ft.	GUY LENGTH ft.	Initial Tension K	Initial Tension K	Initial Tension K	Initial Tension K	Initial Tension K	Initial Tension K	Initial Tension K	Initial Tension K	Initial Tension K
40.00	A	Miscl	7/16 GR. 180	66.00	72.453	2.401	2.288	2.175	2.063	1.950	1.837	1.725	1.612	1.499
40.00	B	Miscl	7/16 GR. 180	65.00	73.554	2.386	2.277	2.168	2.059	1.950	1.841	1.732	1.623	1.514
40.00	C	Miscl	7/16 GR. 180	66.00	77.642	2.379	2.272	2.164	2.057	1.950	1.843	1.736	1.628	1.521
90.00	A	EHS	1/2	66.00	105.351	2.915	2.859	2.803	2.746	2.690	2.634	2.577	2.521	2.465
90.00	B	EHS	1/2	65.00	107.979	2.917	2.860	2.803	2.747	2.690	2.633	2.577	2.520	2.463
90.00	C	EHS	1/2	66.00	113.471	2.936	2.874	2.813	2.751	2.690	2.629	2.567	2.506	2.444

501 INITIAL GUY TENSION TEMPERATURE VARIATION TABLE

GUY WIRE NOTES:

1. GUY TENSIONS SHOWN ARE INTEGRAL PART OF TOWER DESIGN AND IT IS IMPORTANT TO TENSION WIRES ACCURATELY TO ASSURE PROPER TOWER STIFFNESS.
2. CONTRACTOR SHALL CLEARLY LABEL ALL GUY WIRES TENSIONS AT ANCHORS END INDICATING THE PERCENTAGE OF WIRE BREAKING STRENGTH. CONTACT OWNER FOR LABELING PREFERENCE.
3. CONTRACTOR SHALL TENSION THE GUY WIRES TO WITHIN A RANGE FROM THE NOTED TARGET TENSION WITHIN THE GUY WIRE SCHEDULE TO ±10% OF THE TARGET TENSION FOR WIRES ≤ 1" AND WITHIN ±5% FOR WIRES > 1" IN DIA. CONTRACTOR SHOULD TENSION TO THE UPPER 75TH PERCENTILE OF THE LIMITS.
4. PLUMB TOWER IN CALM WEATHER ONLY SINCE WIND AFFECTS GUY WIRES TENSIONS.
5. TOWER PLUMBING PROCEDURE TO BE IN CONFORMANCE WITH THE TIA-222 STANDARD.



*NOTE: GUY RADIUS AND ELEVATIONS BASED ON TOWER DESIGN DRAWINGS. FIELD VERIFY.

502 PLAN: GUY ANCHOR LAYOUT

SCALE: NOT TO SCALE

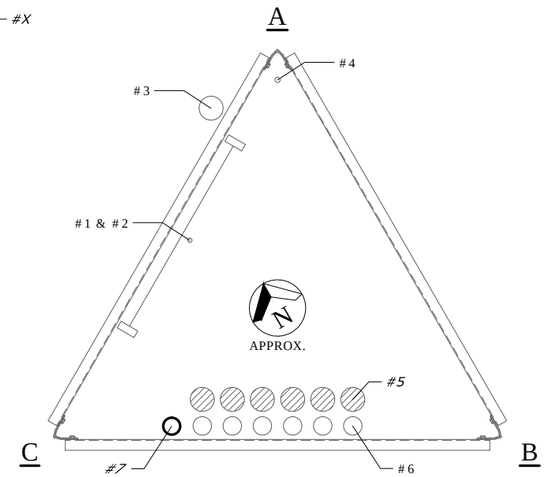
APPROX.

No.	QTY.	DESCRIPTION	ELEV.	TENANT
1	1	CLIMBING LADDER	100'	E
2	1	3/8" SAFETY LINE	100'	E
3	1	1 5/8"	100.2'	E / #8
4	1	0.40" BLACK CABLE	104.6'	E / #1
5	6	1 5/8" (TO BE REMOVED)	96'	T-MOBILE / R
6	6	1 1/4"	96'	T-MOBILE / E
7	1	1-3/8" (HCS 6X12) HYBRID	96'	T-MOBILE / P

LEGEND:

E = EXISTING — #X
P = PROPOSED — #X
F = FUTURE — #X
R = REMOVE — #X
TO RELOCATE

CONTACT MEI IF LINE LAYOUT IS DIFFERENT FROM WHAT IS SHOWN BELOW.



503 PLAN: SCHEMATIC Tx-LINE LAYOUT

SCALE: NOT TO SCALE

NOTES:
1. Tx LINE LAYOUT IS SCHEMATIC ONLY, BASED UPON HTS MAPPING DATED 10/04/2016.
2. NEW BRACKET SUPPORT SPECIFICATION BY OTHERS.

REFER 101 FOR NEW AND EXISTING MEMBER SIZES AND SCHEDULES.

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STATE OF CONNECTICUT
LEE MARK MALOUF
No. 17715
LICENSED PROFESSIONAL ENGINEER
AUGUST 19, 2019

TRANSCEND WIRELESS / T-MOBILE

TENSION TABLE, ANCHOR LAYOUT, AND TX-LINE LAYOUT

MEI PROJECT ID	SHEET NUMBER	REV.
CT05213G-19V0	S05	0

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

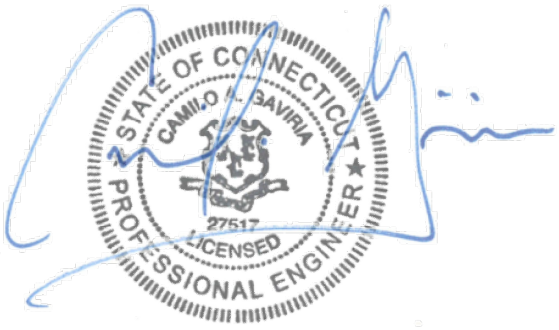
T-Mobile Site #: CT11358A

Wildcat Hill Road
Harwinton, CT

Centek Project No. 19027.13

Date: April 25 2019

Max Stress Ratio = 31.8%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

April 25, 2019

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11358A
Wildcat Hill Road
Harwinton, CT 06791

Centek Project No. 19027.13

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting of three (3) 5-ft Sitepro T-Frames (P/N: CWT02) to support the equipment configuration. The review considered the effects of wind load, dead load and ice load. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- **T-Mobile:**
- **T-Frames: Three (3) Ericsson RFS APX18-206516 panel antennas, three (3) RFS APXVAARR24-43-NA20 panel antennas, three (3) TMAs, three (3) Ericsson 4449 B71+B12 remote radio units mounted on three (3) T-Frames with a RAD center elevation of 96-ft +/- AGL. (NOTE: APXVAARR24-43 antenna must be mounted at a maximum of 3-ft away from outrigger arm.**

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 93 mph for Harwinton as required in Appendix N of the 2018 Connecticut State Building Code.

A structural analysis of tower and foundation needs to be completed prior to any work.

Based on our review of the installation, it is our opinion that the **existing T-arms antenna mounts, with the installation of one (1) SitePro universal heavy-duty sector frame stiff arm kit (p/n SPTB), are structurally adequate to support the proposed antenna configuration.** If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Camilo A. Gaviria, PE
Structural Engineer

STATE OF CONNECTICUT
CAMILO A. GAVIRIA
27517
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Fernando J. Palacios
Engineer

Section 2 - Calculations

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: Loads on Equipment

Location: Harwinton, CT

Rev. 0: 04/17/19

Prepared by: F.J.P Checked by: C.A.G.
Job No. 19027.13

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-G

Wind Speeds

Basic Wind Speed	$V := 93$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 40$	mph	(User Input per Annex B of TIA-222-G)

Input

Structure Type =	Structure_Type := Lattice		(User Input)
Structure Category =	SC := II		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 100$	ft	(User Input)
Height to Center of Antennas =	$z := 96$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.00$	in	(User Input per Annex B of TIA-222-G)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1.0$		(User Input)
	$K_a := 1.0$		(User Input)
Gust Response Factor =	$G_H = 1.2$		(User Input)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if Structure\_Type} = \text{Pole} \\ 0.85 & \text{if Structure\_Type} = \text{Lattice} \end{cases} = 0.85$$

(Per Table 2-2 of TIA-222-G)

(Per Table 2-3 of TIA-222-G)

Importance Factors =

$$I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.00 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \end{cases} = 1$$

$$K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.113$$

Velocity Pressure Coefficient Antennas =

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.225$$

$$Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.255$$

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot K_d \cdot Kz \cdot V^2 \cdot I_{Wind} = 23.615$

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot K_d \cdot Kz \cdot V_i^2 \cdot I_{Wind} = 4.369$

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAARR24_43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 19.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 133.4$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.9$		
Antenna Force Coefficient =	$Ca_{ant} = 1.31$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 13.1$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 485$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 214$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 16.8$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 115$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 9.2$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 63$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 133$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 2 \cdot 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 500$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 500$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RF APXV18-206516S-C-A20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 53.1$	in	(User Input)
Antenna Width =	$W_{ant} := 6.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 18.7$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 7.7$		
Antenna Force Coefficient =	$Ca_{ant} = 1.42$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 2.5$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 103$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.2$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 47$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 4.5$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 34$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 23$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 19$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1154$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 3811$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 124$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 124$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4449 B71B12		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 14.9$	in	(User Input)
RRUS Width =	$W_{RRUS} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 10.4$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 74$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 46$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 37$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.4$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 15$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 13$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 74$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 3027$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 98$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 98$	lbs

Development of Wind & Ice Load on TMA's

TMA Data:

TMA Model =	Ericsson KRY112 TMA		
TMA Shape =	Flat	in	(User Input)
TMA Height =	$L_{TMA} := 6.9$	in	(User Input)
TMA Width =	$W_{TMA} := 6.1$	in	(User Input)
TMA Thickness =	$T_{TMA} := 2.8$	lbs	(User Input)
TMA Weight =	$WT_{TMA} := 11$		(User Input)
Number of TMA's =	$N_{TMA} := 1$		(User Input)
TMA Aspect Ratio =	$Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1.1$		
TMA Force Coefficient =	$Ca_{TMA} = 1.2$		

Wind Load (without ice)

Surface Area for One TMA =	$SA_{TMAF} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.3$	sf
Total TMA Wind Force =	$F_{TMA} := qz \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAF} = 10$	lbs
Surface Area for One TMA =	$SA_{TMAS} := \frac{L_{TMA} \cdot T_{TMA}}{144} = 0.1$	sf
Total TMA Wind Force =	$F_{TMA} := qz \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAS} = 5$	lbs

Wind Load (with ice)

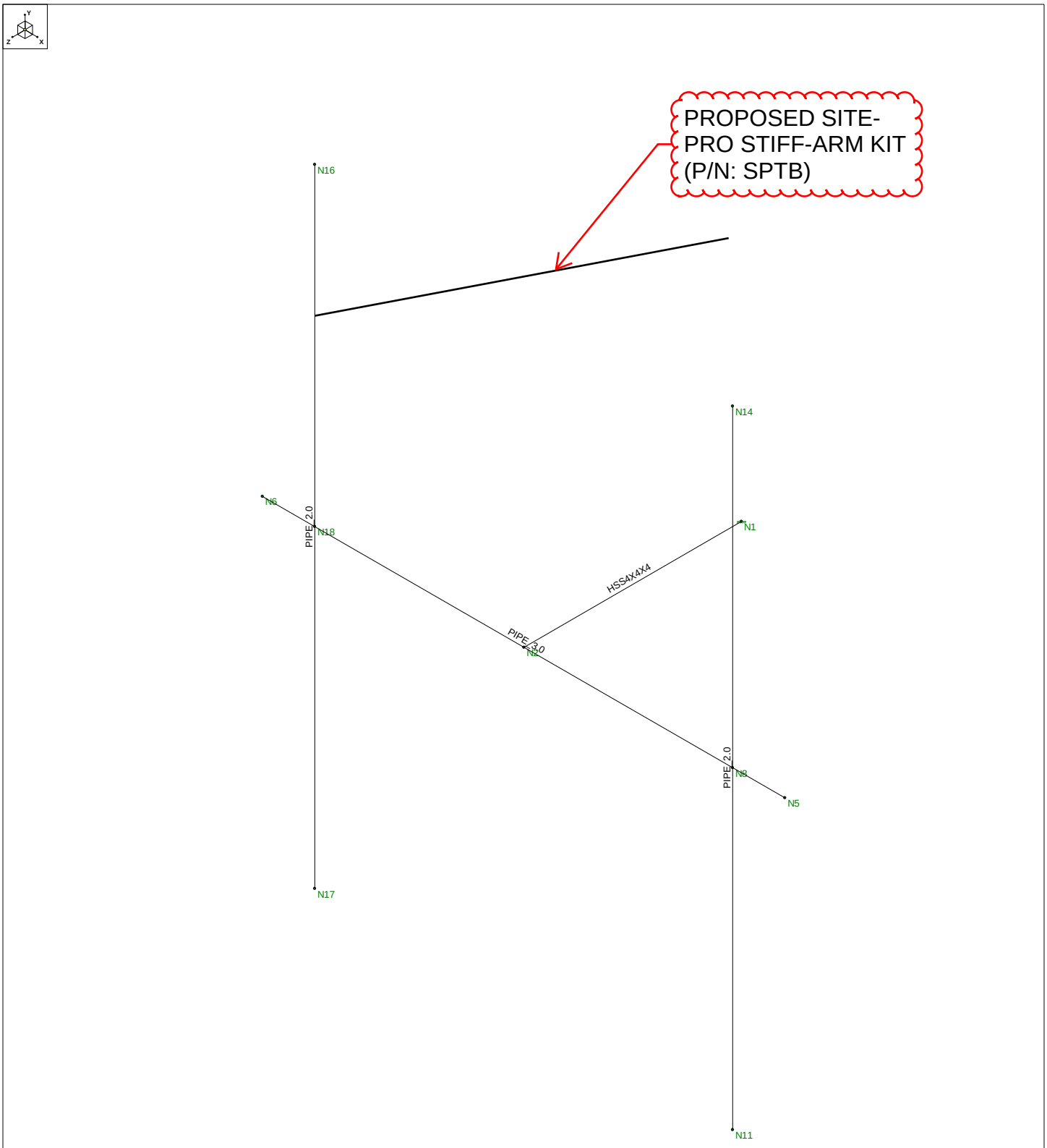
Surface Area for One TMA w/ Ice =	$SA_{ICETMAF} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz})}{144} = 0.8$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAF} = 5$	lbs
Surface Area for One TMA w/ Ice =	$SA_{ICETMAS} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz})}{144} = 0.6$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAS} = 4$	lbs

Gravity Load (without ice)

Weight of All TMAs =	$WT_{TMA} \cdot N_{TMA} = 11$	lbs

Gravity Loads (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 118$	cu in
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz}) - V_{TMA} = 750$	cu in
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 24$	lbs
Weight of Ice on All TMAs =	$W_{ICETMA} \cdot N_{TMA} = 24$	lbs



Envelope Only Solution

Centek		
FJP	CT11358A- Mount	Apr 25, 2019 at 8:25 AM
19027.13	Member Framing	CT11358A_AMA.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-12: ASD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: Strength
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[..	Lcomp bot[..	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	HSS4X4X4	2.084			Lbyy						Lateral
2	M3	Horz	5			Lbyy						Lateral
3	M5	Antenna M...	6			Lbyy						Lateral
4	M7	Antenna M...	6			Lbyy						Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Desig..	A [in2]	Iyy [i...	Izz [i..	J [in4]
1	Outrigger	HSS4X4X4	Beam	Tube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
2	Horz	PIPE_3.0	Beam	Pipe	A53 Grade B	Typical	2.07	2.85	2.85	5.69
3	Antenna Mast	PIPE_2.0	Colu...	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			HSS4X4X4	Beam	Tube	A500 Gr.42	DR1
2	M3	N6	N5			Horz	Beam	Pipe	A53 Grad...	Typical
3	M5	N14	N11			Antenna Mast	Column	Pipe	A53 Grad...	Typical
4	M7	N17	N16			Antenna Mast	Column	Pipe	A53 Grad...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diaphragm
1	N1	0	0	-0.916667	0	
2	N2	0	0	1.167	0	
3	N5	2.5	0	1.167	0	
4	N6	-2.5	0	1.167	0	
5	N8	2	0	1.167	0	
6	N11	2	-3	1.167	0	
7	N14	2	3	1.167	0	
8	N16	-2	3	1.167	0	
9	N17	-2	-3	1.167	0	
10	N18	-2	0	1.167	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M7	Y	-.067	1.639
2	M7	Y	-.067	4.361
3	M5	Y	-.009	4.22
4	M5	Y	-.009	1.88
5	M7	Y	-.074	3
6	M5	Y	-.011	3

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M7	Y	-.25	1.639
2	M7	Y	-.25	4.361
3	M5	Y	-.062	1.88
4	M5	Y	-.062	4.22
5	M7	Y	-.098	3
6	M5	Y	-.024	3

Member Point Loads (BLC 4 : Wind with Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M7	X	.032	1.639
2	M7	X	.032	4.361
3	M5	X	.011	1.88

Member Point Loads (BLC 4 : Wind with Ice X) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
4	M5	X	.011	4.22
5	M7	X	.013	3
6	M5	X	.003	3

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M7	X	.107	1.639
2	M7	X	.107	4.361
3	M5	X	.024	1.88
4	M5	X	.024	4.22
5	M7	X	.037	3
6	M5	X	.005	3

Member Point Loads (BLC 6 : Wind with Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M7	Z	.058	1.639
2	M7	Z	.058	4.361
3	M5	Z	.017	4.22
4	M5	Z	.017	1.88
5	M7	Z	.015	3
6	M5	Z	.005	3

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M7	Z	.242	1.639
2	M7	Z	.242	4.361
3	M5	Z	.052	4.22
4	M5	Z	.052	1.88
5	M7	Z	.046	3
6	M5	Z	.01	3

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (i...
No Data to Print ...			

Member Distributed Loads (BLC 4 : Wind with Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.002	.002	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.008	.008	0	0

Member Distributed Loads (BLC 6 : Wind with Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M3	Z	.002	.002	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M3	Z	.007	.007	0	0

Basic Load Cases

	BLC Description	Category	X Gr...	Y Gr...	Z Gr...	Joint	Point	Distri...	Area(...	Surface(Plate/Wall)
1	Self Weight	None		-1						
2	Dead Load	None					6			
3	Ice Load	None					6			
4	Wind with Ice X	None					6	1		
5	Wind X	None					6	1		
6	Wind with Ice Z	None					6	1		
7	Wind Z	None					6	1		

Load Combinations

	Description	Solve	P...	SR...	BLC	F...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-direction)	Yes	Y		1	1...	2	1.2	5	1.6																
2	0.9D + 1.6W (X-direction)	Yes	Y		1	.9	2	.9	5	1.6																
3	1.2D + 1.0Di + 1.0Wi (X...	Yes	Y		1	1...	2	1.2	3	1	4	1														
4	1.2D + 1.6W (Z-direction)	Yes	Y		1	1...	2	1.2	7	1.6																
5	0.9D + 1.6W (Z-direction)	Yes	Y		1	.9	2	.9	7	1.6																
6	1.2D + 1.0Di + 1.0Wi (Z...	Yes	Y		1	1...	2	1.2	3	1	6	1														

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	0	6	1.151	6	0	3	-.603	5	-.182	6	-.319	5
2		min	-.511	1	.304	2	-1.086	4	-2.369	3	-1.335	4	-1.326	3
3	Totals:	max	0	6	1.151	6	0	3						
4		min	-.511	1	.304	2	-1.086	4						

Envelope Joint Displacements

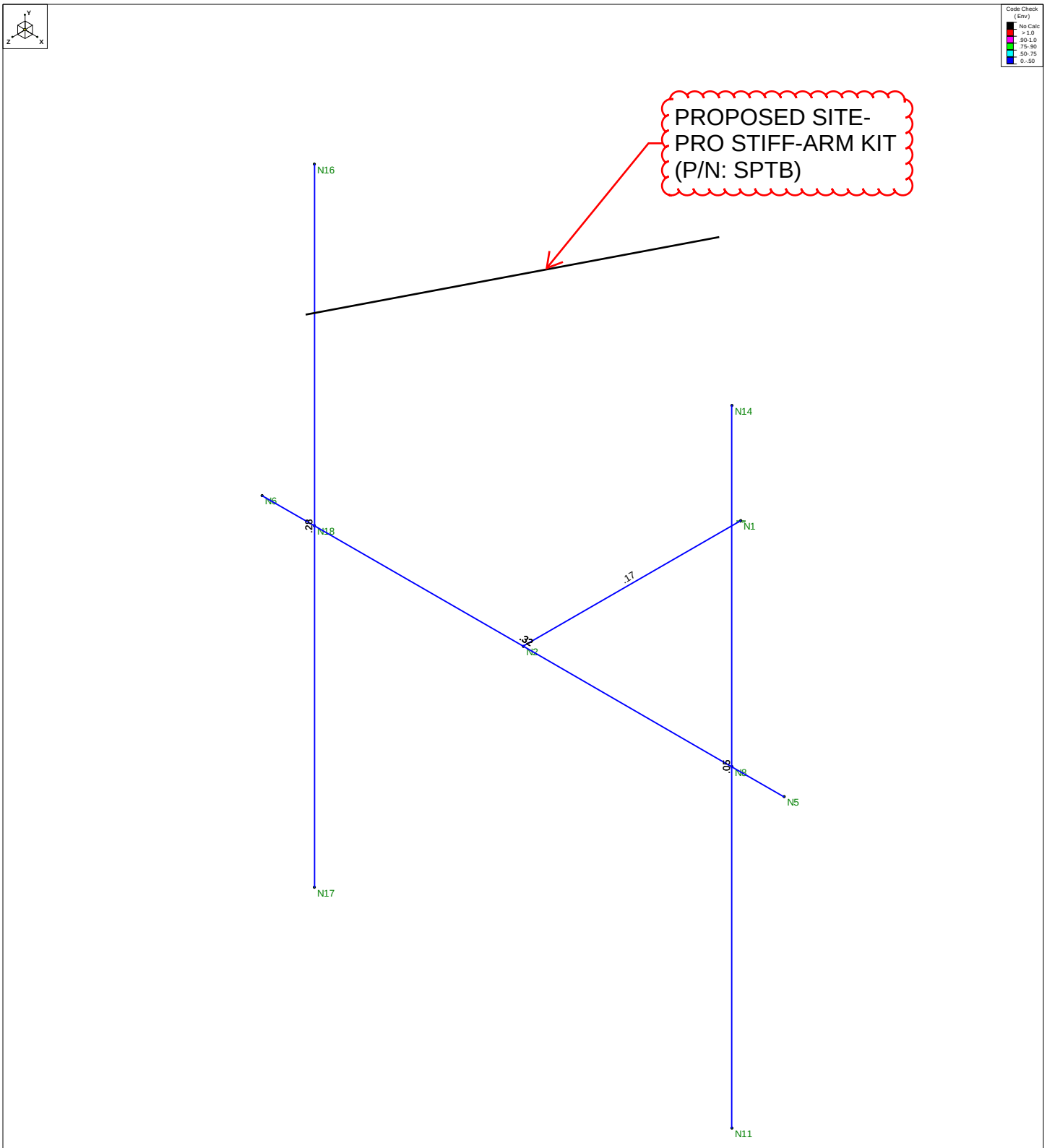
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	6	0	6	0	6	0	6	0	6	0	6
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	N2	max	.028	5	-.009	5	0	5	1.956e-03	3	2.216e-03	5	2.788e-03	3
4		min	.003	3	-.034	3	0	1	4.871e-04	5	1.782e-04	3	6.696e-04	5
5	N5	max	.028	5	.028	3	-.005	6	1.956e-03	3	1.365e-03	5	1.834e-03	3
6		min	.003	3	.006	5	-.047	4	4.499e-04	5	1.233e-04	6	4.344e-04	5
7	N6	max	.028	5	-.05	5	.151	5	1.956e-03	3	5.98e-03	5	6.632e-03	3
8		min	.003	3	-.204	3	.005	3	4.9e-04	5	1.783e-04	3	1.599e-03	5
9	N8	max	.028	5	.017	3	-.004	6	1.956e-03	3	1.365e-03	5	1.834e-03	3
10		min	.003	3	.004	5	-.039	4	4.499e-04	5	1.234e-04	6	4.347e-04	5
11	N11	max	.072	3	.017	3	-.036	5	1.952e-03	3	1.365e-03	5	1.916e-03	3
12		min	.04	2	.004	5	-.075	3	-1.571e-04	5	1.234e-04	6	4.345e-04	5
13	N14	max	.012	5	.017	3	.069	6	2.055e-03	6	1.365e-03	5	1.83e-03	6
14		min	-.062	6	.004	5	-.006	5	5.006e-04	2	1.234e-04	6	2.268e-04	2
15	N16	max	.006	2	-.04	5	.249	4	4.223e-03	4	5.979e-03	5	6.678e-03	6
16		min	-.236	6	-.165	3	.039	2	5.011e-04	2	1.783e-04	3	3.931e-05	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
17	N17	max	.25	3	-.04	5	.207	5	1.941e-03	3	5.979e-03	5	6.868e-03	3
18		min	.085	5	-.165	3	-.066	3	-3.064e-03	5	1.783e-04	3	1.596e-03	5
19	N18	max	.028	5	-.04	5	.115	5	1.956e-03	3	5.979e-03	5	6.632e-03	3
20		min	.003	3	-.164	3	.004	3	4.9e-04	5	1.783e-04	3	1.598e-03	5

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Me...	Shape	Code C...	Loc...	LC	Shear C...	Loc[ft]	Dir	LC	phi*Pn...	phi*P...	phi*Mn...	phi*...	Cb	Eqn
1	M1	HSS4X4X4	.175	0	3	.139	0	y	3	125.29	127.3...	14.774	14.774	1.673	H1-1b
2	M3	PIPE_3.0	.318	2.5	4	.049	2.5		4	57.037	65.205	5.749	5.749	1.586	H1-1b
3	M5	PIPE_2.0	.054	3	4	.009	1.938		4	20.867	32.13	1.872	1.872	1.316	H1-1b
4	M7	PIPE_2.0	.284	3	4	.040	3		4	20.867	32.13	1.872	1.872	1.316	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
FJP	CT11358A- Mount	Apr 25, 2019 at 8:33 AM
19027.13	Member Unity Check	CT11358A_AMA.r3d

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: CT11358A

Harwinton SNET_1
Wildcat Hill Road
Harwinton, Connecticut 06791

May 20, 2019

EBI Project Number: 6219001694

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**7.69%**

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

May 20, 2019

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

Emissions Analysis for Site: CT11358A - Harwinton SNET_1

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **Wildcat Hill Road** in **Harwinton, Connecticut** 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 ($\mu W/cm^2$). 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), 2100 MHz (AWS) and 11 GHz 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 Wildcat Hill Road in Harwinton, Connecticut 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated

value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

6) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antennas used in this modeling are the RFS APXV18-206516S-C-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector A, the RFS APXV18-206516S-C-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector B, the RFS APXV18-206516S-C-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector C. 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is 96 feet above ground level (AGL).

9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

10) 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
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20
Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz
Gain:	16.3 dBd / 16.3 dBd	Gain:	16.3 dBd / 16.3 dBd	Gain:	16.3 dBd / 16.3 dBd
Height (AGL):	96 feet	Height (AGL):	96 feet	Height (AGL):	96 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	10,237.91	ERP (W):	10,237.91	ERP (W):	10,237.91
Antenna A1 MPE %:	**3.99%**	Antenna B1 MPE %:	**3.99%**	Antenna C1 MPE %:	**3.99%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz
Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd
Height (AGL):	96 feet	Height (AGL):	96 feet	Height (AGL):	96 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	2,481.08	ERP (W):	2,481.08	ERP (W):	2,481.08
Antenna A2 MPE %:	**2.24%**	Antenna B2 MPE %:	**2.24%**	Antenna C2 MPE %:	**2.24%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	6.23%
PageNet	1.46%
Site Total MPE % :	7.69%

T-Mobile Sector A Total:	6.23%
T-Mobile Sector B Total:	6.23%
T-Mobile Sector C Total:	6.23%
Site Total:	7.69%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM	4	1279.74	96.0	19.97	1900 MHz GSM	1000	2.00%
T-Mobile 1900 MHz LTE	2	2559.48	96.0	19.97	1900 MHz LTE	1000	2.00%
T-Mobile 600 MHz LTE	2	591.73	96.0	4.62	600 MHz LTE	400	1.15%
T-Mobile 700 MHz LTE	2	648.82	96.0	5.06	700 MHz LTE	467	1.08%
						Total:	**6.23%**

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:	6.23%
Sector B:	6.23%
Sector C:	6.23%
T-Mobile Maximum MPE % (Sector A):	6.23%
Site Total:	7.69%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.69%** 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.