Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

July 30, 2021

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

RE: Notice of Exempt Modification
10 Polly Lane, Bozrah, CT 06336 (also known as 3 Polly Lane)
Latitude: 41.574423100
Longitude: -72.20040200
T-Mobile Site#: CT11258B – L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 182-foot level of the existing 187-foot guyed tower at 10 Polly Lane in Bozarah, CT. The 187-foot guyed tower is owned and operated by Everest Communications. The property is owned by 17 Mile Real Estate LLC. T-Mobile now intends to remove the six (6) existing antennas and add three (3) new 600/700/1900/2100 MHz antennas. The new antennas will support 5G services and will be installed at the new 177-foot level of the tower. New mounts will need to be installed as per the enclosed mount analysis.

Planned Modifications:
Tower:
Remove
(3) EMS RR90-17-XXDP
(3) TMA
(12) 1-5/8" coax

Remove and Replace:
(3) LNX-6515DS-A1M for (3) APXVALL24_43-U-NA20 600/700/1900/2100 MHz antennas

Install New:
(3) Radio 4415 B25 RRU
(3) Radio 4415 B66
(3) Radio 4449 B71+ B85
(3) 1-5/8" Hybrid

Existing to Remain:
N/A

Ground:
Install New:
(1) 6160 Cabinet and (1) B160 Battery Cabinet

This facility was not originally approved by the Connecticut Siting Council. Based on previous Siting Council filings for this tower, the Town of Bozrah does not have record of the original facility approval. Enclosed is a memo related to this.

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 – Carl Zorn, Elected Official, and Stephen Seder, Chairman of the Town of Bozrah Planning and Zoning Commission, as well as the tower 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: Carl Zorn – Town of Bozrah First Selectman
Stephen Seder– Town of Bozrah Planning and Zoning Commission Chairman
Everest Communications – Tower Owner
17 Mile Real Estate LLC- Property Owner

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Thursday, August 5, 2021 11:23 PM
To: krichers@transcendwireless.com
Subject: UPS Schedule Delivery Update, Tracking Number 1ZV257424291991689

Your scheduled delivery date has changed.
Scheduled Delivery Date: Monday, 08/09/2021

Important Delivery Information

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424291991689

Shipment Details

Ship To:	Everest Infrastructure Partners Two Allegheny Center ALLEGHENY, PA 15212 US
Number of Packages:	1
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11258B CSC TO

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Thursday, August 5, 2021 11:23 PM
To: krichers@transcendwireless.com
Subject: UPS Schedule Delivery Update, Tracking Number 1ZV257424294917674

Your scheduled delivery date has changed.
Scheduled Delivery Date: Friday, 08/06/2021

Important Delivery Information

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424294917674

Shipment Details

Ship To:	Stephen Seder Town of Bozrah 1 River Road BOZRAH, CT 06334 US
Number of Packages:	1
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11258B CSC ZO

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Thursday, August 5, 2021 11:23 PM
To: krichers@transcendwireless.com
Subject: UPS Schedule Delivery Update, Tracking Number 1ZV257424293669695

A signature is required for package delivery. Log in or enroll in UPS My Choice to take any action.

Your scheduled delivery date has changed.

Scheduled Delivery Date: Friday, 08/06/2021

Sign Now

Change Delivery | Manage Preferences | View Delivery Planner

Important Delivery Information

From: TRANSCEND WIRELESS

Tracking Number: 1ZV257424293669695

Shipment Details

Ship To:
17 Mile Real Estate LLC
69 Harry Street
CONSHOHOCKEN, PA 19428
US

UPS Service: UPS GROUND

Number of Packages: 1

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Thursday, August 5, 2021 11:23 PM
To: krichers@transcendwireless.com
Subject: UPS Schedule Delivery Update, Tracking Number 1ZV257424290847668

Your scheduled delivery date has changed.
Scheduled Delivery Date: Friday, 08/06/2021

Important Delivery Information

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424290847668

Shipment Details

Ship To:	Carl Zorn Town of Bozrah 1 River Road BOZRAH, CT 06334 US
Number of Packages:	1
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11258B CSC EO

All information is for assessment purposes only. Assessments are calculated at 70% of the estimated October 1, 2017 market value which was the date of the last revaluation as completed by eQuality Valuation Services, LLC.

Information on the Property Records for the Municipality of Bozrah was last updated on 8/3/2021.

Parcel Information

Location:	POLLY LA	Property Use:	Vacant Land	Primary Use:	Commercial Vacant Land
Unique ID:	00073200	Map Block Lot:	02/039	Acres:	8.40
490 Acres:	0.00	Zone:	I-80	Volume / Page:	107/ 483
Developers Map / Lot:		Census:	7131		

Value Information

	Appraised Value	Assessed Value
Land	149,520	104,660
Buildings	0	0
Detached Outbuildings	0	0

	Appraised Value	Assessed Value
Total	149,520	104,660

Owner's Information

Owner's Data
17 MILE REAL ESTATE LLC 69 HARRY STREET CONSHOCKEN, PA 19428

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Sale Price
17 MILE REAL ESTATE LLC	0107	0483	01/02/2019	Warranty Deed	$1,141,162
MAYNARD LEONARD P	0084	0593	09/19/2006		$0
MAYNARD ALICE M	0021	0524			$0

June 11, 2020

Memo: No Initial Zoning Decision Found:
EM-AT&T-013-200604 (Polly Lane, Bozrah)

No original facility approval for this tower could be found, despite consultation with Tom Weber, Building Official for the Town of Bozrah. The building official's phone number is 860.889.2689 Ext. 206.

Please contact me with any questions or concerns regarding this matter.

Best Regards,

Ryan Lynch
Real Estate Manager
Smartlink
781.392.4040
Ryan.Lynch@smartlinkgroup.com

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

BOZRAH-1/RT. 2
SITE ID: CT11258B
10 POLLY LANE
BOZRAH, CT 06336

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.

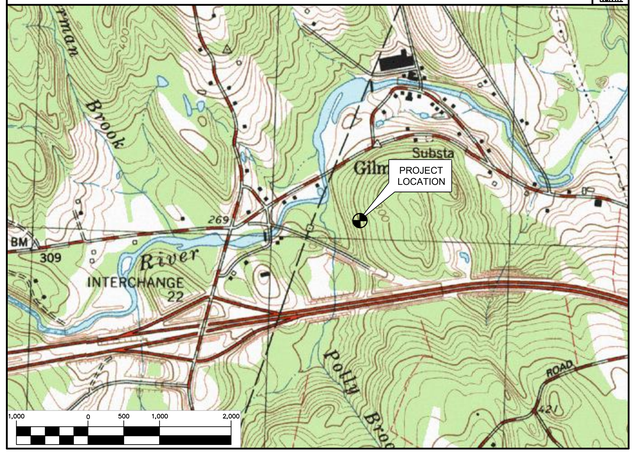
SITE DIRECTIONS

FROM: 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002 **TO:** 10 POLLY LANE, BOZRAH, CT 06336

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	0.30 MI.
2.	TAKE THE 2ND RIGHT ONTO DAY HILL RD.	3.64 MI.
3.	MERGE ONTO I-91 S TOWARD HARTFORD	7.65 MI.
4.	MERGE ONTO I-84 E/US-6 E via EXIT 30 ON THE LEFT TOWARD NEW LONDON/E HARTFORD/CT-2.	0.61 MI.
5.	MERGE ONTO CT-2 E via EXIT 55 TOWARD NEW LONDON/NORWICH	30.16 MI.
6.	TAKE EXIT 22 TOWARD LEBANON/GILMAN	0.25 MI.
7.	TURN LEFT ONTO SCOTT HILL RD	0.36 MI.
8.	TURN RIGHT ONTO NORWICH AVE. TURN RIGHT ONTO POLLY LN	0.31 MI.
9.	3 POLLY LN, GILMAN, CT 06336, 10 POLLY LN IS ON THE LEFT	

VICINITY MAP

SCALE: 1" = 1000'



T-MOBILE RF CONFIGURATION

67D97C

PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

A. REMOVE (1) EXISTING RBS 6201 ODE CABINET
B. INSTALL (1) B160 CABINET AND 6160 CABINET
C. REMOVE (3) EMS ANTENNAS
D. REMOVE (3) LB DUAL ANTENNAS
E. INSTALL (3) LB/MB OCTA 8' ANTENNAS
F. REMOVE (3) GENERIC TWIN STYLE TMA
G. INSTALL (3) RADIO 4415 B25
H. INSTALL (3) RADIO 4415 B66A
I. INSTALL (3) RADIO 4449
J. REMOVE (12) COAX CABLES
K. INSTALL (3) NEW 6X12 HYBRIDS
L. REMOVE EXISTING 100A METER AND DISCONNECT
M. INSTALL (1) 200A METER AND CIRCUIT BREAKER
N. INSTALL (1) NEW 200A PPC CABINET
O. INSTALL 125A BREAKER

PROJECT SUMMARY (STRUCTURAL)

FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) S-1 FOR ADDITIONAL DETAILS. SECTOR MOUNTS NEED TO BE REPLACED.

- EXISTING SECTOR FRAMES AT 172' A.G.L TO BE REMOVED BY OTHERS
- EXISTING T-MOBILE MOUNT AT 182' A.G.L. TO BE REMOVED BY OTHERS
- INSTALL NEW ANTENNA MOUNTS AT 177' A.G.L.

PROJECT INFORMATION

SITE NAME:	BOZRAH-1/RT. 2
SITE ID:	CT11258B
SITE ADDRESS:	10 POLLY LANE BOZRAH, CT 06336
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°-34'-32.2" N LONGITUDE: 72°-12'-8.9" W GROUND ELEVATION: 318'± AMSL SITE 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 ELEVATION	1
C-3	ANTENNA MOUNTING CONFIGURATION	1
C-4	TYPICAL EQUIPMENT DETAILS	1
S-1	STRUCTURAL DETAILS	1
E-1	ELECTRICAL RISER DIAGRAM AND CONDUIT ROUTING	1
E-2	TYPICAL ELECTRICAL DETAILS	1
E-3	ELECTRICAL SPECIFICATIONS	1

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/23/21	TJL	TJR	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT'S COMMENTS
	07/28/21	ANC	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

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
BOZRAH-1/RT. 2
SITE ID: CT11258B
10 POLLY LANE
BOZRAH, CT 06336

DATE: 05/08/19
SCALE: AS NOTED
JOB NO. 19027.17

TITLE SHEET

T-1

Sheet No. 1 of 10

NOTES AND SPECIFICATIONS

DESIGN BASIS:

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

1. DESIGN CRITERIA:

- RISK CATEGORY III (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 105 MPH (Vasd) (EXPOSURE C/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

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." 2017 CONNECTICUT FIRE SAFETY CODE, 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 IT'S 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 SITE OWNER'S 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.
18. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
19. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
20. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

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	07/23/21	TJL	TJR	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT'S COMMENTS
	07/28/21	ANC	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

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

BOZRAH-1/RT. 2

SITE ID: CT11258B

10 POLLY LANE
BOZRAH, CT 06336

DATE: 05/08/19
SCALE: AS NOTED
JOB NO. 19027.17

DESIGN BASIS AND SITE NOTES

N-1

Sheet No. 2 of 10

1 / C-1 **SITE LOCATION PLAN**
SCALE: 1" = 100'

TRUE NORTH

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/23/21	TJL	TJR	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION
	07/28/21	ANC	TJR	CONSTRUCTION DOCUMENTS – REVISED PER CLIENT'S COMMENTS

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

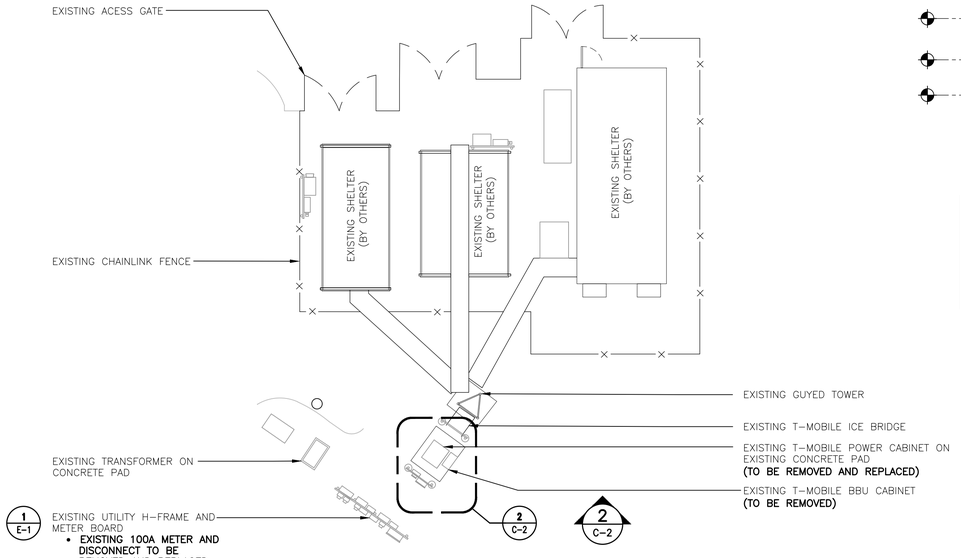
T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
BOZRAH-1/RT. 2
SITE ID: CT11258B
10 POLLY LANE
BOZRAH, CT 06336

DATE: 05/08/19
SCALE: AS NOTED
JOB NO. 19027.17

SITE LOCATION PLAN

C-1

Sheet No. 3 of 10

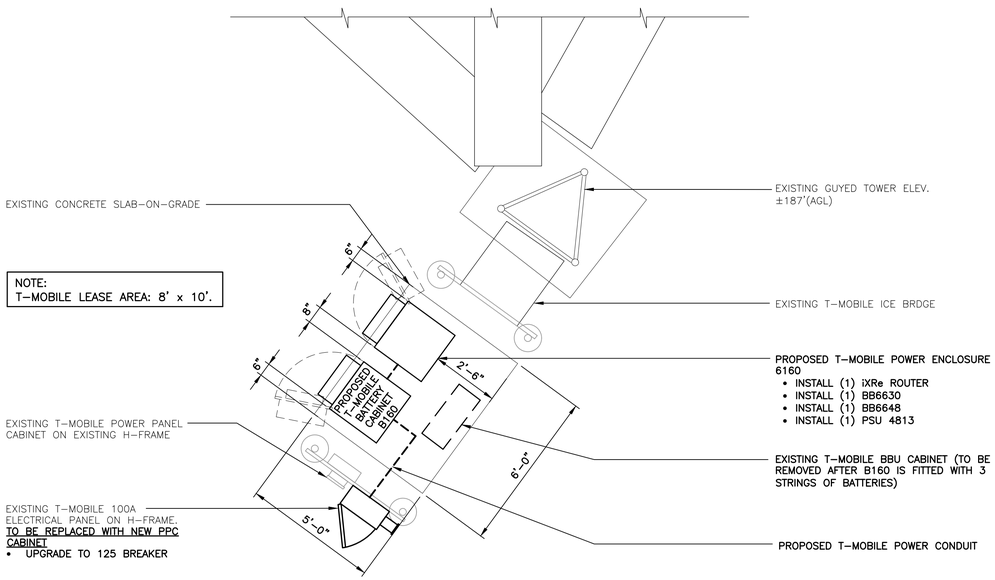


1 C-2 **SITE PLAN**
SCALE: 1" = 10'

TRUE NORTH

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

NOTE:
REFERENCE SHEET T-1 FOR
T-MOBILE EQUIPMENT SCOPE OF WORK



NOTE:
T-MOBILE LEASE AREA: 8' x 10'.

2 C-2 **EQUIPMENT PLAN - PROPOSED**
SCALE: 3/8" = 1'

TRUE NORTH

TOP OF EXISTING GUYED TOWER
EL. ±187' (AGL)

℄ EXISTING T-MOBILE MOUNT (TO BE REMOVED BY OTHERS)
EL. ±182'-0" A.G.L.

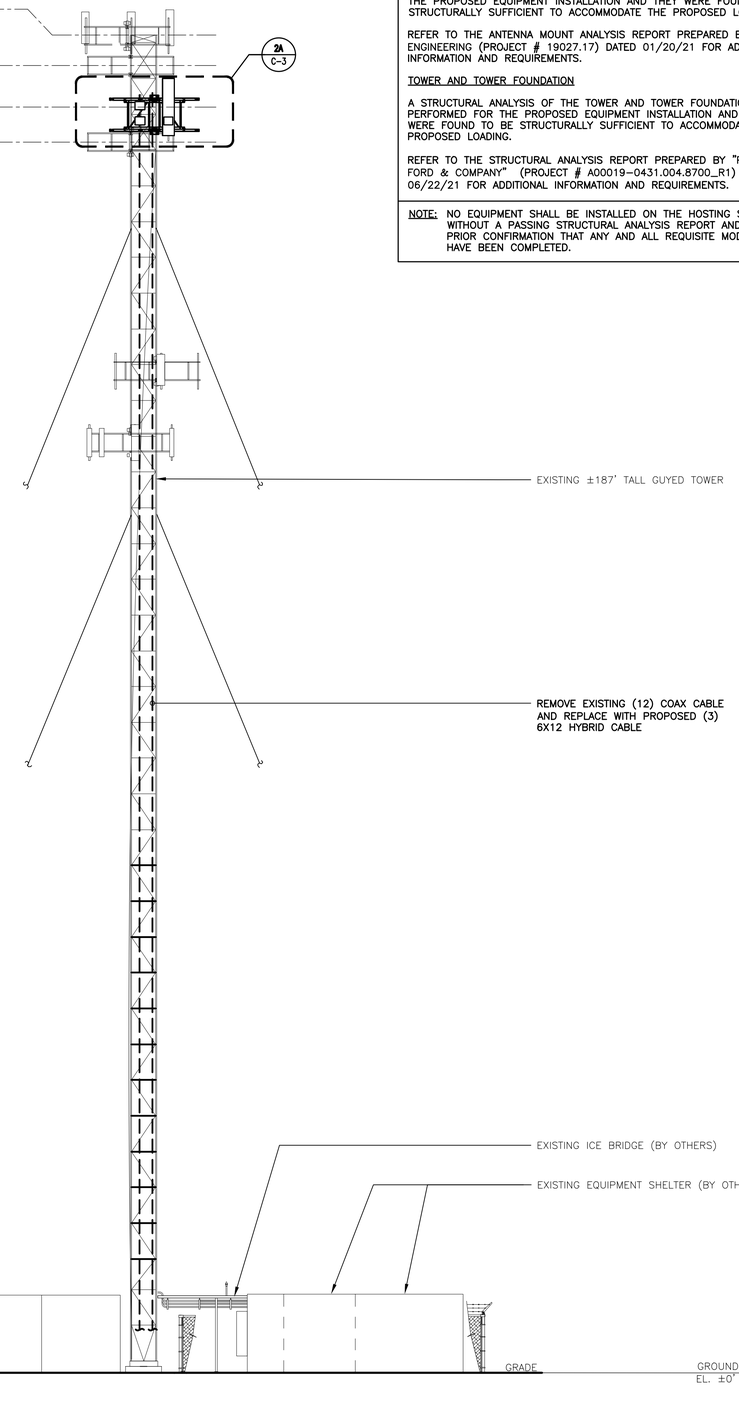
℄ PROPOSED T-MOBILE ANTENNAS
EL. ±177'-0" A.G.L.

℄ EXISTING UNUSED MOUNT (TO BE REMOVED BY OTHERS)
EL. ±172'-0" A.G.L.

NOTE:

1. ABANDONED MOUNT AT 172' A.G.L. TO BE REMOVED BY OTHERS
2. EXISTING T-MOBILE MOUNT AT 182' A.G.L. TO BE REMOVED BY OTHERS

CONTRACTOR TO COORDINATE OUT OF SCOPE WORK



3 C-2 **SOUTH TOWER ELEVATION**
SCALE: 1" = 10'

TRUE NORTH

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 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 SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING..

REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 19027.17) DATED 01/20/21 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 SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY "PAUL J. FORD & COMPANY" (PROJECT # A00019-0431.004.8700_R1) DATED 06/22/21 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.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/23/21	TJL	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
A	07/28/21	ANC	TJR	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT'S COMMENTS

PROFESSIONAL ENGINEER SEAL

T-Mobile
Transcend Wireless

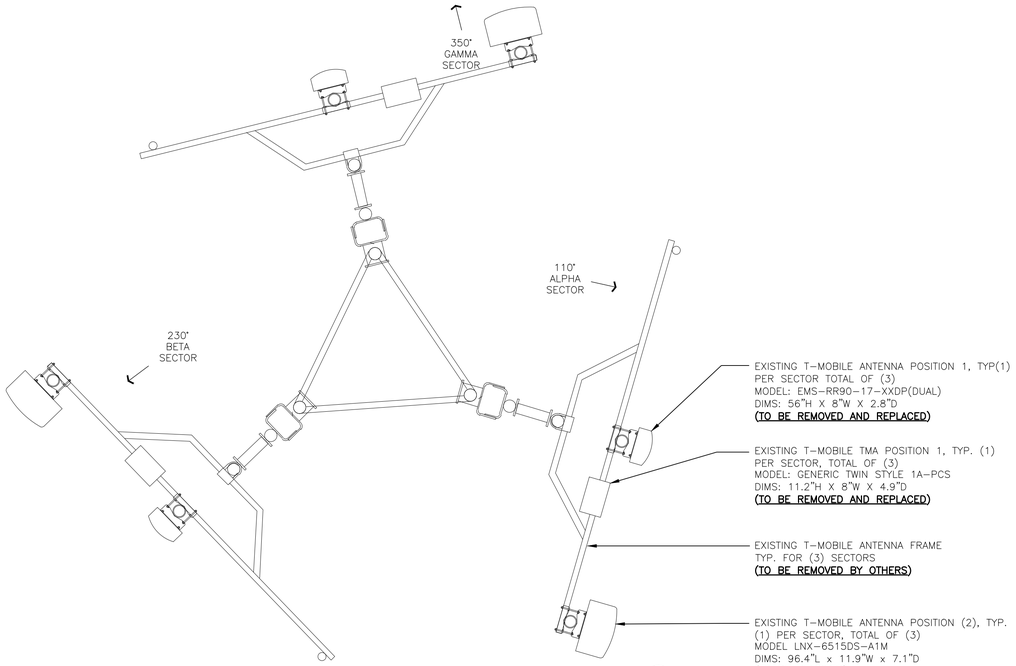
CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
BOZRAH-1/RT. 2
SITE ID: CT11258B
10 POLLY LANE
BOZRAH, CT 06336

DATE: 05/08/19
SCALE: AS NOTED
JOB NO. 19027.17

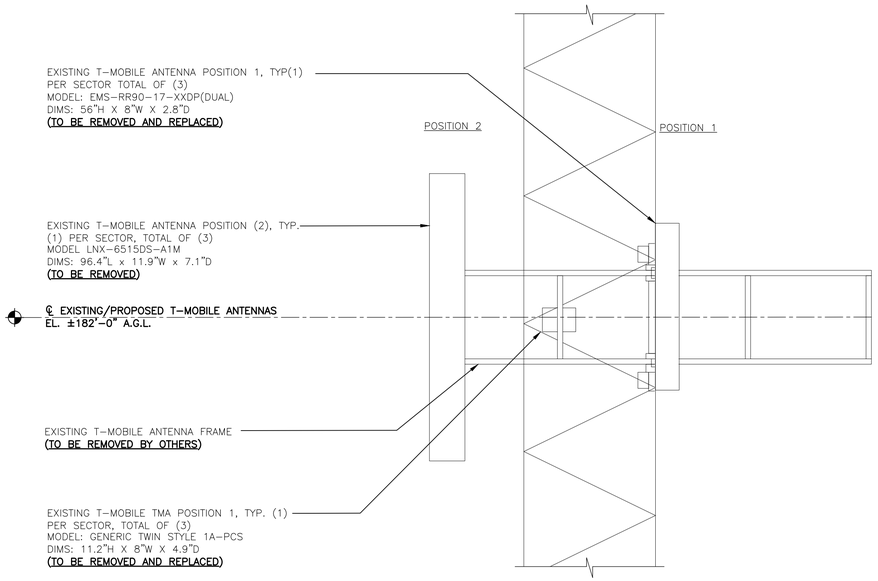
COMPOUND PLAN, AND ELEVATION

C-2
Sheet No. 4 of 10

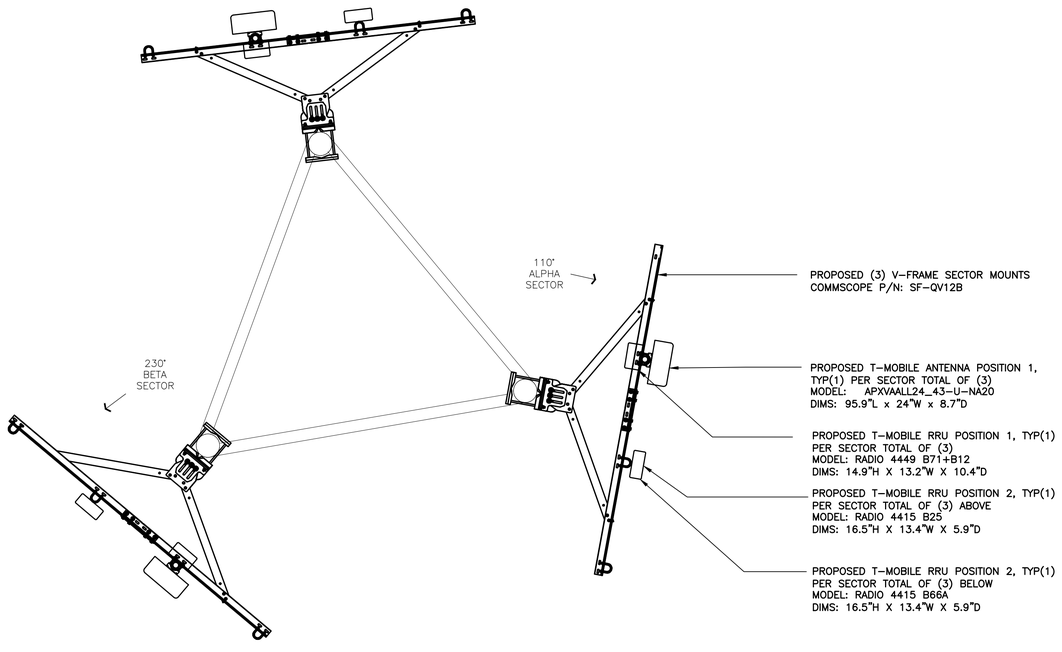


1 C-3 **EXISTING ANTENNA MOUNTING CONFIGURATION**
SCALE: 3/4" = 1'

TRUE NORTH

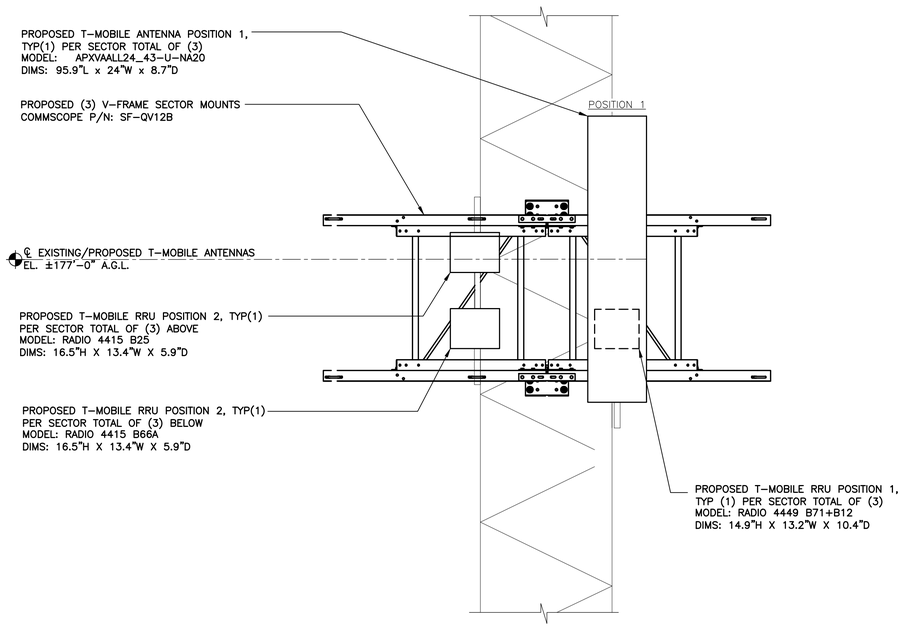


1A C-3 **EXISTING ANTENNA ELEVATION**
SCALE: 1/2" = 1'



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

TRUE NORTH



2A C-3 **PROPOSED ANTENNA ELEVATION**
SCALE: 1/2" = 1'

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/23/21	TJL	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
	07/28/21	ANC	TJR	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT'S COMMENTS

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

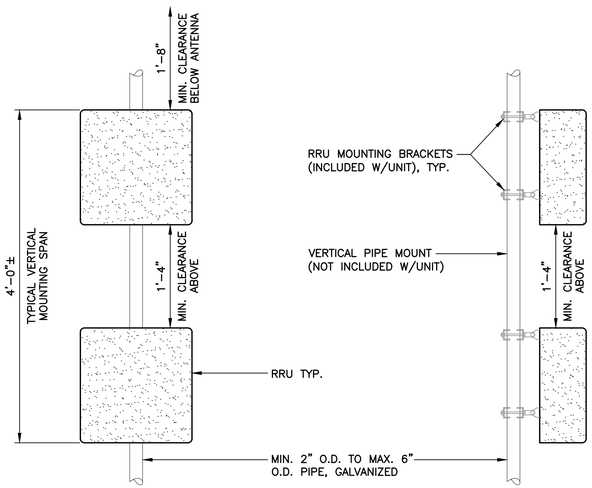
T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
BOZRAH-1/RT. 2
SITE ID: CT11258B
10 POLLY LANE
BOZRAH, CT 06336

DATE: 05/08/19
SCALE: AS NOTED
JOB NO. 19027.17

ANTENNA MOUNTING CONFIGURATION

C-3

Sheet No. 5 of 10

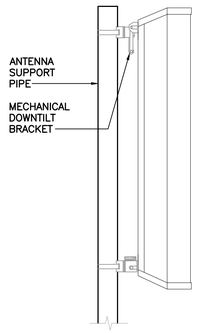


FRONT ELEVATION SIDE ELEVATION

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.

1 / C-4 **TYPICAL RRU MOUNTING DETAIL**
SCALE: NOT TO SCALE



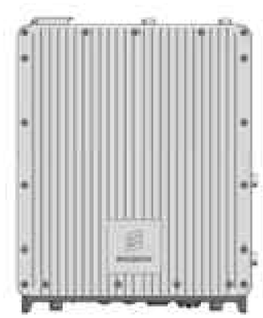
SIDE

APXVAARR24_43-U-NA20

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAALL24_43-U-NA20	95.9"L x 24.0"W x 8.5"D	±150 LBS.

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

2 / C-4 **PROPOSED ANTENNA DETAIL**
SCALE: NOT TO SCALE



RADIO 4415 B25/B66

RADIO 4449 B71+B85

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4415 B25/B66	16.5"L x 13.4"W x 5.9"D	±46 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4449 B71+B85	17.9"L x 13.2"W x 9.4"D	±74 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.

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

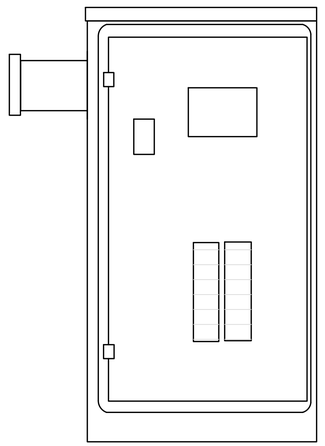
3 / C-4 **PROPOSED RRU DETAIL**
SCALE: NOT TO SCALE

EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: ENCLOSURE 6160 CABINET	62.0"H x 26.0"W x 26.0"D	±1200 LBS

4 / C-4 **ENCLOSURE 6160 CABINET DETAIL**
SCALE: NOT TO SCALE

EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: BATTERY B160 CABINET	62.0"H x 26.0"W x 26.0"D	±1883 LBS

5 / C-4 **BATTERY B160 CABINET DETAIL**
SCALE: NOT TO SCALE



PPC CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: EMERSON MODEL: CAC-A75201090	40.0"H x 20.0"W x 10.0"D	±80 LBS

6 / C-4 **PPC CABINET DETAIL**
NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/23/21	TJL	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
	07/28/21	ANC	TJR	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT'S COMMENTS

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
BOZRAH-1/RT. 2
SITE ID: CT11258B
10 POLLY LANE
BOZRAH, CT 06336

DATE: 05/08/19
SCALE: AS NOTED
JOB NO. 19027.17

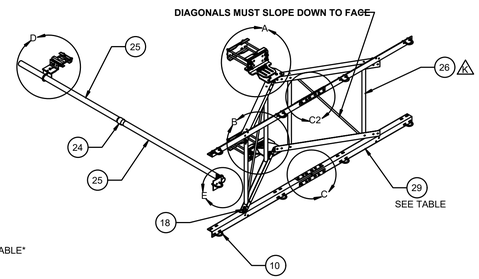
TYPICAL EQUIPMENT DETAILS

C-4

Sheet No. 6 of 10

ITEM PART NO.	DESCRIPTION	QTY. WEIGHT
1 SFQV01	SF-QV Arm Frame Weldment	1 59.92 LBS
2 SFQV02	SF-QV Transition Swivel Plate	2 9.20 LBS
3 SFQV03	Top SF-QV Mount Bracket	1 18.22 LBS
4 SFQV04	Lower SFQV Mount Bracket	1 18.75 LBS
5 MTC360613	SPLICE PLATE	8 2.04 LBS
6 SFQV11	Taper Plate Bushing	2 0.06 LBS
7 SFQV12	90 Deg Tower Bracket	2 5.31 LBS
8 SFQV13	SF-QV Back Clamp	2 7.51 LBS
9 SFQV14	60 Deg Tower Bracket	2 5.22 LBS
10 GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	11 0.56 LBS
11 SAB01	FORMED CLAMP	2 1.35 LBS
12 OS15034	3/4" X 1-1/2" OFFSET COLLAR	1 0.14 LBS
13 XA2020.01	CROSS OVER ANGLE	3 2.65 LBS
14 GB-05245	5/8" X 2-1/2" GALV BOLT KIT	6 0.30 LBS
15 GWF-05	5/8" GALV FLAT WASHER	34 0.06 LBS
16 GWL-05	5/8" GALV LOCK WASHER	16 0.03 LBS
17 GN-05	5/8" GALV HEX NUT	24 0.08 LBS
18 GB-04145	1/2" X 1-1/2" GALV BOLT KIT	32 0.13 LBS
19 GWF-04	1/2" GALV FLAT WASHER	20 0.03 LBS
20 GWL-04	1/2" GALV LOCK WASHER	4 0.01 LBS
21 GN-04	1/2" GALV HEX NUT	4 0.04 LBS
22 MT-379-8	1/2" X 8" GALV THREADED ROD	2 0.44 LBS
23 MT-382-16	5/8" X 16" GALV THREADED ROD	8 1.38 LBS
24 200GC	2" RMC COUPLING	1 1.57 LBS
25 SAB6301	Ø2-3/8" O.D. X 64" SCH 40 PIPE NPT 1 END	2 18.98 LBS
26 MTC360601	RIGHT FRAME WELDMENT	1 59.92 LBS
27 GB-04125	1/2" X 1-1/4" GALV BOLT KIT	1 0.12 LBS
28 GB-04265	1/2" X 2-3/4" GALV BOLT KIT	1 0.20 LBS
29 SFQVXX	SF-QV Face Angle (SEE TABLE)	4 24.99 LBS

* SEE TABLE*



SF-QV-B SERIES TABLE

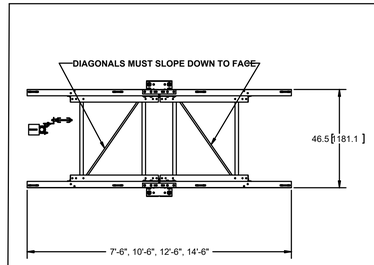
PART NUMBER	DESCRIPTION	SFQV06	SFQV05	SFQV04	SFQV03	WEIGHT
SF-QV7-B	Quik-Vee Sector Frame, 7'-6" Face, Pipes ordered separately 4 - - - 372.85 LBS					
SF-QV10-B	Quik-Vee Sector Frame, 10'-6" Face, Pipes ordered separately - 4 - - 397.66 LBS					
SF-QV12-B	Quik-Vee Sector Frame, 12'-6" Face, Pipes ordered separately - - 4 - 416.59 LBS					
SF-QV14-B	Quik-Vee Sector Frame, 14'-6" Face, Pipes ordered separately - - - 4 436.08 LBS					

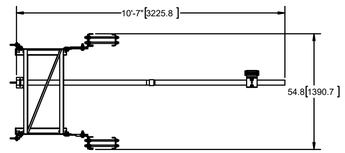
NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.
2. DETAILS ON SHEET 3 - 5.
3. OVERALL DIMS ON SHEET 5.
4. ASSEMBLY STEPS ON SHEET 3.
5. FITS TOWER LEGS UP TO 8" OD, 8" ANGLE 60 , OR 6" ANGLE 90 . °
6. USE TOWER BRACKETS SFQV12 FOR 90 LEGS AND SFQV14 FOR 60 LEGS.

DRAWN BY: MSM	SHEET: 2 of 7	TITLE: SF-QV-B SERIES	
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: Sector Frame Quick-V	
RELEASED: 11/30/11	MATERIAL: A36,A500,A529	DESCRIPTION: ASSEMBLY DRAWING	
REVISION: K	FINISH: GALV A123		
	WEIGHT: SEE TABLE	ANDREW U.S.A.	WESTCHESTER, IL. 60154

ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED: X ± ± .12 ANGLES ±2° XX ± ± .06 FRACTIONS ±1/32 XXX± ± .03
REMOVE BURRS AND BREAK EDGES .005
DO NOT SCALE THIS PRINT

1 S-1 **PROPOSED SECTOR MOUNT DETAIL**
SCALE: NOT TO SCALE





DRAWN BY: MSM	SHEET: 6 of 7	TITLE: SF-QV-B SERIES	
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: Sector Frame Quick-V	
RELEASED: 11/30/11	MATERIAL: A36,A500,A529	DESCRIPTION: ASSEMBLY DRAWING	
REVISION: K	FINISH: GALV A123		
	WEIGHT: SEE TABLE	ANDREW U.S.A.	WESTCHESTER, IL. 60154

ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED: X ± ± .12 ANGLES ±2° XX ± ± .06 FRACTIONS ±1/32 XXX± ± .03
REMOVE BURRS AND BREAK EDGES .005
DO NOT SCALE THIS PRINT

2 S-2 **PROPOSED SECTOR MOUNT DETAIL**
SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/23/21	TJL	TJR	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION
A	07/28/21	ANC	TJR	CONSTRUCTION DOCUMENTS – REVISED PER CLIENT'S COMMENTS

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

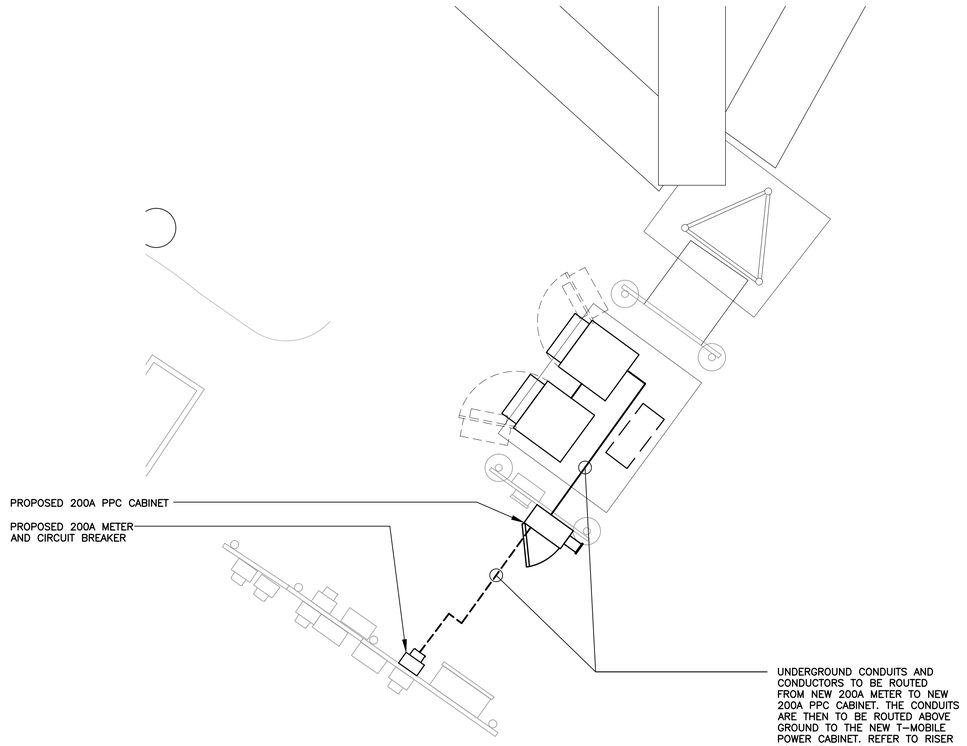
T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
BOZRAH-1/RT. 2
SITE ID: CT11258B
10 POLLY LANE
BOZRAH, CT 06336

DATE: 05/08/19
SCALE: AS NOTED
JOB NO. 19027.17

STRUCTURAL DETAILS

S-1

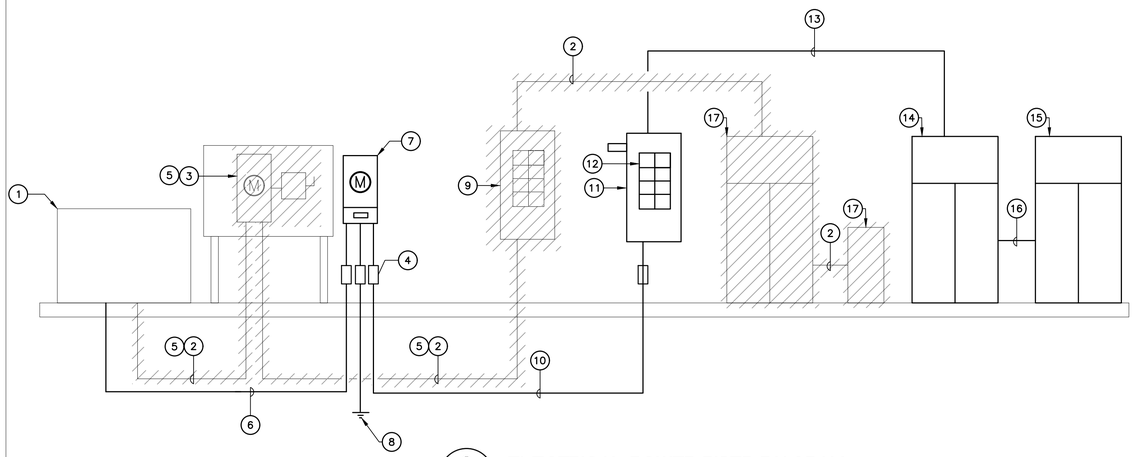
Sheet No. 7 of 10



1 E-1 **ELECTRICAL CONDUIT ROUTING PLAN**
SCALE: 3/8" = 1'

RISER DIAGRAM NOTES

1. EXISTING UTILITY TRANSFORMER TO REMAIN.
2. EXISTING CONDUITS AND CONDUCTORS TO BE REMOVED.
3. EXISTING UTILITY METER AND METER SOCKET TO BE REMOVED.
4. EXPANSION COUPLING TYP.
5. EXISTING ELEMENTS MAYBE REUSED PROVIDED THEY MEET THE SPECIFICATIONS IN THESE DRAWINGS AND ARE IN GOOD WORKING CONDITIONS
6. (3) 3/0 AWG, 3" CONDUIT. COORDINATE REQUIREMENTS WITH UTILITY COMPANY.
7. NEW 200A, 240V, SINGLE PHASE, NEMA-3R METER SOCKET WITH 200A/2P CIRCUIT BREAKER AND 200A, SINGLE PHASE, 240V RATED UTILITY METER. ALL EQUIPMENT TO BE UTILITY APPROVED.
8. (1) #4 AWG GROUNDING ELECTRODE CONDUCTOR IN 3/4" CONDUIT BONDED TO EXISTING COMPOUND GROUND RING
9. EXISTING 100A ELECTRICAL PANEL TO BE REMOVED AND REPLACED. RELOCATE ALL EXISTING CIRCUIT BREAKERS TO NEW PPC CABINET.
10. (3) 3/0 AWG, (1) #6 AWG GROUND, 2-1/2" CONDUIT
11. NEW 200A PPC CABINET.
12. NEW 125A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET
13. (3) #1 AWG, (1) #6 AWG GROUND, 1-1/2" CONDUIT.
14. NEW T-MOBILE EQUIPMENT CABINET
15. NEW T-MOBILE BATTERY CABINET
16. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.
17. EXISTING CABINETS TO BE REMOVED.



2 E-1 **ELECTRICAL POWER RISER DIAGRAM**
SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/23/21	TJL	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
A	07/28/21	ANC	TJR	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT'S COMMENTS

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

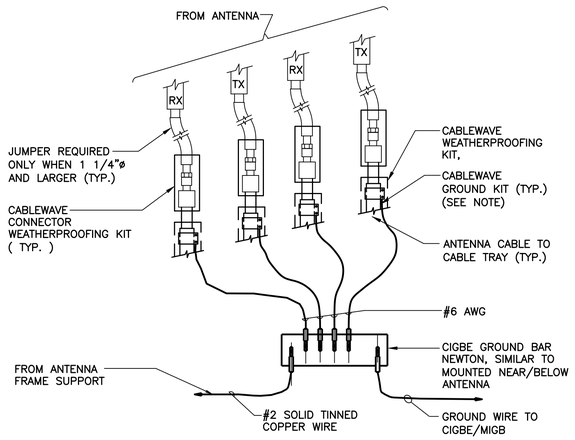
T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
BOZRAH-1/RT. 2
SITE ID: CT11258B
10 POLLY LANE
BOZRAH, CT 06336

DATE: 05/08/19
SCALE: AS NOTED
JOB NO. 19027.17

ELECTRICAL RISER DIAGRAM AND CONDUIT ROUTING

E-1

Sheet No. 8 of 10

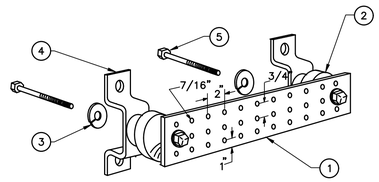


NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

1 E-2 CONNECTION OF GROUND WIRES TO GROUND BAR

SCALE: NOT TO SCALE

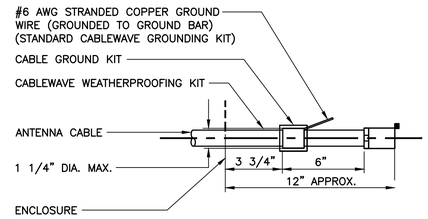


NOTES

1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

2 E-2 GROUND BAR DETAIL

SCALE: NOT TO SCALE

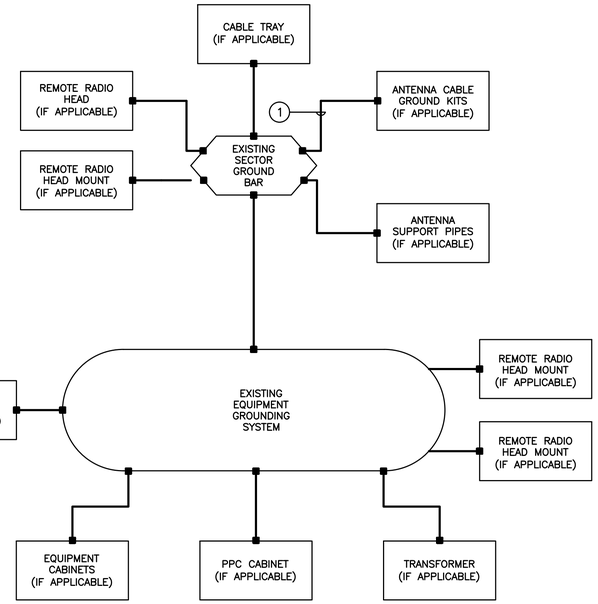


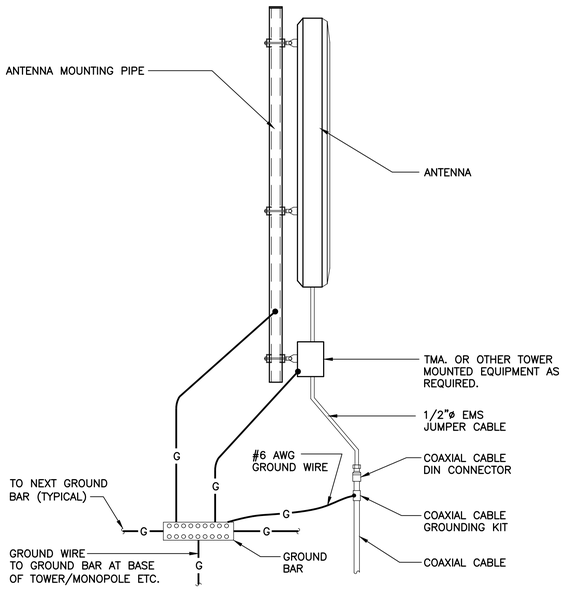
NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

3 E-2 ANTENNA CABLE GROUNDING DETAIL

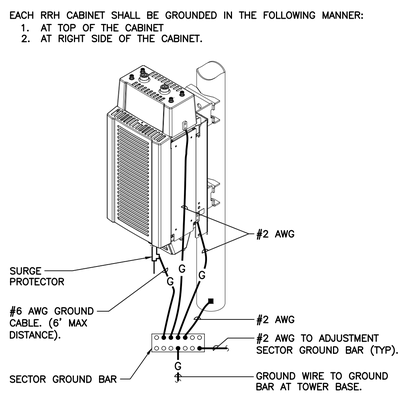
SCALE: NOT TO SCALE





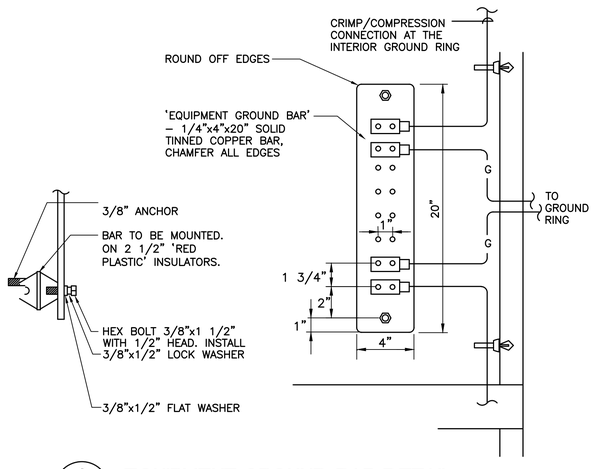
4 E-2 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE



5 E-2 RRH POLE MOUNT GROUNDING

SCALE: NOT TO SCALE



6 E-2 EQUIPMENT GROUND BAR DETAIL

SCALE: NOT TO SCALE

GROUNDING SCHEMATIC NOTES

(1) #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. BOND CABLE TRAY SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
7. COORDINATE ALL ROOF MOUNTED EQUIPMENT WITH OWNER.
8. ALL ROOF MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
9. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

7 E-2 ELECTRICAL SCHEMATIC DIAGRAM

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/23/21	TJL	TJR	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION
	07/28/21	ANC	TJR	CONSTRUCTION DOCUMENTS – REVISED PER CLIENT'S COMMENTS

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

BOZRAH-1/RT. 2

SITE ID: CT11258B

10 POLLY LANE

BOZRAH, CT 06336

DATE: 05/08/19

SCALE: AS NOTED

JOB NO. 19027.17

TYPICAL ELECTRICAL DETAILS

E-2

Sheet No. 9 of 10

ELECTRICAL SPECIFICATIONS

SECTION 16010

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR THE SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

F. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

G. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

H. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

I. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

J. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

K. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

L. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

M. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.

2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

N. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUITS

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

B. THE INTERIOR OF RACEWAYS/ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.

D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS

E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111

CONDUIT TYPE	NEC REFERENCE	APPLICATION	MIN. BURIAL DEPTH (PER NEC TABLE 300.5) [2,3]
EMT	ARTICLE 358	INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS	N/A
RMC, RIGID GALV. STEEL	ARTICLE 344, 300.5, 300.50	ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS.	6 INCHES
PVC, SCHEDULE 40	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
PVC, SCHEDULE 80	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
LIQUID TIGHT FLEX. METAL	ARTICLE 350	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A
FLEX. METAL	ARTICLE 348	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A

[1] PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

[2] UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

[3] WHERE SOLID ROCK PREVENTS COMPLIANCE WITH MINIMUM COVER DEPTHS, WIRING SHALL BE INSTALLED IN PERMITTED RACEWAY FOR DIRECT BURIAL. THE RACEWAY SHALL BE COVERED BY A MINIMUM OF 2" OF CONCRETE EXTENDING DOWN TO ROCK.

SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH - INTERMATIC #FF15M (INTERIOR LIGHTS)

2. DUPLEX RECEPTACLE - P&S #2095 (GFCI) SPECIFICATION GRADE

3. SINGLE POLE SWITCH - P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE

4. DUPLEX RECEPTACLE - P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES - ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.

2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.

2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.

3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS

2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).

3. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.

2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.

3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE CONNECTED TO THE PANELBOARDS SO THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/23/21	TJL	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
	07/28/21	ANC	TJR	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT'S COMMENTS

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

BOZRAH-1/RT. 2

SITE ID: CT11258B

10 POLLY LANE

BOZRAH, CT 06336

DATE: 05/08/19

SCALE: AS NOTED

JOB NO. 19027.17

ELECTRICAL SPECIFICATIONS

E-3

Sheet No. 10 of 10

PAUL J. FORD & COMPANY

Report Date: June 22, 2021

Client: Everest Infrastructure Partners
Two Allegheny Center
Pittsburgh, PA 15212
Attn: Thomas Rigg
(603) 498-7462
tom.rigg@everestinfrastructure.com

Structure: Modified 187-ft Guyed Tower
Site Name: Bozrah Polly Lane
Site Reference #: 701695
Site Address: 10 Polly Lane
City, County, State: Bozrah, New London County, CT
Latitude, Longitude: 41.573333°, -72.203333°

PJF Project: A00019-0431.004.8700_R1

Paul J. Ford and Company is pleased to submit this "**Structural Analysis Report**" to determine the tower stress level.

Analysis Criteria:
This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 135 mph converted to a nominal 3-second gust wind speed of 104 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.000 and Risk Category II was used in this analysis.

Proposed Appurtenance Loads:
The structure was analyzed with the proposed loading configuration shown in Table 1 combined with the other considered equipment shown in Table 2 of this report.

Summary of Analysis Results:
Existing Structure: Pass – 87.9%
Existing Foundation: Pass – 83.8%

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and Everest Infrastructure Partners. If you have any questions or need further assistance on this or any other projects, please give us a call.

Respectfully Submitted by:
Paul J. Ford and Company

Anthony Pelino, E.I.
Structural Designer
apelino@pauljford.com

SFM

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER

2021.06.23
15:41:33-04'00'

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 187 ft Guyed tower designed by Fred A. Nudd Corporation.

The tower has been modified per reinforcement drawings prepared by Paul J. Ford in March of 2020. Reinforcement consists of expanding the Base Foundation by adding concrete.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Wind Speed:	105 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	0.75 in
Wind Speed with Ice:	50 mph
Seismic Ss:	NA
Seismic S1:	NA
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
177.0	177.0	3	ericsson	RADIO 4415	3	1-3/8
		3	ericsson	RADIO 4415 B66A		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAALL24_43-U-NA20 w/ Mount Pipe		
		3	tower mounts	8’ x 2” Sch 40 Pipe Mount		
		3	commscope	SF-QV12-B [SM 502-3]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
187.0	187.0	6	cci antennas	DMP65R-BU8D w/ Mount Pipe	12 1 2	1-5/8 1-3/8 0.66
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	ericsson	RRUS 8843 B2/B66A		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP 17201		
		2	raycap	DC6-48-60-18-8F		
		1	tower mounts	Sector Mount [SM 801-3]		
150.0	150.0	3	alcatel lucent	1900 MHz 4x45W RRH	4	1/4
		3	alcatel lucent	RRH 8x20W + Solar Shield		
		6	alcatel lucent	RRH2x50-WCS		
		3	commscope	DT465B-2XR w/ Mount Pipe		
		3	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe		
		1	tower mounts	Sector Mount [SM 502-3]		
136.0	136.0	3	antel	BXA-171085-8CF-EDIN-X w/ Mount Pipe	12	1-5/8
		3	antel	BXA-70063/6CF-EDIN w/ Mount Pipe		
		6	antel	LPA-80080-4CF-EDIN-0 w/ Mount Pipe		
		6	rfs celwave	FD9R6004/2C-3L		
		1	tower mounts	Sector Mount [SM 502-3]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Foundation Mapping Report	TEP, 11/20/2019	133845.318836	Everest
Geotechnical Report	TEP, 8/24/2009	080004.46E	Everest
Previous Structural Analysis	Fred A. Nudd Corporation, 12/28/2017	117-23243.4	Everest
Tower Modification Drawings	Paul J. Ford, 3/12/020	A00019-0431.002.8800_R1	Everest
Construction Drawings	Centek Engineering, 5/8/2019	19027.17	Everest
Collocation Application	Everest, 2/18/2021	-	Everest

3.1) Analysis Method

tnxTower (version 8.0.9.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were maintained in accordance with the TIA-222 standard.

2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

3) The structure was modified in conformance with the referenced modification drawings as shown in the referenced post modification inspection.

4) The guy anchor foundation drawings were not available at the time of analysis. Therefore, we have assumed the material grades, guy rod information, and reinforcing steel information provided in the previous structural analysis report, referenced in Table 3, are correct.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	187 - 180	Leg	P2.875"x0.203" (2.5 STD)	3	-17.03	74.72	22.8	Pass
T2	180 - 160	Leg	P2.875"x0.203" (2.5 STD)	25	-67.04	79.61	84.2	Pass
T3	160 - 140	Leg	P2.875"x0.203" (2.5 STD)	86	-67.12	79.61	84.3	Pass
T4	140 - 120	Leg	P2.875"x0.203" (2.5 STD)	146	-69.30	79.61	87.1	Pass
T5	120 - 100	Leg	P2.875"x0.203" (2.5 STD)	206	-66.96	79.61	84.1	Pass
T6	100 - 80	Leg	P2.875"x0.203" (2.5 STD)	267	-53.59	79.61	67.3	Pass
T7	80 - 60	Leg	P2.875"x0.203" (2.5 STD)	327	-55.35	79.61	69.5	Pass
T8	60 - 40	Leg	P2.875"x0.203" (2.5 STD)	387	-61.56	79.61	77.3	Pass
T9	40 - 20	Leg	P2.875"x0.203" (2.5 STD)	447	-63.59	79.61	79.9	Pass
T10	20 - 0	Leg	P2.875"x0.203" (2.5 STD)	505	-63.66	79.61	80.0	Pass
T1	187 - 180	Diagonal	5/8	13	7.81	9.94	78.6	Pass
T2	180 - 160	Diagonal	C3x4.1	39	-5.74	31.24	18.4	Pass
T3	160 - 140	Diagonal	5/8	142	6.85	9.94	68.9	Pass
T4	140 - 120	Diagonal	5/8	166	4.62	9.94	46.4	Pass
T5	120 - 100	Diagonal	5/8	261	6.12	9.94	61.5	Pass
T6	100 - 80	Diagonal	5/8	322	3.75	9.94	37.7	Pass
T7	80 - 60	Diagonal	5/8	336	4.10	9.94	41.2	Pass
T8	60 - 40	Diagonal	5/8	439	4.19	9.94	42.1	Pass
T9	40 - 20	Diagonal	5/8	458	3.63	9.94	36.5	Pass
T10	20 - 0	Diagonal	5/8	517	4.62	9.94	46.4	Pass
T1	187 - 180	Horizontal	L 1.5 x 1.5 x 3/16	16	-6.32	7.19	87.9	Pass
T2	180 - 160	Horizontal	L 1.5 x 1.5 x 3/16	67	-3.11	7.19	43.2	Pass
T3	160 - 140	Horizontal	L 1.5 x 1.5 x 3/16	137	-5.29	7.19	73.6	Pass
T4	140 - 120	Horizontal	L 1.5 x 1.5 x 3/16	169	-4.90	7.19	68.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T5	120 - 100	Horizontal	L 1.5 x 1.5 x 3/16	257	-4.17	7.19	58.1	Pass
T6	100 - 80	Horizontal	L 1.5 x 1.5 x 3/16	282	-3.74	7.19	52.0	Pass
T7	80 - 60	Horizontal	L 1.5 x 1.5 x 3/16	378	-3.62	7.19	50.4	Pass
T8	60 - 40	Horizontal	L 1.5 x 1.5 x 3/16	400	-3.59	7.19	50.0	Pass
T9	40 - 20	Horizontal	L 1.5 x 1.5 x 3/16	462	-3.77	7.19	52.5	Pass
T10	20 - 0	Horizontal	L 1.5 x 1.5 x 3/16	558	-3.63	7.19	50.5	Pass
T1	187 - 180	Top Girt	L 1.5 x 1.5 x 3/16	4	-4.24	7.19	59.0	Pass
T2	180 - 160	Top Girt	L 1.5 x 1.5 x 3/16	30	-1.16	7.19	16.1	Pass
T3	160 - 140	Top Girt	L 1.5 x 1.5 x 3/16	89	-4.06	7.19	56.4	Pass
T4	140 - 120	Top Girt	L 1.5 x 1.5 x 3/16	149	-2.63	7.19	36.6	Pass
T5	120 - 100	Top Girt	L 1.5 x 1.5 x 3/16	210	-3.42	7.19	47.5	Pass
T6	100 - 80	Top Girt	L 1.5 x 1.5 x 3/16	269	-2.18	7.19	30.3	Pass
T7	80 - 60	Top Girt	L 1.5 x 1.5 x 3/16	330	-2.03	7.19	28.2	Pass
T9	40 - 20	Top Girt	L 1.5 x 1.5 x 3/16	448	-1.79	7.19	24.9	Pass
T10	20 - 0	Top Girt	L 1.5 x 1.5 x 3/16	510	-2.06	7.19	28.7	Pass
T1	187 - 180	Bottom Girt	L 1.5 x 1.5 x 3/16	7	-4.65	7.19	64.7	Pass
T2	180 - 160	Bottom Girt	L 1.5 x 1.5 x 3/16	33	5.93	17.09	34.7	Pass
T3	160 - 140	Bottom Girt	L 1.5 x 1.5 x 3/16	91	-2.41	7.19	33.6	Pass
T4	140 - 120	Bottom Girt	L 1.5 x 1.5 x 3/16	152	-4.43	7.19	61.6	Pass
T5	120 - 100	Bottom Girt	L 1.5 x 1.5 x 3/16	213	-2.14	7.19	29.8	Pass
T6	100 - 80	Bottom Girt	L 1.5 x 1.5 x 3/16	271	-1.88	7.19	26.1	Pass
T7	80 - 60	Bottom Girt	L 1.5 x 1.5 x 3/16	333	-1.79	7.19	24.9	Pass
T8	60 - 40	Bottom Girt	L 1.5 x 1.5 x 3/16	393	-2.12	7.19	29.5	Pass
T9	40 - 20	Bottom Girt	L 1.5 x 1.5 x 3/16	453	-1.85	7.19	25.7	Pass
T10	20 - 0	Bottom Girt	L 1.5 x 1.5 x 3/16	512	-0.38	7.19	5.3	Pass
T2	180 - 160	Guy A@160.375	5/8	577	14.17	25.44	55.7	Pass
		Guy A@170	5/8	606	14.95	25.44	58.7	Pass
T4	140 - 120	Guy A@120.375	9/16	595	8.35	21.00	39.8	Pass
T8	60 - 40	Guy A@59.625	9/16	603	7.95	21.00	37.9	Pass
T2	180 - 160	Guy B@160.375	5/8	572	13.90	25.44	54.6	Pass
		Guy B@170	5/8	605	14.88	25.44	58.5	Pass
T4	140 - 120	Guy B@120.375	9/16	590	8.84	21.00	42.1	Pass
T8	60 - 40	Guy B@59.625	9/16	602	9.11	21.00	43.4	Pass
T2	180 - 160	Guy C@160.375	5/8	566	15.50	25.44	60.9	Pass
		Guy C@170	5/8	604	16.12	25.44	63.4	Pass
T4	140 - 120	Guy C@120.375	9/16	583	9.82	21.00	46.8	Pass
T8	60 - 40	Guy C@59.625	9/16	601	9.06	21.00	43.2	Pass
T2	180 - 160	Top Guy Pull-Off@160.375	L 2 x 2 x 5/16	41	10.55	37.26	28.3	Pass
		Top Guy Pull-Off@170	L 1.5 x 1.5 x 3/16	60	4.79	17.09	28.0	Pass
T4	140 - 120	Top Guy Pull-Off@120.375	L 2 x 2 x 5/16	162	-7.15	21.94	32.6	Pass
T8	60 - 40	Top Guy Pull-Off@59.625	L 1.5 x 1.5 x 3/16	388	-1.22	6.70	18.2	Pass
T2	180 - 160	Torque Arm Top@160.375	L 3 x 3 x 1/4	567	15.05	46.58	32.3	Pass
T4	140 - 120	Torque Arm Top@120.375	L 3 x 3 x 1/4	585	8.46	46.58	18.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T2	180 - 160	Torque Arm Bottom@160.375	L 3 x 3 x 1/4	575	-12.66	36.39	34.8	Pass
T4	140 - 120	Torque Arm Bottom@120.375	L 3 x 3 x 1/4	593	-7.76	36.39	21.3	Pass
							Summary	
						Leg (T4)	87.1	Pass
						Diagonal (T1)	78.6	Pass
						Horizontal (T1)	87.9	Pass
						Top Girt (T1)	59.0	Pass
						Bottom Girt (T1)	64.7	Pass
						Guy A (T2)	58.7	Pass
						Guy B (T2)	58.5	Pass
						Guy C (T2)	63.4	Pass
						Top Guy Pull-Off (T4)	32.6	Pass
						Torque Arm Top (T2)	32.3	Pass
						Torque Arm Bottom (T2)	34.8	Pass
						Bolt Checks	21.9	Pass
						Rating =	87.9	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Base Foundation Structural	-	0.4	Pass
1	Base Foundation Soil Interaction	-	63.8	Pass
1	Guy Anchor Shaft	-	77.5	Pass
1	Guy Anchor Foundation Structural	-	41.8	Pass
1	Guy Anchor Foundation Soil Interaction	-	83.8	Pass

Structure Rating (max from all components) =	**87.9%**

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

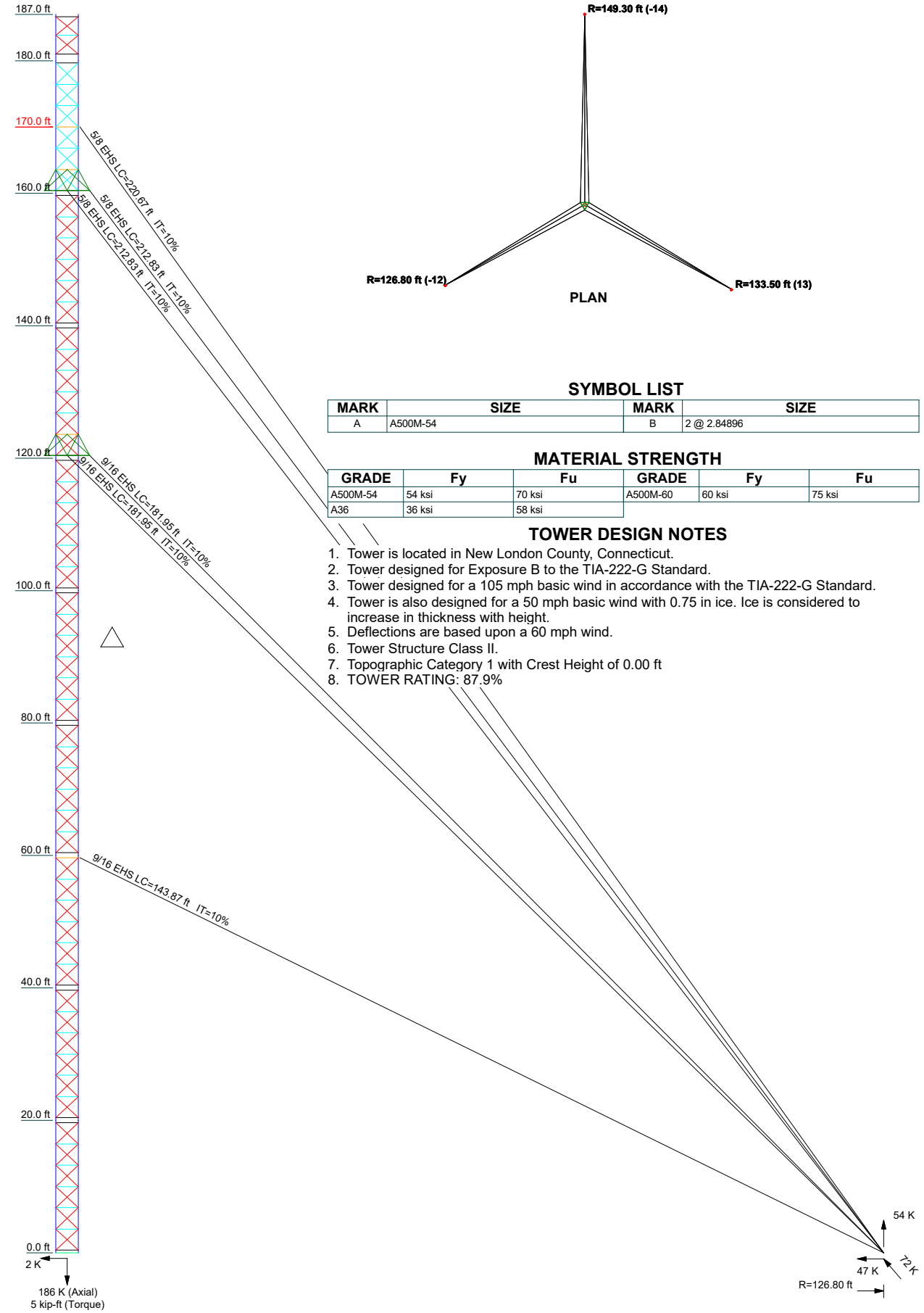
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Legs						P2.875"x0.203" (2.5 STD)				
Leg Grade						A500M-60				
Diagonals	A	C3x4.1				SR 5/8				
Diagonal Grade	SR 5/8					A36				
Top Girts				L 1.5 x 1.5 x 3/16				N.A.		L 1.5 x 1.5 x 3/16
Bottom Girts					L 1.5 x 1.5 x 3/16					
Horizontals					L 1.5 x 1.5 x 3/16					
Top Guy Pull-Offs	L 2 x 2 x 5/16		N.A.	L 2 x 2 x 5/16		N.A.		L 1.5 x 1.5 x 3/16		N.A.
Face Width (ft)	N.A.					3.5				
# Panels @ (ft)	B					55 @ 3.20833				
Weight (K)	0.2	1.4	0.7	0.9	0.7	0.7	0.7	0.7	0.7	0.7



PLAN

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	A500M-54	B	2 @ 2.84896

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500M-54	54 ksi	70 ksi	A500M-60	60 ksi	75 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 87.9%

ALL REACTIONS ARE FACTORED

Paul J. Ford and Company
250 E. Broad St., Ste 600
Columbus, OH 43215
Phone: 614-221-6679
FAX:

Job:	***A00019-0431.002.8800***		
Project:	***Bozrah Polly Lane***		
Client:	Everest Infrastructure Partners	Drawn by: ADP	App'd:
Code:	TIA-222-G	Date: 06/17/21	Scale: NTS
Path:	G:\TOWER\000_Misc\2019\00019-0431 Bozrah Polly Lane 7016950\00019-0431.004.8700_SA\tnx\00019-0431.004.8700.eri		Dwg No. E-1

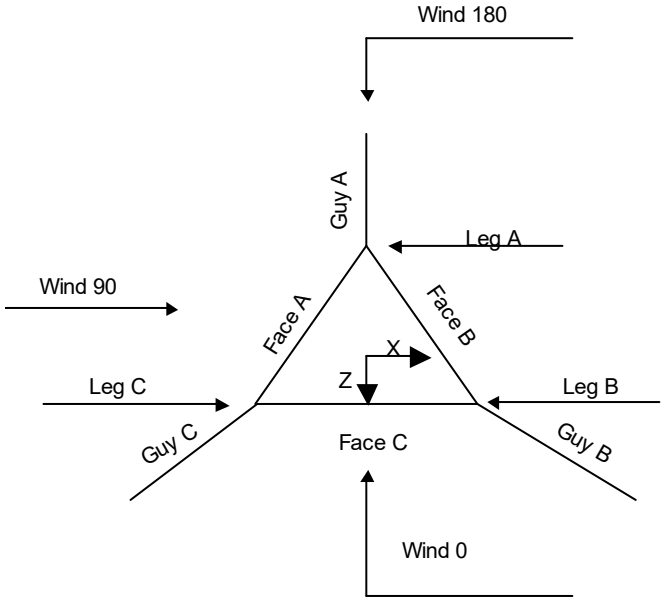
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 187.00 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 3.50 ft at the top and 3.50 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

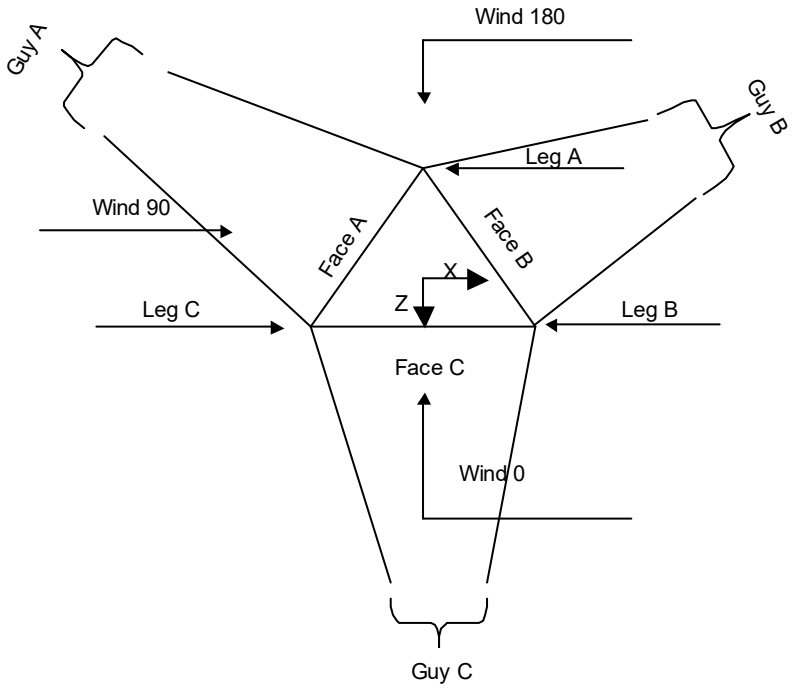
- Tower is located in New London County, Connecticut.
- Basic wind speed of 105 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- Tension only take-up is 0.0313 in.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Safety factor used in guy design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	187.00-180.00			3.50	1	7.00
T2	180.00-160.00			3.50	1	20.00
T3	160.00-140.00			3.50	1	20.00
T4	140.00-120.00			3.50	1	20.00
T5-T6	120.00-80.00			3.50	2	20.00
T7	80.00-60.00			3.50	1	20.00
T8-T10	60.00-0.00			3.50	3	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	187.00-180.00	2.85	TX Brace	No	Yes	3.7500	11.8750
T2	180.00-160.00	3.21	X Brace	No	Yes	4.5000	4.5000
T3	160.00-140.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T4	140.00-120.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T5-T6	120.00-80.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T7	80.00-60.00	3.21	TX Brace	No	Yes	4.5000	4.5000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T8-T10	60.00-0.00	3.21	TX Brace	No	Yes	4.5000	4.5000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 187.00-180.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 180.00-160.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Channel	C3x4.1	A36 (36 ksi)
T3 160.00-140.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T4 140.00-120.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T5-T6 120.00-80.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 80.00-60.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T8-T10 60.00-0.00	Pipe	P2.875"x0.203" (2.5 STD)	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 187.00-180.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T2 180.00-160.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T3 160.00-140.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T4 140.00-120.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T5-T6 120.00-80.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T7 80.00-60.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T8-T10 60.00-0.00	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 187.00-180.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T2 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T3 160.00-140.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T4 140.00-120.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T5-T6 120.00-80.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T7 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T8-T10 60.00-0.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 187.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5-T6 120.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8-T10 60.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 187.00-180.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 180.00-160.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.00-140.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 140.00-120.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5-T6 120.00-80.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 80.00-60.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8-T10 60.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 187.00-180.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5-T6 120.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8-T10 60.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 187.00-180.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 180.00-160.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 160.00-140.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 140.00-120.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5-T6 120.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8-T10 60.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 187.00-180.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.00-140.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.00-120.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5-T6 120.00-80.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.00-60.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8-T10 60.00-0.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
160.375	EHS	A	5/8	4.24	10%	23000	0.813	228.10	149.30	0.0000	-14.00	100%
		B	5/8	4.24	10%	23000	0.813	197.38	133.50	0.0000	13.00	100%
		C	5/8	4.24	10%	23000	0.813	212.66	126.80	0.0000	-12.00	100%
120.375	EHS	A	9/16	3.50	10%	23000	0.671	199.25	149.30	0.0000	-14.00	100%
		B	9/16	3.50	10%	23000	0.671	169.66	133.50	0.0000	13.00	100%
		C	9/16	3.50	10%	23000	0.671	181.81	126.80	0.0000	-12.00	100%
59.625	EHS	A	9/16	3.50	10%	23000	0.671	164.53	149.30	0.0000	-14.00	100%
		B	9/16	3.50	10%	23000	0.671	139.40	133.50	0.0000	13.00	100%
		C	9/16	3.50	10%	23000	0.671	143.76	126.80	0.0000	-12.00	100%
170	EHS	A	5/8	4.24	10%	23000	0.813	235.50	149.30	0.0000	-14.00	100%
		B	5/8	4.24	10%	23000	0.813	204.63	133.50	0.0000	13.00	100%
		C	5/8	4.24	10%	23000	0.813	220.50	126.80	0.0000	-12.00	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
160.375	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L 3 x 3 x 1/4
120.375	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L 3 x 3 x 1/4
59.625	Corner						
170	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
160.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L 2 x 2 x 5/16
120.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L 2 x 2 x 5/16
59.63	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16
170.00	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L 1.5 x 1.5 x 3/16

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
160.375	0.19	0.16	0.17		4.91	3.69	4.27	

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
					3.8 sec/pulse	3.3 sec/pulse	3.6 sec/pulse	
120.375	0.13	0.11	0.12		3.76	2.73	3.13	
					3.3 sec/pulse	2.9 sec/pulse	3.1 sec/pulse	
59.625	0.11	0.09	0.10		2.58	1.86	1.97	
					2.8 sec/pulse	2.4 sec/pulse	2.4 sec/pulse	
170	0.19	0.17	0.18		5.23	3.96	4.59	
					3.9 sec/pulse	3.4 sec/pulse	3.7 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
160.375	No	No	1	1	1	1	1	1
120.375	No	No	1	1	1	1	1	1
59.625	No	No			1	1	1	1
170	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
160.375	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
120.375	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
59.625	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
170	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
160.375	A	73.19	22	5	1.6244
	B	86.69	23	5	1.6521
	C	74.19	22	5	1.6266
120.375	A	53.19	20	4	1.5733
	B	66.69	21	5	1.6093
	C	54.19	20	5	1.5763
59.625	A	22.81	17	4	1.4456
	B	36.31	18	4	1.5144
	C	23.81	17	4	1.4518
170	A	78.00	22	5	1.6347
	B	91.50	23	5	1.6610
	C	79.00	22	5	1.6368

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
FDH1206-24S50-xxM(1 3/8) (T-Mobile) *****	A	No	No	Ar (CaAa)	182.00 - 0.00	0.0000	0.1	3	3	1.0000 1.4300	1.4300		1.63
FXL-1480(1-1/4) (Sprint)	B	No	No	Ar (CaAa)	150.00 - 0.00	0.0000	0.25	4	4	1.0000 1.5700	1.5700		0.45
AVA7-50(1-5/8) (AT&T)	B	No	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	12	4	1.0000 2.0100	2.0100		0.70
AVA7-50(1-5/8) (Verizon)	A	No	No	Ar (CaAa)	136.00 - 0.00	0.0000	0.4	12	6	1.0000 2.0100	2.0100		0.70
.66" Fiber (AT&T)	B	No	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	2	2	0.6600	0.6600		0.40
FDH1206-24S50-xxM(1-3/8) (AT&T)	B	No	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	1	1	1.4300	1.4300		1.63
3" Conduit (2 1/2" EMT) (AT&T) *****	B	No	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	1	1	2.8750	2.8750		2.16
Safety Line 3/8 *****	C	No	No	Ar (CaAa)	187.00 - 0.00	0.5000	0	1	1	0.3750	0.3750		0.22

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
187									
(2) DMP65R-BU8D_TIA w/ Mount Pipe (P - AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	18.11 18.84 19.59	10.26 11.78 13.33	0.14 0.26 0.39
(2) DMP65R-BU8D_TIA w/ Mount Pipe (P - AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	18.11 18.84 19.59	10.26 11.78 13.33	0.14 0.26 0.39
(2) DMP65R-BU8D_TIA w/ Mount Pipe (P - AT&T)	C	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	18.11 18.84 19.59	10.26 11.78 13.33	0.14 0.26 0.39
RRUS 4449 B5/B12 (P - AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	0.07 0.09 0.11
RRUS 4449 B5/B12 (P - AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	0.07 0.09 0.11
RRUS 4449 B5/B12 (P - AT&T)	C	From Leg	4.00 0.00	0.0000	187.00	No Ice 1/2"	1.97 2.14	1.41 1.56	0.07 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				Ice	2.33	1.73	0.11
							1" Ice			
RRUS 8843 B2/B66A (P - AT&T)	A	From Leg	4.00	0.00	0.0000	187.00	No Ice	1.64	1.35	0.07
			0.00				1/2"	1.80	1.50	0.09
			0.00				Ice	1.97	1.65	0.11
							1" Ice			
RRUS 8843 B2/B66A (P - AT&T)	B	From Leg	4.00	0.00	0.0000	187.00	No Ice	1.64	1.35	0.07
			0.00				1/2"	1.80	1.50	0.09
			0.00				Ice	1.97	1.65	0.11
							1" Ice			
RRUS 8843 B2/B66A (P - AT&T)	C	From Leg	4.00	0.00	0.0000	187.00	No Ice	1.64	1.35	0.07
			0.00				1/2"	1.80	1.50	0.09
			0.00				Ice	1.97	1.65	0.11
							1" Ice			
RRUS 4478 B14 (P - AT&T)	A	From Leg	4.00	0.00	0.0000	187.00	No Ice	2.02	1.25	0.06
			0.00				1/2"	2.20	1.40	0.08
			0.00				Ice	2.39	1.55	0.10
							1" Ice			
RRUS 4478 B14 (P - AT&T)	B	From Leg	4.00	0.00	0.0000	187.00	No Ice	2.02	1.25	0.06
			0.00				1/2"	2.20	1.40	0.08
			0.00				Ice	2.39	1.55	0.10
							1" Ice			
RRUS 4478 B14 (P - AT&T)	C	From Leg	4.00	0.00	0.0000	187.00	No Ice	2.02	1.25	0.06
			0.00				1/2"	2.20	1.40	0.08
			0.00				Ice	2.39	1.55	0.10
							1" Ice			
7770_TIA w/ Mount Pipe (E - AT&T)	A	From Leg	4.00	0.00	0.0000	187.00	No Ice	5.75	4.25	0.06
			0.00				1/2"	6.18	5.01	0.10
			0.00				Ice	6.61	5.71	0.16
							1" Ice			
7770_TIA w/ Mount Pipe (E - AT&T)	B	From Leg	4.00	0.00	0.0000	187.00	No Ice	5.75	4.25	0.06
			0.00				1/2"	6.18	5.01	0.10
			0.00				Ice	6.61	5.71	0.16
							1" Ice			
7770_TIA w/ Mount Pipe (E - AT&T)	C	From Leg	4.00	0.00	0.0000	187.00	No Ice	5.75	4.25	0.06
			0.00				1/2"	6.18	5.01	0.10
			0.00				Ice	6.61	5.71	0.16
							1" Ice			
(2) LGP 17201 (E - AT&T)	A	From Leg	4.00	0.00	0.0000	187.00	No Ice	1.67	0.47	0.03
			0.00				1/2"	1.83	0.57	0.04
			0.00				Ice	2.00	0.68	0.06
							1" Ice			
(2) LGP 17201 (E - AT&T)	B	From Leg	4.00	0.00	0.0000	187.00	No Ice	1.67	0.47	0.03
			0.00				1/2"	1.83	0.57	0.04
			0.00				Ice	2.00	0.68	0.06
							1" Ice			
(2) LGP 17201 (E - AT&T)	C	From Leg	4.00	0.00	0.0000	187.00	No Ice	1.67	0.47	0.03
			0.00				1/2"	1.83	0.57	0.04
			0.00				Ice	2.00	0.68	0.06
							1" Ice			
(2) DC6-48-60-18-8F (E - AT&T)	A	From Leg	4.00	0.00	0.0000	187.00	No Ice	1.21	1.21	0.03
			0.00				1/2"	1.89	1.89	0.05
			0.00				Ice	2.11	2.11	0.08
							1" Ice			
Sector Mount [SM 801-3] (E - AT&T)	C	None			0.0000	187.00	No Ice	20.61	20.61	0.88
							1/2"	29.42	29.42	1.28
							Ice	38.23	38.23	1.82
							1" Ice			
mount mods	A	From Leg	2.00	0.00	0.0000	187.00	No Ice	4.16	8.47	0.24
			0.00				1/2"	5.29	10.84	0.27
			0.00				Ice	6.42	13.22	0.29
							1" Ice			
mount mods	B	From Leg	2.00	0.00	0.0000	187.00	No Ice	4.16	8.47	0.24
			0.00				1/2"	5.29	10.84	0.27
			0.00				Ice	6.42	13.22	0.29

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
mount mods	C	From Leg	2.00 0.00 0.00	0.0000	187.00	No Ice 1/2" Ice 1" Ice	4.16 5.29 6.42	8.47 10.84 13.22	0.24 0.27 0.29
177									
APXVAALL24_43-U-NA20_TIA w/ Mount Pipe (TMO)	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	11.02 12.55 14.10	0.19 0.32 0.47
APXVAALL24_43-U-NA20_TIA w/ Mount Pipe (TMO)	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	11.02 12.55 14.10	0.19 0.32 0.47
APXVAALL24_43-U-NA20_TIA w/ Mount Pipe (TMO)	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	11.02 12.55 14.10	0.19 0.32 0.47
RADIO 4449 B12/B71 (TMO)	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RADIO 4449 B12/B71 (TMO)	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RADIO 4449 B12/B71 (TMO)	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RADIO 4415 (TMO)	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.87 1.00 1.14	0.05 0.06 0.08
RADIO 4415 (TMO)	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.87 1.00 1.14	0.05 0.06 0.08
RADIO 4415 (TMO)	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.87 1.00 1.14	0.05 0.06 0.08
RADIO 4415 B66A (TMO)	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.87 1.00 1.13	0.05 0.06 0.08
RADIO 4415 B66A (TMO)	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.87 1.00 1.13	0.05 0.06 0.08
RADIO 4415 B66A (TMO)	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.87 1.00 1.13	0.05 0.06 0.08
8' x 2" Sch 40 Pipe Mount	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
8' x 2" Sch 40 Pipe Mount	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
8' x 2" Sch 40 Pipe Mount	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
Sector Mount [SM 1305-3] (TMO)	C	None		0.0000	177.00	No Ice 1/2" Ice 1" Ice	31.68 41.02 50.37	31.68 41.02 50.37	1.25 1.94 2.79
173 ***150***									
APXV9ERR18-C-A20_TIA w/ Mount Pipe (Sprint)	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	7.47 8.66 9.56	0.10 0.17 0.24
APXV9ERR18-C-A20_TIA w/ Mount Pipe (Sprint)	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	7.47 8.66 9.56	0.10 0.17 0.24
APXV9ERR18-C-A20_TIA w/ Mount Pipe (Sprint)	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	7.47 8.66 9.56	0.10 0.17 0.24
DT465B-2XR w/ Mount Pipe (Sprint)	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	5.50 5.97 6.45	4.38 4.84 5.30	0.09 0.16 0.25
DT465B-2XR w/ Mount Pipe (Sprint)	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	5.50 5.97 6.45	4.38 4.84 5.30	0.09 0.16 0.25
DT465B-2XR w/ Mount Pipe (Sprint)	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	5.50 5.97 6.45	4.38 4.84 5.30	0.09 0.16 0.25
1900 MHz 4x45W RRH (Sprint)	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
1900 MHz 4x45W RRH (Sprint)	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
1900 MHz 4x45W RRH (Sprint)	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
RRH 8x20W + Solar Shield (Sprint)	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
RRH 8x20W + Solar Shield (Sprint)	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
RRH 8x20W + Solar Shield (Sprint)	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
(2) RRH2x50-WCS (Sprint)	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.91 5.23 5.55	2.70 3.00 3.30	0.08 0.11 0.14
(2) RRH2x50-WCS (Sprint)	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.91 5.23 5.55	2.70 3.00 3.30	0.08 0.11 0.14
(2) RRH2x50-WCS (Sprint)	C	From Leg	4.00 0.00	0.0000	150.00	No Ice 1/2"	4.91 5.23	2.70 3.00	0.08 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	5.55	3.30	0.14
						1" Ice			
Sector Mount [SM 502-3]	C	None		0.0000	150.00	No Ice	29.82	29.82	1.67
						1/2" Ice	42.21	42.21	2.27
						1" Ice	54.43	54.43	3.05
136									
(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe (VZW)	A	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	2.86 3.22 3.59	6.57 7.19 7.84	0.03 0.08 0.13
(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe (VZW)	B	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	2.86 3.22 3.59	6.57 7.19 7.84	0.03 0.08 0.13
(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe (VZW)	C	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	2.86 3.22 3.59	6.57 7.19 7.84	0.03 0.08 0.13
BXA-70063/6CF_TIA w/ Mount Pipe (VZW)	A	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	7.87 8.42 8.94	6.27 7.43 8.30	0.06 0.12 0.19
BXA-70063/6CF_TIA w/ Mount Pipe (VZW)	B	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	7.87 8.42 8.94	6.27 7.43 8.30	0.06 0.12 0.19
BXA-70063/6CF_TIA w/ Mount Pipe (VZW)	C	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	7.87 8.42 8.94	6.27 7.43 8.30	0.06 0.12 0.19
BXA-171085-8CF-EDIN-X w/ Mount Pipe (VZW)	A	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	3.16 3.53 3.90	3.33 3.94 4.56	0.03 0.06 0.10
BXA-171085-8CF-EDIN-X w/ Mount Pipe (VZW)	B	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	3.16 3.53 3.90	3.33 3.94 4.56	0.03 0.06 0.10
BXA-171085-8CF-EDIN-X w/ Mount Pipe (VZW)	C	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	3.16 3.53 3.90	3.33 3.94 4.56	0.03 0.06 0.10
(2) FD9R6004/2C-3L (VZW)	A	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
(2) FD9R6004/2C-3L (VZW)	B	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
(2) FD9R6004/2C-3L (VZW)	C	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
Sector Mount [SM 502-3]	C	None		0.0000	136.00	No Ice 1/2" Ice 1" Ice	29.82 42.21 54.43	29.82 42.21 54.43	1.67 2.27 3.05
***** *									

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	3.25			
Bracing Weight	3.96			
Total Member Self-Weight	7.21			
Guy Weight	2.61			
Total Weight	25.73			
Wind 0 deg - No Ice		0.00	-22.50	6.14
Wind 30 deg - No Ice		10.92	-18.92	5.29
Wind 60 deg - No Ice		19.60	-11.31	0.72
Wind 90 deg - No Ice		23.87	0.00	-5.19
Wind 120 deg - No Ice		20.96	12.10	-8.06
Wind 150 deg - No Ice		11.43	19.79	-6.87
Wind 180 deg - No Ice		0.00	22.10	-6.14
Wind 210 deg - No Ice		-10.92	18.92	-5.29
Wind 240 deg - No Ice		-19.94	11.51	-0.72
Wind 270 deg - No Ice		-23.87	0.00	5.19
Wind 300 deg - No Ice		-20.61	-11.90	8.06
Wind 330 deg - No Ice		-11.43	-19.79	6.87
Member Ice	19.65			
Guy Ice	14.98			
Total Weight Ice	112.72			
Wind 0 deg - Ice		0.00	-8.54	1.63
Wind 30 deg - Ice		4.27	-7.39	1.44
Wind 60 deg - Ice		7.56	-4.37	0.44
Wind 90 deg - Ice		8.92	0.00	-1.03
Wind 120 deg - Ice		7.73	4.46	-1.80
Wind 150 deg - Ice		4.33	7.50	-1.73
Wind 180 deg - Ice		0.00	8.47	-1.63
Wind 210 deg - Ice		-4.27	7.39	-1.44
Wind 240 deg - Ice		-7.62	4.40	-0.44
Wind 270 deg - Ice		-8.92	0.00	1.03
Wind 300 deg - Ice		-7.67	-4.43	1.80
Wind 330 deg - Ice		-4.33	-7.50	1.73
Total Weight	25.73			
Wind 0 deg - Service		0.00	-7.35	2.01
Wind 30 deg - Service		3.57	-6.18	1.73
Wind 60 deg - Service		6.40	-3.69	0.23
Wind 90 deg - Service		7.79	0.00	-1.70
Wind 120 deg - Service		6.85	3.95	-2.64
Wind 150 deg - Service		3.73	6.46	-2.24
Wind 180 deg - Service		0.00	7.22	-2.01
Wind 210 deg - Service		-3.57	6.18	-1.73
Wind 240 deg - Service		-6.51	3.76	-0.23
Wind 270 deg - Service		-7.79	0.00	1.70
Wind 300 deg - Service		-6.73	-3.89	2.64
Wind 330 deg - Service		-3.73	-6.46	2.24

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	187 - 180	2.410	29	0.2126	0.0514
T2	180 - 160	2.079	29	0.2061	0.0468
T3	160 - 140	1.369	29	0.1251	0.0445
T4	140 - 120	1.001	29	0.0744	0.0599
T5	120 - 100	0.762	29	0.0362	0.0643
T6	100 - 80	0.712	30	0.0176	0.1054
T7	80 - 60	0.650	30	0.0239	0.1232
T8	60 - 40	0.538	30	0.0208	0.1185
T9	40 - 20	0.468	31	0.0283	0.0953
T10	20 - 0	0.294	31	0.0571	0.0538

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
187.00	(2) DMP65R-BU8D_TIA w/ Mount Pipe	29	2.410	0.2126	0.0514	18325
177.00	APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	29	1.948	0.1985	0.0453	12471
170.00	Guy	29	1.675	0.1707	0.0437	11461
160.38	Guy	29	1.379	0.1266	0.0443	10166
150.00	APXV9ERR18-C-A20_TIA w/ Mount Pipe	29	1.158	0.0947	0.0528	18287
136.00	(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	29	0.944	0.0665	0.0604	60723

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.38	Guy	29	0.765	0.0368	0.0639	20204
59.63	Guy	30	0.537	0.0207	0.1182	55589

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	187 - 180	20.270	6	1.5765	0.3523
T2	180 - 160	17.931	6	1.5459	0.3421
T3	160 - 140	12.409	6	1.1325	0.3322
T4	140 - 120	8.820	6	0.7909	0.4090
T5	120 - 100	6.344	6	0.4611	0.4335
T6	100 - 80	5.337	6	0.2191	0.6736
T7	80 - 60	4.643	6	0.1778	0.7301
T8	60 - 40	3.857	6	0.1678	0.6754
T9	40 - 20	3.158	6	0.2246	0.5363
T10	20 - 0	1.898	6	0.3827	0.3073

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
187.00	(2) DMP65R-BU8D_TIA w/ Mount Pipe	6	20.270	1.5765	0.3523	3976
177.00	APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	6	16.978	1.5090	0.3380	2646
170.00	Guy	6	14.917	1.3710	0.3306	2356
160.38	Guy	6	12.493	1.1409	0.3317	2112
150.00	APXV9ERR18-C-A20_TIA w/ Mount Pipe	6	10.434	0.9459	0.3623	3260
136.00	(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	6	8.231	0.7264	0.4123	5311
120.38	Guy	6	6.376	0.4670	0.4309	2511
59.63	Guy	6	3.844	0.1676	0.6737	11783

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	187	Leg	A325N	0.7500	4	0.36	29.82	0.012	1	Bolt Tension
T2	180	Leg	A325N	0.7500	4	3.24	29.82	0.109	1	Bolt Tension
T3	160	Leg	A325N	0.7500	4	6.52	29.82	0.219	1	Bolt Tension
T4	140	Leg	A325N	0.7500	4	4.04	29.82	0.136	1	Bolt Tension
T5	120	Leg	A325N	0.7500	4	5.55	29.82	0.186	1	Bolt Tension
T6	100	Leg	A325N	0.7500	4	4.08	29.82	0.137	1	Bolt Tension
T7	80	Leg	A325N	0.7500	4	4.35	29.82	0.146	1	Bolt Tension
T8	60	Leg	A325N	0.7500	4	4.52	29.82	0.152	1	Bolt Tension
T9	40	Leg	A325N	0.7500	4	5.07	29.82	0.170	1	Bolt Tension
T10	20	Leg	A325N	0.7500	4	5.23	29.82	0.175	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T2	160.38 (A) (577)	5/8 EHS	4.24	42.40	14.17	25.44	1.000	1.795
	160.38 (A) (578)	5/8 EHS	4.24	42.40	13.45	25.44	1.000	1.892
	160.38 (B) (571)	5/8 EHS	4.24	42.40	13.28	25.44	1.000	1.915
	160.38 (B) (572)	5/8 EHS	4.24	42.40	13.90	25.44	1.000	1.831
	160.38 (C) (565)	5/8 EHS	4.24	42.40	15.38	25.44	1.000	1.654
	160.38 (C) (566)	5/8 EHS	4.24	42.40	15.50	25.44	1.000	1.641
	170.00 (A) (606)	5/8 EHS	4.24	42.40	14.95	25.44	1.000	1.702
	170.00 (B) (605)	5/8 EHS	4.24	42.40	14.88	25.44	1.000	1.709
	170.00 (C) (604)	5/8 EHS	4.24	42.40	16.12	25.44	1.000	1.578
T4	120.38 (A) (595)	9/16 EHS	3.50	35.00	8.35	21.00	1.000	2.515
	120.38 (A) (596)	9/16 EHS	3.50	35.00	7.96	21.00	1.000	2.638
	120.38 (B) (589)	9/16 EHS	3.50	35.00	7.89	21.00	1.000	2.660
	120.38 (B) (590)	9/16 EHS	3.50	35.00	8.84	21.00	1.000	2.377
	120.38 (C) (583)	9/16 EHS	3.50	35.00	9.82	21.00	1.000	2.139
	120.38 (C) (584)	9/16 EHS	3.50	35.00	9.19	21.00	1.000	2.285
T8	59.63 (A) (603)	9/16 EHS	3.50	35.00	7.95	21.00	1.000	2.641
	59.63 (B) (602)	9/16 EHS	3.50	35.00	9.11	21.00	1.000	2.305
	59.63 (C) (601)	9/16 EHS	3.50	35.00	9.06	21.00	1.000	2.317

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	P2.875"x0.203" (2.5 STD)	7.00	2.85	36.1 K=1.00	1.7040	-17.03	74.72	0.228 [1]
T2	180 - 160	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-67.04	79.61	0.842 [1]
T3	160 - 140	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-67.12	79.61	0.843 [1]
T4	140 - 120	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-69.30	79.61	0.871 [1]
T5	120 - 100	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-66.96	79.61	0.841 [1]
T6	100 - 80	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6 K=1.00	1.7040	-53.59	79.61	0.673 [1]
T7	80 - 60	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6	1.7040	-55.35	79.61	0.695 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	60 - 40	P2.875"x0.203" (2.5 STD)	20.00	3.21	K=1.00 40.6	1.7040	-61.56	79.61	0.773 [1]
T9	40 - 20	P2.875"x0.203" (2.5 STD)	20.00	3.21	K=1.00 40.6	1.7040	-63.59	79.61	0.799 [1]
T10	20 - 0	P2.875"x0.203" (2.5 STD)	20.00	3.21	K=1.00 40.6	1.7040	-63.66	79.61	0.800 [1]
					K=1.00				

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	C3x4.1	4.75	2.21	65.7 K=1.00	1.2100	-5.74	31.24	0.184 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-6.32	7.19	0.879 [1]
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.11	7.19	0.432 [1]
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-5.29	7.19	0.736 [1]
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-4.90	7.19	0.682 [1]
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-4.17	7.19	0.581 [1]
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.74	7.19	0.520 [1]
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.62	7.19	0.504 [1]
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.59	7.19	0.500 [1]
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.77	7.19	0.525 [1]
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.63	7.19	0.505 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-4.24	7.19	0.590 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.16	7.19	0.161 [1]
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-4.06	7.19	0.564 [1]
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.63	7.19	0.366 [1]
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.42	7.19	0.475 [1]
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.18	7.19	0.303 [1]
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.03	7.19	0.282 [1]
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.79	7.19	0.249 [1]
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.06	7.19	0.287 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-4.65	7.19	0.647 [1]
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.65	7.19	0.229 [1]
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.41	7.19	0.336 [1]
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-4.43	7.19	0.616 [1]
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.14	7.19	0.298 [1]
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.88	7.19	0.261 [1]
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.79	7.19	0.249 [1]
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.12	7.19	0.295 [1]
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.85	7.19	0.257 [1]
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.38	7.19	0.053 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L 2 x 2 x 5/16	3.50	3.26	100.3 K=1.00	1.1500	-4.64	21.94	0.212 [1]
T4	140 - 120	L 2 x 2 x 5/16	3.50	3.26	100.3 K=1.00	1.1500	-7.15	21.94	0.326 [1]
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	133.4 K=1.00	0.5273	-1.22	6.70	0.182 [1]

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160 (569)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-12.53	36.39	0.344 [1]
T2	180 - 160 (570)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-11.52	36.39	0.317 [1]
T2	180 - 160 (575)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-12.66	36.39	0.348 [1]
T2	180 - 160 (576)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-11.44	36.39	0.314 [1]
T2	180 - 160 (581)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-11.61	36.39	0.319 [1]
T2	180 - 160 (582)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-11.82	36.39	0.325 [1]
T4	140 - 120 (587)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-7.18	36.39	0.197 [1]
T4	140 - 120 (588)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-6.31	36.39	0.174 [1]
T4	140 - 120 (593)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-7.76	36.39	0.213 [1]
T4	140 - 120 (594)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-6.29	36.39	0.173 [1]
T4	140 - 120 (599)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-6.68	36.39	0.184 [1]
T4	140 - 120 (600)	L 3 x 3 x 1/4	3.50	3.38	68.5 K=1.00	1.4375	-7.22	36.39	0.198 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	P2.875"x0.203" (2.5 STD)	7.00	2.85	36.1	1.7040	12.96	82.82	0.156 [1]
T2	180 - 160	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6	1.7040	38.64	92.02	0.420 [1]
T3	160 - 140	P2.875"x0.203" (2.5 STD)	20.00	3.21	40.6	1.7040	26.08	92.02	0.283 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	187 - 180	5/8	4.51	4.20	322.9	0.3068	7.81	9.94	0.786 [1]
T2	180 - 160	C3x4.1	4.75	2.21	65.7	1.2100	6.57	39.20	0.168 [1]
T3	160 - 140	5/8	4.75	4.42	339.7	0.3068	6.85	9.94	0.689 [1]
T4	140 - 120	5/8	4.75	4.42	339.7	0.3068	4.62	9.94	0.464 [1]

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T5	120 - 100	5/8	4.75	4.42	339.7	0.3068	6.12	9.94	0.615 [1]
T6	100 - 80	5/8	4.75	4.42	339.7	0.3068	3.75	9.94	0.377 [1]
T7	80 - 60	5/8	4.75	4.42	339.7	0.3068	4.10	9.94	0.412 [1]
T8	60 - 40	5/8	4.75	4.42	339.7	0.3068	4.19	9.94	0.421 [1]
T9	40 - 20	5/8	4.75	4.42	339.7	0.3068	3.63	9.94	0.365 [1]
T10	20 - 0	5/8	4.75	4.42	339.7	0.3068	4.62	9.94	0.464 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	187 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.29	17.09	0.017 [1]
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	4.86	17.09	0.284 [1]
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.16	17.09	0.068 [1]
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.20	17.09	0.070 [1]
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.16	17.09	0.068 [1]
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.93	17.09	0.054 [1]
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.96	17.09	0.056 [1]
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.07	17.09	0.062 [1]
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.10	17.09	0.064 [1]
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.10	17.09	0.065 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.16	17.09	0.068 [1]
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.16	17.09	0.068 [1]
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.20	17.09	0.070 [1]
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.16	17.09	0.068 [1]
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.93	17.09	0.054 [1]
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.96	17.09	0.056 [1]
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.10	17.09	0.064 [1]
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.10	17.09	0.065 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	187 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.29	17.09	0.017 [1]
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	5.93	17.09	0.347 [1]
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.16	17.09	0.068 [1]
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.20	17.09	0.070 [1]
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.16	17.09	0.068 [1]
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.93	17.09	0.054 [1]
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.96	17.09	0.056 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.07	17.09	0.062 [1]
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.10	17.09	0.064 [1]
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.69	17.09	0.041 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L 2 x 2 x 5/16	3.50	3.26	65.1	1.1500	10.55	37.26	0.283 [1]
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	4.79	17.09	0.280 [1]
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	2.39	17.09	0.140 [1]

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160 (567)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	15.05	46.58	0.323 [1]
T2	180 - 160 (568)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	14.95	46.58	0.321 [1]
T2	180 - 160 (573)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	14.67	46.58	0.315 [1]
T2	180 - 160 (574)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	14.94	46.58	0.321 [1]
T2	180 - 160 (579)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	13.82	46.58	0.297 [1]
T2	180 - 160 (580)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	13.93	46.58	0.299 [1]
T4	140 - 120 (585)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	8.46	46.58	0.182 [1]
T4	140 - 120 (586)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	8.36	46.58	0.179 [1]
T4	140 - 120 (591)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	7.30	46.58	0.157 [1]
T4	140 - 120 (592)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	7.73	46.58	0.166 [1]
T4	140 - 120 (597)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	6.93	46.58	0.149 [1]
T4	140 - 120 (598)	L 3 x 3 x 1/4	4.75	4.59	59.1	1.4375	7.13	46.58	0.153 [1]

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	4.72	46.58	0.101 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	(569)								
T2	180 - 160 (570)	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	4.18	46.58	0.090 [1]
T2	180 - 160 (575)	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	5.00	46.58	0.107 [1]
T2	180 - 160 (576)	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	4.36	46.58	0.094 [1]
T2	180 - 160 (581)	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	5.08	46.58	0.109 [1]
T2	180 - 160 (582)	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	5.18	46.58	0.111 [1]
T4	140 - 120 (587)	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	3.67	46.58	0.079 [1]
T4	140 - 120 (588)	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	3.45	46.58	0.074 [1]
T4	140 - 120 (593)	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	3.74	46.58	0.080 [1]
T4	140 - 120 (594)	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	3.79	46.58	0.081 [1]
T4	140 - 120 (599)	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	4.40	46.58	0.094 [1]
T4	140 - 120 (600)	L 3 x 3 x 1/4	3.50	3.38	43.6	1.4375	4.11	46.58	0.088 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	187 - 180	Leg	P2.875"x0.203" (2.5 STD)	3	-17.03	74.72	22.8	Pass
T2	180 - 160	Leg	P2.875"x0.203" (2.5 STD)	25	-67.04	79.61	84.2	Pass
T3	160 - 140	Leg	P2.875"x0.203" (2.5 STD)	86	-67.12	79.61	84.3	Pass
T4	140 - 120	Leg	P2.875"x0.203" (2.5 STD)	146	-69.30	79.61	87.1	Pass
T5	120 - 100	Leg	P2.875"x0.203" (2.5 STD)	206	-66.96	79.61	84.1	Pass
T6	100 - 80	Leg	P2.875"x0.203" (2.5 STD)	267	-53.59	79.61	67.3	Pass
T7	80 - 60	Leg	P2.875"x0.203" (2.5 STD)	327	-55.35	79.61	69.5	Pass
T8	60 - 40	Leg	P2.875"x0.203" (2.5 STD)	387	-61.56	79.61	77.3	Pass
T9	40 - 20	Leg	P2.875"x0.203" (2.5 STD)	447	-63.59	79.61	79.9	Pass
T10	20 - 0	Leg	P2.875"x0.203" (2.5 STD)	505	-63.66	79.61	80.0	Pass
T1	187 - 180	Diagonal	5/8	13	7.81	9.94	78.6	Pass
T2	180 - 160	Diagonal	C3x4.1	39	-5.74	31.24	18.4	Pass
T3	160 - 140	Diagonal	5/8	142	6.85	9.94	68.9	Pass
T4	140 - 120	Diagonal	5/8	166	4.62	9.94	46.4	Pass
T5	120 - 100	Diagonal	5/8	261	6.12	9.94	61.5	Pass
T6	100 - 80	Diagonal	5/8	322	3.75	9.94	37.7	Pass
T7	80 - 60	Diagonal	5/8	336	4.10	9.94	41.2	Pass
T8	60 - 40	Diagonal	5/8	439	4.19	9.94	42.1	Pass
T9	40 - 20	Diagonal	5/8	458	3.63	9.94	36.5	Pass
T10	20 - 0	Diagonal	5/8	517	4.62	9.94	46.4	Pass
T1	187 - 180	Horizontal	L 1.5 x 1.5 x 3/16	16	-6.32	7.19	87.9	Pass
T2	180 - 160	Horizontal	L 1.5 x 1.5 x 3/16	67	-3.11	7.19	43.2	Pass
T3	160 - 140	Horizontal	L 1.5 x 1.5 x 3/16	137	-5.29	7.19	73.6	Pass
T4	140 - 120	Horizontal	L 1.5 x 1.5 x 3/16	169	-4.90	7.19	68.2	Pass
T5	120 - 100	Horizontal	L 1.5 x 1.5 x 3/16	257	-4.17	7.19	58.1	Pass
T6	100 - 80	Horizontal	L 1.5 x 1.5 x 3/16	282	-3.74	7.19	52.0	Pass
T7	80 - 60	Horizontal	L 1.5 x 1.5 x 3/16	378	-3.62	7.19	50.4	Pass
T8	60 - 40	Horizontal	L 1.5 x 1.5 x 3/16	400	-3.59	7.19	50.0	Pass
T9	40 - 20	Horizontal	L 1.5 x 1.5 x 3/16	462	-3.77	7.19	52.5	Pass
T10	20 - 0	Horizontal	L 1.5 x 1.5 x 3/16	558	-3.63	7.19	50.5	Pass
T1	187 - 180	Top Girt	L 1.5 x 1.5 x 3/16	4	-4.24	7.19	59.0	Pass
T2	180 - 160	Top Girt	L 1.5 x 1.5 x 3/16	30	-1.16	7.19	16.1	Pass
T3	160 - 140	Top Girt	L 1.5 x 1.5 x 3/16	89	-4.06	7.19	56.4	Pass
T4	140 - 120	Top Girt	L 1.5 x 1.5 x 3/16	149	-2.63	7.19	36.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T5	120 - 100	Top Girt	L 1.5 x 1.5 x 3/16	210	-3.42	7.19	47.5	Pass
T6	100 - 80	Top Girt	L 1.5 x 1.5 x 3/16	269	-2.18	7.19	30.3	Pass
T7	80 - 60	Top Girt	L 1.5 x 1.5 x 3/16	330	-2.03	7.19	28.2	Pass
T9	40 - 20	Top Girt	L 1.5 x 1.5 x 3/16	448	-1.79	7.19	24.9	Pass
T10	20 - 0	Top Girt	L 1.5 x 1.5 x 3/16	510	-2.06	7.19	28.7	Pass
T1	187 - 180	Bottom Girt	L 1.5 x 1.5 x 3/16	7	-4.65	7.19	64.7	Pass
T2	180 - 160	Bottom Girt	L 1.5 x 1.5 x 3/16	33	5.93	17.09	34.7	Pass
T3	160 - 140	Bottom Girt	L 1.5 x 1.5 x 3/16	91	-2.41	7.19	33.6	Pass
T4	140 - 120	Bottom Girt	L 1.5 x 1.5 x 3/16	152	-4.43	7.19	61.6	Pass
T5	120 - 100	Bottom Girt	L 1.5 x 1.5 x 3/16	213	-2.14	7.19	29.8	Pass
T6	100 - 80	Bottom Girt	L 1.5 x 1.5 x 3/16	271	-1.88	7.19	26.1	Pass
T7	80 - 60	Bottom Girt	L 1.5 x 1.5 x 3/16	333	-1.79	7.19	24.9	Pass
T8	60 - 40	Bottom Girt	L 1.5 x 1.5 x 3/16	393	-2.12	7.19	29.5	Pass
T9	40 - 20	Bottom Girt	L 1.5 x 1.5 x 3/16	453	-1.85	7.19	25.7	Pass
T10	20 - 0	Bottom Girt	L 1.5 x 1.5 x 3/16	512	-0.38	7.19	5.3	Pass
T2	180 - 160	Guy A@160.375	5/8	577	14.17	25.44	55.7	Pass
		Guy A@170	5/8	606	14.95	25.44	58.7	Pass
T4	140 - 120	Guy A@120.375	9/16	595	8.35	21.00	39.8	Pass
T8	60 - 40	Guy A@59.625	9/16	603	7.95	21.00	37.9	Pass
T2	180 - 160	Guy B@160.375	5/8	572	13.90	25.44	54.6	Pass
		Guy B@170	5/8	605	14.88	25.44	58.5	Pass
T4	140 - 120	Guy B@120.375	9/16	590	8.84	21.00	42.1	Pass
T8	60 - 40	Guy B@59.625	9/16	602	9.11	21.00	43.4	Pass
T2	180 - 160	Guy C@160.375	5/8	566	15.50	25.44	60.9	Pass
		Guy C@170	5/8	604	16.12	25.44	63.4	Pass
T4	140 - 120	Guy C@120.375	9/16	583	9.82	21.00	46.8	Pass
T8	60 - 40	Guy C@59.625	9/16	601	9.06	21.00	43.2	Pass
T2	180 - 160	Top Guy Pull-Off@160.375	L 2 x 2 x 5/16	41	10.55	37.26	28.3	Pass
		Top Guy Pull-Off@170	L 1.5 x 1.5 x 3/16	60	4.79	17.09	28.0	Pass
T4	140 - 120	Top Guy Pull-Off@120.375	L 2 x 2 x 5/16	162	-7.15	21.94	32.6	Pass
T8	60 - 40	Top Guy Pull-Off@59.625	L 1.5 x 1.5 x 3/16	388	-1.22	6.70	18.2	Pass
T2	180 - 160	Torque Arm Top@160.375	L 3 x 3 x 1/4	567	15.05	46.58	32.3	Pass
T4	140 - 120	Torque Arm Top@120.375	L 3 x 3 x 1/4	585	8.46	46.58	18.2	Pass
T2	180 - 160	Torque Arm Bottom@160.375	L 3 x 3 x 1/4	575	-12.66	36.39	34.8	Pass
T4	140 - 120	Torque Arm Bottom@120.375	L 3 x 3 x 1/4	593	-7.76	36.39	21.3	Pass

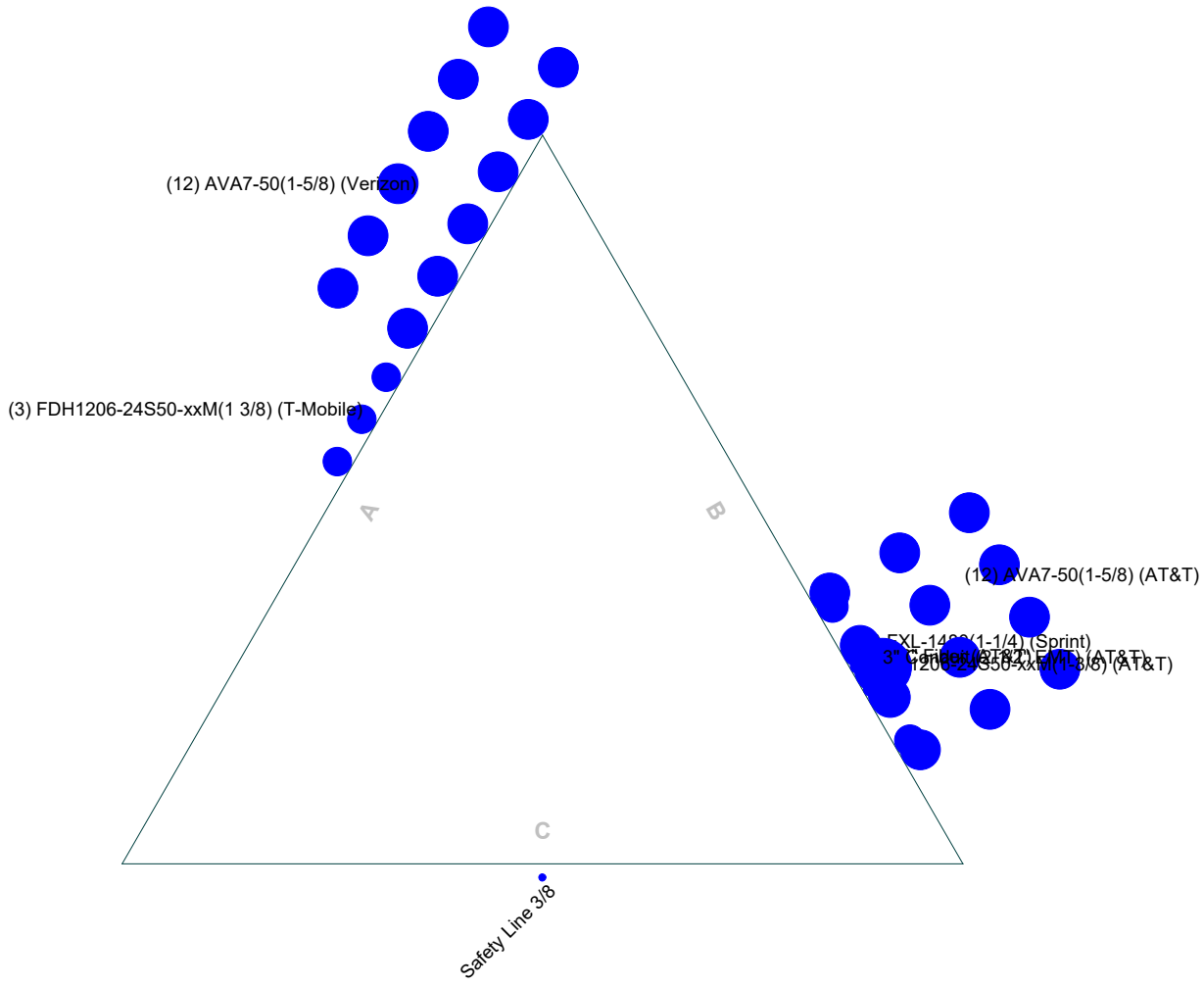
Summary		
Leg (T4)	87.1	Pass
Diagonal (T1)	78.6	Pass
Horizontal (T1)	87.9	Pass
Top Girt (T1)	59.0	Pass
Bottom Girt (T1)	64.7	Pass
Guy A (T2)	58.7	Pass
Guy B (T2)	58.5	Pass
Guy C (T2)	63.4	Pass
Top Guy Pull-Off (T4)	32.6	Pass
Torque Arm Top (T2)	32.3	Pass
Torque Arm Bottom (T2)	34.8	Pass
Bolt Checks	21.9	Pass
RATING =	**87.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan

Round Flat App In Face App Out Face



Paul J. Ford and Company
250 E. Broad St., Ste 600
Columbus, OH 43215
Phone: 614-221-6679
FAX:

Job: ***A00019-0431.002.8800***			
Project: ***Bozrah Polly Lane***			
Client: Everest Infrastructure Partners		Drawn by: ADP	App'd:
Code: TIA-222-G		Date: 06/17/21	Scale: NTS
Path: G:\TOWER\000_Misc\2019\00019-0431 Bozrah Polly Lane 7016950\00019-0431.004.8700_SA\tmx\00019-0431.004.8700.eri			Dwg No. E-7

APPENDIX C

ADDITIONAL CALCULATIONS

foundation loads

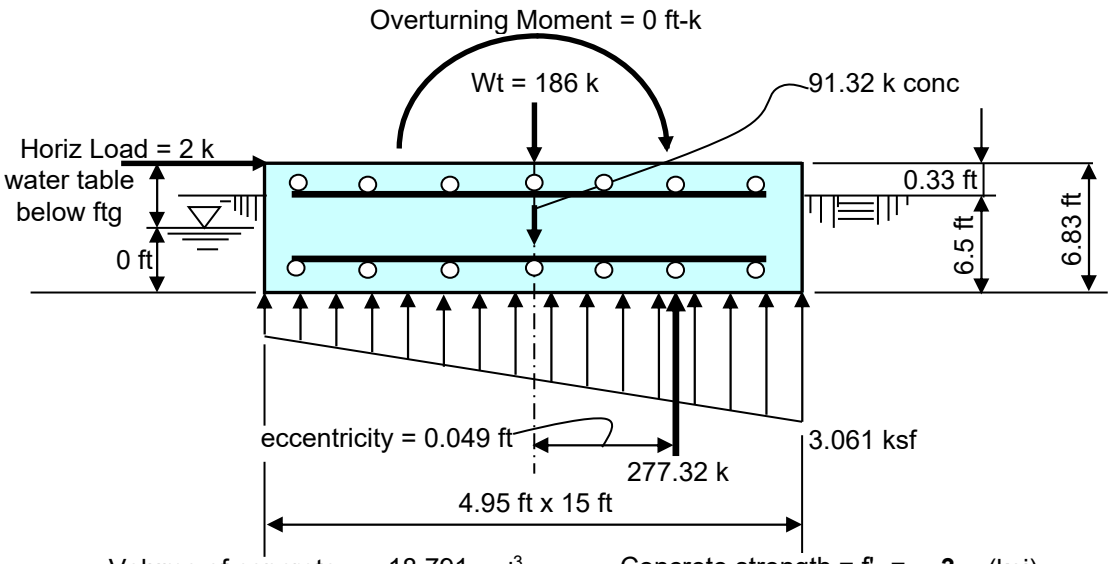
Limit states Tower or Pole Weight =	**186**	kips
limit states total horizontal force =	**2**	kips
limit states overturning moment =	**0**	ft-kips

soil properties

Safety factor against overturning =	**1**	
Soil Density =	**115**	pcf
Ultimate soil bearing =	**8**	ksf
Depth to water table =	**20**	ft

mat dimensions

depth to bottom of footing =	**6.5**	ft
Footing thickness =	**6.833**	ft
Footing Width =	**4.95**	ft
Footing Length =	**15**	ft
Tower/Pole Center Offset =	**0**	ft



Volume of concrete = 18.791 yd^3 Concrete strength = f'_c = **3** (ksi)

Rebar = (18) #9 x 4.45 ft long plus (58) #9 x 14.5 ft long

reinforcing steel = **(9) #9 by 4.45 long @ 21.75 in o.c. top and bot short bars**

reinforcing steel = **(29) #9 by 14.5 long @ 1.91 in o.c. top and bot long bars**

Summary of analysis results

Overturning Moment: (Stress Ratio = 0.027)

Calculated Ultimate Overturning Moment = 13.7 ft-kips

Resisting Moment = 514.8 ft-kips

Factor of Safety against overturning = 37.669 **> 1 okay**

Rebar strength = F_y = **60** (ksi)

minimum cover over rebar = **3** inches

Soil Bearing (Stress Ratio = 0.638) **< CONTROLLING CRITERIA**

Limit States Maximum Net Soil Bearing = 4.8 ksf

Calculated limit states Soil Bearing Pressure = 3.061 **ksf < 4.8 ksf okay**

Bending Moment (Stress Ratio = 0.001)

Ultimate Bending Moment Resistance = 9339 ft-kips

Calculated Ultimate Bending Moment = 7 **ft-kips < 9339 ft-kips okay**

Bending Shear (Stress Ratio = 0.004)

Ultimate Bending Shear Resistance = 377 kips

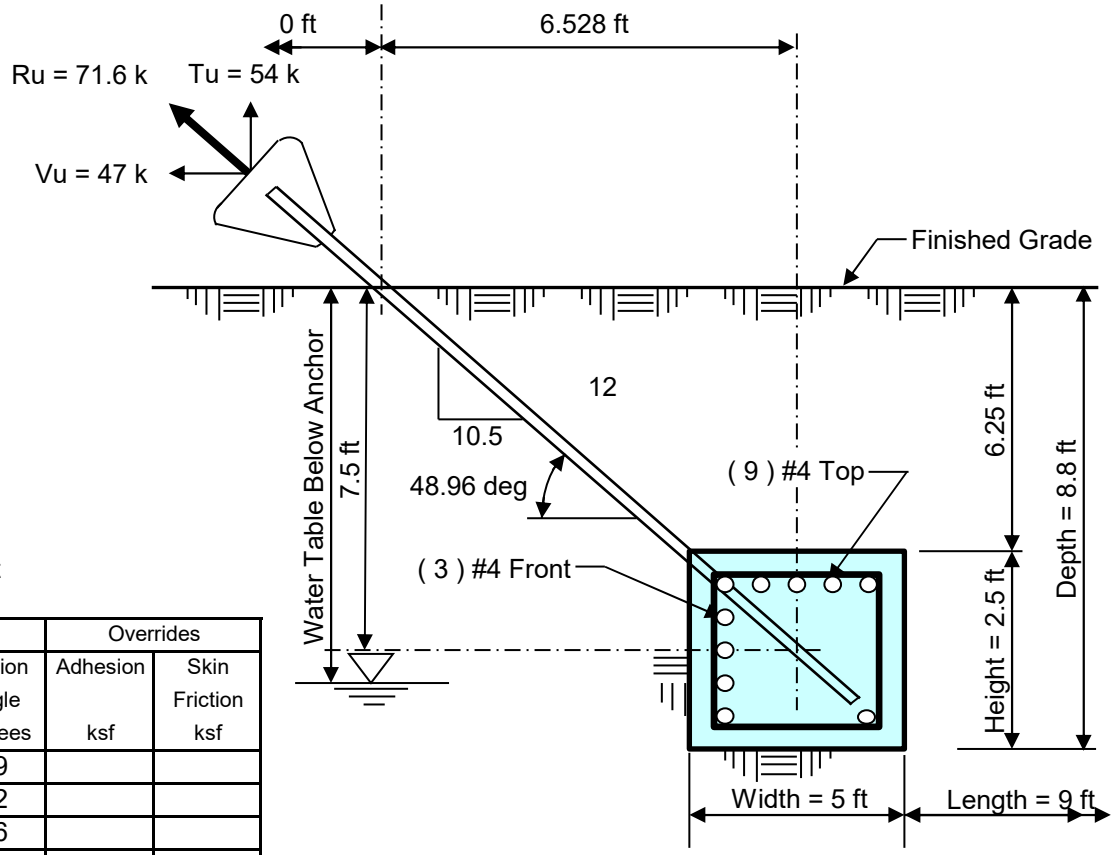
Calculated Ultimate Bending Shear = 1 **kips < 377 kips okay**

Deadman Guy Anchor Analysis (LRFD)

Guy Anchor: Bozrah, CT

PJF Job No. **00019-0431.004.8700** Project Name: **Bozrah Polly Lane** Engineer: **ADP**

Uplift Force =	**54**	k
Horizontal Force =	**47**	k
Load Factor, Concrete Weight =	**0.9**	
Φ, Soil Weight =	**0.75**	
Depth to Water Table =	**20**	ft
Toe Width (If Any) =	**0**	in
Toe Height (If Any) =	**0**	in
Depth to Bottom of Deadman =	**8.75**	ft
Deadman Block Height =	**2.5**	ft
Deadman Block Width =	**5**	ft
Deadman Block Length =	**9**	ft
Guy Rod Steel Strength, Fy =	**48**	ksi
Guy Rod Cross-Sectional Area =	**2.405**	in^2
Concrete Strength, f'c =	**3**	ksi
Rebar Strength, Fy =	**60**	ksi
Minimum Cover Over Rebar =	**3**	in
Horiz. Ult. Passive Press. Override =		ksf/ft



			Uplift		Horizontal		Overrides	
Layer Thk ft	Dry Soil Density pcf	Sat Soil Density pcf	Cohesion ksf	Friction Angle degrees	Cohesion ksf	Friction Angle degrees	Adhesion ksf	Skin Friction ksf
2.5	110	100		29		29		
2.5	115	115		32		32		
12	120	120		36		36		

Uplift Based on: **Soil Cone**

Inverted pyramid of soil in uplift will be taken from the top of the anchor.

Concrete Volume per Anchor =	**4.17**	yd^3
Concrete Volume for (3) Anchors =	**12.50**	yd^3

Summary Results:

	Required		Available			
Guy Rod Tensile Force =	**71.59**	k	**92.4**	k	Capacity Ratio =	**77.5%** in Tensile Force
Soil, Horizontal Resistance =	**47.0**	k	**56.1**	k	Capacity Ratio =	**83.8%** in Horiz Resistance
Soil, Uplift Resistance =	**54.0**	k	**96.7**	k	Capacity Ratio =	**55.8%** in Uplift Resistance
Steel, Uplift Bending Moment =	**81.3**	k-ft	**199.2**	k-ft	Capacity Ratio =	**40.8%** in Bending Moment
Steel, Horizontal Bending Moment =	**52.9**	k-ft	**126.4**	k-ft	Capacity Ratio =	**41.8%** in Bending Moment
Toe Shear =		k/ft		k/ft	Capacity Ratio =	in Shear

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY PAUL J. FORD AND COMPANY

1) Paul J. Ford and Company has not made a field inspection to verify the tower member sizes or the antenna/coax loading. If the existing conditions are not as represented on these drawings, we should be contacted immediately to evaluate the significance of the deviation.

2) No allowance was made for any damaged, missing, or rusted members. The analysis of this tower assumes that no physical deterioration has occurred in any of the structural components of the tower and that all the tower members have the same load carrying capacity as the day the tower was erected.

3) It is not possible to have all the detailed information to perform a thorough analysis of every structural sub-component of an existing tower. The structural analysis by Paul J. Ford and Company verifies the adequacy of the main structural members of the tower. Paul J. Ford and Company provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc.

4) This tower has been analyzed according to the minimum design wind loads recommended by the Telecommunications Industry Association Standard ANSI/TIA-222-G. If the owner or local or state agencies require a higher design wind load, Paul J. Ford and Company should be made aware of this requirement.

5) The enclosed sketches are a schematic representation of the tower that we have analyzed. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions and for the proper fit and clearance in the field.

6) Miscellaneous items such as antenna mounts etc. have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

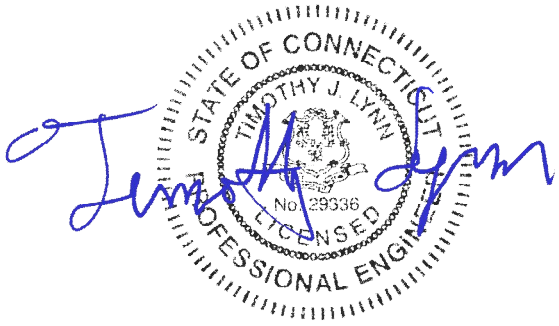
T-Mobile Site #: CT11258B

10 Polly Lane
Bozrah, CT

Centek Project No. 19027.17

~~Date: May 3, 2019~~
Rev 2: January 20, 2021

Max Stress Ratio = 94.3%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

January 20, 2021

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

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11258B
10 Polly Lane
Bozrah, CT 06249

Centek Project No. 19027.17

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 proposed mount, consisting three (3) V - frame sector mounts (Commscope P/N: SF-QV12-B) with stiff arms to support the proposed/existing equipment configuration. 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:
  V-Frames: Three (3) RFS APXVAARR24-43-NA20 panel antennas, three (3) Ericsson 4449 B71_B12 remote radio units, three (3) Ericsson 4415 B25 remote radio units and three (3) Ericsson 4415 B66A remote radio units mounted on three (3) V-Frames with a RAD center elevation of 177-ft +/- AGL.

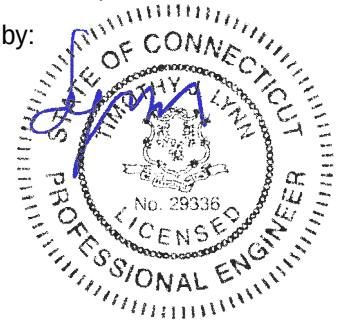
The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 105 mph for Bozrah as required in Appendix N of the 2018 Connecticut State Building Code.

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 subject proposed replacement antenna frames have sufficient capacity to support the aforementioned antenna configuration. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural 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: TIA-222-G Loads

Location: Bozrah, CT

Rev. 2: 1/20/21

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 19027.17

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

Wind Speeds

Basic Wind Speed: $V := 105$ mph (User Input - 2018 CSBC Appendix N)

Basic Wind Speed with Ice: $V_i := 50$ 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 = $h := 187$ ft (User Input)

Height to Center of Antennas = $z_{Ant} := 177$ ft (User Input)

Radial Ice Thickness = $t_i := 0.75$ 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 = $G_H := 1.113$ (User Input)

Output

Wind Direction Probability Factor =

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

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

Importance Factors =

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

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

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

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

$$K_{iz} := \left(\frac{z_{Ant}}{33}\right)^{0.1} = 1.183$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.774$$

Velocity Pressure Coefficient Antennas =

$$Kz_{Ant} := 2.01\left(\left(\frac{z_{Ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.427$$

Velocity Pressure w/o Ice Antennas =

$$qz_{Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V^2 \cdot I_{Wind} = 34.241$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V_i^2 \cdot I_{Wind} = 7.764$$

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:	TIA-222-G Loads
Location:	Bozrah, CT
Rev. 2: 1/20/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 19027.17

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPXVAARR24-43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 153$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 771$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 280$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 19$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 208$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.5$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 93$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 153$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \times 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 439$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 439$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4449

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 = $N_{RRUS} := 1$ (User Input)

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 = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 62$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 49$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 22$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.8$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 19$ 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 = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2466$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 73$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 73$ lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4415 B25

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 16.5$ in (User Input)

RRUS Width = $W_{RRUS} := 13.4$ in (User Input)

RRUS Thickness = $T_{RRUS} := 5.9$ in (User Input)

RRUS Weight = $WT_{RRUS} := 46$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$ (User Input)

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.2$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.5$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 70$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.7$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 31$ 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 = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 24$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.3$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 14$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 46$ lbs

Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1304$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1906$

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 62$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 62$ lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4415 B66

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 16.54$ in (User Input)

RRUS Width = $W_{RRUS} := 13.46$ in (User Input)

RRUS Thickness = $T_{RRUS} := 5.86$ in (User Input)

RRUS Weight = $WT_{RRUS} := 47.4$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$ (User Input)

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.2$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.5$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 71$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.7$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 31$ 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 = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 25$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.3$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 14$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 47$ lbs

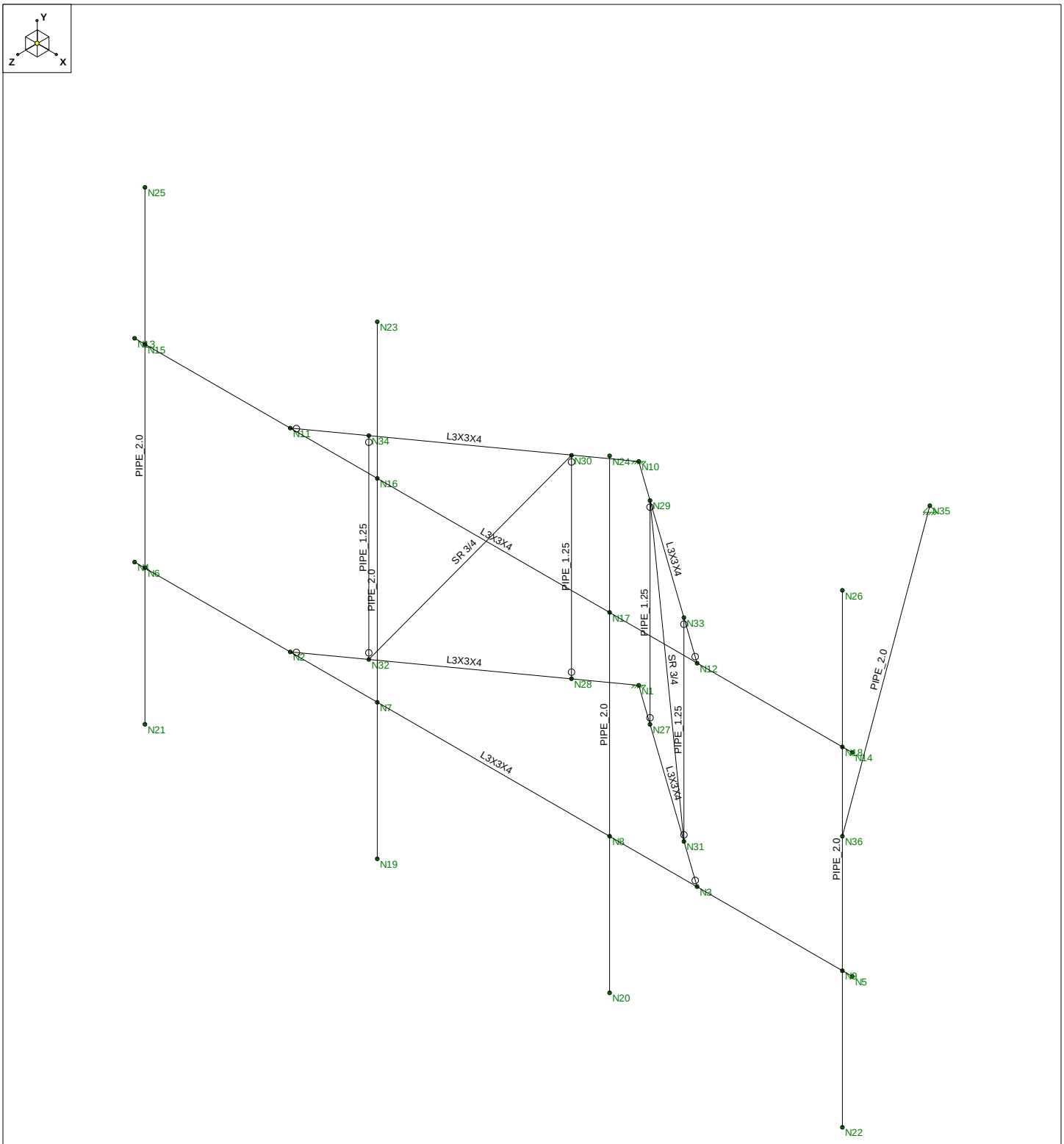
Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1305$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1910$

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 62$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 62$ lbs



Envelope Only Solution

Centek		
FJP	CT11258B_AMA	Jan 20, 2021 at 1:25 PM
19027.17	Member Framing	CT11258B_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 S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\...	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 Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	L3x3x1/4	L3X3X4	Beam	Pipe	A36 Gr.36	Typical	1.44	1.23	1.23	.031
2	Pipe 1.25	PIPE_1.25	Beam	Pipe	A53 Grade B	Typical	.625	.184	.184	.368
3	Pipe 2.0	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Antenna Mast Pipe 2.0	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
5	SR3/4	SR 3/4	Beam	Pipe	A36 Gr.36	Typical	.442	.016	.016	.031

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	L3x3x1/4	4.301			Lbyy						Lateral
2	M2	L3x3x1/4	4.301			Lbyy						Lateral
3	M3	L3x3x1/4	12.34			Lbyy						Lateral
4	M4	L3x3x1/4	4.301			Lbyy						Lateral
5	M5	L3x3x1/4	4.301			Lbyy						Lateral
6	M6	L3x3x1/4	12.34			Lbyy						Lateral
7	M7	Antenna Mast Pipe ...	8			Lbyy						Lateral
8	M8	Antenna Mast Pipe ...	8			Lbyy						Lateral
9	M9	Antenna Mast Pipe ...	8			Lbyy						Lateral
10	M10	Antenna Mast Pipe ...	8			Lbyy						Lateral
11	M11	Pipe 1.25	3.333			Lbyy						Lateral
12	M12	Pipe 1.25	3.333			Lbyy						Lateral
13	M13	Pipe 1.25	3.333			Lbyy						Lateral
14	M14	Pipe 1.25	3.333			Lbyy						Lateral
15	M15	SR3/4	4.166			Lbyy						Lateral
16	M16	SR3/4	4.166			Lbyy						Lateral
17	M17	Pipe 2.0	7.049			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N3		270	L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
2	M2	N1	N2			L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
3	M3	N4	N5		180	L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
4	M4	N10	N12		180	L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
5	M5	N10	N11		90	L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
6	M6	N13	N14		270	L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
7	M7	N25	N21			Antenna Mast Pipe 2.0	Beam	Pipe	A53 Gra...	Typical
8	M8	N19	N23			Antenna Mast Pipe 2.0	Beam	Pipe	A53 Gra...	Typical
9	M9	N20	N24			Antenna Mast Pipe 2.0	Beam	Pipe	A53 Gra...	Typical
10	M10	N26	N22			Antenna Mast Pipe 2.0	Beam	Pipe	A53 Gra...	Typical
11	M11	N29	N27			Pipe 1.25	Beam	Pipe	A53 Gra...	Typical
12	M12	N33	N31			Pipe 1.25	Beam	Pipe	A53 Gra...	Typical
13	M13	N30	N28			Pipe 1.25	Beam	Pipe	A53 Gra...	Typical
14	M14	N34	N32			Pipe 1.25	Beam	Pipe	A53 Gra...	Typical
15	M15	N30	N32			SR3/4	Beam	Pipe	A36 Gr.36	Typical
16	M16	N29	N31			SR3/4	Beam	Pipe	A36 Gr.36	Typical
17	M17	N36	N35			Pipe 2.0	Beam	Pipe	A53 Gra...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	0	0	
2	N2	-3.5	0	2.5	0	
3	N3	3.5	0	2.5	0	
4	N4	-6.17	0	2.5	0	
5	N5	6.17	0	2.5	0	
6	N6	-6	0	2.5	0	
7	N7	-2	0	2.5	0	
8	N8	2	0	2.5	0	
9	N9	6	0	2.5	0	
10	N10	0	3.333	0	0	
11	N11	-3.5	3.333	2.5	0	
12	N12	3.5	3.333	2.5	0	
13	N13	-6.17	3.333	2.5	0	
14	N14	6.17	3.333	2.5	0	
15	N15	-6	3.333	2.5	0	
16	N16	-2	3.333	2.5	0	
17	N17	2	3.333	2.5	0	
18	N18	6	3.333	2.5	0	
19	N19	-2	-2.333	2.5	0	
20	N20	2	-2.333	2.5	0	
21	N21	-6	-2.333	2.5	0	
22	N22	6	-2.333	2.5	0	
23	N23	-2	5.667	2.5	0	
24	N24	2	5.667	2.5	0	
25	N25	-6	5.667	2.5	0	
26	N26	6	5.667	2.5	0	
27	N27	0.675399	0	0.482428	0	
28	N28	-0.675399	0	0.482428	0	
29	N29	0.675399	3.333	0.482428	0	
30	N30	-0.675399	3.333	0.482428	0	
31	N31	2.709732	0	1.935523	0	
32	N32	-2.709732	0	1.935523	0	
33	N33	2.709732	3.333	1.935523	0	
34	N34	-2.709732	3.333	1.935523	0	
35	N35	1.825	2	-3.18	0	
36	N36	6	2	2.5	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
2	N10	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N35	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	Y	-.074	1.5
2	M10	Y	-.046	2.917
3	M10	Y	-.047	2.833

Member Point Loads (BLC 2 : Dead Load) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
4	M10	Y	-.077	1
5	M10	Y	-.077	7

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	Y	-.073	1.5
2	M10	Y	-.062	2.917
3	M10	Y	-.062	2.833
4	M10	Y	-.22	1
5	M10	Y	-.22	7

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	X	.019	1.5
2	M10	X	.014	2.917
3	M10	X	.014	2.833
4	M10	X	.047	1
5	M10	X	.047	7

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	X	.049	1.5
2	M10	X	.031	2.917
3	M10	X	.031	2.833
4	M10	X	.14	1
5	M10	X	.14	7

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	Z	.104	1
2	M10	Z	.104	7

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	Z	.386	1
2	M10	Z	.386	7

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.002	.002	0	0
2	M2	X	.002	.002	0	0
3	M4	X	.002	.002	0	0
4	M5	X	.002	.002	0	0
5	M8	X	.002	.002	0	0
6	M9	X	.002	.002	0	0
7	M17	X	.002	.002	0	0
8	M10	X	.002	.002	0	0
9	M7	X	.002	.002	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
10	M8	X	.002	.002	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.009	.009	0	0
2	M2	X	.009	.009	0	0
3	M4	X	.009	.009	0	0
4	M5	X	.009	.009	0	0
5	M8	X	.007	.007	0	0
6	M9	X	.007	.007	0	0
7	M17	X	.007	.007	0	0
8	M10	X	.007	.007	0	0
9	M7	X	.007	.007	0	0
10	M8	X	.007	.007	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M6	Z	.002	.002	0	0
2	M3	Z	.002	.002	0	0
3	M2	Z	.002	.002	0	0
4	M5	Z	.002	.002	0	0
5	M4	Z	.002	.002	0	0
6	M1	Z	.002	.002	0	0
7	M8	Z	.002	.002	0	0
8	M9	Z	.002	.002	0	0
9	M7	Z	.002	.002	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M6	Z	.009	.009	0	0
2	M3	Z	.009	.009	0	0
3	M2	Z	.009	.009	0	0
4	M5	Z	.009	.009	0	0
5	M4	Z	.009	.009	0	0
6	M1	Z	.009	.009	0	0
7	M8	Z	.007	.007	0	0
8	M9	Z	.007	.007	0	0
9	M7	Z	.007	.007	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	DL		-1						
2	Dead Load	None					5			
3	Ice Load	None					5			
4	Wind with Ice X	None					5	10		
5	Wind X	None					5	10		
6	Wind with Ice Z	None					2	9		
7	Wind Z	None					2	9		

Load Combinations

	Description	Solve	P...	S...	B...	Fa...	BLC	Fact...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-dir...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-dir...	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (Z-dire...	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-dire...	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	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	1.81	6	.635	3	.884	3	-.081	5	1.328	4	.509	1
2		min	-.145	2	.299	5	-.258	5	-.214	3	-.866	2	-.526	5
3	N10	max	-.025	5	.819	6	-.526	2	-.114	2	.98	5	.623	4
4		min	-1.934	3	.309	2	-.969	6	-.284	6	-1.145	1	-.421	2
5	N35	max	.149	2	.029	6	.277	1	0	6	0	6	0	6
6		min	-.819	4	.012	5	-1.087	4	0	1	0	1	0	1
7	Totals:	max	0	6	1.48	6	0	3						
8		min	-1.4	1	.632	2	-2.107	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	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	.085	2	.011	6	.119	2	2.39e-03	3	4.46e-03	2	-1.514e-04	2
4		min	-.153	4	-.003	1	-.213	4	8.902e-04	2	-3.593e-03	4	-4.052e-04	6
5	N3	max	.085	2	-.04	2	.216	4	5.932e-04	1	2.369e-03	3	-2.586e-03	5
6		min	-.155	4	-.102	6	-.119	2	-6.997e-03	5	-6.626e-03	5	-8.262e-03	3
7	N4	max	.085	2	.047	6	.27	2	5.011e-03	3	4.942e-03	2	-6.719e-04	2
8		min	-.153	4	.011	2	-.302	4	1.383e-03	5	-2.296e-03	4	-1.916e-03	6
9	N5	max	.085	2	-.119	5	.466	5	2.448e-03	1	5.909e-04	3	-6.792e-04	5
10		min	-.155	4	-.404	3	-.115	1	-2.431e-02	5	-8.871e-03	5	-6.272e-03	3
11	N6	max	.085	2	.043	6	.259	2	5.011e-03	3	4.942e-03	2	-6.719e-04	2
12		min	-.153	4	.01	2	-.297	4	1.383e-03	5	-2.296e-03	4	-1.916e-03	6
13	N7	max	.085	2	.003	6	.041	2	1.834e-03	6	4.202e-03	2	-1.694e-04	2
14		min	-.153	4	-.006	1	-.14	4	6.497e-04	2	-4.332e-03	4	-8.223e-04	6
15	N8	max	.085	2	-.006	2	.112	4	-8.527e-04	5	1.694e-03	2	-9.991e-04	2
16		min	-.154	4	-.015	4	-.095	2	-3.658e-03	3	-5.364e-03	4	-2.682e-03	6
17	N9	max	.085	2	-.118	5	.448	5	2.448e-03	1	5.908e-04	3	-6.792e-04	5
18		min	-.155	4	-.391	3	-.118	1	-2.431e-02	5	-8.871e-03	5	-6.272e-03	3
19	N10	max	0	6	0	6	0	6	0	6	0	6	0	6
20		min	0	1	0	1	0	1	0	1	0	1	0	1
21	N11	max	.126	1	.011	6	.176	1	2.683e-03	6	6.026e-03	1	-1.372e-04	2
22		min	-.103	5	0	1	-.143	5	9.985e-04	2	-3.106e-03	5	-4.032e-04	6
23	N12	max	.127	1	-.025	5	.146	5	5.71e-03	5	-8.485e-04	2	-1.493e-03	5
24		min	-.104	5	-.099	3	-.176	1	-9.937e-04	1	-3.622e-03	4	-8.136e-03	3
25	N13	max	.126	1	.047	6	.361	1	5.016e-03	3	5.407e-03	1	-7.064e-04	2
26		min	-.103	5	.011	2	-.224	5	2.026e-03	2	-2.438e-03	5	-1.911e-03	6
27	N14	max	.128	1	-.126	5	.29	4	1.695e-02	4	-1.38e-03	3	-3.374e-03	2
28		min	-.104	5	-.406	3	-.081	2	-1.215e-03	2	-5.21e-03	4	-6.877e-03	6

Envelope Joint Displacements (Continued)

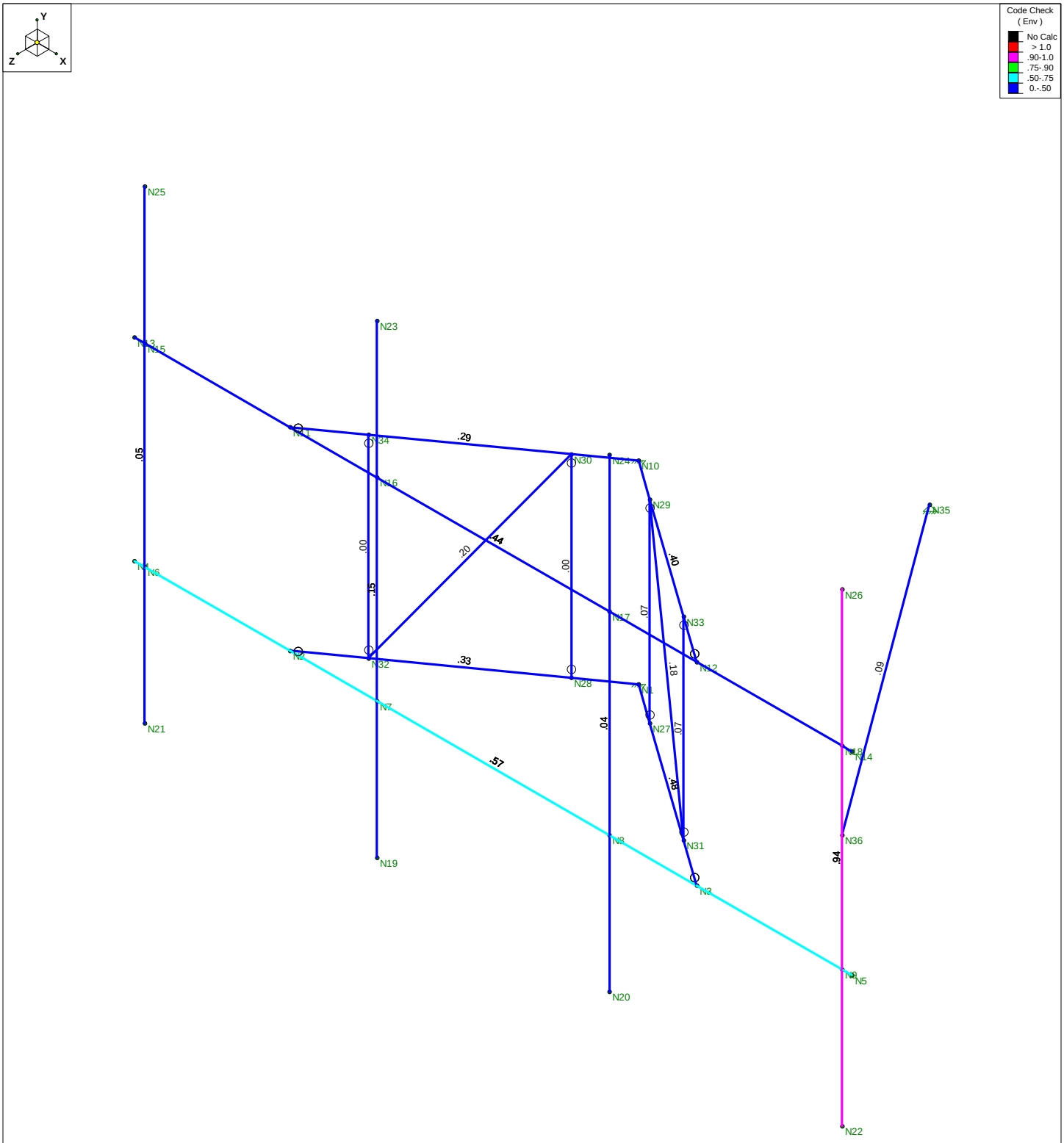
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
29	N15	max	.126	1	.043	6	.35	1	5.016e-03	3	5.407e-03	1	-7.064e-04	2
30		min	-.103	5	.01	2	-.219	5	2.026e-03	2	-2.438e-03	5	-1.911e-03	6
31	N16	max	.127	1	.003	6	.07	1	1.979e-03	4	5.539e-03	1	-5.394e-04	2
32		min	-.103	5	-.006	1	-.077	5	6.523e-04	2	-4.002e-03	5	-8.61e-04	3
33	N17	max	.127	1	-.006	2	.09	5	1.21e-04	5	2.428e-03	1	-4.23e-04	5
34		min	-.104	5	-.015	4	-.16	1	-3.685e-03	3	-3.188e-03	5	-2.592e-03	3
35	N18	max	.128	1	-.118	5	.279	4	1.695e-02	4	-1.38e-03	3	-3.374e-03	2
36		min	-.104	5	-.392	3	-.087	2	-1.215e-03	2	-5.21e-03	4	-6.877e-03	6
37	N19	max	.09	2	.003	6	.022	2	1.792e-03	6	4.202e-03	2	2.999e-04	2
38		min	-.167	4	-.006	1	-.172	4	6.496e-04	2	-4.332e-03	4	-8.221e-04	6
39	N20	max	.062	2	-.006	2	.187	6	-1.087e-03	5	1.694e-03	2	-7.644e-04	2
40		min	-.2	4	-.015	4	-.055	2	-3.658e-03	3	-5.364e-03	4	-2.681e-03	6
41	N21	max	.071	2	.043	6	.203	2	5.01e-03	3	4.942e-03	2	-4.372e-04	2
42		min	-.181	4	.01	2	-.345	4	1.148e-03	5	-2.296e-03	4	-1.916e-03	6
43	N22	max	.107	2	-.118	5	1.253	5	2.445e-03	1	5.908e-04	3	1.203e-03	2
44		min	-.246	6	-.392	3	-.187	1	-2.971e-02	5	-8.871e-03	5	-6.223e-03	6
45	N23	max	.154	1	.003	6	.097	3	2.214e-03	4	5.539e-03	1	-6.253e-04	5
46		min	-.086	5	-.006	1	-.022	5	6.523e-04	2	-4.002e-03	5	-1.098e-03	1
47	N24	max	.157	1	-.006	2	.099	5	3.56e-04	5	2.428e-03	1	-4.23e-04	5
48		min	-.092	5	-.015	4	-.21	1	-3.686e-03	3	-3.188e-03	5	-2.635e-03	3
49	N25	max	.156	1	.043	6	.421	1	5.023e-03	6	5.407e-03	1	-8.506e-04	5
50		min	-.079	5	.01	2	-.156	5	2.026e-03	2	-2.438e-03	5	-1.95e-03	3
51	N26	max	.298	1	-.118	5	.88	4	2.244e-02	4	-1.38e-03	3	-4.222e-03	5
52		min	.014	5	-.392	3	-.121	2	-1.218e-03	2	-5.21e-03	4	-7.369e-03	3
53	N27	max	.005	2	-.002	2	.011	4	-9.184e-05	2	1.735e-03	2	-8.562e-05	2
54		min	-.008	4	-.005	3	-.007	2	-8.005e-04	4	-2.429e-03	4	-6.101e-04	4
55	N28	max	.005	2	0	6	.007	2	3.139e-04	6	1.526e-03	2	-2.768e-05	2
56		min	-.008	4	0	1	-.011	4	1.219e-04	2	-2.558e-03	4	-1.792e-04	6
57	N29	max	.008	1	-.003	2	.007	5	7.806e-04	4	2.215e-03	1	2.135e-04	5
58		min	-.005	5	-.008	6	-.01	1	-7.794e-05	3	-1.835e-03	5	-6.563e-04	3
59	N30	max	.007	1	0	6	.009	1	4.647e-04	6	2.197e-03	1	-3.63e-05	2
60		min	-.005	5	0	1	-.007	5	1.256e-04	2	-1.753e-03	5	-3.134e-04	6
61	N31	max	.063	2	-.009	2	.133	4	7.549e-04	1	3.578e-03	2	-1.768e-03	2
62		min	-.095	4	-.027	6	-.088	2	-1.785e-03	5	-7.817e-03	4	-5.289e-03	6
63	N32	max	.057	2	.002	6	.079	2	8.882e-04	6	4.002e-03	2	-1.927e-04	2
64		min	-.102	4	0	1	-.141	4	4.306e-04	2	-7.233e-03	4	-1.239e-03	6
65	N33	max	.081	1	-.01	2	.101	5	2.879e-03	5	6.136e-03	1	1.016e-03	5
66		min	-.072	5	-.03	6	-.112	1	-8.675e-04	3	-4.783e-03	5	-5.722e-03	3
67	N34	max	.085	1	.003	6	.118	1	1.267e-03	6	5.904e-03	1	-4.769e-04	2
68		min	-.069	5	0	1	-.095	5	4.915e-04	2	-4.883e-03	5	-1.492e-03	6
69	N35	max	0	6	0	6	0	6	5.194e-03	3	3.799e-03	1	-1.555e-03	2
70		min	0	1	0	1	0	1	8.147e-04	5	-8.302e-04	5	-3.696e-03	3
71	N36	max	.1	1	-.118	5	.124	5	1.519e-03	6	-4.155e-04	3	-5.524e-04	2
72		min	-.16	5	-.392	3	-.075	1	2.844e-04	5	-5.523e-03	4	-1.55e-03	4

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...			phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
1	M1	L3X3X4	.476	3....	6	.080	3.36	z	6	30.969	46.656	1.688	3.707	1.6...	H2-1
2	M2	L3X3X4	.330	0	4	.016	4....	z	4	30.969	46.656	1.688	3.714	1.6...	H2-1
3	M3	L3X3X4	.571	12...	6	.092	9....	y	4	5.077	46.656	1.688	3.158	2.0...	H2-1

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo.....	...	...	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
4	M4	L3X3X4	.404	3.36	3	.063	0	y	6	30.969	46.656	1.688	3.702	1.6...	H2-1
5	M5	L3X3X4	.287	0	1	.013	.851	y	1	30.969	46.656	1.688	3.756	1.7...	H2-1
6	M6	L3X3X4	.439	12...	3	.054	9....	z	4	5.077	46.656	1.688	3.262	2.3...	H2-1
7	M7	PIPE_2.0	.049	5....	6	.021	5....		3	14.916	32.13	1.872	1.872	4.9...	H1-...
8	M8	PIPE_2.0	.155	2....	3	.071	2....		3	14.916	32.13	1.872	1.872	4.6...	H1-...
9	M9	PIPE_2.0	.044	5....	5	.043	5....		4	14.916	32.13	1.872	1.872	2.97	H1-...
10	M10	PIPE_2.0	.943	3....	4	.177	3....		5	14.916	32.13	1.872	1.872	2.4...	H1-...
11	M11	PIPE_1.25	.069	3....	6	.012	0		6	14.908	19.688	.801	.801	1	H1-...
12	M12	PIPE_1.25	.074	3....	3	.076	0		6	14.908	19.688	.801	.801	1	H1-...
13	M13	PIPE_1.25	.003	0	6	.019	0		6	14.908	19.688	.801	.801	1	H1-...
14	M14	PIPE_1.25	.003	0	3	.057	0		6	14.908	19.688	.801	.801	1	H1-...
15	M15	SR 3/4	.199	4....	6	.018	0		4	1.404	14.314	.179	.179	2.0...	H1-...
16	M16	SR 3/4	.176	4....	6	.009	4....		6	1.404	14.314	.179	.179	2.4...	H1-...
17	M17	PIPE_2.0	.093	0	4	.005	7....		1	17.707	32.13	1.872	1.872	1.1...	H1-...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
FJP	CT11258B_AMA	Jan 20, 2021 at 1:25 PM
19027.17	Unity Check	CT11258B_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: CT11258B

Bozrah-1/ Rt 2
10 Polly Lane
Bozrah, Connecticut 06336

August 5, 2021

EBI Project Number: 6221004298

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**9.68%**

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

August 5, 2021

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

Emissions Analysis for Site: CT11258B - Bozrah-1/ Rt 2

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **10 Polly Lane** in **Bozrah, 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 10 Polly Lane in Bozrah, 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) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 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.

4) 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.

5) 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.

6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 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.

8) 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.

9) The antennas used in this modeling are the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 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.

10) The antenna mounting height centerline of the proposed antennas is 177 feet above ground level (AGL).

11) 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.

12) 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 APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd
Height (AGL):	177 feet	Height (AGL):	177 feet	Height (AGL):	177 feet
Channel Count:	13	Channel Count:	13	Channel Count:	13
Total TX Power (W):	560 Watts	Total TX Power (W):	560 Watts	Total TX Power (W):	560 Watts
ERP (W):	17,868.72	ERP (W):	17,868.72	ERP (W):	17,868.72
Antenna A1 MPE %:	**2.90%**	Antenna B1 MPE %:	**2.90%**	Antenna C1 MPE %:	**2.90%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	2.90%
AT&T	2.1%
Sprint	2.62%
Verizon	2.06%
Site Total MPE % :	9.68%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	2.90%
T-Mobile Sector B Total:	2.90%
T-Mobile Sector C Total:	2.90%
Site Total MPE % :	9.68%

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 600 MHz LTE	2	591.73	177.0	1.46	600 MHz LTE	400	0.36%
T-Mobile 600 MHz NR	1	1577.94	177.0	1.94	600 MHz NR	400	0.49%
T-Mobile 700 MHz LTE	2	695.22	177.0	1.71	700 MHz LTE	467	0.37%
T-Mobile 1900 MHz GSM	4	1052.26	177.0	5.17	1900 MHz GSM	1000	0.52%
T-Mobile 1900 MHz LTE	2	2104.51	177.0	5.17	1900 MHz LTE	1000	0.52%
T-Mobile 2100 MHz LTE	2	2649.42	177.0	6.51	2100 MHz LTE	1000	0.65%
						Total:	**2.90%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

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

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	2.90%
Sector B:	2.90%
Sector C:	2.90%
T-Mobile Maximum MPE % (Sector A):	2.90%
Site Total:	9.68%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **9.68%** 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.