Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

August 15, 2019

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

RE: Notice of Exempt Modification
600 Old Hartford Road, Colchester, CT 06415
Latitude: 41.5867000000
Longitude: -72.2782611200
T-Mobile Site#: CTNL250A – L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 150-foot level of the existing 180-foot guyed tower at 600 Old Hartford Road, Colchester, CT. The 180-foot guyed tower is owned by Cordless Data Transfer. The property is owned by AT&T Mobility. T-Mobile now intends to replace three (3) of its existing antennas with three (3) new 600/700 MHz antennas. The new antennas will be installed at the same 150-foot level of the tower.

Planned Modifications:
Tower:

Remove
N/A

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

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

Existing to Remain:
(3) RFS APXV18-206516S Antenna 1900/2100 MHz
(3) TMA
(12) 1-5/8" Coax

Ground:

Install New: Equipment inside existing 6102 cabinet

This facility was approved by the CSC for T-Mobile use in TS-T-Mobile-028-170818 dated September 14, 2017. This modification complies with this approval.

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

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

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

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

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

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

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

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

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

Sincerely,

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

Attachments
cc: Arthur Shilosky – Town of Colchester First Selectman
Kamey Cavanaugh– Town of Colchester Land Use Assistant
Cordless Data Transfer – tower owner
AT&T Mobility- property owner

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, August 7, 2019 4:26 PM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTNL250A UPS PO

You have a package coming.

Scheduled Delivery Date: Monday, 08/12/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424296088478
Ship To:	AT&T Mobility 909 Chestnut Street SAINT LOUIS, MO 631012017 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	08/12/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTNL250A UPS PO

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, August 7, 2019 4:29 PM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTNL250A CSC TO

You have a package coming.

Scheduled Delivery Date: Thursday, 08/08/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424298058489
Ship To:	Mark LeGault Cordless Data Transfer 600 Old Hartford Road COLCHESTER, CT 064152417 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	08/08/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTNL250A CSC TO

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, August 7, 2019 4:32 PM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTNL250A CSC ZO

You have a package coming.

Scheduled Delivery Date: Thursday, 08/08/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424297058507
Ship To:	Kamey Cavanaugh Town of Colchester 127 Norwich Ave. COLCHESTER, CT 064151230 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	08/08/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTNL250A CSC ZO

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, August 7, 2019 4:32 PM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTNL250A CSC EO

You have a package coming.

Scheduled Delivery Date: Thursday, 08/08/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424295048496
Ship To:	Art Shilosky Town of Colchester 127 Norwich Avenue COLCHESTER, CT 064151230 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	08/08/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTNL250A CSC EO

Download the UPS mobile app

600 OLD HARTFORD RD

Location	600 OLD HARTFORD RD	**Mblu**	06-10/ / 051-000/ TWR/
Acct#	11AT0006	**Owner**	AT&T MOBILITY
Assessment	$345,300	**Appraisal**	$493,400
PID	105116	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$493,400	$0	$493,400
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$345,300	$0	$345,300

Owner of Record

Owner	AT&T MOBILITY	**Sale Price**	$0
Co-Owner	ATTN TAX MANAGER	**Certificate**	
Address	909 CHESTNUT ST ST LOUIS, MO 63101	**Book & Page**	000/ 000
		Sale Date	10/01/2011

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
AT&T MOBILITY	$0		000/ 000	10/01/2011

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: $0
Building Percent Good:
Replacement Cost Less Depreciation: $0

Building Attributes	
Field	**Description**

Style	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	

Building Photo

(http://images.vgsi.com/photos2/colchesterCTPhotos//default.jpg

Building Layout

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	4310
Description	Tel Rel Tw
Zone	
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0
Frontage	
Depth	
Assessed Value	$0
Appraised Value	$0

Outbuildings

Outbuildings	Legend

Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
TWR2	Cell Tower			2 SITES	$420,000	1
SHD9	Cell Shed			312 S.F.	$70,200	1
FN4	Fence 8' Chain			360 L.F.	$3,200	1

Valuation History

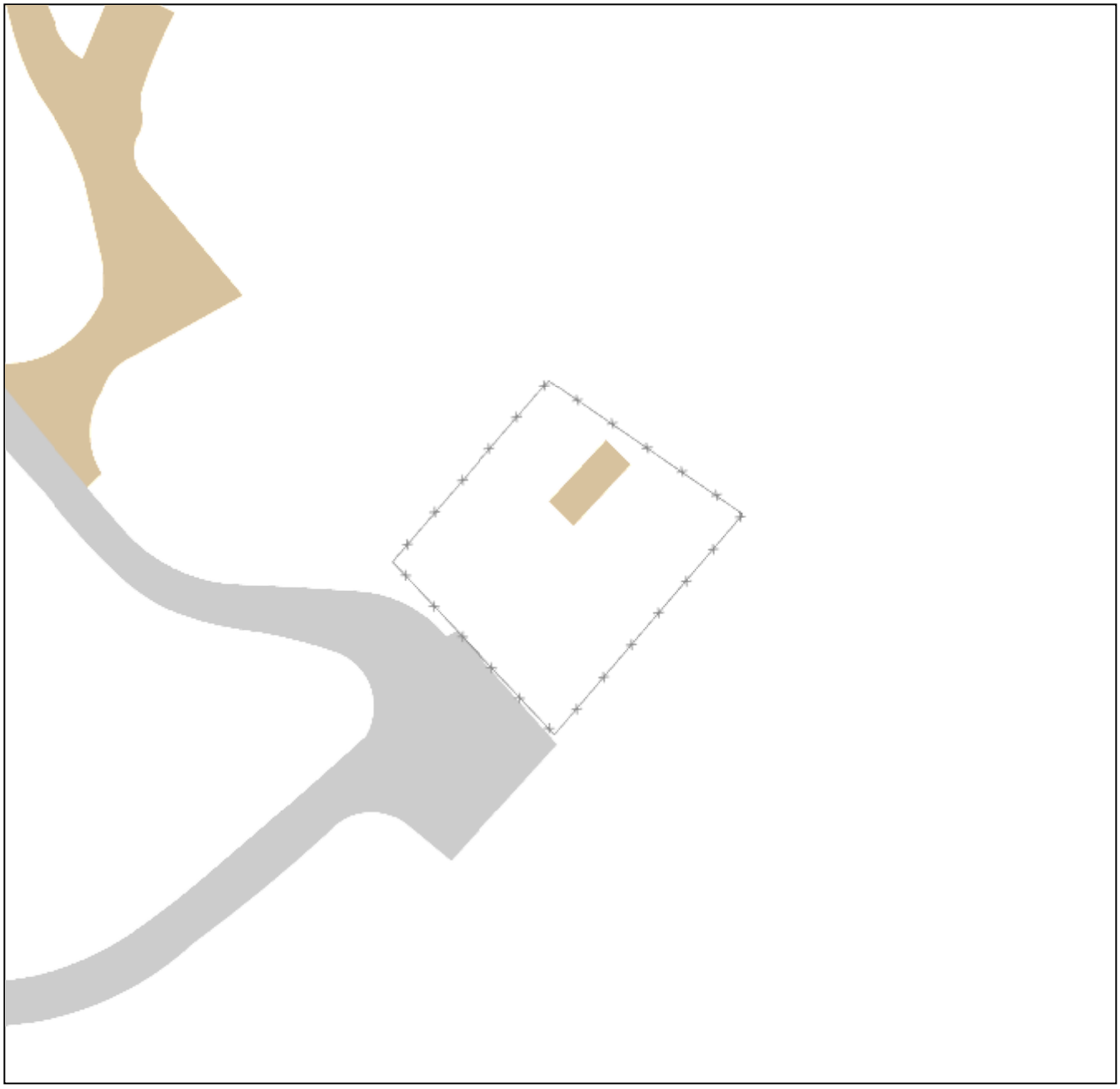
Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$554,000	$0	$554,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$387,800	$0	$387,800

Town of Colchester

Geographic Information System (GIS)

Date Printed: 5/29/2019



MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Colchester and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 50 feet

0 50 Feet

N W E S

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

September 14, 2017

Denise Sabo
Northeast Site Solutions
199 Brickyard Road
Farmington, CT 06032

RE: **TS-T-MOBILE-028-170818** - T-Mobile request for an order to approve tower sharing at an existing telecommunications facility located at 600 Old Hartford Road, Colchester, Connecticut.

Dear Ms. Sabo:

At a public meeting held on September 14, 2017, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures with the following conditions:

1. Any deviation from the proposed installation as specified in the original tower share request and supporting materials with the Council shall render this decision invalid;

2. Any material changes to the proposed installation as specified in the original tower share request and supporting materials filed with the Council shall require an explicit request for modification to the Council pursuant to Connecticut General Statutes § 16-50aa, including all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65;

3. Not less than 45 days after completion of the proposed installation, the Council shall be notified in writing that the installation has been completed;

4. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by T-Mobile shall be removed within 60 days of the date the antenna ceased to function;

5. The validity of this action shall expire one year from the date of this letter; and

6. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

This decision is under the exclusive jurisdiction of the Council and applies only to this request for tower sharing dated August 10, 2017 and supplemental information submitted September 8, 2017. This facility has been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower. Any deviation from the approved tower sharing request is enforceable under the provisions of Connecticut General Statutes § 16-50u.

The proposed shared use is to be implemented as specified in your letter dated August 10, 2017 and supplemental information submitted September 8, 2017, including the placement of all necessary equipment and shelters within the tower compound.

Please be advised that the validity of this action shall expire one year from the date of this letter.

Thank you for your attention and cooperation.

Very truly yours,

Robert Stein
Chairman

RS/MAB/bm

c: The Honorable Arthur P. Shilosky, First Selectman, Town of Colchester
Randall Benson, Town Planner, Town of Colchester
Cordless Data Transfer, Inc., Tower and Property Owner

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

CTNL250A

SITE ID: CTNL250A

600 OLD HARTFORD ROAD

COLCHESTER, CT 06415

T-MOBILE RF CONFIGURATION

67D04G_SIMO

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, 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

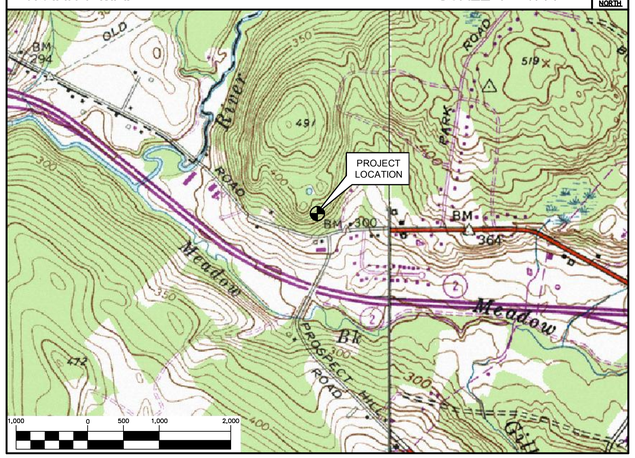
FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

TO: 600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	0.30 MI.
2.	TAKE THE 2ND RIGHT ONTO DAY HILL RD.	0.14 MI.
3.	TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187	1.88 MI.
4.	TURN LEFT ONTO CT-305/OLD WINDSOR RD.	2.33 MI.
5.	STAY STRAIGHT TO GO ONTO BLOOMFIELD AVE/CT-305.	0.01 MI.
6.	MERGE ONTO I-91 S TOWARD HARTFORD	6.04 MI.
7.	MERGE ONTO I-84 E/US-6 E via EXIT 30 ON THE LEFT TOWARD NEW LONDON/NORWICH	0.61 MI.
8.	TAKE THE CT-149 EXIT, EXIT 16 TOWARD WESTCHESTER/MOODUS	0.23 MI.
9.	TURN LEFT ONTO WESTCHESTER RD/CT-149	0.26 MI.
10.	TURN RIGHT ONTO OLD HARTFORD RD.	0.88 MI.
11.	600 OLD HARTFORD RD, COLCHESTER, CT 06415-2417, 600 OLD HARTFORD RD IS ON THE LEFT	

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

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

   A. REMOVE (3) EXISTING ANTENNAS, TYP. (1) PER SECTOR
   B. INSTALL (3) NEW RFS ANTENNAS, TYP. (1) PER SECTOR
   C. INSTALL (3) NEW RADIO 4449, TYP. (1) PER SECTOR
   D. INSTALL (1) BB 6630 FOR FUTURE 5G (N600 DARK)
   E. INSTALL (1) 6 X 12 HCS

PROJECT INFORMATION

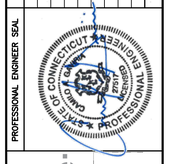
SITE NAME:	CTNL250A
SITE ID:	CTNL250A
SITE ADDRESS:	600 OLD HARTFORD ROAD COLCHESTER, CT 06415
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	DAN REID (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (203) 592-8291
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-35'-12.30" N LONGITUDE: 72°-22'-41.20" W GROUND ELEVATION: 385'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	06/14/19	RTS	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
2	06/07/19	RTS	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
1	06/02/19	RTS	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
0	05/29/19	RTS	CAG	CONSTRUCTION DRAWINGS - 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
CTNL250A
SITE ID: CTNL250A
600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

DATE: 05/08/19
SCALE: AS NOTED
JOB NO. 19027.18

TITLE SHEET

T-1

Sheet No. 1 of 6

DESIGN BASIS:

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

1. DESIGN CRITERIA:

- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- ULTIMATE DESIGN SPEED (OTHER STRUCTURE): 130 MPH (ULT) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10) PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

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

STRUCTURAL STEEL

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

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

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	08/14/19	RTS	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
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1	08/02/19	RTS	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
0	05/29/19	RTS	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
CTNL250A
SITE ID: CTNL250A
600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

DATE: 05/08/19
SCALE: AS NOTED
JOB NO. 19027.18

DESIGN BASIS AND SITE NOTES

N-1

Sheet No. 2 of 6

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

TRUE NORTH

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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COLCHESTER, CT 06415

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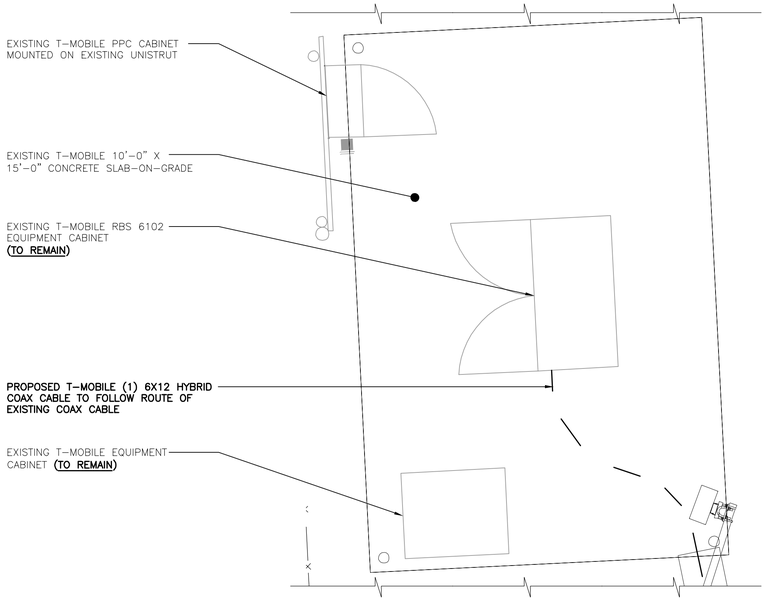
JOB NO. 19027.18

SITE LOCATION PLAN

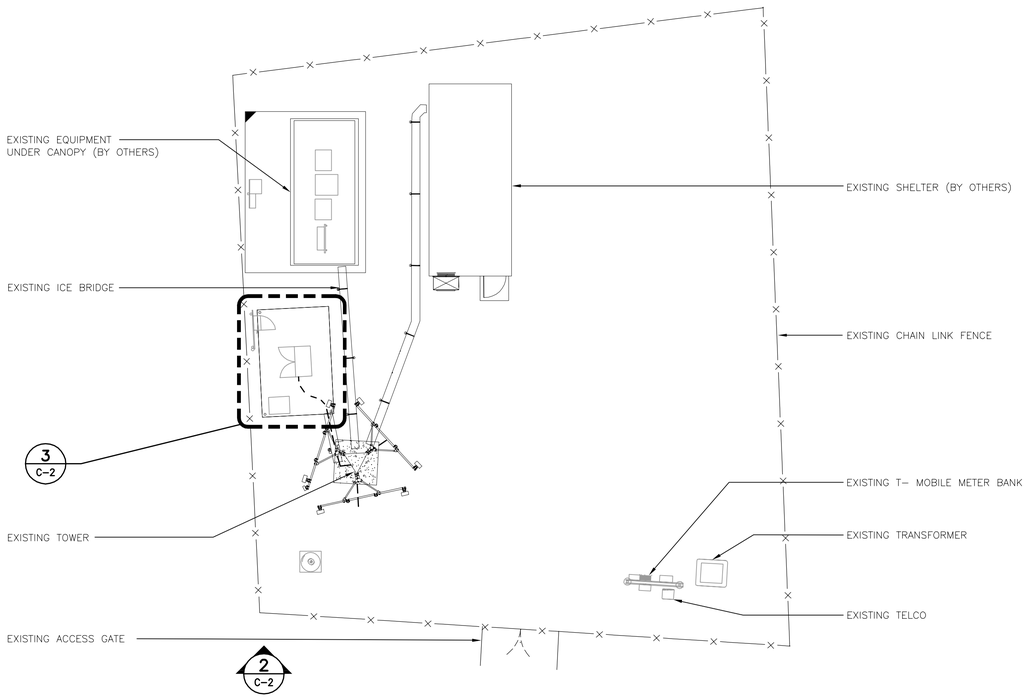
C-1

Sheet No. 3 of 6



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

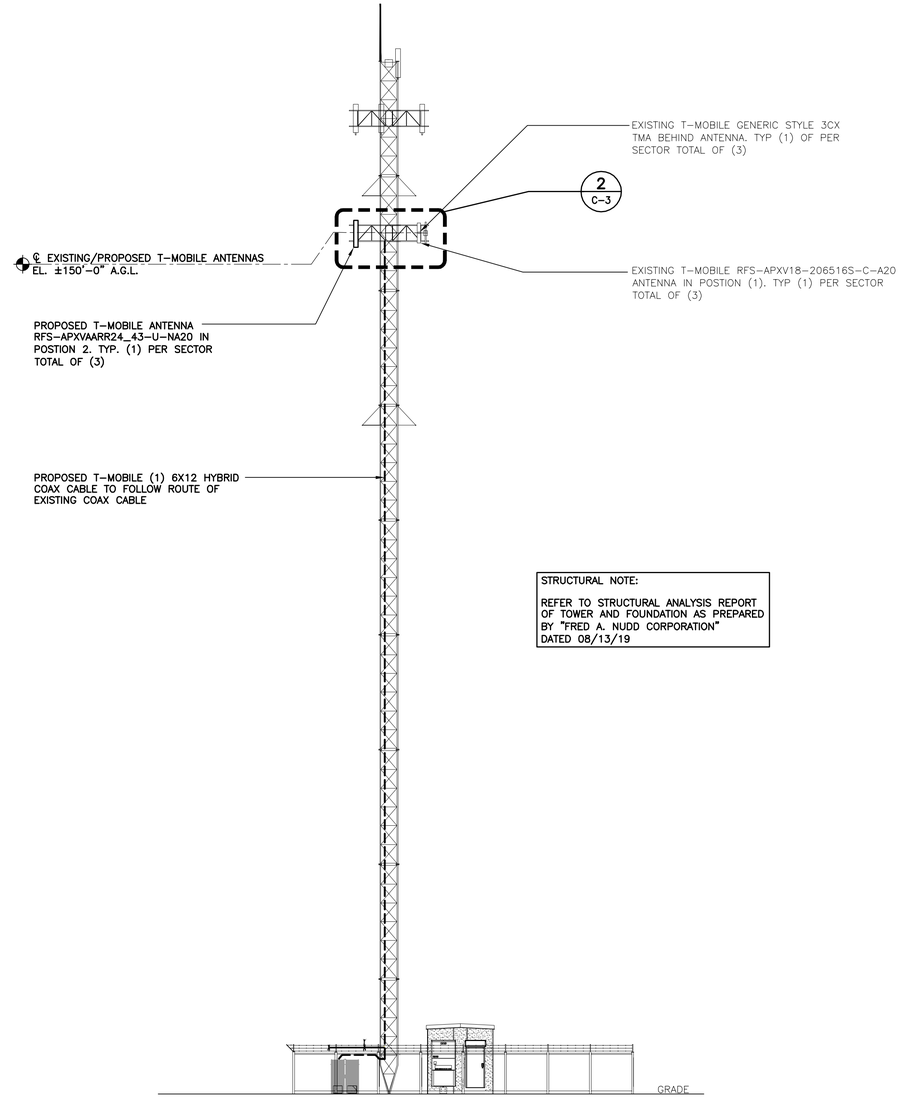
3 / C-2 **EQUIPMENT PLAN**
SCALE: 3/8" = 1'
TRUE NORTH



1 / C-2 **COMPOUND PLAN**
SCALE: 1" = 10'
TRUE NORTH

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

T-MOBILE RAN TEMPLATE: 67D04G_SIMO
T-MOBILE RF CONFIGURATION: 67D04G_1DP+10P



STRUCTURAL NOTE:

REFER TO STRUCTURAL ANALYSIS REPORT OF TOWER AND FOUNDATION AS PREPARED BY "FRED A. NUDD CORPORATION" DATED 08/13/19

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

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

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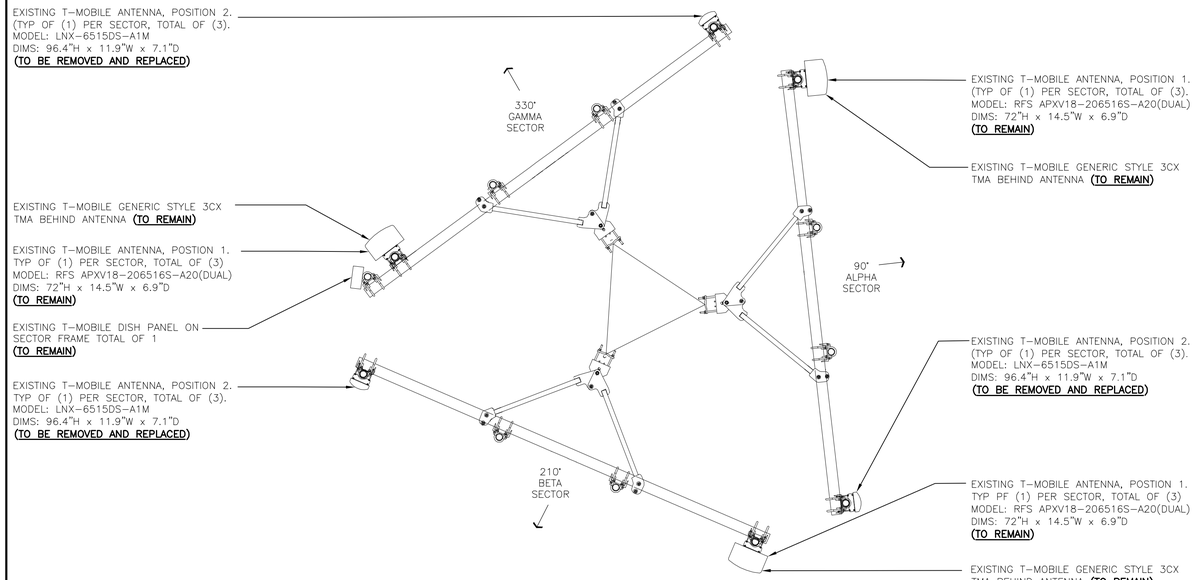
COMPOUND PLAN, AND ELEVATION

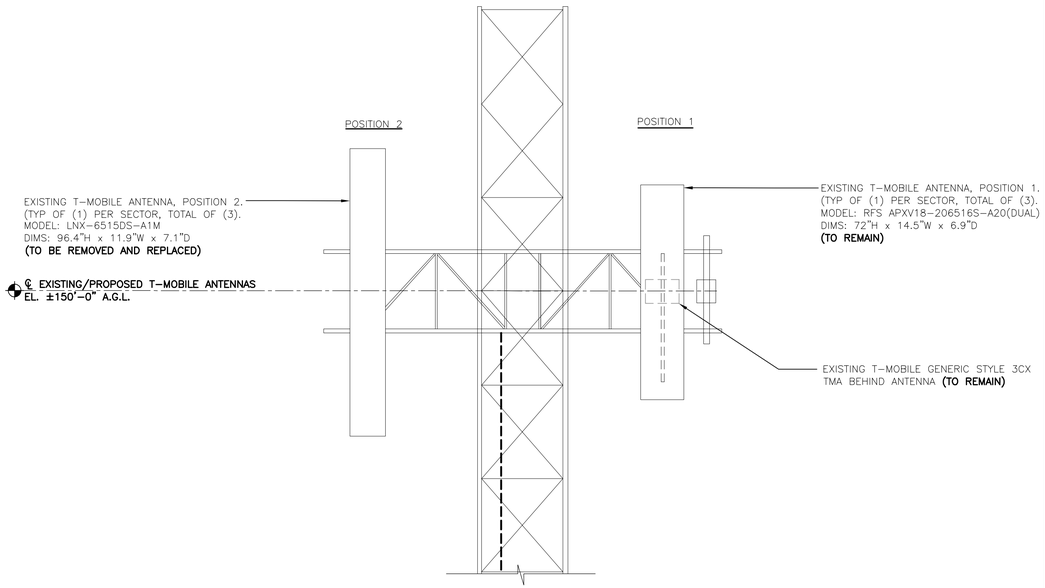
C-2

Sheet No. 4 of 6



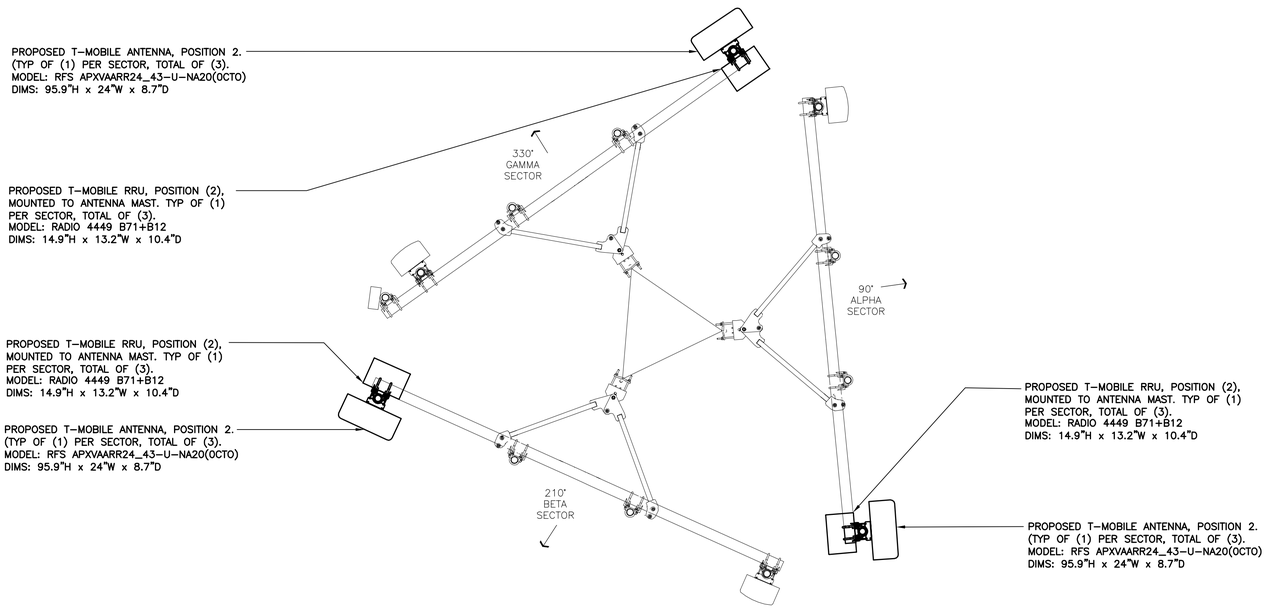
1 / C-3 **EXISTING ANTENNA MOUNTING CONFIGURATION**
SCALE: 1/2" = 1'

TRUE NORTH



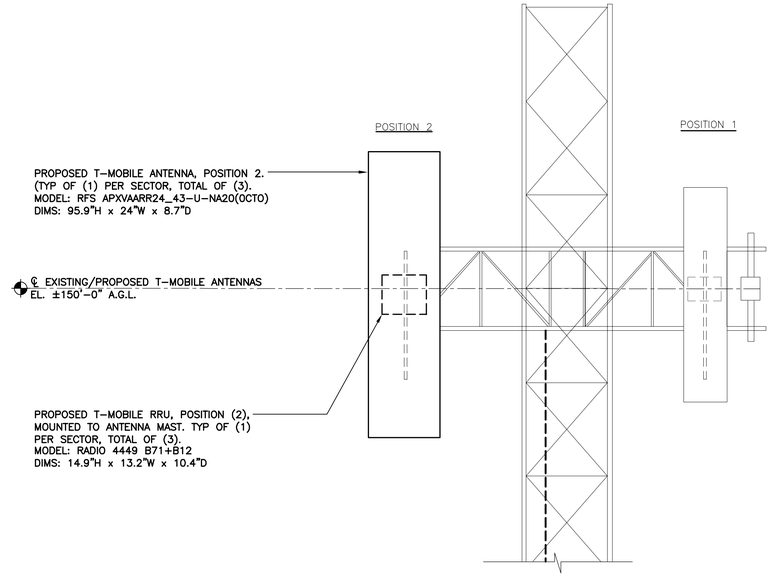
1A / C-3 **EXISTING ANTENNA ELEVATION**
SCALE: 1/2" = 1'

TRUE NORTH



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

TRUE NORTH



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

TRUE NORTH

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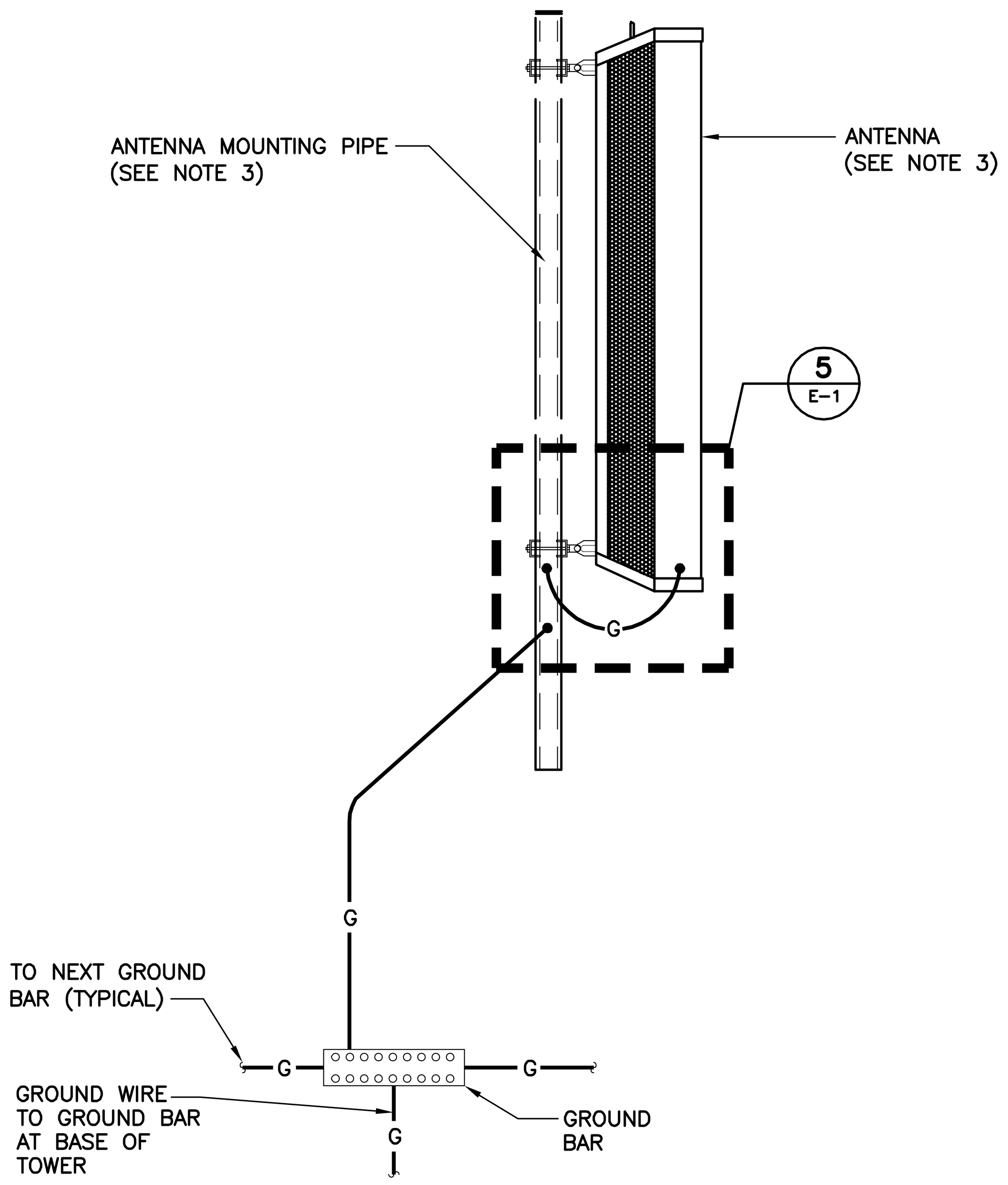
DATE: 05/08/19
SCALE: AS NOTED
JOB NO. 19027.18

ANTENNA MOUNTING CONFIGURATION

C-3

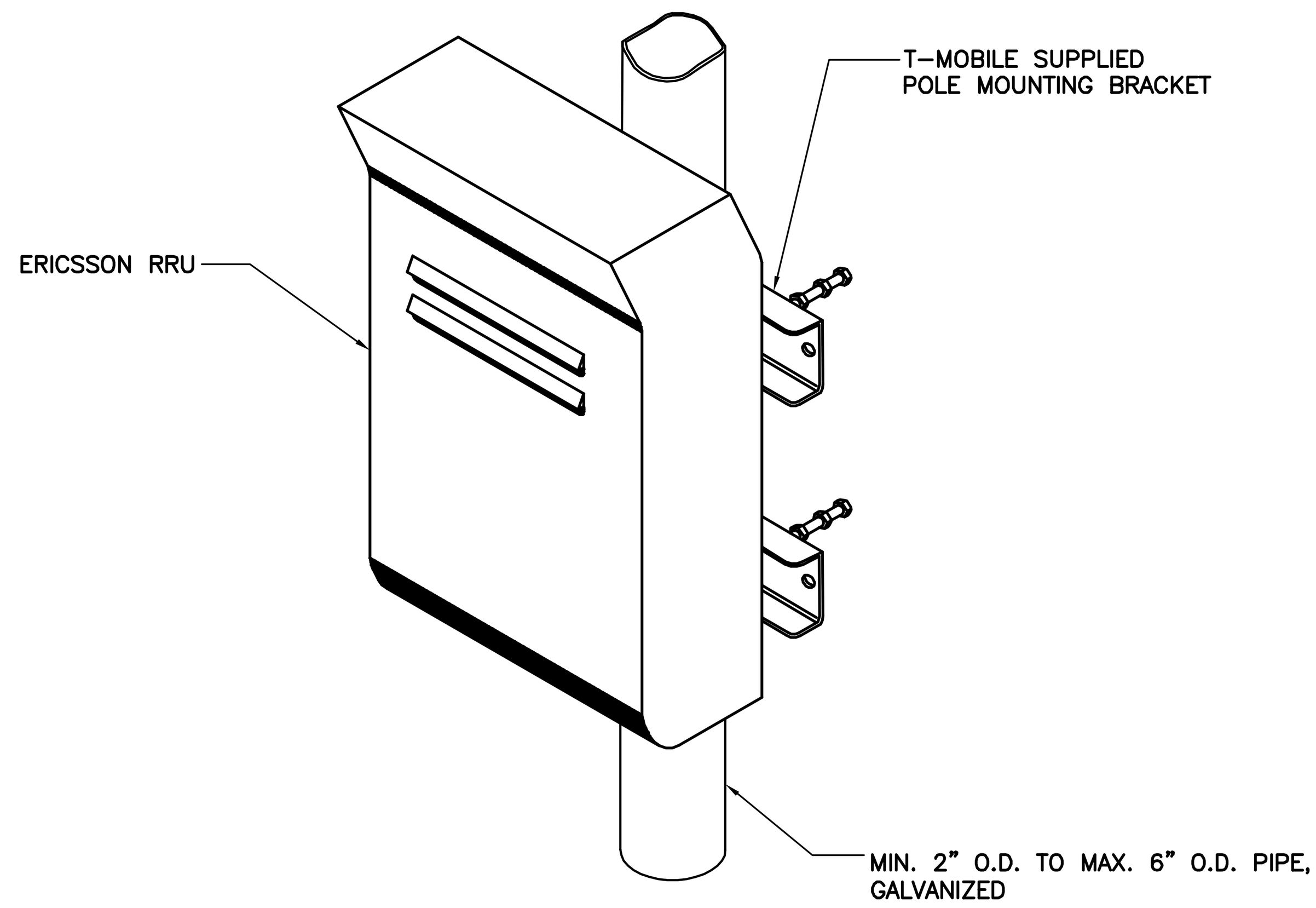
Sheet No. 5 of 6



NOTES:

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

1 / E-1 TYPICAL ANTENNA GROUNDING DETAIL
SCALE: NOT TO SCALE

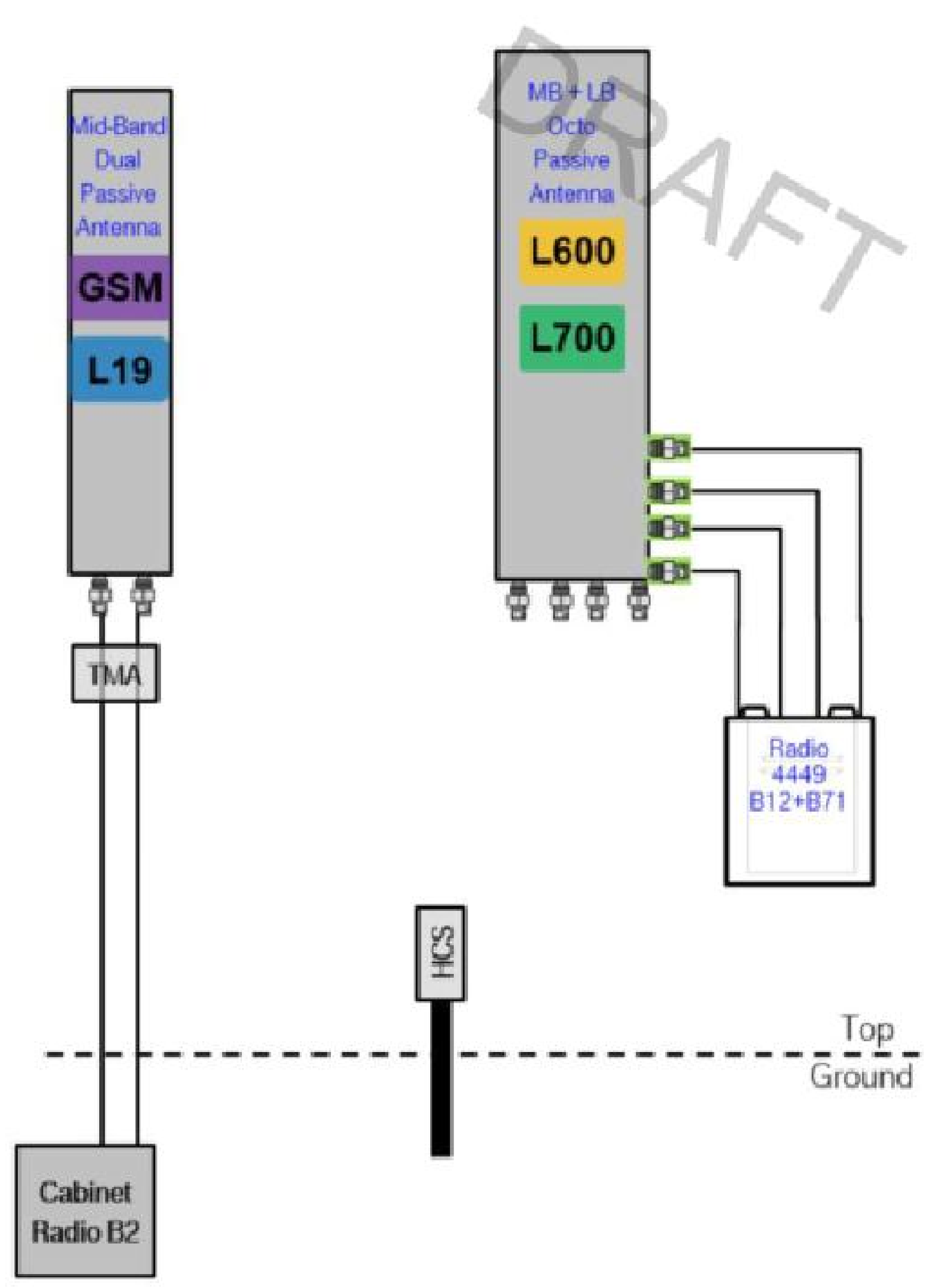


ISOMETRIC VIEW

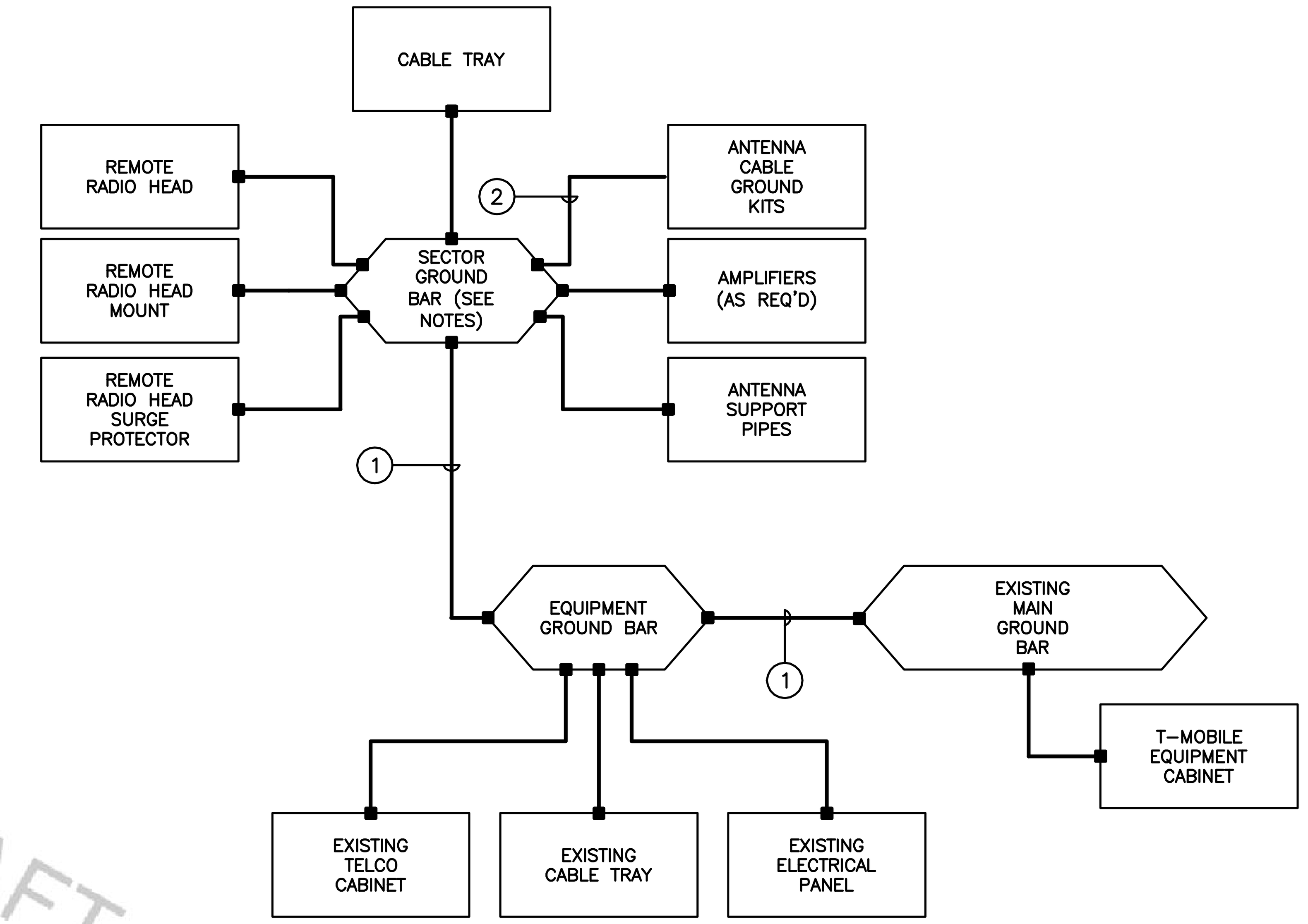
NOTES:

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

2 / E-1 TYPICAL RRUS MOUNTING DETAILS
SCALE: NOT TO SCALE



3 / E-1 PROPOSED PLUMBING DIAGRAM
SCALE: NOT TO SCALE



GROUNDING SCHEMATIC NOTES

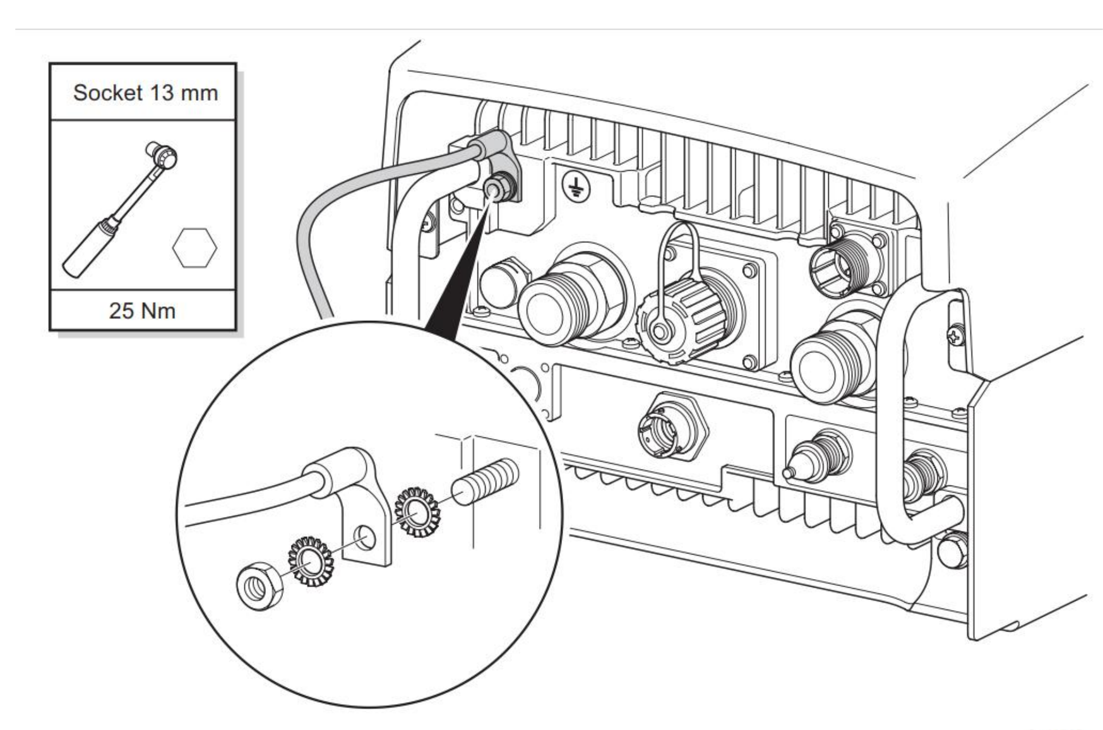
(1) #2 AWG

(2) #6 AWG

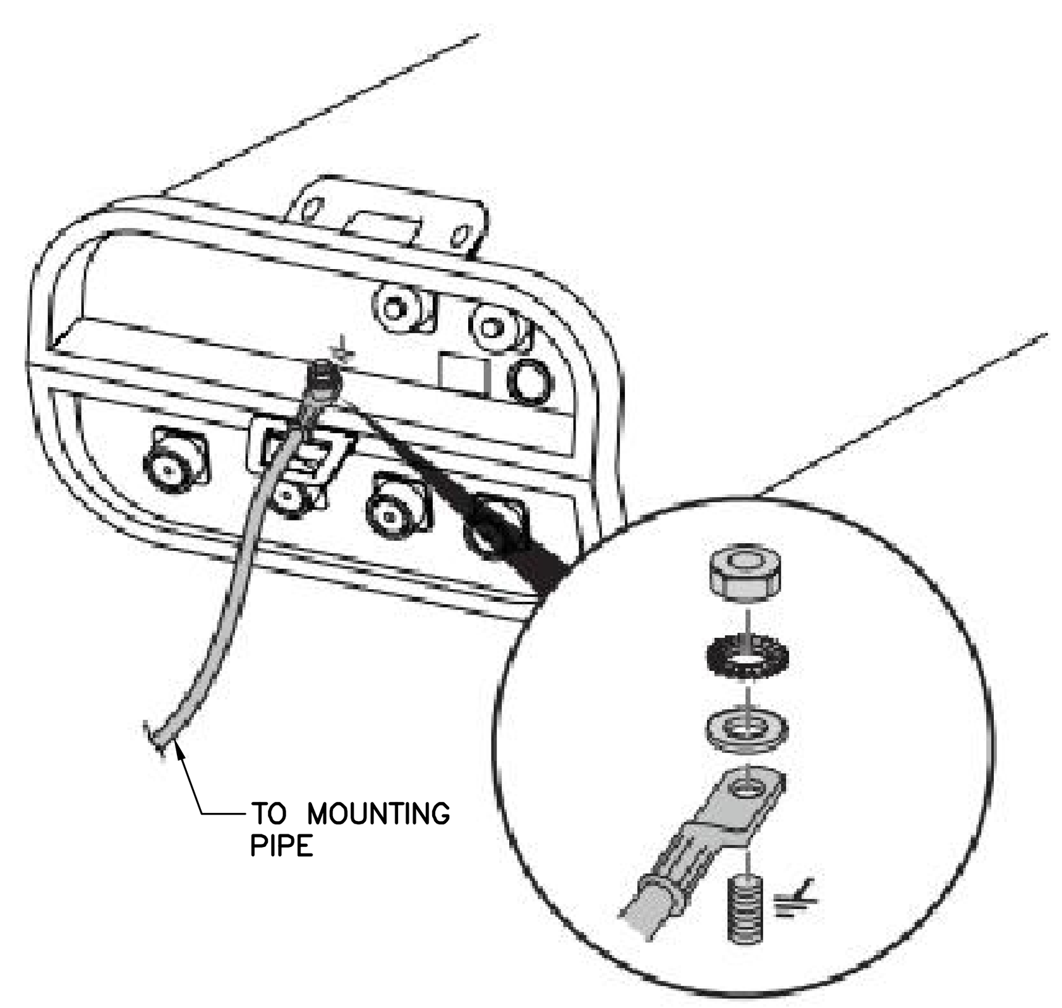
GENERAL NOTES:

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

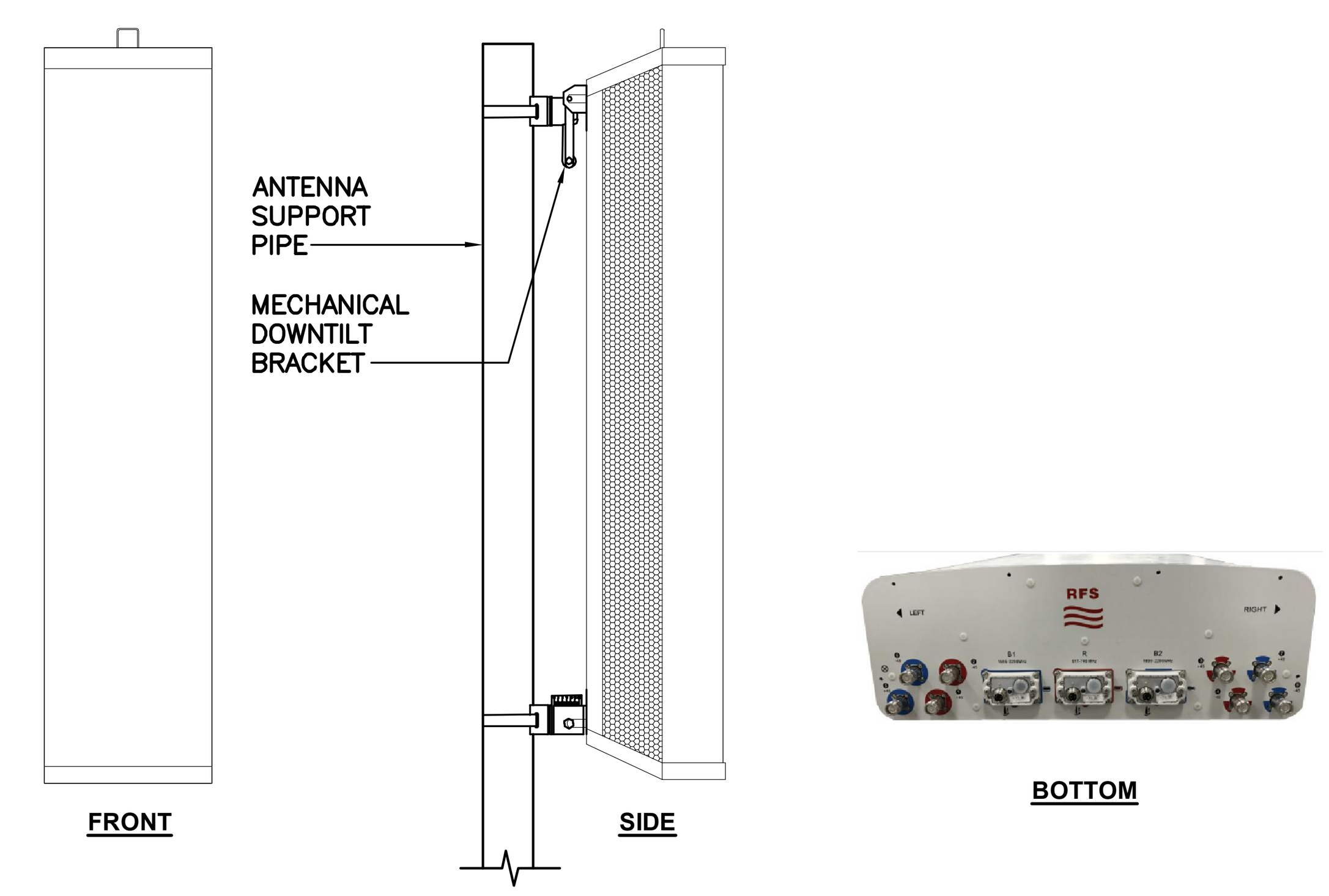
4 / E-1 TYPICAL GROUNDING SCHEMATIC DETAIL
SCALE: NOT TO SCALE



5 / E-1 TYPICAL RRU GROUNDING DETAIL
SCALE: NOT TO SCALE



6 / E-1 TYPICAL ANTENNA GROUNDING DETAIL
SCALE: NOT TO SCALE



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAARR24_43-U-NA20	95.9"L x 24"W x 8.7"D	153 LBS.

7 / E-1 PROPOSED ANTENNA DETAIL
SCALE: NOT TO SCALE

ISOMETRIC VIEW

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

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

8 / E-1 PROPOSED RRU DETAIL
SCALE: NOT TO SCALE

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0	05/29/19	RTS	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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DATE:	05/08/19
SCALE:	AS NOTED
JOB NO.	19027.18

TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 6 of 6

FRED A. NUDD CORPORATION

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(315) 524-2531 FAX (315) 524-4249

www.nuddtowers.com

Mark LeGault
Cordless Data Transfer, Inc.
600 Old Hartford Road
Colchester, CT 06415
August 13, 2019

Nudd Job Number: 119-23103

Site Location: 600 Old Hartford Road, Colchester, CT 06415, New London County (Latitude and Longitude: 41-35-12, -72-22-40)

Subject: Structural Analysis of an existing 180 ft Guyed Tower

Fred A. Nudd Corporation has completed a three-dimensional, finite element model structural analysis of the above noted guyed tower. This tower was analyzed considered appurtenance loads noted in the appurtenance loading table on the following page. The design loading criteria and strength design are per the TIA-222-G standard, which is the recommended design standard per the 2015 International Building Code and is the basis of the 2018 Connecticut State Building Code. Tower and foundation dimensions have been taken from original design drawings by Fred A. Nudd Corporation (Drawing Number 00-7265-1 & 00-7265-2, March 10, 2000). Onsite soil conditions were taken from a geotechnical report by Coneco Engineers (dated March 15, 2000). The tower is assumed to be in good, undamaged and equivalent to as new condition and has been maintained / inspected per criteria by TIA-222.

The purpose of this analysis is to determine the structure's ability to support new T-Mobile equipment installed at a rad center of 150 ft above ground level (AGL). The new equipment to be installed, which includes antennas, and associated hardware are listed on the following page in the appurtenance loading table.

Results of the analysis indicate the tower will be able to the support the design loads noted in the appurtenance loading table on the following page. Specific section design loads, capacities and stress ratios are provided on the following pages. Maximum member usage was found to be 79%.

The tower base foundation and anchors were analyzed considering onsite soil information from the aforementioned geotechnical report. Based on this analysis, the foundation and anchors will be able support the proposed appurtenance loading, in addition to the existing wireless equipment and tower superstructure. Specific design loads, capacities and stress ratios are provided on the following pages.

In conclusion, the tower superstructure and substructure can support the listed existing and proposed appurtenance loading.

We trust this report satisfies your needs. Please contact us with any questions or concerns regarding this report.

Best Regards,

Fred A. Nudd Corporation

Code Design Criteria

TIA/EIA-222-G
Windspeed = 99 mph, V_{asd} / 128 mph, V_{ult}, 3-Second Gust
Radial Ice = 0.75 inch
Ice Windspeed = 50 mph, V_{asd}, 3-Second Gust
Exposure = B
Topographic Category = 1
Structure Class = II
Seismic Accelerations are less than 1.0g, thus seismic loading can be ignored

Appurtenance Loading – Existing / Remaining

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
180	Sprint	(3) RFS APXV9ERR18-C-A20 (3) Alcatel Lucent 4x45W, 1900 MHz (3) Alcatel Lucent TD-RRH8x200-25 (6) Alcatel Lucent 2x50, 800 MHz (3) Commscope DT465B-2XR	(3) 12 ft Boom / Frame	(4) 1-1/4 Hybrid
170	AT&T	(3) Powerwave 7770.00 (6) Kathrein 800-10966 (3) Ericsson RRUS 4478 B14 (3) Ericsson 4449 B5/B12 (3) Ericsson RRUS 8843 B2/B66A (6) Powerwave LGP 21401 (6) Powerwave LGP 21901	(3) Nudd NSTD 445 12 ft Booms	(12) 1-1/4 (3) 1.34 Fiber (6) 0.65 DC

- *Height measurement taken as distance from top of base foundation to center of appurtenance.*

Appurtenance Loading – Final Configuration for T-Mobile

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
150	T-Mobile	(3) RFS APXV18-206516S-C-A20 (3) RFS APXVAARR24_43-U-NA20 (3) Ericsson 4449 B71 B12 (3) Ericsson KRY 112	(3) 12 ft Boom / Frame	(12) 1-5/8 (1) 1-3/8 Hybrid

- *Height measurement taken as distance from top of base foundation to center of appurtenance.*
- *T-Mobile's additional coax may be installed alongside or in the same location as their existing coax.*

Maximum Member Usage

Member	Percentage
Leg	70
Diagonal	74
Horizontal	79
Bolts	34
Guys	53
Anchor Rod	57

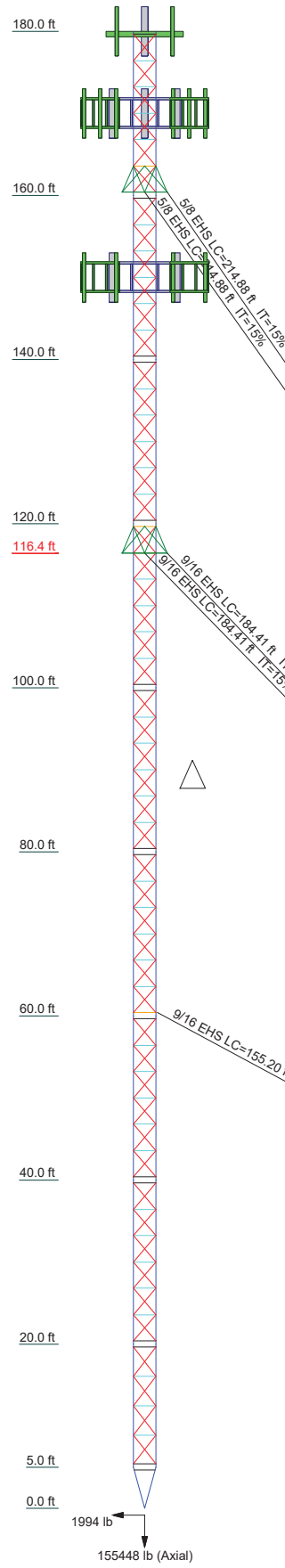
- *Percentage less than 100% denote member stress levels are satisfactory for loading*
- *Percentage greater than 100% indicates member strengthening is required*

Foundation Usage

Design Load	Capacity (kips)	Analysis (kips)	Percentage
Base Axial	216.0	160.9	74
Anchor Uplift	80.3	33.6	42
Anchor Shear	78.1	39.5	50

- *Percentage less than 100% denote foundation is satisfactory for loading*
- *Percentage greater than 100% indicates foundation analysis is required*

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs			A500M-63	A500M-60	A500M-63	P2.5x.203	A500M-60	A500M-63	A500M-63	
Leg Grade										
Diagonals	N.A.					SR 5/8				
Diagonal Grade	N.A.					A36				
Top Girts				L1 1/2x1 1/2x3/16			N.A.	L1 1/2x1 1/2x3/16		L1 3/4x1 3/4x3/16
Bottom Girts	N.A.			L1 1/2x1 1/2x3/16	N.A.		L1 1/2x1 1/2x3/16			N.A.
Horizontals	N.A.				L1 1/2x1 1/2x3/16					L1 3/4x1 3/4x3/16
Top Guy Pull-Offs			N.A.		L1 1/2x1 1/2x3/16	N.A.	L1 1/2x1 1/2x3/16		N.A.	L1 1/2x1 1/2x3/16
Bot Guy Pull-Offs				N.A.			L1 1/2x1 1/2x3/16		N.A.	L1 1/2x1 1/2x3/16
Face Width (ft)										3.5
# Panels @ (ft)	A	4 @ 3.5625				48 @ 3.20833				
Weight (lb)	111.2	480.3	658.2	658.2	658.2	658.2	872.6	658.2	658.2	889.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Low Profile Platform (Sprint)	180	Ericsson RRUS 4478 B14 (ATI)	170
RFS APXV9ERR18-C-A20 (Sprint)	180	Ericsson RRUS 4478 B14 (ATI)	170
RFS APXV9ERR18-C-A20 (Sprint)	180	Ericsson 4449 B5/B12 (ATI)	170
RFS APXV9ERR18-C-A20 (Sprint)	180	Ericsson 4449 B5/B12 (ATI)	170
Commscope DT465B-2XR (Sprint)	180	Ericsson 4449 B5/B12 (ATI)	170
Commscope DT465B-2XR (Sprint)	180	Ericsson RRUS 8843 (ATI)	170
Commscope DT465B-2XR (Sprint)	180	Ericsson RRUS 8843 (ATI)	170
Alcatel Lucent 4x45W (Sprint)	180	Ericsson RRUS 8843 (ATI)	170
Alcatel Lucent 4x45W (Sprint)	180	(2) Powerwave LGP21901 (ATI)	170
Alcatel Lucent 4x45W (Sprint)	180	(2) Powerwave LGP21901 (ATI)	170
Alcatel Lucent 8x200-25 (Sprint)	180	(2) Powerwave LGP21901 (ATI)	170
Alcatel Lucent 8x200-25 (Sprint)	180	RFS APXVAARR24_43-U-NA20 (T-Mobile)	150
Alcatel Lucent 8x200-25 (Sprint)	180	RFS APXVAARR24_43-U-NA20 (T-Mobile)	150
(2) Alcatel Lucent 2x50 (Sprint)	180	RFS APXVAARR24_43-U-NA20 (T-Mobile)	150
(2) Alcatel Lucent 2x50 (Sprint)	180	TMA (T-Mobile)	150
(2) Alcatel Lucent 2x50 (Sprint)	180	TMA (T-Mobile)	150
12 ft Boom / Sector Mount (ATI)	170	TMA (T-Mobile)	150
12 ft Boom / Sector Mount (ATI)	170	RFS APXV18-206516S-C-A20 (T-Mobile)	150
12 ft Boom / Sector Mount (ATI)	170	RFS APXV18-206516S-C-A20 (T-Mobile)	150
Powerwave 7770.00 (ATI)	170	RFS APXV18-206516S-C-A20 (T-Mobile)	150
Powerwave 7770.00 (ATI)	170	Ericsson 4449 B71 B12 (T-Mobile)	150
Powerwave 7770.00 (ATI)	170	Ericsson 4449 B71 B12 (T-Mobile)	150
(2) Powerwave LGP21401 (ATI)	170	Ericsson 4449 B71 B12 (T-Mobile)	150
(2) Powerwave LGP21401 (ATI)	170		
(2) Powerwave LGP21401 (ATI)	170		
(2) Kathrein 800 10966 (ATI)	170		
(2) Kathrein 800 10966 (ATI)	170		
(2) Kathrein 800 10966 (ATI)	170		
Ericsson RRUS 4478 B14 (ATI)	170		

SYMBOL LIST

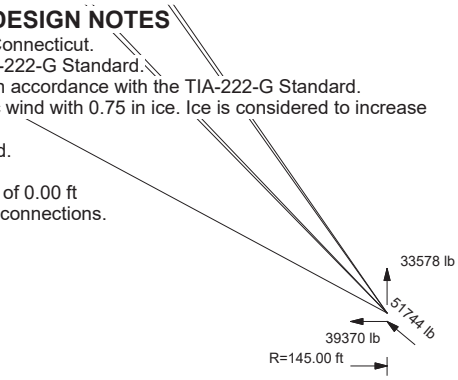
MARK	SIZE	MARK	SIZE
A	1 @ 4.625		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500M-63	63 ksi	80 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 99 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. Weld together tower sections have flange connections.
9. TOWER RATING: 79.3%



ALL REACTIONS ARE FACTORED

Fred A. Nudd Corporation
1743 Route 104
Ontario, NY 14519
Phone: 315.524.2531
FAX: 315.524.4249

Job: **119-23103**			
Project: **Colchester, CT**			
Client: CDT	Drawn by: FAN	App'd:	
Code: TIA-222-G	Date: 08/13/19	Scale: NTS	
Path:		Dwg No. E-1	

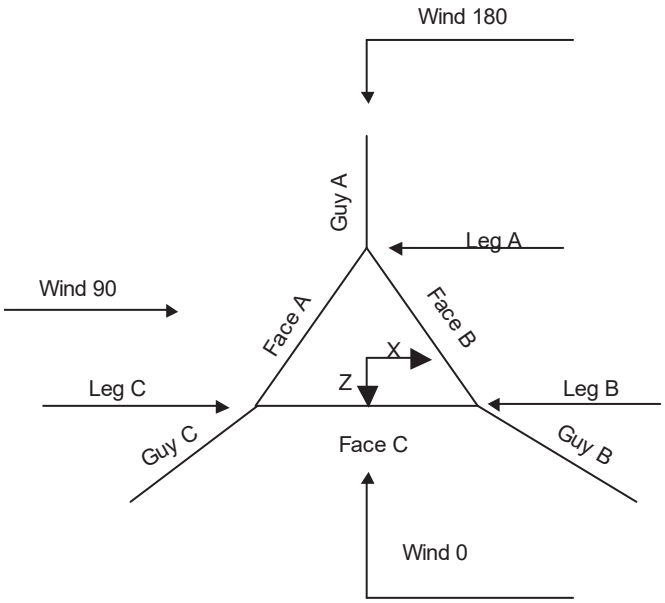
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 180.00 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 tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

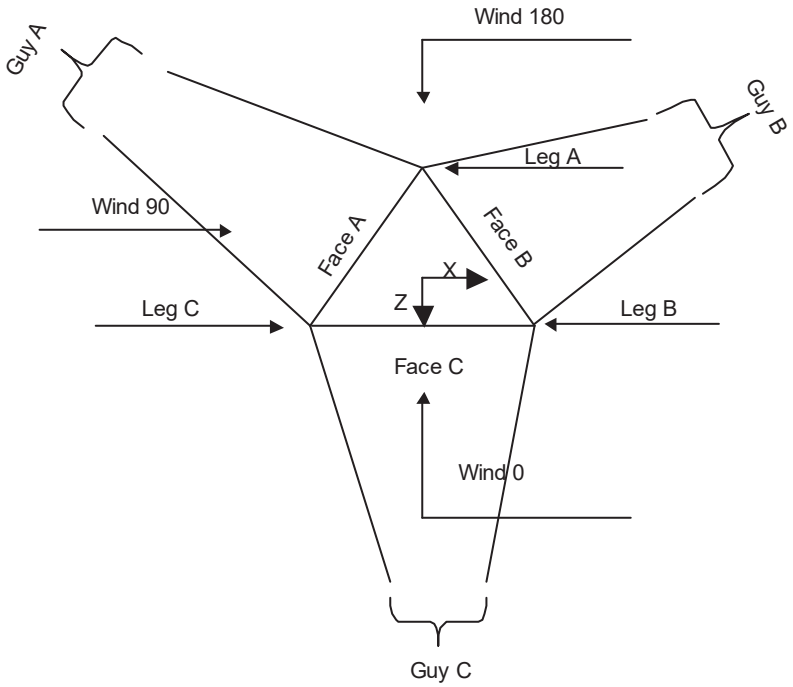
Tower is located in New London County, Connecticut.
Basic wind speed of 99 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Tension only take-up is 0.0313 in.
Pressures are calculated at each section.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

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	180.00-160.00			3.50	1	20.00
T2	160.00-140.00			3.50	1	20.00
T3	140.00-120.00			3.50	1	20.00
T4	120.00-100.00			3.50	1	20.00
T5	100.00-80.00			3.50	1	20.00
T6	80.00-60.00			3.50	1	20.00
T7	60.00-40.00			3.50	1	20.00
T8	40.00-20.00			3.50	1	20.00
T9	20.00-5.00			3.50	1	15.00
T10	5.00-0.00			3.50	1	5.00

Tower Section Geometry *(cont'd)*

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
T1	180.00-160.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T2	160.00-140.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T3	140.00-120.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T4	120.00-100.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T5	100.00-80.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T6	80.00-60.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T7	60.00-40.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T8	40.00-20.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T9	20.00-5.00	3.56	TX Brace	No	Yes	4.5000	4.5000
T10	5.00-0.00	4.63	TX Brace	No	Yes	4.5000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-160.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 160.00-140.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T3 140.00-120.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T4 120.00-100.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 100.00-80.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 80.00-60.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 60.00-40.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T8 40.00-20.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T9 20.00-5.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T10 5.00-0.00	Pipe	P2.5x.203	A500M-63 (63 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 180.00-160.00	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 160.00-140.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 140.00-120.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 120.00-100.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 100.00-80.00	Equal Angle	L1 1/2x1 1/2x3/16	A36	Equal Angle	L1 1/2x1 1/2x3/16	A36

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T6 80.00-60.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T7 60.00-40.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T8 40.00-20.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T9 20.00-5.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T10 5.00-0.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) 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 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 160.00-140.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 140.00-120.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 120.00-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 100.00-80.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T6 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T7 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T8 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T9 20.00-5.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T10 5.00-0.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	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 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	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
140.00-120.00			(36 ksi)						
T4	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
120.00-100.00			(36 ksi)						
T5	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
100.00-80.00			(36 ksi)						
T6 80.00-60.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T7 60.00-40.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T8 40.00-20.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T9 20.00-5.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T10 5.00-0.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						

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	Yes	Yes	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T9 20.00-5.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 5.00-0.00	Yes	Yes	0.33	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 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T3 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T4 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T5 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T6 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T7 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T8 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T9 20.00-5.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T10 5.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	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 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
T2 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
T3 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
T4 120.00-100.00	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 100.00-80.00	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
T6 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
T7 60.00-40.00	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 40.00-20.00	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
T9 20.00-5.00	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
T10 5.00-0.00	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 lb	%	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	6360.00	15%	21000	0.813	214.61	145.00	0.0000	0.00	100%
		B	5/8	6360.00	15%	21000	0.813	214.61	145.00	0.0000	0.00	100%
		C	5/8	6360.00	15%	21000	0.813	214.61	145.00	0.0000	0.00	100%
116.417	EHS	A	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
		B	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
		C	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
60.375	EHS	A	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	100%
		B	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	100%
		C	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	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	L2x2x5/16 L3x3x1/4
116.417	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L2x2x5/16 L3x3x1/4
60.375	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	L1 1/2x1 1/2x3/16
116.42	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16
60.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
160.375	174.48	174.48	174.48		2.92 2.9 sec/pulse	2.92 2.9 sec/pulse	2.92 2.9 sec/pulse	
116.417	123.58	123.58	123.58		2.15 2.5 sec/pulse	2.15 2.5 sec/pulse	2.15 2.5 sec/pulse	
60.375	104.01	104.01	104.01		1.53 2.1 sec/pulse	1.53 2.1 sec/pulse	1.53 2.1 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	0.65	0.65	1	1
116.417	No	No	1	1	0.65	0.65	1	1
60.375	No	No			0.65	0.65	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	0.7500 A325N	2	0.0000	1	0.6250 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1
116.417	0.7500 A325N	2	0.0000	1	0.6250 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1
60.375	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
160.375	A	80.19	20	5	1.6393
	B	80.19	20	5	1.6393
	C	80.19	20	5	1.6393
116.417	A	58.21	18	5	1.5876
	B	58.21	18	5	1.5876
	C	58.21	18	5	1.5876
60.375	A	30.19	15	4	1.4867
	B	30.19	15	4	1.4867
	C	30.19	15	4	1.4867

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
160.375	A	48.2735	6490.22 6360.00	-104.64	4882.39	-4274.84	-9865.97	15173.38	-17088.36
	A	48.2735	6490.22	104.64	4882.39	-4274.84	-9865.97	-15173.38	17088.36

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
			6360.00						
	B	48.2735	6490.22	3754.44	4882.39	2046.79	19731.94	15173.38	0.00
			6360.00						
	B	48.2735	6490.22	3649.79	4882.39	2228.04	-9865.97	-15173.38	-17088.36
			6360.00						
	C	48.2735	6490.22	-3649.79	4882.39	2228.04	-9865.97	15173.38	17088.36
			6360.00						
	C	48.2735	6490.22	-3754.44	4882.39	2046.79	19731.94	-15173.38	0.00
			6360.00						
			Sum:	0.00	29294.33	-0.00	-0.00	0.00	0.00
116.417	A	39.1448	5328.01	-100.37	3400.60	-4100.44	-6871.68	14554.35	-11902.11
			5250.00						
	A	39.1448	5328.01	100.37	3400.60	-4100.44	-6871.68	-14554.35	11902.11
			5250.00						
	B	39.1448	5328.01	3601.27	3400.60	1963.29	13743.37	14554.35	0.00
			5250.00						
	B	39.1448	5328.01	3500.89	3400.60	2137.14	-6871.68	-14554.35	-11902.11
			5250.00						
	C	39.1448	5328.01	-3500.89	3400.60	2137.14	-6871.68	14554.35	11902.11
			5250.00						
	C	39.1448	5328.01	-3601.27	3400.60	1963.29	13743.37	-14554.35	0.00
			5250.00						
			Sum:	0.00	20403.61	-0.00	-0.00	0.00	0.00
60.375	A	22.8926	5290.46	0.00	2102.12	-4854.90	-4247.81	0.00	0.00
			5250.00						
	B	22.8926	5290.46	4204.47	2102.12	2427.45	2123.90	0.00	-3678.71
			5250.00						
	C	22.8926	5290.46	-4204.47	2102.12	2427.45	2123.90	-0.00	3678.71
			5250.00						
			Sum:	0.00	6306.36	0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
160.375	A	48.2735	9780.14	-152.09	7551.53	-6213.09	-15259.56	22053.13	-26430.34
			8923.84						
	A	48.2735	9780.14	152.09	7551.53	-6213.09	-15259.56	-22053.13	26430.34
			8923.84						
	B	48.2735	9780.14	5456.74	7551.53	2974.83	30519.13	22053.13	0.00
			8923.84						
	B	48.2735	9780.14	5304.65	7551.53	3238.26	-15259.56	-22053.13	-26430.34
			8923.84						
	C	48.2735	9780.14	-5304.65	7551.53	3238.26	-15259.56	22053.13	26430.34
			8923.84						
	C	48.2735	9780.14	-5456.74	7551.53	2974.83	30519.13	-22053.13	0.00
			8923.84						
			Sum:	0.00	45309.15	0.00	-0.00	0.00	0.00
116.417	A	39.1448	8161.99	-149.36	5419.13	-6101.54	-10950.57	21657.20	-18966.95
			7599.28						
	A	39.1448	8161.99	149.36	5419.13	-6101.54	-10950.57	-21657.20	18966.95

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
			7599.28						
	B	39.1448	8161.99	5358.77	5419.13	2921.42	21901.14	21657.20	0.00
			7599.28						
	B	39.1448	8161.99	5209.41	5419.13	3180.12	-10950.57	-21657.20	-18966.95
			7599.28						
	C	39.1448	8161.99	-5209.41	5419.13	3180.12	-10950.57	21657.20	18966.95
			7599.28						
	C	39.1448	8161.99	-5358.77	5419.13	2921.42	21901.14	-21657.20	0.00
			7599.28						
			Sum:	0.00	32514.76	-0.00	-0.00	0.00	0.00
60.375	A	22.8926	7815.32	0.00	3328.32	-7071.17	-6725.63	0.00	0.00
			7550.50						
	B	22.8926	7815.32	6123.81	3328.32	3535.58	3362.82	0.00	-5824.57
			7550.50						
	C	22.8926	7815.32	-6123.81	3328.32	3535.58	3362.82	-0.00	5824.57
			7550.50						
			Sum:	0.00	9984.97	-0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
160.375	A	48.2735	6490.22	-104.64	4882.39	-4274.84	-9865.97	15173.38	-17088.36
			6360.00						
	A	48.2735	6490.22	104.64	4882.39	-4274.84	-9865.97	-15173.38	17088.36
			6360.00						
	B	48.2735	6490.22	3754.44	4882.39	2046.79	19731.94	15173.38	0.00
			6360.00						
	B	48.2735	6490.22	3649.79	4882.39	2228.04	-9865.97	-15173.38	-17088.36
			6360.00						
	C	48.2735	6490.22	-3649.79	4882.39	2228.04	-9865.97	15173.38	17088.36
			6360.00						
	C	48.2735	6490.22	-3754.44	4882.39	2046.79	19731.94	-15173.38	0.00
			6360.00						
			Sum:	0.00	29294.33	-0.00	-0.00	0.00	0.00
116.417	A	39.1448	5328.01	-100.37	3400.60	-4100.44	-6871.68	14554.35	-11902.11
			5250.00						
	A	39.1448	5328.01	100.37	3400.60	-4100.44	-6871.68	-14554.35	11902.11
			5250.00						
	B	39.1448	5328.01	3601.27	3400.60	1963.29	13743.37	14554.35	0.00
			5250.00						
	B	39.1448	5328.01	3500.89	3400.60	2137.14	-6871.68	-14554.35	-11902.11
			5250.00						
	C	39.1448	5328.01	-3500.89	3400.60	2137.14	-6871.68	14554.35	11902.11
			5250.00						
	C	39.1448	5328.01	-3601.27	3400.60	1963.29	13743.37	-14554.35	0.00
			5250.00						
			Sum:	0.00	20403.61	-0.00	-0.00	0.00	0.00
60.375	A	22.8926	5290.46	0.00	2102.12	-4854.90	-4247.81	0.00	0.00
			5250.00						
	B	22.8926	5290.46	4204.47	2102.12	2427.45	2123.90	0.00	-3678.71

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
	C	22.8926	5250.00 5290.46 5250.00	-4204.47	2102.12	2427.45	2123.90	-0.00	3678.71
			Sum:	0.00	6306.36	0.00	0.00	0.00	0.00

Guy-Tensioning Information

Guy Elevation		H	V	Temperature At Time Of Tensioning 0 F		20 F		40 F		60 F		80 F		100 F		120 F	
				Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept
ft		ft	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft
160.375	A	143.02	160.38	7202	2.58	6920	2.68	6640	2.80	6360	2.92	6081	3.05	5803	3.20	5526	3.35
	B	143.02	160.38	7202	2.58	6920	2.68	6640	2.80	6360	2.92	6081	3.05	5803	3.20	5526	3.35
	C	143.02	160.38	7202	2.58	6920	2.68	6640	2.80	6360	2.92	6081	3.05	5803	3.20	5526	3.35
116.417	A	143.02	116.42	6193	1.83	5878	1.93	5563	2.03	5250	2.15	4938	2.29	4627	2.44	4319	2.62
	B	143.02	116.42	6193	1.83	5878	1.93	5563	2.03	5250	2.15	4938	2.29	4627	2.44	4319	2.62
	C	143.02	116.42	6193	1.83	5878	1.93	5563	2.03	5250	2.15	4938	2.29	4627	2.44	4319	2.62
60.375	A	142.98	60.38	6582	1.22	6137	1.31	5692	1.41	5250	1.53	4810	1.67	4373	1.84	3942	2.04
	B	142.98	60.38	6582	1.22	6137	1.31	5692	1.41	5250	1.53	4810	1.67	4373	1.84	3942	2.04
	C	142.98	60.38	6582	1.22	6137	1.31	5692	1.41	5250	1.53	4810	1.67	4373	1.84	3942	2.04

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
LDF6-50A (1-1/4 FOAM) (Sprint)	A	No	No	Ar (CaAa)	180.00 - 0.00	0.0000	0.25	4	4	0.5000	1.5500		0.66
Safety Line 3/8	B	No	No	Ar (CaAa)	180.00 - 0.00	0.0000	0.25	1	1	0.5000	0.3750		0.22
LDF6-50A (1-1/4 FOAM) (AT&T)	A	No	No	Ar (CaAa)	170.00 - 0.00	0.0000	-0.25	12	6	0.5000	1.5500		0.66
1.34 in Fiber (AT&T)	A	No	No	Ar (CaAa)	170.00 - 0.00	0.0000	-0.25	3	3	0.5000	1.3400		0.15
0.65 DC (AT&T)	A	No	No	Ar (CaAa)	170.00 - 0.00	0.0000	-0.25	6	6	0.5000	0.6500		0.10
LDF7-50A (1-5/8 FOAM) (T-Mobile)	B	No	No	Ar (CaAa)	150.00 - 0.00	0.0000	0	12	6	0.5000	1.9800		0.82
1-3/8 in Hybrid (T-Mobile)	B	No	No	Ar (CaAa)	150.00 - 0.00	0.0000	0	1	1	1.5800	1.5800		0.70

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	180.00-160.00	A	0.000	0.000	38.920	0.000	142.50
		B	0.000	0.000	0.750	0.000	4.40
		C	0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	26.090	0.000	109.80
		C	0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	51.430	0.000	215.20
		C	0.000	0.000	0.000	0.000	0.00
T4	120.00-100.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	51.430	0.000	215.20
		C	0.000	0.000	0.000	0.000	0.00
T5	100.00-80.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	51.430	0.000	215.20
		C	0.000	0.000	0.000	0.000	0.00
T6	80.00-60.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	51.430	0.000	215.20
		C	0.000	0.000	0.000	0.000	0.00
T7	60.00-40.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	51.430	0.000	215.20
		C	0.000	0.000	0.000	0.000	0.00
T8	40.00-20.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	51.430	0.000	215.20
		C	0.000	0.000	0.000	0.000	0.00
T9	20.00-5.00	A	0.000	0.000	49.080	0.000	174.15
		B	0.000	0.000	38.572	0.000	161.40
		C	0.000	0.000	0.000	0.000	0.00
T10	5.00-0.00	A	0.000	0.000	16.360	0.000	58.05
		B	0.000	0.000	12.858	0.000	53.80
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	180.00-160.00	A	1.767	0.000	0.000	77.751	0.000	1065.91
		B		0.000	0.000	7.819	0.000	96.90
		C		0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	1.745	0.000	0.000	124.089	0.000	1716.80
		B		0.000	0.000	37.250	0.000	654.97
		C		0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	1.720	0.000	0.000	123.429	0.000	1694.56
		B		0.000	0.000	66.408	0.000	1200.71
		C		0.000	0.000	0.000	0.000	0.00
T4	120.00-100.00	A	1.692	0.000	0.000	122.671	0.000	1669.15
		B		0.000	0.000	65.992	0.000	1184.24
		C		0.000	0.000	0.000	0.000	0.00
T5	100.00-80.00	A	1.658	0.000	0.000	121.779	0.000	1639.39
		B		0.000	0.000	65.501	0.000	1164.97
		C		0.000	0.000	0.000	0.000	0.00
T6	80.00-60.00	A	1.617	0.000	0.000	120.687	0.000	1603.24
		B		0.000	0.000	64.901	0.000	1141.61
		C		0.000	0.000	0.000	0.000	0.00
T7	60.00-40.00	A	1.564	0.000	0.000	119.270	0.000	1556.75
		B		0.000	0.000	64.121	0.000	1111.60
		C		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T8	40.00-20.00	A	1.486	0.000	0.000	117.212	0.000	1490.08
		B		0.000	0.000	62.986	0.000	1068.69
		C		0.000	0.000	0.000	0.000	0.00
T9	20.00-5.00	A	1.361	0.000	0.000	85.449	0.000	1039.44
		B		0.000	0.000	45.880	0.000	751.42
		C		0.000	0.000	0.000	0.000	0.00
T10	5.00-0.00	A	1.159	0.000	0.000	27.159	0.000	305.79
		B		0.000	0.000	14.558	0.000	224.55
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	180.00-160.00	-4.2047	-1.8918	-2.4532	-0.9833
T2	160.00-140.00	-4.4672	-1.9077	-3.4136	-1.0014
T3	140.00-120.00	-2.7848	-2.5798	-2.5244	-1.4571
T4	120.00-100.00	-2.7848	-2.5798	-2.5587	-1.4762
T5	100.00-80.00	-2.7848	-2.5798	-2.5989	-1.4986
T6	80.00-60.00	-2.7848	-2.5798	-2.6478	-1.5257
T7	60.00-40.00	-2.7848	-2.5798	-2.7110	-1.5607
T8	40.00-20.00	-2.7848	-2.5798	-2.8021	-1.6109
T9	20.00-5.00	-2.8080	-2.5954	-3.0471	-1.7403
T10	5.00-0.00	-2.5674	-3.9876	-3.1538	-3.4116

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	LDF6-50A (1-1/4 FOAM)	160.00 - 180.00	0.6000	0.3843
T1	2	Safety Line 3/8	160.00 - 180.00	0.6000	0.3843
T1	3	LDF6-50A (1-1/4 FOAM)	160.00 - 170.00	0.6000	0.3843
T1	5	1.34 in Fiber	160.00 - 170.00	0.6000	0.3843
T1	6	0.65 DC	160.00 - 170.00	0.6000	0.3843
T2	1	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3932
T2	2	Safety Line 3/8	140.00 - 160.00	0.6000	0.3932
T2	3	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3932
T2	5	1.34 in Fiber	140.00 - 160.00	0.6000	0.3932
T2	6	0.65 DC	140.00 - 160.00	0.6000	0.3932
T2	7	LDF7-50A (1-5/8 FOAM)	140.00 -	0.6000	0.3932

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			150.00		
T2	8	1-3/8 in Hybrid	140.00 - 150.00	0.6000	0.3932
T3	1	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.3985
T3	2	Safety Line 3/8	120.00 - 140.00	0.6000	0.3985
T3	3	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.3985
T3	5	1.34 in Fiber	120.00 - 140.00	0.6000	0.3985
T3	6	0.65 DC	120.00 - 140.00	0.6000	0.3985
T3	7	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.3985
T3	8	1-3/8 in Hybrid	120.00 - 140.00	0.6000	0.3985
T4	1	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.4047
T4	2	Safety Line 3/8	100.00 - 120.00	0.6000	0.4047
T4	3	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.4047
T4	5	1.34 in Fiber	100.00 - 120.00	0.6000	0.4047
T4	6	0.65 DC	100.00 - 120.00	0.6000	0.4047
T4	7	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.4047
T4	8	1-3/8 in Hybrid	100.00 - 120.00	0.6000	0.4047
T5	1	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.4119
T5	2	Safety Line 3/8	80.00 - 100.00	0.6000	0.4119
T5	3	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.4119
T5	5	1.34 in Fiber	80.00 - 100.00	0.6000	0.4119
T5	6	0.65 DC	80.00 - 100.00	0.6000	0.4119
T5	7	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.4119
T5	8	1-3/8 in Hybrid	80.00 - 100.00	0.6000	0.4119
T6	1	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.4208
T6	2	Safety Line 3/8	60.00 - 80.00	0.6000	0.4208
T6	3	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.4208
T6	5	1.34 in Fiber	60.00 - 80.00	0.6000	0.4208
T6	6	0.65 DC	60.00 - 80.00	0.6000	0.4208
T6	7	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.4208
T6	8	1-3/8 in Hybrid	60.00 - 80.00	0.6000	0.4208
T7	1	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.4325
T7	2	Safety Line 3/8	40.00 - 60.00	0.6000	0.4325
T7	3	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.4325
T7	5	1.34 in Fiber	40.00 - 60.00	0.6000	0.4325
T7	6	0.65 DC	40.00 - 60.00	0.6000	0.4325
T7	7	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.4325
T7	8	1-3/8 in Hybrid	40.00 - 60.00	0.6000	0.4325
T8	1	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.4495
T8	2	Safety Line 3/8	20.00 - 40.00	0.6000	0.4495
T8	3	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.4495
T8	5	1.34 in Fiber	20.00 - 40.00	0.6000	0.4495
T8	6	0.65 DC	20.00 - 40.00	0.6000	0.4495
T8	7	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.4495
T8	8	1-3/8 in Hybrid	20.00 - 40.00	0.6000	0.4495
T9	1	LDF6-50A (1-1/4 FOAM)	5.00 - 20.00	0.6000	0.4939
T9	2	Safety Line 3/8	5.00 - 20.00	0.6000	0.4939
T9	3	LDF6-50A (1-1/4 FOAM)	5.00 - 20.00	0.6000	0.4939

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	5	1.34 in Fiber	5.00 - 20.00	0.6000	0.4939
T9	6	0.65 DC	5.00 - 20.00	0.6000	0.4939
T9	7	LDF7-50A (1-5/8 FOAM)	5.00 - 20.00	0.6000	0.4939
T9	8	1-3/8 in Hybrid	5.00 - 20.00	0.6000	0.4939
T10	1	LDF6-50A (1-1/4 FOAM)	0.00 - 5.00	0.6000	0.4910
T10	2	Safety Line 3/8	0.00 - 5.00	0.6000	0.4910
T10	3	LDF6-50A (1-1/4 FOAM)	0.00 - 5.00	0.6000	0.4910
T10	5	1.34 in Fiber	0.00 - 5.00	0.6000	0.4910
T10	6	0.65 DC	0.00 - 5.00	0.6000	0.4910
T10	7	LDF7-50A (1-5/8 FOAM)	0.00 - 5.00	0.6000	0.4910
T10	8	1-3/8 in Hybrid	0.00 - 5.00	0.6000	0.4910

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 lb
Low Profile Platform	A	None		0.0000	180.00	No Ice	26.30	26.30	1950.00
(Sprint)						1/2" Ice	35.60	35.60	2340.00
						1" Ice	44.90	44.90	2730.00
RFS	A	From Leg	3.00	0.0000	150.00	No Ice	3.62	2.01	18.70
APXV18-206516S-C-A20			0.00			1/2" Ice	4.29	2.72	63.10
(T-Mobile)			0.00			1" Ice	4.97	3.38	125.50
RFS	B	From Leg	3.00	0.0000	150.00	No Ice	3.62	2.01	18.70
APXV18-206516S-C-A20			0.00			1/2" Ice	4.29	2.72	63.10
(T-Mobile)			0.00			1" Ice	4.97	3.38	125.50
RFS	C	From Leg	3.00	0.0000	150.00	No Ice	3.62	2.01	18.70
APXV18-206516S-C-A20			0.00			1/2" Ice	4.29	2.72	63.10
(T-Mobile)			0.00			1" Ice	4.97	3.38	125.50
RFS	A	From Leg	3.00	0.0000	150.00	No Ice	20.27	8.90	153.30
APXVAARR24_43-U-NA20			0.00			1/2" Ice	20.88	9.54	266.00
(T-Mobile)			0.00			1" Ice	21.50	10.16	387.20
RFS	B	From Leg	3.00	0.0000	150.00	No Ice	20.27	8.90	153.30
APXVAARR24_43-U-NA20			0.00			1/2" Ice	20.88	9.54	266.00
(T-Mobile)			0.00			1" Ice	21.50	10.16	387.20
RFS	C	From Leg	3.00	0.0000	150.00	No Ice	20.27	8.90	153.30
APXVAARR24_43-U-NA20			0.00			1/2" Ice	20.88	9.54	266.00
(T-Mobile)			0.00			1" Ice	21.50	10.16	387.20
TMA	A	From Leg	3.00	0.0000	150.00	No Ice	2.06	0.50	22.00
(T-Mobile)			0.00			1/2" Ice	2.39	0.72	49.80
			0.00			1" Ice	2.75	0.97	88.20
TMA	B	From Leg	3.00	0.0000	150.00	No Ice	2.06	0.50	22.00
(T-Mobile)			0.00			1/2" Ice	2.39	0.72	49.80
			0.00			1" Ice	2.75	0.97	88.20
TMA	C	From Leg	3.00	0.0000	150.00	No Ice	2.06	0.50	22.00
(T-Mobile)			0.00			1/2" Ice	2.39	0.72	49.80
			0.00			1" Ice	2.75	0.97	88.20
RFS APXV9ERR18-C-A20	A	From Leg	3.00	0.0000	180.00	No Ice	8.02	5.81	62.00
(Sprint)			0.00			1/2" Ice	8.48	6.27	114.00
			0.00			1" Ice	8.93	6.73	172.10
RFS APXV9ERR18-C-A20	B	From Leg	3.00	0.0000	180.00	No Ice	8.02	5.81	62.00

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 lb
(Sprint)			0.00				1/2" Ice	8.48	6.27	114.00
			0.00				1" Ice	8.93	6.73	172.10
RFS APXV9ERR18-C-A20	C	From Leg	3.00	0.0000	180.00		No Ice	8.02	5.81	62.00
(Sprint)			0.00				1/2" Ice	8.48	6.27	114.00
			0.00				1" Ice	8.93	6.73	172.10
Commscope DT465B-2XR	A	From Leg	3.00	0.0000	180.00		No Ice	9.22	5.87	50.00
(Sprint)			0.00				1/2" Ice	9.68	6.33	108.00
			0.00				1" Ice	10.14	6.79	172.40
Commscope DT465B-2XR	A	From Leg	3.00	0.0000	180.00		No Ice	9.22	5.87	50.00
(Sprint)			0.00				1/2" Ice	9.68	6.33	108.00
			0.00				1" Ice	10.14	6.79	172.40
Commscope DT465B-2XR	B	From Leg	3.00	0.0000	180.00		No Ice	9.22	5.87	50.00
(Sprint)			0.00				1/2" Ice	9.68	6.33	108.00
			0.00				1" Ice	10.14	6.79	172.40
Alcatel Lucent 4x45W	A	From Leg	3.00	0.0000	180.00		No Ice	2.54	1.61	51.00
(Sprint)			0.00				1/2" Ice	2.72	1.78	71.10
			0.00				1" Ice	2.92	1.96	94.30
Alcatel Lucent 4x45W	B	From Leg	3.00	0.0000	180.00		No Ice	2.54	1.61	51.00
(Sprint)			0.00				1/2" Ice	2.72	1.78	71.10
			0.00				1" Ice	2.92	1.96	94.30
Alcatel Lucent 4x45W	C	From Leg	3.00	0.0000	180.00		No Ice	2.54	1.61	51.00
(Sprint)			0.00				1/2" Ice	2.72	1.78	71.10
			0.00				1" Ice	2.92	1.96	94.30
Alcatel Lucent 8x200-25	A	From Leg	3.00	0.0000	180.00		No Ice	4.05	1.53	70.00
(Sprint)			0.00				1/2" Ice	4.27	1.70	97.10
			0.00				1" Ice	4.50	1.88	127.80
Alcatel Lucent 8x200-25	B	From Leg	3.00	0.0000	180.00		No Ice	4.05	1.53	70.00
(Sprint)			0.00				1/2" Ice	4.27	1.70	97.10
			0.00				1" Ice	4.50	1.88	127.80
Alcatel Lucent 8x200-25	C	From Leg	3.00	0.0000	180.00		No Ice	4.05	1.53	70.00
(Sprint)			0.00				1/2" Ice	4.27	1.70	97.10
			0.00				1" Ice	4.50	1.88	127.80
(2) Alcatel Lucent 2x50	A	From Leg	3.00	0.0000	180.00		No Ice	2.27	1.35	42.00
(Sprint)			0.00				1/2" Ice	2.45	1.51	59.30
			0.00				1" Ice	2.64	1.68	79.60
(2) Alcatel Lucent 2x50	B	From Leg	3.00	0.0000	180.00		No Ice	2.27	1.35	42.00
(Sprint)			0.00				1/2" Ice	2.45	1.51	59.30
			0.00				1" Ice	2.64	1.68	79.60
(2) Alcatel Lucent 2x50	C	From Leg	3.00	0.0000	180.00		No Ice	2.27	1.35	42.00
(Sprint)			0.00				1/2" Ice	2.45	1.51	59.30
			0.00				1" Ice	2.64	1.68	79.60
12 ft Boom / Sector Mount	A	From Leg	0.00	0.0000	170.00		No Ice	17.50	8.50	450.00
(AT&T)			0.00				1/2" Ice	22.50	11.00	700.00
			0.00				1" Ice	28.00	14.00	900.00
12 ft Boom / Sector Mount	B	From Leg	0.00	0.0000	170.00		No Ice	17.50	8.50	450.00
(AT&T)			0.00				1/2" Ice	22.50	11.00	700.00
			0.00				1" Ice	28.00	14.00	900.00
12 ft Boom / Sector Mount	C	From Leg	0.00	0.0000	170.00		No Ice	17.50	8.50	450.00
(AT&T)			0.00				1/2" Ice	22.50	11.00	700.00
			0.00				1" Ice	28.00	14.00	900.00
Powerwave 7770.00	A	From Leg	3.00	0.0000	170.00		No Ice	5.51	2.93	35.00
(AT&T)			0.00				1/2" Ice	5.86	3.29	67.60
			0.00				1" Ice	6.21	3.64	105.10
Powerwave 7770.00	B	From Leg	3.00	0.0000	170.00		No Ice	5.51	2.93	35.00
(AT&T)			0.00				1/2" Ice	5.86	3.29	67.60
			0.00				1" Ice	6.21	3.64	105.10
Powerwave 7770.00	C	From Leg	3.00	0.0000	170.00		No Ice	5.51	2.93	35.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			0.00				1/2" Ice	5.86	3.29	67.60
			0.00				1" Ice	6.21	3.64	105.10
(2) Powerwave LGP21401	A	From Leg	3.00		0.0000	170.00	No Ice	1.67	0.47	31.00
(AT&T)			0.00				1/2" Ice	1.81	0.57	42.00
			0.00				1" Ice	1.96	0.67	55.30
(2) Powerwave LGP21401	B	From Leg	3.00		0.0000	170.00	No Ice	1.67	0.47	31.00
(AT&T)			0.00				1/2" Ice	1.81	0.57	42.00
			0.00				1" Ice	1.96	0.67	55.30
(2) Powerwave LGP21401	C	From Leg	3.00		0.0000	170.00	No Ice	1.67	0.47	31.00
(AT&T)			0.00				1/2" Ice	1.81	0.57	42.00
			0.00				1" Ice	1.96	0.67	55.30
(2) Kathrein 800 10966	A	From Leg	3.00		0.0000	170.00	No Ice	17.36	4.39	125.70
(AT&T)			0.00				1/2" Ice	17.97	5.05	217.90
			0.00				1" Ice	18.58	5.68	318.20
(2) Kathrein 800 10966	B	From Leg	3.00		0.0000	170.00	No Ice	17.36	4.39	125.70
(AT&T)			0.00				1/2" Ice	17.97	5.05	217.90
			0.00				1" Ice	18.58	5.68	318.20
(2) Kathrein 800 10966	C	From Leg	3.00		0.0000	170.00	No Ice	17.36	4.39	125.70
(AT&T)			0.00				1/2" Ice	17.97	5.05	217.90
			0.00				1" Ice	18.58	5.68	318.20
Ericsson RRUS 4478 B14	A	From Leg	3.00		0.0000	170.00	No Ice	2.02	1.25	55.00
(AT&T)			0.00				1/2" Ice	2.18	1.38	72.60
			0.00				1" Ice	2.35	1.52	93.00
Ericsson RRUS 4478 B14	B	From Leg	3.00		0.0000	170.00	No Ice	2.02	1.25	55.00
(AT&T)			0.00				1/2" Ice	2.18	1.38	72.60
			0.00				1" Ice	2.35	1.52	93.00
Ericsson RRUS 4478 B14	C	From Leg	3.00		0.0000	170.00	No Ice	2.02	1.25	55.00
(AT&T)			0.00				1/2" Ice	2.18	1.38	72.60
			0.00				1" Ice	2.35	1.52	93.00
Ericsson 4449 B5/B12	A	From Leg	3.00		0.0000	170.00	No Ice	1.65	1.30	20.00
(AT&T)			0.00				1/2" Ice	1.79	1.43	37.20
			0.00				1" Ice	1.94	1.57	57.10
Ericsson 4449 B5/B12	B	From Leg	3.00		0.0000	170.00	No Ice	1.65	1.30	20.00
(AT&T)			0.00				1/2" Ice	1.79	1.43	37.20
			0.00				1" Ice	1.94	1.57	57.10
Ericsson 4449 B5/B12	C	From Leg	3.00		0.0000	170.00	No Ice	1.65	1.30	20.00
(AT&T)			0.00				1/2" Ice	1.79	1.43	37.20
			0.00				1" Ice	1.94	1.57	57.10
Ericsson RRUS 8843	A	From Leg	3.00		0.0000	170.00	No Ice	1.64	1.35	20.00
(AT&T)			0.00				1/2" Ice	1.78	1.48	37.60
			0.00				1" Ice	1.93	1.62	57.90
Ericsson RRUS 8843	B	From Leg	3.00		0.0000	170.00	No Ice	1.64	1.35	20.00
(AT&T)			0.00				1/2" Ice	1.78	1.48	37.60
			0.00				1" Ice	1.93	1.62	57.90
Ericsson RRUS 8843	C	From Leg	3.00		0.0000	170.00	No Ice	1.64	1.35	20.00
(AT&T)			0.00				1/2" Ice	1.78	1.48	37.60
			0.00				1" Ice	1.93	1.62	57.90
(2) Powerwave LGP21901	A	From Leg	3.00		0.0000	170.00	No Ice	0.23	0.11	10.00
(AT&T)			0.00				1/2" Ice	0.29	0.15	12.40
			0.00				1" Ice	0.35	0.20	15.90
(2) Powerwave LGP21901	B	From Leg	3.00		0.0000	170.00	No Ice	0.23	0.11	10.00
(AT&T)			0.00				1/2" Ice	0.29	0.15	12.40
			0.00				1" Ice	0.35	0.20	15.90
(2) Powerwave LGP21901	C	From Leg	3.00		0.0000	170.00	No Ice	0.23	0.11	10.00
(AT&T)			0.00				1/2" Ice	0.29	0.15	12.40
			0.00				1" Ice	0.35	0.20	15.90
Ericsson 4449 B71 B12	A	From Leg	3.00		0.0000	150.00	No Ice	1.64	0.67	50.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(T-Mobile)			0.00			1/2" Ice	1.78	0.80	66.10
			0.00			1" Ice	1.93	0.93	84.80
Ericsson 4449 B71 B12	B	From Leg	3.00	0.0000	150.00	No Ice	1.64	0.67	50.00
(T-Mobile)			0.00			1/2" Ice	1.78	0.80	66.10
			0.00			1" Ice	1.93	0.93	84.80
Ericsson 4449 B71 B12	C	From Leg	3.00	0.0000	150.00	No Ice	1.64	0.67	50.00
(T-Mobile)			0.00			1/2" Ice	1.78	0.80	66.10
			0.00			1" Ice	1.93	0.93	84.80

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	170.00	1.15	25	74.792	A	3.192	12.348	9.583	61.67	38.920	0.000
180.00-160.00					B	3.192	12.348		61.67	0.750	0.000
					C	3.192	12.348		61.67	0.000	0.000
T2	150.00	1.11	24	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
160.00-140.00					B	2.853	12.348		63.05	26.090	0.000
					C	2.853	12.348		63.05	0.000	0.000
T3	130.00	1.065	23	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
140.00-120.00					B	2.853	12.348		63.05	51.430	0.000
					C	2.853	12.348		63.05	0.000	0.000
T4	110.00	1.016	22	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
120.00-100.00					B	2.853	12.348		63.05	51.430	0.000
					C	2.853	12.348		63.05	0.000	0.000
T5	90.00	0.959	20	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
100.00-80.00					B	2.853	12.348		63.05	51.430	0.000
					C	2.853	12.348		63.05	0.000	0.000
T6 80.00-60.00	70.00	0.892	19	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	51.430	0.000
					C	2.853	12.348		63.05	0.000	0.000
T7 60.00-40.00	50.00	0.811	17	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	51.430	0.000
					C	2.853	12.348		63.05	0.000	0.000
T8 40.00-20.00	30.00	0.701	15	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	51.430	0.000
					C	2.853	12.348		63.05	0.000	0.000
T9 20.00-5.00	12.50	0.7	15	56.094	A	2.038	9.126	7.188	64.38	49.080	0.000
					B	2.038	9.126		64.38	38.572	0.000
					C	2.038	9.126		64.38	0.000	0.000
T10 5.00-0.00	2.50	0.7	15	10.019	A	0.375	2.584	2.584	87.33	16.360	0.000
					B	0.375	2.584		87.33	12.858	0.000
					C	0.375	2.584		87.33	0.000	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.15	6	1.7672	80.682	A	3.192	46.484	21.365	43.01	77.751	0.000
180.00-160.00						B	3.192	46.484		43.01	7.819	0.000
						C	3.192	46.484		43.01	0.000	0.000
T2	150.00	1.11	6	1.7452	80.609	A	2.853	46.059	21.218	43.38	124.089	0.000
160.00-140.00						B	2.853	46.059		43.38	37.250	0.000
						C	2.853	46.059		43.38	0.000	0.000
T3	130.00	1.065	6	1.7204	80.526	A	2.853	45.580	21.053	43.47	123.429	0.000
140.00-120.00						B	2.853	45.580		43.47	66.408	0.000
						C	2.853	45.580		43.47	0.000	0.000
T4	110.00	1.016	6	1.6919	80.431	A	2.853	45.030	20.863	43.57	122.671	0.000
120.00-100.00						B	2.853	45.030		43.57	65.992	0.000
						C	2.853	45.030		43.57	0.000	0.000
T5 100.00-80.00	90.00	0.959	5	1.6583	80.319	A	2.853	44.380	20.639	43.70	121.779	0.000
						B	2.853	44.380		43.70	65.501	0.000
						C	2.853	44.380		43.70	0.000	0.000
T6 80.00-60.00	70.00	0.892	5	1.6171	80.182	A	2.853	43.585	20.364	43.85	120.687	0.000
						B	2.853	43.585		43.85	64.901	0.000
						C	2.853	43.585		43.85	0.000	0.000
T7 60.00-40.00	50.00	0.811	4	1.5636	80.004	A	2.853	42.552	20.008	44.07	119.270	0.000
						B	2.853	42.552		44.07	64.121	0.000
						C	2.853	42.552		44.07	0.000	0.000
T8 40.00-20.00	30.00	0.701	4	1.4858	79.744	A	2.853	41.048	19.488	44.39	117.212	0.000
						B	2.853	41.048		44.39	62.986	0.000
						C	2.853	41.048		44.39	0.000	0.000
T9 20.00-5.00	12.50	0.7	4	1.3612	59.497	A	2.038	28.074	13.994	46.47	85.449	0.000
						B	2.038	28.074		46.47	45.880	0.000
						C	2.038	28.074		46.47	0.000	0.000
T10 5.00-0.00	2.50	0.7	4	1.1589	11.042	A	0.375	5.246	4.667	83.03	27.159	0.000
						B	0.375	5.246		83.03	14.558	0.000
						C	0.375	5.246		83.03	0.000	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.15	9	74.792	A	3.192	12.348	9.583	61.67	38.920	0.000
180.00-160.00					B	3.192	12.348		61.67	0.750	0.000
					C	3.192	12.348		61.67	0.000	0.000
T2	150.00	1.11	9	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
160.00-140.00					B	2.853	12.348		63.05	26.090	0.000
					C	2.853	12.348		63.05	0.000	0.000
T3	130.00	1.065	8	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
140.00-120.00					B	2.853	12.348		63.05	51.430	0.000
					C	2.853	12.348		63.05	0.000	0.000
T4	110.00	1.016	8	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
120.00-100.00					B	2.853	12.348		63.05	51.430	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	2.853	12.348		63.05	0.000	0.000
T5	90.00	0.959	8	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
100.00-80.00					B	2.853	12.348		63.05	51.430	0.000
					C	2.853	12.348		63.05	0.000	0.000
T6 80.00-60.00	70.00	0.892	7	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	51.430	0.000
					C	2.853	12.348		63.05	0.000	0.000
T7 60.00-40.00	50.00	0.811	6	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	51.430	0.000
					C	2.853	12.348		63.05	0.000	0.000
T8 40.00-20.00	30.00	0.701	5	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	51.430	0.000
					C	2.853	12.348		63.05	0.000	0.000
T9 20.00-5.00	12.50	0.7	5	56.094	A	2.038	9.126	7.188	64.38	49.080	0.000
					B	2.038	9.126		64.38	38.572	0.000
					C	2.038	9.126		64.38	0.000	0.000
T10 5.00-0.00	2.50	0.7	5	10.019	A	0.375	2.584	2.584	87.33	16.360	0.000
					B	0.375	2.584		87.33	12.858	0.000
					C	0.375	2.584		87.33	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	25	1	1	10.303	1000.13	50.01	A
180.00-160.00		TA 214.38	B	0.208	2.57		1	1	10.303			
			C	0.208	2.57		1	1	10.303			
T2	342.00	658.24	A	0.203	2.585	24	1	1	9.953	1347.28	67.36	A
160.00-140.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T3	447.40	658.24	A	0.203	2.585	23	1	1	9.953	1412.11	70.61	A
140.00-120.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T4	447.40	658.24	A	0.203	2.585	22	1	1	9.953	1346.29	67.31	A
120.00-100.00		TA 214.38	B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T5	447.40	658.24	A	0.203	2.585	20	1	1	9.953	1271.28	63.56	A
100.00-80.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T6	447.40	658.24	A	0.203	2.585	19	1	1	9.953	1183.19	59.16	A
80.00-60.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T7	447.40	658.24	A	0.203	2.585	17	1	1	9.953	1074.74	53.74	A
60.00-40.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T8	447.40	658.24	A	0.203	2.585	15	1	1	9.953	928.79	46.44	A
40.00-20.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T9 20.00-5.00	335.55	480.27	A	0.199	2.599	15	1	1	7.279	691.20	46.08	A
			B	0.199	2.599		1	1	7.279			
			C	0.199	2.599		1	1	7.279			
T10 5.00-0.00	111.85	111.24	A	0.295	2.309	15	1	1	1.919	206.58	41.32	A
			B	0.295	2.309		1	1	1.919			
			C	0.295	2.309		1	1	1.919			
Sum Weight:	3620.70	6302.97								10461.59		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	25	0.8	1	9.665	965.91	48.30	B
180.00-160.00		TA 214.38	B	0.208	2.57		0.8	1	9.665			
			C	0.208	2.57		0.8	1	9.665			
T2	342.00	658.24	A	0.203	2.585	24	0.8	1	9.383	1317.61	65.88	B
160.00-140.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T3	447.40	658.24	A	0.203	2.585	23	0.8	1	9.383	1383.63	69.18	B
140.00-120.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T4	447.40	658.24	A	0.203	2.585	22	0.8	1	9.383	1319.14	65.96	B
120.00-100.00		TA 214.38	B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T5	447.40	658.24	A	0.203	2.585	20	0.8	1	9.383	1245.63	62.28	B
100.00-80.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T6	447.40	658.24	A	0.203	2.585	19	0.8	1	9.383	1159.33	57.97	B
80.00-60.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T7	447.40	658.24	A	0.203	2.585	17	0.8	1	9.383	1053.07	52.65	B
60.00-40.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T8	447.40	658.24	A	0.203	2.585	15	0.8	1	9.383	910.06	45.50	B
40.00-20.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T9 20.00-5.00	335.55	480.27	A	0.199	2.599	15	0.8	1	6.871	677.76	45.18	B
			B	0.199	2.599		0.8	1	6.871			
			C	0.199	2.599		0.8	1	6.871			
T10 5.00-0.00	111.85	111.24	A	0.295	2.309	15	0.8	1	1.844	204.38	40.88	B
			B	0.295	2.309		0.8	1	1.844			
			C	0.295	2.309		0.8	1	1.844			
Sum Weight:	3620.70	6302.97								10236.52		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	25	0.85	1	9.824	942.41	47.12	C
180.00-160.00		TA 214.38	B	0.208	2.57		0.85	1	9.824			
			C	0.208	2.57		0.85	1	9.824			
T2	342.00	658.24	A	0.203	2.585	24	0.85	1	9.526	1338.00	66.90	C
160.00-140.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T3	447.40	658.24	A	0.203	2.585	23	0.85	1	9.526	1475.03	73.75	C
140.00-120.00			B	0.203	2.585		0.85	1	9.526			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.203	2.585		0.85	1	9.526			
T4	447.40	658.24	A	0.203	2.585	22	0.85	1	9.526	1406.28	70.31	C
120.00-100.00		TA 214.38	B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T5	447.40	658.24	A	0.203	2.585	20	0.85	1	9.526	1327.92	66.40	C
100.00-80.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T6	447.40	658.24	A	0.203	2.585	19	0.85	1	9.526	1235.92	61.80	C
80.00-60.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T7	447.40	658.24	A	0.203	2.585	17	0.85	1	9.526	1122.63	56.13	C
60.00-40.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T8	447.40	658.24	A	0.203	2.585	15	0.85	1	9.526	970.18	48.51	C
40.00-20.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T9 20.00-5.00	335.55	480.27	A	0.199	2.599	15	0.85	1	6.973	722.66	48.18	C
			B	0.199	2.599		0.85	1	6.973			
			C	0.199	2.599		0.85	1	6.973			
T10 5.00-0.00	111.85	111.24	A	0.295	2.309	15	0.85	1	1.862	218.78	43.76	C
			B	0.295	2.309		0.85	1	1.862			
			C	0.295	2.309		0.85	1	1.862			
Sum Weight:	3620.70	6302.97								10759.82		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1162.81	2816.31	A	0.616	1.795	6	1	1	38.232	530.18	26.51	A
180.00-160.00		TA 769.52	B	0.616	1.795		1	1	38.232			
			C	0.616	1.795		1	1	38.232			
T2	2371.77	2719.08	A	0.607	1.8	6	1	1	37.308	633.69	31.68	A
160.00-140.00			B	0.607	1.8		1	1	37.308			
			C	0.607	1.8		1	1	37.308			
T3	2895.27	2673.93	A	0.601	1.803	6	1	1	36.795	641.86	32.09	A
140.00-120.00			B	0.601	1.803		1	1	36.795			
			C	0.601	1.803		1	1	36.795			
T4	2853.39	2622.61	A	0.595	1.807	6	1	1	36.211	610.31	30.52	A
120.00-100.00		TA 738.18	B	0.595	1.807		1	1	36.211			
			C	0.595	1.807		1	1	36.211			
T5	2804.36	2562.85	A	0.588	1.812	5	1	1	35.529	574.51	28.73	A
100.00-80.00			B	0.588	1.812		1	1	35.529			
			C	0.588	1.812		1	1	35.529			
T6	2744.85	2490.82	A	0.579	1.818	5	1	1	34.703	532.69	26.63	A
80.00-60.00			B	0.579	1.818		1	1	34.703			
			C	0.579	1.818		1	1	34.703			
T7	2668.35	2399.07	A	0.568	1.828	4	1	1	33.646	481.52	24.08	A
60.00-40.00			B	0.568	1.828		1	1	33.646			
			C	0.568	1.828		1	1	33.646			
T8	2558.77	2269.35	A	0.551	1.843	4	1	1	32.141	413.23	20.66	A
40.00-20.00			B	0.551	1.843		1	1	32.141			
			C	0.551	1.843		1	1	32.141			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T9 20.00-5.00	1790.86	1497.28	A	0.506	1.892	4	1	1	21.362	307.67	20.51	A
			B	0.506	1.892		1	1	21.362			
			C	0.506	1.892		1	1	21.362			
T10 5.00-0.00	530.34	248.75	A	0.509	1.889	4	1	1	3.994	75.06*	15.01	B
			B	0.509	1.889		1	1	3.994			
			C	0.509	1.889		1	1	3.994			
Sum Weight:	22380.78	23807.75			*2.1A_g limit					4800.72		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1162.81	2816.31	A	0.616	1.795	6	0.8	1	37.593	524.09	26.20	B
180.00-160.00		TA 769.52	B	0.616	1.795		0.8	1	37.593			
			C	0.616	1.795		0.8	1	37.593			
T2	2371.77	2719.08	A	0.607	1.8	6	0.8	1	36.738	628.42	31.42	B
160.00-140.00			B	0.607	1.8		0.8	1	36.738			
			C	0.607	1.8		0.8	1	36.738			
T3	2895.27	2673.93	A	0.601	1.803	6	0.8	1	36.225	636.80	31.84	B
140.00-120.00			B	0.601	1.803		0.8	1	36.225			
			C	0.601	1.803		0.8	1	36.225			
T4	2853.39	2622.61	A	0.595	1.807	6	0.8	1	35.641	605.47	30.27	B
120.00-100.00		TA 738.18	B	0.595	1.807		0.8	1	35.641			
			C	0.595	1.807		0.8	1	35.641			
T5	2804.36	2562.85	A	0.588	1.812	5	0.8	1	34.958	569.93	28.50	B
100.00-80.00			B	0.588	1.812		0.8	1	34.958			
			C	0.588	1.812		0.8	1	34.958			
T6	2744.85	2490.82	A	0.579	1.818	5	0.8	1	34.133	528.40	26.42	B
80.00-60.00			B	0.579	1.818		0.8	1	34.133			
			C	0.579	1.818		0.8	1	34.133			
T7	2668.35	2399.07	A	0.568	1.828	4	0.8	1	33.076	477.61	23.88	B
60.00-40.00			B	0.568	1.828		0.8	1	33.076			
			C	0.568	1.828		0.8	1	33.076			
T8	2558.77	2269.35	A	0.551	1.843	4	0.8	1	31.571	409.82	20.49	B
40.00-20.00			B	0.551	1.843		0.8	1	31.571			
			C	0.551	1.843		0.8	1	31.571			
T9 20.00-5.00	1790.86	1497.28	A	0.506	1.892	4	0.8	1	20.954	305.17	20.34	B
			B	0.506	1.892		0.8	1	20.954			
			C	0.506	1.892		0.8	1	20.954			
T10 5.00-0.00	530.34	248.75	A	0.509	1.889	4	0.8	1	3.919	75.06*	15.01	C
			B	0.509	1.889		0.8	1	3.919			
			C	0.509	1.889		0.8	1	3.919			
Sum Weight:	22380.78	23807.75			*2.1A_g limit					4760.77		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1162.81	2816.31	A	0.616	1.795	6	0.85	1	37.753	512.52	25.63	C
180.00-160.00		TA 769.52	B	0.616	1.795		0.85	1	37.753			
			C	0.616	1.795		0.85	1	37.753			
T2	2371.77	2719.08	A	0.607	1.8	6	0.85	1	36.880	624.15	31.21	C
160.00-140.00			B	0.607	1.8		0.85	1	36.880			
			C	0.607	1.8		0.85	1	36.880			
T3	2895.27	2673.93	A	0.601	1.803	6	0.85	1	36.368	644.80	32.24	C
140.00-120.00			B	0.601	1.803		0.85	1	36.368			
			C	0.601	1.803		0.85	1	36.368			
T4	2853.39	2622.61	A	0.595	1.807	6	0.85	1	35.783	613.20	30.66	C
120.00-100.00		TA 738.18	B	0.595	1.807		0.85	1	35.783			
			C	0.595	1.807		0.85	1	35.783			
T5	2804.36	2562.85	A	0.588	1.812	5	0.85	1	35.101	577.34	28.87	C
100.00-80.00			B	0.588	1.812		0.85	1	35.101			
			C	0.588	1.812		0.85	1	35.101			
T6	2744.85	2490.82	A	0.579	1.818	5	0.85	1	34.275	535.43	26.77	C
80.00-60.00			B	0.579	1.818		0.85	1	34.275			
			C	0.579	1.818		0.85	1	34.275			
T7	2668.35	2399.07	A	0.568	1.828	4	0.85	1	33.218	484.15	24.21	C
60.00-40.00			B	0.568	1.828		0.85	1	33.218			
			C	0.568	1.828		0.85	1	33.218			
T8	2558.77	2269.35	A	0.551	1.843	4	0.85	1	31.713	415.67	20.78	C
40.00-20.00			B	0.551	1.843		0.85	1	31.713			
			C	0.551	1.843		0.85	1	31.713			
T9 20.00-5.00	1790.86	1497.28	A	0.506	1.892	4	0.85	1	21.056	309.91	20.66	C
			B	0.506	1.892		0.85	1	21.056			
			C	0.506	1.892		0.85	1	21.056			
T10 5.00-0.00	530.34	248.75	A	0.509	1.889	4	0.85	1	3.938	75.06*	15.01	C
			B	0.509	1.889		0.85	1	3.938			
			C	0.509	1.889		0.85	1	3.938			
Sum Weight:	22380.78	23807.75			*2.1A_g limit					4792.23		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	9	1	1	10.303	367.36	18.37	A
180.00-160.00		TA 214.38	B	0.208	2.57		1	1	10.303			
			C	0.208	2.57		1	1	10.303			
T2	342.00	658.24	A	0.203	2.585	9	1	1	9.953	494.87	24.74	A
160.00-140.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T3	447.40	658.24	A	0.203	2.585	8	1	1	9.953	518.68	25.93	A
140.00-120.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T4	447.40	658.24	A	0.203	2.585	8	1	1	9.953	494.51	24.73	A
120.00-100.00		TA 214.38	B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T5	447.40	658.24	A	0.203	2.585	8	1	1	9.953	466.95	23.35	A
100.00-80.00			B	0.203	2.585		1	1	9.953			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.203	2.585		1	1	9.953			
T6	447.40	658.24	A	0.203	2.585	7	1	1	9.953	434.60	21.73	A
80.00-60.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T7	447.40	658.24	A	0.203	2.585	6	1	1	9.953	394.76	19.74	A
60.00-40.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T8	447.40	658.24	A	0.203	2.585	5	1	1	9.953	341.15	17.06	A
40.00-20.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T9 20.00-5.00	335.55	480.27	A	0.199	2.599	5	1	1	7.279	253.88	16.93	A
			B	0.199	2.599		1	1	7.279			
			C	0.199	2.599		1	1	7.279			
T10 5.00-0.00	111.85	111.24	A	0.295	2.309	5	1	1	1.919	75.88	15.18	A
			B	0.295	2.309		1	1	1.919			
			C	0.295	2.309		1	1	1.919			
Sum Weight:	3620.70	6302.97								3842.64		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	9	0.8	1	9.665	354.79	17.74	B
180.00-160.00		TA 214.38	B	0.208	2.57		0.8	1	9.665			
			C	0.208	2.57		0.8	1	9.665			
T2	342.00	658.24	A	0.203	2.585	9	0.8	1	9.383	483.97	24.20	B
160.00-140.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T3	447.40	658.24	A	0.203	2.585	8	0.8	1	9.383	508.22	25.41	B
140.00-120.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T4	447.40	658.24	A	0.203	2.585	8	0.8	1	9.383	484.53	24.23	B
120.00-100.00		TA 214.38	B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T5	447.40	658.24	A	0.203	2.585	8	0.8	1	9.383	457.53	22.88	B
100.00-80.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T6	447.40	658.24	A	0.203	2.585	7	0.8	1	9.383	425.83	21.29	B
80.00-60.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T7	447.40	658.24	A	0.203	2.585	6	0.8	1	9.383	386.80	19.34	B
60.00-40.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T8	447.40	658.24	A	0.203	2.585	5	0.8	1	9.383	334.27	16.71	B
40.00-20.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T9 20.00-5.00	335.55	480.27	A	0.199	2.599	5	0.8	1	6.871	248.95	16.60	B
			B	0.199	2.599		0.8	1	6.871			
			C	0.199	2.599		0.8	1	6.871			
T10 5.00-0.00	111.85	111.24	A	0.295	2.309	5	0.8	1	1.844	75.07	15.01	B
			B	0.295	2.309		0.8	1	1.844			
			C	0.295	2.309		0.8	1	1.844			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
Sum Weight:	3620.70	6302.97								3759.97		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	9	0.85	1	9.824	346.16	17.31	C
180.00-160.00		TA 214.38	B	0.208	2.57		0.85	1	9.824			
			C	0.208	2.57		0.85	1	9.824			
T2	342.00	658.24	A	0.203	2.585	9	0.85	1	9.526	491.46	24.57	C
160.00-140.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T3	447.40	658.24	A	0.203	2.585	8	0.85	1	9.526	541.79	27.09	C
140.00-120.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T4	447.40	658.24	A	0.203	2.585	8	0.85	1	9.526	516.54	25.83	C
120.00-100.00		TA 214.38	B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T5	447.40	658.24	A	0.203	2.585	8	0.85	1	9.526	487.76	24.39	C
100.00-80.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T6	447.40	658.24	A	0.203	2.585	7	0.85	1	9.526	453.96	22.70	C
80.00-60.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T7	447.40	658.24	A	0.203	2.585	6	0.85	1	9.526	412.35	20.62	C
60.00-40.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T8	447.40	658.24	A	0.203	2.585	5	0.85	1	9.526	356.36	17.82	C
40.00-20.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T9 20.00-5.00	335.55	480.27	A	0.199	2.599	5	0.85	1	6.973	265.44	17.70	C
			B	0.199	2.599		0.85	1	6.973			
			C	0.199	2.599		0.85	1	6.973			
T10 5.00-0.00	111.85	111.24	A	0.295	2.309	5	0.85	1	1.862	80.36	16.07	C
			B	0.295	2.309		0.85	1	1.862			
			C	0.295	2.309		0.85	1	1.862			
Sum Weight:	3620.70	6302.97								3952.18		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	3138.04			
Bracing Weight	3164.93			
Total Member Self-Weight	6302.97			

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Guy Weight	2100.38			
Total Weight	18397.26			
Wind 0 deg - No Ice		-20.53	-14245.98	-1860.56
Wind 30 deg - No Ice		7038.42	-12281.15	-1190.90
Wind 60 deg - No Ice		13236.02	-7670.22	-2669.08
Wind 90 deg - No Ice		16200.63	20.53	-2951.31
Wind 120 deg - No Ice		13782.15	8009.23	-46.36
Wind 150 deg - No Ice		7440.55	12936.59	2217.10
Wind 180 deg - No Ice		20.53	14020.90	1860.56
Wind 210 deg - No Ice		-7038.42	12281.15	1190.90
Wind 240 deg - No Ice		-13430.94	7782.75	2669.08
Wind 270 deg - No Ice		-16200.63	-20.53	2951.31
Wind 300 deg - No Ice		-13587.23	-7896.69	46.36
Wind 330 deg - No Ice		-7440.55	-12936.59	-2217.10
Member Ice	17504.78			
Guy Ice	12178.48			
Total Weight Ice	88007.46			
Wind 0 deg - Ice		-6.30	-7069.19	-862.82
Wind 30 deg - Ice		3514.49	-6112.48	-787.18
Wind 60 deg - Ice		6275.08	-3630.20	-940.02
Wind 90 deg - Ice		7452.95	6.30	-816.47
Wind 120 deg - Ice		6464.94	3747.09	-37.43
Wind 150 deg - Ice		3613.05	6270.60	730.33
Wind 180 deg - Ice		6.30	7028.78	862.82
Wind 210 deg - Ice		-3514.49	6112.48	787.18
Wind 240 deg - Ice		-6309.68	3650.17	939.81
Wind 270 deg - Ice		-7452.95	-6.30	816.47
Wind 300 deg - Ice		-6430.34	-3727.11	37.46
Wind 330 deg - Ice		-3613.05	-6270.60	-730.33
Total Weight	18397.26			
Wind 0 deg - Service		-7.54	-5232.68	-683.40
Wind 30 deg - Service		2585.28	-4510.98	-437.43
Wind 60 deg - Service		4861.72	-2817.34	-980.38
Wind 90 deg - Service		5950.65	7.54	-1084.04
Wind 120 deg - Service		5062.31	2941.87	-17.03
Wind 150 deg - Service		2732.98	4751.73	814.36
Wind 180 deg - Service		7.54	5150.01	683.40
Wind 210 deg - Service		-2585.28	4510.98	437.43
Wind 240 deg - Service		-4933.31	2858.68	980.38
Wind 270 deg - Service		-5950.65	-7.54	1084.04
Wind 300 deg - Service		-4990.72	-2900.53	17.03
Wind 330 deg - Service		-2732.98	-4751.73	-814.36

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 Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	15	155447.56	-31.59	398.99
	Max. H_x	11	79121.27	1987.36	-17.56
	Max. H_z	2	78517.56	-1.85	1599.20
	Max. M_x	1	0.00	-2.82	-7.82
	Max. M_z	1	0.00	-2.82	-7.82
	Max. Torsion	1	0.00	-2.82	-7.82
	Min. Vert	1	72296.75	-2.82	-7.82
	Min. H_x	5	79155.26	-1994.23	-18.84
	Min. H_z	8	78825.85	-3.25	-1551.94
	Min. M_x	1	0.00	-2.82	-7.82
	Min. M_z	1	0.00	-2.82	-7.82
	Min. Torsion	1	0.00	-2.82	-7.82
Guy C @ 145 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-4738.70	-5367.82	3090.95
	Max. H_x	10	-4738.70	-5367.82	3090.95
	Max. H_z	4	-33089.36	-33678.48	19458.35
	Min. Vert	4	-33089.36	-33678.48	19458.35
	Min. H_x	4	-33089.36	-33678.48	19458.35
	Min. H_z	10	-4738.70	-5367.82	3090.95
Guy B @ 145 ft Elev 0 ft	Max. Vert	6	-4479.35	5129.64	2962.36

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Azimuth 120 deg					
	Max. H_x	12	-33577.73	34094.75	19685.17
	Max. H_z	12	-33577.73	34094.75	19685.17
	Min. Vert	12	-33577.73	34094.75	19685.17
	Min. H_x	6	-4479.35	5129.64	2962.36
	Min. H_z	6	-4479.35	5129.64	2962.36
Guy A @ 145 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-5455.84	-5.59	-7349.38
	Max. H_x	11	-19091.13	748.11	-22713.55
	Max. H_z	2	-5455.84	-5.59	-7349.38
	Min. Vert	8	-32333.87	8.17	-37679.11
	Min. H_x	5	-19161.98	-748.30	-22770.40
	Min. H_z	8	-32333.87	8.17	-37679.11

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	72296.75	2.82	7.82	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	78517.56	1.85	-1599.20	0.00	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	78683.85	802.12	-1398.60	0.00	0.00	0.00
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	78926.03	1586.27	-907.23	0.00	0.00	0.00
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	79155.26	1994.23	18.84	0.00	0.00	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	79003.09	1670.45	973.45	0.00	0.00	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	79050.54	861.40	1479.22	0.00	0.00	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	78825.85	3.25	1551.94	0.00	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	78609.92	-814.11	1406.48	0.00	0.00	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	78482.82	-1644.39	960.11	0.00	0.00	0.00
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	79121.27	-1987.36	17.56	0.00	0.00	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	79068.06	-1600.20	-918.24	0.00	0.00	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	79106.26	-839.32	-1469.22	0.00	0.00	0.00
1.2 Dead+1.0 Ice+1.0 Temp+Guy	154263.65	31.79	37.79	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	155447.56	31.59	-398.99	0.00	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	155060.14	235.14	-342.71	0.00	0.00	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	154719.23	415.51	-184.96	0.00	0.00	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	155068.82	502.40	50.33	0.00	0.00	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	155445.42	444.88	275.78	0.00	0.00	0.00

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	155059.65	265.90	415.89	0.00	0.00	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	154705.60	32.15	450.17	0.00	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	155052.11	-194.39	403.17	0.00	0.00	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	155443.08	-370.89	269.60	0.00	0.00	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	155076.55	-438.31	49.78	0.00	0.00	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	154739.22	-361.56	-190.81	0.00	0.00	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	155075.73	-178.99	-355.14	0.00	0.00	0.00
Dead+Wind 0 deg - Service+Guy	72418.81	2.64	-360.08	0.00	0.00	0.00
Dead+Wind 30 deg - Service+Guy	72382.13	188.64	-316.10	0.00	0.00	0.00
Dead+Wind 60 deg - Service+Guy	72347.74	371.42	-205.23	0.00	0.00	0.00
Dead+Wind 90 deg - Service+Guy	72381.32	462.64	8.68	0.00	0.00	0.00
Dead+Wind 120 deg - Service+Guy	72416.86	384.06	228.30	0.00	0.00	0.00
Dead+Wind 150 deg - Service+Guy	72381.71	199.68	347.71	0.00	0.00	0.00
Dead+Wind 180 deg - Service+Guy	72347.41	2.99	366.61	0.00	0.00	0.00
Dead+Wind 210 deg - Service+Guy	72382.51	-184.17	331.01	0.00	0.00	0.00
Dead+Wind 240 deg - Service+Guy	72418.13	-373.72	225.39	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	72381.40	-456.95	8.35	0.00	0.00	0.00
Dead+Wind 300 deg - Service+Guy	72347.80	-370.42	-208.06	0.00	0.00	0.00
Dead+Wind 330 deg - Service+Guy	72381.43	-192.83	-332.76	0.00	0.00	0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-18396.80	0.00	-0.40	18396.80	-2.27	0.013%
2	-32.85	-21830.35	-25487.44	32.94	21827.73	25429.59	0.173%
3	12605.03	-21656.17	-21976.94	-12595.78	21654.03	21907.77	0.209%
4	23510.61	-21481.99	-13619.29	-23379.06	21479.76	13543.05	0.439%
5	28608.13	-21656.17	32.85	-28541.32	21653.77	-1.87	0.205%
6	24384.41	-21830.35	14161.71	-24332.45	21827.47	-14131.72	0.168%
7	13248.44	-21656.17	23025.66	-13193.14	21653.85	-22987.18	0.197%
8	32.85	-21481.99	25127.32	-30.93	21479.88	-24992.20	0.409%
9	-12605.03	-21656.17	21976.94	12539.41	21653.73	-21923.48	0.254%
10	-23822.48	-21830.35	13799.35	23772.30	21827.87	-13770.25	0.165%
11	-28608.13	-21656.17	-32.85	28524.24	21653.28	69.85	0.256%
12	-24072.54	-21481.99	-13981.65	23938.29	21479.55	13900.91	0.446%
13	-13248.44	-21656.17	-23025.66	13242.81	21653.71	22956.17	0.204%
14	0.00	-91263.74	0.00	-7.88	91263.73	-12.93	0.017%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
15	-6.30	-91441.96	-9811.99	6.34	91441.67	9739.17	0.079%
16	4882.43	-91263.74	-8481.83	-4845.00	91263.42	8422.68	0.076%
17	8650.42	-91085.51	-5001.60	-8586.94	91085.12	4964.51	0.080%
18	10188.84	-91263.74	6.30	-10113.16	91263.41	-8.34	0.082%
19	8840.28	-91441.96	5118.49	-8771.17	91441.68	-5078.34	0.087%
20	4981.00	-91263.74	8639.95	-4947.54	91263.43	-8576.06	0.079%
21	6.30	-91085.51	9771.58	-6.47	91085.15	-9700.99	0.077%
22	-4882.43	-91263.74	8481.83	4850.30	91263.45	-8419.61	0.076%
23	-8685.02	-91441.96	5021.57	8618.26	91441.69	-4982.75	0.084%
24	-10188.84	-91263.74	-6.30	10112.94	91263.40	4.45	0.083%
25	-8805.68	-91085.51	-5098.51	8740.53	91085.08	5060.61	0.082%
26	-4981.00	-91263.74	-8639.95	4942.87	91263.39	8578.48	0.079%
27	-7.54	-18436.79	-5851.11	7.52	18436.76	5802.36	0.252%
28	2893.72	-18396.80	-5045.21	-2868.20	18396.76	5002.84	0.256%
29	5397.29	-18356.81	-3126.56	-5360.15	18356.76	3105.09	0.221%
30	6567.52	-18396.80	7.54	-6522.32	18396.76	-8.21	0.231%
31	5597.89	-18436.79	3251.08	-5560.19	18436.76	-3229.28	0.223%
32	3041.42	-18396.80	5285.96	-3016.26	18396.76	-5240.41	0.269%
33	7.54	-18356.81	5768.44	-7.51	18356.76	-5719.27	0.256%
34	-2893.72	-18396.80	5045.21	2869.89	18396.76	-5001.89	0.256%
35	-5468.89	-18436.79	3167.89	5431.92	18436.76	-3146.53	0.219%
36	-6567.52	-18396.80	-7.54	6522.31	18396.76	6.84	0.231%
37	-5526.29	-18356.81	-3209.74	5488.42	18356.76	3187.83	0.225%
38	-3041.42	-18396.80	-5285.96	3014.59	18396.76	5241.33	0.269%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	50	0.00000001	0.00001445
2	Yes	77	0.00136108	0.00048717
3	Yes	74	0.00128703	0.00041671
4	Yes	69	0.00140368	0.00041351
5	Yes	75	0.00125287	0.00043318
6	Yes	78	0.00136724	0.00052960
7	Yes	75	0.00126736	0.00043661
8	Yes	69	0.00138908	0.00039978
9	Yes	73	0.00146341	0.00046274
10	Yes	77	0.00127801	0.00046755
11	Yes	74	0.00147359	0.00050082
12	Yes	69	0.00142393	0.00043167
13	Yes	75	0.00131748	0.00045666
14	Yes	50	0.00056549	0.00008168
15	Yes	71	0.00145608	0.00011099
16	Yes	71	0.00134628	0.00010458
17	Yes	71	0.00131719	0.00010315
18	Yes	71	0.00134993	0.00010256
19	Yes	71	0.00145990	0.00010658
20	Yes	71	0.00132582	0.00009986
21	Yes	71	0.00128983	0.00009943
22	Yes	71	0.00131225	0.00009874
23	Yes	71	0.00143825	0.00010495
24	Yes	71	0.00136573	0.00010435
25	Yes	71	0.00134092	0.00010675
26	Yes	71	0.00137693	0.00010797
27	Yes	66	0.00144425	0.00013724

28	Yes	66	0.00145714	0.00013800
29	Yes	67	0.00122410	0.00012304
30	Yes	67	0.00125062	0.00013063
31	Yes	67	0.00122350	0.00012543
32	Yes	66	0.00149303	0.00014490
33	Yes	66	0.00146602	0.00013797
34	Yes	66	0.00145644	0.00013757
35	Yes	67	0.00121358	0.00012344
36	Yes	67	0.00125066	0.00013064
37	Yes	67	0.00123401	0.00012523
38	Yes	66	0.00149385	0.00014542

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
T1	180 - 160	1.687	37	0.1515	0.0480
T2	160 - 140	1.094	37	0.1176	0.0332
T3	140 - 120	0.728	36	0.0754	0.0377
T4	120 - 100	0.502	36	0.0365	0.0358
T5	100 - 80	0.460	30	0.0065	0.0622
T6	80 - 60	0.455	30	0.0057	0.0896
T7	60 - 40	0.419	30	0.0067	0.1093
T8	40 - 20	0.389	30	0.0188	0.1242
T9	20 - 5	0.251	30	0.0475	0.1327
T10	5 - 0	0.068	30	0.0621	0.1354

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	°	°	*ft*
180.00	Low Profile Platform	37	1.687	0.1515	0.0480	58018
170.00	12 ft Boom / Sector Mount	37	1.370	0.1355	0.0383	29009
160.38	Guy	37	1.103	0.1184	0.0333	15747
150.00	RFS APXV18-206516S-C-A20	37	0.887	0.0969	0.0351	24417
116.42	Guy	36	0.483	0.0299	0.0383	21986
60.38	Guy	30	0.419	0.0066	0.1090	96599

Maximum Tower Deflections - Design Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
T1	180 - 160	8.755	6	0.7498	0.2846
T2	160 - 140	5.711	6	0.6057	0.2192
T3	140 - 120	3.655	5	0.4177	0.2194
T4	120 - 100	2.396	5	0.2153	0.1921
T5	100 - 80	2.062	5	0.0487	0.2977
T6	80 - 60	1.985	5	0.0337	0.4169

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T7	60 - 40	1.820	11	0.0315	0.5024
T8	40 - 20	1.696	11	0.0811	0.5676
T9	20 - 5	1.098	11	0.2074	0.6049
T10	5 - 0	0.299	11	0.2716	0.6170

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Low Profile Platform	6	8.755	0.7498	0.2846	13443
170.00	12 ft Boom / Sector Mount	6	7.146	0.6826	0.2437	6721
160.38	Guy	6	5.759	0.6089	0.2196	3641
150.00	RFS APXV18-206516S-C-A20	6	4.573	0.5154	0.2194	5441
116.42	Guy	5	2.275	0.1776	0.2007	4106
60.38	Guy	11	1.822	0.0314	0.5010	21717

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Leg	A325N	0.7500	4	264.86	29820.60	0.009 ✔	1	Bolt Tension
		Torque Arm Top@160.375	A325N	0.7500	2	6142.34	17892.40	0.343 ✔	1	Bolt Shear
		Torque Arm Bottom@160.375	A325N	0.7500	2	4925.56	17892.40	0.275 ✔	1	Bolt Shear
T2	160	Leg	A325N	0.7500	4	3090.41	29820.60	0.104 ✔	1	Bolt Tension
T3	140	Leg	A325N	0.7500	4	2597.68	29820.60	0.087 ✔	1	Bolt Tension
T4	120	Leg	A325N	0.7500	4	3209.63	29820.60	0.108 ✔	1	Bolt Tension
		Torque Arm Top@116.417	A325N	0.7500	2	3971.59	17892.40	0.222 ✔	1	Bolt Shear
		Torque Arm Bottom@116.417	A325N	0.7500	2	2544.80	17892.40	0.142 ✔	1	Bolt Shear
T5	100	Leg	A325N	0.7500	4	3516.84	29820.60	0.118 ✔	1	Bolt Tension
T6	80	Leg	A325N	0.7500	4	3526.27	29820.60	0.118 ✔	1	Bolt Tension
T7	60	Leg	A325N	0.7500	4	3917.54	29820.60	0.131 ✔	1	Bolt Tension
T8	40	Leg	A325N	0.7500	4	4308.81	29820.60	0.144 ✔	1	Bolt Tension
T9	20	Leg	A325N	0.7500	4	4451.14	29820.60	0.149 ✔	1	Bolt Tension
T10	5	Leg	A325N	0.7500	4	4397.37	29820.60	0.147 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T1	160.38 (A) (541)	5/8 EHS	6360.00	42399.99	13183.60	25440.00	1.000	1.930 ✔
	160.38 (A) (542)	5/8 EHS	6360.00	42399.99	13324.10	25440.00	1.000	1.909 ✔
	160.38 (B) (535)	5/8 EHS	6360.00	42399.99	13514.50	25440.00	1.000	1.882 ✔
	160.38 (B) (536)	5/8 EHS	6360.00	42399.99	13569.20	25440.00	1.000	1.875 ✔
	160.38 (C) (529)	5/8 EHS	6360.00	42399.99	13396.50	25440.00	1.000	1.899 ✔
	160.38 (C) (530)	5/8 EHS	6360.00	42399.99	13141.80	25440.00	1.000	1.936 ✔
T4	116.42 (A) (559)	9/16 EHS	5250.00	35000.04	8231.94	21000.00	1.000	2.551 ✔
	116.42 (A) (560)	9/16 EHS	5250.00	35000.04	8292.77	21000.00	1.000	2.532 ✔
	116.42 (B) (553)	9/16 EHS	5250.00	35000.04	8526.95	21000.00	1.000	2.463 ✔
	116.42 (B) (554)	9/16 EHS	5250.00	35000.04	8481.27	21000.00	1.000	2.476 ✔
	116.42 (C) (547)	9/16 EHS	5250.00	35000.04	8599.41	21000.00	1.000	2.442 ✔
	116.42 (C) (548)	9/16 EHS	5250.00	35000.04	8286.58	21000.00	1.000	2.534 ✔
T6	60.38 (A) (567)	9/16 EHS	5250.00	35000.04	8330.94	21000.00	1.000	2.521 ✔
	60.38 (B) (566)	9/16 EHS	5250.00	35000.04	8753.35	21000.00	1.000	2.399 ✔
	60.38 (C) (565)	9/16 EHS	5250.00	35000.04	8738.03	21000.00	1.000	2.403 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-40940.10	82983.90	0.493 [1] ✔
T2	160 - 140	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-39487.40	82983.90	0.476 [1] ✔
T3	140 - 120	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-40986.00	79606.90	0.515 [1] ✔
T4	120 - 100	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-47780.40	79606.90	0.600 [1] ✔
T5	100 - 80	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-44397.00	82983.90	0.535 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	80 - 60	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-47003.40	82983.90	0.566 [1] ✔
T7	60 - 40	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-53057.00	78158.60	0.679 [1] ✔
T8	40 - 20	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-54953.50	81406.40	0.675 [1] ✔
T9	20 - 5	P2.5x.203	15.00	3.56	45.1 K=1.00	1.7040	1.00	-54436.90	80094.30	0.680 [1] ✔
T10	5 - 0	P2.5x.203	5.39	4.99	20.9 K=0.33	1.7040	0.88	-56819.70	81531.20	0.697 [1] ✔

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 3/4x1 3/4x3/16	3.50	3.26	117.0 K=1.03	0.6211	-6075.11	9793.71	0.620 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-5299.11	7190.10	0.737 [1] ✔
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-5255.38	7190.10	0.731 [1] ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-4377.86	7190.10	0.609 [1] ✔
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-4037.22	7190.10	0.561 [1] ✔
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-4238.77	7190.10	0.590 [1] ✔
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-3997.67	7190.10	0.556 [1] ✔
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-4128.76	7190.10	0.574 [1] ✔
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-3583.42	7190.10	0.498 [1] ✔

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 3/4x1 3/4x3/16	3.50	3.26	117.0 K=1.03	0.6211	-3603.19	9793.71	0.368 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	128.2	0.5273	-3556.56	7190.10	0.495 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2676.29	7190.10	0.372 [1]
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2479.94	7190.10	0.345 [1]
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2122.12	7190.10	0.295 [1]
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2015.35	7190.10	0.280 [1]
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2019.27	7190.10	0.281 [1]
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-1944.27	7190.10	0.270 [1]

[1] $P_u / \phi P_n$ controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2742.61	7190.10	0.381 [1]
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-3329.47	7190.10	0.463 [1]
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2255.98	7190.10	0.314 [1]
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2107.51	7190.10	0.293 [1]
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2271.62	7190.10	0.316 [1]
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2026.95	7190.10	0.282 [1]

[1] $P_u / \phi P_n$ 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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-9127.07	11503.00	0.793 [1]
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3344.92	11503.00	0.291 [1]
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-717.34	11503.00	0.062 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000
T4	120 - 100	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000
T6	80 - 60	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	L1 1/2x1 1/2x3/16	0.793	0.000	0.000	0.793 [1] ✔	1.000	4.8.1 ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	0.291	0.000	0.000	0.291 [1] ✔	1.000	4.8.1 ✔
T6	80 - 60	L1 1/2x1 1/2x3/16	0.062	0.000	0.000	0.062 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Bottom Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4326.88	11503.00	0.376 [1]
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-6723.78	11503.00	0.585 [1]

[1] P_u / ϕP_n controls

Bottom Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000
T4	120 - 100	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000

Bottom Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	L1 1/2x1 1/2x3/16	0.376	0.000	0.000	0.376 [1] ✔	1.000	4.8.1 ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	0.585	0.000	0.000	0.585 [1] ✔	1.000	4.8.1 ✔

[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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (533)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9632.57	36439.50	0.264 [1] ✔
T1	180 - 160 (534)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9620.00	36439.50	0.264 [1] ✔
T1	180 - 160 (539)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9622.95	36439.50	0.264 [1] ✔
T1	180 - 160 (540)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9851.13	36439.50	0.270 [1] ✔
T1	180 - 160 (545)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9757.82	36439.50	0.268 [1] ✔
T1	180 - 160 (546)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9527.63	36439.50	0.261 [1] ✔
T4	120 - 100 (551)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-4947.45	36439.50	0.136 [1] ✔
T4	120 - 100 (552)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-4811.71	36439.50	0.132 [1] ✔
T4	120 - 100 (557)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-5087.29	36439.50	0.140 [1] ✔
T4	120 - 100 (558)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-5089.60	36439.50	0.140 [1] ✔
T4	120 - 100 (563)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-4800.21	36439.50	0.132 [1] ✔
T4	120 - 100 (564)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-4706.37	36439.50	0.129 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg 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	lb	lb	
T1	180 - 160	P2.5x.203	20.00	3.21	40.6	1.7040	14622.20	96619.60	0.151 [1] ✓
T2	160 - 140	P2.5x.203	20.00	3.21	40.6	1.7040	10436.70	96619.60	0.108 [1] ✓
T3	140 - 120	P2.5x.203	20.00	3.21	40.6	1.7040	6097.81	92018.70	0.066 [1] ✓
T4	120 - 100	P2.5x.203	20.00	3.21	40.6	1.7040	6096.06	92018.70	0.066 [1] ✓

[1] P_u / ϕP_n controls

Diagonal 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	lb	lb	
T1	180 - 160	5/8	4.75	4.42	339.7	0.3068	7316.10	9940.20	0.736 [1] ✓
T2	160 - 140	5/8	4.75	4.42	339.7	0.3068	5200.47	9940.20	0.523 [1] ✓
T3	140 - 120	5/8	4.75	4.42	339.7	0.3068	4445.17	9940.20	0.447 [1] ✓
T4	120 - 100	5/8	4.75	4.42	339.7	0.3068	4415.79	9940.20	0.444 [1] ✓
T5	100 - 80	5/8	4.75	4.42	339.7	0.3068	4033.56	9940.20	0.406 [1] ✓
T6	80 - 60	5/8	4.75	4.42	339.7	0.3068	3928.85	9940.20	0.395 [1] ✓
T7	60 - 40	5/8	4.75	4.42	339.7	0.3068	4018.78	9940.20	0.404 [1] ✓
T8	40 - 20	5/8	4.75	4.42	339.7	0.3068	3262.09	9940.20	0.328 [1] ✓
T9	20 - 5	5/8	4.99	4.65	357.3	0.3068	3574.07	9940.20	0.360 [1] ✓

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 3/4x1 3/4x3/16	3.50	3.26	72.9	0.6211	709.10	20123.40	0.035 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	683.94	17085.90	0.040 [1] ✔
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	709.90	17085.90	0.042 [1] ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	827.58	17085.90	0.048 [1] ✔
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	768.98	17085.90	0.045 [1] ✔
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	805.60	17085.90	0.047 [1] ✔
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	918.97	17085.90	0.054 [1] ✔
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	951.82	17085.90	0.056 [1] ✔
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	942.87	17085.90	0.055 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T10	5 - 0	L1 1/2x1 1/2x3/16	3.24	3.00	78.8	0.5273	6159.47	17085.90	0.361 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	5398.03	17085.90	0.316 [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 (lb)	ϕP_n (lb)	Ratio $\frac{P_u}{\phi P_n}$
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	2503.92	17085.90	0.147 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation (ft)	Size	M_{ux} (lb-ft)	ϕM_{nx} (lb-ft)	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} (lb-ft)	ϕM_{ny} (lb-ft)	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T6	80 - 60	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation (ft)	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T6	80 - 60	L1 1/2x1 1/2x3/16	0.147	0.000	0.000	0.147 [1] ✔	1.000	4.8.1 ✔

[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 (lb)	ϕP_n (lb)	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (531)	L2x2x5/16	4.75	4.59	91.6	1.1500	11956.60	37260.00	0.321 [1] ✔
T1	180 - 160 (532)	L2x2x5/16	4.75	4.59	91.6	1.1500	12284.70	37260.00	0.330 [1] ✔
T1	180 - 160 (537)	L2x2x5/16	4.75	4.59	91.6	1.1500	11900.00	37260.00	0.319 [1] ✔
T1	180 - 160 (538)	L2x2x5/16	4.75	4.59	91.6	1.1500	11869.70	37260.00	0.319 [1] ✔
T1	180 - 160 (543)	L2x2x5/16	4.75	4.59	91.6	1.1500	11666.10	37260.00	0.313 [1] ✔
T1	180 - 160 (544)	L2x2x5/16	4.75	4.59	91.6	1.1500	11989.90	37260.00	0.322 [1] ✔
T4	120 - 100 (549)	L2x2x5/16	4.75	4.59	91.6	1.1500	7931.51	37260.00	0.213 [1] ✔
T4	120 - 100 (550)	L2x2x5/16	4.75	4.59	91.6	1.1500	7900.50	37260.00	0.212 [1] ✔
T4	120 - 100 (555)	L2x2x5/16	4.75	4.59	91.6	1.1500	7864.22	37260.00	0.211 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	120 - 100 (556)	L2x2x5/16	4.75	4.59	91.6	1.1500	7904.07	37260.00	0.212 [1] ✔
T4	120 - 100 (561)	L2x2x5/16	4.75	4.59	91.6	1.1500	7943.19	37260.00	0.213 [1] ✔
T4	120 - 100 (562)	L2x2x5/16	4.75	4.59	91.6	1.1500	7872.27	37260.00	0.211 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (533)	L3x3x1/4	3.50	3.38	43.6	1.4400	3009.81	46656.00	0.065 [1] ✔
T1	180 - 160 (534)	L3x3x1/4	3.50	3.38	43.6	1.4400	3077.25	46656.00	0.066 [1] ✔
T1	180 - 160 (539)	L3x3x1/4	3.50	3.38	43.6	1.4400	3131.44	46656.00	0.067 [1] ✔
T1	180 - 160 (540)	L3x3x1/4	3.50	3.38	43.6	1.4400	3219.33	46656.00	0.069 [1] ✔
T1	180 - 160 (545)	L3x3x1/4	3.50	3.38	43.6	1.4400	3083.39	46656.00	0.066 [1] ✔
T1	180 - 160 (546)	L3x3x1/4	3.50	3.38	43.6	1.4400	3033.99	46656.00	0.065 [1] ✔
T4	120 - 100 (551)	L3x3x1/4	3.50	3.38	43.6	1.4400	2182.43	46656.00	0.047 [1] ✔
T4	120 - 100 (552)	L3x3x1/4	3.50	3.38	43.6	1.4400	1863.74	46656.00	0.040 [1] ✔
T4	120 - 100 (557)	L3x3x1/4	3.50	3.38	43.6	1.4400	2187.92	46656.00	0.047 [1] ✔
T4	120 - 100 (558)	L3x3x1/4	3.50	3.38	43.6	1.4400	2152.19	46656.00	0.046 [1] ✔
T4	120 - 100 (563)	L3x3x1/4	3.50	3.38	43.6	1.4400	2092.51	46656.00	0.045 [1] ✔
T4	120 - 100 (564)	L3x3x1/4	3.50	3.38	43.6	1.4400	1782.17	46656.00	0.038 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	180 - 160	Leg	P2.5x.203	2	-40940.10	82983.90	49.3	Pass
		Diagonal	5/8	22	7316.10	9940.20	73.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Horizontal	L1 3/4x1 3/4x3/16	52	-6075.11	9793.71	62.0	Pass
		Top Girt	L1 3/4x1 3/4x3/16	4	-3603.19	9793.71	36.8	Pass
		Guy A@160.375	5/8	542	13324.10	25440.00	52.4	Pass
		Guy B@160.375	5/8	536	13569.20	25440.00	53.3	Pass
		Guy C@160.375	5/8	529	13396.50	25440.00	52.7	Pass
		Top Guy Pull-Off@160.375	L1 1/2x1 1/2x3/16	18	-9127.07	11503.00	79.3	Pass
		Bottom Guy Pull-Off@160.375	L1 1/2x1 1/2x3/16	9	-4326.88	11503.00	37.6	Pass
		Torque Arm Top@160.375	L2x2x5/16	532	12284.70	37260.00	33.0 34.3 (b)	Pass
		Torque Arm Bottom@160.375	L3x3x1/4	540	-9851.13	36439.50	27.0 27.5 (b)	Pass
T2	160 - 140	Leg	P2.5x.203	63	-39487.40	82983.90	47.6	Pass
		Diagonal	5/8	115	5200.47	9940.20	52.3	Pass
		Horizontal	L1 1/2x1 1/2x3/16	112	-5299.11	7190.10	73.7	Pass
		Top Girt	L1 1/2x1 1/2x3/16	66	-3556.56	7190.10	49.5	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	67	-2742.61	7190.10	38.1	Pass
T3	140 - 120	Leg	P2.5x.203	122	-40986.00	79606.90	51.5	Pass
		Diagonal	5/8	132	4445.17	9940.20	44.7	Pass
		Horizontal	L1 1/2x1 1/2x3/16	136	-5255.38	7190.10	73.1	Pass
		Top Girt	L1 1/2x1 1/2x3/16	124	-2676.29	7190.10	37.2	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	129	-3329.47	7190.10	46.3	Pass
T4	120 - 100	Leg	P2.5x.203	182	-47780.40	79606.90	60.0	Pass
		Diagonal	5/8	230	4415.79	9940.20	44.4	Pass
		Horizontal	L1 1/2x1 1/2x3/16	216	-4377.86	7190.10	60.9	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	188	-2255.98	7190.10	31.4	Pass
		Guy A@116.417	9/16	560	8292.77	21000.00	39.5	Pass
		Guy B@116.417	9/16	553	8526.95	21000.00	40.6	Pass
		Guy C@116.417	9/16	547	8599.41	21000.00	40.9	Pass
		Top Guy Pull-Off@116.417	L1 1/2x1 1/2x3/16	186	-3344.92	11503.00	29.1	Pass
		Bottom Guy Pull-Off@116.417	L1 1/2x1 1/2x3/16	234	-6723.78	11503.00	58.5	Pass
		Torque Arm Top@116.417	L2x2x5/16	561	7943.19	37260.00	21.3 22.2 (b)	Pass
		Torque Arm Bottom@116.417	L3x3x1/4	558	-5089.60	36439.50	14.0 14.2 (b)	Pass
T5	100 - 80	Leg	P2.5x.203	243	-44397.00	82983.90	53.5	Pass
		Diagonal	5/8	299	4033.56	9940.20	40.6	Pass
		Horizontal	L1 1/2x1 1/2x3/16	292	-4037.22	7190.10	56.1	Pass
		Top Girt	L1 1/2x1 1/2x3/16	246	-2479.94	7190.10	34.5	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	248	-2107.51	7190.10	29.3	Pass
T6	80 - 60	Leg	P2.5x.203	301	-47003.40	82983.90	56.6	Pass
		Diagonal	5/8	310	3928.85	9940.20	39.5	Pass
		Horizontal	L1 1/2x1 1/2x3/16	317	-4238.77	7190.10	59.0	Pass
		Top Girt	L1 1/2x1 1/2x3/16	305	-2122.12	7190.10	29.5	Pass
		Guy A@60.375	9/16	567	8330.94	21000.00	39.7	Pass
		Guy B@60.375	9/16	566	8753.35	21000.00	41.7	Pass
		Guy C@60.375	9/16	565	8738.03	21000.00	41.6	Pass
		Top Guy Pull-Off@60.375	L1 1/2x1 1/2x3/16	309	2503.92	17085.90	14.7	Pass
T7	60 - 40	Leg	P2.5x.203	362	-53057.00	78158.60	67.9	Pass
		Diagonal	5/8	420	4018.78	9940.20	40.4	Pass
		Horizontal	L1 1/2x1 1/2x3/16	377	-3997.67	7190.10	55.6	Pass
		Top Girt	L1 1/2x1 1/2x3/16	365	-2015.35	7190.10	28.0	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	369	-2271.62	7190.10	31.6	Pass
T8	40 - 20	Leg	P2.5x.203	422	-54953.50	81406.40	67.5	Pass
		Diagonal	5/8	480	3262.09	9940.20	32.8	Pass
		Horizontal	L1 1/2x1 1/2x3/16	474	-4128.76	7190.10	57.4	Pass
		Top Girt	L1 1/2x1 1/2x3/16	425	-2019.27	7190.10	28.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Bottom Girt	L1 1/2x1 1/2x3/16	429	-2026.95	7190.10	28.2	Pass
T9	20 - 5	Leg	P2.5x.203	481	-54436.90	80094.30	68.0	Pass
		Diagonal	5/8	490	3574.07	9940.20	36.0	Pass
		Horizontal	L1 1/2x1 1/2x3/16	497	-3583.42	7190.10	49.8	Pass
		Top Girt	L1 1/2x1 1/2x3/16	486	-1944.27	7190.10	27.0	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	487	5398.03	17085.90	31.6	Pass
T10	5 - 0	Leg	P2.5x.203	525	-56819.70	81531.20	69.7	Pass
		Top Girt	L1 1/2x1 1/2x3/16	528	6159.47	17085.90	36.1	Pass
							Summary	
						Leg (T10)	69.7	Pass
						Diagonal (T1)	73.6	Pass
						Horizontal (T2)	73.7	Pass
						Top Girt (T2)	49.5	Pass
						Bottom Girt (T3)	46.3	Pass
						Guy A (T1)	52.4	Pass
						Guy B (T1)	53.3	Pass
						Guy C (T1)	52.7	Pass
						Top Guy Pull-Off (T1)	79.3	Pass
						Bottom Guy Pull-Off (T4)	58.5	Pass
						Torque Arm Top (T1)	34.3	Pass
						Torque Arm Bottom (T1)	27.5	Pass
						Bolt Checks	34.3	Pass
						RATING =	**79.3**	**Pass**

Site Name:	**Colchester**
Client:	**CDT**
Job Number:	**119-23103**
Date:	**8/13/2019**

Design Base Loads (Factored) per TIA-222-G

Moment (M_u):	0.0	k-ft	Concrete Compressive Strength (f'_c):	3000.0	psi
Shear/Leg (V_u):	2.0	k	Bending/Tension Reduction Factor (ϕ_B):	0.90	
Compression/Leg (P_u):	155.4	k	Shear Reduction Factor (ϕ_V):	0.75	
Uplift/Leg (T_u):	0.0	k	Compression Reduction Factor (ϕ_V):	0.65	
Diameter of Prismatic Portion of Pier (d):	1.0	ft	Steel Elastic Modulus:	29000	ksi
Depth to Base of Foundation:	2.0	ft	Pad Steel Rebar Size #:	4	
Pier Height Above Ground (h):	2.0	ft	Pad Steel Rebar Area:	0.20	in^2
Length / Width of Pad (w):	6.0	ft	Pad Steel Rebar Yield Strength (F_y):	60	ksi
Thickness of Pad (t):	4.0	ft	# of Rebar in Top of Pad:		
Depth Below Ground Surface to Water Table (w):	20.0	ft	# of Rebar in Base of Pad:	2	
Unit Weight of Concrete:	150.0	pcf	Pad Clear Cover:	3	in
Unit Weight of Water:	62.4	pcf			
Unit Weight of Soil Above Water Table:	120.0	pcf			
Unit Weight of Soil Below Water Table:	65.0	pcf			
Friction Angle of Uplift from Top of Pad:	30	Degrees			
Friction Angle of Uplift from Base of Pad:	30	Degrees			
Uplift Angle Started at Top or Base of Pad (T/B):	T				
Ultimate Skin Friction:	0	psf			
Ultimate Compressive Bearing Pressure:	10000	psf			
Capacity Increase (Due to Transient Loads):	1.00				
Bearing Strength Reduction Factor (ϕ_s):	0.60				
Uplift Strength Reduction Factor (ϕ_s):	0.75				

Axial Capacities

Nominal Uplift Capacity per Leg ($\phi_s T_n$):	12.0	k	
Nominal Compressive Capacity per Leg ($\phi_s P_n$):	216.0	k	
P_u:	160.9	k	
$T_u/\phi_s T_n$:	0.00	Result:	OK
$P_u/\phi_s P_n$:	0.74	Result:	OK

Site Name:	**Colchester**
Client:	**CDT**
Job Number:	**119-23103**
Date:	**8/13/2019**

Design Standard per TIA-222-G

Anchor Radius:	145.0	ft
Uplift (Factored - P_u):	33.6	k
Shear (Factored - V_u):	39.4	k
Anchor Base Depth (d):	7.5	ft
Width of Anchor (W):	5.5	ft
Length of Anchor (L):	11.5	ft
Thickness of Anchor (t):	2.0	ft
Depth Below Ground Surface to Water Table (w):	20.0	ft
Soil Uplift at Base / Top of Anchor (B/T):	T	
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil Above Water Table:	120.0	pcf
Unit Weight of Water:	62.4	pcf
Submerged Soil Unit Weight:	65.0	pcf
Internal Angle of Friction:	30	Degrees
Cohesion:	500	psf
Ultimate Skin Friction of Pad Sides to Soil:	0	psf
Ultimate Coefficient of Shear Friction:	0.30	
Maximum Top Conical Failure Angle:	30	Degrees
Maximum Base Conical Failure Angle:	30	Degrees
Allowable Capacity Increase:	1.00	(Due to Transient Loads)
Uplift Strength Reduction Factor (ϕ_u):	0.75	
Shear Strength Reduction Factor (ϕ_v):	0.75	
Concrete Uplift Strength Reduction Factor (ϕ_u):	0.90	

Uplift

Weight of Concrete (Buoyancy Effect Considered):	19.0	k
Weight of Soil (Buoyancy Effect Considered):	84.3	k
Ultimate Uplift Resistance from Skin Friction:	0.0	k
Nominal Factored Uplift Resistance ($\phi_u P_n$):::	80.3	k
P_u / $\phi_u P_n$:	0.42	Result: OK

Shear

Ultimate Shear Friction Resistance Due to Normal Force - Uplift:	10.7	k
Passive Pressure:	4072	psf
Ultimate Passure Pressure Resistance:	93.7	k
Nominal Shear Resistance ($\phi_v V_n$):	78.2	k
V_u / $\phi_v V_n$:	0.50	Result: OK

Anchor Rod Capacity

# of Anchor Rods:	1		Rod F_y:	47 ksi
Anchor Rod Gross Area:	2.41	in^2	Rod F_u:	62 ksi
Anchor Rod Net Area:	2.41	in^2	ϕ_y:	0.80
Resultant Tensile Load (T_u):	51.7	k	ϕ_t:	0.65
Anchor Rod Tensile Resistance (ϕT_n):::	90.4	k		
T_u / ϕT_n:	0.57	Result: OK		

Strength Analysis of Reinforced Concrete

Concrete Compressive Srength (f'_c):	3000	psi
Longitudinal Rebar Yield Strength:	60000	psi
# Longitudinal Rebar (Top):	9	
# Longitudinal Rebar (1 Side):	3	
Rebar Size:	4	
Strength Reduction Factor for Shear (ϕ_v):	0.75	
Strength Reduction Factor for Flexure (ϕ_b):	0.9	
Compression Zone Factor (β_1):	0.85	
Area of Single Rebar:	0.20	in^2
One Way Shear due to Shear Load (V_u):	10.8	k
Nominal One Way Shear Capacity for Shear Load ($\phi_c V_n$):	122.3	k
$V_u/\phi_v V_n$:	0.09	Result: OK
One Way Shear due to Uplift (V_u):	14.4	k
Nominal One Way Shear Capacity for Uplift ($\phi_c V_n$):	108.4	k
$V_u/\phi_v V_n$:	0.13	Result: OK
Pad Flexure due to Shear Load (M_u):	56.6	k-ft
Nominal Flexural Capacity for Shear Load ($\phi_b M_n$):	167.4	k-ft
Pad Flexure due to Uplift (M_u):	48.3	k-ft
Nominal Flexural Capacity for Uplift ($\phi_b M_n$):	161.9	k-ft
$M_u/\phi_b M_n$ (Max.):	0.34	Result: OK

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

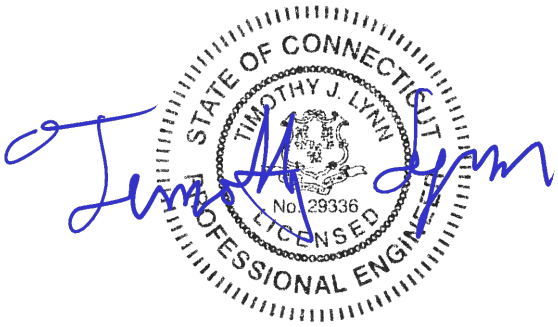
T-Mobile Site #: CTNL250A

600 Old Hartford Road
Colchester, CT

Centek Project No. 19027.18

Date: May 03, 2019

Max Stress Ratio = 87.6%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

May 03, 2019

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

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTNL250A
600 Old Hartford Road
Colchester, CT 06415

Centek Project No. 19027.18

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting of three (3) V-frame sector mounts with stiff arms to support the proposed 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-Frame: Three (3) RFS-APXV18-206516S-C-A20 panel antennas, three (3) RFS APXVAARR24-43-U-NA20 panel antennas, three (3) KRY112 TMAs and three (3) Ericsson 4449 B71_B12 remote radio units mounted on three (3) V-Arms with a RAD center elevation of 150-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 101 mph for Colchester 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 antenna mount has 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

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Fernando J. Palacios
Engineer

Section 2 - Calculations

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

Subject: Loads on Equipment

Location: Colchester, CT

Rev. 0: 04/25/19

Prepared by: F.J.P Checked by: C.A.G.
Job No. 19027.18

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

Wind Speeds

Basic Wind Speed	$V := 101$	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 =	$h := 180$	ft	(User Input)
Height to Center of Antennas =	$z := 150$	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 =	$G_H = 1.12$		(User Input)

Output

Wind Direction Probability Factor =

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

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

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

Importance Factors =

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

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

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

$$K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.163$$

Velocity Pressure Coefficient Antennas =

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.745$$

$$Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.378$$

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot K_d \cdot Kz \cdot V^2 \cdot I_{Wind} = 30.597\,psf$

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot K_d \cdot Kz \cdot V_i^2 \cdot I_{Wind} = 7.498\ psf$

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAARR24_43-U-NA20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 19.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 133.4$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.9$		
Antenna Force Coefficient =	$Ca_{ant} = 1.31$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 13.1$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 587$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 259$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 16$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 175$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.4$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 92$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \cdot 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 378$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 378$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

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

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 2.5$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 124$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.2$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 57$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 4.1$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 49$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 2.6$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 31$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1154$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 2750$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 89$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 89$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

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

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 56$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 44$	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 =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 21$	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 =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 18$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2218$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 72$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 72$	lbs

Development of Wind & Ice Load on TMA's

TMA Data:

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

Wind Load (without ice)

Surface Area for One TMA =	$SA_{TMAF} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.3$	sf
Total TMA Wind Force =	$F_{TMA} := qz \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAF} = 12$	lbs
Surface Area for One TMA =	$SA_{TMAS} := \frac{L_{TMA} \cdot T_{TMA}}{144} = 0.1$	sf
Total TMA Wind Force =	$F_{TMA} := qz \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAS} = 6$	lbs

Wind Load (with ice)

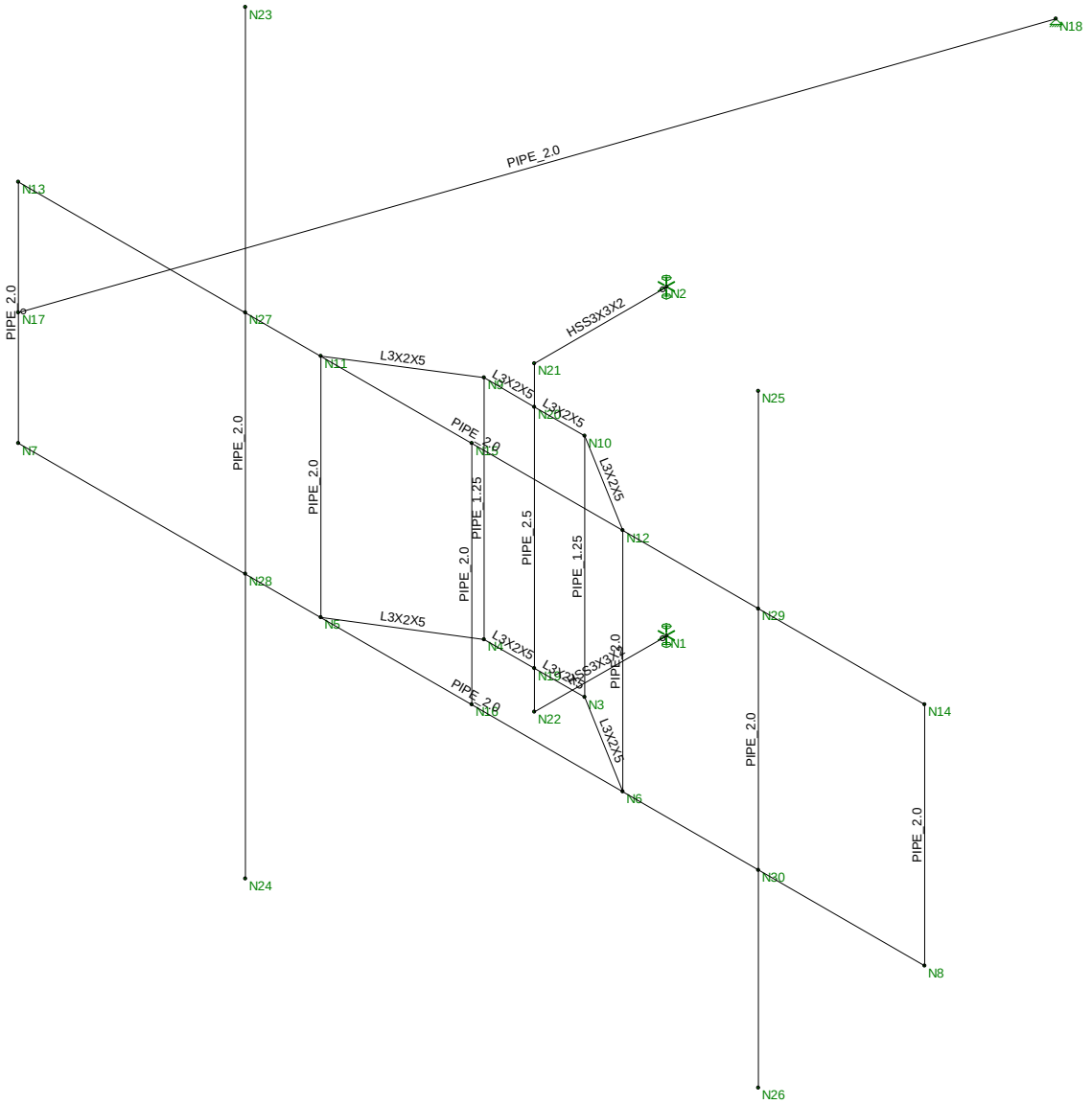
Surface Area for One TMA w/ Ice =	$SA_{ICETMAF} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz})}{144} = 0.7$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAF} = 7$	lbs
Surface Area for One TMA w/ Ice =	$SA_{ICETMAS} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz})}{144} = 0.5$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAS} = 5$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 118$	cu in
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz}) - V_{TMA} = 509$	cu in
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 16$	lbs
Weight of Ice on All TMAs =	$W_{ICETMA} \cdot N_{TMA} = 16$	lbs



Envelope Only Solution

Centek		
THC	CTNL250A - Mount	May 3, 2019 at 3:36 PM
19027.18	Member Framing	CTNL250A_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?	Yes
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

Hot Rolled Steel Properties

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

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[..	Lcomp bot[..	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	L3x2x5	.667	Segment	Segment	Segment	Segment	Segm...				Lateral
2	M2	L3x2x5	1.572			Lbyy						Lateral
3	M3	L3x2x5	1.572			Lbyy						Lateral
4	M4	Horizontal	12	Segment	Segment	Segment	Segment	Segm...				Lateral
5	M5	L3x2x5	.667	Segment	Segment	Segment	Segment	Segm...				Lateral
6	M6	L3x2x5	1.572			Lbyy						Lateral
7	M7	L3x2x5	1.572			Lbyy						Lateral
8	M8	Horizontal	12	Segment	Segment	Segment	Segment	Segm...				Lateral
9	M9	Pipe1.25	3			Lbyy						Lateral
10	M10	Pipe1.25	3			Lbyy						Lateral
11	M11	Antenna M...	3			Lbyy						Lateral
12	M12	Antenna M...	3			Lbyy						Lateral
13	M13	Antenna M...	3			Lbyy						Lateral
14	M14	Antenna M...	3			Lbyy						Lateral
15	M15	Antenna M...	3			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[..	Lcomp bot[..	L-torq...	Kyy	Kzz	Cb	Functi...
16	M16	Stablizer A...	12			Lbyy						Lateral
17	M17	L3x2x5	.667	Segment	Segment	Segment	Segment	Segm...				Lateral
18	M18	L3x2x5	.667	Segment	Segment	Segment	Segment	Segm...				Lateral
19	M19	Vertical	4			Lbyy						Lateral
20	M20	Outrigger	1.75			Lbyy						Lateral
21	M21	Outrigger	1.75			Lbyy						Lateral
22	M22	Antenna M...	10	Segment	Segment	Segment	Segment	Segm...				Lateral
23	M23	Antenna M...	8	Segment	Segment	Segment	Segment	Segm...				Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Desig..	A [in2]	Iyy [i...	Izz [i..	J [in4]
1	Antenna Mast	PIPE_2.0	Colu...	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
2	Outrigger	HSS3X3X2	Beam	Tube	A500 Gr.46	Typical	1.3	1.78	1.78	2.84
3	Horizontal	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Vertical	PIPE_2.5	Colu...	Pipe	A53 Grade B	Typical	1.61	1.45	1.45	2.89
5	L3x2x5	L3X2X5	Beam	Single An...	A36 Gr.36	Typical	1.48	.467	1.32	.051
6	Stablizer Arm	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
7	Pipe1.25	PIPE_1.25	Colu...	Pipe	A53 Grade B	Typical	.625	.184	.184	.368

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N4	N19			L3x2x5	Beam	Single Angle	A36 Gr.36	Typical
2	M2	N3	N6			L3x2x5	Beam	Single Angle	A36 Gr.36	Typical
3	M3	N4	N5		270	L3x2x5	Beam	Single Angle	A36 Gr.36	Typical
4	M4	N7	N8			Horizontal	Beam	Pipe	A53 Grad...	Typical
5	M5	N9	N20		90	L3x2x5	Beam	Single Angle	A36 Gr.36	Typical
6	M6	N10	N12		90	L3x2x5	Beam	Single Angle	A36 Gr.36	Typical
7	M7	N9	N11		180	L3x2x5	Beam	Single Angle	A36 Gr.36	Typical
8	M8	N13	N14		90	Horizontal	Beam	Pipe	A53 Grad...	Typical
9	M9	N4	N9		90	Pipe1.25	Column	Pipe	A53 Grad...	Typical
10	M10	N10	N3		270	Pipe1.25	Column	Pipe	A53 Grad...	Typical
11	M11	N13	N7			Antenna Mast	Column	Pipe	A53 Grad...	Typical
12	M12	N11	N5			Antenna Mast	Column	Pipe	A53 Grad...	Typical
13	M13	N12	N6			Antenna Mast	Column	Pipe	A53 Grad...	Typical
14	M14	N14	N8			Antenna Mast	Column	Pipe	A53 Grad...	Typical
15	M15	N15	N16			Antenna Mast	Column	Pipe	A53 Grad...	Typical
16	M16	N17	N18			Stablizer Arm	Beam	Pipe	A53 Grad...	Typical
17	M17	N19	N3			L3x2x5	Beam	Single Angle	A36 Gr.36	Typical
18	M18	N20	N10		90	L3x2x5	Beam	Single Angle	A36 Gr.36	Typical
19	M19	N21	N22			Vertical	Column	Pipe	A53 Grad...	Typical
20	M20	N2	N21			Outrigger	Beam	Tube	A500 Gr.46	Typical
21	M21	N1	N22			Outrigger	Beam	Tube	A500 Gr.46	Typical
22	M22	N23	N24			Antenna Mast	Column	Pipe	A53 Grad...	Typical
23	M23	N25	N26			Antenna Mast	Column	Pipe	A53 Grad...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diaphragm
1	N1	0	0	0.75697	0	
2	N2	0	4	0.75697	0	
3	N3	0.6667	.5	2.506967	0	
4	N4	-0.6667	.5	2.506967	0	
5	N5	-2	.5	3.34	0	
6	N6	2	.5	3.34	0	
7	N7	-6	.5	3.34	0	
8	N8	6	.5	3.34	0	
9	N9	-0.6667	3.5	2.506967	0	
10	N10	0.6667	3.5	2.506967	0	
11	N11	-2	3.5	3.34	0	
12	N12	2	3.5	3.34	0	
13	N13	-6	3.5	3.34	0	
14	N14	6	3.5	3.34	0	
15	N15	0	3.5	3.34	0	
16	N16	0	.5	3.34	0	
17	N17	-6	2	3.34	0	
18	N18	-4	.5	-8.3967	0	
19	N19	0	.5	2.506967	0	
20	N20	0	3.5	2.506967	0	
21	N21	0	4	2.506967	0	
22	N22	0	0	2.506967	0	
23	N23	-3	7	3.34	0	
24	N24	-3	-3	3.34	0	
25	N25	3.8	6	3.34	0	
26	N26	3.8	-2	3.34	0	
27	N27	-3	3.5	3.34	0	
28	N28	-3	.5	3.34	0	
29	N29	3.8	3.5	3.34	0	
30	N30	3.8	.5	3.34	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	N2	Reaction	Reaction	Reaction		Reaction	
2	N1	Reaction	Reaction	Reaction		Reaction	
3	N18	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	Y	-.067	8.5
2	M22	Y	-.067	1.5
3	M23	Y	-.009	2
4	M23	Y	-.009	6
5	M22	Y	-.074	5
6	M23	Y	-.011	4

Member Point Loads (BLC 3 : Ice Weight)

Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]

Member Point Loads (BLC 3 : Ice Weight) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	Y	-.189	1.5
2	M22	Y	-.189	8.5
3	M23	Y	-.044	6
4	M23	Y	-.044	2
5	M22	Y	-.072	5
6	M23	Y	-.016	4

Member Point Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	X	.046	1.5
2	M22	X	.046	8.5
3	M23	X	.015	6
4	M23	X	.015	2
5	M22	X	.018	5
6	M23	X	.005	4

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	X	.13	1.5
2	M22	X	.13	8.5
3	M23	X	.029	6
4	M23	X	.029	2
5	M22	X	.044	5
6	M23	X	.006	4

Member Point Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	Z	.087	8.5
2	M22	Z	.087	1.5
3	M23	Z	.025	2
4	M23	Z	.025	6
5	M22	Z	.021	5
6	M23	Z	.007	4

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M22	Z	.293	1.5
2	M22	Z	.293	8.5
3	M23	Z	.062	2
4	M23	Z	.062	6
5	M22	Z	.056	5
6	M23	Z	.012	4

Joint Loads and Enforced Displacements

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

Member Distributed Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M16	X	.002	.002	0	0
2	M22	X	.002	.002	0	0
3	M20	X	.002	.002	0	0
4	M11	X	.002	.002	0	0
5	M12	X	.002	.002	0	0
6	M9	X	.002	.002	0	0
7	M15	X	.002	.002	0	0
8	M19	X	.002	.002	0	0
9	M10	X	.002	.002	0	0
10	M13	X	.002	.002	0	0
11	M23	X	.002	.002	0	0
12	M14	X	.002	.002	0	0
13	M7	X	.002	.002	0	0
14	M3	X	.002	.002	0	0
15	M2	X	.002	.002	0	0
16	M6	X	.002	.002	0	0
17	M21	X	.002	.002	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M16	X	.008	.008	0	0
2	M11	X	.008	.008	0	0
3	M22	X	.008	.008	0	0
4	M12	X	.008	.008	0	0
5	M9	X	.008	.008	0	0
6	M15	X	.008	.008	0	0
7	M19	X	.008	.008	0	0
8	M20	X	.008	.008	0	0
9	M10	X	.008	.008	0	0
10	M21	X	.008	.008	0	0
11	M13	X	.008	.008	0	0
12	M23	X	.008	.008	0	0
13	M14	X	.008	.008	0	0
14	M2	X	.008	.008	0	0
15	M3	X	.008	.008	0	0
16	M7	X	.008	.008	0	0
17	M6	X	.008	.008	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M16	Z	.002	.002	0	0
2	M22	Z	.002	.002	0	0
3	M8	Z	.002	.002	0	0
4	M11	Z	.002	.002	0	0
5	M4	Z	.002	.002	0	0
6	M12	Z	.002	.002	0	0
7	M7	Z	.002	.002	0	0
8	M3	Z	.002	.002	0	0
9	M9	Z	.002	.002	0	0
10	M15	Z	.002	.002	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
11	M19	Z	.002	.002	0	0
12	M1	Z	.002	.002	0	0
13	M17	Z	.002	.002	0	0
14	M10	Z	.002	.002	0	0
15	M13	Z	.002	.002	0	0
16	M2	Z	.002	.002	0	0
17	M6	Z	.002	.002	0	0
18	M18	Z	.002	.002	0	0
19	M5	Z	.002	.002	0	0
20	M23	Z	.002	.002	0	0
21	M14	Z	.002	.002	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M22	Z	.008	.008	0	0
2	M23	Z	.008	.008	0	0
3	M19	Z	.008	.008	0	0
4	M9	Z	.008	.008	0	0
5	M10	Z	.008	.008	0	0
6	M13	Z	.008	.008	0	0
7	M12	Z	.008	.008	0	0
8	M11	Z	.008	.008	0	0
9	M14	Z	.008	.008	0	0
10	M8	Z	.008	.008	0	0
11	M4	Z	.008	.008	0	0
12	M7	Z	.008	.008	0	0
13	M3	Z	.008	.008	0	0
14	M1	Z	.008	.008	0	0
15	M2	Z	.008	.008	0	0
16	M6	Z	.008	.008	0	0
17	M5	Z	.008	.008	0	0
18	M18	Z	.008	.008	0	0
19	M16	Z	.008	.008	0	0
20	M17	Z	.008	.008	0	0
21	M15	Z	.008	.008	0	0

Basic Load Cases

	BLC Description	Category	X Gr...	Y Gr...	Z Gr...	Joint	Point	Distri...	Area(...	Surface(Plate/Wall)
1	Self Weight	DL		-1						
2	Equipment Weight	DL					6			
3	Ice Weight	DL					6			
4	Wind w/ Ice X	WLX					6	17		
5	Wind X	WLX					6	17		
6	Wind w/ Ice Z	WLZ					6	21		
7	Wind Z	WLZ					6	21		

Load Combinations

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

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N2	max	.435	6	.649	6	-.063	2	0	6	0	6	0	6
2		min	-.448	2	.229	2	-1.324	4	0	1	0	1	0	1
3	N1	max	-.273	5	.623	3	.831	3	0	6	0	6	0	6
4		min	-.999	1	.101	5	-.544	5	0	1	0	1	0	1
5	N18	max	.081	4	.015	6	-.094	6	0	6	0	6	0	6
6		min	.009	3	-.053	2	-.577	1	0	1	0	1	0	1
7	Totals:	max	0	6	1.241	6	0	3						
8		min	-1.378	1	.515	2	-2.322	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	6	0	6	0	6	0	6	0	6	5.126e-03	6
2		min	0	1	0	1	0	1	0	1	0	1	2.175e-03	2
3	N2	max	0	6	0	6	0	6	0	6	0	6	6.032e-03	1
4		min	0	1	0	1	0	1	0	1	0	1	2.755e-03	5
5	N3	max	.672	1	-.02	2	-.027	6	3.568e-03	1	1.847e-02	1	5.618e-03	3
6		min	.16	6	-.065	6	-.169	1	1.26e-03	5	3.89e-03	6	2.952e-03	5
7	N4	max	.672	1	-.076	5	.168	1	8.393e-04	6	1.734e-02	1	7.639e-03	3
8		min	.16	6	-.163	3	.043	6	-1.517e-03	2	3.128e-03	6	3.921e-03	5
9	N5	max	.825	1	-.15	5	.411	1	3.172e-04	2	1.29e-02	1	7.912e-03	3
10		min	.188	6	-.31	3	.087	6	-3.773e-03	4	3.201e-03	6	4.249e-03	5
11	N6	max	.826	1	.031	2	-.071	6	1.193e-03	3	1.616e-02	1	5.367e-03	3
12		min	.187	6	0	6	-.417	1	8.696e-05	5	2.017e-03	6	3.041e-03	5
13	N7	max	.825	1	-.348	5	.253	1	-2.749e-03	3	2.518e-04	6	6.273e-03	3
14		min	.188	6	-.666	3	.147	6	-5.423e-03	4	-1.13e-02	2	3.461e-03	5
15	N8	max	.826	1	.266	3	-.119	6	1.31e-03	3	1.601e-02	1	5.839e-03	3
16		min	.187	6	.152	5	-1.188	1	5.219e-04	5	-1.477e-03	5	3.109e-03	5
17	N9	max	.51	2	-.076	5	.142	2	2.582e-03	1	1.827e-02	1	8.004e-03	3
18		min	-.033	6	-.164	3	0	6	6.331e-04	5	1.417e-03	6	3.966e-03	5
19	N10	max	.509	2	-.02	2	-.013	6	1.019e-03	6	1.665e-02	1	5.141e-03	3
20		min	-.032	6	-.066	6	-.15	1	-1.517e-03	2	9.006e-04	6	2.717e-03	5
21	N11	max	.661	2	-.15	5	.384	1	2.105e-03	5	1.058e-02	1	8.15e-03	3
22		min	-.019	6	-.31	3	.022	6	-8.551e-04	1	1.116e-03	6	3.685e-03	5
23	N12	max	.663	2	.03	2	-.033	6	1.324e-03	4	1.594e-02	1	5.537e-03	3
24		min	-.02	6	0	6	-.398	1	1.474e-04	2	1.354e-03	6	2.819e-03	5
25	N13	max	.662	2	-.348	5	.199	1	2.232e-03	5	3.251e-04	6	6.546e-03	3
26		min	-.02	6	-.666	3	.063	6	-1.75e-03	3	-1.13e-02	2	3.74e-03	5
27	N14	max	.663	2	.266	3	-.071	6	1.335e-03	6	1.599e-02	1	5.88e-03	3
28		min	-.02	6	.152	5	-1.165	1	4.405e-04	2	-1.474e-03	5	3.092e-03	5

Envelope Joint Displacements (Continued)

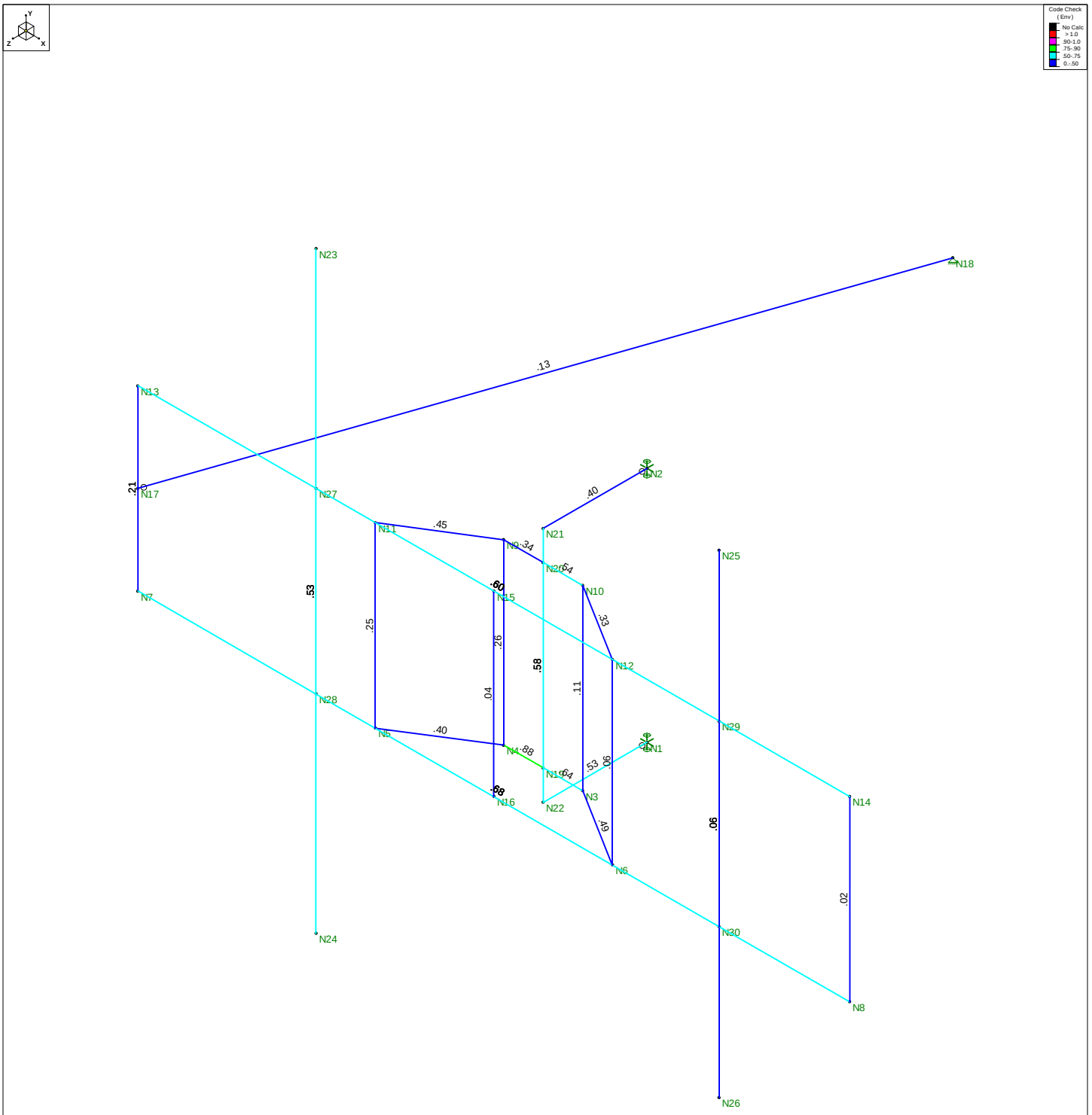
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
29	N15	max	.662	2	-.063	5	.025	2	9.345e-04	5	1.783e-02	1	6.296e-03	3
30		min	-.02	6	-.137	3	-.004	6	-5.997e-05	1	1.271e-03	6	3.368e-03	5
31	N16	max	.826	1	-.063	5	.017	1	4.775e-04	2	1.848e-02	1	6.376e-03	3
32		min	.188	6	-.137	3	0	6	-1.001e-03	4	3.424e-03	6	3.199e-03	5
33	N17	max	.751	1	-.348	5	.195	1	-1.237e-03	2	2.885e-04	6	5.817e-03	3
34		min	.085	6	-.666	3	.082	5	-2.377e-03	6	-1.13e-02	2	2.989e-03	5
35	N18	max	0	6	0	6	0	6	6.555e-03	6	1.425e-02	1	6.934e-03	6
36		min	0	1	0	1	0	1	4.787e-03	2	1.648e-03	6	1.586e-03	2
37	N19	max	.672	1	-.048	5	.012	4	1.422e-03	4	2.508e-02	1	5.401e-03	3
38		min	.16	6	-.108	3	.003	2	1.881e-04	2	5.631e-03	6	2.672e-03	2
39	N20	max	.509	2	-.048	5	.002	5	1.011e-03	3	1.937e-02	2	5.831e-03	1
40		min	-.032	6	-.107	3	-.01	3	-4.251e-04	5	3.339e-04	6	2.858e-03	5
41	N21	max	.477	2	-.048	5	0	4	2.874e-03	3	2.107e-02	2	6.032e-03	1
42		min	-.062	6	-.107	3	0	2	6.035e-04	5	-1.357e-03	6	2.755e-03	5
43	N22	max	.689	1	-.048	5	0	5	2.955e-03	6	2.903e-02	1	5.126e-03	6
44		min	.191	6	-.108	3	0	3	1.108e-03	2	7.409e-03	6	2.175e-03	2
45	N23	max	.664	2	-.199	5	.766	5	1.595e-02	5	2.777e-03	4	7.212e-03	6
46		min	-.322	6	-.408	3	.03	3	-1.624e-03	3	1.108e-03	3	-1.023e-03	2
47	N24	max	1.27	1	-.199	5	.934	4	-8.524e-04	2	3.28e-03	4	1.155e-02	1
48		min	.418	5	-.408	3	.258	3	-1.851e-02	4	1.802e-03	3	3.881e-03	5
49	N25	max	.563	2	.118	1	-.011	6	1.92e-03	4	1.596e-02	1	5.405e-03	3
50		min	-.178	6	.073	5	-.728	1	3.465e-04	2	-8.238e-04	5	2.989e-03	5
51	N26	max	.971	1	.118	1	-.131	6	1.269e-03	3	1.605e-02	1	5.615e-03	3
52		min	.341	5	.073	5	-.787	1	-4.082e-04	5	-8.188e-04	5	2.937e-03	5
53	N27	max	.662	2	-.199	5	.453	1	5.761e-03	5	2.777e-03	4	7.214e-03	3
54		min	-.02	6	-.408	3	.038	6	-1.61e-03	3	1.108e-03	3	3.944e-03	2
55	N28	max	.825	1	-.199	5	.497	1	-8.542e-04	2	3.28e-03	4	7.648e-03	3
56		min	.188	6	-.408	3	.118	6	-8.393e-03	4	1.802e-03	3	3.889e-03	5
57	N29	max	.663	2	.118	1	-.053	6	1.481e-03	4	1.596e-02	1	5.467e-03	3
58		min	-.02	6	.073	5	-.743	1	3.464e-04	2	-8.238e-04	5	2.989e-03	5
59	N30	max	.826	1	.118	1	-.099	6	1.27e-03	3	1.605e-02	1	5.553e-03	3
60		min	.187	6	.073	5	-.765	1	2.961e-05	5	-8.188e-04	5	2.938e-03	5

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

	Me...	Shape	Code C...	Loc...	LC	Shear C...	Loc[ft]	Dir	LC	phi*Pn...	phi*P...	phi*Mn...	phi*...	Cb	Eqn
1	M1	L3X2X5	.876	.667	1	.084	.007	z	1	47.078	47.952	1.008	3.025	2.145	H2-1
2	M2	L3X2X5	.488	0	1	.063	1.572	z	1	43.29	47.952	1.008	3.025	2.217	H2-1
3	M3	L3X2X5	.398	1.5...	1	.058	0	z	4	43.29	47.952	1.008	3.025	1.382	H2-1
4	M4	PIPE_2.0	.680	4	1	.313	4		4	31.747	32.13	1.872	1.872	2.027	H1-1b
5	M5	L3X2X5	.340	.667	2	.057	.667	y	4	47.078	47.952	1.008	3.025	1.22	H2-1
6	M6	L3X2X5	.326	0	2	.046	1.572	y	2	43.29	47.952	1.008	3.025	2.178	H2-1
7	M7	L3X2X5	.445	1.5...	2	.043	0	y	3	43.29	47.952	1.008	3.025	1.082	H2-1
8	M8	PIPE_2.0	.597	4	2	.269	4		5	31.747	32.13	1.872	1.872	1.104	H1-1b
9	M9	PIPE_1.25	.256	3	3	.045	3		6	15.716	19.688	.801	.801	2.237	H1-1b
10	M10	PIPE_1.25	.111	3	1	.049	0		6	15.716	19.688	.801	.801	1.49	H1-1b
11	M11	PIPE_2.0	.214	1.5	4	.036	3		1	28.843	32.13	1.872	1.872	1.973	H1-1b
12	M12	PIPE_2.0	.248	0	6	.075	3		3	28.843	32.13	1.872	1.872	2.266	H1-1b
13	M13	PIPE_2.0	.062	3	3	.021	0		3	28.843	32.13	1.872	1.872	2.227	H1-1b
14	M14	PIPE_2.0	.015	3	4	.004	0		1	28.843	32.13	1.872	1.872	2.261	H1-1b
15	M15	PIPE_2.0	.043	0	4	.046	0		6	28.843	32.13	1.872	1.872	2.207	H1-1b

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

	Me...	Shape	Code C...	Loc...	LC	Shear C...	Loc[ft]	Dir	LC	phi*Pn...	phi*P...	phi*Mn...	phi*...	Cb	Eqn
16	M16	PIPE_2.0	.131	6	1	.008	12		1	6.831	32.13	1.872	1.872	1.136	H1-1b
17	M17	L3X2X5	.635	0	1	.075	0	z	1	47.078	47.952	1.008	3.025	1.016	H2-1
18	M18	L3X2X5	.545	0	2	.063	0	z	1	47.078	47.952	1.008	3.025	1.06	H2-1
19	M19	PIPE_2.5	.580	4	1	.640	4		1	44.491	50.715	3.596	3.596	1.894	H3-6
20	M20	HSS3X3X2	.397	1.75	6	.042	0	y	6	52.667	53.82	4.83	4.83	1.663	H1-1b
21	M21	HSS3X3X2	.525	1.75	1	.067	0	z	1	52.667	53.82	4.83	4.83	1.661	H1-1b
22	M22	PIPE_2.0	.528	3.4...	4	.053	3.438		4	27.741	32.13	1.872	1.872	1.701	H1-1b
23	M23	PIPE_2.0	.056	5.5	4	.014	2.5		4	28.843	32.13	1.872	1.872	2.261	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
THC	CTNL250A - Mount	May 3, 2019 at 3:35 PM
19027.18	Member Unity Check	CTNL250A_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: CTNL250A

600 Old Hartford Road
Colchester, Connecticut 06415

May 17, 2019

EBI Project Number: 6219001693

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**5.81%**

May 17, 2019

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

Emissions Analysis for Site: CTNL250A -

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **600 Old Hartford Road** in **Colchester, 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 600 Old Hartford Road in Colchester, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

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

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

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

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

7) The antennas used in this modeling are the RFS APXV18-206516S-C-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector A, the RFS APXV18-206516S-C-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector B, the RFS APXV18-206516S-C-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is 150 feet above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20
Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz
Gain:	16.3 dBd / 16.3 dBd	Gain:	16.3 dBd / 16.3 dBd	Gain:	16.3 dBd / 16.3 dBd
Height (AGL):	150 feet	Height (AGL):	150 feet	Height (AGL):	150 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	10,237.91	ERP (W):	10,237.91	ERP (W):	10,237.91
Antenna A1 MPE %:	**1.64%**	Antenna B1 MPE %:	**1.64%**	Antenna C1 MPE %:	**1.64%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz
Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd
Height (AGL):	150 feet	Height (AGL):	150 feet	Height (AGL):	150 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	2,481.08	ERP (W):	2,481.08	ERP (W):	2,481.08
Antenna A2 MPE %:	**0.92%**	Antenna B2 MPE %:	**0.92%**	Antenna C2 MPE %:	**0.92%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	2.55%
Town	0.59%
AT&T	1.28%
Sprint	1.39%
Site Total MPE % :	5.81%

T-Mobile Sector A Total:	2.55%
T-Mobile Sector B Total:	2.55%
T-Mobile Sector C Total:	2.55%
Site Total:	5.81%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM	4	1279.74	150.0	8.18	1900 MHz GSM	1000	0.82%
T-Mobile 1900 MHz LTE	2	2559.48	150.0	8.18	1900 MHz LTE	1000	0.82%
T-Mobile 600 MHz LTE	2	591.73	150.0	1.89	600 MHz LTE	400	0.47%
T-Mobile 700 MHz LTE	2	648.82	150.0	2.07	700 MHz LTE	467	0.44%
						Total:	**2.55%**

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:	2.55%
Sector B:	2.55%
Sector C:	2.55%
T-Mobile Maximum MPE % (Sector A):	2.55%
Site Total:	5.81%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.81%** 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.