Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

June 11, 2019

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

RE: Notice of Exempt Modification
7 Surdan Mountain Road, Sharon, CT 06069
Latitude: 41.8623935100
Longitude: -73.4005328700
T-Mobile Site#: CTNH544A – L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 140-foot level of the existing 195-foot lattice tower at 7 Surdan Mountain Road, Sharon, CT. The 195-foot lattice tower is owned by the Litchfield County Dispatch. The property is owned by Ann Adele Prindle. 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 140-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
(3) RRUS11B12 (Remove) - Radio 4449 B71+B12 (Replace)

Install New:
(1) 1-3/8” Hybrid Cables

Existing to Remain:
(3) RFS APX16DWV-16DWV-S—E-A20 Antenna 1900/2100 MHz
(3) RRUS11B2
(3) RRUS11B4
(2) 1-3/8” Hybrid Cables

Ground:
Install New: Equipment inside existing 6201 cabinet

This facility was approved by the CSC for T-Mobile use in TS-T-Mobile-125-170330 dated April 27, 2017. This modification complies with this approval. Please see the enclosed.

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 -Brent M. Colley, Elected Official, and Barclay Prindle, Chairman of the Planning & Zoning Commission for the Town of Sharon, 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: Brent Colley – Town of Sharon First Selectman
Barclay Prindle– Town of Sharon Chairman of the Planning & Zoning Commission
Litchfield County Dispatch- tower owner
Ann Prindle- property owner

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Tuesday, June 11, 2019 9:40 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTNH544A CSC PO

A signature is required for package delivery

You have a package coming.

Scheduled Delivery Date: Wednesday, 06/12/2019

Sign Now

Change Delivery | Manage Preferences | View Delivery Planner

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:	1ZV257424290901607
Ship To:	Ann Prindle 7 Surdan Mountain Road SHARON, CT 060692429 US

UPS Service:	UPS GROUND
Number of Packages:	1
Package Weight:	1.0 LBS
Scheduled Delivery:	06/12/2019
Signature Required:	A signature is required for package delivery
Reference Number 1:	CTNH544A CSC PO

 Download the UPS mobile app

UPS Privacy Notice

Help and Support Center

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Tuesday, June 11, 2019 9:40 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTNH544A CSC FS

You have a package coming.

Scheduled Delivery Date: Wednesday, 06/12/2019

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:	1ZV257424290597625
Ship To:	Brent Colley Town of Sharon 63 Main Street SHARON, CT 060692018 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/12/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTNH544A CSC FS

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Tuesday, June 11, 2019 9:40 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTNH544A CSC TO

You have a package coming.

Scheduled Delivery Date: Wednesday, 06/12/2019

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:	1ZV257424291547614
Ship To:	Dan Soule Litchfield County Dispatch Inc. 111 Water Street TORRINGTON, CT 067905321 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/12/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTNH544A CSC TO

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Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Tuesday, June 11, 2019 9:42 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTNH544A CSC ZO

You have a package coming.

Scheduled Delivery Date: Wednesday, 06/12/2019

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:	1ZV257424294651639
Ship To:	Barclay W. Prindle Town of Sharon 63 Main Street SHARON, CT 060692018 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/12/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTNH544A CSC ZO

Download the UPS mobile app

7 SURDAN MOUNTAIN RD

Location	7 SURDAN MOUNTAIN RD	**Mblu**	15/ 2/ / /
Acct#	00173200	**Owner**	PRINDLE ANN ADELE
Assessment	$438,000	**Appraisal**	$625,700
PID	1487	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$403,200	$222,500	$625,700
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$282,200	$155,800	$438,000

Owner of Record

Owner	PRINDLE ANN ADELE	**Sale Price**	$0
Co-Owner		**Certificate**	
		Book & Page	158/ 453
		Sale Date	04/19/2004

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
PRINDLE ANN ADELE	$0		158/ 453	04/19/2004
PRINDLE DARIEN R & ANN ADELE	$0		136/ 456	09/23/1999
PRINDLE DARIEN R & ANN ADELE	$115,000		132/ 861	08/03/1998
PRINDLE DARIEN	$0		98/ 458	10/19/1981

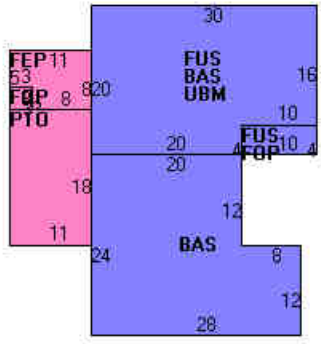
Building Information

Building 1 : Section 1

Year Built:	1952
Living Area:	1,736
Building Percent Good:	75
Replacement Cost Less Depreciation:	$154,000

Building Attributes	
Field	**Description**
Style	Conventional
Model	Residential
Grade:	C+
Stories:	2 Stories
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure:	Gable/Hip
Roof Cover	Asphalt Shngl.
Interior Wall 1	Drywall
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	Carpet
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	3 Bedrooms
Total Bthrms:	2
Total Half Baths:	0
Total Rooms:	7
Bath Style:	Average
Kitchen Style:	Average

Building Layout



(http://images.vgsi.com/photos/SharonCTPhotos//Sketches/1487

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,136	1,136
FUS	Upper Story, Finished	600	600
FEP	Enclosed Porch	79	0
FOP	Open Porch	49	0
PTO	Patio	198	0
UBM	Basement, Unfinished	560	0
		2,622	1,736

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	101
Description	Single Family
Zone	RR
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	9.6
Frontage	
Depth	
Assessed Value	$155,800
Appraised Value	$222,500

Outbuildings

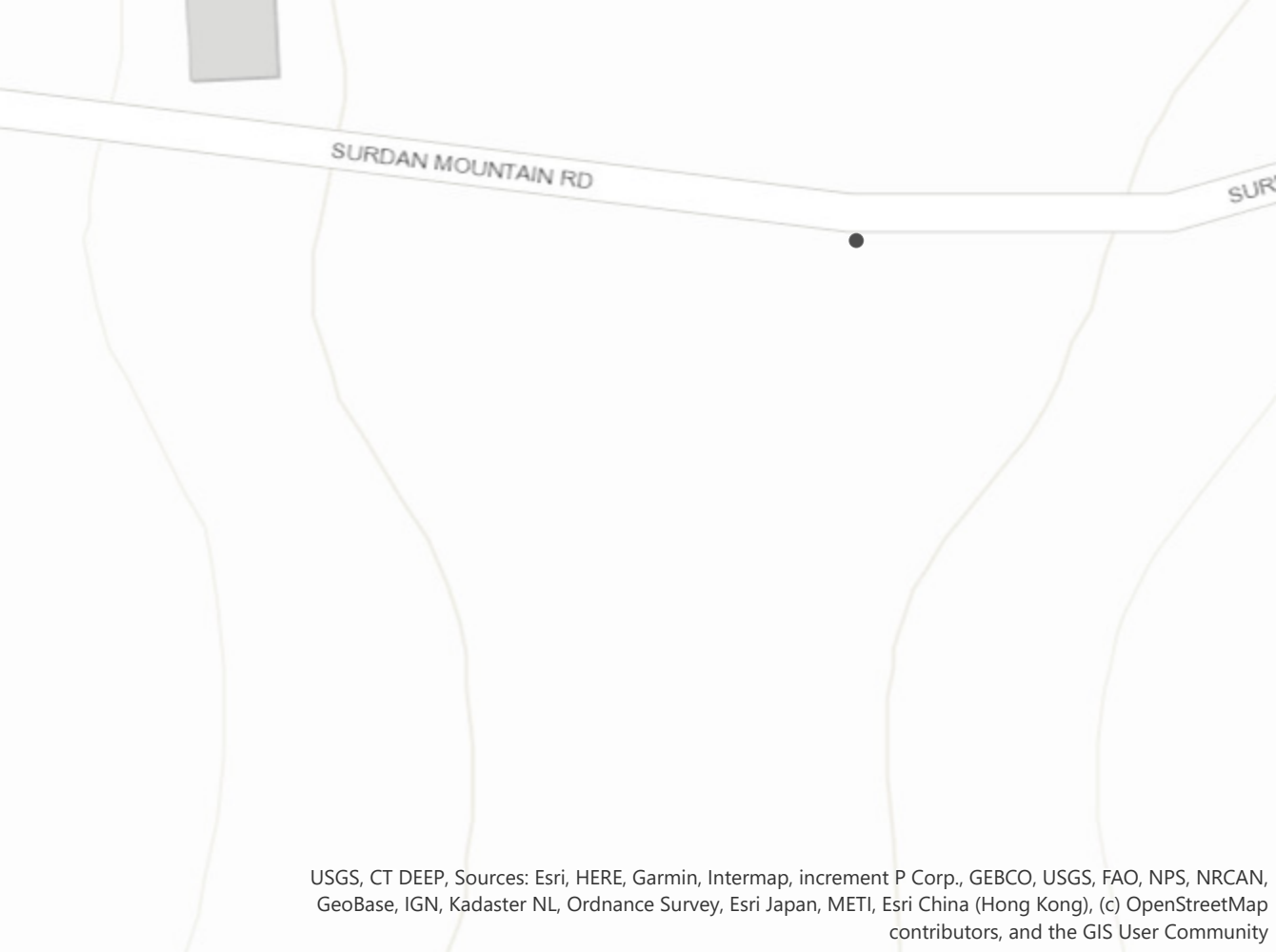
Outbuildings	Legend

Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
BRN1	Barn 1 St.			860 S.F.	$11,600	1
SHD1	Shed			100 S.F.	$1,400	1
GAR1	Garage w/Shop			1254 S.F.	$31,000	1
CELL	Cell Tower site			1 UNITS	$205,200	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$412,700	$264,700	$677,400
2016	$412,700	$264,700	$677,400

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$288,900	$185,300	$474,200
2016	$288,900	$185,300	$474,200



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

April 28, 2017

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

RE: **TS-T-MOBILE-125-170330** – T-Mobile Northeast LLC request for an order to approve tower sharing at an existing telecommunications facility located at 7 Surdan Mountain Road, Sharon, Connecticut.

Dear Ms Sabo:

At a public meeting held on April 27, 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 Northeast LLC 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 March 28, 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 March 28, 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 MAB

Robert Stein
Chairman

RS/RDM/lm

c: The Honorable Brent M. Colley, First Selectman, Town of Sharon
Barclay W. Prindle, Chm, Planning and Zoning Comm., Town of Sharon
Litchfield County Dispatch
Ann Adele Prindle, property owner

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

CTNH544A

SITE ID: CTNH544A

7 SURDAN MOUNTAIN ROAD

SHARON, CT 06069

T-MOBILE RF CONFIGURATION
67D07C_6102 MUAC

GENERAL NOTES

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

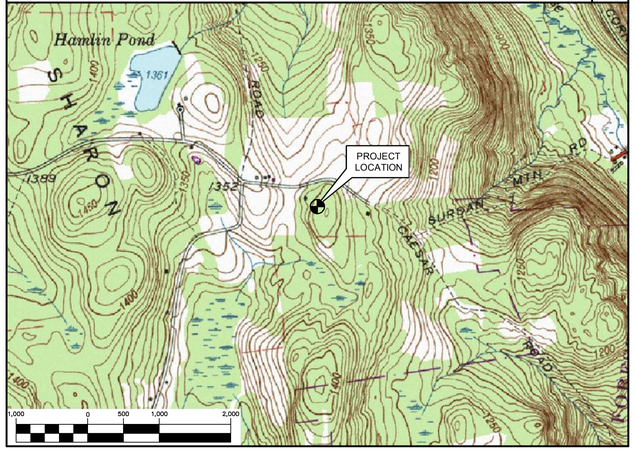
SITE DIRECTIONS

FROM: 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002 **TO:** 7 SURDAN MOUNTAIN RD, SHARON, CT 06069

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	0.30 MI.
2.	TAKE THE 1ST LEFT ONTO DAY HILL RD.TURN RIGHT ONTO TUNXIS AVE/CT-189	0.91 MI.
3.	TURN LEFT ONTO STATE HIGHWAY 187/CT-187/CT-189.	0.56 MI.
4.	MERGE ONTO CT-189 N TOWARD TARIFFVILLE/GRANBY.TURN RIGHT ONTO SALMON BROOK ST US-202.	5.23 MI.
5.	TURN SLIGHT LEFT ONTO N GRANBY RD/CT-20/CT-189.CONTINUE TO FOLLOW CT-20	3.65 MI.
6.	TURN LEFT ONTO BARKHAMSTED RD/CT-219.CONTINUE TO FOLLOW CT-219	3.78 MI.
7.	TURN LEFT ONTO E HARTLAND RD/CT-179/CT-219.CONTINUE TO FOLLOW HARTLAND RD	2.53 MI.
8.	TURN SLIGHT RIGHT ONTO SAVILLE DAM RD/CT-318.TURN LEFT ONTO PLEASENT VALLEY RD	3.15 MI.
9.	TURN RIGHT ONTO NEW HARTFORD RD/US-44W.CONTINUE TO FOLLOW US-44 W	3.15 MI.
10.	MERGE ONTOT CT-8 S TOWARD WATERBURY/TORRINGTON.TAKE EXIT 44, DTWN TORRINGTON US-202	8.24 MI.
11.	TURN SLIGHT RIGHT ONTO E ELM ST/CT-4.CONTINUE TO FOLLOW CT-4 THROUGH 1 ROUNDABOUT.	0.17 MI.
12.	TURN RIGHT ONTO SHARON TURNPIKE/CT-4.CONTINUE TO FOLLOW CT-4	5.28 MI.
13.	TURN LEFT ONTO CEMTERY HILL RD/CT-4.CONTINUE TO FOLLOW CT-4 BECOMES RT7/US-7 N.	4.69 MI.
14.	TURN LEFT ONTO CORNWALL BRIDGE RD/CT-4.	1.36 MI.
15.	TURN RIGHT ONTO EAST ST.TURN RIGHT ONTO SURDAN MOUNTAIN RD	3.23 MI.
16.	7 SURDAN MOUNTAIN RD, SHARON, CT 06069-2429. 7 SURDAN MOUNTAIN RD IS ON THE RIGHT	

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. REMOVE (3) EXISTING RRU'S, TYP. (1) PER SECTOR
   C. INSTALL (3) PROPOSED ANTENNAS, TYP. (1) PER SECTOR
   D. INSTALL (3) PROPOSED RRUS, TYP. (1) PER SECTOR
   E. INSTALL NEW 125 BREAKER
   F. INSTALL (1) NEW 6x12 HYBRID CABLE
   G. SWAP (1) EXISTING DUS41 WITH (1) BB 6630 AND ADD (1) ADDITIONAL BB 6630 (N600 DARK)

PROJECT INFORMATION

SITE NAME:	CTNH544A
SITE ID:	CTNH544A
SITE ADDRESS:	7 SURDAN MOUNTAIN ROAD SHARON, CT 06069
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°-51'-43.38" N LONGITUDE: 73°-23'-58.657" W GROUND ELEVATION: 1369'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	DESIGN BASIS AND SITE NOTES	0
C-1	SITE LOCATION PLAN	0
C-2	COMPOUND PLAN AND ELEVATION	0
C-3	ANTENNA MOUNTING AND ELEVATION	0
E-1	TYPICAL ELECTRICAL DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	05/30/19	RTS	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT · ENGINEER · PROFESSIONAL

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

CTNH544A

SITE ID: CTNH544A

7 SURDAN MOUNTAIN ROAD

SHARON, CT 06069

DATE: 04/09/19

SCALE: AS NOTED

JOB NO. 19027.16

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:

- WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 90-100 MPH (3 SECOND GUST)
- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 89 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10) PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

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

STRUCTURAL STEEL

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

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

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	05/30/19	RTS	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
CTNH544A
SITE ID: CTNH544A
7 SURDAN MOUNTAIN ROAD
SHARON, CT 06069

DATE:	04/09/19
SCALE:	AS NOTED
JOB NO.	19027.16

DESIGN BASIS AND SITE NOTES

N-1

Sheet No. 2 of 6

1 / C-1 **SITE LOCATION PLAN**
SCALE: 1" = 50'

APPROX. NORTH

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

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SCALE: AS NOTED
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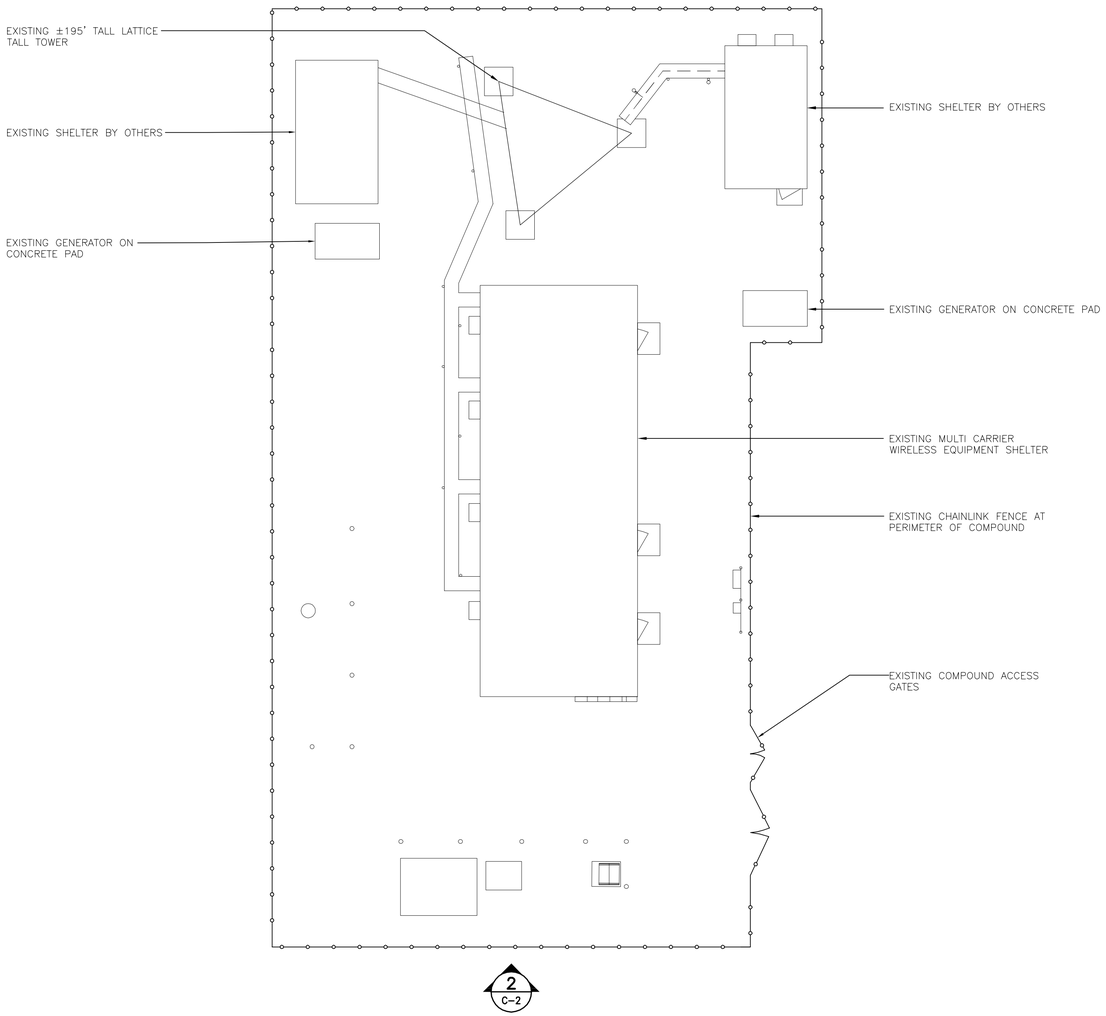
SITE LOCATION PLAN

C-1

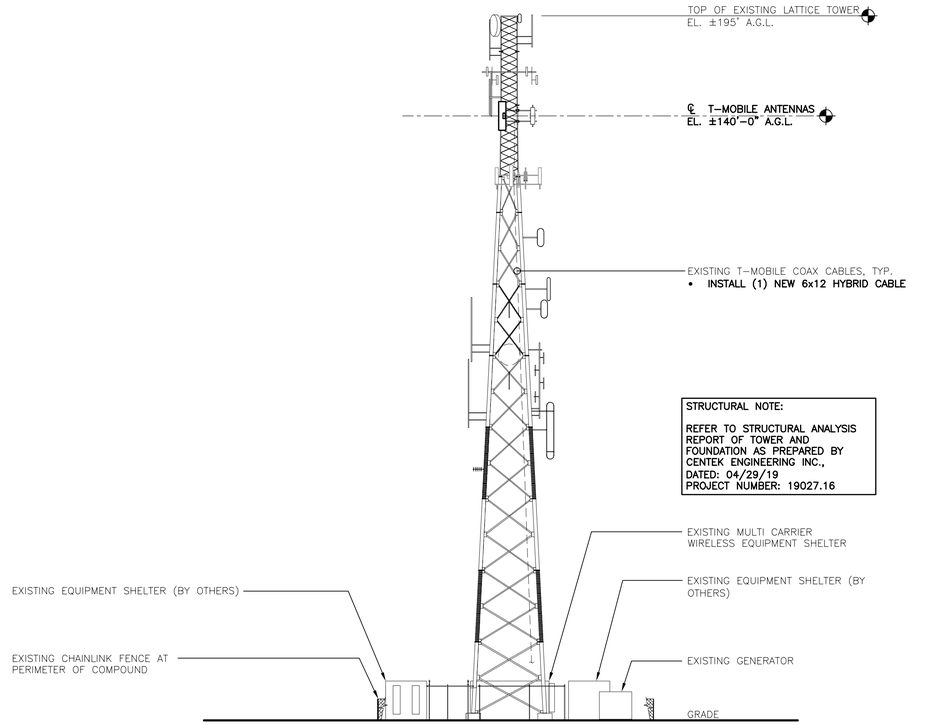
Sheet No. 3 of 6



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

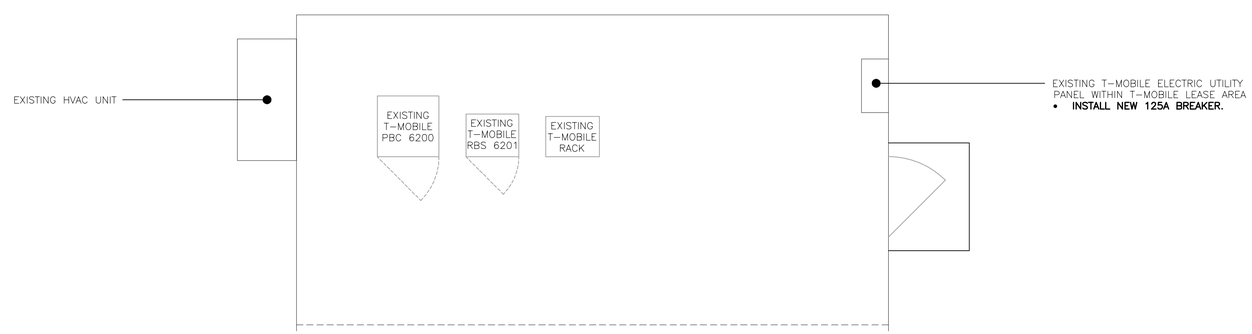
TRUE NORTH

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



2 C-2 **NORTH TOWER ELEVATION - PROPOSED**
SCALE: 1" = 20'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.



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

TRUE NORTH

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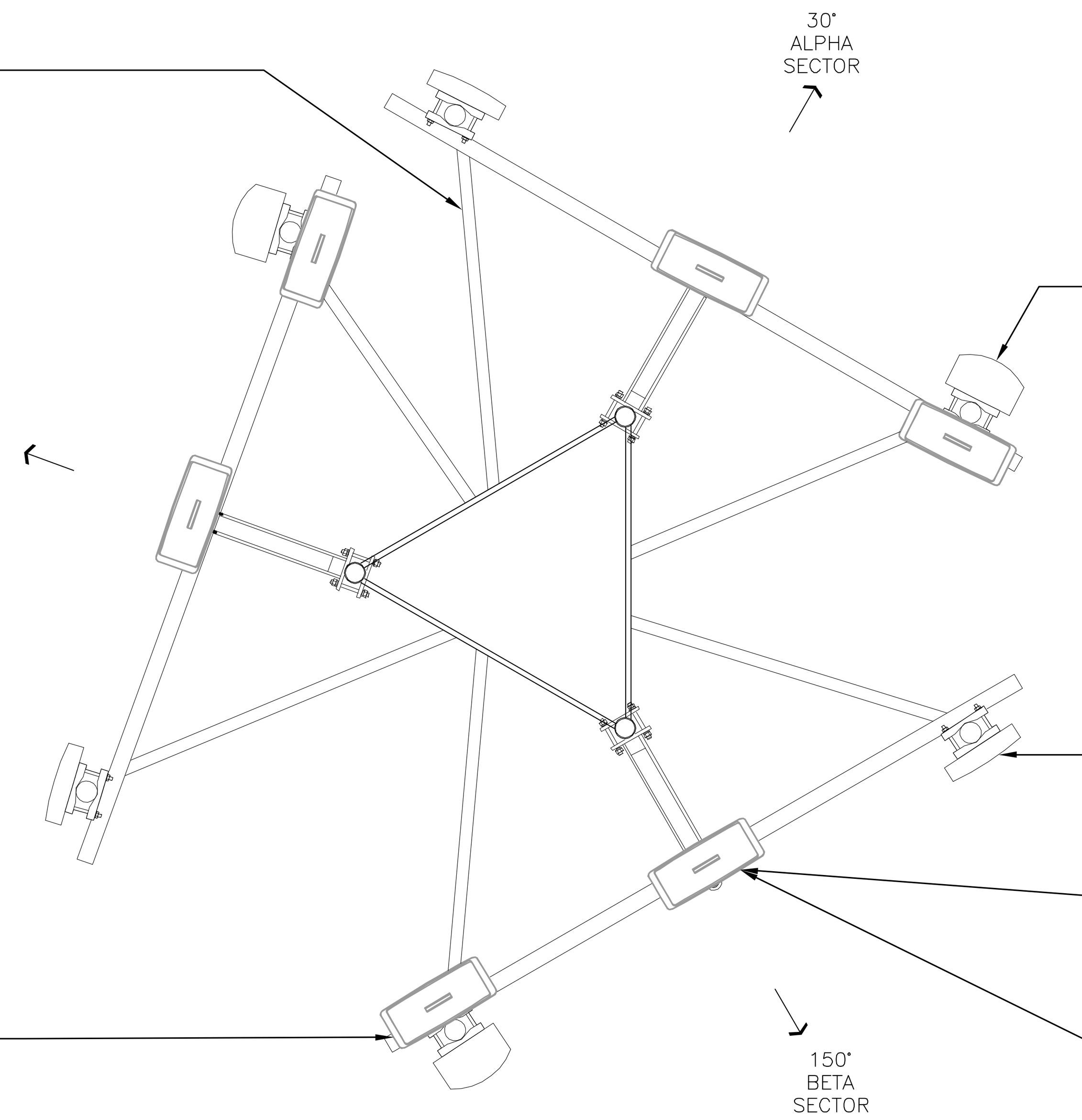
COMPOUND PLAN, AND ELEVATION

C-2

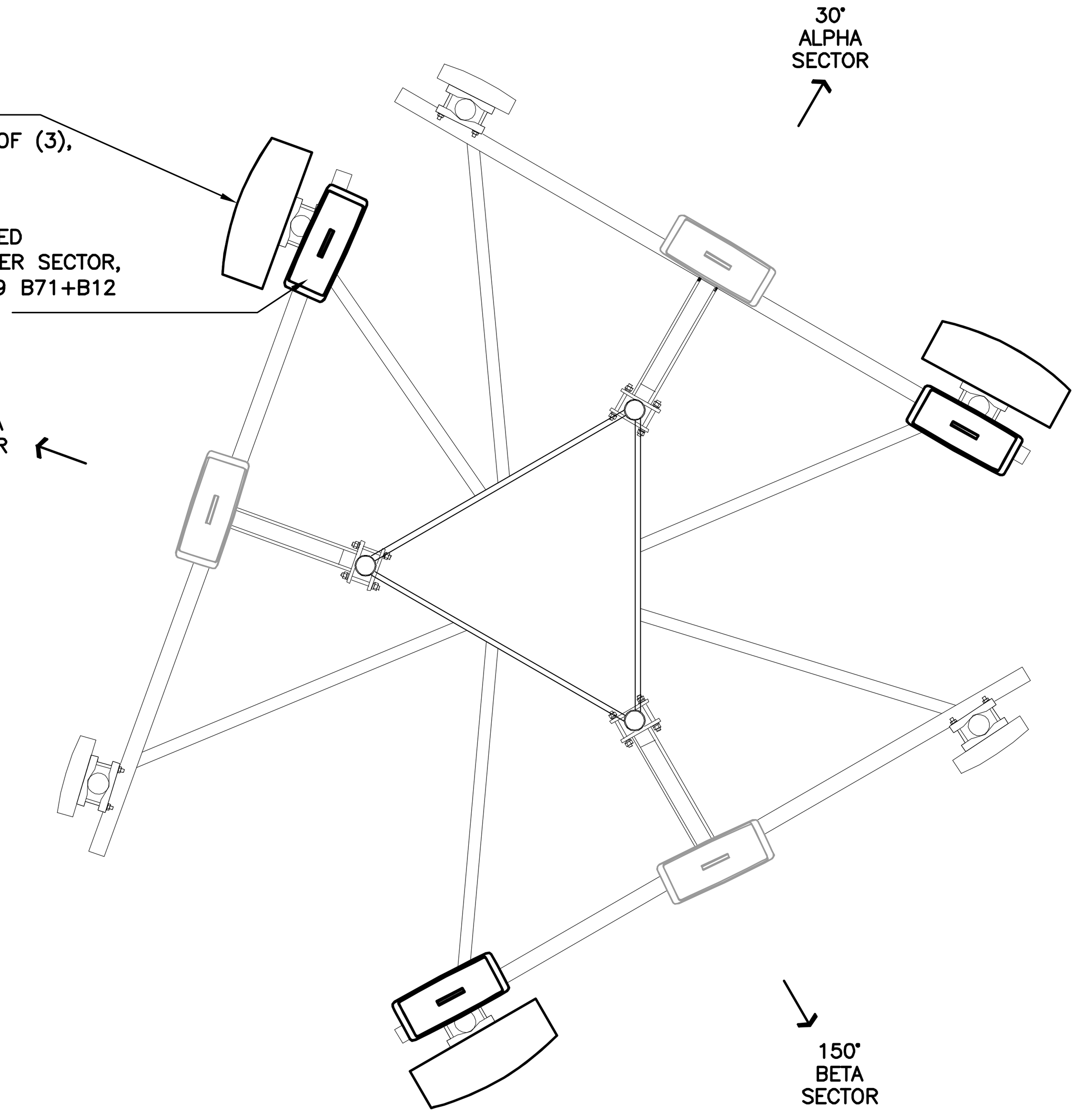
Sheet No. 4 of 6

T-MOBILE RAN TEMPLATE:
67D07C 6102 MUAC

T-MOBILE RF CONFIGURATION:
67D07C_1QP+1OP

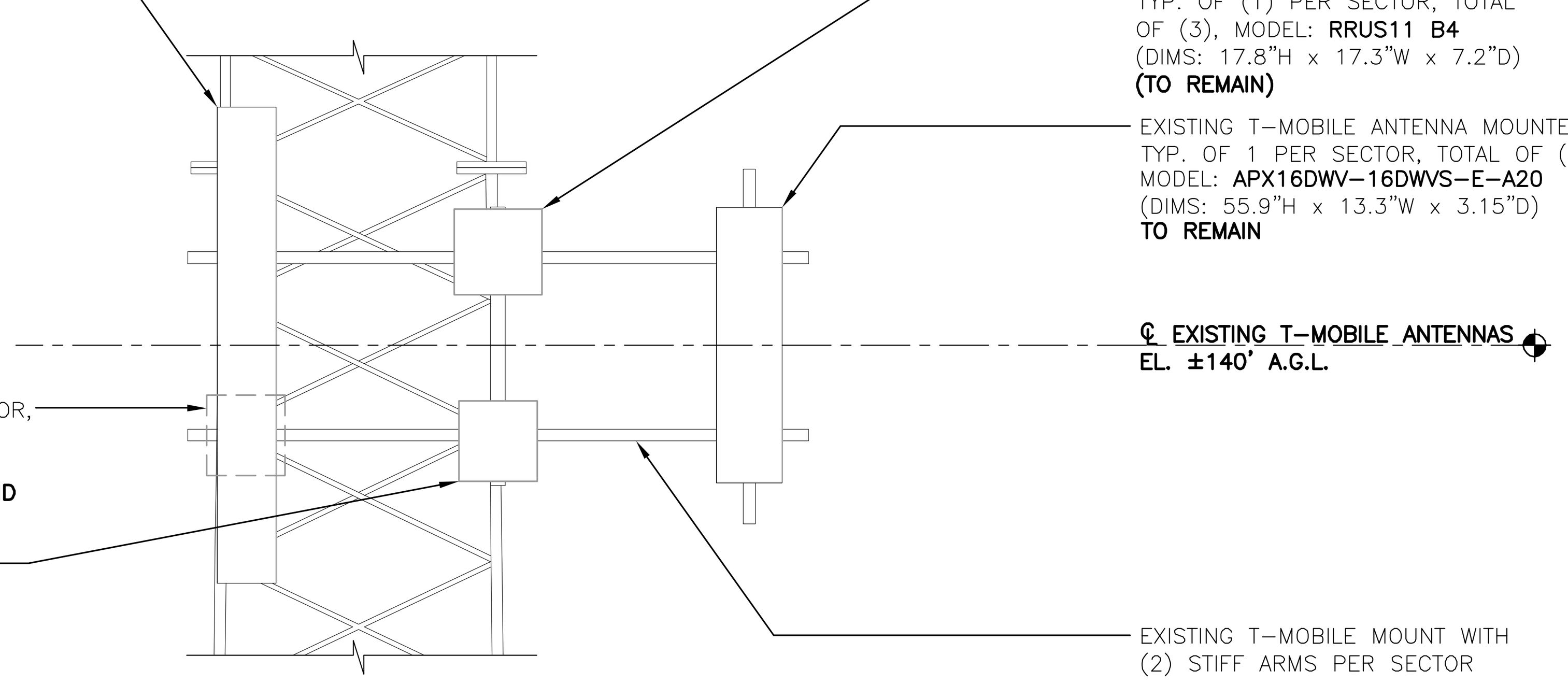


1 / C-3 **EXISTING ANTENNA MOUNTING CONFIGURATION**
SCALE: 1/2" = 1' — 140' ELEVATION

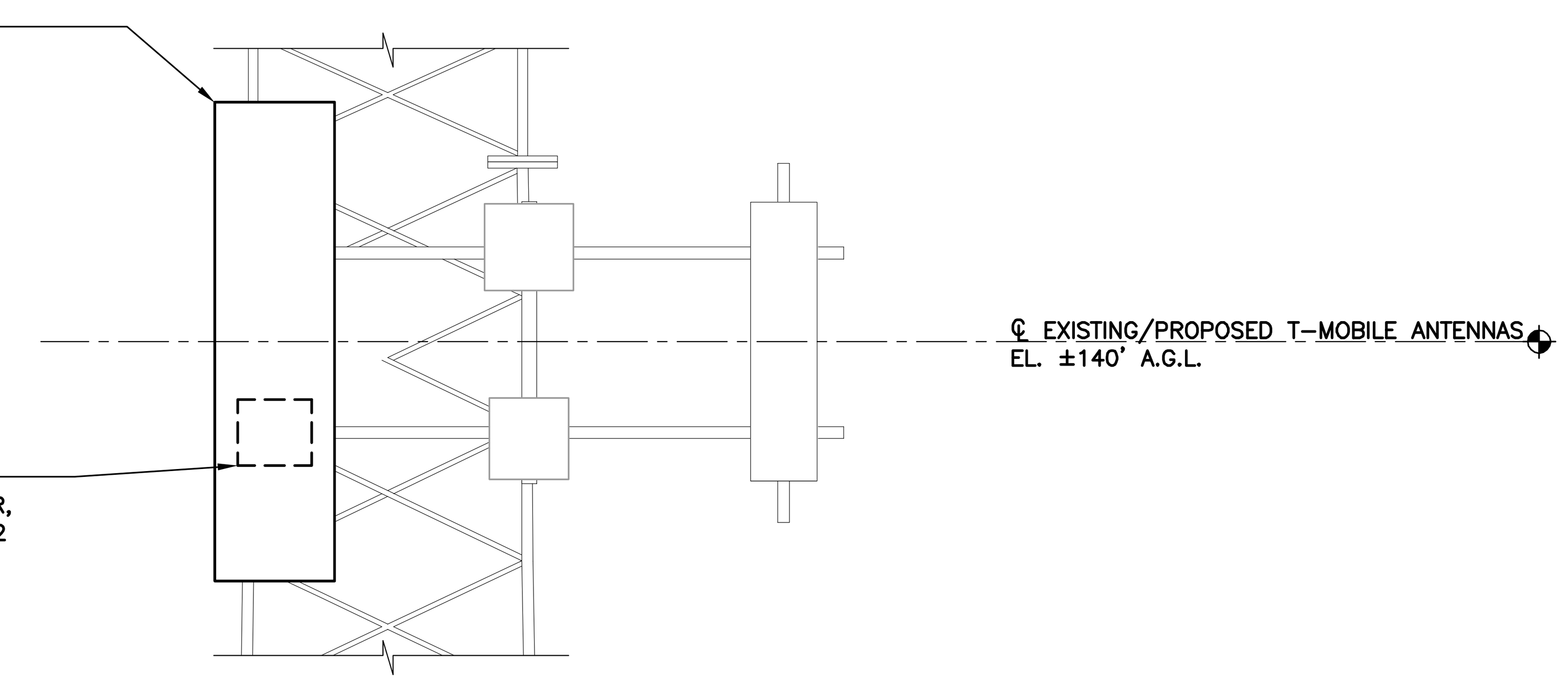


2 / C-3 **PROPOSED ANTENNA MOUNTING CONFIGURATION**
SCALE: 1/2" = 1' — 140' ELEVATION

ADDITIONAL ANTENNA MAST NOTE:
REPLACE EXISTING PIPE MAST WITH 2" STD (O.D = 2.375") x 9'-0" LONG PIPE @ RFS APXVAARR24_43-U-NA20



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



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

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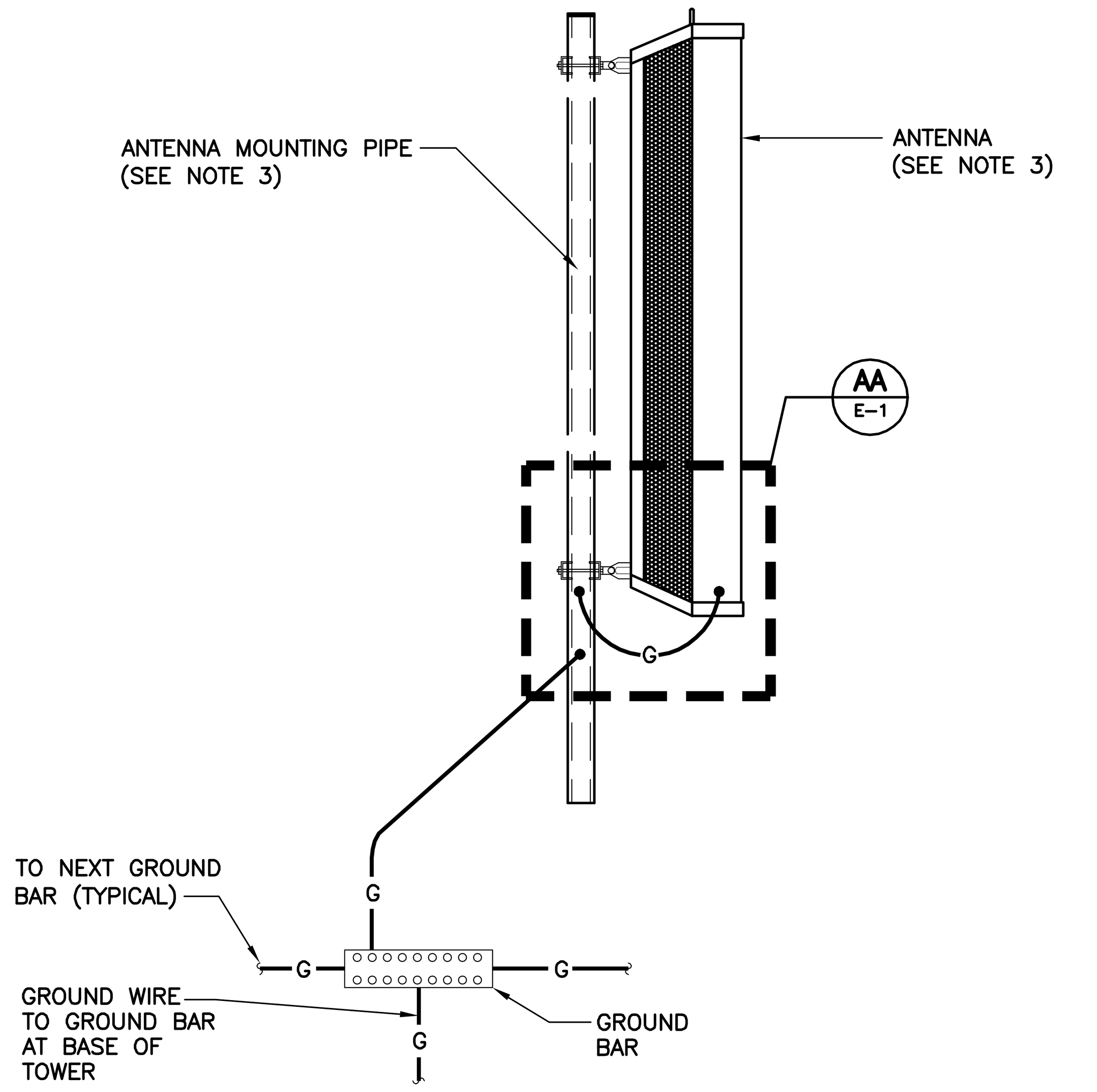
ANTENNA MOUNTING AND ELEVATION

C-3

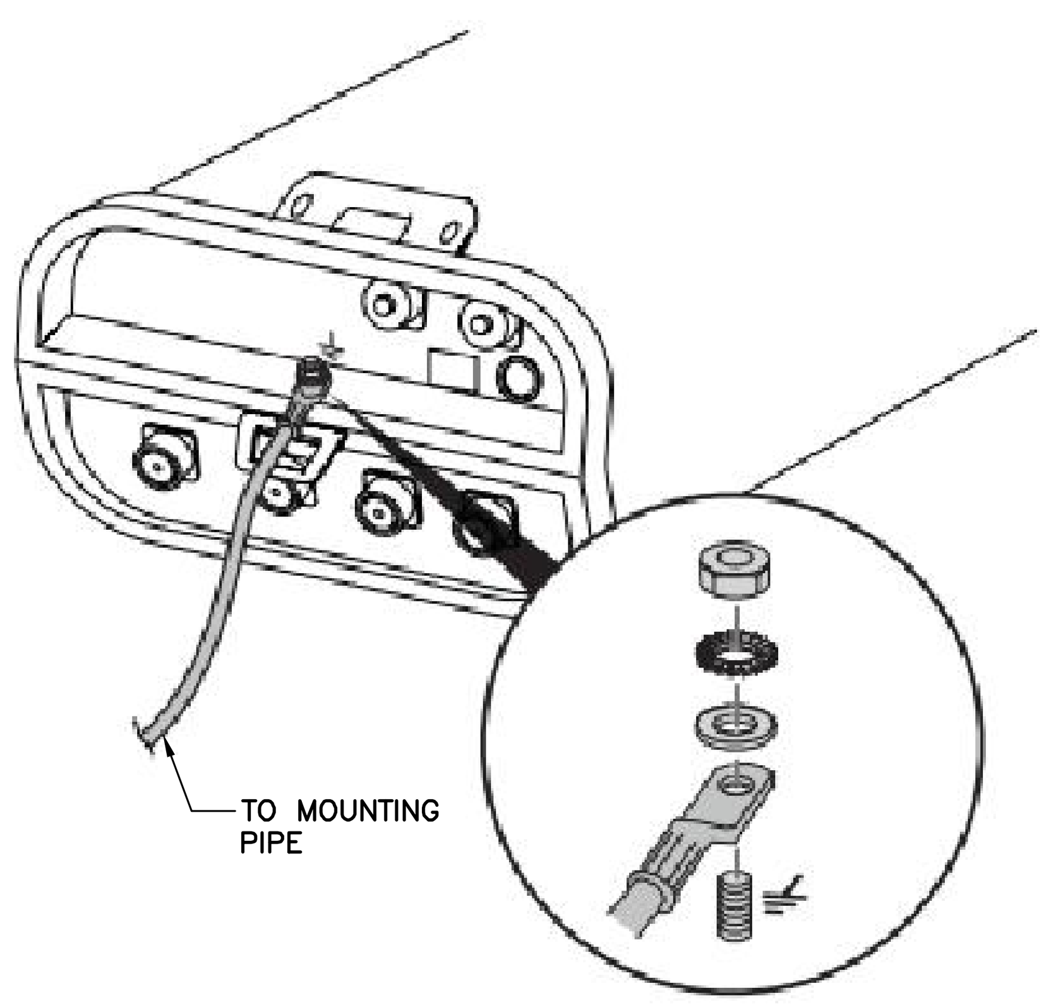
Sheet No. 5 of 6



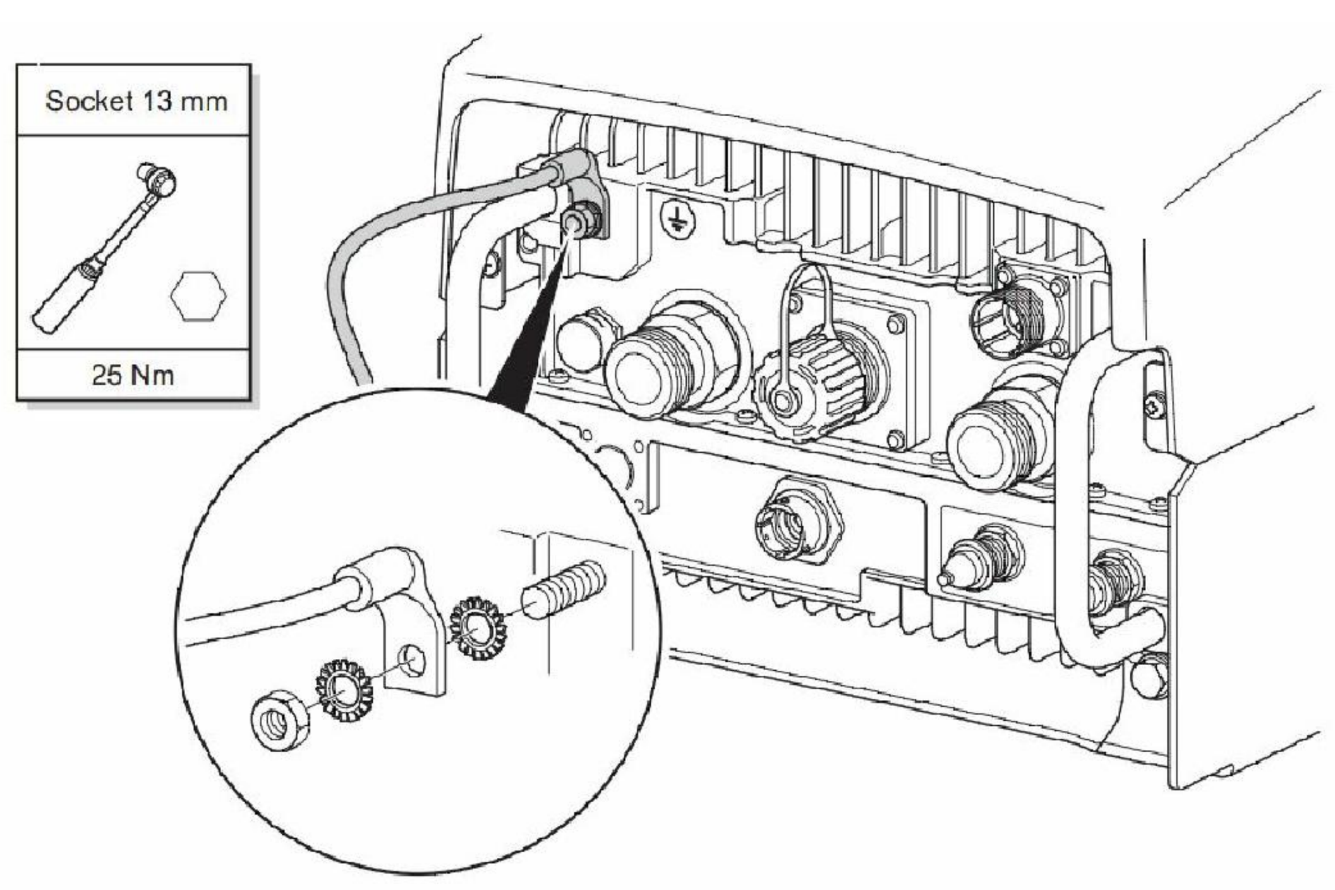
NOTES:

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.

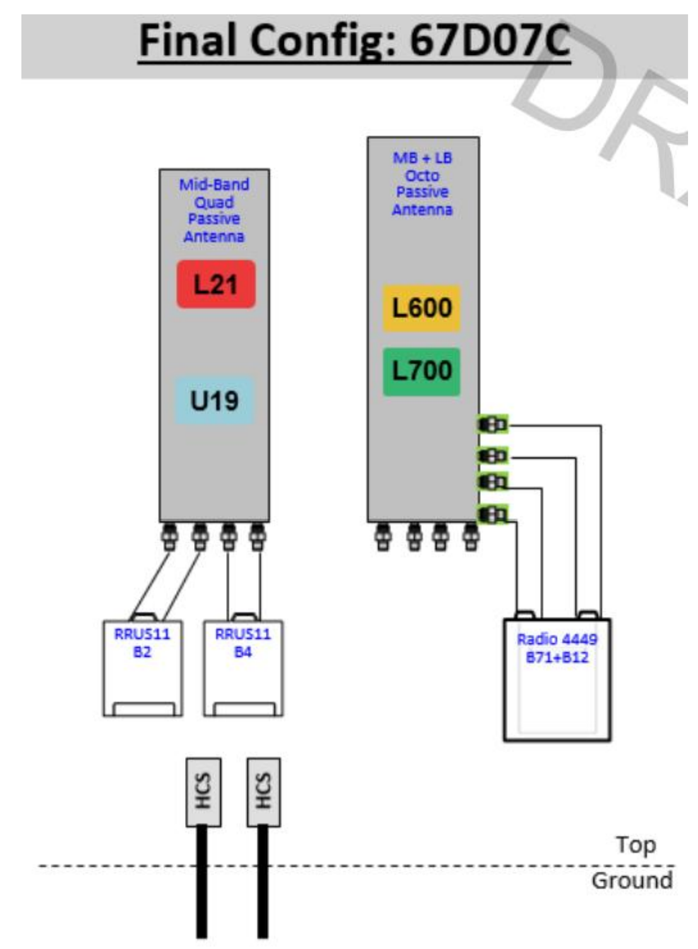
1 (E-1) TYPICAL ANTENNA GROUNDING DETAIL
SCALE: NONE



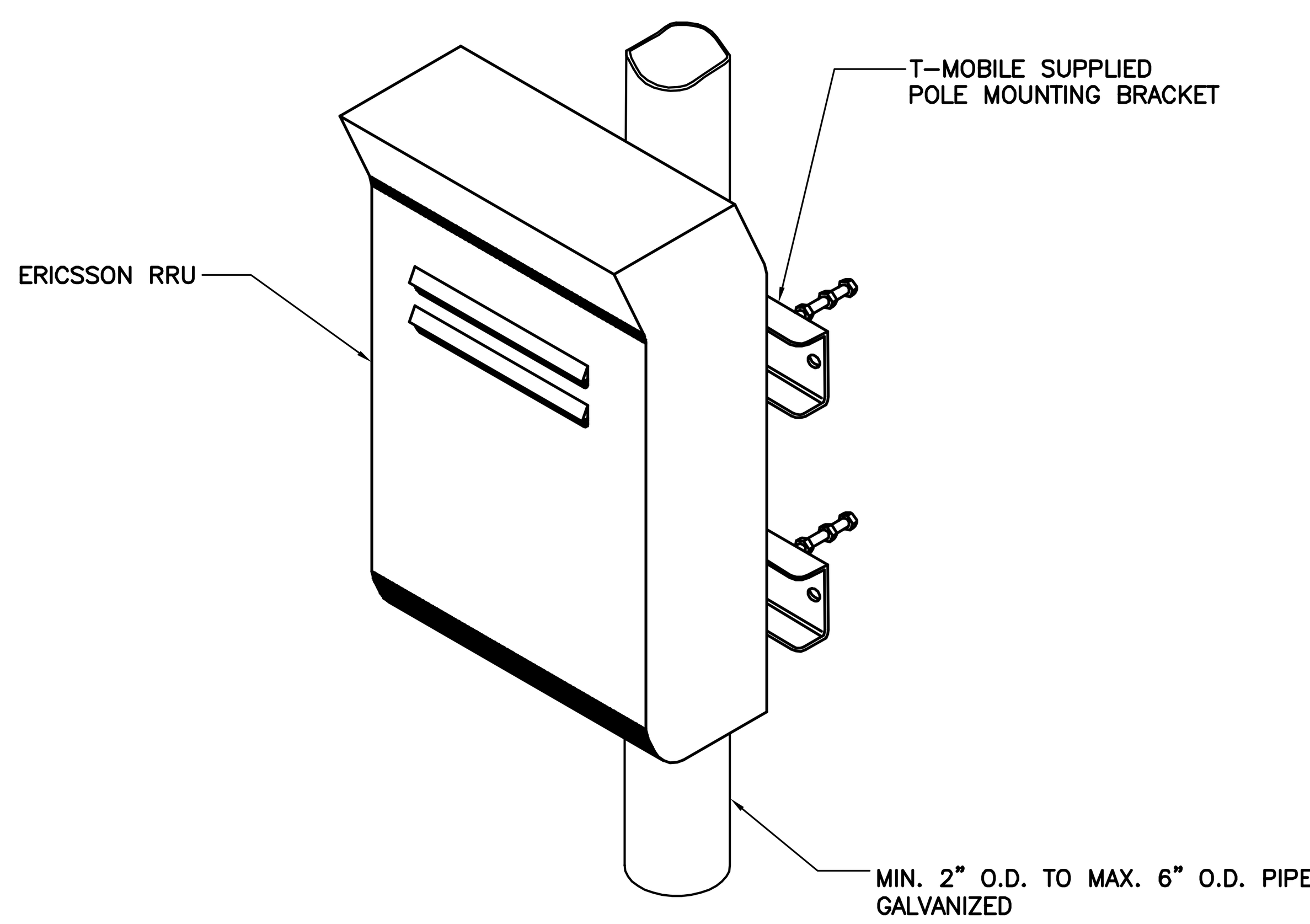
AA (E-1) TYPICAL ANTENNA GROUNDING DETAIL
SCALE: NONE



2 (E-1) TYPICAL RRU GROUNDING DETAIL
NOT TO SCALE



3 (E-1) PROPOSED PLUMBING DIAGRAM
SCALE: NONE



ISOMETRIC VIEW

NOTES:

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

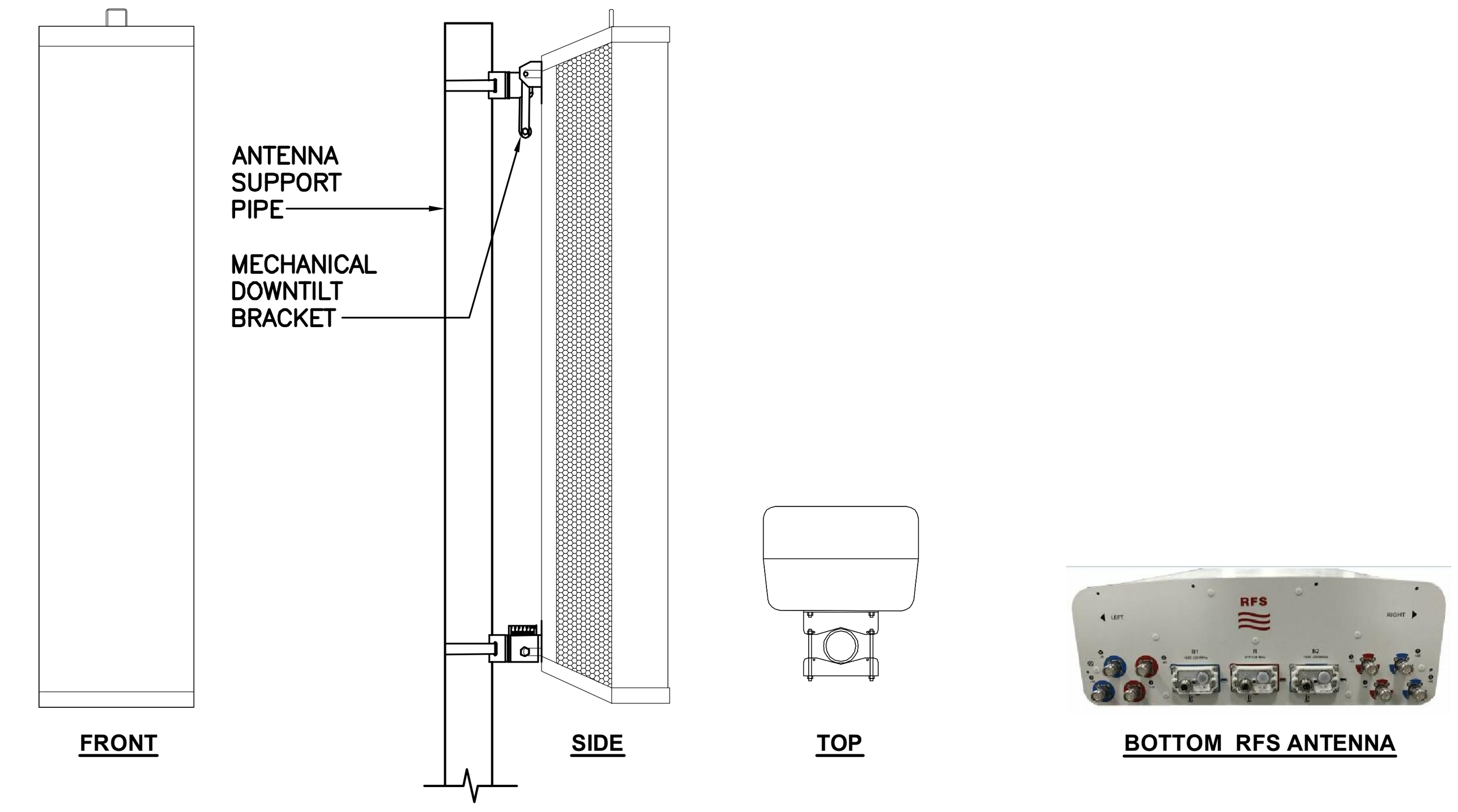
4 (E-1) TYPICAL RRUS MOUNTING DETAILS
SCALE: NOT TO SCALE

ISOMETRIC VIEW

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

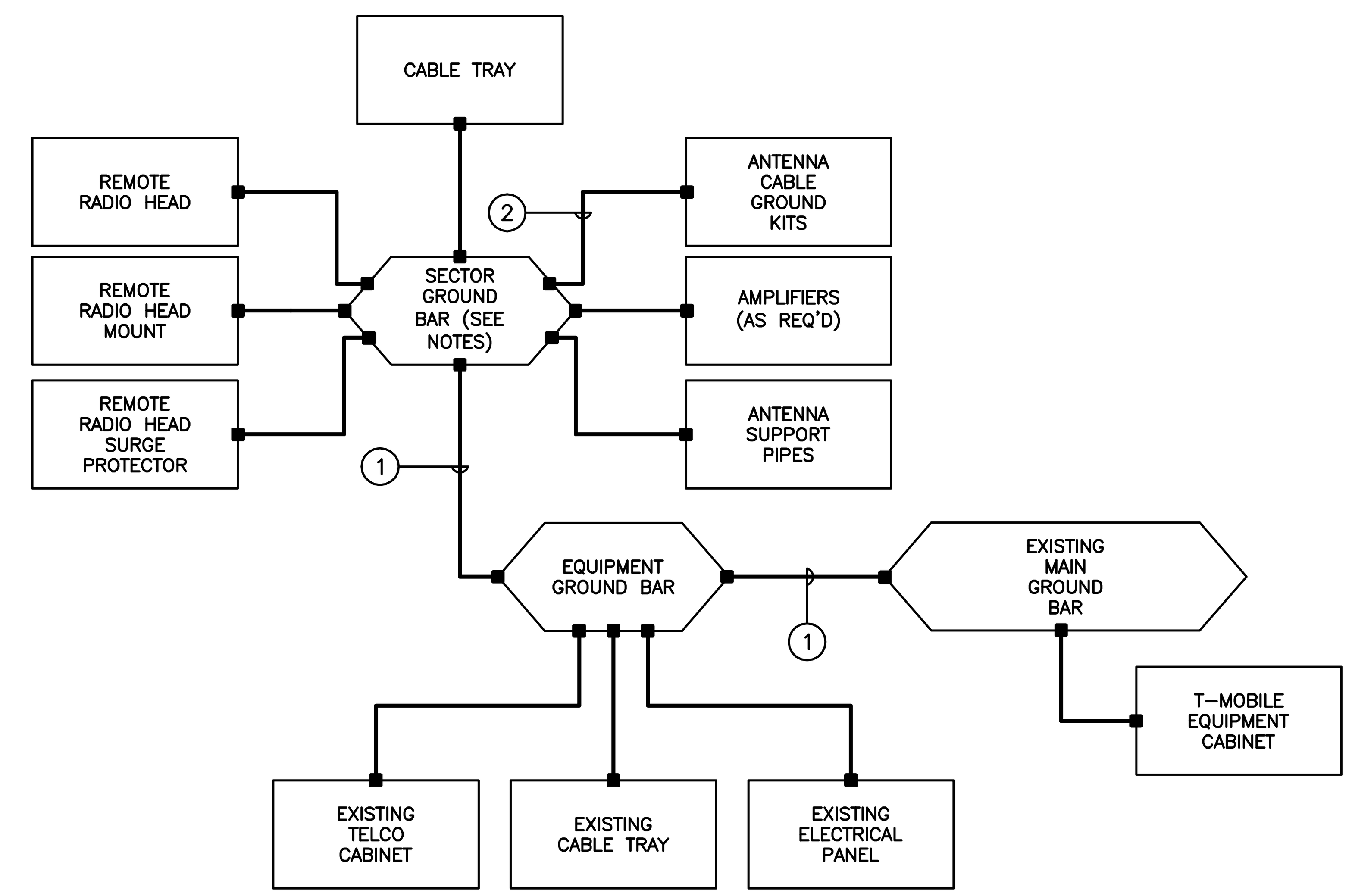
NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 (E-1) PROPOSED RRU DETAIL
SCALE: NONE



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

6 (E-1) PROPOSED ANTENNA DETAIL
SCALE: NONE



GROUNDING SCHEMATIC NOTES

(1) #2 AWG

(2) #6 AWG

GENERAL NOTES:

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

7 (E-1) TYPICAL GROUNDING SCHEMATIC DETAIL
SCALE: NOT TO SCALE

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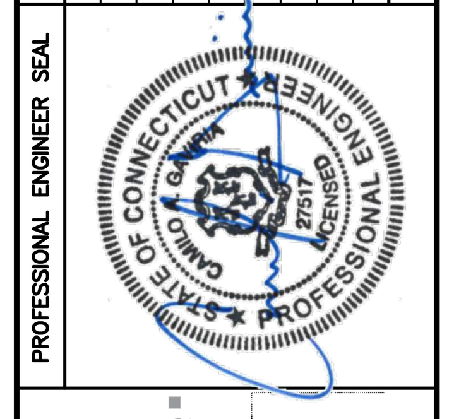

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TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 6 of 6

CENTEK engineering

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Structural Analysis Report

195-ft Existing Valmont Lattice Tower

Proposed T-Mobile
Antenna Upgrade

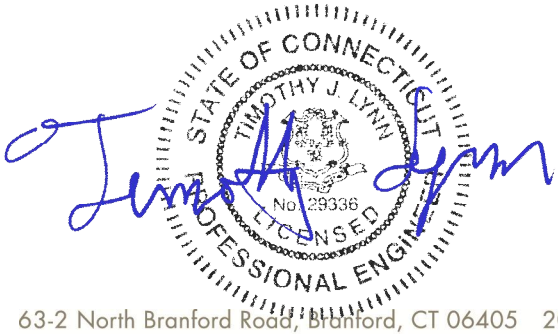
T-Mobile Site Ref: CTNH544A

7 Surdan Mountain Road
Sharon, CT

CENTEK Project No. 19027.16

~~Date: April 24, 2019~~
Rev 1: April 29, 2019

Max Stress Ratio = 86.7%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna modification proposed by the T-Mobile on the existing lattice tower located in Sharon, Connecticut.

The host tower is a 195-ft, three legged, steel lattice tower originally designed and manufactured by PiROD Inc., Job No. A-115074, signed and sealed 10/14/1998. The tower geometry and structure member sizes were taken from a combination of the original design documents and a previous structural analysis prepared by Centek project no. 17154.00 dated October 12, 2017.

Antenna and appurtenance information were obtained from the aforementioned structural analysis report and information provided by T-Mobile.

The tower consists of eleven (11) vertical sections consisting of solid round/truss legs conforming to ASTM A572 Gr. 50. Horizontal and diagonal lateral support bracing consists of steel angle and solid round construction conforming to ASTM A572-50 and ASTM A36. The vertical tower sections are connected by bolted flange plates while the legs and bracing are connected by bolted and welded gusset connections. The tower face width is 4.50-ft at the top and 20.00-ft at the bottom.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- Unknown (Existing):
  Antennas: One (1) single dipole antenna leg mounted with a RAD center elevation of ±196.26-ft above grade level.
  Coax Cable: One (1) 7/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Equipment: One (1) vacant 6-ft PiROD Rigid Side arm face mounted to the existing tower with a RAD center elevation of ±196-ft above grade level.
- CSP (Existing):
  Antennas: One (1) RFS PA6-65AC Microwave dish and one (1) 6ft x 4in. pipe mount leg mounted with a RAD center elevation of ±194.25-ft above grade level.
  Coax Cable: One (1) WE-65 elliptical coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antennas: One (1) 9-ft Omni-directional whip antenna mounted on one (1) existing 4-ft side arm with a RAD center elevation of 192.75-ft above grade level.
  Coax Cables: One (1) 1-5/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.

- Unknown (Existing):
  Antennas: (1) Kathrein OGT9-840N-ft Omni-directional whip antenna mounted on a low profile rotatable platform with a RAD center elevation of 190.25-ft above grade level.
  Coax Cables: One (1) 1-5/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antennas: One (1) DB222-A 2-Bay Dipole antenna mounted on an existing low profile rotatable platform with a RAD center elevation of 188.25-ft above grade level.
  Coax Cables: One (1) 7/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antennas: One (1) RFS PD220 Omni-directional whip antenna mounted on an existing 6-ft side arm with a RAD center elevation of ±182.25-ft above grade level.
  Coax Cable: One (1) 7/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- CSP (Existing):
  Antennas: Two (2) Sinclair SC479-HF1LDF antennas (inverted), one (1) Sinclair SE414-SWBP4LDF antenna and one (1) Bird 432E-83I-01T TTA mounted to an existing low profile rotatable platform with an elevation of 182-ft above grade level.
  Coax Cables: Two (2) 1-5/8" ∅ and one (1) 1/2" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antennas: One (1) BCD87077 Omni-directional whip antenna mounted on an existing 4-ft side arm with a RAD center elevation of ±181.50-ft above grade level.
  Coax Cable: One (1) 7/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antennas: One (1) DB222-A 2-Bay Dipole antenna (inverted) mounted to an existing 4-ft side arm (same as Omni @180.25-ft) with a RAD center elevation of ±180.25-ft above grade level.
  Coax Cables: One (1) 7/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antennas: One (1) 12-ft Omni-directional whip antenna (inverted) and one (1) 10-ft Omni-directional whip antenna (inverted) mounted on an existing low profile rotatable platform with respective RAD center elevations of 175.25-ft and 174.25-ft above grade level.
  Coax Cables: Two (2) 1-5/8" ∅ coax cables running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antennas: One (1) 12-ft Omni-directional whip antenna mounted on an existing 3-ft side arm with a RAD center elevation of 175.25-ft above grade level.
  Coax Cables: One (1) 7/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.

- Unknown (Existing):
  Antennas: One (1) Telewave ANT150D6-9, 4 bay dipole antenna (inverted) mounted on an existing low profile rotatable platform with a RAD center elevation of 173.75-ft above grade level.
  Coax Cables: One (1) 7/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Verizon (Existing):
  Antennas: Six (6) Antel LPA80080-4CF and six (6) Antel LPA LPA185080-8CF panel antennas mounted on three (3) existing 15-ft T-Frames with a RAD center elevation of ±167-ft above grade level.
  Coax Cable: Twelve (12) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- AT&T (Existing to Remain):
  Antenna: Six (6) Powerwave 7770 panel antennas, two (2) KMW AM-X-CD-16-65-00T panel antennas, one (1) Kathrein 800-10764 panel antenna, six (6) Powerwave LGP21401 TMAs, six (6) Powerwave LGP13519 Diplexers, six (6) Ericsson RRUS-11 remote radio heads and one (1) Raycap DC6-48-60-18-8F surge arrestor mounted on three (3) existing 12-ft T-Frames with a RAD center elevation of ±150.25-ft above grade level.
  Coax Cable: Twelve (12) 1-5/8" ∅ coax cables, one (1) fiber cable and two (2) dc control cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- NEU (Existing):
  Antennas: One (1) Sinclair SD210 single dipole antenna mounted to an existing PiROD 6-ft Rigid side arm with an elevation of ±135ft above grade level.
  Coax Cable: One (1) 7/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- NEU (Existing):
  Antennas: Two (2) Andrew DB586-Y Omni-directional whip antennas (one upright, one inverted) and one (1) TTA mounted to an existing PiROD 6-ft Rigid side arm with respective RAD center elevations of ±130ft and ±125ft above grade level.
  Coax Cable: Two (2) 7/8" ∅ coax cables running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Equipment: One (1) vacant 6-ft PiROD Rigid Side arm face mounted to the existing tower with a RAD center elevation of ±120.5-ft above grade level.
- Unknown (Existing):
  Antennas: One (1) DB212 Single Dipole antenna mounted to an existing PiROD 6-ft Rigid side arm with an elevation of ±120.67ft above grade level.
  Coax Cables: One (1) 7/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antennas: One (1) DB205-L Omni-directional whip antenna mounted to an existing PiROD 6-ft Rigid side arm with an elevation of ±109.25ft above grade level.
  Coax Cables: One (1) 7/8" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.

- CSP (Existing):
  Antennas: One (1) RFS PA6-65AC Microwave dish and one (1) 6ft x 4in. pipe mount leg mounted with a RAD center elevation of ±102.25-ft above grade level.
  Coax Cable: One (1) WE-65 elliptical coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antennas: One (1) DB224-A 4 Bay Dipole antenna mounted to an existing 2-ft side arm with a RAD center elevation of ±94-ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antennas: One (1) RFS PD220-2 Omni-directional whip antenna mounted to an existing PiROD 6-ft Rigid side arm with a RAD center elevation of ±90.41ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antennas: One (1) 12-ftx3in. ∅ Omni-directional whip antenna (inverted) mounted to an existing PiROD 6-ft Rigid side arm with a RAD center elevation of ±79.5ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- KB1AEV (Existing):
  Antennas: One (1) Andrew DB432-A Yagi antenna leg mounted with a RAD center elevation of ±70.25ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the leg/face of the existing tower as specified in Section 3 of this report.
- Verizon (Existing):
  Antennas: One (1) Channel Master 1.2M Dish antenna mounted on a side arm with a RAD center elevation of ±17-ft above grade level.
  Coax Cables: Two (2) 1/4" ∅ coax cables running on the leg/face of the existing tower as specified in Section 3 of this report.
- T-MOBILE (EXISTING TO REMAIN):
  Antennas: Three (3) RFS APX16DWV-16DWVS panel antennas and six (6) Ericsson RRUS-11 remote radio heads mounted on (3) 10-ft T-Frames with a RAD center elevation of 140-ft above grade level.
  Coax Cables: Two (2) 6x12 Hybrid cables running on a leg of the existing tower.
- T-MOBILE (EXISTING TO REMOVE):
  Antennas: Three (3) Andrew LNX-6515DS panel antennas and three (3) Ericsson RRUS-11 remote radio heads mounted on (3) 10-ft T-Frames with a RAD center elevation of 140-ft above grade level.
- **T-MOBILE (PROPOSED):**
  Antennas: Three (3) RFS APXVAARR24_43 panel antennas and three (3) Ericsson 4449 B71 B12 remote radio heads mounted on (3) 10-ft T-Frames with a RAD center elevation of 140-ft above grade level.
  Coax Cables: One (1) 6x12 fiber line running on a leg of the existing tower.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 1.00" radial ice on the tower structure and its components.

Basic Wind Speed:	Sharon; v = 89 mph (3 second gust)	*[Appendix N of the 2018 CT Building Code]*
Load Cases:	Load Case 1; 89 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; = 40 mph wind speed w/ 1.00" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2015 International Building Code as amended by the 2018 Connecticut State Building Code (CSBC).

Tower Capacity

- Calculated stresses were found to be within allowable limits. Per tnxTower "Section Capacity Table", this tower was found to be at **86.7%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T3)	152'-0"- 172'-0"	82.9%	**PASS**
Diagonal (T11)	2'-0"- 22'-0"	86.7%	**PASS**

Foundation and Anchors

The existing foundation consists of three (3) rock anchored reinforced concrete pad and piers bearing directly on existing sub grade. The sub-grade conditions used in the analysis of the existing foundation were obtained from a combination of the aforementioned manufacturers original design documents; PiROD Job No. A-115075 (foundation alternate #2) and a geo-technical soils study report prepared by Clarence Welti & Associates, Inc., dated March 03, 1998. The tower legs are connected to the foundation by means of six (6) 1.25"∅, ASTM 687 Grade 105 anchor bolts per leg, embedded ±6-ft into the concrete foundation structure.

- The tower reactions developed from the governing Load Case of the were used in the verification of the foundation and anchor bolts:

Leg Reactions	Vector	Proposed Tower Reactions
Leg	Shear	**44 kips**
	Compression	**431 kips**
	Uplift	**379 kips**
Base	Shear	**69 kips**
	Compression	**67 kips**
	Moment	**7075 kip-ft**

- The anchor bolts were found to be within allowable limits.

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	63.8%	**PASS**

- The foundation was found to be within allowable limits.

Foundation Type	Design Limit	Allowable Limit/FS	Proposed Loading	Result
Rock Anchored Pad and Pier (x3)	Ultimate Bearing Pressure	20.00 ksf	6.5 ksf	**PASS**
	Rock Mass Uplift Resistance	1.00 (1)	1.53	**PASS**

Note 1: Minimum required Factor of Safety (FS) of 1.0 required per TIA-222-G section 9.4

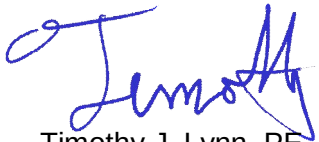
Conclusion

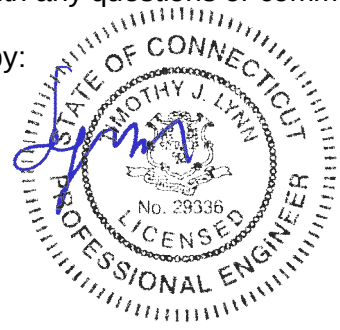
This analysis shows that the subject tower **is adequate** to support the proposed antenna configuration.

The analysis is based, in part, on the information provided to this office by T-Mobile. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:





Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

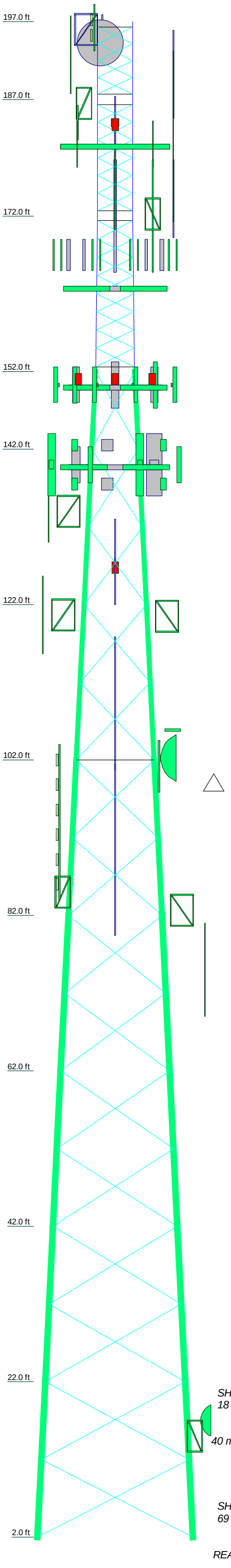
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly RISA Tower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Section	SR 1 3/4	SR 2	SR 2 1/4	Pirod 105245	Pirod 105217	Pirod 105218	Pirod 105218 reinf. w/1" dia. S.R.	Pirod 105219 reinf. w/1" dia. S.R.		Pirod 105220 reinf. w/1" dia. S.R.	
Legs	SR 7/8	SR 7/8	SR 1	L2 1/2x2 1/2x3/16	L3x3x3/16	L3x3x1/4	L3x3x3/16	L3x3x5/16	L3 1/2x3 1/2x1/4	L3 1/2x3 1/2x5/16	L4x4x1/4
Leg Grade	A572-50	A572-50	A572-50	A36	A572-50	A572-50	A572-50	A36	A572-50	A36	A572-50
Diagonals	L3x3x5/16	7 @ 2.27733	9 @ 2.344	5 @ 2.166							
Diagonal Grade	A572-50										
Top Girts	SR 1	SR 1	N.A.								
Bottom Girts	SR 7/8	SR 7/8									
Face Width (ft)	4.5	5	6	8	10	12	14	16	18	20	
# Panels @ (ft)	5 @ 2.166	7 @ 2.27733	9 @ 2.344		15 @ 10						
Weight (K)	0.6	0.9	1.6	1.3	2.5	3.2	4.2	5.5	5.6	6.4	6.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Single Dipole (Unknown)	196.26	Pirod 12' T-Frame Sector Mount (1) (ATI)	150.25
PIROD 6'-8" Rigid Side Arm (Vacant)	196	(2) 7770.00 (ATI)	150.25
6'x4" Pipe Mount (CSP)	194.92	(2) LGP21401 TMA (ATI)	150.25
PA6-65AC (CSP)	194.25	(2) LGP21401 TMA (ATI)	150.25
9' x 3" Dia Omni (Unknown)	192.75	(2) 7770.00 (ATI)	150.25
OGT9-840 (Unknown)	190.25	(2) 7770.00 (ATI)	150.25
Pirod 4' Side Mount Standoff (1) (Unknown)	186.5	APX16DWV-16DWVS-E-A20 (T-Mobile Existing)	140
DB222-A (Unknown)	185.25	APX16DWV-16DWVS-E-A20 (T-Mobile Existing)	140
SC479-HF1LDF (CSP (Inverted))	184	APX16DWV-16DWVS-E-A20 (T-Mobile Existing)	140
SC479-HF1LDF (CSP (Inverted))	184	APXVAARR24-43 (T-Mobile Proposed)	140
SE414-SWBP4LDF (D00) (CSP)	184	APXVAARR24-43 (T-Mobile Proposed)	140
TX/RX 432E-83I-01T (CSP)	184	APXVAARR24-43 (T-Mobile Proposed)	140
Filter Box (CSP)	183	RRUS-11 (T-Mobile Existing)	140
PD220 (Unknown)	182.25	RRUS-11 (T-Mobile Existing)	140
BCD-87077 (Pagenet)	181.5	RRUS-11 (T-Mobile Existing)	140
(4) 6'x2" Pipe Mount (Unknown)	181.25	RRUS-11 (T-Mobile Existing)	140
(4) 6'x2" Pipe Mount (Unknown)	181.25	RRUS-11 (T-Mobile Existing)	140
PiROD 15' Rotatable Platform (Lattice) (Unknown)	181.25	RRUS-11 (T-Mobile Existing)	140
(4) 6'x2" Pipe Mount (Unknown)	181.25	Radio 4449 B71 B12 (T-Mobile Proposed)	140
DB222-A (Unknown (Inverted))	180.25	Radio 4449 B71 B12 (T-Mobile Proposed)	140
12' x 3" Dia Omni (Unknown)	175.25	Radio 4449 B71 B12 (T-Mobile Proposed)	140
12' x 3" Dia Omni (Unknown (Inverted))	175.25	10-ft T-Frame (T-Mobile Existing)	140
Pirod 4' Side Mount Standoff (1) (Unknown)	174.25	10-ft T-Frame (T-Mobile Existing)	140
10' x 3" Dia Omni (Unknown (Inverted))	174.25	10-ft T-Frame (T-Mobile Existing)	140
ANT150D6-9 (Unknown (Inverted))	173.75	SRL110A (NEU)	135
Pirod 6' Side Mount Standoff (1) (Unknown)	172.25	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe (NEU)	134
3' Sidearm (Unknown)	170.2	DB586-Y (NEU)	130
LPA-185080-8CF_2 (Verizon)	167	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe (NEU)	126
LPA-185080/8CF_2 (Verizon)	167	Tower Top Amplifier (NEU)	126
LPA-80080-4CF (Verizon)	167	DB586-Y (NEU (Inverted))	125
LPA-80080-4CF (Verizon)	167	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe (Unknown)	120.67
LPA-185080-8CF_2 (Verizon)	167	DB212-1 (Unknown)	120.67
LPA-185080/8CF_2 (Verizon)	167	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe (Vacant)	120.5
LPA-80080-4CF (Verizon)	167	DB205-L (Unknown)	109.25
LPA-80080-4CF (Verizon)	167	Ice Canopy	106
LPA-80080-4CF (Verizon)	167	PA6-65AC (CSP)	102.25
LPA-185080/8CF_2 (Verizon)	167	6'8"x4" Pipe Mount (CSP)	101.2
PiROD 15' T-Frame (Verizon)	163	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe (Unknown)	100.83
PiROD 15' T-Frame (Verizon)	163	DB224 (Unknown)	94
PiROD 15' T-Frame (Verizon)	163	PD220 (Unknown)	90.41
(2) LGP21401 TMA (ATI)	150.25	2-ft Stand Off (Unknown)	85
(2) LGP13519 Diplexer (ATI)	150.25	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe (Unknown)	82.67
(2) LGP13519 Diplexer (ATI)	150.25	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe (Unknown)	79.5
(2) LGP13519 Diplexer (ATI)	150.25	12' x 3" Dia Omni (Unknown)	75
AM-X-CD-16-65-00T-RET(72") (ATI)	150.25	DB432-A (Unknown)	70.25
AM-X-CD-16-65-00T-RET(72") (ATI)	150.25	1.2M (Verizon)	17
800-10764 (ATI)	150.25	2-ft Stand Off (Unknown)	15
(2) RRUS-11 (ATI)	150.25		
(2) RRUS-11 (ATI)	150.25		
(2) RRUS-11 (ATI)	150.25		
DC6-48-60-18-8F Surge Arrestor (ATI)	150.25		
Pirod 12' T-Frame Sector Mount (1) (ATI)	150.25		
Pirod 12' T-Frame Sector Mount (1) (ATI)	150.25		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

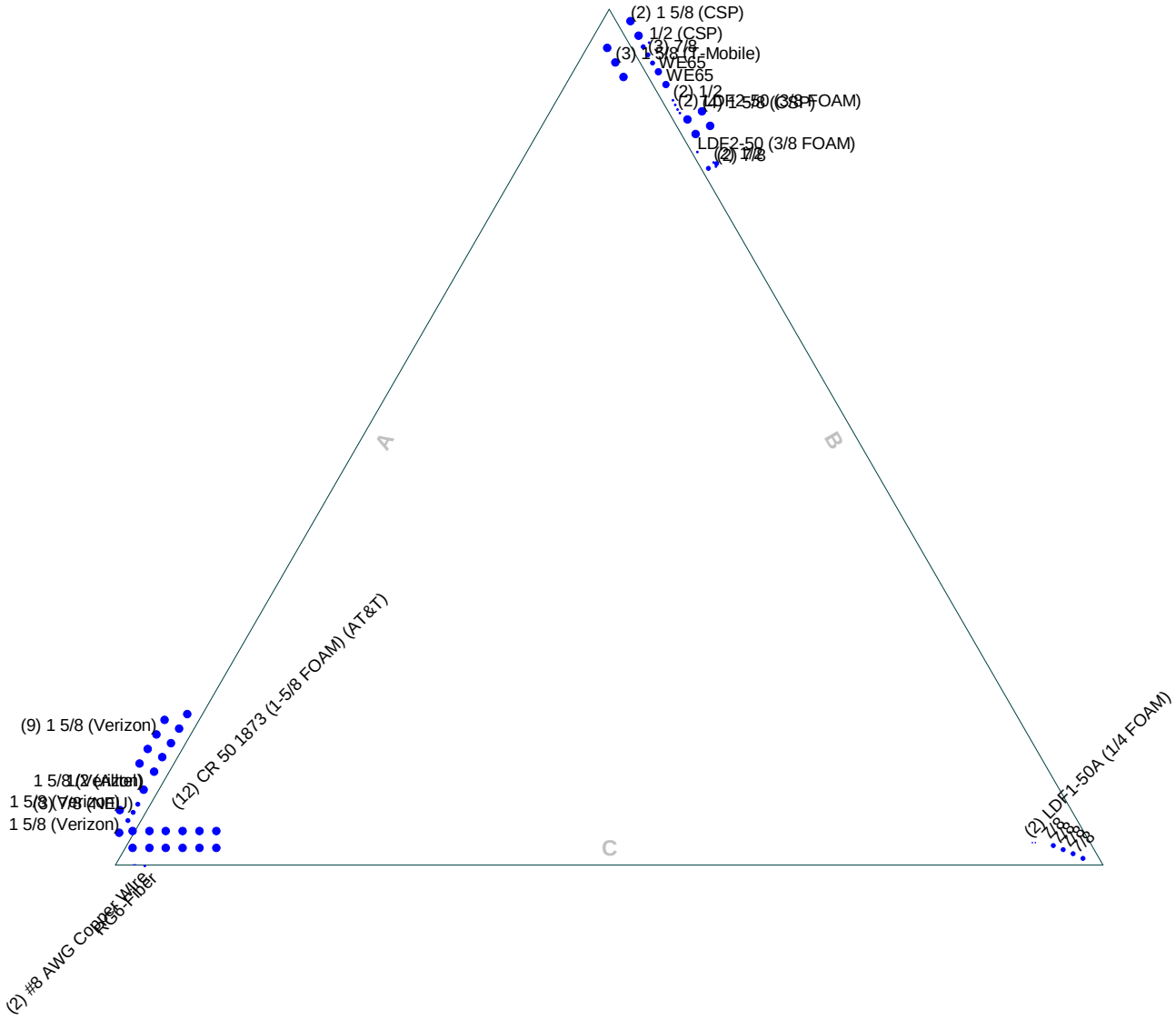
1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 89 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class III.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 86.7%

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **19027.16 - CTNH544A**		
Project: **7 Surdan Mountain Road, Sharon, CT**		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 04/24/19	Scale: NTS
Path:		Dwg No. E-1

Feed Line Plan

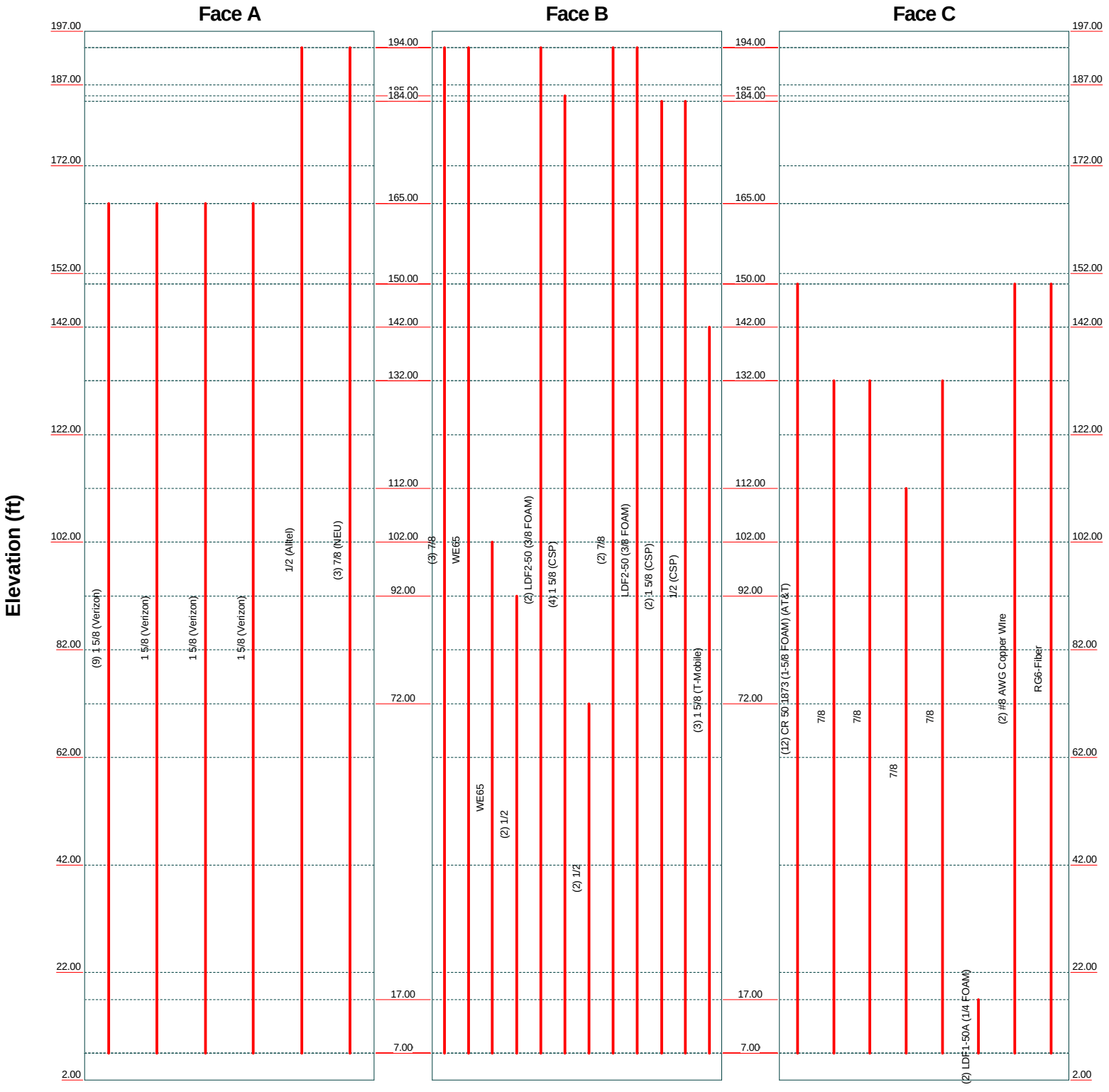
Round | Flat | App In Face | App Out Face | Truss-Leg



Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: ***19027.16 - CTNH544A***		
	Project: ***7 Surdan Mountain Road, Sharon, CT***		
	Client: T-Mobile	Drawn by: TJL	App'd:
	Code: TIA-222-G	Date: 04/24/19	Scale: NTS
	Path:		Dwg No. E-7

Feed Line Distribution Chart
2' - 197'

Round | Flat | App In Face | App Out Face | Truss Leg



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63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **19027.16 - CTNH544A**			
Project: ***7 Surdan Mountain Road, Sharon, CT***			
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 04/24/19	Scale: NTS	
Path:		Dwg No. E-7	

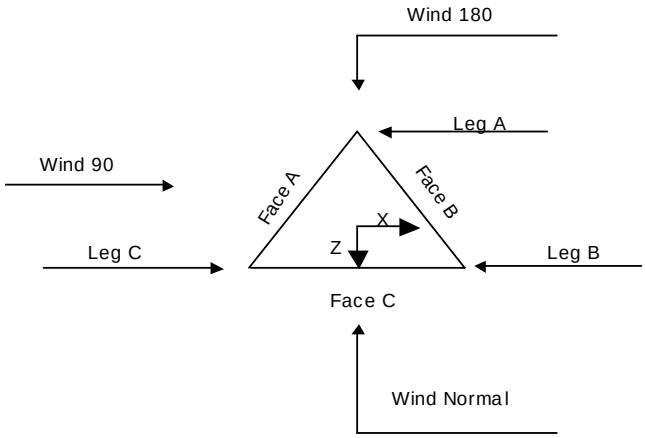
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 197.00 ft above the ground line.
The base of the tower is set at an elevation of 2.00 ft above the ground line.
The face width of the tower is 4.50 ft at the top and 20.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 89 mph.
Structure Class III.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in 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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	197.00-187.00		V4.5 111574	4.50	1	10.00
T2	187.00-172.00		V4.5 111574	4.50	1	15.00
T3	172.00-152.00		H5.0 116640	4.50	1	20.00
T4	152.00-142.00		U6.0 105245	5.00	1	10.00
T5	142.00-122.00		U8.0 105217	6.00	1	20.00
T6	122.00-102.00		U10.0 105217 L3x3/16	8.00	1	20.00
T7	102.00-82.00		U12.0 105218	10.00	1	20.00
T8	82.00-62.00		U14.0 105218	12.00	1	20.00
T9	62.00-42.00		U16.0 105219	14.00	1	20.00
T10	42.00-22.00		U18.0 105219	16.00	1	20.00
T11	22.00-2.00		U20.0 105219 L3.5x5/16	18.00	1	20.00

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	197.00-187.00	2.17	X Brace	No	Steps	8.0160	8.0160
T2	187.00-172.00	2.28	X Brace	No	Steps	8.0160	8.0160
T3	172.00-152.00	2.34	X Brace	No	Steps	7.4880	7.4880
T4	152.00-142.00	10.00	X Brace	No	No	0.0000	0.0000

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
T5	142.00-122.00	10.00	X Brace	No	No	0.0000	0.0000
T6	122.00-102.00	10.00	X Brace	No	No	0.0000	0.0000
T7	102.00-82.00	10.00	X Brace	No	Yes	0.0000	0.0000
T8	82.00-62.00	10.00	X Brace	No	No	0.0000	0.0000
T9	62.00-42.00	10.00	X Brace	No	Yes	0.0000	0.0000
T10	42.00-22.00	10.00	X Brace	No	No	0.0000	0.0000
T11	22.00-2.00	10.00	X Brace	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 197.00-187.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 187.00-172.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 172.00-152.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T4 152.00-142.00	Truss Leg	Pirod 105245	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 142.00-122.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A572-50 (50 ksi)
T6 122.00-102.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T7 102.00-82.00	Truss Leg	Pirod 105218 reinf. w/1" dia. S.R.	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T8 82.00-62.00	Truss Leg	Pirod 105219 reinf. w/1" dia. S.R.	A572-50 (50 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T9 62.00-42.00	Truss Leg	Pirod 105219 reinf. w/1" dia. S.R.	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 42.00-22.00	Truss Leg	Pirod 105220 reinf. w/1" dia. S.R.	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T11 22.00-2.00	Truss Leg	Pirod 105220 reinf. w/1" dia. S.R.	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A572-50 (50 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 197.00-187.00	Single Angle	L3x3x5/16	A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 187.00-172.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 172.00-152.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T7 102.00-82.00	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		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 197.00-187.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000	36.0000
T2 187.00-172.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000	36.0000
T3 172.00-152.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000	36.0000
T4 152.00-142.00	1.78	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 142.00-122.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000	36.0000
T6 122.00-102.00	3.22	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 102.00-82.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000	36.0000
T8 82.00-62.00	3.22	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 62.00-42.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000	36.0000
T10 42.00-22.00	3.22	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T11 22.00-2.00	3.22	0.5000	A36 (36 ksi)	1	1.02	1.05	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	No	Yes	1	1	1	1	1	1	1	1
197.00-187.00				1	1	1	1	1	1	1
T2	No	Yes	1	1	1	1	0.5	1	1	1
187.00-172.00				1	1	1	0.5	1	1	1
T3	No	Yes	1	1	1	1	0.5	1	1	1
172.00-152.00				1	1	1	0.5	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
152.00-142.00				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
142.00-122.00				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
122.00-102.00				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
102.00-82.00				1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1
82.00-62.00				1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1
62.00-42.00				1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1
42.00-22.00				1	1	1	1	1	1	1

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
T11 22.00-2.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals
T4 152.00-142.00	1	0.5	0.85	1	0.5	0.85
T5 142.00-122.00	1	0.5	0.85	1	0.5	0.85
T6 122.00-102.00	1	0.5	0.85	1	0.5	0.85
T7 102.00-82.00	1	0.5	0.85	1	0.5	0.85
T8 82.00-62.00	1	0.5	0.85	1	0.5	0.85
T9 62.00-42.00	1	0.5	0.85	1	0.5	0.85
T10 42.00-22.00	1	0.5	0.85	1	0.5	0.85
T11 22.00-2.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 197.00-187.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 187.00-172.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 172.00-152.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 152.00-142.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 142.00-122.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

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
T6 122.00-102.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 102.00-82.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 82.00-62.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 62.00-42.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 42.00-22.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T11 22.00-2.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

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 197.00-187.00	Sleeve DS	0.6250 A325N	5	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 187.00-172.00	Sleeve DS	0.7500 A325N	5	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 172.00-152.00	Flange	1.0000 A325N	6	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 152.00-142.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 142.00-122.00	Flange	1.0000 A325N	6	1.0000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 122.00-102.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 102.00-82.00	Flange	1.0000 A325N	6	1.0000 A325X	1	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 82.00-62.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T9 62.00-42.00	Flange	1.2500 A325N	6	1.2500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T10 42.00-22.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T11 22.00-2.00	Flange	1.2500 A687	6	1.2500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0

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
1 5/8 (Verizon)	A	No	No	Ar (CaAa)	165.00 - 7.00	2.0000	-0.365	9	5	1.9800	1.9800		1.04

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
1 5/8 (Verizon)	A	No	No	Ar (CaAa)	165.00 - 7.00	2.0000	-0.42	1	1	1.9800	1.9800		1.04
1 5/8 (Verizon)	A	No	No	Ar (CaAa)	165.00 - 7.00	4.5000	-0.45	1	1	1.9800	1.9800		1.04
1 5/8 (Verizon)	A	No	No	Ar (CaAa)	165.00 - 7.00	2.0000	-0.47	1	1	1.9800	1.9800		1.04
1/2 (Alltel)	A	No	No	Ar (CaAa)	194.00 - 7.00	3.0000	-0.42	1	1	0.5800	0.5800		0.25
7/8 (NEU)	A	No	No	Ar (CaAa)	194.00 - 7.00	2.0000	-0.445	3	3	1.1100	1.1100		0.54
CR 50 1873 (1-5/8 FOAM) (AT&T)	C	No	No	Ar (CaAa)	150.00 - 7.00	-7.0000	0.44	12	6	1.9800	1.9800		0.83
7/8	C	No	No	Ar (CaAa)	132.00 - 7.00	-1.0000	-0.48	1	1	1.1100	1.1100		0.54
7/8	C	No	No	Ar (CaAa)	132.00 - 7.00	-2.0000	-0.47	1	1	1.1100	1.1100		0.54
7/8	C	No	No	Ar (CaAa)	112.00 - 7.00	-3.0000	-0.46	1	1	1.1100	1.1100		0.54
7/8	C	No	No	Ar (CaAa)	132.00 - 7.00	-4.0000	-0.45	1	1	1.1100	1.1100		0.54
7/8	B	No	No	Ar (CaAa)	194.00 - 7.00	2.0000	-0.44	3	3	1.1100	1.1100		0.54
WE65	B	No	No	Ar (CaAa)	194.00 - 7.00	2.0000	-0.42	1	1	1.5836	1.5836		0.53
WE65	B	No	No	Ar (CaAa)	102.00 - 7.00	2.0000	-0.405	1	1	1.5836	1.5836		0.53
1/2	B	No	No	Ar (CaAa)	92.00 - 7.00	2.0000	-0.385	2	2	0.5800	0.5800		0.25
LDF2-50 (3/8 FOAM)	B	No	No	Ar (CaAa)	194.00 - 7.00	2.0000	-0.375	2	2	0.4400	0.4400		0.08
1 5/8 (CSP)	B	No	No	Ar (CaAa)	185.00 - 7.00	2.0000	-0.355	4	2	1.9800	1.9800		1.04
1/2	B	No	No	Ar (CaAa)	72.00 - 7.00	3.0000	-0.31	2	2	0.5800	0.5800		0.25
7/8	B	No	No	Ar (CaAa)	194.00 - 7.00	1.0000	-0.31	2	1	1.1100	1.1100		0.54
LDF1-50A (1/4 FOAM)	C	No	No	Ar (CaAa)	17.00 - 7.00	-5.0000	-0.43	2	2	0.3500	0.3500		0.06
#8 AWG Copper WIre	C	No	No	Ar (CaAa)	150.00 - 7.00	0.0000	0.48	2	2	0.2500	0.1285		0.05
RG6-Fiber	C	No	No	Ar (CaAa)	150.00 - 7.00	0.0000	0.47	1	1	0.5000	0.5000		1.00
LDF2-50 (3/8 FOAM)	B	No	No	Ar (CaAa)	194.00 - 7.00	1.0000	-0.33	1	1	0.4400	0.4400		0.08
1 5/8 (CSP)	B	No	No	Ar (CaAa)	184.00 - 7.00	2.0000	-0.47	2	2	1.9800	1.9800		1.04
1/2 (CSP)	B	No	No	Ar (CaAa)	184.00 - 7.00	4.0000	-0.45	1	1	0.5800	0.5800		0.25
1 5/8 (T-Mobile)	B	No	No	Ar (CaAa)	142.00 - 7.00	-4.0000	-0.45	3	3	1.9800	1.9800		1.04

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	197.00-187.00	A	0.000	0.000	2.737	0.000	0.01

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	5.918	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.00
T2	187.00-172.00	A	0.000	0.000	5.865	0.000	0.03
		B	0.000	0.000	28.424	0.000	0.13
		C	0.000	0.000	0.000	0.000	0.00
T3	172.00-152.00	A	0.000	0.000	38.708	0.000	0.20
		B	0.000	0.000	41.827	0.000	0.20
		C	0.000	0.000	0.000	0.000	0.00
T4	152.00-142.00	A	0.000	0.000	27.670	0.000	0.14
		B	0.000	0.000	20.914	0.000	0.10
		C	0.000	0.000	19.614	0.000	0.09
T5	142.00-122.00	A	0.000	0.000	55.340	0.000	0.29
		B	0.000	0.000	53.707	0.000	0.26
		C	0.000	0.000	52.364	0.000	0.24
T6	122.00-102.00	A	0.000	0.000	55.340	0.000	0.29
		B	0.000	0.000	53.707	0.000	0.26
		C	0.000	0.000	56.804	0.000	0.26
T7	102.00-82.00	A	0.000	0.000	55.340	0.000	0.29
		B	0.000	0.000	58.034	0.000	0.28
		C	0.000	0.000	57.914	0.000	0.26
T8	82.00-62.00	A	0.000	0.000	55.340	0.000	0.29
		B	0.000	0.000	60.354	0.000	0.29
		C	0.000	0.000	57.914	0.000	0.26
T9	62.00-42.00	A	0.000	0.000	55.340	0.000	0.29
		B	0.000	0.000	61.514	0.000	0.29
		C	0.000	0.000	57.914	0.000	0.26
T10	42.00-22.00	A	0.000	0.000	55.340	0.000	0.29
		B	0.000	0.000	61.514	0.000	0.29
		C	0.000	0.000	57.914	0.000	0.26
T11	22.00-2.00	A	0.000	0.000	41.505	0.000	0.22
		B	0.000	0.000	46.136	0.000	0.22
		C	0.000	0.000	44.136	0.000	0.20

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	197.00-187.00	A	2.981	0.000	0.000	16.403	0.000	0.29
		B		0.000	0.000	40.291	0.000	0.72
		C		0.000	0.000	0.000	0.000	0.00
T2	187.00-172.00	A	2.961	0.000	0.000	34.986	0.000	0.61
		B		0.000	0.000	142.349	0.000	2.70
		C		0.000	0.000	0.000	0.000	0.00
T3	172.00-152.00	A	2.931	0.000	0.000	119.902	0.000	2.76
		B		0.000	0.000	203.700	0.000	3.85
		C		0.000	0.000	0.000	0.000	0.00
T4	152.00-142.00	A	2.903	0.000	0.000	79.343	0.000	1.89
		B		0.000	0.000	101.185	0.000	1.90
		C		0.000	0.000	43.691	0.000	1.13
T5	142.00-122.00	A	2.872	0.000	0.000	157.766	0.000	3.73
		B		0.000	0.000	244.527	0.000	4.57
		C		0.000	0.000	129.239	0.000	3.23
T6	122.00-102.00	A	2.825	0.000	0.000	156.383	0.000	3.66
		B		0.000	0.000	242.018	0.000	4.47
		C		0.000	0.000	155.173	0.000	3.75
T7	102.00-82.00	A	2.770	0.000	0.000	154.756	0.000	3.59
		B		0.000	0.000	265.204	0.000	4.81

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	160.083	0.000	3.81
T8	82.00-62.00	A	2.703	0.000	0.000	152.775	0.000	3.49
		B		0.000	0.000	284.409	0.000	4.94
		C		0.000	0.000	157.829	0.000	3.71
T9	62.00-42.00	A	2.616	0.000	0.000	150.219	0.000	3.37
		B		0.000	0.000	289.861	0.000	4.86
		C		0.000	0.000	154.921	0.000	3.58
T10	42.00-22.00	A	2.492	0.000	0.000	146.559	0.000	3.20
		B		0.000	0.000	280.984	0.000	4.56
		C		0.000	0.000	150.756	0.000	3.40
T11	22.00-2.00	A	2.259	0.000	0.000	104.772	0.000	2.18
		B		0.000	0.000	198.247	0.000	3.02
		C		0.000	0.000	116.451	0.000	2.40

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	197.00-187.00	-1.5379	-4.5250	-0.6553	-2.4507
T2	187.00-172.00	0.1190	-11.9565	-0.3320	-6.7768
T3	172.00-152.00	-7.4237	-7.2451	-3.1851	-6.2870
T4	152.00-142.00	-11.2640	-1.2169	-3.8060	-2.0537
T5	142.00-122.00	-13.0528	-1.8719	-7.7989	-4.8445
T6	122.00-102.00	-14.9301	-1.4007	-10.0745	-6.0307
T7	102.00-82.00	-16.1618	-2.0257	-11.0981	-8.3623
T8	82.00-62.00	-18.4961	-2.5678	-13.4083	-11.8855
T9	62.00-42.00	-19.8049	-2.8107	-14.8733	-13.9922
T10	42.00-22.00	-21.6372	-2.9031	-16.8367	-15.4221
T11	22.00-2.00	-18.4897	-2.3053	-14.6483	-13.2228

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	5	1/2	187.00 - 194.00	0.6000	0.2102
T1	6	7/8	187.00 - 194.00	0.6000	0.2102
T1	12	7/8	187.00 - 194.00	0.6000	0.2102
T1	13	WE65	187.00 - 194.00	0.6000	0.2102
T1	16	LDF2-50 (3/8 FOAM)	187.00 - 194.00	0.6000	0.2102
T1	19	7/8	187.00 - 194.00	0.6000	0.2102
T1	23	LDF2-50 (3/8 FOAM)	187.00 - 194.00	0.6000	0.2102
T2	5	1/2	172.00 - 187.00	0.6000	0.2530

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	6	7/8	172.00 - 187.00	0.6000	0.2530
T2	12	7/8	172.00 - 187.00	0.6000	0.2530
T2	13	WE65	172.00 - 187.00	0.6000	0.2530
T2	16	LDF2-50 (3/8 FOAM)	172.00 - 187.00	0.6000	0.2530
T2	17	1 5/8	172.00 - 185.00	0.6000	0.2530
T2	19	7/8	172.00 - 187.00	0.6000	0.2530
T2	23	LDF2-50 (3/8 FOAM)	172.00 - 187.00	0.6000	0.2530
T2	24	1 5/8	172.00 - 184.00	0.6000	0.2530
T2	25	1/2	172.00 - 184.00	0.6000	0.2530
T3	1	1 5/8	152.00 - 165.00	0.6000	0.2737
T3	2	1 5/8	152.00 - 165.00	0.6000	0.2737
T3	3	1 5/8	152.00 - 165.00	0.6000	0.2737
T3	4	1 5/8	152.00 - 165.00	0.6000	0.2737
T3	5	1/2	152.00 - 172.00	0.6000	0.2737
T3	6	7/8	152.00 - 172.00	0.6000	0.2737
T3	12	7/8	152.00 - 172.00	0.6000	0.2737
T3	13	WE65	152.00 - 172.00	0.6000	0.2737
T3	16	LDF2-50 (3/8 FOAM)	152.00 - 172.00	0.6000	0.2737
T3	17	1 5/8	152.00 - 172.00	0.6000	0.2737
T3	19	7/8	152.00 - 172.00	0.6000	0.2737
T3	23	LDF2-50 (3/8 FOAM)	152.00 - 172.00	0.6000	0.2737
T3	24	1 5/8	152.00 - 172.00	0.6000	0.2737
T3	25	1/2	152.00 - 172.00	0.6000	0.2737
T4	1	1 5/8	142.00 - 152.00	0.6000	0.1545
T4	2	1 5/8	142.00 - 152.00	0.6000	0.1545
T4	3	1 5/8	142.00 - 152.00	0.6000	0.1545
T4	4	1 5/8	142.00 - 152.00	0.6000	0.1545
T4	5	1/2	142.00 - 152.00	0.6000	0.1545
T4	6	7/8	142.00 - 152.00	0.6000	0.1545
T4	7	CR 50 1873 (1-5/8 FOAM)	142.00 - 150.00	0.6000	0.1545
T4	12	7/8	142.00 - 152.00	0.6000	0.1545

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	13	WE65	142.00 - 152.00	0.6000	0.1545
T4	16	LDF2-50 (3/8 FOAM)	142.00 - 152.00	0.6000	0.1545
T4	17	1 5/8	142.00 - 152.00	0.6000	0.1545
T4	19	7/8	142.00 - 152.00	0.6000	0.1545
T4	21	#8 AWG Copper WIre	142.00 - 150.00	0.6000	0.1545
T4	22	RG6-Fiber	142.00 - 150.00	0.6000	0.1545
T4	23	LDF2-50 (3/8 FOAM)	142.00 - 152.00	0.6000	0.1545
T4	24	1 5/8	142.00 - 152.00	0.6000	0.1545
T4	25	1/2	142.00 - 152.00	0.6000	0.1545
T5	1	1 5/8	122.00 - 142.00	0.6000	0.3091
T5	2	1 5/8	122.00 - 142.00	0.6000	0.3091
T5	3	1 5/8	122.00 - 142.00	0.6000	0.3091
T5	4	1 5/8	122.00 - 142.00	0.6000	0.3091
T5	5	1/2	122.00 - 142.00	0.6000	0.3091
T5	6	7/8	122.00 - 142.00	0.6000	0.3091
T5	7	CR 50 1873 (1-5/8 FOAM)	122.00 - 142.00	0.6000	0.3091
T5	8	7/8	122.00 - 132.00	0.6000	0.3091
T5	9	7/8	122.00 - 132.00	0.6000	0.3091
T5	11	7/8	122.00 - 132.00	0.6000	0.3091
T5	12	7/8	122.00 - 142.00	0.6000	0.3091
T5	13	WE65	122.00 - 142.00	0.6000	0.3091
T5	16	LDF2-50 (3/8 FOAM)	122.00 - 142.00	0.6000	0.3091
T5	17	1 5/8	122.00 - 142.00	0.6000	0.3091
T5	19	7/8	122.00 - 142.00	0.6000	0.3091
T5	21	#8 AWG Copper WIre	122.00 - 142.00	0.6000	0.3091
T5	22	RG6-Fiber	122.00 - 142.00	0.6000	0.3091
T5	23	LDF2-50 (3/8 FOAM)	122.00 - 142.00	0.6000	0.3091
T5	24	1 5/8	122.00 - 142.00	0.6000	0.3091
T5	25	1/2	122.00 - 142.00	0.6000	0.3091
T5	26	1 5/8	122.00 - 142.00	0.6000	0.3091
T6	1	1 5/8	102.00 - 122.00	0.6000	0.4289

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	2	1 5/8	102.00 - 122.00	0.6000	0.4289
T6	3	1 5/8	102.00 - 122.00	0.6000	0.4289
T6	4	1 5/8	102.00 - 122.00	0.6000	0.4289
T6	5	1/2	102.00 - 122.00	0.6000	0.4289
T6	6	7/8	102.00 - 122.00	0.6000	0.4289
T6	7	CR 50 1873 (1-5/8 FOAM)	102.00 - 122.00	0.6000	0.4289
T6	8	7/8	102.00 - 122.00	0.6000	0.4289
T6	9	7/8	102.00 - 122.00	0.6000	0.4289
T6	10	7/8	102.00 - 112.00	0.6000	0.4289
T6	11	7/8	102.00 - 122.00	0.6000	0.4289
T6	12	7/8	102.00 - 122.00	0.6000	0.4289
T6	13	WE65	102.00 - 122.00	0.6000	0.4289
T6	16	LDF2-50 (3/8 FOAM)	102.00 - 122.00	0.6000	0.4289
T6	17	1 5/8	102.00 - 122.00	0.6000	0.4289
T6	19	7/8	102.00 - 122.00	0.6000	0.4289
T6	21	#8 AWG Copper WIre	102.00 - 122.00	0.6000	0.4289
T6	22	RG6-Fiber	102.00 - 122.00	0.6000	0.4289
T6	23	LDF2-50 (3/8 FOAM)	102.00 - 122.00	0.6000	0.4289
T6	24	1 5/8	102.00 - 122.00	0.6000	0.4289
T6	25	1/2	102.00 - 122.00	0.6000	0.4289
T6	26	1 5/8	102.00 - 122.00	0.6000	0.4289
T7	1	1 5/8	82.00 - 102.00	0.6000	0.4670
T7	2	1 5/8	82.00 - 102.00	0.6000	0.4670
T7	3	1 5/8	82.00 - 102.00	0.6000	0.4670
T7	4	1 5/8	82.00 - 102.00	0.6000	0.4670
T7	5	1/2	82.00 - 102.00	0.6000	0.4670
T7	6	7/8	82.00 - 102.00	0.6000	0.4670
T7	7	CR 50 1873 (1-5/8 FOAM)	82.00 - 102.00	0.6000	0.4670
T7	8	7/8	82.00 - 102.00	0.6000	0.4670
T7	9	7/8	82.00 - 102.00	0.6000	0.4670
T7	10	7/8	82.00 - 102.00	0.6000	0.4670
T7	11	7/8	82.00 - 102.00	0.6000	0.4670
T7	12	7/8	82.00 - 102.00	0.6000	0.4670
T7	13	WE65	82.00 - 102.00	0.6000	0.4670
T7	14	WE65	82.00 - 102.00	0.6000	0.4670
T7	15	1/2	82.00 - 92.00	0.6000	0.4670
T7	16	LDF2-50 (3/8 FOAM)	82.00 - 102.00	0.6000	0.4670
T7	17	1 5/8	82.00 - 102.00	0.6000	0.4670
T7	19	7/8	82.00 - 102.00	0.6000	0.4670
T7	21	#8 AWG Copper WIre	82.00 - 102.00	0.6000	0.4670
T7	22	RG6-Fiber	82.00 - 102.00	0.6000	0.4670

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	23	LDF2-50 (3/8 FOAM)	82.00 - 102.00	0.6000	0.4670
T7	24	1 5/8	82.00 - 102.00	0.6000	0.4670
T7	25	1/2	82.00 - 102.00	0.6000	0.4670
T7	26	1 5/8	82.00 - 102.00	0.6000	0.4670
T8	1	1 5/8	62.00 - 82.00	0.6000	0.5556
T8	2	1 5/8	62.00 - 82.00	0.6000	0.5556
T8	3	1 5/8	62.00 - 82.00	0.6000	0.5556
T8	4	1 5/8	62.00 - 82.00	0.6000	0.5556
T8	5	1/2	62.00 - 82.00	0.6000	0.5556
T8	6	7/8	62.00 - 82.00	0.6000	0.5556
T8	7	CR 50 1873 (1-5/8 FOAM)	62.00 - 82.00	0.6000	0.5556
T8	8	7/8	62.00 - 82.00	0.6000	0.5556
T8	9	7/8	62.00 - 82.00	0.6000	0.5556
T8	10	7/8	62.00 - 82.00	0.6000	0.5556
T8	11	7/8	62.00 - 82.00	0.6000	0.5556
T8	12	7/8	62.00 - 82.00	0.6000	0.5556
T8	13	WE65	62.00 - 82.00	0.6000	0.5556
T8	14	WE65	62.00 - 82.00	0.6000	0.5556
T8	15	1/2	62.00 - 82.00	0.6000	0.5556
T8	16	LDF2-50 (3/8 FOAM)	62.00 - 82.00	0.6000	0.5556
T8	17	1 5/8	62.00 - 82.00	0.6000	0.5556
T8	18	1/2	62.00 - 72.00	0.6000	0.5556
T8	19	7/8	62.00 - 82.00	0.6000	0.5556
T8	21	#8 AWG Copper WIre	62.00 - 82.00	0.6000	0.5556
T8	22	RG6-Fiber	62.00 - 82.00	0.6000	0.5556
T8	23	LDF2-50 (3/8 FOAM)	62.00 - 82.00	0.6000	0.5556
T8	24	1 5/8	62.00 - 82.00	0.6000	0.5556
T8	25	1/2	62.00 - 82.00	0.6000	0.5556
T8	26	1 5/8	62.00 - 82.00	0.6000	0.5556
T9	1	1 5/8	42.00 - 62.00	0.6000	0.5846
T9	2	1 5/8	42.00 - 62.00	0.6000	0.5846
T9	3	1 5/8	42.00 - 62.00	0.6000	0.5846
T9	4	1 5/8	42.00 - 62.00	0.6000	0.5846
T9	5	1/2	42.00 - 62.00	0.6000	0.5846
T9	6	7/8	42.00 - 62.00	0.6000	0.5846
T9	7	CR 50 1873 (1-5/8 FOAM)	42.00 - 62.00	0.6000	0.5846
T9	8	7/8	42.00 - 62.00	0.6000	0.5846
T9	9	7/8	42.00 - 62.00	0.6000	0.5846
T9	10	7/8	42.00 - 62.00	0.6000	0.5846
T9	11	7/8	42.00 - 62.00	0.6000	0.5846
T9	12	7/8	42.00 - 62.00	0.6000	0.5846
T9	13	WE65	42.00 - 62.00	0.6000	0.5846
T9	14	WE65	42.00 - 62.00	0.6000	0.5846
T9	15	1/2	42.00 - 62.00	0.6000	0.5846
T9	16	LDF2-50 (3/8 FOAM)	42.00 - 62.00	0.6000	0.5846
T9	17	1 5/8	42.00 - 62.00	0.6000	0.5846
T9	18	1/2	42.00 - 62.00	0.6000	0.5846
T9	19	7/8	42.00 - 62.00	0.6000	0.5846
T9	21	#8 AWG Copper WIre	42.00 - 62.00	0.6000	0.5846
T9	22	RG6-Fiber	42.00 - 62.00	0.6000	0.5846
T9	23	LDF2-50 (3/8 FOAM)	42.00 - 62.00	0.6000	0.5846
T9	24	1 5/8	42.00 - 62.00	0.6000	0.5846
T9	25	1/2	42.00 - 62.00	0.6000	0.5846
T9	26	1 5/8	42.00 - 62.00	0.6000	0.5846
T10	1	1 5/8	22.00 - 42.00	0.6000	0.6000
T10	2	1 5/8	22.00 - 42.00	0.6000	0.6000
T10	3	1 5/8	22.00 - 42.00	0.6000	0.6000
T10	4	1 5/8	22.00 - 42.00	0.6000	0.6000
T10	5	1/2	22.00 - 42.00	0.6000	0.6000
T10	6	7/8	22.00 - 42.00	0.6000	0.6000
T10	7	CR 50 1873 (1-5/8 FOAM)	22.00 - 42.00	0.6000	0.6000
T10	8	7/8	22.00 - 42.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	9	7/8	22.00 - 42.00	0.6000	0.6000
T10	10	7/8	22.00 - 42.00	0.6000	0.6000
T10	11	7/8	22.00 - 42.00	0.6000	0.6000
T10	12	7/8	22.00 - 42.00	0.6000	0.6000
T10	13	WE65	22.00 - 42.00	0.6000	0.6000
T10	14	WE65	22.00 - 42.00	0.6000	0.6000
T10	15	1/2	22.00 - 42.00	0.6000	0.6000
T10	16	LDF2-50 (3/8 FOAM)	22.00 - 42.00	0.6000	0.6000
T10	17	1 5/8	22.00 - 42.00	0.6000	0.6000
T10	18	1/2	22.00 - 42.00	0.6000	0.6000
T10	19	7/8	22.00 - 42.00	0.6000	0.6000
T10	21	#8 AWG Copper WIre	22.00 - 42.00	0.6000	0.6000
T10	22	RG6-Fiber	22.00 - 42.00	0.6000	0.6000
T10	23	LDF2-50 (3/8 FOAM)	22.00 - 42.00	0.6000	0.6000
T10	24	1 5/8	22.00 - 42.00	0.6000	0.6000
T10	25	1/2	22.00 - 42.00	0.6000	0.6000
T10	26	1 5/8	22.00 - 42.00	0.6000	0.6000
T11	1	1 5/8	7.00 - 22.00	0.6000	0.6000
T11	2	1 5/8	7.00 - 22.00	0.6000	0.6000
T11	3	1 5/8	7.00 - 22.00	0.6000	0.6000
T11	4	1 5/8	7.00 - 22.00	0.6000	0.6000
T11	5	1/2	7.00 - 22.00	0.6000	0.6000
T11	6	7/8	7.00 - 22.00	0.6000	0.6000
T11	7	CR 50 1873 (1-5/8 FOAM)	7.00 - 22.00	0.6000	0.6000
T11	8	7/8	7.00 - 22.00	0.6000	0.6000
T11	9	7/8	7.00 - 22.00	0.6000	0.6000
T11	10	7/8	7.00 - 22.00	0.6000	0.6000
T11	11	7/8	7.00 - 22.00	0.6000	0.6000
T11	12	7/8	7.00 - 22.00	0.6000	0.6000
T11	13	WE65	7.00 - 22.00	0.6000	0.6000
T11	14	WE65	7.00 - 22.00	0.6000	0.6000
T11	15	1/2	7.00 - 22.00	0.6000	0.6000
T11	16	LDF2-50 (3/8 FOAM)	7.00 - 22.00	0.6000	0.6000
T11	17	1 5/8	7.00 - 22.00	0.6000	0.6000
T11	18	1/2	7.00 - 22.00	0.6000	0.6000
T11	19	7/8	7.00 - 22.00	0.6000	0.6000
T11	20	LDF1-50A (1/4 FOAM)	7.00 - 17.00	0.6000	0.6000
T11	21	#8 AWG Copper WIre	7.00 - 22.00	0.6000	0.6000
T11	22	RG6-Fiber	7.00 - 22.00	0.6000	0.6000
T11	23	LDF2-50 (3/8 FOAM)	7.00 - 22.00	0.6000	0.6000
T11	24	1 5/8	7.00 - 22.00	0.6000	0.6000
T11	25	1/2	7.00 - 22.00	0.6000	0.6000
T11	26	1 5/8	7.00 - 22.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
Single Dipole	C	From Leg	0.50	0.0000	196.26	No Ice	0.90	0.90	0.01
(Unknown)			0.00			1/2" Ice	1.40	1.40	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	1.90	1.90	0.02
PIROD 6'-8" Rigid Side Arm	A	From Face	3.00	0.0000	196.00	No Ice	8.00	8.00	0.19
(Vacant)			0.00			1/2" Ice	9.60	9.60	0.22
			0.00			1" Ice	11.20	11.20	0.26
6'x4" Pipe Mount	A	From Face	0.67	0.0000	194.92	No Ice	1.80	1.80	0.05
(CSP)			0.00			1/2" Ice	2.46	2.46	0.07
			0.00			1" Ice	2.83	2.83	0.09
OGT9-840	A	From Leg	3.00	0.0000	190.25	No Ice	2.27	2.27	0.02
(Unknown)			7.50			1/2" Ice	3.44	3.44	0.04
			0.00			1" Ice	4.61	4.61	0.06
Filter Box	C	From Face	0.00	0.0000	183.00	No Ice	3.00	1.20	0.04
(CSP)			0.00			1/2" Ice	3.21	1.35	0.06
			0.00			1" Ice	3.44	1.50	0.09
10' x 3" Dia Omni	A	From Leg	3.00	0.0000	174.25	No Ice	3.00	3.00	0.03
(Unknown (Inverted))			7.50			1/2" Ice	4.03	4.03	0.05
			0.00			1" Ice	5.03	5.03	0.08
12' x 3" Dia Omni	C	From Face	4.00	0.0000	175.25	No Ice	3.60	3.60	0.04
(Unknown (Inverted))			0.00			1/2" Ice	4.83	4.83	0.06
			0.00			1" Ice	6.08	6.08	0.09
DB222-A	A	From Leg	3.00	0.0000	185.25	No Ice	1.60	1.60	0.02
(Unknown)			-7.50			1/2" Ice	2.88	2.88	0.02
			0.00			1" Ice	4.16	4.16	0.03
ANT150D6-9	A	From Leg	3.00	0.0000	173.75	No Ice	4.00	4.00	0.03
(Unknown (Inverted))			-7.50			1/2" Ice	4.60	4.60	0.03
			0.00			1" Ice	5.20	5.20	0.04
9' x 3" Dia Omni	C	From Leg	4.00	-60.0000	192.75	No Ice	2.70	2.70	0.03
(Unknown)			0.00			1/2" Ice	3.63	3.63	0.05
			0.00			1" Ice	4.33	4.33	0.08
Pirod 4' Side Mount Standoff	C	From Leg	2.00	-60.0000	186.50	No Ice	2.72	2.72	0.05
(1)			0.00			1/2" Ice	4.91	4.91	0.09
(Unknown)			0.00			1" Ice	7.10	7.10	0.13
DB222-A	C	From Leg	4.00	-60.0000	180.25	No Ice	1.60	1.60	0.02
(Unknown (Inverted))			0.00			1/2" Ice	2.88	2.88	0.02
			0.00			1" Ice	4.16	4.16	0.03
BCD-87077	A	From Leg	4.00	0.0000	181.50	No Ice	3.06	3.06	0.03
(Pagenet)			0.00			1/2" Ice	4.27	4.27	0.05
			0.00			1" Ice	5.49	5.49	0.08
PiROD 15' Rotatable	C	None		0.0000	181.25	No Ice	24.90	24.90	1.81
Platform (Lattice)						1/2" Ice	30.70	30.70	2.44
(Unknown)						1" Ice	36.50	36.50	3.06
(4) 6'x2" Pipe Mount	A	From Leg	3.00	0.0000	181.25	No Ice	1.20	1.20	0.02
(Unknown)			0.00			1/2" Ice	1.80	1.80	0.03
			0.00			1" Ice	2.17	2.17	0.04
(4) 6'x2" Pipe Mount	B	From Leg	3.00	0.0000	181.25	No Ice	1.20	1.20	0.02
(Unknown)			0.00			1/2" Ice	1.80	1.80	0.03
			0.00			1" Ice	2.17	2.17	0.04
(4) 6'x2" Pipe Mount	C	From Leg	3.00	0.0000	181.25	No Ice	1.20	1.20	0.02
(Unknown)			0.00			1/2" Ice	1.80	1.80	0.03
			0.00			1" Ice	2.17	2.17	0.04
Pirod 4' Side Mount Standoff	A	From Leg	2.00	0.0000	174.25	No Ice	2.72	2.72	0.05
(1)			0.00			1/2" Ice	4.91	4.91	0.09
(Unknown)			0.00			1" Ice	7.10	7.10	0.13
PD220	B	From Leg	6.00	0.0000	182.25	No Ice	3.08	3.08	0.02
(Unknown)			0.00			1/2" Ice	5.30	5.30	0.05
			0.00			1" Ice	7.54	7.54	0.09
Pirod 6' Side Mount Standoff	B	From Leg	3.00	0.0000	172.25	No Ice	4.97	4.97	0.07
(1)			0.00			1/2" Ice	6.12	6.12	0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Unknown)			0.00			1" Ice	7.27	7.27	0.19
12' x 3" Dia Omni	A	From Leg	2.50	-10.0000	175.25	No Ice	3.60	3.60	0.04
(Unknown)			0.00			1/2" Ice	4.83	4.83	0.06
			0.00			1" Ice	6.08	6.08	0.09
3' Sidearm	A	From Leg	1.25	-10.0000	170.20	No Ice	5.90	5.90	0.13
(Unknown)			0.00			1/2" Ice	6.60	6.60	0.15
			0.00			1" Ice	7.30	7.30	0.16
LPA-80080-4CF	A	From Leg	3.00	0.0000	167.00	No Ice	2.62	5.40	0.01
(Verizon)			6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
LPA-185080/8CF_2	A	From Leg	3.00	0.0000	167.00	No Ice	2.09	2.79	0.01
(Verizon)			4.00			1/2" Ice	2.39	3.09	0.03
			0.00			1" Ice	2.69	3.40	0.05
LPA-185080/8CF_2	A	From Leg	3.00	0.0000	167.00	No Ice	2.09	2.79	0.01
(Verizon)			-4.00			1/2" Ice	2.39	3.09	0.03
			0.00			1" Ice	2.69	3.40	0.05
LPA-80080-4CF	A	From Leg	3.00	0.0000	167.00	No Ice	2.62	5.40	0.01
(Verizon)			-6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
LPA-80080-4CF	B	From Leg	3.00	0.0000	167.00	No Ice	2.62	5.40	0.01
(Verizon)			6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
LPA-185080-8CF_2	B	From Leg	3.00	0.0000	167.00	No Ice	2.09	2.79	0.01
(Verizon)			4.00			1/2" Ice	2.39	3.09	0.03
			0.00			1" Ice	2.69	3.40	0.05
LPA-185080/8CF_2	B	From Leg	3.00	0.0000	167.00	No Ice	2.09	2.79	0.01
(Verizon)			-4.00			1/2" Ice	2.39	3.09	0.03
			0.00			1" Ice	2.69	3.40	0.05
LPA-80080-4CF	B	From Leg	3.00	0.0000	167.00	No Ice	2.62	5.40	0.01
(Verizon)			-6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
LPA-80080-4CF	C	From Leg	3.00	0.0000	167.00	No Ice	2.62	5.40	0.01
(Verizon)			6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
LPA-185080-8CF_2	C	From Leg	3.00	0.0000	167.00	No Ice	2.09	2.79	0.01
(Verizon)			4.00			1/2" Ice	2.39	3.09	0.03
			0.00			1" Ice	2.69	3.40	0.05
LPA-185080/8CF_2	C	From Leg	3.00	0.0000	167.00	No Ice	2.09	2.79	0.01
(Verizon)			-4.00			1/2" Ice	2.39	3.09	0.03
			0.00			1" Ice	2.69	3.40	0.05
LPA-80080-4CF	C	From Leg	3.00	0.0000	167.00	No Ice	2.62	5.40	0.01
(Verizon)			-6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
PiROD 15' T-Frame	A	From Leg	1.50	0.0000	163.00	No Ice	15.00	15.00	0.50
(Verizon)			0.00			1/2" Ice	20.60	20.60	0.65
			0.00			1" Ice	26.20	26.20	0.80
PiROD 15' T-Frame	B	From Leg	1.50	0.0000	163.00	No Ice	15.00	15.00	0.50
(Verizon)			0.00			1/2" Ice	20.60	20.60	0.65
			0.00			1" Ice	26.20	26.20	0.80
PiROD 15' T-Frame	C	From Leg	1.50	0.0000	163.00	No Ice	15.00	15.00	0.50
(Verizon)			0.00			1/2" Ice	20.60	20.60	0.65
			0.00			1" Ice	26.20	26.20	0.80
(2) 7770.00	A	From Leg	3.00	0.0000	150.25	No Ice	5.51	2.93	0.04
(AT&T)			0.00			1/2" Ice	5.87	3.27	0.07
			0.00			1" Ice	6.23	3.63	0.11
(2) 7770.00	B	From Leg	3.00	0.0000	150.25	No Ice	5.51	2.93	0.04
(AT&T)			0.00			1/2" Ice	5.87	3.27	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	6.23	3.63	0.11
(2) 7770.00	C	From Leg	3.00	0.0000	150.25	No Ice	5.51	2.93	0.04
(AT&T)			0.00			1/2" Ice	5.87	3.27	0.07
			0.00			1" Ice	6.23	3.63	0.11
(2) LGP21401 TMA	A	From Leg	2.50	0.0000	150.25	No Ice	0.00	0.37	0.02
(AT&T)			0.00			1/2" Ice	0.00	0.48	0.02
			0.00			1" Ice	0.00	0.60	0.03
(2) LGP21401 TMA	B	From Leg	2.50	0.0000	150.25	No Ice	0.00	0.37	0.02
(AT&T)			0.00			1/2" Ice	0.00	0.48	0.02
			0.00			1" Ice	0.00	0.60	0.03
(2) LGP21401 TMA	C	From Leg	2.50	0.0000	150.25	No Ice	0.00	0.37	0.02
(AT&T)			0.00			1/2" Ice	0.00	0.48	0.02
			0.00			1" Ice	0.00	0.60	0.03
(2) LGP13519 Diplexer	A	From Leg	2.50	0.0000	150.25	No Ice	0.23	0.16	0.01
(AT&T)			0.00			1/2" Ice	0.29	0.21	0.01
			0.00			1" Ice	0.36	0.28	0.01
(2) LGP13519 Diplexer	B	From Leg	2.50	0.0000	150.25	No Ice	0.23	0.16	0.01
(AT&T)			0.00			1/2" Ice	0.29	0.21	0.01
			0.00			1" Ice	0.36	0.28	0.01
(2) LGP13519 Diplexer	C	From Leg	2.50	0.0000	150.25	No Ice	0.23	0.16	0.01
(AT&T)			0.00			1/2" Ice	0.29	0.21	0.01
			0.00			1" Ice	0.36	0.28	0.01
AM-X-CD-16-65-00T-RET(72")	A	From Leg	3.00	0.0000	150.25	No Ice	8.02	4.64	0.05
			0.00			1/2" Ice	8.48	5.09	0.10
(AT&T)			0.00			1" Ice	8.94	5.54	0.15
AM-X-CD-16-65-00T-RET(72")	B	From Leg	3.00	0.0000	150.25	No Ice	8.02	4.64	0.05
			0.00			1/2" Ice	8.48	5.09	0.10
(AT&T)			0.00			1" Ice	8.94	5.54	0.15
800-10764	C	From Leg	3.00	0.0000	150.25	No Ice	5.87	3.39	0.04
(AT&T)			0.00			1/2" Ice	6.23	3.74	0.08
			0.00			1" Ice	6.60	4.10	0.12
(2) RRUS-11	A	From Leg	2.50	0.0000	150.25	No Ice	2.57	1.07	0.05
(AT&T)			0.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
(2) RRUS-11	B	From Leg	2.50	0.0000	150.25	No Ice	2.57	1.07	0.05
(AT&T)			0.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
(2) RRUS-11	C	From Leg	2.50	0.0000	150.25	No Ice	2.57	1.07	0.05
(AT&T)			0.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
DC6-48-60-18-8F Surge Arrestor	B	From Leg	2.50	0.0000	150.25	No Ice	1.91	1.91	0.02
			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T)			0.00			1" Ice	2.29	2.29	0.06
Pirod 12' T-Frame Sector Mount (1)	A	From Leg	1.25	0.0000	150.25	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
(AT&T)			0.00			1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector Mount (1)	B	From Leg	1.25	0.0000	150.25	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
(AT&T)			0.00			1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector Mount (1)	C	From Leg	1.25	0.0000	150.25	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
(AT&T)			0.00			1" Ice	23.20	23.20	0.73
SRL110A	C	From Leg	6.00	0.0000	135.00	No Ice	9.00	9.00	0.03
(NEU)			0.00			1/2" Ice	10.58	10.58	0.09
			0.00			1" Ice	12.16	12.16	0.14
PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	C	From Leg	3.00	0.0000	134.00	No Ice	2.60	3.41	0.20
			0.00			1/2" Ice	4.21	7.18	0.30

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(NEU)			0.00			1" Ice	5.82	10.95	0.40
DB586-Y	A	From Leg	6.00	0.0000	130.00	No Ice	1.01	1.01	0.01
(NEU)			0.00			1/2" Ice	1.28	1.28	0.02
			0.00			1" Ice	1.56	1.56	0.03
PIROD 6' Rigid Side Arm w/	A	From Leg	3.00	0.0000	126.00	No Ice	2.60	3.41	0.20
3" STD mount pipe			0.00			1/2" Ice	4.21	7.18	0.30
(NEU)			0.00			1" Ice	5.82	10.95	0.40
Tower Top Amplifier	A	From Leg	3.00	0.0000	126.00	No Ice	2.10	2.10	0.04
(NEU)			0.00			1/2" Ice	2.40	2.40	0.06
			0.00			1" Ice	2.70	2.70	0.08
DB586-Y	A	From Leg	6.00	0.0000	125.00	No Ice	1.01	1.01	0.01
(NEU (Inverted))			0.00			1/2" Ice	1.28	1.28	0.02
			0.00			1" Ice	1.56	1.56	0.03
PIROD 6' Rigid Side Arm w/	B	From Leg	3.00	0.0000	120.50	No Ice	2.60	3.41	0.20
3" STD mount pipe			0.00			1/2" Ice	4.21	7.18	0.30
(Vacant)			0.00			1" Ice	5.82	10.95	0.40
DB212-1	C	From Leg	6.00	0.0000	120.67	No Ice	4.40	4.40	0.03
(Unknown)			0.00			1/2" Ice	8.42	8.42	0.07
			0.00			1" Ice	12.45	12.45	0.13
PIROD 6' Rigid Side Arm w/	C	From Leg	3.00	0.0000	120.67	No Ice	2.60	3.41	0.20
3" STD mount pipe			0.00			1/2" Ice	4.21	7.18	0.30
(Unknown)			0.00			1" Ice	5.82	10.95	0.40
DB205-L	A	From Leg	5.20	0.0000	109.25	No Ice	1.72	1.72	0.04
(Unknown)			0.00			1/2" Ice	3.45	3.45	0.05
			0.00			1" Ice	5.20	5.20	0.08
PIROD 6' Rigid Side Arm w/	A	From Leg	3.00	0.0000	100.83	No Ice	2.60	3.41	0.20
3" STD mount pipe			0.00			1/2" Ice	4.21	7.18	0.30
(Unknown)			0.00			1" Ice	5.82	10.95	0.40
Ice Canopy	B	From Leg	3.00	-50.0000	106.00	No Ice	3.73	2.80	0.30
			0.00			1/2" Ice	4.39	3.30	0.55
			0.00			1" Ice	5.05	3.80	0.80
6'8"x4" Pipe Mount	B	From Leg	0.67	0.0000	101.20	No Ice	2.16	2.16	0.07
(CSP)			0.00			1/2" Ice	3.01	3.01	0.09
			0.00			1" Ice	3.42	3.42	0.12
DB224	C	From Leg	2.00	60.0000	94.00	No Ice	3.15	3.15	0.03
(Unknown)			0.00			1/2" Ice	5.67	5.67	0.04
			0.00			1" Ice	8.19	8.19	0.05
2-ft Stand Off	C	From Leg	1.00	60.0000	85.00	No Ice	1.07	1.07	0.02
(Unknown)			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
PD220	A	From Leg	5.20	0.0000	90.41	No Ice	3.08	3.08	0.02
(Unknown)			0.00			1/2" Ice	5.30	5.30	0.05
			0.00			1" Ice	7.54	7.54	0.09
PIROD 6' Rigid Side Arm w/	A	From Leg	3.00	0.0000	79.50	No Ice	2.60	3.41	0.20
3" STD mount pipe			0.00			1/2" Ice	4.21	7.18	0.30
(Unknown)			0.00			1" Ice	5.82	10.95	0.40
PIROD 6' Rigid Side Arm w/	B	From Leg	3.00	0.0000	82.67	No Ice	2.60	3.41	0.20
3" STD mount pipe			0.00			1/2" Ice	4.21	7.18	0.30
(Unknown)			0.00			1" Ice	5.82	10.95	0.40
12' x 3" Dia Omni	B	From Leg	6.00	0.0000	75.00	No Ice	3.60	3.60	0.04
(Unknown)			0.00			1/2" Ice	4.83	4.83	0.06
			0.00			1" Ice	6.08	6.08	0.09
DB432-A	A	From Leg	1.50	0.0000	70.25	No Ice	0.30	0.30	0.01
(Unknown)			0.00			1/2" Ice	0.54	0.54	0.01
			0.00			1" Ice	0.78	0.78	0.01
2-ft Stand Off	B	From Leg	1.00	0.0000	15.00	No Ice	1.07	1.07	0.02
(Unknown)			0.00			1/2" Ice	1.62	1.62	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	2.17	2.17	0.04
SC479-HF1LDF	A	From Leg	3.00	0.0000	184.00	No Ice	4.85	4.85	0.03
(CSP (Inverted))			0.00			1/2" Ice	6.54	6.54	0.07
			-12.00			1" Ice	8.04	8.04	0.11
SC479-HF1LDF	B	From Leg	3.00	0.0000	184.00	No Ice	4.85	4.85	0.03
(CSP (Inverted))			0.00			1/2" Ice	6.54	6.54	0.07
			-12.00			1" Ice	8.04	8.04	0.11
SE414-SWBP4LDF (D00)	C	From Leg	3.00	0.0000	184.00	No Ice	1.90	4.27	0.01
(CSP)			0.00			1/2" Ice	2.22	4.61	0.04
			0.00			1" Ice	2.55	4.95	0.06
TX/RX 432E-83I-01T	A	From Leg	0.00	0.0000	184.00	No Ice	1.20	0.75	0.03
(CSP)			0.00			1/2" Ice	1.34	0.86	0.04
			0.00			1" Ice	1.48	0.98	0.05
APX16DWV-16DWVS-E-A	A	From Leg	3.00	0.0000	140.00	No Ice	6.46	2.15	0.04
20			-5.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile Existing)			0.00			1" Ice	7.21	2.84	0.11
APX16DWV-16DWVS-E-A	B	From Leg	3.00	0.0000	140.00	No Ice	6.46	2.15	0.04
20			-5.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile Existing)			0.00			1" Ice	7.21	2.84	0.11
APX16DWV-16DWVS-E-A	C	From Leg	3.00	0.0000	140.00	No Ice	6.46	2.15	0.04
20			-5.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile Existing)			0.00			1" Ice	7.21	2.84	0.11
APXVAARR24-43	A	From Leg	3.00	0.0000	140.00	No Ice	20.24	8.89	0.16
(T-Mobile Proposed)			5.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
APXVAARR24-43	B	From Leg	3.00	0.0000	140.00	No Ice	20.24	8.89	0.16
(T-Mobile Proposed)			5.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
APXVAARR24-43	C	From Leg	3.00	0.0000	140.00	No Ice	20.24	8.89	0.16
(T-Mobile Proposed)			5.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
RRUS-11	A	From Leg	3.00	0.0000	140.00	No Ice	2.57	1.07	0.05
(T-Mobile Existing)			-1.00			1/2" Ice	2.76	1.21	0.07
			2.50			1" Ice	2.97	1.36	0.09
RRUS-11	A	From Leg	3.00	0.0000	140.00	No Ice	2.57	1.07	0.05
(T-Mobile Existing)			-1.00			1/2" Ice	2.76	1.21	0.07
			-2.50			1" Ice	2.97	1.36	0.09
RRUS-11	B	From Leg	3.00	0.0000	140.00	No Ice	2.57	1.07	0.05
(T-Mobile Existing)			-1.00			1/2" Ice	2.76	1.21	0.07
			2.50			1" Ice	2.97	1.36	0.09
RRUS-11	B	From Leg	3.00	0.0000	140.00	No Ice	2.57	1.07	0.05
(T-Mobile Existing)			-1.00			1/2" Ice	2.76	1.21	0.07
			-2.50			1" Ice	2.97	1.36	0.09
RRUS-11	C	From Leg	3.00	0.0000	140.00	No Ice	2.57	1.07	0.05
(T-Mobile Existing)			-1.00			1/2" Ice	2.76	1.21	0.07
			2.50			1" Ice	2.97	1.36	0.09
RRUS-11	C	From Leg	3.00	0.0000	140.00	No Ice	2.57	1.07	0.05
(T-Mobile Existing)			-1.00			1/2" Ice	2.76	1.21	0.07
			-2.50			1" Ice	2.97	1.36	0.09
Radio 4449 B71 B12	A	From Leg	3.00	0.0000	140.00	No Ice	1.64	1.29	0.07
(T-Mobile Proposed)			5.00			1/2" Ice	1.80	1.44	0.09
			0.00			1" Ice	1.97	1.59	0.11
Radio 4449 B71 B12	B	From Leg	3.00	0.0000	140.00	No Ice	1.64	1.29	0.07
(T-Mobile Proposed)			5.00			1/2" Ice	1.80	1.44	0.09
			0.00			1" Ice	1.97	1.59	0.11
Radio 4449 B71 B12	C	From Leg	3.00	0.0000	140.00	No Ice	1.64	1.29	0.07
(T-Mobile Proposed)			5.00			1/2" Ice	1.80	1.44	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	1.97	1.59	0.11
10-ft T-Frame	A	From Leg	1.00	0.0000	140.00	No Ice	13.60	13.60	0.38
(T-Mobile Existing)			0.00			1/2" Ice	17.50	17.50	0.53
			0.00			1" Ice	21.40	21.40	0.68
10-ft T-Frame	B	From Leg	1.00	0.0000	140.00	No Ice	13.60	13.60	0.38
(T-Mobile Existing)			0.00			1/2" Ice	17.50	17.50	0.53
			0.00			1" Ice	21.40	21.40	0.68
10-ft T-Frame	C	From Leg	1.00	0.0000	140.00	No Ice	13.60	13.60	0.38
(T-Mobile Existing)			0.00			1/2" Ice	17.50	17.50	0.53
			0.00			1" Ice	21.40	21.40	0.68

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
PA6-65AC	B	Paraboloid w/o	From	1.00	-50.0000		102.25	6.00	No Ice	28.27	0.09
(CSP)		Radome	Leg	0.00					1/2" Ice	29.05	0.24
				0.00					1" Ice	29.83	0.39
PA6-65AC	A	Paraboloid w/o	From	1.00	-10.0000		194.25	6.00	No Ice	28.27	0.09
(CSP)		Radome	Face	0.00					1/2" Ice	29.05	0.24
				0.00					1" Ice	29.83	0.39
1.2M	B	Paraboloid w/o	From	2.00	40.0000		17.00	4.00	No Ice	12.17	0.17
(Verizon)		Radome	Leg	0.00					1/2" Ice	13.09	0.23
				0.00					1" Ice	14.01	0.30

Truss-Leg Interaction Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Section Modulus S_x in^3	Section Modulus S_y in^3	Leg Area in^2
Pirod 105245	1090.3344	3704.6418	0.68	1.39	7.5718	25.7267	18.4723	21.3300	5.3014
Pirod 105217	2296.2363	7024.0136	0.59	2.50	7.9730	24.3889	18.4723	21.3300	5.3014
Pirod 105218	2425.3141	7062.7245	0.72	2.46	8.4212	24.5233	25.1958	29.0936	7.2158
Pirod 105218 reinf. w/1" dia. S.R.	2638.2422	7138.7823	0.98	2.43	9.1606	24.7874	38.1835	44.0905	10.8915
Pirod 105219 reinf. w/1" dia. S.R.	2799.7828	7152.9920	1.35	2.44	9.7215	24.8368	46.3174	53.4827	13.1787
Pirod 105219 reinf. w/1" dia. S.R.	2799.7828	7091.4325	1.35	2.31	9.7215	24.6230	46.3174	53.4827	13.1787
Pirod 105220 reinf. w/1" dia. S.R.	2877.1901	7042.1146	1.46	2.16	9.9902	24.4518	51.8434	59.8636	14.7262
Pirod 105220 reinf. w/1" dia. S.R.	2877.1901	6876.4820	1.46	1.85	9.9902	23.8767	51.8434	59.8636	14.7262

Tower Pressures - No Ice

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	192.00	1.452	29	46.458	A	1.089	6.053	2.917	40.84	2.737	0.000
197.00-187.00					B	1.089	6.053		40.84	5.918	0.000
					C	1.089	6.053		40.84	0.000	0.000
T2	179.50	1.431	28	70.000	A	0.000	9.972	5.000	50.14	5.865	0.000
187.00-172.00					B	0.000	9.972		50.14	28.424	0.000
					C	0.000	9.972		50.14	0.000	0.000
T3	162.00	1.401	28	98.750	A	0.000	15.045	7.501	49.85	38.708	0.000
172.00-152.00					B	0.000	15.045		49.85	41.827	0.000
					C	0.000	15.045		49.85	0.000	0.000
T4	147.00	1.373	27	66.264	A	6.024	12.641	12.641	67.73	27.670	0.000
152.00-142.00					B	6.024	12.641		67.73	20.914	0.000
					C	6.024	12.641		67.73	19.614	0.000
T5	132.00	1.342	27	162.528	A	13.687	27.153	26.621	65.18	55.340	0.000
142.00-122.00					B	13.687	27.153		65.18	53.707	0.000
					C	13.687	27.153		65.18	52.364	0.000
T6	112.00	1.296	26	202.945	A	15.184	28.118	28.118	64.93	55.340	0.000
122.00-102.00					B	15.184	28.118		64.93	53.707	0.000
					C	15.184	28.118		64.93	56.804	0.000
T7	92.00	1.244	25	243.613	A	18.990	31.198	30.586	60.94	55.340	0.000
102.00-82.00					B	18.990	31.198		60.94	58.034	0.000
					C	18.990	31.198		60.94	57.914	0.000
T8 82.00-62.00	72.00	1.181	23	283.972	A	18.364	32.459	32.459	63.87	55.340	0.000
					B	18.364	32.459		63.87	60.354	0.000
					C	18.364	32.459		63.87	57.914	0.000
T9 62.00-42.00	52.00	1.103	22	323.972	A	22.855	33.108	32.459	58.00	55.340	0.000
					B	22.855	33.108		58.00	61.514	0.000
					C	22.855	33.108		58.00	57.914	0.000
T10	32.00	0.996	20	364.197	A	24.881	33.356	33.356	57.28	55.340	0.000
42.00-22.00					B	24.881	33.356		57.28	61.514	0.000
					C	24.881	33.356		57.28	57.914	0.000
T11 22.00-2.00	12.00	0.85	17	404.197	A	30.345	34.023	33.356	51.82	41.505	0.000
					B	30.345	34.023		51.82	46.136	0.000
					C	30.345	34.023		51.82	44.136	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	192.00	1.452	5	2.9814	51.427	A	1.089	39.527	12.855	31.65	16.403	0.000
197.00-187.00						B	1.089	39.527		31.65	40.291	0.000
						C	1.089	39.527		31.65	0.000	0.000
T2	179.50	1.431	5	2.9614	77.403	A	0.000	57.821	19.807	34.26	34.986	0.000
187.00-172.00						B	0.000	57.821		34.26	142.349	0.000
						C	0.000	57.821		34.26	0.000	0.000

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
T3	162.00	1.401	5	2.9312	108.522	A	0.000	78.817	27.044	34.31	119.902	0.000
172.00-152.00						B	0.000	78.817		34.31	203.700	0.000
						C	0.000	78.817		34.31	0.000	0.000
T4	147.00	1.373	5	2.9028	71.108	A	6.024	54.096	42.949	71.44	79.343	0.000
152.00-142.00						B	6.024	54.096		71.44	101.185	0.000
						C	6.024	54.096		71.44	43.691	0.000
T5	132.00	1.342	5	2.8717	172.113	A	13.687	105.218	81.432	68.48	157.766	0.000
142.00-122.00						B	13.687	105.218		68.48	244.527	0.000
						C	13.687	105.218		68.48	129.239	0.000
T6	112.00	1.296	5	2.8249	212.374	A	15.184	106.103	81.881	67.51	156.383	0.000
122.00-102.00						B	15.184	106.103		67.51	242.018	0.000
						C	15.184	106.103		67.51	155.173	0.000
T7 102.00-82.00	92.00	1.244	4	2.7699	252.857	A	18.990	115.778	82.762	61.41	154.756	0.000
						B	18.990	115.778		61.41	265.204	0.000
						C	18.990	115.778		61.41	160.083	0.000
T8 82.00-62.00	72.00	1.181	4	2.7028	292.992	A	18.364	111.832	82.927	63.69	152.775	0.000
						B	18.364	111.832		63.69	284.409	0.000
						C	18.364	111.832		63.69	157.829	0.000
T9 62.00-42.00	52.00	1.103	4	2.6163	332.703	A	22.855	115.364	82.213	59.48	150.219	0.000
						B	22.855	115.364		59.48	289.861	0.000
						C	22.855	115.364		59.48	154.921	0.000
T10 42.00-22.00	32.00	0.996	3	2.4923	372.515	A	24.881	113.981	81.642	58.79	146.559	0.000
						B	24.881	113.981		58.79	280.984	0.000
						C	24.881	113.981		58.79	150.756	0.000
T11 22.00-2.00	12.00	0.85	3	2.2595	411.738	A	30.345	113.924	79.721	55.26	104.772	0.000
						B	30.345	113.924		55.26	198.247	0.000
						C	30.345	113.924		55.26	116.451	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	192.00	1.452	11	46.458	A	1.089	6.053	2.917	40.84	2.737	0.000
197.00-187.00					B	1.089	6.053		40.84	5.918	0.000
					C	1.089	6.053		40.84	0.000	0.000
T2	179.50	1.431	11	70.000	A	0.000	9.972	5.000	50.14	5.865	0.000
187.00-172.00					B	0.000	9.972		50.14	28.424	0.000
					C	0.000	9.972		50.14	0.000	0.000
T3	162.00	1.401	11	98.750	A	0.000	15.045	7.501	49.85	38.708	0.000
172.00-152.00					B	0.000	15.045		49.85	41.827	0.000
					C	0.000	15.045		49.85	0.000	0.000
T4	147.00	1.373	11	66.264	A	6.024	12.641	12.641	67.73	27.670	0.000
152.00-142.00					B	6.024	12.641		67.73	20.914	0.000
					C	6.024	12.641		67.73	19.614	0.000
T5	132.00	1.342	11	162.528	A	13.687	27.153	26.621	65.18	55.340	0.000
142.00-122.00					B	13.687	27.153		65.18	53.707	0.000
					C	13.687	27.153		65.18	52.364	0.000
T6	112.00	1.296	10	202.945	A	15.184	28.118	28.118	64.93	55.340	0.000
122.00-102.00					B	15.184	28.118		64.93	53.707	0.000
					C	15.184	28.118		64.93	56.804	0.000
T7	92.00	1.244	10	243.613	A	18.990	31.198	30.586	60.94	55.340	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
102.00-82.00					B	18.990	31.198		60.94	58.034	0.000
					C	18.990	31.198		60.94	57.914	0.000
T8 82.00-62.00	72.00	1.181	9	283.972	A	18.364	32.459	32.459	63.87	55.340	0.000
					B	18.364	32.459		63.87	60.354	0.000
					C	18.364	32.459		63.87	57.914	0.000
T9 62.00-42.00	52.00	1.103	9	323.972	A	22.855	33.108	32.459	58.00	55.340	0.000
					B	22.855	33.108		58.00	61.514	0.000
					C	22.855	33.108		58.00	57.914	0.000
T10	32.00	0.996	8	364.197	A	24.881	33.356	33.356	57.28	55.340	0.000
42.00-22.00					B	24.881	33.356		57.28	61.514	0.000
					C	24.881	33.356		57.28	57.914	0.000
T11 22.00-2.00	12.00	0.85	7	404.197	A	30.345	34.023	33.356	51.82	41.505	0.000
					B	30.345	34.023		51.82	46.136	0.000
					C	30.345	34.023		51.82	44.136	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.04	0.61	A	0.154	2.758	29	1	1	4.526	0.43	43.24	C
197.00-187.00			B	0.154	2.758		1	1	4.526			
			C	0.154	2.758		1	1	4.526			
T2	0.16	0.94	A	0.142	2.799	28	1	1	5.652	0.88	58.52	C
187.00-172.00			B	0.142	2.799		1	1	5.652			
			C	0.142	2.799		1	1	5.652			
T3	0.40	1.60	A	0.152	2.763	28	1	1	8.542	1.70	84.88	C
172.00-152.00			B	0.152	2.763		1	1	8.542			
			C	0.152	2.763		1	1	8.542			
T4	0.44	1.24	A	0.282	2.346	27	1	1	13.525	1.68	168.00	C
152.00-142.00			B	0.282	2.346		1	1	13.525			
			C	0.282	2.346		1	1	13.525			
T5	0.98	2.33	A	0.251	2.434	27	1	1	29.580	3.82	190.84	C
142.00-122.00			B	0.251	2.434		1	1	29.580			
			C	0.251	2.434		1	1	29.580			
T6	1.00	3.00	A	0.213	2.552	26	1	1	31.407	3.92	196.17	C
122.00-102.00			B	0.213	2.552		1	1	31.407			
			C	0.213	2.552		1	1	31.407			
T7	1.03	3.99	A	0.206	2.576	25	1	1	36.946	4.15	207.37	C
102.00-82.00			B	0.206	2.576		1	1	36.946			
			C	0.206	2.576		1	1	36.946			
T8	1.04	5.31	A	0.179	2.668	23	1	1	36.902	4.03	201.58	C
82.00-62.00			B	0.179	2.668		1	1	36.902			
			C	0.179	2.668		1	1	36.902			
T9	1.04	5.37	A	0.173	2.69	22	1	1	41.734	4.03	201.71	C
62.00-42.00			B	0.173	2.69		1	1	41.734			
			C	0.173	2.69		1	1	41.734			
T10	1.04	6.16	A	0.16	2.735	20	1	1	43.848	3.77	188.56	C
42.00-22.00			B	0.16	2.735		1	1	43.848			
			C	0.16	2.735		1	1	43.848			
T11	0.83	6.18	A	0.159	2.738	17	1	1	49.689	3.08	154.02	C
22.00-2.00			B	0.159	2.738		1	1	49.689			
			C	0.159	2.738		1	1	49.689			
Sum Weight:	8.00	38.22						OTM	2682.09 kip-ft	31.49		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	0.61	A	0.154	2.758	29	0.825	1	4.336	0.42	41.95	C
197.00-187.00			B	0.154	2.758		0.825	1	4.336			
			C	0.154	2.758		0.825	1	4.336			
T2	0.16	0.94	A	0.142	2.799	28	0.825	1	5.652	0.88	58.52	C
187.00-172.00			B	0.142	2.799		0.825	1	5.652			
			C	0.142	2.799		0.825	1	5.652			
T3	0.40	1.60	A	0.152	2.763	28	0.825	1	8.542	1.70	84.88	C
172.00-152.00			B	0.152	2.763		0.825	1	8.542			
			C	0.152	2.763		0.825	1	8.542			
T4	0.44	1.24	A	0.282	2.346	27	0.825	1	12.471	1.62	162.28	C
152.00-142.00			B	0.282	2.346		0.825	1	12.471			
			C	0.282	2.346		0.825	1	12.471			
T5	0.98	2.33	A	0.251	2.434	27	0.825	1	27.185	3.69	184.25	C
142.00-122.00			B	0.251	2.434		0.825	1	27.185			
			C	0.251	2.434		0.825	1	27.185			
T6	1.00	3.00	A	0.213	2.552	26	0.825	1	28.749	3.78	188.77	C
122.00-102.00			B	0.213	2.552		0.825	1	28.749			
			C	0.213	2.552		0.825	1	28.749			
T7	1.03	3.99	A	0.206	2.576	25	0.825	1	33.623	3.97	198.41	C
102.00-82.00			B	0.206	2.576		0.825	1	33.623			
			C	0.206	2.576		0.825	1	33.623			
T8	1.04	5.31	A	0.179	2.668	23	0.825	1	33.688	3.86	193.05	C
82.00-62.00			B	0.179	2.668		0.825	1	33.688			
			C	0.179	2.668		0.825	1	33.688			
T9	1.04	5.37	A	0.173	2.69	22	0.825	1	37.735	3.83	191.71	C
62.00-42.00			B	0.173	2.69		0.825	1	37.735			
			C	0.173	2.69		0.825	1	37.735			
T10	1.04	6.16	A	0.16	2.735	20	0.825	1	39.494	3.57	178.57	C
42.00-22.00			B	0.16	2.735		0.825	1	39.494			
			C	0.16	2.735		0.825	1	39.494			
T11	0.83	6.18	A	0.159	2.738	17	0.825	1	44.379	2.87	143.61	C
22.00-2.00			B	0.159	2.738		0.825	1	44.379			
			C	0.159	2.738		0.825	1	44.379			
Sum Weight:	8.00	38.22						OTM	2591.77 kip-ft	30.19		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	0.61	A	0.154	2.758	29	0.8	1	4.309	0.42	41.77	C
197.00-187.00			B	0.154	2.758		0.8	1	4.309			
			C	0.154	2.758		0.8	1	4.309			
T2	0.16	0.94	A	0.142	2.799	28	0.8	1	5.652	0.88	58.52	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
187.00-172.00			B	0.142	2.799		0.8	1	5.652			
			C	0.142	2.799		0.8	1	5.652			
T3	0.40	1.60	A	0.152	2.763	28	0.8	1	8.542	1.70	84.88	C
172.00-152.00			B	0.152	2.763		0.8	1	8.542			
			C	0.152	2.763		0.8	1	8.542			
T4	0.44	1.24	A	0.282	2.346	27	0.8	1	12.321	1.61	161.46	C
152.00-142.00			B	0.282	2.346		0.8	1	12.321			
			C	0.282	2.346		0.8	1	12.321			
T5	0.98	2.33	A	0.251	2.434	27	0.8	1	26.843	3.67	183.31	C
142.00-122.00			B	0.251	2.434		0.8	1	26.843			
			C	0.251	2.434		0.8	1	26.843			
T6	1.00	3.00	A	0.213	2.552	26	0.8	1	28.370	3.75	187.71	C
122.00-102.00			B	0.213	2.552		0.8	1	28.370			
			C	0.213	2.552		0.8	1	28.370			
T7	1.03	3.99	A	0.206	2.576	25	0.8	1	33.148	3.94	197.12	C
102.00-82.00			B	0.206	2.576		0.8	1	33.148			
			C	0.206	2.576		0.8	1	33.148			
T8	1.04	5.31	A	0.179	2.668	23	0.8	1	33.229	3.84	191.83	C
82.00-62.00			B	0.179	2.668		0.8	1	33.229			
			C	0.179	2.668		0.8	1	33.229			
T9	1.04	5.37	A	0.173	2.69	22	0.8	1	37.163	3.81	190.28	C
62.00-42.00			B	0.173	2.69		0.8	1	37.163			
			C	0.173	2.69		0.8	1	37.163			
T10	1.04	6.16	A	0.16	2.735	20	0.8	1	38.872	3.54	177.14	C
42.00-22.00			B	0.16	2.735		0.8	1	38.872			
			C	0.16	2.735		0.8	1	38.872			
T11	0.83	6.18	A	0.159	2.738	17	0.8	1	43.620	2.84	142.13	C
22.00-2.00			B	0.159	2.738		0.8	1	43.620			
			C	0.159	2.738		0.8	1	43.620			
Sum Weight:	8.00	38.22						OTM	2578.87 kip-ft	30.00		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.04	0.61	A	0.154	2.758	29	0.85	1	4.363	0.42	42.14	C
197.00-187.00			B	0.154	2.758		0.85	1	4.363			
			C	0.154	2.758		0.85	1	4.363			
T2	0.16	0.94	A	0.142	2.799	28	0.85	1	5.652	0.88	58.52	C
187.00-172.00			B	0.142	2.799		0.85	1	5.652			
			C	0.142	2.799		0.85	1	5.652			
T3	0.40	1.60	A	0.152	2.763	28	0.85	1	8.542	1.70	84.88	C
172.00-152.00			B	0.152	2.763		0.85	1	8.542			
			C	0.152	2.763		0.85	1	8.542			
T4	0.44	1.24	A	0.282	2.346	27	0.85	1	12.622	1.63	163.10	C
152.00-142.00			B	0.282	2.346		0.85	1	12.622			
			C	0.282	2.346		0.85	1	12.622			
T5	0.98	2.33	A	0.251	2.434	27	0.85	1	27.527	3.70	185.20	C
142.00-122.00			B	0.251	2.434		0.85	1	27.527			
			C	0.251	2.434		0.85	1	27.527			
T6	1.00	3.00	A	0.213	2.552	26	0.85	1	29.129	3.80	189.83	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
122.00-102.00			B	0.213	2.552		0.85	1	29.129			
			C	0.213	2.552		0.85	1	29.129			
T7	1.03	3.99	A	0.206	2.576	25	0.85	1	34.098	3.99	199.69	C
102.00-82.00			B	0.206	2.576		0.85	1	34.098			
			C	0.206	2.576		0.85	1	34.098			
T8	1.04	5.31	A	0.179	2.668	23	0.85	1	34.147	3.89	194.27	C
82.00-62.00			B	0.179	2.668		0.85	1	34.147			
			C	0.179	2.668		0.85	1	34.147			
T9	1.04	5.37	A	0.173	2.69	22	0.85	1	38.306	3.86	193.14	C
62.00-42.00			B	0.173	2.69		0.85	1	38.306			
			C	0.173	2.69		0.85	1	38.306			
T10	1.04	6.16	A	0.16	2.735	20	0.85	1	40.116	3.60	180.00	C
42.00-22.00			B	0.16	2.735		0.85	1	40.116			
			C	0.16	2.735		0.85	1	40.116			
T11	0.83	6.18	A	0.159	2.738	17	0.85	1	45.137	2.90	145.10	C
22.00-2.00			B	0.159	2.738		0.85	1	45.137			
			C	0.159	2.738		0.85	1	45.137			
Sum Weight:	8.00	38.22						OTM	2604.68 kip-ft	30.37		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.01	3.36	A	0.79	1.809	5	1	1	35.779	0.33	32.93	C
197.00-187.00			B	0.79	1.809		1	1	35.779			
			C	0.79	1.809		1	1	35.779			
T2	3.31	4.66	A	0.747	1.786	5	1	1	48.875	0.56	37.33	C
187.00-172.00			B	0.747	1.786		1	1	48.875			
			C	0.747	1.786		1	1	48.875			
T3	6.61	6.69	A	0.726	1.78	5	1	1	65.419	0.85	42.50	C
172.00-152.00			B	0.726	1.78		1	1	65.419			
			C	0.726	1.78		1	1	65.419			
T4	5.19	4.89	A	0.845	1.857	5	1	1	54.675	0.55	55.31	C
152.00-142.00			B	0.845	1.857		1	1	54.675			
			C	0.845	1.857		1	1	54.675			
T5	12.02	13.49	A	0.691	1.776	5	1	1	96.964	1.34	66.81	C
142.00-122.00			B	0.691	1.776		1	1	96.964			
			C	0.691	1.776		1	1	96.964			
T6	12.37	14.33	A	0.571	1.825	5	1	1	90.971	1.55	77.37	C
122.00-102.00			B	0.571	1.825		1	1	90.971			
			C	0.571	1.825		1	1	90.971			
T7	12.68	16.25	A	0.533	1.861	4	1	1	99.256	1.68	83.83	C
102.00-82.00			B	0.533	1.861		1	1	99.256			
			C	0.533	1.861		1	1	99.256			
T8	12.60	17.15	A	0.444	1.983	4	1	1	90.726	1.78	89.21	C
82.00-62.00			B	0.444	1.983		1	1	90.726			
			C	0.444	1.983		1	1	90.726			
T9	12.27	17.55	A	0.415	2.034	4	1	1	96.035	1.77	88.64	C
62.00-42.00			B	0.415	2.034		1	1	96.035			
			C	0.415	2.034		1	1	96.035			
T10	11.62	18.00	A	0.373	2.12	3	1	1	95.174	1.62	80.85	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
42.00-22.00			B	0.373	2.12		1	1	95.174			
			C	0.373	2.12		1	1	95.174			
T11	8.02	17.36	A	0.35	2.171	3	1	1	99.713	1.18	58.88	C
22.00-2.00			B	0.35	2.171		1	1	99.713			
			C	0.35	2.171		1	1	99.713			
Sum Weight:	97.71	135.22						OTM	1146.79 kip-ft	13.20		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.01	3.36	A	0.79	1.809	5	0.825	1	35.588	0.33	32.78	C
197.00-187.00			B	0.79	1.809		0.825	1	35.588			
			C	0.79	1.809		0.825	1	35.588			
T2	3.31	4.66	A	0.747	1.786	5	0.825	1	48.875	0.56	37.33	C
187.00-172.00			B	0.747	1.786		0.825	1	48.875			
			C	0.747	1.786		0.825	1	48.875			
T3	6.61	6.69	A	0.726	1.78	5	0.825	1	65.419	0.85	42.50	C
172.00-152.00			B	0.726	1.78		0.825	1	65.419			
			C	0.726	1.78		0.825	1	65.419			
T4	5.19	4.89	A	0.845	1.857	5	0.825	1	53.621	0.55	54.51	C
152.00-142.00			B	0.845	1.857		0.825	1	53.621			
			C	0.845	1.857		0.825	1	53.621			
T5	12.02	13.49	A	0.691	1.776	5	0.825	1	94.569	1.32	65.97	C
142.00-122.00			B	0.691	1.776		0.825	1	94.569			
			C	0.691	1.776		0.825	1	94.569			
T6	12.37	14.33	A	0.571	1.825	5	0.825	1	88.314	1.53	76.44	C
122.00-102.00			B	0.571	1.825		0.825	1	88.314			
			C	0.571	1.825		0.825	1	88.314			
T7	12.68	16.25	A	0.533	1.861	4	0.825	1	95.933	1.65	82.70	C
102.00-82.00			B	0.533	1.861		0.825	1	95.933			
			C	0.533	1.861		0.825	1	95.933			
T8	12.60	17.15	A	0.444	1.983	4	0.825	1	87.512	1.76	88.10	C
82.00-62.00			B	0.444	1.983		0.825	1	87.512			
			C	0.444	1.983		0.825	1	87.512			
T9	12.27	17.55	A	0.415	2.034	4	0.825	1	92.035	1.75	87.31	C
62.00-42.00			B	0.415	2.034		0.825	1	92.035			
			C	0.415	2.034		0.825	1	92.035			
T10	11.62	18.00	A	0.373	2.12	3	0.825	1	90.820	1.59	79.49	C
42.00-22.00			B	0.373	2.12		0.825	1	90.820			
			C	0.373	2.12		0.825	1	90.820			
T11	8.02	17.36	A	0.35	2.171	3	0.825	1	94.403	1.15	57.43	C
22.00-2.00			B	0.35	2.171		0.825	1	94.403			
			C	0.35	2.171		0.825	1	94.403			
Sum Weight:	97.71	135.22						OTM	1135.08 kip-ft	13.03		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.01	3.36	A	0.79	1.809	5	0.8	1	35.561	0.33	32.76	C
197.00-187.00			B	0.79	1.809		0.8	1	35.561			
			C	0.79	1.809		0.8	1	35.561			
T2	3.31	4.66	A	0.747	1.786	5	0.8	1	48.875	0.56	37.33	C
187.00-172.00			B	0.747	1.786		0.8	1	48.875			
			C	0.747	1.786		0.8	1	48.875			
T3	6.61	6.69	A	0.726	1.78	5	0.8	1	65.419	0.85	42.50	C
172.00-152.00			B	0.726	1.78		0.8	1	65.419			
			C	0.726	1.78		0.8	1	65.419			
T4	5.19	4.89	A	0.845	1.857	5	0.8	1	53.470	0.54	54.40	C
152.00-142.00			B	0.845	1.857		0.8	1	53.470			
			C	0.845	1.857		0.8	1	53.470			
T5	12.02	13.49	A	0.691	1.776	5	0.8	1	94.227	1.32	65.85	C
142.00-122.00			B	0.691	1.776		0.8	1	94.227			
			C	0.691	1.776		0.8	1	94.227			
T6	12.37	14.33	A	0.571	1.825	5	0.8	1	87.934	1.53	76.31	C
122.00-102.00			B	0.571	1.825		0.8	1	87.934			
			C	0.571	1.825		0.8	1	87.934			
T7	12.68	16.25	A	0.533	1.861	4	0.8	1	95.458	1.65	82.53	C
102.00-82.00			B	0.533	1.861		0.8	1	95.458			
			C	0.533	1.861		0.8	1	95.458			
T8	12.60	17.15	A	0.444	1.983	4	0.8	1	87.053	1.76	87.94	C
82.00-62.00			B	0.444	1.983		0.8	1	87.053			
			C	0.444	1.983		0.8	1	87.053			
T9	12.27	17.55	A	0.415	2.034	4	0.8	1	91.464	1.74	87.12	C
62.00-42.00			B	0.415	2.034		0.8	1	91.464			
			C	0.415	2.034		0.8	1	91.464			
T10	11.62	18.00	A	0.373	2.12	3	0.8	1	90.198	1.59	79.30	C
42.00-22.00			B	0.373	2.12		0.8	1	90.198			
			C	0.373	2.12		0.8	1	90.198			
T11	8.02	17.36	A	0.35	2.171	3	0.8	1	93.644	1.14	57.22	C
22.00-2.00			B	0.35	2.171		0.8	1	93.644			
			C	0.35	2.171		0.8	1	93.644			
Sum Weight:	97.71	135.22						OTM	1133.40 kip-ft	13.01		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.01	3.36	A	0.79	1.809	5	0.85	1	35.615	0.33	32.80	C
197.00-187.00			B	0.79	1.809		0.85	1	35.615			
			C	0.79	1.809		0.85	1	35.615			
T2	3.31	4.66	A	0.747	1.786	5	0.85	1	48.875	0.56	37.33	C
187.00-172.00			B	0.747	1.786		0.85	1	48.875			
			C	0.747	1.786		0.85	1	48.875			
T3	6.61	6.69	A	0.726	1.78	5	0.85	1	65.419	0.85	42.50	C
172.00-152.00			B	0.726	1.78		0.85	1	65.419			
			C	0.726	1.78		0.85	1	65.419			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T4	5.19	4.89	A	0.845	1.857	5	0.85	1	53.771	0.55	54.63	C
152.00-142.00			B	0.845	1.857		0.85	1	53.771			
			C	0.845	1.857		0.85	1	53.771			
T5	12.02	13.49	A	0.691	1.776	5	0.85	1	94.911	1.32	66.09	C
142.00-122.00			B	0.691	1.776		0.85	1	94.911			
			C	0.691	1.776		0.85	1	94.911			
T6	12.37	14.33	A	0.571	1.825	5	0.85	1	88.693	1.53	76.58	C
122.00-102.00			B	0.571	1.825		0.85	1	88.693			
			C	0.571	1.825		0.85	1	88.693			
T7	12.68	16.25	A	0.533	1.861	4	0.85	1	96.407	1.66	82.86	C
102.00-82.00			B	0.533	1.861		0.85	1	96.407			
			C	0.533	1.861		0.85	1	96.407			
T8	12.60	17.15	A	0.444	1.983	4	0.85	1	87.971	1.77	88.26	C
82.00-62.00			B	0.444	1.983		0.85	1	87.971			
			C	0.444	1.983		0.85	1	87.971			
T9	12.27	17.55	A	0.415	2.034	4	0.85	1	92.606	1.75	87.50	C
62.00-42.00			B	0.415	2.034		0.85	1	92.606			
			C	0.415	2.034		0.85	1	92.606			
T10	11.62	18.00	A	0.373	2.12	3	0.85	1	91.442	1.59	79.69	C
42.00-22.00			B	0.373	2.12		0.85	1	91.442			
			C	0.373	2.12		0.85	1	91.442			
T11	8.02	17.36	A	0.35	2.171	3	0.85	1	95.162	1.15	57.63	C
22.00-2.00			B	0.35	2.171		0.85	1	95.162			
			C	0.35	2.171		0.85	1	95.162			
Sum Weight:	97.71	135.22						OTM	1136.75 kip-ft	13.06		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.04	0.61	A	0.154	2.758	11	1	1	4.526	0.17	17.09	C
197.00-187.00			B	0.154	2.758		1	1	4.526			
			C	0.154	2.758		1	1	4.526			
T2	0.16	0.94	A	0.142	2.799	11	1	1	5.652	0.35	23.13	C
187.00-172.00			B	0.142	2.799		1	1	5.652			
			C	0.142	2.799		1	1	5.652			
T3	0.40	1.60	A	0.152	2.763	11	1	1	8.542	0.67	33.54	C
172.00-152.00			B	0.152	2.763		1	1	8.542			
			C	0.152	2.763		1	1	8.542			
T4	0.44	1.24	A	0.282	2.346	11	1	1	13.525	0.66	66.39	C
152.00-142.00			B	0.282	2.346		1	1	13.525			
			C	0.282	2.346		1	1	13.525			
T5	0.98	2.33	A	0.251	2.434	11	1	1	29.580	1.51	75.42	C
142.00-122.00			B	0.251	2.434		1	1	29.580			
			C	0.251	2.434		1	1	29.580			
T6	1.00	3.00	A	0.213	2.552	10	1	1	31.407	1.55	77.53	C
122.00-102.00			B	0.213	2.552		1	1	31.407			
			C	0.213	2.552		1	1	31.407			
T7	1.03	3.99	A	0.206	2.576	10	1	1	36.946	1.64	81.96	C
102.00-82.00			B	0.206	2.576		1	1	36.946			
			C	0.206	2.576		1	1	36.946			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T8	1.04	5.31	A	0.179	2.668	9	1	1	36.902	1.59	79.67	C
82.00-62.00			B	0.179	2.668		1	1	36.902			
			C	0.179	2.668		1	1	36.902			
T9	1.04	5.37	A	0.173	2.69	9	1	1	41.734	1.59	79.72	C
62.00-42.00			B	0.173	2.69		1	1	41.734			
			C	0.173	2.69		1	1	41.734			
T10	1.04	6.16	A	0.16	2.735	8	1	1	43.848	1.49	74.52	C
42.00-22.00			B	0.16	2.735		1	1	43.848			
			C	0.16	2.735		1	1	43.848			
T11	0.83	6.18	A	0.159	2.738	7	1	1	49.689	1.22	60.87	C
22.00-2.00			B	0.159	2.738		1	1	49.689			
			C	0.159	2.738		1	1	49.689			
Sum Weight:	8.00	38.22						OTM	1059.98 kip-ft	12.45		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	0.61	A	0.154	2.758	11	0.825	1	4.336	0.17	16.58	C
197.00-187.00			B	0.154	2.758		0.825	1	4.336			
			C	0.154	2.758		0.825	1	4.336			
T2	0.16	0.94	A	0.142	2.799	11	0.825	1	5.652	0.35	23.13	C
187.00-172.00			B	0.142	2.799		0.825	1	5.652			
			C	0.142	2.799		0.825	1	5.652			
T3	0.40	1.60	A	0.152	2.763	11	0.825	1	8.542	0.67	33.54	C
172.00-152.00			B	0.152	2.763		0.825	1	8.542			
			C	0.152	2.763		0.825	1	8.542			
T4	0.44	1.24	A	0.282	2.346	11	0.825	1	12.471	0.64	64.13	C
152.00-142.00			B	0.282	2.346		0.825	1	12.471			
			C	0.282	2.346		0.825	1	12.471			
T5	0.98	2.33	A	0.251	2.434	11	0.825	1	27.185	1.46	72.82	C
142.00-122.00			B	0.251	2.434		0.825	1	27.185			
			C	0.251	2.434		0.825	1	27.185			
T6	1.00	3.00	A	0.213	2.552	10	0.825	1	28.749	1.49	74.60	C
122.00-102.00			B	0.213	2.552		0.825	1	28.749			
			C	0.213	2.552		0.825	1	28.749			
T7	1.03	3.99	A	0.206	2.576	10	0.825	1	33.623	1.57	78.41	C
102.00-82.00			B	0.206	2.576		0.825	1	33.623			
			C	0.206	2.576		0.825	1	33.623			
T8	1.04	5.31	A	0.179	2.668	9	0.825	1	33.688	1.53	76.30	C
82.00-62.00			B	0.179	2.668		0.825	1	33.688			
			C	0.179	2.668		0.825	1	33.688			
T9	1.04	5.37	A	0.173	2.69	9	0.825	1	37.735	1.52	75.77	C
62.00-42.00			B	0.173	2.69		0.825	1	37.735			
			C	0.173	2.69		0.825	1	37.735			
T10	1.04	6.16	A	0.16	2.735	8	0.825	1	39.494	1.41	70.57	C
42.00-22.00			B	0.16	2.735		0.825	1	39.494			
			C	0.16	2.735		0.825	1	39.494			
T11	0.83	6.18	A	0.159	2.738	7	0.825	1	44.379	1.14	56.76	C
22.00-2.00			B	0.159	2.738		0.825	1	44.379			
			C	0.159	2.738		0.825	1	44.379			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	8.00	38.22						OTM	1024.29 kip-ft	11.93		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.04	0.61	A	0.154	2.758	11	0.8	1	4.309	0.17	16.51	C
197.00-187.00			B	0.154	2.758		0.8	1	4.309			
			C	0.154	2.758		0.8	1	4.309			
T2	0.16	0.94	A	0.142	2.799	11	0.8	1	5.652	0.35	23.13	C
187.00-172.00			B	0.142	2.799		0.8	1	5.652			
			C	0.142	2.799		0.8	1	5.652			
T3	0.40	1.60	A	0.152	2.763	11	0.8	1	8.542	0.67	33.54	C
172.00-152.00			B	0.152	2.763		0.8	1	8.542			
			C	0.152	2.763		0.8	1	8.542			
T4	0.44	1.24	A	0.282	2.346	11	0.8	1	12.321	0.64	63.81	C
152.00-142.00			B	0.282	2.346		0.8	1	12.321			
			C	0.282	2.346		0.8	1	12.321			
T5	0.98	2.33	A	0.251	2.434	11	0.8	1	26.843	1.45	72.45	C
142.00-122.00			B	0.251	2.434		0.8	1	26.843			
			C	0.251	2.434		0.8	1	26.843			
T6	1.00	3.00	A	0.213	2.552	10	0.8	1	28.370	1.48	74.18	C
122.00-102.00			B	0.213	2.552		0.8	1	28.370			
			C	0.213	2.552		0.8	1	28.370			
T7	1.03	3.99	A	0.206	2.576	10	0.8	1	33.148	1.56	77.90	C
102.00-82.00			B	0.206	2.576		0.8	1	33.148			
			C	0.206	2.576		0.8	1	33.148			
T8	1.04	5.31	A	0.179	2.668	9	0.8	1	33.229	1.52	75.81	C
82.00-62.00			B	0.179	2.668		0.8	1	33.229			
			C	0.179	2.668		0.8	1	33.229			
T9	1.04	5.37	A	0.173	2.69	9	0.8	1	37.163	1.50	75.20	C
62.00-42.00			B	0.173	2.69		0.8	1	37.163			
			C	0.173	2.69		0.8	1	37.163			
T10	1.04	6.16	A	0.16	2.735	8	0.8	1	38.872	1.40	70.01	C
42.00-22.00			B	0.16	2.735		0.8	1	38.872			
			C	0.16	2.735		0.8	1	38.872			
T11	0.83	6.18	A	0.159	2.738	7	0.8	1	43.620	1.12	56.17	C
22.00-2.00			B	0.159	2.738		0.8	1	43.620			
			C	0.159	2.738		0.8	1	43.620			
Sum Weight:	8.00	38.22						OTM	1019.19 kip-ft	11.86		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	0.61	A	0.154	2.758	11	0.85	1	4.363	0.17	16.65	C
197.00-187.00			B	0.154	2.758		0.85	1	4.363			
			C	0.154	2.758		0.85	1	4.363			
T2	0.16	0.94	A	0.142	2.799	11	0.85	1	5.652	0.35	23.13	C
187.00-172.00			B	0.142	2.799		0.85	1	5.652			
			C	0.142	2.799		0.85	1	5.652			
T3	0.40	1.60	A	0.152	2.763	11	0.85	1	8.542	0.67	33.54	C
172.00-152.00			B	0.152	2.763		0.85	1	8.542			
			C	0.152	2.763		0.85	1	8.542			
T4	0.44	1.24	A	0.282	2.346	11	0.85	1	12.622	0.64	64.46	C
152.00-142.00			B	0.282	2.346		0.85	1	12.622			
			C	0.282	2.346		0.85	1	12.622			
T5	0.98	2.33	A	0.251	2.434	11	0.85	1	27.527	1.46	73.19	C
142.00-122.00			B	0.251	2.434		0.85	1	27.527			
			C	0.251	2.434		0.85	1	27.527			
T6	1.00	3.00	A	0.213	2.552	10	0.85	1	29.129	1.50	75.02	C
122.00-102.00			B	0.213	2.552		0.85	1	29.129			
			C	0.213	2.552		0.85	1	29.129			
T7	1.03	3.99	A	0.206	2.576	10	0.85	1	34.098	1.58	78.92	C
102.00-82.00			B	0.206	2.576		0.85	1	34.098			
			C	0.206	2.576		0.85	1	34.098			
T8	1.04	5.31	A	0.179	2.668	9	0.85	1	34.147	1.54	76.78	C
82.00-62.00			B	0.179	2.668		0.85	1	34.147			
			C	0.179	2.668		0.85	1	34.147			
T9	1.04	5.37	A	0.173	2.69	9	0.85	1	38.306	1.53	76.33	C
62.00-42.00			B	0.173	2.69		0.85	1	38.306			
			C	0.173	2.69		0.85	1	38.306			
T10	1.04	6.16	A	0.16	2.735	8	0.85	1	40.116	1.42	71.14	C
42.00-22.00			B	0.16	2.735		0.85	1	40.116			
			C	0.16	2.735		0.85	1	40.116			
T11	0.83	6.18	A	0.159	2.738	7	0.85	1	45.137	1.15	57.34	C
22.00-2.00			B	0.159	2.738		0.85	1	45.137			
			C	0.159	2.738		0.85	1	45.137			
Sum Weight:	8.00	38.22						OTM	1029.39 kip-ft	12.00		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	26.37					
Bracing Weight	10.36					
Total Member Self-Weight	36.73			-3.61	13.35	
Gusset Weight	1.49					
Total Weight	56.24			-3.61	13.35	
Wind 0 deg - No Ice		-0.16	-42.25	-4285.31	41.47	-39.33
Wind 30 deg - No Ice		20.76	-35.49	-3601.07	-2157.25	-37.28
Wind 45 deg - No Ice		29.63	-28.76	-2901.52	-3103.25	-31.16
Wind 60 deg - No Ice		36.02	-19.96	-1998.74	-3759.39	-24.35
Wind 90 deg - No Ice		41.75	0.47	78.17	-4315.92	-7.30
Wind 120 deg - No Ice		37.20	21.24	2169.31	-3823.52	13.13
Wind 135 deg - No Ice		30.25	29.42	3005.37	-3136.37	23.00

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 150 deg - No Ice		21.50	35.46	3634.29	-2263.15	31.18
Wind 180 deg - No Ice		0.13	41.12	4241.44	-74.02	36.42
Wind 210 deg - No Ice		-21.34	35.36	3604.26	2208.42	36.88
Wind 225 deg - No Ice		-29.54	28.82	2943.63	3053.31	32.24
Wind 240 deg - No Ice		-37.03	21.20	2145.57	3781.22	24.92
Wind 270 deg - No Ice		-41.77	0.11	20.12	4305.74	6.02
Wind 300 deg - No Ice		-36.06	-20.21	-2078.37	3737.90	-17.06
Wind 315 deg - No Ice		-29.71	-28.85	-2966.27	3075.40	-26.74
Wind 330 deg - No Ice		-20.94	-35.54	-3643.82	2162.69	-32.92
Member Ice	97.00					
Gusset Ice	2.03					
Total Weight Ice	281.63			-81.18	164.43	
Wind 0 deg - Ice		-0.04	-17.93	-1927.52	171.21	-12.54
Wind 30 deg - Ice		8.94	-15.37	-1662.26	-767.89	-16.63
Wind 45 deg - Ice		12.71	-12.52	-1364.60	-1164.63	-16.78
Wind 60 deg - Ice		15.53	-8.78	-977.97	-1455.72	-16.09
Wind 90 deg - Ice		17.94	0.10	-63.78	-1699.87	-11.74
Wind 120 deg - Ice		15.68	8.99	849.31	-1463.47	-3.91
Wind 135 deg - Ice		12.81	12.61	1223.34	-1170.33	0.66
Wind 150 deg - Ice		9.10	15.37	1509.03	-790.93	5.16
Wind 180 deg - Ice		0.03	17.80	1764.94	145.85	11.98
Wind 210 deg - Ice		-9.06	15.34	1501.90	1101.58	16.57
Wind 225 deg - Ice		-12.70	12.53	1211.98	1478.22	17.03
Wind 240 deg - Ice		-15.65	8.98	842.65	1777.40	16.22
Wind 270 deg - Ice		-17.95	0.01	-77.71	2021.38	11.52
Wind 300 deg - Ice		-15.54	-8.84	-995.86	1776.09	3.20
Wind 315 deg - Ice		-12.74	-12.54	-1379.11	1484.20	-1.35
Wind 330 deg - Ice		-8.99	-15.38	-1671.91	1094.49	-5.47
Total Weight	56.24			-3.61	13.35	
Wind 0 deg - Service		-0.06	-16.70	-1693.09	6.45	-15.54
Wind 30 deg - Service		8.21	-14.03	-1422.67	-862.50	-14.73
Wind 45 deg - Service		11.71	-11.36	-1146.21	-1236.37	-12.32
Wind 60 deg - Service		14.24	-7.89	-789.42	-1495.68	-9.62
Wind 90 deg - Service		16.50	0.18	31.39	-1715.62	-2.88
Wind 120 deg - Service		14.70	8.39	857.82	-1521.02	5.19
Wind 135 deg - Service		11.95	11.63	1188.24	-1249.46	9.09
Wind 150 deg - Service		8.50	14.01	1436.79	-904.35	12.32
Wind 180 deg - Service		0.05	16.25	1676.74	-39.19	14.39
Wind 210 deg - Service		-8.43	13.98	1424.92	862.84	14.57
Wind 225 deg - Service		-11.68	11.39	1163.84	1196.75	12.74
Wind 240 deg - Service		-14.63	8.38	848.44	1484.42	9.85
Wind 270 deg - Service		-16.51	0.04	8.45	1691.72	2.38
Wind 300 deg - Service		-14.25	-7.99	-820.89	1467.30	-6.74
Wind 315 deg - Service		-11.74	-11.40	-1171.79	1205.48	-10.57
Wind 330 deg - Service		-8.28	-14.05	-1439.57	844.77	-13.01

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice

Comb. No.	Description
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	197 - 187	Leg	Max Tension	7	4.07	0.40	-0.33
			Max. Compression	12	-5.15	-0.11	-0.07
			Max. Mx	6	-1.38	0.65	-0.13
			Max. My	2	0.49	-0.14	-0.52
			Max. Vy	6	1.20	-0.15	0.03
			Max. Vx	2	-0.97	0.04	0.12
		Diagonal	Max Tension	4	1.63	0.00	0.00
			Max. Compression	22	-1.65	0.00	0.00
			Max. Mx	39	0.29	-0.01	0.00
			Max. My	23	-1.64	-0.00	0.00
			Max. Vy	38	0.02	-0.01	0.00
			Max. Vx	22	-0.00	-0.00	0.00
		Top Girt	Max Tension	7	0.19	0.00	0.00
			Max. Compression	8	-0.26	0.00	0.00
			Max. Mx	43	-0.03	-0.09	0.00
			Max. My	22	0.05	0.00	-0.00
			Max. Vy	43	0.08	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Bottom Girt	Max Tension	6	0.68	0.00	0.00
			Max. Compression	13	-0.76	0.00	0.00
			Max. Mx	43	0.21	0.04	0.00
			Max. My	22	0.22	0.00	0.00
			Max. Vy	43	-0.04	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
T2	187 - 172	Leg	Max Tension	7	21.54	-0.29	0.36
			Max. Compression	12	-26.87	-0.39	-0.33
			Max. Mx	26	-2.56	-1.49	0.01
			Max. My	18	19.48	0.09	1.35
			Max. Vy	26	-2.88	0.43	0.01
			Max. Vx	18	2.70	0.01	-0.42
		Diagonal	Max Tension	6	4.13	0.00	0.00
			Max. Compression	22	-4.21	0.00	0.00
			Max. Mx	48	1.19	-0.01	-0.00
			Max. My	22	-4.21	-0.00	0.00
			Max. Vy	48	0.02	-0.01	-0.00
			Max. Vx	22	-0.00	-0.00	0.00
		Top Girt	Max Tension	12	0.81	0.00	0.00
			Max. Compression	6	-0.73	0.00	0.00
			Max. Mx	43	-0.23	0.04	0.00
			Max. My	22	-0.22	0.00	0.00
			Max. Vy	43	-0.04	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	1.58	0.00	0.00
			Max. Compression	12	-1.72	0.00	0.00
			Max. Mx	43	0.58	0.04	0.00
			Max. My	22	0.52	0.00	0.00
			Max. Vy	43	-0.04	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
T3	172 - 152	Leg	Max Tension	9	67.02	0.67	-0.10
			Max. Compression	12	-77.05	2.95	0.26
			Max. Mx	12	-77.05	2.95	0.26
			Max. My	26	-2.60	-0.01	-2.23
			Max. Vy	12	-5.86	2.95	0.26
			Max. Vx	26	3.26	0.02	-1.56
		Diagonal	Max Tension	4	5.49	0.00	0.00
			Max. Compression	22	-5.59	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	35	1.25	-0.02	0.00
			Max. My	22	-4.63	-0.00	0.00
			Max. Vy	35	0.03	-0.02	-0.00
			Max. Vx	22	-0.00	-0.00	0.00
		Top Girt	Max Tension	12	1.80	0.00	0.00
			Max. Compression	8	-1.67	0.00	0.00
			Max. Mx	43	-0.60	0.04	0.00
			Max. My	4	0.04	0.00	0.00
			Max. Vy	43	0.04	0.00	0.00
			Max. Vx	4	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	0.64	0.00	0.00
			Max. Compression	13	-0.67	0.00	0.00
			Max. Mx	48	0.34	0.05	0.00
			Max. My	4	-0.06	0.00	0.00
			Max. Vy	48	-0.04	0.00	0.00
			Max. Vx	4	-0.00	0.00	0.00
T4	152 - 142	Leg	Max Tension	9	74.16	-2.71	0.27
			Max. Compression	12	-84.91	5.32	-0.18
			Max. Mx	8	72.35	-5.52	-0.68
			Max. My	10	1.34	-0.48	7.30
			Max. Vy	18	-0.81	-2.69	-0.05
			Max. Vx	16	1.02	-0.70	-7.08
		Diagonal	Max Tension	9	8.97	0.05	0.01
			Max. Compression	24	-9.58	0.00	0.00
			Max. Mx	48	0.87	0.07	-0.01
			Max. My	24	-9.56	-0.04	-0.05
			Max. Vy	48	0.05	0.07	0.01
			Max. Vx	22	0.01	0.00	0.00
T5	142 - 122	Leg	Max Tension	9	121.78	-4.89	-0.38
			Max. Compression	12	-138.41	6.66	-0.02
			Max. Mx	12	-138.41	6.66	-0.02
			Max. My	10	1.06	-0.48	7.30
			Max. Vy	8	-1.16	-5.52	-0.68
			Max. Vx	16	-1.37	-0.70	-7.08
		Diagonal	Max Tension	4	10.92	0.00	0.00
			Max. Compression	20	-11.41	0.00	0.00
			Max. Mx	35	0.97	0.14	0.02
			Max. My	22	-10.85	-0.04	-0.04
			Max. Vy	49	0.08	0.11	0.02
			Max. Vx	22	0.01	0.00	0.00
T6	122 - 102	Leg	Max Tension	9	167.02	-4.40	-0.65
			Max. Compression	12	-188.61	7.63	-0.07
			Max. Mx	12	-188.61	7.63	-0.07
			Max. My	16	2.38	-0.64	-8.48
			Max. Vy	24	-0.99	7.23	-0.38
			Max. Vx	16	-0.96	-0.64	-8.48
		Diagonal	Max Tension	7	11.56	0.00	0.00
			Max. Compression	22	-12.12	0.00	0.00
			Max. Mx	46	1.14	0.18	0.02
			Max. My	3	-7.76	-0.02	0.03
			Max. Vy	49	0.10	0.16	0.03
			Max. Vx	37	-0.01	0.00	0.00
T7	102 - 82	Leg	Max Tension	9	212.65	-4.52	-0.55
			Max. Compression	12	-239.38	7.03	-0.14
			Max. Mx	12	-213.45	7.63	-0.07
			Max. My	10	-3.09	-0.48	8.15
			Max. Vy	12	0.56	7.63	-0.07
			Max. Vx	16	0.98	-0.58	-8.10
		Diagonal	Max Tension	20	11.60	0.00	0.00
			Max. Compression	20	-11.85	0.00	0.00
			Max. Mx	35	1.75	0.19	0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	4	-11.22	-0.02	0.04
			Max. Vy	48	0.11	0.18	0.03
			Max. Vx	37	-0.01	0.00	0.00
		Top Girt	Max Tension	8	4.07	0.00	0.00
			Max. Compression	13	-3.73	0.00	0.00
			Max. Mx	34	1.61	-0.35	0.00
			Max. My	46	1.92	0.00	0.01
			Max. Vy	34	0.14	0.00	0.00
			Max. Vx	46	-0.00	0.00	0.00
T8	82 - 62	Leg	Max Tension	9	255.04	-5.76	-0.27
			Max. Compression	12	-287.00	5.66	-0.07
			Max. Mx	12	-262.81	7.03	-0.14
			Max. My	16	0.44	-0.23	-6.09
			Max. Vy	18	-0.31	-6.58	-0.05
			Max. Vx	2	0.34	-3.16	5.36
		Diagonal	Max Tension	20	12.23	0.00	0.00
			Max. Compression	20	-12.53	0.00	0.00
			Max. Mx	48	1.91	0.24	0.03
			Max. My	46	-0.09	0.20	-0.04
			Max. Vy	48	0.13	0.24	0.03
			Max. Vx	46	-0.01	0.00	0.00
T9	62 - 42	Leg	Max Tension	29	295.27	-5.52	0.08
			Max. Compression	12	-332.66	6.87	-0.16
			Max. Mx	12	-332.66	6.87	-0.16
			Max. My	16	-3.70	-0.25	-6.82
			Max. Vy	8	0.28	-6.64	-0.06
			Max. Vx	2	-0.34	-3.29	6.01
		Diagonal	Max Tension	20	12.72	0.00	0.00
			Max. Compression	20	-13.09	0.00	0.00
			Max. Mx	48	1.88	0.30	-0.04
			Max. My	46	-0.04	0.27	-0.04
			Max. Vy	48	0.16	0.30	-0.04
			Max. Vx	46	-0.01	0.00	0.00
T10	42 - 22	Leg	Max Tension	29	333.88	-5.75	0.08
			Max. Compression	12	-377.31	6.00	-0.01
			Max. Mx	12	-354.34	6.87	-0.16
			Max. My	16	-3.99	-0.25	-6.82
			Max. Vy	38	0.78	-6.49	0.09
			Max. Vx	32	0.34	-0.05	5.50
		Diagonal	Max Tension	20	13.63	0.00	0.00
			Max. Compression	20	-13.99	0.00	0.00
			Max. Mx	48	2.79	0.37	0.04
			Max. My	37	-3.32	0.33	0.05
			Max. Vy	48	0.18	0.37	0.04
			Max. Vx	37	0.01	0.00	0.00
T11	22 - 2	Leg	Max Tension	29	369.67	-5.96	0.08
			Max. Compression	12	-419.62	0.00	-0.00
			Max. Mx	46	-198.44	9.65	0.26
			Max. My	10	-13.70	-0.53	9.95
			Max. Vy	37	-1.39	-6.44	0.41
			Max. Vx	16	-1.15	-0.61	-9.87
		Diagonal	Max Tension	5	14.60	0.00	0.00
			Max. Compression	20	-15.19	0.00	0.00
			Max. Mx	48	-0.15	0.42	-0.06
			Max. My	37	-5.92	0.38	0.06
			Max. Vy	49	0.18	0.35	0.04
			Max. Vx	38	-0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	24	425.89	37.12	-22.73
	Max. H_x	24	425.89	37.12	-22.73
	Max. H_z	7	-367.27	-32.06	21.37
	Min. Vert	9	-378.10	-33.65	20.85
	Min. H_x	9	-378.10	-33.65	20.85
	Min. H_z	24	425.89	37.12	-22.73
Leg B	Max. Vert	12	430.97	-38.18	-21.37
	Max. H_x	29	-379.13	34.83	19.13
	Max. H_z	29	-379.13	34.83	19.13
	Min. Vert	29	-379.13	34.83	19.13
	Min. H_x	12	430.97	-38.18	-21.37
	Min. H_z	12	430.97	-38.18	-21.37
Leg A	Max. Vert	2	420.28	-1.80	43.08
	Max. H_x	25	-182.21	4.31	-19.65
	Max. H_z	2	420.28	-1.80	43.08
	Min. Vert	19	-376.58	1.84	-39.49
	Min. H_x	9	202.06	-3.82	20.79
	Min. H_z	19	-376.58	1.84	-39.49

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	56.24	0.00	0.00	-3.62	13.35	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	67.48	-0.25	-67.60	-6889.81	61.81	-63.04
0.9 Dead+1.6 Wind 0 deg - No Ice	50.61	-0.25	-67.60	-6879.93	57.65	-63.02
1.2 Dead+1.6 Wind 30 deg - No Ice	67.49	33.22	-56.79	-5789.54	-3474.64	-59.74
0.9 Dead+1.6 Wind 30 deg - No Ice	50.61	33.22	-56.79	-5781.08	-3474.13	-59.71
1.2 Dead+1.6 Wind 45 deg - No Ice	67.49	47.41	-46.01	-4664.49	-4996.35	-49.95
0.9 Dead+1.6 Wind 45 deg - No Ice	50.61	47.41	-46.01	-4657.50	-4993.80	-49.92
1.2 Dead+1.6 Wind 60 deg - No Ice	67.49	57.64	-31.94	-3212.60	-6051.56	-39.06
0.9 Dead+1.6 Wind 60 deg - No Ice	50.61	57.64	-31.94	-3207.49	-6047.66	-39.03
1.2 Dead+1.6 Wind 90 deg - No Ice	67.49	66.80	0.74	127.36	-6946.42	-11.76
0.9 Dead+1.6 Wind 90 deg - No Ice	50.61	66.80	0.75	128.22	-6941.43	-11.74
1.2 Dead+1.6 Wind 120 deg - No Ice	67.49	59.52	33.98	3490.05	-6154.47	21.01
0.9 Dead+1.6 Wind 120 deg - No Ice	50.61	59.52	33.98	3486.67	-6150.51	21.01
1.2 Dead+1.6 Wind 135 deg - No Ice	67.49	48.40	47.08	4834.61	-5049.52	36.85
0.9 Dead+1.6 Wind 135 deg - No Ice	50.61	48.40	47.08	4829.51	-5046.95	36.84
1.2 Dead+1.6 Wind 150 deg -	67.49	34.40	56.74	5846.09	-3645.33	49.96

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
No Ice						
0.9 Dead+1.6 Wind 150 deg - No Ice	50.61	34.40	56.74	5839.67	-3644.52	49.95
1.2 Dead+1.6 Wind 180 deg - No Ice	67.49	0.21	65.79	6822.56	-124.97	58.38
0.9 Dead+1.6 Wind 180 deg - No Ice	50.61	0.21	65.79	6814.85	-128.63	58.35
1.2 Dead+1.6 Wind 210 deg - No Ice	67.49	-34.14	56.58	5797.36	3546.29	59.12
0.9 Dead+1.6 Wind 210 deg - No Ice	50.61	-34.14	56.58	5791.06	3537.73	59.09
1.2 Dead+1.6 Wind 225 deg - No Ice	67.49	-47.27	46.12	4734.98	4904.94	51.70
0.9 Dead+1.6 Wind 225 deg - No Ice	50.61	-47.27	46.12	4730.02	4894.64	51.66
1.2 Dead+1.6 Wind 240 deg - No Ice	67.49	-59.24	33.91	3451.52	6075.26	39.98
0.9 Dead+1.6 Wind 240 deg - No Ice	50.61	-59.24	33.91	3448.23	6063.52	39.97
1.2 Dead+1.6 Wind 270 deg - No Ice	67.49	-66.83	0.17	33.60	6918.96	9.73
0.9 Dead+1.6 Wind 270 deg - No Ice	50.61	-66.83	0.17	34.68	6906.06	9.71
1.2 Dead+1.6 Wind 300 deg - No Ice	67.49	-57.70	-32.33	-3341.07	6005.88	-27.31
0.9 Dead+1.6 Wind 300 deg - No Ice	50.61	-57.70	-32.33	-3335.63	5994.14	-27.31
1.2 Dead+1.6 Wind 315 deg - No Ice	67.49	-47.54	-46.16	-4768.89	4940.47	-42.84
0.9 Dead+1.6 Wind 315 deg - No Ice	50.61	-47.54	-46.16	-4761.62	4930.11	-42.83
1.2 Dead+1.6 Wind 330 deg - No Ice	67.49	-33.50	-56.86	-5858.42	3472.73	-52.77
0.9 Dead+1.6 Wind 330 deg - No Ice	50.61	-33.50	-56.86	-5849.77	3464.26	-52.76
1.2 Dead+1.0 Ice+1.0 Temp	292.87	0.00	0.00	-84.53	170.97	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	292.87	-0.04	-17.93	-1977.47	178.41	-12.84
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	292.87	8.94	-15.37	-1705.48	-784.62	-16.99
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	292.87	12.71	-12.52	-1400.27	-1191.53	-17.14
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	292.87	15.53	-8.78	-1003.86	-1489.92	-16.42
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	292.87	17.94	0.10	-66.74	-1740.09	-11.94
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	292.87	15.68	8.99	869.20	-1497.72	-3.94
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	292.87	12.81	12.61	1252.65	-1197.28	0.73
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	292.87	9.10	15.37	1545.57	-808.41	5.32
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	292.87	0.03	17.80	1808.01	151.83	12.28
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	292.87	-9.06	15.34	1538.14	1132.06	16.94
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	292.87	-12.70	12.53	1240.96	1518.17	17.38
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	292.87	-15.65	8.98	862.32	1824.77	16.55
1.2 Dead+1.0 Wind 270	292.87	-17.95	0.01	-81.20	2075.02	11.73

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	292.87	-15.54	-8.84	-1022.56	1823.56	3.23
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 315	292.87	-12.74	-12.54	-1415.44	1524.28	-1.42
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	292.87	-8.99	-15.38	-1715.57	1124.76	-5.63
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	56.24	-0.06	-16.70	-1702.99	24.63	-15.57
Dead+Wind 30 deg - Service	56.24	8.21	-14.03	-1431.41	-848.13	-14.77
Dead+Wind 45 deg - Service	56.24	11.71	-11.36	-1153.74	-1223.66	-12.34
Dead+Wind 60 deg - Service	56.24	14.24	-7.89	-795.42	-1484.08	-9.65
Dead+Wind 90 deg - Service	56.24	16.50	0.18	28.87	-1704.93	-2.89
Dead+Wind 120 deg - Service	56.24	14.70	8.39	858.78	-1509.49	5.19
Dead+Wind 135 deg - Service	56.24	11.95	11.63	1190.61	-1236.79	9.10
Dead+Wind 150 deg - Service	56.24	8.50	14.01	1440.23	-890.24	12.33
Dead+Wind 180 deg - Service	56.24	0.05	16.25	1681.23	-21.42	14.42
Dead+Wind 210 deg - Service	56.24	-8.43	13.98	1428.25	884.62	14.61
Dead+Wind 225 deg - Service	56.24	-11.68	11.39	1166.07	1219.95	12.77
Dead+Wind 240 deg - Service	56.24	-14.63	8.38	849.31	1508.81	9.88
Dead+Wind 270 deg - Service	56.24	-16.51	0.04	5.75	1717.04	2.39
Dead+Wind 300 deg - Service	56.24	-14.25	-7.99	-827.15	1491.68	-6.75
Dead+Wind 315 deg - Service	56.24	-11.74	-11.40	-1179.54	1228.72	-10.58
Dead+Wind 330 deg - Service	56.24	-8.28	-14.05	-1448.44	866.48	-13.02

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-56.24	0.00	0.00	56.24	0.00	0.000%
2	-0.25	-67.49	-67.60	0.25	67.48	67.60	0.000%
3	-0.25	-50.61	-67.60	0.25	50.61	67.60	0.000%
4	33.22	-67.49	-56.79	-33.22	67.49	56.79	0.000%
5	33.22	-50.61	-56.79	-33.22	50.61	56.79	0.000%
6	47.41	-67.49	-46.01	-47.41	67.49	46.01	0.000%
7	47.41	-50.61	-46.01	-47.41	50.61	46.01	0.000%
8	57.64	-67.49	-31.94	-57.64	67.49	31.94	0.000%
9	57.64	-50.61	-31.94	-57.64	50.61	31.94	0.000%
10	66.80	-67.49	0.75	-66.80	67.49	-0.74	0.000%
11	66.80	-50.61	0.75	-66.80	50.61	-0.75	0.000%
12	59.52	-67.49	33.98	-59.52	67.49	-33.98	0.000%
13	59.52	-50.61	33.98	-59.52	50.61	-33.98	0.000%
14	48.40	-67.49	47.08	-48.40	67.49	-47.08	0.000%
15	48.40	-50.61	47.08	-48.40	50.61	-47.08	0.000%
16	34.40	-67.49	56.74	-34.40	67.49	-56.74	0.000%
17	34.40	-50.61	56.74	-34.40	50.61	-56.74	0.000%
18	0.21	-67.49	65.79	-0.21	67.49	-65.79	0.000%
19	0.21	-50.61	65.79	-0.21	50.61	-65.79	0.000%
20	-34.14	-67.49	56.58	34.14	67.49	-56.58	0.000%
21	-34.14	-50.61	56.58	34.14	50.61	-56.58	0.000%
22	-47.27	-67.49	46.12	47.27	67.49	-46.12	0.000%
23	-47.27	-50.61	46.12	47.27	50.61	-46.12	0.000%
24	-59.24	-67.49	33.91	59.24	67.49	-33.91	0.000%
25	-59.24	-50.61	33.91	59.24	50.61	-33.91	0.000%
26	-66.83	-67.49	0.17	66.83	67.49	-0.17	0.000%
27	-66.83	-50.61	0.17	66.83	50.61	-0.17	0.000%
28	-57.70	-67.49	-32.33	57.70	67.49	32.33	0.000%
29	-57.70	-50.61	-32.33	57.70	50.61	32.33	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
30	-47.54	-67.49	-46.16	47.54	67.49	46.16	0.000%
31	-47.54	-50.61	-46.16	47.54	50.61	46.16	0.000%
32	-33.50	-67.49	-56.86	33.50	67.49	56.86	0.000%
33	-33.50	-50.61	-56.86	33.50	50.61	56.86	0.000%
34	0.00	-292.87	0.00	-0.00	292.87	-0.00	0.000%
35	-0.04	-292.87	-17.93	0.04	292.87	17.93	0.000%
36	8.94	-292.87	-15.37	-8.94	292.87	15.37	0.000%
37	12.71	-292.87	-12.52	-12.71	292.87	12.52	0.000%
38	15.53	-292.87	-8.78	-15.53	292.87	8.78	0.000%
39	17.94	-292.87	0.10	-17.94	292.87	-0.10	0.000%
40	15.68	-292.87	8.99	-15.68	292.87	-8.99	0.000%
41	12.81	-292.87	12.61	-12.81	292.87	-12.61	0.000%
42	9.10	-292.87	15.37	-9.10	292.87	-15.37	0.000%
43	0.03	-292.87	17.80	-0.03	292.87	-17.80	0.000%
44	-9.06	-292.87	15.34	9.06	292.87	-15.34	0.000%
45	-12.70	-292.87	12.53	12.70	292.87	-12.53	0.000%
46	-15.65	-292.87	8.98	15.65	292.87	-8.98	0.000%
47	-17.95	-292.87	0.01	17.95	292.87	-0.01	0.000%
48	-15.54	-292.87	-8.84	15.54	292.87	8.84	0.000%
49	-12.74	-292.87	-12.54	12.74	292.87	12.54	0.000%
50	-8.99	-292.87	-15.38	8.99	292.87	15.38	0.000%
51	-0.06	-56.24	-16.70	0.06	56.24	16.70	0.000%
52	8.21	-56.24	-14.03	-8.21	56.24	14.03	0.000%
53	11.71	-56.24	-11.36	-11.71	56.24	11.36	0.000%
54	14.24	-56.24	-7.89	-14.24	56.24	7.89	0.000%
55	16.50	-56.24	0.18	-16.50	56.24	-0.18	0.000%
56	14.70	-56.24	8.39	-14.70	56.24	-8.39	0.000%
57	11.95	-56.24	11.63	-11.95	56.24	-11.63	0.000%
58	8.50	-56.24	14.01	-8.50	56.24	-14.01	0.000%
59	0.05	-56.24	16.25	-0.05	56.24	-16.25	0.000%
60	-8.43	-56.24	13.98	8.43	56.24	-13.98	0.000%
61	-11.68	-56.24	11.39	11.68	56.24	-11.39	0.000%
62	-14.63	-56.24	8.38	14.63	56.24	-8.38	0.000%
63	-16.51	-56.24	0.04	16.51	56.24	-0.04	0.000%
64	-14.25	-56.24	-7.99	14.25	56.24	7.99	0.000%
65	-11.74	-56.24	-11.40	11.74	56.24	11.40	0.000%
66	-8.28	-56.24	-14.05	8.28	56.24	14.05	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000153
3	Yes	4	0.00000001	0.00000127
4	Yes	4	0.00000001	0.00000077
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000107
7	Yes	4	0.00000001	0.00000097
8	Yes	4	0.00000001	0.00000154
9	Yes	4	0.00000001	0.00000144
10	Yes	4	0.00000001	0.00000167
11	Yes	4	0.00000001	0.00000151
12	Yes	4	0.00000001	0.00000116
13	Yes	4	0.00000001	0.00000103
14	Yes	4	0.00000001	0.00000126

15	Yes	4	0.00000001	0.00000113
16	Yes	4	0.00000001	0.00000163
17	Yes	4	0.00000001	0.00000143
18	Yes	4	0.00000001	0.00000126
19	Yes	4	0.00000001	0.00000107
20	Yes	4	0.00000001	0.00000090
21	Yes	4	0.00000001	0.00000069
22	Yes	4	0.00000001	0.00000157
23	Yes	4	0.00000001	0.00000142
24	Yes	4	0.00000001	0.00000227
25	Yes	4	0.00000001	0.00000185
26	Yes	4	0.00000001	0.00000152
27	Yes	4	0.00000001	0.00000139
28	Yes	4	0.00000001	0.00000074
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000122
31	Yes	4	0.00000001	0.00000105
32	Yes	4	0.00000001	0.00000161
33	Yes	4	0.00000001	0.00000144
34	Yes	4	0.00000001	0.00000664
35	Yes	4	0.00000001	0.00004411
36	Yes	4	0.00000001	0.00004315
37	Yes	4	0.00000001	0.00004312
38	Yes	4	0.00000001	0.00004260
39	Yes	4	0.00000001	0.00004069
40	Yes	4	0.00000001	0.00003912
41	Yes	4	0.00000001	0.00003901
42	Yes	4	0.00000001	0.00003943
43	Yes	4	0.00000001	0.00004096
44	Yes	4	0.00000001	0.00004194
45	Yes	4	0.00000001	0.00004263
46	Yes	4	0.00000001	0.00004352
47	Yes	4	0.00000001	0.00004545
48	Yes	4	0.00000001	0.00004646
49	Yes	4	0.00000001	0.00004624
50	Yes	4	0.00000001	0.00004557
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000001
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000001
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000001
62	Yes	4	0.00000001	0.00000001
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000001
66	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	197 - 187	6.051	56	0.2911	0.1554
T2	187 - 172	5.429	56	0.2905	0.1398

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T3	172 - 152	4.489	56	0.2798	0.1039
T4	152 - 142	3.345	56	0.2393	0.0732
T5	142 - 122	2.847	56	0.2173	0.0581
T6	122 - 102	2.007	56	0.1663	0.0391
T7	102 - 82	1.375	56	0.1244	0.0281
T8	82 - 62	0.887	56	0.0952	0.0206
T9	62 - 42	0.515	56	0.0703	0.0149
T10	42 - 22	0.245	56	0.0452	0.0093
T11	22 - 2	0.077	56	0.0225	0.0046

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
196.26	Single Dipole	56	6.006	0.2911	0.1544	157868
196.00	PIROD 6'-8" Rigid Side Arm	56	5.989	0.2911	0.1541	157868
194.92	6'x4" Pipe Mount	56	5.922	0.2911	0.1526	157868
194.25	PA6-65AC	56	5.881	0.2911	0.1517	157868
192.75	9' x 3" Dia Omni	56	5.788	0.2911	0.1495	157868
190.25	OGT9-840	56	5.632	0.2910	0.1456	118914
186.50	Pirod 4' Side Mount Standoff (1)	56	5.397	0.2904	0.1387	112186
185.25	DB222-A	56	5.319	0.2900	0.1361	140786
184.00	SC479-HF1LDF	56	5.240	0.2896	0.1332	209377
183.00	Filter Box	56	5.177	0.2892	0.1309	353954
182.25	PD220	56	5.130	0.2889	0.1291	463061
181.50	BCD-87077	56	5.082	0.2885	0.1272	252606
181.25	PiROD 15' Rotatable Platform (Lattice)	56	5.066	0.2884	0.1266	219366
180.25	DB222-A	56	5.003	0.2878	0.1241	143720
175.25	12' x 3" Dia Omni	56	4.690	0.2837	0.1115	50444
174.25	10' x 3" Dia Omni	56	4.628	0.2826	0.1091	44662
173.75	ANT150D6-9	56	4.597	0.2820	0.1079	42377
172.25	Pirod 6' Side Mount Standoff (1)	56	4.504	0.2801	0.1045	37312
170.20	3' Sidearm	56	4.379	0.2771	0.1001	33413
167.00	LPA-80080-4CF	56	4.187	0.2717	0.0941	30337
163.00	PiROD 15' T-Frame	56	3.952	0.2637	0.0875	27605
150.25	(2) 7770.00	56	3.254	0.2355	0.0706	22633
140.00	APX16DWV-16DWVS-E-A20	56	2.754	0.2125	0.0554	23867
135.00	SRL110A	56	2.529	0.2000	0.0497	22947
134.00	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	56	2.486	0.1974	0.0487	22757
130.00	DB586-Y	56	2.317	0.1869	0.0451	22028
126.00	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	56	2.158	0.1765	0.0419	21348
125.00	DB586-Y	56	2.119	0.1739	0.0412	21214
120.67	DB212-1	56	1.959	0.1631	0.0383	21563
120.50	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	56	1.953	0.1627	0.0382	21620
109.25	DB205-L	56	1.584	0.1379	0.0316	29081
106.00	Ice Canopy	56	1.488	0.1316	0.0300	32420
102.25	PA6-65AC	56	1.382	0.1248	0.0282	36399
101.20	6'8"x4" Pipe Mount	56	1.353	0.1230	0.0277	37149
100.83	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	56	1.343	0.1224	0.0276	37355
94.00	DB224	56	1.165	0.1116	0.0247	38608
90.41	PD220	56	1.077	0.1064	0.0234	38993

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
85.00	2-ft Stand Off	56	0.952	0.0990	0.0215	39604
82.67	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	56	0.901	0.0960	0.0208	40010
79.50	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	56	0.834	0.0920	0.0198	41004
75.00	12' x 3" Dia Omni	56	0.744	0.0864	0.0185	42998
70.25	DB432-A	56	0.656	0.0805	0.0172	45367
17.00	1.2M	56	0.052	0.0169	0.0035	57446
15.00	2-ft Stand Off	56	0.043	0.0147	0.0030	66284

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	197 - 187	24.769	12	1.2014	0.6308
T2	187 - 172	22.202	12	1.1964	0.5673
T3	172 - 152	18.339	12	1.1492	0.4217
T4	152 - 142	13.650	12	0.9803	0.2964
T5	142 - 122	11.614	12	0.8894	0.2352
T6	122 - 102	8.179	12	0.6796	0.1587
T7	102 - 82	5.601	12	0.5074	0.1140
T8	82 - 62	3.610	12	0.3881	0.0834
T9	62 - 42	2.097	12	0.2868	0.0605
T10	42 - 22	0.996	12	0.1842	0.0375
T11	22 - 2	0.312	12	0.0918	0.0186

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
196.26	Single Dipole	12	24.579	1.2013	0.6268	42787
196.00	PIROD 6'-8" Rigid Side Arm	12	24.513	1.2012	0.6253	42787
194.92	6'x4" Pipe Mount	12	24.237	1.2010	0.6194	42787
194.25	PA6-65AC	12	24.065	1.2008	0.6156	42787
192.75	9' x 3" Dia Omni	12	23.681	1.2004	0.6069	42787
190.25	OGT9-840	12	23.040	1.1992	0.5912	32183
186.50	Pirod 4' Side Mount Standoff (1)	12	22.073	1.1958	0.5632	29212
185.25	DB222-A	12	21.749	1.1942	0.5523	35219
184.00	SC479-HF1LDF	12	21.425	1.1922	0.5409	50423
183.00	Filter Box	12	21.166	1.1903	0.5313	83811
182.25	PD220	12	20.971	1.1887	0.5239	105288
181.50	BCD-87077	12	20.776	1.1870	0.5164	62684
181.25	PiROD 15' Rotatable Platform (Lattice)	12	20.711	1.1864	0.5139	53415
180.25	DB222-A	12	20.452	1.1838	0.5037	33563
175.25	12' x 3" Dia Omni	12	19.164	1.1659	0.4526	11780
174.25	10' x 3" Dia Omni	12	18.909	1.1612	0.4428	10508
173.75	ANT150D6-9	12	18.781	1.1587	0.4379	10000
172.25	Pirod 6' Side Mount Standoff (1)	12	18.402	1.1506	0.4240	8861
170.20	3' Sidearm	12	17.888	1.1379	0.4063	7969

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
167.00	LPA-80080-4CF	12	17.100	1.1149	0.3818	7252
163.00	PiROD 15' T-Frame	12	16.138	1.0818	0.3547	6610
150.25	(2) 7770.00	12	13.278	0.9645	0.2860	5452
140.00	APX16DWV-16DWVS-E-A20	12	11.232	0.8698	0.2244	5817
135.00	SRL110A	12	10.312	0.8181	0.2012	5592
134.00	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	12	10.135	0.8074	0.1972	5545
130.00	DB586-Y	12	9.447	0.7643	0.1825	5365
126.00	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	12	8.794	0.7213	0.1698	5198
125.00	DB586-Y	12	8.637	0.7107	0.1669	5165
120.67	DB212-1	12	7.983	0.6663	0.1552	5249
120.50	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	12	7.958	0.6646	0.1548	5263
109.25	DB205-L	12	6.453	0.5627	0.1283	7092
106.00	Ice Canopy	12	6.061	0.5369	0.1217	7913
102.25	PA6-65AC	12	5.629	0.5092	0.1145	8895
101.20	6'8"x4" Pipe Mount	12	5.511	0.5018	0.1125	9081
100.83	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	12	5.470	0.4992	0.1119	9132
94.00	DB224	12	4.744	0.4550	0.1004	9452
90.41	PD220	12	4.386	0.4339	0.0949	9554
85.00	2-ft Stand Off	12	3.876	0.4040	0.0873	9715
82.67	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	12	3.668	0.3916	0.0843	9818
79.50	PIROD 6' Rigid Side Arm w/ 3" STD mount pipe	12	3.396	0.3752	0.0804	10062
75.00	12' x 3" Dia Omni	12	3.030	0.3523	0.0751	10545
70.25	DB432-A	12	2.668	0.3284	0.0697	11118
17.00	1.2M	12	0.209	0.0691	0.0140	14082
15.00	2-ft Stand Off	12	0.174	0.0599	0.0122	16249

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	197	Leg	A325N	0.6250	5	1.03	24.85	0.041 ✓	1	Bolt DS
T2	187	Leg	A325N	0.7500	5	5.37	35.78	0.150 ✓	1	Bolt DS
T3	172	Leg	A325N	1.0000	6	11.17	53.01	0.211 ✓	1	Bolt Tension
T4	152	Leg	A325N	1.0000	6	12.36	53.01	0.233 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	8.97	12.72	0.705 ✓	1	Member Bearing
T5	142	Leg	A325N	1.0000	6	20.30	53.01	0.383 ✓	1	Bolt Tension
		Diagonal	A325X	1.0000	1	10.92	14.26	0.766 ✓	1	Member Bearing
T6	122	Leg	A325N	1.0000	6	27.84	53.01	0.525 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	11.56	19.01	0.608 ✓	1	Member Bearing
T7	102	Leg	A325N	1.0000	6	35.44	53.01	0.669 ✓	1	Bolt Tension
		Diagonal	A325X	1.0000	1	11.60	19.01	0.610 ✓	1	Member Bearing
		Top Girt	A325N	1.0000	1	4.07	12.72	0.320 ✓	1	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T8	82	Leg	A325N	1.2500	6	42.51	82.83	0.513 ✔	1	Bolt Tension
		Diagonal	A325N	1.2500	1	12.23	26.64	0.459 ✔	1	Member Bearing
T9	62	Leg	A325N	1.2500	6	49.21	82.83	0.594 ✔	1	Bolt Tension
		Diagonal	A325X	1.2500	1	12.72	23.89	0.533 ✔	1	Member Bearing
T10	42	Leg	A325N	1.2500	6	55.65	82.83	0.672 ✔	1	Bolt Tension
		Diagonal	A325N	1.2500	1	13.63	26.64	0.512 ✔	1	Member Bearing
T11	22	Leg	A687	1.2500	6	61.61	96.64	0.638 ✔	1	Bolt Tension
		Diagonal	A325X	1.2500	1	14.60	23.89	0.611 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $P_u / \phi P_n$
T1	197 - 187	1 3/4	10.00	2.17	59.4 K=1.00	2.4053	-1.67	83.62	0.020
T2	187 - 172	2	15.00	2.28	54.7 K=1.00	3.1416	-26.80	113.63	0.236
T3	172 - 152	2 1/4	20.00	2.34	50.0 K=1.00	3.9761	-77.05	149.02	0.517
T4	152 - 142	Pirod 105245	10.02	10.02	37.8 K=1.00	5.3014	-82.86	214.86	0.386
T5	142 - 122	Pirod 105217	20.03	10.02	37.8 K=1.00	5.3014	-138.41	214.86	0.644
T6	122 - 102	Pirod 105218	20.03	10.02	32.4 K=1.00	7.2158	-188.61	300.68	0.627
T7	102 - 82	Pirod 105218 reinf. w/1" dia. S.R.	20.03	10.02	26.4 K=1.00	10.8915	-239.38	465.78	0.514
T8	82 - 62	Pirod 105219 reinf. w/1" dia. S.R.	20.03	10.02	24.4 K=1.00	13.1787	-287.00	567.86	0.505
T9	62 - 42	Pirod 105219 reinf. w/1" dia. S.R.	20.03	10.02	24.4 K=1.00	13.1787	-332.66	567.86	0.586
T10	42 - 22	Pirod 105220 reinf. w/1" dia. S.R.	20.03	10.02	24.3 K=1.00	14.7262	-377.31	634.59	0.595
T11	22 - 2	Pirod 105220 reinf. w/1" dia. S.R.	20.03	10.02	24.3 K=1.00	14.7262	-419.22	634.59	0.661

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $M_{ux} / \phi M_{nx}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $M_{uy} / \phi M_{ny}$

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	197 - 187	1 3/4	0.66	3.35	0.197	0.00	3.35	0.000
T2	187 - 172	2	1.51	5.00	0.301	0.00	5.00	0.000
T3	172 - 152	2 1/4	2.96	7.12	0.416	0.00	7.12	0.000
T4	152 - 142	Pirod 105245	5.16	62.39	0.083	1.31	72.04	0.018
T5	142 - 122	Pirod 105217	6.66	62.39	0.107	-0.02	72.04	0.000
T6	122 - 102	Pirod 105218	7.63	87.49	0.087	-0.07	101.03	0.001
T7	102 - 82	Pirod 105218 reinf. w/1" dia. S.R.	7.03	136.08	0.052	-0.14	157.13	0.001
T8	82 - 62	Pirod 105219 reinf. w/1" dia. S.R.	5.66	166.32	0.034	-0.07	192.04	0.000
T9	62 - 42	Pirod 105219 reinf. w/1" dia. S.R.	6.87	166.32	0.041	-0.16	192.04	0.001
T10	42 - 22	Pirod 105220 reinf. w/1" dia. S.R.	6.00	186.17	0.032	-0.01	214.97	0.000
T11	22 - 2	Pirod 105220 reinf. w/1" dia. S.R.	5.48	186.17	0.029	-0.08	214.97	0.000

Leg Interaction Design Data (Compression)

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	197 - 187	1 3/4	0.020	0.197	0.000	0.207 ✔	1.000	4.8.1 ✔
T2	187 - 172	2	0.236	0.301	0.000	0.477 ✔	1.000	4.8.1 ✔
T3	172 - 152	2 1/4	0.517	0.416	0.000	0.829 ✔	1.000	4.8.1 ✔
T4	152 - 142	Pirod 105245	0.386	0.083	0.018	0.487 ✔	1.000	4.8.1 ✔
T5	142 - 122	Pirod 105217	0.644	0.107	0.000	0.751 ✔	1.000	4.8.1 ✔
T6	122 - 102	Pirod 105218	0.627	0.087	0.001	0.715 ✔	1.000	4.8.1 ✔
T7	102 - 82	Pirod 105218 reinf. w/1" dia. S.R.	0.514	0.052	0.001	0.566 ✔	1.000	4.8.1 ✔
T8	82 - 62	Pirod 105219 reinf. w/1" dia. S.R.	0.505	0.034	0.000	0.540 ✔	1.000	4.8.1 ✔
T9	62 - 42	Pirod 105219 reinf. w/1" dia. S.R.	0.586	0.041	0.001	0.628 ✔	1.000	4.8.1 ✔
T10	42 - 22	Pirod 105220 reinf. w/1" dia. S.R.	0.595	0.032	0.000	0.627 ✔	1.000	4.8.1 ✔
T11	22 - 2	Pirod 105220 reinf. w/1" dia. S.R.	0.661	0.029	0.000	0.690 ✔	1.000	4.8.1 ✔

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T4	152 - 142	0.5	1.47	120.0	238.57	0.1963	1.02	3.45	0.298 ✔
T5	142 - 122	0.5	1.47	120.0	238.57	0.1963	1.38	3.34	0.416 ✔
T6	122 - 102	0.5	1.46	119.0	324.71	0.1963	1.16	3.38	0.344 ✔
T7	102 - 82	0.5	1.44	117.4	490.12	0.1963	0.99	3.44	0.287 ✔
T8	82 - 62	0.625	1.43	93.3	593.04	0.3068	0.38	7.04	0.055 ✔
T9	62 - 42	0.625	1.43	93.3	593.04	0.3068	0.38	7.04	0.055 ✔
T10	42 - 22	0.625	1.42	92.9	662.68	0.3068	0.79	7.06	0.111 ✔
T11	22 - 2	0.625	1.42	92.9	662.68	0.3068	1.39	7.06	0.197 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	197 - 187	7/8	4.99	2.42	119.3 K=0.90	0.6013	-1.65	9.55	0.173 [1] ✔
T2	187 - 172	7/8	5.04	2.43	119.9 K=0.90	0.6013	-4.21	9.45	0.445 [1] ✔
T3	172 - 152	1	5.48	2.65	114.6 K=0.90	0.7854	-5.59	13.51	0.414 [1] ✔
T4	152 - 142	L2 1/2x2 1/2x3/16	11.42	5.02	121.8 K=1.00	0.9020	-9.58	13.38	0.716 [1] ✔
T5	142 - 122	L3x3x3/16	12.50	5.67	115.6 K=1.01	1.0900	-11.41	18.13	0.630 [1] ✔
T6	122 - 102	L3x3x1/4	13.80	6.37	129.1 K=1.00	1.4400	-12.12	19.52	0.621 [1] ✔
T7	102 - 82	L3x3x1/4	15.24	7.12	144.4 K=1.00	1.4400	-11.85	15.60	0.759 [1] ✔
T8	82 - 62	L3x3x5/16	16.80	7.89	160.8 K=1.00	1.7800	-12.53	15.55	0.805 [1] ✔
T9	62 - 42	L3 1/2x3 1/2x1/4	18.45	8.73	150.9 K=1.00	1.6900	-13.09	16.76	0.781 [1] ✔
T10	42 - 22	L3 1/2x3 1/2x5/16	20.16	9.59	166.8 K=1.00	2.0900	-13.99	16.96	0.825 [1] ✔
T11	22 - 2	L4x4x1/4	21.92	10.48	158.2 K=1.00	1.9400	-15.19	17.52	0.867 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	197 - 187	L3x3x5/16	4.50	4.35	88.7 K=1.00	1.7800	-0.26	38.11	0.007 [1] ✔
T2	187 - 172	1	4.50	4.33	85.3 K=0.41	0.7854	-0.73	20.77	0.035 [1] ✔
T3	172 - 152	1	4.52	4.33	85.3 K=0.41	0.7854	-1.67	20.77	0.080 [1] ✔
T7	102 - 82	L3x3x3/16	10.00	8.67	174.5 K=1.00	1.0900	-3.73	8.09	0.462 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	197 - 187	7/8	4.50	4.35	167.2 K=0.70	0.6013	-0.76	4.86	0.157 [1] ✔
T2	187 - 172	1	4.50	4.33	85.3 K=0.41	0.7854	-1.72	20.77	0.083 [1] ✔
T3	172 - 152	1	4.98	4.80	84.8 K=0.37	0.7854	-0.67	20.89	0.032 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	197 - 187	1 3/4	10.00	2.17	59.4	1.7942	1.15	87.47	0.013 #
T2	187 - 172	2	15.00	2.28	54.7	2.1885	21.53	106.69	0.202 #
T3	172 - 152	2 1/4	20.00	2.34	50.0	3.9761	67.01	178.92	0.375
T4	152 - 142	Pirod 105245	10.02	10.02	37.8	5.3014	73.69	238.57	0.309
T5	142 - 122	Pirod 105217	20.03	10.02	37.8	5.3014	118.83	238.57	0.498
T6	122 - 102	Pirod 105218	20.03	10.02	32.4	7.2158	166.45	324.71	0.513
T7	102 - 82	Pirod 105218 reinf. w/1" dia. S.R.	20.03	10.02	26.4	10.8915	212.41	490.12	0.433
T8	82 - 62	Pirod 105219 reinf. w/1" dia. S.R.	20.03	10.02	24.4	13.1787	255.04	593.04	0.430
T9	62 - 42	Pirod 105219 reinf. w/1" dia. S.R.	20.03	10.02	24.4	13.1787	294.77	593.04	0.497
T10	42 - 22	Pirod 105220 reinf. w/1" dia. S.R.	20.03	10.02	24.3	14.7262	333.88	662.68	0.504

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T11	22 - 2	Pirod 105220 reinf. w/1" dia. S.R.	20.03	10.02	24.3	14.7262	369.67	662.68	0.558

[#] Based on net area of leg in section below

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	197 - 187	1 3/4	0.61	3.35	0.182	0.00	3.35	0.000
T2	187 - 172	2	1.41	5.00	0.282	0.00	5.00	0.000
T3	172 - 152	2 1/4	2.72	7.12	0.382	0.00	7.12	0.000
T4	152 - 142	Pirod 105245	-5.46	69.27	0.079	-0.69	79.99	0.009
T5	142 - 122	Pirod 105217	-6.03	69.27	0.087	1.23	79.99	0.015
T6	122 - 102	Pirod 105218	-6.56	94.48	0.069	-0.64	109.10	0.006
T7	102 - 82	Pirod 105218 reinf. w/1" dia. S.R.	-6.64	143.19	0.046	-0.09	165.34	0.001
T8	82 - 62	Pirod 105219 reinf. w/1" dia. S.R.	-5.76	173.69	0.033	-0.27	200.56	0.001
T9	62 - 42	Pirod 105219 reinf. w/1" dia. S.R.	-6.64	173.69	0.038	0.27	200.56	0.001
T10	42 - 22	Pirod 105220 reinf. w/1" dia. S.R.	-5.75	194.41	0.030	0.08	224.49	0.000
T11	22 - 2	Pirod 105220 reinf. w/1" dia. S.R.	-5.96	194.41	0.031	0.08	224.49	0.000

Leg Interaction Design Data (Tension)

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	197 - 187	1 3/4	0.013	0.182	0.000	0.189 [#] ✔	1.000	4.8.1 ✔
T2	187 - 172	2	0.202	0.282	0.000	0.430 [#] ✔	1.000	4.8.1 ✔
T3	172 - 152	2 1/4	0.375	0.382	0.000	0.673 ✔	1.000	4.8.1 ✔
T4	152 - 142	Pirod 105245	0.309	0.079	0.009	0.396 ✔	1.000	4.8.1 ✔
T5	142 - 122	Pirod 105217	0.498	0.087	0.015	0.600 ✔	1.000	4.8.1 ✔
T6	122 - 102	Pirod 105218	0.513	0.069	0.006	0.588 ✔	1.000	4.8.1 ✔
T7	102 - 82	Pirod 105218 reinf. w/1" dia. S.R.	0.433	0.046	0.001	0.480 ✔	1.000	4.8.1 ✔
T8	82 - 62	Pirod 105219 reinf. w/1" dia. S.R.	0.430	0.033	0.001	0.465 ✔	1.000	4.8.1 ✔
T9	62 - 42	Pirod 105219 reinf. w/1" dia. S.R.	0.497	0.038	0.001	0.537 ✔	1.000	4.8.1 ✔

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
T10	42 - 22	Pirod 105220 reinf. w/1" dia. S.R.	0.504	0.030	0.000	0.534 ✔	1.000	4.8.1 ✔
T11	22 - 2	Pirod 105220 reinf. w/1" dia. S.R.	0.558	0.031	0.000	0.589 ✔	1.000	4.8.1 ✔

[#] Based on net area of leg in section below

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T4	152 - 142	0.5	1.47	120.0	238.57	0.1963	1.02	3.45	0.298 ✔
T5	142 - 122	0.5	1.47	120.0	238.57	0.1963	1.38	3.34	0.416 ✔
T6	122 - 102	0.5	1.46	119.0	324.71	0.1963	1.16	3.38	0.344 ✔
T7	102 - 82	0.5	1.44	117.4	490.12	0.1963	0.99	3.44	0.287 ✔
T8	82 - 62	0.625	1.43	93.3	593.04	0.3068	0.38	7.04	0.055 ✔
T9	62 - 42	0.625	1.43	93.3	593.04	0.3068	0.38	7.04	0.055 ✔
T10	42 - 22	0.625	1.42	92.9	662.68	0.3068	0.79	7.06	0.111 ✔
T11	22 - 2	0.625	1.42	92.9	662.68	0.3068	1.39	7.06	0.197 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	197 - 187	7/8	4.99	2.42	132.5	0.6013	1.63	27.06	0.060 [1] ✔
T2	187 - 172	7/8	5.04	2.43	133.2	0.6013	4.13	27.06	0.153 [1] ✔
T3	172 - 152	1	5.48	2.65	127.4	0.7854	5.49	35.34	0.155 [1] ✔
T4	152 - 142	L2 1/2x2 1/2x3/16	11.42	5.02	80.1	0.9020	8.97	29.22	0.307 [1] ✔
T5	142 - 122	L3x3x3/16	12.50	5.67	74.6	0.8791	10.92	42.85	0.255 [1] ✔
T6	122 - 102	L3x3x1/4	13.80	6.37	84.3	1.1588	11.56	56.49	0.205 [1] ✔
T7	102 - 82	L3x3x1/4	15.24	7.12	94.1	1.1588	11.60	56.49	0.205 [1] ✔
T8	82 - 62	L3x3x5/16	16.80	7.89	105.3	1.7800	12.23	57.67	0.212 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	62 - 42	L3 1/2x3 1/2x1/4	18.45	8.73	98.3	1.3463	12.72	65.63	0.194 [1]
T10	42 - 22	L3 1/2x3 1/2x5/16	20.16	9.59	108.8	2.0900	13.63	67.72	0.201 [1]
T11	22 - 2	L4x4x1/4	21.92	10.48	102.5	1.5963	14.60	77.82	0.188 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	197 - 187	L3x3x5/16	4.50	4.35	56.7	1.7800	0.19	57.67	0.003 [1]
T2	187 - 172	1	4.50	4.33	208.0	0.7854	0.81	35.34	0.023 [1]
T3	172 - 152	1	4.52	4.33	207.7	0.7854	1.80	35.34	0.051 [1]
T7	102 - 82	L3x3x3/16	10.00	8.67	115.0	1.0900	4.07	35.32	0.115 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	197 - 187	7/8	4.50	4.35	238.9	0.6013	0.68	27.06	0.025 [1]
T2	187 - 172	1	4.50	4.33	208.0	0.7854	1.58	35.34	0.045 [1]
T3	172 - 152	1	4.98	4.80	230.3	0.7854	0.64	35.34	0.018 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	197 - 187	Leg	1 3/4	3	-1.67	83.62	20.7	Pass
T2	187 - 172	Leg	2	35	-26.80	113.63	47.7	Pass
T3	172 - 152	Leg	2 1/4	80	-77.05	149.02	82.9	Pass
T4	152 - 142	Leg	Pirod 105245	137	-82.86	214.86	48.7	Pass
T5	142 - 122	Leg	Pirod 105217	146	-138.41	214.86	75.1	Pass
T6	122 - 102	Leg	Pirod 105218	161	-188.61	300.68	71.5	Pass
T7	102 - 82	Leg	Pirod 105218 reinf. w/1" dia. S.R.	176	-239.38	465.78	56.6 66.9 (b)	Pass
T8	82 - 62	Leg	Pirod 105219 reinf. w/1" dia. S.R.	194	-287.00	567.86	54.0	Pass
T9	62 - 42	Leg	Pirod 105219 reinf. w/1" dia. S.R.	209	-332.66	567.86	62.8	Pass
T10	42 - 22	Leg	Pirod 105220 reinf. w/1" dia. S.R.	224	-377.31	634.59	62.7 67.2 (b)	Pass
T11	22 - 2	Leg	Pirod 105220 reinf. w/1" dia. S.R.	239	-419.22	634.59	69.0	Pass
T1	197 - 187	Diagonal	7/8	15	-1.65	9.55	17.3	Pass
T2	187 - 172	Diagonal	7/8	48	-4.21	9.45	44.5	Pass
T3	172 - 152	Diagonal	1	93	-5.59	13.51	41.4	Pass
T4	152 - 142	Diagonal	L2 1/2x2 1/2x3/16	144	-9.58	13.38	71.6	Pass
T5	142 - 122	Diagonal	L3x3x3/16	153	-11.41	18.13	63.0 76.6 (b)	Pass
T6	122 - 102	Diagonal	L3x3x1/4	168	-12.12	19.52	62.1	Pass
T7	102 - 82	Diagonal	L3x3x1/4	186	-11.85	15.60	75.9	Pass
T8	82 - 62	Diagonal	L3x3x5/16	201	-12.53	15.55	80.5	Pass
T9	62 - 42	Diagonal	L3 1/2x3 1/2x1/4	216	-13.09	16.76	78.1	Pass
T10	42 - 22	Diagonal	L3 1/2x3 1/2x5/16	231	-13.99	16.96	82.5	Pass
T11	22 - 2	Diagonal	L4x4x1/4	246	-15.19	17.52	86.7	Pass
T1	197 - 187	Top Girt	L3x3x5/16	6	-0.26	38.11	0.7	Pass
T2	187 - 172	Top Girt	1	38	-0.73	20.77	3.5	Pass
T3	172 - 152	Top Girt	1	83	-1.67	20.77	8.0	Pass
T7	102 - 82	Top Girt	L3x3x3/16	180	-3.73	8.09	46.2	Pass
T1	197 - 187	Bottom Girt	7/8	9	-0.76	4.86	15.7	Pass
T2	187 - 172	Bottom Girt	1	42	-1.72	20.77	8.3	Pass
T3	172 - 152	Bottom Girt	1	87	-0.67	20.89	3.2	Pass
							Summary	
						Leg (T3)	82.9	Pass
						Diagonal (T11)	86.7	Pass
						Top Girt (T7)	46.2	Pass
						Bottom Girt (T1)	15.7	Pass
						Bolt Checks	76.6	Pass
						RATING =	**86.7**	**Pass**

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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	FOUNDATION WITH ROCK ANCHORS
Location:	Sharon, CT
Rev. 0: 4/24/19	Prepared by: T.J.L. Checked by: C.A.G. Job No. 19027.16

Rock Anchor Foundation Analysis:

Input Data:

Max Pier Reactions:

Uplift =	Uplift := 379·kips	*user input*	
Shear =	Shear := 44·kips	*user input*	
Compression =	Axial := 431·kips	*user input*	

Structure:

Footing Width =	$B_{ftg} := 10.0ft$	*user input*	
Footing Length =	$L_{ftg} := 10.0ft$	*user input*	
Footing Thickness =	$T_{ftg} := 3.25ft$	*user input*	
Pier Length/Width =	$L_{pier} := 4.0ft$	*user input*	
Pier Height =	$T_{pier} := 3.25ft$	*user input*	
Pier Projection Above Grade =	$P_p := 3.00·ft$	*user input*	

Depths:

Depth to Bottom of Footing =	$D_{ftg} := 3.5ft$	*user input*	(from grade line)
Depth to Suitable Rock =	$D_{rock} := 5.0ft$	*user input*	(from grade line)
Depth to Suitable Earth =	$D_{earth} := 1.0ft$	*user input*	(from grade line)
Anchor Length =	$L_{anchor} := 26.75ft$	*user input*	(from grade line)
Depth to Top of Submerged Anchor =	$D_{anchortop} := 2.50ft$	*user input*	(from grade line)
Anchor Depth =	$D_{anchor} := D_{anchortop} + L_{anchor}$		(from grade line)
	$D_{anchor} = 29.25\,ft$		

Subgrade Properties:

Internal Friction Angle =	$\phi := 35deg$	*user input*	
Unit Weight of Earth =	$\gamma_{earth} := 120\frac{lb}{ft^3}$	*user input*	(Existing sub-grade conditions utilized in the analysis of the existing foundation system were obtained from a geo-technical soils study prepared by Clarence Welti & Assoc., P.E., P.C; dated March 3, 1998.
Unit Weight of Rock =	$\gamma_{rock} := 165\frac{lb}{ft^3}$	*user input*	
Unit Weight of Conc =	$\gamma_{conc} := 150\frac{lb}{ft^3}$	*user input*	
Ultimate Bearing =	Bearing := 20000·psf	*user input*	

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Rock Anchor Properties:

Number of Anchors =	$N_{anchor} := 4$	*user input*	
Hole Diameter =	$hole_d := 3.00in$	*user input*	
Allowable Bond Stress Between Rock and Grout =	$\sigma_{bond} := 175 \cdot psi$	*user input*	Working bond Strength based on Weathered Rock/Sandstone
Grout Allowable Compressive Stress =	$fc_g := 5000 \cdot psi$	*user input*	
Anchor Spacing* (along length) =	$S_{anchor} := 5.50ft$	*user input*	
Required Factor of Safety =	$F_S := 1.0$	*user input*	
Rock Anchor Ultimate Strength =	$Fu_{anchor} := 150.0ksi$	*user input*	Williams R71-11 1-3/8" dia. 150ksi
Rock Anchor Yield Strength =	$Fy_{anchor} := 127.7ksi$	*user input*	Per Recommendation of PTI For Prestressed Rock Anchors and Soil Anchors Section 6.6 Design Load Should not be more than 60% of Specified Minimum Tensile Strength.
Rock Anchor Diameter =	$d_{ra} := 1.375in$	*user input*	
Rock Anchor Area per Group =	$A_g := 1.58in^2$	*user input*	
Rock Anchor Ultimate Tensile Load =	$T_u := 237kips$		
Rock Anchor Allowable Tension =	$T_{all} := 0.60 \cdot T_u = 142.2 \cdot kips$		
Rock Anchor Maximum Working Load to Yield =	$T_y := 0.80 \cdot T_u = 189.6 \cdot kips$		
Rock Anchor Shear Capacity =	$Sh := 0.4 \cdot T_y = 75.84 \cdot kips$		
Total Volume of Concrete =	$V_{conc} := B_{ftg} \cdot L_{ftg} \cdot T_{ftg} + \frac{\pi \cdot L_{pier}^2}{4} \cdot T_{pier} = 365.8 \cdot ft^3$		
Weight of Pad =	$W_{pad} := \left(B_{ftg} \cdot L_{ftg} \cdot T_{ftg}\right) \cdot \gamma_{conc} = 48.75 \cdot kips$		
Weight of Pier =	$W_{pier} := \left(L_{pier}^2 \cdot T_{pier}\right) \cdot \gamma_{conc} = 7.8 \cdot kips$		
Total Weight of Concrete =	$W_{conc} := W_{pad} + W_{pier} = 56.5 \cdot kips$		

Rock Anchor Tension/Shear Check:

Actual Tension Force per Anchor = $T_a := \frac{Uplift - W_{conc}}{N_{anchor}} = 80.6 \cdot kips$

Design Shear Force per Anchor = $S_a := \frac{Shear}{N_{anchor}} = 11 \cdot kips$

Reduced Tension For Tension/Shear Combination = $T_{allr} := \left[1 - \left(\frac{S_a}{T_{all}}\right)^2\right] \cdot T_{all} = 141.35 \cdot kips$

Tension Check = $TensionCheck := if\left(T_{allr} \geq T_a, "OK", "IncreaseSize"\right) = "OK"$

Shear Check = $ShearCheck := if\left(Sh \geq S_a, "OK", "IncreaseSize"\right) = "OK"$

Provided Safety Factor = $\frac{T_{allr}}{T_a} = 1.75$

$SafetyFactor := if\left(\frac{T_{allr}}{T_a} \geq 1.0, "OK", "Overstressed"\right)$

SafetyFactor = "OK"

Rock Anchor Req'd Development Length in Rock:

Minimum Free Stress Length Required = $F_{stressreqd} := 10.0ft$ (Original Centek design free stress length)

Minimum Free Stress Length Provided = $F_{stressprov} := 10.0ft$

Controlling Free Stress Length: $L_f := if\left(F_{stressprov} > F_{stressreqd}, F_{stressprov}, F_{stressreqd}\right)$ $L_f = 10\,ft$

Required Rock Anchor Proof Load (1.33x Design Load) = $T_p := T_a \cdot 1.33 = 107.2 \cdot kips$

Provided Rock Anchor Proof Load (1.33 x Design Load) = $T_{pp} := 40kips \cdot 1.33 \cdot F_S = 53.2 \cdot kips$ $T_{PLmax} := 0.80 \cdot T_u = 189.6 \cdot kips$

Required Release Lock Off Load (1.10x Design Load) = $T_L := T_a \cdot 1.10 = 88.7 \cdot kips$

Actual Release Lock Off Load (1.00x Design Load) = $T_{LL} := 40kips \cdot 1.00 \cdot F_S = 40 \cdot kips$ $T_{LLmax} := 0.70 \cdot T_u = 165.9 \cdot kips$

Rock Anchor/Grout Bond Length: $L_d := \frac{\left(\frac{0.04}{in} T_{LL}\right)}{\sqrt{fc_g \cdot psi}}$ $L_d = 1.89 \cdot ft$

Required Rock/Grout Bond Length: $L_b := \frac{T_{LL}}{\pi \cdot hole_d \cdot \sigma_{bond}} = 2.02\,ft$

Note:
Max Allowable Tensile Load = 60% of Ultimate Strength.
Max Lock Off Load = 70% of Ultimate Strength.
Max. Proof Load = 80% of Ultimate Strength.

Controlling Length: $L_a := if\left(L_b < L_d, L_d, L_b\right)$ $L_a = 2.02\,ft$

$L_{bprov} := D_{anchor} - L_f - D_{anchortop} = 16.75\,ft$

$Bond\_Length\_Check := if\left(\frac{L_a}{L_{bprov}} \leq 1.00, "OK", "Increase\ Length"\right)$

Bond_Length_Check = "OK"

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Calculated Uplift Resistance:

Intermediate Dimension:

Suitable Earth Height = $H := D_{rock} - D_{earth} = 4\,ft$

Suitable Rock Height = $Z := \left(D_{anchor} - D_{rock}\right) = 24.25\,ft$

Total Anchor Width = $W := S_{anchor} = 5.5\,ft$

Volumes:

Base Area 1 of Resisting Pyramid = $B_1 := W^2 = 30.25\,ft^2$

Base Area 2 of Resisting Pyramid = $B_2 := [\tan(\phi)\cdot(Z\cdot 0.5)\cdot 2 + W]^2 = 505.4\,ft^2$

Note: Rock Cone Taken At Half Suitable Rock Height - See Rock Volume Calculations.

Base Area 3 of Resisting Pyramid = $B_3 := [\tan(\phi)\cdot(Z\cdot 0.5 + H)\cdot 2 + W]^2 = 788.6\,ft^2$

Total Vdume of Resisting Material = $V_{tot} := \frac{\left[[H + (Z\cdot 0.5)]\cdot\left(B_1 + B_3 + \sqrt{B_1\cdot B_3}\right)\right]}{3} = 5231.4\cdot ft^3$

Volume of Rock = $V_{rock} := \frac{\left[(Z\cdot 0.5)\cdot\left(B_1 + B_2 + \sqrt{B_1\cdot B_2}\right)\right]}{3} = 2664.4\cdot ft^3$

Volume of Earth = $V_{earth} := V_{tot} - V_{rock} - V_{conc} = 2201.1\cdot ft^3$

Resisting Forces:

Resisting Rock Force = $W_{rock} := V_{rock}\cdot\gamma_{rock} = 439.6\cdot kips$

Resisting Earth Force = $W_{earth} := V_{earth}\cdot\gamma_{earth} = 264.1\cdot kips$

Total Resisting Force = $W_{total} := 0.75W_{rock} + 0.75\cdot W_{earth} + 0.9W_{conc} = 578.7\cdot kips$

Foundation Uplift Check:

Factor of Safety = $\frac{W_{total}}{Uplift} = 1.53$

$Uplift\_Check := if\left(\frac{W_{total}}{Uplift} \geq F_S, \text{"OK"}, \text{"Overstressed"}\right)$

Uplift_Check = "OK"

Rock Bearing Capacity Check:

Bearing Force = $MaxBearing := \left[\frac{\left(Axial + W_{conc}\right) + \left(N_{anchor}T_{LL}\right)}{B_{ftg}\cdot L_{ftg}}\right] = 6475\cdot psf$

$\frac{MaxBearing}{0.75Bearing} = 0.43$

$Rock\_Bearing\_Check := if\left(\frac{MaxBearing}{0.75Bearing} \leq 1.00, \text{"OK"}, \text{"Overstressed"}\right)$

Rock_Bearing_Check = "OK"

RAN Template:	A&L Template:	Power System Template:
67D07C 6102 MUAC	67D07C_1QP+1OP	Custom

CTNH544A_L600_3.1_draft

Section 1 - Site Information

Site ID: CTNH544A
Status: Draft
Version: 3.1
Project Type: L600
Approved: Not Approved
Approved By: Not Approved
Last Modified: 4/12/2019 5:3:25 PM
Last Modified By: GSM1900\MSaklay

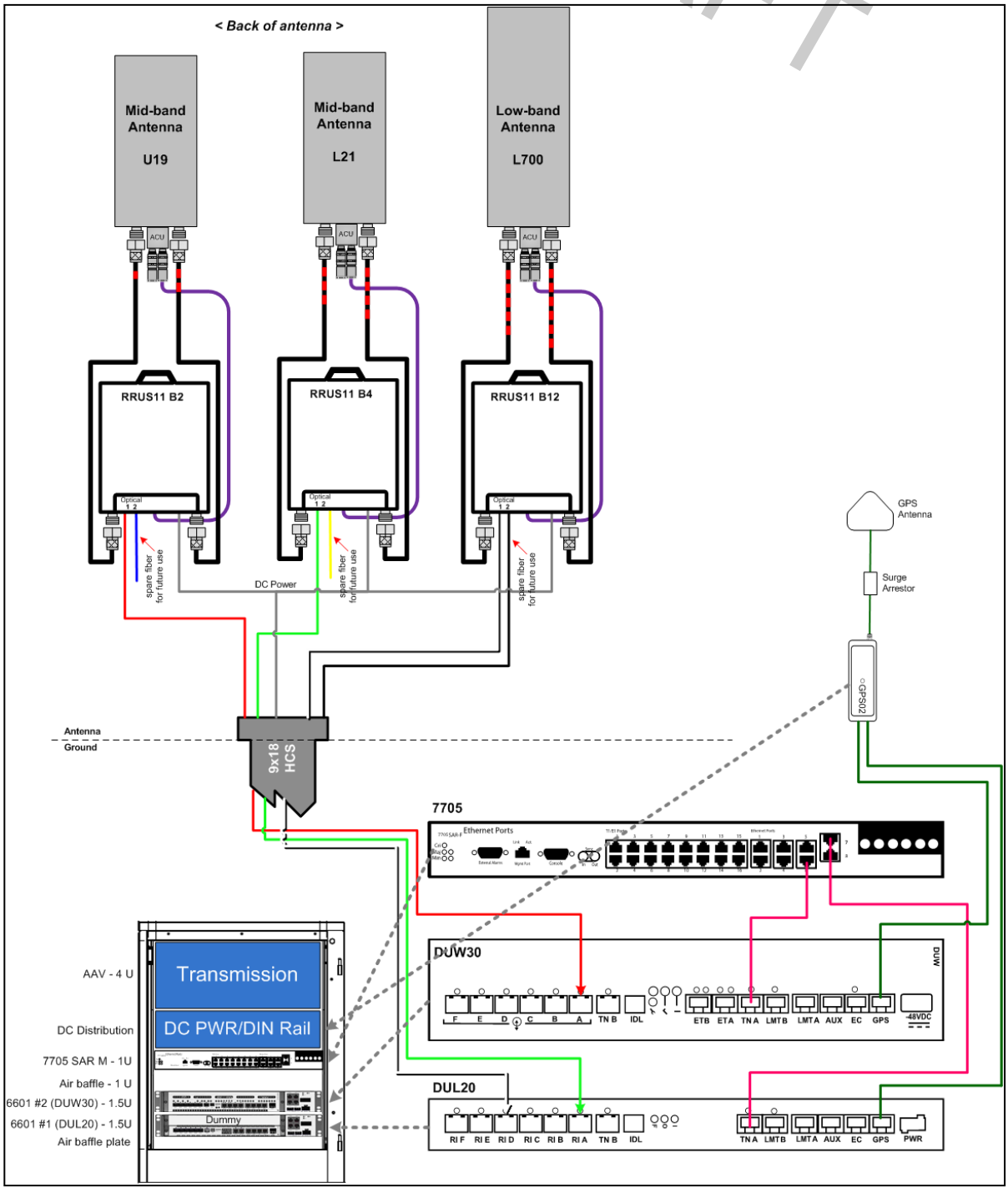
Site Name: CTNH544A
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2019
Market: CONNECTICUT
Vendor: Ericsson
Landlord: Litchfield County Dispatch

Latitude: 41.8623935100
Longitude: -73.4005328700
Address: 7 Surdan Mountain Rd
City, State: Sharon, CT
Region: NORTHEAST

RAN Template: 67D07C 6102 MUAC			AL Template: 67D07C_1QP+1OP	
Sector Count: 3	**Antenna Count:** 6	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 9

Section 2 - Existing Template Images

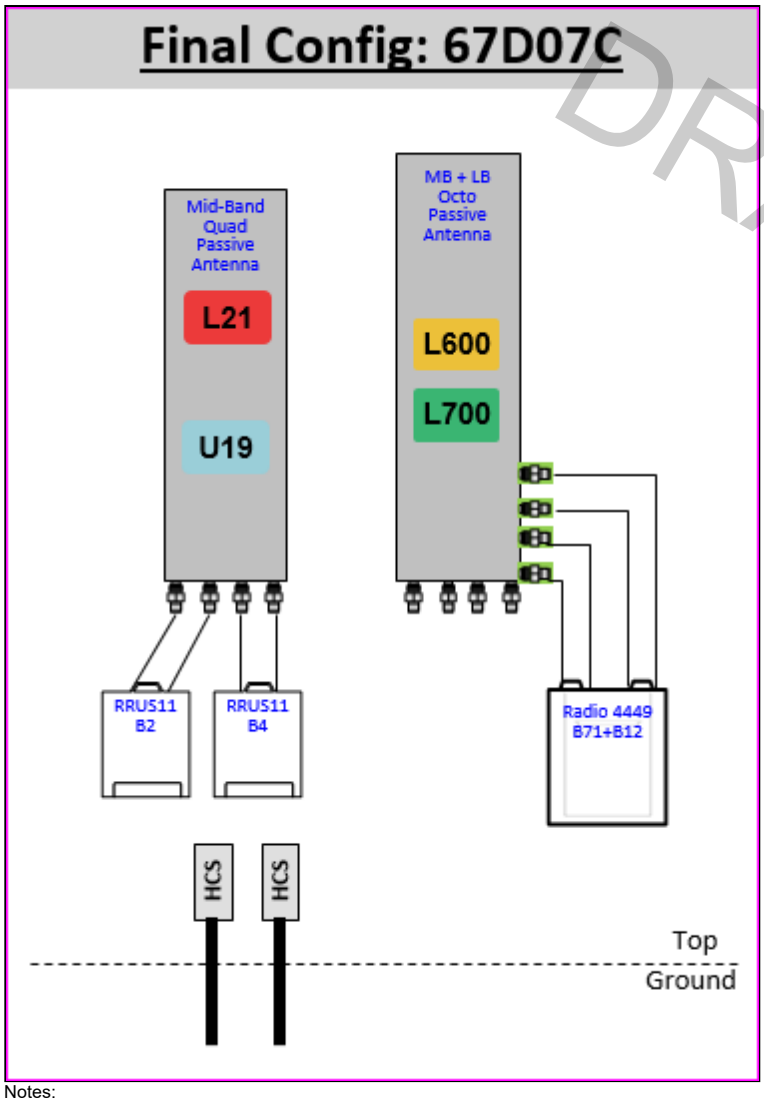
AL_707C_TowerTop.png



Notes:

Section 3 - Proposed Template Images

AL_67D07C_1QPw2xRRUS11+1OPw1x4449.png



Notes:

Section 4 - Siteplan Images

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RAN Template:	A&L Template:	Power System Template:
67D07C 6102 MUAC	67D07C_1QP+1OP	Custom

CTNH544A_L600_3.1_draft

Section 5 - RAN Equipment

Existing RAN Equipment	
Template:	707C Tower
Enclosure	1
Enclosure Type	RBS 6201
Baseband	DUW30 (U1900); DUS41 (L2100, L700)
Hybrid Cable System	Ericsson 6x12 HCS *Select AWG & Length*; Ericsson 6x12 HCS *Select Length & AWG*

Proposed RAN Equipment	
Template:	67D07C 6102 MUAC
Enclosure	1
Enclosure Type	RBS 6201
Baseband	DUW30 (U1900); BB 6630 (L2100, L1900, L700, L600); BB 6630 (N600 (DARK))
Hybrid Cable System	Ericsson 6x12 HCS *Select AWG & Length*; Ericsson 6x12 HCS *Select Length & AWG* (x2)

RAN Scope of Work:

RAN Config Name is with 6102 MU AC Cabinet. Although, existing cabinet will stay as RBS 6201 that is indoor and not in ODE (Out Door Enclose).
Confirm that the Cabinet has got (4) PSU A03's.
Swap (1) existing DUS41 with (1) BB 6630 and add (1) additional BB 6630 (N600 Dark).
Adding also L1900.
Add (1) 6x12 HCS that will be the 3rd HCS.
Swap (3) LB Dual Antennas with (3) LB/MB Octa 8' Antennas. Swap (3) RRUS11 B12s with (3) Radio 4449 B71+B12s.

RAN Template:	A&L Template:	Power System Template:
67D07C 6102 MUAC	67D07C_1QP+1OP	Custom

CTNH544A_L600_3.1_draft

Section 6 - A&L Equipment

Existing Template: 707C_Tower_1QP_1DP
Proposed Template: 67D07C_1QP+1OP

Sector 1 (Existing) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	1		2
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Andrew - LNX-6515DS-A1M (Dual)
Azimuth	30		30
M. Tilt	0		0
Height	140		140
Ports	P1	P2	P3
Active Tech.	U1900	L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt	2	2	2
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**
TMAs			
Diplexers / Combiners			
Radio	RRUS11 B2 (At Antenna)	RRUS11 B4 (At Antenna)	RRUS11 B12 (At Antenna)
Sector Equipment			

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:	Power System Template:
67D07C 6102 MUAC	67D07C_1QP+1OP	Custom

CTNH544A_L600_3.1_draft

Sector 1 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	30		30			
M. Tilt	0		0			
Height	140		140			
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	U1900	L2100	L700 L600	L700 L600		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2		
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs						
Diplexers / Combiners						
Radio	RRUS11 B2 (At Antenna)	RRUS11 B4 (At Antenna)	Radio 4449 B71+B12 (At Antenna)	SHARED Radio 4449 B71+B12 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

Swap (1) LB Dual Antenna with (1) LB/MB Octa 8' Antenna. Swap (1) RRUS11 B12 with (1) Radio 4449 B71+B12.

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

RAN Template:	A&L Template:	Power System Template:
67D07C 6102 MUAC	67D07C_1QP+1OP	Custom

CTNH544A_L600_3.1_draft

Sector 2 (Existing) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	1		2
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Andrew - LNX-6515DS-A1M (Dual)
Azimuth	150		150
M. Tilt	0		0
Height	140		140
Ports	P1	P2	P3
Active Tech.	U1900	L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt	2	2	2
Cables	Coax Jumper (x2)	Coax Jumper (x2)	Coax Jumper (x2)
TMAs			
Diplexers / Combiners			
Radio	RRUS11 B2 (At Antenna)	RRUS11 B4 (At Antenna)	RRUS11 B12 (At Antenna)
Sector Equipment			

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:	Power System Template:
67D07C 6102 MUAC	67D07C_1QP+1OP	Custom

CTNH544A_L600_3.1_draft

Sector 2 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	150		150			
M. Tilt	0		0			
Height	140		140			
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	U1900	L2100	L700 L600	L700 L600		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2		
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs						
Diplexers / Combiners						
Radio	RRUS11 B2 (At Antenna)	RRUS11 B4 (At Antenna)	Radio 4449 B71+B12 (At Antenna)	SHARED Radio 4449 B71+B12 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

Swap (1) LB Dual Antenna with (1) LB/MB Octa 8' Antenna. Swap (1) RRUS11 B12 with (1) Radio 4449 B71+B12.

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

RAN Template:	A&L Template:	Power System Template:
67D07C 6102 MUAC	67D07C_1QP+1OP	Custom

CTNH544A_L600_3.1_draft

Sector 3 (Existing) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	1		2
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Andrew - LNX-6515DS-A1M (Dual)
Azimuth	290		290
M. Tilt	0		0
Height	140		140
Ports	P1	P2	P3
Active Tech.	U1900	L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt	2	2	2
Cables	Coax Jumper (x2)	Coax Jumper (x2)	Coax Jumper (x2)
TMAs			
Diplexers / Combiners			
Radio	RRUS11 B2 (At Antenna)	RRUS11 B4 (At Antenna)	RRUS11 B12 (At Antenna)
Sector Equipment			

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:	Power System Template:
67D07C 6102 MUAC	67D07C_1QP+1OP	Custom

CTNH544A_L600_3.1_draft

Sector 3 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	290		290			
M. Tilt	0		0			
Height	140		140			
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	U1900	L2100	L700 L600	L700 L600		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2		
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs						
Diplexers / Combiners						
Radio	RRUS11 B2 (At Antenna)	RRUS11 B4 (At Antenna)	Radio 4449 B71+B12 (At Antenna)	SHARED Radio 4449 B71+B12 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

Swap (1) LB Dual Antenna with (1) LB/MB Octa 8' Antenna. Swap (1) RRUS11 B12 with (1) Radio 4449 B71+B12.

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

RAN Template:	A&L Template:	Power System Template:
67D07C 6102 MUAC	67D07C_1QP+1OP	Custom

CTNH544A_L600_3.1_draft

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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Proposed Power Systems Equipment

RADIO FREQUENCY SYSTEMS
The Clear Choice®

Dual Slant Polarized Quad Band (8 Port) Antenna, 617-746/617-746/1695-2200/1695-2200MHz, 65deg, 15/15/18/18dBi, 2.4m (8ft), VET, RET, 0-12°/0-12°/2-12°/2-12°

FEATURES / BENEFITS

This antenna provides a 8 Port multi-band flexible platform for advanced use for flexible use in deployment scenarios for encompassing 600MHz, 700MHz, AWS & PCS applications.

- **24 Inch Width For Easier Zoning**
- **Field Replaceable (Integrated) AISG RET platform for reduced environmental exposure and long lasting quality**
- **Superior elevation pattern performance across the entire electrical down tilt range**
- **Includes three AISG RET motors - Includes 0.5m AISG jumper for optional diasy chain of two high band RET motors for one single AISG point of high band tilt control.**
- **Low band arrays driven by a single RET motor**

Technical Features

LOW BAND LEFT ARRAY (617-746 MHZ) [R1]

Frequency Band	MHz	617-698	698-746
Gain	dBi	15.1	15.5
Horizontal Beamwidth @3dB	Deg	65	62
Vertical Beamwidth @3dB	Deg	11.4	10.4
Electrical Downtilt Range	Deg	0-12	0-12
Upper Side Lobe Suppression 0 to +20	dB	19	20
Front-to-Back, at +/-30°, Copolar	dB	25	24
Cross Polar Discrimination (XPD) @ Boresight	dB	19	19
Cross Polar Discrimination (XPD) @ +/-60	dB	5	3
3rd Order PIM 2 x 43dBm	dBc		-153
VSWR	-	1.5:1	1.5:1
Cross Polar Isolation	dB	25	25
Maximum Effective Power per Port	Watt	250	250

LOW BAND RIGHT ARRAY (617-746 MHZ) [R2]

Frequency Band	MHz	617-698	698-746
Gain	dBi	14.8	15.1
Horizontal Beamwidth @3dB	Deg	65	62
Vertical Beamwidth @3dB	Deg	11.4	10.3
Electrical Downtilt Range	Deg	0-12	0-12
Upper Side Lobe Suppression 0 to +20	dB	19	20
Front-to-Back, at +/-30°, Copolar	dB	25	23
Cross Polar Discrimination (XPD) @ Boresight	dB	19	19
Cross Polar Discrimination (XPD) @ +/-60	dB	5	3
3rd Order PIM 2 x 43dBm	dBc		-153
VSWR	-	1.5:1	1.5:1
Cross Polar Isolation	dB	25	25
Maximum Effective Power per Port	Watt	250	250

RADIO FREQUENCY SYSTEMS
The Clear Choice®

Dual Slant Polarized Quad Band (8 Port) Antenna, 617-746/617-746/1695-2200/1695-2200MHz, 65deg, 15/15/18/18dBi, 2.4m (8ft), VET, RET, 0-12°/0-12°/2-12°/2-12°

ELECTRICAL SPECIFICATIONS

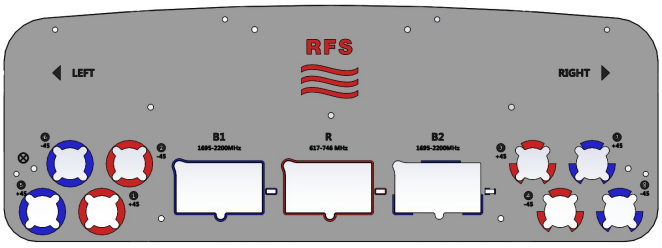
Impedance	Ohm	50.0
Polarization	Deg	±45°

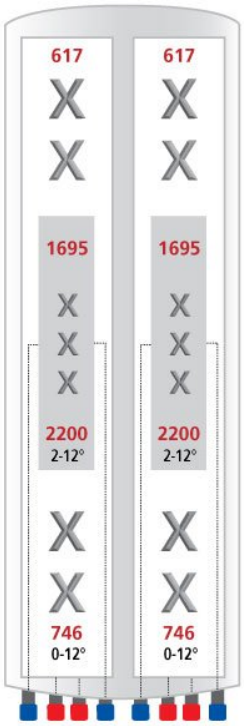
MECHANICAL SPECIFICATIONS

Dimensions - H x W x D	mm (in)	2436 x 609 x 222 (95.9 x 24 x 8.7)
Weight (Antenna Only)	kg (lb)	58 (128)
Weight (Mounting Hardware only)	kg (lb)	11.5 (25.3)
Shipping Weight	kg (lb)	80 (176)
Connector type		8 x 4.3-10 female at bottom + 6 AISG connectors (3 male, 3 female)
Adjustment mechanism		Integrated RET solution AISG compliant (Field Replaceable) + Manual Override + External Tilt Indicator
Mounting Hardware Material		Galvanized steel
Radome Material / Color		Fiber Glass / Light Grey RAL7035

TESTING AND ENVIRONMENTAL

Temperature Range	°C (°F)	-40 to 60 (-40 to 140)
Lightning protection		IEC 61000-4-5
Survival/Rated Wind Velocity	km/h	241 (150)
Environmental		ETSI 300-019-2-4 Class 4.1E





ORDERING INFORMATION

Order No.	Configuration	Mounting Hardware	Mounting pipe Diameter	Shipping Weight
APXVAARR24_43-U-NA20	Field Replace RET included (3)	APM40-5E Beam tilt kit (included)	60-120mm	80 Kg

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

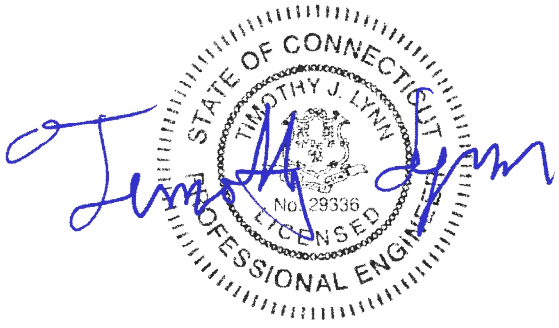
T-Mobile Site #: CTNH544A

7 Surdan Mountain Road
Sharon, CT

Centek Project No. 19027.16

Date: April 25, 2019

Max Stress Ratio = 59.5%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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CENTEK engineering

Centered on Solutions℠

April 25, 2019

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

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTNH544A
7 Surdan Mountain Road
Sharon, CT 06069

Centek Project No. 19027.16

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 three (3) T frame sector mounts with stiff arms to support the proposed/existing equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  T-Frames: Three (3) RFS APX16DWV-16DWV-S-E-A20 panel antennas, three (3) RFS APXVAARR24-43-NA20 panel antennas, three (3) Ericsson 4449 B71_B12 remote radio units and six (6) Ericsson RRUS 11 remote radio units mounted on three (3) T-Frames with a RAD center elevation of 140-ft +/- AGL.

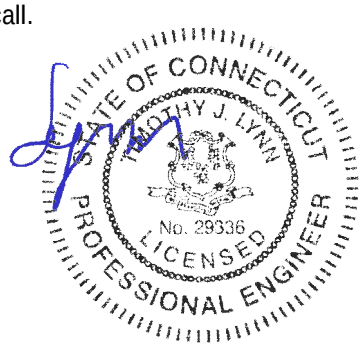
The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 89 mph for Sharon as required in Appendix N of the 2018 Connecticut State Building Code.

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

Based on our review of the installation, it is our opinion that the existing T-frames are structurally adequate to support the proposed antenna configuration. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer



Prepared by:

Fernando J. Palacios
Engineer

Section 2 - Calculations

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

Subject: Loads on Equipment

Location: Sharon, CT

Rev. 0: 04/22/19

Prepared by: F.J.P Checked by: C.A.G.
Job No. 19027.16

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

Wind Speeds

Basic Wind Speed	$V := 89$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 40$	mph	(User Input per Annex B of TIA-222-G)

Input

Structure Type =	Structure_Type := Lattice		(User Input)
Structure Category =	SC := II		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 195$	ft	(User Input)
Height to Center of Antennas =	$z := 140$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.00$	in	(User Input per Annex B of TIA-222-G)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1.0$		(User Input)
	$K_a := 1.0$		(User Input)
Gust Response Factor =	$G_H = 1.105$		(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 =

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

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

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

$$K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.155$$

Velocity Pressure Coefficient Antennas =

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.311$$

$$Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.359$$

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot K_d \cdot Kz \cdot V^2 \cdot I_{Wind} = 23.42$ psf

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot K_d \cdot Kz \cdot V_i^2 \cdot I_{Wind} = 4.73$ 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 =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 443$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 196$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 17$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 116$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 9.3$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 63$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 2 \cdot 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 523$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 523$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APX16DWV-16DWVS-E-A20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55.9$	in	(User Input)
Antenna Width =	$W_{ant} := 13$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 40.7$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.3$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 167$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.2$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 40$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 7.4$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 50$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.3$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 22$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 41$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2289$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 6000$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 194$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 194$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson RRUS 11		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 19.68$	in	(User Input)
RRUS Width =	$W_{RRUS} := 16.97$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 7.16$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 50.7$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.2$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.3$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 72$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 30$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3.6$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 23$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 12$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 51$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2391$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 3791$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 123$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 123$	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 =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 42$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 33$	lbs

Wind Load (with ice)

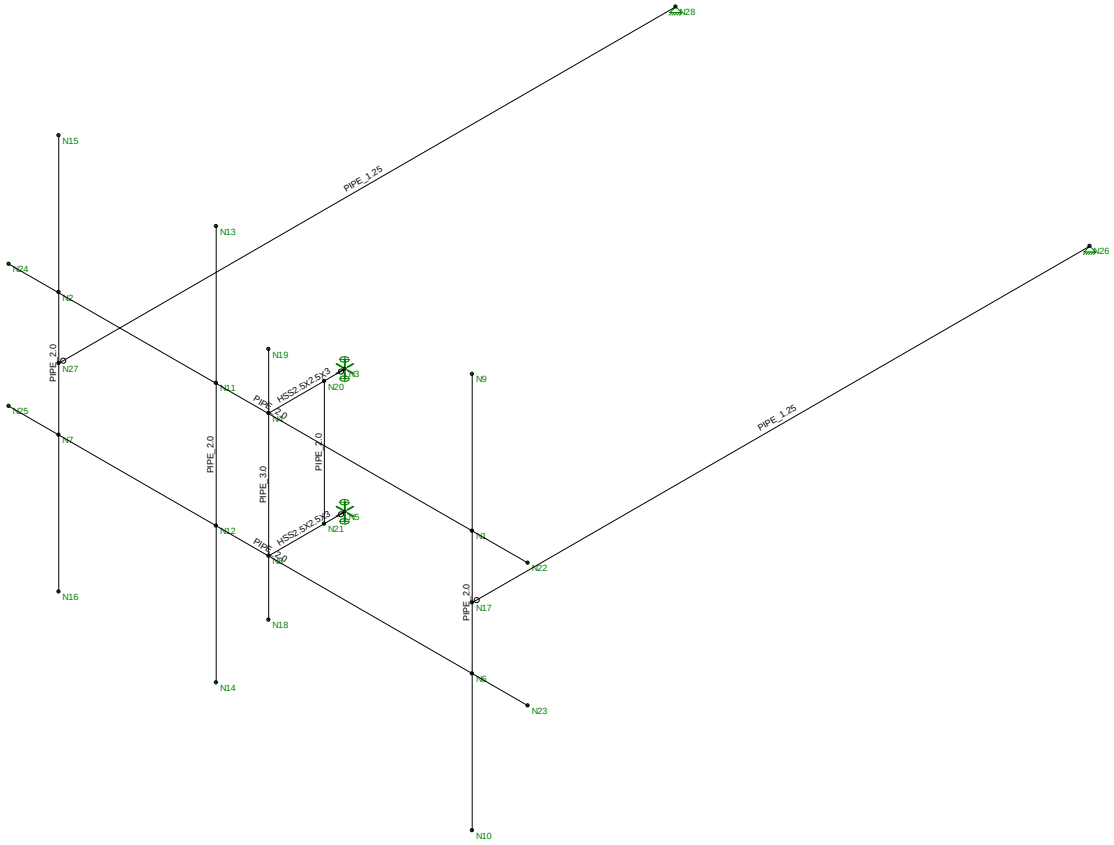
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.4$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 15$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS}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

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 3181$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 103$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 103$	lbs



Loads: BLC 1, Self Weight
Envelope Only Solution

Centek		
FJP	CTNH544A_AMA	Apr 25, 2019 at 10:00 AM
19027.16	Member Framing	CTNH544A_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	1
Cd X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	(E)Vert	PIPE_3.0	Column	Pipe	A53 Grade B	Typical	2.07	2.85	2.85	5.69
2	(E) Outrigger	HSS2.5X2.5X3	Beam	Tube	A500 Gr.46	Typical	1.54	1.35	1.35	2.25
3	(E) Horz	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	(P) Stiff Arm	PIPE_1.25	Beam	Pipe	A53 Grade B	Typical	.625	.184	.184	.368
5	Antenna Mast	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
6	(E) Outrigger Br...	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Antenna Mast	8			Lbyy						Lateral
2	M2	Antenna Mast	8			Lbyy						Lateral
3	M3	Antenna Mast	8			Lbyy						Lateral
4	M4	(E) Outrigger	1.552	Segment	Segment	Segment	Segment	Segme...				Lateral
5	M5	(E) Horz	10.5	Segment	Segment	Segment	Segment	Segme...				Lateral
6	M6	(E) Outrigger	1.552	Segment	Segment	Segment	Segment	Segme...				Lateral
7	M7	(E) Horz	10.5	Segment	Segment	Segment	Segment	Segme...				Lateral
8	M8	(E)Vert	4.75	Segment	Segment	Lbyy						Lateral
9	M9	(E) Outrigge...	2.5									Lateral
10	M10	(P) Stiff Arm	12.5			Lbyy						Lateral
11	M11	(P) Stiff Arm	12.5			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N16	N15			Antenna Mast	Column	Pipe	A53 Gra...	Typical
2	M2	N14	N13			Antenna Mast	Column	Pipe	A53 Gra...	Typical
3	M3	N10	N9			Antenna Mast	Column	Pipe	A53 Gra...	Typical
4	M4	N5	N8			(E) Outrigger	Beam	Tube	A500 Gr....	Typical
5	M5	N23	N25			(E) Horz	Beam	Pipe	A53 Gra...	Typical
6	M6	N3	N4			(E) Outrigger	Beam	Tube	A500 Gr....	Typical
7	M7	N22	N24			(E) Horz	Beam	Pipe	A53 Gra...	Typical
8	M8	N19	N18			(E)Vert	Column	Pipe	A53 Gra...	Typical
9	M9	N20	N21			(E) Outrigger Brace	Column	Pipe	A53 Gra...	Typical
10	M10	N17	N26			(P) Stiff Arm	Beam	Pipe	A53 Gra...	Typical
11	M11	N27	N28			(P) Stiff Arm	Beam	Pipe	A53 Gra...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	-1.375002	0	0.	0	
2	N2	-9.750002	0	0.	0	
3	N3	-5.500002	0	-1.552083	0	
4	N4	-5.500002	0	0.	0	
5	N5	-5.500002	-2.5	-1.552083	0	
6	N6	-1.375002	-2.5	0.	0	
7	N7	-9.750002	-2.5	0.	0	
8	N8	-5.500002	-2.5	0.	0	
9	N9	-1.375002	2.75	0.	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
10	N10	-1.375002	-5.25	0.	0	
11	N11	-6.562502	0	0.	0	
12	N12	-6.562502	-2.5	0.	0	
13	N13	-6.562502	2.75	0.	0	
14	N14	-6.562502	-5.25	0.	0	
15	N15	-9.750002	2.75	0.	0	
16	N16	-9.750002	-5.25	0.	0	
17	N17	-1.375002	-1.25	0.	0	
18	N18	-5.500002	-3.625	0.	0	
19	N19	-5.500002	1.125	0.	0	
20	N20	-5.500002	0	-1.135416	0	
21	N21	-5.500002	-2.5	-1.135416	0	
22	N22	-0.250002	0	0.	0	
23	N23	-0.250002	-2.5	0.	0	
24	N24	-10.750002	0	0.	0	
25	N25	-10.750002	-2.5	0.	0	
26	N26	-1.374918	-1.25	-12.5	0	
27	N27	-9.750006	-1.25	0.	0	
28	N28	-9.750006	-1.25	-12.5	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N3	Reaction	Reaction	Reaction		Reaction	
2	N5	Reaction	Reaction	Reaction		Reaction	
3	N20						
4	N21						
5	N26	Reaction	Reaction	Reaction			
6	N28	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.021	6.333
2	M1	Y	-.021	1.667
3	M3	Y	-.067	.333
4	M3	Y	-.067	7.667
5	M1	Y	-.051	3.667
6	M1	Y	-.051	4.333
7	M3	Y	-.074	4.333

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.097	6.333
2	M1	Y	-.097	1.667
3	M3	Y	-.262	.333
4	M3	Y	-.262	7.667
5	M1	Y	-.123	3.667
6	M1	Y	-.123	4.333
7	M3	Y	-.103	4.333

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	-.011	6.333
2	M1	X	-.011	1.667
3	M3	X	-.032	.333
4	M3	X	-.032	7.667
5	M1	X	-.023	3.667
6	M1	X	-.023	4.333
7	M3	X	-.015	4.333

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	-.02	6.333
2	M1	X	-.02	1.667
3	M3	X	-.098	.333
4	M3	X	-.098	7.667
5	M1	X	-.072	3.667
6	M1	X	-.072	4.333
7	M3	X	-.042	4.333

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	-.025	6.333
2	M1	Z	-.025	1.667
3	M3	Z	-.058	.333
4	M3	Z	-.058	7.667
5	M1	Z	-.012	3.667
6	M1	Z	-.012	4.333
7	M3	Z	-.013	4.333

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	-.084	6.333
2	M1	Z	-.084	1.667
3	M3	Z	-.222	.333
4	M3	Z	-.222	7.667
5	M1	Z	-.03	3.667
6	M1	Z	-.03	4.333
7	M3	Z	-.033	4.333

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M9	X	-.0009	-.0009	0	0
2	M10	X	-.0009	-.0009	0	0
3	M2	X	-.0009	-.0009	0	0
4	M6	X	-.0009	-.0009	0	0
5	M4	X	-.0009	-.0009	0	0
6	M8	X	-.001	-.001	0	0
7	M11	X	-.0009	-.0009	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M9	X	-.005	-.005	0	0
2	M10	X	-.005	-.005	0	0
3	M2	X	-.005	-.005	0	0
4	M4	X	-.005	-.005	0	0
5	M6	X	-.005	-.005	0	0
6	M8	X	-.007	-.007	0	0
7	M11	X	-.005	-.005	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M5	Z	-.0009	-.0009	0	0
2	M7	Z	-.0009	-.0009	0	0
3	M9	Z	-.0009	-.0009	0	0
4	M2	Z	-.0009	-.0009	0	0
5	M8	Z	-.001	-.001	0	0
6	M11	Z	-.0009	-.0009	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M5	Z	-.005	-.005	0	0
2	M7	Z	-.005	-.005	0	0
3	M9	Z	-.005	-.005	0	0
4	M2	Z	-.005	-.005	0	0
5	M8	Z	-.007	-.007	0	0
6	M11	Z	-.005	-.005	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	Self Weight	None		-1						
2	Equipment Weight	None					7			
3	Ice Weight	None					7			
4	Wind w/ Ice X	None					7	7		
5	Wind X	None					7	7		
6	Wind w/ Ice Z	None					7	6		
7	Wind Z	None					7	6		

Load Combinations

	Description	Solve	PDel...	S...	B...	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-dire...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-dire...	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1.0Wi...	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (X-dire...	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (X-dire...	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1.0Wi...	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N3	max	.393	2	.89	3	-.175	5	0	6	0	6	0	6
2		min	-.387	6	.2	5	-1.091	3	0	1	0	1	0	1
3	N5	max	.556	1	.896	6	1.108	6	0	6	0	6	0	6
4		min	.077	5	.266	2	.327	2	0	1	0	1	0	1
5	N26	max	.047	1	.016	1	.758	5	0	6	0	6	0	6
6		min	0	6	.011	5	-.171	1	0	1	0	1	0	1
7	N28	max	.047	2	.016	3	.469	4	0	6	0	6	0	6
8		min	0	6	.012	5	.032	3	0	1	0	1	0	1
9	Totals:	max	1.017	2	1.807	6	1.507	5						
10		min	0	4	.556	2	0	1						

Envelope Joint Displacements

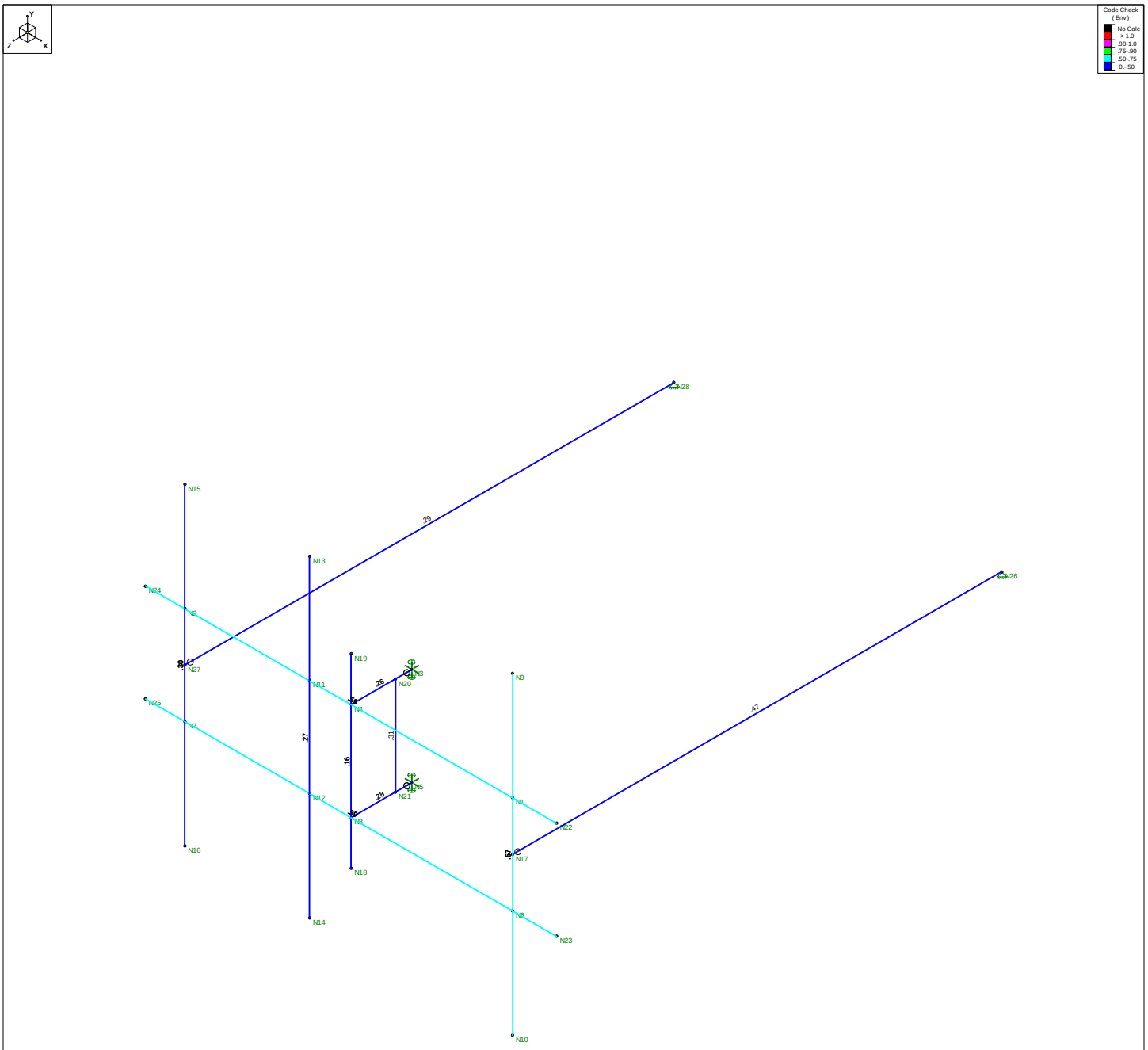
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
1	N1	max	.03	6	-.142	2	.008	1	5.665e-04	1	2.514e-03	5	6.369e-04	2
2		min	-.12	2	-.575	6	-.098	4	-1.062e-02	5	2.865e-04	6	-5.742e-03	6
3	N2	max	.028	6	-.051	5	.011	3	6.965e-04	3	2.266e-03	1	5.327e-04	6
4		min	-.12	2	-.163	3	-.022	5	-2.074e-03	5	-8.49e-04	5	4.075e-05	2
5	N3	max	0	6	0	6	0	6	0	6	0	6	-2.643e-04	5
6		min	0	1	0	1	0	1	0	1	0	1	-1.282e-03	3
7	N4	max	.029	6	-.012	5	0	3	7.754e-04	3	7.91e-04	6	-4.839e-04	5
8		min	-.12	2	-.043	3	0	5	-6.61e-05	5	-4.84e-03	2	-2.303e-03	3
9	N5	max	0	6	0	6	0	6	0	6	0	6	-1.37e-04	2
10		min	0	1	0	1	0	1	0	1	0	1	-1.268e-03	6
11	N6	max	.005	5	-.142	2	.007	2	1.018e-02	4	2.469e-03	4	-1.363e-03	5
12		min	-.132	1	-.575	6	-.09	5	-4.717e-04	2	5.428e-04	6	-6.109e-03	3
13	N7	max	.005	5	-.051	5	-.01	2	2.52e-03	4	2.25e-03	2	6.478e-04	1
14		min	-.131	1	-.163	3	-.029	4	6.468e-04	2	-8.659e-04	4	2.583e-04	5
15	N8	max	.005	5	-.013	2	0	2	8.196e-04	6	4.132e-04	5	-3.106e-04	2
16		min	-.131	1	-.043	6	0	6	2.2e-04	2	-5.145e-03	1	-2.285e-03	6
17	N9	max	.221	6	-.142	2	.027	1	5.675e-04	1	2.514e-03	5	5.175e-03	2
18		min	-.247	2	-.575	6	-.69	4	-2.09e-02	4	2.865e-04	6	-5.78e-03	6
19	N10	max	-.04	5	-.143	2	.023	2	2.041e-02	5	2.469e-03	4	-1.362e-03	5
20		min	-.363	1	-.575	6	-.666	5	-4.711e-04	2	5.428e-04	6	-8.286e-03	1
21	N11	max	.028	6	-.012	5	.007	6	5.685e-04	3	2.829e-04	6	4.563e-04	1
22		min	-.12	2	-.035	3	-.041	2	-4.445e-04	5	-1.733e-03	2	2.312e-04	5
23	N12	max	.005	5	-.012	5	0	5	7.863e-04	4	-3.331e-04	5	3.305e-04	6
24		min	-.131	1	-.035	3	-.044	1	2.062e-04	2	-1.902e-03	1	1.628e-04	2
25	N13	max	.017	6	-.012	5	.023	6	5.686e-04	3	2.829e-04	6	7.145e-04	1
26		min	-.14	1	-.035	3	-.038	2	-7.026e-04	5	-1.733e-03	2	2.313e-04	5
27	N14	max	.013	4	-.012	5	-.03	6	1.044e-03	4	-3.331e-04	5	3.305e-04	6
28		min	-.131	2	-.035	3	-.052	1	2.062e-04	2	-1.902e-03	1	-9.521e-05	2
29	N15	max	.01	6	-.051	5	.034	3	6.982e-04	3	2.266e-03	1	5.833e-04	3
30		min	-.128	1	-.164	3	-.113	5	-2.852e-03	5	-8.49e-04	5	2.267e-04	2
31	N16	max	.015	4	-.051	5	-.031	2	3.294e-03	4	2.25e-03	2	5.295e-04	6
32		min	-.116	2	-.164	3	-.134	4	6.465e-04	2	-8.659e-04	4	2.582e-04	5
33	N17	max	.011	5	-.142	2	.002	1	1.543e-05	2	2.486e-03	4	1.321e-04	1
34		min	-.111	1	-.575	6	-.008	5	-3.21e-04	4	4.147e-04	6	-2.018e-04	6
35	N18	max	-.002	5	-.013	2	-.003	2	8.203e-04	6	4.132e-04	5	-3.162e-04	2
36		min	-.138	1	-.043	6	-.011	6	2.2e-04	2	-5.145e-03	1	-2.285e-03	6

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
37	N19	max	.06	6	-.012	5	.011	3	7.754e-04	3	7.91e-04	6	-4.839e-04	5
38		min	-.112	2	-.043	3	0	5	-7.172e-05	5	-4.84e-03	2	-2.303e-03	3
39	N20	max	.009	6	-.004	2	0	3	2.396e-03	6	1.732e-03	6	-2.643e-04	5
40		min	-.036	2	-.014	6	0	5	7.06e-04	2	-6.995e-03	2	-1.282e-03	3
41	N21	max	.001	5	-.004	5	0	2	2.387e-03	3	2.334e-04	5	-1.37e-04	2
42		min	-.04	1	-.014	3	0	6	6.504e-04	5	-7.701e-03	1	-1.268e-03	6
43	N22	max	.03	6	-.134	2	-.005	3	5.665e-04	1	2.532e-03	5	6.296e-04	2
44		min	-.12	2	-.653	6	-.132	5	-1.062e-02	5	2.88e-04	3	-5.752e-03	6
45	N23	max	.005	5	-.163	5	-.004	3	1.018e-02	4	2.487e-03	4	-1.371e-03	5
46		min	-.132	1	-.657	3	-.123	4	-4.717e-04	2	5.449e-04	6	-6.118e-03	3
47	N24	max	.028	6	-.054	2	.024	1	6.965e-04	3	2.266e-03	1	5.396e-04	6
48		min	-.12	2	-.17	3	-.032	5	-2.074e-03	5	-8.614e-04	5	4.59e-05	2
49	N25	max	.005	5	-.055	5	.017	2	2.52e-03	4	2.25e-03	2	6.547e-04	1
50		min	-.131	1	-.17	3	-.039	4	6.468e-04	2	-8.783e-04	4	2.635e-04	5
51	N26	max	0	6	0	6	0	6	1.084e-02	6	7.044e-05	5	1.321e-04	1
52		min	0	1	0	1	0	1	6.205e-03	2	-2.139e-02	1	-2.018e-04	6
53	N27	max	.011	5	-.051	5	0	3	8.321e-04	6	2.257e-03	1	-5.81e-04	2
54		min	-.13	1	-.164	3	-.004	4	1.801e-04	2	-8.563e-04	5	-2.785e-03	6
55	N28	max	0	6	0	6	0	6	8.097e-03	3	7.05e-05	5	-5.81e-04	2
56		min	0	1	0	1	0	1	5.599e-03	5	-2.151e-02	1	-2.785e-03	6

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	...	Eqn
1	M1	PIPE_2.0	.297	5.25	3	.048	4.4...		3	14.916	32.13	1.872	1.872	...	H1-...
2	M2	PIPE_2.0	.268	5.25	3	.057	5.25		3	14.916	32.13	1.872	1.872	...	H1-...
3	M3	PIPE_2.0	.573	4	4	.082	2.75		3	14.916	32.13	1.872	1.872	...	H1-...
4	M4	HSS2.5X2.5X3	.285	1.5...	3	.091	.42	y	3	62.854	63.756	4.554	4.554	...	H1-...
5	M5	PIPE_2.0	.587	5.25	6	.154	5.25		4	31.698	32.13	1.872	1.872	...	H1-...
6	M6	HSS2.5X2.5X3	.260	1.5...	6	.093	.42	y	6	62.854	63.756	4.554	4.554	...	H1-...
7	M7	PIPE_2.0	.595	5.25	3	.168	5.25		4	31.698	32.13	1.872	1.872	...	H1-...
8	M8	PIPE_3.0	.158	3.6...	6	.086	3.6...		6	63.06	65.205	5.749	5.749	...	H1-...
9	M9	PIPE_2.0	.310	0	6	.126	2.5		6	29.81	32.13	1.872	1.872	...	H1-...
10	M10	PIPE_1.25	.466	6.25	4	.008	12.5		1	1.847	19.688	.801	.801	...	H1-...
11	M11	PIPE_1.25	.287	7.6...	4	.008	0		1	1.847	19.688	.801	.801	...	H1-...



Member Code Checks Displayed (Enveloped)
Loads: BLC 1, Self Weight
Envelope Only Solution

Centek		
FJP	CTNH544A_AMA	Apr 25, 2019 at 10:00 AM
19027.16	Unity Check	CTNH544A_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: CTNH544A

Sharon_Surdan Mountain Road
7 Surdan Mountain Road
Sharon, CT 06069

May 1, 2019

EBI Project Number: 6219001440

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	13.51 %

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

EBI Consulting
environmental | engineering | due diligence

May 1, 2019

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

Emissions Analysis for Site: **CTNH544A – Sharon_Surdan Mountain Road**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **7 Surdan Mountain Road, Sharon, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **7 Surdan Mountain Road, Sharon, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 1 UMTS channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

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

3) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

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 manufactures supplied specifications, minus 10 dB for directional panel antennas, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antennas used in this modeling are the **RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **RFS APXVAARR24_43-U-NA20** for 600 MHz and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **140 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 APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	140 feet	Height (AGL):	140 feet	Height (AGL):	140 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	3	Channel Count	3	Channel Count	3
Total TX Power(W):	160	Total TX Power(W):	160	Total TX Power(W):	160
ERP (W):	6,825.27	ERP (W):	6,825.27	ERP (W):	6,825.27
Antenna A1 MPE%	**1.36**	Antenna B1 MPE%	**1.36**	Antenna C1 MPE%	**1.36**
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
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height (AGL):	140 feet	Height (AGL):	140 feet	Height (AGL):	140 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,519.14	ERP (W):	2,519.14	ERP (W):	2,519.14
Antenna A3 MPE%	**1.14**	Antenna B3 MPE%	**1.14**	Antenna C3 MPE%	**1.14**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.50 %**
CT State Police (RX Only)	**1.87** %
LCD	**1.00** %
PageNet	**0.26** %
Verizon	**2.54** %
CL&P (All Systems)	**2.49** %
Ham	**0.97** %
Town of Sharon	**0.33** %
AT&T	**1.55** %
Site Total MPE %:	**13.51 %**

T-Mobile Sector A Total:	2.50 %
T-Mobile Sector B Total:	2.50 %
T-Mobile Sector C Total:	2.50 %
Site Total:	13.51 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz UMTS	1	1,706.32	140	3.42	PCS - 1900 MHz	1000.00	0.34%
T-Mobile AWS - 2100 MHz LTE	2	2,559.48	140	10.25	AWS - 2100 MHz	1000.00	1.02%
T-Mobile 600 MHz LTE	2	394.48	140	1.58	600 MHz	400.00	0.40%
T-Mobile 700 MHz LTE	2	865.09	140	3.46	700 MHz	467.00	0.74%
						Total:	**2.50%**

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:	2.50 %
Sector B:	2.50 %
Sector C:	2.50 %
T-Mobile Maximum MPE % (Per Sector):	2.50 %
Site Total:	13.51 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **13.51%** 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.