10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

August 12, 2020

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

RE: Notice of Exempt Modification
57 Cook Drive, Montville, CT 06382
Latitude: 41.4748874700
Longitude: -72.1055295000
T-Mobile Site#: CTNL023C – Anchor

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 188-foot and 190-foot level of the existing 190-foot guyed tower at 57 Cook Drive, Montville, CT. The 190-foot guyed tower is owned and operated by Wireless Solutions, LLC. The property is owned by Robert and Karen Kingsborough. T-Mobile now intends to replace three (3) of its existing antennas with three (3) new 1900/2100 MHz antennas, as well as add three (3) new 2500 MHz antennas. The new antennas will be installed at the same 190-foot level of the tower.

Planned Modifications:
Tower:

Remove
(6) TMA
(12) 1-5/8" Coax

Remove and Replace:
(3) APX16DWV-16DWVS (Remove) – AIR 32 Antenna (Replace) 1900/2100 MHz

Install New:
(3) AIR 6449 B41 Antenna 2500 MHz
(3) Ericsson 4415 RRU
(3) 1-5/8" Hybrid Cable

Existing to Remain:
(3) RFS APXVARR24_43 Antenna 600/700/1900 MHz
(3) Radio 4449 RRU
(3) 1-5/8" Hybrid Cable

Ground:
Install New: 6' X 4' Concrete Pad
(1) B160 Battery Cabinet
(1) 6160 Cabinet

This tower facility was originally approved by the Town of Montville Planning and Zoning Commission on January 14, 1997. This approval did not come with conditions that would be violated by the modification. A copy of this original approval is 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 Mayor – Ronald McDaniel, Elected Official, and Marcia Vlaun, Town Planner for the Town of Montville, as well as the property owner and tower 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: Ronald McDaniel – Mayor - Town of Montville
Marcia Vlaun – Town of Monvtille Town Planner
Wireless Solutions, LLC – tower owner
Robert and Karen Kingsborough – property owner

UPS Internet Shipping: View/Print Label

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

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

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

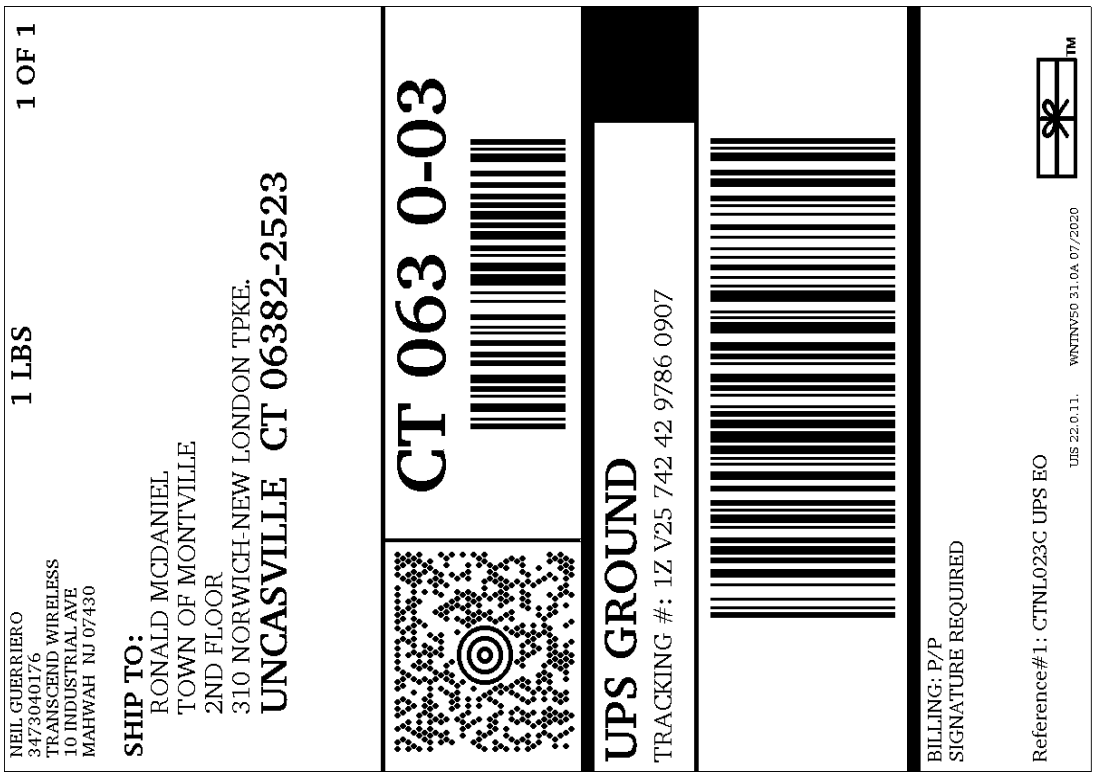
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the 'Find Locations' Quick link at ups.com.
   Schedule a same day or future day Pickup to have a UPS driver pickup all of your Internet Shipping packages.
   Hand the package to any UPS driver in your area.

UPS Access Point™
MICHAELS STORE # 7773
75 INTERSTATE SHOP CTR
RAMSEY ,NJ 07446

UPS Access Point™
THE UPS STORE
115 FRANKLIN TPKE
MAHWAH ,NJ 07430

UPS Access Point™
THE UPS STORE
120 E MAIN ST
RAMSEY ,NJ 07446

FOLD HERE



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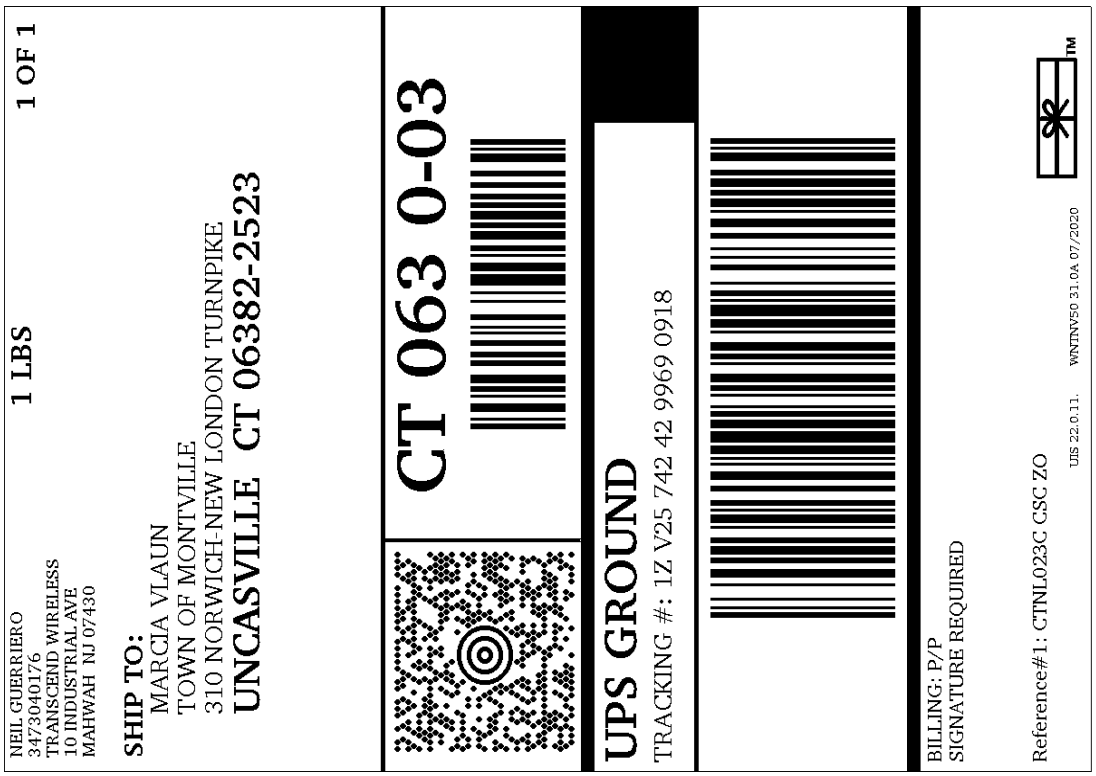

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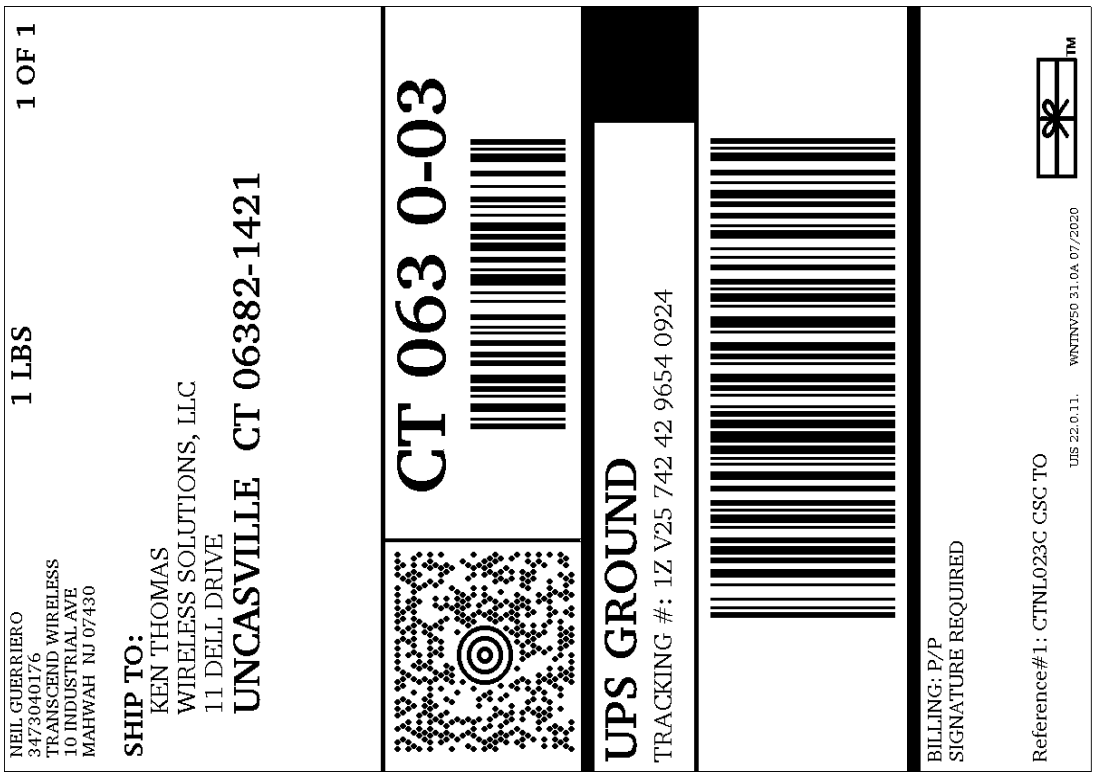

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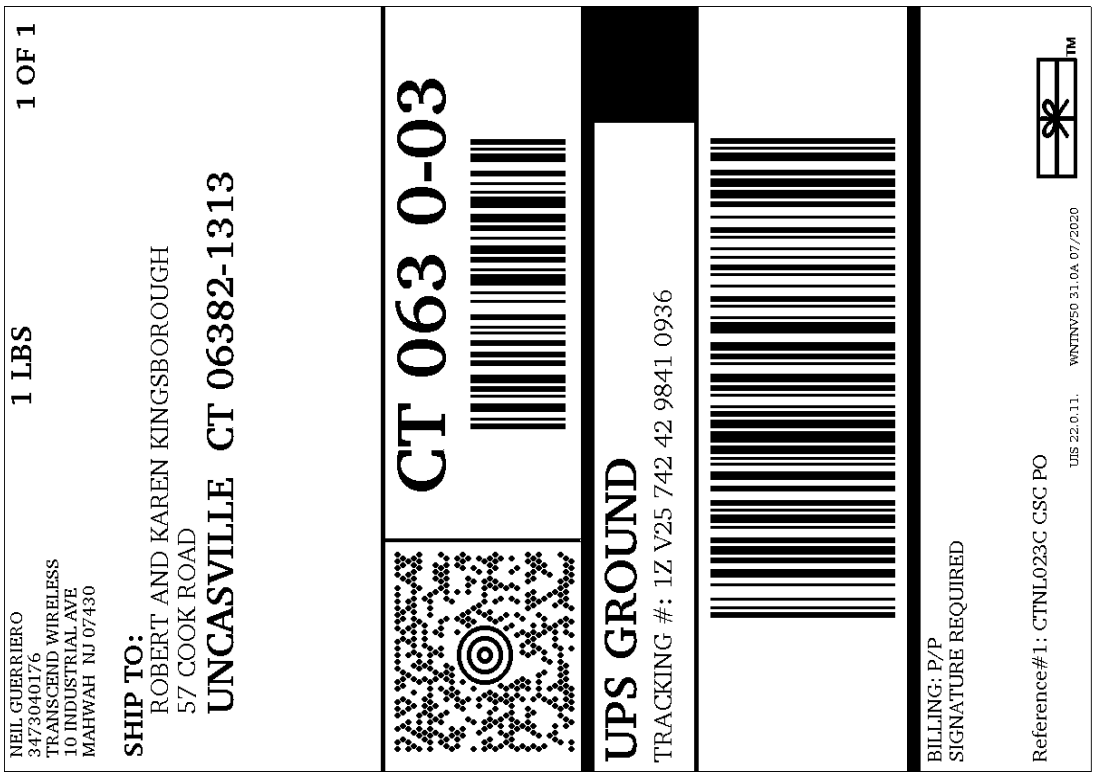


57 COOK RD

Location	57 COOK RD	**Mblu**	040/ 013/ 000/ /
Acct#	K0555700	**Owner**	KINGSBOROUGH ROBERT W & KAREN A
Assessment	$752,390	**Appraisal**	$1,168,630
PID	2568	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$1,003,750	$164,880	$1,168,630

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$702,630	$49,760	$752,390

Owner of Record

Owner	KINGSBOROUGH ROBERT W & KAREN A	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	57 COOK RD	**Book & Page**	0546/0511
	UNCASVILLE, CT 06382	**Sale Date**	03/04/2010
		Instrument	29

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
KINGSBOROUGH ROBERT W & KAREN A	$0		0546/0511	29	03/04/2010
KINGSBOROUGH ROBERT W	$0	1	0292/0446		10/23/1996
KINGSBOROUGH ROBERT W & D L MARIE	$0		0207/0299		11/12/1988

Building Information

Building 1 : Section 1

Year Built:	1989
Living Area:	3,462
Replacement Cost:	$360,409

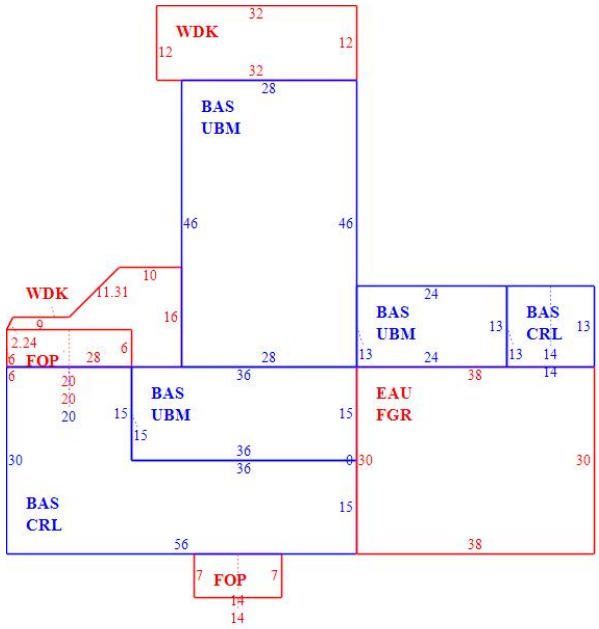
Building Percent Good: 84
Replacement Cost
Less Depreciation: $302,740

Building Attributes	
Field	**Description**
Style	Ranch
Model	Residential
Grade:	B
Stories:	1
Occupancy	1
Exterior Wall A	Vinyl Siding
Exterior Wall B	
Roof Structure:	Gable
Roof Cover	Asphalt
Interior Wall A	Drywall
Interior Wall B	
Interior Flr A	Carpet
Interior Flr B	
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	5 Bedrooms
Total Bthrms:	3
Total Half Baths:	0
Total Xtra Fixtrs:	0
Total Rooms:	9
Bath Style:	Average
Kitchen Style:	Average
Whirlpool Tub	
Fireplaces	1
Fin Bsmnt	
Fin Bsmnt Qual	
Attic Access	None
Basement Garage	0
Family Suite	1
MH Basement	

Building Photo


Building Photo
(http://images.vgsi.com/photos2/montvilleCTPhotos//00\02\43/64.jpg)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	3,462	3,462
CRL	Crawl Space	1,322	0
EAU	Unfinished Expansion Attic	1,140	0
FGR	Garage	1,140	0
FOP	Open Porch	218	0
UBM	Basement	2,140	0
WDK	Wood Deck	719	0
		10,141	3,462

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
KIT	Kitchen	1.00 UNITS	$4,200	1

Land

Land Use

Use Code	1010
Description	Single Family
Zone	C-3
Neighborhood	002
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	45.30
Frontage	
Depth	
Assessed Value	$49,760
Appraised Value	$164,880

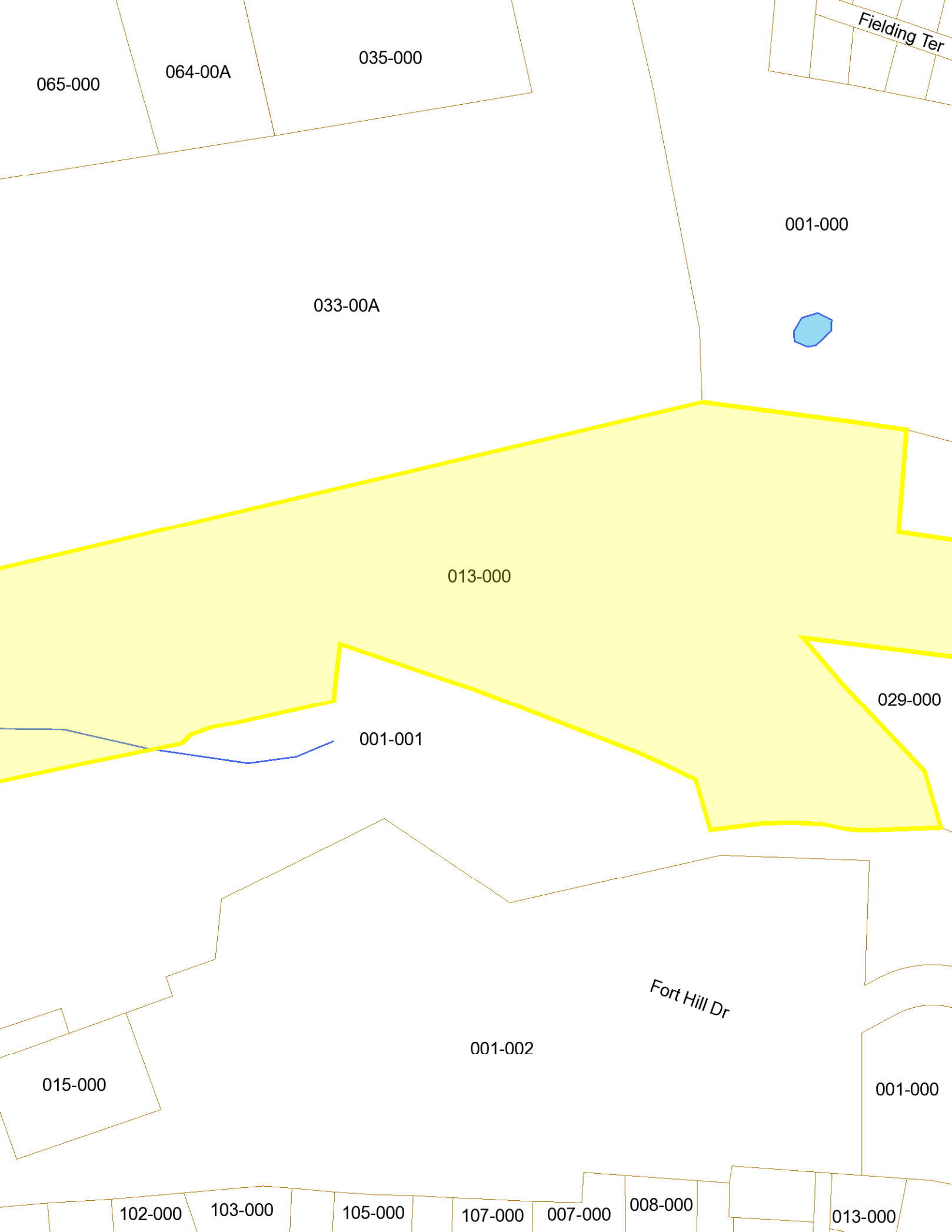
Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$1,003,750	$164,880	$1,168,630
2015	$943,790	$264,140	$1,207,930
2014	$943,790	$264,140	$1,207,930

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$702,630	$49,760	$752,390
2015	$660,650	$57,950	$718,600
2014	$660,650	$57,950	$718,600


065-000
064-00A
035-000
Fielding Ter
001-000
033-00A
013-000
029-000
001-001
Fort Hill Dr
001-002
015-000
001-000
102-000
103-000
105-000
107-000
007-000
008-000
013-000

TEL: 848-8549
FAX: 848-2354

TOWN OF MONTVILLE
PLANNING & ZONING COMMISSION

310 NORWICH-NEW LONDON TPKE.
UNCASVILLE, CONNECTICUT 06382-2599

LEGAL NOTICE

The Montville Planning and Zoning Commission at its meeting held on January 14, 1997, took the following action:

APPROVED the site plan submitted by **Wireless Solutions, LLC and Robert W. Kingsborough** to install a 180' radio tower and antenna for wireless communication purposes on property located at 57 Cook Drive, Montville, Ct. Shown on Assessor's Map 98, Lot 2.

APPROVED modifications to approved subdivision plans of **Lochdale Estates Subdivision** to eliminate the requirement that dry sewers be installed in Phase II and Phase III.

The application of **Christy's Market, Inc./Jack D'Elia** was withdrawn.

Maps and documentation concerning the above applications are on file in the office of the Town Planner, Town Hall Annex, Montville, Ct.

Dated at Montville, Ct. this 15th day of January, 1997.

MONTVILLE PLANNING AND ZONING COMMISSION
Gregory Majewski, Chairman

PUBLISH IN THE NEW LONDON DAY January 17, 1997.

PLEASE REFERENCE PURCHASE ORDER 6100 F 1 ON INVOICE.

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

CT023/MONTVILLE COOKST MP
SITE ID: CTNL023C
57 COOK ST
MONTVILLE, CT 06370

T-MOBILE RF CONFIGURATION

67D5997DB_2xAIR+1OP

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTON, 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 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 MANUFACTURER'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 CONDUITS 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 THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

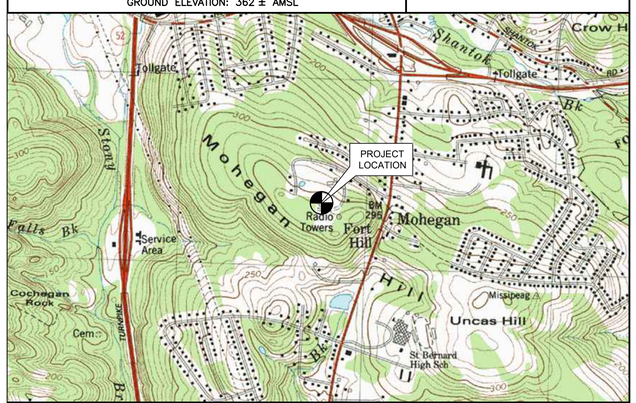
FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

TO: 57 COOK DRIVE
MONTVILLE, CT 06382

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	
2.	TAKE THE 2ND RIGHT ONTO DAY HILL RD.	0.30 MI.
3.	TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187. CONTINUE TO FOLLOW CT-187.	0.14 MI.
4.	STAY STRAIGHT TO GO ONTO BLUE HILLS AVE/CT-187.	0.64 MI.
5.	TURN LEFT ONTO OLD WINDSOR RD/CT-305. CONTINUE TO FOLLOW CT-305.	1.24 MI.
6.	MERGE ONTO I-91 S TOWARD HARTFORD.	2.33 MI.
7.	MERGE ONTO I-84 E/US-6 E VIA EXIT 30 ON THE LEFT TOWARD NEW LONDON/E HARTFORD/CT-2.	6.04 MI.
8.	MERGE ONTO CT-2 E VIA EXIT 55 TOWARD NEW LONDON/NORWICH.	0.61 MI.
9.	MERGE ONTO I-395 S/CT-2A E VIA EXIT 28S TOWARD NEW HAVEN.	36.36 MI.
10.	MERGE ONTO CT-2A E VIA EXIT 9 TOWARD LEDYARD/PRESTON.	3.87 MI.
11.	TAKE THE CT-32 EXIT, EXIT 5, TOWARD NORWICH/UNCASVILLE.	1.11 MI.
12.	TURN RIGHT ONTO NORWICH NEW LONDON TURNPIKE/CT-32.	0.38 MI.
13.	TURN RIGHT ONTO COOK DR.	0.41 MI.
14.	57 COOK DR, UNCASVILLE, CT 06382-1313, 57 COOK DR IS ON THE RIGHT.	0.25 MI.

SITE COORDINATES: LATITUDE: 41°-28'-29.82" N
LONGITUDE: 72°-06'-18.14" W
GROUND ELEVATION: 362'± AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP

NORTH

PROJECT SUMMARY

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

1. INSTALL (1) POWER ENECLOSURE 6160
2. INSTALL (1) BATTERY CABINET B160
3. INSTALL (1) iXRe ROUTER
4. INSTALL (1) BB6630
5. INSTALL (1) BB6648
6. REMOVE ALL COAX CABLES
7. INSTALL (3) 6x12 HYBRID CABLES.
8. REMOVE (2) TMA'S PER SECTOR. TOTAL OF (6)
9. INSTALL (1) RADIO 4415 B25 PER SECTOR. TOTAL OF (3)
10. REMOVE (1) RFS-APX16DWV ANTENNA PER SECTOR. TOTAL OF (3)
11. INSTALL (1) AIR32 KRD901146-1 ANTENNA PER SECTOR. TOTAL OF (3)
12. INSTALL (1) AIR6449 B41 ANTENNA PER SECTOR. TOTAL OF (3)
13. INSTALL 6'-0" x 4'-0" CONCRETE PAD.

PROJECT SUMMARY (STRUCTURAL)

FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) S-1 FOR ADDITIONAL DETAILS. NEW CONCRETE PAD TO BE INSTALLED.

PROJECT INFORMATION

SITE NAME:	CT023/MONTVILLE COOKST MP
SITE ID:	CTNL023C
SITE ADDRESS:	57 COOK ST MONTVILLE, CT 06370
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 OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
PROJECT COORDINATES:	LATITUDE: 41°-28'-29.82" N LONGITUDE: 72°-06'-18.14" W GROUND ELEVATION: 362'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	GENERAL NOTES AND SPECIFICATIONS	0
C-1	SITE LOCATION PLAN	0
C-2	COMPOUND PLAN AND ELEVATION	0
C-3	EQUIPMENT PLANS	0
C-4	ANTENNA PLANS	0
C-5	TYPICAL EQUIPMENT DETAILS	0
E-1	TYPICAL ELECTRICAL DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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SCALE:	AS NOTED
JOB NO.	20074.51

TITLE SHEET

T-1

Sheet No. 1 of 8

NOTES AND SPECIFICATIONS

DESIGN BASIS:

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

1. DESIGN CRITERIA:

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

SITE NOTES

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

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND IT'S COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS, ARE TO BE BROUGHT TO THE ATTENTION OF THE SITE OWNER'S CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "DIG SAFE" (DIAL 811) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
20. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
21. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.
22. PREVAILING WAGE RATES MAY APPLY TO THIS PROJECT. REFER TO ARTICLE 8 OF THE NEW YORK STATE DEPARTMENT OF LABOR FOR PREVAILING WAGE SCHEDULES/UPDATES ON A COUNTY-BY COUNTY BASIS. AN ORIGINAL WAGE SCHEDULE MUST BE REQUESTED FROM THE BUREAU OF PUBLIC WORK.

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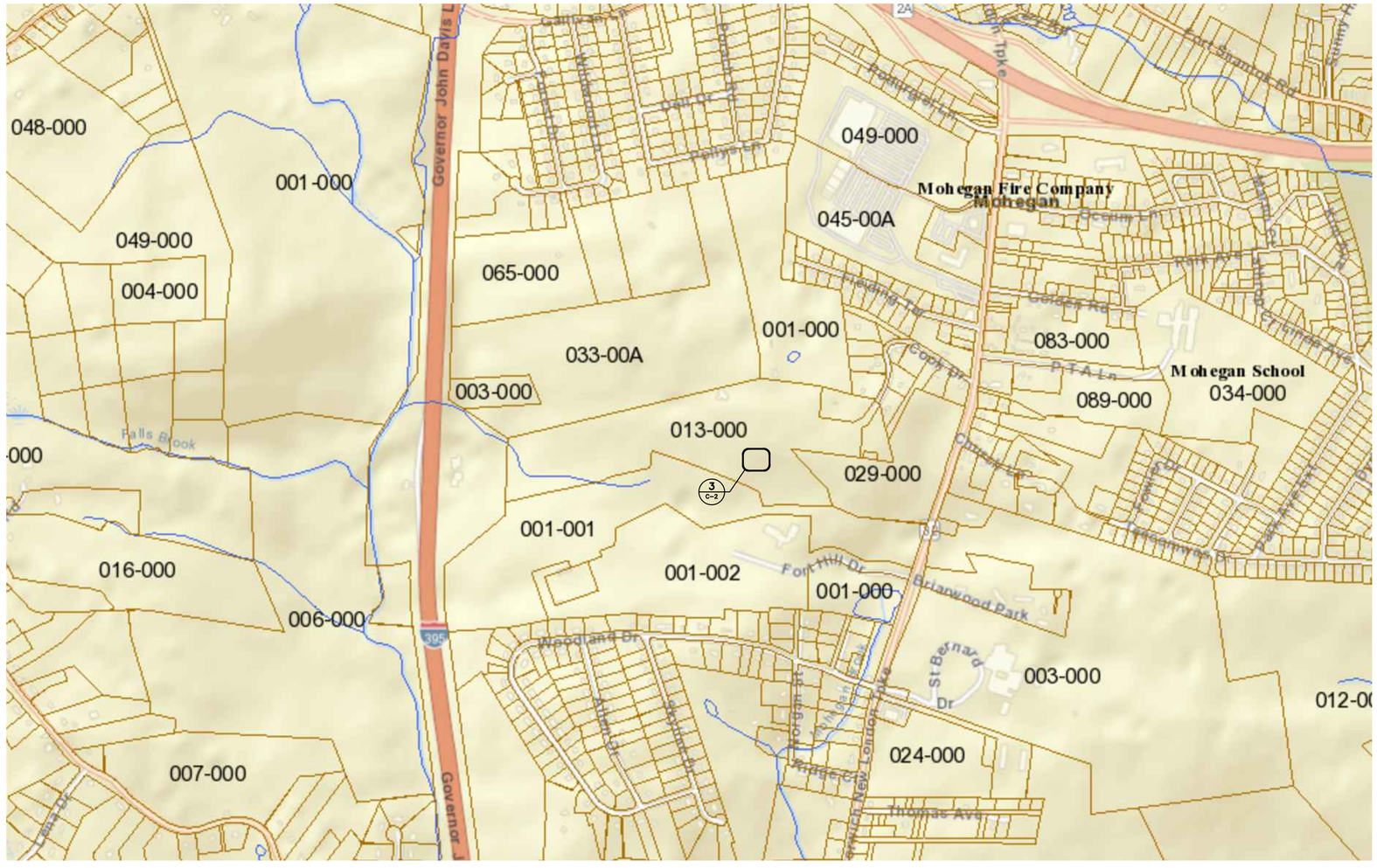
GENERAL NOTES AND SPECIFICATIONS

N-1

NOTE:
ALL COAX LENGTHS TO BE MEASURED
AND VERIFIED IN FIELD BEFORE ORDERING

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA (QTY)	(QTY) PROPOSED COAX (LENGTH)
A1	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	188'	60°	(E) RADIO 4449 B71 (1), (P) RADIO 4415 B25 (1)		(1) 6x12 HYBRID CABLE (±212')
A2	EXISTING	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	190'	60°			
A3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	190'	60°			
B1	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	188'	170°	(E) RADIO 4449 B71 (1), (P) RADIO 4415 B25 (1)		(1) 6x12 HYBRID CABLE (±212')
B2	EXISTING	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	190'	170°			
B3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	190'	170°			
C1	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	188'	330°	(E) RADIO 4449 B71 (1), (P) RADIO 4415 B25 (1)		(1) 6x12 HYBRID CABLE (±212')
C2	EXISTING	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	190'	330°			
C3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	190'	330°			



1 / C-1 SITE LOCATION PLAN
SCALE: NOT TO SCALE

TRUE NORTH

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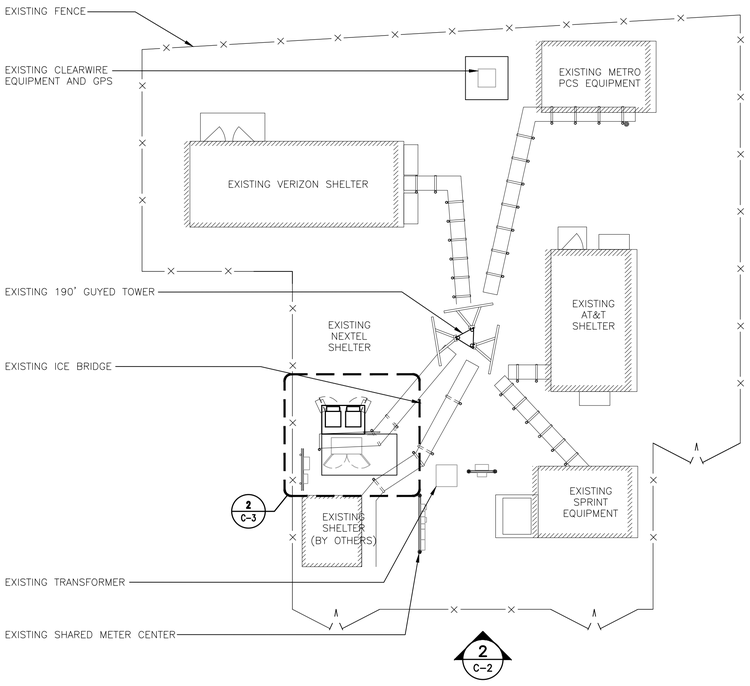
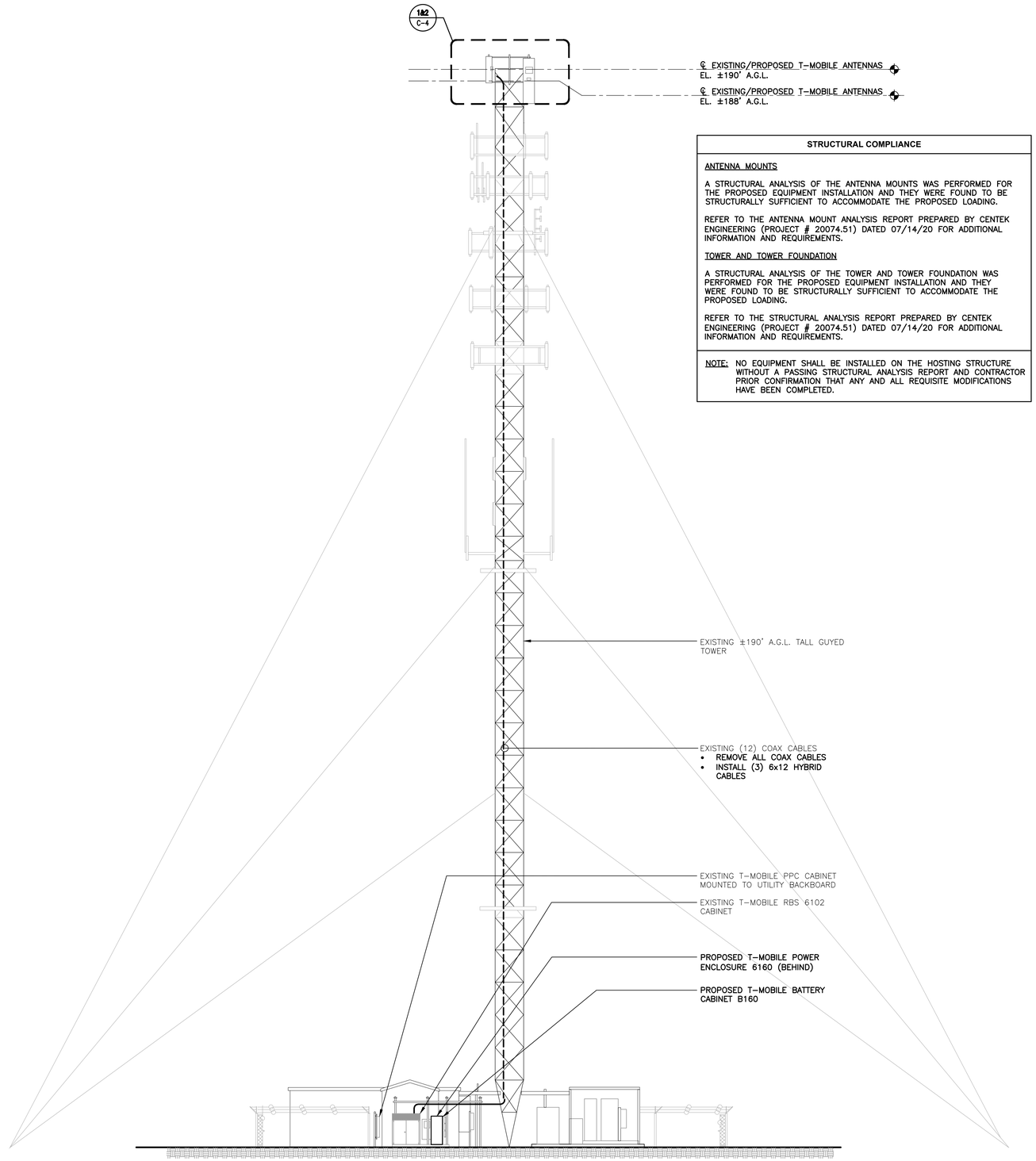
SITE LOCATION PLAN

C-1

Sheet No. 3 of 8



1 C-2 **PROPOSED COMPOUND PLAN**
SCALE: 1" = 10'-0"
APPROXIMATE NORTH



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

GRAPHIC SCALE
10 0 5 10 20 40
1" = 10'-0"

STRUCTURAL COMPLIANCE

ANTENNA MOUNTS

A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 20074.51) DATED 07/14/20 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 20074.51) DATED 07/14/20 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

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

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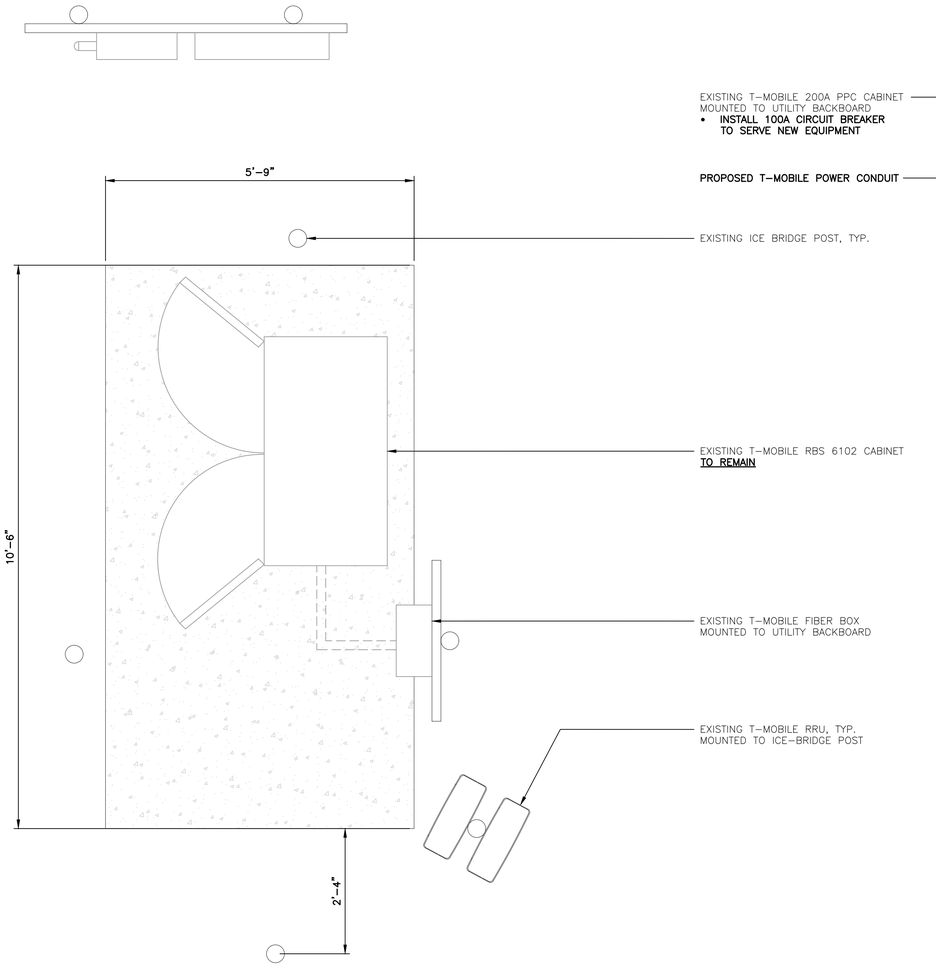
COMPOUND PLAN AND ELEVATION

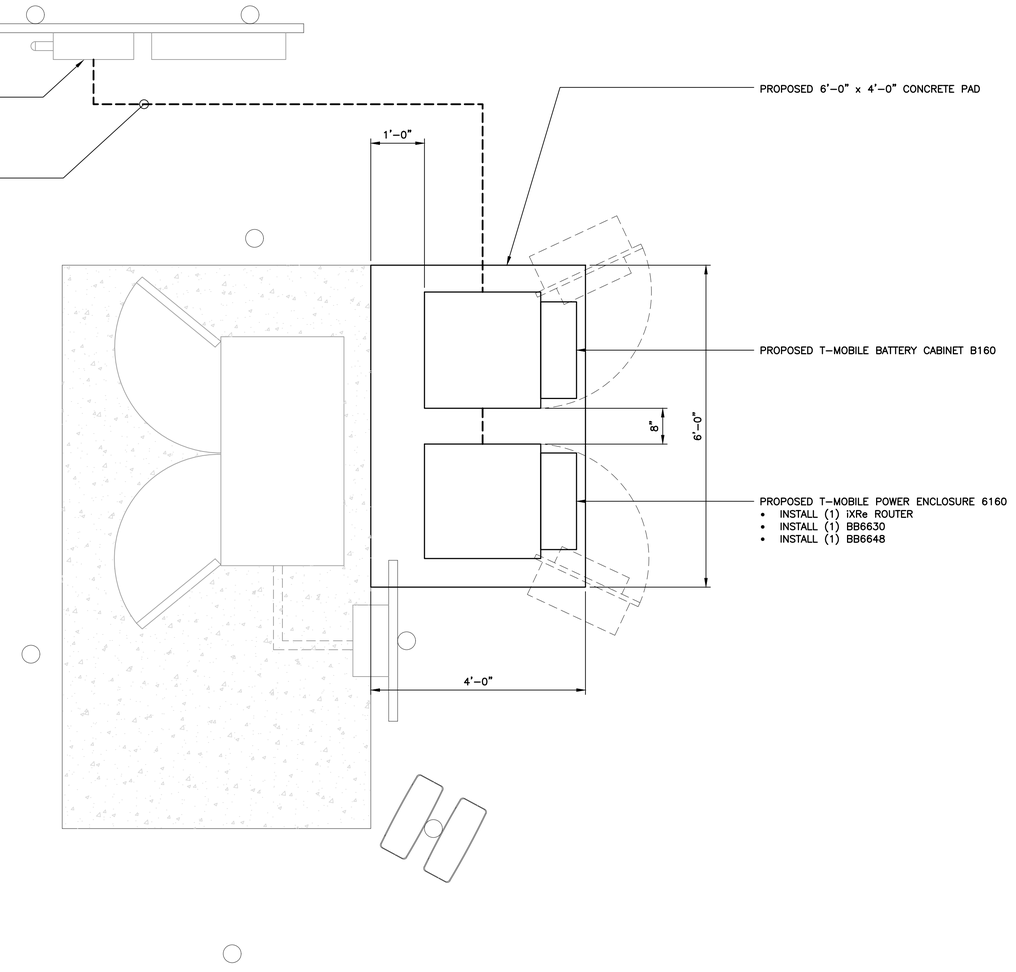
C-2

Sheet No. 4 of 8



1 C-3 **EXISTING EQUIPMENT PLAN**
SCALE: 3/4" = 1'

APPROXIMATE NORTH



2 C-3 **PROPOSED EQUIPMENT PLAN**
SCALE: 3/4" = 1'

APPROXIMATE NORTH

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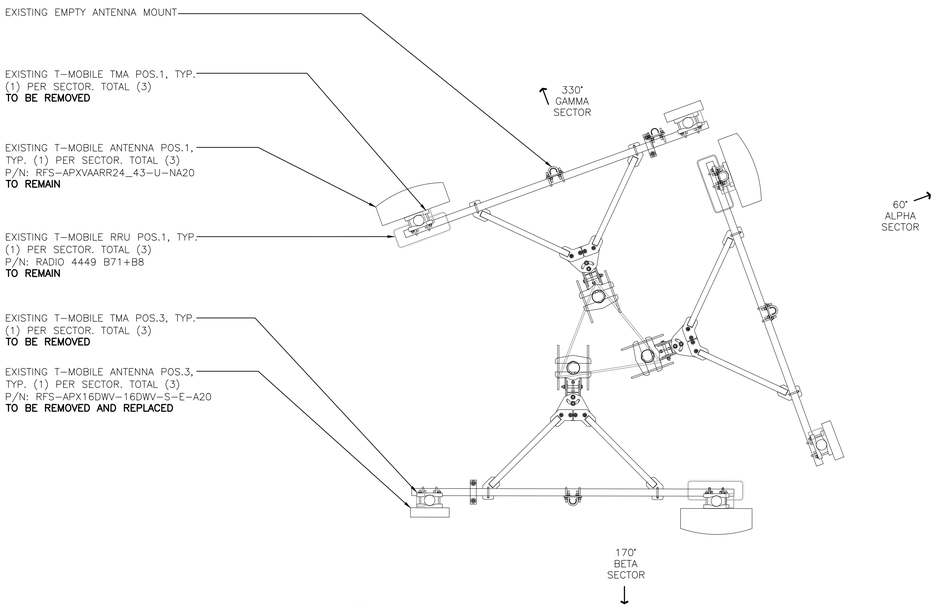
EQUIPMENT PLANS

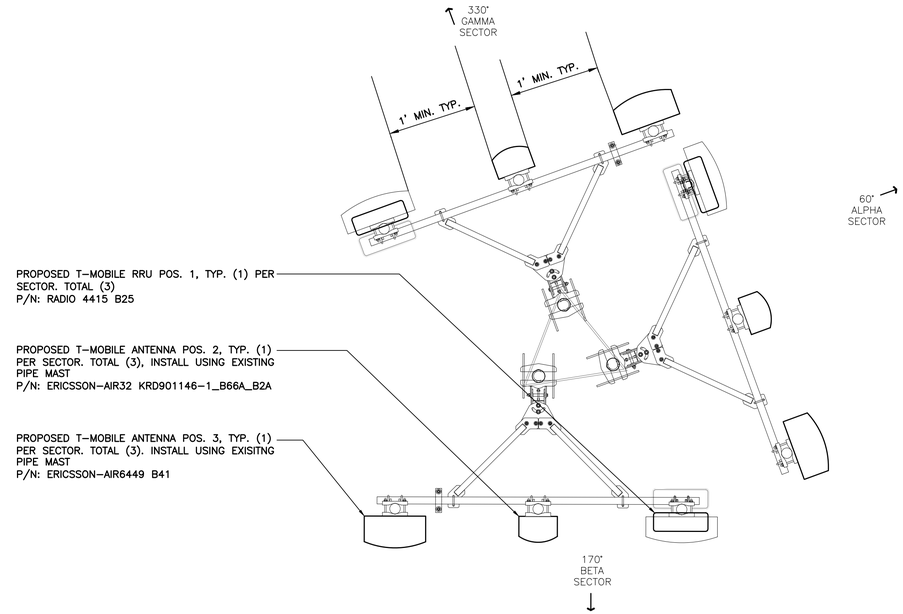
C-3

Sheet No. 4 of 8



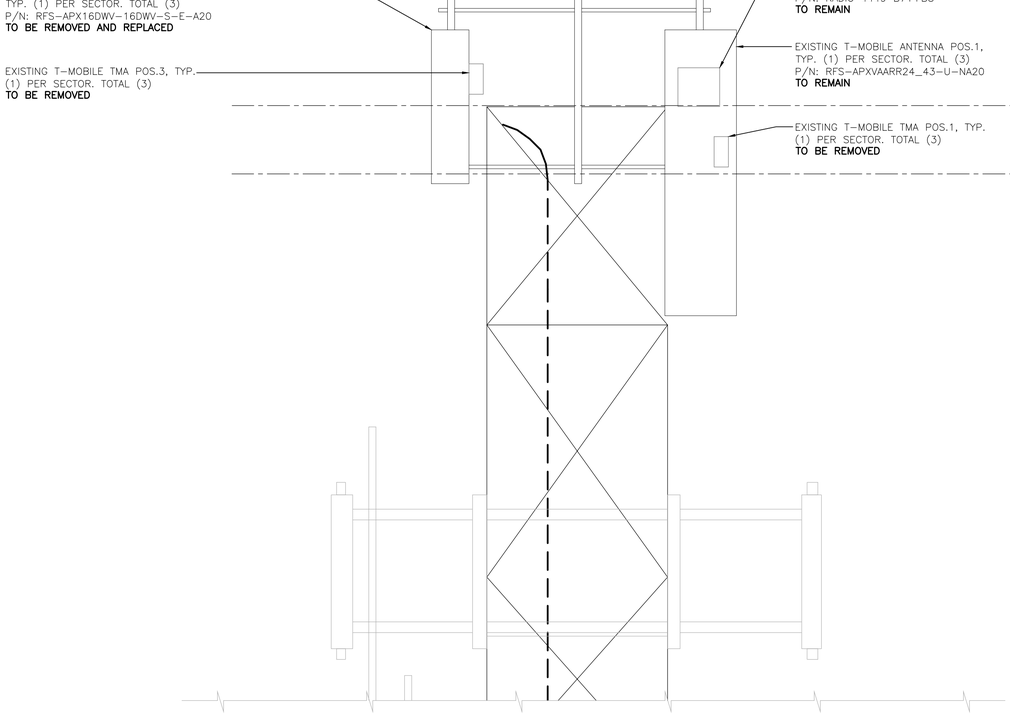
1 / C-4 EQUIPMENT AND ANTENNA PLAN - EXISTING

SCALE: 1/2" = 1'



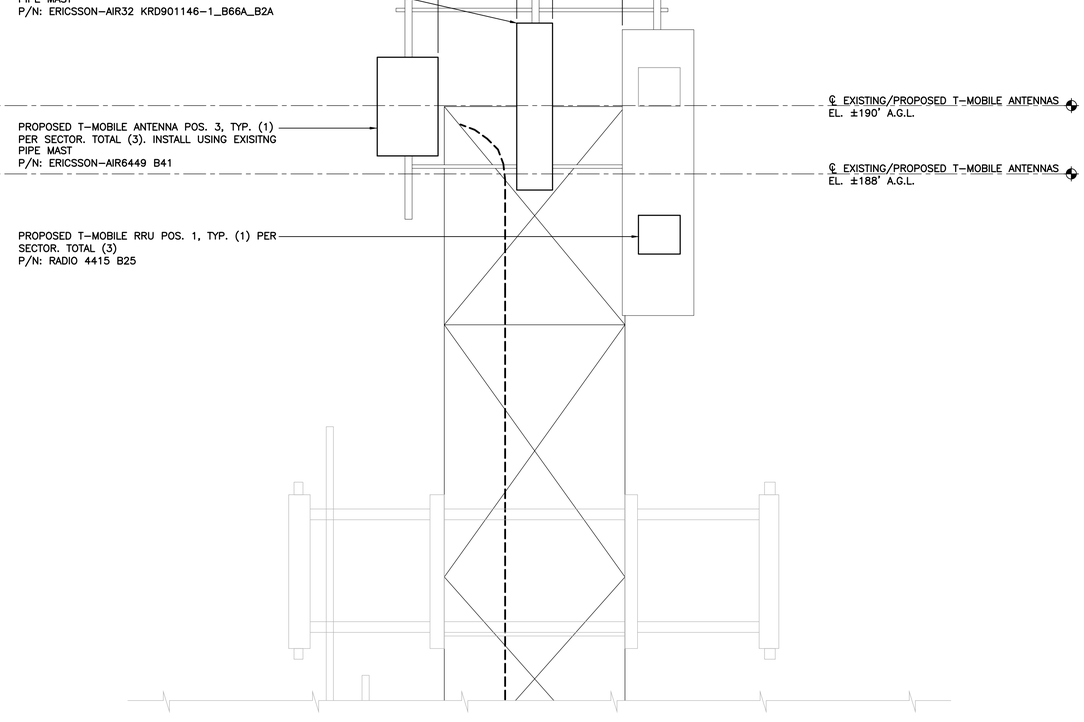
2 / C-4 EQUIPMENT AND ANTENNA PLAN - PROPOSED

SCALE: 1/2" = 1'



1A / C-4 ANTENNA ELEVATION - EXISTING

SCALE: 1/2" = 1'



2A / C-4 ANTENNA ELEVATION - PROPOSED

SCALE: 1/2" = 1'

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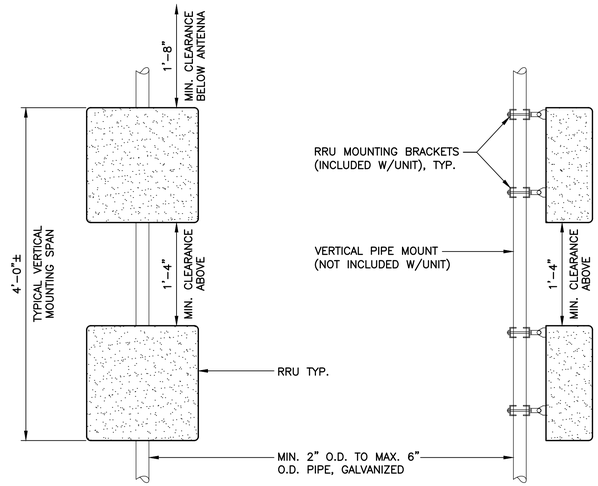
ANTENNA PLANS

C-4

Sheet No. 6 of 8



FRONT ELEVATION SIDE ELEVATION

NOTES:

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

1 / C-5 **TYPICAL RRUS MOUNTING DETAILS**
SCALE: NOT TO SCALE

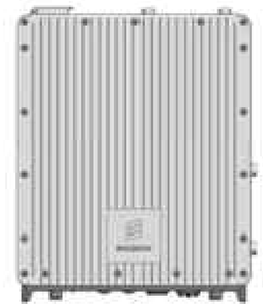
SIDE

AIR6449

AIR32

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6449 B41	33.1"L x 20.6"W x 8.6"D	±104 LBS.
MAKE: ERICSSON MODEL: AIR32 KRD901146-1_B66A_B2A	56.6"L x 12.9"W x 8.7"D	±105 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

2 / C-5 **PROPOSED ANTENNA DETAIL**
SCALE: NOT TO SCALE



FRONT VIEW

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4415 B25	14.9"L x 13.2"W x 5.4"D	±46 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.			

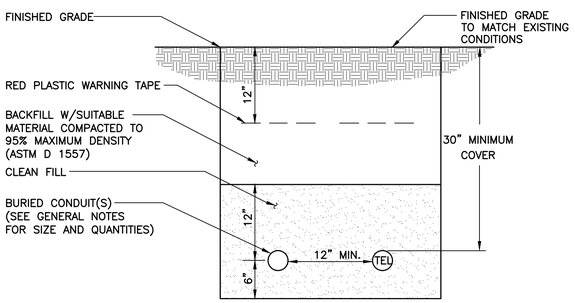
3 / C-5 **PROPOSED RRU DETAIL**
SCALE: NOT TO SCALE

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

4 / C-5 **ENCLOSURE 6160 (OUTDOOR)**
SCALE: NOT TO SCALE

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

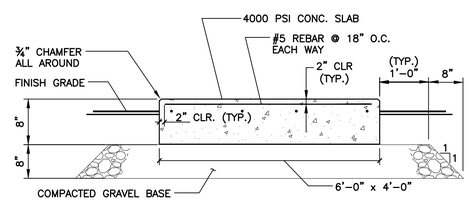
5 / C-5 **BATTERY CABINET DETAIL**
NOT TO SCALE



NOTES:

1. THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.

6 / C-5 **TYPICAL ELECTRICAL/TEL TRENCH DETAIL**
NOT TO SCALE



7 / C-5 **TYPICAL CONCRETE PAD DETAIL**
NOT TO SCALE

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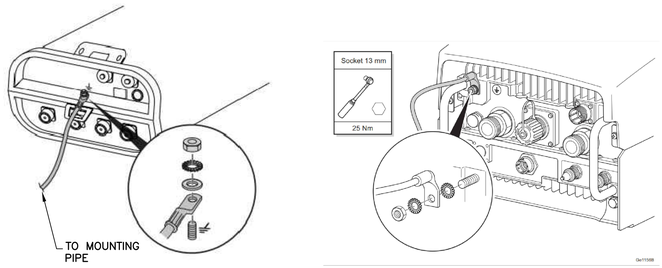
TYPICAL EQUIPMENT DETAILS

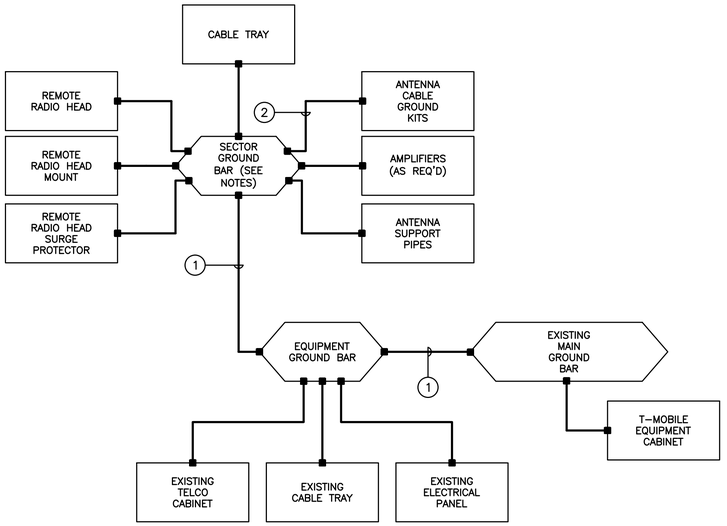
C-5

Sheet No. 7 of 8



1 E-1 TYPICAL ANTENNA/RRU GROUNDING DETAILS

SCALE: NOT TO SCALE



GROUNDING SCHEMATIC NOTES

(1) #2 AWG

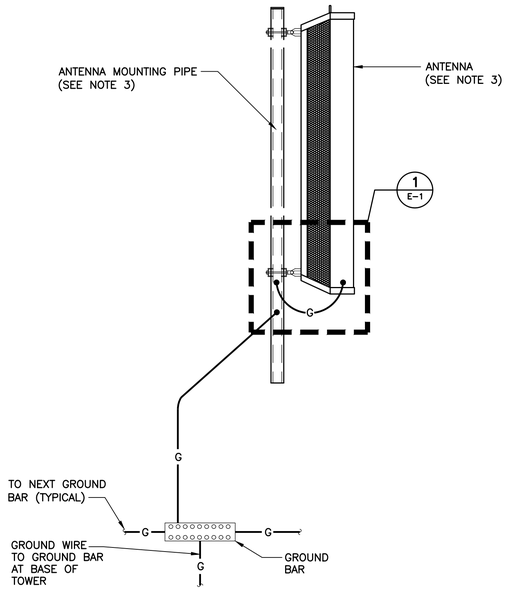
(2) #6 AWG

GENERAL NOTES:

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

4 E-1 TYPICAL GROUNDING SCHEMATIC DETAIL

SCALE: NOT TO SCALE

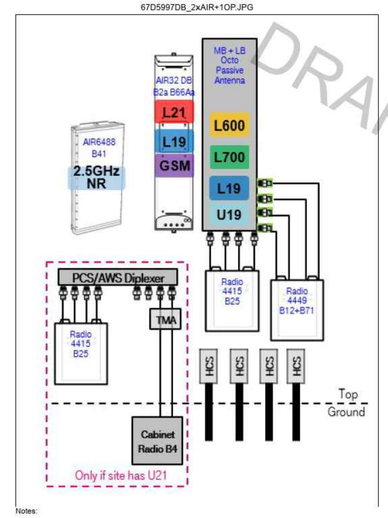


NOTES:

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.

2 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE



3 E-1 PROPOSED PLUMBING DIAGRAM

SCALE: NOT TO SCALE

RISER DIAGRAM NOTES

(1) EXISTING 200A, PPC CABINET TO REMAIN.

(2) NEW 100A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.

(3) EXISTING CABINETS TO REMAIN.

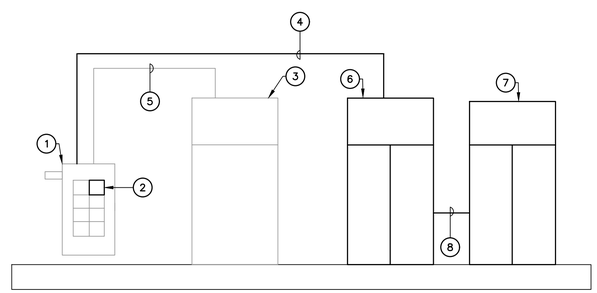
(4) (3) #1 AWG, (1) #8 AWG GROUND, 1–1/4" CONDUIT.

(5) EXISTING CONDUITS AND CONDUCTORS TO REMAIN.

(6) NEW T–MOBILE EQUIPMENT CABINET

(7) NEW T–MOBILE BATTERY CABINET

(8) DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.



5 E-1 ELECTRICAL POWER RISER DIAGRAM

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/12/20	RTS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

Transcend Wireless

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

T-MOBILE NORTHEAST LLC

WIRELESS COMMUNICATIONS FACILITY

CT023/MONTVILLE COOKST MP

SITE ID: CTNL023C

57 COOK ST

MONTVILLE, CT 06370

DATE:	07/05/20
SCALE:	AS NOTED
JOB NO.	20074.51

TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 8 of 8

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

193-ft Existing Guyed Lattice Tower

Proposed T-Mobile
Antenna Upgrade

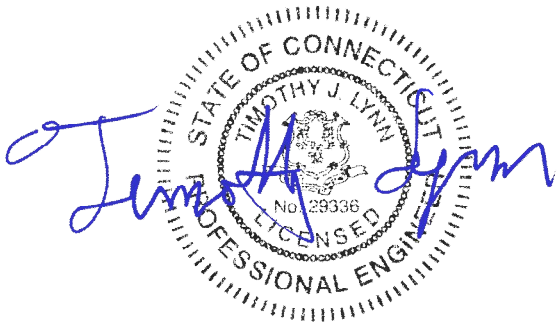
T-Mobile Site Ref: CTNL023C

57 Cook Drive
Montville, CT

Centek Project No. 20074.51

Date: July 14, 2020

Max Stress Ratio = 84.0%



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 upgrade proposed by T-Mobile on the existing guyed lattice tower located in Montville, Connecticut.

The host tower is a 193-ft, three face, guyed steel lattice tower originally designed and manufactured by UNR-ROHN. The tower was extended by 10-ft to its current height of 193-ft in 2002 per UHN-ROHN drawing no. C020301. The tower geometry, structure member sizes and foundation design information were obtained from UNR-ROHN design drawing B971656, job no. 35489PH dated March, 1997. Subsequent tower reinforcement material information was obtained from MetroPCS construction drawings prepared by Fullerton Engineering Consultants, dated November 12, 2010; a previous Reinforcement Design prepared by this office Centek Job No. 11001.CO27, marked Revision #1, dated May 25, 2012; and a Structural Analysis Report with Modification Plan for AT&T prepared by Hudson Design Group dated March 14, 2013.

Antenna and appurtenance information was taken a previous Structural Analysis Report prepared by Centek, job no. 19027.72 dated June 10, 2019 and a T-Mobile RF data sheet.

The tower consists of eleven (11) vertical sections constructed of steel pipe legs conforming to ASTM A572-50. Diagonal and horizontal lateral support bracing consists of a combination of steel angle and steel pipe construction conforming to ASTM A36 and ASTM A53-B-42. The vertical tower sections are connected by bolted flange plates with the diagonal and horizontal bracing to pipe legs consisting of bolted connections. The width of the tower face is 3.42-ft at throughout its length with the exception of a 5'-0" high tapered base section.

Antenna and Appurtenance Summary

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

- UNKNOWN (Existing):
  Antenna: One (1) 20' by 3" ∅ Omni-directional (whip) antenna mounted with an elevation of ±188.75-ft above the tower base.
  Coax Cable: One (1) 7/8" coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 6' by 3" ∅ Omni-directional (whip) antenna mounted with an elevation of ±180.0-ft above the tower base.
  Coax Cable: One (1) 7/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- AT&T (Existing):
  Antennas: Three (3) Powerwave 7770 panel antennas, three (3) CCI HPA-65R-BUU-H8 panel antennas, two (2) CCI TPA-65R-LCUUUU-H8 panel antennas, one (1) Quintel QS66512-2 panel antennas, six (6) TMAs, six (6) triplexers, three (3) RRUS11, three (3) RRUS12, three (3) RRUS32, three (3) 4426 B66 RRHs and two (2) DC6-48-60-18-8F Surge Arrestors mounted on three (3) 12-ft Boom Gates with a RAD center elevation of ±178.75-ft above the existing tower base.
  Coax Cables: Twelve (12) 1-1/4" ∅ coax cables, two (2) fiber line, and four (4) DC power cables running on a leg/face of the existing tower as specified in Section 3 of this report.

- VERIZON (Existing):
  Antennas: Three (3) Antel LPA 80080/4CF panel antennas, nine (9) Andrew SBNHH-1D65B panel antennas, three (3) Alcatel-Lucent RRH2x60-700 remote radio heads, three (3) Alcatel-Lucent RRH2x60-PCS remote radio heads, three (3) Alcatel-Lucent RRH4x45-AWS remote radio heads and two (2) RFS DB-T1-6Z-8AB-0Z main distribution boxes mounted on three (3) 15-ft T-Frames with a RAD center elevation of ±169-ft above the existing tower base.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables and two (2) 1-5/8" ∅ Hybriflex fiber cables running on the face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 6-ft 4-Bay Dipole antenna mounted with an elevation of ±155.5-ft above the tower base.
  Coax Cable: One (1) 1-1/4" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- SPRINT (Existing):
  Antennas: Three (3) RFS APXV9ERR18-C panel antennas, three (3) RFS APXVTM14 panel antennas and nine (9) RRHs mounted on three (3) 12-ft Boom Gates with a RAD center elevation of ±150.0-ft above the existing tower base.
  Coax Cables: Six (6) 1-5/8" ∅ fiber lines running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (EXISTING):
  Antenna: One (1) Decibel DB408 8-Bay Dipole antenna mounted on a 3' Standoff with an elevation of ±126-ft above the tower base.
  Coax Cable: One (1) 1-1/4" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (EXISTING):
  Antenna: Two (2) PD220 antennas mounted on 3'-6" Standoffs with an elevation of ±121-ft above the tower base.
  Coax Cable: Two (2) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) Folded Dipole antenna on a 6' x 3" Pipe Mount with an elevation of ±111-ft above the tower base.
  Coax Cable: One (1) 1-1/4" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 2' by 2" ∅ Omni-directional (whip) antenna mounted on a 2' Stand-off with an elevation of ±106-ft above the tower base.
  Coax Cable: Two (2) 1/2" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.

- T-MOBILE (Existing to Remain):
  Antennas: Three (3) RFS APXVAARR24_43 panel antennas and three (3) Ericsson 4449 remote radio heads mounted on three (3) Boom Gates with a RAD center elevation of ±190.0-ft above the existing tower base.
  Coax Cables: Three (3) 6x12 fiber cable running on the exterior of the existing tower.
- **T-MOBILE (Existing to Remove):**
  Antennas: Three (3) RFS APX16DWV-16DWVS panel antennas and six (6) TMAs mounted on three (3) Boom Gates with a RAD center elevation of ±190.0-ft above the existing tower base.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on the exterior of the existing tower.
- **T-MOBILE (Proposed):**
  Antennas: Three (3) AIR32 panel antennas, three (3) Ericsson AIR6449 panel antennas and three (3) Ericsson 4415 remote radio heads mounted on three (3) Boom Gates with a RAD center elevation of ±190.0-ft above the existing tower base.
  Coax Cables: Three (3) 6x12 fiber cable running on the exterior 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.
- All coax cables routed as specified in Section 3 of this report.

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 0.75" radial ice on the tower structure and its components.

Basic Wind Speed:	Montville; v = 105 mph (3 second gust)	*[Appendix N of the 2018 CT Building Code]*
Load Cases:	Load Case 1; 105 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; 50 mph wind speed w/ 0.75" 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. This tower was found to be at **84.0%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T2)	160'-0"-180'-0"	78.5%	**PASS**
Diagonal (T3)	140'-0"-160'-0"	53.4%	**PASS**
Guy C @ 140-ft radius (T2)	160'-0"	84.0%	**PASS**

Base Foundation and Guy Anchors

The existing tower foundation consists of a 2.5-ft ∅ reinforced concrete pedestal with a 7.0-ft square reinforced concrete pad bearing directly on the existing sub grade. Additionally, guy wire loading is transferred to three (3) 9.0-ft long by 5.0-ft wide by 2.0-ft thick reinforced concrete anchor support blocks at a 140-ft radius from the center of the existing tower and three (3) 12.0-ft long by 6.0-ft wide by 4.0-ft thick reinforced concrete anchor support blocks at a 88-ft radius from the center of the existing tower. The sub-grade conditions used as the basis for the foundation analysis were derived from a geo-technical study report for a proposed lattice tower within proximity of the subject guyed tower. The geo-technical report was prepared by Clarence Welti Associates, Inc., dated April 18, 2001.

- The worst case tower base and guy anchor reactions developed from the governing Load Case were used in the verification of the anchorage foundations:

Tower Guy Reactions		
Vector	**Proposed Reactions Guy Anchor B @ Radius of 88-ft**	**Proposed Reactions Guy Anchor C @ Radius of 140-ft**
Horizontal (In Plane of GW)	**31 kips**	**37 kips**
Horizontal (Out of Plane of GW)	**1 kips**	**1 kips**
Vertical	**32 kips**	**43 kips**
Resultant Force at end of Guy Wire	**45 kips**	**56 kips**
Tower Base Reactions		
Vector	**Proposed Reaction**	
Horizontal Shear	**4.0 kips**	
Axial Compression	**208 kips**	
Moment	**0 kip-ft**	

Foundation	Design Limit	TIA-222-G Section 9.4 FS(1)	Proposed Loading (FS)(1)	Result
Reinf. Conc. Anchor Block (B) at 88-ft radius.	Uplift	1.0	2.39	**PASS**
	Sliding	1.0	3.6	**PASS**
Reinf. Conc. Anchor Block (C) at 140-ft radius.	Uplift	1.0	2.34	**PASS**
	Sliding	1.0	2.0	**PASS**
		Ultimate	**Proposed**	
Base Foundation	Bearing	12.0 ksf	4.44 ksf	**PASS**

Note 1: FS denotes 'Factor of Safety'.

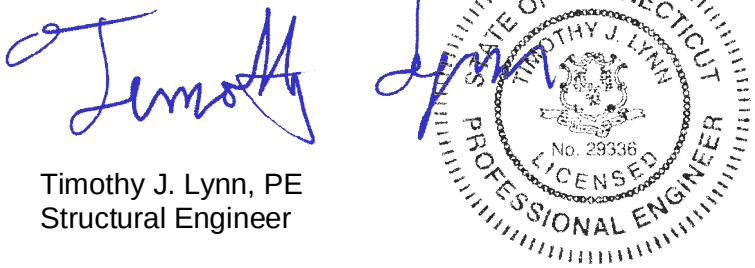
Conclusion

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

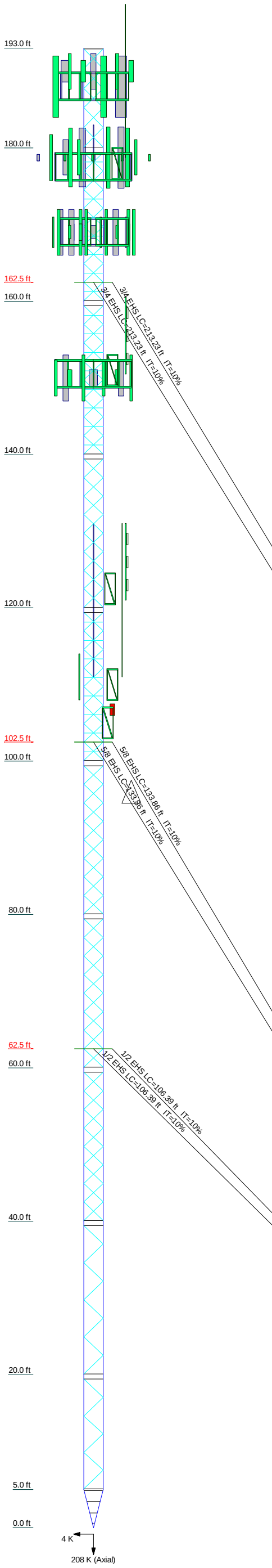
TnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, TnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

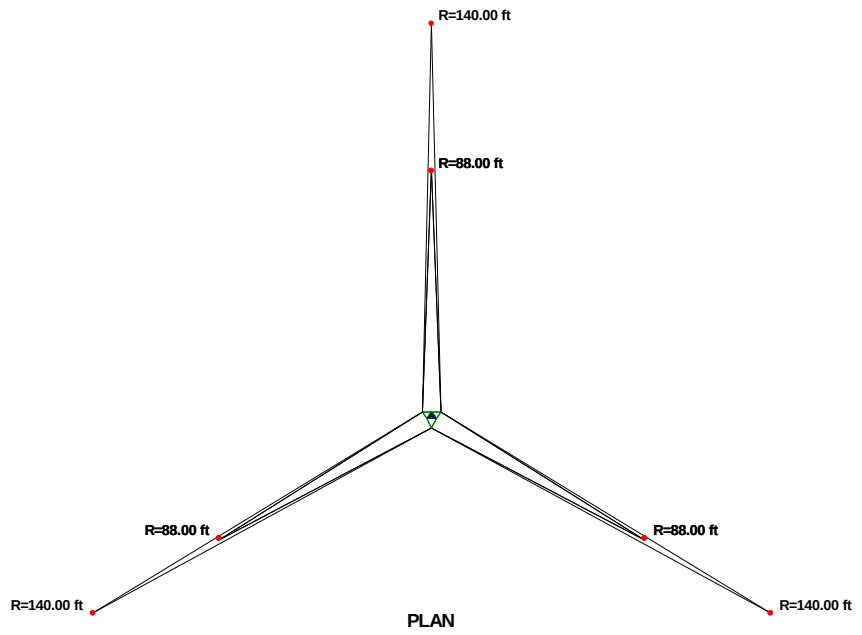
TnxTower Features:

- 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.

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	
Legs	P2.5x.276	ROHN 2.5 EH w/plate	L2x2x1/4	P2.5x.276	L2x2x1/4	ROHN TS1.5x16 ga	L1 3/4x1 3/4x3/16	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	6 @ 2.38368		13.1
Leg Grade			A36		A36	A53-B-42	A36		A53-B-42			
Diagonals			ROHN TS1.5x11 ga	ROHN TS1.5x11 ga	L2x2x1/4	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga		ROHN TS1.5x11 ga		N.A.	
Diagonal Grade			A53-B-42		A36				A53-B-42		N.A.	
Top Girts			ROHN TS1.5x11 ga		L2x2x1/4	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga		ROHN TS1.5x16 ga		L3x3x1/2	
Mid Girts												
Bottom Girts			ROHN TS1.5x11 ga		L2x2x1/4	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga		ROHN TS1.5x16 ga		L3x3x1/2	
Sec. Horizontals												
Face Width (ft)												
# Panels @ (ft)			64 @ 2.41276								A	
Weight (K)												

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	
Legs	P2.5x.276	ROHN 2.5 EH w/plate	L2x2x1/4	P2.5x.276	L2x2x1/4	ROHN TS1.5x16 ga	L1 3/4x1 3/4x3/16	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	5 @ 2.56667		3.417
Leg Grade			A36		A36	A53-B-42	A36		A53-B-42			
Diagonals			ROHN TS1.5x11 ga	ROHN TS1.5x11 ga	L2x2x1/4	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga		ROHN TS1.5x11 ga		N.A.	
Diagonal Grade			A53-B-42		A36				A53-B-42		N.A.	
Top Girts			ROHN TS1.5x11 ga		L2x2x1/4	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga		ROHN TS1.5x16 ga		L2x2x1/4	
Mid Girts												
Bottom Girts			ROHN TS1.5x11 ga		L2x2x1/4	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga		ROHN TS1.5x16 ga		L2x2x1/4	
Sec. Horizontals												
Face Width (ft)												
# Panels @ (ft)			64 @ 2.41276								N.A.	
Weight (K)												





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
AIR6449 (T-Mobile - Proposed)	190	SBNHH-1D65B (Verizon)	169
AIR6449 (T-Mobile - Proposed)	190	SBNHH-1D65B (Verizon)	169
AIR6449 (T-Mobile - Proposed)	190	LPA-80080-4CF (Verizon)	169
AIR32 (T-Mobile - Proposed)	190	SBNHH-1D65B (Verizon)	169
AIR32 (T-Mobile - Proposed)	190	SBNHH-1D65B (Verizon)	169
AIR32 (T-Mobile - Proposed)	190	SBNHH-1D65B (Verizon)	169
Radio 4449 B71 B12 (T-Mobile - Existing)	190	LPA-80080-4CF (Verizon)	169
Radio 4449 B71 B12 (T-Mobile - Existing)	190	RRH4x45/2x90-AWS (Verizon)	169
Radio 4449 B71 B12 (T-Mobile - Existing)	190	RRH4x45/2x90-AWS (Verizon)	169
4415 B25 (T-Mobile - Proposed)	190	RRH4x45/2x90-AWS (Verizon)	169
4415 B25 (T-Mobile - Proposed)	190	RRH2x60-PCS (Verizon)	169
4415 B25 (T-Mobile - Proposed)	190	RRH2x60-PCS (Verizon)	169
20' x 3" Dia Omni	188.75	RRH2x60-PCS (Verizon)	169
APXVAARR24-43 (T-Mobile - Existing)	188	RRH2x60-07-U (Verizon)	169
APXVAARR24-43 (T-Mobile - Existing)	188	RRH2x60-07-U (Verizon)	169
Rohn 6'x10' Boom Gate (T-Mobile)	188	RRH2x60-07-U (Verizon)	169
Rohn 6'x10' Boom Gate (T-Mobile)	188	DB-T1-6Z-8AB-0Z (Verizon)	169
Rohn 6'x10' Boom Gate (T-Mobile)	188	DB-T1-6Z-8AB-0Z (Verizon)	169
APXVAARR24-43 (T-Mobile - Existing)	188	Pirod 15' T-Frame Sector Mount (1) (Verizon)	169
6' x 3" Dia Omni	180	Pirod 15' T-Frame Sector Mount (1) (Verizon)	169
TPA-65R-LCUUUU-H8 (ATI)	178.75	Pirod 15' T-Frame Sector Mount (1) (Verizon)	169
7770.00 (ATI)	178.75	SBNHH-1D65B (Verizon)	169
HPA-65R-BUU-H8 (ATI)	178.75	SBNHH-1D65B (Verizon)	169
TPA-65R-LCUUUU-H8 (ATI)	178.75	LPA-80080-4CF (Verizon)	169
7770.00 (ATI)	178.75	SBNHH-1D65B (Verizon)	169
HPA-65R-BUU-H8 (ATI)	178.75	4 Bay Dipole	155.5
QS66512-2 (ATI)	178.75	3'-6" Standoff	151
(2) TT19-08BP111-001 TMA (ATI)	178.75	Rohn 6'x15' Boom Gate (Sprint)	150.5
(2) TT19-08BP111-001 TMA (ATI)	178.75	Rohn 6'x15' Boom Gate (Sprint)	150.5
(2) TT19-08BP111-001 TMA (ATI)	178.75	Rohn 6'x15' Boom Gate (Sprint)	150.5
(2) DBCT108F1V92-1 (ATI)	178.75	FD-RRH 2x50 800 (Sprint)	150
(2) DBCT108F1V92-1 (ATI)	178.75	FD-RRH 2x50 800 (Sprint)	150
(2) DBCT108F1V92-1 (ATI)	178.75	FD-RRH 2x50 800 (Sprint)	150
RRUS-11 (ATI)	178.75	TD-RRH8x20-25 (Sprint)	150
RRUS-11 (ATI)	178.75	TD-RRH8x20-25 (Sprint)	150
RRUS-11 (ATI)	178.75	TD-RRH8x20-25 (Sprint)	150
RRUS-12 (ATI)	178.75	FD-RRH 4x40 1900 (Sprint)	150
RRUS-12 (ATI)	178.75	FD-RRH 4x40 1900 (Sprint)	150
RRUS-12 (ATI)	178.75	FD-RRH 4x40 1900 (Sprint)	150
RRUS-32 (ATI)	178.75	APXV9ERR18-C-A20 w/ Mount (Sprint)	150
RRUS-32 (ATI)	178.75	APXV9ERR18-C-A20 w/ Mount (Sprint)	150
RRUS-32 (ATI)	178.75	APXV9ERR18-C-A20 w/ Mount (Sprint)	150
4426 B66 (ATI)	178.75	APXVTM14 (Sprint)	150
4426 B66 (ATI)	178.75	APXVTM14 (Sprint)	150
4426 B66 (ATI)	178.75	APXVTM14 (Sprint)	150
DC6-48-60-18-8F Surge Arrestor (ATI)	178.75	DB408	126
DC6-48-60-18-8F Surge Arrestor (ATI)	178.75	3' Standoff	122.5
7770.00 (ATI)	178.75	PD220	121
HPA-65R-BUU-H8 (ATI)	178.75	PD220	121
6' Standoff	178	Folded Dipole	111
3' Standoff	178	6'x3" Pipe Mount	111
Rohn 6'x15' Boom Gate (ATI)	177.5	3'-6" Standoff	110
Rohn 6'x15' Boom Gate (ATI)	177.5	3'-6" Standoff	110
Rohn 6'x15' Boom Gate (ATI)	177.5	2'x2" Omni	106
SBNHH-1D65B (Verizon)	169	2' Standoff	105

SYMBOL LIST

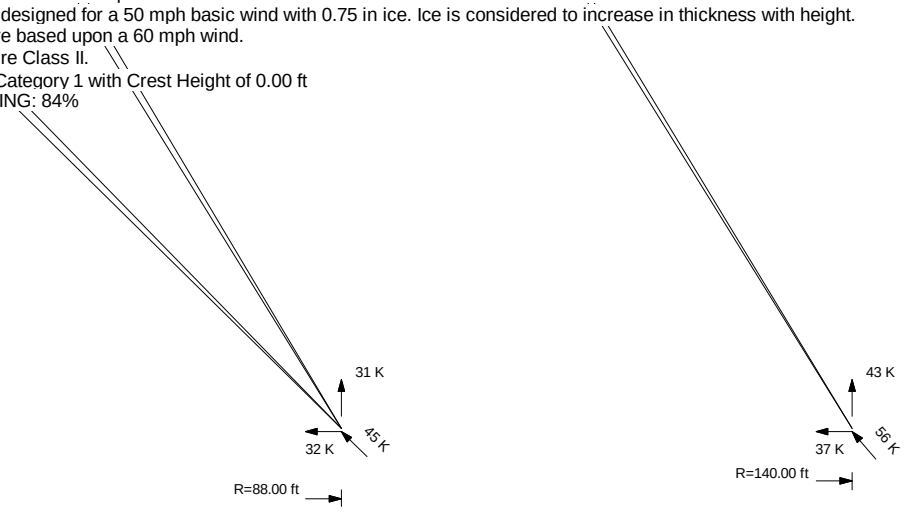
MARK	SIZE	MARK	SIZE
A	3 @ 1.44444		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-42	42 ksi	63 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-G Standard.
2. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 84%



ALL REACTIONS ARE FACTORED

Centek Engineering Inc.
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Branford, CT 06405
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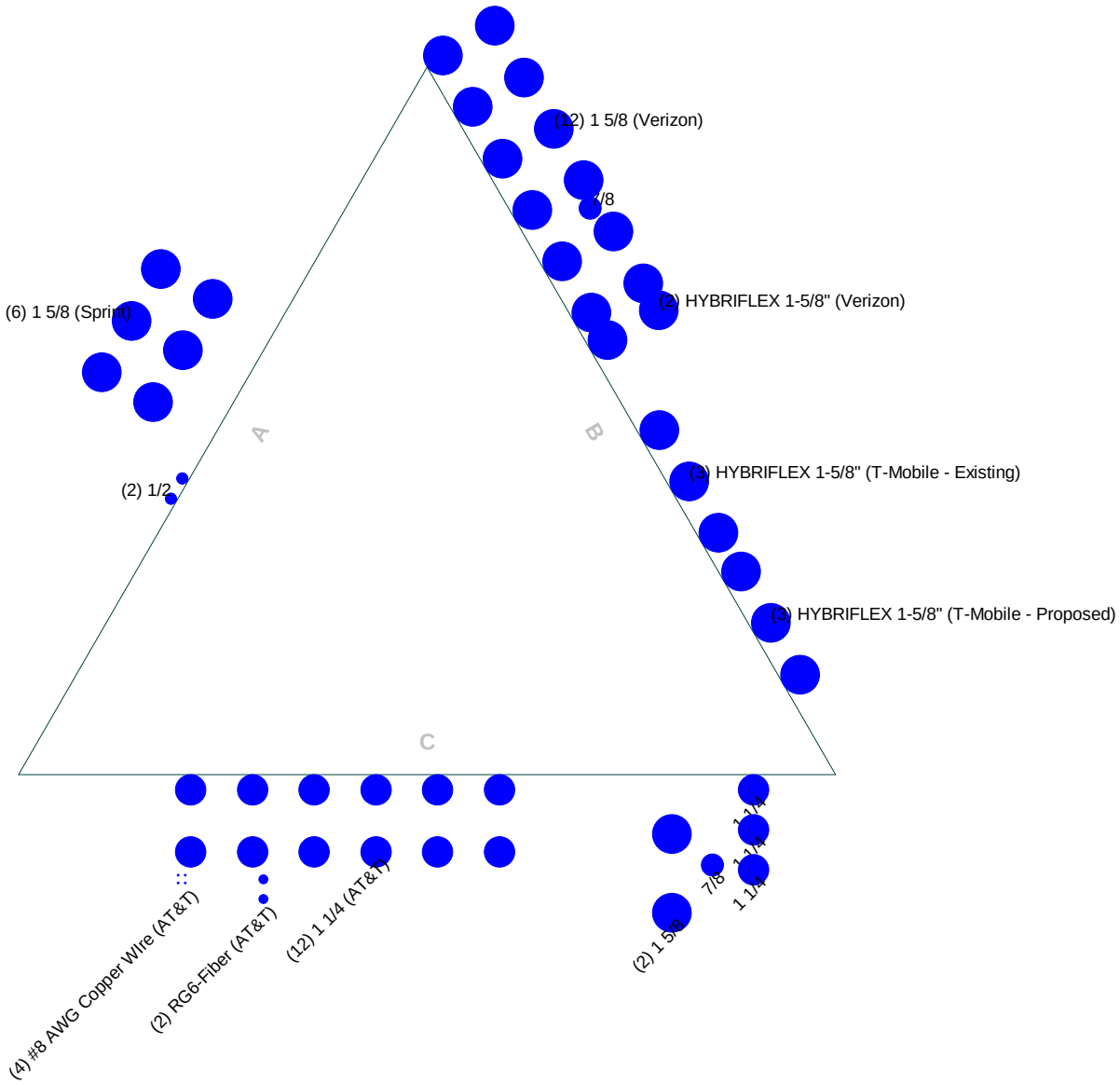
FAX: (203) 488-8587

Job: ***20074.51 - CTNL023C***			
Project: ***193' Guyed Lattice Tower - 57 Cook Road, Montville, CT***			
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 07/14/20	Scale: NTS	
Path: J:\Jobs\2007400.WI\51. CTNL023C\05. Structural\Tower Analysis\Backup Documentation\Calcs\tnxTower Files\193' Guyed Rohn Tower.eri		Dwg No. E-1	

Feed Line Plan

Round Flat App In Face App Out Face



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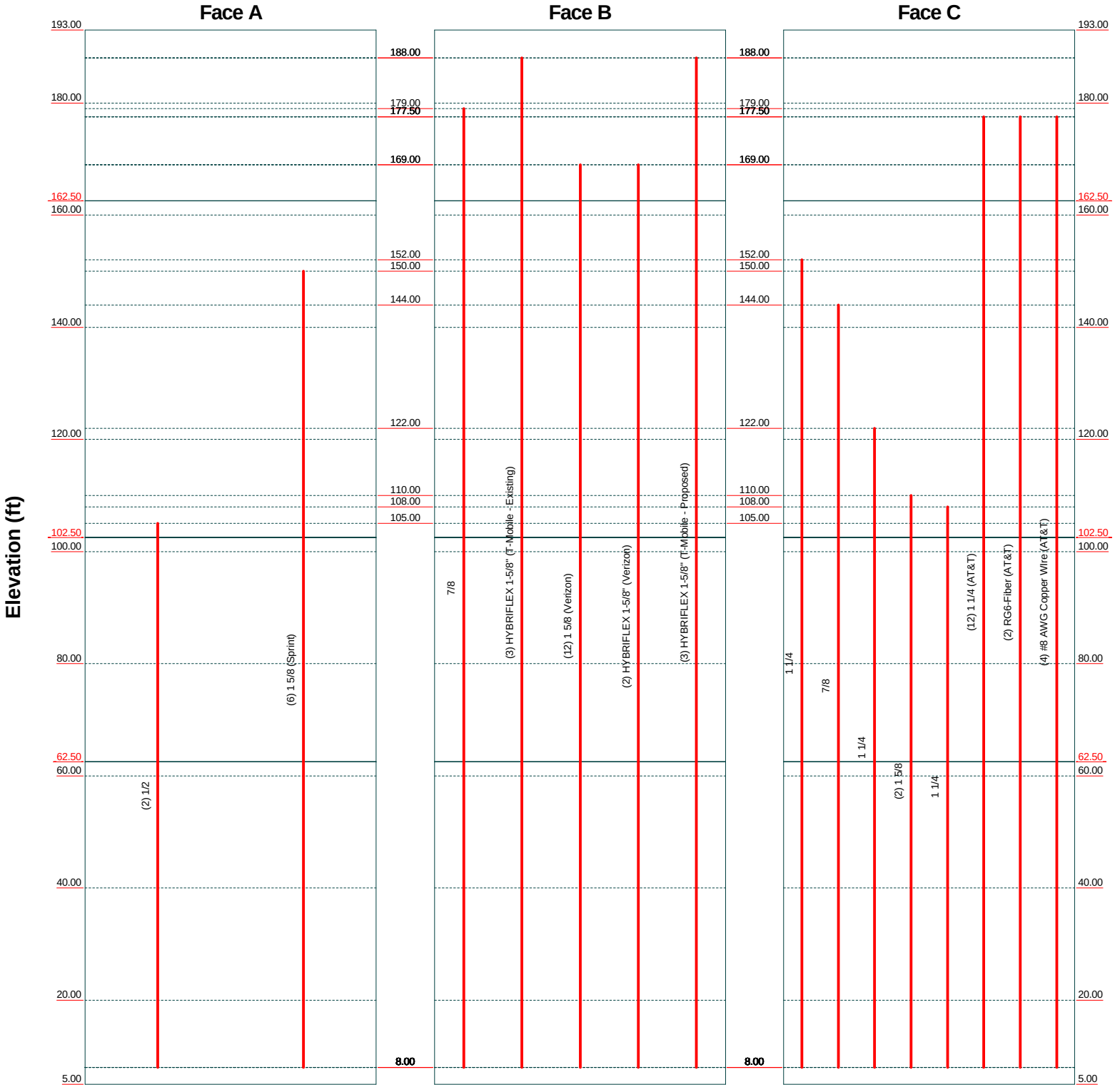
Feed Line Distribution Chart
5' - 193'

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



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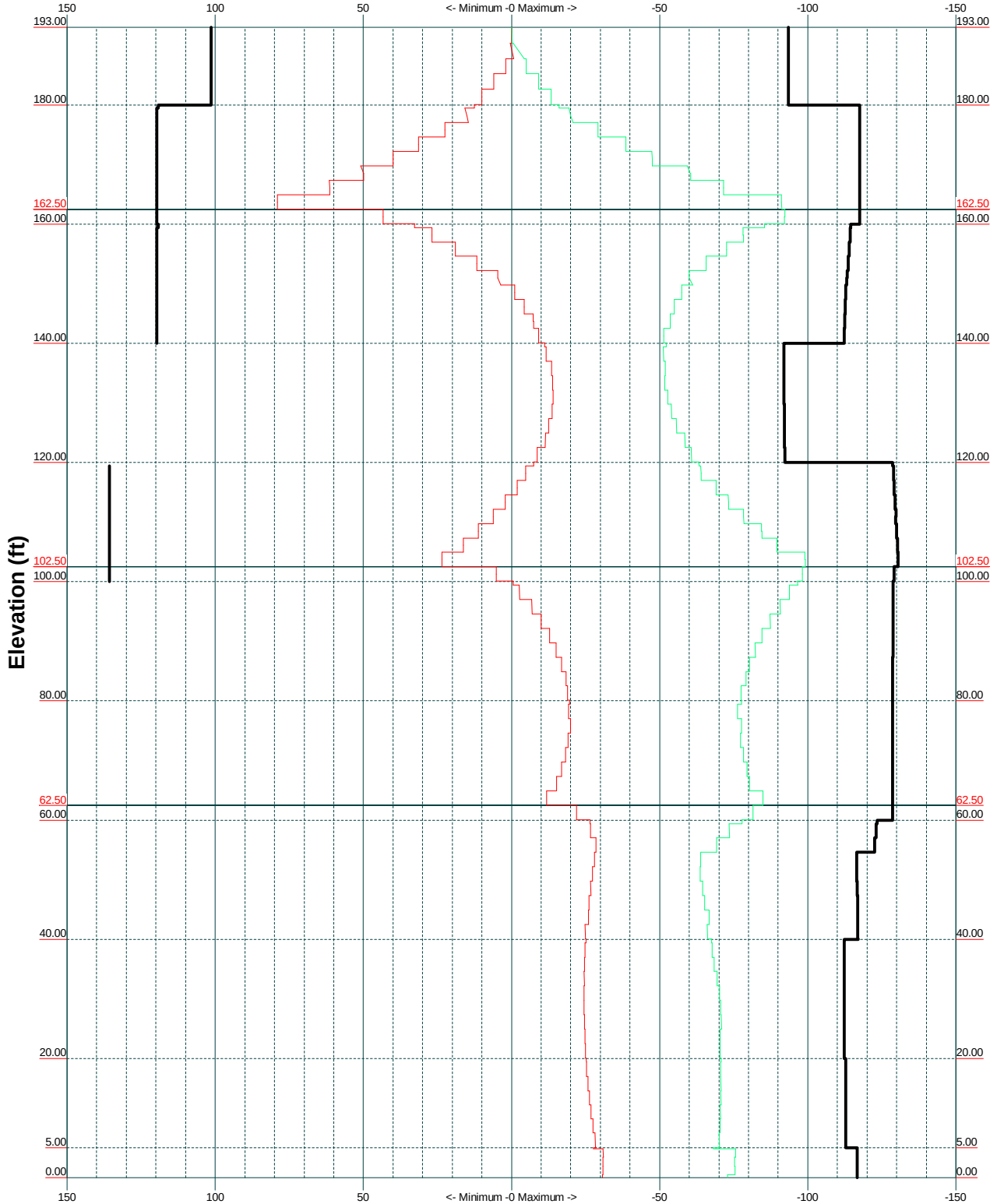
Path: J:\Jobs\20074\00\WI\51_CTNL023C\05_Structural\Tower Analysis\Backup Documentation\Calcs\tnxTower Files\193' Guyed Rohn Tower.eri			Dwg No. E-7

TIA-222-G - 105 mph/50 mph 0.7500 in Ice Exposure B

Leg Capacity ——— **Leg Compression (K)**



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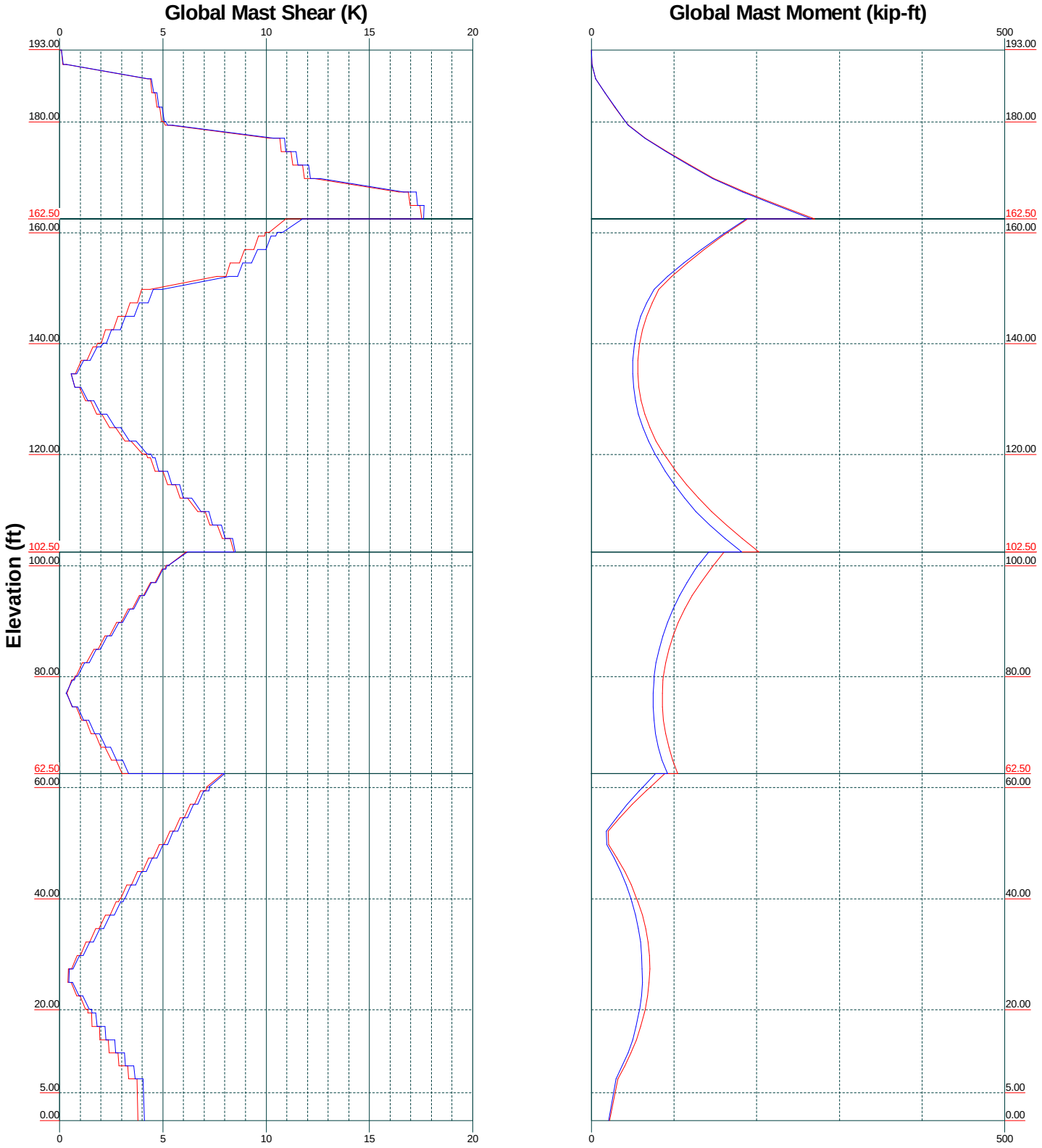
Client: T-Mobile		Drawn by: TJL	App'd:
Code: TIA-222-G		Date: 07/14/20	Scale: NTS
Path: J:\Jobs\20074\00\Wi51_CTNL023C\05_Structural\Tower Analysis\Backup Documentation\Calcs\tnxTower Files\193' Guyed Rohn Tower.eri			Dwg No. E-3

TIA-222-G - 105 mph/50 mph 0.7500 in Ice Exposure B

Maximum Values

Vx Vz Mx Mz



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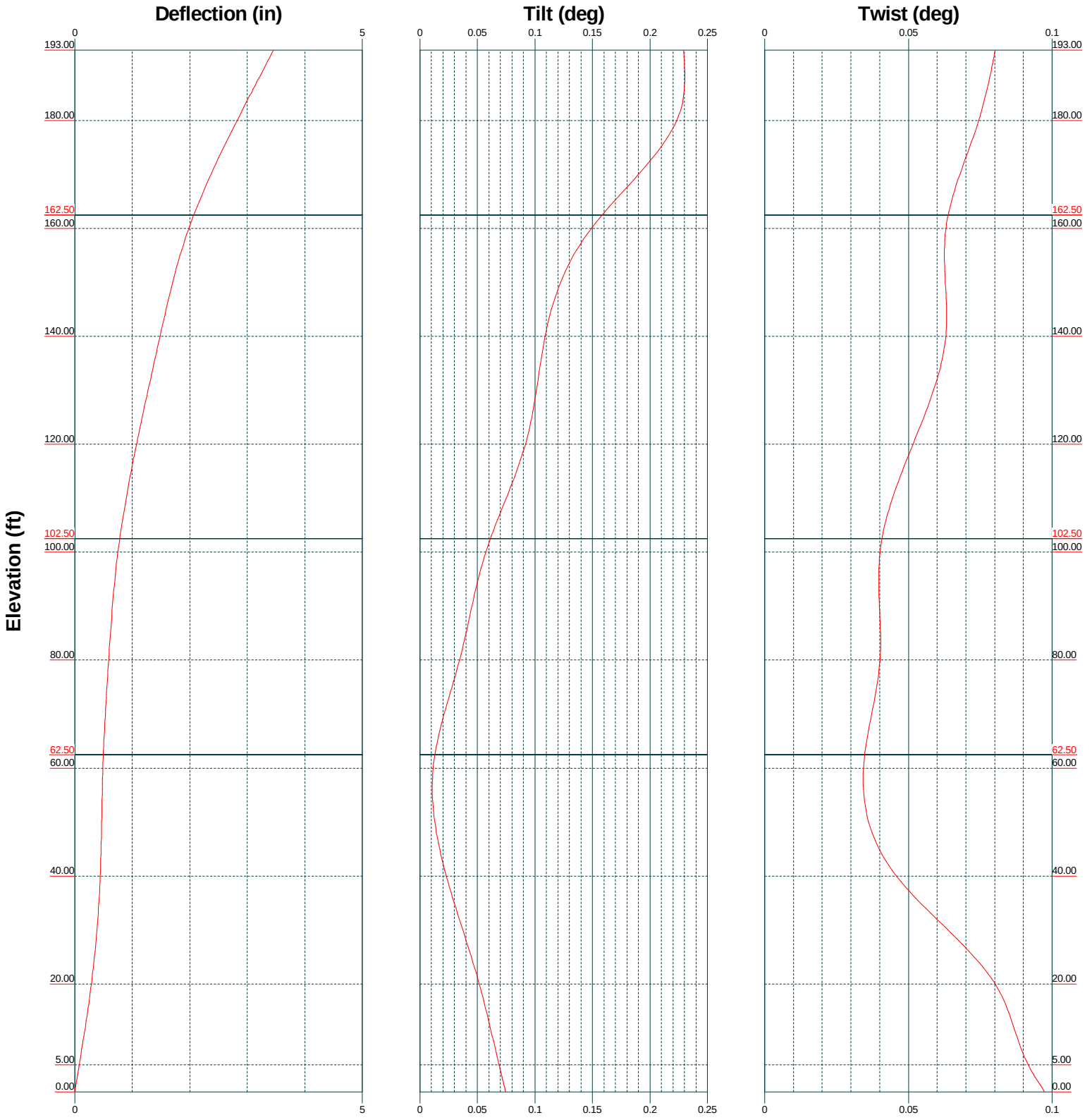
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 07/14/20	Scale: NTS
Path: J:\Jobs\20074\00 WI\51_CTNL023C\05_Structural\Tower Analysis\Backup Documentation\Calcs\tnxTower Files\193' Guyed Rohn Tower.eri		Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values



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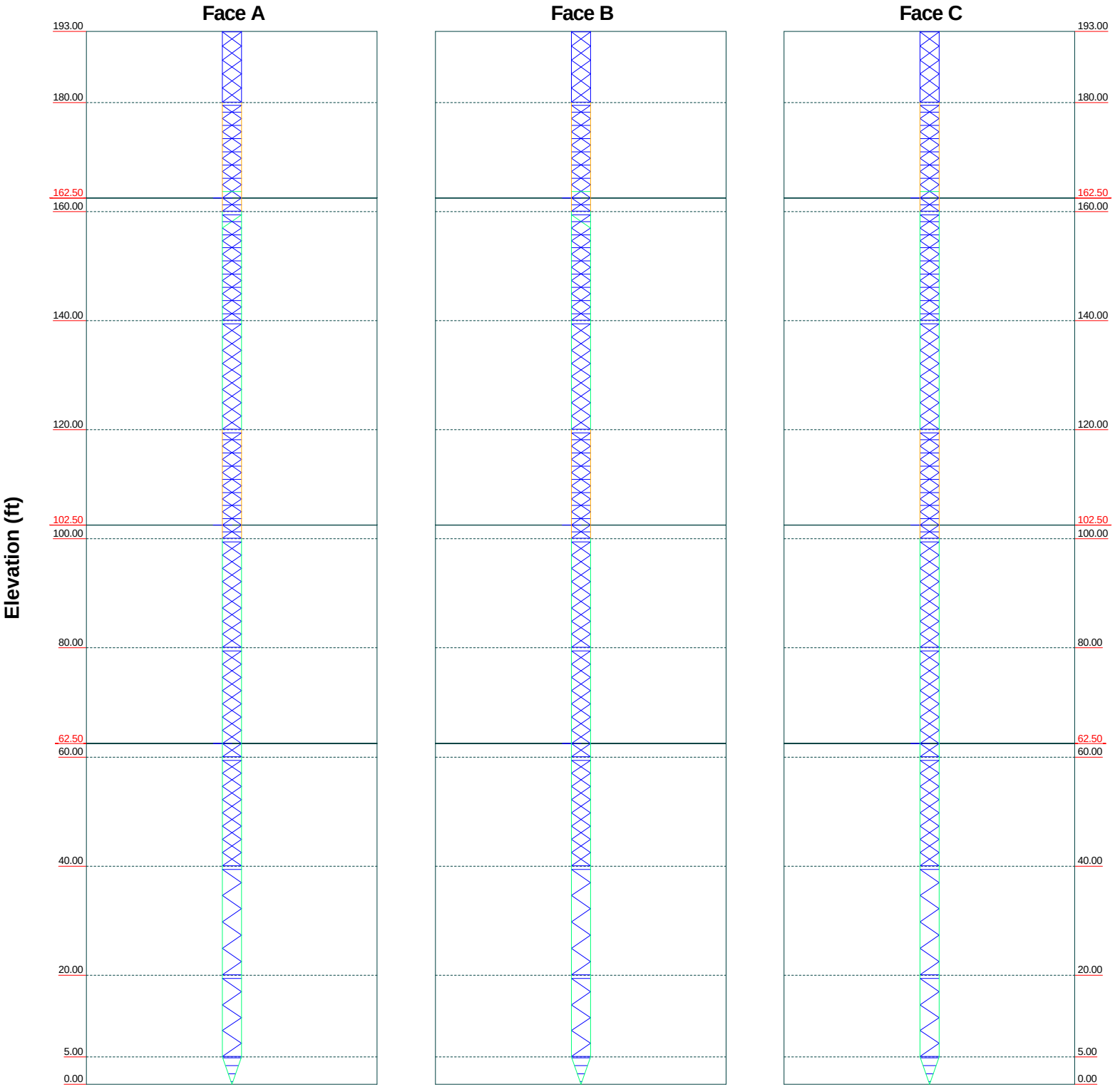
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 07/14/20	Scale: NTS	
Path: J:\Jobs\20074\00 WI\51_CTNL023C\05_Structural\Tower Analysis\Backup Documentation\Calculinx\Tower Files\193' Guyed Rohn Tower.eri		Dwg No. E-5	

Stress Distribution Chart
0' - 193'

> 100% | 90%-100% | 75%-90% | 50%-75% | < 50% Overstress



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Client: T-Mobile		Drawn by: TJL	App'd:
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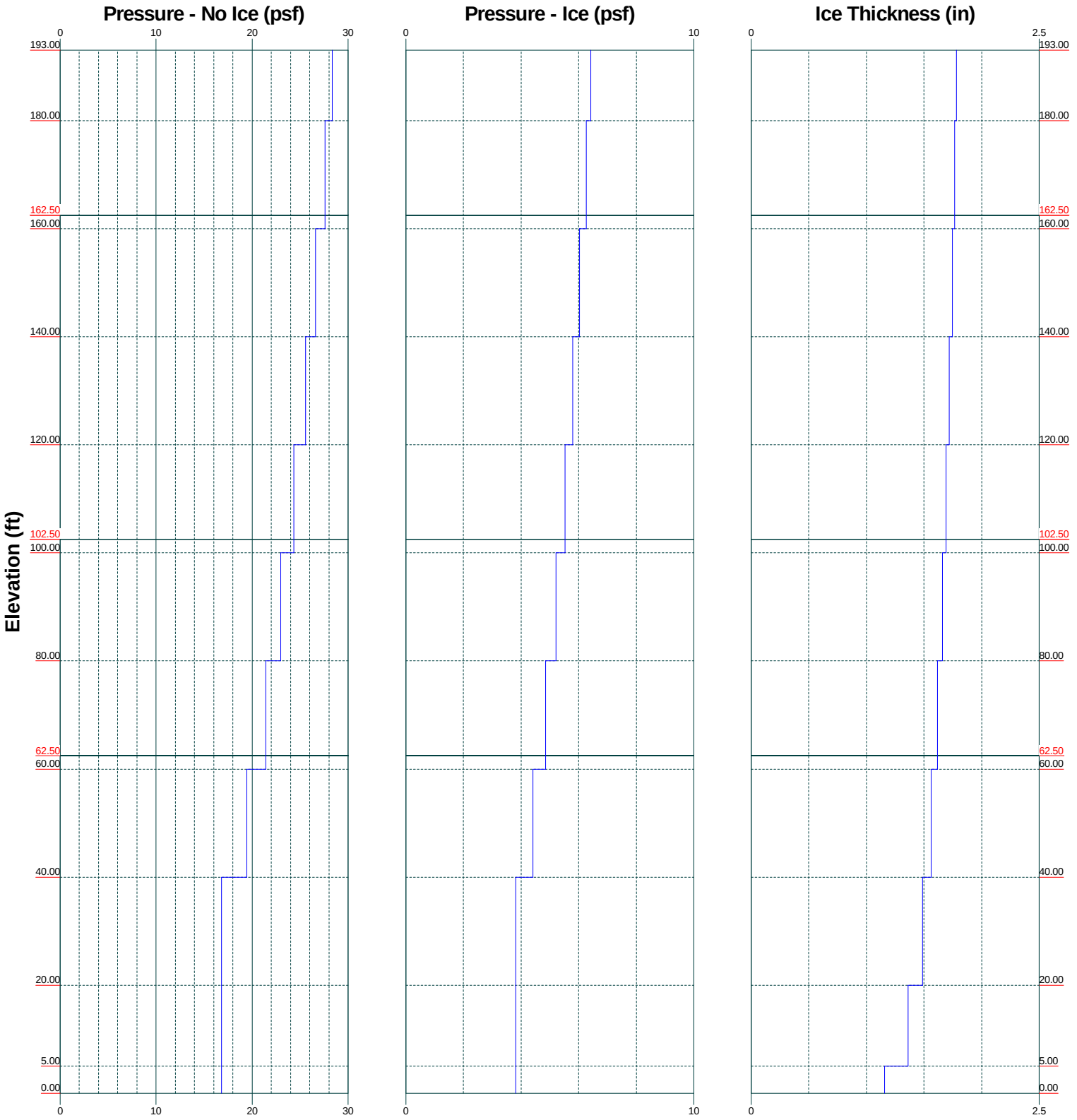
Path: J:\Jobs\20074\00\Wi51_CTNL023C\05_Structural\Tower Analysis\Backup Documentation\Calcs\tnxTower Files\193' Guyed Rohn Tower.eri			Dwg No. E-8

Wind Pressures and Ice Thickness

TIA-222-G - 105 mph/50 mph 0.7500 in Ice Exposure B



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Code: TIA-222-G	Date: 07/14/20	Scale: NTS	
Path: J:\Jobs\20074\00 WI\51_CTNL023C\05_Structural\Tower Analysis\Backup Documentation\Calculinx\Tower Files\193' Guyed Rohn Tower.eri		Dwg No. E-9	

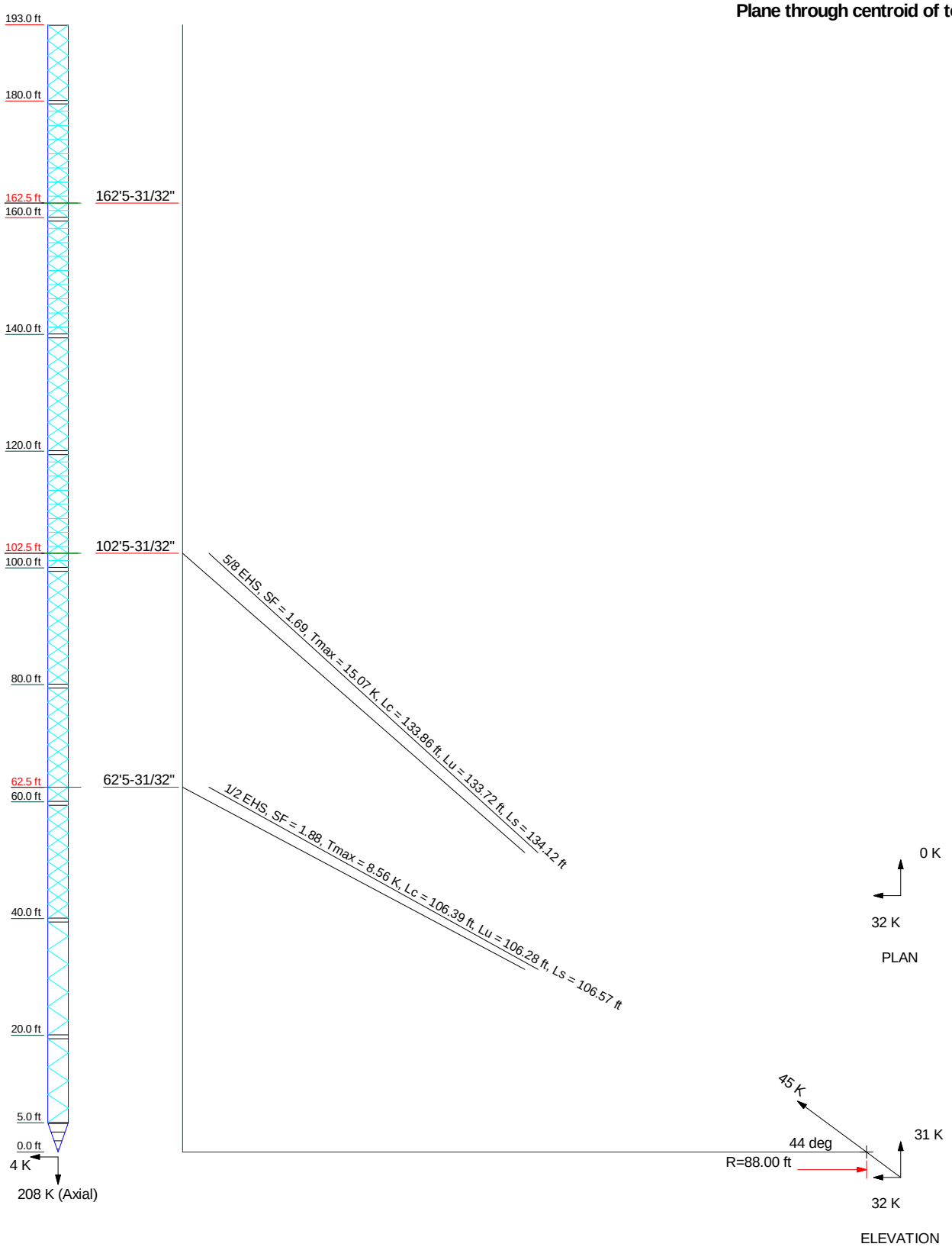
Guy Tensions and Tower Reactions

TIA-222-G - 105 mph/50 mph 0.7500 in Ice Exposure B

Maximum Values

Anchor 'B'@88 ft Azimuth 120 deg Elev 0 ft

Plane through centroid of tower



Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: ***20074.51 - CTNL023C***		
	Project: ***193' Guyed Lattice Tower - 57 Cook Road, Montville, CT***		
	Client: T-Mobile	Drawn by: TJL	App'd:
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	Path: J:\Jobs\20074\00\WI51_CTNL023C\05_Structural\Tower Analysis\Backup Documentation\Calcs\tnxTower Files\193' Guyed Rohn Tower.eri		Dwg No. E-6

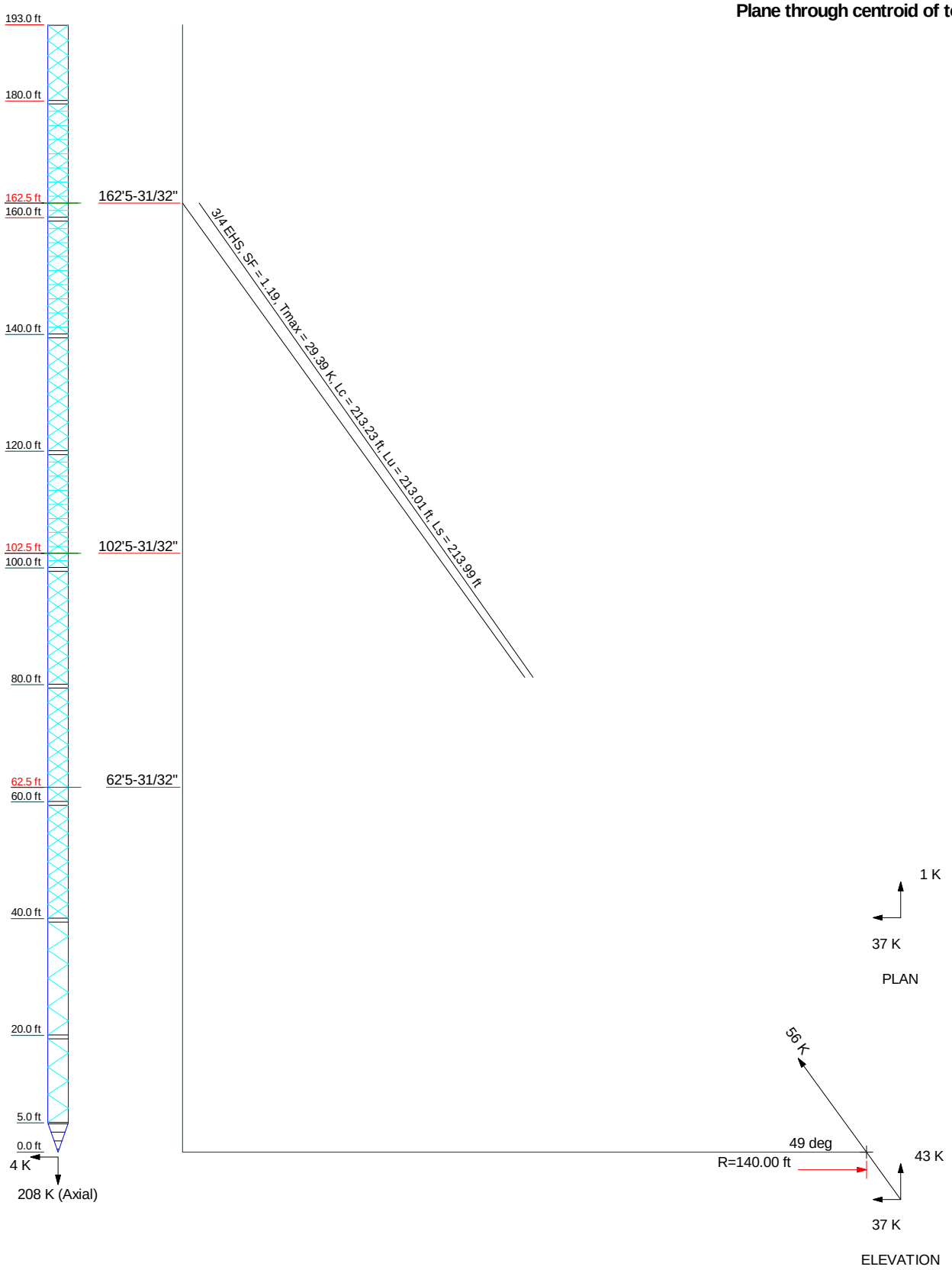
Guy Tensions and Tower Reactions

TIA-222-G - 105 mph/50 mph 0.7500 in Ice Exposure B

Maximum Values

Anchor 'C'@140 ft Azimuth 240 deg Elev 0 ft

Plane through centroid of tower



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Path: J:\Jobs\20074\00\Wi51_CTNL023C\05_Structural\Tower Analysis\Backup Documentation\Calcs\tnxTower Files\193' Guyed Rohn Tower.eri		Dwg No. E-6

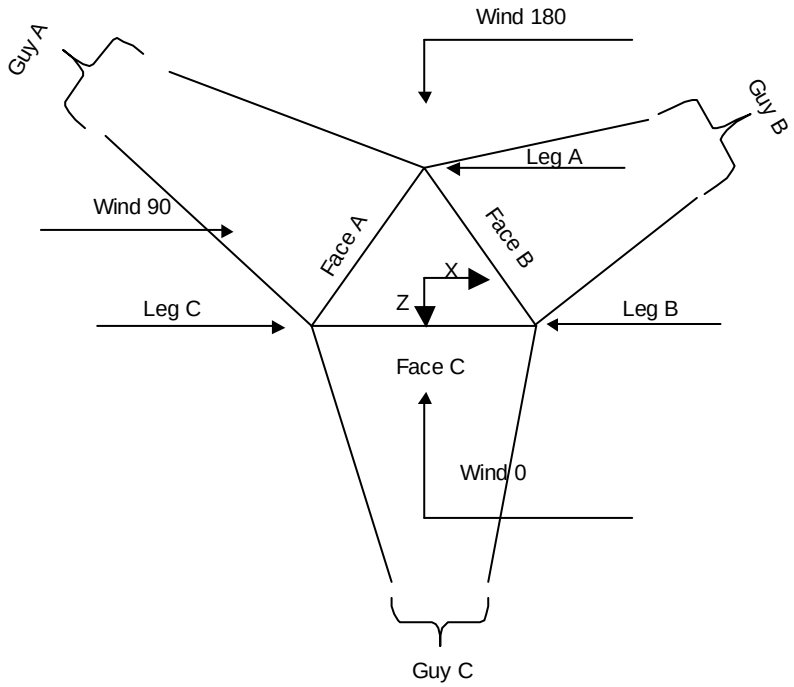
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 193.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.42 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

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

Options

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



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	193.00-180.00			3.42	1	13.00
T2	180.00-160.00			3.42	1	20.00
T3	160.00-140.00			3.42	1	20.00
T4	140.00-120.00			3.42	1	20.00
T5	120.00-100.00			3.42	1	20.00
T6	100.00-80.00			3.42	1	20.00
T7	80.00-60.00			3.42	1	20.00
T8	60.00-40.00			3.42	1	20.00
T9	40.00-20.00			3.42	1	20.00
T10	20.00-5.00			3.42	1	15.00
T11	5.00-0.00			3.42	1	5.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	193.00-180.00	2.57	X Brace	No	No	1.0000	1.0000
T2	180.00-160.00	2.41	X Brace	No	Yes	7.3750	1.0000
T3	160.00-140.00	2.41	X Brace	No	Yes	7.3750	1.0000
T4	140.00-120.00	2.41	CX Brace	No	No	7.3750	1.0000
T5	120.00-100.00	2.41	X Brace	No	Yes	7.3750	1.0000
T6	100.00-80.00	2.41	CX Brace	No	No	7.3750	1.0000
T7	80.00-60.00	2.41	X Brace	No	No	7.3750	1.0000
T8	60.00-40.00	2.41	CX Brace	No	No	7.3750	1.0000
T9	40.00-20.00	2.41	K Brace Left	No	No	7.3750	1.0000
T10	20.00-5.00	2.38	K Brace Left	No	No	7.3750	1.0000
T11	5.00-0.00	1.44	X Brace	No	Yes	2.0000	6.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 193.00-180.00	Pipe	P2.5x.276	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T2 180.00-160.00	Pipe	ROHN 2.5 EH w/plate	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T3 160.00-140.00	Pipe	ROHN 2.5 EH w/plate	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T4 140.00-120.00	Pipe	P2.5x.276	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 120.00-100.00	Pipe	P3x.3	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T6 100.00-80.00	Pipe	P3x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T7 80.00-60.00	Pipe	P3x.3	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T8 60.00-40.00	Pipe	P3x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A36 (36 ksi)
T9 40.00-20.00	Pipe	P3x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.00-5.00	Pipe	P3x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T11 5.00-0.00	Pipe	P3x.3	A572-50 (50 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 193.00-180.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T2 180.00-160.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T3 160.00-140.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T4 140.00-120.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 120.00-100.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T6 100.00-80.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T7 80.00-60.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T8 60.00-40.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T9 40.00-20.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.00-5.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T11 5.00-0.00	Single Angle	L3x3x1/2	A36 (36 ksi)	Equal Angle	L3x3x1/2	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T11 5.00-0.00	2	Single Angle	L3x3x1/2	A36 (36 ksi)	Single Angle		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T2 180.00-160.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T3 160.00-140.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T5 120.00-100.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 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 193.00-180.00	0.28	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 180.00-160.00	0.07	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 160.00-140.00	0.07	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 140.00-120.00	0.07	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 120.00-100.00	0.07	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 100.00-80.00	0.07	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 80.00-60.00	0.07	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 60.00-40.00	0.07	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 40.00-20.00	0.07	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 20.00-5.00	0.07	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T11 5.00-0.00	0.07	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
193.00-180.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
20.00-5.00				1	1	1	1	1	1	1
T11 5.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 193.00-180.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 20.00-5.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 5.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower 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 193.00-180.00	Flange	0.7500 A325N	4	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T3 160.00-140.00	Flange	0.7500 A325N	4	0.6250 A325X	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T4 140.00-120.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 120.00-100.00	Flange	0.7500 A325N	4	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T6 100.00-80.00	Flange	0.7500 A325N	4	0.5000 A490X	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.00-60.00	Flange	0.7500 A325N	4	0.6250 A325X	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 60.00-40.00	Flange	0.7500 A325N	4	0.5000 A325X	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 40.00-20.00	Flange	0.7500 A325N	4	0.6250 A490X	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 20.00-5.00	Flange	0.7500 A325N	4	0.5000 A490X	1	0.5000 A325N	1	0.6250 A490X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

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.
T11 5.00-0.00	Flange	0.7500 A325N	4	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
162.496	EHS	A	3/4	5.83	10%	19000	1.155	213.04	140.00	0.0000	0.00	100%
		B	3/4	5.83	10%	19000	1.155	213.04	140.00	0.0000	0.00	100%
		C	3/4	5.83	10%	19000	1.155	213.04	140.00	0.0000	0.00	100%
102.496	EHS	A	5/8	4.24	10%	21000	0.813	133.74	88.00	0.0000	0.00	100%
		B	5/8	4.24	10%	21000	0.813	133.74	88.00	0.0000	0.00	100%
		C	5/8	4.24	10%	21000	0.813	133.74	88.00	0.0000	0.00	100%
62.4961	EHS	A	1/2	2.69	10%	21000	0.517	106.30	88.00	0.0000	0.00	100%
		B	1/2	2.69	10%	21000	0.517	106.30	88.00	0.0000	0.00	100%
		C	1/2	2.69	10%	21000	0.517	106.30	88.00	0.0000	0.00	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
162.496	Torque Arm	6.83	0.0000	Channel	A36 (36 ksi)	Channel	C15x50
102.496	Torque Arm	6.83	0.0000	Channel	A36 (36 ksi)	Channel	C15x33.9
62.4961	Torque Arm	6.83	0.0000	Channel	A36 (36 ksi)	Channel	C12x25

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
162.50	A572-50 (50 ksi)	Solid Round				A36 (36 ksi)	Channel	
102.50	A572-50 (50 ksi)	Solid Round				A36 (36 ksi)	Channel	
62.50	A572-50 (50 ksi)	Solid Round				A36 (36 ksi)	Channel	

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
162.496	0.25	0.25	0.25		4.43 3.6 sec/pulse	4.43 3.6 sec/pulse	4.43 3.6 sec/pulse	
102.496	0.11	0.11	0.11		1.70 2.3 sec/pulse	1.70 2.3 sec/pulse	1.70 2.3 sec/pulse	
62.4961	0.05	0.05	0.05		1.08 1.8 sec/pulse	1.08 1.8 sec/pulse	1.08 1.8 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
162.496	No	No	1	1	1	1	1	1
102.496	No	No	1	1	1	1	1	1
62.4961	No	No	1	1	1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
162.496	0.8750 A325N	4	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
102.496	0.8750 A325N	4	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
62.4961	0.8750 A325N	4	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
162.496	A	81.25	22	5	1.6414
	B	81.25	22	5	1.6414
	C	81.25	22	5	1.6414
102.496	A	51.25	20	4	1.5675
	B	51.25	20	4	1.5675
	C	51.25	20	4	1.5675
62.4961	A	31.25	17	4	1.4918

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
	B	31.25	17	4	1.4918
	C	31.25	17	4	1.4918

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom K	F_x K	F_y K	F_z K	M_x kip-ft	M_y kip-ft	M_z kip-ft
162.496	A	49.6461	6.02 5.83	-0.09	4.64	-3.83	-9.15	13.29	-15.84
	A	49.6461	6.02 5.83	0.09	4.64	-3.83	-9.15	-13.29	15.84
	B	49.6461	6.02 5.83	3.37	4.64	1.83	18.30	13.29	0.00
	B	49.6461	6.02 5.83	3.27	4.64	2.00	-9.15	-13.29	-15.84
	C	49.6461	6.02 5.83	-3.27	4.64	2.00	-9.15	13.29	15.84
	C	49.6461	6.02 5.83	-3.37	4.64	1.83	18.30	-13.29	0.00
			Sum:	0.00	27.82	0.00	-0.00	0.00	0.00
102.496	A	49.9703	4.32 4.24	-0.11	3.33	-2.75	-6.58	9.62	-11.39
	A	49.9703	4.32 4.24	0.11	3.33	-2.75	-6.58	-9.62	11.39
	B	49.9703	4.32 4.24	2.44	3.33	1.28	13.15	9.62	0.00
	B	49.9703	4.32 4.24	2.33	3.33	1.47	-6.58	-9.62	-11.39
	C	49.9703	4.32 4.24	-2.33	3.33	1.47	-6.58	9.62	11.39
	C	49.9703	4.32 4.24	-2.44	3.33	1.28	13.15	-9.62	0.00
			Sum:	0.00	20.00	0.00	-0.00	0.00	0.00
62.4961	A	35.9758	2.72 2.69	-0.09	1.62	-2.19	-3.19	7.65	-5.53
	A	35.9758	2.72 2.69	0.09	1.62	-2.19	-3.19	-7.65	5.53
	B	35.9758	2.72 2.69	1.94	1.62	1.02	6.38	7.65	0.00
	B	35.9758	2.72 2.69	1.85	1.62	1.17	-3.19	-7.65	-5.53
	C	35.9758	2.72 2.69	-1.85	1.62	1.17	-3.19	7.65	5.53
	C	35.9758	2.72 2.69	-1.94	1.62	1.02	6.38	-7.65	0.00
			Sum:	0.00	9.70	0.00	-0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
162.496	A	49.6461	10.20 9.23	-0.16	8.04	-6.28	-15.85	21.76	-27.46
	A	49.6461	10.20 9.23	0.16	8.04	-6.28	-15.85	-21.76	27.46
	B	49.6461	10.20 9.23	5.51	8.04	3.00	31.70	21.76	0.00
	B	49.6461	10.20 9.23	5.36	8.04	3.27	-15.85	-21.76	-27.46
	C	49.6461	10.20 9.23	-5.36	8.04	3.27	-15.85	21.76	27.46
	C	49.6461	10.20 9.23	-5.51	8.04	3.00	31.70	-21.76	0.00
			Sum:	0.00	48.21	0.00	-0.00	0.00	0.00
102.496	A	49.9703	6.95 6.44	-0.17	5.46	-4.30	-10.77	15.03	-18.66
	A	49.9703	6.95 6.44	0.17	5.46	-4.30	-10.77	-15.03	18.66
	B	49.9703	6.95 6.44	3.81	5.46	2.00	21.55	15.03	0.00
	B	49.9703	6.95 6.44	3.64	5.46	2.30	-10.77	-15.03	-18.66
	C	49.9703	6.95 6.44	-3.64	5.46	2.30	-10.77	15.03	18.66
	C	49.9703	6.95 6.44	-3.81	5.46	2.00	21.55	-15.03	0.00
			Sum:	0.00	32.77	0.00	-0.00	0.00	0.00
62.4961	A	35.9758	4.65 4.39	-0.14	2.87	-3.65	-5.67	12.75	-9.82
	A	35.9758	4.65 4.39	0.14	2.87	-3.65	-5.67	-12.75	9.82
	B	35.9758	4.65 4.39	3.23	2.87	1.70	11.33	12.75	0.00
	B	35.9758	4.65 4.39	3.09	2.87	1.95	-5.67	-12.75	-9.82
	C	35.9758	4.65 4.39	-3.09	2.87	1.95	-5.67	12.75	9.82
	C	35.9758	4.65 4.39	-3.23	2.87	1.70	11.33	-12.75	0.00
			Sum:	0.00	17.24	0.00	-0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
162.496	A	49.6461	6.02 5.83	-0.09	4.64	-3.83	-9.15	13.29	-15.84
	A	49.6461	6.02 5.83	0.09	4.64	-3.83	-9.15	-13.29	15.84
	B	49.6461	6.02 5.83	3.37	4.64	1.83	18.30	13.29	0.00
	B	49.6461	6.02	3.27	4.64	2.00	-9.15	-13.29	-15.84

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
			5.83						
	C	49.6461	6.02	-3.27	4.64	2.00	-9.15	13.29	15.84
			5.83						
	C	49.6461	6.02	-3.37	4.64	1.83	18.30	-13.29	0.00
			5.83						
			Sum:	0.00	27.82	0.00	-0.00	0.00	0.00
102.496	A	49.9703	4.32	-0.11	3.33	-2.75	-6.58	9.62	-11.39
			4.24						
	A	49.9703	4.32	0.11	3.33	-2.75	-6.58	-9.62	11.39
			4.24						
	B	49.9703	4.32	2.44	3.33	1.28	13.15	9.62	0.00
			4.24						
	B	49.9703	4.32	2.33	3.33	1.47	-6.58	-9.62	-11.39
			4.24						
	C	49.9703	4.32	-2.33	3.33	1.47	-6.58	9.62	11.39
			4.24						
	C	49.9703	4.32	-2.44	3.33	1.28	13.15	-9.62	0.00
			4.24						
			Sum:	0.00	20.00	0.00	-0.00	0.00	0.00
62.4961	A	35.9758	2.72	-0.09	1.62	-2.19	-3.19	7.65	-5.53
			2.69						
	A	35.9758	2.72	0.09	1.62	-2.19	-3.19	-7.65	5.53
			2.69						
	B	35.9758	2.72	1.94	1.62	1.02	6.38	7.65	0.00
			2.69						
	B	35.9758	2.72	1.85	1.62	1.17	-3.19	-7.65	-5.53
			2.69						
	C	35.9758	2.72	-1.85	1.62	1.17	-3.19	7.65	5.53
			2.69						
	C	35.9758	2.72	-1.94	1.62	1.02	6.38	-7.65	0.00
			2.69						
			Sum:	0.00	9.70	0.00	-0.00	0.00	0.00

Guy-Tensioning Information

				Temperature At Time Of Tensioning													
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation		H	V	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept
ft		ft	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft
162.496	A	138.07	162.50	6.824	3.79	6.490	3.98	6.159	4.20	5.830	4.43	5.505	4.69	5.183	4.97	4.867	5.29
	B	138.07	162.50	6.824	3.79	6.490	3.98	6.159	4.20	5.830	4.43	5.505	4.69	5.183	4.97	4.867	5.29
	C	138.07	162.50	6.824	3.79	6.490	3.98	6.159	4.20	5.830	4.43	5.505	4.69	5.183	4.97	4.867	5.29
102.496	A	86.10	102.50	5.024	1.44	4.761	1.51	4.500	1.60	4.240	1.70	3.981	1.81	3.724	1.93	3.468	2.07
	B	86.10	102.50	5.024	1.44	4.761	1.51	4.500	1.60	4.240	1.70	3.981	1.81	3.724	1.93	3.468	2.07
	C	86.10	102.50	5.024	1.44	4.761	1.51	4.500	1.60	4.240	1.70	3.981	1.81	3.724	1.93	3.468	2.07
62.4961	A	86.10	62.50	3.480	0.84	3.215	0.90	2.952	0.98	2.690	1.08	2.430	1.20	2.173	1.34	1.920	1.51
	B	86.10	62.50	3.480	0.84	3.215	0.90	2.952	0.98	2.690	1.08	2.430	1.20	2.173	1.34	1.920	1.51
	C	86.10	62.50	3.480	0.84	3.215	0.90	2.952	0.98	2.690	1.08	2.430	1.20	2.173	1.34	1.920	1.51

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
1/2	A	No	No	Ar (CaAa)	105.00 - 8.00	0.0000	-0.1	2	2	0.5800	0.5800		0.25
7/8	B	No	No	Ar (CaAa)	179.00 - 8.00	3.0000	-0.25	1	1	1.1100	1.1100		0.54
1 1/4	C	No	No	Ar (CaAa)	152.00 - 8.00	0.0000	-0.4	1	1	1.5500	1.5500		0.66
7/8	C	No	No	Ar (CaAa)	144.00 - 8.00	4.0000	-0.35	1	1	1.1100	1.1100		0.54
1 1/4	C	No	No	Ar (CaAa)	122.00 - 8.00	2.0000	-0.4	1	1	1.5500	1.5500		0.66
1 5/8	C	No	No	Ar (CaAa)	110.00 - 8.00	2.0000	-0.3	2	1	1.9800	1.9800		1.04
1 1/4	C	No	No	Ar (CaAa)	108.00 - 8.00	4.0000	-0.4	1	1	1.5500	1.5500		0.66
HYBRIFLEX 1-5/8" (T-Mobile - Existing)	B	No	No	Ar (CaAa)	188.00 - 8.00	0.0000	0.1	3	3	1.0000	1.9800		1.90
1 1/4 (AT&T)	C	No	No	Ar (CaAa)	177.50 - 8.00	0.0000	0.1	12	6	1.5500	1.5500		0.66
RG6-Fiber (AT&T)	C	No	No	Ar (CaAa)	177.50 - 8.00	5.0000	0.2	2	1	0.5000	0.5000		1.00
#8 AWG Copper WIre (AT&T)	C	No	No	Ar (CaAa)	177.50 - 8.00	5.0000	0.3	4	2	0.2500	0.1285		0.05
1 5/8 (Verizon)	B	No	No	Ar (CaAa)	169.00 - 8.00	0.0000	-0.32	12	6	1.0000	1.9800		1.04
HYBRIFLEX 1-5/8" (Verizon)	B	No	No	Ar (CaAa)	169.00 - 8.00	0.0000	-0.1	2	1	1.0000	1.9800		1.90
1 5/8 (Sprint)	A	No	No	Ar (CaAa)	150.00 - 8.00	2.5000	0.05	6	3	1.0000	1.9800		1.04
HYBRIFLEX 1-5/8" (T-Mobile - Proposed)	B	No	No	Ar (CaAa)	188.00 - 8.00	0.0000	0.3	3	3	1.0000	1.9800		1.90

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	193.00-180.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	9.504	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.00
T2	180.00-160.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	50.817	0.000	0.38
		C	0.000	0.000	35.200	0.000	0.18
T3	160.00-140.00	A	0.000	0.000	11.880	0.000	0.06
		B	0.000	0.000	81.420	0.000	0.56
		C	0.000	0.000	42.532	0.000	0.21
T4	140.00-120.00	A	0.000	0.000	23.760	0.000	0.12
		B	0.000	0.000	81.420	0.000	0.56
		C	0.000	0.000	45.858	0.000	0.23
T5	120.00-100.00	A	0.000	0.000	24.340	0.000	0.13
		B	0.000	0.000	81.420	0.000	0.56

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
		C	0.000	0.000	53.848	0.000	0.27
T6	100.00-80.00	A	0.000	0.000	26.080	0.000	0.13
		B	0.000	0.000	81.420	0.000	0.56
		C	0.000	0.000	59.668	0.000	0.29
T7	80.00-60.00	A	0.000	0.000	26.080	0.000	0.13
		B	0.000	0.000	81.420	0.000	0.56
		C	0.000	0.000	59.668	0.000	0.29
T8	60.00-40.00	A	0.000	0.000	26.080	0.000	0.13
		B	0.000	0.000	81.420	0.000	0.56
		C	0.000	0.000	59.668	0.000	0.29
T9	40.00-20.00	A	0.000	0.000	26.080	0.000	0.13
		B	0.000	0.000	81.420	0.000	0.56
		C	0.000	0.000	59.668	0.000	0.29
T10	20.00-5.00	A	0.000	0.000	15.648	0.000	0.08
		B	0.000	0.000	48.852	0.000	0.34
		C	0.000	0.000	35.801	0.000	0.18
T11	5.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	193.00-180.00	A	1.784	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	25.549	0.000	0.39
		C		0.000	0.000	0.000	0.000	0.00
T2	180.00-160.00	A	1.767	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	108.746	0.000	1.84
		C		0.000	0.000	75.072	0.000	1.39
T3	160.00-140.00	A	1.745	0.000	0.000	17.769	0.000	0.34
		B		0.000	0.000	152.862	0.000	2.73
		C		0.000	0.000	93.233	0.000	1.70
T4	140.00-120.00	A	1.720	0.000	0.000	35.364	0.000	0.68
		B		0.000	0.000	152.098	0.000	2.70
		C		0.000	0.000	104.915	0.000	1.86
T5	120.00-100.00	A	1.692	0.000	0.000	39.213	0.000	0.70
		B		0.000	0.000	151.222	0.000	2.67
		C		0.000	0.000	130.363	0.000	2.19
T6	100.00-80.00	A	1.658	0.000	0.000	50.889	0.000	0.79
		B		0.000	0.000	150.188	0.000	2.63
		C		0.000	0.000	148.270	0.000	2.41
T7	80.00-60.00	A	1.617	0.000	0.000	50.313	0.000	0.78
		B		0.000	0.000	148.924	0.000	2.58
		C		0.000	0.000	146.484	0.000	2.35
T8	60.00-40.00	A	1.564	0.000	0.000	49.564	0.000	0.76
		B		0.000	0.000	147.281	0.000	2.51
		C		0.000	0.000	144.164	0.000	2.27
T9	40.00-20.00	A	1.486	0.000	0.000	48.475	0.000	0.73
		B		0.000	0.000	144.895	0.000	2.42
		C		0.000	0.000	140.788	0.000	2.17
T10	20.00-5.00	A	1.361	0.000	0.000	28.040	0.000	0.41
		B		0.000	0.000	84.651	0.000	1.37
		C		0.000	0.000	81.236	0.000	1.20
T11	5.00-0.00	A	1.159	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	193.00-180.00	2.6612	0.1316	1.8963	0.0889
T2	180.00-160.00	1.9162	0.4028	0.1648	1.7997
T3	160.00-140.00	1.6758	-2.9996	0.5994	-0.6484
T4	140.00-120.00	1.0677	-3.4272	0.9869	-0.6081
T5	120.00-100.00	1.4421	-2.3123	1.2296	0.5482
T6	100.00-80.00	1.8487	-1.9077	1.9616	1.3087
T7	80.00-60.00	1.7560	-1.8413	1.9151	1.2748
T8	60.00-40.00	1.8487	-1.9077	2.0075	1.2557
T9	40.00-20.00	1.8930	-1.9536	2.4627	1.2534
T10	20.00-5.00	1.8285	-1.8871	2.3974	1.1309
T11	5.00-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	9	HYBRIFLEX 1-5/8"	180.00 - 188.00	0.6000	0.3008
T1	16	HYBRIFLEX 1-5/8"	180.00 - 188.00	0.6000	0.3008
T2	2	7/8	160.00 - 179.00	1.0000	1.0000
T2	9	HYBRIFLEX 1-5/8"	160.00 - 180.00	0.6000	0.1782
T2	10	1 1/4	160.00 - 177.50	1.0000	1.0000
T2	11	RG6-Fiber	160.00 - 177.50	1.0000	1.0000
T2	12	#8 AWG Copper WIre	160.00 - 177.50	1.0000	1.0000
T2	13	1 5/8	160.00 - 169.00	1.0000	1.0000
T2	14	HYBRIFLEX 1-5/8"	160.00 - 169.00	1.0000	1.0000
T2	16	HYBRIFLEX 1-5/8"	160.00 - 180.00	0.6000	0.1782
T3	2	7/8	140.00 - 160.00	1.0000	1.0000
T3	3	1 1/4	140.00 - 152.00	1.0000	1.0000
T3	4	7/8	140.00 - 144.00	1.0000	1.0000
T3	9	HYBRIFLEX 1-5/8"	140.00 - 160.00	0.6000	0.1870
T3	10	1 1/4	140.00 - 160.00	1.0000	1.0000
T3	11	RG6-Fiber	140.00 - 160.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	12	#8 AWG Copper WIre	140.00 - 160.00	1.0000	1.0000
T3	13	1 5/8	140.00 - 160.00	1.0000	1.0000
T3	14	HYBRIFLEX 1-5/8"	140.00 - 160.00	1.0000	1.0000
T3	15	1 5/8	140.00 - 150.00	1.0000	1.0000
T3	16	HYBRIFLEX 1-5/8"	140.00 - 160.00	0.6000	0.1870
T4	2	7/8	120.00 - 140.00	1.0000	1.0000
T4	3	1 1/4	120.00 - 140.00	1.0000	1.0000
T4	4	7/8	120.00 - 140.00	1.0000	1.0000
T4	5	1 1/4	120.00 - 122.00	1.0000	1.0000
T4	9	HYBRIFLEX 1-5/8"	120.00 - 140.00	0.6000	0.3722
T4	10	1 1/4	120.00 - 140.00	1.0000	1.0000
T4	11	RG6-Fiber	120.00 - 140.00	1.0000	1.0000
T4	12	#8 AWG Copper WIre	120.00 - 140.00	1.0000	1.0000
T4	13	1 5/8	120.00 - 140.00	1.0000	1.0000
T4	14	HYBRIFLEX 1-5/8"	120.00 - 140.00	1.0000	1.0000
T4	15	1 5/8	120.00 - 140.00	1.0000	1.0000
T4	16	HYBRIFLEX 1-5/8"	120.00 - 140.00	0.6000	0.3722
T5	1	1/2	100.00 - 105.00	1.0000	1.0000
T5	2	7/8	100.00 - 120.00	1.0000	1.0000
T5	3	1 1/4	100.00 - 120.00	1.0000	1.0000
T5	4	7/8	100.00 - 120.00	1.0000	1.0000
T5	5	1 1/4	100.00 - 120.00	1.0000	1.0000
T5	6	1 5/8	100.00 - 110.00	1.0000	1.0000
T5	7	1 1/4	100.00 - 108.00	1.0000	1.0000
T5	9	HYBRIFLEX 1-5/8"	100.00 - 120.00	0.6000	0.1900
T5	10	1 1/4	100.00 - 120.00	1.0000	1.0000
T5	11	RG6-Fiber	100.00 - 120.00	1.0000	1.0000
T5	12	#8 AWG Copper WIre	100.00 - 120.00	1.0000	1.0000
T5	13	1 5/8	100.00 - 120.00	1.0000	1.0000
T5	14	HYBRIFLEX 1-5/8"	100.00 - 120.00	1.0000	1.0000
T5	15	1 5/8	100.00 - 120.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	16	HYBRIFLEX 1-5/8"	100.00 - 120.00	0.6000	0.1900
T6	1	1/2	80.00 - 100.00	1.0000	1.0000
T6	2	7/8	80.00 - 100.00	1.0000	1.0000
T6	3	1 1/4	80.00 - 100.00	1.0000	1.0000
T6	4	7/8	80.00 - 100.00	1.0000	1.0000
T6	5	1 1/4	80.00 - 100.00	1.0000	1.0000
T6	6	1 5/8	80.00 - 100.00	1.0000	1.0000
T6	7	1 1/4	80.00 - 100.00	1.0000	1.0000
T6	9	HYBRIFLEX 1-5/8"	80.00 - 100.00	0.6000	0.3725
T6	10	1 1/4	80.00 - 100.00	1.0000	1.0000
T6	11	RG6-Fiber	80.00 - 100.00	1.0000	1.0000
T6	12	#8 AWG Copper WIre	80.00 - 100.00	1.0000	1.0000
T6	13	1 5/8	80.00 - 100.00	1.0000	1.0000
T6	14	HYBRIFLEX 1-5/8"	80.00 - 100.00	1.0000	1.0000
T6	15	1 5/8	80.00 - 100.00	1.0000	1.0000
T6	16	HYBRIFLEX 1-5/8"	80.00 - 100.00	0.6000	0.3725
T7	1	1/2	60.00 - 80.00	1.0000	1.0000
T7	2	7/8	60.00 - 80.00	1.0000	1.0000
T7	3	1 1/4	60.00 - 80.00	1.0000	1.0000
T7	4	7/8	60.00 - 80.00	1.0000	1.0000
T7	5	1 1/4	60.00 - 80.00	1.0000	1.0000
T7	6	1 5/8	60.00 - 80.00	1.0000	1.0000
T7	7	1 1/4	60.00 - 80.00	1.0000	1.0000
T7	9	HYBRIFLEX 1-5/8"	60.00 - 80.00	0.6000	0.3647
T7	10	1 1/4	60.00 - 80.00	1.0000	1.0000
T7	11	RG6-Fiber	60.00 - 80.00	1.0000	1.0000
T7	12	#8 AWG Copper WIre	60.00 - 80.00	1.0000	1.0000
T7	13	1 5/8	60.00 - 80.00	1.0000	1.0000
T7	14	HYBRIFLEX 1-5/8"	60.00 - 80.00	1.0000	1.0000
T7	15	1 5/8	60.00 - 80.00	1.0000	1.0000
T7	16	HYBRIFLEX 1-5/8"	60.00 - 80.00	0.6000	0.3647
T8	1	1/2	40.00 - 60.00	1.0000	1.0000
T8	2	7/8	40.00 - 60.00	1.0000	1.0000
T8	3	1 1/4	40.00 - 60.00	1.0000	1.0000
T8	4	7/8	40.00 - 60.00	1.0000	1.0000
T8	5	1 1/4	40.00 - 60.00	1.0000	1.0000
T8	6	1 5/8	40.00 - 60.00	1.0000	1.0000
T8	7	1 1/4	40.00 - 60.00	1.0000	1.0000
T8	9	HYBRIFLEX 1-5/8"	40.00 - 60.00	0.6000	0.3915
T8	10	1 1/4	40.00 - 60.00	1.0000	1.0000
T8	11	RG6-Fiber	40.00 - 60.00	1.0000	1.0000
T8	12	#8 AWG Copper WIre	40.00 - 60.00	1.0000	1.0000
T8	13	1 5/8	40.00 - 60.00	1.0000	1.0000
T8	14	HYBRIFLEX 1-5/8"	40.00 - 60.00	1.0000	1.0000
T8	15	1 5/8	40.00 - 60.00	1.0000	1.0000
T8	16	HYBRIFLEX 1-5/8"	40.00 - 60.00	0.6000	0.3915
T9	1	1/2	20.00 - 40.00	1.0000	1.0000
T9	2	7/8	20.00 - 40.00	1.0000	1.0000
T9	3	1 1/4	20.00 - 40.00	1.0000	1.0000
T9	4	7/8	20.00 - 40.00	1.0000	1.0000
T9	5	1 1/4	20.00 - 40.00	1.0000	1.0000
T9	6	1 5/8	20.00 - 40.00	1.0000	1.0000
T9	7	1 1/4	20.00 - 40.00	1.0000	1.0000
T9	9	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.5513
T9	10	1 1/4	20.00 - 40.00	1.0000	1.0000
T9	11	RG6-Fiber	20.00 - 40.00	1.0000	1.0000
T9	12	#8 AWG Copper WIre	20.00 - 40.00	1.0000	1.0000
T9	13	1 5/8	20.00 - 40.00	1.0000	1.0000
T9	14	HYBRIFLEX 1-5/8"	20.00 - 40.00	1.0000	1.0000
T9	15	1 5/8	20.00 - 40.00	1.0000	1.0000
T9	16	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.5513

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	1	1/2	8.00 - 20.00	1.0000	1.0000
T10	2	7/8	8.00 - 20.00	1.0000	1.0000
T10	3	1 1/4	8.00 - 20.00	1.0000	1.0000
T10	4	7/8	8.00 - 20.00	1.0000	1.0000
T10	5	1 1/4	8.00 - 20.00	1.0000	1.0000
T10	6	1 5/8	8.00 - 20.00	1.0000	1.0000
T10	7	1 1/4	8.00 - 20.00	1.0000	1.0000
T10	9	HYBRIFLEX 1-5/8"	8.00 - 20.00	0.6000	0.5598
T10	10	1 1/4	8.00 - 20.00	1.0000	1.0000
T10	11	RG6-Fiber	8.00 - 20.00	1.0000	1.0000
T10	12	#8 AWG Copper WIre	8.00 - 20.00	1.0000	1.0000
T10	13	1 5/8	8.00 - 20.00	1.0000	1.0000
T10	14	HYBRIFLEX 1-5/8"	8.00 - 20.00	1.0000	1.0000
T10	15	1 5/8	8.00 - 20.00	1.0000	1.0000
T10	16	HYBRIFLEX 1-5/8"	8.00 - 20.00	0.6000	0.5598

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AIR6449	A	From Leg	3.00	0.0000	190.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			-5.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
AIR6449	B	From Leg	3.00	0.0000	190.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			-5.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
AIR6449	C	From Leg	3.00	0.0000	190.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			-5.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
AIR32	A	From Leg	3.00	0.0000	190.00	No Ice	6.51	4.71	0.13
(T-Mobile - Proposed)			0.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
AIR32	B	From Leg	3.00	0.0000	190.00	No Ice	6.51	4.71	0.13
(T-Mobile - Proposed)			0.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
AIR32	C	From Leg	3.00	0.0000	190.00	No Ice	6.51	4.71	0.13
(T-Mobile - Proposed)			0.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
APXVAARR24-43	A	From Leg	3.00	0.0000	188.00	No Ice	20.24	8.89	0.15
(T-Mobile - Existing)			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	188.00	No Ice	20.24	8.89	0.15
(T-Mobile - Existing)			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	188.00	No Ice	20.24	8.89	0.15
(T-Mobile - Existing)			5.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
Radio 4449 B71 B12	A	From Leg	3.00	0.0000	190.00	No Ice	1.64	1.29	0.07
(T-Mobile - Existing)			0.00			1/2" Ice	1.80	1.44	0.09
			0.00			1" Ice	1.97	1.59	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Radio 4449 B71 B12	B	From Leg	3.00	0.0000	190.00	No Ice	1.64	1.29	0.07
(T-Mobile - Existing)			0.00			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	190.00	No Ice	1.64	1.29	0.07
(T-Mobile - Existing)			0.00			1/2" Ice	1.80	1.44	0.09
			0.00			1" Ice	1.97	1.59	0.11
4415 B25	A	From Leg	3.00	0.0000	190.00	No Ice	1.84	0.82	0.05
(T-Mobile - Proposed)			0.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
4415 B25	B	From Leg	3.00	0.0000	190.00	No Ice	1.84	0.82	0.05
(T-Mobile - Proposed)			0.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
4415 B25	C	From Leg	3.00	0.0000	190.00	No Ice	1.84	0.82	0.05
(T-Mobile - Proposed)			0.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
Rohn 6'x10' Boom Gate	A	From Leg	2.00	0.0000	188.00	No Ice	14.00	9.00	0.51
(T-Mobile)			0.00			1/2" Ice	20.00	12.00	0.72
			0.00			1" Ice	26.00	15.00	0.93
Rohn 6'x10' Boom Gate	B	From Leg	2.00	0.0000	188.00	No Ice	14.00	9.00	0.51
(T-Mobile)			0.00			1/2" Ice	20.00	12.00	0.72
			0.00			1" Ice	26.00	15.00	0.93
Rohn 6'x10' Boom Gate	C	From Leg	2.00	0.0000	188.00	No Ice	14.00	9.00	0.51
(T-Mobile)			0.00			1/2" Ice	20.00	12.00	0.72
			0.00			1" Ice	26.00	15.00	0.93
7770.00	A	From Leg	4.00	0.0000	178.75	No Ice	5.51	2.93	0.04
(AT&T)			-5.00			1/2" Ice	5.87	3.27	0.07
			0.00			1" Ice	6.23	3.63	0.11
HPA-65R-BUU-H8	A	From Leg	4.00	0.0000	178.75	No Ice	12.98	7.52	0.07
(AT&T)			-2.00			1/2" Ice	13.56	8.09	0.14
			0.00			1" Ice	14.15	8.67	0.22
TPA-65R-LCUUUU-H8	A	From Leg	4.00	0.0000	178.75	No Ice	13.30	8.82	0.08
(AT&T)			5.00			1/2" Ice	13.90	9.42	0.15
			0.00			1" Ice	14.50	10.03	0.24
7770.00	B	From Leg	4.00	0.0000	178.75	No Ice	5.51	2.93	0.04
(AT&T)			-5.00			1/2" Ice	5.87	3.27	0.07
			0.00			1" Ice	6.23	3.63	0.11
HPA-65R-BUU-H8	B	From Leg	4.00	0.0000	178.75	No Ice	12.98	7.52	0.07
(AT&T)			-2.00			1/2" Ice	13.56	8.09	0.14
			0.00			1" Ice	14.15	8.67	0.22
TPA-65R-LCUUUU-H8	B	From Leg	4.00	0.0000	178.75	No Ice	13.30	8.82	0.08
(AT&T)			5.00			1/2" Ice	13.90	9.42	0.15
			0.00			1" Ice	14.50	10.03	0.24
7770.00	C	From Leg	4.00	0.0000	178.75	No Ice	5.51	2.93	0.04
(AT&T)			-5.00			1/2" Ice	5.87	3.27	0.07
			0.00			1" Ice	6.23	3.63	0.11
HPA-65R-BUU-H8	C	From Leg	4.00	0.0000	178.75	No Ice	12.98	7.52	0.07
(AT&T)			-2.00			1/2" Ice	13.56	8.09	0.14
			0.00			1" Ice	14.15	8.67	0.22
QS66512-2	C	From Leg	4.00	0.0000	178.75	No Ice	8.13	6.80	0.11
(AT&T)			5.00			1/2" Ice	8.59	7.27	0.17
			0.00			1" Ice	9.05	7.72	0.23
(2) TT19-08BP111-001 TMA	A	From Leg	4.00	0.0000	178.75	No Ice	0.55	0.45	0.02
(AT&T)			-5.00			1/2" Ice	0.65	0.53	0.02
			0.00			1" Ice	0.75	0.63	0.03
(2) TT19-08BP111-001 TMA	B	From Leg	4.00	0.0000	178.75	No Ice	0.55	0.45	0.02
(AT&T)			-5.00			1/2" Ice	0.65	0.53	0.02
			0.00			1" Ice	0.75	0.63	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
(2) TT19-08BP111-001 TMA	C	From Leg	4.00	0.0000	178.75	No Ice	0.55	0.45	0.02
(AT&T)			-5.00			1/2" Ice	0.65	0.53	0.02
			0.00			1" Ice	0.75	0.63	0.03
(2) DBCT108F1V92-1	A	From Leg	4.00	0.0000	178.75	No Ice	0.60	0.32	0.02
(AT&T)			-5.00			1/2" Ice	0.71	0.40	0.02
			0.00			1" Ice	0.81	0.49	0.03
(2) DBCT108F1V92-1	B	From Leg	4.00	0.0000	178.75	No Ice	0.60	0.32	0.02
(AT&T)			-5.00			1/2" Ice	0.71	0.40	0.02
			0.00			1" Ice	0.81	0.49	0.03
(2) DBCT108F1V92-1	C	From Leg	4.00	0.0000	178.75	No Ice	0.60	0.32	0.02
(AT&T)			-5.00			1/2" Ice	0.71	0.40	0.02
			0.00			1" Ice	0.81	0.49	0.03
RRUS-11	A	From Leg	4.00	0.0000	178.75	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
RRUS-11	B	From Leg	4.00	0.0000	178.75	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
RRUS-11	C	From Leg	4.00	0.0000	178.75	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
RRUS-12	A	From Leg	4.00	0.0000	178.75	No Ice	3.15	1.29	0.06
(AT&T)			0.00			1/2" Ice	3.36	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
RRUS-12	B	From Leg	4.00	0.0000	178.75	No Ice	3.15	1.29	0.06
(AT&T)			0.00			1/2" Ice	3.36	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
RRUS-12	C	From Leg	4.00	0.0000	178.75	No Ice	3.15	1.29	0.06
(AT&T)			0.00			1/2" Ice	3.36	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
RRUS-32	A	From Leg	4.00	0.0000	178.75	No Ice	3.31	2.42	0.08
(AT&T)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
RRUS-32	B	From Leg	4.00	0.0000	178.75	No Ice	3.31	2.42	0.08
(AT&T)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
RRUS-32	C	From Leg	4.00	0.0000	178.75	No Ice	3.31	2.42	0.08
(AT&T)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
4426 B66	A	From Leg	4.00	0.0000	178.75	No Ice	1.65	0.73	0.05
(AT&T)			0.00			1/2" Ice	1.81	0.84	0.06
			0.00			1" Ice	1.98	0.97	0.08
4426 B66	B	From Leg	4.00	0.0000	178.75	No Ice	1.65	0.73	0.05
(AT&T)			0.00			1/2" Ice	1.81	0.84	0.06
			0.00			1" Ice	1.98	0.97	0.08
4426 B66	C	From Leg	4.00	0.0000	178.75	No Ice	1.65	0.73	0.05
(AT&T)			0.00			1/2" Ice	1.81	0.84	0.06
			0.00			1" Ice	1.98	0.97	0.08
DC6-48-60-18-8F Surge	A	From Leg	4.00	0.0000	178.75	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T)			0.00			1" Ice	2.29	2.29	0.06
DC6-48-60-18-8F Surge	B	From Leg	4.00	0.0000	178.75	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T)			0.00			1" Ice	2.29	2.29	0.06
Rohn 6'x15' Boom Gate	A	From Leg	2.00	0.0000	177.50	No Ice	17.50	9.00	0.51
(AT&T)			0.00			1/2" Ice	23.50	12.00	0.72
			0.00			1" Ice	29.50	15.00	0.93

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
Rohn 6'x15' Boom Gate	B	From Leg	2.00	0.0000	177.50	No Ice	17.50	9.00	0.51
(AT&T)			0.00			1/2" Ice	23.50	12.00	0.72
			0.00			1" Ice	29.50	15.00	0.93
Rohn 6'x15' Boom Gate	C	From Leg	2.00	0.0000	177.50	No Ice	17.50	9.00	0.51
(AT&T)			0.00			1/2" Ice	23.50	12.00	0.72
			0.00			1" Ice	29.50	15.00	0.93
SBNHH-1D65B	A	From Leg	3.00	0.0000	169.00	No Ice	8.08	5.34	0.04
(Verizon)			-6.00			1/2" Ice	8.53	5.79	0.09
			0.00			1" Ice	9.00	6.26	0.15
SBNHH-1D65B	A	From Leg	3.00	0.0000	169.00	No Ice	8.08	5.34	0.04
(Verizon)			-4.00			1/2" Ice	8.53	5.79	0.09
			0.00			1" Ice	9.00	6.26	0.15
SBNHH-1D65B	A	From Leg	3.00	0.0000	169.00	No Ice	8.08	5.34	0.04
(Verizon)			4.00			1/2" Ice	8.53	5.79	0.09
			0.00			1" Ice	9.00	6.26	0.15
LPA-80080-4CF	A	From Leg	3.00	0.0000	169.00	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
SBNHH-1D65B	B	From Leg	3.00	0.0000	169.00	No Ice	8.08	5.34	0.04
(Verizon)			-6.00			1/2" Ice	8.53	5.79	0.09
			0.00			1" Ice	9.00	6.26	0.15
SBNHH-1D65B	B	From Leg	3.00	0.0000	169.00	No Ice	8.08	5.34	0.04
(Verizon)			-4.00			1/2" Ice	8.53	5.79	0.09
			0.00			1" Ice	9.00	6.26	0.15
SBNHH-1D65B	B	From Leg	3.00	0.0000	169.00	No Ice	8.08	5.34	0.04
(Verizon)			4.00			1/2" Ice	8.53	5.79	0.09
			0.00			1" Ice	9.00	6.26	0.15
LPA-80080-4CF	B	From Leg	3.00	0.0000	169.00	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
SBNHH-1D65B	C	From Leg	3.00	0.0000	169.00	No Ice	8.08	5.34	0.04
(Verizon)			-6.00			1/2" Ice	8.53	5.79	0.09
			0.00			1" Ice	9.00	6.26	0.15
SBNHH-1D65B	C	From Leg	3.00	0.0000	169.00	No Ice	8.08	5.34	0.04
(Verizon)			-4.00			1/2" Ice	8.53	5.79	0.09
			0.00			1" Ice	9.00	6.26	0.15
SBNHH-1D65B	C	From Leg	3.00	0.0000	169.00	No Ice	8.08	5.34	0.04
(Verizon)			4.00			1/2" Ice	8.53	5.79	0.09
			0.00			1" Ice	9.00	6.26	0.15
LPA-80080-4CF	C	From Leg	3.00	0.0000	169.00	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
RRH4x45/2x90-AWS	A	From Leg	3.00	0.0000	169.00	No Ice	2.58	1.69	0.08
(Verizon)			-4.00			1/2" Ice	2.79	1.87	0.10
			0.00			1" Ice	3.01	2.06	0.12
RRH4x45/2x90-AWS	B	From Leg	3.00	0.0000	169.00	No Ice	2.58	1.69	0.08
(Verizon)			-4.00			1/2" Ice	2.79	1.87	0.10
			0.00			1" Ice	3.01	2.06	0.12
RRH4x45/2x90-AWS	C	From Leg	3.00	0.0000	169.00	No Ice	2.58	1.69	0.08
(Verizon)			-4.00			1/2" Ice	2.79	1.87	0.10
			0.00			1" Ice	3.01	2.06	0.12
RRH2x60-PCS	A	From Leg	3.00	0.0000	169.00	No Ice	0.00	1.55	0.06
(Verizon)			4.00			1/2" Ice	0.00	1.74	0.07
			0.00			1" Ice	0.00	1.94	0.09
RRH2x60-PCS	B	From Leg	3.00	0.0000	169.00	No Ice	0.00	1.55	0.06
(Verizon)			4.00			1/2" Ice	0.00	1.74	0.07
			0.00			1" Ice	0.00	1.94	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
RRH2x60-PCS	C	From Leg	3.00	0.0000	169.00	No Ice	0.00	1.55	0.06
(Verizon)			4.00			1/2" Ice	0.00	1.74	0.07
			0.00			1" Ice	0.00	1.94	0.09
RRH2x60-07-U	A	From Leg	3.00	0.0000	169.00	No Ice	2.10	1.41	0.05
(Verizon)			0.00			1/2" Ice	2.29	1.56	0.07
			0.00			1" Ice	2.48	1.74	0.09
RRH2x60-07-U	B	From Leg	3.00	0.0000	169.00	No Ice	2.10	1.41	0.05
(Verizon)			0.00			1/2" Ice	2.29	1.56	0.07
			0.00			1" Ice	2.48	1.74	0.09
RRH2x60-07-U	C	From Leg	3.00	0.0000	169.00	No Ice	2.10	1.41	0.05
(Verizon)			0.00			1/2" Ice	2.29	1.56	0.07
			0.00			1" Ice	2.48	1.74	0.09
DB-T1-6Z-8AB-0Z	A	From Leg	1.50	0.0000	169.00	No Ice	0.00	2.33	0.04
(Verizon)			0.00			1/2" Ice	0.00	2.56	0.08
			0.00			1" Ice	0.00	2.79	0.12
DB-T1-6Z-8AB-0Z	B	From Leg	1.50	0.0000	169.00	No Ice	0.00	2.33	0.04
(Verizon)			0.00			1/2" Ice	0.00	2.56	0.08
			0.00			1" Ice	0.00	2.79	0.12
Pirod 15' T-Frame Sector	A	From Leg	2.00	0.0000	169.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(Verizon)			0.00			1" Ice	26.20	26.20	0.80
Pirod 15' T-Frame Sector	B	From Leg	2.00	0.0000	169.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(Verizon)			0.00			1" Ice	26.20	26.20	0.80
Pirod 15' T-Frame Sector	C	From Leg	2.00	0.0000	169.00	No Ice	15.00	15.00	0.50
Mount (1)			0.00			1/2" Ice	20.60	20.60	0.65
(Verizon)			0.00			1" Ice	26.20	26.20	0.80
APXV9ERR18-C-A20 w/	A	From Leg	3.00	0.0000	150.00	No Ice	8.72	8.59	0.12
Mount			-5.00			1/2" Ice	9.33	9.67	0.20
(Sprint)			0.00			1" Ice	9.92	10.63	0.30
APXV9ERR18-C-A20 w/	B	From Leg	3.00	0.0000	150.00	No Ice	8.72	8.59	0.12
Mount			-5.00			1/2" Ice	9.33	9.67	0.20
(Sprint)			0.00			1" Ice	9.92	10.63	0.30
APXV9ERR18-C-A20 w/	C	From Leg	3.00	0.0000	150.00	No Ice	8.72	8.59	0.12
Mount			-5.00			1/2" Ice	9.33	9.67	0.20
(Sprint)			0.00			1" Ice	9.92	10.63	0.30
APXVTM14	A	From Leg	3.00	0.0000	150.00	No Ice	6.34	3.61	0.06
(Sprint)			5.00			1/2" Ice	6.72	3.97	0.10
			0.00			1" Ice	7.10	4.33	0.14
APXVTM14	B	From Leg	3.00	0.0000	150.00	No Ice	6.34	3.61	0.06
(Sprint)			5.00			1/2" Ice	6.72	3.97	0.10
			0.00			1" Ice	7.10	4.33	0.14
APXVTM14	C	From Leg	3.00	0.0000	150.00	No Ice	6.34	3.61	0.06
(Sprint)			5.00			1/2" Ice	6.72	3.97	0.10
			0.00			1" Ice	7.10	4.33	0.14
FD-RRH 4x40 1900	A	From Leg	3.00	0.0000	150.00	No Ice	2.24	2.32	0.06
(Sprint)			0.00			1/2" Ice	2.44	2.53	0.08
			0.00			1" Ice	2.65	2.74	0.11
FD-RRH 4x40 1900	B	From Leg	3.00	0.0000	150.00	No Ice	2.24	2.32	0.06
(Sprint)			0.00			1/2" Ice	2.44	2.53	0.08
			0.00			1" Ice	2.65	2.74	0.11
FD-RRH 4x40 1900	C	From Leg	3.00	0.0000	150.00	No Ice	2.24	2.32	0.06
(Sprint)			0.00			1/2" Ice	2.44	2.53	0.08
			0.00			1" Ice	2.65	2.74	0.11
FD-RRH 2x50 800	A	From Leg	3.00	0.0000	150.00	No Ice	2.06	1.93	0.06
(Sprint)			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
FD-RRH 2x50 800	B	From Leg	3.00	0.0000	150.00	No Ice	2.06	1.93	0.06
(Sprint)			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
FD-RRH 2x50 800	C	From Leg	3.00	0.0000	150.00	No Ice	2.06	1.93	0.06
(Sprint)			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
TD-RRH8x20-25	A	From Leg	3.00	0.0000	150.00	No Ice	4.05	1.53	0.07
(Sprint)			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	B	From Leg	3.00	0.0000	150.00	No Ice	4.05	1.53	0.07
(Sprint)			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	C	From Leg	3.00	0.0000	150.00	No Ice	4.05	1.53	0.07
(Sprint)			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
Rohn 6'x15' Boom Gate	A	From Leg	2.00	0.0000	150.50	No Ice	17.50	9.00	0.51
(Sprint)			0.00			1/2" Ice	23.50	12.00	0.72
			0.00			1" Ice	29.50	15.00	0.93
Rohn 6'x15' Boom Gate	B	From Leg	2.00	0.0000	150.50	No Ice	17.50	9.00	0.51
(Sprint)			0.00			1/2" Ice	23.50	12.00	0.72
			0.00			1" Ice	29.50	15.00	0.93
Rohn 6'x15' Boom Gate	C	From Leg	2.00	0.0000	150.50	No Ice	17.50	9.00	0.51
(Sprint)			0.00			1/2" Ice	23.50	12.00	0.72
			0.00			1" Ice	29.50	15.00	0.93
20' x 3" Dia Omni	B	From Leg	4.75	0.0000	188.75	No Ice	6.00	6.00	0.05
			0.00			1/2" Ice	8.03	8.03	0.09
			0.00			1" Ice	10.08	10.08	0.15
6' Standoff	B	From Leg	3.00	0.0000	178.00	No Ice	4.80	4.80	0.10
			0.00			1/2" Ice	6.40	6.40	0.14
			0.00			1" Ice	8.00	8.00	0.18
6' x 3" Dia Omni	A	From Leg	4.75	0.0000	180.00	No Ice	1.77	1.77	0.02
			0.00			1/2" Ice	2.13	2.13	0.03
			0.00			1" Ice	2.50	2.50	0.05
3' Standoff	A	From Leg	1.50	0.0000	178.00	No Ice	2.40	2.40	0.05
			0.00			1/2" Ice	3.20	3.20	0.07
			0.00			1" Ice	4.00	4.00	0.09
4 Bay Dipole	B	From Leg	4.75	0.0000	155.50	No Ice	1.65	1.65	0.02
			0.00			1/2" Ice	2.61	2.61	0.03
			0.00			1" Ice	3.60	3.60	0.05
3'-6" Standoff	B	From Leg	2.00	0.0000	151.00	No Ice	2.40	2.40	0.05
			0.00			1/2" Ice	3.20	3.20	0.07
			0.00			1" Ice	4.00	4.00	0.09
DB408	B	From Leg	4.75	0.0000	126.00	No Ice	1.65	1.65	0.02
			0.00			1/2" Ice	2.61	2.61	0.03
			0.00			1" Ice	3.60	3.60	0.05
3' Standoff	B	From Leg	1.50	0.0000	122.50	No Ice	3.00	3.00	0.05
			0.00			1/2" Ice	4.00	4.00	0.07
			0.00			1" Ice	5.00	5.00	0.09
PD220	A	From Leg	4.00	0.0000	121.00	No Ice	3.08	3.08	0.02
			0.00			1/2" Ice	5.30	5.30	0.05
			0.00			1" Ice	7.54	7.54	0.09
3'-6" Standoff	A	From Leg	2.00	0.0000	110.00	No Ice	2.40	2.40	0.05
			0.00			1/2" Ice	3.20	3.20	0.07
			0.00			1" Ice	4.00	4.00	0.09
PD220	B	From Leg	4.00	0.0000	121.00	No Ice	3.08	3.08	0.02
			0.00			1/2" Ice	5.30	5.30	0.05
			0.00			1" Ice	7.54	7.54	0.09

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
3'-6" Standoff	B	From Leg	2.00	0.0000	110.00	No Ice	2.40	2.40	0.05
			0.00			1/2" Ice	3.20	3.20	0.07
			0.00			1" Ice	4.00	4.00	0.09
Folded Dipole	C	From Leg	1.50	0.0000	111.00	No Ice	1.20	1.20	0.03
			0.00			1/2" Ice	2.40	2.40	0.04
			0.00			1" Ice	3.60	3.60	0.05
6'x3" Pipe Mount	C	From Leg	1.00	0.0000	111.00	No Ice	1.77	1.77	0.03
			0.00			1/2" Ice	2.13	2.13	0.05
			0.00			1" Ice	2.50	2.50	0.07
2' Standoff	B	From Leg	1.00	0.0000	105.00	No Ice	0.60	0.60	0.01
			0.00			1/2" Ice	0.80	0.80	0.02
			0.00			1" Ice	1.00	1.00	0.03
2'x2" Omni	B	From Leg	2.00	0.0000	106.00	No Ice	0.30	0.30	0.02
			0.00			1/2" Ice	0.43	0.43	0.02
			0.00			1" Ice	0.58	0.58	0.03

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	186.50	1.181	28	47.536	A	7.962	6.229	6.229	43.89	0.000	0.000
193.00-180.00					B	7.962	6.229		43.89	9.504	0.000
					C	7.962	6.229		43.89	0.000	0.000
T2	170.00	1.15	28	73.132	A	15.735	9.583	9.583	37.85	0.000	0.000
180.00-160.00					B	15.735	9.583		37.85	50.817	0.000
					C	15.735	9.583		37.85	35.200	0.000
T3	150.00	1.11	27	73.132	A	14.676	10.378	9.583	38.25	11.880	0.000
160.00-140.00					B	14.676	10.378		38.25	81.420	0.000
					C	14.676	10.378		38.25	42.532	0.000
T4	130.00	1.065	26	73.132	A	0.067	18.157	9.583	52.59	23.760	0.000
140.00-120.00					B	0.067	18.157		52.59	81.420	0.000
					C	0.067	18.157		52.59	45.858	0.000
T5	110.00	1.016	24	74.173	A	15.478	11.667	11.667	42.98	24.340	0.000
120.00-100.00					B	15.478	11.667		42.98	81.420	0.000
					C	15.478	11.667		42.98	53.848	0.000
T6	90.00	0.959	23	74.173	A	0.067	20.100	11.667	57.85	26.080	0.000
100.00-80.00					B	0.067	20.100		57.85	81.420	0.000
					C	0.067	20.100		57.85	59.668	0.000
T7 80.00-60.00	70.00	0.892	21	74.173	A	8.994	12.448	11.667	54.41	26.080	0.000
					B	8.994	12.448		54.41	81.420	0.000
					C	8.994	12.448		54.41	59.668	0.000
T8 60.00-40.00	50.00	0.811	19	74.173	A	0.067	20.100	11.667	57.85	26.080	0.000
					B	0.067	20.100		57.85	81.420	0.000
					C	0.067	20.100		57.85	59.668	0.000
T9 40.00-20.00	30.00	0.701	17	74.173	A	0.067	16.274	11.667	71.40	26.080	0.000
					B	0.067	16.274		71.40	81.420	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.067	16.274		71.40	59.668	0.000
T10 20.00-5.00	12.50	0.7	17	55.630	A	0.067	12.389	8.750	70.25	15.648	0.000
					B	0.067	12.389		70.25	48.852	0.000
					C	0.067	12.389		70.25	35.801	0.000
T11 5.00-0.00	2.50	0.7	17	10.084	A	1.598	3.135	3.135	66.24	0.000	0.000
					B	1.598	3.135		66.24	0.000	0.000
					C	1.598	3.135		66.24	0.000	0.000

Tower Pressure - With Ice

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	186.50	1.181	6	1.7836	51.400	A	7.962	27.976	13.958	38.84	0.000	0.000
193.00-180.00						B	7.962	27.976		38.84	25.549	0.000
						C	7.962	27.976		38.84	0.000	0.000
T2	170.00	1.15	6	1.7672	79.022	A	15.735	49.206	21.365	32.90	0.000	0.000
180.00-160.00						B	15.735	49.206		32.90	108.746	0.000
						C	15.735	49.206		32.90	75.072	0.000
T3	150.00	1.11	6	1.7452	78.949	A	14.676	49.507	21.218	33.06	17.769	0.000
160.00-140.00						B	14.676	49.507		33.06	152.862	0.000
						C	14.676	49.507		33.06	93.233	0.000
T4	130.00	1.065	6	1.7204	78.866	A	0.067	49.442	21.053	42.52	35.364	0.000
140.00-120.00						B	0.067	49.442		42.52	152.098	0.000
						C	0.067	49.442		42.52	104.915	0.000
T5	110.00	1.016	6	1.6919	79.813	A	15.478	49.167	22.946	35.50	39.213	0.000
120.00-100.00						B	15.478	49.167		35.50	151.222	0.000
						C	15.478	49.167		35.50	130.363	0.000
T6 100.00-80.00	90.00	0.959	5	1.6583	79.701	A	0.067	49.945	22.722	45.43	50.889	0.000
						B	0.067	49.945		45.43	150.188	0.000
						C	0.067	49.945		45.43	148.270	0.000
T7 80.00-60.00	70.00	0.892	5	1.6171	79.564	A	8.994	41.552	22.448	44.41	50.313	0.000
						B	8.994	41.552		44.41	148.924	0.000
						C	8.994	41.552		44.41	146.484	0.000
T8 60.00-40.00	50.00	0.811	4	1.5636	79.385	A	0.067	48.241	22.091	45.73	49.564	0.000
						B	0.067	48.241		45.73	147.281	0.000
						C	0.067	48.241		45.73	144.164	0.000
T9 40.00-20.00	30.00	0.701	4	1.4858	79.126	A	0.067	35.434	21.572	60.76	48.475	0.000
						B	0.067	35.434		60.76	144.895	0.000
						C	0.067	35.434		60.76	140.788	0.000
T10 20.00-5.00	12.50	0.7	4	1.3612	59.033	A	0.067	25.918	15.556	59.87	28.040	0.000
						B	0.067	25.918		59.87	84.651	0.000
						C	0.067	25.918		59.87	81.236	0.000
T11 5.00-0.00	2.50	0.7	4	1.1589	11.104	A	1.598	6.494	5.212	64.41	0.000	0.000
						B	1.598	6.494		64.41	0.000	0.000
						C	1.598	6.494		64.41	0.000	0.000

Tower Pressure - Service

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	186.50	1.181	9	47.536	A	7.962	6.229	6.229	43.89	0.000	0.000
193.00-180.00					B	7.962	6.229		43.89	9.504	0.000
					C	7.962	6.229		43.89	0.000	0.000
T2	170.00	1.15	9	73.132	A	15.735	9.583	9.583	37.85	0.000	0.000
180.00-160.00					B	15.735	9.583		37.85	50.817	0.000
					C	15.735	9.583		37.85	35.200	0.000
T3	150.00	1.11	9	73.132	A	14.676	10.378	9.583	38.25	11.880	0.000
160.00-140.00					B	14.676	10.378		38.25	81.420	0.000
					C	14.676	10.378		38.25	42.532	0.000
T4	130.00	1.065	8	73.132	A	0.067	18.157	9.583	52.59	23.760	0.000
140.00-120.00					B	0.067	18.157		52.59	81.420	0.000
					C	0.067	18.157		52.59	45.858	0.000
T5	110.00	1.016	8	74.173	A	15.478	11.667	11.667	42.98	24.340	0.000
120.00-100.00					B	15.478	11.667		42.98	81.420	0.000
					C	15.478	11.667		42.98	53.848	0.000
T6	90.00	0.959	8	74.173	A	0.067	20.100	11.667	57.85	26.080	0.000
100.00-80.00					B	0.067	20.100		57.85	81.420	0.000
					C	0.067	20.100		57.85	59.668	0.000
T7 80.00-60.00	70.00	0.892	7	74.173	A	8.994	12.448	11.667	54.41	26.080	0.000
					B	8.994	12.448		54.41	81.420	0.000
					C	8.994	12.448		54.41	59.668	0.000
T8 60.00-40.00	50.00	0.811	6	74.173	A	0.067	20.100	11.667	57.85	26.080	0.000
					B	0.067	20.100		57.85	81.420	0.000
					C	0.067	20.100		57.85	59.668	0.000
T9 40.00-20.00	30.00	0.701	5	74.173	A	0.067	16.274	11.667	71.40	26.080	0.000
					B	0.067	16.274		71.40	81.420	0.000
					C	0.067	16.274		71.40	59.668	0.000
T10 20.00-5.00	12.50	0.7	5	55.630	A	0.067	12.389	8.750	70.25	15.648	0.000
					B	0.067	12.389		70.25	48.852	0.000
					C	0.067	12.389		70.25	35.801	0.000
T11 5.00-0.00	2.50	0.7	5	10.084	A	1.598	3.135	3.135	66.24	0.000	0.000
					B	1.598	3.135		66.24	0.000	0.000
					C	1.598	3.135		66.24	0.000	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	0.10	0.77	A	0.299	2.3	28	1	1	11.690	0.78	60.36	C
193.00-180.00			B	0.299	2.3		1	1	11.690			
			C	0.299	2.3		1	1	11.690			
T2	0.56	1.51	A	0.346	2.18	28	1	1	21.626	2.90	145.00	C
180.00-160.00		TA 1.03	B	0.346	2.18		1	1	21.626			
			C	0.346	2.18		1	1	21.626			
T3	0.84	1.48	A	0.343	2.189	27	1	1	21.041	3.47*	173.75	C
160.00-140.00			B	0.343	2.189		1	1	21.041			
			C	0.343	2.189		1	1	21.041			
T4	0.92	0.85	A	0.249	2.44	26	1	1	10.685	3.34*	166.79	C
140.00-120.00			B	0.249	2.44		1	1	10.685			
			C	0.249	2.44		1	1	10.685			
T5	0.96	1.58	A	0.366	2.135	24	1	1	22.737	3.23*	161.28	C
120.00-100.00		TA 0.69	B	0.366	2.135		1	1	22.737			

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
			C	0.366	2.135		1	1	22.737			
T6	1.00	0.81	A	0.272	2.373	23	1	1	11.940	3.05*	152.29	C
100.00-80.00			B	0.272	2.373		1	1	11.940			
			C	0.272	2.373		1	1	11.940			
T7	1.00	1.08	A	0.289	2.325	21	1	1	16.408	2.83*	141.74	C
80.00-60.00		TA 0.51	B	0.289	2.325		1	1	16.408			
			C	0.289	2.325		1	1	16.408			
T8	1.00	1.01	A	0.272	2.373	19	1	1	11.940	2.57*	128.75	C
60.00-40.00			B	0.272	2.373		1	1	11.940			
			C	0.272	2.373		1	1	11.940			
T9	1.00	0.72	A	0.22	2.53	17	1	1	9.479	2.23*	111.26	C
40.00-20.00			B	0.22	2.53		1	1	9.479			
			C	0.22	2.53		1	1	9.479			
T10	0.60	0.63	A	0.224	2.518	17	1	1	7.241	1.61	107.37	C
20.00-5.00			B	0.224	2.518		1	1	7.241			
			C	0.224	2.518		1	1	7.241			
T11 5.00-0.00	0.00	0.37	A	0.469	1.943	17	1	1	3.695	0.10	20.50	C
			B	0.469	1.943		1	1	3.695			
			C	0.469	1.943		1	1	3.695			
Sum Weight:	7.98	13.10			*2.1A_g limit					26.12		

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	0.10	0.77	A	0.299	2.3	28	0.8	1	10.098	0.70	53.58	C
193.00-180.00			B	0.299	2.3		0.8	1	10.098			
			C	0.299	2.3		0.8	1	10.098			
T2	0.56	1.51	A	0.346	2.18	28	0.8	1	18.479	2.74	136.96	C
180.00-160.00		TA 1.03	B	0.346	2.18		0.8	1	18.479			
			C	0.346	2.18		0.8	1	18.479			
T3	0.84	1.48	A	0.343	2.189	27	0.8	1	18.106	3.47*	173.75	C
160.00-140.00			B	0.343	2.189		0.8	1	18.106			
			C	0.343	2.189		0.8	1	18.106			
T4	0.92	0.85	A	0.249	2.44	26	0.8	1	10.672	3.34*	166.79	C
140.00-120.00			B	0.249	2.44		0.8	1	10.672			
			C	0.249	2.44		0.8	1	10.672			
T5	0.96	1.58	A	0.366	2.135	24	0.8	1	19.641	3.23*	161.28	C
120.00-100.00		TA 0.69	B	0.366	2.135		0.8	1	19.641			
			C	0.366	2.135		0.8	1	19.641			
T6	1.00	0.81	A	0.272	2.373	23	0.8	1	11.926	3.05*	152.29	C
100.00-80.00			B	0.272	2.373		0.8	1	11.926			
			C	0.272	2.373		0.8	1	11.926			
T7	1.00	1.08	A	0.289	2.325	21	0.8	1	14.609	2.83*	141.74	C
80.00-60.00		TA 0.51	B	0.289	2.325		0.8	1	14.609			
			C	0.289	2.325		0.8	1	14.609			
T8	1.00	1.01	A	0.272	2.373	19	0.8	1	11.926	2.57*	128.75	C
60.00-40.00			B	0.272	2.373		0.8	1	11.926			
			C	0.272	2.373		0.8	1	11.926			
T9	1.00	0.72	A	0.22	2.53	17	0.8	1	9.465	2.23*	111.26	C
40.00-20.00			B	0.22	2.53		0.8	1	9.465			

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
			C	0.22	2.53		0.8	1	9.465			
T10	0.60	0.63	A	0.224	2.518	17	0.8	1	7.228	1.61	107.34	C
20.00-5.00			B	0.224	2.518		0.8	1	7.228			
			C	0.224	2.518		0.8	1	7.228			
T11 5.00-0.00	0.00	0.37	A	0.469	1.943	17	0.8	1	3.376	0.09	18.72	C
			B	0.469	1.943		0.8	1	3.376			
			C	0.469	1.943		0.8	1	3.376			
Sum Weight:	7.98	13.10			*2.1A_g limit					25.86		

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	0.10	0.77	A	0.299	2.3	28	0.85	1	10.496	0.72	55.28	C
193.00-180.00			B	0.299	2.3		0.85	1	10.496			
			C	0.299	2.3		0.85	1	10.496			
T2	0.56	1.51	A	0.346	2.18	28	0.85	1	19.265	2.78	138.97	C
180.00-160.00		TA 1.03	B	0.346	2.18		0.85	1	19.265			
			C	0.346	2.18		0.85	1	19.265			
T3	0.84	1.48	A	0.343	2.189	27	0.85	1	18.840	3.47*	173.75	C
160.00-140.00			B	0.343	2.189		0.85	1	18.840			
			C	0.343	2.189		0.85	1	18.840			
T4	0.92	0.85	A	0.249	2.44	26	0.85	1	10.675	3.34*	166.79	C
140.00-120.00			B	0.249	2.44		0.85	1	10.675			
			C	0.249	2.44		0.85	1	10.675			
T5	0.96	1.58	A	0.366	2.135	24	0.85	1	20.415	3.23*	161.28	C
120.00-100.00		TA 0.69	B	0.366	2.135		0.85	1	20.415			
			C	0.366	2.135		0.85	1	20.415			
T6	1.00	0.81	A	0.272	2.373	23	0.85	1	11.930	3.05*	152.29	C
100.00-80.00			B	0.272	2.373		0.85	1	11.930			
			C	0.272	2.373		0.85	1	11.930			
T7	1.00	1.08	A	0.289	2.325	21	0.85	1	15.059	2.83*	141.74	C
80.00-60.00		TA 0.51	B	0.289	2.325		0.85	1	15.059			
			C	0.289	2.325		0.85	1	15.059			
T8	1.00	1.01	A	0.272	2.373	19	0.85	1	11.930	2.57*	128.75	C
60.00-40.00			B	0.272	2.373		0.85	1	11.930			
			C	0.272	2.373		0.85	1	11.930			
T9	1.00	0.72	A	0.22	2.53	17	0.85	1	9.469	2.23*	111.26	C
40.00-20.00			B	0.22	2.53		0.85	1	9.469			
			C	0.22	2.53		0.85	1	9.469			
T10	0.60	0.63	A	0.224	2.518	17	0.85	1	7.231	1.61	107.35	C
20.00-5.00			B	0.224	2.518		0.85	1	7.231			
			C	0.224	2.518		0.85	1	7.231			
T11 5.00-0.00	0.00	0.37	A	0.469	1.943	17	0.85	1	3.456	0.10	19.17	C
			B	0.469	1.943		0.85	1	3.456			
			C	0.469	1.943		0.85	1	3.456			
Sum Weight:	7.98	13.10			*2.1A_g limit					25.92		

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 ft^2	F K	w plf	Ctrl. Face
T1	0.42	2.66	A	0.699	1.776	6	1	1	30.382	0.34	25.89	C
193.00-180.00			B	0.699	1.776		1	1	30.382			
			C	0.699	1.776		1	1	30.382			
T2	3.24	5.12	A	0.822	1.834	6	1	1	60.009	0.88*	44.12	C
180.00-160.00		TA 1.79	B	0.822	1.834		1	1	60.009			
			C	0.822	1.834		1	1	60.009			
T3	4.78	4.97	A	0.813	1.826	6	1	1	58.881	0.85*	42.53	C
160.00-140.00			B	0.813	1.826		1	1	58.881			
			C	0.813	1.826		1	1	58.881			
T4	5.24	2.93	A	0.628	1.789	6	1	1	37.612	0.82*	40.79	C
140.00-120.00			B	0.628	1.789		1	1	37.612			
			C	0.628	1.789		1	1	37.612			
T5	5.57	5.06	A	0.81	1.824	6	1	1	59.267	0.79*	39.35	C
120.00-100.00		TA 1.42	B	0.81	1.824		1	1	59.267			
			C	0.81	1.824		1	1	59.267			
T6	5.83	2.86	A	0.627	1.79	5	1	1	37.990	0.74*	37.11	C
100.00-80.00			B	0.627	1.79		1	1	37.990			
			C	0.627	1.79		1	1	37.990			
T7	5.71	3.43	A	0.635	1.786	5	1	1	40.742	0.69*	34.48	C
80.00-60.00		TA 1.08	B	0.635	1.786		1	1	40.742			
			C	0.635	1.786		1	1	40.742			
T8	5.55	2.88	A	0.609	1.799	4	1	1	36.107	0.62*	31.25	C
60.00-40.00			B	0.609	1.799		1	1	36.107			
			C	0.609	1.799		1	1	36.107			
T9	5.33	1.92	A	0.449	1.976	4	1	1	23.321	0.54*	26.91	C
40.00-20.00			B	0.449	1.976		1	1	23.321			
			C	0.449	1.976		1	1	23.321			
T10	2.99	1.45	A	0.44	1.99	4	1	1	16.955	0.40*	26.75	C
20.00-5.00			B	0.44	1.99		1	1	16.955			
			C	0.44	1.99		1	1	16.955			
T11 5.00-0.00	0.01	0.64	A	0.729	1.781	4	1	1	6.917	0.04	7.97	C
			B	0.729	1.781		1	1	6.917			
			C	0.729	1.781		1	1	6.917			
Sum Weight:	44.68	38.27			*2.1A_g limit					6.71		

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 ft^2	F K	w plf	Ctrl. Face
T1	0.42	2.66	A	0.699	1.776	6	0.8	1	28.789	0.32	24.70	C
193.00-180.00			B	0.699	1.776		0.8	1	28.789			
			C	0.699	1.776		0.8	1	28.789			
T2	3.24	5.12	A	0.822	1.834	6	0.8	1	56.862	0.88*	44.12	C
180.00-160.00		TA 1.79	B	0.822	1.834		0.8	1	56.862			
			C	0.822	1.834		0.8	1	56.862			
T3	4.78	4.97	A	0.813	1.826	6	0.8	1	55.946	0.85*	42.53	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
160.00-140.00			B	0.813	1.826		0.8	1	55.946			
			C	0.813	1.826		0.8	1	55.946			
T4	5.24	2.93	A	0.628	1.789	6	0.8	1	37.598	0.82*	40.79	C
140.00-120.00			B	0.628	1.789		0.8	1	37.598			
			C	0.628	1.789		0.8	1	37.598			
T5	5.57	5.06	A	0.81	1.824	6	0.8	1	56.171	0.79*	39.35	C
120.00-100.00		TA 1.42	B	0.81	1.824		0.8	1	56.171			
			C	0.81	1.824		0.8	1	56.171			
T6	5.83	2.86	A	0.627	1.79	5	0.8	1	37.976	0.74*	37.11	C
100.00-80.00			B	0.627	1.79		0.8	1	37.976			
			C	0.627	1.79		0.8	1	37.976			
T7	5.71	3.43	A	0.635	1.786	5	0.8	1	38.943	0.69*	34.48	C
80.00-60.00		TA 1.08	B	0.635	1.786		0.8	1	38.943			
			C	0.635	1.786		0.8	1	38.943			
T8	5.55	2.88	A	0.609	1.799	4	0.8	1	36.094	0.62*	31.25	C
60.00-40.00			B	0.609	1.799		0.8	1	36.094			
			C	0.609	1.799		0.8	1	36.094			
T9	5.33	1.92	A	0.449	1.976	4	0.8	1	23.307	0.54*	26.91	C
40.00-20.00			B	0.449	1.976		0.8	1	23.307			
			C	0.449	1.976		0.8	1	23.307			
T10	2.99	1.45	A	0.44	1.99	4	0.8	1	16.941	0.40*	26.75	C
20.00-5.00			B	0.44	1.99		0.8	1	16.941			
			C	0.44	1.99		0.8	1	16.941			
T11 5.00-0.00	0.01	0.64	A	0.729	1.781	4	0.8	1	6.597	0.04	7.60	C
			B	0.729	1.781		0.8	1	6.597			
			C	0.729	1.781		0.8	1	6.597			
Sum Weight:	44.68	38.27			*2.1A_g limit					6.69		

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	0.42	2.66	A	0.699	1.776	6	0.85	1	29.187	0.32	25.00	C
193.00-180.00			B	0.699	1.776		0.85	1	29.187			
			C	0.699	1.776		0.85	1	29.187			
T2	3.24	5.12	A	0.822	1.834	6	0.85	1	57.648	0.88*	44.12	C
180.00-160.00		TA 1.79	B	0.822	1.834		0.85	1	57.648			
			C	0.822	1.834		0.85	1	57.648			
T3	4.78	4.97	A	0.813	1.826	6	0.85	1	56.680	0.85*	42.53	C
160.00-140.00			B	0.813	1.826		0.85	1	56.680			
			C	0.813	1.826		0.85	1	56.680			
T4	5.24	2.93	A	0.628	1.789	6	0.85	1	37.602	0.82*	40.79	C
140.00-120.00			B	0.628	1.789		0.85	1	37.602			
			C	0.628	1.789		0.85	1	37.602			
T5	5.57	5.06	A	0.81	1.824	6	0.85	1	56.945	0.79*	39.35	C
120.00-100.00		TA 1.42	B	0.81	1.824		0.85	1	56.945			
			C	0.81	1.824		0.85	1	56.945			
T6	5.83	2.86	A	0.627	1.79	5	0.85	1	37.980	0.74*	37.11	C
100.00-80.00			B	0.627	1.79		0.85	1	37.980			
			C	0.627	1.79		0.85	1	37.980			
T7	5.71	3.43	A	0.635	1.786	5	0.85	1	39.393	0.69*	34.48	C

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
80.00-60.00		TA 1.08	B	0.635	1.786		0.85	1	39.393			
			C	0.635	1.786		0.85	1	39.393			
T8	5.55	2.88	A	0.609	1.799	4	0.85	1	36.097	0.62*	31.25	C
60.00-40.00			B	0.609	1.799		0.85	1	36.097			
			C	0.609	1.799		0.85	1	36.097			
T9	5.33	1.92	A	0.449	1.976	4	0.85	1	23.311	0.54*	26.91	C
40.00-20.00			B	0.449	1.976		0.85	1	23.311			
			C	0.449	1.976		0.85	1	23.311			
T10	2.99	1.45	A	0.44	1.99	4	0.85	1	16.944	0.40*	26.75	C
20.00-5.00			B	0.44	1.99		0.85	1	16.944			
			C	0.44	1.99		0.85	1	16.944			
T11 5.00-0.00	0.01	0.64	A	0.729	1.781	4	0.85	1	6.677	0.04	7.70	C
			B	0.729	1.781		0.85	1	6.677			
			C	0.729	1.781		0.85	1	6.677			
Sum Weight:	44.68	38.27			*2.1A_g limit					6.70		

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 ft^2	F K	w plf	Ctrl. Face
T1	0.10	0.77	A	0.299	2.3	9	1	1	11.690	0.26	19.71	C
193.00-180.00			B	0.299	2.3		1	1	11.690			
			C	0.299	2.3		1	1	11.690			
T2	0.56	1.51	A	0.346	2.18	9	1	1	21.626	0.95	47.35	C
180.00-160.00		TA 1.03	B	0.346	2.18		1	1	21.626			
			C	0.346	2.18		1	1	21.626			
T3	0.84	1.48	A	0.343	2.189	9	1	1	21.041	1.13*	56.73	C
160.00-140.00			B	0.343	2.189		1	1	21.041			
			C	0.343	2.189		1	1	21.041			
T4	0.92	0.85	A	0.249	2.44	8	1	1	10.685	1.09*	54.46	C
140.00-120.00			B	0.249	2.44		1	1	10.685			
			C	0.249	2.44		1	1	10.685			
T5	0.96	1.58	A	0.366	2.135	8	1	1	22.737	1.05*	52.66	C
120.00-100.00		TA 0.69	B	0.366	2.135		1	1	22.737			
			C	0.366	2.135		1	1	22.737			
T6	1.00	0.81	A	0.272	2.373	8	1	1	11.940	0.99*	49.73	C
100.00-80.00			B	0.272	2.373		1	1	11.940			
			C	0.272	2.373		1	1	11.940			
T7	1.00	1.08	A	0.289	2.325	7	1	1	16.408	0.93*	46.28	C
80.00-60.00		TA 0.51	B	0.289	2.325		1	1	16.408			
			C	0.289	2.325		1	1	16.408			
T8	1.00	1.01	A	0.272	2.373	6	1	1	11.940	0.84*	42.04	C
60.00-40.00			B	0.272	2.373		1	1	11.940			
			C	0.272	2.373		1	1	11.940			
T9	1.00	0.72	A	0.22	2.53	5	1	1	9.479	0.73*	36.33	C
40.00-20.00			B	0.22	2.53		1	1	9.479			
			C	0.22	2.53		1	1	9.479			
T10	0.60	0.63	A	0.224	2.518	5	1	1	7.241	0.53	35.06	C
20.00-5.00			B	0.224	2.518		1	1	7.241			
			C	0.224	2.518		1	1	7.241			
T11 5.00-0.00	0.00	0.37	A	0.469	1.943	5	1	1	3.695	0.03	6.69	C

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
			B	0.469	1.943		1	1	3.695			
			C	0.469	1.943		1	1	3.695			
Sum Weight:	7.98	13.10			*2.1A_g limit					8.53		

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 ft^2	F K	w plf	Ctrl. Face
T1	0.10	0.77	A	0.299	2.3	9	0.8	1	10.098	0.23	17.50	C
193.00-180.00			B	0.299	2.3		0.8	1	10.098			
			C	0.299	2.3		0.8	1	10.098			
T2	0.56	1.51	A	0.346	2.18	9	0.8	1	18.479	0.89	44.72	C
180.00-160.00		TA 1.03	B	0.346	2.18		0.8	1	18.479			
			C	0.346	2.18		0.8	1	18.479			
T3	0.84	1.48	A	0.343	2.189	9	0.8	1	18.106	1.13*	56.73	C
160.00-140.00			B	0.343	2.189		0.8	1	18.106			
			C	0.343	2.189		0.8	1	18.106			
T4	0.92	0.85	A	0.249	2.44	8	0.8	1	10.672	1.09*	54.46	C
140.00-120.00			B	0.249	2.44		0.8	1	10.672			
			C	0.249	2.44		0.8	1	10.672			
T5	0.96	1.58	A	0.366	2.135	8	0.8	1	19.641	1.05*	52.66	C
120.00-100.00		TA 0.69	B	0.366	2.135		0.8	1	19.641			
			C	0.366	2.135		0.8	1	19.641			
T6	1.00	0.81	A	0.272	2.373	8	0.8	1	11.926	0.99*	49.73	C
100.00-80.00			B	0.272	2.373		0.8	1	11.926			
			C	0.272	2.373		0.8	1	11.926			
T7	1.00	1.08	A	0.289	2.325	7	0.8	1	14.609	0.93*	46.28	C
80.00-60.00		TA 0.51	B	0.289	2.325		0.8	1	14.609			
			C	0.289	2.325		0.8	1	14.609			
T8	1.00	1.01	A	0.272	2.373	6	0.8	1	11.926	0.84*	42.04	C
60.00-40.00			B	0.272	2.373		0.8	1	11.926			
			C	0.272	2.373		0.8	1	11.926			
T9	1.00	0.72	A	0.22	2.53	5	0.8	1	9.465	0.73*	36.33	C
40.00-20.00			B	0.22	2.53		0.8	1	9.465			
			C	0.22	2.53		0.8	1	9.465			
T10	0.60	0.63	A	0.224	2.518	5	0.8	1	7.228	0.53	35.05	C
20.00-5.00			B	0.224	2.518		0.8	1	7.228			
			C	0.224	2.518		0.8	1	7.228			
T11 5.00-0.00	0.00	0.37	A	0.469	1.943	5	0.8	1	3.376	0.03	6.11	C
			B	0.469	1.943		0.8	1	3.376			
			C	0.469	1.943		0.8	1	3.376			
Sum Weight:	7.98	13.10			*2.1A_g limit					8.44		

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	0.10	0.77	A	0.299	2.3	9	0.85	1	10.496	0.23	18.05	C
193.00-180.00			B	0.299	2.3		0.85	1	10.496			
			C	0.299	2.3		0.85	1	10.496			
T2	0.56	1.51	A	0.346	2.18	9	0.85	1	19.265	0.91	45.38	C
180.00-160.00		TA 1.03	B	0.346	2.18		0.85	1	19.265			
			C	0.346	2.18		0.85	1	19.265			
T3	0.84	1.48	A	0.343	2.189	9	0.85	1	18.840	1.13*	56.73	C
160.00-140.00			B	0.343	2.189		0.85	1	18.840			
			C	0.343	2.189		0.85	1	18.840			
T4	0.92	0.85	A	0.249	2.44	8	0.85	1	10.675	1.09*	54.46	C
140.00-120.00			B	0.249	2.44		0.85	1	10.675			
			C	0.249	2.44		0.85	1	10.675			
T5	0.96	1.58	A	0.366	2.135	8	0.85	1	20.415	1.05*	52.66	C
120.00-100.00		TA 0.69	B	0.366	2.135		0.85	1	20.415			
			C	0.366	2.135		0.85	1	20.415			
T6	1.00	0.81	A	0.272	2.373	8	0.85	1	11.930	0.99*	49.73	C
100.00-80.00			B	0.272	2.373		0.85	1	11.930			
			C	0.272	2.373		0.85	1	11.930			
T7	1.00	1.08	A	0.289	2.325	7	0.85	1	15.059	0.93*	46.28	C
80.00-60.00		TA 0.51	B	0.289	2.325		0.85	1	15.059			
			C	0.289	2.325		0.85	1	15.059			
T8	1.00	1.01	A	0.272	2.373	6	0.85	1	11.930	0.84*	42.04	C
60.00-40.00			B	0.272	2.373		0.85	1	11.930			
			C	0.272	2.373		0.85	1	11.930			
T9	1.00	0.72	A	0.22	2.53	5	0.85	1	9.469	0.73*	36.33	C
40.00-20.00			B	0.22	2.53		0.85	1	9.469			
			C	0.22	2.53		0.85	1	9.469			
T10	0.60	0.63	A	0.224	2.518	5	0.85	1	7.231	0.53	35.05	C
20.00-5.00			B	0.224	2.518		0.85	1	7.231			
			C	0.224	2.518		0.85	1	7.231			
T11 5.00-0.00	0.00	0.37	A	0.469	1.943	5	0.85	1	3.456	0.03	6.26	C
			B	0.469	1.943		0.85	1	3.456			
			C	0.469	1.943		0.85	1	3.456			
Sum Weight:	7.98	13.10			*2.1A_g limit					8.46		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	5.55			
Bracing Weight	7.51			
Total Member Self-Weight	13.06			
Gusset Weight	0.04			
Guy Weight	2.46			
Total Weight	35.43			
Wind 0 deg - No Ice		-0.01	-37.37	6.86
Wind 30 deg - No Ice		18.58	-32.20	4.27
Wind 60 deg - No Ice		32.13	-18.55	0.48
Wind 90 deg - No Ice		37.17	0.01	-3.42
Wind 120 deg - No Ice		32.36	18.69	-6.33
Wind 150 deg - No Ice		18.59	32.20	-7.69

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Wind 180 deg - No Ice		0.01	37.12	-6.92
Wind 210 deg - No Ice		-18.58	32.20	-4.27
Wind 240 deg - No Ice		-32.36	18.68	-0.53
Wind 270 deg - No Ice		-37.17	-0.01	3.42
Wind 300 deg - No Ice		-32.14	-18.56	6.44
Wind 330 deg - No Ice		-18.59	-32.20	7.69
Member Ice	25.16			
Gusset Ice	0.06			
Guy Ice	11.81			
Total Weight Ice	130.93			
Wind 0 deg - Ice		-0.00	-10.78	2.19
Wind 30 deg - Ice		5.39	-9.33	2.22
Wind 60 deg - Ice		9.32	-5.38	1.65
Wind 90 deg - Ice		10.77	0.00	0.63
Wind 120 deg - Ice		9.34	5.39	-0.56
Wind 150 deg - Ice		5.39	9.33	-1.59
Wind 180 deg - Ice		0.00	10.77	-2.20
Wind 210 deg - Ice		-5.39	9.33	-2.22
Wind 240 deg - Ice		-9.34	5.39	-1.63
Wind 270 deg - Ice		-10.77	-0.00	-0.63
Wind 300 deg - Ice		-9.32	-5.38	0.56
Wind 330 deg - Ice		-5.39	-9.33	1.59
Total Weight	35.43			
Wind 0 deg - Service		-0.00	-12.20	2.24
Wind 30 deg - Service		6.07	-10.51	1.39
Wind 60 deg - Service		10.49	-6.06	0.16
Wind 90 deg - Service		12.14	0.00	-1.12
Wind 120 deg - Service		10.57	6.10	-2.07
Wind 150 deg - Service		6.07	10.52	-2.51
Wind 180 deg - Service		0.00	12.12	-2.26
Wind 210 deg - Service		-6.07	10.51	-1.39
Wind 240 deg - Service		-10.57	6.10	-0.17
Wind 270 deg - Service		-12.14	-0.00	1.12
Wind 300 deg - Service		-10.49	-6.06	2.10
Wind 330 deg - Service		-6.07	-10.52	2.51

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy

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

Maximum 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	193 - 180	Leg	Max Tension	4	12.50	0.45	-0.20
			Max. Compression	6	-16.11	0.27	0.18
			Max. Mx	11	10.49	-0.46	-0.07
			Max. My	2	-15.86	-0.07	-0.50
			Max. Vy	11	-1.93	-0.30	-0.05
			Max. Vx	2	-2.05	-0.05	-0.33
		Diagonal	Max Tension	13	2.52	0.00	0.00
			Max. Compression	2	-2.63	0.00	0.00
			Max. Mx	6	0.21	0.03	-0.00
			Max. My	8	-1.90	0.00	0.01
			Max. Vy	19	-0.02	0.02	0.00
			Max. Vx	8	-0.00	0.00	0.01
		Top Girt	Max Tension	4	0.02	0.00	0.00
			Max. Compression	2	-0.02	0.00	0.00
			Max. Mx	19	-0.00	-0.02	0.00
			Max. My	2	0.01	0.00	-0.00
			Max. Vy	19	-0.02	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Bottom Girt	Max Tension	4	0.89	0.00	0.00
			Max. Compression	6	-0.82	0.00	0.00
			Max. Mx	19	-0.10	-0.02	0.00
			Max. My	2	0.50	0.00	-0.00
			Max. Vy	19	-0.02	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
T2	180 - 160	Leg	Max Tension	4	79.08	-1.08	0.63
			Max. Compression	6	-92.25	-1.10	-0.62
			Max. Mx	5	-4.78	-5.01	-0.41
			Max. My	3	-5.41	-2.17	4.67
			Max. Vy	5	4.97	-5.01	-0.41

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	8	-5.51	0.01	-1.91
		Diagonal	Max Tension	8	9.03	0.02	-0.01
			Max. Compression	2	-9.90	0.00	0.00
			Max. Mx	3	0.56	-0.19	-0.05
			Max. My	7	-5.94	-0.08	0.09
			Max. Vy	3	-0.09	0.00	0.00
			Max. Vx	7	0.04	-0.08	0.09
		Secondary Horizontal	Max Tension	4	5.57	-0.16	-0.01
			Max. Compression	2	-5.07	0.00	0.00
			Max. Mx	8	-0.93	-0.16	-0.01
			Max. My	4	-1.71	0.07	0.03
			Max. Vy	8	0.10	0.00	0.00
			Max. Vx	4	0.02	0.07	0.03
		Top Girt	Max Tension	2	0.78	0.00	0.00
			Max. Compression	12	-0.77	0.00	0.00
			Max. Mx	19	0.19	-0.02	0.00
			Max. My	2	-0.41	0.00	-0.00
			Max. Vy	19	0.02	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Bottom Girt	Max Tension	6	6.55	0.00	0.00
			Max. Compression	4	-5.26	0.00	0.00
			Max. Mx	19	1.94	-0.02	0.00
			Max. My	2	-1.82	0.00	-0.00
			Max. Vy	19	0.02	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Guy A	Bottom Tension	9	29.14		
			Top Tension	9	29.33		
			Top Cable Vert	9	22.41		
			Top Cable Norm	9	18.92		
			Top Cable Tan	9	0.06		
			Bot Cable Vert	9	-21.99		
			Bot Cable Norm	9	19.12		
			Bot Cable Tan	9	0.27		
		Guy B	Bottom Tension	11	28.91		
			Top Tension	11	29.09		
			Top Cable Vert	11	22.23		
			Top Cable Norm	11	18.77		
			Top Cable Tan	11	0.06		
			Bot Cable Vert	11	-21.82		
			Bot Cable Norm	11	18.97		
			Bot Cable Tan	11	0.27		
		Guy C	Bottom Tension	3	29.21		
			Top Tension	3	29.39		
			Top Cable Vert	3	22.46		
			Top Cable Norm	3	18.96		
			Top Cable Tan	3	0.06		
			Bot Cable Vert	3	-22.04		
			Bot Cable Norm	3	19.16		
			Bot Cable Tan	3	0.27		
		Torque Arm Top	Max Tension	7	20.49	0.00	0.00
			Max. Compression	7	-10.05	0.00	0.00
			Max. Mx	7	0.36	-77.71	0.00
			Max. My	2	-8.02	-64.48	0.00
			Max. Vy	7	22.85	-77.71	0.00
			Max. Vx	2	0.00	-64.48	0.00
T3	160 - 140	Leg	Max Tension	4	32.78	-1.22	0.80
			Max. Compression	6	-85.36	1.66	1.08
			Max. Mx	6	-78.20	1.66	1.08
			Max. My	2	-77.86	-0.00	-1.97
			Max. Vy	4	-4.60	-1.22	0.80

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	8	-5.49	0.01	-1.46
		Diagonal	Max Tension	4	5.58	0.00	0.00
			Max. Compression	7	-6.86	0.04	-0.00
			Max. Mx	2	1.29	-0.09	-0.01
			Max. My	6	1.01	-0.08	-0.01
			Max. Vy	2	-0.04	0.00	0.00
			Max. Vx	6	-0.01	-0.08	-0.01
		Secondary Horizontal	Max Tension	6	2.69	-0.01	-0.01
			Max. Compression	4	-1.60	-0.01	0.00
			Max. Mx	6	-0.52	-0.03	-0.00
			Max. My	9	1.85	0.02	-0.01
			Max. Vy	17	0.03	0.03	-0.01
			Max. Vx	9	-0.01	0.00	0.00
		Top Girt	Max Tension	3	0.76	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	19	0.36	0.01	0.00
			Max. My	2	0.73	0.00	0.00
			Max. Vy	19	-0.02	0.00	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Bottom Girt	Max Tension	15	0.43	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	19	0.41	0.01	0.00
			Max. My	2	0.40	0.00	0.00
			Max. Vy	19	-0.02	0.00	0.00
			Max. Vx	2	-0.00	0.00	0.00
T4	140 - 120	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-63.26	-0.04	-0.00
			Max. Mx	11	-12.93	-0.34	-0.11
			Max. My	8	-11.23	0.10	-0.38
			Max. Vy	11	-1.74	-0.20	-0.08
			Max. Vx	2	-1.92	-0.12	-0.17
		Diagonal	Max Tension	2	1.72	0.00	0.00
			Max. Compression	2	-2.76	0.00	0.00
			Max. Mx	18	-0.63	0.02	0.00
			Max. My	2	0.05	0.00	-0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Top Girt	Max Tension	3	0.86	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	23	0.60	0.01	0.00
			Max. My	2	0.83	0.00	0.00
			Max. Vy	23	-0.02	0.00	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Bottom Girt	Max Tension	7	1.02	0.00	0.00
			Max. Compression	6	-0.07	0.00	0.00
			Max. Mx	14	0.68	0.01	0.00
			Max. My	2	0.97	0.00	0.00
			Max. Vy	14	-0.02	0.00	0.00
			Max. Vx	2	-0.00	0.00	0.00
T5	120 - 100	Leg	Max Tension	4	23.55	-0.47	0.27
			Max. Compression	6	-99.14	1.83	1.01
			Max. Mx	11	-21.26	3.88	-0.88
			Max. My	3	-21.24	-1.18	3.83
			Max. Vy	11	-3.64	3.88	-0.88
			Max. Vx	3	-3.76	-1.18	3.83
		Diagonal	Max Tension	8	3.99	0.01	0.00
			Max. Compression	2	-6.17	0.00	0.00
			Max. Mx	7	-1.00	0.12	0.02
			Max. My	7	-3.25	-0.08	0.04
			Max. Vy	7	-0.06	0.12	0.02

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	7	0.02	-0.08	0.04
		Secondary Horizontal	Max Tension	8	4.73	0.00	0.00
			Max. Compression	2	-2.80	0.04	0.01
			Max. Mx	11	-1.48	0.07	-0.01
			Max. My	7	-1.49	-0.06	-0.02
			Max. Vy	11	-0.04	0.07	-0.01
			Max. Vx	7	0.01	0.00	0.00
		Top Girt	Max Tension	10	0.63	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.58	-0.02	0.00
			Max. My	2	0.46	0.00	-0.00
			Max. Vy	14	-0.02	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Bottom Girt	Max Tension	10	3.02	0.00	0.00
			Max. Compression	12	-1.46	0.00	0.00
			Max. Mx	14	0.99	-0.02	0.00
			Max. My	2	-0.05	0.00	-0.00
			Max. Vy	14	-0.02	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Guy A	Bottom Tension	9	14.98		
			Top Tension	9	15.06		
			Top Cable Vert	9	11.57		
			Top Cable Norm	9	9.65		
			Top Cable Tan	9	0.00		
			Bot Cable Vert	9	-11.39		
			Bot Cable Norm	9	9.74		
			Bot Cable Tan	9	0.10		
		Guy B	Bottom Tension	11	14.99		
			Top Tension	11	15.07		
			Top Cable Vert	11	11.58		
			Top Cable Norm	11	9.65		
			Top Cable Tan	11	0.00		
			Bot Cable Vert	11	-11.39		
			Bot Cable Norm	11	9.74		
			Bot Cable Tan	11	0.10		
		Guy C	Bottom Tension	3	14.98		
			Top Tension	3	15.06		
			Top Cable Vert	3	11.57		
			Top Cable Norm	3	9.64		
			Top Cable Tan	3	0.00		
			Bot Cable Vert	3	-11.38		
			Bot Cable Norm	3	9.74		
			Bot Cable Tan	3	0.10		
		Torque Arm Top	Max Tension	13	10.44	0.00	0.00
			Max. Compression	13	-5.28	0.00	0.00
			Max. Mx	13	0.65	-39.66	-0.00
			Max. My	2	-4.20	-31.81	0.00
			Max. Vy	13	11.68	-39.66	-0.00
			Max. Vx	2	0.00	-31.81	0.00
T6	100 - 80	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-96.58	0.23	0.15
			Max. Mx	5	-10.22	-1.00	0.36
			Max. My	8	-0.69	0.03	-1.17
			Max. Vy	12	2.47	1.00	0.62
			Max. Vx	8	-2.89	0.03	-1.17
		Diagonal	Max Tension	3	2.08	0.00	0.00
			Max. Compression	3	-2.74	0.00	0.00
			Max. Mx	26	-0.70	0.01	0.00
			Max. My	15	-0.31	0.00	-0.00
			Max. Vy	26	-0.01	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. Vx	15	0.00	0.00	0.00
		Top Girt	Max Tension	6	0.65	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.59	0.01	0.00
			Max. My	2	0.65	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Bottom Girt	Max Tension	2	0.42	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.40	0.01	0.00
			Max. My	6	0.42	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
T7	80 - 60	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-84.85	0.67	0.30
			Max. Mx	11	-39.13	2.12	-0.33
			Max. My	2	-81.55	0.08	2.03
			Max. Vy	10	3.38	1.74	-1.04
			Max. Vx	2	3.97	0.08	2.03
		Diagonal	Max Tension	6	3.79	0.00	0.00
			Max. Compression	12	-5.18	0.00	0.00
			Max. Mx	13	0.47	0.07	-0.01
			Max. My	13	-4.61	0.00	0.02
			Max. Vy	13	-0.04	0.07	-0.01
			Max. Vx	13	0.01	0.00	0.00
		Top Girt	Max Tension	6	0.91	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.81	0.01	0.00
			Max. My	6	0.90	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Bottom Girt	Max Tension	10	1.92	0.00	0.00
			Max. Compression	4	-0.59	0.00	0.00
			Max. Mx	14	0.93	0.01	0.00
			Max. My	6	0.27	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	8.52		
			Top Tension	7	8.55		
			Top Cable Vert	7	5.05		
			Top Cable Norm	7	6.90		
			Top Cable Tan	7	0.00		
			Bot Cable Vert	7	-4.96		
			Bot Cable Norm	7	6.93		
			Bot Cable Tan	7	0.04		
		Guy B	Bottom Tension	13	8.53		
			Top Tension	13	8.56		
			Top Cable Vert	13	5.05		
			Top Cable Norm	13	6.91		
			Top Cable Tan	13	0.00		
			Bot Cable Vert	13	-4.96		
			Bot Cable Norm	13	6.94		
			Bot Cable Tan	13	0.04		
		Guy C	Bottom Tension	5	8.38		
			Top Tension	5	8.41		
			Top Cable Vert	5	4.97		
			Top Cable Norm	5	6.79		
			Top Cable Tan	5	0.01		
			Bot Cable Vert	5	-4.88		
			Bot Cable Norm	5	6.82		
			Bot Cable Tan	5	0.04		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Torque Arm Top	Max Tension	13	7.85	0.00	0.00
			Max. Compression	13	-4.07	0.00	0.00
			Max. Mx	13	0.12	-16.67	-0.00
			Max. My	6	-3.15	-12.42	-0.00
			Max. Vy	13	4.93	-16.67	-0.00
			Max. Vx	6	-0.00	-12.42	-0.00
T8	60 - 40	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-77.85	0.59	0.49
			Max. Mx	10	-77.72	1.46	-0.87
			Max. My	2	-77.84	0.06	1.70
			Max. Vy	10	3.41	1.46	-0.87
			Max. Vx	2	4.01	0.06	1.70
		Diagonal	Max Tension	13	3.15	0.00	0.00
			Max. Compression	7	-4.50	0.00	0.00
			Max. Mx	21	0.34	0.01	0.00
			Max. My	6	0.10	0.00	0.00
			Max. Vy	21	0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
		Top Girt	Max Tension	23	0.87	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.85	0.01	0.00
			Max. My	6	0.70	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Bottom Girt	Max Tension	6	1.18	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.84	0.01	0.00
			Max. My	13	0.31	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
T9	40 - 20	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	7	-70.84	0.06	0.15
			Max. Mx	6	-44.08	-0.69	-0.53
			Max. My	2	-44.08	0.13	0.82
			Max. Vy	10	1.30	0.68	-0.47
			Max. Vx	2	1.37	0.13	0.82
		Diagonal	Max Tension	13	2.42	0.00	0.00
			Max. Compression	7	-2.80	0.00	0.00
			Max. Mx	22	-0.07	0.01	0.00
			Max. My	16	0.03	0.00	-0.00
			Max. Vy	22	-0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
		Top Girt	Max Tension	7	0.92	0.00	0.00
			Max. Compression	13	-0.61	0.00	0.00
			Max. Mx	19	0.16	0.01	0.00
			Max. My	13	-0.61	0.00	0.00
			Max. Vy	19	0.01	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
		Bottom Girt	Max Tension	12	0.39	0.00	0.00
			Max. Compression	8	-0.16	0.00	0.00
			Max. Mx	19	0.18	0.01	0.00
			Max. My	13	0.01	0.00	0.00
			Max. Vy	19	0.01	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
T10	20 - 5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-70.73	-0.37	0.10
			Max. Mx	25	-70.00	1.40	0.73
			Max. My	21	-69.92	-0.07	-1.57
			Max. Vy	5	7.51	-1.24	0.75
			Max. Vx	22	8.27	-0.06	-1.57
		Diagonal	Max Tension	9	3.04	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. Compression	11	-2.71	0.00	0.00
			Max. Mx	22	0.76	0.01	0.00
			Max. My	12	0.05	0.00	-0.00
			Max. Vy	22	-0.01	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
		Top Girt	Max Tension	8	0.69	0.00	0.00
			Max. Compression	12	-0.15	0.00	0.00
			Max. Mx	19	0.31	0.01	0.00
			Max. My	13	0.51	0.00	0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
		Bottom Girt	Max Tension	26	4.37	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	19	4.35	0.01	0.00
			Max. My	13	2.89	0.00	0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
T11	5 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-75.68	0.16	-0.04
			Max. Mx	15	-72.86	-1.82	-0.00
			Max. My	12	-36.20	-1.23	-0.28
			Max. Vy	23	18.13	-1.70	-0.08
			Max. Vx	7	0.88	-1.53	-0.25
		Top Girt	Max Tension	26	11.88	0.24	-0.12
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	11	9.75	0.40	-0.11
			Max. My	6	10.01	0.15	-0.14
			Max. Vy	8	-0.12	0.36	-0.09
			Max. Vx	5	-0.02	0.07	-0.05
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-3.16	0.66	-0.28
			Max. Mx	6	-2.81	0.82	-0.33
			Max. My	2	-2.81	0.82	-0.33
			Max. Vy	11	-1.86	0.80	-0.27
			Max. Vx	2	0.51	0.20	-0.15
		Mid Girt	Max Tension	10	0.10	0.00	0.00
			Max. Compression	25	-0.64	0.00	0.00
			Max. Mx	15	-0.64	-0.01	0.00
			Max. My	15	-0.60	0.00	-0.00
			Max. Vy	15	0.02	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	19	207.68	-0.39	-0.26
	Max. H_x	12	125.13	3.13	1.78
	Max. H_z	2	170.26	0.02	2.51
	Max. M_x	1	0.00	0.01	-0.01
	Max. M_z	1	0.00	0.01	-0.01
	Max. Torsion	1	0.00	0.01	-0.01
	Min. Vert	1	90.48	0.01	-0.01
	Min. H_x	4	125.05	-3.09	1.78
	Min. H_z	8	125.14	0.03	-3.60
	Min. M_x	1	0.00	0.01	-0.01

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. M_z	1	0.00	0.01	-0.01
	Min. Torsion	1	0.00	0.01	-0.01
Guy C @ 140 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.46	-0.21	0.12
	Max. H_x	10	-0.46	-0.21	0.12
	Max. H_z	3	-42.51	-31.79	18.91
	Min. Vert	5	-42.52	-32.29	18.07
	Min. H_x	5	-42.52	-32.29	18.07
	Min. H_z	10	-0.46	-0.21	0.12
Guy B @ 140 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.46	0.21	0.12
	Max. H_x	11	-42.39	32.19	18.02
	Max. H_z	13	-42.44	31.72	18.91
	Min. Vert	13	-42.44	31.72	18.91
	Min. H_x	6	-0.46	0.21	0.12
	Min. H_z	6	-0.46	0.21	0.12
Guy A @ 140 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.46	0.00	-0.24
	Max. H_x	10	-36.62	0.75	-31.78
	Max. H_z	2	-0.46	0.00	-0.24
	Min. Vert	7	-42.48	-0.51	-36.97
	Min. H_x	6	-36.70	-0.77	-31.86
	Min. H_z	7	-42.48	-0.51	-36.97
Guy C @ 88 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.33	-0.18	0.10
	Max. H_x	10	-0.33	-0.18	0.10
	Max. H_z	3	-31.29	-27.53	16.15
	Min. Vert	3	-31.29	-27.53	16.15
	Min. H_x	5	-31.29	-27.75	15.77
	Min. H_z	10	-0.33	-0.18	0.10
Guy B @ 88 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.33	0.18	0.10
	Max. H_x	11	-31.36	27.81	15.81
	Max. H_z	13	-31.40	27.60	16.27
	Min. Vert	13	-31.40	27.60	16.27
	Min. H_x	6	-0.33	0.18	0.10
	Min. H_z	6	-0.33	0.18	0.10
Guy A @ 88 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.33	0.00	-0.20
	Max. H_x	11	-16.76	0.45	-16.86
	Max. H_z	2	-0.33	0.00	-0.20
	Min. Vert	7	-31.36	-0.29	-31.99
	Min. H_x	6	-26.95	-0.45	-27.33
	Min. H_z	7	-31.36	-0.29	-31.99

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	90.48	-0.01	0.01	0.00	0.00	0.00

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
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	170.26	-0.02	-2.51	0.00	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	155.87	1.82	-2.30	0.00	0.00	0.00
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	125.05	3.09	-1.78	0.00	0.00	0.00
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	155.88	2.90	-0.42	0.00	0.00	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	170.27	2.16	1.27	0.00	0.00	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	155.91	1.07	2.76	0.00	0.00	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	125.14	-0.03	3.60	0.00	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	155.76	-1.11	2.75	0.00	0.00	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	170.13	-2.20	1.27	0.00	0.00	0.00
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	155.76	-2.94	-0.42	0.00	0.00	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	125.13	-3.13	-1.78	0.00	0.00	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	155.90	-1.85	-2.30	0.00	0.00	0.00
1.2 Dead+1.0 Ice+1.0 Temp+Guy	205.40	-0.06	0.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	207.61	-0.06	-0.52	0.00	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	207.18	0.19	-0.45	0.00	0.00	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	206.84	0.38	-0.25	0.00	0.00	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	207.22	0.46	0.01	0.00	0.00	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	207.68	0.39	0.26	0.00	0.00	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	207.21	0.21	0.44	0.00	0.00	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	206.80	-0.06	0.51	0.00	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	207.11	-0.32	0.44	0.00	0.00	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	207.53	-0.51	0.26	0.00	0.00	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	207.09	-0.57	0.01	0.00	0.00	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	206.76	-0.50	-0.25	0.00	0.00	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	207.14	-0.31	-0.45	0.00	0.00	0.00
Dead+Wind 0 deg - Service+Guy	90.83	-0.01	-0.79	0.00	0.00	0.00
Dead+Wind 30 deg - Service+Guy	90.79	0.38	-0.68	0.00	0.00	0.00
Dead+Wind 60 deg - Service+Guy	90.77	0.67	-0.39	0.00	0.00	0.00
Dead+Wind 90 deg - Service+Guy	90.79	0.78	0.01	0.00	0.00	0.00
Dead+Wind 120 deg - Service+Guy	90.84	0.67	0.41	0.00	0.00	0.00
Dead+Wind 150 deg -	90.79	0.38	0.69	0.00	0.00	0.00

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
Service+Guy						
Dead+Wind 180 deg - Service+Guy	90.77	-0.01	0.80	0.00	0.00	0.00
Dead+Wind 210 deg - Service+Guy	90.78	-0.41	0.69	0.00	0.00	0.00
Dead+Wind 240 deg - Service+Guy	90.83	-0.70	0.41	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	90.78	-0.80	0.01	0.00	0.00	0.00
Dead+Wind 300 deg - Service+Guy	90.76	-0.70	-0.39	0.00	0.00	0.00
Dead+Wind 330 deg - Service+Guy	90.78	-0.41	-0.68	0.00	0.00	0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-35.43	0.00	0.00	35.43	-0.00	0.003%
2	-0.01	-42.19	-63.25	0.01	42.19	63.25	0.002%
3	31.45	-42.02	-54.50	-31.45	42.02	54.50	0.002%
4	54.41	-41.86	-31.41	-54.40	41.86	31.41	0.002%
5	62.93	-42.02	0.01	-62.93	42.02	-0.01	0.002%
6	54.77	-42.19	31.64	-54.77	42.19	-31.64	0.002%
7	31.47	-42.02	54.51	-31.47	42.02	-54.51	0.002%
8	0.01	-41.86	62.84	-0.01	41.86	-62.84	0.002%
9	-31.45	-42.02	54.50	31.45	42.02	-54.50	0.002%
10	-54.76	-42.19	31.62	54.76	42.19	-31.62	0.003%
11	-62.93	-42.02	-0.01	62.93	42.02	0.01	0.002%
12	-54.42	-41.86	-31.43	54.42	41.86	31.43	0.002%
13	-31.47	-42.02	-54.51	31.47	42.02	54.51	0.002%
14	-0.00	-137.52	0.00	0.00	137.52	0.00	0.001%
15	-0.00	-137.66	-13.60	0.00	137.66	13.60	0.001%
16	6.79	-137.52	-11.76	-6.79	137.52	11.76	0.001%
17	11.76	-137.38	-6.79	-11.76	137.38	6.79	0.001%
18	13.58	-137.52	0.00	-13.58	137.52	0.00	0.001%
19	11.78	-137.66	6.80	-11.78	137.66	-6.80	0.001%
20	6.79	-137.52	11.76	-6.79	137.52	-11.76	0.001%
21	0.00	-137.38	13.58	0.00	137.38	-13.58	0.001%
22	-6.79	-137.52	11.76	6.79	137.52	-11.76	0.001%
23	-11.78	-137.66	6.80	11.78	137.66	-6.80	0.001%
24	-13.58	-137.52	-0.00	13.58	137.52	0.00	0.001%
25	-11.76	-137.38	-6.79	11.76	137.38	6.79	0.001%
26	-6.79	-137.52	-11.76	6.79	137.52	11.76	0.001%
27	-0.00	-35.46	-12.91	0.00	35.46	12.91	0.001%
28	6.42	-35.43	-11.12	-6.42	35.43	11.12	0.003%
29	11.10	-35.39	-6.41	-11.10	35.39	6.41	0.003%
30	12.84	-35.43	0.00	-12.84	35.43	-0.00	0.003%
31	11.18	-35.46	6.46	-11.18	35.46	-6.46	0.001%
32	6.42	-35.43	11.13	-6.42	35.43	-11.12	0.003%
33	0.00	-35.39	12.82	-0.00	35.39	-12.82	0.003%
34	-6.42	-35.43	11.12	6.42	35.43	-11.12	0.003%
35	-11.18	-35.46	6.45	11.18	35.46	-6.45	0.001%
36	-12.84	-35.43	-0.00	12.84	35.43	0.00	0.003%
37	-11.11	-35.39	-6.41	11.10	35.39	6.41	0.003%
38	-6.42	-35.43	-11.13	6.42	35.43	11.12	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	8	0.00000001	0.00005239
2	Yes	24	0.00002737	0.00006046
3	Yes	23	0.00003905	0.00006382
4	Yes	16	0.00006498	0.00006107
5	Yes	23	0.00003910	0.00006783
6	Yes	24	0.00002742	0.00006171
7	Yes	23	0.00003919	0.00008539
8	Yes	20	0.00007219	0.00005064
9	Yes	23	0.00003893	0.00006291
10	Yes	23	0.00004873	0.00009576
11	Yes	23	0.00003890	0.00006903
12	Yes	19	0.00007833	0.00005762
13	Yes	23	0.00003913	0.00008847
14	Yes	11	0.00010000	0.00005842
15	Yes	17	0.00000001	0.00004928
16	Yes	17	0.00000001	0.00003190
17	Yes	15	0.00000001	0.00004552
18	Yes	17	0.00000001	0.00003502
19	Yes	18	0.00000001	0.00002628
20	Yes	17	0.00000001	0.00003521
21	Yes	15	0.00000001	0.00004465
22	Yes	17	0.00000001	0.00002763
23	Yes	17	0.00000001	0.00004327
24	Yes	17	0.00000001	0.00002806
25	Yes	15	0.00000001	0.00004220
26	Yes	17	0.00000001	0.00003243
27	Yes	13	0.00000001	0.00004606
28	Yes	12	0.00000001	0.00007534
29	Yes	11	0.00000001	0.00008305
30	Yes	12	0.00000001	0.00007680
31	Yes	13	0.00000001	0.00004652
32	Yes	12	0.00000001	0.00007786
33	Yes	11	0.00000001	0.00008276
34	Yes	12	0.00000001	0.00007248
35	Yes	13	0.00000001	0.00004342
36	Yes	12	0.00000001	0.00007399
37	Yes	11	0.00000001	0.00008328
38	Yes	12	0.00000001	0.00007785

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	193 - 180	3.453	31	0.2316	0.0781
T2	180 - 160	2.823	31	0.2256	0.0754
T3	160 - 140	1.983	31	0.1502	0.0627
T4	140 - 120	1.482	27	0.1081	0.0609
T5	120 - 100	1.073	37	0.0922	0.0520
T6	100 - 80	0.749	37	0.0553	0.0408

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T7	80 - 60	0.588	37	0.0326	0.0373
T8	60 - 40	0.487	37	0.0132	0.0330
T9	40 - 20	0.441	37	0.0225	0.0472
T10	20 - 5	0.287	37	0.0535	0.0782
T11	5 - 0	0.076	37	0.0696	0.0911

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.00	AIR6449	31	3.306	0.2324	0.0779	143273
188.75	20' x 3" Dia Omni	31	3.245	0.2326	0.0777	143273
188.00	APXVAARR24-43	31	3.209	0.2326	0.0776	143273
180.00	6' x 3" Dia Omni	31	2.823	0.2256	0.0754	48888
178.75	7770.00	31	2.764	0.2228	0.0747	41106
178.00	6' Standoff	31	2.729	0.2209	0.0743	37070
177.50	Rohn 6'x15' Boom Gate	31	2.705	0.2195	0.0740	34664
169.00	SBNHH-1D65B	31	2.325	0.1878	0.0681	15634
162.50	Guy	31	2.069	0.1599	0.0638	11103
155.50	4 Bay Dipole	31	1.845	0.1356	0.0615	12850
151.00	3'-6" Standoff	31	1.726	0.1243	0.0612	18448
150.50	Rohn 6'x15' Boom Gate	31	1.714	0.1233	0.0611	19387
150.00	APXV9ERR18-C-A20 w/ Mount	31	1.702	0.1223	0.0611	20426
126.00	DB408	37	1.191	0.0984	0.0558	91059
122.50	3' Standoff	37	1.121	0.0952	0.0536	68160
121.00	PD220	37	1.092	0.0935	0.0527	60936
111.00	Folded Dipole	37	0.909	0.0766	0.0462	31588
110.00	3'-6" Standoff	37	0.892	0.0746	0.0456	30063
106.00	2'x2" Omni	37	0.829	0.0665	0.0434	25197
105.00	2' Standoff	37	0.814	0.0645	0.0429	24217
102.50	Guy	37	0.780	0.0597	0.0418	22276
62.50	Guy	37	0.495	0.0146	0.0331	47153

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	193 - 180	35.390	6	1.8936	0.6070
T2	180 - 160	30.236	6	1.8659	0.5934
T3	160 - 140	22.925	6	1.4996	0.5294
T4	140 - 120	17.292	6	1.2603	0.5053
T5	120 - 100	12.384	2	1.0655	0.4248
T6	100 - 80	8.478	10	0.7519	0.3557
T7	80 - 60	5.983	10	0.5065	0.3168
T8	60 - 40	4.282	10	0.3059	0.2937
T9	40 - 20	3.220	10	0.2791	0.3610
T10	20 - 5	1.896	10	0.3912	0.5032
T11	5 - 0	0.494	10	0.4590	0.5341

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.00	AIR6449	6	34.194	1.8979	0.6056	30226
188.75	20' x 3" Dia Omni	6	33.696	1.8989	0.6049	30226
188.00	APXVAARR24-43	6	33.398	1.8990	0.6044	30226
180.00	6' x 3" Dia Omni	6	30.236	1.8659	0.5934	10275
178.75	7770.00	6	29.746	1.8525	0.5903	8619
178.00	6' Standoff	6	29.454	1.8433	0.5883	7762
177.50	Rohn 6'x15' Boom Gate	6	29.259	1.8367	0.5868	7252
169.00	SBNHH-1D65B	6	26.040	1.6834	0.5574	3246
162.50	Guy	6	23.749	1.5474	0.5356	2299
155.50	4 Bay Dipole	6	21.528	1.4262	0.5223	2559
151.00	3'-6" Standoff	6	20.226	1.3671	0.5185	3430
150.50	Rohn 6'x15' Boom Gate	6	20.086	1.3612	0.5182	3565
150.00	APXV9ERR18-C-A20 w/ Mount	6	19.947	1.3555	0.5178	3710
126.00	DB408	2	13.787	1.1359	0.4517	6259
122.50	3' Standoff	2	12.959	1.0969	0.4357	5334
121.00	PD220	2	12.612	1.0784	0.4291	5016
111.00	Folded Dipole	10	10.458	0.9290	0.3909	3590
110.00	3'-6" Standoff	10	10.260	0.9126	0.3875	3491
106.00	2'x2" Omni	10	9.501	0.8465	0.3746	3143
105.00	2' Standoff	10	9.320	0.8301	0.3714	3067
102.50	Guy	10	8.885	0.7900	0.3636	2909
62.50	Guy	10	4.452	0.3238	0.2937	5489

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	193	Leg	A325N	0.7500	4	0.00	29.82	0.000 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	2	1.31	12.43	0.106 ✔	1	Bolt Shear
		Top Girt	A325N	0.6250	2	0.01	12.43	0.001 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.6250	2	0.45	12.43	0.036 ✔	1	Bolt Shear
T2	180	Leg	A325N	0.7500	4	3.13	29.82	0.105 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	2	4.95	12.43	0.398 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	5.57	10.44	0.534 ✔	1	Member Bearing
		Top Girt	A325N	0.6250	2	0.39	12.43	0.031 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.6250	2	3.27	12.43	0.263 ✔	1	Bolt Shear
		Torque Arm Top@162.496	A325N	0.8750	4	5.12	24.35	0.210 ✔	1	Bolt Shear
T3	160	Leg	A325N	0.7500	4	8.19	29.82	0.275 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	5.58	10.44	0.534 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	2.69	10.44	0.258 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.76	7.95	0.096 ✔	1	Bolt Shear

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
		Bottom Girt	A325N	0.5000	1	0.43	7.95	0.055 ✔	1	Bolt Shear
T4	140	Leg	A325N	0.7500	4	4.36	29.82	0.146 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	2.76	7.95	0.347 ✔	1	Bolt Shear
		Top Girt	A325N	0.5000	1	0.86	7.95	0.109 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.5000	1	1.02	7.95	0.128 ✔	1	Bolt Shear
T5	120	Leg	A325N	0.7500	4	5.27	29.82	0.177 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	2	3.09	12.43	0.248 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	4.73	10.44	0.453 ✔	1	Member Bearing
		Top Girt	A325N	0.6250	2	0.31	12.43	0.025 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.6250	2	1.51	12.43	0.122 ✔	1	Bolt Shear
		Torque Arm Top@102.496	A325N	0.8750	4	2.61	24.35	0.107 ✔	1	Bolt Shear
T6	100	Leg	A325N	0.7500	4	8.05	29.82	0.270 ✔	1	Bolt Tension
		Diagonal	A490X	0.5000	1	2.08	4.17	0.499 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.65	4.17	0.156 ✔	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.42	4.17	0.100 ✔	1	Member Bearing
T7	80	Leg	A325N	0.7500	4	6.47	29.82	0.217 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	3.79	7.83	0.484 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.91	7.95	0.114 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.5000	1	1.92	7.95	0.241 ✔	1	Bolt Shear
		Torque Arm Top@62.4961	A325N	0.8750	4	1.96	24.35	0.081 ✔	1	Bolt Shear
T8	60	Leg	A325N	0.7500	4	6.49	29.82	0.218 ✔	1	Bolt Tension
		Diagonal	A325X	0.5000	1	4.50	9.72	0.463 ✔	1	Bolt Shear
		Top Girt	A325N	0.5000	1	0.87	7.95	0.109 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.5000	1	1.18	7.95	0.148 ✔	1	Bolt Shear
T9	40	Leg	A325N	0.7500	4	5.63	29.82	0.189 ✔	1	Bolt Tension
		Diagonal	A490X	0.6250	1	2.42	5.26	0.461 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.92	4.17	0.220 ✔	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.39	4.17	0.095 ✔	1	Member Bearing
T10	20	Leg	A325N	0.7500	4	5.89	29.82	0.198 ✔	1	Bolt Tension
		Diagonal	A490X	0.5000	1	3.04	8.62	0.353 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.69	7.95	0.087 ✔	1	Bolt Shear
		Bottom Girt	A490X	0.6250	1	4.37	10.89	0.402 ✔	1	Member Bearing
T11	5	Leg	A325N	0.7500	4	5.68	29.82	0.190 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T2	162.50 (A) (594)	3/4 EHS	5.83	58.30	29.33	34.98	1.000	1.193 ✔
	162.50 (A) (595)	3/4 EHS	5.83	58.30	28.62	34.98	1.000	1.222 ✔
	162.50 (B) (590)	3/4 EHS	5.83	58.30	28.59	34.98	1.000	1.224 ✔
	162.50 (B) (591)	3/4 EHS	5.83	58.30	29.09	34.98	1.000	1.202 ✔
	162.50 (C) (586)	3/4 EHS	5.83	58.30	29.19	34.98	1.000	1.198 ✔
	162.50 (C) (587)	3/4 EHS	5.83	58.30	29.39	34.98	1.000	1.190 ✔
T5	102.50 (A) (606)	5/8 EHS	4.24	42.40	15.07	25.44	1.000	1.689 ✔
	102.50 (A) (607)	5/8 EHS	4.24	42.40	14.46	25.44	1.000	1.759 ✔
	102.50 (B) (602)	5/8 EHS	4.24	42.40	14.48	25.44	1.000	1.757 ✔
	102.50 (B) (603)	5/8 EHS	4.24	42.40	15.07	25.44	1.000	1.688 ✔
	102.50 (C) (598)	5/8 EHS	4.24	42.40	15.05	25.44	1.000	1.690 ✔
	102.50 (C) (599)	5/8 EHS	4.24	42.40	15.06	25.44	1.000	1.689 ✔
T7	62.50 (A) (618)	1/2 EHS	2.69	26.90	8.55	16.14	1.000	1.887 ✔
	62.50 (A) (619)	1/2 EHS	2.69	26.90	8.08	16.14	1.000	1.997 ✔
	62.50 (B) (614)	1/2 EHS	2.69	26.90	8.01	16.14	1.000	2.016 ✔
	62.50 (B) (615)	1/2 EHS	2.69	26.90	8.56	16.14	1.000	1.885 ✔
	62.50 (C) (610)	1/2 EHS	2.69	26.90	8.41	16.14	1.000	1.919 ✔
	62.50 (C) (611)	1/2 EHS	2.69	26.90	8.34	16.14	1.000	1.936 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 180	P2.5x.276	13.00	2.57	33.3 K=1.00	2.2535	1.00	-16.11	93.50	0.172 [1] ✔
T2	180 - 160	ROHN 2.5 EH w/plate	20.00	1.21	16.0 K=1.00	2.6593	1.00	-92.25	117.46	0.785 [1] ✔
T3	160 - 140	ROHN 2.5 EH w/plate	20.00	1.21	16.0 K=1.00	2.6593	0.98	-85.36	114.53	0.745 [1] ✔
T4	140 - 120	P2.5x.276	20.00	2.41	31.3 K=1.00	2.2535	0.98	-63.26	92.34	0.685 [1] ✔
T5	120 - 100	P3x.3	20.00	1.21	12.7 K=1.00	3.0159	0.96	-98.21	129.17	0.760 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	100 - 80	P3x.3	20.00	2.41	25.5 K=1.00	3.0159	1.00	-96.58	128.83	0.750 [1]
T7	80 - 60	P3x.3	20.00	2.41	25.5 K=1.00	3.0159	0.99	-84.85	128.71	0.659 [1]
T8	60 - 40	P3x.3	20.00	2.41	25.5 K=1.00	3.0159	0.95	-77.85	123.38	0.631 [1]
T9	40 - 20	P3x.3	20.00	2.41	51.0 K=2.00	3.0159	1.00	-70.84	112.25	0.631 [1]
T10	20 - 5	P3x.3	15.00	2.38	50.3 K=2.00	3.0159	1.00	-70.73	112.76	0.627 [1]
T11	5 - 0	P3x.3	5.38	1.55	16.4 K=1.00	3.0159	0.88	-75.68	116.72	0.648 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 180	L2x2x1/4	4.27	1.79	71.2 K=1.30	0.9380	-2.63	23.28	0.113 [1]
T2	180 - 160	L2x2x1/4	4.18	1.75	70.2 K=1.31	0.9380	-9.90	23.44	0.422 [1]
T3	160 - 140	L2x2x1/4	4.18	1.83	72.0 K=1.29	0.9380	-6.86	23.13	0.296 [1]
T4	140 - 120	ROHN TS1.5x11 ga	4.18	3.89	95.3 K=1.00	0.5202	-2.76	11.26	0.245 [1]
T5	120 - 100	L2x2x1/4	4.18	1.72	69.5 K=1.32	0.9380	-6.17	23.57	0.262 [1]
T6	100 - 80	ROHN TS1.5x16 ga	4.18	3.83	90.0 K=1.00	0.2627	-2.74	6.04	0.453 [1]
T7	80 - 60	L1 3/4x1 3/4x3/16	4.18	1.79	77.0 K=1.23	0.6211	-5.18	14.73	0.352 [1]
T8	60 - 40	ROHN TS1.5x11 ga	4.18	3.83	93.7 K=1.00	0.5202	-4.50	10.61	0.424 [1]
T9	40 - 20	ROHN TS1.5x16 ga	4.18	3.83	90.0 K=1.00	0.2627	-2.80	6.04	0.464 [1]
T10	20 - 5	ROHN TS1.5x11 ga	4.17	3.81	93.4 K=1.00	0.5202	-2.71	11.51	0.235 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x1/4	3.42	2.94	88.9 K=1.54	0.9380	-5.07	20.04	0.253 [1] ✔
T3	160 - 140	L2x2x1/4	3.42	2.94	88.9 K=1.54	0.9380	-1.60	20.04	0.080 [1] ✔
T5	120 - 100	L2x2x1/4	3.42	2.89	88.4 K=1.56	0.9380	-2.80	20.14	0.139 [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	193 - 180	L2x2x1/4	3.42	2.78	102.7 K=1.20	0.9380	-0.02	17.45	0.001 [1] ✔
T2	180 - 160	L2x2x1/4	3.42	2.78	102.7 K=1.20	0.9380	-0.77	17.45	0.044 [1] ✔
T9	40 - 20	ROHN TS1.5x16 ga	3.42	3.13	73.5 K=1.00	0.2627	-0.61	7.13	0.086 [1] ✔
T10	20 - 5	ROHN TS1.5x11 ga	3.42	3.13	76.6 K=1.00	0.5202	-0.15	13.72	0.011 [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	193 - 180	L2x2x1/4	3.42	2.78	102.7 K=1.20	0.9380	-0.82	17.45	0.047 [1] ✔
T2	180 - 160	L2x2x1/4	3.42	2.78	102.7 K=1.20	0.9380	-5.26	17.45	0.302 [1] ✔
T4	140 - 120	ROHN TS1.5x11 ga	3.42	3.18	77.9 K=1.00	0.5202	-0.07	13.55	0.005 [1] ✔
T5	120 - 100	L2x2x1/4	3.42	2.73	101.9 K=1.22	0.9380	-1.46	17.60	0.083 [1] ✔
T7	80 - 60	ROHN TS1.5x11 ga	3.42	3.13	76.6 K=1.00	0.5202	-0.59	13.72	0.043 [1] ✔
T9	40 - 20	ROHN TS1.5x16 ga	3.42	3.13	73.5 K=1.00	0.2627	-0.16	7.13	0.022 [1] ✔
T11	5 - 0	L3x3x1/2	0.34	0.05	60.5 K=58.86	2.7500	-3.16	73.48	0.043 [1] ✔

[1] P_u / ϕP_n controls

Mid Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T11	5 - 0	L3x3x1/2	2.32	2.02	80.8 K=1.94	2.7500	-0.64	63.19	0.010 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T2	180 - 160 (588)	C15x50	3.42	3.30	45.6 K=1.00	14.7000	-9.56	426.82	0.022
T2	180 - 160 (589)	C15x50	3.42	3.30	45.6 K=1.00	14.7000	-9.54	426.82	0.022
T2	180 - 160 (592)	C15x50	3.42	3.30	45.6 K=1.00	14.7000	-9.67	426.82	0.023
T2	180 - 160 (593)	C15x50	3.42	3.30	45.6 K=1.00	14.7000	-9.69	426.82	0.023
T2	180 - 160 (596)	C15x50	3.42	3.30	45.6 K=1.00	14.7000	-10.03	426.82	0.024
T2	180 - 160 (597)	C15x50	3.42	3.30	45.6 K=1.00	14.7000	-10.04	426.82	0.024
T5	120 - 100 (600)	C15x33.9	3.42	3.27	43.4 K=1.00	9.9600	-4.94	292.21	0.017
T5	120 - 100 (601)	C15x33.9	3.42	3.27	43.4 K=1.00	9.9600	-4.95	292.21	0.017
T5	120 - 100 (604)	C15x33.9	3.42	3.27	43.4 K=1.00	9.9600	-4.97	292.21	0.017
T5	120 - 100 (605)	C15x33.9	3.42	3.27	43.4 K=1.00	9.9600	-4.95	292.21	0.017
T5	120 - 100 (608)	C15x33.9	3.42	3.27	43.4 K=1.00	9.9600	-5.28	292.21	0.018
T5	120 - 100 (609)	C15x33.9	3.42	3.27	43.4 K=1.00	9.9600	-5.27	292.21	0.018
T7	80 - 60 (612)	C12x25	3.42	3.27	50.3 K=1.00	7.3500	-3.77	208.41	0.018
T7	80 - 60 (613)	C12x25	3.42	3.27	50.3 K=1.00	7.3500	-3.78	208.41	0.018
T7	80 - 60 (616)	C12x25	3.42	3.27	50.3 K=1.00	7.3500	-3.73	208.41	0.018
T7	80 - 60 (617)	C12x25	3.42	3.27	50.3 K=1.00	7.3500	-0.49	208.41	0.002
T7	80 - 60 (620)	C12x25	3.42	3.27	50.3 K=1.00	7.3500	-4.07	208.41	0.020
T7	80 - 60 (621)	C12x25	3.42	3.27	50.3 K=1.00	7.3500	-4.06	208.41	0.019

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T2	180 - 160 (588)	C15x50	-74.64	184.14	0.405	0.00	15.31	0.000
T2	180 - 160 (589)	C15x50	-74.47	184.14	0.404	-0.00	15.31	0.000
T2	180 - 160 (592)	C15x50	-74.82	184.14	0.406	0.00	15.31	0.000
T2	180 - 160 (593)	C15x50	-75.09	184.14	0.408	-0.00	15.31	0.000
T2	180 - 160 (596)	C15x50	-76.38	184.14	0.415	0.00	15.31	0.000
T2	180 - 160 (597)	C15x50	-76.46	184.14	0.415	-0.00	15.31	0.000
T5	120 - 100 (600)	C15x33.9	-36.66	136.08	0.269	0.00	12.60	0.000
T5	120 - 100 (601)	C15x33.9	-36.67	136.08	0.269	-0.00	12.60	0.000
T5	120 - 100 (604)	C15x33.9	-36.70	136.08	0.270	0.00	12.60	0.000
T5	120 - 100 (605)	C15x33.9	-36.66	136.08	0.269	-0.00	12.60	0.000
T5	120 - 100 (608)	C15x33.9	-38.22	136.08	0.281	0.00	12.60	0.000
T5	120 - 100 (609)	C15x33.9	-38.17	136.08	0.281	-0.00	12.60	0.000
T7	80 - 60 (612)	C12x25	-15.29	78.77	0.194	0.00	7.61	0.000
T7	80 - 60 (613)	C12x25	-15.32	78.77	0.194	-0.00	7.61	0.000
T7	80 - 60 (616)	C12x25	-15.16	78.77	0.192	0.00	7.61	0.000
T7	80 - 60 (617)	C12x25	-15.77	78.77	0.200	-0.00	7.61	0.000
T7	80 - 60 (620)	C12x25	-16.17	78.77	0.205	0.00	7.61	0.000
T7	80 - 60 (621)	C12x25	-16.15	78.77	0.205	-0.00	7.61	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	180 - 160 (588)	C15x50	0.022	0.405	0.000	0.417 ✔	1.000	4.8.1 ✔
T2	180 - 160 (589)	C15x50	0.022	0.404	0.000	0.416 ✔	1.000	4.8.1 ✔
T2	180 - 160 (592)	C15x50	0.023	0.406	0.000	0.418 ✔	1.000	4.8.1 ✔
T2	180 - 160 (593)	C15x50	0.023	0.408	0.000	0.419 ✔	1.000	4.8.1 ✔
T2	180 - 160 (596)	C15x50	0.024	0.415	0.000	0.427 ✔	1.000	4.8.1 ✔
T2	180 - 160 (597)	C15x50	0.024	0.415	0.000	0.427 ✔	1.000	4.8.1 ✔
T5	120 - 100 (600)	C15x33.9	0.017	0.269	0.000	0.278 ✔	1.000	4.8.1 ✔
T5	120 - 100 (601)	C15x33.9	0.017	0.269	0.000	0.278 ✔	1.000	4.8.1 ✔
T5	120 - 100 (604)	C15x33.9	0.017	0.270	0.000	0.278 ✔	1.000	4.8.1 ✔
T5	120 - 100 (605)	C15x33.9	0.017	0.269	0.000	0.278 ✔	1.000	4.8.1 ✔
T5	120 - 100 (608)	C15x33.9	0.018	0.281	0.000	0.290 ✔	1.000	4.8.1 ✔
T5	120 - 100 (609)	C15x33.9	0.018	0.281	0.000	0.290 ✔	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
T7	80 - 60 (612)	C12x25	0.018	0.194	0.000	0.203 ✔	1.000	4.8.1 ✔
T7	80 - 60 (613)	C12x25	0.018	0.194	0.000	0.204 ✔	1.000	4.8.1 ✔
T7	80 - 60 (616)	C12x25	0.018	0.192	0.000	0.201 ✔	1.000	4.8.1 ✔
T7	80 - 60 (617)	C12x25	0.002	0.200	0.000	0.201 ✔	1.000	4.8.1 ✔
T7	80 - 60 (620)	C12x25	0.020	0.205	0.000	0.215 ✔	1.000	4.8.1 ✔
T7	80 - 60 (621)	C12x25	0.019	0.205	0.000	0.215 ✔	1.000	4.8.1 ✔

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	193 - 180	P2.5x.276	13.00	2.57	33.3	2.2535	12.50	101.41	0.123 [1] ✔
T2	180 - 160	ROHN 2.5 EH w/plate	20.00	1.21	16.0	2.6593	79.08	119.67	0.661 [1] ✔
T3	160 - 140	ROHN 2.5 EH w/plate	20.00	1.21	16.0	2.6593	32.78	119.67	0.274 [1] ✔
T5	120 - 100	P3x.3	20.00	1.21	12.7	3.0159	23.55	135.72	0.174 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 180	L2x2x1/4	4.27	1.79	39.2	0.5629	2.52	24.49	0.103 [1] ✔
T2	180 - 160	L2x2x1/4	4.18	1.75	38.3	0.5629	9.03	24.49	0.369 [1] ✔
T3	160 - 140	L2x2x1/4	4.18	1.83	38.3	0.5629	5.58	24.49	0.228 [1] ✔
T4	140 - 120	ROHN TS1.5x11 ga	4.18	3.89	95.3	0.5202	1.72	19.67	0.088 [1] ✔
T5	120 - 100	L2x2x1/4	4.18	1.72	37.7	0.5629	3.99	24.49	0.163 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	100 - 80	ROHN TS1.5x16 ga	4.18	3.83	90.0	0.2627	2.08	9.93	0.209 [1]
T7	80 - 60	L1 3/4x1 3/4x3/16	4.18	1.79	42.8	0.3604	3.79	15.68	0.242 [1]
T8	60 - 40	ROHN TS1.5x11 ga	4.18	3.83	93.7	0.5202	3.15	16.86	0.187 [1]
T9	40 - 20	ROHN TS1.5x16 ga	4.18	3.83	90.0	0.2627	2.42	9.93	0.244 [1]
T10	20 - 5	ROHN TS1.5x11 ga	4.17	3.81	93.4	0.5202	3.04	19.67	0.155 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x1/4	3.42	2.94	62.6	0.5629	5.57	24.49	0.228 [1]
T3	160 - 140	L2x2x1/4	3.42	2.94	62.6	0.5629	2.69	24.49	0.110 [1]
T5	120 - 100	L2x2x1/4	3.42	2.89	61.6	0.5629	4.73	24.49	0.193 [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	193 - 180	L2x2x1/4	3.42	2.78	62.6	0.5629	0.02	24.49	0.001 [1]
T2	180 - 160	L2x2x1/4	3.42	2.78	62.6	0.5629	0.78	24.49	0.032 [1]
T3	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9	0.5202	0.76	19.67	0.039 [1]
T4	140 - 120	ROHN TS1.5x11 ga	3.42	3.18	77.9	0.5202	0.86	19.67	0.044 [1]
T5	120 - 100	L2x2x1/4	3.42	2.73	61.6	0.5629	0.63	24.49	0.026 [1]
T6	100 - 80	ROHN TS1.5x16 ga	3.42	3.13	73.5	0.2627	0.65	9.93	0.065 [1]
T7	80 - 60	ROHN TS1.5x11 ga	3.42	3.13	76.6	0.5202	0.91	19.67	0.046 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	60 - 40	ROHN TS1.5x11 ga	3.42	3.13	76.6	0.5202	0.87	19.67	0.044 [1]
T9	40 - 20	ROHN TS1.5x16 ga	3.42	3.13	73.5	0.2627	0.92	9.93	0.092 [1]
T10	20 - 5	ROHN TS1.5x11 ga	3.42	3.13	76.6	0.5202	0.69	19.67	0.035 [1]
T11	5 - 0	L3x3x1/2	3.30	3.01	40.2	2.7500	11.88	89.10	0.133 [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	193 - 180	L2x2x1/4	3.42	2.78	62.6	0.5629	0.89	24.49	0.036 [1]
T2	180 - 160	L2x2x1/4	3.42	2.78	62.6	0.5629	6.55	24.49	0.267 [1]
T3	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9	0.5202	0.43	19.67	0.022 [1]
T4	140 - 120	ROHN TS1.5x11 ga	3.42	3.18	77.9	0.5202	1.02	19.67	0.052 [1]
T5	120 - 100	L2x2x1/4	3.42	2.73	61.6	0.5629	3.02	24.49	0.124 [1]
T6	100 - 80	ROHN TS1.5x16 ga	3.42	3.13	73.5	0.2627	0.42	9.93	0.042 [1]
T7	80 - 60	ROHN TS1.5x11 ga	3.42	3.13	76.6	0.5202	1.92	19.67	0.097 [1]
T8	60 - 40	ROHN TS1.5x11 ga	3.42	3.13	76.6	0.5202	1.18	19.67	0.060 [1]
T9	40 - 20	ROHN TS1.5x16 ga	3.42	3.13	73.5	0.2627	0.39	9.93	0.040 [1]
T10	20 - 5	ROHN TS1.5x11 ga	3.42	3.13	76.6	0.5202	4.37	19.67	0.222 [1]

[1] P_u / ϕP_n controls

Mid 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 $\frac{P_u}{\phi P_n}$
T11	5 - 0	L3x3x1/2	1.33	1.04	13.9	2.7500	0.10	89.10	0.001 [1]

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

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T2	180 - 160 (588)	C15x50	3.42	3.30	45.6	14.7000	8.20	476.28	0.017
T2	180 - 160 (589)	C15x50	3.42	3.30	45.6	14.7000	0.36	476.28	0.001
T2	180 - 160 (592)	C15x50	3.42	3.30	45.6	14.7000	0.36	476.28	0.001
T2	180 - 160 (593)	C15x50	3.42	3.30	45.6	14.7000	8.02	476.28	0.017
T2	180 - 160 (596)	C15x50	3.42	3.30	45.6	14.7000	8.79	476.28	0.018
T2	180 - 160 (597)	C15x50	3.42	3.30	45.6	14.7000	8.43	476.28	0.018
T5	120 - 100 (600)	C15x33.9	3.42	3.27	43.4	9.9600	3.95	322.70	0.012
T5	120 - 100 (601)	C15x33.9	3.42	3.27	43.4	9.9600	0.65	322.70	0.002
T5	120 - 100 (604)	C15x33.9	3.42	3.27	43.4	9.9600	0.65	322.70	0.002
T5	120 - 100 (605)	C15x33.9	3.42	3.27	43.4	9.9600	3.96	322.70	0.012
T5	120 - 100 (608)	C15x33.9	3.42	3.27	43.4	9.9600	4.36	322.70	0.014
T5	120 - 100 (609)	C15x33.9	3.42	3.27	43.4	9.9600	4.36	322.70	0.014
T7	80 - 60 (612)	C12x25	3.42	3.27	50.3	7.3500	2.48	238.14	0.010
T7	80 - 60 (613)	C12x25	3.42	3.27	50.3	7.3500	0.12	238.14	0.000
T7	80 - 60 (616)	C12x25	3.42	3.27	50.3	7.3500	0.12	238.14	0.000
T7	80 - 60 (617)	C12x25	3.42	3.27	50.3	7.3500	2.56	238.14	0.011
T7	80 - 60 (620)	C12x25	3.42	3.27	50.3	7.3500	2.84	238.14	0.012
T7	80 - 60 (621)	C12x25	3.42	3.27	50.3	7.3500	2.98	238.14	0.013

Torque-Arm Top Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
T2	180 - 160 (588)	C15x50	-66.46	184.14	0.361	0.00	15.31	0.000
T2	180 - 160 (589)	C15x50	-77.71	184.14	0.422	0.00	15.31	0.000
T2	180 - 160 (592)	C15x50	-77.65	184.14	0.422	-0.00	15.31	0.000
T2	180 - 160 (593)	C15x50	-66.08	184.14	0.359	-0.00	15.31	0.000
T2	180 - 160 (596)	C15x50	-67.42	184.14	0.366	0.00	15.31	0.000
T2	180 - 160 (597)	C15x50	-66.92	184.14	0.363	0.00	15.31	0.000
T5	120 - 100 (600)	C15x33.9	-33.59	136.08	0.247	0.00	12.60	0.000
T5	120 - 100 (601)	C15x33.9	-39.59	136.08	0.291	0.00	12.60	0.000
T5	120 - 100 (604)	C15x33.9	-39.66	136.08	0.291	-0.00	12.60	0.000
T5	120 - 100 (605)	C15x33.9	-33.55	136.08	0.247	-0.00	12.60	0.000
T5	120 - 100 (608)	C15x33.9	-34.77	136.08	0.255	0.00	12.60	0.000
T5	120 - 100 (609)	C15x33.9	-34.73	136.08	0.255	0.00	12.60	0.000
T7	80 - 60 (612)	C12x25	-13.34	78.77	0.169	0.00	7.61	0.000
T7	80 - 60 (613)	C12x25	-16.64	78.77	0.211	0.00	7.61	0.000
T7	80 - 60 (616)	C12x25	-16.67	78.77	0.212	-0.00	7.61	0.000
T7	80 - 60 (617)	C12x25	-13.43	78.77	0.170	-0.00	7.61	0.000
T7	80 - 60 (620)	C12x25	-13.93	78.77	0.177	-0.00	7.61	0.000
T7	80 - 60 (621)	C12x25	-14.10	78.77	0.179	-0.00	7.61	0.000

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

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	180 - 160 (588)	C15x50	0.017	0.361	0.000	0.370 ✔	1.000	4.8.1 ✔
T2	180 - 160 (589)	C15x50	0.001	0.422	0.000	0.422 ✔	1.000	4.8.1 ✔
T2	180 - 160 (592)	C15x50	0.001	0.422	0.000	0.422 ✔	1.000	4.8.1 ✔
T2	180 - 160 (593)	C15x50	0.017	0.359	0.000	0.367 ✔	1.000	4.8.1 ✔
T2	180 - 160 (596)	C15x50	0.018	0.366	0.000	0.375 ✔	1.000	4.8.1 ✔
T2	180 - 160 (597)	C15x50	0.018	0.363	0.000	0.372 ✔	1.000	4.8.1 ✔
T5	120 - 100 (600)	C15x33.9	0.012	0.247	0.000	0.253 ✔	1.000	4.8.1 ✔
T5	120 - 100 (601)	C15x33.9	0.002	0.291	0.000	0.292 ✔	1.000	4.8.1 ✔
T5	120 - 100 (604)	C15x33.9	0.002	0.291	0.000	0.292 ✔	1.000	4.8.1 ✔
T5	120 - 100 (605)	C15x33.9	0.012	0.247	0.000	0.253 ✔	1.000	4.8.1 ✔
T5	120 - 100 (608)	C15x33.9	0.014	0.255	0.000	0.262 ✔	1.000	4.8.1 ✔
T5	120 - 100 (609)	C15x33.9	0.014	0.255	0.000	0.262 ✔	1.000	4.8.1 ✔
T7	80 - 60 (612)	C12x25	0.010	0.169	0.000	0.175 ✔	1.000	4.8.1 ✔
T7	80 - 60 (613)	C12x25	0.000	0.211	0.000	0.212 ✔	1.000	4.8.1 ✔
T7	80 - 60 (616)	C12x25	0.000	0.212	0.000	0.212 ✔	1.000	4.8.1 ✔
T7	80 - 60 (617)	C12x25	0.011	0.170	0.000	0.176 ✔	1.000	4.8.1 ✔
T7	80 - 60 (620)	C12x25	0.012	0.177	0.000	0.183 ✔	1.000	4.8.1 ✔
T7	80 - 60 (621)	C12x25	0.013	0.179	0.000	0.185 ✔	1.000	4.8.1 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	193 - 180	Leg	P2.5x.276	2	-16.11	93.50	17.2	Pass
T2	180 - 160	Leg	ROHN 2.5 EH w/plate	41	-92.25	117.46	78.5	Pass
T3	160 - 140	Leg	ROHN 2.5 EH w/plate	122	-85.36	114.53	74.5	Pass
T4	140 - 120	Leg	P2.5x.276	203	-63.26	92.34	68.5	Pass
T5	120 - 100	Leg	P3x.3	260	-98.21	129.17	76.0	Pass
T6	100 - 80	Leg	P3x.3	341	-96.58	128.83	75.0	Pass
T7	80 - 60	Leg	P3x.3	398	-84.85	128.71	65.9	Pass
T8	60 - 40	Leg	P3x.3	455	-77.85	123.38	63.1	Pass
T9	40 - 20	Leg	P3x.3	513	-70.84	112.25	63.1	Pass
T10	20 - 5	Leg	P3x.3	545	-70.73	112.76	62.7	Pass
T11	5 - 0	Leg	P3x.3	572	-75.68	116.72	64.8	Pass
T1	193 - 180	Diagonal	L2x2x1/4	13	-2.63	23.28	11.3	Pass
T2	180 - 160	Diagonal	L2x2x1/4	70	-9.90	23.44	42.2	Pass
T3	160 - 140	Diagonal	L2x2x1/4	196	-6.86	23.13	29.6	Pass
							53.4 (b)	
T4	140 - 120	Diagonal	ROHN TS1.5x11 ga	214	-2.76	11.26	24.5	Pass
							34.7 (b)	
T5	120 - 100	Diagonal	L2x2x1/4	289	-6.17	23.57	26.2	Pass
T6	100 - 80	Diagonal	ROHN TS1.5x16 ga	396	-2.74	6.04	45.3	Pass
							49.9 (b)	
T7	80 - 60	Diagonal	L1 3/4x1 3/4x3/16	408	-5.18	14.73	35.2	Pass
							48.4 (b)	
T8	60 - 40	Diagonal	ROHN TS1.5x11 ga	508	-4.50	10.61	42.4	Pass
							46.3 (b)	
T9	40 - 20	Diagonal	ROHN TS1.5x16 ga	542	-2.80	6.04	46.4	Pass
T10	20 - 5	Diagonal	ROHN TS1.5x11 ga	553	-2.71	11.51	23.5	Pass
							35.3 (b)	
T2	180 - 160	Secondary Horizontal	L2x2x1/4	64	-5.07	20.04	25.3	Pass
							53.4 (b)	
T3	160 - 140	Secondary Horizontal	L2x2x1/4	200	2.69	24.49	11.0	Pass
							25.8 (b)	
T5	120 - 100	Secondary Horizontal	L2x2x1/4	283	4.73	24.49	19.3	Pass
							45.3 (b)	
T1	193 - 180	Top Girt	L2x2x1/4	6	-0.02	17.45	0.2	Pass
T2	180 - 160	Top Girt	L2x2x1/4	45	-0.77	17.45	4.4	Pass
T3	160 - 140	Top Girt	ROHN TS1.5x11 ga	125	0.76	19.67	3.9	Pass
							9.6 (b)	
T4	140 - 120	Top Girt	ROHN TS1.5x11 ga	206	0.86	19.67	4.4	Pass
							10.9 (b)	
T5	120 - 100	Top Girt	L2x2x1/4	263	0.63	24.49	2.6	Pass
T6	100 - 80	Top Girt	ROHN TS1.5x16 ga	344	0.65	9.93	6.5	Pass
							15.6 (b)	
T7	80 - 60	Top Girt	ROHN TS1.5x11 ga	401	0.91	19.67	4.6	Pass
							11.4 (b)	
T8	60 - 40	Top Girt	ROHN TS1.5x11 ga	458	0.87	19.67	4.4	Pass
							10.9 (b)	
T9	40 - 20	Top Girt	ROHN TS1.5x16 ga	515	0.92	9.93	9.2	Pass
							22.0 (b)	
T10	20 - 5	Top Girt	ROHN TS1.5x11 ga	549	0.69	19.67	3.5	Pass
							8.7 (b)	
T11	5 - 0	Top Girt	L3x3x1/2	574	11.88	89.10	13.3	Pass
T1	193 - 180	Bottom Girt	L2x2x1/4	9	-0.82	17.45	4.7	Pass
T2	180 - 160	Bottom Girt	L2x2x1/4	47	-5.26	17.45	30.2	Pass
T3	160 - 140	Bottom Girt	ROHN TS1.5x11 ga	129	0.43	19.67	2.2	Pass
							5.5 (b)	
T4	140 - 120	Bottom Girt	ROHN TS1.5x11 ga	208	1.02	19.67	5.2	Pass
							12.8 (b)	
T5	120 - 100	Bottom Girt	L2x2x1/4	266	3.02	24.49	12.4	Pass
T6	100 - 80	Bottom Girt	ROHN TS1.5x16 ga	348	0.42	9.93	4.2	Pass
							10.0 (b)	
T7	80 - 60	Bottom Girt	ROHN TS1.5x11 ga	404	1.92	19.67	9.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T8	60 - 40	Bottom Girt	ROHN TS1.5x11 ga	462	1.18	19.67	24.1 (b) 6.0	Pass
T9	40 - 20	Bottom Girt	ROHN TS1.5x16 ga	517	0.39	9.93	14.8 (b) 4.0	Pass
T10	20 - 5	Bottom Girt	ROHN TS1.5x11 ga	550	4.37	19.67	9.5 (b) 22.2	Pass
T11	5 - 0	Bottom Girt	L3x3x1/2	577	-3.16	73.48	40.2 (b) 6.4	Pass
T11	5 - 0	Mid Girt	L3x3x1/2	583	-0.64	63.19	1.0	Pass
T2	180 - 160	Guy A@162.496	3/4	594	29.33	34.98	83.8	Pass
T5	120 - 100	Guy A@102.496	5/8	606	15.07	25.44	59.2	Pass
T7	80 - 60	Guy A@62.4961	1/2	618	8.55	16.14	53.0	Pass
T2	180 - 160	Guy B@162.496	3/4	591	29.09	34.98	83.2	Pass
T5	120 - 100	Guy B@102.496	5/8	603	15.07	25.44	59.2	Pass
T7	80 - 60	Guy B@62.4961	1/2	615	8.56	16.14	53.1	Pass
T2	180 - 160	Guy C@162.496	3/4	587	29.39	34.98	84.0	Pass
T5	120 - 100	Guy C@102.496	5/8	599	15.06	25.44	59.2	Pass
T7	80 - 60	Guy C@62.4961	1/2	610	8.41	16.14	52.1	Pass
T2	180 - 160	Torque Arm Top@162.496	C15x50	597	-10.04	426.82	42.7	Pass
T5	120 - 100	Torque Arm Top@102.496	C15x33.9	604	-4.97	292.21	29.2	Pass
T7	80 - 60	Torque Arm Top@62.4961	C12x25	620	-4.07	208.41	21.5	Pass
							Summary	
						Leg (T2)	78.5	Pass
						Diagonal (T3)	53.4	Pass
						Secondary Horizontal (T2)	53.4	Pass
						Top Girt (T9)	22.0	Pass
						Bottom Girt (T10)	40.2	Pass
						Mid Girt (T11)	1.0	Pass
						Guy A (T2)	83.8	Pass
						Guy B (T2)	83.2	Pass
						Guy C (T2)	84.0	Pass
						Torque Arm Top (T2)	42.7	Pass
						Bolt Checks	53.4	Pass
						RATING =	**84.0**	**Pass**

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

Job :	T-Mobile ~ CTNL023C: 193-ft Guyed Lattice Tower	Project No.	19027.72	Sheet	1	of	2
Address:	57 Cook Drive Montville, CT	Computed by	TJL	Date		7/14/20	
Description:	Guy Anchor Evaluation	Checked by	CAG	Date			

CHECK UPLIFT RESISTANCE

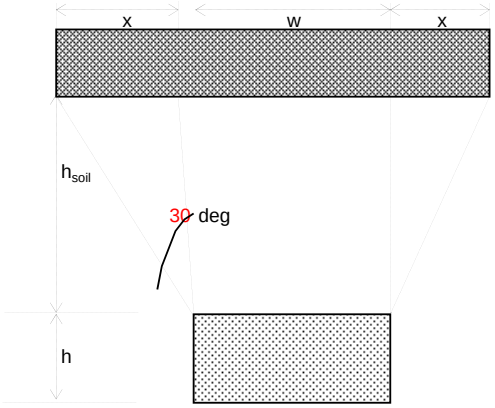
ANCHOR (C) AT 140ft RADIUS

RESULTS FROM COMPUTER ANALYSIS:

Uplift =	43	kips
Sliding =	37	kips
Wdepth =	6	ft

CONCRETE PARAMETERS:

γ_{conc} =	150	pcf
$\gamma_{conc.sub}$ =	87.6	pcf
w =	5	ft
h =	2	ft
d =	9	ft
Vol. =	0.00	ft^3
Vol.sub =	90.00	ft^3
Wc =	*7.88*	kips
Ø =	*0.90*	
	7.10	



Foundation Section

SOIL PARAMETERS:

γ_{soil} =	120	pcf
$\gamma_{soil.sub}$ =	57.6	pcf
h_{soil} =	8	ft
x =	*4.62*	ft

Soil Weight (Wr):

B1 =	45.00	
B2 =	82.66	
B3 =	259.66	
W.soil =	117.32	kips
W.soil.sub =	7.24	kips
Total =	*124.56*	kips
Ø =	*0.75*	
	93.42	

SF AGAINST SLIDING

2.34 **>** *1* ***OK***

GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE

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Job :	T-Mobile ~ CTNL023C: 193-ft Guyed Lattice Tower	Project No.	19027.72	Sheet	2	of	2
Address:	57 Cook Drive Montville, CT	Computed by	TJL	Date		7/14/20	
Description:	Guy Anchor Evaluation	Checked by	CFC	Date			

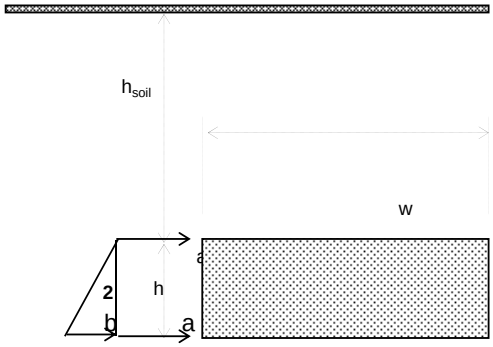
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma soil$ =	120	pcf
$\gamma soil$ =	57.6	pcf
h_{soil} =	8	ft
h =	2	ft
ϕ =	30	degrees

ANCHOR PARAMETERS

w =	5.0	ft
h =	2.0	ft
d =	9.0	ft



Foundation Elevation View

K_p = 3.00

HORIZONTAL FORCES

	2.51	ksf
	2.85	ksf
RESIST TO SLIDING =	48.21	k

SOIL & CONCRETE WEIGHT =	Wr + Wc = 100.52	k
UPLIFT REACTIONS =	-43	k
SUM =	57.52	k

COEF. OF FRICTION, (0.45) =	25.88	k
RESIST TO SLIDING =	48.21	k
SUM =	74.09	k

SF AGAINST SLIDING

SF = 2.0 > 1 OK

GUY ANCHORS AGAINST SLIDING ARE ADEQUATE

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Job :	T-Mobile ~ CTNL023C: 193-ft Guyed Lattice Tower	Project No.	20074.51	Sheet	1	of	2
Address:	57 Cook Drive Montville, CT	Computed by	TJL	Date		7/14/20	
Description:	Guy Anchor Evaluation	Checked by	CAG	Date			

CHECK UPLIFT RESISTANCE

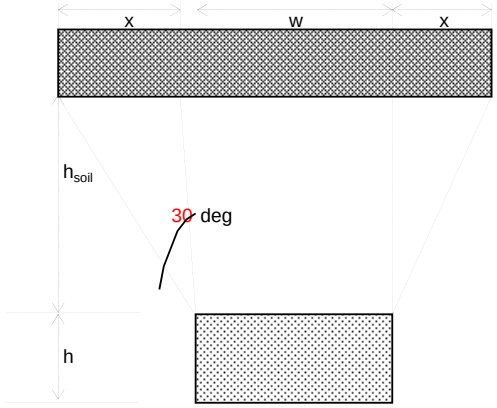
ANCHOR (B) AT 88ft RADIUS

RESULTS FROM COMPUTER ANALYSIS:

Uplift =	31	kips
Sliding =	32	kips
Wdepth =	6	ft

CONCRETE PARAMETERS:

γ_{conc} =	150	pcf
$\gamma_{conc.sub}$ =	87.6	pcf
w =	6	ft
h =	4	ft
d =	12	ft
Vol. =	144.00	ft^3
Vol.sub =	144.00	ft^3
Wc =	*34.21*	kips
Ø =	*0.90*	
	30.79	



Foundation Section

SOIL PARAMETERS:

γ_{soil} =	120	pcf
$\gamma_{soil.sub}$ =	57.6	pcf
h_{soil} =	4	ft
x =	*2.31*	ft

Soil Weight (Wr):

B1 =	72.00	
B2 =	72.00	
B3 =	176.47	
W.soil =	57.79	kips
W.soil.sub =	0.00	kips
Total =	*57.79*	kips
Ø =	*0.75*	
	43.34	

SF AGAINST SLIDING

2.39 **>** *1* ***OK***

GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE

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Branford, CT 06405 F: (203) 488-8587

Job :	T-Mobile ~ CTNL023C: 193-ft Guyed Lattice Tower	Project No.	20074.51	Sheet	2	of	2
Address:	57 Cook Drive Montville, CT	Computed by	TJL	Date		7/14/20	
Description:	Guy Anchor Evaluation	Checked by	CFC	Date			

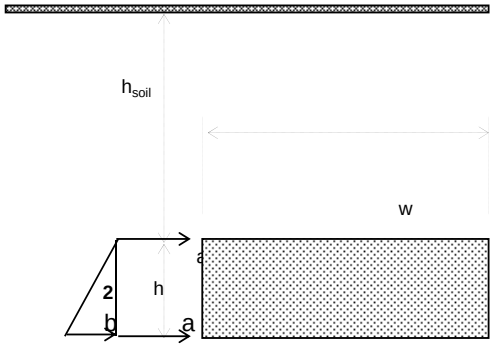
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma soil$ =	120	pcf
$\gamma soil$ =	57.6	pcf
h_{soil} =	4	ft
h =	4	ft
ϕ =	30	degrees

ANCHOR PARAMETERS

w =	6.0	ft
h =	4.0	ft
d =	12.0	ft



Foundation Elevation View

K_p = 3.00

HORIZONTAL FORCES

		1.44	ksf
		2.51	ksf
RESIST TO SLIDING =		94.69	k
SOIL & CONCRETE WEIGHT =	Wr + Wc =	74.14	k
UPLIFT REACTIONS =		-31	k
SUM =		43.14	k
COEF. OF FRICTION, (0.45) =		19.41	k
RESIST TO SLIDING =		94.69	k
SUM =		114.11	k

SF AGAINST SLIDING

SF = 3.6 > 1 OK

GUY ANCHORS AGAINST SLIDING ARE ADEQUATE

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

Subject:	Base Foundation Analysis
Location:	193-ft Guyed Lattice Tower Montville, CT
Rev. 0: 7/14/20	Prepared by: T.J.L. Checked by: C.F.C. Job No. 20074.51

Guyed Tower Base Foundation:

Input Data:

Tower Data

Shear Force =	$Shear := 4 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$Axial := 208 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 193 \cdot ft$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 5.0 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 3.75 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0.5 \cdot ft$	(User Input)	
Width of Pier =	$W_p := 2.5 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 1.75 \cdot ft$	(User Input)	
Width of Footing =	$W_{f1} := 7 \cdot ft$	(User Input)	
Length of Footing =	$W_{f2} := 7 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 3000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Ultimate Soil Bearing Capacity =	$q_s := 12000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 120 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 1$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Calculated Factors:

Coefficient of Lateral Soil Pressure =

$$K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$$

Load Factor =

$$LF := \begin{cases} 1.333 & \text{if } H_t \le 700 \cdot ft \\ 1.7 & \text{if } H_t \ge 1200 \cdot ft \\ 1.333 + \left(\frac{H_t - 700ft}{1200ft - 700ft}\right) \cdot 0.4 & \text{otherwise} \end{cases} = 1.333$$

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 87.6 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 57.6 \cdot pcf$

Passive Pressure = $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} = 0 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 0.562 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 0.562 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 0.864 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 0.713 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 1.75$

$A_p := W_{f1} \cdot T_p = 12.25$

Soil Shear Resistance = $Sl_1 := P_{ave} \cdot A_p = 8.73 \cdot kip$

Weight of Concrete = $WT_c := \left[(W_{f1} \cdot W_{f2} \cdot T_f) + W_p^2 L_p\right] \cdot \gamma_c = 9.56 \cdot kip$

Total Weight = $WT_{tot} := WT_c + Axial = 217.56 \cdot kip$

Soil/Concrete Friction Resistance = $Sl_2 := \mu \cdot WT_{tot} = 97.9 \cdot kips$

Total Sliding Resistance = $Sl_{tot} := Sl_1 + Sl_2 = 106.64 \cdot kips$

Sliding Resistance Ratio = $Sliding\_Resistance_{ratio} := \frac{0.75 Sl_{tot}}{Shear} = 19.99$

$Sliding\_Resistance\_Check := if\left[\left(\frac{Shear}{0.75 Sl_{tot}} < 1.0\right), "Okay", "No Good"\right]$

Sliding_Resistance_Check = "Okay"

Bearing Pressure Caused by Footing:

Area of the Mat = $A_{mat} := W_{f1} \cdot W_{f2} = 49$

Maximum Pressure in Mat = $P_{max} := \frac{WT_{tot}}{A_{mat}} = 4.44 \cdot ksf$

$Max\_Pressure\_Check := if(P_{max} < 0.6 q_s, "Okay", "No Good")$

Max_Pressure_Check = "Okay"

RAN Template:	A&L Template:
67D5A997DB Hybrid	67D5997DB_2xAIR+1OP (U21 Market)

CTNL023C_Anchor_3_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 1 - Site Information

Site ID: CTNL023C
Status: Draft
Version: 3
Project Type: Anchor
Approved: Not Approved
Approved By: Not Approved
Last Modified: 6/30/2020 5:8:35 PM
Last Modified By: Dominic.Kallas2@T-Mobile.com

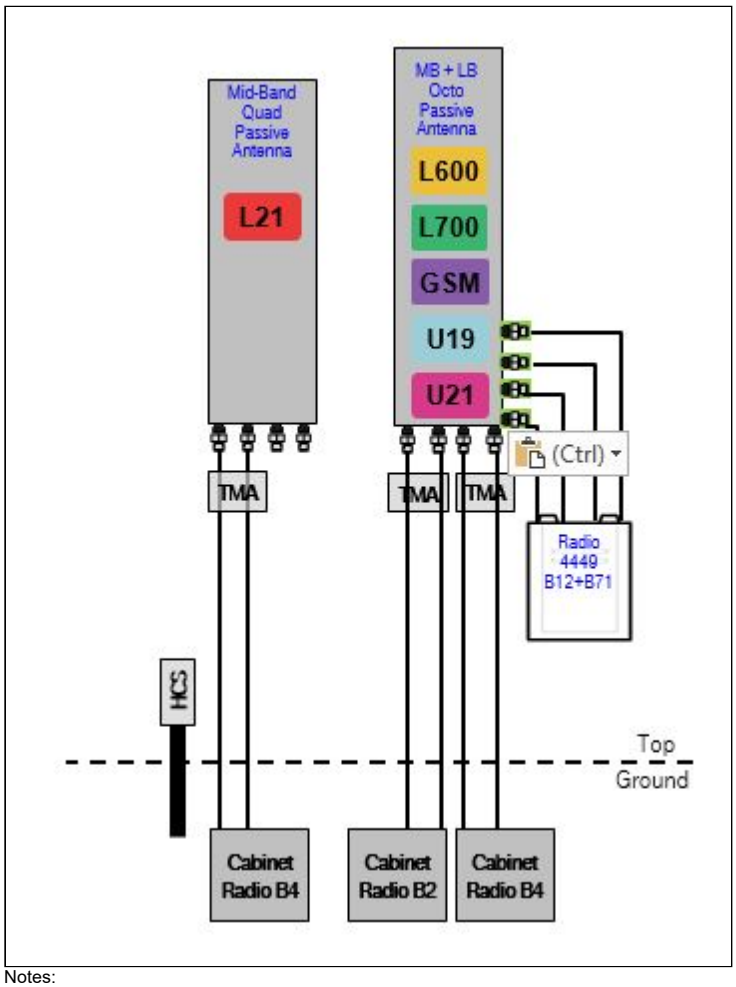
Site Name: CT023/Montville CookSt MP
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2020
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Wireless Solutions

Latitude: 41.47488747
Longitude: -72.10552950
Address: 57 Cook St
City, State: Montville, CT
Region: NORTHEAST

RAN Template: 67D5A997DB Hybrid			AL Template: 67D5997DB_2xAIR+1OP (U21 Market)	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 6

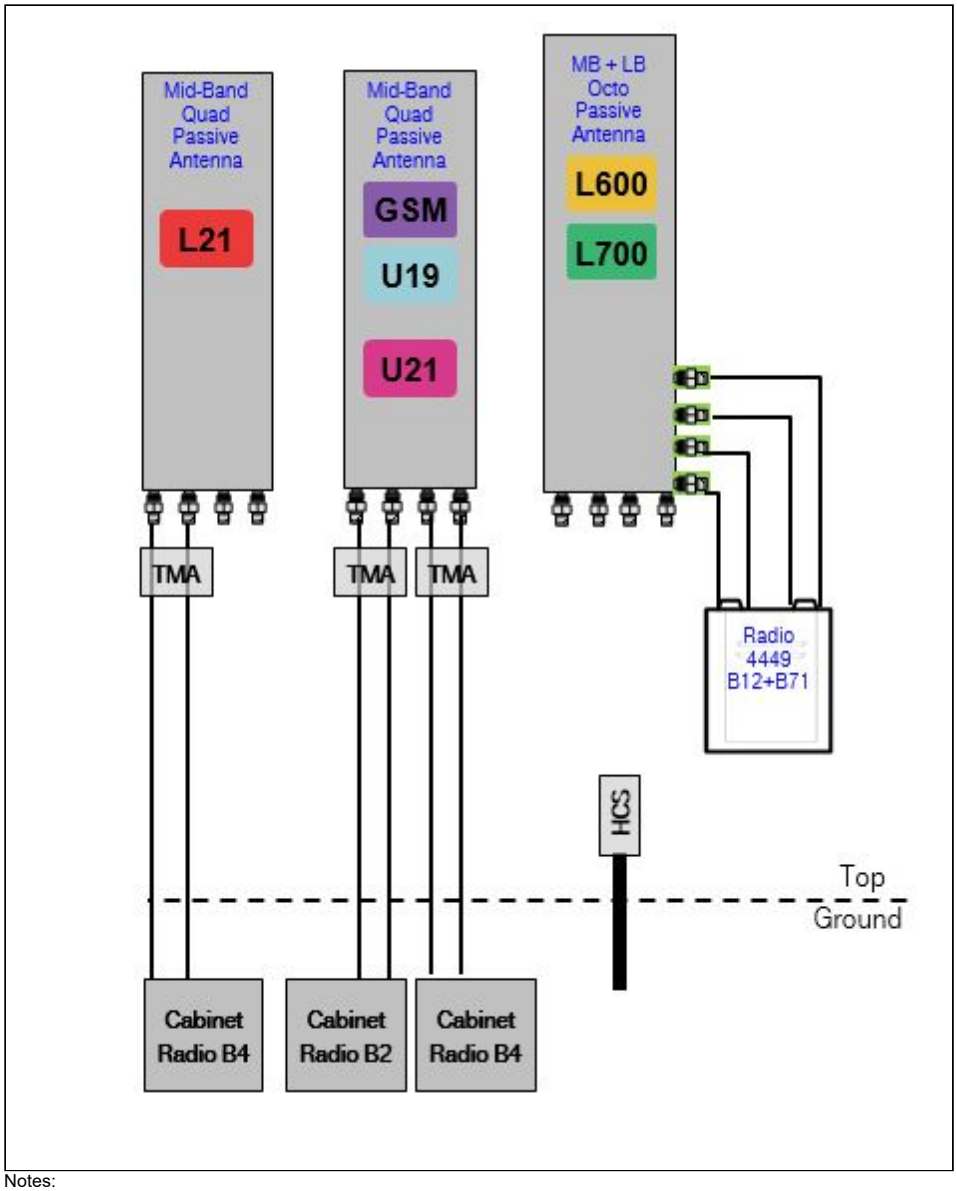
Section 2 - Existing Template Images

67D04B.JPG



Notes:

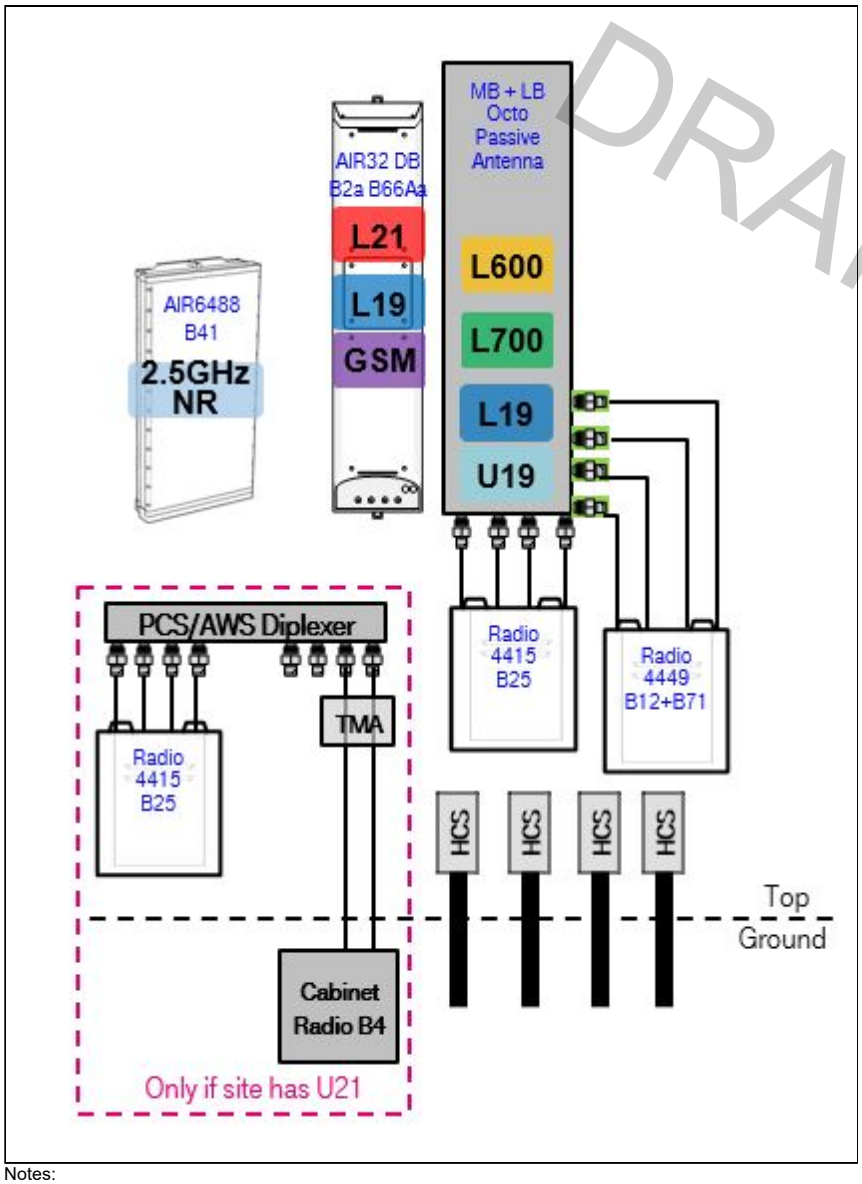
67D04B_2QP+1OP.JPG


Mid-Band
Quad
Passive
Antenna
L21
Mid-Band
Quad
Passive
Antenna
GSM
U19
U21
MB + LB
Octo
Passive
Antenna
L600
L700
TMA
TMA
TMA
Radio
4449
B12+B71
HCS
Top
Ground
Cabinet
Radio B4
Cabinet
Radio B2
Cabinet
Radio B4

Notes:

Section 3 - Proposed Template Images

67D5997DB_2xAIR+1OP.JPG



Notes:

Section 4 - Siteplan Images

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RAN Template:	A&L Template:
67D5A997DB Hybrid	67D5997DB_2xAIR+1OP (U21 Market)

CTNL023C_Anchor_3_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 67D04B Hybrid

Enclosure	1	2
Enclosure Type	RBS 6102	S12000 Outdoor
Baseband	DUW30 (U1900); DUW30 (U2100 (DECOMMISSIONED)); DUG20 (G1900); BB 6630 (L700, L600, L2100); BB 6630 (N600)	
Hybrid Cable System	Ericsson 6x12 HCS *Select Length & AWG* **(x 3)**	
Radio	RUS01 B2 **(x 3)** (G1900); RUS01 B2 **(x 3)** (U1900); RUS01 B4 **(x 6)** (L2100)	

Proposed RAN Equipment

Template: 67D5A997DB Hybrid

Enclosure	1	2	3
Enclosure Type	RBS 6102	Enclosure 6160	B160
Baseband	DUW30 (U1900); DUW30; DUG20 (G1900); BB 6630 (L1900, L700, L600, L2100); BB 6630 (N600)	BB 6630 (L2500); BB 6648 (N2500)	
Hybrid Cable System	Ericsson 6x12 HCS *Select Length & AWG* **(x 3)**	Ericsson 6x12 HCS *Select AWG & Length* **(x 3)**	
Radio	RUS01 B2 **(x 6)**; RUS01 B4 **(x 6)**		

RAN Scope of Work:

All cabinet radios in existing RBS6102 Cabinet will become dark.

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) BB6630 for L2500 to new Enclosure 6160.

Add (1) BB6648 for N2500 to new Enclosure 6160.

Existing: (12) Coaxial Lines; 0 HCS

Remove all coaxial lines

Add (3) 6X12 HCS for Anchor A&L Equipment. Length of new HCS will match that of existing HCS.

RAN Template:	A&L Template:
67D5A997DB Hybrid	67D5997DB_2xAIR+1OP (U21 Market)

CTNL023C_Anchor_3_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 6 - A&L Equipment

Existing Template: 67D04B_1QP+1OP
Proposed Template: 67D5997DB_2xAIR+1OP (U21 Market)

Sector 1 (Existing) view from behind							
Coverage Type	A - Outdoor Macro						
Antenna	1				2	3	
Antenna Model	RFS - APXVAARR24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	60					60	
M. Tilt	0					0	
Height	188					190	
Ports	P1	P2	P3	P4		P5	P6
Active Tech.	L700 L600 N600	L700 L600 N600		U1900 G1900			L2100
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							U2100
E. Tilt	2					2	2
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)**		1-5/8" Coax - 212 ft. **(x2)**			1-5/8" Coax - 212 ft. **(x2)**
TMAs				Generic Twin Style 1A - PCS (AtAntenna)			Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners							
Radio	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)					
Sector Equipment							

Unconnected Equipment:

Scope of Work:

*** Existing: Three Mounts Per Sector. LNX in Position 1. position 2 is Empty. Quad in Position 3 ***

Replace LB Dual in Position 1 with (1) LB/MB Octo.
Replace RRUS11 B12 in Position 1 with (1) Radio 4449 B71+B12 for L600 and L700.

Move PCS Technologies to Mid-Band Ports of Octo and leave L2100 on Quad

Remove (2) Coaxial Lines.

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

RAN Template:	A&L Template:
67D5A997DB Hybrid	67D5997DB_2xAIR+1OP (U21 Market)

CTNL023C_Anchor_3_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 1 (Proposed) view from behind										
Coverage Type	A - Outdoor Macro									
Antenna	1				2				3	
Antenna Model	RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	60				60				60	
M. Tilt	0				0				0	
Height	188				190				190	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
Active Tech.	L700 L600 N600	L700 L600 N600	L1900	L1900 U1900	L2100	L2100	L1900 G1900	L1900	L2500 N2500	L2500 N2500
Dark Tech.										
Restricted Tech.										
Decomm. Tech.										
E. Tilt	2	2	2	2	2	2	2	2	2	2
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)**	Fiber Jumper		Fiber Jumper		Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs										
Diplexers / Combiners										
Radio	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna)	SHARED Radio 4415 B25 (At Antenna)						
Sector Equipment										

Unconnected Equipment:

Scope of Work:

*** Existing: Three Mounts Per Sector. LNX in Position 1. position 2 is Empty. Quad in Position 3 ***

*** L600 Scope of Work ***

Replace LB Dual in Position 1 with (1) LB/MB Octo.

Replace RRUS11 B12 in Position 1 with (1) Radio 4449 B71+B85 for L600, L700, and N600 in Position 1 at antenna, and connect its ports to the Low-Band ports of the Octo antenna.

***

*** Anchor Scope of Work ***

Remove all coaxial lines.

Remove PCS TMA from Position 1.

Add (1) Radio 4415 B25 for L1900 2nd Carrier and U1900 to Position 1 at antenna, and connect its ports to the Mid-Band ports of the Octo antenna.

Add (1) AIR32 B66A/B2A for L2100, L1900 1st Carrier, and GSM to Position 2.

Remove Mid-Band Quad and AWS TMA from Position 3.

Remove coaxial lines from Position 3.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 3.

Ensure RET control is enabled for all technology layers according to the Design Documents.

***

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

RAN Template:	A&L Template:
67D5A997DB Hybrid	67D5997DB_2xAIR+1OP (U21 Market)

CTNL023C_Anchor_3_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	1				2	3	
Antenna Model	RFS - APXVAARR24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	170					170	
M. Tilt	0					0	
Height	188					190	
Ports	P1	P2	P3	P4		P5	P6
Active Tech.	L700 L600 N600	L700 L600 N600		U1900 G1900			L2100
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							U2100
E. Tilt	2					2	2
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)**		1-5/8" Coax - 212 ft. **(x2)**			1-5/8" Coax - 212 ft. **(x2)**
TMAs				Generic Twin Style 1A - PCS (AtAntenna)			Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners							
Radio	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)					
Sector Equipment							

Unconnected Equipment:

Scope of Work:

*** Existing: Three Mounts Per Sector. LNX in Position 1. position 2 is Empty. Quad in Position 3 ***

Replace LB Dual in Position 1 with (1) LB/MB Octo.
Replace RRUS11 B12 in Position 1 with (1) Radio 4449 B71+B12 for L600 and L700.

Move PCS Technologies to Mid-Band Ports of Octo and leave L2100 on Quad

Remove (2) Coaxial Lines.

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

RAN Template:	A&L Template:
67D5A997DB Hybrid	67D5997DB_2xAIR+1OP (U21 Market)

CTNL023C_Anchor_3_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro									
Antenna	1				2				3	
Antenna Model	RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	170				170				170	
M. Tilt	0				0				0	
Height	188				190				190	
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Active Tech.	L700 L600 N600	L700 L600 N600	L1900	L1900 U1900	L2100	L2100	L1900 G1900	L1900	L2500 N2500	L2500 N2500
Dark Tech.										
Restricted Tech.										
Decomm. Tech.										
E. Tilt	2	2	2	2	2	2	2	2	2	2
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)**	Fiber Jumper		Fiber Jumper		Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs										
Diplexers / Combiners										
Radio	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna)	SHARED Radio 4415 B25 (At Antenna)						
Sector Equipment										

Unconnected Equipment:

Scope of Work:

*** Existing: Three Mounts Per Sector. LNX in Position 1. position 2 is Empty. Quad in Position 3 ***

*** L600 Scope of Work ***

Replace LB Dual in Position 1 with (1) LB/MB Octo.

Replace RRUS11 B12 in Position 1 with (1) Radio 4449 B71+B85 for L600, L700, and N600 in Position 1 at antenna, and connect its ports to the Low-Band ports of the Octo antenna.

***

*** Anchor Scope of Work ***

Remove all coaxial lines.

Remove PCS TMA from Position 1.

Add (1) Radio 4415 B25 for L1900 2nd Carrier and U1900 to Position 1 at antenna, and connect its ports to the Mid-Band ports of the Octo antenna.

Add (1) AIR32 B66A/B2A for L2100, L1900 1st Carrier, and GSM to Position 2.

Remove Mid-Band Quad and AWS TMA from Position 3.

Remove coaxial lines.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 3.

Ensure RET control is enabled for all technology layers according to the Design Documents.

***

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

RAN Template:	A&L Template:
67D5A997DB Hybrid	67D5997DB_2xAIR+1OP (U21 Market)

CTNL023C_Anchor_3_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 3 (Existing) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	1				2	3	
Antenna Model	RFS - APXVAARR24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	330					330	
M. Tilt	0					0	
Height	188					190	
Ports	P1	P2	P3	P4		P5	P6
Active Tech.	L700 L600 N600	L700 L600 N600		U1900 G1900			L2100
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							U2100
E. Tilt	2					2	2
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)**		1-5/8" Coax - 212 ft. **(x2)**			1-5/8" Coax - 212 ft. **(x2)**
TMAs				Generic Twin Style 1A - PCS (AtAntenna)			Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners							
Radio	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)					
Sector Equipment							

Unconnected Equipment:

Scope of Work:

*** Existing: Three Mounts Per Sector. LNX in Position 1. position 2 is Empty. Quad in Position 3 ***
*** Existing RRUS11 B12 are at Ground ***

Replace LB Dual in Position 1 with (1) LB/MB Octo.
Replace RRUS11 B12 in Position 1 with (1) Radio 4449 B71+B12 for L600 and L700.

Move PCS Technologies to Mid-Band Ports of Octo and leave L2100 on Quad

Remove (2) Coaxial Lines.

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

RAN Template:	A&L Template:
67D5A997DB Hybrid	67D5997DB_2xAIR+1OP (U21 Market)

CTNL023C_Anchor_3_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 3 (Proposed) view from behind										
Coverage Type	A - Outdoor Macro									
Antenna	1				2				3	
Antenna Model	RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	330				330				330	
M. Tilt	0				0				0	
Height	188				190				190	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
Active Tech.	L700 L600 N600	L700 L600 N600	L1900	L1900 U1900	L2100	L2100	L1900 G1900	L1900	L2500 N2500	L2500 N2500
Dark Tech.										
Restricted Tech.										
Decomm. Tech.										
E. Tilt	2	2	2	2	2	2	2	2	2	2
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)**	Fiber Jumper		Fiber Jumper		Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs										
Diplexers / Combiners										
Radio	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna)	SHARED Radio 4415 B25 (At Antenna)						
Sector Equipment										

Unconnected Equipment:

Scope of Work:

*** Existing: Three Mounts Per Sector. LNX in Position 1. position 2 is Empty. Quad in Position 3 ***

*** L600 Scope of Work ***

Replace LB Dual in Position 1 with (1) LB/MB Octo.

Replace RRUS11 B12 in Position 1 with (1) Radio 4449 B71+B85 for L600, L700, and N600 in Position 1 at antenna, and connect its ports to the Low-Band ports of the Octo antenna.

***

*** Anchor Scope of Work ***

Remove all coaxial lines.

Remove PCS TMA from Position 1.

Add (1) Radio 4415 B25 for L1900 2nd Carrier and U1900 to Position 1 at antenna, and connect its ports to the Mid-Band ports of the Octo antenna.

Add (1) AIR32 B66A/B2A for L2100, L1900 1st Carrier, and GSM to Position 2.

Remove Mid-Band Quad and AWS TMA from Position 3.

Remove coaxial lines.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 3.

Ensure RET control is enabled for all technology layers according to the Design Documents.

***

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

RAN Template:	A&L Template:
67D5A997DB Hybrid	67D5997DB_2xAIR+1OP (U21 Market)

CTNL023C_Anchor_3_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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

Proposed Power Systems Equipment

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

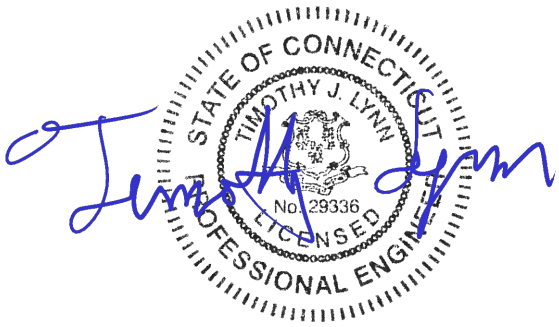
T-Mobile Site #: CTNL023C

57 Cook Drive
Montville, CT

Centek Project No. 20074.51

Date: July 14, 2020

Max Stress Ratio =84.9%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

July 14, 2020

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

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTNL023C
57 Cook Drive
Montville, CT 06382

Centek Project No. 20074.51

Dear Mr. Reid,

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

The loads considered in this analysis consist of the following:

- T-Mobile:
  V-Frames: Three (3) RFS APXVAARR24_43 panel antennas, three (3) Ericsson AIR32 panel antennas, three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson 4449 remote radio units and three (3) Ericsson 4415 remote radio units mounted on three (3) V-Frames with a RAD center elevation of 190-ft +/- AGL.

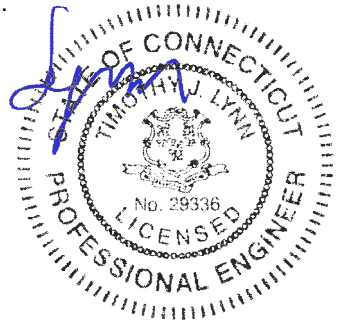
The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 105 mph for Montville as required in Appendix N of the 2018 Connecticut State Building Code.

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

Based on our review of the equipment upgrade, it is our opinion that the existing antenna mounts 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



Section 2 - Calculations

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

Subject: TIA-222-G Loads

Location: Montville, CT

Rev. 0: 7/13/20

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 20074.51

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

Wind Speeds

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

Basic Wind Speed with Ice $V_i := 50$ mph (User Input per Annex B of TIA-222-G)

Input

Structure Type = Structure_Type := Lattice (User Input)

Structure Category = $SC := II$ (User Input)

Exposure Category = $Exp := C$ (User Input)

Structure Height = $h := 193$ ft (User Input)

Height to Center of Antennas = $z_{Ant} := 190$ ft (User Input)

Radial Ice Thickness = $t_i := 0.75$ in (User Input per Annex B of TIA-222-G)

Radial Ice Density = $Id := 56.00$ pcf (User Input)

Topograpic Factor = $K_{zt} := 1.0$ (User Input)

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H := 1.11$ (User Input)

Output

Wind Direction Probability Factor =

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

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

Importance Factors =

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

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

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

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

$$K_{iz} := \left(\frac{z_{Ant}}{33}\right)^{0.1} = 1.191$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.787$$

Velocity Pressure Coefficient Antennas =

$$Kz_{Ant} := 2.01\left(\left(\frac{z_{Ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.449$$

Velocity Pressure w/o Ice Antennas =

$$qz_{Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V^2 \cdot I_{Wind} = 34.756$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V_i^2 \cdot I_{Wind} = 7.881$$

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

Subject:	TIA-222-G Loads
Location:	Montville, CT
Rev. 0: 7/13/20	Prepared by: T.J.L. Checked by: C.F.C. Job No. 20074.51

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAARR24-43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 153$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 781$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 283$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 19$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 211$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.5$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 94$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \times 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 442$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 442$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR32		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56.6$	in	(User Input)
Antenna Width =	$W_{ant} := 12.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 132$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.4$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.1$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 251$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.4$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 169$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.9$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 77$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 5.1$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 58$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 132$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6352$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 5815$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 188$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 188$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR6449		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 33.1$	in	(User Input)
Antenna Width =	$W_{ant} := 20.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 103$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.6$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 218$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 88$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.1$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 64$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 32$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 103$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5632$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4851$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 157$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 157$	lbs

Development of Wind & Ice Load on RRUS

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

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$

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

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 63$ lbs

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

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 50$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.2$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 23$ lbs

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

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 19$ lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2285$

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 74$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 74$ lbs

Development of Wind & Ice Load on RRUS

RRUS Data:

RRUS Model = Ericsson 4415 B25

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 = $T_{RRUS} := 5.4$ in (User Input)

RRUS Weight = $WT_{RRUS} := 47$ lbs (User Input)

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

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$

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

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 63$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.6$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 26$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.2$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 23$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.2$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 12$ lbs

Gravity Load (without ice)

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

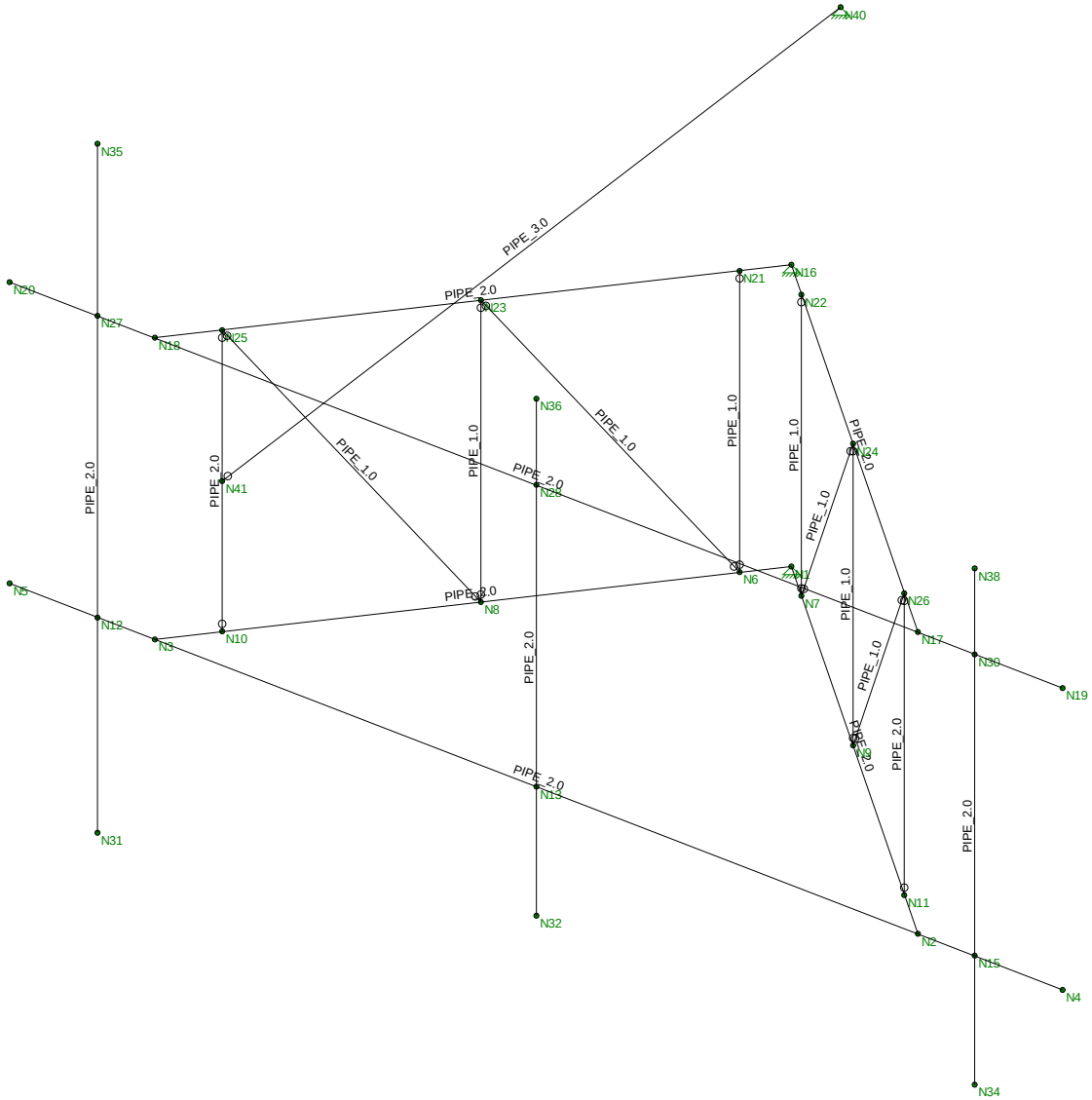
Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1062$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1719$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 56$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 56$ lbs



Envelope Only Solution

Centek		
TJL	CTNL023C - Mount	July 13, 2020 at 4:32 PM
20074.51	Member Framing	CTNL023C_AMA.r3d

(Global) Model Settings

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

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-12: ASD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: ASD
Aluminum Code	AA ADM1-15: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Antenna Mast	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
2	2" Pipe	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
3	1" Pipe	PIPE_1.0	VBrace	Pipe	A53 Grade B	Typical	.469	.083	.083	.166
4	Outrigger	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
5	Stabilizer	PIPE_3.0	Beam	Pipe	A53 Grade B	Typical	2.07	2.85	2.85	5.69

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Outrigger	6.152			Lbyy						Lateral
2	M2	Outrigger	6.152			Lbyy						Lateral
3	M3	Outrigger	12			Lbyy						Lateral
4	M4	Outrigger	6.152			Lbyy						Lateral
5	M5	Outrigger	6.152			Lbyy						Lateral
6	M6	Outrigger	12			Lbyy						Lateral
7	M7	Antenna Mast	8			Lbyy						Lateral
8	M8	Antenna Mast	6			Lbyy						Lateral
9	M10	Antenna Mast	6			Lbyy						Lateral
10	M11	1" Pipe	3.5			Lbyy						Lateral
11	M13	2" Pipe	3.5			Lbyy						Lateral
12	M14	1" Pipe	3.5			Lbyy						Lateral
13	M15	1" Pipe	3.5			Lbyy						Lateral
14	M16	2" Pipe	3.5			Lbyy						Lateral
15	M21	Stabilizer	9.735			Lbyy						Lateral
16	M18	1" Pipe	4.301			Lbyy						Lateral
17	M19	1" Pipe	4.301			Lbyy						Lateral
18	M20	1" Pipe	4.301			Lbyy						Lateral
19	M19A	1" Pipe	3.5			Lbyy						Lateral
20	M20A	1" Pipe	4.301			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N3			Outrigger	Column	Pipe	A53 Gra...	Typical
2	M2	N1	N2			Outrigger	Column	Pipe	A53 Gra...	Typical
3	M3	N5	N4			Outrigger	Column	Pipe	A53 Gra...	Typical
4	M4	N16	N18			Outrigger	Column	Pipe	A53 Gra...	Typical
5	M5	N16	N17			Outrigger	Column	Pipe	A53 Gra...	Typical
6	M6	N20	N19			Outrigger	Column	Pipe	A53 Gra...	Typical
7	M7	N31	N35			Antenna Mast	Column	Pipe	A53 Gra...	Typical
8	M8	N32	N36			Antenna Mast	Column	Pipe	A53 Gra...	Typical
9	M10	N34	N38			Antenna Mast	Column	Pipe	A53 Gra...	Typical
10	M11	N22	N7			1" Pipe	VBrace	Pipe	A53 Gra...	Typical
11	M13	N26	N11			2" Pipe	Column	Pipe	A53 Gra...	Typical
12	M14	N21	N6			1" Pipe	VBrace	Pipe	A53 Gra...	Typical
13	M15	N23	N8			1" Pipe	VBrace	Pipe	A53 Gra...	Typical
14	M16	N25	N10			2" Pipe	Column	Pipe	A53 Gra...	Typical
15	M21	N41	N40			Stabilizer	Beam	Pipe	A53 Gra...	Typical
16	M18	N7	N24			1" Pipe	VBrace	Pipe	A53 Gra...	Typical
17	M19	N6	N23			1" Pipe	VBrace	Pipe	A53 Gra...	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
18	M20	N8	N25			1" Pipe	VBrace	Pipe	A53 Gra...	Typical
19	M19A	N24	N9			1" Pipe	VBrace	Pipe	A53 Gra...	Typical
20	M20A	N9	N26			1" Pipe	VBrace	Pipe	A53 Gra...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	0	0	
2	N2	4.35	0	4.35	0	
3	N3	-4.35	0	4.35	0	
4	N4	6	0	4.35	0	
5	N5	-6	0	4.35	0	
6	N6	-0.353553	0	0.353553	0	
7	N7	0.353553	0	0.353553	0	
8	N8	-2.12132	0	2.12132	0	
9	N9	2.12132	0	2.12132	0	
10	N10	-3.889087	0	3.889087	0	
11	N11	3.889087	0	3.889087	0	
12	N12	-5	0	4.35	0	
13	N13	0	0	4.35	0	
14	N15	5	0	4.35	0	
15	N16	0	3.5	0	0	
16	N17	4.35	3.5	4.35	0	
17	N18	-4.35	3.5	4.35	0	
18	N19	6	3.5	4.35	0	
19	N20	-6	3.5	4.35	0	
20	N21	-0.353553	3.5	0.353553	0	
21	N22	0.353553	3.5	0.353553	0	
22	N23	-2.12132	3.5	2.12132	0	
23	N24	2.12132	3.5	2.12132	0	
24	N25	-3.889087	3.5	3.889087	0	
25	N26	3.889087	3.5	3.889087	0	
26	N27	-5	3.5	4.35	0	
27	N28	0	3.5	4.35	0	
28	N30	5	3.5	4.35	0	
29	N31	-5	-2.5	4.35	0	
30	N32	0	-1.5	4.35	0	
31	N34	5	-1.5	4.35	0	
32	N35	-5	5.5	4.35	0	
33	N36	0	4.5	4.35	0	
34	N38	5	4.5	4.35	0	
35	N40	-3.33	1.75	-5.83	0	
36	N41	-3.889087	1.75	3.889087	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction			
2	N16	Reaction	Reaction	Reaction			
3	N40	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	Y	-.052	6
2	M10	Y	-.052	1.35
3	M7	Y	-.076	8
4	M7	Y	-.076	0
5	M7	Y	-.074	3
6	M8	Y	-.066	.5
7	M8	Y	-.066	5.5
8	M7	Y	-.047	6.5

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	Y	-.079	1.35
2	M10	Y	-.079	6
3	M7	Y	-.221	0
4	M7	Y	-.221	8
5	M7	Y	-.074	3
6	M8	Y	-.094	.5
7	M8	Y	-.094	5.5
8	M7	Y	-.056	6.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	X	.016	1.35
2	M10	X	.016	6
3	M7	X	.047	0
4	M7	X	.047	8
5	M7	X	.019	3
6	M8	X	.029	.5
7	M8	X	.029	5.5
8	M7	X	.012	6.5

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	X	.044	1.35
2	M10	X	.044	6
3	M7	X	.141	0
4	M7	X	.141	8
5	M7	X	.05	3
6	M8	X	.085	.5
7	M8	X	.085	5.5
8	M7	X	.026	6.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	Z	.032	6
2	M10	Z	.032	1.35
3	M7	Z	.105	8
4	M7	Z	.105	0
5	M8	Z	.039	.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
6	M8	Z	.039	5.5

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	Z	.109	6
2	M10	Z	.109	1.35
3	M7	Z	.391	8
4	M7	Z	.391	0
5	M8	Z	.126	.5
6	M8	Z	.126	5.5

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M10	X	.002	.002	0	1.35
2	M8	X	.002	.002	0	0
3	M16	X	.002	.002	0	0
4	M20	X	.002	.002	0	0
5	M15	X	.002	.002	0	0
6	M4	X	.002	.002	0	0
7	M1	X	.002	.002	0	0
8	M19	X	.002	.002	0	0
9	M14	X	.002	.002	0	0
10	M11	X	.002	.002	0	0
11	M18	X	.002	.002	0	0
12	M19A	X	.002	.002	0	0
13	M20A	X	.002	.002	0	0
14	M13	X	.002	.002	0	0
15	M21	X	.002	.002	0	0
16	M5	X	.002	.002	0	0
17	M2	X	.002	.002	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M10	X	.007	.007	0	1.35
2	M21	X	.007	.007	0	0
3	M16	X	.007	.007	0	0
4	M20	X	.007	.007	0	0
5	M15	X	.007	.007	0	0
6	M19	X	.007	.007	0	0
7	M14	X	.007	.007	0	0
8	M11	X	.007	.007	0	0
9	M18	X	.007	.007	0	0
10	M19A	X	.007	.007	0	0
11	M20A	X	.007	.007	0	0
12	M13	X	.007	.007	0	0
13	M4	X	.007	.007	0	0
14	M1	X	.007	.007	0	0
15	M5	X	.007	.007	0	0
16	M2	X	.007	.007	0	0

Member Distributed Loads (BLC 5 : Wind X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
17	M8	X	.007	.007	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M10	Z	.002	.002	0	1.35
2	M4	Z	.002	.002	0	0
3	M1	Z	.002	.002	0	0
4	M16	Z	.002	.002	0	0
5	M20	Z	.002	.002	0	0
6	M15	Z	.002	.002	0	0
7	M19	Z	.002	.002	0	0
8	M6	Z	.002	.002	0	0
9	M3	Z	.002	.002	0	0
10	M8	Z	.002	.002	0	0
11	M14	Z	.002	.002	0	0
12	M11	Z	.002	.002	0	0
13	M18	Z	.002	.002	0	0
14	M19A	Z	.002	.002	0	0
15	M20A	Z	.002	.002	0	0
16	M13	Z	.002	.002	0	0
17	M5	Z	.002	.002	0	0
18	M2	Z	.002	.002	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M3	Z	.007	.007	0	0
2	M6	Z	.007	.007	0	0
3	M4	Z	.007	.007	0	0
4	M1	Z	.007	.007	0	0
5	M5	Z	.007	.007	0	0
6	M2	Z	.007	.007	0	0
7	M20	Z	.007	.007	0	0
8	M19	Z	.007	.007	0	0
9	M18	Z	.007	.007	0	0
10	M20A	Z	.007	.007	0	0
11	M8	Z	.007	.007	0	0
12	M16	Z	.007	.007	0	0
13	M15	Z	.007	.007	0	0
14	M14	Z	.007	.007	0	0
15	M10	Z	.007	.007	0	1.35
16	M11	Z	.007	.007	0	0
17	M19A	Z	.007	.007	0	0
18	M13	Z	.007	.007	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	DL		-1						
2	Equipment Weight	None					8			
3	Ice Weight	None					8			

Basic Load Cases (Continued)

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
4	Wind w/ Ice X	None					8	17		
5	Wind X	None					8	17		
6	Wind w/ Ice Z	None					6	18		
7	Wind Z	None					6	18		

Load Combinations

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.2D + 1.6W (X-direc...	Yes	Y		1	1.2	2	1.2	5	1.6																
2	0.9D + 1.6W (X-direc...	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 (Z-direc...	Yes	Y		1	1.2	2	1.2	7	1.6																
5	0.9D + 1.6W (Z-direc...	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	N1	max	-.293	5	1.085	6	2.471	3	0	6	0	6	0	6
2		min	-1.374	1	.458	2	-.166	5	0	1	0	1	0	1
3	N16	max	.934	6	.908	3	.012	2	0	6	0	6	0	6
4		min	-.666	2	.027	5	-2.443	6	0	1	0	1	0	1
5	N40	max	.068	4	.042	1	-.197	6	0	6	0	6	0	6
6		min	.011	6	.031	5	-1.766	1	0	1	0	1	0	1
7	Totals:	max	0	6	1.987	6	0	3						
8		min	-1.913	1	.802	2	-3.092	4						

Envelope Joint Displacements

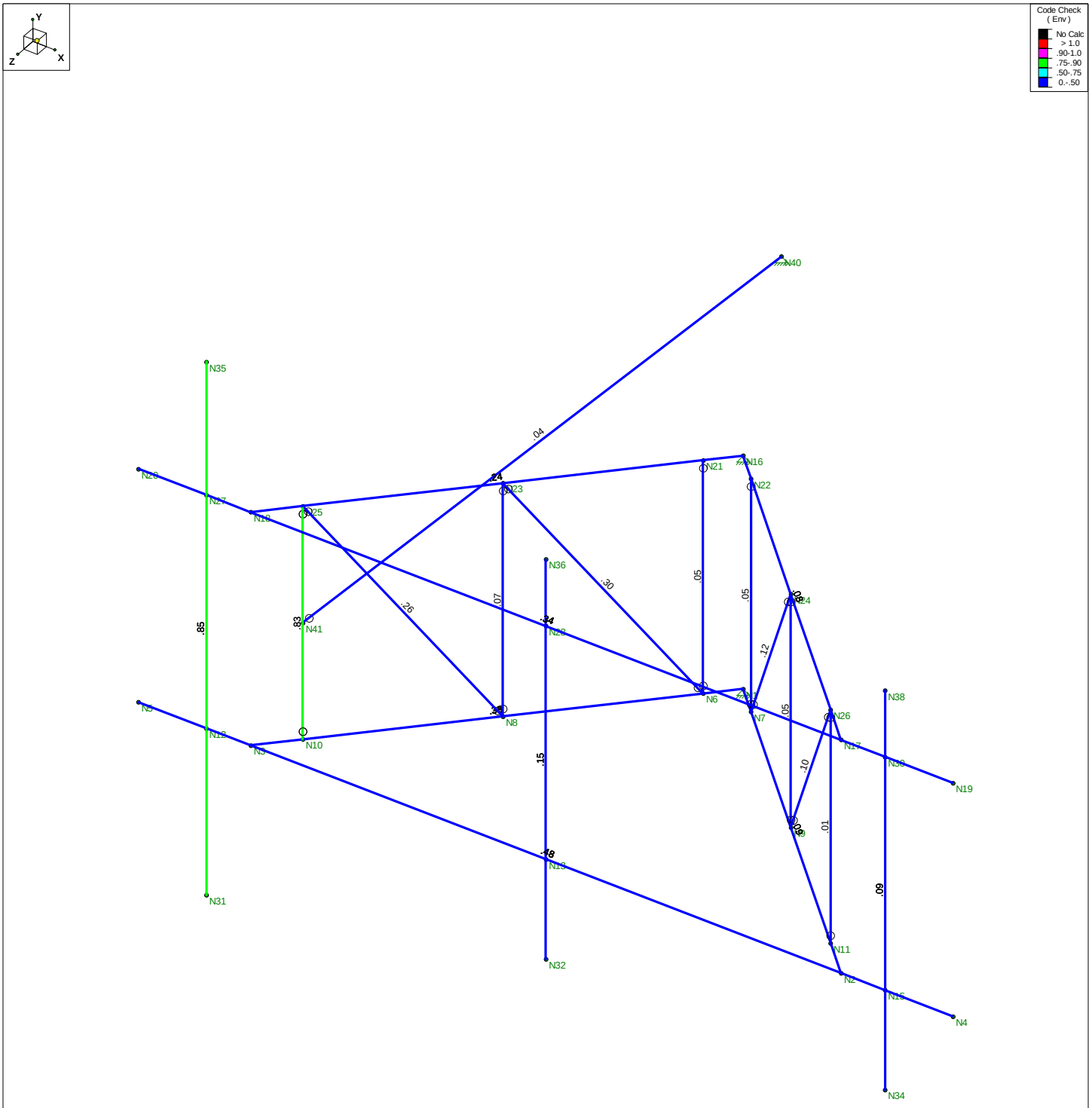
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
1	N1	max	0	6	0	6	0	6	3.968e-03	3	5.369e-03	1	1.759e-03	6
2		min	0	1	0	1	0	1	1.272e-03	5	6.05e-04	6	5.269e-04	2
3	N2	max	.258	1	-.01	5	-.041	6	1.784e-03	3	5.677e-03	4	1.008e-03	6
4		min	.04	6	-.031	3	-.259	1	-1.078e-04	5	9.091e-04	3	2.963e-04	2
5	N3	max	.257	1	-.003	5	.25	1	1.257e-03	3	6.955e-03	2	3.784e-03	4
6		min	.04	6	-.077	3	.037	6	-1.006e-02	5	8.597e-04	6	6.356e-04	2
7	N4	max	.258	1	-.005	5	-.061	6	1.273e-03	3	5.159e-03	4	6.635e-04	3
8		min	.04	6	-.017	3	-.334	1	-1.981e-04	5	9.237e-04	3	2.742e-04	5
9	N5	max	.257	1	-.06	2	.387	2	3.244e-04	3	6.904e-03	2	3.635e-03	4
10		min	.04	6	-.116	6	.056	6	-1.482e-02	5	9.662e-04	6	1.919e-03	3
11	N6	max	.022	1	-.008	2	.022	1	3.353e-03	3	4.984e-03	1	1.415e-03	6
12		min	.003	6	-.024	6	.002	6	4.911e-04	5	6.38e-04	6	4.171e-04	2
13	N7	max	.023	1	-.003	5	-.003	6	3.656e-03	3	5.631e-03	1	1.775e-03	6
14		min	.002	6	-.01	3	-.024	1	1.377e-03	5	5.714e-04	6	5.363e-04	2
15	N8	max	.115	1	-.015	2	.111	1	2.384e-04	3	3.971e-03	1	3.474e-03	5
16		min	.019	6	-.044	6	.016	6	-2.839e-03	5	6.996e-04	6	-8.023e-04	3
17	N9	max	.142	1	-.007	5	-.016	6	2.013e-03	3	5.15e-03	1	2.199e-03	3
18		min	.015	6	-.018	3	-.143	1	6.773e-04	5	7.242e-04	6	6.328e-04	5
19	N10	max	.218	1	-.019	2	.212	1	1.441e-03	3	6.52e-03	2	5.098e-03	4
20		min	.035	6	-.06	6	.032	6	-7.211e-03	5	8.719e-04	6	5.08e-04	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
21	N11	max	.237	1	-.01	5	-.035	6	2.058e-03	3	5.191e-03	4	1.024e-03	3
22		min	.034	6	-.025	3	-.237	1	2.985e-04	5	9.25e-04	3	1.263e-04	5
23	N12	max	.257	1	-.029	2	.304	1	3.244e-04	3	6.904e-03	2	3.628e-03	4
24		min	.04	6	-.092	6	.044	6	-1.482e-02	5	9.635e-04	6	1.912e-03	3
25	N13	max	.257	1	-.052	2	.131	5	6.87e-04	3	4.594e-03	1	5.4e-04	1
26		min	.04	6	-.133	6	-.049	1	-4.245e-03	5	5.537e-04	6	-4.657e-04	5
27	N15	max	.258	1	-.009	5	-.049	6	1.273e-03	3	5.178e-03	4	6.703e-04	3
28		min	.04	6	-.025	3	-.288	1	-1.981e-04	5	9.237e-04	3	2.794e-04	5
29	N16	max	0	6	0	6	0	6	3.533e-03	6	5.034e-03	2	1.496e-03	6
30		min	0	1	0	1	0	1	1.393e-03	2	-7.7e-05	6	4.227e-04	2
31	N17	max	.247	2	-.013	2	-.006	6	2.618e-03	4	4.951e-03	5	1.103e-03	6
32		min	.009	6	-.031	6	-.245	2	6.877e-04	2	5.107e-04	3	3.441e-04	2
33	N18	max	.245	2	-.032	2	.243	2	9.446e-03	4	6.898e-03	2	1.422e-03	3
34		min	.01	6	-.083	6	.017	6	1.767e-03	2	7.94e-04	6	-2.462e-03	5
35	N19	max	.247	2	.003	5	-.016	6	2.784e-03	4	4.54e-03	5	1.013e-03	4
36		min	.009	6	-.018	3	-.317	2	4.983e-04	2	4.96e-04	3	-1.39e-05	2
37	N20	max	.246	2	-.011	5	.381	2	1.279e-02	4	6.969e-03	1	1.136e-03	6
38		min	.01	6	-.106	6	.039	6	7.42e-04	3	1.153e-03	6	-1.878e-03	5
39	N21	max	.021	2	-.007	2	.021	2	3.06e-03	6	4.683e-03	2	1.091e-03	3
40		min	0	6	-.021	6	0	6	1.257e-03	2	-3.192e-05	6	-1.517e-04	5
41	N22	max	.022	2	-.004	5	0	6	3.259e-03	6	5.309e-03	2	1.628e-03	6
42		min	0	6	-.008	3	-.022	2	1.255e-03	2	-1.077e-04	6	5.028e-04	2
43	N23	max	.107	2	-.013	2	.107	2	2.791e-03	4	3.807e-03	2	-8.65e-04	3
44		min	-.002	6	-.038	6	.004	6	3.56e-04	3	1.751e-04	6	-3.601e-03	4
45	N24	max	.136	2	-.006	5	.003	6	2.025e-03	6	4.947e-03	2	2.151e-03	6
46		min	0	6	-.016	3	-.135	2	7.111e-04	2	7.973e-05	6	7.611e-04	2
47	N25	max	.207	2	-.019	2	.205	2	7.252e-03	4	6.429e-03	2	1.439e-03	3
48		min	.006	6	-.059	6	.013	6	1.828e-03	2	7.086e-04	6	-3.469e-03	5
49	N26	max	.226	2	-.01	5	-.003	6	2.289e-03	4	4.635e-03	5	1.287e-03	4
50		min	.006	6	-.024	3	-.225	2	7.774e-04	2	5.465e-04	6	3.622e-04	2
51	N27	max	.246	2	-.029	2	.297	2	1.279e-02	4	6.969e-03	1	1.129e-03	6
52		min	.01	6	-.093	6	.026	6	7.42e-04	3	1.15e-03	6	-1.883e-03	5
53	N28	max	.246	2	-.052	2	.119	4	3.51e-03	4	4.416e-03	2	1.064e-03	4
54		min	.01	6	-.133	6	-.04	2	5.463e-04	2	6.168e-05	6	-5.75e-05	2
55	N30	max	.247	2	-.009	5	-.01	6	2.784e-03	4	4.559e-03	5	1.02e-03	4
56		min	.009	6	-.025	3	-.273	2	4.983e-04	2	4.96e-04	3	-8.746e-06	2
57	N31	max	.478	1	-.03	2	1.063	5	3.212e-04	3	6.904e-03	2	9.652e-03	1
58		min	.099	6	-.093	6	.055	3	-3.408e-02	5	9.635e-04	6	1.977e-03	6
59	N32	max	.278	1	-.052	2	.222	5	6.863e-04	3	4.594e-03	1	1.277e-03	1
60		min	.044	6	-.133	6	-.051	1	-5.305e-03	5	5.537e-04	6	-4.655e-04	5
61	N34	max	.266	1	-.009	5	-.069	6	1.272e-03	3	5.178e-03	4	6.807e-04	3
62		min	.052	6	-.025	3	-.3	1	-2.819e-04	5	9.237e-04	3	2.793e-04	5
63	N35	max	.354	2	-.029	2	.707	4	2.521e-02	4	6.969e-03	1	1.138e-03	6
64		min	-.017	6	-.093	6	.068	3	7.475e-04	3	1.15e-03	6	-6.e-03	2
65	N36	max	.249	2	-.052	2	.164	4	3.779e-03	4	4.416e-03	2	1.064e-03	4
66		min	.004	6	-.133	6	-.033	2	5.464e-04	2	6.168e-05	6	-2.449e-04	2
67	N38	max	.25	2	-.009	5	.011	6	3.649e-03	4	4.559e-03	5	1.02e-03	4
68		min	0	6	-.025	3	-.267	2	4.984e-04	2	4.96e-04	3	-3.573e-04	2
69	N40	max	0	6	0	6	0	6	1.176e-03	6	2.958e-03	2	8.063e-04	4
70		min	0	1	0	1	0	1	6.792e-04	2	1.838e-04	6	2.87e-04	2
71	N41	max	.232	2	-.019	2	.018	2	-1.537e-04	2	6.475e-03	2	7.175e-04	4
72		min	.021	6	-.06	6	.002	6	-6.2e-04	4	7.903e-04	6	2.391e-04	2

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
1	M7	PIPE_2.0	.849	2.5	4	.072	6	5	14.916	32.13	1.872	1.872	1.5...	H1-...
2	M16	PIPE_2.0	.833	1.75	2	.094	0	1	27.741	32.13	1.872	1.872	1.2...	H1-...
3	M3	PIPE_2.0	.476	1....	4	.521	1....	4	6.831	32.13	1.872	1.872	1.8...	H3-6
4	M1	PIPE_2.0	.379	6....	4	.177	5....	4	20.41	32.13	1.872	1.872	3.1...	H1-...
5	M6	PIPE_2.0	.342	1....	5	.375	1....	5	6.831	32.13	1.872	1.872	2.0...	H3-6
6	M19	PIPE_1.0	.299	2....	6	.026	0	5	6.837	14.774	.465	.465	1.1...	H1-...
7	M20	PIPE_1.0	.262	2....	6	.047	0	5	6.837	14.774	.465	.465	1.1...	H1-...
8	M4	PIPE_2.0	.238	6....	5	.114	5....	5	20.41	32.13	1.872	1.872	2.7...	H1-...
9	M8	PIPE_2.0	.152	1.5	5	.031	1.5	4	20.867	32.13	1.872	1.872	1.6...	H1-...
10	M18	PIPE_1.0	.124	0	3	.012	4....	1	6.837	14.774	.465	.465	1.1...	H1-...
11	M20A	PIPE_1.0	.101	0	3	.021	0	5	6.837	14.774	.465	.465	1.1...	H1-...
12	M10	PIPE_2.0	.095	5	4	.031	1.5	4	20.867	32.13	1.872	1.872	1.4...	H1-...
13	M2	PIPE_2.0	.090	6....	4	.061	0	4	20.41	32.13	1.872	1.872	3.3...	H1-...
14	M5	PIPE_2.0	.083	0	4	.042	0	3	20.41	32.13	1.872	1.872	2.5...	H1-...
15	M15	PIPE_1.0	.069	1.75	4	.010	0	4	8.87	14.774	.465	.465	1	H1-...
16	M19A	PIPE_1.0	.050	1.75	1	.011	0	4	8.87	14.774	.465	.465	1.1...	H1-...
17	M14	PIPE_1.0	.050	1.75	1	.011	0	4	8.87	14.774	.465	.465	1.1...	H1-...
18	M11	PIPE_1.0	.046	1.75	5	.010	0	4	8.87	14.774	.465	.465	1	H1-...
19	M21	PIPE_3.0	.043	4....	1	.004	9....	1	39.26	65.205	5.749	5.749	1.1...	H1-...
20	M13	PIPE_2.0	.013	1.75	4	.012	0	4	27.741	32.13	1.872	1.872	1	H1-...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CTNL023C - Mount	July 13, 2020 at 4:32 PM
20074.51	Unity Check	CTNL023C_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: CTNL023C

CT023/Montville CookSt MP
57 Cook Street
Montville, Connecticut 06382

July 27, 2020

EBI Project Number: 6220003397

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**14.37%**

July 27, 2020

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

Emissions Analysis for Site: CTNL023C - CT023/Montville CookSt MP

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **57 Cook Street** in **Montville, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 57 Cook Street in Montville, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

5) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) 4 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

8) 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.

9) 2 LTE channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

10) 2 NR channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

11) 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.

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

13) The antennas used in this modeling are the RFS APXVAARR24_43-U-NA20 for the 700 MHz / 600 MHz / 600 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 32 for the 2100 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR6449 B41 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APXVAARR24_43-U-NA20 for the 700 MHz / 600 MHz / 600 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 32 for the 2100 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR6449 B41 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APXVAARR24_43-U-NA20 for the 700 MHz / 600 MHz / 600 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 32 for the 2100 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR6449 B41 for the 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site

Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

14) The antenna mounting height centerlines of the proposed antennas are 190 feet above ground level (AGL).

15) 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.

16) 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 APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	700 MHz / 600 MHz / 600 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	700 MHz / 600 MHz / 600 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	700 MHz / 600 MHz / 600 MHz / 1900 MHz / 1900 MHz
Gain:	13.35 dBd / 12.95 dBd / 12.95 dBd / 15.65 dBd / 15.65 dBd	Gain:	13.35 dBd / 12.95 dBd / 12.95 dBd / 15.65 dBd / 15.65 dBd	Gain:	13.35 dBd / 12.95 dBd / 12.95 dBd / 15.65 dBd / 15.65 dBd
Height (AGL):	190 feet	Height (AGL):	190 feet	Height (AGL):	190 feet
Channel Count:	9	Channel Count:	9	Channel Count:	9
Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts
ERP (W):	10,670.10	ERP (W):	10,670.10	ERP (W):	10,670.10
Antenna A1 MPE %:	**1.62%**	Antenna B1 MPE %:	**1.62%**	Antenna C1 MPE %:	**1.62%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	2100 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	2100 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	2100 MHz / 1900 MHz / 1900 MHz
Gain:	15.85 dBd / 15.35 dBd / 15.35 dBd	Gain:	15.85 dBd / 15.35 dBd / 15.35 dBd	Gain:	15.85 dBd / 15.35 dBd / 15.35 dBd
Height (AGL):	190 feet	Height (AGL):	190 feet	Height (AGL):	190 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts
ERP (W):	12,841.53	ERP (W):	12,841.53	ERP (W):	12,841.53
Antenna A2 MPE %:	**1.28%**	Antenna B2 MPE %:	**1.28%**	Antenna C2 MPE %:	**1.28%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR6449 B41	Make / Model:	Ericsson AIR6449 B41	Make / Model:	Ericsson AIR6449 B41
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	190 feet	Height (AGL):	190 feet	Height (AGL):	190 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts
ERP (W):	25,651.93	ERP (W):	25,651.93	ERP (W):	25,651.93
Antenna A3 MPE %:	**2.55%**	Antenna B3 MPE %:	**2.55%**	Antenna C3 MPE %:	**2.55%**

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	5.46%
AT&T	3.19%
Clearwire	0.47%
Nextel	0.46%
Verizon	2.32%
Sprint	2.47%
Site Total MPE % :	14.37%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	5.46%
T-Mobile Sector B Total:	5.46%
T-Mobile Sector C Total:	5.46%
Site Total MPE % :	14.37%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 700 MHz LTE	2	648.82	188.0	1.32	700 MHz LTE	467	0.28%
T-Mobile 600 MHz LTE	2	591.73	188.0	1.20	600 MHz LTE	400	0.30%
T-Mobile 600 MHz NR	1	1577.94	190.0	1.57	600 MHz NR	400	0.39%
T-Mobile 1900 MHz LTE	2	2203.69	190.0	4.39	1900 MHz LTE	1000	0.44%
T-Mobile 1900 MHz UMTS	2	1101.85	190.0	2.19	1900 MHz UMTS	1000	0.22%
T-Mobile 2100 MHz LTE	2	2307.55	190.0	4.60	2100 MHz LTE	1000	0.46%
T-Mobile 1900 MHz LTE	2	2056.61	190.0	4.10	1900 MHz LTE	1000	0.41%
T-Mobile 1900 MHz GSM	4	1028.30	190.0	4.10	1900 MHz GSM	1000	0.41%
T-Mobile 2500 MHz LTE	2	6412.98	190.0	12.77	2500 MHz LTE	1000	1.28%
T-Mobile 2500 MHz NR	2	6412.98	190.0	12.77	2500 MHz NR	1000	1.28%
						Total:	**5.46%**

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

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	5.46%
Sector B:	5.46%
Sector C:	5.46%
T-Mobile Maximum MPE % (Sector A):	5.46%
Site Total:	14.37%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **14.37%** 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.