Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

9/6/18

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: **Notice of Exempt Modification for T-Mobile Crown Site BU: 806377**
T-Mobile Site ID: CT11711A
197 South St., Vernon, CT 06066
Latitude: 41° 51′ 12.51″/ Longitude: -72° 27′ 7.52″

Dear Ms. Bachman:

T-Mobile currently maintains six (9) antennas at the 84-foot level of the existing 132- foot lattice tower at 197 South St., Vernon, CT 06066. The tower is owned by Crown Castle. The property is owned by Connecticut Water Company. T-Mobile intends to replace (6) panel antennas for (6) proposed panel antennas, add swap out (3) RRUs as well as add (2) hybrid fiber line and remove (2) coax.

This facility was approved by the by the Connecticut Siting Council in Docket No. 58A on April 22, 1987. This approval included the conditions that:

1. The tower shall be no taller than necessary to provide the proposed service, and in no event shall exceed a total height, including antennas, of 143 feet. This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b) (2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Daniel A. Champagne, Mayor, Town of Vernon, Andrew Marchese - Zoning Enforcement Officer, the property owner and Crown Castle is the tower owner.

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

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

3. The proposed modification 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 Communication 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-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: William Stone.

Sincerely,

William Stone
Real Estate Specialist
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
518-373-3543
William.stone@crowncastle.com

Attachments:

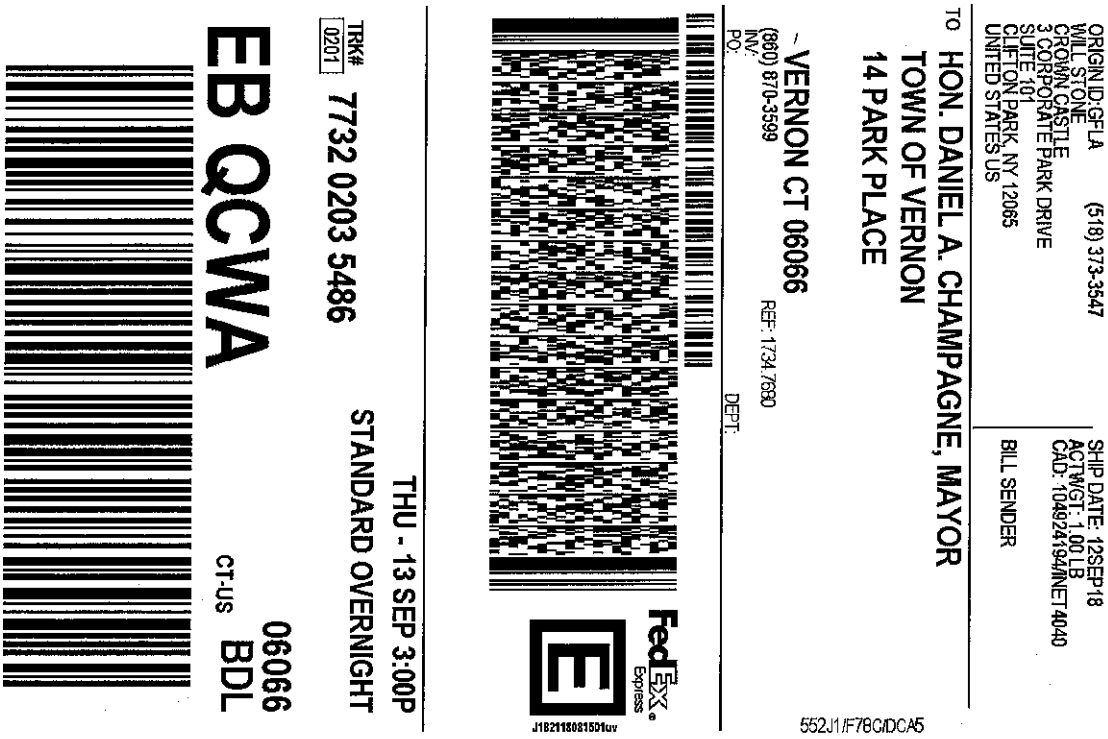
Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc:

The Honorable Daniel A. Champagne, Mayor
Town of Vernon
14 Park Place
Vernon, CT 06066-3291

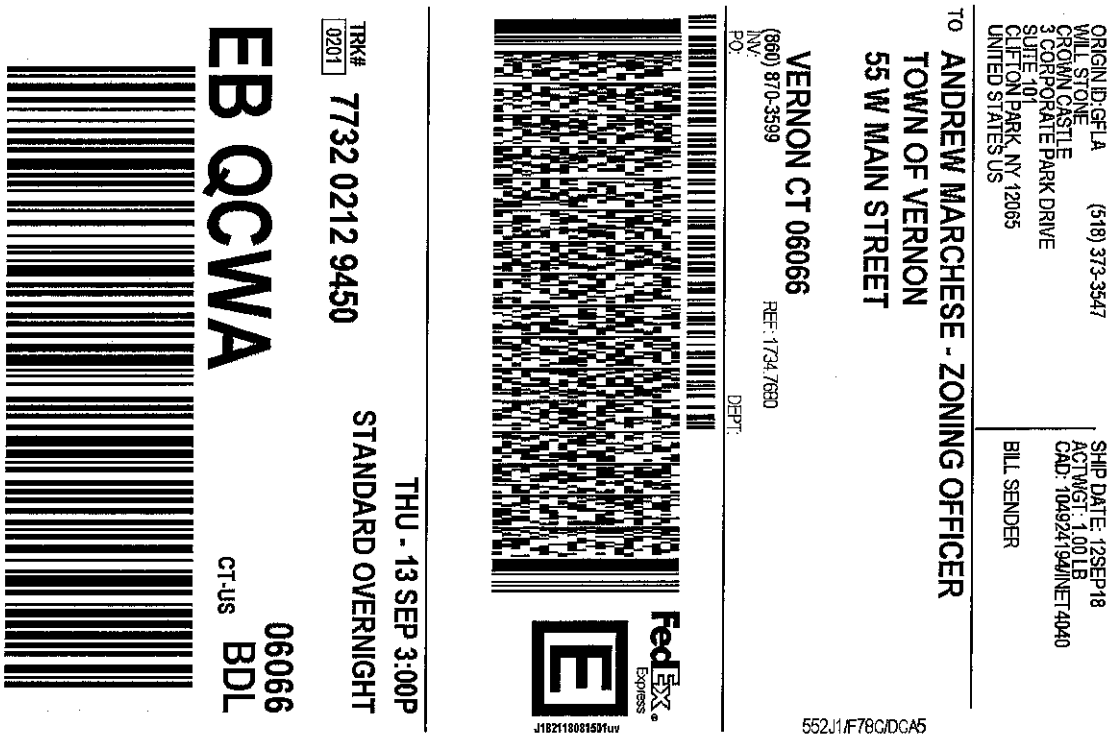
Andrew Marchese - Zoning Enforcement Officer
OFFICE OF ZONING ADMINISTRATION
55 W MAIN ST, VERNON, CT 06066

Connecticut Water Company
93 W Main Street
Clinton, CT 06413-1600



After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



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B1

DOCKET NO. 58A

AN APPLICATION FOR AN AMENDMENT TO THE CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR TELECOMMUNICATIONS TOWERS AND ASSOCIATED EQUIPMENT TO PROVIDE CELLULAR SERVICE IN HARTFORD, MIDDLESEX, AND TOLLAND COUNTIES.	:	CONNECTICUT SITING COUNCIL
	:	April 22, 1987

D E C I S I O N A N D O R D E R

The Connecticut Siting Council (Council) hereby amends the Certificate of Environmental Compatibility and Public Need issued pursuant to sections 16-50g through 16-50x of the Connecticut General Statutes of Connecticut (CGS) for the construction, operation, and maintenance of cellular mobile telephone telecommunications towers and associated equipment in Hartford, Tolland, and Middlesex Counties to permit the relocation of the Vernon tower 250 feet to the west, subject to the conditions below.

1. The tower shall be no taller than necessary to provide the proposed service, and in no event shall exceed a total height, including antennas, of 143 feet.
2. The Certificate holder shall submit a development and management plan (D&M plan) for the Vernon site, pursuant to sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies (RSA). The D&M plan shall provide plans for evergreen screening around the fenced perimeter of the tower site.
3. This facility shall be constructed, operated, and maintained as specified in the Council's record and in the plan required by order number 2.

4. The certificate holder shall comply with any future radiofrequency (RF) standards promulgated by state or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility shall be brought into compliance with such standards.

5. The certificate holder shall permit public or private entities to share space on the tower approved herein, for due consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. In addition to complying with section 16-50j-73 of the RSA, the certificate holder shall notify the Council of the addition of any equipment to the approved tower.

6. A chain link fence not lower than eight feet shall surround the tower and associated equipment.

7. Unless necessary to comply with order eight, no lights shall be installed on this tower.

8. The facility's construction and any future tower sharing shall be in accordance with all applicable federal, state, and municipal laws and regulations. Shared uses by entities not subject to Council jurisdiction pursuant to Section 16-50k of the CGS shall be subject to all applicable federal, state, and municipal laws and regulations.

9. Construction activities shall take place during daylight working hours.

URS Greiner

URS Greiner, Inc. A·E·S
500 Enterprise Drive. Suite 3B
Rocky Hill. Connecticut 06067-4002
Telephone: (860) 529-8882
Facsimile: (860) 529-3991
Offices in Principal Cities Nationwide

April 21, 1998

Mr. Christopher Klem
Bell Atlantic Mobile
20 Alexander Drive
P.O. Box 5029
Wallingford, CT 06492-5029

Reference: Tower As-Built
South Street
Vernon, Connecticut
F3-01648.25

Dear Chris:

We have added the microwave RAD centers, enclosed are two copies and a CAD disk of our report for this site entitled "Existing Conditions, Tower Site, South Street, Vernon, Connecticut Prepared for Bell Atlantic Mobile", dated March 1998, sheet 2 revised 4-16-98.

Please call me if you have any questions.

Sincerely,

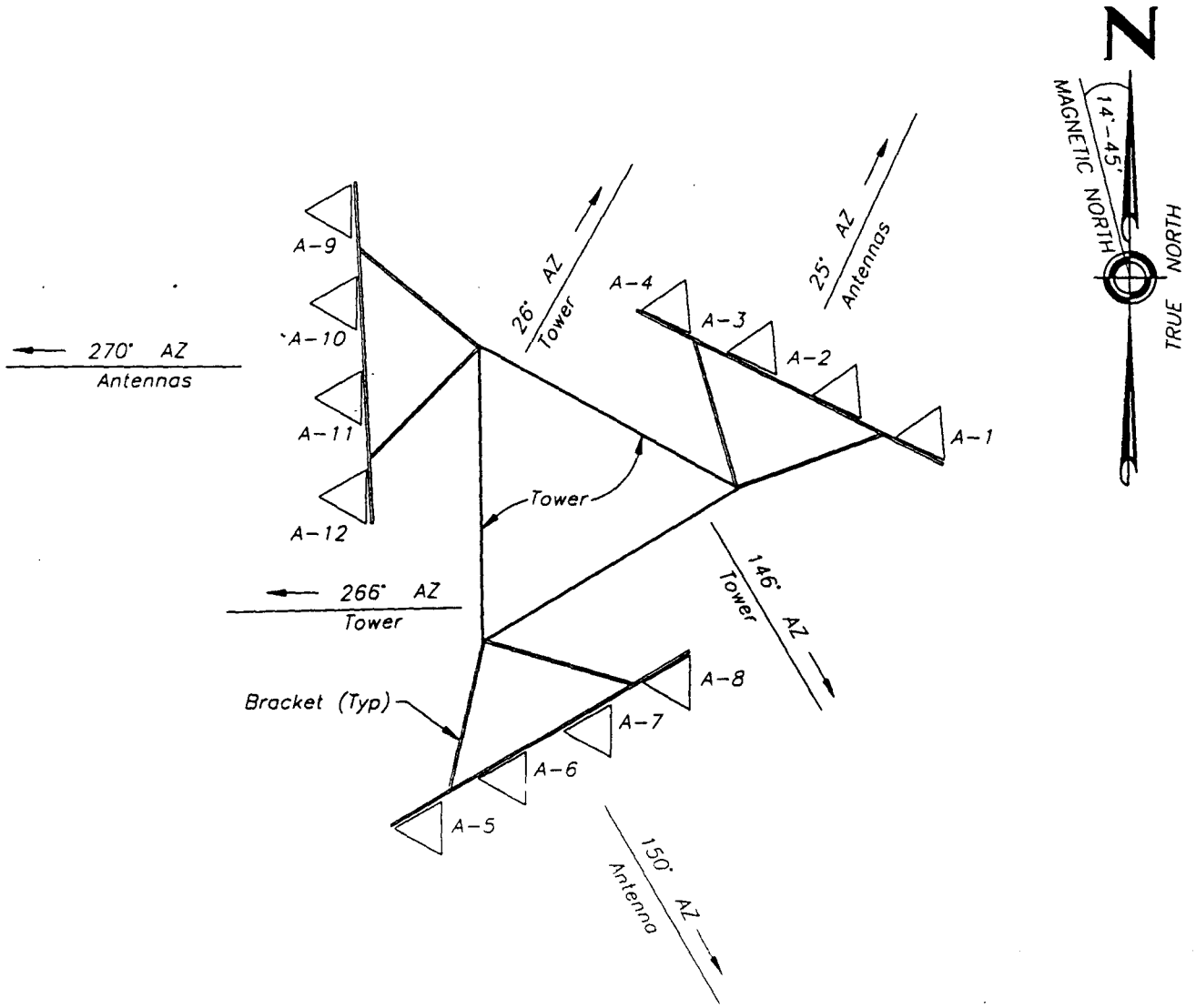
URS Greiner, Inc. A·E·S

Michael G. Wilmes, L.S.
Manager, Survey Services

TLANTIC MOBILE

NAME: Vernon
DRESS: South Street
Vernon, Connecticut

	DMS	
NAD 27	41°-51'-12.2"	72°-27'-09.2"
NAD 83	41°-51'-12.5"	72°-27'-07.5"



TOWER PLAN

NOTE:

1. DIRECTIONS REFER TO TRUE NORTH.

URS Greiner

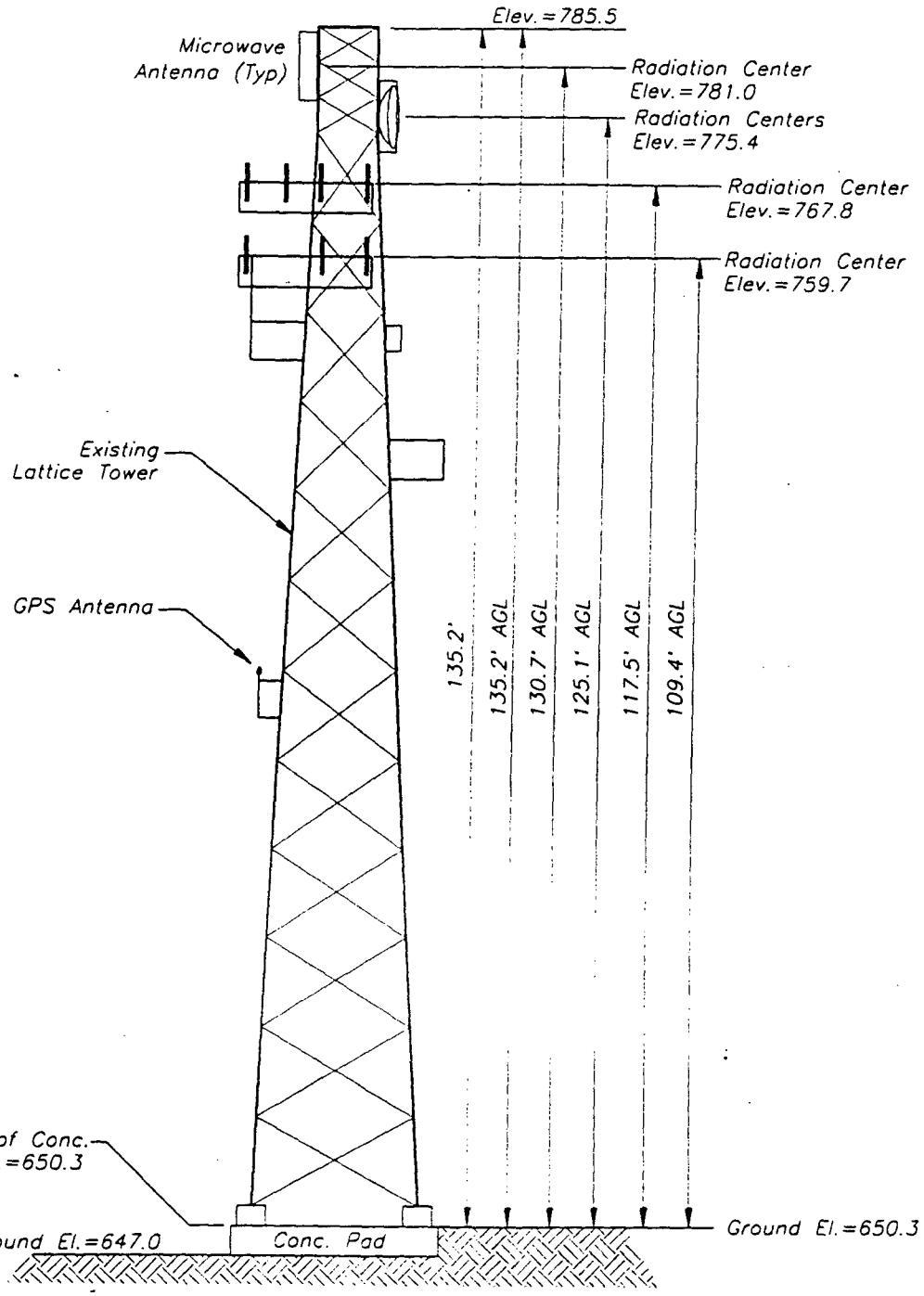
Scale: NTS
Date: MARCH 1998

Surveying and Mapping by:
URS Greiner, Inc. A·E·S
500 Enterprise Drive, POB 4002
Rocky Hill, Connecticut 06067
Tel. (860) 529-8882

Field book #	Crew Chief	Search #	Project #
1450-12	F.SEGALINE	~	F30164825
Computed by	Drawn by	Checked by	Sheet #
E.LEWIS	E.LEWIS		1 of 3

[redacted]LANTIC MOBILE

[redacted]AME: Vernon
[redacted]RESS: South Street
Vernon, Connecticut



TOWER ELEVATION

REVISED: 4-16-98

NOTES:

1. ELEVATIONS REFER TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.
2. ONLY ANTENNAS OF ONE SECTOR SHOWN.
3. EQUIPMENT BUILDINGS AND CABLE TRAYS NOT SHOWN.

URS Greiner

Scale: 1" = 20'
Date: MARCH 1998

Surveying and Mapping by:
URS Greiner, Inc. A·E·S
500 Enterprise Drive, POB 4002
Rocky Hill, Connecticut 06067
Tel. (860) 529-8882

Field book #	Crew Chief	Search #	Project #
1450-12	F.SEGALINE	~	F30164825
Computed by	Drawn by	Checked by	Sheet #
E.LEWIS	E.LEWIS	[illegible]	2 of 3

CONNECTICUT WATER CO
93 WEST MAIN ST
CLINTON, CT 06413-1600
CENSUS TRACT: 530400

Neighborhood Number
11800
Neighborhood Name
GENERAL COMMERCIAL
TAXING DISTRICT INFORMATION

Jurisdiction Name	Town of Vernon
Area	146
Routing Number	5887

Tax ID 39-065B-0016A Printed 06/12/2016 Card No. 1 of 1

Transfer of Ownership

Owner	Consideration	Transfer Date	Deed Book/Page	Deed Type
NA	0	12/21/1978	351 39	

Site Description

Topography

Public Utilities
Water, Sewer, Gas, Electric
Street or Road
Paved
Neighborhood

Zoning:
R-22
Legal Acres:
2.0000

Valuation Record

Assessment Year		2006	2010	2011					
Reason for Change		2006 Reval	2010 ASMT	2011 REVAL					
Market	L	156820	156820	156820					
	I	270940	270940	270220					
	T	427760	427760	427040					
70% Assessed/Use	L	109770	109770	109770					
	I	189660	189660	189160					
	T	299430	299430	298930					

Land Size

Land Type	Rating, Soil ID - or - Actual Frontage	Acreage - or - Effective Frontage	Square Feet - or - Effective Depth	Influence Factor

Tax ID 39-065B-0016A Printed 06/12/2016

Physical Characteristics

ROOFING
Other

WALLS

	B	1	2	U
Frame		Yes		
Guard	Yes	Yes	Yes	Yes

FRAMING

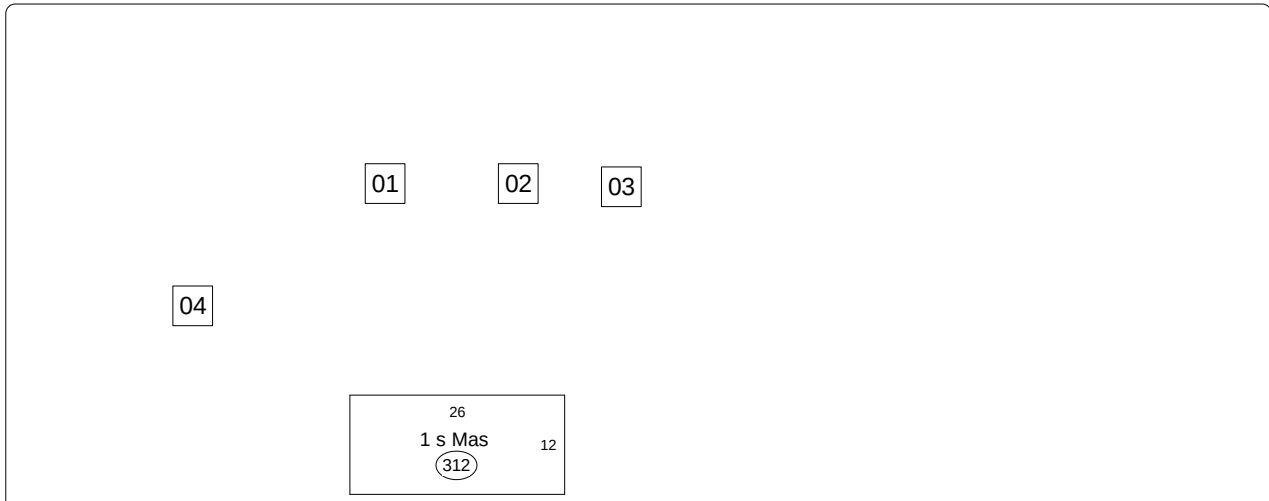
	B	1	2	U
F Res	0	312	0	0

FINISH

	UF	SF	FO	FD
1	312	0	0	0
Total	312	0	0	0

HEATING AND AIR CONDITIONING

	B	1	2	U

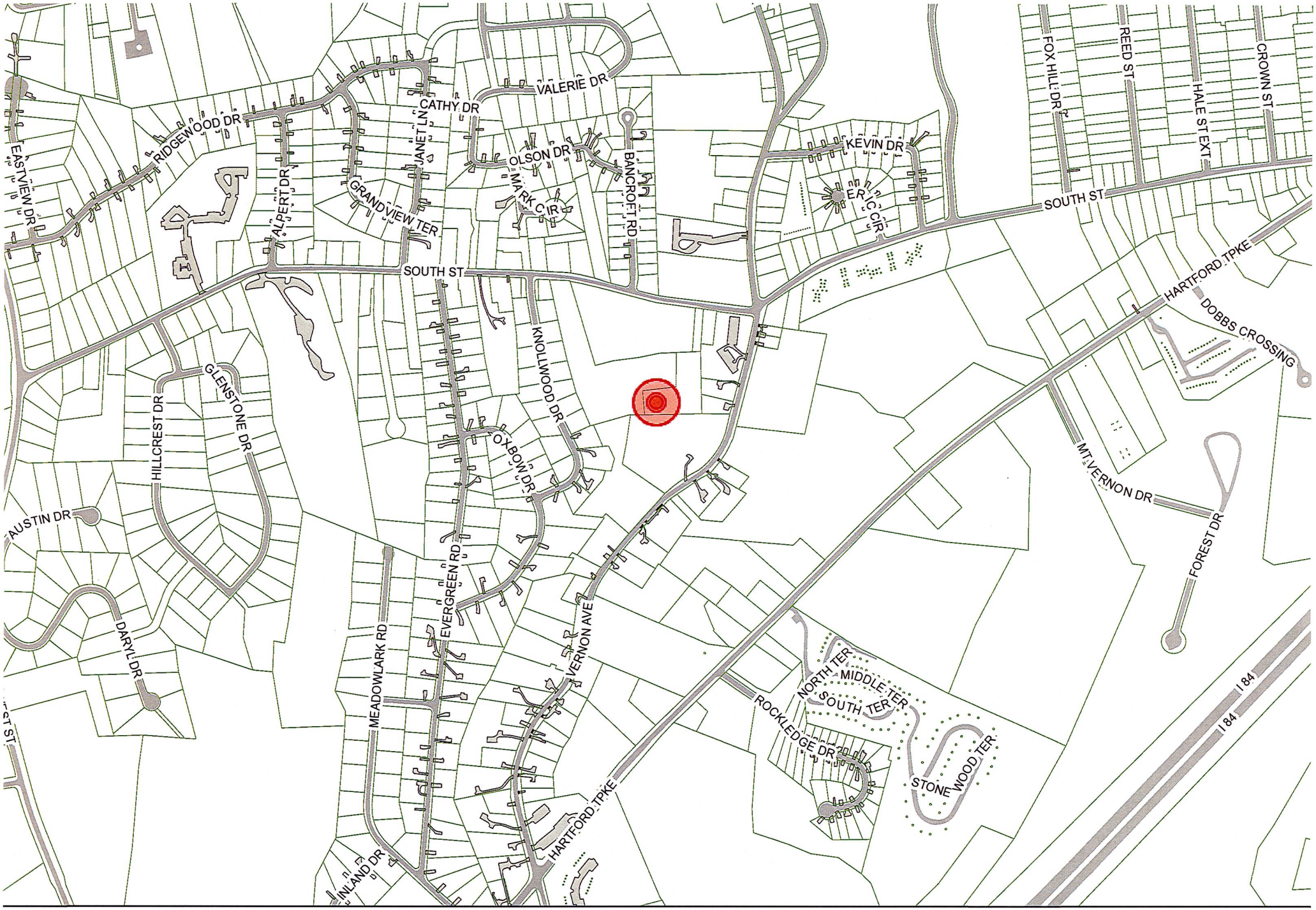


Special Features

Description

Summary of Improvements

ID	USE	Story Height	Const Type	Grade	Year Cons	Eff Year	Cond	Size or Area
C	UTLSTOR	0.00		Avg	1963	1986	AV	312
01	FENCECL	6.00	51C	Avg	1963	1985	AV	510
02	UTLSHED	0.00	4	Avg	1963	1985	AV	300
03	TANKWATR	0.00	51	Avg	1963	1985	AV	125000
04	TOWERSUP	100.00		Avg	2002	2002	AV	1 DIA


EASTVIEW DR
RIDGEWOOD DR
ALPERT DR
GRANDVIEW TER
JANET LN
CATHY DR
VALERIE DR
OLSON DR
MARK CIR
BANCROFT RD
KEVIN DR
ERIC CIR
FOX HILL DR
REED ST
HALE ST EXT
CROWN ST
SOUTH ST
HARTFORD TPKE
DOBBS CROSSING
MT VERNON DR
FOREST DR
KNOLLWOOD DR
OXBOW DR
EVERGREEN RD
VERNON AVE
HILLCREST DR
GLENSTONE DR
AUSTIN DR
DARYL DR
MEADOWLARK RD
INLAND DR
NORTH TER
MIDDLE TER
SOUTH TER
ROCKLEDGE DR
STONE WOOD TER
I 84
0
0.1

T-Mobile

CROWN CASTLE

CBU
806377

SITE ID
CT11711A

SITE NAME
CROWN CASTLE SST

SITE ADDRESS
197 SOUTH ST.
VERNON, CT 06066

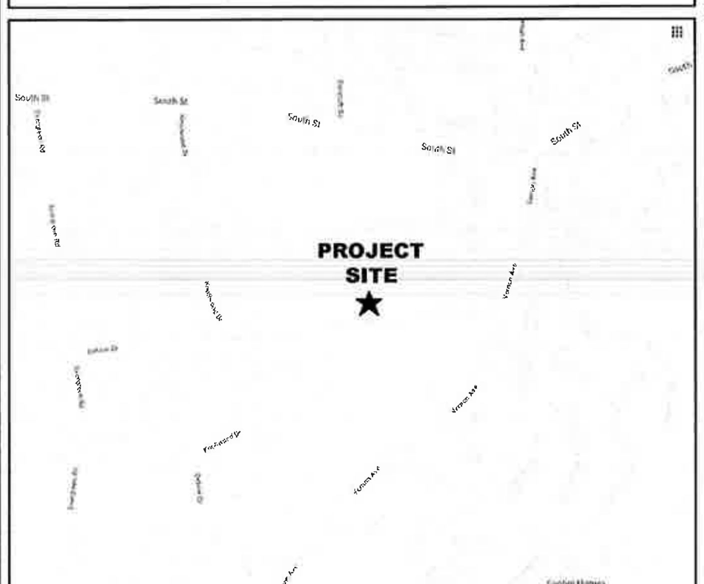
CONFIGURATION
67D92DB_2XAIR+1OP

SHEET INDEX

TOWER OWNER NOTIFICATION

ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, CONTRACTOR WILL CONTACT THE CROWN CASTLE CONSTRUCTION MANAGER OF RECORD (NOTED ON THE FIRST PAGE ON THIS CONSTRUCTION DRAWING) A MINIMUM OF 48 HOURS PRIOR TO WORK START. UPON ARRIVAL TO THE JOB SITE, CONTRACTOR CREW IS REQUIRED CALL 1-800-788-7011 TO NOTIFY THE CROWN CASTLE NOC WORK HAS BEGUN.

LOCATION MAP



GENERAL NOTES

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRH AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
- THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON STORMWATER DRAINAGE.
- NO SANITARY SEWER, POTABLE WATER, OR TRASH DISPOSAL SERVICE IS REQUIRED
- NO COMMERCIAL SIGNAGE IS PROPOSED

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED WITH ANY LOCAL AMENDMENTS BY THE LOCAL GOVERNING AUTHORITIES:

- INTERNATIONAL BUILDING CODE
- NATIONAL ELECTRICAL CODE
- NATIONAL FIRE PROTECTION ASSOCIATION 101
- NATIONAL FIRE PROTECTION ASSOCIATION 1
- LOCAL BUILDING CODES
- CITY/COUNTY ORDINANCES
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
- UNDERWRITERS LABORATORIES APPROVED ELECTRICAL PRODUCTS.
- ANSI EIA/TIA 222 REV. G
- TIA 607
- INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
- IEEE C2 (LATEST EDITION)
- TELCORDIA GR-1275
- ANSI T1.311

PROJECT SITE INFORMATION

SITE ID:	CT11711A
SITE NAME:	CROWN CASTLE SST
SITE ADDRESS:	197 SOUTH ST. VERNON, CT 06066
PERMITTING JURISDICTION:	TOWN OF VERNON
COUNTY:	TOLLAND COUNTY
ZONING:	R-22
SITE COORDINATES:	
LATITUDE:	41.853537° (NAD 83)
LONGITUDE:	-72.452097° (NAD 83)
APPLICANT:	T-MOBILE NORTHEAST LLC 103 MONARCH DRIVE LIVERPOOL, NY 13088

STRUCTURAL ANALYSIS INFORMATION

TOWER ANALYSIS

INFINIGY ENGINEERING HAS NOT EVALUATED THE EXISTING **TOWER** FOR THIS SITE AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO STRUCTURAL ANALYSIS FROM TOWER OWNER PRIOR TO ANY CONSTRUCTION.

ANTENNA MOUNTS

BASED ON THE MOUNT ANALYSIS COMPLETED BY **MASER CONSULTING** DATED **07/30/2018**. THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION

PROJECT TEAM INFORMATION

CLIENT REPRESENTATIVE:	CROWN CASTLE 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
CLIENT REP. CONTACT:	WILL STONE (518) 373-3543
ENGINEER:	INFINIGY 6865 DEERPATH ROAD SUITE 152 ELKRIDGE, MD 21075
ENGINEER CONTACT:	MATTHEW LIVERETTE (518) 690-0790

SCOPE OF WORK

SCOPE OF WORK:
TMO L600 67D04G (UPSTATE NY MARKET)
REPLACING (6) EXISTING ANTENNAS WITH NEW MODELS. ADDING (2) HYBRID FIBER CABLES, AND (3) RRUS. REMOVE (3) EXISTING RRUs. REMOVE (2) EXISTING COAX.

811 Know what's below. Call before you dig.

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN CONNECTICUT, CONTACT CALL BEFORE YOU DIG
TOLL FREE: 1-800-922-4455 OR www.cbyd.com
CONNECTICUT STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

T-Mobile
T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (443) 592-3143

STATE OF CONNECTICUT JOHN S. STEVENS No. 25 LICENSED PROFESSIONAL ENGINEER
SEP. 06 2018

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

No.	Submittal/Revision	App'd	Date
1	ANTENNA REVISION	RCD	08/31/18
0	ISSUED FOR CONSTRUCTION	RCD	08/20/18
A	ISSUED FOR REVIEW	RCD	08/08/18

Drawn: SL
Designed: MRL
Checked: AJD

Project Number: 600-007

Project Title:
CT11711A
CROWN CASTLE SST
197 SOUTH ST.
VERNON, CT 06066

Prepared For: CROWN CASTLE

Drawing Title: **TITLE PAGE**

Drawing Number: **T1**

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
- B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
- C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
- D. AND NFPA 101 (LIFE SAFETY CODE).
- E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
- F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: T-MOBILE CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE T-MOBILE WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY T-MOBILE TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR T-MOBILE PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
- B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
- C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
- D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO T-MOBILE OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
- E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
- F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
- C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
- D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
- E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
- F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
- G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
M	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
	UNDERGROUND UTILITIES
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
	GROUND ROD
	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
	DC POWER AND FIBER OPTIC TRUNK CABLES
E	DC POWER CABLES
# / #	REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

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SEP 06 2018

No	Submittal / Revision	App'd	Date
1	ANTENNA REVISION	RCD	08/31/18
0	ISSUED FOR CONSTRUCTION	RCD	08/20/18
A	ISSUED FOR REVIEW	RCD	08/06/18

Drawn: SL
Designed: MRL
Checked: AJO

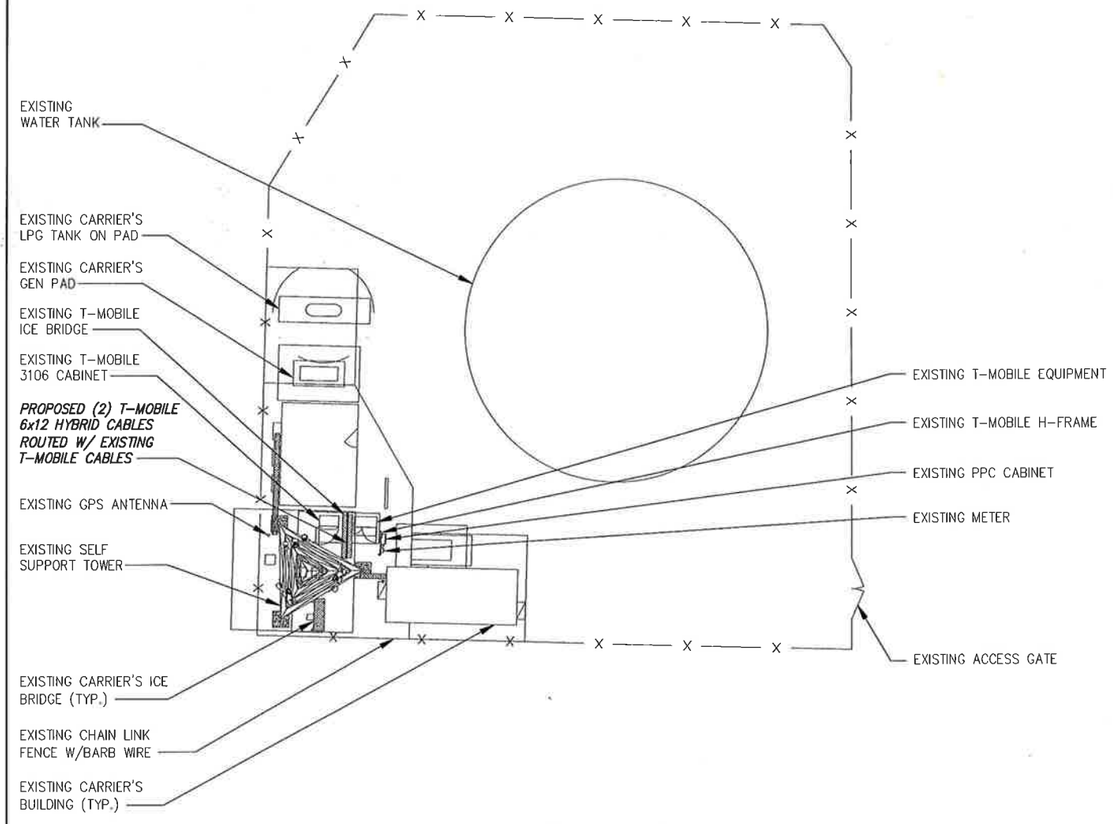
Project Number: 600-007

Project Title:
CT11711A
CROWN CASTLE SST
197 SOUTH ST.
VERNON, CT 06066

Prepared For: CROWN CASTLE

Drawing Title: **NOTES**

Drawing Number: **N1**



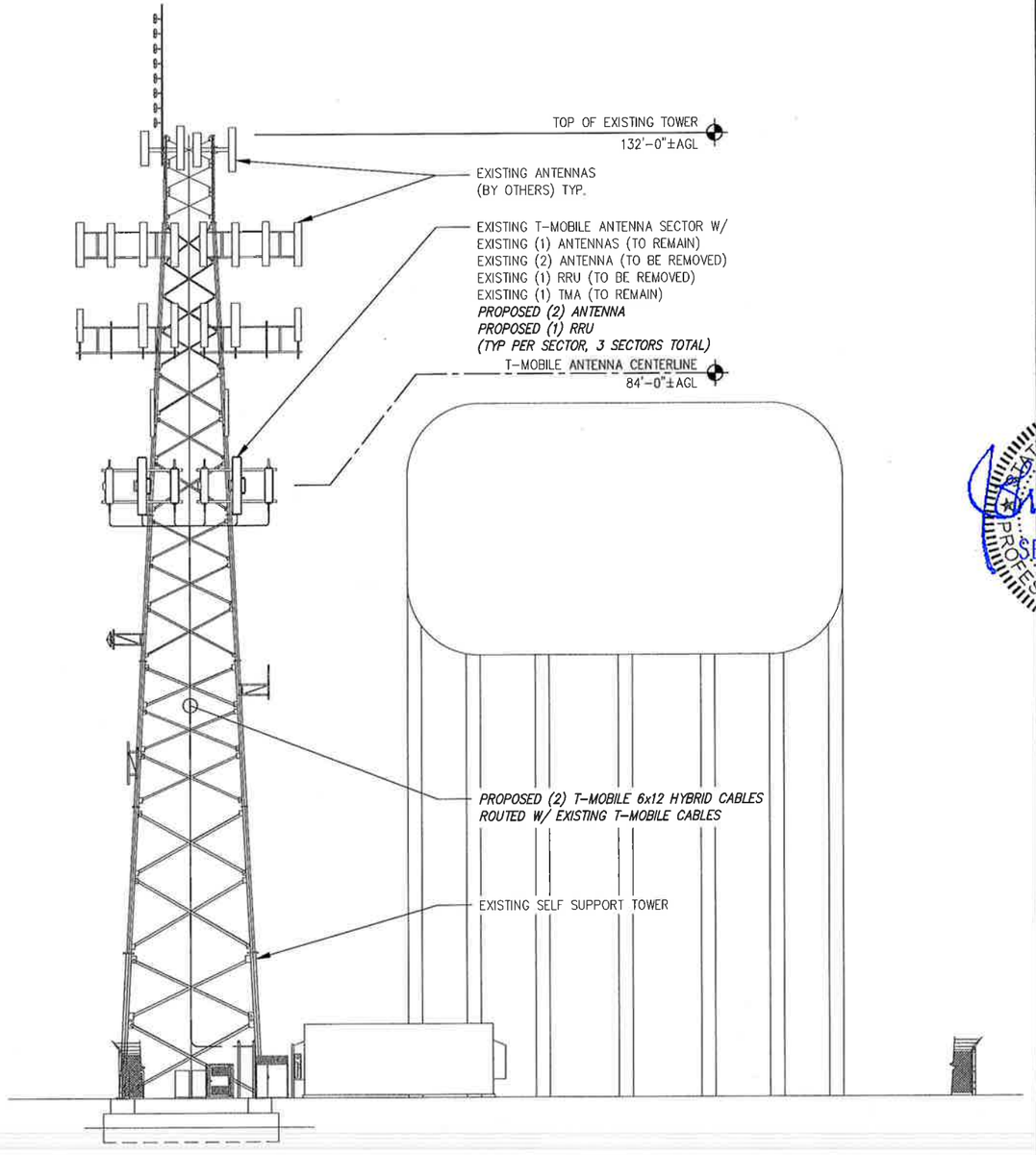
NORTH

1 / C1 PLAN VIEW
SCALE: AS NOTED

GRAPHIC SCALE:

30' 15' 0 15' 30'

SCALE (11x17): 1" = 30'-0"
SCALE (22x34): 1" = 15'-0"



2 / C1 ELEVATION
SCALE: NOT TO SCALE

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SEP 06 2018

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Drawing Title
PLAN AND ELEVATION

Drawing Number
C1

SECTOR	ANTENNA POSITION	ANTENNA MODEL #	VENDOR	AZIMUTH	M-TILT	E-TILT	ANTENNA CENTERLINE	TMA/RRU MODEL #	CABLE LENGTH	CABLE TYPE AND QUANTITY
ALPHA	A-1	AIR21 B2A/B4P	ERICSSON	0°	0	-	84'-0"	TWIN STYLE 1B-AWS	EXISTING	(2) 1-5/8" COAX
	A-2	**APXVAARR24_43-U-NA20**	**RFS**	**0°**	0	-	84'-0"	**4449 B71+B12**	**132'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	A-3	**AIR32 B66A/B2A**	**ERICSSON**	**0°**	0	-	84'-0"	-	132'±	(1) 6X12 HYBRID TRUNK CABLE (SHARED)
BETA	B-1	AIR21 B2A/B4P	ERICSSON	120°	0	-	84'-0"	TWIN STYLE 1B-AWS	EXISTING	(2) 1-5/8" COAX
	B-2	**APXVAARR24_43-U-NA20**	**RFS**	**120°**	0	-	84'-0"	**4449 B71+B12**	**132'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	B-3	**AIR32 B66A/B2A**	**RFS**	**120°**	0	-	84'-0"	-	132'±	(1) 6X12 HYBRID TRUNK CABLE (SHARED)
GAMMA	C-1	AIR21 B2A/B4P	ERICSSON	240°	0	-	84'-0"	TWIN STYLE 1B-AWS	EXISTING	(2) 1-5/8" COAX
	C-2	**APXVAARR24_43-U-NA20**	**RFS**	**240°**	0	-	84'-0"	**4449 B71+B12**	**132'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	C-3	**AIR32 B66A/B2A**	**ERICSSON**	**240°**	0	-	84'-0"	-	132'±	(1) 6X12 HYBRID TRUNK CABLE (SHARED)

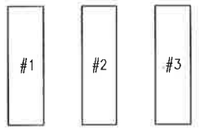
1 C2 RF SYSTEM CHART
SCALE: NOT TO SCALE

KEY

EXISTING
PROPOSED

ANTENNA LOCATION KEY

VIEWED FROM BEHIND

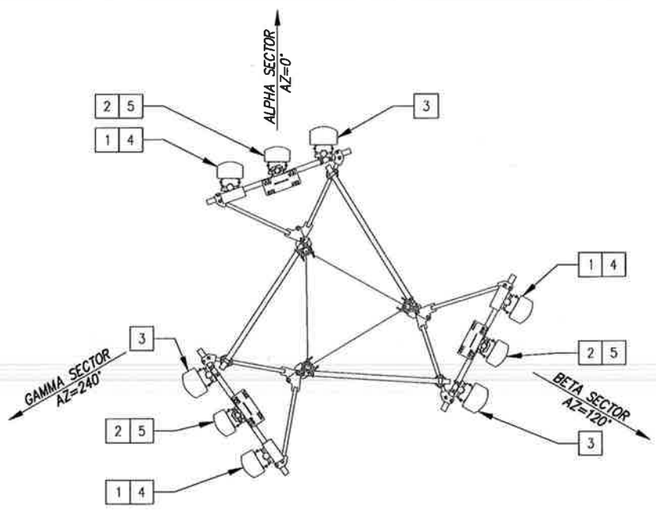


GENERAL NOTES:

1. CONTRACTOR TO VERIFY PROPOSED ANTENNA INFORMATION IS THE MOST CURRENT AT TIME OF CONSTRUCTION.
2. CONTRACTOR TO CONFIRM CABLE LENGTHS FOR ANY PROPOSED CABLES/JUMPERS PRIOR TO CONSTRUCTION.

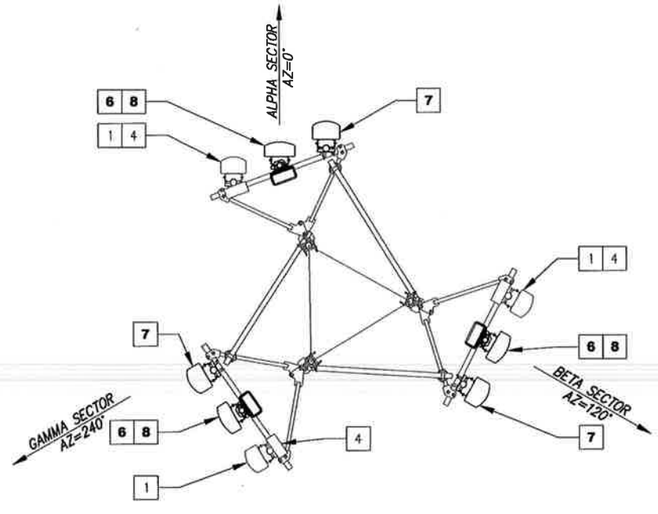
ORIENTATION PLAN KEY

KEY	DESCRIPTION	TYPE	QTY	STATUS
1	AIR21_B2A_B4P	ANTENNA	3	REMAIN
2	LNX-6514DS-A1M	ANTENNA	3	REMOVED
3	AIR21_B2P_B4A	ANTENNA	3	REMOVED
4	TWINSTYLE 1B-AWS	TMA	3	REMAIN
5	RRUS11 B12	RRU	3	REMOVED
6	**APXVAARR24_43-U-NA20**	**ANTENNA**	**3**	**PROPOSED**
7	**AIR32_B66A_B2A**	**ANTENNA**	**3**	**PROPOSED**
8	**4449 B71+B12**	**RRU**	**3**	**PROPOSED**



NORTH

2 C2 EXISTING ANTENNA ORIENTATION
SCALE: NOT TO SCALE



NORTH

3 C2 PROPOSED ANTENNA ORIENTATION
SCALE: NOT TO SCALE

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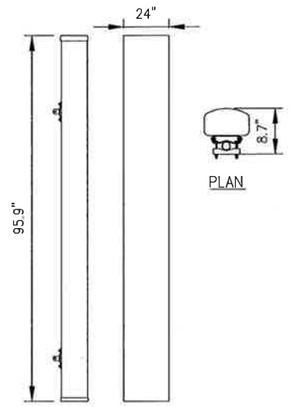
Prepared For:
CROWN CASTLE

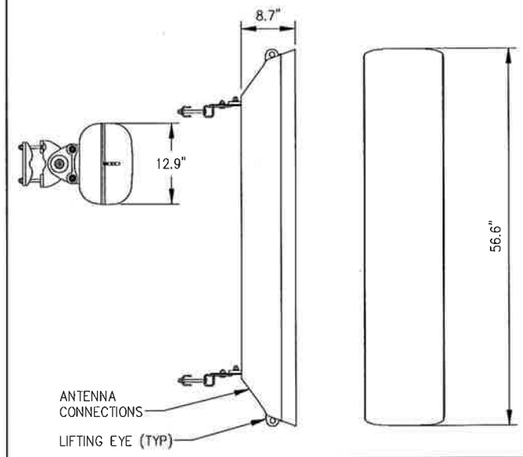
Drawing Title
RF CHART

Drawing Number
C2



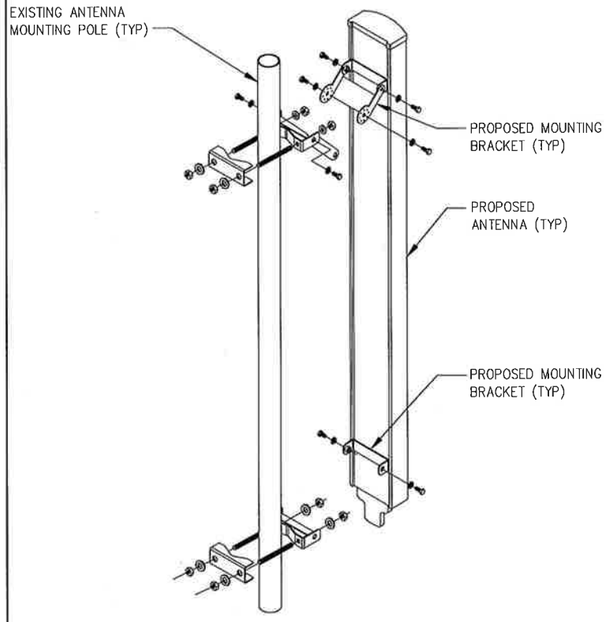
RFS MODEL NO.:	APXVAARR24_43-U-NA20
RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD:	95.9"x24"x8.7"
WEIGHT, W/O MOUNTING KIT:	128 LBS

1 / D1 APX ANTENNA DETAIL
SCALE: NOT TO SCALE

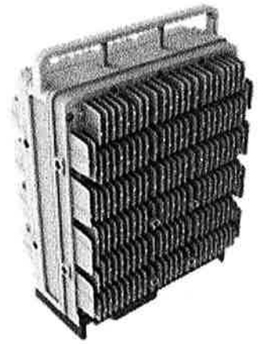


ERICSSON MODEL NO.:	AIR32 B66A-B2A
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	56.6"x12.9"x8.7"
WEIGHT, W/ PRE-MOUNTED BRACKETS:	132.2 LBS

2 / D1 AIR32 B66A ANTENNA DETAIL
SCALE: NOT TO SCALE



3 / D1 ANTENNA/RRU MOUNTING DETAIL
SCALE: NOT TO SCALE



ERICSSON 4449 B71+B12 SPECIFICATIONS

- HxWxD, (INCHES) : 17.91"x13.19"x10.63"
- WEIGHT (LBS) : 74.96
- COLOR : GRAY

4 / D1 4449 B71+B12 RRU DETAIL
SCALE: NOT TO SCALE

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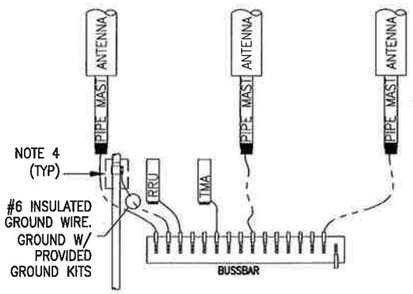
VERNON, CT 06066

Prepared For: CROWN CASTLE

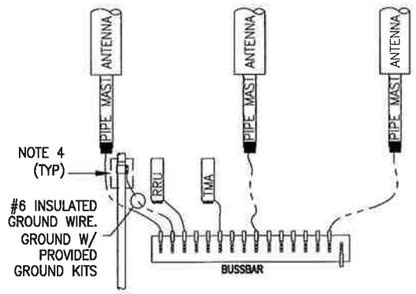
Drawing Title: **EQUIPMENT DETAILS**

Drawing Number: **D1**

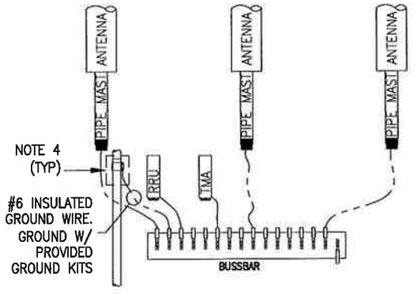
ALPHA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



BETA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)

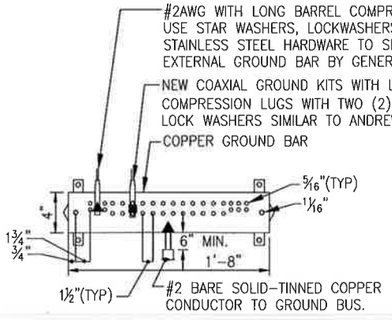


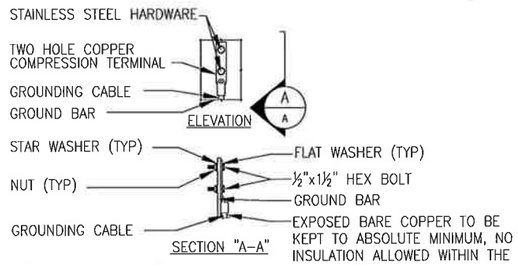
GAMMA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



NOTES:
1. PROVIDE #2AWG GROUNDING CONDUCTOR, U.O.N.
2. PROVIDE BONDING AND GROUNDING CONDUCTORS WITH GREEN TYPE THWN INSULATION, U.O.N.
3. PROVIDE SOLID TINNED BARE COPPER WIRE (BCW) GROUNDING CONDUCTOR.
4. PROVIDE STANDARD COAX OR HYBRID CABLE GROUNDING KIT OR FIELD FABRICATE TO SUIT CONDITIONS. TOTAL LENGTH OF GROUNDING CONDUCTOR SHALL NOT EXCEED 10'-0".
5. PROVIDE GROUNDING ELECTRODES QUANTITY, TYPE AND SIZE AS INDICATED ON SITE GROUNDING PLAN.
6. LEAVE GROUND WIRE COILED UP ABOVE GRADE. CAP END OF CONDUIT.
7. ADD COAX OR HYBRID CABLE GROUND KIT CONNECTION TO BUSSBAR WHEN LENGTH OF CABLE TRAY (FROM TOWER OR MONOPOLE TO EQUIPMENT) IS GREATER THAN 20'-0".
8. ADD #2/0 GREEN INSULATED CONDUCTOR BETWEEN CABLE TRAY AND GRIPSTRUT/COVER.
9. BUSSBARS ARE TO BE TINNED COPPER BARS (¼"X2"X12") MOUNTED ON INSULATORS, U.O.N.
10. GROUND ALL PROPOSED ANTENNAS, DIPLEXERS, TMAS, AND RRUS PER MANU. SPECS.

1 / E1 GROUNDING DIAGRAM
SCALE: NOT TO SCALE

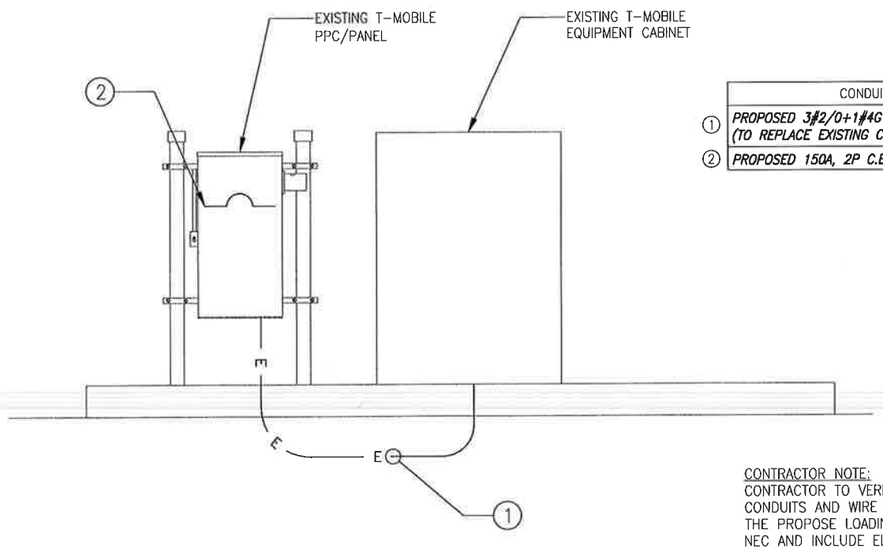




NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

2 / E1 GROUND BAR CONNECTION DETAIL
SCALE: NOT TO SCALE



CONDUIT SCHEDULE	
①	PROPOSED 3#2/0+1#4G IN 2" CONDUIT (TO REPLACE EXISTING CONDUCTOR AND CONDUIT)
②	PROPOSED 150A, 2P C.B.

CONTRACTOR NOTE:
CONTRACTOR TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSE LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

3 / E1 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (443) 592-3143

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
PROFESSIONAL ENGINEER
SEP 06 2018

No	Submittal / Revision	Appd	Date
1	ANTENNA REVISION	RCD	08/31/18
0	ISSUED FOR CONSTRUCTION	RCD	08/20/18
A	ISSUED FOR REVIEW	RCD	08/08/18

Drawn: SL
Designed: MRL
Checked: AJD

Project Number: 800-007

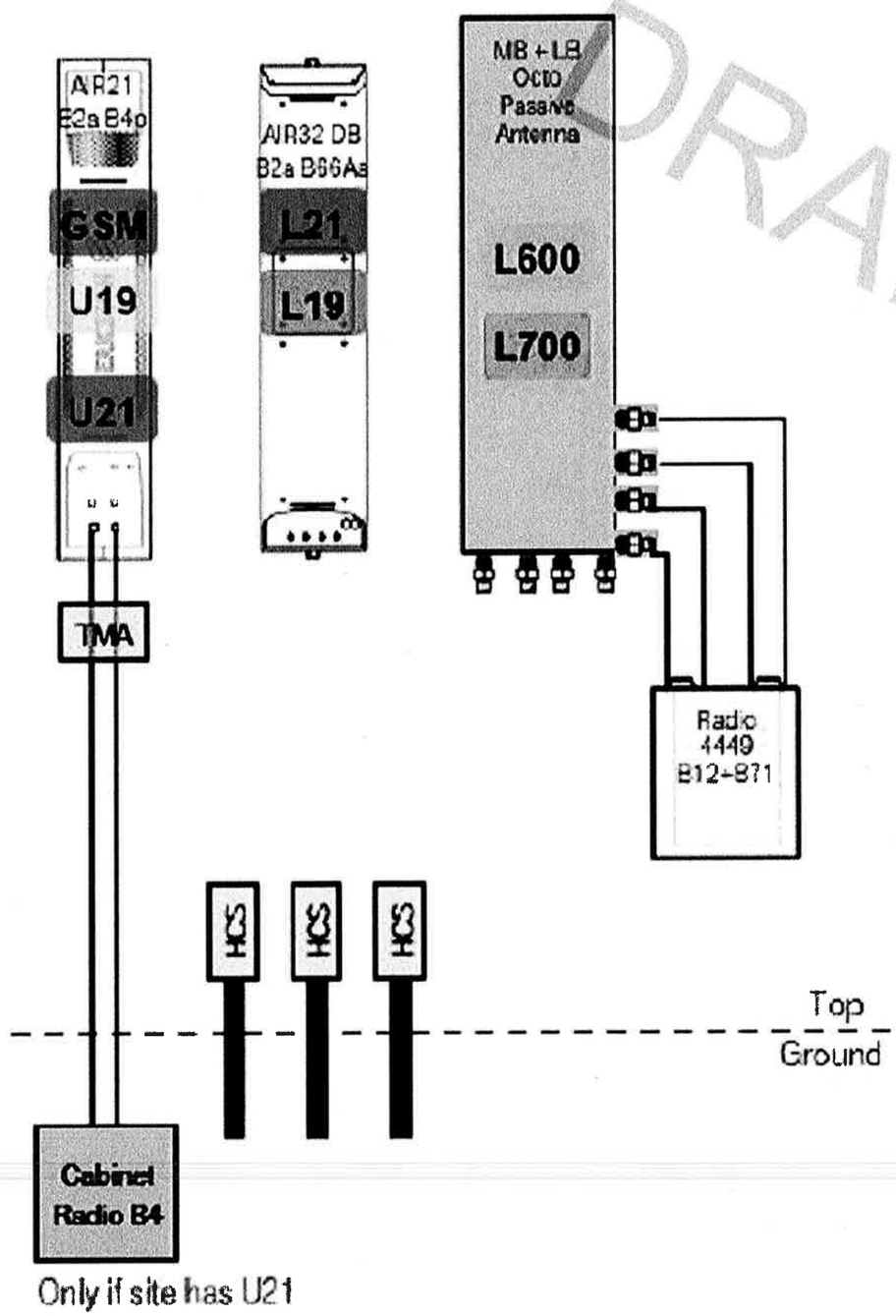
Project Title:
CT11711A
CROWN CASTLE SST
197 SOUTH ST.
VERNON, CT 06066

Prepared For: CROWN CASTLE

Drawing Title
GROUNDING & ELECTRICAL DETAILS

Drawing Number
E1

67D92DB_2xAIR+1OP.JPG



1 / E2 RF PLUMBING DIAGRAM
SCALE: AS NOTED

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (445) 392-3143

SEP 06 2018
No. 24705
LICENSED PROFESSIONAL ENGINEER

No.	Submittal / Revision	Appd.	Date
1	ANTENNA REVISION	RCD	08/31/18
0	ISSUED FOR CONSTRUCTION	RCD	08/20/18
A	ISSUED FOR REVIEW	RCD	08/08/18

Drawn: SL
Designed: MRL
Checked: AJD

Project Number: 600-007

Project Title:
CT11711A
CROWN CASTLE
SST
197 SOUTH ST.
VERNON, CT 06066

Prepared For: CROWN CASTLE

Drawing Title
RF PLUMBING DIAGRAM

Drawing Number
E2

Date: **August 8, 2018**

Amanda Brown
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

SSOE Group
320 Seven Springs Way, Suite 350
Brentwood, TN 37027
(615) 661-7585

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11711A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	806377
	Crown Castle Site Name:	HRT 084 943242
	Crown Castle JDE Job Number:	512589
	Crown Castle Work Order Number:	1604435
	Crown Castle Order Number:	446129 Rev. 0
Engineering Firm Designation:	**SSOE Group Project Number:**	018-00035-00 BC 1108
Site Data:	**197 South St., Vernon, CT 06066, Tolland County** **Latitude *41° 51' 12.51"*, Longitude *-72° 27' 7.52"*** **132 Foot – Modified Rohn Self Support Tower**	

Dear Ms. Amanda Brown,

SSOE Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1230063, in accordance with order 446129, revision 0.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

We at *SSOE Group* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Jajwalya Joshi

Respectfully submitted by:

Barry W. Burgess, PE
Section Manager

08/08/2018

TABLE OF CONTENTS

1) INTRODUCTION

The existing 132' tower is supported on three legs and has seven major sections. It has a triangular cross section made of bolted connections, with an "X" frame configuration. The tower is fabricated with pipe legs and angle diagonals.

The tower was originally designed for Motorola, Inc. and Metro Mobile CTS by Rohn in accordance with E.I.A. Zone "A" with 0.5" radial ice.

Modifications designed by L&W Engineering (W.O. #: 2106-2, dated 10/31/95), which consisted of replacing pipe legs from 60.0' to 80.0' and tower diagonals from the 100.0' to 120.0' elevations, have been considered.

Modifications designed by SSOE Group (Project #: 015-00428-01, WO #: 1059741, dated 05/15/15), which consisted of installing secondary horizontals from 0.0' to 10.0' and 80.0' to 86.7' elevations, have been considered.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a nominal 3-second gust wind speed of 97 mph with no ice, 40 mph with 1" ice thickness and 60 mph under service loads, Exposure Category B.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
84.0	84.0	3	Ericsson	AIR 32 B2A/B66AA w/ Mount Pipe	2	1-3/8	1
		3	Ericsson	RADIO 4449 B12/B71			
		3	RFS Celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe			

Notes:
1) See Appendix B for the proposed coax layout.

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
130.0	141.0	1	Decibel	DB413-B	3 1 2	1-1/4 5/8 7/8	1
	130.0	3	Alcatel Lucent	TD-RRH8x20-25			
		3	RFS Celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
		3	Alcatel Lucent	1900MHz RRH (65MHz)			
		1	-	T- Arm Mount [TA 702-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
117.0	118.0	2	RFS Celwave	DB-T1-6Z-8AB-0Z	-	-	1
	117.0	3	Alcatel Lucent	B13 RRH 4X30	1 1	1-5/8 7/8	2
		3	Alcatel Lucent	B25 RRH2x60 PCS			
		3	Alcatel Lucent	B66A RRH4X45			
		3	Amphenol	QUAD656C0000X w/ Mount Pipe			
		3	Nokia	AIRSCALE RRH 4T4R B5 160W			
		6	Andrew	SBNHH-1D65B w/ Mount Pipe	11 1	7/8 1-5/8	1
		2	Andrew	LBX-6515DS-T0M w/ Mount Pipe			
		1	Andrew	LNX-6514DS-T4M w/ Mount Pipe			
		1	-	Sector Mount [SM 504-3]			
104.0	106.0	1	CCI Antennas	TPA-65R-LCUUUU-H8-K w/ Mount Pipe	-	-	2
		2	Quintel Technology	QS66512-2 w/ Mount Pipe			
		3	Ericsson	RRUS 32 B2			
		2	CCI Antennas	HPA-65R-BUU-H6	2 2 14	3/8 3/4 7/8	1
		1	CCI Antennas	HPA-65R-BUU-H8			
		3	Ericsson	RRUS 32			
		6	Kathrein	860 10025			
		2	Raycap	DC6-48-60-18-8F			
		6	Communication Components	DTMABP7819VG12A			
		6	Kathrein	782-10250			
		3	Kathrein	800 10121 w/ Mount Pipe			
		3	Ericsson	RRUS-11			
	104.0	1	-	Sector Mount [SM 504-3]			
94.0	94.0	3	Kathrein	742 213 w/ Mount Pipe	6	1-5/8	1
84.0	84.0	3	Andrew	LNX-6515DS-A1M w/ Mount Pipe	2	7/8	3
		3	Ericsson	RRUS 11 B12			
		3	Ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	Ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1 10	1-5/8 7/8	1
		3	Ericsson	KRY 112 144/1			
		3	Site Pro 1	VFA12-U			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
63.0	63.0	1	Maxrad	MPRC2449	2	3/8	1
		1	Redline Communications	RDL-3000			
		1	-	Side Arm Mount [SO 311-1]			
56.0	59.0	1	Maxrad	GPS-TMG-20N	1	1/2	1
	56.0	1	-	Side Arm Mount [SO 311-1]			
46.0	47.0	1	Lucent	KS24019-L112A	1	1/2	1
	46.0	1	-	Side Arm Mount [SO 701-1]			

Notes:
1) Existing equipment.
2) Reserved Loading
3) Existing equipment to be removed; not considered in this analysis.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
127.0	127.0	4	Celwave	PD10017	-	-
		4	-	3' Side Arm Mount		
124.0	124.0	2	Generic	8' Dia. STD Dishes	-	-
112.0	112.0	6	Celwave	PD1132	-	-
		3	-	6' Side Arm Mount		
80.0	80.0	1	Celwave	PD1109	-	-
		1	-	6' Side Arm Mount		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Tower Manufacturer Drawings	Rohn File #: 22731JC, dated 7/24/87	529704	CCISites
Tower Foundation Drawings	FDH Engineering Project #: 1310781500, dated 07/18/13	1014812	CCISites
Geotechnical Reports	FDH Engineering Project #: 04-1212E, dated 12/30/04	1014866	CCISites
Modification Drawings	L&W Engineering Work Order #: 2106-2, dated 10/31/95	2240842	CCISites
Modification Drawings	SSOE Group Project #: 015-00428-01, WO #: 1059741, dated 5/15/18	5678760	CCISites
Post Modification Inspection	Engineered Tower Solutions, PLLC. Project #: 150657, dated 8/18/15	5849707	CCISites
Mount Analysis Report	Maser Consulting, Connecticut Project #: 18922078A, dated 7/30/18	-	Crown Castle

3.1) Analysis Method

tnxTower (version 8.0.2.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and foundation were constructed in accordance with their original design and maintained per the manufacturer's specifications, and in good condition, and the tower is twist free and plumb.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) The existing base plate grout was not considered in this analysis.
5) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package included in Work Order #: 1604435, last modified on 8/2/18 with any adjustments as noted below.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	132 - 124	Leg	ROHN 2 STD	2	-3.57	36.84	9.7	Pass
T2	124 - 120	Leg	ROHN 2 STD	20	-4.99	36.84	13.5	Pass
T3	120 - 100	Leg	ROHN 2.5 STD	30	-28.08	57.13	49.1	Pass
T4	100 - 93.3333	Leg	ROHN 3 STD	60	-36.91	70.89	52.1	Pass
T5	93.3333 - 86.6667	Leg	ROHN 3 STD	69	-46.54	70.89	65.6	Pass
T6	86.6667 - 80	Leg	ROHN 3 STD	77	-57.33	91.43	62.7	Pass
T7	80 - 60	Leg	ROHN 3 XX-STR	89	-90.26	160.27	56.3	Pass
T8	60 - 40	Leg	ROHN 4 X-STR	110	-121.30	159.91	75.9	Pass
T9	40 - 20	Leg	ROHN 5 X-STR	131	-148.58	201.25	73.8	Pass
T10	20 - 10	Leg	ROHN 5 X-STR	146	-163.39	201.25	81.2	Pass
T11	10 - 0	Leg	ROHN 5 X-STR	155	-176.44	253.28	69.7	Pass
T1	132 - 124	Diagonal	L1 3/4x1 3/4x3/16	9	-1.24	8.62	14.4 20.9 (b)	Pass
T2	124 - 120	Diagonal	L1 3/4x1 3/4x3/16	25	-1.12	8.59	13.1 18.3 (b)	Pass
T3	120 - 100	Diagonal	L2x2x3/16	36	-4.09	7.60	53.8 56.7 (b)	Pass
T4	100 - 93.3333	Diagonal	L2 1/2x2 1/2x3/16	63	-4.84	11.42	42.3 56.4 (b)	Pass
T5	93.3333 - 86.6667	Diagonal	L2 1/2x2 1/2x3/16	72	-5.00	10.38	48.2 58.8 (b)	Pass
T6	86.6667 - 80	Diagonal	L2 1/2x2 1/2x3/16	81	-6.32	9.07	69.7 72.0 (b)	Pass
T7	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	93	-6.48	7.17	90.3	Pass
T8	60 - 40	Diagonal	L3x3x3/16	115	-7.23	9.97	72.5 74.8 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T9	40 - 20	Diagonal	L3x3x1/4	136	-8.43	8.87	95.0	Pass
T10	20 - 10	Diagonal	L3 1/2x3 1/2x1/4	151	-8.56	13.12	65.3 69.6 (b)	Pass
T11	10 - 0	Diagonal	L3 1/2x3 1/2x1/4	160	-8.98	11.73	76.6	Pass
T6	86.6667 - 80	Secondary Horizontal	L1 1/2x1 1/2x3/16	85	-0.99	2.82	35.3	Pass
T11	10 - 0	Secondary Horizontal	L2 1/2x2 1/2x3/16	163	-3.06	4.38	69.8	Pass
T1	132 - 124	Top Girt	L2x2x3/16	6	-0.09	2.09	4.1	Pass
T3	120 - 100	Top Girt	L2x2x3/16	33	-0.11	3.98	2.8	Pass
							Summary	
						Leg (T10)	81.2	Pass
						Diagonal (T9)	95.0	Pass
						Secondary Horizontal (T11)	69.8	Pass
						Top Girt (T1)	4.1	Pass
						Bolt Checks	76.2	Pass
						Rating =	95.0	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Foundation (Structural)		66.7%	Pass
1	Foundation (Soil Interaction)		18.1%	Pass
1	Anchor Rods		97.4.%	Pass

Structure Rating (max from all components) =	97.4%

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

4.1) Recommendations

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

5) DISCLAIMER OF WARRANTIES

SSOE Group has not performed a site visit to the tower to verify member sizes or antenna/coax loading. SSOE Group shall be contacted immediately if the existing conditions are not as represented on the tower elevation contained in this report in order to evaluate the significance of the discrepancy. SSOE Group has not performed a condition assessment of the tower foundation. This report does not replace a full tower inspection

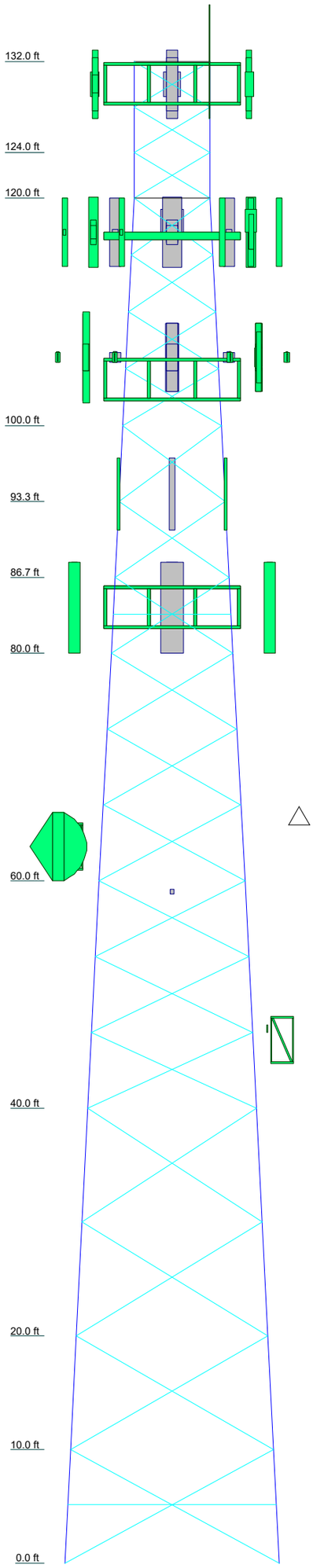
The engineering services rendered by SSOE Group in connection with this structural analysis are limited to an analysis of the tower structure and theoretical capacity of its main structural members. Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of suitable size and strength be purchased from a reputable tower manufacturer.

SSOE Group makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. SSOE Group will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data contained in this report. The maximum liability of SSOE Group pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

TNXTOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Legs	ROHN 2 STD		ROHN 2.5 STD		ROHN 3 STD		ROHN 3 XX-STR	ROHN 4 X-STR	ROHN 5 X-STR		
Leg Grade	A572-50										
Diagonals	L1 3/4x1 3/4x3/16		L2x2x3/16				L2 1/2x2 1/2x3/16	L3x3x3/16	L3x3x1/4	L3 1/2x3 1/2x1/4	
Diagonal Grade	A36								A572-50		
Top Girts		L1 3/4x1 3/4x1/8	L2x2x1/8					N.A.			
Sec. Horizontals		N.A.	N.A.			A		N.A.		L2 1/2x2 1/2x3/16	
Face Width (ft)	6.60417	6.63194	6.64583	8.6875	9.35417	10.0208	10.6875	12.7604	14.7708	16.7708	17.7708
# Panels @ (ft)	3 @ 4		4 @ 5				9 @ 6.66667		4 @ 10		
Weight (K)	0.3	0.1	1.0	0.4	0.4	0.5	2.0	2.0	2.5	1.4	1.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
3" x 10' mount pipe	130	800 10121 w/ Mount Pipe	104
APXVSPP18-C-A20 w/ Mount Pipe	130	HPA-65R-BUU-H6 w/ Mount Pipe	104
APXVTM14-C-120 w/ Mount Pipe	130	AM-X-CD-16-65-00T-RET w/ Mount Pipe	104
1900MHZ RRH (65MHz)	130	QS66512-2 w/ Mount Pipe	104
800MHz 2x50W RRH W/FILTER	130	(2) 782-10250	104
TD-RRH8x20-25	130	RRUS-11	104
APXVSPP18-C-A20 w/ Mount Pipe	130	(2) DTMABP7819VG12A	104
APXVTM14-C-120 w/ Mount Pipe	130	(2) 860 10025	104
800MHz 2x50W RRH W/FILTER	130	RRUS 32	104
1900MHZ RRH (65MHz)	130	RRUS 32 B2	104
TD-RRH8x20-25	130	DC6-48-60-18-8F	104
DB413-B	130	800 10121 w/ Mount Pipe	104
APXVSPP18-C-A20 w/ Mount Pipe	130	HPA-65R-BUU-H8 w/ Mount Pipe	104
APXVTM14-C-120 w/ Mount Pipe	130	TPA-65R-LCUUUU-H8-K w/ Mount Pipe	104
800MHz 2x50W RRH W/FILTER	130	(2) 782-10250	104
1900MHZ RRH (65MHz)	130	(2) DTMABP7819VG12A	104
TD-RRH8x20-25	130	RRUS-11	104
T-Arm Mount [TA 702-3]	130	(2) 860 10025	104
LBX-6515DS-T0M w/ Mount Pipe	117	RRUS 32	104
LNX-6514DS-T4M w/ Mount Pipe	117	RRUS 32 B2	104
(2) SBNHH-1D65B w/ Mount Pipe	117	Sector Mount [SM 504-3]	104
(2) FD9R6004/2C-3L	117	742 213 w/ Mount Pipe	94
DB-T1-6Z-8AB-0Z	117	742 213 w/ Mount Pipe	94
RRH2x60-AWS	117	742 213 w/ Mount Pipe	94
RRH2X60-PCS	117	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	84
RRH2x60-700	117	LNX-6515DS-A1M w/ Mount Pipe	84
QUAD656C0000X w/ Mount Pipe	117	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	84
B13 RRH 4X30	117	KRY 112 144/1	84
B25 RRH2x60 PCS	117	RRUS 11 B12	84
B66A RRH4X45	117	AIR 32 B2A/B66AA w/ Mount Pipe	84
AIRSCALE RRH 4T4R B5 160W	117	RADIO 4449 B12/B71	84
LBX-6515DS-T0M w/ Mount Pipe	117	APXVAARR24_43-U-NA20 w/ Mount Pipe	84
LNX-6514DS-T4M w/ Mount Pipe	117	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	84
(2) FD9R6004/2C-3L	117	LNX-6515DS-A1M w/ Mount Pipe	84
(2) SBNHH-1D65B w/ Mount Pipe	117	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	84
RRH2x60-AWS	117	KRY 112 144/1	84
DB-T1-6Z-8AB-0Z	117	RRUS 11 B12	84
RRH2x60-700	117	AIR 32 B2A/B66AA w/ Mount Pipe	84
RRH2X60-PCS	117	RADIO 4449 B12/B71	84
QUAD656C0000X w/ Mount Pipe	117	APXVAARR24_43-U-NA20 w/ Mount Pipe	84
B13 RRH 4X30	117	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	84
B25 RRH2x60 PCS	117	LNX-6515DS-A1M w/ Mount Pipe	84
B66A RRH4X45	117	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	84
AIRSCALE RRH 4T4R B5 160W	117	KRY 112 144/1	84
LNX-6514DS-T6M w/ Mount Pipe	117	RRUS 11 B12	84
LNX-6514DS-T4M w/ Mount Pipe	117	AIR 32 B2A/B66AA w/ Mount Pipe	84
(2) SBNHH-1D65B w/ Mount Pipe	117	RADIO 4449 B12/B71	84
BXA-70063-6CF-2 w/ Mount Pipe	117	APXVAARR24_43-U-NA20 w/ Mount Pipe	84
(2) FD9R6004/2C-3L	117	VFA12-U	84
RRH2x60-AWS	117	VFA12-U	84
RRH2x60-700	117	VFA12-U	84
RRH2X60-PCS	117	RDL-3000	63
QUAD656C0000X w/ Mount Pipe	117	Side Arm Mount [SO 311-1]	63
B13 RRH 4X30	117	MPRC2449	63
B25 RRH2x60 PCS	117	Side Arm Mount [SO 311-1]	56
B66A RRH4X45	117	GPS-TMG-20N	56
AIRSCALE RRH 4T4R B5 160W	117	Side Arm Mount [SO 701-1]	46
Sector Mount [SM 504-3]	117	KS24019-L112A	46
800 10121 w/ Mount Pipe	104		
HPA-65R-BUU-H6 w/ Mount Pipe	104		
AM-X-CD-16-65-00T-RET w/ Mount Pipe	104		
QS66512-2 w/ Mount Pipe	104		
(2) 782-10250	104		
RRUS-11	104		
DC6-48-60-18-8F	104		
(2) DTMABP7819VG12A	104		
(2) 860 10025	104		
RRUS 32	104		
RRUS 32 B2	104		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 1/2x1 1/2x3/16		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

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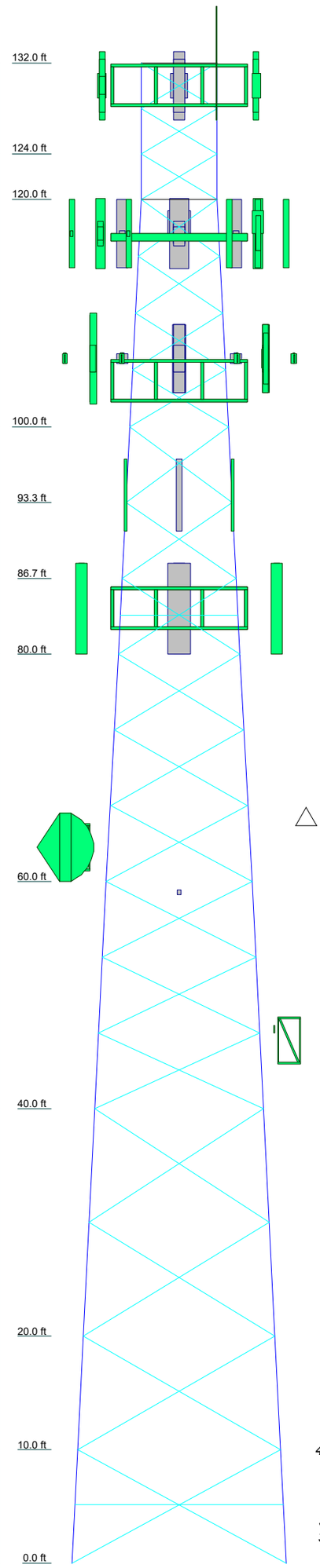
SSOE Group
320 Seven Springs Way, Suite 350
Brentwood, TN 37027
Phone: (615) 661-7585
FAX: (615) 661-7569

Job: ***BU 806377 HRT 084 943242***			
Project: ***018-00035-00***			
Client: CCI	Drawn by: 16314	App'd:	
Code: TIA-222-G	Date: 08/08/18	Scale: NTS	
Path: G:\DEPT\8080 Structural\05Structural Engineers\Hesson\Crown\Towers\SA\806377 HRT 084 943242\tnx\806377.eri		Dwg No. E-1	



Section	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		ROHN 5 X-STR		ROHN 4 X-STR	ROHN 3 XX-STR		ROHN 3 STD		ROHN 2.5 STD		ROHN 2 STD
Leg Grade					A572-50						
Diagonals	L3 1/2x3 1/2x1/4		L3x3x1/4	L3x3x3/16	L2 1/2x2 1/2x3/16				L2x2x3/16		L1 3/4x1 3/4x3/16
Diagonal Grade			A572-50			A36					
Top Girts				N.A.					L2x2x1/8	N.A.	L1 3/4x1 3/4x1/8
Sec. Horizontals	L2 1/2x2 1/2x3/16			N.A.		A			N.A.		
Face Width (ft)	17.7708	16.7708	14.7708	12.7604	10.6875	10.0208	9.35417	8.6875	6.64583	6.63194	6.60417
# Panels @ (ft)	1.6	4 @ 10	2.5	2.0	9 @ 6.66667	0.5	0.4	0.4	4 @ 5	0.1	3 @ 4 0.3
Weight (K)	12.1	1.4		2.0	2.0				1.0		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 1/2x1 1/2x3/16		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

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5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 95%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 184 K
SHEAR: 22 K

UPLIFT: -152 K
SHEAR: 19 K

AXIAL 144 K
SHEAR 8 K *MOMENT 748 kip-ft*

TORQUE 10 kip-ft
40 mph WIND - 1.00 in ICE

AXIAL 39 K
SHEAR 35 K *MOMENT 2771 kip-ft*

TORQUE 34 kip-ft
REACTIONS - 97 mph WIND

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Job: ***BU 806377 HRT 084 943242***		
Project: ***018-00035-00***		
Client: CCI	Drawn by: 16314	App'd:
Code: TIA-222-G	Date: 08/08/18	Scale: NTS
Path: G:\DEPT\8080 Structural\05Structural Engineers\Hesson\Crown\Towers\SA\806377 HRT 084 943242\tnx\806377.eri		Dwg No. E-1

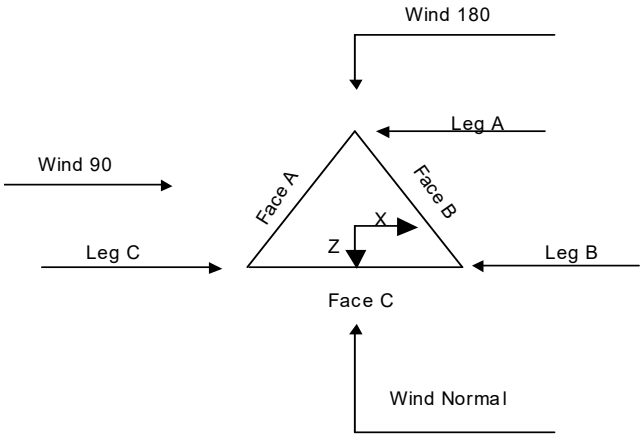
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 132.00 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 6.60 ft at the top and 18.77 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Tolland County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.00 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	132.00-124.00			6.60	1	8.00
T2	124.00-120.00			6.63	1	4.00
T3	120.00-100.00			6.65	1	20.00
T4	100.00-93.33			8.69	1	6.67
T5	93.33-86.67			9.35	1	6.67
T6	86.67-80.00			10.02	1	6.67
T7	80.00-60.00			10.69	1	20.00
T8	60.00-40.00			12.76	1	20.00
T9	40.00-20.00			14.77	1	20.00
T10	20.00-10.00			16.77	1	10.00
T11	10.00-0.00			17.77	1	10.00

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	132.00-124.00	4.00	X Brace	No	No	0.00	0.00
T2	124.00-120.00	4.00	X Brace	No	No	0.00	0.00
T3	120.00-100.00	5.00	X Brace	No	No	0.00	0.00
T4	100.00-93.33	6.67	X Brace	No	No	0.00	0.00

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T5	93.33-86.67	6.67	X Brace	No	No	0.00	0.00
T6	86.67-80.00	6.67	X Brace	No	Yes	0.00	0.00
T7	80.00-60.00	6.67	X Brace	No	No	0.00	0.00
T8	60.00-40.00	6.67	X Brace	No	No	0.00	0.00
T9	40.00-20.00	10.00	X Brace	No	No	0.00	0.00
T10	20.00-10.00	10.00	X Brace	No	No	0.00	0.00
T11	10.00-0.00	10.00	X Brace	No	Yes	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 132.00-124.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 124.00-120.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 120.00-100.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 100.00-93.33	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 93.33-86.67	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 86.67-80.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 80.00-60.00	Pipe	ROHN 3 XX-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 60.00-40.00	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A572-50 (50 ksi)
T9 40.00-20.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T10 20.00-10.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T11 10.00-0.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 132.00-124.00	Equal Angle	L1 3/4x1 3/4x1/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T3 120.00-100.00	Equal Angle	L2x2x1/8	A36 (36 ksi)	Flat Bar		A36 (36 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
T6 86.67-80.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T11 10.00-0.00	Equal Angle	L2 1/2x2 1/2x3/16	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 132.00-124.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T2 124.00-120.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T3 120.00-100.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T4 100.00-93.33	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T5 93.33-86.67	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T6 86.67-80.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T7 80.00-60.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T8 60.00-40.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T9 40.00-20.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T10 20.00-10.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T11 10.00-0.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00

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
132.00-124.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
124.00-120.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
100.00-93.33				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
93.33-86.67				1	1	1	1	1	1	1
T6	No	Yes	1	1	1	1	1	1	1	1
86.67-80.00				1	1	1	1	1	0.5	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
20.00-10.00				1	1	1	1	1	1	1
T11	No	Yes	1	1	1	1	1	1	1	1
10.00-0.00				1	1	1	1	1	0.5	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 Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 132.00-124.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T2 124.00-120.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T3 120.00-100.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T4 100.00-93.33	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T5 93.33-86.67	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T6 86.67-80.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T7 80.00-60.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T8 60.00-40.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T9 40.00-20.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T10 20.00-10.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T11 10.00-0.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	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 132.00-124.00	Flange	0.00 A325N	0	0.63 A325N	1	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T2 124.00-120.00	Flange	0.63 A325N	4	0.63 A325N	1	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T3 120.00-100.00	Flange	0.75 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T4 100.00-93.33	Flange	0.88 A325N	0	0.63 A325N	1	0.50 A325N	0	0.00 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T5 93.33-86.67	Flange	0.88 A325N	0	0.63 A325N	1	0.63 A325N	0	0.00 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T6 86.67-80.00	Flange	0.88 A325N	4	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	1
T7 80.00-60.00	Flange	0.88 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T8 60.00-40.00	Flange	1.00 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T9 40.00-20.00	Flange	1.00 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T10 20.00-10.00	Flange	1.00 A449	0	0.75 A325N	1	0.63 A325N	0	0.00 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T11 10.00-0.00	Flange	1.00 A449	0	0.75 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	1

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF5-50A(7/8")	A	No	Ar (CaAa)	117.00 - 8.00	0.00	0.35	8	8	1.00	1.09		0.00
LDF5-50A(7/8")	A	No	Ar (CaAa)	117.00 - 8.00	2.00	0.25	3	2	1.00	1.09		0.00
HB158-1-08U8-S8J18(1-5/8)	A	No	Ar (CaAa)	117.00 - 8.00	0.00	0.45	1	1	1.98	1.98		0.00
HB158-1-08U8-S8J18(1-5/8)	A	No	Ar (CaAa)	117.00 - 8.00	0.00	0.43	1	1	1.00	1.98		0.00
LDF5-50A(7/8")	A	No	Ar (CaAa)	117.00 - 8.00	2.00	0.45	1	1	1.00	1.09		0.00
Banjo Bracket	A	No	Af (CaAa)	117.00 - 8.00	0.00	0.33	1	1	1.00	0.50		0.01
Feedline Ladder (Af)	A	No	Af (CaAa)	117.00 - 8.00	0.00	0.4	1	1	3.00	3.00		0.01
Safety Line 3/8	A	No	Ar (CaAa)	132.00 - 8.00	0.00	0.5	1	1	1.00	0.38		0.00
Step Pegs	A	No	Ar (CaAa)	132.00 - 8.00	0.00	0.5	1	1	1.00	0.80		0.00
LDF4RN-50A (1/2 FOAM)	B	No	Ar (CaAa)	56.00 - 8.00	0.00	-0.43	1	1	1.00	0.63		0.00
HB078-1-08U3-M3J(7/8")	B	No	Ar (CaAa)	130.00 - 8.00	0.00	-0.39	2	2	1.00	1.09		0.00
LDF2-50 (3/8 FOAM)	B	No	Ar (CaAa)	63.00 - 8.00	0.00	-0.37	2	2	1.00	0.44		0.00
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	94.00 - 8.00	-25.00	0.35	6	2	1.00	1.98		0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	84.00 - 8.00	-20.00	0.4	10	3	1.00	1.09		0.00
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	84.00 - 8.00	-25.00	0.4	1	1	1.00	1.98		0.00
HCS 6X12 6AWG(1-3/8)	B	No	Ar (CaAa)	84.00 - 8.00	-25.00	0.35	2	2	1.00	1.38		0.00
LDF4RN-50A (1/2 FOAM)	B	No	Ar (CaAa)	46.00 - 8.00	2.00	0.4	1	1	1.00	0.63		0.00
HB114-1-08U4-M5J(1 1/4")	B	No	Ar (CaAa)	130.00 - 8.00	0.00	0.4	3	3	1.00	1.54		0.00
HB058-1-08U1-S1J(5/8")	B	No	Ar (CaAa)	130.00 - 8.00	0.00	0.38	1	1	1.00	0.84		0.00
T-Bracket	B	No	Af (CaAa)	94.00 - 8.00	-10.00	0.4	1	1	1.00	1.00		0.01
Step Pegs	B	No	Ar (CaAa)	40.00 - 8.00	0.00	0.5	1	1	1.00	0.80		0.00
Feedline Ladder (Af)	B	No	Af (CaAa)	130.00 - 8.00	0.00	-0.4	1	1	3.00	3.00		0.01
Feedline Ladder (Af)	B	No	Af (CaAa)	130.00 - 8.00	0.00	0.4	1	1	3.00	3.00		0.01
LDF5-50A(7/8")	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.4	14	12	1.00	1.09		0.00
FB-L98B-002-75000(3/8")	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.47	1	1	1.00	0.39		0.00
WR-VG86ST-BRD(3/4)	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.49	2	2	1.00	0.00		0.00
Feedline Ladder (Af)	C	No	Af (CaAa)	104.00 - 8.00	0.00	-0.4	1	1	3.00	3.00		0.01
2.5" Flex Conduit	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.49	1	1	1.00	2.50		0.00
Step Pegs	C	No	Ar (CaAa)	40.00 - 8.00	0.00	-0.5	1	1	1.00	0.80		0.00
FB-L98B-002-75000(3/8")	C	No	Ar (CaAa)	104.00 - 8.00	0.00	-0.49	1	1	1.00	0.00		0.00

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	132.00-124.00	A	0.000	0.000	0.940	0.000	0.02
		B	0.000	0.000	10.584	0.000	0.13
		C	0.000	0.000	0.000	0.000	0.00
T2	124.00-120.00	A	0.000	0.000	0.470	0.000	0.01
		B	0.000	0.000	7.056	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.00
T3	120.00-100.00	A	0.000	0.000	41.235	0.000	0.48
		B	0.000	0.000	35.280	0.000	0.45
		C	0.000	0.000	9.261	0.000	0.06
T4	100.00-93.33	A	0.000	0.000	16.032	0.000	0.19
		B	0.000	0.000	12.663	0.000	0.16
		C	0.000	0.000	15.436	0.000	0.10
T5	93.33-86.67	A	0.000	0.000	16.032	0.000	0.19
		B	0.000	0.000	20.791	0.000	0.25
		C	0.000	0.000	15.436	0.000	0.10
T6	86.67-80.00	A	0.000	0.000	16.032	0.000	0.19
		B	0.000	0.000	27.047	0.000	0.28
		C	0.000	0.000	15.436	0.000	0.10
T7	80.00-60.00	A	0.000	0.000	48.097	0.000	0.56
		B	0.000	0.000	93.917	0.000	0.90

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	46.307	0.000	0.29
T8	60.00-40.00	A	0.000	0.000	48.097	0.000	0.56
		B	0.000	0.000	96.799	0.000	0.90
		C	0.000	0.000	46.307	0.000	0.29
T9	40.00-20.00	A	0.000	0.000	48.097	0.000	0.56
		B	0.000	0.000	99.533	0.000	0.96
		C	0.000	0.000	47.907	0.000	0.35
T10	20.00-10.00	A	0.000	0.000	24.048	0.000	0.28
		B	0.000	0.000	49.767	0.000	0.48
		C	0.000	0.000	23.954	0.000	0.17
T11	10.00-0.00	A	0.000	0.000	4.810	0.000	0.06
		B	0.000	0.000	9.953	0.000	0.10
		C	0.000	0.000	4.791	0.000	0.03

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	132.00-124.00	A	2.290	0.000	0.000	8.269	0.000	0.15
		B		0.000	0.000	31.531	0.000	0.62
		C		0.000	0.000	0.000	0.000	0.00
T2	124.00-120.00	A	2.279	0.000	0.000	4.117	0.000	0.08
		B		0.000	0.000	20.964	0.000	0.41
		C		0.000	0.000	0.000	0.000	0.00
T3	120.00-100.00	A	2.256	0.000	0.000	144.974	0.000	2.75
		B		0.000	0.000	104.215	0.000	2.03
		C		0.000	0.000	28.742	0.000	0.51
T4	100.00-93.33	A	2.227	0.000	0.000	55.255	0.000	1.04
		B		0.000	0.000	36.195	0.000	0.71
		C		0.000	0.000	47.622	0.000	0.84
T5	93.33-86.67	A	2.211	0.000	0.000	55.037	0.000	1.03
		B		0.000	0.000	51.346	0.000	1.07
		C		0.000	0.000	47.468	0.000	0.83
T6	86.67-80.00	A	2.194	0.000	0.000	54.804	0.000	1.02
		B		0.000	0.000	66.281	0.000	1.33
		C		0.000	0.000	47.303	0.000	0.82
T7	80.00-60.00	A	2.156	0.000	0.000	162.850	0.000	3.01
		B		0.000	0.000	229.980	0.000	4.48
		C		0.000	0.000	140.803	0.000	2.43
T8	60.00-40.00	A	2.085	0.000	0.000	159.911	0.000	2.90
		B		0.000	0.000	252.721	0.000	4.65
		C		0.000	0.000	138.725	0.000	2.34
T9	40.00-20.00	A	1.981	0.000	0.000	155.637	0.000	2.74
		B		0.000	0.000	263.645	0.000	4.72
		C		0.000	0.000	145.226	0.000	2.40
T10	20.00-10.00	A	1.848	0.000	0.000	75.089	0.000	1.27
		B		0.000	0.000	126.935	0.000	2.20
		C		0.000	0.000	70.418	0.000	1.12
T11	10.00-0.00	A	1.656	0.000	0.000	14.228	0.000	0.23
		B		0.000	0.000	23.972	0.000	0.40
		C		0.000	0.000	13.448	0.000	0.20

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	132.00-124.00	4.60	-2.48	5.08	-4.98
T2	124.00-120.00	6.29	-2.96	7.34	-5.89
T3	120.00-100.00	5.60	-11.88	7.01	-15.40
T4	100.00-93.33	12.30	-9.72	15.73	-12.01
T5	93.33-86.67	14.51	-7.19	17.80	-9.97
T6	86.67-80.00	15.92	-4.26	19.09	-6.89
T7	80.00-60.00	19.90	-3.32	23.24	-6.35
T8	60.00-40.00	21.23	-4.39	25.97	-9.36
T9	40.00-20.00	26.42	-4.65	32.85	-8.89
T10	20.00-10.00	27.29	-4.92	34.90	-9.55
T11	10.00-0.00	8.05	-1.47	12.99	-3.59

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	10	Safety Line 3/8	124.00 - 132.00	0.6000	0.5026
T1	11	Step Pegs	124.00 - 132.00	0.6000	0.5026
T1	14	HB078-1-08U3-M3J(7/8")	124.00 - 130.00	0.6000	0.5026
T1	21	HB114-1-08U4-M5J(1 1/4")	124.00 - 130.00	0.6000	0.5026
T1	22	HB058-1-08U1-S1J(5/8")	124.00 - 130.00	0.6000	0.5026
T1	25	Feedline Ladder (Af)	124.00 - 130.00	0.6000	0.5026
T1	26	Feedline Ladder (Af)	124.00 - 130.00	0.6000	0.5026
T2	10	Safety Line 3/8	120.00 - 124.00	0.6000	0.5637
T2	11	Step Pegs	120.00 - 124.00	0.6000	0.5637
T2	14	HB078-1-08U3-M3J(7/8")	120.00 - 124.00	0.6000	0.5637
T2	21	HB114-1-08U4-M5J(1 1/4")	120.00 - 124.00	0.6000	0.5637
T2	22	HB058-1-08U1-S1J(5/8")	120.00 - 124.00	0.6000	0.5637
T2	25	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.5637
T2	26	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.5637
T3	2	LDF5-50A(7/8")	100.00 - 117.00	0.6000	0.5950
T3	4	LDF5-50A(7/8")	100.00 - 117.00	0.6000	0.5950
T3	5	HB158-1-08U8-S8J18(1-5/8)	100.00 - 117.00	0.6000	0.5950
T3	6	HB158-1-08U8-S8J18(1-5/8)	100.00 - 117.00	0.6000	0.5950
T3	7	LDF5-50A(7/8")	100.00 - 117.00	0.6000	0.5950

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	8	Banjo Bracket	100.00 - 117.00	0.6000	0.5950
T3	9	Feedline Ladder (Af)	100.00 - 117.00	0.6000	0.5950
T3	10	Safety Line 3/8	100.00 - 120.00	0.6000	0.5950
T3	11	Step Pegs	100.00 - 120.00	0.6000	0.5950
T3	14	HB078-1-08U3-M3J(7/8")	100.00 - 120.00	0.6000	0.5950
T3	21	HB114-1-08U4-M5J(1 1/4")	100.00 - 120.00	0.6000	0.5950
T3	22	HB058-1-08U1-S1J(5/8")	100.00 - 120.00	0.6000	0.5950
T3	25	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.5950
T3	26	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.5950
T3	28	LDF5-50A(7/8")	100.00 - 104.00	0.6000	0.5950
T3	29	FB-L98B-002-75000(3/8")	100.00 - 104.00	0.6000	0.5950
T3	30	WR-VG86ST-BRD(3/4)	100.00 - 104.00	0.6000	0.5950
T3	31	Feedline Ladder (Af)	100.00 - 104.00	0.6000	0.5950
T3	32	2.5" Flex Conduit	100.00 - 104.00	0.6000	0.5950
T3	34	FB-L98B-002-75000(3/8")	100.00 - 104.00	0.6000	0.5950
T4	2	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	4	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	5	HB158-1-08U8-S8J18(1-5/8)	93.33 - 100.00	0.6000	0.6000
T4	6	HB158-1-08U8-S8J18(1-5/8)	93.33 - 100.00	0.6000	0.6000
T4	7	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	8	Banjo Bracket	93.33 - 100.00	0.6000	0.6000
T4	9	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T4	10	Safety Line 3/8	93.33 - 100.00	0.6000	0.6000
T4	11	Step Pegs	93.33 - 100.00	0.6000	0.6000
T4	14	HB078-1-08U3-M3J(7/8")	93.33 - 100.00	0.6000	0.6000
T4	16	LDF7-50A (1-5/8 FOAM)	93.33 - 94.00	0.6000	0.6000
T4	21	HB114-1-08U4-M5J(1 1/4")	93.33 - 100.00	0.6000	0.6000
T4	22	HB058-1-08U1-S1J(5/8")	93.33 - 100.00	0.6000	0.6000
T4	23	T-Bracket	93.33 - 94.00	0.6000	0.6000
T4	25	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T4	26	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T4	28	LDF5-50A(7/8")	93.33 - 100.00	0.6000	0.6000
T4	29	FB-L98B-002-75000(3/8")	93.33 - 100.00	0.6000	0.6000
T4	30	WR-VG86ST-BRD(3/4)	93.33 - 100.00	0.6000	0.6000
T4	31	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T4	32	2.5" Flex Conduit	93.33 - 100.00	0.6000	0.6000
T4	34	FB-L98B-002-75000(3/8")	93.33 - 100.00	0.6000	0.6000
T5	2	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	4	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	5	HB158-1-08U8-S8J18(1-5/8)	86.67 - 93.33	0.6000	0.6000
T5	6	HB158-1-08U8-S8J18(1-5/8)	86.67 - 93.33	0.6000	0.6000
T5	7	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	8	Banjo Bracket	86.67 - 93.33	0.6000	0.6000
T5	9	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T5	10	Safety Line 3/8	86.67 - 93.33	0.6000	0.6000
T5	11	Step Pegs	86.67 - 93.33	0.6000	0.6000
T5	14	HB078-1-08U3-M3J(7/8")	86.67 - 93.33	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	16	LDF7-50A (1-5/8 FOAM)	86.67 - 93.33	0.6000	0.6000
T5	21	HB114-1-08U4-M5J(1 1/4")	86.67 - 93.33	0.6000	0.6000
T5	22	HB058-1-08U1-S1J(5/8")	86.67 - 93.33	0.6000	0.6000
T5	23	T-Bracket	86.67 - 93.33	0.6000	0.6000
T5	25	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T5	26	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T5	28	LDF5-50A(7/8")	86.67 - 93.33	0.6000	0.6000
T5	29	FB-L98B-002-75000(3/8")	86.67 - 93.33	0.6000	0.6000
T5	30	WR-VG86ST-BRD(3/4)	86.67 - 93.33	0.6000	0.6000
T5	31	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T5	32	2.5" Flex Conduit	86.67 - 93.33	0.6000	0.6000
T5	34	FB-L98B-002-75000(3/8")	86.67 - 93.33	0.6000	0.6000
T6	2	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	4	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	5	HB158-1-08U8-S8J18(1-5/8)	80.00 - 86.67	0.6000	0.6000
T6	6	HB158-1-08U8-S8J18(1-5/8)	80.00 - 86.67	0.6000	0.6000
T6	7	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	8	Banjo Bracket	80.00 - 86.67	0.6000	0.6000
T6	9	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T6	10	Safety Line 3/8	80.00 - 86.67	0.6000	0.6000
T6	11	Step Pegs	80.00 - 86.67	0.6000	0.6000
T6	14	HB078-1-08U3-M3J(7/8")	80.00 - 86.67	0.6000	0.6000
T6	16	LDF7-50A (1-5/8 FOAM)	80.00 - 86.67	0.6000	0.6000
T6	17	LDF5-50A (7/8 FOAM)	80.00 - 84.00	0.6000	0.6000
T6	18	LDF7-50A (1-5/8 FOAM)	80.00 - 84.00	0.6000	0.6000
T6	19	HCS 6X12 6AWG(1-3/8)	80.00 - 84.00	1.0000	1.0000
T6	21	HB114-1-08U4-M5J(1 1/4")	80.00 - 86.67	0.6000	0.6000
T6	22	HB058-1-08U1-S1J(5/8")	80.00 - 86.67	0.6000	0.6000
T6	23	T-Bracket	80.00 - 86.67	0.6000	0.6000
T6	25	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T6	26	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T6	28	LDF5-50A(7/8")	80.00 - 86.67	0.6000	0.6000
T6	29	FB-L98B-002-75000(3/8")	80.00 - 86.67	0.6000	0.6000
T6	30	WR-VG86ST-BRD(3/4)	80.00 - 86.67	0.6000	0.6000
T6	31	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T6	32	2.5" Flex Conduit	80.00 - 86.67	0.6000	0.6000
T6	34	FB-L98B-002-75000(3/8")	80.00 - 86.67	0.6000	0.6000
T7	2	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	4	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	5	HB158-1-08U8-S8J18(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	6	HB158-1-08U8-S8J18(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	7	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	8	Banjo Bracket	60.00 - 80.00	0.6000	0.6000
T7	9	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	10	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T7	11	Step Pegs	60.00 - 80.00	0.6000	0.6000
T7	14	HB078-1-08U3-M3J(7/8")	60.00 - 80.00	0.6000	0.6000
T7	15	LDF2-50 (3/8 FOAM)	60.00 - 63.00	0.6000	0.6000
T7	16	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	17	LDF5-50A (7/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	18	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	19	HCS 6X12 6AWG(1-3/8)	60.00 - 80.00	1.0000	1.0000
T7	21	HB114-1-08U4-M5J(1 1/4")	60.00 - 80.00	0.6000	0.6000
T7	22	HB058-1-08U1-S1J(5/8")	60.00 - 80.00	0.6000	0.6000
T7	23	T-Bracket	60.00 - 80.00	0.6000	0.6000
T7	25	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	26	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	28	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	29	FB-L98B-002-75000(3/8")	60.00 - 80.00	0.6000	0.6000
T7	30	WR-VG86ST-BRD(3/4)	60.00 - 80.00	0.6000	0.6000
T7	31	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	32	2.5" Flex Conduit	60.00 - 80.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	34	FB-L98B-002-75000(3/8")	60.00 - 80.00	0.6000	0.6000
T8	2	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	4	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	5	HB158-1-08U8-S8J18(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	6	HB158-1-08U8-S8J18(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	7	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	8	Banjo Bracket	40.00 - 60.00	0.6000	0.6000
T8	9	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	10	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T8	11	Step Pegs	40.00 - 60.00	0.6000	0.6000
T8	13	LDF4RN-50A (1/2 FOAM)	40.00 - 56.00	0.6000	0.6000
T8	14	HB078-1-08U3-M3J(7/8")	40.00 - 60.00	0.6000	0.6000
T8	15	LDF2-50 (3/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	16	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	17	LDF5-50A (7/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	18	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	19	HCS 6X12 6AWG(1-3/8)	40.00 - 60.00	1.0000	1.0000
T8	20	LDF4RN-50A (1/2 FOAM)	40.00 - 46.00	0.6000	0.6000
T8	21	HB114-1-08U4-M5J(1 1/4")	40.00 - 60.00	0.6000	0.6000
T8	22	HB058-1-08U1-S1J(5/8")	40.00 - 60.00	0.6000	0.6000
T8	23	T-Bracket	40.00 - 60.00	0.6000	0.6000
T8	25	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	26	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	28	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	29	FB-L98B-002-75000(3/8")	40.00 - 60.00	0.6000	0.6000
T8	30	WR-VG86ST-BRD(3/4)	40.00 - 60.00	0.6000	0.6000
T8	31	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	32	2.5" Flex Conduit	40.00 - 60.00	0.6000	0.6000
T8	34	FB-L98B-002-75000(3/8")	40.00 - 60.00	0.6000	0.6000
T9	2	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	4	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	5	HB158-1-08U8-S8J18(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	6	HB158-1-08U8-S8J18(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	7	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	8	Banjo Bracket	20.00 - 40.00	0.6000	0.6000
T9	9	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	10	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T9	11	Step Pegs	20.00 - 40.00	0.6000	0.6000
T9	13	LDF4RN-50A (1/2 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	14	HB078-1-08U3-M3J(7/8")	20.00 - 40.00	0.6000	0.6000
T9	15	LDF2-50 (3/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	16	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	17	LDF5-50A (7/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	18	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	19	HCS 6X12 6AWG(1-3/8)	20.00 - 40.00	1.0000	1.0000
T9	20	LDF4RN-50A (1/2 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	21	HB114-1-08U4-M5J(1 1/4")	20.00 - 40.00	0.6000	0.6000
T9	22	HB058-1-08U1-S1J(5/8")	20.00 - 40.00	0.6000	0.6000
T9	23	T-Bracket	20.00 - 40.00	0.6000	0.6000
T9	24	Step Pegs	20.00 - 40.00	0.6000	0.6000
T9	25	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	26	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	28	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	29	FB-L98B-002-75000(3/8")	20.00 - 40.00	0.6000	0.6000
T9	30	WR-VG86ST-BRD(3/4)	20.00 - 40.00	0.6000	0.6000
T9	31	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	32	2.5" Flex Conduit	20.00 - 40.00	0.6000	0.6000
T9	33	Step Pegs	20.00 - 40.00	0.6000	0.6000
T9	34	FB-L98B-002-75000(3/8")	20.00 - 40.00	0.6000	0.6000
T10	2	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	4	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	5	HB158-1-08U8-S8J18(1-5/8)	10.00 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	6	HB158-1-08U8-S8J18(1-5/8)	10.00 - 20.00	0.6000	0.6000
T10	7	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	8	Banjo Bracket	10.00 - 20.00	0.6000	0.6000
T10	9	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T10	10	Safety Line 3/8	10.00 - 20.00	0.6000	0.6000
T10	11	Step Pegs	10.00 - 20.00	0.6000	0.6000
T10	13	LDF4RN-50A (1/2 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	14	HB078-1-08U3-M3J(7/8")	10.00 - 20.00	0.6000	0.6000
T10	15	LDF2-50 (3/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	16	LDF7-50A (1-5/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	17	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	18	LDF7-50A (1-5/8 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	19	HCS 6X12 6AWG(1-3/8)	10.00 - 20.00	1.0000	1.0000
T10	20	LDF4RN-50A (1/2 FOAM)	10.00 - 20.00	0.6000	0.6000
T10	21	HB114-1-08U4-M5J(1 1/4")	10.00 - 20.00	0.6000	0.6000
T10	22	HB058-1-08U1-S1J(5/8")	10.00 - 20.00	0.6000	0.6000
T10	23	T-Bracket	10.00 - 20.00	0.6000	0.6000
T10	24	Step Pegs	10.00 - 20.00	0.6000	0.6000
T10	25	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T10	26	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T10	28	LDF5-50A(7/8")	10.00 - 20.00	0.6000	0.6000
T10	29	FB-L98B-002-75000(3/8")	10.00 - 20.00	0.6000	0.6000
T10	30	WR-VG86ST-BRD(3/4)	10.00 - 20.00	0.6000	0.6000
T10	31	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T10	32	2.5" Flex Conduit	10.00 - 20.00	0.6000	0.6000
T10	33	Step Pegs	10.00 - 20.00	0.6000	0.6000
T10	34	FB-L98B-002-75000(3/8")	10.00 - 20.00	0.6000	0.6000
T11	2	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	4	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	5	HB158-1-08U8-S8J18(1-5/8)	8.00 - 10.00	0.6000	0.6000
T11	6	HB158-1-08U8-S8J18(1-5/8)	8.00 - 10.00	0.6000	0.6000
T11	7	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	8	Banjo Bracket	8.00 - 10.00	0.6000	0.6000
T11	9	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	10	Safety Line 3/8	8.00 - 10.00	0.6000	0.6000
T11	11	Step Pegs	8.00 - 10.00	0.6000	0.6000
T11	13	LDF4RN-50A (1/2 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	14	HB078-1-08U3-M3J(7/8")	8.00 - 10.00	0.6000	0.6000
T11	15	LDF2-50 (3/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	16	LDF7-50A (1-5/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	17	LDF5-50A (7/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	18	LDF7-50A (1-5/8 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	19	HCS 6X12 6AWG(1-3/8)	8.00 - 10.00	1.0000	1.0000
T11	20	LDF4RN-50A (1/2 FOAM)	8.00 - 10.00	0.6000	0.6000
T11	21	HB114-1-08U4-M5J(1 1/4")	8.00 - 10.00	0.6000	0.6000
T11	22	HB058-1-08U1-S1J(5/8")	8.00 - 10.00	0.6000	0.6000
T11	23	T-Bracket	8.00 - 10.00	0.6000	0.6000
T11	24	Step Pegs	8.00 - 10.00	0.6000	0.6000
T11	25	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	26	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	28	LDF5-50A(7/8")	8.00 - 10.00	0.6000	0.6000
T11	29	FB-L98B-002-75000(3/8")	8.00 - 10.00	0.6000	0.6000
T11	30	WR-VG86ST-BRD(3/4)	8.00 - 10.00	0.6000	0.6000
T11	31	Feedline Ladder (Af)	8.00 - 10.00	0.6000	0.6000
T11	32	2.5" Flex Conduit	8.00 - 10.00	0.6000	0.6000
T11	33	Step Pegs	8.00 - 10.00	0.6000	0.6000
T11	34	FB-L98B-002-75000(3/8")	8.00 - 10.00	0.6000	0.6000

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
3" x 10' mount pipe	B	From Leg	0.00	0.00	130.00	No Ice	3.00	3.00	0.03
			0.00			1/2" Ice	4.03	4.03	0.05
			2.00			1" Ice	5.03	5.03	0.08
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.00	130.00	No Ice	8.02	6.71	0.08
			0.00			1/2" Ice	8.48	7.66	0.14
			0.00			1" Ice	8.94	8.49	0.22
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00	0.00	130.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
1900MHZ RRH (65MHz)	A	From Leg	4.00	0.00	130.00	No Ice	2.31	2.38	0.06
			0.00			1/2" Ice	2.52	2.58	0.08
			0.00			1" Ice	2.73	2.79	0.11
800MHz 2x50W RRH W/FILTER	A	From Leg	4.00	0.00	130.00	No Ice	2.06	1.93	0.06
			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	4.00	0.00	130.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.00	130.00	No Ice	8.02	6.71	0.08
			0.00			1/2" Ice	8.48	7.66	0.14
			0.00			1" Ice	8.94	8.49	0.22
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00	0.00	130.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
800MHz 2x50W RRH W/FILTER	B	From Leg	4.00	0.00	130.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
1900MHZ RRH (65MHz)	B	From Leg	4.00	0.00	130.00	No Ice	2.31	2.38	0.06
			0.00			1/2" Ice	2.52	2.58	0.08
			0.00			1" Ice	2.73	2.79	0.11
TD-RRH8x20-25	B	From Leg	4.00	0.00	130.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
DB413-B	B	From Leg	4.00	0.00	130.00	No Ice	2.55	2.55	0.03
			0.00			1/2" Ice	4.59	4.59	0.04
			11.00			1" Ice	6.63	6.63	0.05
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.00	130.00	No Ice	8.02	6.71	0.08
			0.00			1/2" Ice	8.48	7.66	0.14
			0.00			1" Ice	8.94	8.49	0.22
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00	0.00	130.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
800MHz 2x50W RRH W/FILTER	C	From Leg	4.00	0.00	130.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
1900MHZ RRH (65MHz)	C	From Leg	4.00	0.00	130.00	No Ice	2.31	2.38	0.06
			0.00			1/2" Ice	2.52	2.58	0.08
			0.00			1" Ice	2.73	2.79	0.11
TD-RRH8x20-25	C	From Leg	4.00	0.00	130.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
T-Arm Mount [TA 702-3]	C	None		0.00	130.00	No Ice	5.64	5.64	0.34

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
						1/2" Ice	6.55	6.55	0.43
						1" Ice	7.46	7.46	0.52
LBX-6515DS-T0M w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	8.60 9.17 9.69	6.10 7.27 8.16	0.05 0.11 0.19
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	8.16 8.62 9.09	6.82 7.78 8.61	0.06 0.13 0.20
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 1.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	0.04 0.08 0.12
QUAD656C0000X w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	13.48 14.10 14.68	7.33 8.55 9.50	0.08 0.17 0.28
B13 RRH 4X30	A	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B25 RRH2x60 PCS	A	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	2.14 2.33 2.53	1.31 1.46 1.63	0.05 0.07 0.09
B66A RRH4X45	A	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	2.54 2.75 2.97	1.61 1.79 1.98	0.06 0.08 0.10
AIRSCALE RRH 4T4R B5 160W	A	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	1.29 1.43 1.58	0.72 0.83 0.96	0.04 0.05 0.06
LBX-6515DS-T0M w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	8.60 9.17 9.69	6.10 7.27 8.16	0.05 0.11 0.19
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	8.16 8.62 9.09	6.82 7.78 8.61	0.06 0.13 0.20
DB-T1-6Z-8AB-0Z	B	From Leg	4.00 0.00 1.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	0.04 0.08 0.12
QUAD656C0000X w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	13.48 14.10 14.68	7.33 8.55 9.50	0.08 0.17 0.28
B13 RRH 4X30	B	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B25 RRH2x60 PCS	B	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	2.14 2.33 2.53	1.31 1.46 1.63	0.05 0.07 0.09
B66A RRH4X45	B	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	2.54 2.75 2.97	1.61 1.79 1.98	0.06 0.08 0.10
AIRSCALE RRH 4T4R B5 160W	B	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	1.29 1.43 1.58	0.72 0.83 0.96	0.04 0.05 0.06
LNX-6514DS-T4M w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	8.32 8.88 9.40	7.00 8.19 9.08	0.06 0.13 0.20
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	117.00	No Ice 1/2" Ice 1" Ice	8.16 8.62 9.09	6.82 7.78 8.61	0.06 0.13 0.20
QUAD656C0000X w/ Mount	C	From Leg	4.00	0.00	117.00	No Ice	13.48	7.33	0.08

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
Pipe			0.00			1/2" Ice	14.10	8.55	0.17
			0.00			1" Ice	14.68	9.50	0.28
B13 RRH 4X30	C	From Leg	4.00	0.00	117.00	No Ice	2.06	1.32	0.06
			0.00			1/2" Ice	2.24	1.48	0.07
			0.00			1" Ice	2.43	1.64	0.09
B25 RRH2x60 PCS	C	From Leg	4.00	0.00	117.00	No Ice	2.14	1.31	0.05
			0.00			1/2" Ice	2.33	1.46	0.07
			0.00			1" Ice	2.53	1.63	0.09
B66A RRH4X45	C	From Leg	4.00	0.00	117.00	No Ice	2.54	1.61	0.06
			0.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
AIRSCALE RRH 4T4R B5 160W	C	From Leg	4.00	0.00	117.00	No Ice	1.29	0.72	0.04
			0.00			1/2" Ice	1.43	0.83	0.05
			0.00			1" Ice	1.58	0.96	0.06
Sector Mount [SM 504-3]	C	None		0.00	117.00	No Ice	34.25	34.25	1.71
						1/2" Ice	48.98	48.98	2.29
						1" Ice	63.71	63.71	2.86
800 10121 w/ Mount Pipe	A	From Leg	4.00	0.00	104.00	No Ice	5.39	4.60	0.07
			0.00			1/2" Ice	5.81	5.34	0.11
			2.00			1" Ice	6.23	6.04	0.17
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00	0.00	104.00	No Ice	9.90	8.11	0.08
			0.00			1/2" Ice	10.47	9.30	0.16
			2.00			1" Ice	11.01	10.21	0.25
QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.00	104.00	No Ice	8.37	8.46	0.14
			0.00			1/2" Ice	8.93	9.66	0.21
			2.00			1" Ice	9.46	10.55	0.30
(2) 782-10250	A	From Leg	4.00	0.00	104.00	No Ice	0.45	0.25	0.01
			0.00			1/2" Ice	0.54	0.32	0.01
			2.00			1" Ice	0.64	0.40	0.02
RRUS-11	A	From Leg	4.00	0.00	104.00	No Ice	0.00	1.37	0.05
			0.00			1/2" Ice	0.00	1.55	0.07
			2.00			1" Ice	0.00	1.74	0.09
DC6-48-60-18-8F	A	From Leg	4.00	0.00	104.00	No Ice	2.20	2.20	0.02
			0.00			1/2" Ice	2.40	2.40	0.04
			2.00			1" Ice	2.60	2.60	0.07
(2) DTMABP7819VG12A	A	From Leg	4.00	0.00	104.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			2.00			1" Ice	1.23	0.51	0.04
(2) 860 10025	A	From Leg	4.00	0.00	104.00	No Ice	0.16	0.13	0.00
			0.00			1/2" Ice	0.21	0.19	0.00
			2.00			1" Ice	0.28	0.25	0.01
RRUS 32	A	From Leg	4.00	0.00	104.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			2.00			1" Ice	3.32	2.17	0.10
RRUS 32 B2	A	From Leg	4.00	0.00	104.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			2.00			1" Ice	3.18	2.05	0.10
800 10121 w/ Mount Pipe	B	From Leg	4.00	0.00	104.00	No Ice	5.39	4.60	0.07
			0.00			1/2" Ice	5.81	5.34	0.11
			2.00			1" Ice	6.23	6.04	0.17
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00	0.00	104.00	No Ice	9.90	8.11	0.08
			0.00			1/2" Ice	10.47	9.30	0.16
			2.00			1" Ice	11.01	10.21	0.25
QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.00	104.00	No Ice	8.37	8.46	0.14
			0.00			1/2" Ice	8.93	9.66	0.21
			2.00			1" Ice	9.46	10.55	0.30
(2) 782-10250	B	From Leg	4.00	0.00	104.00	No Ice	0.45	0.25	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	0.54	0.32	0.01
			2.00			1" Ice	0.64	0.40	0.02
RRUS-11	B	From Leg	4.00	0.00	104.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			2.00			1" Ice	3.21	1.49	0.09
(2) DTMABP7819VG12A	B	From Leg	4.00	0.00	104.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			2.00			1" Ice	1.23	0.51	0.04
(2) 860 10025	B	From Leg	4.00	0.00	104.00	No Ice	0.16	0.13	0.00
			0.00			1/2" Ice	0.21	0.19	0.00
			2.00			1" Ice	0.28	0.25	0.01
RRUS 32	B	From Leg	4.00	0.00	104.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			2.00			1" Ice	3.32	2.17	0.10
RRUS 32 B2	B	From Leg	4.00	0.00	104.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			2.00			1" Ice	3.18	2.05	0.10
DC6-48-60-18-8F	B	From Leg	4.00	0.00	104.00	No Ice	2.20	2.20	0.02
			0.00			1/2" Ice	2.40	2.40	0.04
			2.00			1" Ice	2.60	2.60	0.07
800 10121 w/ Mount Pipe	C	From Leg	3.91	0.00	104.00	No Ice	5.39	4.60	0.07
			0.00			1/2" Ice	5.81	5.34	0.11
			2.00			1" Ice	6.23	6.04	0.17
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	3.91	0.00	104.00	No Ice	13.21	9.58	0.10
			0.00			1/2" Ice	13.90	11.05	0.20
			2.00			1" Ice	14.59	12.50	0.30
TPA-65R-LCUUUU-H8-K w/ Mount Pipe	C	From Leg	3.91	0.00	104.00	No Ice	13.54	10.96	0.13
			0.00			1/2" Ice	14.24	12.49	0.23
			2.00			1" Ice	14.95	14.04	0.34
(2) 782-10250	C	From Leg	3.91	0.00	104.00	No Ice	0.45	0.25	0.01
			0.00			1/2" Ice	0.54	0.32	0.01
			2.00			1" Ice	0.64	0.40	0.02
(2) DTMABP7819VG12A	C	From Leg	3.91	0.00	104.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			2.00			1" Ice	1.23	0.51	0.04
RRUS-11	C	From Leg	3.91	0.00	104.00	No Ice	0.00	1.37	0.05
			0.00			1/2" Ice	0.00	1.55	0.07
			2.00			1" Ice	0.00	1.74	0.09
(2) 860 10025	C	From Leg	3.91	0.00	104.00	No Ice	0.16	0.13	0.00
			0.00			1/2" Ice	0.21	0.19	0.00
			2.00			1" Ice	0.28	0.25	0.01
RRUS 32	C	From Leg	3.91	0.00	104.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			2.00			1" Ice	3.32	2.17	0.10
RRUS 32 B2	C	From Leg	4.00	0.00	104.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			2.00			1" Ice	3.18	2.05	0.10
Sector Mount [SM 504-3]	C	None		0.00	104.00	No Ice	34.25	34.25	1.71
						1/2" Ice	48.98	48.98	2.29
						1" Ice	63.71	63.71	2.86
742 213 w/ Mount Pipe	A	From Leg	0.03	0.00	94.00	No Ice	5.37	4.62	0.05
			0.00			1/2" Ice	5.95	6.00	0.09
			0.00			1" Ice	6.50	6.98	0.15
742 213 w/ Mount Pipe	B	From Leg	0.03	0.00	94.00	No Ice	5.37	4.62	0.05
			0.00			1/2" Ice	5.95	6.00	0.09
			0.00			1" Ice	6.50	6.98	0.15
742 213 w/ Mount Pipe	C	From Leg	0.03	0.00	94.00	No Ice	5.37	4.62	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	5.95	6.00	0.09
			0.00			1" Ice	6.50	6.98	0.15
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.00	84.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			0.00			1" Ice	7.21	7.13	0.23
KRY 112 144/1	A	From Leg	4.00	0.00	84.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
			0.00			1" Ice	0.51	0.30	0.02
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00	0.00	84.00	No Ice	6.75	6.07	0.15
			0.00			1/2" Ice	7.20	6.87	0.21
			0.00			1" Ice	7.65	7.58	0.28
RADIO 4449 B12/B71	A	From Leg	4.00	0.00	84.00	No Ice	1.65	1.30	0.08
			0.00			1/2" Ice	1.81	1.44	0.09
			0.00			1" Ice	1.98	1.60	0.11
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00	0.00	84.00	No Ice	20.48	11.02	0.16
			0.00			1/2" Ice	21.23	12.55	0.30
			0.00			1" Ice	21.99	14.10	0.44
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.00	84.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			0.00			1" Ice	7.21	7.13	0.23
KRY 112 144/1	B	From Leg	4.00	0.00	84.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
			0.00			1" Ice	0.51	0.30	0.02
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00	0.00	84.00	No Ice	6.75	6.07	0.15
			0.00			1/2" Ice	7.20	6.87	0.21
			0.00			1" Ice	7.65	7.58	0.28
RADIO 4449 B12/B71	B	From Leg	4.00	0.00	84.00	No Ice	1.65	1.30	0.08
			0.00			1/2" Ice	1.81	1.44	0.09
			0.00			1" Ice	1.98	1.60	0.11
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00	0.00	84.00	No Ice	20.48	11.02	0.16
			0.00			1/2" Ice	21.23	12.55	0.30
			0.00			1" Ice	21.99	14.10	0.44
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.00	84.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			0.00			1" Ice	7.21	7.13	0.23
KRY 112 144/1	C	From Leg	4.00	0.00	84.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
			0.00			1" Ice	0.51	0.30	0.02
AIR 32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00	0.00	84.00	No Ice	6.75	6.07	0.15
			0.00			1/2" Ice	7.20	6.87	0.21
			0.00			1" Ice	7.65	7.58	0.28
RADIO 4449 B12/B71	C	From Leg	4.00	0.00	84.00	No Ice	1.65	1.30	0.08
			0.00			1/2" Ice	1.81	1.44	0.09
			0.00			1" Ice	1.98	1.60	0.11
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00	0.00	84.00	No Ice	20.48	11.02	0.16
			0.00			1/2" Ice	21.23	12.55	0.30
			0.00			1" Ice	21.99	14.10	0.44
VFA12-U	A	From Leg	2.00	0.00	84.00	No Ice	10.80	6.40	0.51
			0.00			1/2" Ice	16.20	10.00	0.64
			0.00			1" Ice	21.60	13.60	0.83
VFA12-U	B	From Leg	2.00	0.00	84.00	No Ice	10.80	6.40	0.51
			0.00			1/2" Ice	16.20	10.00	0.64
			0.00			1" Ice	21.60	13.60	0.83
VFA12-U	C	From Leg	2.00	0.00	84.00	No Ice	10.80	6.40	0.51
			0.00			1/2" Ice	16.20	10.00	0.64
			0.00			1" Ice	21.60	13.60	0.83
RDL-3000	C	From Leg	1.50	0.00	63.00	No Ice	1.01	0.26	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	1.13	0.34	0.01
			0.00			1" Ice	1.27	0.42	0.02
Side Arm Mount [SO 311-1]	C	From Leg	3.00	0.00	63.00	No Ice	2.97	3.51	0.06
			0.00			1/2" Ice	4.39	5.33	0.09
			0.00			1" Ice	5.81	7.15	0.13
GPS-TMG-20N	A	From Leg	1.50	0.00	56.00	No Ice	0.13	0.13	0.00
			0.00			1/2" Ice	0.18	0.18	0.00
			3.00			1" Ice	0.24	0.24	0.01
Side Arm Mount [SO 311-1]	A	From Leg	3.00	0.00	56.00	No Ice	2.97	3.51	0.06
			0.00			1/2" Ice	4.39	5.33	0.09
			0.00			1" Ice	5.81	7.15	0.13
KS24019-L112A	B	From Leg	1.50	0.00	46.00	No Ice	0.14	0.14	0.01
			0.00			1/2" Ice	0.20	0.20	0.01
			1.00			1" Ice	0.26	0.26	0.01
Side Arm Mount [SO 701-1]	B	From Leg	3.00	0.00	46.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
MPRC2449	C	Paraboloid w/Radome	From Leg	0.00	90.00		63.00	2.17	No Ice	3.69	0.02
				3.00					1/2" Ice	3.98	0.04
				0.00					1" Ice	4.27	0.06

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice

Comb. No.	Description
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	132 - 124	Leg	Max Tension	7	1.40	0.15	0.01
			Max. Compression	31	-3.57	-0.02	-0.00
			Max. Mx	10	-1.08	-0.58	0.01
			Max. My	4	-0.71	-0.00	0.65
			Max. Vy	10	-0.46	0.32	0.01
			Max. Vx	4	0.51	-0.00	-0.34
		Diagonal	Max Tension	24	1.27	0.00	0.00
			Max. Compression	12	-1.24	0.00	0.00
			Max. Mx	28	0.30	0.03	0.00
			Max. My	12	-1.21	0.00	0.00
			Max. Vy	28	-0.03	0.03	0.00
			Max. Vx	14	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.09	0.00	0.00
			Max. Compression	11	-0.09	0.00	0.00
			Max. Mx	26	0.00	-0.08	0.00
			Max. My	27	0.00	0.00	0.00
			Max. Vy	26	-0.05	0.00	0.00
			Max. Vx	27	0.00	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
T2	124 - 120	Leg	Max Tension	7	3.47	-0.35	-0.00
			Max. Compression	10	-4.99	0.33	0.02
			Max. Mx	14	3.13	-0.36	0.02
			Max. My	4	-0.94	-0.02	-0.36
			Max. Vy	14	0.14	-0.36	0.02
			Max. Vx	16	-0.15	-0.01	0.36
		Diagonal	Max Tension	2	1.11	0.00	0.00
			Max. Compression	24	-1.12	0.00	0.00
			Max. Mx	30	0.11	0.03	0.00
			Max. My	5	-0.92	0.00	-0.00
			Max. Vy	31	-0.03	0.03	0.00
			Max. Vx	5	0.00	0.00	-0.00
T3	120 - 100	Leg	Max Tension	7	20.37	-0.47	0.01
			Max. Compression	2	-28.08	0.20	-0.02
			Max. Mx	14	3.81	1.13	0.02
			Max. My	20	-2.29	-0.03	1.14
			Max. Vy	6	-0.97	-0.47	0.01
			Max. Vx	8	0.89	-0.01	0.29
		Diagonal	Max Tension	12	4.03	0.00	0.00
			Max. Compression	12	-4.09	0.00	0.00
			Max. Mx	28	0.24	0.05	0.01
			Max. My	24	-4.03	0.00	-0.01
			Max. Vy	28	0.05	0.04	0.01
			Max. Vx	29	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.19	0.00	0.00
			Max. Compression	11	-0.11	0.00	0.00
			Max. Mx	26	0.11	-0.09	0.00
			Max. My	27	0.12	0.00	0.00
			Max. Vy	26	0.05	0.00	0.00
			Max. Vx	27	-0.00	0.00	0.00
T4	100 - 93.3333	Leg	Max Tension	7	28.22	-0.12	-0.01
			Max. Compression	2	-36.91	0.16	-0.05
			Max. Mx	22	26.92	-0.27	-0.02
			Max. My	8	-4.62	-0.03	0.46
			Max. Vy	18	-0.15	0.17	0.01
			Max. Vx	4	-0.15	-0.03	-0.45
		Diagonal	Max Tension	12	4.78	0.00	0.00
			Max. Compression	12	-4.84	0.00	0.00
			Max. Mx	27	0.96	0.08	0.01
			Max. My	32	0.54	0.07	0.01
			Max. Vy	27	-0.06	0.08	-0.01
			Max. Vx	32	-0.00	0.00	0.00
T5	93.3333 - 86.6667	Leg	Max Tension	7	36.96	-0.05	-0.01
			Max. Compression	2	-46.54	-0.02	-0.04
			Max. Mx	18	-45.41	0.17	0.01
			Max. My	4	-5.00	-0.05	-0.39
			Max. Vy	18	0.07	0.17	0.01
			Max. Vx	4	0.14	-0.05	-0.39
		Diagonal	Max Tension	12	4.98	0.00	0.00
			Max. Compression	12	-5.00	0.00	0.00
			Max. Mx	27	0.73	0.08	-0.01
			Max. My	30	-0.42	0.07	0.01
			Max. Vy	29	0.06	0.07	-0.01
			Max. Vx	30	-0.00	0.00	0.00
T6	86.6667 - 80	Leg	Max Tension	7	45.58	-0.05	-0.01
			Max. Compression	10	-57.33	-0.10	0.02
			Max. Mx	2	-57.31	0.47	0.00
			Max. My	4	-5.28	-0.05	-0.39
			Max. Vy	22	0.84	-0.38	0.00
			Max. Vx	16	-0.58	0.04	-0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	13	6.10	0.03	-0.00
			Max. Compression	12	-6.32	0.00	0.00
			Max. Mx	27	0.96	0.09	0.01
			Max. My	37	0.90	0.09	-0.01
			Max. Vy	27	-0.06	0.09	0.01
			Max. Vx	32	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	10	0.99	0.01	-0.00
			Max. Compression	10	-0.99	0.00	0.00
			Max. Mx	27	0.36	0.05	0.00
			Max. My	29	-0.18	0.05	0.00
			Max. Vy	31	-0.04	0.05	0.00
			Max. Vx	30	-0.00	0.00	0.00
T7	80 - 60	Leg	Max Tension	7	73.44	-0.11	-0.03
			Max. Compression	10	-90.26	0.24	0.01
			Max. Mx	11	-87.95	0.24	0.01
			Max. My	4	-8.50	-0.00	-0.25
			Max. Vy	14	0.09	-0.24	0.02
			Max. Vx	4	0.11	-0.00	-0.25
		Diagonal	Max Tension	12	6.46	0.00	0.00
			Max. Compression	12	-6.48	0.00	0.00
			Max. Mx	29	0.77	0.11	-0.01
			Max. My	27	0.01	0.10	-0.02
			Max. Vy	29	0.08	0.11	-0.01
			Max. Vx	27	-0.00	0.00	0.00
T8	60 - 40	Leg	Max Tension	7	99.91	-0.42	-0.04
			Max. Compression	10	-121.30	0.47	0.06
			Max. Mx	37	-17.41	-0.61	-0.03
			Max. My	5	-7.76	0.01	-0.39
			Max. Vy	37	0.18	-0.61	-0.03
			Max. Vx	3	0.12	-0.22	-0.38
		Diagonal	Max Tension	24	7.11	0.00	0.00
			Max. Compression	24	-7.23	0.00	0.00
			Max. Mx	31	1.31	0.16	-0.02
			Max. My	27	0.50	0.13	-0.02
			Max. Vy	29	0.09	0.14	-0.02
			Max. Vx	27	-0.00	0.00	0.00
T9	40 - 20	Leg	Max Tension	15	122.87	-0.30	0.12
			Max. Compression	10	-148.58	0.85	0.07
			Max. Mx	37	-19.20	-0.94	-0.02
			Max. My	4	-11.33	-0.08	-0.83
			Max. Vy	37	0.20	-0.94	-0.02
			Max. Vx	4	-0.20	-0.08	-0.83
		Diagonal	Max Tension	24	8.22	0.00	0.00
			Max. Compression	24	-8.43	0.00	0.00
			Max. Mx	29	0.50	0.21	-0.03
			Max. My	33	-2.07	0.19	0.03
			Max. Vy	29	0.11	0.20	0.03
			Max. Vx	33	0.01	0.00	0.00
T10	20 - 10	Leg	Max Tension	15	135.25	-0.69	0.13
			Max. Compression	10	-163.39	-0.42	0.02
			Max. Mx	37	-16.98	-0.94	-0.02
			Max. My	4	-13.43	-0.16	-1.25
			Max. Vy	37	-0.22	-0.94	-0.02
			Max. Vx	4	0.25	-0.16	-1.25
		Diagonal	Max Tension	24	8.48	0.00	0.00
			Max. Compression	24	-8.56	0.00	0.00
			Max. Mx	31	0.37	0.30	0.03
			Max. My	33	-2.80	0.27	0.04
			Max. Vy	29	0.13	0.30	-0.03
			Max. Vx	33	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
T11	10 - 0	Leg	Max Tension	15	146.50	0.14	0.09
			Max. Compression	10	-176.44	0.00	-0.00
			Max. Mx	10	-176.28	1.52	-0.01
			Max. My	4	-13.81	-0.16	-1.25
			Max. Vy	10	-0.43	1.52	-0.01
			Max. Vx	4	-0.30	-0.16	-1.25
		Diagonal	Max Tension	25	8.45	0.11	0.01
			Max. Compression	24	-8.98	0.00	0.00
			Max. Mx	31	2.49	0.22	-0.04
			Max. My	27	1.84	0.22	-0.04
			Max. Vy	30	0.12	0.21	0.04
			Max. Vx	27	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	10	3.06	0.04	-0.00
			Max. Compression	10	-3.06	0.00	0.00
			Max. Mx	28	0.95	0.14	0.01
			Max. My	30	-0.14	0.13	0.01
			Max. Vy	28	0.08	0.14	0.01
			Max. Vx	30	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	177.28	18.41	-10.23
	Max. H_x	18	177.28	18.41	-10.23
	Max. H_z	7	-151.36	-16.07	8.87
	Min. Vert	7	-151.36	-16.07	8.87
	Min. H_x	7	-151.36	-16.07	8.87
	Min. H_z	18	177.28	18.41	-10.23
Leg B	Max. Vert	10	183.52	-18.39	-11.32
	Max. H_x	23	-151.85	15.96	9.88
	Max. H_z	25	-131.96	13.17	10.15
	Min. Vert	23	-151.85	15.96	9.88
	Min. H_x	10	183.52	-18.39	-11.32
	Min. H_z	10	183.52	-18.39	-11.32
Leg A	Max. Vert	2	182.96	1.06	21.62
	Max. H_x	22	95.18	2.91	10.81
	Max. H_z	2	182.96	1.06	21.62
	Min. Vert	15	-152.47	-1.02	-18.85
	Min. H_x	11	-74.14	-2.96	-9.50
	Min. H_z	15	-152.47	-1.02	-18.85

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	32.67	-0.00	0.00	-9.44	-25.20	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	39.20	-0.02	-35.04	-2761.73	-27.60	33.80
0.9 Dead+1.6 Wind 0 deg - No	29.40	-0.02	-35.04	-2755.10	-19.99	33.77

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
Ice						
1.2 Dead+1.6 Wind 30 deg - No Ice	39.20	16.51	-28.57	-2283.26	-1342.63	31.26
0.9 Dead+1.6 Wind 30 deg - No Ice	29.40	16.50	-28.56	-2277.24	-1333.11	31.24
1.2 Dead+1.6 Wind 60 deg - No Ice	39.20	28.15	-16.21	-1307.94	-2283.60	11.46
0.9 Dead+1.6 Wind 60 deg - No Ice	29.40	28.14	-16.20	-1303.21	-2272.74	11.45
1.2 Dead+1.6 Wind 90 deg - No Ice	39.20	32.73	0.03	-8.05	-2649.31	-8.79
0.9 Dead+1.6 Wind 90 deg - No Ice	29.40	32.72	0.03	-5.13	-2638.00	-8.78
1.2 Dead+1.6 Wind 120 deg - No Ice	39.20	30.27	17.46	1363.58	-2412.28	-19.14
0.9 Dead+1.6 Wind 120 deg - No Ice	29.40	30.26	17.46	1364.54	-2401.39	-19.11
1.2 Dead+1.6 Wind 150 deg - No Ice	39.20	17.00	29.39	2309.69	-1373.98	-28.65
0.9 Dead+1.6 Wind 150 deg - No Ice	29.40	16.99	29.38	2309.25	-1364.55	-28.61
1.2 Dead+1.6 Wind 180 deg - No Ice	39.20	0.02	33.44	2638.84	-33.24	-33.64
0.9 Dead+1.6 Wind 180 deg - No Ice	29.40	0.02	33.43	2637.90	-25.62	-33.61
1.2 Dead+1.6 Wind 210 deg - No Ice	39.20	-16.51	28.59	2262.21	1281.92	-31.08
0.9 Dead+1.6 Wind 210 deg - No Ice	29.40	-16.51	28.58	2261.84	1287.75	-31.07
1.2 Dead+1.6 Wind 240 deg - No Ice	39.20	-29.55	17.05	1337.37	2310.23	-11.29
0.9 Dead+1.6 Wind 240 deg - No Ice	29.40	-29.55	17.04	1338.37	2314.62	-11.28
1.2 Dead+1.6 Wind 270 deg - No Ice	39.20	-32.71	-0.01	-13.87	2587.17	8.94
0.9 Dead+1.6 Wind 270 deg - No Ice	29.40	-32.70	-0.01	-10.94	2591.10	8.93
1.2 Dead+1.6 Wind 300 deg - No Ice	39.20	-28.83	-16.64	-1334.75	2262.12	19.29
0.9 Dead+1.6 Wind 300 deg - No Ice	29.40	-28.82	-16.63	-1329.99	2266.44	19.26
1.2 Dead+1.6 Wind 330 deg - No Ice	39.20	-16.99	-29.37	-2331.68	1312.66	28.76
0.9 Dead+1.6 Wind 330 deg - No Ice	29.40	-16.99	-29.37	-2325.61	1318.33	28.72
1.2 Dead+1.0 Ice+1.0 Temp	143.86	-0.00	0.00	-35.53	-147.50	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	143.86	-0.01	-7.80	-648.06	-147.18	10.12
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	143.86	3.80	-6.58	-555.56	-447.80	7.88
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	143.86	6.48	-3.74	-332.43	-663.07	2.17
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	143.86	7.54	0.01	-34.85	-746.85	-3.86
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	143.86	6.71	3.87	270.13	-677.06	-7.50
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	143.86	3.86	6.68	490.66	-452.24	-9.39
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	143.86	0.00	7.66	568.16	-148.54	-10.10
1.2 Dead+1.0 Wind 210	143.86	-3.80	6.58	484.18	151.95	-7.85

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
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240	143.86	-6.60	3.81	265.37	374.26	-2.15
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270	143.86	-7.54	-0.00	-36.30	450.58	3.88
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	143.86	-6.58	-3.80	-336.91	373.52	7.52
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	143.86	-3.86	-6.68	-561.84	156.51	9.41
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	32.67	-0.00	-8.38	-666.43	-24.60	8.08
Dead+Wind 30 deg - Service	32.67	3.95	-6.83	-552.15	-338.72	7.47
Dead+Wind 60 deg - Service	32.67	6.73	-3.87	-319.17	-563.49	2.74
Dead+Wind 90 deg - Service	32.67	7.82	0.01	-8.67	-650.84	-2.10
Dead+Wind 120 deg - Service	32.67	7.24	4.18	318.97	-594.23	-4.57
Dead+Wind 150 deg - Service	32.67	4.06	7.03	544.97	-346.21	-6.85
Dead+Wind 180 deg - Service	32.67	0.00	7.99	623.60	-25.94	-8.04
Dead+Wind 210 deg - Service	32.67	-3.95	6.84	533.62	288.20	-7.43
Dead+Wind 240 deg - Service	32.67	-7.07	4.08	312.71	533.83	-2.70
Dead+Wind 270 deg - Service	32.67	-7.82	-0.00	-10.06	599.98	2.13
Dead+Wind 300 deg - Service	32.67	-6.89	-3.98	-325.57	522.34	4.61
Dead+Wind 330 deg - Service	32.67	-4.06	-7.02	-563.71	295.55	6.88

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	-32.67	0.00	0.00	32.67	-0.00	0.000%
2	-0.02	-39.20	-35.05	0.02	39.20	35.04	0.010%
3	-0.02	-29.40	-35.05	0.02	29.40	35.04	0.027%
4	16.51	-39.20	-28.57	-16.51	39.20	28.57	0.010%
5	16.51	-29.40	-28.57	-16.50	29.40	28.56	0.030%
6	28.16	-39.20	-16.21	-28.15	39.20	16.21	0.011%
7	28.16	-29.40	-16.21	-28.14	29.40	16.20	0.032%
8	32.74	-39.20	0.03	-32.73	39.20	-0.03	0.010%
9	32.74	-29.40	0.03	-32.72	29.40	-0.03	0.030%
10	30.27	-39.20	17.47	-30.27	39.20	-17.46	0.010%
11	30.27	-29.40	17.47	-30.26	29.40	-17.46	0.027%
12	17.00	-39.20	29.39	-17.00	39.20	-29.39	0.010%
13	17.00	-29.40	29.39	-16.99	29.40	-29.38	0.030%
14	0.02	-39.20	33.44	-0.02	39.20	-33.44	0.011%
15	0.02	-29.40	33.44	-0.02	29.40	-33.43	0.032%
16	-16.51	-39.20	28.60	16.51	39.20	-28.59	0.010%
17	-16.51	-29.40	28.60	16.51	29.40	-28.58	0.029%
18	-29.56	-39.20	17.05	29.55	39.20	-17.05	0.010%
19	-29.56	-29.40	17.05	29.55	29.40	-17.04	0.027%
20	-32.71	-39.20	-0.01	32.71	39.20	0.01	0.010%
21	-32.71	-29.40	-0.01	32.70	29.40	0.01	0.030%
22	-28.84	-39.20	-16.64	28.83	39.20	16.64	0.011%
23	-28.84	-29.40	-16.64	28.82	29.40	16.63	0.032%
24	-16.99	-39.20	-29.38	16.99	39.20	29.37	0.010%
25	-16.99	-29.40	-29.38	16.99	29.40	29.37	0.030%
26	0.00	-143.86	0.00	0.00	143.86	-0.00	0.003%
27	-0.01	-143.86	-7.80	0.01	143.86	7.80	0.001%
28	3.80	-143.86	-6.58	-3.80	143.86	6.58	0.001%
29	6.49	-143.86	-3.74	-6.48	143.86	3.74	0.001%
30	7.54	-143.86	0.01	-7.54	143.86	-0.01	0.001%
31	6.71	-143.86	3.87	-6.71	143.86	-3.87	0.001%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
32	3.86	-143.86	6.68	-3.86	143.86	-6.68	0.003%
33	0.01	-143.86	7.66	-0.00	143.86	-7.66	0.003%
34	-3.80	-143.86	6.58	3.80	143.86	-6.58	0.003%
35	-6.60	-143.86	3.81	6.60	143.86	-3.81	0.002%
36	-7.54	-143.86	-0.00	7.54	143.86	0.00	0.002%
37	-6.58	-143.86	-3.80	6.58	143.86	3.80	0.003%
38	-3.86	-143.86	-6.68	3.86	143.86	6.68	0.003%
39	-0.00	-32.67	-8.38	0.00	32.67	8.38	0.011%
40	3.95	-32.67	-6.83	-3.95	32.67	6.83	0.011%
41	6.73	-32.67	-3.88	-6.73	32.67	3.87	0.011%
42	7.83	-32.67	0.01	-7.82	32.67	-0.01	0.011%
43	7.24	-32.67	4.18	-7.24	32.67	-4.18	0.011%
44	4.07	-32.67	7.03	-4.06	32.67	-7.03	0.010%
45	0.00	-32.67	8.00	-0.00	32.67	-7.99	0.010%
46	-3.95	-32.67	6.84	3.95	32.67	-6.84	0.010%
47	-7.07	-32.67	4.08	7.07	32.67	-4.08	0.010%
48	-7.82	-32.67	-0.00	7.82	32.67	0.00	0.010%
49	-6.90	-32.67	-3.98	6.89	32.67	3.98	0.010%
50	-4.06	-32.67	-7.03	4.06	32.67	7.02	0.010%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00004168
2	Yes	7	0.00017975	0.00051803
3	Yes	6	0.00039896	0.00082351
4	Yes	7	0.00019217	0.00055271
5	Yes	6	0.00043524	0.00089766
6	Yes	7	0.00020302	0.00058296
7	Yes	6	0.00046675	0.00096189
8	Yes	7	0.00019212	0.00055279
9	Yes	6	0.00043512	0.00089784
10	Yes	7	0.00017963	0.00051752
11	Yes	6	0.00039869	0.00082281
12	Yes	7	0.00019158	0.00055034
13	Yes	6	0.00043414	0.00089423
14	Yes	7	0.00020301	0.00058223
15	Yes	6	0.00046694	0.00096114
16	Yes	7	0.00019201	0.00055221
17	Yes	6	0.00043503	0.00089726
18	Yes	7	0.00000001	0.00051828
19	Yes	6	0.00039889	0.00082439
20	Yes	7	0.00019210	0.00055322
21	Yes	6	0.00043523	0.00089879
22	Yes	7	0.00020304	0.00058305
23	Yes	6	0.00046698	0.00096225
24	Yes	7	0.00019173	0.00055125
25	Yes	6	0.00043449	0.00089559
26	Yes	6	0.00000001	0.00057880
27	Yes	8	0.00000001	0.00034969
28	Yes	8	0.00000001	0.00037003
29	Yes	8	0.00000001	0.00037955
30	Yes	8	0.00000001	0.00037669
31	Yes	8	0.00000001	0.00036272
32	Yes	7	0.00069494	0.00097477

33	Yes	7	0.00000001	0.00086999
34	Yes	7	0.00000001	0.00075968
35	Yes	7	0.00000001	0.00069815
36	Yes	7	0.00000001	0.00071729
37	Yes	7	0.00000001	0.00081119
38	Yes	7	0.00000001	0.00092129
39	Yes	6	0.00000001	0.00090651
40	Yes	6	0.00000001	0.00092093
41	Yes	6	0.00000001	0.00093463
42	Yes	6	0.00000001	0.00092048
43	Yes	6	0.00000001	0.00090446
44	Yes	6	0.00000001	0.00091221
45	Yes	6	0.00000001	0.00092414
46	Yes	6	0.00000001	0.00090720
47	Yes	6	0.00000001	0.00089433
48	Yes	6	0.00000001	0.00090983
49	Yes	6	0.00000001	0.00092698
50	Yes	6	0.00000001	0.00091521

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	132	Diagonal	A325N	0.63	1	1.27	6.10	0.209 ✔	1	Member Block Shear
		Top Girt	A325N	0.63	1	0.09	3.87	0.023 ✔	1	Member Block Shear
T2	124	Leg	A325N	0.63	4	0.87	20.71	0.042 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	1.11	6.10	0.183 ✔	1	Member Block Shear
T3	120	Leg	A325N	0.75	4	5.09	29.82	0.171 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	4.03	7.12	0.567 ✔	1	Member Block Shear
T4	100	Diagonal	A325N	0.63	1	4.78	8.48	0.564 ✔	1	Member Bearing
T5	93.3333	Diagonal	A325N	0.63	1	4.98	8.48	0.588 ✔	1	Member Bearing
T6	86.6667	Leg	A325N	0.88	4	11.18	40.59	0.275 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	6.10	8.48	0.720 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.63	1	0.99	4.79	0.207 ✔	1	Member Block Shear
T7	80	Leg	A325N	0.88	4	18.36	40.59	0.452 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	6.46	8.48	0.762 ✔	1	Member Bearing
T8	60	Leg	A325N	1.00	4	24.98	53.01	0.471 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	7.11	9.51	0.748 ✔	1	Member Bearing
T9	40	Leg	A325N	1.00	4	30.72	53.01	0.579 ✔	1	Bolt Tension
		Diagonal	A325N	0.63	1	8.43	12.43	0.678 ✔	1	Bolt Shear
T10	20	Diagonal	A325N	0.75	1	8.48	12.19	0.696 ✔	1	Member Bearing
T11	10	Diagonal	A325N	0.75	1	8.45	12.19	0.693 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.63	1	3.06	7.83	0.391 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	ROHN 2 STD	8.00	4.00	61.0 K=1.00	1.07	-3.57	36.84	0.097 [1] ✔
T2	124 - 120	ROHN 2 STD	4.00	4.00	61.0 K=1.00	1.07	-4.99	36.84	0.135 [1] ✔
T3	120 - 100	ROHN 2.5 STD	20.03	5.01	63.4 K=1.00	1.70	-28.08	57.13	0.491 [1] ✔
T4	100 - 93.3333	ROHN 3 STD	6.68	6.68	68.9 K=1.00	2.23	-36.91	70.89	0.521 [1] ✔
T5	93.3333 - 86.6667	ROHN 3 STD	6.68	6.68	68.9 K=1.00	2.23	-46.54	70.89	0.656 [1] ✔
T6	86.6667 - 80	ROHN 3 STD	6.68	3.45	35.5 K=1.00	2.23	-57.33	91.43	0.627 [1] ✔
T7	80 - 60	ROHN 3 XX-STR	20.04	6.68	76.5 K=1.00	5.47	-90.26	160.27	0.563 [1] ✔
T8	60 - 40	ROHN 4 X-STR	20.03	6.68	54.3 K=1.00	4.41	-121.30	159.91	0.759 [1] ✔
T9	40 - 20	ROHN 5 X-STR	20.03	10.02	65.4 K=1.00	6.11	-148.58	201.25	0.738 [1] ✔
T10	20 - 10	ROHN 5 X-STR	10.02	10.02	65.4 K=1.00	6.11	-163.39	201.25	0.812 [1] ✔
T11	10 - 0	ROHN 5 X-STR	10.02	5.15	33.6 K=1.00	6.11	-176.44	253.28	0.697 [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	132 - 124	L1 3/4x1 3/4x3/16	7.74	3.63	126.9 K=1.00	0.62	-1.24	8.62	0.144 [1] ✔
T2	124 - 120	L1 3/4x1 3/4x3/16	7.75	3.64	127.1 K=1.00	0.62	-1.12	8.59	0.131 [1] ✔
T3	120 - 100	L2x2x3/16	9.80	4.79	145.8 K=1.00	0.71	-4.09	7.60	0.538 [1] ✔
T4	100 - 93.3333	L2 1/2x2 1/2x3/16	11.22	5.51	133.6 K=1.00	0.90	-4.84	11.42	0.423 [1] ✔
T5	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11.76	5.78	140.1 K=1.00	0.90	-5.00	10.38	0.482 [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	86.6667 - 80	L2 1/2x2 1/2x3/16	12.32	6.18	149.9 K=1.00	0.90	-6.32	9.07	0.697 [1] ✔
T7	80 - 60	L2 1/2x2 1/2x3/16	14.09	6.95	168.5 K=1.00	0.90	-6.48	7.17	0.903 [1] ✔
T8	60 - 40	L3x3x3/16	15.90	7.80	157.1 K=1.00	1.09	-7.23	9.97	0.725 [1] ✔
T9	40 - 20	L3x3x1/4	19.10	9.45	191.5 K=1.00	1.44	-8.43	8.87	0.950 [1] ✔
T10	20 - 10	L3 1/2x3 1/2x1/4	19.96	9.87	170.6 K=1.00	1.69	-8.56	13.12	0.653 [1] ✔
T11	10 - 0	L3 1/2x3 1/2x1/4	20.83	10.44	180.4 K=1.00	1.69	-8.98	11.73	0.766 [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 $\frac{P_u}{\phi P_n}$
T6	86.6667 - 80	L1 1/2x1 1/2x3/16	10.34	5.03	205.6 K=1.00	0.53	-0.99	2.82	0.353 [1] ✔
T11	10 - 0	L2 1/2x2 1/2x3/16	18.26	8.90	215.7 K=1.00	0.90	-3.06	4.38	0.698 [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	132 - 124	L1 3/4x1 3/4x1/8	6.60	6.17	213.4 K=1.00	0.42	-0.09	2.09	0.041 [1] ✔
T3	120 - 100	KL/R > 200 (C) - 6 L2x2x1/8	6.65	6.45	165.9 K=0.85	0.48	-0.11	3.98	0.028 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	132 - 124	ROHN 2 STD	8.00	4.00	61.0	1.07	1.40	48.35	0.029 [1] ✔
T2	124 - 120	ROHN 2 STD	4.00	4.00	61.0	1.07	3.47	48.35	0.072 [1] ✔
T3	120 - 100	ROHN 2.5 STD	20.03	5.01	63.4	1.70	20.37	76.68	0.266 [1] ✔
T4	100 - 93.3333	ROHN 3 STD	6.68	6.68	68.9	2.23	28.22	100.28	0.281 [1] ✔
T5	93.3333 - 86.6667	ROHN 3 STD	6.68	6.68	68.9	2.23	36.96	100.28	0.369 [1] ✔
T6	86.6667 - 80	ROHN 3 STD	6.68	3.45	35.5	2.23	45.58	100.28	0.454 [1] ✔
T7	80 - 60	ROHN 3 XX-STR	20.04	6.68	76.5	5.47	73.44	245.99	0.299 [1] ✔
T8	60 - 40	ROHN 4 X-STR	20.03	6.68	54.3	4.41	99.91	198.34	0.504 [1] ✔
T9	40 - 20	ROHN 5 X-STR	20.03	10.02	65.4	6.11	122.88	275.04	0.447 [1] ✔
T10	20 - 10	ROHN 5 X-STR	10.02	10.02	65.4	6.11	135.25	275.04	0.492 [1] ✔
T11	10 - 0	ROHN 5 X-STR	10.02	5.15	33.6	6.11	146.50	275.04	0.533 [1] ✔

[1] $P_u / \phi P_n$ 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	132 - 124	L1 3/4x1 3/4x3/16	7.74	3.63	84.0	0.36	1.27	15.68	0.081 [1] ✔
T2	124 - 120	L1 3/4x1 3/4x3/16	7.75	3.64	84.1	0.36	1.11	15.68	0.071 [1] ✔
T3	120 - 100	L2x2x3/16	9.80	4.79	95.5	0.43	4.03	18.74	0.215 [1] ✔
T4	100 - 93.3333	L2 1/2x2 1/2x3/16	11.22	5.51	86.9	0.57	4.78	24.84	0.193 [1] ✔
T5	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11.76	5.78	91.1	0.57	4.98	24.84	0.201 [1] ✔
T6	86.6667 - 80	L2 1/2x2 1/2x3/16	12.32	6.18	95.4	0.57	6.10	24.84	0.246 [1] ✔
T7	80 - 60	L2 1/2x2 1/2x3/16	14.09	6.95	109.2	0.57	6.46	24.84	0.260 [1] ✔
T8	60 - 40	L3x3x3/16	15.90	7.80	101.3	0.71	7.11	34.71	0.205 [1] ✔
T9	40 - 20	L3x3x1/4	19.10	9.45	123.5	0.94	8.22	45.79	0.179 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 10	L3 1/2x3 1/2x1/4	19.96	9.87	110.1	1.10	8.48	53.79	0.158 [1]
T11	10 - 0	L3 1/2x3 1/2x1/4	20.83	10.44	114.9	1.10	8.45	53.79	0.157 [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 $\frac{P_u}{\phi P_n}$
T6	86.6667 - 80	L1 1/2x1 1/2x3/16	10.34	5.03	264.1	0.29	0.99	12.62	0.079 [1]
T11	10 - 0	L2 1/2x2 1/2x3/16	18.26	8.90	274.5	0.57	3.06	24.84	0.123 [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	132 - 124	L1 3/4x1 3/4x1/8	6.60	6.17	140.9	0.25	0.09	10.71	0.008 [1]
T3	120 - 100	L2x2x1/8	6.65	6.45	123.6	0.48	0.19	15.69	0.012 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

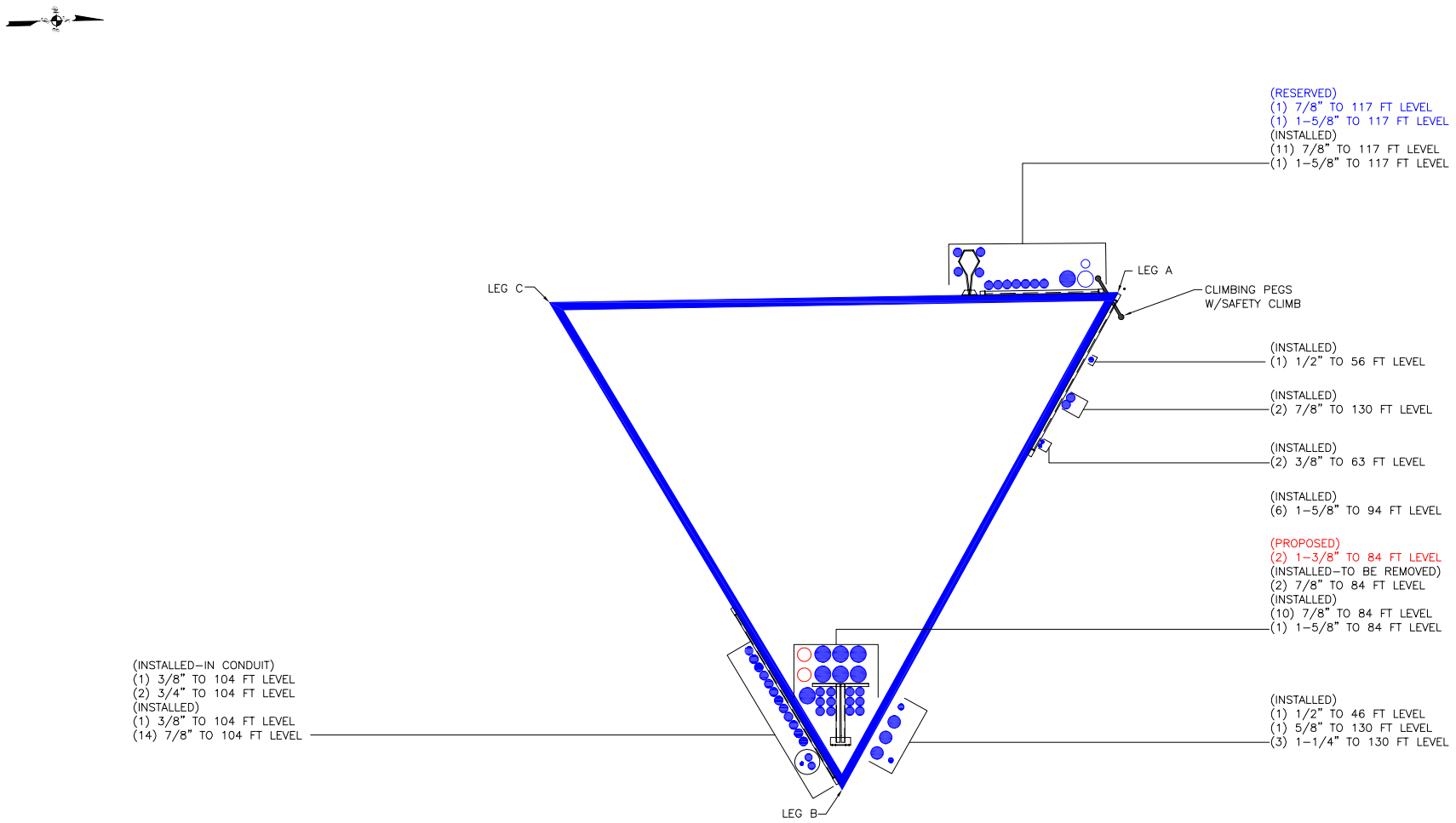
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	132 - 124	Leg	ROHN 2 STD	2	-3.57	36.84	9.7	Pass
T2	124 - 120	Leg	ROHN 2 STD	20	-4.99	36.84	13.5	Pass
T3	120 - 100	Leg	ROHN 2.5 STD	30	-28.08	57.13	49.1	Pass
T4	100 - 93.3333	Leg	ROHN 3 STD	60	-36.91	70.89	52.1	Pass
T5	93.3333 - 86.6667	Leg	ROHN 3 STD	69	-46.54	70.89	65.6	Pass
T6	86.6667 - 80	Leg	ROHN 3 STD	77	-57.33	91.43	62.7	Pass
T7	80 - 60	Leg	ROHN 3 XX-STR	89	-90.26	160.27	56.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T8	60 - 40	Leg	ROHN 4 X-STR	110	-121.30	159.91	75.9	Pass
T9	40 - 20	Leg	ROHN 5 X-STR	131	-148.58	201.25	73.8	Pass
T10	20 - 10	Leg	ROHN 5 X-STR	146	-163.39	201.25	81.2	Pass
T11	10 - 0	Leg	ROHN 5 X-STR	155	-176.44	253.28	69.7	Pass
T1	132 - 124	Diagonal	L1 3/4x1 3/4x3/16	9	-1.24	8.62	14.4	Pass
							20.9 (b)	
T2	124 - 120	Diagonal	L1 3/4x1 3/4x3/16	25	-1.12	8.59	13.1	Pass
							18.3 (b)	
T3	120 - 100	Diagonal	L2x2x3/16	36	-4.09	7.60	53.8	Pass
							56.7 (b)	
T4	100 - 93.3333	Diagonal	L2 1/2x2 1/2x3/16	63	-4.84	11.42	42.3	Pass
							56.4 (b)	
T5	93.3333 - 86.6667	Diagonal	L2 1/2x2 1/2x3/16	72	-5.00	10.38	48.2	Pass
							58.8 (b)	
T6	86.6667 - 80	Diagonal	L2 1/2x2 1/2x3/16	81	-6.32	9.07	69.7	Pass
							72.0 (b)	
T7	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	93	-6.48	7.17	90.3	Pass
T8	60 - 40	Diagonal	L3x3x3/16	115	-7.23	9.97	72.5	Pass
							74.8 (b)	
T9	40 - 20	Diagonal	L3x3x1/4	136	-8.43	8.87	95.0	Pass
T10	20 - 10	Diagonal	L3 1/2x3 1/2x1/4	151	-8.56	13.12	65.3	Pass
							69.6 (b)	
T11	10 - 0	Diagonal	L3 1/2x3 1/2x1/4	160	-8.98	11.73	76.6	Pass
T6	86.6667 - 80	Secondary Horizontal	L1 1/2x1 1/2x3/16	85	-0.99	2.82	35.3	Pass
T11	10 - 0	Secondary Horizontal	L2 1/2x2 1/2x3/16	163	-3.06	4.38	69.8	Pass
T1	132 - 124	Top Girt	L1 3/4x1 3/4x1/8	6	-0.09	2.09	4.1	Pass
T3	120 - 100	Top Girt	L2x2x1/8	33	-0.11	3.98	2.8	Pass

Summary	ELC:	LC7
Leg (T10)	81.2	Pass
Diagonal (T9)	95.0	Pass
Secondary Horizontal (T11)	69.8	Pass
Top Girt (T1)	4.1	Pass
Bolt Checks	76.2	Pass
Rating =	95.0	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806377 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Anchor Rod Check for Self Supporting Towers

TIA-222-G, Section 4.9.9

Rev. 6.1

Site Data	
BU#:	**806377**
Site Name:	**HRT 084 943242**
App #:	**446129 Rev. 0**

Anchor Rod Data		
Qty:	**4**	
Diam:	**1**	in
Rod Material:	**A449 (1/4 to 1 Incl.)**	
Strength (Fu):	120	ksi
Yield (Fy):	92	ksi

* Rod Circle:		in
* e:		in
* # of Rods		1 or 2

Mu= Pu x e:		ft-kips

** Only enter rod circle, offset (e) and number of anchor rods at the extreme fiber to consider if eccentric load due to leg reinforcement exist.*

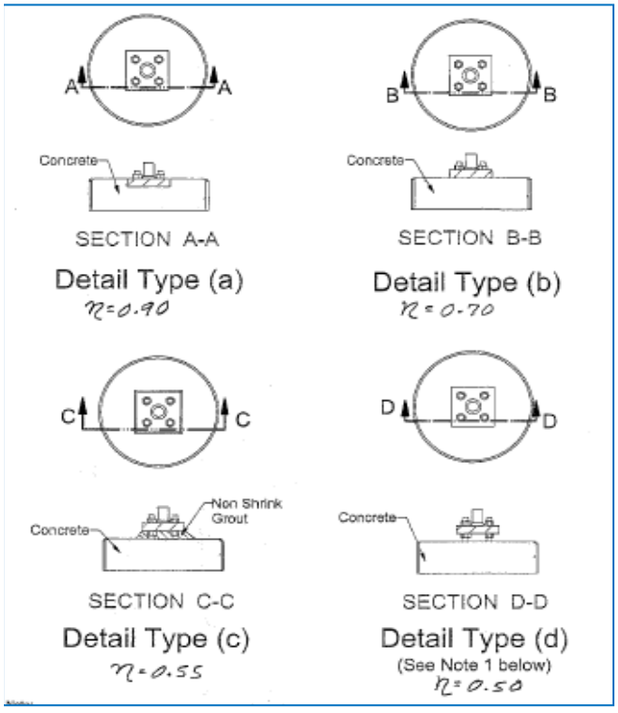


Figure 4-4 of TIA-222-G

Reactions		
Eta Factor, η	**0.5**	Detail Type
Down load, Pu:	**183.52**	kips
Shear, Vu:	**21.59**	kips

l_{ar}:		in
Mu = 0.65*l_{ar}*V_u		ft-kips

Anchor Rod Results:

Max Rod (Cu+ Vu/ń):	56.7	Kips
Design Axial, Φ*Fu*Anet:	58.2	Kips
Anchor Rod Stress Ratio:	97.4%	

If Applicable;

Anchor Rod Results with Bending Considered:

When the clear distance from the top of concrete to the bottom of level nut excceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied (see Figure 4-4 of Rev. G):

$$(V_u/\phi R_{nv})^2 + [(P_u/\phi R_{nt}) + (M_u/\phi R_{nm})]^2 <= 1$$

$\phi R_{nv}=\phi*0.45*F_{ub}*A_b=$		kips
$\phi R_{nt}=\phi*F_u*A_{net}=$		kips
$\phi R_{nm}=\phi*F_y*Z=$		ft-kips

Maximum Acceptable Ratio:	**105**	%
Governing Stress Ratio:	**97.4%**	**Pass**

SST Unit Base Foundation

BU # :	806377
Site Name:	HRT 084 943242
App. Number:	446129 Rev. 0

TIA-222 Revision: G

Tower Centroid Offset?:	☐
Block Foundation?:	☐

Superstructure Analysis Reactions

Global Moment, **M**:	2770.99	ft-kips
Global Axial, **P**:	39.2	kips
Global Shear, **V**:	35.04	kips
Leg Compression, $\mathbf{P_{comp}}$:	183.52	kips
Leg Comp. Shear, $\mathbf{V_{u\_comp}}$:	21.59	kips
Leg Uplift, $\mathbf{P_{uplift}}$:	152.47	kips
Leg Uplift. Shear, $\mathbf{V_{u\_uplift}}$:	18.88	kips
Tower Height, **H**:	132	ft
Base Face Width, **BW**:	18.770833	ft
BP Dist. Above Fdn, $\mathbf{bp_{dist}}$:	2.375	in

Foundation Analysis Checks

	Capacity	Demand	Rating	Check
Lateral (Sliding) (kips)	1484.23	35.04	**2.4%**	**Pass**
Bearing Pressure (ksf)	22.50	4.08	**18.1%**	**Pass**
*Overturning (kip*ft)*	31223.40	3699.48	**11.8%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	907.26	477.14	**52.6%**	**Pass**
*Pier Flexure (Tension) (kip*ft)*	625.33	417.25	**66.7%**	**Pass**
Pier Compression (kip)	2437.87	223.74	**9.2%**	**Pass**
*Pad Flexure (kip*ft)*	3850.11	444.85	**11.6%**	**Pass**
Pad Shear - 1-way (kips)	1086.07	44.35	**4.1%**	**Pass**
Pad Shear - Comp 2-way (ksi)	0.164	0.023	**13.7%**	**Pass**

Pier Properties

Pier Shape:	Square	
Pier Diameter, **dpier**:	3.3	ft
Ext. Above Grade, **E**:	2.30	ft
Pier Rebar Size, **Sc**:	9	
Pier Rebar Quantity, **mc**:	12	
Pier Tie/Spiral Size, **St**:	5	
Pier Tie/Spiral Quantity, **mt**:	3	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $\mathbf{cc_{pier}}$:	4	in

Soil Rating:	**18.1%**
Structural Rating:	**66.7%**

Pad Properties

Depth, **D**:	24.00	ft
Pad Width, **W**:	24.00	ft
Pad Thickness, **T**:	4.20	ft
Pad Rebar Size (Bottom), **Sp**:	8	
Pad Rebar Quantity (Bottom), **mp**:	24	
Pad Clear Cover, $\mathbf{cc_{pad}}$:	3	in

Material Properties

Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	3000	psi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties

Total Soil Unit Weight, γ:	115	pcf
Ultimate Gross Bearing, Qult:	30.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	33	degrees
SPT Blow Count, $\mathbf{N_{blows}}$:		
Base Friction, μ:	0.4	
Neglected Depth, **N**:	3.3	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	16	ft

<-- Toggle between Gross and Net

Version 3.0.0

Date: **July 30, 2018**

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Subject:	**Mount Structural Analysis Report**	
Carrier Designation:	**T-Mobile Tower Equipment**	
	Carrier Site Number:	CT11711A
	Carrier Site Name:	CT11711A
Crown Castle Designation:	**Crown Castle BU Number:**	806377
	Crown Castle Site Name:	HRT 084 943242
	Crown Castle JDE Job Number:	512589
	Crown Castle PO Number:	1217261
	Crown Castle Application Number:	446129
Engineering Firm Designation:	**Maser Consulting, Connecticut Project Number:** 18922078A	
Site Data:	**197 South Street, Vernon, Tolland County, CT, 06066** **Latitude 41°51'12.51" Longitude -72°27'7.52"**	
Structure Information:	**Tower Height & Type:**	**132 ft Self Support**
	Mount Elevation:	**84 ft**
	Mount Type:	**12.5 ft Sector Mount**

Dear Charles McGuirt,

Maser Consulting, Connecticut is pleased to submit this **"Mount Structural Analysis Report"** to determine the structural integrity of T-Mobile's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

Based upon our analysis, we have determined the adequacy of the antenna mounting system that will support the existing and proposed loading to be:

Sector Mount (Typical of 3) **Sufficient**

This analysis has been performed in accordance with the 2016 Connecticut State Building Code, incorporating the 2012 International Building Code based upon an ultimate 3-second gust wind speed of 115 mph converted to a nominal 3-second gust wind speed of 89 mph per section 1609.3.1 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with Topographic Category 1 and Risk Category II were used in this analysis.

We at Maser Consulting, Connecticut appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects, please give us a call.

Mount structural analysis prepared by: Pedro Sabillon
Respectfully Submitted by:

Petros E. Tsoukalas, P.E.
Principal Associate/Geographic Discipline Leader
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Ptsoukalas@Maserconsulting.com

Pedro Sabillon
Engineer

TABLE OF CONTENTS

1) INTRODUCTION

The existing antenna mounting system can be categorized as Sector Mount, SitePro 1 P/N: VFA12-U, installed at 84 ft above ground level. The proposed equipment is to be supported on this antenna mounting system at a centerline of 84 ft above ground level. This report is based upon this information, as well as information from manufacturer specifications.

2) ANALYSIS CRITERIA

The structural analysis was performed in accordance with the requirements of ANSI/TIA-222-G-2-2009 Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 89 mph with no ice, 40 mph with 1.0 inch escalated ice thickness, Exposure B and Topographic Category 1. In addition, the mount has been analyzed for various live loading conditions consisting of a 250-pound man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust wind speed of 30 mph.

Table 1 - Proposed Equipment Loading Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Proposed Mount Type	Note
84	84	3	RFS	APXVAARR24_43-U-NA20	-	1
		3	Ericsson	AIR 32 B2A/B66AA		
		3	Ericsson	RADIO 4449 B12/B71		

Note:
1) To be mounted on existing sector mounts

Table 2 - Existing and Reserved Antenna and Cable Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Existing Mount Type	Note
84	84	3	Ericsson	AIR 21 B2A B4P	VFA12-U	1
		3	RFS	KRY 112 144/1		

Note:
1) Equipment to **REMAIN**

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Construction Drawings dated 06/07/2013	Tectonic Engineering & Surveying Consultants P.C.	Project Number 6644.CT11711A	Crown Castle
Construction Drawings dated 09/07/2016	Dewberry Engineers Inc.	Job Number 50078130	Crown Castle

3.1) Analysis Method

RISA-3D, a comprehensive structural analysis program was used for this analysis. The program performs design checks of structures under user specified loads. The user specified loads have

been calculated separately based on the requirements of the above referenced codes. The program performs an analysis based on the steel code to determine the adequacy of the members and produces the reactions at the connection points of the mounts to the existing structure.

Proprietary excel sheets were used to calculate appurtenance and member loading for various load cases. Selected output from the analysis is included in Appendix B.

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 4(a) - Mount Component Stresses vs. Capacity (Sector Mount)

Notes	Component	Mount Centerline (ft)	% Capacity	Pass / Fail
1	V-Horizontals	84	40.6	Pass
1	Inner Bracings	84	63.0	Pass
1	Antenna Pipes	84	28.6	Pass
1	Stabilizer	84	10.8	Pass
1	Face Horizontals	84	39.9	Pass
2	Mount to Monopole Ring Mount Kit	84	12.3	Pass

Structure Rating (max from all components) =	**63.0%**

Notes:

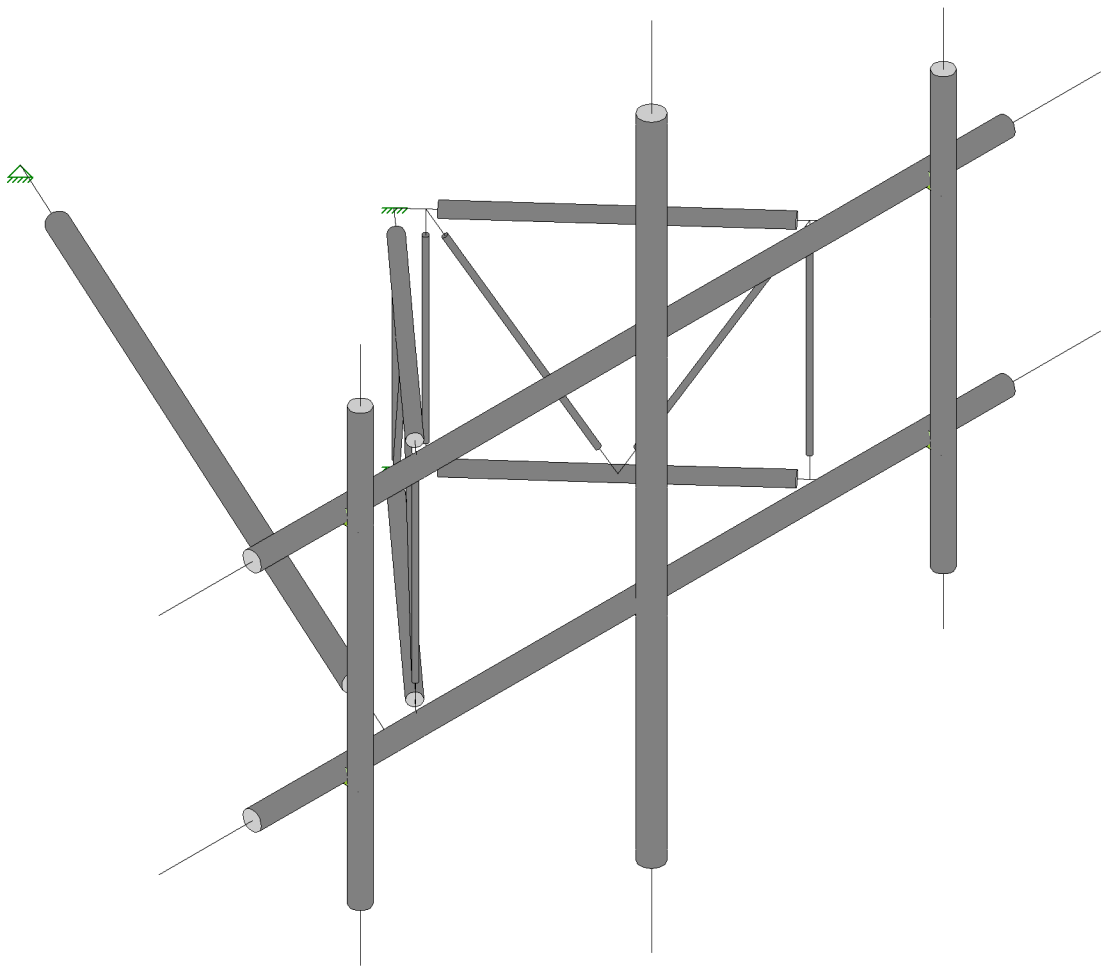
1) See additional documentation in "Appendix C - Analysis Output" for calculations supporting the % capacity consumed.
2) See additional documentation in “Appendix D – Additional Calculations” for calculation supporting the % capacity consumed.

4.1) Recommendations

The mount has sufficient capacity to support the proposed loading, therefore, the proposed installation **CAN** be installed as intended, without modifications.

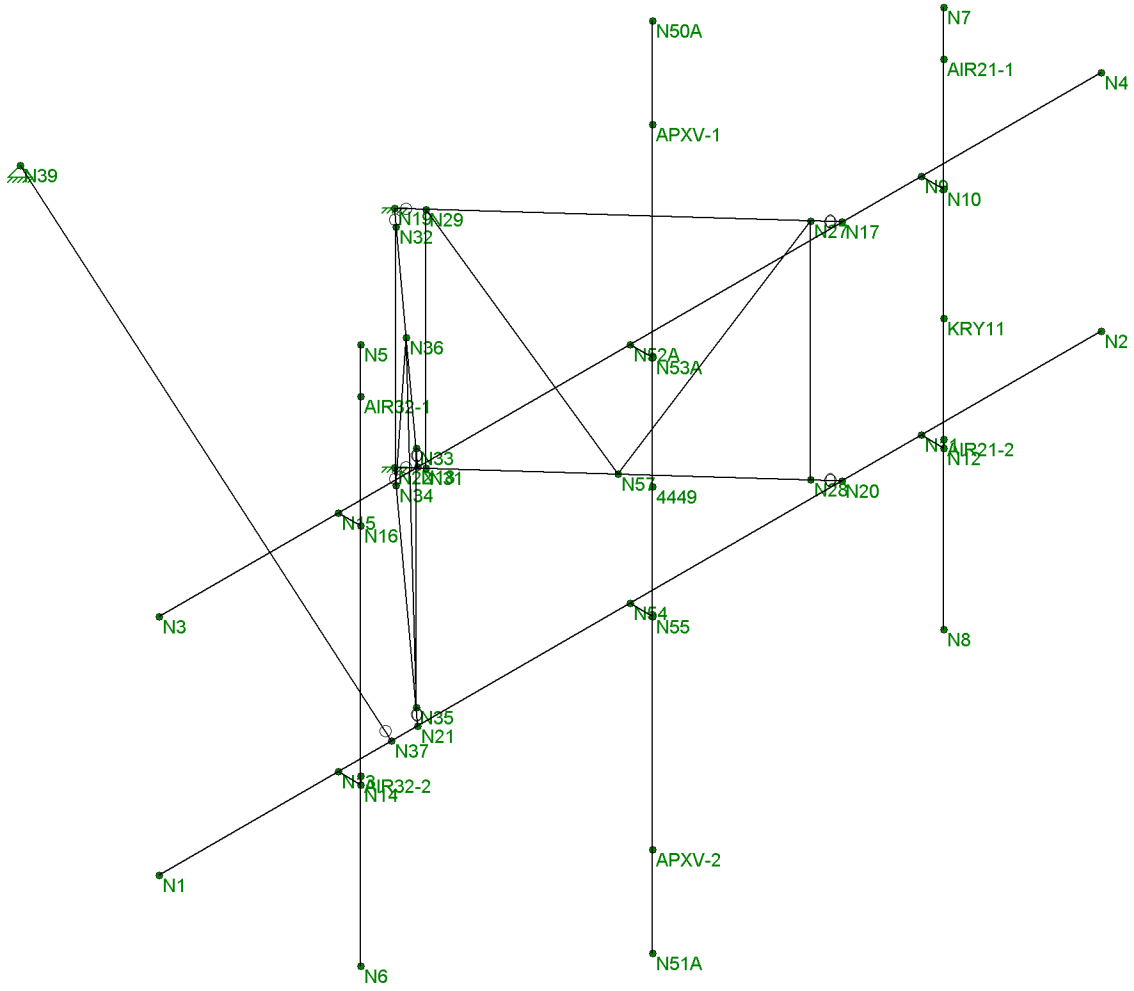
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Maser Consulting P.A.		SK - 1
PSC	806377 - HRT 084 943242	July 25, 2018 at 2:10 PM
18922078A	Rendered View	Sector Mount.r3d



Envelope Only Solution

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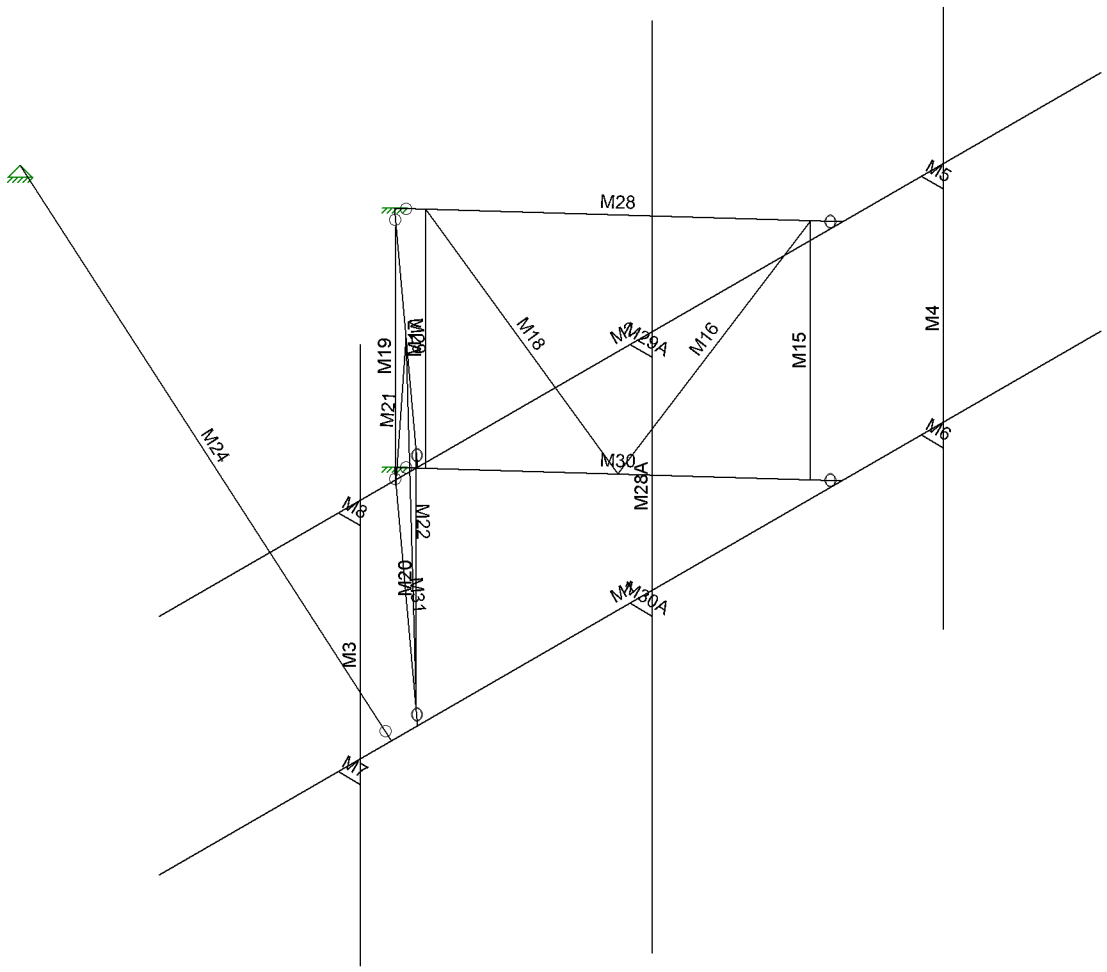

Envelope Only Solution

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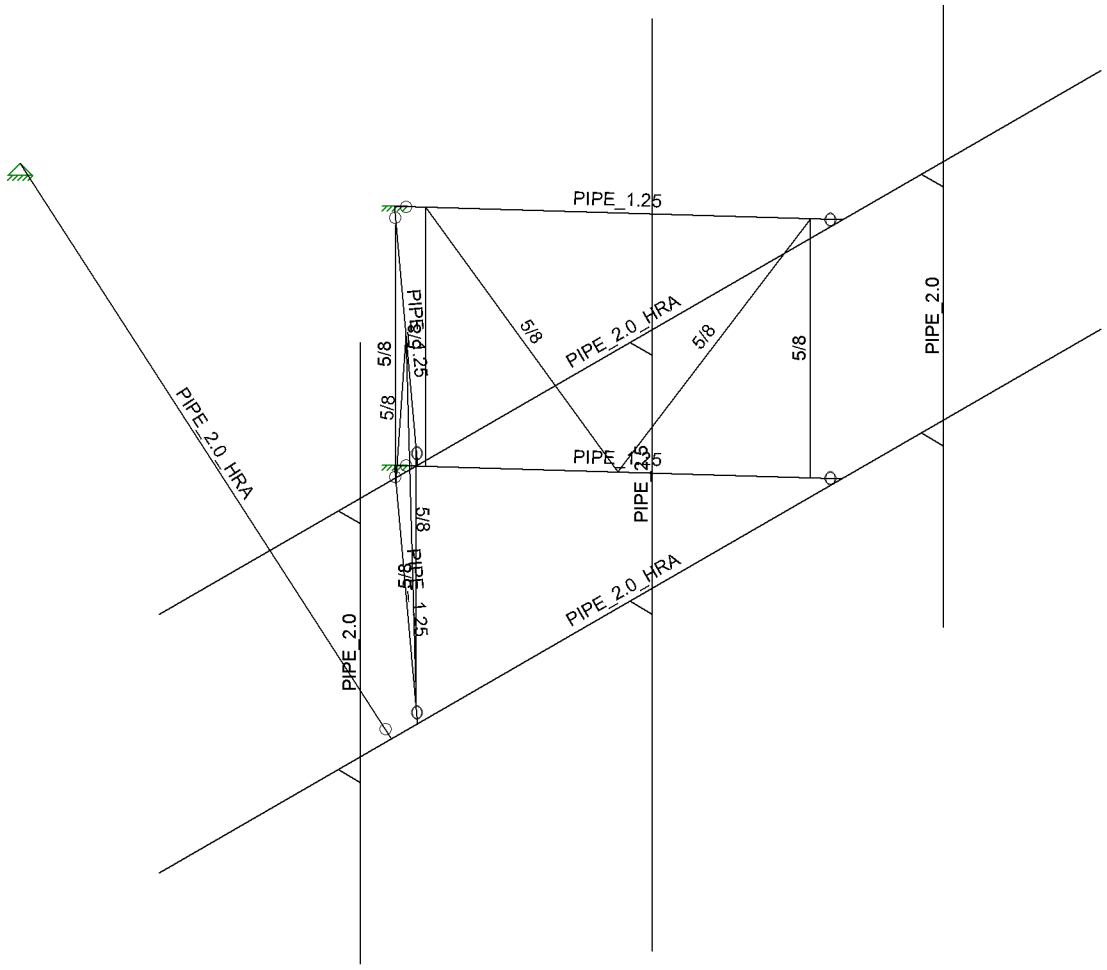

Envelope Only Solution

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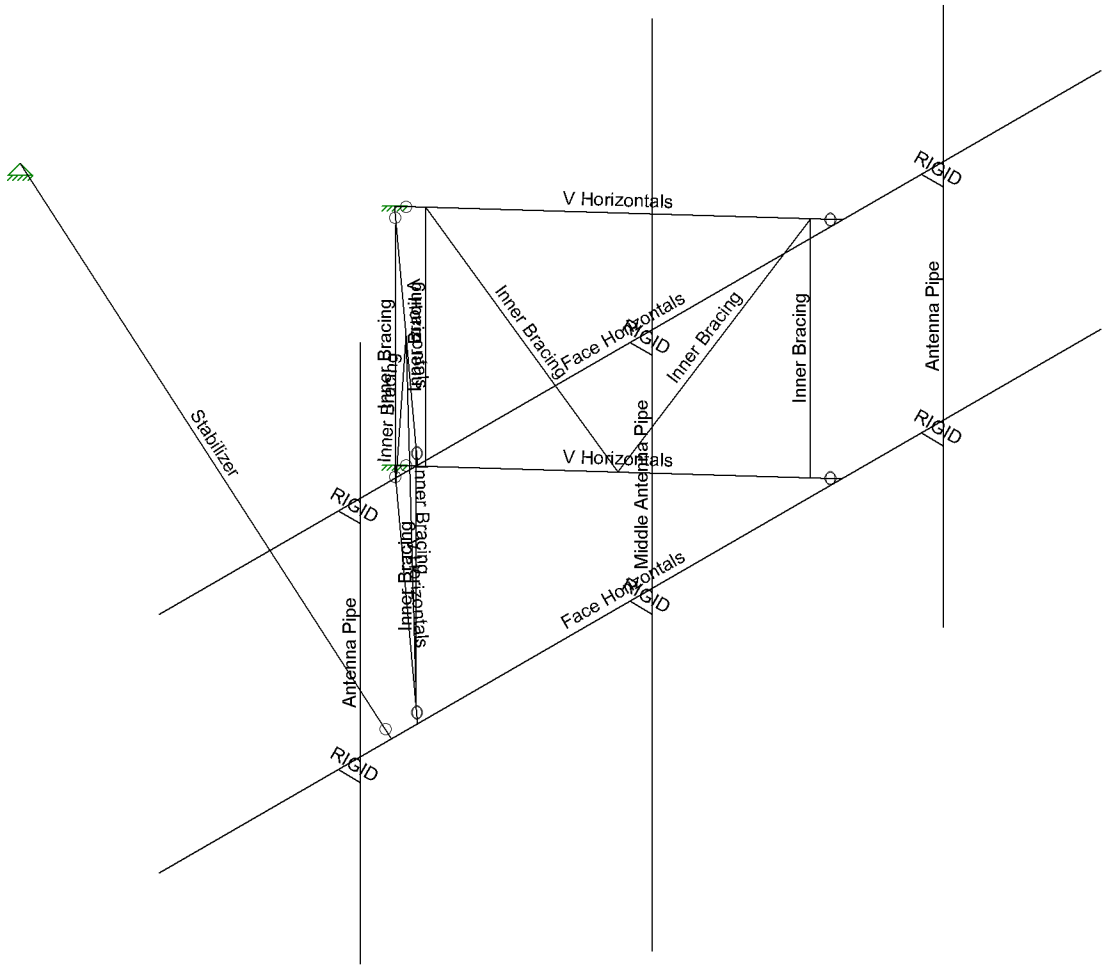

Envelope Only Solution

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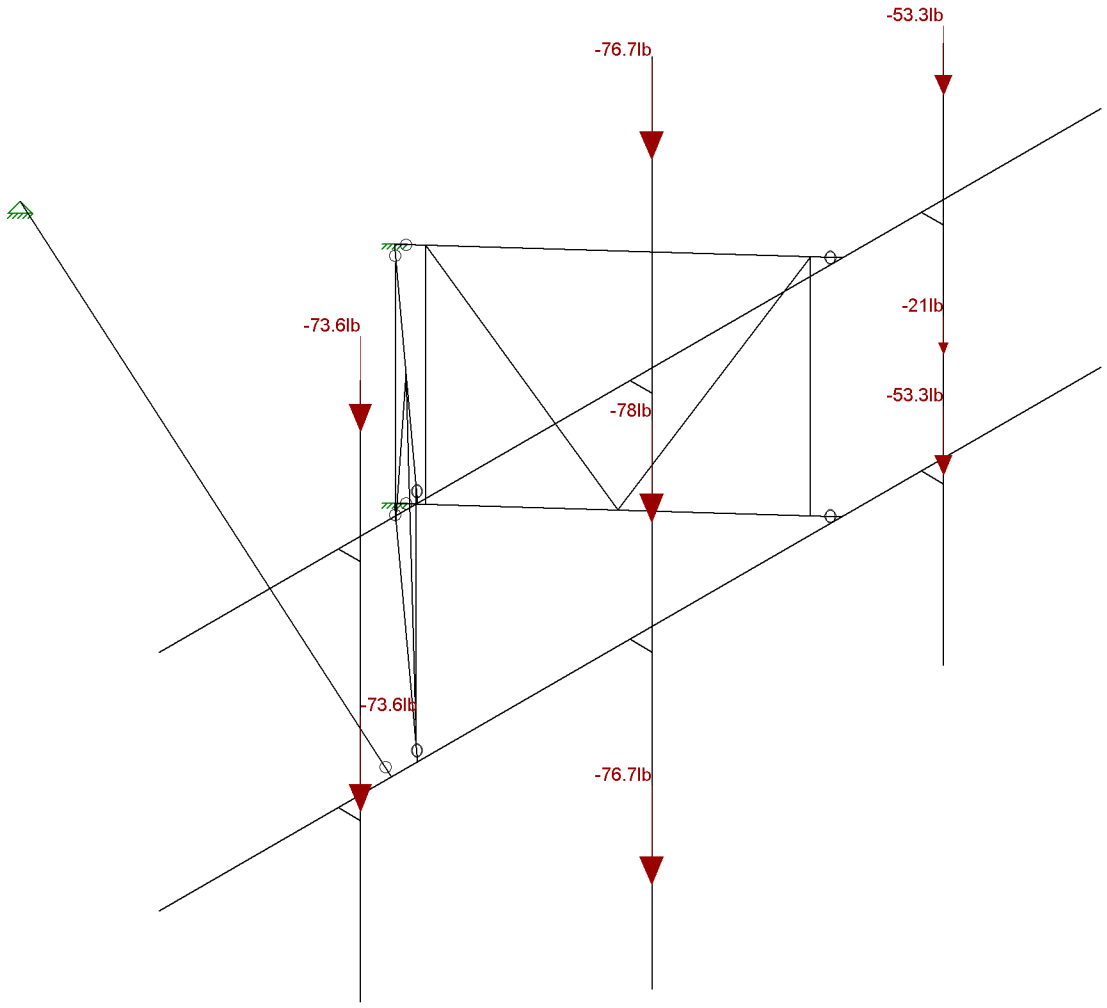

Loads: BLC 1, Dead
Envelope Only Solution

Maser Consulting P.A.		SK - 6
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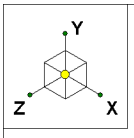
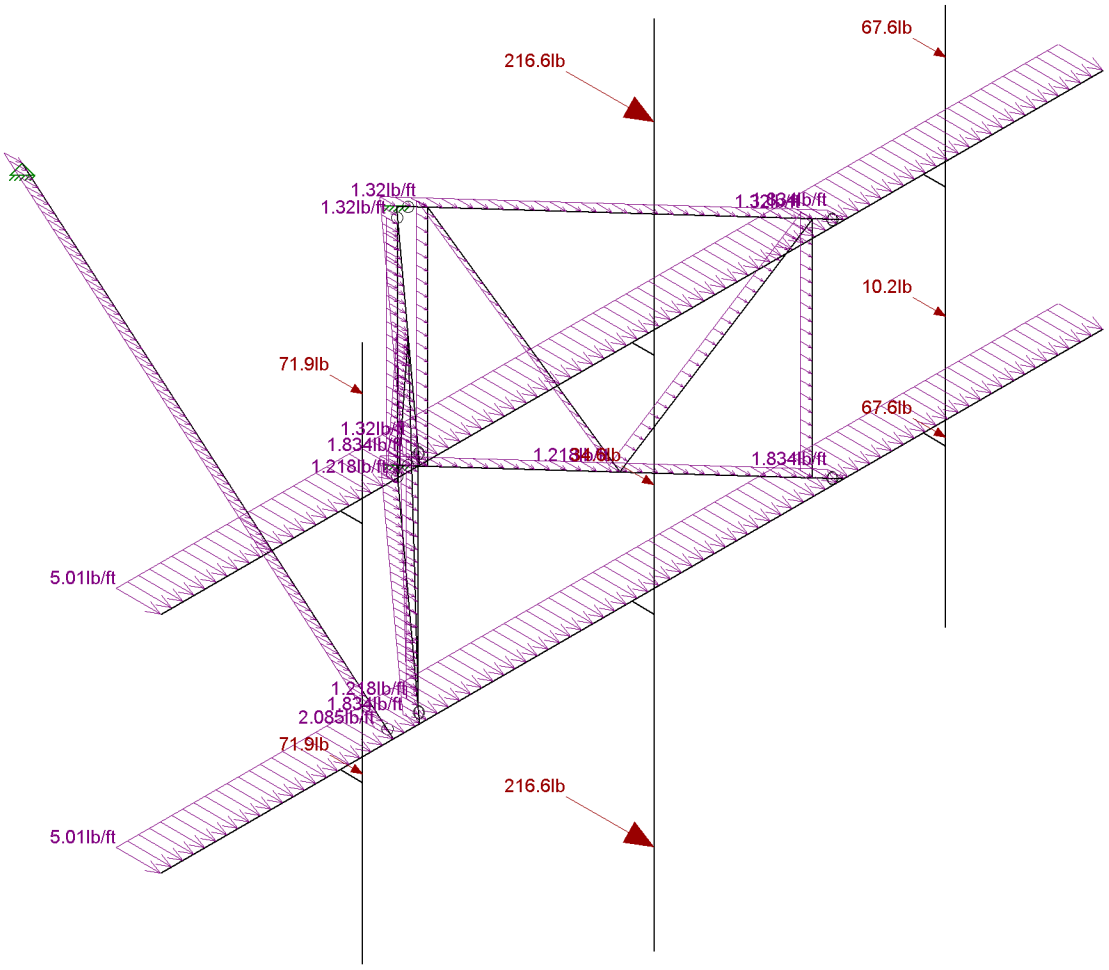
18922078A	Dead Load	Sector Mount.r3d





Loads: BLC 2, Wx
Envelope Only Solution

Maser Consulting P.A.		SK - 7
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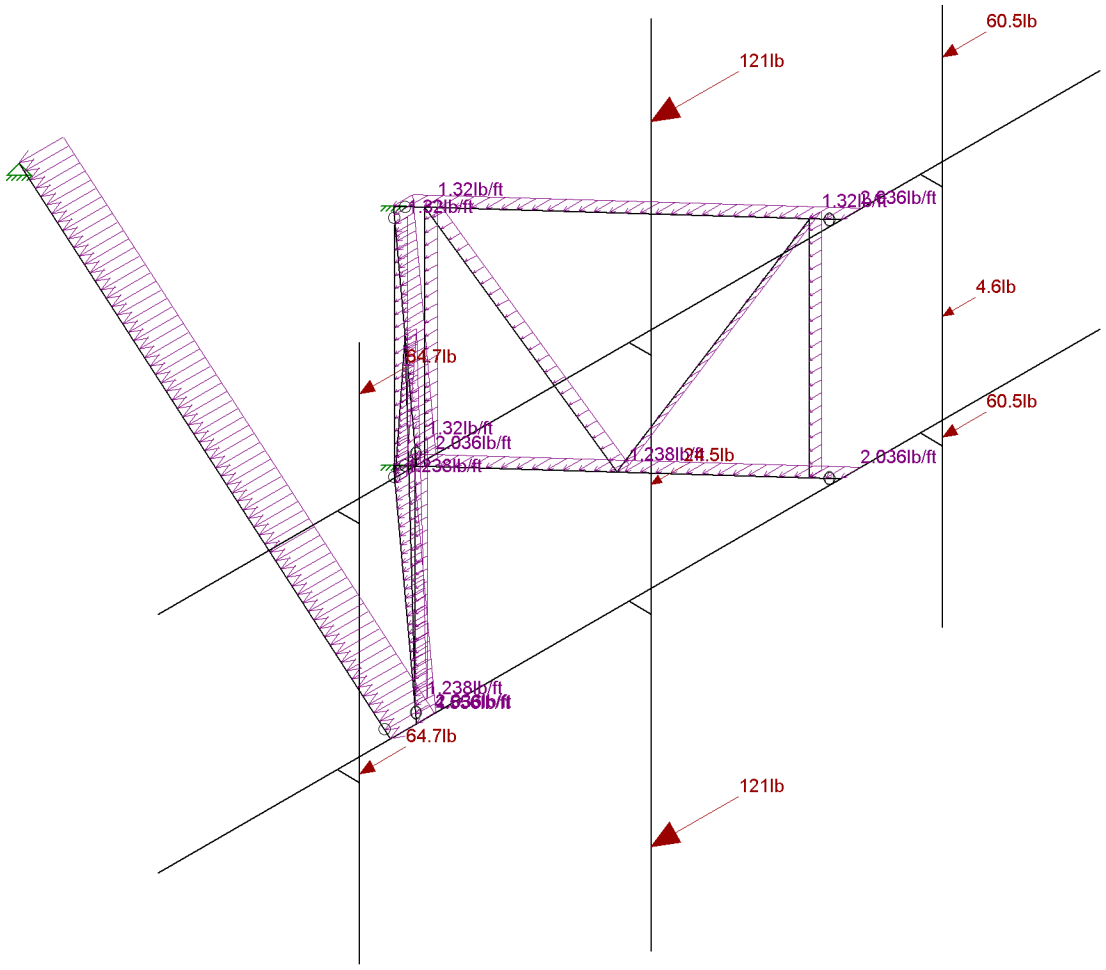
18922078A	Wind X	Sector Mount.r3d



Loads: BLC 3, Wz
Envelope Only Solution

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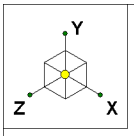

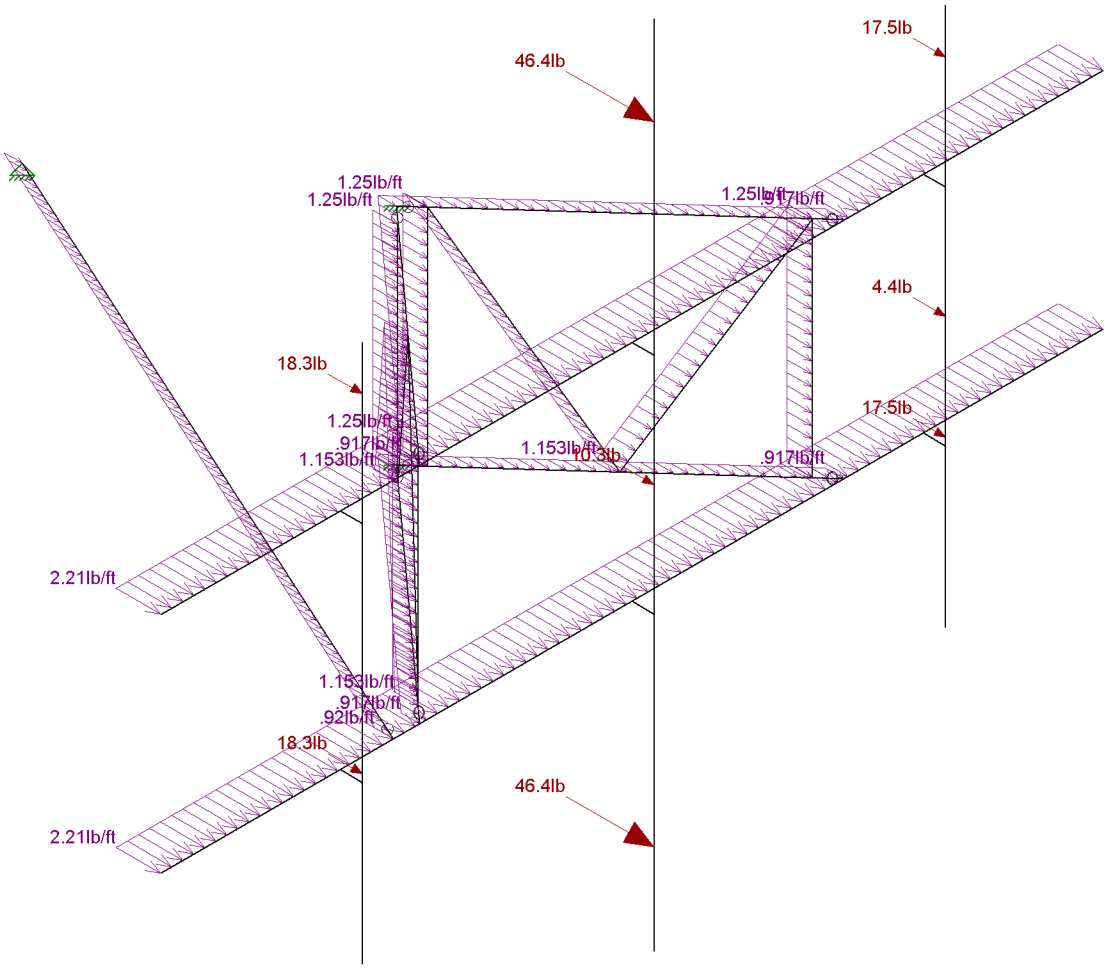

Loads: BLC 4, Wx Ice
Envelope Only Solution

Maser Consulting P.A.		SK - 9
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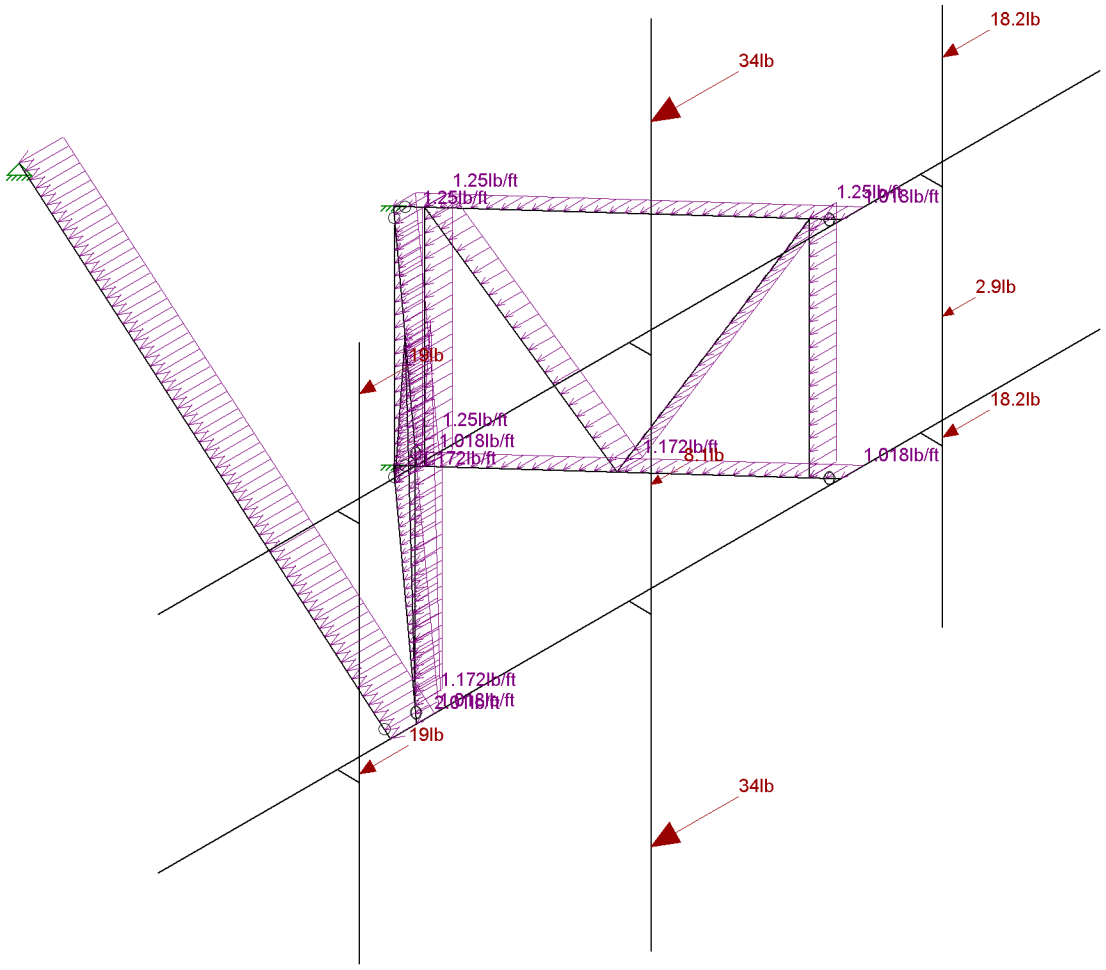
18922078A	Wind X Ice	Sector Mount.r3d



Loads: BLC 5, Wz Ice
Envelope Only Solution

Maser Consulting P.A.		SK - 10
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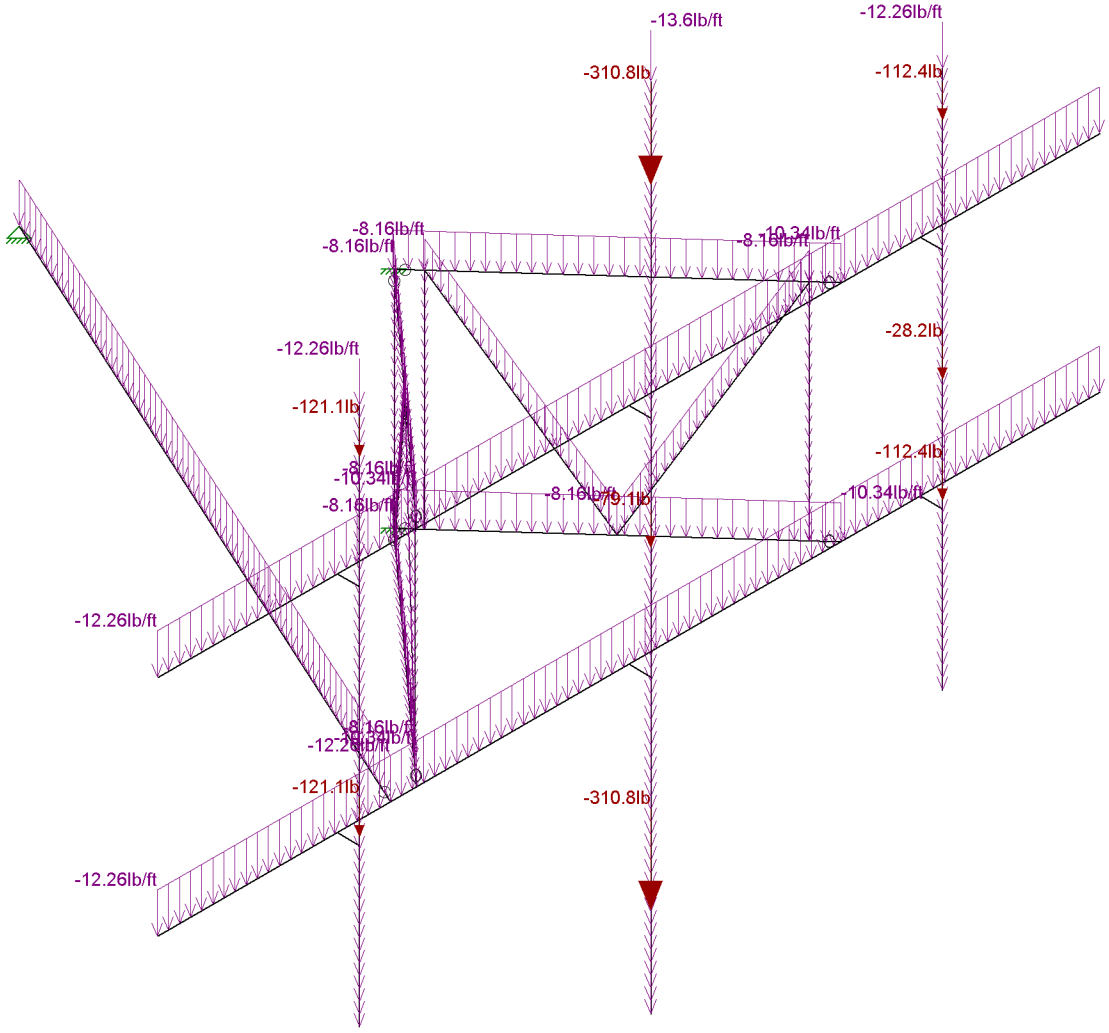
18922078A	Wind Z Ice	Sector Mount.r3d



Loads: BLC 6, Ice Weight
Envelope Only Solution

Maser Consulting P.A.		SK - 11
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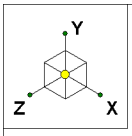
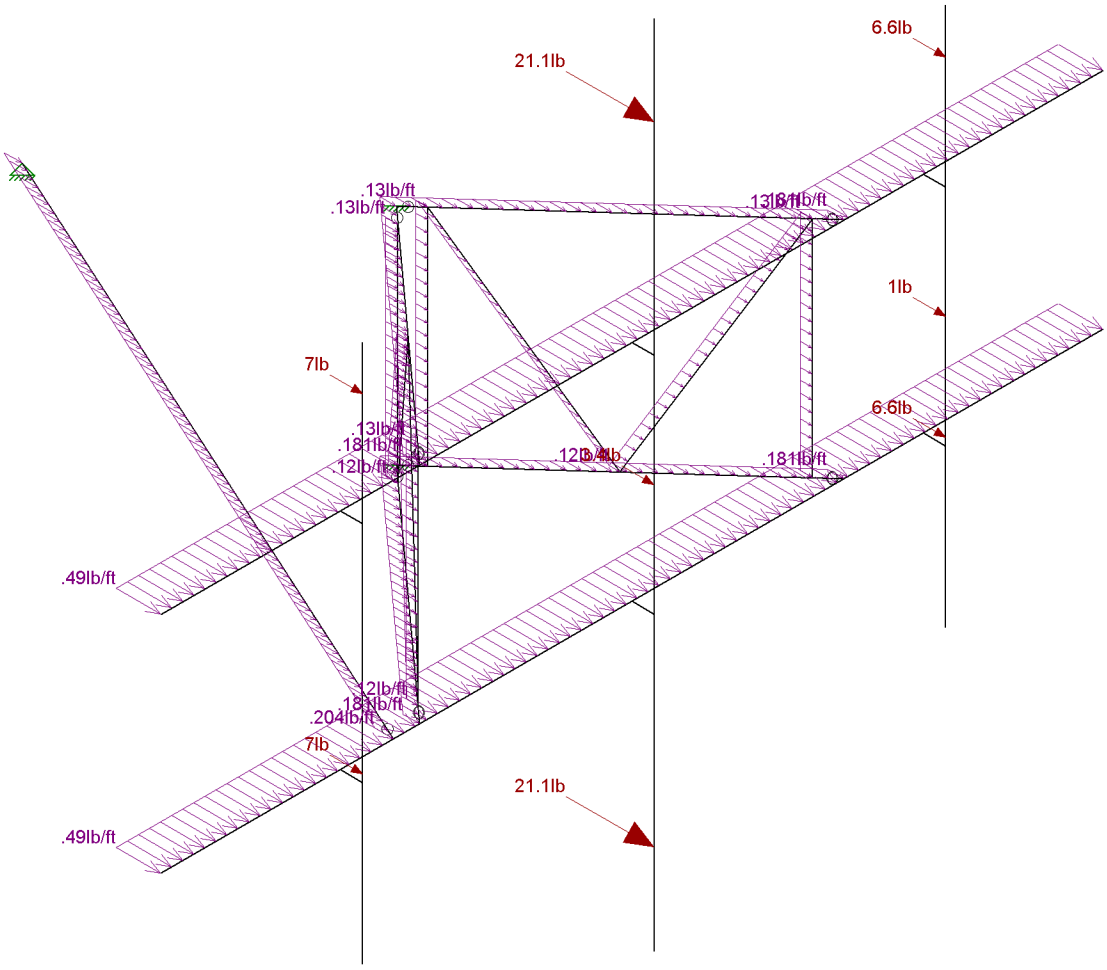
18922078A	Ice Dead Load	Sector Mount.r3d





Loads: BLC 7, Wx Service
Envelope Only Solution

Maser Consulting P.A.		SK - 12
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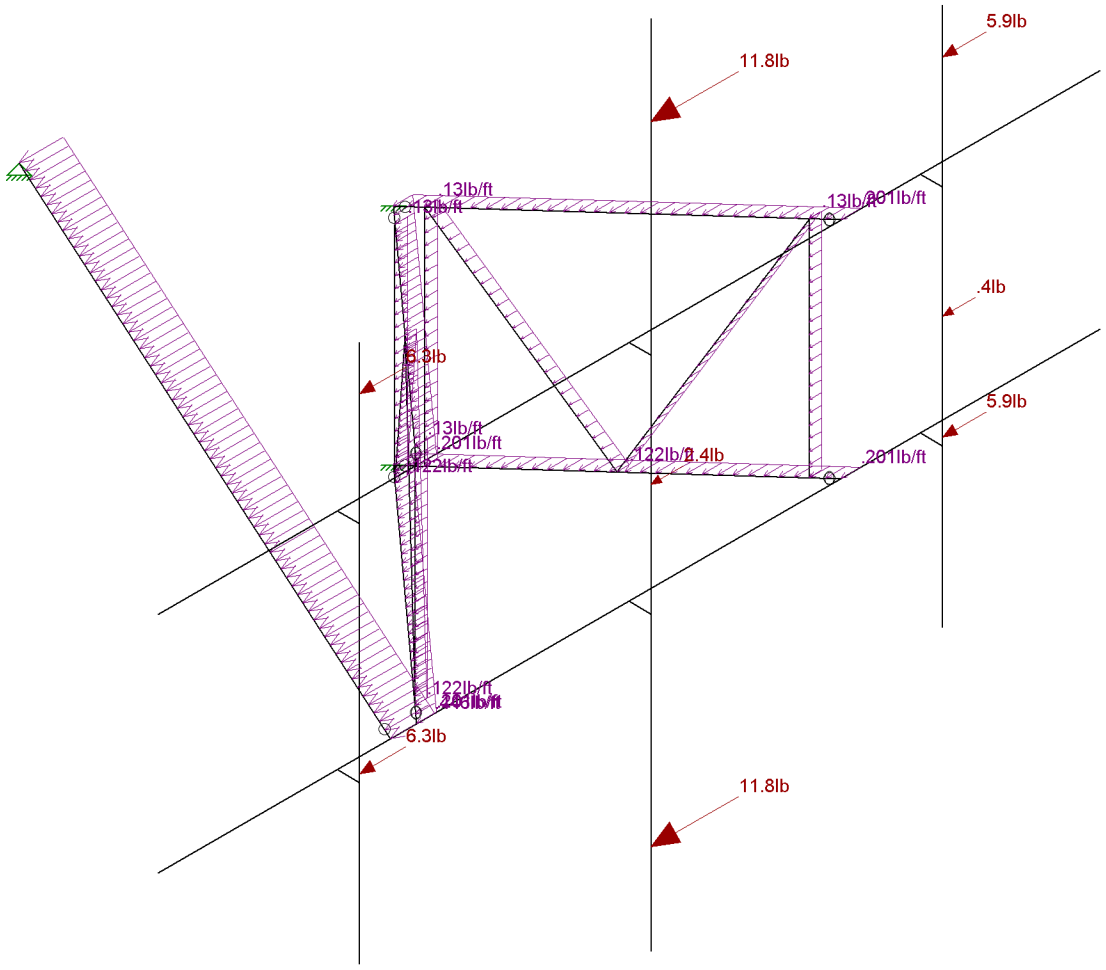

Loads: BLC 8, Wz Service
Envelope Only Solution

Maser Consulting P.A.		SK - 13
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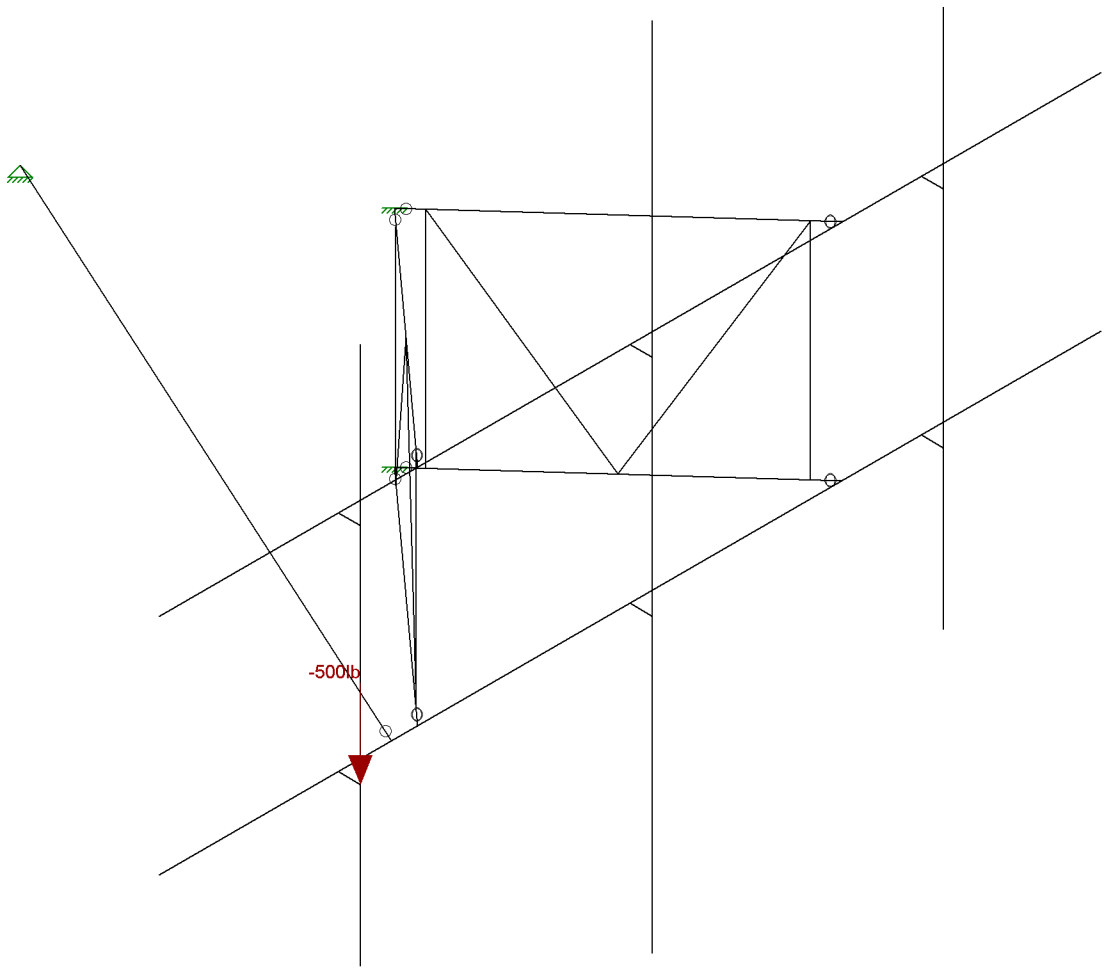

Loads: BLC 9, Maintenance Load LM1
Envelope Only Solution

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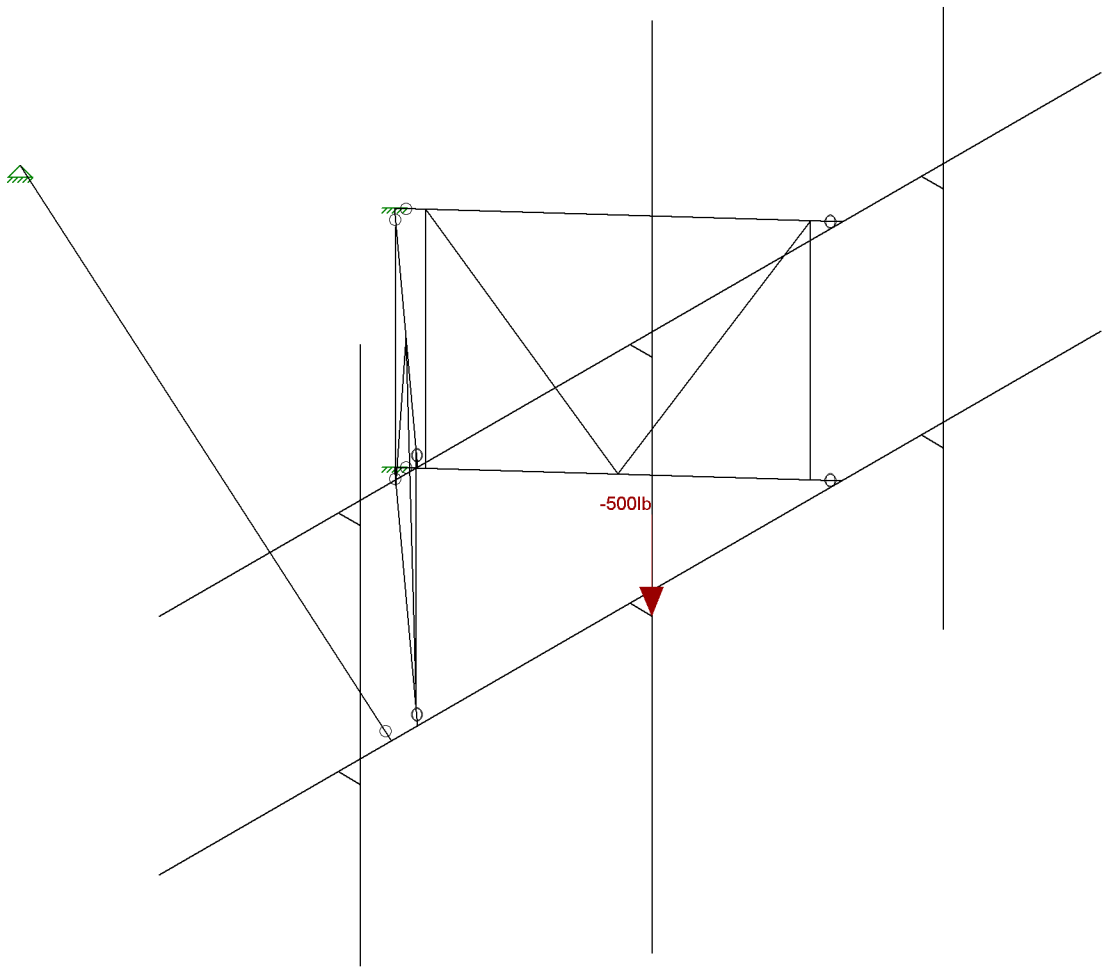
18922078A	Maintenance 1	Sector Mount.r3d



Loads: BLC 10, Maintenance Load LM2
Envelope Only Solution

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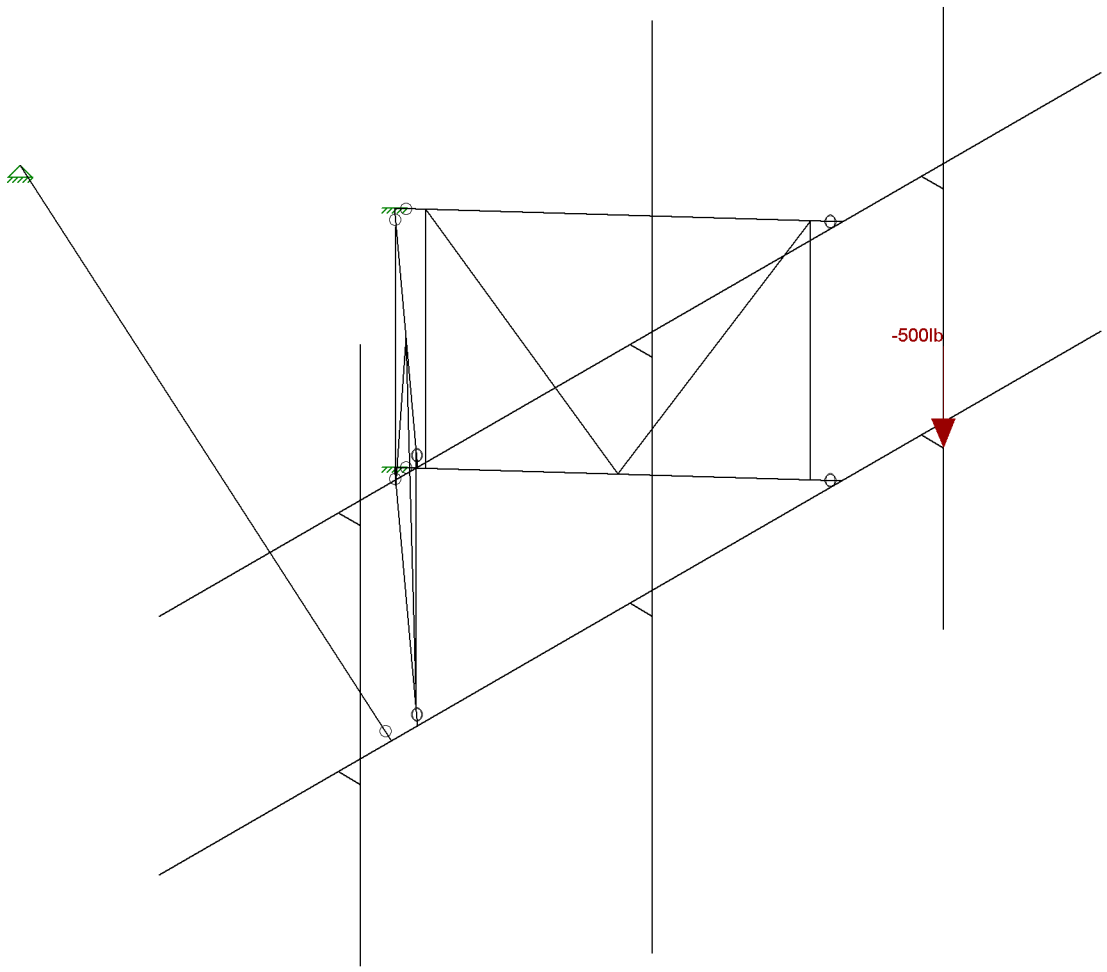

Loads: BLC 11, Maintenance Load LM3
Envelope Only Solution

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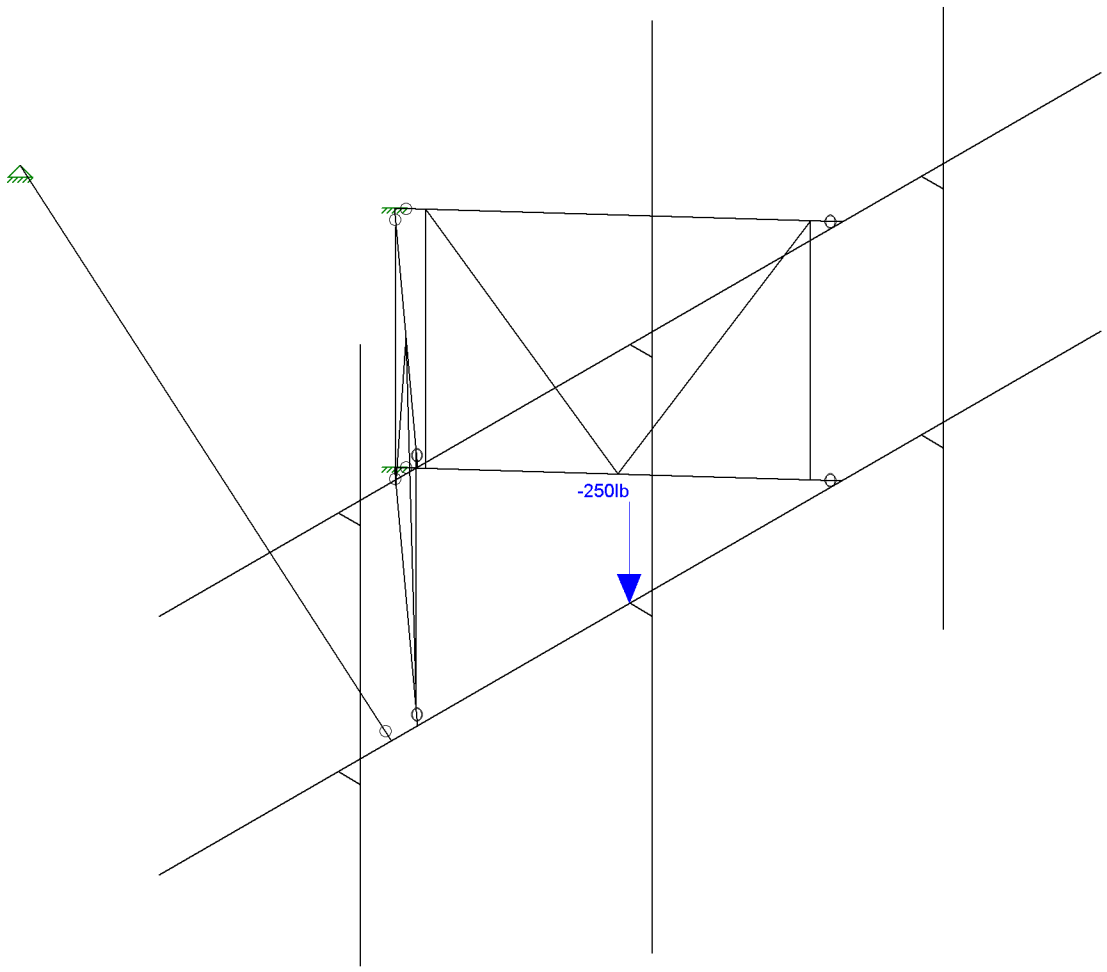

Loads: BLC 13, Maintenance Load LV1
Envelope Only Solution

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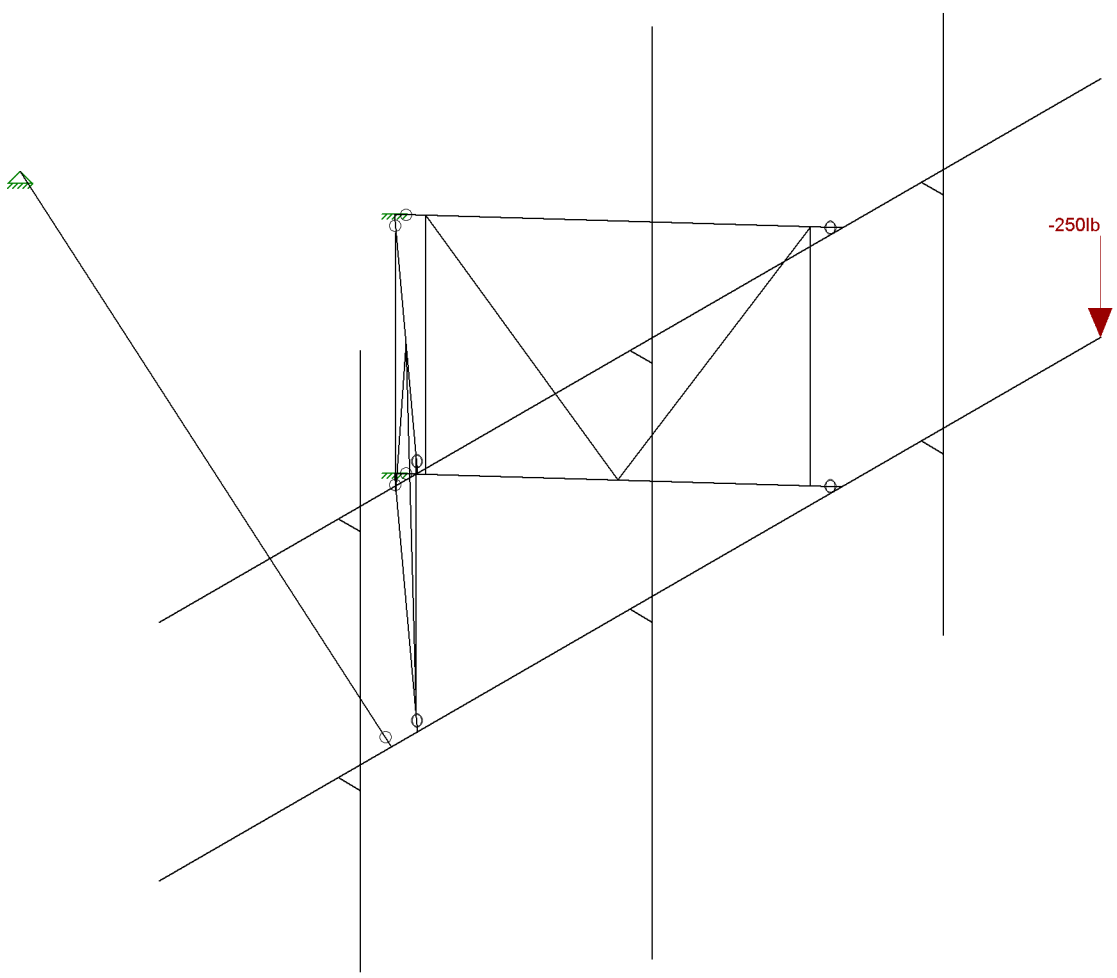


Loads: BLC 14, Maintenance Load LV2
Envelope Only Solution

Maser Consulting P.A.		SK - 18
PSC	806377 - HRT 084 943242	July 25, 2018 at 2:13 PM
18922078A	Maintenance 5	Sector Mount.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Client:	TMobile	Computed By:	PS
Site Name:	806377 - HRT 084 943242	Date:	7/25/2018
Project No.	18922078A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	1

Version 4.0

LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
3	ERICSSON	AIR 21 B2A B4P	Existing	Alpha, Beta, & Gamma
3	**RFS**	**APXVAARR24_43-U-NA20**	**Proposed**	**Alpha, Beta, & Gamma**
3	**ERICSSON**	**Air 32 DB B2A B66Aa**	**Proposed**	**Alpha, Beta, & Gamma**
3	**ERICSSON**	**RRU 4449 B71 + B12**	**Proposed**	**Alpha, Beta, & Gamma**
3	ERICSSON	KRY 112 144/1	Existing	Alpha, Beta, & Gamma

The worst case loading occurs in the Gamma Sector

Quantity	Manufacturer	Antenna/ Appurtenance	Status
1	ERICSSON	AIR 21 B2A B4P	Existing
1	**RFS**	**APXVAARR24_43-U-NA20**	**Proposed**
1	**ERICSSON**	**Air 32 DB B2A B66Aa**	**Proposed**
1	**ERICSSON**	**RRU 4449 B71 + B12**	**Proposed**
1	ERICSSON	KRY 112 144/1	Existing

Client:	TMobile	Computed By:	PS
Site Name:	806377 - HRT 084 943242	Date:	7/25/2018
Project No.	18922078A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	3

I. DESIGN INPUTS

Calculations for gravity and lateral loading on equipment and support mounts are determined as per the ANSI/TIA-222-G Code, Addendum 2

				Reference	Equation
Wind Load Inputs Parameters					
Antenna Centerline	z	84	ft		
Ultimate Wind Speed	V_U	124	mph		
Nominal Wind Speed (3 sec. Gust):	V	96	mph	Ref. 1, Eqn. 16-33	
Nominal Wind Speed with Ice (3 sec. gust):	V_i	40.0	mph	(Figure a5-2a, p. 233)	
Maintenance Wind Speed:	V_m	30.0	mph		
Service Wind Speed:	V_s	60.0	mph	(Figure a5-2a, p. 233)	
Design Ice Thickness:	t_i	1.00	in	(Figure A1-2a, p. 233)	
Exposure Category:		B		Ref. 3, Section 2.6.5.1	
Structure Class:		II		Ref. 3, Table 2-1	
Gust Effect Factor:	G_h	1.00		Ref. 3, Section 2.6.7	
Wind Directionality Factor:	K_d	0.95		Ref. 3, Table 2-2	
Topographic Category:		1		Ref. 3, Section 2.6.6.2	
Wind Load Coefficients					
Importance Factors:					
Non-Iced:	I	1		Ref. 3, Table 2-3	
Iced:	I_{ice}	1		(Table 2-3, P. 39)	
Exposure Category Coefficients:					
3-s Gust-Speed Power Law Exponent:	α	7.0		Ref. 3, Table 2-4	
Nominal Height of the Atmospheric Boundary Layer:	Z_g	1200	ft	Ref. 3, Table 2-4	
Min. Value for k_z:	Kz_{min}	0.70		Ref. 3, Table 2-4	
Terrain Constant:	K_e	0.90		Ref. 3, Table 2-4	
Velocity Pressure Exposure Coefficient:	K_z	0.940		Ref. 3, Section 2.6.5.2	$=2.01\cdot(z/z_g)^{2/\alpha}$
Topographic Category Coefficients:					
Topographic Constant:	K_t	N/A		Ref. 3, Table 2-5	
Height Attenuation Factor:	f	N/A		Ref. 3, Table 2-5	
Height Reduction Factor:	K_h	N/A		Ref. 3, Section 2.6.6.4	$=e^{(f\cdot z/H)}$
Topographic Factor:	K_{zt}	1.00		Ref.3, Section 2.6.6.4	$=[1+(K_e\cdot K_t/K_h)]^2$
Ice Accumulation:					
Ice Velocity Pressure Exposure Coefficient:	K_{iz}	1.10			$=(z/33)^{0.10}$
Factored Ice Thickness:	t_{iz}	2.20	in	(Section 2.6.8, p. 16)	$=2.0\cdot t_i\cdot I\cdot K_{iz}\cdot K_{zt}$
Ice Density:	ρ_i	56.00	pcf		
Design Wind Pressures:					
Velocity Pressure:	q_z	21.10	psf	Ref. 3, Section 2.6.9.6	$=0.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V^2\cdot I$
Velocity Pressure (With Ice):	q_{zi}	3.66	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^2\cdot I$
Velocity Pressure (Maintenance):	q_{zm}	2.06	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_m^2\cdot I$
Velocity Pressure (Service):	q_{zs}	8.23	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^2\cdot I$

Client:	TMobile	Computed By:	PS
Site Name:	806377 - HRT 084 943242	Date:	7/25/2018
Project No.	18922078A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	4

II. CALCULATIONS

- ***Wind Load on Appurtenances***

Dimensions and Force Coefficients

Antenna/ Appurtenance	Non-Iced Condition								Iced Condition							
	Mounting Pipe			Equipment					Mounting Pipe			Equipment				
	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	Force Coefficient $C_{a\ Front}$	Force Coefficient $C_{a\ Side}$	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	Force Coefficient $C_{a\ Front}$	Force Coefficient $C_{a\ Side}$
AIR 21 B2A B4P	72.0	2.375	1.200	56.00	12.10	7.90	1.29	1.40	76.4	6.8	0.895	60.39	16.49	12.29	1.25	1.31
APXVAARR24_43-U-NA20	108.0	2.875	1.200	95.90	24.00	8.70	1.27	1.53	112.4	7.3	0.988	100.29	28.39	13.09	1.25	1.42
Air 32 DB B2A B66Aa	72.0	2.375	1.200	56.60	12.90	8.70	1.28	1.38	76.4	6.8	0.895	60.99	17.29	13.09	1.25	1.30
RRU 4449 B71 + B12	0.0	0.000	0.000	14.90	13.20	9.30	1.20	1.20	0.0	0.0	0.000	19.29	17.59	13.69	1.20	1.20
KRY 112 144/1	0.0	0.000	0.000	7.70	7.50	3.40	1.20	1.20	0.0	0.0	0.000	12.09	11.89	7.79	1.20	1.20

Antenna/ Appurtenance	# of Brackets	Non-Iced Condition			Iced Condition			Maintenance Condition	
		Wind Force (lbs.)		Gravity (lbs.)	Wind Force (lbs.)		Gravity (lbs.)	Wind Force (lbs.)	
		F_N	F_T		F_N	F_T		F_N	F_T
AIR 21 B2A B4P	2	67.6	60.5	**53.3**	17.5	18.2	**112.4**	6.6	5.9
APXVAARR24_43-U-NA20	2	216.6	121.0	**76.7**	46.4	34.0	**310.8**	21.1	11.8
Air 32 DB B2A B66Aa	2	71.9	64.7	**73.6**	18.3	19.0	**121.1**	7.0	6.3
RRU 4449 B71 + B12	1	34.6	24.4	**78.0**	10.3	8.1	**79.1**	3.4	2.4
KRY 112 144/1	1	10.2	4.6	**21.0**	4.4	2.9	**28.2**	1.0	0.4

**** ALL CALCULATED LOADS ARE PER MOUNTING BRACKET. TO GET THE TOTAL EQUIPMENT LOAD, MULTIPLY THE INDIVIDUAL LOADS BY THE NUMBER OF BRACKETS***

- ***Wind Load on Framing Members***

Member Category	Member Shape	Length (in)	Member Surface	Non-Iced Condition			Iced Condition						Maintenance Condition
				Exposed Wind Height (in)	Force Coefficient C_a	Wind Load (plf)	Exposed Wind Height (in)	Depth (in)	Length (in)	Force Coefficient C_a	Wind Load (plf)	Ice Weight (plf)	Wind Load (plf)
Pipe	Pipe 2.0	126	Round	2.38	1.20	5.01	6.77	6.77	130.39	1.07	2.21	12.26	0.49
Pipe	Pipe 2.0	72	Round	2.38	1.20	5.01	6.77	6.77	76.39	0.90	1.85	12.26	0.49
Pipe	Pipe 2.5	108	Round	2.88	1.20	6.06	7.27	7.27	112.39	0.99	2.19	13.60	0.59
Pipe	Pipe 1.25	22	Round	1.66	0.94	2.74	6.05	6.05	26.39	0.74	1.37	10.34	0.27
Solid Round Bar	0.625	35	Round	0.63	1.20	1.32	5.02	5.02	39.39	0.82	1.25	7.57	0.13

Client:	TMobile	Computed By:	PS
Site Name:	806377 - HRT 084 943242	Date:	7/25/2018
Project No.	18922078A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	5

BASIC EQUATIONS

ANSI/TIA-222-G Reference

Importance Factor:

$$I := \begin{cases} 1.0 & \text{if Class} = \text{"II"} \\ 1.15 & \text{if Class} = \text{"III"} \end{cases}$$

Table 2-3, Pg. 39

(Square)

$$C_{f\_square}(h, w) := \begin{cases} 1.2 & \text{if } \frac{h}{w} \le 2.5 \\ \left[1.2 + \frac{0.2}{4.5} \cdot \left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[1.4 + \frac{0.6}{18} \cdot \left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 2.0 & \text{otherwise} \end{cases}$$

Table 2-8, P. 42

Force Coefficient:
(Round)

$$C_{f\_round}(h, w) := \begin{cases} 0.7 & \text{if } \frac{h}{w} \le 2.5 \\ \left[0.7 + \frac{0.1}{4.5} \cdot \left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[0.8 + \frac{0.4}{18} \cdot \left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 1.2 & \text{otherwise} \end{cases}$$

Table 2-8, P. 42

Terrain Exposure Constants:

Table 2-4, P. 40

$$\alpha := \begin{cases} 7.0 & \text{if Exp} = \text{"B"} \\ 9.5 & \text{if Exp} = \text{"C"} \\ 11.5 & \text{if Exp} = \text{"D"} \end{cases} \quad Z_g := \begin{cases} 1200\text{ft} & \text{if Exp} = \text{"B"} \\ 900\text{ft} & \text{if Exp} = \text{"C"} \\ 700\text{ft} & \text{if Exp} = \text{"D"} \end{cases} \quad K_{zmin} := \begin{cases} 0.70 & \text{if Exp} = \text{"B"} \\ 0.85 & \text{if Exp} = \text{"C"} \\ 1.03 & \text{if Exp} = \text{"D"} \end{cases}$$

BASIC EQUATIONS

ANSI/TIA-222-G Reference

Velocity Pressure Coefficient:

$$Kz(z) := \left| \begin{array}{l} K_z \leftarrow \max\left[2.01 \cdot \left(\frac{z}{Z_g} \right)^{\frac{2}{\alpha}}, K_{zmin} \right] \\ K_z \leftarrow \min\left(K_z, 2.01 \right) \end{array} \right.$$

$K_z := Kz(z)$ Section 2.6.5, P. 13

$$Kzt(z) := K_{zt} \leftarrow \left| \begin{array}{l} 1.0 \text{ if Topo = "1"} \\ \text{otherwise} \\ \quad \left| \begin{array}{l} K_e \leftarrow \left| \begin{array}{l} 0.90 \text{ if Exp = "B"} \\ 1.00 \text{ if Exp = "C"} \\ 1.10 \text{ if Exp = "D"} \end{array} \right. \\ K_t \leftarrow \left| \begin{array}{l} 0.43 \text{ if Topo = "2"} \\ 0.53 \text{ if Topo = "3"} \\ 0.72 \text{ if Topo = "4"} \end{array} \right. \\ f \leftarrow \left| \begin{array}{l} 1.25 \text{ if Topo = "2"} \\ 2.00 \text{ if Topo = "3"} \\ 1.50 \text{ if Topo = "4"} \end{array} \right. \\ K_h \leftarrow e^{\left(\frac{f \cdot z}{CH} \right)} \\ \left(1 + \frac{K_e \cdot K_t}{K_h} \right)^2 \end{array} \right. \end{array} \right.$$

Section 2.6.6.4, p. 14

Table 2-4 p. 40

Table 2-5 p. 40

Table 2-5 p. 40

Section 2.6.6.4, P. 14

Section 2.6.6.4, P. 14

$K_{zt} := Kzt(z)$

Velocity Pressure: Section 2.6.9.6, P. 25

$$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 \cdot I \cdot psf$$

LOAD EQUATIONS

WIND LOAD

Area (Normal): $AN_{area} = H_{ant} \cdot Want$

Area (Side): $AT_{area} = H_{ant} \cdot Dant$

$C_{fn} = C_{fsquare}(H_{ant}, Want)$

Force Coefficient (Side): $C_{fs} = C_{fsquare}(H_{ant}, Dant)$

Pipe Area (Normal): $AN_p = \max[(L_p - H_{ant}) * Dp\ , 0]$

Pipe Area (Side): $AT_p = L_p \cdot Dp$

Force Coefficient (Normal): $C_{fp} = C_{fround}(Lp, Dp)$

Normal Effective Projected Area: $E_{pan} = (C_{fn} \cdot ANarea) + (Cfp \cdot ANp)$

Side Effective Projected Area: $E_{pat} = (C_{fs} \cdot ATarea) + (Cfp \cdot ATp)$

Effective Projected Area: $EPA = max(E_{pan}, Epat)$

Wind Force: $F_{ant} = q_z \cdot Gh \cdot EPA$

ICE DEAD LOAD

Largest Out-to-Out Dimension: $D_{ant} = \sqrt{{D_{ant}}^2 + {W_{ant}}^2}$

Cross Sectional Area of Ice: $A_{ice\_ant} = \pi \cdot tiz \cdot (Dant + tiz\ )$

Total Ice Dead Load: $DL_{ice\_ant} = \boldsymbol{\rho_i} \cdot (Aice_{\_ant} \cdot Hant\ )$

ICE WIND LOAD

Dimensions: $H_{i_{ant}} = H_{ant} + 2tiz$

$W_{i_{ant}} = W_{ant} + 2tiz$

$D_{i_{ant}} = D_{ant} + 2tiz$

Area (Normal): $AIN_{area} = H_{i\_ant} \cdot W_{i\_ant}$

Area (Side): $AIT_{area} = H_{i\_ant} \cdot D_{i\_ant}$

Force Coefficient (Normal): $Ci_{fn} = C_{fsquare}(H_{i\_ant}, W_{i\_ant})$

Force Coefficient (Side): $Ci_{fs} = C_{fsquare}(H_{i\_ant}, D_{i\_ant})$

Pipe Area (Normal): $AN_p = \max[(L_{ip} - H_{i\_ant}) * D_{ip}\ , 0]$

Pipe Area (Side): $AT_p = L_{ip} \cdot Dip$

Force Coefficient (Normal): $C_{fp} = C_{fround}(L_{ip}, D_{ip})$

Normal Effective Projected Area: $E_{pain} = (Ci_{fn} \cdot ANarea) + (Cfp \cdot ANp)$

Side Effective Projected Area: $E_{pait} = (Ci_{fs} \cdot ATarea) + (Cfp \cdot ATp)$

Effective Projected Area: $EPA_i = max(E_{pain}, Epait)$

Wind Force: $F_{i\_ant} = q_z \cdot Gh \cdot EPAi$

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			Face Horizontals	Column	Pipe	A53 Gr. B	Typical
2	M2	N3	N4			Face Horizontals	Column	Pipe	A53 Gr. B	Typical
3	M3	N5	N6			Antenna Pipe	Column	Pipe	A53 Gr. B	Typical
4	M4	N7	N8			Antenna Pipe	Column	Pipe	A53 Gr. B	Typical
5	M5	N9	N10			RIGID	None	None	RIGID	Typical
6	M6	N11	N12			RIGID	None	None	RIGID	Typical
7	M7	N13	N14			RIGID	None	None	RIGID	Typical
8	M8	N15	N16			RIGID	None	None	RIGID	Typical
9	M15	N27	N28			Inner Bracing	Column	BAR	A36 Gr.36	Typical
10	M16	N57	N27			Inner Bracing	Column	BAR	A36 Gr.36	Typical
11	M17	N29	N31			Inner Bracing	Column	BAR	A36 Gr.36	Typical
12	M18	N57	N29			Inner Bracing	Column	BAR	A36 Gr.36	Typical
13	M19	N32	N34			Inner Bracing	Column	BAR	A36 Gr.36	Typical
14	M20	N33	N35			Inner Bracing	Column	BAR	A36 Gr.36	Typical
15	M21	N34	N36			Inner Bracing	Column	BAR	A36 Gr.36	Typical
16	M22	N35	N36			Inner Bracing	Column	BAR	A36 Gr.36	Typical
17	M24	N37	N39			Stabilizer	Column	Pipe	A53 Gr. B	Typical
18	M28	N17	N19			V Horizontals	Column	Pipe	A53 Gr. B	Typical
19	M29	N18	N19			V Horizontals	Column	Pipe	A53 Gr. B	Typical
20	M30	N20	N22			V Horizontals	Column	Pipe	A53 Gr. B	Typical
21	M31	N21	N22			V Horizontals	Column	Pipe	A53 Gr. B	Typical
22	M28A	N50A	N51A			Middle Antenn...	Column	Pipe	A53 Gr. B	Typical
23	M29A	N52A	N53A			RIGID	None	None	RIGID	Typical
24	M30A	N54	N55			RIGID	None	None	RIGID	Typical

Joint Loads and Enforced Displacements (BLC 1 : Dead)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	KRY11	L	Y	-21
2	APXV-2	L	Y	-76.7
3	APXV-1	L	Y	-76.7
4	AIR32-2	L	Y	-73.6
5	AIR32-1	L	Y	-73.6
6	AIR21-2	L	Y	-53.3
7	AIR21-1	L	Y	-53.3
8	4449	L	Y	-78

Joint Loads and Enforced Displacements (BLC 2 : Wx)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	KRY11	L	X	10.2
2	APXV-2	L	X	216.6
3	APXV-1	L	X	216.6
4	AIR32-2	L	X	71.9
5	AIR32-1	L	X	71.9
6	AIR21-2	L	X	67.6
7	AIR21-1	L	X	67.6
8	4449	L	X	34.6

Joint Loads and Enforced Displacements (BLC 3 : Wz)

Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^

Joint Loads and Enforced Displacements (BLC 3 : Wz) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	4449	L	Z	24.5
2	AIR21-1	L	Z	60.5
3	AIR21-2	L	Z	60.5
4	AIR32-1	L	Z	64.7
5	AIR32-2	L	Z	64.7
6	APXV-1	L	Z	121
7	APXV-2	L	Z	121
8	KRY11	L	Z	4.6

Joint Loads and Enforced Displacements (BLC 4 : Wx Ice)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	AIR21-1	L	X	17.5
2	AIR21-2	L	X	17.5
3	APXV-1	L	X	46.4
4	APXV-2	L	X	46.4
5	KRY11	L	X	4.4
6	4449	L	X	10.3
7	AIR32-1	L	X	18.3
8	AIR32-2	L	X	18.3

Joint Loads and Enforced Displacements (BLC 5 : Wz Ice)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	AIR21-1	L	Z	18.2
2	AIR21-2	L	Z	18.2
3	APXV-1	L	Z	34
4	APXV-2	L	Z	34
5	KRY11	L	Z	2.9
6	4449	L	Z	8.1
7	AIR32-1	L	Z	19
8	AIR32-2	L	Z	19

Joint Loads and Enforced Displacements (BLC 6 : Ice Weight)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	AIR21-1	L	Y	-112.4
2	AIR21-2	L	Y	-112.4
3	APXV-1	L	Y	-310.8
4	APXV-2	L	Y	-310.8
5	KRY11	L	Y	-28.2
6	4449	L	Y	-79.1
7	AIR32-1	L	Y	-121.1
8	AIR32-2	L	Y	-121.1

Joint Loads and Enforced Displacements (BLC 7 : Wx Service)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	AIR21-1	L	X	6.6
2	AIR21-2	L	X	6.6
3	APXV-1	L	X	21.1
4	APXV-2	L	X	21.1
5	KRY11	L	X	1
6	4449	L	X	3.4

Joint Loads and Enforced Displacements (BLC 7 : Wx Service) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
7	AIR32-1	L	X	7
8	AIR32-2	L	X	7

Joint Loads and Enforced Displacements (BLC 8 : Wz Service)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	AIR21-1	L	Z	5.9
2	AIR21-2	L	Z	5.9
3	APXV-1	L	Z	11.8
4	APXV-2	L	Z	11.8
5	KRY11	L	Z	.4
6	4449	L	Z	2.4
7	AIR32-1	L	Z	6.3
8	AIR32-2	L	Z	6.3

Joint Loads and Enforced Displacements (BLC 9 : Maintenance Load LM1)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	N14	L	Y	-500

Joint Loads and Enforced Displacements (BLC 10 : Maintenance Load LM2)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	N55	L	Y	-500

Joint Loads and Enforced Displacements (BLC 11 : Maintenance Load LM3)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	N12	L	Y	-500

Joint Loads and Enforced Displacements (BLC 14 : Maintenance Load LV2)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	N2	L	Y	-250

Member Distributed Loads (BLC 2 : Wx)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M2	PX	5.01	5.01	0	0
2	M1	PX	5.01	5.01	0	0
3	M24	PX	5.01	5.01	0	0
4	M29	PX	2.74	2.74	0	0
5	M31	PX	2.74	2.74	0	0
6	M30	PX	2.74	2.74	0	0
7	M28	PX	2.74	2.74	0	0
8	M22	PX	1.32	1.32	0	0
9	M20	PX	1.32	1.32	0	0
10	M21	PX	1.32	1.32	0	0
11	M19	PX	1.32	1.32	0	0
12	M17	PX	1.32	1.32	0	0
13	M18	PX	1.32	1.32	0	0
14	M16	PX	1.32	1.32	0	0
15	M15	PX	1.32	1.32	0	0

Member Distributed Loads (BLC 3 : Wz)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M24	PZ	5.01	5.01	0	0
2	M2	PZ	5.01	5.01	0	0
3	M1	PZ	5.01	5.01	0	0
4	M31	PZ	2.74	2.74	0	0
5	M29	PZ	2.74	2.74	0	0
6	M28	PZ	2.74	2.74	0	0
7	M30	PZ	2.74	2.74	0	0
8	M20	PZ	1.32	1.32	0	0
9	M22	PZ	1.32	1.32	0	0
10	M21	PZ	1.32	1.32	0	0
11	M19	PZ	1.32	1.32	0	0
12	M17	PZ	1.32	1.32	0	0
13	M18	PZ	1.32	1.32	0	0
14	M15	PZ	1.32	1.32	0	0
15	M16	PZ	1.32	1.32	0	0

Member Distributed Loads (BLC 4 : Wx Ice)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M2	PX	2.21	2.21	0	0
2	M1	PX	2.21	2.21	0	0
3	M24	PX	2.21	2.21	0	0
4	M29	PX	1.37	1.37	0	0
5	M31	PX	1.37	1.37	0	0
6	M28	PX	1.37	1.37	0	0
7	M30	PX	1.37	1.37	0	0
8	M22	PX	1.25	1.25	0	0
9	M20	PX	1.25	1.25	0	0
10	M21	PX	1.25	1.25	0	0
11	M19	PX	1.25	1.25	0	0
12	M17	PX	1.25	1.25	0	0
13	M18	PX	1.25	1.25	0	0
14	M16	PX	1.25	1.25	0	0
15	M15	PX	1.25	1.25	0	0

Member Distributed Loads (BLC 5 : Wz Ice)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M24	PZ	2.21	2.21	0	0
2	M2	PZ	2.21	2.21	0	0
3	M1	PZ	2.21	2.21	0	0
4	M29	PZ	1.37	1.37	0	0
5	M31	PZ	1.37	1.37	0	0
6	M28	PZ	1.37	1.37	0	0
7	M30	PZ	1.37	1.37	0	0
8	M20	PZ	1.25	1.25	0	0
9	M22	PZ	1.25	1.25	0	0
10	M21	PZ	1.25	1.25	0	0
11	M19	PZ	1.25	1.25	0	0
12	M17	PZ	1.25	1.25	0	0
13	M18	PZ	1.25	1.25	0	0
14	M16	PZ	1.25	1.25	0	0
15	M15	PZ	1.25	1.25	0	0

Member Distributed Loads (BLC 6 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M28A	Y	-13.6	-13.6	0	0
2	M4	Y	-12.26	-12.26	0	0
3	M3	Y	-12.26	-12.26	0	0
4	M2	Y	-12.26	-12.26	0	0
5	M1	Y	-12.26	-12.26	0	0
6	M24	Y	-12.26	-12.26	0	0
7	M29	Y	-10.34	-10.34	0	0
8	M31	Y	-10.34	-10.34	0	0
9	M28	Y	-10.34	-10.34	0	0
10	M30	Y	-10.34	-10.34	0	0
11	M20	Y	-8.16	-8.16	0	0
12	M22	Y	-8.16	-8.16	0	0
13	M21	Y	-8.16	-8.16	0	0
14	M19	Y	-8.16	-8.16	0	0
15	M17	Y	-8.16	-8.16	0	0
16	M18	Y	-8.16	-8.16	0	0
17	M16	Y	-8.16	-8.16	0	0
18	M15	Y	-8.16	-8.16	0	0

Member Distributed Loads (BLC 7 : Wx Service)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M2	PX	.49	.49	0	0
2	M1	PX	.49	.49	0	0
3	M24	PX	.49	.49	0	0
4	M29	PX	.27	.27	0	0
5	M28	PX	.27	.27	0	0
6	M30	PX	.27	.27	0	0
7	M31	PX	.27	.27	0	0
8	M20	PX	.13	.13	0	0
9	M22	PX	.13	.13	0	0
10	M21	PX	.13	.13	0	0
11	M19	PX	.13	.13	0	0
12	M17	PX	.13	.13	0	0
13	M18	PX	.13	.13	0	0
14	M16	PX	.13	.13	0	0
15	M15	PX	.13	.13	0	0

Member Distributed Loads (BLC 8 : Wz Service)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M24	PZ	.49	.49	0	0
2	M2	PZ	.49	.49	0	0
3	M1	PZ	.49	.49	0	0
4	M29	PZ	.27	.27	0	0
5	M28	PZ	.27	.27	0	0
6	M30	PZ	.27	.27	0	0
7	M31	PZ	.27	.27	0	0
8	M20	PZ	.13	.13	0	0
9	M22	PZ	.13	.13	0	0
10	M21	PZ	.13	.13	0	0
11	M19	PZ	.13	.13	0	0
12	M17	PZ	.13	.13	0	0

Member Distributed Loads (BLC 8 : Wz Service) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
13	M18	PZ	.13	.13	0	0
14	M16	PZ	.13	.13	0	0
15	M15	PZ	.13	.13	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	Dead	DL		-1.05		8				
2	Wx	None				8		15		
3	Wz	WL				8		15		
4	Wx Ice	WL				8		15		
5	Wz Ice	WL				8		15		
6	Ice Weight	OL1				8		18		
7	Wx Service	WL				8		15		
8	Wz Service	WL				8		15		
9	Maintenance Load LM1	OL2				1				
10	Maintenance Load LM2	OL2				1				
11	Maintenance Load LM3	OL2				1				
13	Maintenance Load LV1	None					1			
14	Maintenance Load LV2	None				1				

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
1	N1	0.	60.93765	7.516269	0	
2	N2	0.	60.93765	-118.483731	0	
3	N3	0.	90.93765	7.516269	0	
4	N4	0.	90.93765	-118.483731	0	
5	N5	3	111.93765	-16.483731	0	
6	N6	3	39.93765	-16.483731	0	
7	N7	3	111.93765	-94.483731	0	
8	N8	3	39.93765	-94.483731	0	
9	N9	0.	90.93765	-94.483731	0	
10	N10	3	90.93765	-94.483731	0	
11	N11	0.	60.93765	-94.483731	0	
12	N12	3	60.93765	-94.483731	0	
13	N13	0.	60.93765	-16.483731	0	
14	N14	3	60.93765	-16.483731	0	
15	N15	0.	90.93765	-16.483731	0	
16	N16	3	90.93765	-16.483731	0	
17	N17	0.	90.93765	-83.858731	0	
18	N18	0.	90.93765	-27.108731	0	
19	N19	-31.5	90.93765	-55.483731	0	
20	N20	0.	60.93765	-83.858731	0	
21	N21	0.	60.93765	-27.108731	0	
22	N22	-31.5	60.93765	-55.483731	0	
23	N27	-2.229003	90.93765	-81.850859	0	
24	N28	-2.229003	60.93765	-81.850859	0	
25	N29	-29.270997	90.93765	-57.491602	0	
26	N31	-29.270997	60.93765	-57.491602	0	
27	N32	-29.270997	90.93765	-53.475859	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
28	N33	-2.229003	90.93765	-29.116602	0	
29	N34	-29.270997	60.93765	-53.475859	0	
30	N35	-2.229003	60.93765	-29.116602	0	
31	N36	-15.75	90.93765	-41.296231	0	
32	N37	0.	60.93765	-23.608731	0	
33	N39	-91.5	60.93765	-65.483731	0	
34	APXV-1	3	117.93765	-55.483731	0	
35	APXV-2	3	33.93765	-55.483731	0	
36	AIR21-1	3	105.93765	-94.483731	0	
37	AIR21-2	3	61.93765	-94.483731	0	
38	N50A	3	129.93765	-55.483731	0	
39	N51A	3	21.93765	-55.483731	0	
40	N52A	0.	90.93765	-55.483731	0	
41	N53A	3	90.93765	-55.483731	0	
42	N54	0.	60.93765	-55.483731	0	
43	N55	3	60.93765	-55.483731	0	
44	4449	3	75.93765	-55.483731	0	
45	KRY11	3	75.93765	-94.483731	0	
46	N57	-15.75	60.93765	-69.671231	0	
47	AIR32-1	3	105.93765	-16.483731	0	
48	AIR32-2	3	61.93765	-16.483731	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]	Footing
1	N19	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
2	N22	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
3	N39	Reaction	Reaction	Reaction				

Member Point Loads (BLC 13 : Maintenance Load LV1)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Y	-250	%50

Load Combinations

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact...
1	1.4D	Yes	Y		1	1.4														
2	1.2D+1.6W1	Yes	Y		1	1.2	2	1.6	3											
3	1.2D+1.6W2	Yes	Y		1	1.2	2	1.386	3	.8										
4	1.2D+1.6W3	Yes	Y		1	1.2	2	.8	3	1.386										
5	1.2D+1.6W4	Yes	Y		1	1.2	2		3	1.6										
6	1.2D+1.6W5	Yes	Y		1	1.2	2	-.8	3	1.386										
7	1.2D+1.6W6	Yes	Y		1	1.2	2	-1.3...	3	.8										
8	1.2D+1.6W7	Yes	Y		1	1.2	2	-1.6	3											
9	1.2D+1.6W8	Yes	Y		1	1.2	2	-1.3...	3	-.8										
10	1.2D+1.6W9	Yes	Y		1	1.2	2	-.8	3	-1.3...										
11	1.2D+1.6W10	Yes	Y		1	1.2	2		3	-1.6										
12	1.2D+1.6W11	Yes	Y		1	1.2	2	.8	3	-1.3...										
13	1.2D+1.6W12	Yes	Y		1	1.2	2	1.386	3	-.8										

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact...
14																				
15	1.2D+1.0 Ice	Yes	Y		1	1.2	6	1												
16	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4	1	5									
17	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4	.866	5	.5								
18	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4	.5	5	.866								
19	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4		5	1								
20	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4	-.5	5	.866								
21	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4	-.866	5	.5								
22	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4	-1	5									
23	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4	-.866	5	-.5								
24	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4	-.5	5	-.866								
25	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4		5	-1								
26	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4	.5	5	-.866								
27	1.2D+1.0ICE+1.0...	Yes	Y		1	1.2	6	1	4	.866	5	-.5								
28																				
29	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	1	8									
30	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	.866	8	.5								
31	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	.5	8	.866								
32	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7		8	1								
33	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	-.5	8	.866								
34	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	-.866	8	.5								
35	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	-1	8									
36	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	-.866	8	-.5								
37	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	-.5	8	-.866								
38	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7		8	-1								
39	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	.5	8	-.866								
40	1.2D+1.5LM1+1.0...	Yes	Y		1	1.2	9	1.5	7	.866	8	-.5								
41																				
42	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	1	8									
43	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	.866	8	.5								
44	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	.5	8	.866								
45	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7		8	1								
46	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	-.5	8	.866								
47	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	-.866	8	.5								
48	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	-1	8									
49	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	-.866	8	-.5								
50	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	-.5	8	-.866								
51	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7		8	-1								
52	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	.5	8	-.866								
53	1.2D+1.5LM2+1.0...	Yes	Y		1	1.2	10	1.5	7	.866	8	-.5								
54																				
55	1.2D+1.5LV1	Yes	Y		1	1.2	13	1.5												
56	1.2D+1.5LV2	Yes	Y		1	1.2	14	1.5												
57			Y																	
58	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	1	8									
59	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	.866	8	.5								
60	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	.5	8	.866								
61	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7		8	1								
62	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	-.5	8	.866								
63	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	-.866	8	.5								
64	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	-1	8									
65	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	-.866	8	-.5								

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact...
66	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	-.5	8	-.866								
67	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7		8	-1								
68	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	.5	8	-.866								
69	1.2D+1.5LM3+1.0...	Yes	Y		1	1.2	11	1.5	7	.866	8	-.5								
70			Y																	
71	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7	1	8									
72	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7	.866	8	.5								
73	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7	.5	8	.866								
74	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7		8	1								
75	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7	-.5	8	.866								
76	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7	-.866	8	.5								
77	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7	-1	8									
78	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7	-.866	8	-.5								
79	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7	-.5	8	-.866								
80	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7		8	-1								
81	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7	.5	8	-.866								
82	1.2D+1.5LM4+1.0...	Yes	Y		1	1.2	12	1.5	7	.866	8	-.5								

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N22	max	3303.551	24	1537.726	19	1284.39	11	26.583	67	0	1	285.26	18
2		min	-928.609	4	366.78	11	-1188.324	5	-129.937	32	0	1	67.299	11
3	N19	max	-62.494	8	1495.368	25	900.835	67	121.537	67	0	1	279.161	24
4		min	-3089.488	16	341.714	5	-994.144	32	-33.983	32	0	1	64.091	5

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

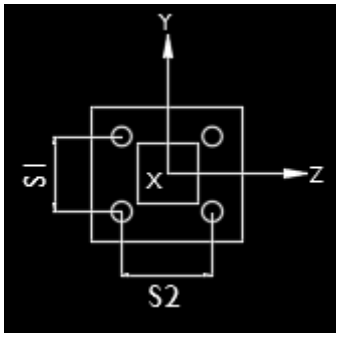
	Member	Shape	Code Check	Loc[in]	LC	She..	Lo...	.....	phi*Pnc ..	phi*Pnt...	phi*Mn ..	phi*M.....	Eqn
1	M21	5/8	.630	35.088	19	.005	35...	5	3040.16	9946.8	96.768	96.768	...H1-...
2	M16	5/8	.584	35.088	25	.005	0	5	3040.16	9946.8	96.768	96.768	...H1-...
3	M31	PIPE_1.25	.406	42.396	24	.198	42...	...	14403.9...	19687.5	800.625	800.6.....	H1-...
4	M1	PIPE_2.0_HRA	.399	102.375	56	.238	34...	5	8922.084	32130	1871.625	1871.....	H1-...
5	M28	PIPE_1.25	.371	42.396	25	.185	42...	...	14403.9...	19687.5	800.625	800.6.....	H1-...
6	M4	PIPE_2.0	.286	51	56	.062	50...	...	20866.7...	32130	1871.625	1871.....	H1-...
7	M2	PIPE_2.0_HRA	.255	63	25	.091	34...	...	8922.084	32130	1871.625	1871.....	H1-...
8	M30	PIPE_1.25	.215	42.396	24	.105	2.65	...	14403.9...	19687.5	800.625	800.6.....	H1-...
9	M28A	PIPE_2.5	.213	38.25	2	.026	54	...	26137.1...	50715	3596.25	3596.....	H1-...
10	M29	PIPE_1.25	.209	42.396	18	.111	2.65	...	14403.9...	19687.5	800.625	800.6.....	H1-...
11	M3	PIPE_2.0	.175	51	31	.073	50...	...	20866.7...	32130	1871.625	1871.....	H1-...
12	M22	5/8	.146	0	23	.007	0	...	3040.16	9946.8	96.768	96.768	...H1-...
13	M20	5/8	.138	30	34	.010	30	...	4134.294	9946.8	96.768	96.768	...H1-...
14	M18	5/8	.136	0	21	.006	0	5	3040.16	9946.8	96.768	96.768	...H1-...
15	M24	PIPE_2.0_HRA	.108	50.313	5	.007	0	...	13827.9...	32130	1871.625	1871.....	H1-...
16	M15	5/8	.087	0	69	.009	30	5	4134.294	9946.8	96.768	96.768	...H1-...
17	M17	5/8	.074	0	26	.007	30	5	4134.294	9946.8	96.768	96.768	...H1-...
18	M19	5/8	.049	30	23	.008	30	...	4134.294	9946.8	96.768	96.768	...H1-...

APPENDIX D

ADDITIONAL CALCUATIONS

Mount to Tower Connection Check:

Applied Tension:	$Rx := 3304 \cdot lbf$	From Risa 3D LRFD Loading
Applied Shear:	$Ry := 1538 lbf$	From Risa 3D LRFD Loading
Applied Shear:	$Rz := 1188 \cdot lbf$	From Risa 3D LRFD Loading
Applied Torque:	$Mx := 130 \cdot lbf \cdot ft$	From Risa 3D LRFD Loading
Applied Moment:	$My := 0 lbf \cdot ft$	From Risa 3D LRFD Loading
Applied Moment:	$Mz := 285 \cdot lbf \cdot ft$	From Risa 3D LRFD Loading
Number of Bolts:	$n := 4$	Per Specifications
Bolts Vertical Spacing:	$S_1 := 3.75 in$	Per Specifications
Bolts Horizontal Spacing:	$S_2 := 5.125 in$	Per Specifications
Applied Tension at Bolt:	$P_{a.t} := \frac{Rx}{n} + \frac{2My}{n \cdot S_2} + \frac{2Mz}{n \cdot S_1} = 1282 lbf$	
Applied Shear at Bolt:	$P_{a.v} := \frac{\sqrt{Ry^2 + Rz^2}}{n} + \frac{2Mx}{\sqrt{S_1^2 + S_2^2}} = 977.2 lbf$	
Bolt Type Used:	**A325N**	
Nominal Tensile Stress, Fnt:	$F_{n.t} := 90 ksi$	AISC, Table J3-2, P. 16.1-104
Nominal Shear Stress, Fnv:	$F_{n.v} := 54 ksi$	AISC, Table J3-2, P. 16.1-104
Nominal Bolt Diameter:	$d_b := \frac{1}{2} in$	Per Specifications
Gross Area of the Bolt:	$A_{b.g} := 0.196 in^2$	AISC, Table 7-18, P. 7-83
Net Area of the Bolt:	$A_{b.n} := 0.142 in^2$	AISC, Table 7-18, P. 7-83
Strength Reduction Factor, ϕ:	$\phi := 0.75$	



Combined Tension And Shear Check

Nominal Tensile Reduced Fntr

$$F_{n.t.r} := 1.3 \cdot F_{n.t} - \frac{F_{n.t}}{\phi \cdot F_{n.v}} \cdot \frac{P_{a.v}}{A_{b.g}} = 105.9 \cdot ksi$$

AISC Eq. J3-3a, P. 16.1-109

Nominal Shear Reduced Fntv

$$F_{n.v.r} := 1.3 \cdot F_{n.v} - \frac{F_{n.v}}{\phi \cdot F_{n.t}} \cdot \frac{P_{a.t}}{A_{b.g}} = 65 \cdot ksi$$

AISC Eq. J3-3a, P. 16.1-109

Bolt Nominal Tensive Strength

$$R_{n.t} := F_{n.t} \cdot A_{b.g} = 17.6 \cdot kip$$

Tension Check

$$Check := \begin{cases} \text{"OK"} & \text{if } \phi \cdot R_{n.t} \geq P_{a.t} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases}$$

$$Check = \text{"OK"}$$

Tension Ratio

$$Ratio_t := \frac{P_{a.t}}{\phi \cdot R_{n.t}} \qquad Ratio_t = 9.7 \cdot \%$$

Bolt Nominal Shear Strength

$$R_{n.v} := F_{n.v} \cdot A_{b.g} = 10.6 \cdot kip$$

Shear Check

$$Check := \begin{cases} \text{"OK"} & \text{if } \phi \cdot R_{n.v} \geq P_{a.v} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases}$$

$$Check = \text{"OK"}$$

Shear Ratio

$$Ratio_v := \frac{P_{a.v}}{\phi \cdot R_{n.v}} \qquad Ratio_v = 12.3 \cdot \%$$

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: CT11711A

Crown Castle SST
197 South Street
Vernon, CT 06066

August 28, 2018

EBI Project Number: 6218005872

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	28.03 %

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

EBI Consulting
environmental | engineering | due diligence

August 28, 2018

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

Emissions Analysis for Site: **CT11711A – Crown Castle SST**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **197 South Street, Vernon, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **197 South Street, Vernon, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 1 GSM channels (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.

2) 1 UMTS channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 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.

5) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

6) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

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

9) The antennas used in this modeling are the **Ericsson AIR32 B2A/B66AA** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **RFS APXVAARR24_43-U-NA20** for 600 MHz and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is **84 feet** above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B2A/B66AA	Make / Model:	Ericsson AIR32 B2A/B66AA	Make / Model:	Ericsson AIR32 B2A/B66AA
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	84 feet	Height (AGL):	84 feet	Height (AGL):	84 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	200	Total TX Power(W):	200	Total TX Power(W):	200
ERP (W):	7,780.90	ERP (W):	7,780.90	ERP (W):	7,780.90
Antenna A1 MPE%	**4.60**	Antenna B1 MPE%	**4.60**	Antenna C1 MPE%	**4.60**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	84 feet	Height (AGL):	84 feet	Height (AGL):	84 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	55	Total TX Power(W):	55	Total TX Power(W):	55
ERP (W):	2,139.75	ERP (W):	2,139.75	ERP (W):	2,139.75
Antenna A2 MPE%	**1.26**	Antenna B2 MPE%	**1.26**	Antenna C2 MPE%	**1.26**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height (AGL):	84 feet	Height (AGL):	84 feet	Height (AGL):	84 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,443.03	ERP (W):	2,443.03	ERP (W):	2,443.03
Antenna A3 MPE%	**3.43**	Antenna B3 MPE%	**3.43**	Antenna C3 MPE%	**3.43**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**9.29 %**
AT&T	**6.48** %
Verizon Wireless	**9.03** %
XM Satellite Radio	**0.14** %
Town	**0.89** %
MetroPCS	**1.12** %
Sprint	**0.97** %
Clearwire	**0.11** %
Site Total MPE %:	**28.03 %**

T-Mobile Sector A Total:	9.29 %
T-Mobile Sector B Total:	9.29 %
T-Mobile Sector C Total:	9.29 %
Site Total:	28.03 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	84	18.39	PCS - 1900 MHz	1000.00	1.84%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	84	27.59	AWS - 2100 MHz	1000.00	2.76%
T-Mobile PCS - 1900 MHz GSM	1	583.57	84	3.45	PCS - 1900 MHz	1000.00	0.34%
T-Mobile AWS - 2100 MHz UMTS	1	1,556.18	84	9.20	AWS - 2100 MHz	1000.00	0.92%
T-Mobile 600 MHz LTE	2	788.97	84	9.32	600 MHz	400.00	2.33%
T-Mobile 700 MHz LTE	2	432.54	84	5.11	700 MHz	467.00	1.10%
						Total:	**9.29%**

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:	9.29 %
Sector B:	9.29 %
Sector C:	9.29 %
T-Mobile Maximum MPE % (Per Sector):	9.29 %
Site Total:	28.03 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **28.03%** 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.