CROWN CASTLE

1 Cityplace Dr, Suite 490

Creve Coeur, MO 63141

Phone: (314) 513-0147

www.crowncastle.com

July 8, 2021

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

RE: **Notice of Exempt Modification for T-Mobile**
Crown Site ID# 806384; T-Mobile Site ID# CTNL037A
93 Roxbury Rd, East Lyme CT 06357
Latitude: 41.33583300/ Longitude: -72.22194400

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 122-foot mount on the existing 151-foot Self Support Tower located at 93 Roxbury Rd, East Lyme CT. The property is owned by the Town of East Lyme and the Tower by Crown Castle. T-Mobile now intends to replace six (6) existing antennas and add three (3) antennas. This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

Planned Modifications:
Tower:

Remove and Replace:
(3) RFS – APXVTM14-C-120 Antennas **(REMOVE) –** (3) RFS-APX16DWV-16DWV-S-E-A20 Antennas **(REPLACE)**

(3) RFS – APXVSPP18C-A20 Antennas **(REMOVE) -** (3) RFS APXVAALL24_43-U-NA20 Antennas **(REPLACE)**

(3) Sprint RRUs Radios **(REMOVE)** – (3) Ericsson 4449 B71+B85 Radios **(REPLACE)**

(3) Sprint RRUs Radios **(REMOVE)** – (3) Ericsson 4415 B66A Radios **(REPLACE)**

(3) Sprint RRUs Radios **(REMOVE) -** (3) Ericsson 4424 B25 Radios **(REPLACE)**

(3) Hybrid Cables **(REMOVE)** – (3) 6x24 HCS Hybrid Cables **(REPLACE)**

Install New:
(3) Ericsson-AIR6449 B41 Antennas

CROWN CASTLE

1 Cityplace Dr, Suite 490

Creve Coeur, MO 63141

Phone: (314) 513-0147

www.crowncastle.com

Remove:
(1) Hybrid Cable

Ground:

Remove and Replace:
(1) MMBS Cabinet **(REMOVE)** – (1) 6160 Equipment Cabinet **(REPLACE)**
(1) BBU Cabinet **(REMOVE)** – (1) B160 Battery Cabinet **(REPLACE)**

Install New:
(3) BB6648 in 6160 Cabinet
(1) DUG20 in 6160 Cabinet
(1) PSU 4813 in 6160 Cabinet
(1) CSR IXRE V2 (Gen 2) in 6160 Cabinet
Upgrade Service to 200AMP

The facility was approved by the Connecticut Siting Council by way of an Application for Certificate of Environmental Compatibility on January 3rd, 1990.

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.C.S.A. §16-50j-73, a copy of this letter is being sent to Mark C. Nickerson, First Selectman of the Town of East Lyme and William Mulholland, Zoning Official Town of East Lyme. A copy will also be sent to the property 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).

Sincerely,

Colin Robinson

Colin Robinson
Project Manager
NETWORK BUILDING + CONSULTING
100 Apollo Drive Suite 303
Chelmsford, MA 01824
crobinson@nbcllc.com
(360) 561-3311

cc:

Mark C. Nickerson, First Selectman *(via email only to mnickerson@eltownhall.com)*
108 Pennsylvania Ave
Niantic, CT 06357-1510
860-691-4110

William Mulholland, Zoning Official *(via email only to billm@eltownhall.com)*
108 Pennsylvania Ave
Niantic, CT 06357-1510
860-691-4114

Colin Robinson

From: Colin Robinson
Sent: Thursday, July 8, 2021 12:25 PM
To: mnickerson@eltownhall.com
Cc: Colin Robinson
Subject: CSC Application 93 Roxbury Rd, East Lyme CT 806384
Attachments: CSC Application 93 Roxbury Rd, East Lyme CT 806384 070821.pdf

Good Afternoon First Selectman Nickerson,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 93 Roxbury Rd, East Lyme CT.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

Colin

Colin Robinson
Project Manager
NETWORK BUILDING + CONSULTING
100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824
M 360.561.3311

Colin Robinson

From: Colin Robinson
Sent: Thursday, July 8, 2021 12:25 PM
To: billm@eltownhall.com
Cc: Colin Robinson
Subject: CSC Application 93 Roxbury Rd, East Lyme CT 806384
Attachments: CSC Application 93 Roxbury Rd, East Lyme CT 806384 070821.pdf

Good Afternoon Zoning Official Mulholland,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 93 Roxbury Rd, East Lyme CT.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

Colin

Colin Robinson
Project Manager
NETWORK BUILDING + CONSULTING
100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824
M 360.561.3311

Exhibit A

Original Facility Approval

ORIGINAL

An application of Metro Mobile CTS of New London Inc., for a Certificate of Environmental Compatibility and Public Need for the construction, operation, and maintenance of cellular telephone tower and associated equipment in the Town of East Lyme, Connecticut.	:	Docket No. 116 Connecticut Siting Council January 3, 1990

DECISION AND ORDER

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council finds that the effects associated with the construction, operation, and maintenance of a cellular telephone facility at the proposed East Lyme site, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not significant either alone or cumulatively with other effects, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by Section 16-50k of the General Statutes of Connecticut (CGS), be issued to Metro Mobile CTS of New London, Inc., for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building at the proposed East Lyme site in East Lyme, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The self-supporting, lattice tower including antennas and associated equipment shall not exceed a height of 343 feet AMSL.
2. The facility shall be constructed in accordance with the State of Connecticut Basic Building Code.

3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies. The D&M plan shall include detailed plans of the site preparation with compacted fill and adjustment for tower height in relation to the new site elevation.

4. The Certificate Holder shall comply with any future radio frequency (RF) standard, promulgated by State or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted in this Decision and Order shall be brought into compliance with such standards.

5. The Certificate Holder or its successor shall provide the Council a recalculated report of power density if and when additional channels over the proposed 60 channels, higher wattage over the proposed 100 watts per channel, or if other circumstances in operation cause a change in power density above the levels originally calculated in the application.

6. The Certificate Holder or its successor shall permit public or private entities to share space on the East Lyme tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

7. If this facility does not initially provide, or permanently ceases to provide cellular service following completion of construction, this Decision and Order shall be void, and the tower and all associated equipment in this application shall be dismantled and removed or reapplication for any new use shall be made to the Council before any such new use is made.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the issuance of this Decision and Order, or within three years after the completion of any appeal to this Decision and Order.

Pursuant to Section 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below. A notice of issuance shall be published in the New London Day.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with section 16-50j-17 of the Regulations of State Agencies.

The parties or intervenors to this proceeding are:

Metro Mobile CTS of New London, Inc. (Applicant)
100 Corporate Drive
Windsor, CT 06095

ATTN: Gary Schulman
General Manager

Robinson and Cole (Its Representative)
One Commercial Plaza
Hartford, CT 06103-3597
Attn: Earl W. Phillips, Jr., Esq.

SNET Cellular, Inc. (Intervenor)
227 Church Street
New Haven, CT 06506

Peter J. Tyrrell (Its Representative)
SNET Cellular, Inc.
Room 1021
227 Church Street
New Haven, CT 06506

3782E-9-11

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case in Docket No. 116 or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut the 3rd day of January, 1990.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner Peter Boucher Designee: Robert A. Pulito	Yes
Commissioner Leslie Carothers Designee: Brian Emerick	Absent
Harry E. Covey	Yes
Mortimer A. Gelston	Yes
Daniel P. Lynch, Jr.	Yes
Paulann H. Sheets	Yes
William H. Smith	Yes
Colin C. Tait	Yes

Exhibit B

Property Card

93 ROXBURY RD

Location	93 ROXBURY RD	**Mblu**	15.0/ 3/ / /
Acct#	008267	**Owner**	METRO MOBILE CTS OF N L INC
Assessment	$810,530	**Appraisal**	$1,157,900
PID	4698	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$32,900	$1,125,000	$1,157,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$23,030	$787,500	$810,530

Owner of Record

Owner	METRO MOBILE CTS OF N L INC	**Sale Price**	$0
Co-Owner	C/O CROWN ATLANTIC CO	**Certificate**	
Address	PMB 353 4017 WASHINGTON RD MCMURRAY, PA 15317	**Book & Page**	0297/0552
		Sale Date	03/05/1990

Ownership History

Ownership History
No Data for Ownership History

Building Information

Building 1 : Section 1

Year Built:	1990
Living Area:	450
Replacement Cost:	$36,171
Building Percent Good:	82
Replacement Cost Less Depreciation:	$29,700

Building Attributes	
Field	**Description**
STYLE	Commercial
MODEL	Commercial
Grade	Average
Stories:	1
Occupancy	1.00
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Tar & Gravel
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	NA
Heating Type	None
AC Type	None
Struct Class	
Bldg Use	TEL X STA M94
Total Rooms	
Total Bedrms	00
Total Baths	0
Usrfld 218	
Usrfld 219	
1st Floor Use:	430C
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	NONE
Ceiling/Wall	NONE
Rooms/Prtns	LIGHT
Wall Height	10.00
% Comn Wall	0.00

Building Photo

(http://images.vgsi.com/photos2/EastLymeCTPhotos//\01\00\33\53.jpg)

Building Layout

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	450	450
		450	450

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	430C
Description	TEL X STA M94
Zone	R40
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.09
Frontage	0
Depth	0
Assessed Value	$787,500
Appraised Value	$1,125,000

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
FN4	FENCE-8' CHAIN			250.00 L.F.	$3,200	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$33,900	$1,125,000	$1,158,900
2019	$33,900	$1,125,000	$1,158,900
2018	$33,900	$1,125,000	$1,158,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$23,730	$787,500	$811,230
2019	$23,730	$787,500	$811,230
2018	$23,730	$787,500	$811,230

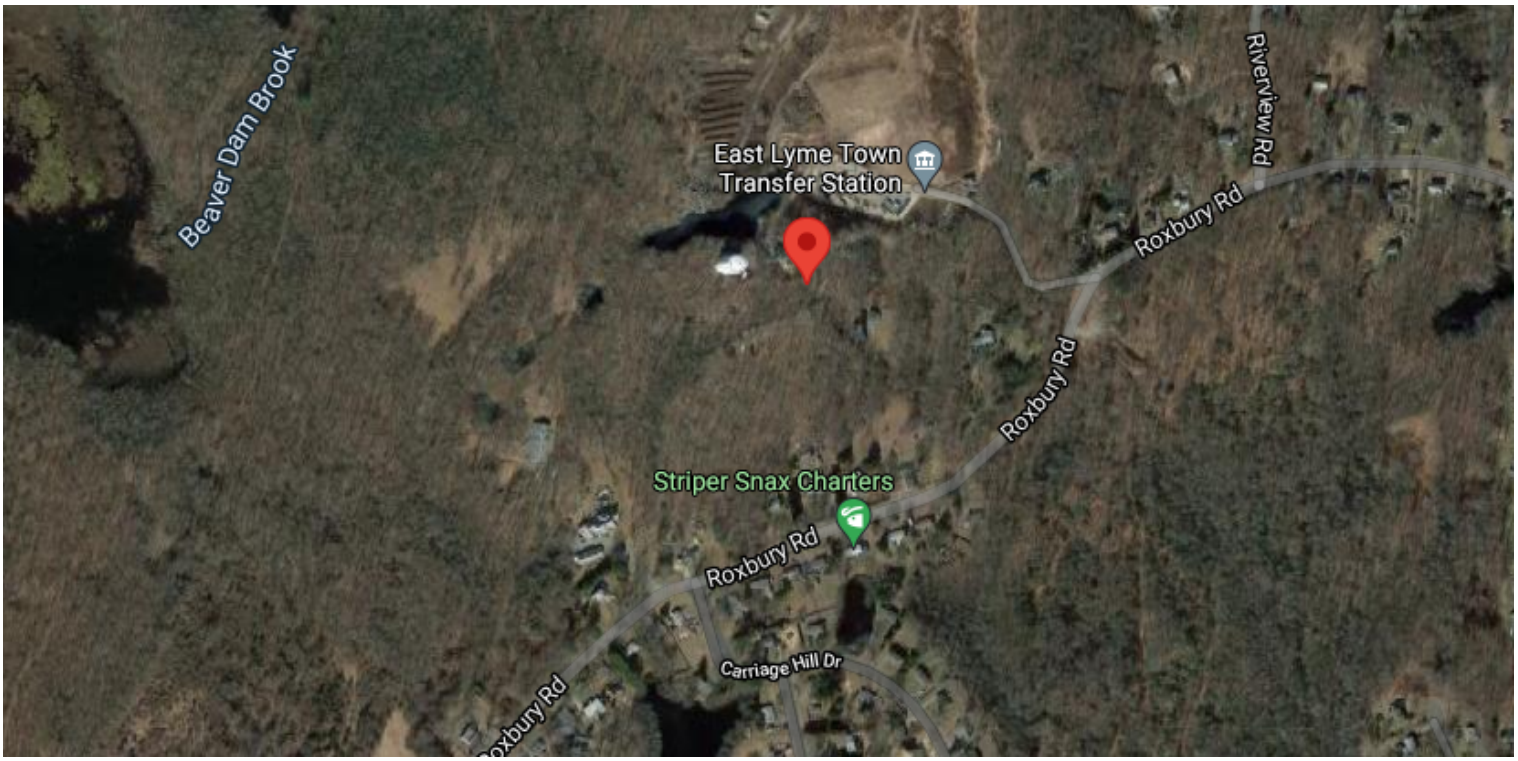

Beaver Dam Brook
East Lyme Town
Transfer Station
Riverview Rd
Roxbury Rd
Roxbury Rd
Striper Snax Charters
Roxbury Rd
Carriage Hill Dr
oxbury Rd

Exhibit C

Construction Drawings

T-Mobile

T-MOBILE SITE NUMBER: CTNL037A
T-MOBILE SITE NAME: CTNL037A
SITE TYPE: SELF SUPPORT TOWER
TOWER HEIGHT: 151'-4"

BUSINESS UNIT #: 806384
SITE ADDRESS: 93 ROXBURY ROAD EAST LYME, CT 06357
COUNTY: NEW LONDON
JURISDICTION: NEW LONDON COUNTY

T-MOBILE SPRINT RETAIN SITE CONFIGURATION: 67D5A998C 6160 (GSM ONLY)

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	NLN 136 943455
SITE ADDRESS:	93 ROXBURY ROAD EAST LYME, CT 06357
COUNTY:	NEW LONDON
MAP/PARCEL #:	VERIFY
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.33583300° (41° 20' 8.35")
LONGITUDE:	-72.22194400° (-72° 13' 18.28")
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	177.16 FT
CURRENT ZONING:	N/A
JURISDICTION:	NEW LONDON COUNTY
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	TBD -- --
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	TBD
TELCO PROVIDER:	TBD

PROJECT TEAM

A&E FIRM:	INFINIGY 1033 WATERVLIET SHAKER RD. ALBANY, NY 12205
CROWN CASTLE USA INC. DISTRICT CONTACTS:	1500 CORPORATE DRIVE CANONSBURG, PA 15317
	TBD - PROJECT MANAGER
	TBD - CONSTRUCTION MANAGER

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN & ENLARGED SITE PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECS
C-6	EQUIPMENT SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR ----. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT DESCRIPTION

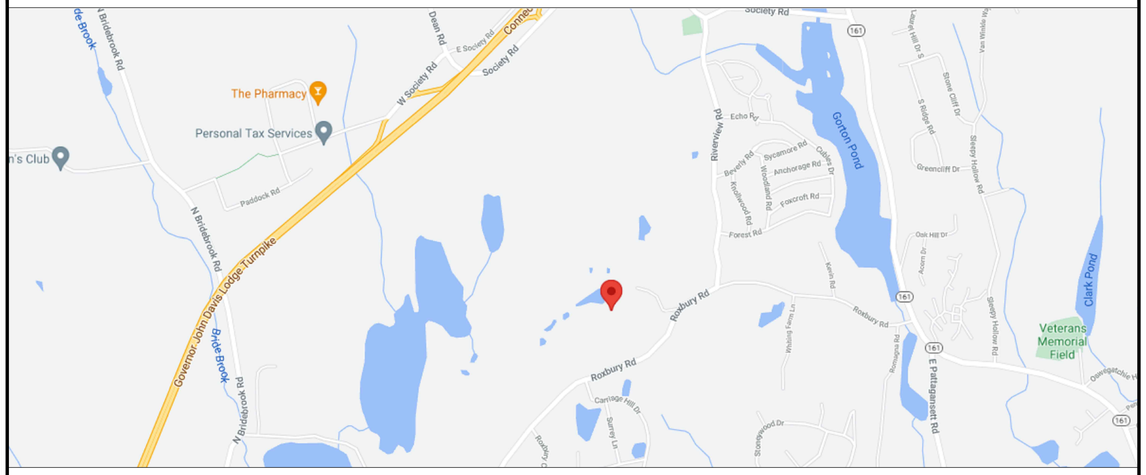
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- REMOVE (6) ANTENNAS
- REMOVE (9) RRHs
- REMOVE (4) HYBRID CABLES
- INSTALL (9) ANTENNAS
- INSTALL (9) RRHs
- INSTALL (3) HYBRID CABLES

GROUND SCOPE OF WORK:
- REMOVE (1) MMBS EQUIPMENT CABINET
- REMOVE (1) BBU EQUIPMENT CABINET
- INSTALL (1) 6160 & (1) B160 BATTERY CABINETS
- INSTALL (3) BB 6648
- INSTALL (1) DUG20
- INSTALL (1) PSU 4813
- INSTALL (1) CSR IXRe V2 (GEN2)
- UPGRADE SERVICE TO 200AMP.

NOTE:
PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER.

LOCATION MAP



NO SCALE

APPLICABLE CODES/REFERENCE DOCUMENTS

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	BY OTHERS
DATED:	
MOUNT ANALYSIS:	INFINIGY
DATED:	04/30/2021
RFDS REVISION:	1
DATED:	04/09/2021
ORDER ID:	557902
REVISION:	0

CALL CONNECTICUT ONE CALL
(800) 922-4455 CBYD.COM
CALL 2 WORKING DAYS BEFORE YOU DIG!

APPROVALS

APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.		
LAND USE PLANNER		
T-MOBILE		
OPERATIONS		
RF		
NETWORK		
BACKHAUL		
CONSTRUCTION MANAGER		

THE PARTIES ABOVE HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES AND MODIFICATIONS THEY MAY IMPOSE.

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1500 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTNL037A

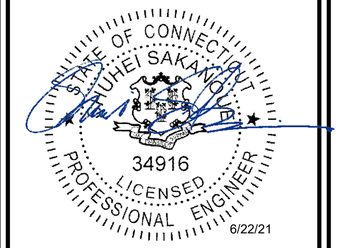
BU #: **806384**
NLN 136 943455

93 ROXBURY ROAD
EAST LYME, CT 06357

EXISTING 151'-4" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
1	06/01/21	RCD	FINAL	SS



SHEET NUMBER: T-1
REVISION: 1

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED– NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800–788–7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT: THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED–STD–10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED–STD–10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
   CARRIER: T–MOBILE
   TOWER OWNER: CROWN CASTLE USA INC.
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CROWN CASTLE.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION AND IS TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF CROWN CASTLE USA INC.
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE–THAW CYCLES SHALL CONTAIN ~~AIR ENTRAINING~~ ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER–TO–CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
   #4 BARS AND SMALLER.......................................40 ksi
   #5 BARS AND LARGER.......................................60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.......................3"
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 BARS AND LARGER.......................................2"
   #5 BARS AND SMALLER.......................................1–1/2"
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
   SLAB AND WALLS.......................................3/4"
   BEAMS AND COLUMNS.......................................1–1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
   4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
   4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERYIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI–CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL–CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON–PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER–ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "T–MOBILE".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

CONDUCTOR COLOR CODE

SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
	GROUND	GREEN
120/208V, 3Ø	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
	NEUTRAL	WHITE
	GROUND	GREEN
277/480V, 3Ø	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
	NEUTRAL	GREY
	GROUND	GREEN
DC VOLTAGE	POS (+)	RED**
	NEG (–)	BLACK**

* SEE NEC 210.5(C)(1) AND (2)
** POLARITY MARKED AT TERMINATION

APWA UNIFORM COLOR CODE:

WHITE	PROPOSED EXCAVATION
PINK	TEMPORARY SURVEY MARKINGS
RED	ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
YELLOW	GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS
ORANGE	COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
BLUE	POTABLE WATER
PURPLE	RECLAIMED WATER, IRRIGATION, AND SLURRY LINES
GREEN	SEWERS AND DRAIN LINES

GREENFIELD GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMICALLY WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON–ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON–METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON–METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD–WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).

ABBREVIATIONS:

ANT	ANTENNA
(E)	EXISTING
FIF	FACILITY INTERFACE FRAME
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
GSM	GLOBAL SYSTEM FOR MOBILE
LTE	LONG TERM EVOLUTION
MGB	MASTER GROUND BAR
MW	MICROWAVE
(N)	NEW
NEC	NATIONAL ELECTRIC CODE
(P)	PROPOSED
PP	POWER PLANT
QTY	QUANTITY
RECT	RECTIFIER
RBS	RADIO BASE STATION
RET	REMOTE ELECTRIC TILT
RFDS	RADIO FREQUENCY DATA SHEET
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
SIAD	SMART INTEGRATED DEVICE
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
W.P.	WORK POINT

T · · Mobile · · ·
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1500 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTNL037A

BU #: **806384**
NLN 136 943455

93 ROXBURY ROAD
EAST LYME, CT 06357

EXISTING 151'-4" SELF SUPPORT TOWER

ISSUED FOR:

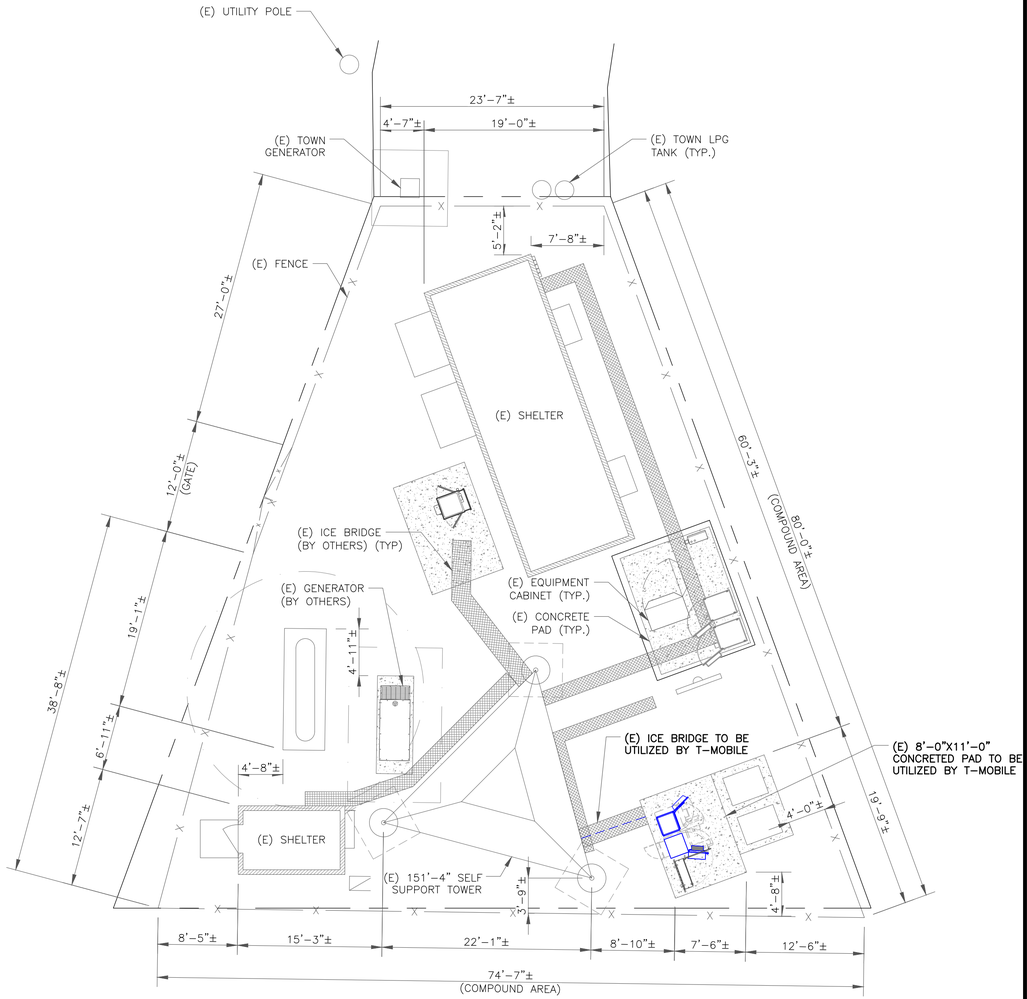
REV	DATE	DRWN	DESCRIPTION	DES./QA
1	06/01/21	RCD	FINAL	SS

STATE OF CONNECTICUT SHUHEI SAKANOUE 34916 LICENSED PROFESSIONAL ENGINEER
6/22/21

SHEET NUMBER:	REVISION:
T-2	1

NOTE:

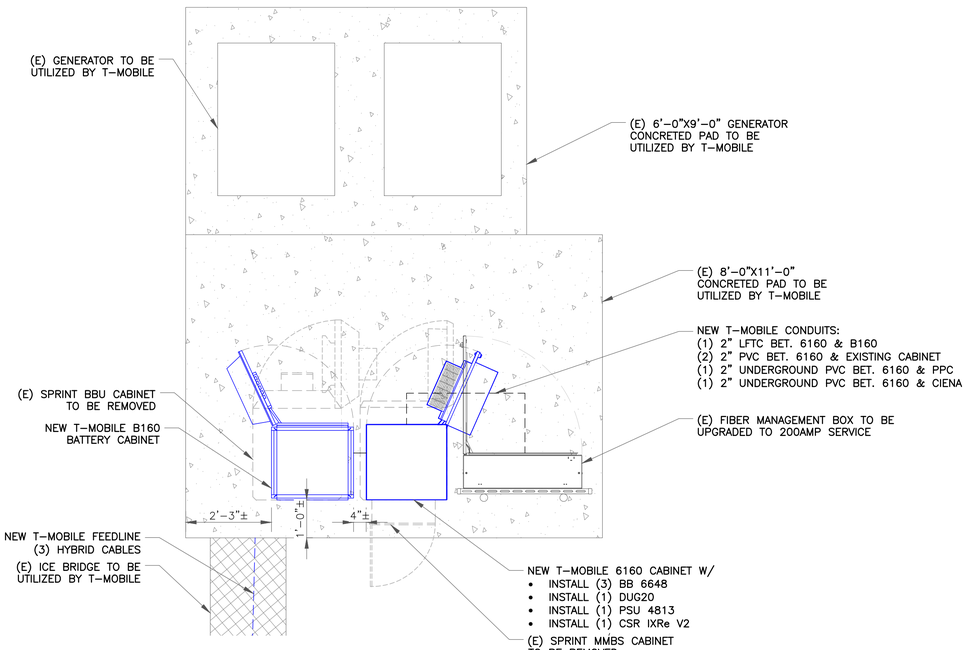
1. PLANS BASED ON SITE PLAN PROVIDED BY TOWER OWNER AND SITE VISIT PERFORMED BY INFINIGY. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING T-MOBILE EQUIPMENT.



1 SITE PLAN
SCALE: 8' 6' 4' 2' 0 8' 1/8"=1'-0" (FULL SIZE) 1/16"=1'-0" (11x17)

NOTES:

THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. T-MOBILE IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.



2 ENLARGED SITE PLAN
SCALE: 2' 1' 0 2' 1/2"=1'-0" (FULL SIZE) 1/4"=1'-0" (11x17)

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1500 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTNL037A

BU #: **806384**
NLN 136 943455

93 ROXBURY ROAD
EAST LYME, CT 06357

EXISTING 151'-4" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
1	06/01/21	RCD	FINAL	SS

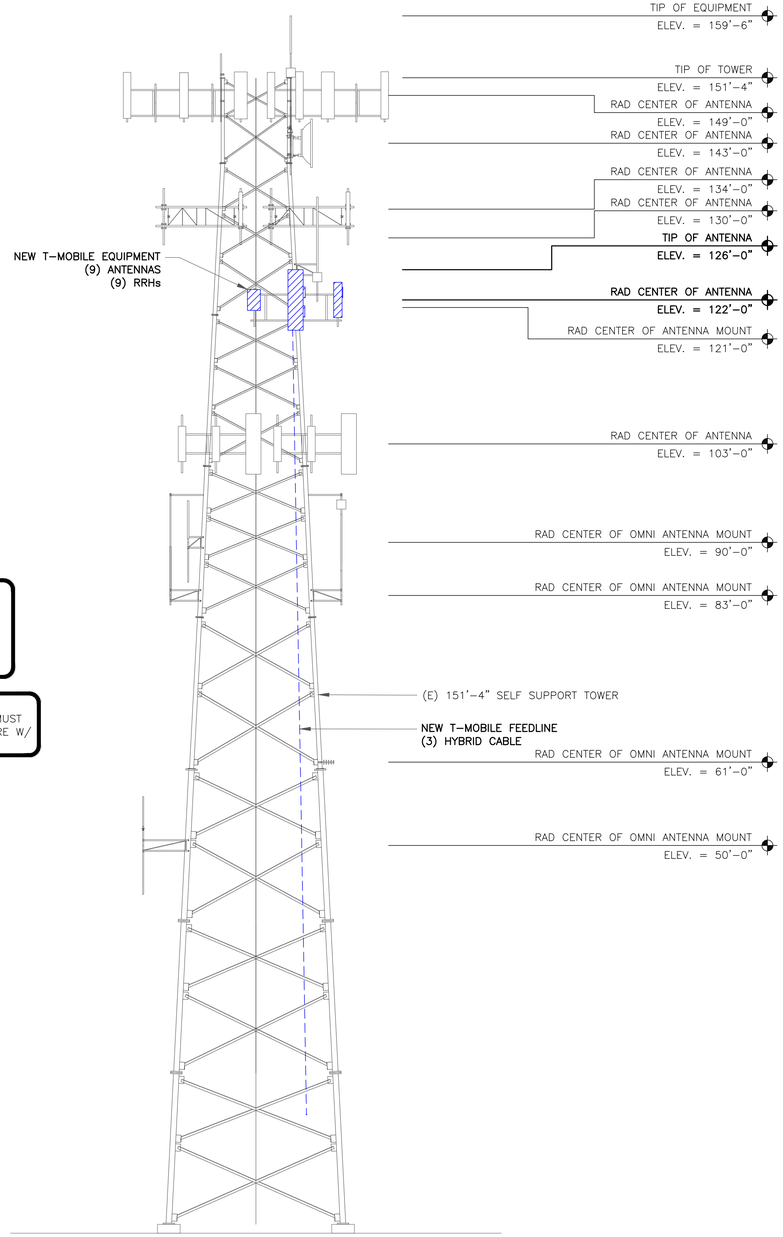
STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
6/22/21

SHEET NUMBER: C-1

REVISION: 1

NOTES:

1. ELEVATION BASED ON DRAWING PROVIDED BY TOWER OWNER. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.
2. INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.

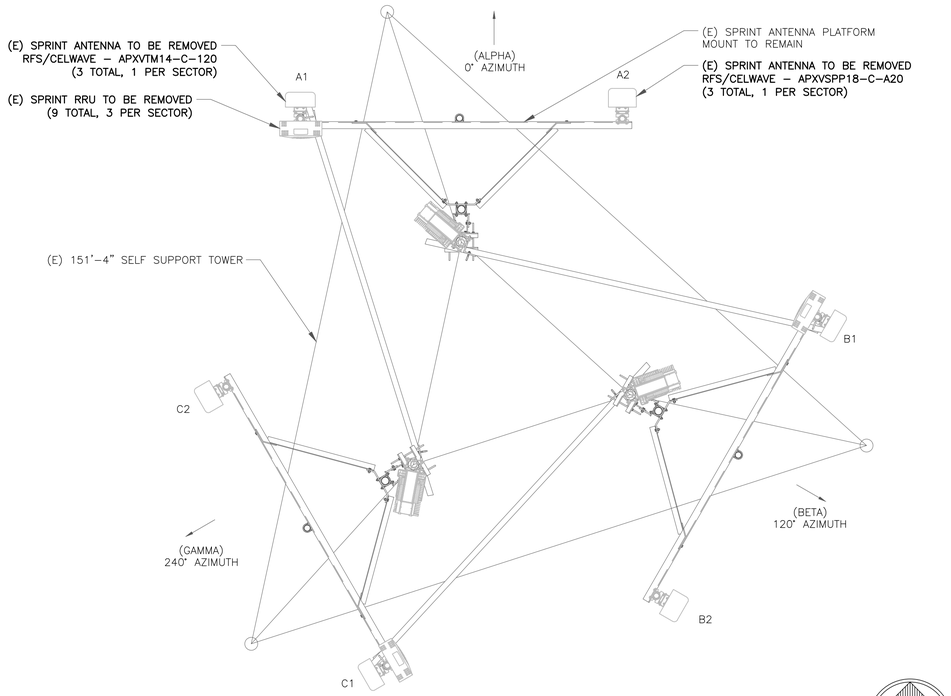


T-MOBILE EQUIPMENT

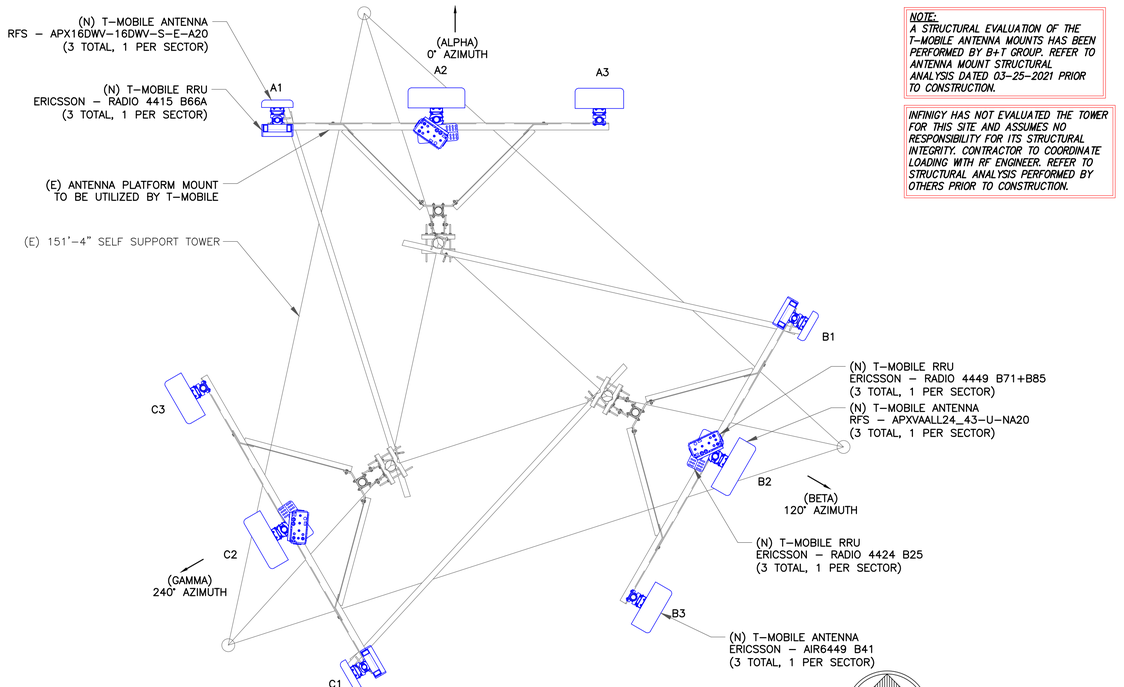
ANTENNA CL: 122'-0"
MOUNT CL: 121'-0"
ANTENNA CL: 52'-0"
MOUNT CL: 50'-0"

ANY AND ALL TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ EXISTING SAFETY CLIMB

1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE



NOTE:
A STRUCTURAL EVALUATION OF THE T-MOBILE ANTENNA MOUNTS HAS BEEN PERFORMED BY B+T GROUP. REFER TO ANTENNA MOUNT STRUCTURAL ANALYSIS DATED 03-25-2021 PRIOR TO CONSTRUCTION.

INFINIGY HAS NOT EVALUATED THE TOWER FOR THIS SITE AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. CONTRACTOR TO COORDINATE LOADING WITH RF ENGINEER. REFER TO STRUCTURAL ANALYSIS PERFORMED BY OTHERS PRIOR TO CONSTRUCTION.

3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1500 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTNL037A

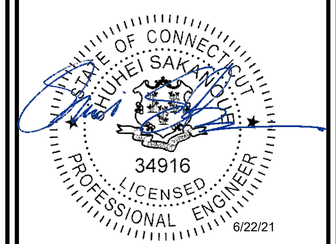
BU #: **806384**
NLN 136 943455

93 ROXBURY ROAD
EAST LYME, CT 06357

EXISTING 151'-4" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
1	06/01/21	RCD	FINAL	SS



SHEET NUMBER: C-2

REVISION: 1

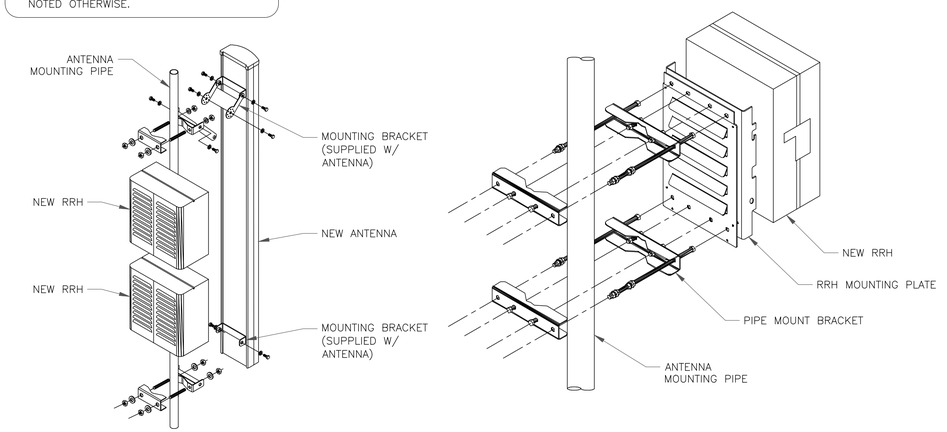
ANTENNA SCHEDULE

SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	L2100	122'-0"	0°	RFS	APX16DWV-16DWV-S-E-A20	0°	--	(1) ERICSSON - RRUS 4415 B66A	(1) 6X24 HCS HYBRID (SHARED)
ALPHA	A3	L700, L600, N600, L1900, G1900	122'-0"	0°	RFS	APXVAALL24_43-U-NA20	0°	--	(1) ERICSSON - RRUS 4449 B71+B85 (1) ERICSSON - RRUS 4424 B25	(1) 6X24 HCS HYBRID
ALPHA	A4	L2500, N2500	122'-0"	0°	ERICSSON	AIR6449 B41	0°	--	--	(1) 6X24 HCS HYBRID (SHARED)
BETA	B1	L2100	122'-0"	120°	RFS	APX16DWV-16DWV-S-E-A20	0°	--	(1) ERICSSON - RRUS 4415 B66A	(1) 6X24 HCS HYBRID (SHARED)
BETA	B3	L700, L600, N600, L1900, G1900	122'-0"	120°	RFS	APXVAALL24_43-U-NA20	0°	--	(1) ERICSSON - RRUS 4449 B71+B85 (1) ERICSSON - RRUS 4424 B25	(1) 6X24 HCS HYBRID
BETA	B4	L2500, N2500	122'-0"	120°	ERICSSON	AIR6449 B41	0°	--	--	(1) 6X24 HCS HYBRID (SHARED)
GAMMA	C1	L2100	122'-0"	240°	RFS	APX16DWV-16DWV-S-E-A20	0°	--	(1) ERICSSON - RRUS 4415 B66A	(1) 6X24 HCS HYBRID (SHARED)
GAMMA	C3	L700, L600, N600, L1900, G1900	122'-0"	240°	RFS	APXVAALL24_43-U-NA20	0°	--	(1) ERICSSON - RRUS 4449 B71+B85 (1) ERICSSON - RRUS 4424 B25	(1) 6X24 HCS HYBRID
GAMMA	C4	L2500, N2500	122'-0"	240°	ERICSSON	AIR6449 B41	0°	--	--	(1) 6X24 HCS HYBRID (SHARED)

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRHs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



NOTE:

1. CONTRACTOR SHALL INSTALL 3RD DUAL RRH MOUNT TO ACCOMMODATE ALL RRH BRACKETS HOLES IF NECESSARY.

2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1500 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTNL037A

BU #: **806384**
NLN 136 943455

93 ROXBURY ROAD
EAST LYME, CT 06357

EXISTING 151'-4" SELF SUPPORT TOWER

ISSUED FOR:

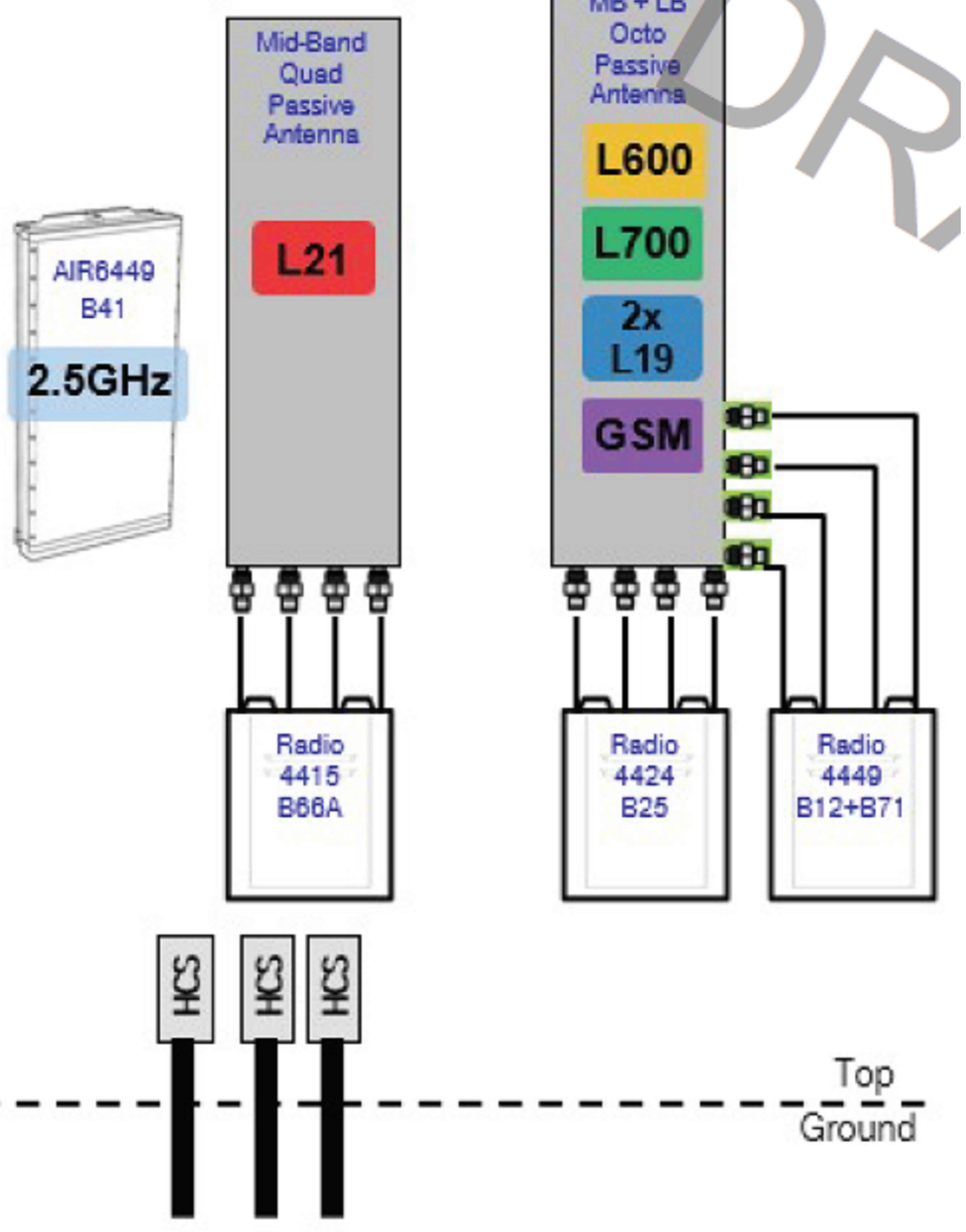
REV	DATE	DRWN	DESCRIPTION	DES./QA
1	06/01/21	RCD	FINAL	SS

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
6/22/21

SHEET NUMBER: C-3

REVISION: 1

67D5A998C_1xAIR+1xQP+1xOP.jpg



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1500 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTNL037A

BU #: **806384**
NLN 136 943455

93 ROXBURY ROAD
EAST LYME, CT 06357

EXISTING 151'-4" SELF SUPPORT TOWER

ISSUED FOR:

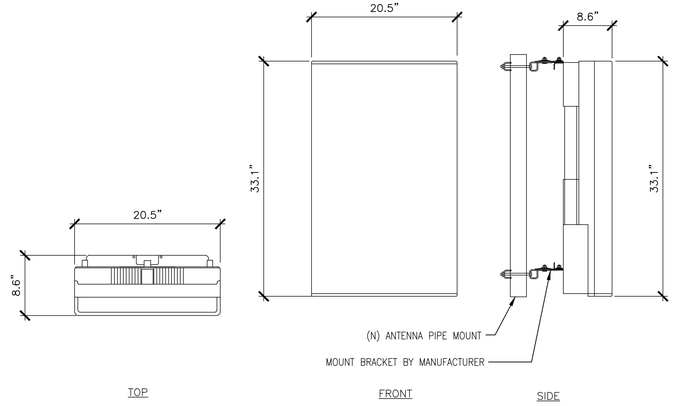
REV	DATE	DRWN	DESCRIPTION	DES./QA
1	06/01/21	RCD	FINAL	SS

STATE OF CONNECTICUT
YASUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
6/22/21

SHEET NUMBER: C-4

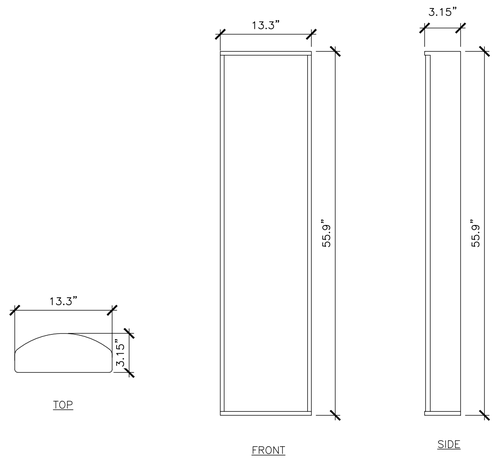
REVISION: 1

MANUFACTURER: ERICSSON
MODEL: AIR6449 B41
WEIGHT: 104 LBS (W/ MOUNT BRACKET 113)
DIMENSIONS: 33.1"H. X 20.5"W. X 8.6"D.
FREQUENCY: REFER TO RF DATA SHEET

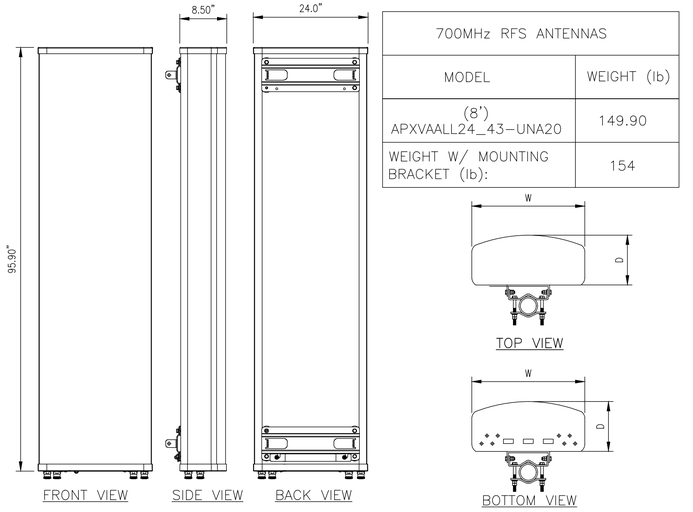


1 (N) AIR6449 B41 ANTENNA SPEC
SCALE: NOT TO SCALE

MANUFACTURER: RFS
MODEL: APX16DWV-16DWV-S-E-A20
WEIGHT: 40.7 LBS
DIMENSIONS: 55.9"H. X 13.3"W. X 3.15"D.
FREQUENCY: REFER TO RF DATA SHEET



2 (N) APX16DWV-16DWV-S-E-A20 ANTENNA SPEC
SCALE: NOT TO SCALE

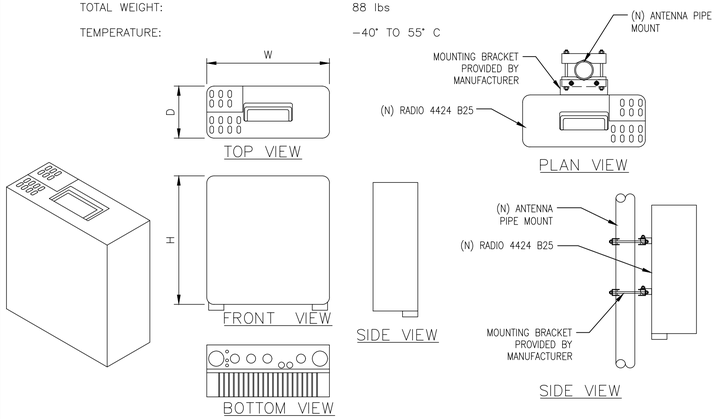


700MHz RFS ANTENNAS	
MODEL	WEIGHT (lb)
(8') APXVAALL24_43-UNA20	149.90
WEIGHT W/ MOUNTING BRACKET (lb):	154

3 (N) APXVAALL24_43-UNA20 ANTENNA SPEC
SCALE: NOT TO SCALE

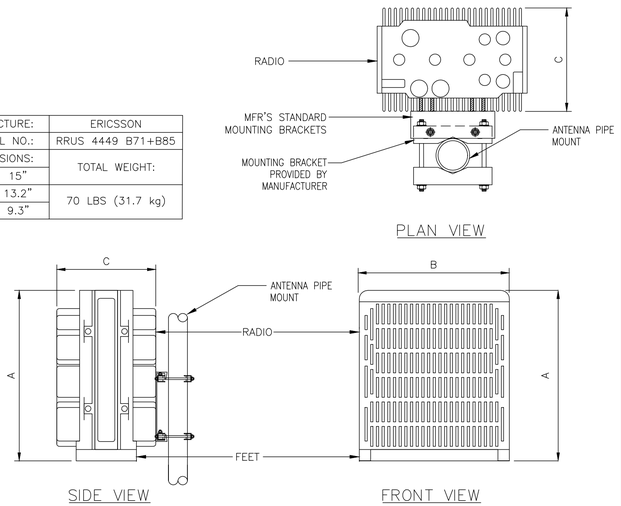
ERICSSON RADIO-4424 B25

DIMENSIONS, WxDxH:	13.5"x9.6"x16.5"
MAX OUTPUT POWER:	4x80W (2x(2x80W))
TOTAL WEIGHT:	88 lbs
TEMPERATURE:	-40° TO 55° C



4 (N) RADIO 4424 B25 SPEC
SCALE: NOT TO SCALE

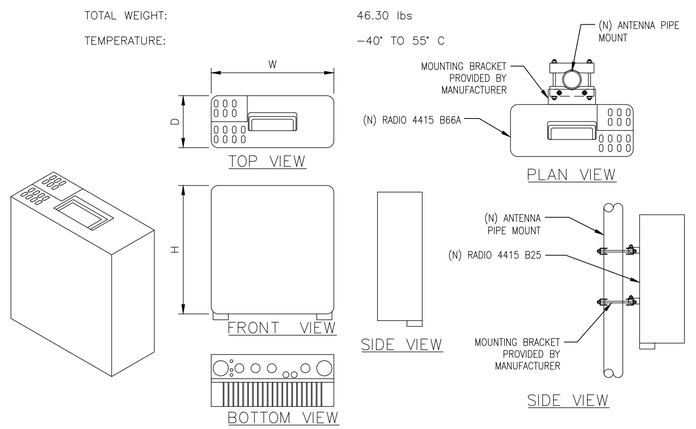
MANUFACTURE:		ERICSSON
MODEL NO.:		RRUS 4449 B71+B85
DIMENSIONS:		TOTAL WEIGHT:
A	15"	
B	13.2"	70 LBS (31.7 kg)
C	9.3"	



5 (N) RADIO 4449 B71+B85 SPEC
SCALE: NOT TO SCALE

ERICSSON RADIO-4415 B66A

DIMENSIONS, WxDxH:	14.90"x5.40"x13.20"
POWER CONSUMPTION:	660 WATTS
TOTAL WEIGHT:	46.30 lbs
TEMPERATURE:	-40° TO 55° C



6 (N) RADIO 4415 B66A SPEC
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1500 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTNL037A

BU #: **806384**
NLN 136 943455

93 ROXBURY ROAD
EAST LYME, CT 06357

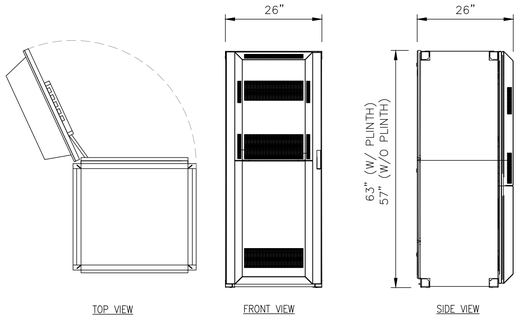
EXISTING 151'-4" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
1	06/01/21	RCD	FINAL	SS

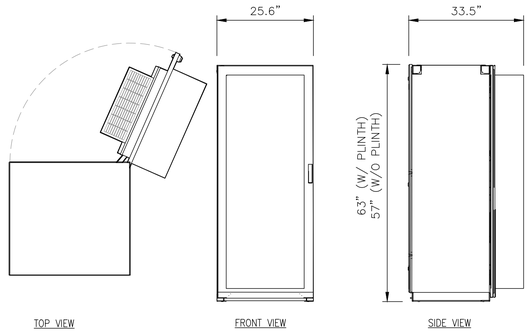
STATE OF CONNECTICUT
TOSHIHEI SAKAMOTO
34916
LICENSED
PROFESSIONAL ENGINEER
6/22/21

SHEET NUMBER:	REVISION:
C-5	1



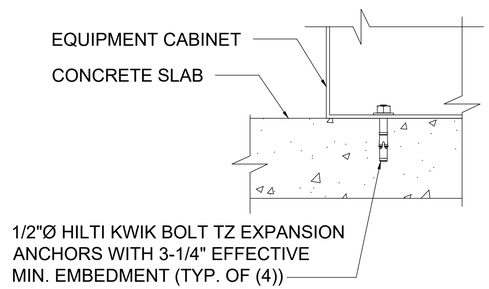
ERICSSON MODEL NO.:	B160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x26"x26" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	485 LBS
MAXIMUM WEIGHT:	2100± LBS

1 (N) B160 CABINET DETAIL
SCALE: NOT TO SCALE

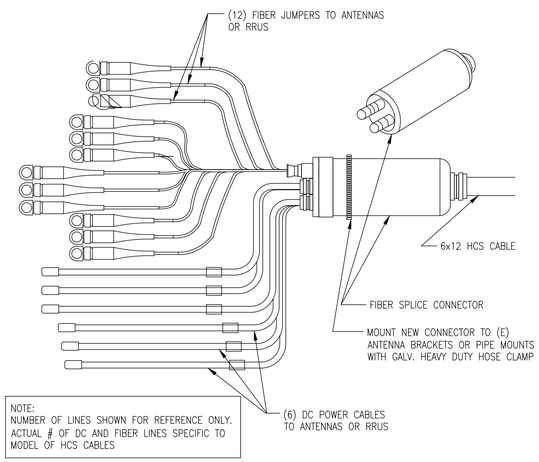


ERICSSON MODEL NO.:	6160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x25.6"x25.6" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	410 LBS
MAXIMUM WEIGHT:	770± LBS

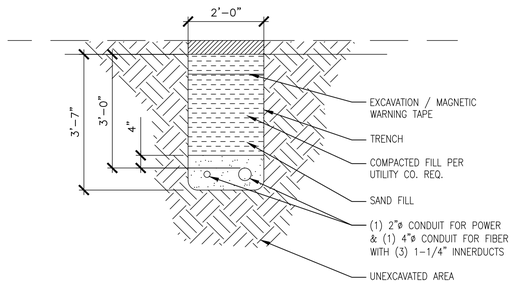
2 (N) 6160 CABINET DETAIL
SCALE: NOT TO SCALE



3 (N) EQUIPMENT CABINET MOUNTING DETAIL
SCALE: NOT TO SCALE



4 (N) 6X12 HCS CABLE DETAIL
SCALE: NOT TO SCALE



5 (N) CONDUIT TRENCH DETAIL
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1500 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTNL037A

BU #: **806384**
NLN 136 943455

93 ROXBURY ROAD
EAST LYME, CT 06357

EXISTING 151'-4" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
1	06/01/21	RCD	FINAL	SS

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER
6/22/21

SHEET NUMBER: C-6
REVISION: 1

T-MOBILE PANEL SCHEDULE

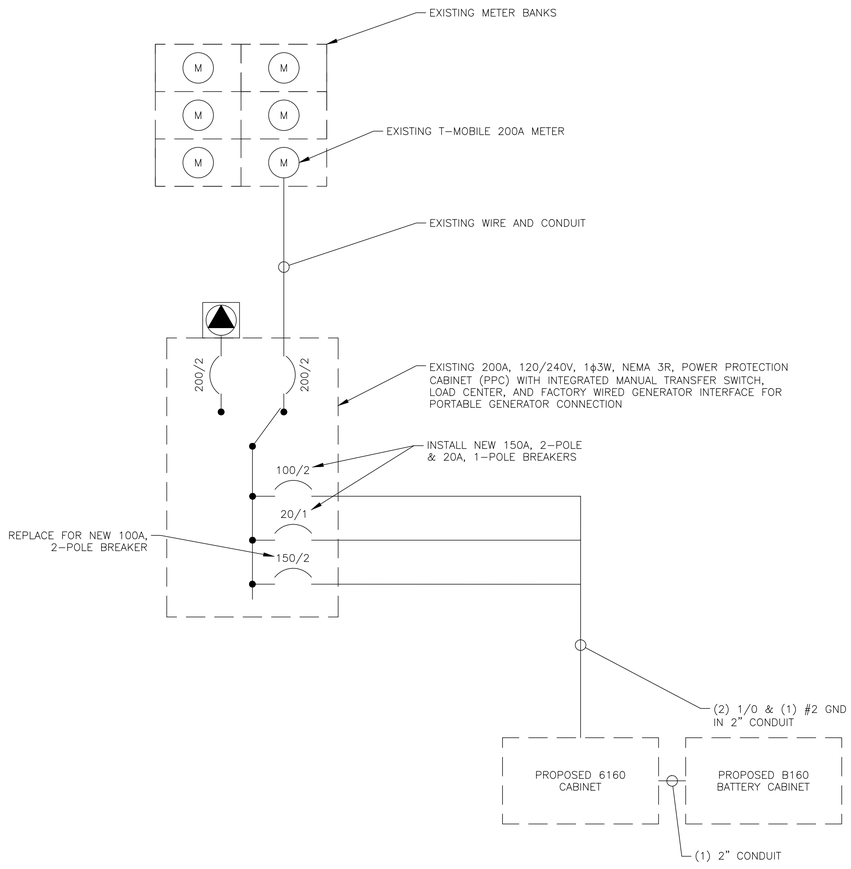
MAIN: 200A MAIN BREAKER			**VOTAGE/PHASE:** 120/240V, 1-PHASE, 3-WIRE						**SHORT CIRCUIT CURRENT RATING:** --		
MOUNTING: INSIDE PPC ENCLOSURE			**ENCLOSURE:** NEMA 3R						**SURGE PROTECTION DEVICE:** YES		
					PHASE LOADS (VA)						
DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	A	B	CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
RBS 6601	1000	C	100	1	1000		2	30	NC	0	GENERATOR
	1000	C		3		1000	4		NC	0	
6160	7000	C	100	5	7200		6	20	NC	200	TOWER LIGHTS
	7000	C		7		7200	8		NC	200	
6160 GFI	180	NC	20	9	360		10	20	NC	180	TELCO GFCI
BLANK				11		0	12				BLANK
				13	0		14				
				15		0	16				
				17	0		18				
				19		0	20				
				21	0		22				
				23		0	24				

BASE LOAD (VA) =	8560	8200	*INDICATES NEW LOAD. ALL OTHER LOADS ARE EXISTING. NEW BREAKER TO BE SAME TYPE AND HAVE SAME AIC RATING AS EXISTING. CUSTOMER HAS NOT PROVIDED LOADS FOR EQUIPMENT CABINETS THEREFORE THE CABINET LOADS SHOWN ARE ESTIMATED VALUES.
25% OF CONTINUOUS LOAD (VA) =	2050	2050	
TOTAL LOAD (VA) =	11610	10250	
TOTAL LOAD (A) =	89	86	

1 AC PANEL SCHEDULE
SCALE: NOT TO SCALE

NOTES:

1. ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE THHW, THWN, THWN-2, XHHW, OR XHHW-2 UNLESS NOTED OTHERWISE.
2. CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
3. ALL GROUNDING AND BONDING PER THE NEC.



2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1500 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTNL037A

BU #: **806384**
NLN 136 943455

93 ROXBURY ROAD
EAST LYME, CT 06357

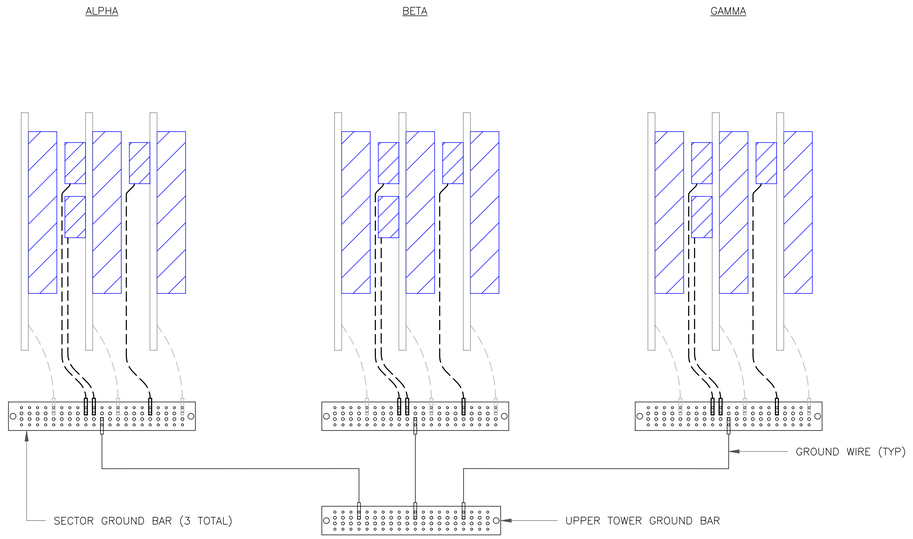
EXISTING 151'-4" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
1	06/01/21	RCD	FINAL	SS

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
6/22/21

SHEET NUMBER: E-1
REVISION: 1



NOTE:

ALL NEW GROUNDS TO BE #6 STRANDED COPPER WITH GREEN INSULATION UNLESS NOTED OTHERWISE.

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1500 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTNL037A

BU #: **806384**
NLN 136 943455

93 ROXBURY ROAD
EAST LYME, CT 06357

EXISTING 151'-4" SELF SUPPORT TOWER

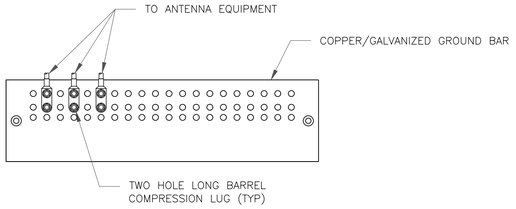
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
1	06/01/21	RCD	FINAL	SS

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER
6/22/21

SHEET NUMBER: G-1

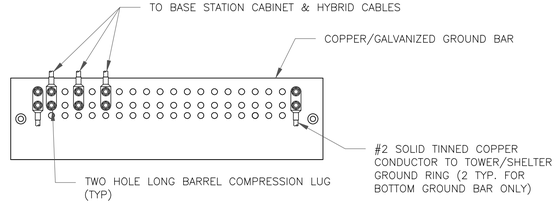
REVISION: 1



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO ANTENNA MOUNT STEEL.

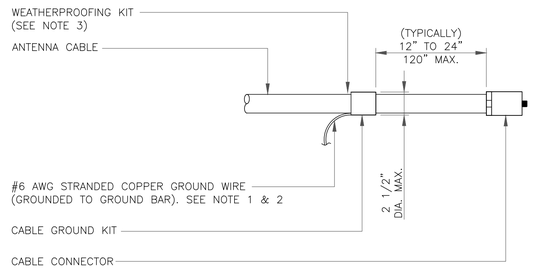
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

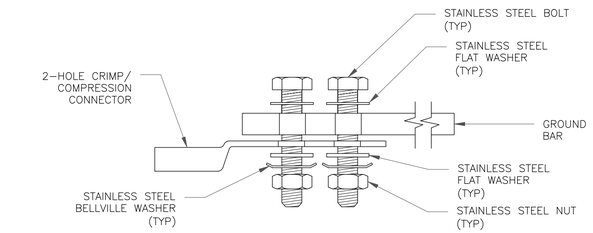
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



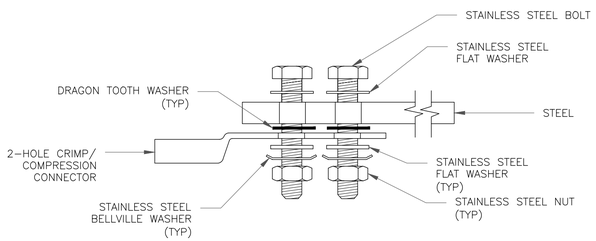
NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

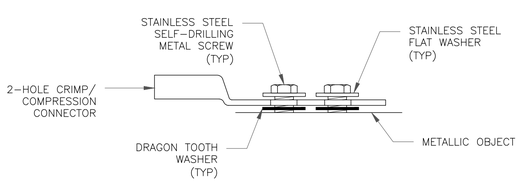
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS



SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

4 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

CROWN CASTLE
1500 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTNL037A

BU #: **806384**
NLN 136 943455

93 ROXBURY ROAD
EAST LYME, CT 06357

EXISTING 151'-4" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
1	06/01/21	RCD	FINAL	SS

STATE OF CONNECTICUT
KAZUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
6/22/21

SHEET NUMBER: G-2
REVISION: 1

Exhibit D

Structural Analysis Report

Date: **May 21, 2021**

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351

Subject: Structural Analysis Report

Carrier Designation:		
	Site Number:	CTNL037A
	Site Name:	CTNL037A
Crown Castle Designation:	**BU Number:**	806384
	Site Name:	NLN 136 943455
	JDE Job Number:	650687
	Work Order Number:	1959952
	Order Number:	557902 Rev. 0
Engineering Firm Designation:	**TEP Project Number:**	45439.546124
Site Data:	**93 Roxbury Road, East Lyme, New London County, CT 06357** **Latitude *41° 20' 8.35"*, Longitude *-72° 13' 18.28"*** **150 Foot - Self-Supporting Tower**	

Tower Engineering Professionals is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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: Proposed Equipment Configuration **Sufficient Capacity**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 145 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Gautam Sopal, E.I. / CLT

Respectfully submitted by:

Aaron T. Rucker, P.E.

Electronic Copy

05/21/2021

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150-ft self supporting tower designed by Rohn. The tower has been modified multiple times in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	III
Wind Speed:	145 mph
Exposure Category:	B
Topographic Factor:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
121.0	122.0	3	Ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe	3	1-5/8
		3	RFS Celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		3	RFS Celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe		
		3	Ericsson	RADIO 4415 B66A_CCIV3		
		3	Ericsson	RADIO 4424 B25_TMOV1		
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE		
	121.0	1	Tower Mounts	Sector Mount [SM 505-3]		
50.0	52.0	1	Lucent	KS24019-L112A	1	1/2
	50.0	1	Tower Mounts	Side Arm Mount [SO 305-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150.0	157.0	1	Telewave	ANT150F2	1	7/8
	152.0	1	Motorola	PTP 400		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
148.0	149.0	4	Commscope	HBXX-6517DS-A2M w/ Mount Pipe	6 8	7/8 1-5/8
		3	Amphenol	QUAD656C0000X w/ Mount Pipe		
		3	Commscope	LNX-6514DS-AIM w/ Mount Pipe		
		2	Commscope	JAHH-65B-R3B w/ Mount Pipe		
		3	Nokia	B25 RRH4X30 (UHFA)		
		3	Samsung Telecom.	RFV01U-D1A		
		3	Nokia	B66A RRH4X45 (UHIE)		
		2	RFS Celwave	DB-B1-6C-12AB-0Z		
		1	Commscope	CBC1923T-DS-43		
	148.0	1	Tower Mounts	Sector Mount [SM 510-3]		
146.0	145.0	1	Panasonic	WV-CW864	2	3/8
133.0	134.0	3	Kathrein	800 10504 w/ Mount Pipe	6	1-5/8
	133.0	1	Tower Mounts	Pipe Mount [PM 601-3]		
		1	Tower Mounts	Sector Mount [SM 104-3]		
126.0	130.0	1	Amphenol	BCD-87010-EDIN-X	1 1	17/64 7/8
		1	Motorola	SC614		
	126.0	1	Tower Mounts	Side Arm Mount [SO 305-1]		
	125.0	1	Motorola	PTP 400		
103.0	103.0	3	RFS Celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe	6	1-5/8
		3	Ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	Ericsson	AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe		
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	Ericsson	RRUS 4415 B25		
		1	Tower Mounts	Sector Mount [SM 701-3]		
		1	Tower Mounts	Pipe Mount [PM 601-3]		
90.0	93.0	1	Telewave	ANT150F2	1	1/2
	90.0	1	Tower Mounts	Side Arm Mount [SO 302-1]		
83.0	95.0	1	Motorola	PTP 400	1 1 1	1/2 17/64 7/8
	90.0	1	Telewave	ANT150D3		
	83.0	2	Tower Mounts	Side Arm Mount [SO 305-1]		
61.0	61.0	1	Maxrad	BMOY8905	1	1/4

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	258373	CCISites
Tower Foundation Drawings	958525	CCISites
Tower Manufacturer Drawings	258359	CCISites
Tower Reinforcement Drawings	801526	CCISites
Tower Reinforcement Drawings	2215933	CCISites
Tower Reinforcement Drawings	2457486	CCISites
Post-Modification Inspection	2457484	CCISites
Tower Reinforcement Drawings	2883931	CCISites
Post-Modification Inspection	3046703	CCISites

3.1) Analysis Method

tnxTower (version 8.0.9.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 Standard.

3.2) Assumptions

1) The tower and structures were maintained in accordance with the TIA-222 Standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (k)	ϕP_{allow} (k)	% Capacity	Pass / Fail
T1	150 - 145	Leg	ROHN 2.5 STD	3	-6.07	60.05	10.1	Pass
T2	145 - 140	Leg	ROHN 2.5 STD	15	-7.73	60.05	12.9	Pass
T3	140 - 120	Leg	ROHN 2.5 EH	24	-31.67	61.44	51.5	Pass
T4	120 - 113.333	Leg	ROHN 2.5 EH (GR)	48	-41.59	67.62	61.5	Pass
T5	113.333 - 106.667	Leg	ROHN 2.5 EH (GR)	57	-52.95	67.61	78.3	Pass
T6	106.667 - 100	Leg	ROHN 2.5 EH (GR)	66	-64.25	105.07	61.1	Pass
T7	100 - 93.3333	Leg	ROHN 3 EH (GR)	78	-76.98	113.64	67.7	Pass
T8	93.3333 - 86.6667	Leg	ROHN 3 EH (GR)	87	-88.71	152.69	58.1	Pass
T9	86.6667 - 80	Leg	ROHN 3 EH (GR)	99	-101.30	152.73	66.3	Pass
T10	80 - 70	Leg	ROHN 4 EH (GR)	111	-117.04	149.91	78.1	Pass
T11	70 - 60	Leg	ROHN 4 EH (GR)	120	-135.10	223.18	60.5	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (k)	ϕP_{allow} (k)	% Capacity	Pass / Fail
T12	60 - 50	Leg	ROHN 4 EH (GR)	131	-153.52	223.22	68.8	Pass
T13	50 - 40	Leg	ROHN 4 EH (GR)	143	-171.81	223.32	76.9	Pass
T14	40 - 30	Leg	ROHN 5 EH (GR)	155	-190.90	259.31	73.6	Pass
T15	30 - 20	Leg	ROHN 5 EH (GR)	164	-208.42	336.60	61.9	Pass
T16	20 - 10	Leg	ROHN 5 EH (GR)	176	-227.48	336.68	67.6	Pass
T17	10 - 0	Leg	ROHN 5 EH (GR)	188	-245.19	336.75	72.8	Pass
T1	150 - 145	Diagonal	L1 1/2x1 1/2x3/16	12	-1.42	4.26	33.4	Pass
T2	145 - 140	Diagonal	L2x2x3/16	20	-3.13	10.47	29.9	Pass
T3	140 - 120	Diagonal	L2 1/2x2 1/2x3/16	33	-4.82	12.57	38.3	Pass
T4-T5	120 - 106.667	Diagonal	L2 1/2x2 1/2x3/16	Note 1	Note 1	Note 1	58.6	Pass
T6	106.667 - 100	Diagonal	L2 1/2x2 1/2x3/16x3/16	69	-7.80	38.58	20.2	Pass
T7-T8	100 - 86.6667	Diagonal	L3x3x3/16	Note 1	Note 1	Note 1	76.3	Pass
T9	86.6667 - 80	Diagonal	2L3x3x3/16x1/4	102	-8.81	47.56	18.5	Pass
T10	80 - 70	Diagonal	2L3x3x3/16x1/4	114	-10.06	39.20	25.7	Pass
T11	70 - 60	Diagonal	2L3x3x3/16x1/4	123	-11.06	35.93	30.8	Pass
T12	60 - 50	Diagonal	2L3x3x1/4x1/4	135	-11.29	46.14	24.5	Pass
T13	50 - 40	Diagonal	2L3x3x1/4x1/4	147	-11.86	42.40	28.0	Pass
T14	40 - 30	Diagonal	2L3 1/2x3 1/2x1/4x1/4	159	-11.57	60.05	19.3	Pass
T15	30 - 20	Diagonal	2L3 1/2x3 1/2x1/4x1/4	168	-13.16	55.93	23.5	Pass
T16	20 - 10	Diagonal	2L4x4x1/4x1/4	180	-12.89	73.00	17.7	Pass
T17	10 - 0	Diagonal	2L4x4x1/4x1/4	192	-14.67	68.42	21.4	Pass
T6	106.667 - 100	Secondary Horizontal	L2x2x3/16	74	-1.03	6.68	15.4	Pass
T8	93.3333 - 86.6667	Secondary Horizontal	L2x2x3/16	94	-0.27	5.39	5.0	Pass
T9	86.6667 - 80	Secondary Horizontal	L2x2x3/16	108	-0.24	4.86	5.0	Pass
T11	70 - 60	Secondary Horizontal	L2 1/2x2 1/2x3/16	129	-0.41	7.61	5.4	Pass
T12	60 - 50	Secondary Horizontal	L3x3x1/4	141	-0.63	15.05	4.2	Pass
T13	50 - 40	Secondary Horizontal	L3x3x1/4	153	-0.50	13.32	3.8	Pass
T15	30 - 20	Secondary Horizontal	L3x3x3/16	174	-0.57	8.45	6.7	Pass
T16	20 - 10	Secondary Horizontal	L3x3x3/16	186	-0.93	7.64	12.2	Pass
T17	10 - 0	Secondary Horizontal	L3 1/2x3 1/2x1/4	198	-0.78	14.61	5.4	Pass
T1	150 - 145	Top Girt	L2 1/2x2 1/2x3/16	4	-0.33	7.00	4.7	Pass
T3	140 - 120	Top Girt	L2 1/2x2 1/2x3/16	27	-0.75	7.00	10.7	Pass
							Summary	
						Leg (T5)	78.3	Pass
						Diagonal (T7-T8)	76.3	Pass
						Secondary Horizontal (T6)	15.4	Pass
						Top Girt (T3)	10.7	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (k)	ϕP_{allow} (k)	% Capacity	Pass / Fail
						Bolt Checks	71.6	Pass
						RATING =	**78.3**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	58.7	Pass
1,2	Base Foundation Soil Interaction	-	81.6	Pass
1,2	Base Foundation Structural	-	54.2	Pass

Structure Rating (max from all components) =	**81.6%**

Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
2) Rating per TIA-222-H Section 15.5

4.1) Recommendations

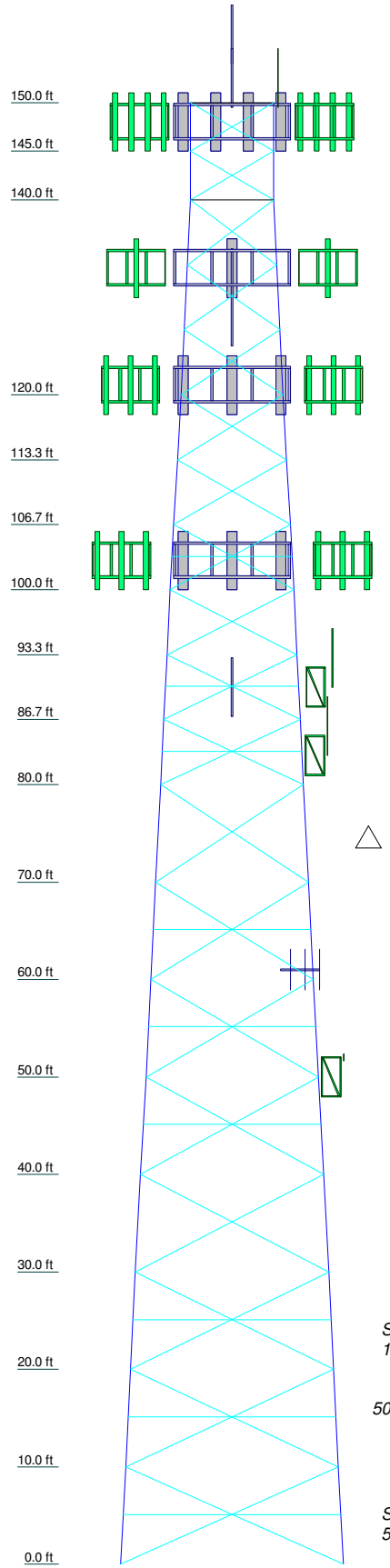
1) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17
Legs		ROHN 2.5 STD		ROHN 2.5 EH		ROHN 2.5 EH (GR)		ROHN 3 EH (GR)			ROHN 4 EH (GR)					ROHN 5 EH (GR)		
Leg Grade		A572-50																
Diagonals	A	B		L2 1/2x2 1/2x3/16			C	L3x3x3/16			2L3x3x3/16x1/4	D	2L3x3x1/4x1/4			2L3 1/2x3 1/2x1/4x1/4		2L4x4x1/4x1/4
Diagonal Grade				A36														
Top Girts	D	N.A.		L2 1/2x2 1/2x3/16														
Sec. Horizontals	D	N.A.		N.A.			L2x2x3/16	N.A.	L2x2x3/16		N.A.	D	L3x3x1/4		N.A.	L3x3x3/16		E
Face Width (ft)	8.5625				10.5625	11.2422	11.9245	12.6042	13.3021	14	14.6979	15.6979	16.6979	17.7344	18.7708	19.776	20.7813	21.7813
# Panels @ (ft)	2 @ 5			9 @ 6.66667							8 @ 10							
Weight (K)	0.3	0.2		1.2	0.5	0.5	0.9	0.7	0.8	1.2	1.7	1.9	2.3	2.4	2.8	3.1	3.5	3.7

27.9



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 1/2x1 1/2x3/16	D	L2 1/2x2 1/2x3/16
B	L2x2x3/16	E	L3 1/2x3 1/2x1/4
C	L2 1/2x2 1/2x3/16x3/16		

MATERIAL STRENGTH

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

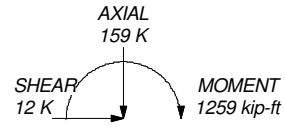
TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 145 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category III.
7. Topographic Category 1 with Crest Height of 0'
8. Grouted pipe f'c is 7 ksi
9. TOWER RATING: 78.3%

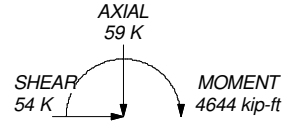
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 255 K
SHEAR: 33 K

UPLIFT: -210 K
SHEAR: 28 K



TORQUE 30 kip-ft
50 mph WIND - 1.5000 in ICE



TORQUE 104 kip-ft
REACTIONS - 145 mph WIND

Tower Engineering Professionals

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: **NLN 136 943455 (BU 806384)**			
Project: ***TEP No. 45439.546124***			
Client: Crown Castle	Drawn by: zschartraw	App'd:	
Code: TIA-222-H	Date: 05/21/21	Scale: NTS	
Path:		Dwg No. E-1	

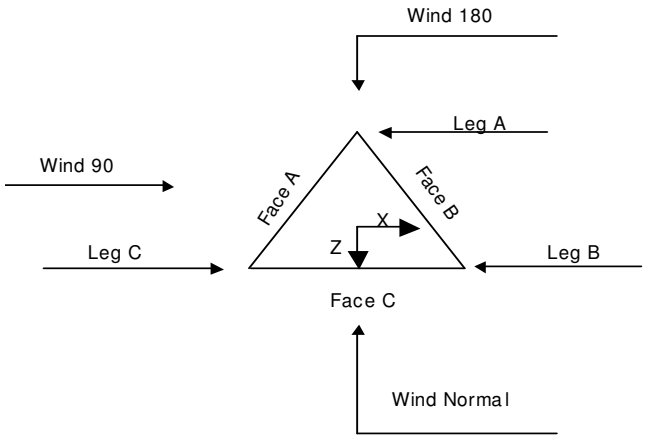
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150' above the ground line.
The base of the tower is set at an elevation of 0' above the ground line.
The face width of the tower is 8'6-3/4" at the top and 22'9-3/8" at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
Tower base elevation above sea level: 173'.
Basic wind speed of 145 mph.
Risk Category III.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0'.
Nominal ice thickness of 1.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Grouted pipe f'_c is 7 ksi.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 1.0$, $K_{es}(t_i) = 1.0$.
Maximum demand-capacity ratio is: 1.05.
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-H Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-H Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	150'-145'			8'6-23/32"	1	5'
T2	145'-140'			8'6-23/32"	1	5'
T3	140'-120'			8'6-23/32"	1	20'
T4	120'-113'3-31/32"			10'6-23/32"	1	6'8-1/32"
T5	113'3-31/32"-106' 8-1/32"			11'2-7/8"	1	6'8-1/32"
T6	106'8-1/32"-100'			11'11-1/32"	1	6'8-1/32"
T7	100'-93'3-31/32"			12'7-3/16"	1	6'8-1/32"
T8	93'3-31/32"-86'8-1/32"			13'3-19/32"	1	6'8-1/32"
T9	86'8-1/32"-80'			14'	1	6'8-1/32"
T10	80'-70'			14'8-13/32"	1	10'
T11	70'-60'			15'8-13/32"	1	10'
T12	60'-50'			16'8-13/32"	1	10'
T13	50'-40'			17'8-3/4"	1	10'
T14	40'-30'			18'9-1/4"	1	10'
T15	30'-20'			19'9-3/8"	1	10'
T16	20'-10'			20'9-3/8"	1	10'
T17	10'-0'			21'9-3/8"	1	10'

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	150'-145'	5'	X Brace	No	No	0.0000	0.0000
T2	145'-140'	5'	X Brace	No	No	0.0000	0.0000
T3	140'-120'	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T4	120'-113'3-31/32"	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T5	113'3-31/32"-106' 8-1/32"	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T6	106'8-1/32"-100'	6'8-1/32"	X Brace	No	Yes	0.0000	0.0000
T7	100'-93'3-31/32"	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T8	93'3-31/32"-86'8-1/32"	6'8-1/32"	X Brace	No	Yes	0.0000	0.0000
T9	86'8-1/32"-80'	6'8-1/32"	X Brace	No	Yes	0.0000	0.0000
T10	80'-70'	10'	X Brace	No	No	0.0000	0.0000
T11	70'-60'	10'	X Brace	No	Yes	0.0000	0.0000
T12	60'-50'	10'	X Brace	No	Yes	0.0000	0.0000
T13	50'-40'	10'	X Brace	No	Yes	0.0000	0.0000
T14	40'-30'	10'	X Brace	No	No	0.0000	0.0000
T15	30'-20'	10'	X Brace	No	Yes	0.0000	0.0000
T16	20'-10'	10'	X Brace	No	Yes	0.0000	0.0000
T17	10'-0'	10'	X Brace	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 150'-145'	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 145'-140'	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T3 140'-120'	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 120'-113'3-31/32"	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 113'3-31/32"-106' 8-1/32"	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 106'8-1/32"-100'	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Double Equal Angle	L2 1/2x2 1/2x3/16x3/16	A36 (36 ksi)
T7 100'-93'3-31/32"	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 93'3-31/32"-86'8-1/32"	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T9 86'8-1/32"-80'	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T10 80'-70'	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T11 70'-60'	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T12 60'-50'	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Equal Angle	2L3x3x1/4x1/4	A36 (36 ksi)
T13 50'-40'	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Equal Angle	2L3x3x1/4x1/4	A36 (36 ksi)
T14 40'-30'	Grouted Pipe	ROHN 5 EH	A572-50	Double Equal	2L3 1/2x3 1/2x1/4x1/4	A36

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
			(50 ksi)	Angle		(36 ksi)
T15 30'-20'	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x1/4	A36 (36 ksi)
T16 20'-10'	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Equal Angle	2L4x4x1/4x1/4	A36 (36 ksi)
T17 10'-0'	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Equal Angle	2L4x4x1/4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 150'-145'	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T3 140'-120'	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		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 106'8-1/32"-100'	Equal Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T8 93'3-31/32"-86'8-1/32"	Equal Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T9 86'8-1/32"-80'	Equal Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T11 70'-60'	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T12 60'-50'	Equal Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T13 50'-40'	Equal Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T15 30'-20'	Equal Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 20'-10'	Equal Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T17 10'-0'	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 150'-145'	0.00	0.1875	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T2 145'-140'	0.00	0.1875	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T3 140'-120'	0.00	0.1875	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T4 120'-113'3-31/32"	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T5 113'3-31/32"-106'8-1/32"	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T6 106'8-1/32"-100'	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T7 100'-93'3-31/32"	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T8 93'3-31/32"-86'8-1/32"	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T9 86'8-1/32"-80'	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T10 80'-70'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T11 70'-60'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T12 60'-50'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T13 50'-40'	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T14 40'-30'	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T15 30'-20'	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T16 20'-10'	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000
T17 10'-0'	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	30.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 150'-145'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 145'-140'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 140'-120'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4	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
120'-113'3-31/32"				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
113'3-31/32"-106'8-1/32"				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
106'8-1/32"-100'				1	1	1	1	1	0.5	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
100'-93'3-31/32"				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
93'3-31/32"-86'8-1/32"				1	1	1	1	1	0.5	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
86'8-1/32"-80'				1	1	1	1	1	0.5	1
T10 80'-70'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 70'-60'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T12 60'-50'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T13 50'-40'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T14 40'-30'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T15 30'-20'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T16 20'-10'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T17 10'-0'	Yes	Yes	1	1	1	1	1	1	1	1
				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		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 150'-145'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 145'-140'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 140'-120'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 120'-113'3-31/32"	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 113'3-31/32"-106'8-1/32"	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T6 106'8-1/32"-100'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100'-93'3-31/32"	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 93'3-31/32"-86'8-1/32"	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 86'8-1/32"-80'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 80'-70'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 70'-60'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 60'-50'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 50'-40'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 40'-30'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 30'-20'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 20'-10'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 10'-0'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 150'-145'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 145'-140'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 140'-120'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 120'-113'3-31/32"	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 113'3-31/32"-106'8-1/32"	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 106'8-1/32"-100'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100'-93'3-31/32"	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 93'3-31/32"-86'8-1/32"	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 86'8-1/32"-80'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 80'-70'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 70'-60'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 60'-50'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 50'-40'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 40'-30'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 30'-20'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 20'-10'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T17 10'-0'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 150'-145'	Flange	0.6250 A325X	0	0.5000 A325X	1	0.5000 A325X	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 145'-140'	Flange	0.6250 A325X	4	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 140'-120'	Flange	0.6250 A325X	4	0.5000 A325X	1	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120'-113'3-31/32"	Flange	0.7500 A325X	0	0.5000 A325X	2 *	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 113'3-31/32"-106'8-1/32"	Flange	0.7500 A325X	0	0.5000 A325X	2 *	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 106'8-1/32"-100'	Flange	0.7500 A325X	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T7 100'-93'3-31/32"	Flange	0.8750 A325X	0	0.5000 A325N	2 *	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 93'3-31/32"-86'8-1/32"	Flange	0.8750 A325X	0	0.5000 A325N	2 *	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T9 86'8-1/32"-80'	Flange	0.8750 A325X	4	0.5000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T10 80'-70'	Flange	0.8750 A325X	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 70'-60'	Flange	0.8750 A325X	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T12 60'-50'	Flange	1.0000 A325X	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T13 50'-40'	Flange	1.0000 A325X	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T14 40'-30'	Flange	1.0000 A325X	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T15 30'-20'	Flange	1.0625 A325X	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T16 20'-10'	Flange	1.0000 A325X	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T17 10'-0'	Flange	0.0000 A354-BC	0	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1

* Out-of-plane partial restraint assumed

Grouted Pipe Properties

Size	F_y ksi	A_s in^2	A_c in^2	Wt plf	E_c ksi	E_m ksi	F_{ym} ksi
ROHN 2.5 EH (GR)	50	2.2535	4.2383	16.498	4769	36175	61
ROHN 3 EH (GR)	50	3.0159	6.6052	24.023	4769	37356	63
ROHN 4 EH (GR)	50	4.4074	11.4969	38.949	4769	38952	66
ROHN 5 EH (GR)	50	6.1120	18.1937	58.701	4769	40357	68

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	A	No	No	Ar (CaAa)	150' - 0'	0.0000	0.5	1	1	0.3750	0.3750		0.22
Step Pegs (5/8" SR) 7-in. w/30" step	A	No	No	Ar (CaAa)	150' - 0'	0.0000	0.5	1	1	0.3500	0.3500		0.49
Step Pegs (5/8" SR) 7-in. w/30" step	B	No	No	Ar (CaAa)	80' - 0'	0.0000	0.5	1	1	0.3500	0.3500		0.49
Step Pegs (5/8" SR) 7-in. w/30" step	C	No	No	Ar (CaAa)	80' - 0'	0.0000	0.5	1	1	0.3500	0.3500		0.49
** A-Face **													
Feedline Ladder (Af)	A	No	No	Af (CaAa)	150' - 0'	0.0000	0.4	1	1	3.0000	3.0000		8.40
FXL 1873 PE(1-5/8)	A	No	No	Ar (CaAa)	133' - 0'	0.0000	0.38	6	6	0.5000	1.9800		0.67
LDF5-50A(7/8)	A	No	No	Ar (CaAa)	126' - 0'	0.0000	0.43	2	2	0.5000	1.0900		0.33
LDF5-50A(7/8)	A	No	No	Ar (CaAa)	150' - 126'	0.0000	0.43	1	1	0.5000	1.0900		0.33
LDF4-50A(1/2)	A	No	No	Ar (CaAa)	83' - 0'	2.5000	0.4	2	2	0.5000	0.6250		0.15
LDF4-50A(1/2)	A	No	No	Ar (CaAa)	90' - 83'	2.5000	0.4	1	1	0.5000	0.6250		0.15
7919A(17/64)	A	No	No	Ar (CaAa)	83' - 0'	0.0000	0.42	2	2	0.2650	0.2650		0.03
7919A(17/64)	A	No	No	Ar (CaAa)	126' - 83'	0.0000	0.42	1	1	0.2650	0.2650		0.03
LDF1-50A(1/4)	A	No	No	Ar (CaAa)	61' - 0'	0.0000	0.41	1	1	0.3450	0.3450		0.06
** B-Face **													
Feedline Ladder (Af)	B	No	No	Af (CaAa)	148' - 0'	0.0000	-0.4	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	B	No	No	Af (CaAa)	121' - 0'	-1.0000	-0.4	1	1	3.0000	3.0000		8.40
HJ7-50A(1-5/8)	B	No	No	Ar (CaAa)	148' - 0'	0.0000	-0.43	4	2	0.5000	1.9800		1.04
HJ7-50A(1-5/8)	B	No	No	Ar (CaAa)	148' - 0'	0.0000	-0.35	4	2	0.5000	1.9800		1.04
LDF5-50A(7/8)	B	No	No	Ar (CaAa)	148' - 0'	0.0000	-0.4	6	6	0.5000	1.0900		0.33
LDF5-50A(7/8)	B	No	No	Ar (CaAa)	83' - 0'	0.0000	-0.45	1	1	0.5000	1.0300		0.33

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF2-50(3/8)	B	No	No	Ar (CaAa)	146' - 0'	-2.0000	-0.48	2	2	0.4400	0.4400		0.08
HB158-21U6S24-xxM_TMO (1-5/8)	B	No	No	Ar (CaAa)	121' - 0'	-3.0000	-0.4	3	3	0.5000	1.9960		2.50
LDF4-50A(1/2)	B	No	No	Ar (CaAa)	50' - 0'	-2.0000	0.49	1	1	0.5000	0.6250		0.15
Feedline Ladder (Af)	B	No	No	Af (CaAa)	103' - 0'	0.0000	0.4	1	1	3.0000	3.0000		8.40
HCS 6X12 4AWG(1-5/8) ***	B	No	No	Ar (CaAa)	103' - 0'	0.0000	0.4	6	3	0.5000	1.6600		2.40

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight plf
***								

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	150'-145'	A	0.000	0.000	3.408	0.000	0.05
		B	0.000	0.000	8.302	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
T2	145'-140'	A	0.000	0.000	3.408	0.000	0.05
		B	0.000	0.000	14.130	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.00
T3	140'-120'	A	0.000	0.000	29.887	0.000	0.24
		B	0.000	0.000	57.619	0.000	0.39
		C	0.000	0.000	0.000	0.000	0.00
T4	120'-113'3-31/32"	A	0.000	0.000	13.367	0.000	0.09
		B	0.000	0.000	26.165	0.000	0.23
		C	0.000	0.000	0.000	0.000	0.00
T5	113'3-31/32"-106' 8-1/32"	A	0.000	0.000	13.367	0.000	0.09
		B	0.000	0.000	26.165	0.000	0.23
		C	0.000	0.000	0.000	0.000	0.00
T6	106'8-1/32"-100'	A	0.000	0.000	13.367	0.000	0.09
		B	0.000	0.000	30.653	0.000	0.30
		C	0.000	0.000	0.000	0.000	0.00
T7	100'-93'3-31/32"	A	0.000	0.000	13.367	0.000	0.09
		B	0.000	0.000	36.139	0.000	0.38
		C	0.000	0.000	0.000	0.000	0.00
T8	93'3-31/32"-86'8-1/32"	A	0.000	0.000	13.575	0.000	0.09
		B	0.000	0.000	36.139	0.000	0.38
		C	0.000	0.000	0.000	0.000	0.00
T9	86'8-1/32"-80'	A	0.000	0.000	14.050	0.000	0.09

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	36.448	0.000	0.38
		C	0.000	0.000	0.000	0.000	0.00
T10	80'-70'	A	0.000	0.000	21.565	0.000	0.14
		B	0.000	0.000	55.588	0.000	0.58
		C	0.000	0.000	0.350	0.000	0.00
T11	70'-60'	A	0.000	0.000	21.599	0.000	0.14
		B	0.000	0.000	55.588	0.000	0.58
		C	0.000	0.000	0.350	0.000	0.00
T12	60'-50'	A	0.000	0.000	21.910	0.000	0.14
		B	0.000	0.000	55.588	0.000	0.58
		C	0.000	0.000	0.350	0.000	0.00
T13	50'-40'	A	0.000	0.000	21.910	0.000	0.14
		B	0.000	0.000	56.213	0.000	0.59
		C	0.000	0.000	0.350	0.000	0.00
T14	40'-30'	A	0.000	0.000	21.910	0.000	0.14
		B	0.000	0.000	56.213	0.000	0.59
		C	0.000	0.000	0.350	0.000	0.00
T15	30'-20'	A	0.000	0.000	21.910	0.000	0.14
		B	0.000	0.000	56.213	0.000	0.59
		C	0.000	0.000	0.350	0.000	0.00
T16	20'-10'	A	0.000	0.000	21.910	0.000	0.14
		B	0.000	0.000	56.213	0.000	0.59
		C	0.000	0.000	0.350	0.000	0.00
T17	10'-0'	A	0.000	0.000	21.910	0.000	0.14
		B	0.000	0.000	56.213	0.000	0.59
		C	0.000	0.000	0.350	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	150'-145'	A	2.004	0.000	0.000	11.422	0.000	0.22
		B		0.000	0.000	17.803	0.000	0.29
		C		0.000	0.000	0.000	0.000	0.00
T2	145'-140'	A	1.997	0.000	0.000	11.394	0.000	0.22
		B		0.000	0.000	32.509	0.000	0.51
		C		0.000	0.000	0.000	0.000	0.00
T3	140'-120'	A	1.978	0.000	0.000	82.365	0.000	1.39
		B		0.000	0.000	131.912	0.000	2.09
		C		0.000	0.000	0.000	0.000	0.00
T4	120'-113'3-31/32"	A	1.957	0.000	0.000	37.347	0.000	0.58
		B		0.000	0.000	59.206	0.000	1.00
		C		0.000	0.000	0.000	0.000	0.00
T5	113'3-31/32"-106' 8-1/32"	A	1.946	0.000	0.000	37.235	0.000	0.58
		B		0.000	0.000	59.043	0.000	0.99
		C		0.000	0.000	0.000	0.000	0.00
T6	106'8-1/32"-100'	A	1.934	0.000	0.000	37.117	0.000	0.57
		B		0.000	0.000	66.217	0.000	1.17
		C		0.000	0.000	0.000	0.000	0.00
T7	100'-93'3-31/32"	A	1.921	0.000	0.000	36.991	0.000	0.57
		B		0.000	0.000	74.965	0.000	1.38
		C		0.000	0.000	0.000	0.000	0.00
T8	93'3-31/32"-86'8-1 /32"	A	1.907	0.000	0.000	38.194	0.000	0.58
		B		0.000	0.000	74.721	0.000	1.37
		C		0.000	0.000	0.000	0.000	0.00
T9	86'8-1/32"-80'	A	1.892	0.000	0.000	41.911	0.000	0.61
		B		0.000	0.000	75.905	0.000	1.38

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	0.000	0.000	0.00
T10	80'-70'	A	1.873	0.000	0.000	67.120	0.000	0.91
		B		0.000	0.000	120.032	0.000	2.14
		C		0.000	0.000	4.095	0.000	0.06
T11	70'-60'	A	1.846	0.000	0.000	67.001	0.000	0.90
		B		0.000	0.000	119.215	0.000	2.12
		C		0.000	0.000	4.042	0.000	0.05
T12	60'-50'	A	1.815	0.000	0.000	69.971	0.000	0.93
		B		0.000	0.000	118.276	0.000	2.09
		C		0.000	0.000	3.981	0.000	0.05
T13	50'-40'	A	1.779	0.000	0.000	69.190	0.000	0.91
		B		0.000	0.000	121.353	0.000	2.10
		C		0.000	0.000	3.909	0.000	0.05
T14	40'-30'	A	1.735	0.000	0.000	68.233	0.000	0.88
		B		0.000	0.000	119.910	0.000	2.06
		C		0.000	0.000	3.820	0.000	0.05
T15	30'-20'	A	1.678	0.000	0.000	66.990	0.000	0.85
		B		0.000	0.000	118.034	0.000	2.00
		C		0.000	0.000	3.706	0.000	0.05
T16	20'-10'	A	1.594	0.000	0.000	65.182	0.000	0.80
		B		0.000	0.000	115.306	0.000	1.91
		C		0.000	0.000	3.538	0.000	0.04
T17	10'-0'	A	1.428	0.000	0.000	61.597	0.000	0.72
		B		0.000	0.000	109.897	0.000	1.75
		C		0.000	0.000	3.207	0.000	0.04

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	150'-145'	0.7162	-14.7996	0.5572	-18.5004
T2	145'-140'	1.4526	-21.2147	1.2525	-25.8276
T3	140'-120'	0.9433	-25.3806	0.8338	-30.4725
T4	120'-113'3-31/32"	0.9842	-33.5685	0.8451	-38.6250
T5	113'3-31/32"-106'8-1/32"	1.0271	-35.0175	0.8920	-40.3771
T6	106'8-1/32"-100'	3.4161	-30.3371	3.4590	-36.0341
T7	100'-93'3-31/32"	6.5335	-29.2313	6.8950	-36.0994
T8	93'3-31/32"-86'8-1/32"	6.0034	-27.7786	6.3988	-34.9929
T9	86'8-1/32"-80'	6.0690	-29.0852	6.3542	-37.2804
T10	80'-70'	7.6546	-35.9179	7.3036	-42.2330
T11	70'-60'	7.1001	-34.1842	7.0393	-41.3926
T12	60'-50'	7.1433	-34.9940	7.0388	-43.5875
T13	50'-40'	7.7848	-35.7797	8.8071	-43.7055
T14	40'-30'	8.6707	-39.3836	9.6982	-47.8441
T15	30'-20'	7.7337	-36.0458	9.0672	-45.3762
T16	20'-10'	7.5507	-35.5537	9.0734	-45.7184
T17	10'-0'	7.5485	-35.7625	9.0916	-46.0849

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Safety Line 3/8	145.00 - 150.00	0.6000	0.5793
T1	2	Step Pegs (5/8" SR) 7-in. w/30" step	145.00 - 150.00	0.6000	0.5793
T1	6	Feedline Ladder (Af)	145.00 - 150.00	0.6000	0.5793
T1	9	LDF5-50A(7/8)	145.00 - 150.00	0.6000	0.5793
T1	16	Feedline Ladder (Af)	145.00 - 148.00	0.6000	0.5793
T1	18	HJ7-50A(1-5/8)	145.00 - 148.00	0.6000	0.5793
T1	19	HJ7-50A(1-5/8)	145.00 - 148.00	0.6000	0.5793
T1	20	LDF5-50A(7/8)	145.00 - 148.00	0.6000	0.5793
T1	22	LDF2-50(3/8)	145.00 - 146.00	0.6000	0.5793
T2	1	Safety Line 3/8	140.00 - 145.00	0.6000	0.6000
T2	2	Step Pegs (5/8" SR) 7-in. w/30" step	140.00 - 145.00	0.6000	0.6000
T2	6	Feedline Ladder (Af)	140.00 - 145.00	0.6000	0.6000
T2	9	LDF5-50A(7/8)	140.00 - 145.00	0.6000	0.6000
T2	16	Feedline Ladder (Af)	140.00 - 145.00	0.6000	0.6000
T2	18	HJ7-50A(1-5/8)	140.00 - 145.00	0.6000	0.6000
T2	19	HJ7-50A(1-5/8)	140.00 - 145.00	0.6000	0.6000
T2	20	LDF5-50A(7/8)	140.00 - 145.00	0.6000	0.6000
T2	22	LDF2-50(3/8)	140.00 - 145.00	0.6000	0.6000
T3	1	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T3	2	Step Pegs (5/8" SR) 7-in. w/30" step	120.00 - 140.00	0.6000	0.6000
T3	6	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T3	7	FXL 1873 PE(1-5/8)	120.00 - 133.00	0.6000	0.6000
T3	8	LDF5-50A(7/8)	120.00 - 126.00	0.6000	0.6000
T3	9	LDF5-50A(7/8)	126.00 - 140.00	0.6000	0.6000
T3	13	7919A(17/64)	120.00 - 126.00	0.6000	0.6000
T3	16	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T3	17	Feedline Ladder (Af)	120.00 - 121.00	0.6000	0.6000
T3	18	HJ7-50A(1-5/8)	120.00 - 140.00	0.6000	0.6000
T3	19	HJ7-50A(1-5/8)	120.00 - 140.00	0.6000	0.6000
T3	20	LDF5-50A(7/8)	120.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			140.00		
T3	22	LDF2-50(3/8)	120.00 - 140.00	0.6000	0.6000
T3	23	HB158-21U6S24-xxM_TMO (1-5/8)	120.00 - 121.00	0.6000	0.6000
T4	1	Safety Line 3/8	113.33 - 120.00	0.6000	0.6000
T4	2	Step Pegs (5/8" SR) 7-in. w/30" step	113.33 - 120.00	0.6000	0.6000
T4	6	Feedline Ladder (Af)	113.33 - 120.00	0.6000	0.6000
T4	7	FXL 1873 PE(1-5/8)	113.33 - 120.00	0.6000	0.6000
T4	8	LDF5-50A(7/8)	113.33 - 120.00	0.6000	0.6000
T4	13	7919A(17/64)	113.33 - 120.00	0.6000	0.6000
T4	16	Feedline Ladder (Af)	113.33 - 120.00	0.6000	0.6000
T4	17	Feedline Ladder (Af)	113.33 - 120.00	0.6000	0.6000
T4	18	HJ7-50A(1-5/8)	113.33 - 120.00	0.6000	0.6000
T4	19	HJ7-50A(1-5/8)	113.33 - 120.00	0.6000	0.6000
T4	20	LDF5-50A(7/8)	113.33 - 120.00	0.6000	0.6000
T4	22	LDF2-50(3/8)	113.33 - 120.00	0.6000	0.6000
T4	23	HB158-21U6S24-xxM_TMO (1-5/8)	113.33 - 120.00	0.6000	0.6000
T5	1	Safety Line 3/8	106.67 - 113.33	0.6000	0.6000
T5	2	Step Pegs (5/8" SR) 7-in. w/30" step	106.67 - 113.33	0.6000	0.6000
T5	6	Feedline Ladder (Af)	106.67 - 113.33	0.6000	0.6000
T5	7	FXL 1873 PE(1-5/8)	106.67 - 113.33	0.6000	0.6000
T5	8	LDF5-50A(7/8)	106.67 - 113.33	0.6000	0.6000
T5	13	7919A(17/64)	106.67 - 113.33	0.6000	0.6000
T5	16	Feedline Ladder (Af)	106.67 - 113.33	0.6000	0.6000
T5	17	Feedline Ladder (Af)	106.67 - 113.33	0.6000	0.6000
T5	18	HJ7-50A(1-5/8)	106.67 - 113.33	0.6000	0.6000
T5	19	HJ7-50A(1-5/8)	106.67 - 113.33	0.6000	0.6000
T5	20	LDF5-50A(7/8)	106.67 - 113.33	0.6000	0.6000
T5	22	LDF2-50(3/8)	106.67 - 113.33	0.6000	0.6000
T5	23	HB158-21U6S24-xxM_TMO (1-5/8)	106.67 - 113.33	0.6000	0.6000
T6	1	Safety Line 3/8	100.00 - 106.67	0.6000	0.6000
T6	2	Step Pegs (5/8" SR) 7-in. w/30" step	100.00 - 106.67	0.6000	0.6000
T6	6	Feedline Ladder (Af)	100.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			106.67		
T6	7	FXL 1873 PE(1-5/8)	100.00 - 106.67	0.6000	0.6000
T6	8	LDF5-50A(7/8)	100.00 - 106.67	0.6000	0.6000
T6	13	7919A(17/64)	100.00 - 106.67	0.6000	0.6000
T6	16	Feedline Ladder (Af)	100.00 - 106.67	0.6000	0.6000
T6	17	Feedline Ladder (Af)	100.00 - 106.67	0.6000	0.6000
T6	18	HJ7-50A(1-5/8)	100.00 - 106.67	0.6000	0.6000
T6	19	HJ7-50A(1-5/8)	100.00 - 106.67	0.6000	0.6000
T6	20	LDF5-50A(7/8)	100.00 - 106.67	0.6000	0.6000
T6	22	LDF2-50(3/8)	100.00 - 106.67	0.6000	0.6000
T6	23	HB158-21U6S24-xxM_TMO (1-5/8)	100.00 - 106.67	0.6000	0.6000
T6	25	Feedline Ladder (Af)	100.00 - 103.00	0.6000	0.6000
T6	26	HCS 6X12 4AWG(1-5/8)	100.00 - 103.00	0.6000	0.6000
T7	1	Safety Line 3/8	93.33 - 100.00	0.6000	0.6000
T7	2	Step Pegs (5/8" SR) 7-in. w/30" step	93.33 - 100.00	0.6000	0.6000
T7	6	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T7	7	FXL 1873 PE(1-5/8)	93.33 - 100.00	0.6000	0.6000
T7	8	LDF5-50A(7/8)	93.33 - 100.00	0.6000	0.6000
T7	13	7919A(17/64)	93.33 - 100.00	0.6000	0.6000
T7	16	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T7	17	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T7	18	HJ7-50A(1-5/8)	93.33 - 100.00	0.6000	0.6000
T7	19	HJ7-50A(1-5/8)	93.33 - 100.00	0.6000	0.6000
T7	20	LDF5-50A(7/8)	93.33 - 100.00	0.6000	0.6000
T7	22	LDF2-50(3/8)	93.33 - 100.00	0.6000	0.6000
T7	23	HB158-21U6S24-xxM_TMO (1-5/8)	93.33 - 100.00	0.6000	0.6000
T7	25	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T7	26	HCS 6X12 4AWG(1-5/8)	93.33 - 100.00	0.6000	0.6000
T8	1	Safety Line 3/8	86.67 - 93.33	0.6000	0.6000
T8	2	Step Pegs (5/8" SR) 7-in. w/30" step	86.67 - 93.33	0.6000	0.6000
T8	6	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T8	7	FXL 1873 PE(1-5/8)	86.67 - 93.33	0.6000	0.6000
T8	8	LDF5-50A(7/8)	86.67 - 93.33	0.6000	0.6000
T8	11	LDF4-50A(1/2)	86.67 - 90.00	0.6000	0.6000
T8	13	7919A(17/64)	86.67 - 93.33	0.6000	0.6000
T8	16	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T8	17	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T8	18	HJ7-50A(1-5/8)	86.67 - 93.33	0.6000	0.6000
T8	19	HJ7-50A(1-5/8)	86.67 - 93.33	0.6000	0.6000
T8	20	LDF5-50A(7/8)	86.67 - 93.33	0.6000	0.6000
T8	22	LDF2-50(3/8)	86.67 - 93.33	0.6000	0.6000
T8	23	HB158-21U6S24-xxM_TMO (1-5/8)	86.67 - 93.33	0.6000	0.6000
T8	25	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T8	26	HCS 6X12 4AWG(1-5/8)	86.67 - 93.33	0.6000	0.6000
T9	1	Safety Line 3/8	80.00 - 86.67	0.6000	0.6000
T9	2	Step Pegs (5/8" SR) 7-in.	80.00 - 86.67	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		w/30" step			
T9	6	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T9	7	FXL 1873 PE(1-5/8)	80.00 - 86.67	0.6000	0.6000
T9	8	LDF5-50A(7/8)	80.00 - 86.67	0.6000	0.6000
T9	10	LDF4-50A(1/2)	80.00 - 83.00	0.6000	0.6000
T9	11	LDF4-50A(1/2)	83.00 - 86.67	0.6000	0.6000
T9	12	7919A(17/64)	80.00 - 83.00	0.6000	0.6000
T9	13	7919A(17/64)	83.00 - 86.67	0.6000	0.6000
T9	16	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T9	17	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T9	18	HJ7-50A(1-5/8)	80.00 - 86.67	0.6000	0.6000
T9	19	HJ7-50A(1-5/8)	80.00 - 86.67	0.6000	0.6000
T9	20	LDF5-50A(7/8)	80.00 - 86.67	0.6000	0.6000
T9	21	LDF5-50A(7/8)	80.00 - 83.00	0.6000	0.6000
T9	22	LDF2-50(3/8)	80.00 - 86.67	0.6000	0.6000
T9	23	HB158-21U6S24-xxM_TMO (1-5/8)	80.00 - 86.67	0.6000	0.6000
T9	25	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T9	26	HCS 6X12 4AWG(1-5/8)	80.00 - 86.67	0.6000	0.6000
T10	1	Safety Line 3/8	70.00 - 80.00	0.6000	0.6000
T10	2	Step Pegs (5/8" SR) 7-in. w/30" step	70.00 - 80.00	0.6000	0.6000
T10	3	Step Pegs (5/8" SR) 7-in. w/30" step	70.00 - 80.00	0.6000	0.6000
T10	4	Step Pegs (5/8" SR) 7-in. w/30" step	70.00 - 80.00	0.6000	0.6000
T10	6	Feedline Ladder (Af)	70.00 - 80.00	0.6000	0.6000
T10	7	FXL 1873 PE(1-5/8)	70.00 - 80.00	0.6000	0.6000
T10	8	LDF5-50A(7/8)	70.00 - 80.00	0.6000	0.6000
T10	10	LDF4-50A(1/2)	70.00 - 80.00	0.6000	0.6000
T10	12	7919A(17/64)	70.00 - 80.00	0.6000	0.6000
T10	16	Feedline Ladder (Af)	70.00 - 80.00	0.6000	0.6000
T10	17	Feedline Ladder (Af)	70.00 - 80.00	0.6000	0.6000
T10	18	HJ7-50A(1-5/8)	70.00 - 80.00	0.6000	0.6000
T10	19	HJ7-50A(1-5/8)	70.00 - 80.00	0.6000	0.6000
T10	20	LDF5-50A(7/8)	70.00 - 80.00	0.6000	0.6000
T10	21	LDF5-50A(7/8)	70.00 - 80.00	0.6000	0.6000
T10	22	LDF2-50(3/8)	70.00 - 80.00	0.6000	0.6000
T10	23	HB158-21U6S24-xxM_TMO (1-5/8)	70.00 - 80.00	0.6000	0.6000
T10	25	Feedline Ladder (Af)	70.00 - 80.00	0.6000	0.6000
T10	26	HCS 6X12 4AWG(1-5/8)	70.00 - 80.00	0.6000	0.6000
T11	1	Safety Line 3/8	60.00 - 70.00	0.6000	0.6000
T11	2	Step Pegs (5/8" SR) 7-in. w/30" step	60.00 - 70.00	0.6000	0.6000
T11	3	Step Pegs (5/8" SR) 7-in. w/30" step	60.00 - 70.00	0.6000	0.6000
T11	4	Step Pegs (5/8" SR) 7-in. w/30" step	60.00 - 70.00	0.6000	0.6000
T11	6	Feedline Ladder (Af)	60.00 - 70.00	0.6000	0.6000
T11	7	FXL 1873 PE(1-5/8)	60.00 - 70.00	0.6000	0.6000
T11	8	LDF5-50A(7/8)	60.00 - 70.00	0.6000	0.6000
T11	10	LDF4-50A(1/2)	60.00 - 70.00	0.6000	0.6000
T11	12	7919A(17/64)	60.00 - 70.00	0.6000	0.6000
T11	14	LDF1-50A(1/4)	60.00 - 61.00	0.6000	0.6000
T11	16	Feedline Ladder (Af)	60.00 - 70.00	0.6000	0.6000
T11	17	Feedline Ladder (Af)	60.00 - 70.00	0.6000	0.6000
T11	18	HJ7-50A(1-5/8)	60.00 - 70.00	0.6000	0.6000
T11	19	HJ7-50A(1-5/8)	60.00 - 70.00	0.6000	0.6000
T11	20	LDF5-50A(7/8)	60.00 - 70.00	0.6000	0.6000
T11	21	LDF5-50A(7/8)	60.00 - 70.00	0.6000	0.6000
T11	22	LDF2-50(3/8)	60.00 - 70.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	23	HB158-21U6S24-xxM_TMO (1-5/8)	60.00 - 70.00	0.6000	0.6000
T11	25	Feedline Ladder (Af)	60.00 - 70.00	0.6000	0.6000
T11	26	HCS 6X12 4AWG(1-5/8)	60.00 - 70.00	0.6000	0.6000
T12	1	Safety Line 3/8	50.00 - 60.00	0.6000	0.6000
T12	2	Step Pegs (5/8" SR) 7-in. w/30" step	50.00 - 60.00	0.6000	0.6000
T12	3	Step Pegs (5/8" SR) 7-in. w/30" step	50.00 - 60.00	0.6000	0.6000
T12	4	Step Pegs (5/8" SR) 7-in. w/30" step	50.00 - 60.00	0.6000	0.6000
T12	6	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T12	7	FXL 1873 PE(1-5/8)	50.00 - 60.00	0.6000	0.6000
T12	8	LDF5-50A(7/8)	50.00 - 60.00	0.6000	0.6000
T12	10	LDF4-50A(1/2)	50.00 - 60.00	0.6000	0.6000
T12	12	7919A(17/64)	50.00 - 60.00	0.6000	0.6000
T12	14	LDF1-50A(1/4)	50.00 - 60.00	0.6000	0.6000
T12	16	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T12	17	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T12	18	HJ7-50A(1-5/8)	50.00 - 60.00	0.6000	0.6000
T12	19	HJ7-50A(1-5/8)	50.00 - 60.00	0.6000	0.6000
T12	20	LDF5-50A(7/8)	50.00 - 60.00	0.6000	0.6000
T12	21	LDF5-50A(7/8)	50.00 - 60.00	0.6000	0.6000
T12	22	LDF2-50(3/8)	50.00 - 60.00	0.6000	0.6000
T12	23	HB158-21U6S24-xxM_TMO (1-5/8)	50.00 - 60.00	0.6000	0.6000
T12	25	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T12	26	HCS 6X12 4AWG(1-5/8)	50.00 - 60.00	0.6000	0.6000
T13	1	Safety Line 3/8	40.00 - 50.00	0.6000	0.6000
T13	2	Step Pegs (5/8" SR) 7-in. w/30" step	40.00 - 50.00	0.6000	0.6000
T13	3	Step Pegs (5/8" SR) 7-in. w/30" step	40.00 - 50.00	0.6000	0.6000
T13	4	Step Pegs (5/8" SR) 7-in. w/30" step	40.00 - 50.00	0.6000	0.6000
T13	6	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T13	7	FXL 1873 PE(1-5/8)	40.00 - 50.00	0.6000	0.6000
T13	8	LDF5-50A(7/8)	40.00 - 50.00	0.6000	0.6000
T13	10	LDF4-50A(1/2)	40.00 - 50.00	0.6000	0.6000
T13	12	7919A(17/64)	40.00 - 50.00	0.6000	0.6000
T13	14	LDF1-50A(1/4)	40.00 - 50.00	0.6000	0.6000
T13	16	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T13	17	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T13	18	HJ7-50A(1-5/8)	40.00 - 50.00	0.6000	0.6000
T13	19	HJ7-50A(1-5/8)	40.00 - 50.00	0.6000	0.6000
T13	20	LDF5-50A(7/8)	40.00 - 50.00	0.6000	0.6000
T13	21	LDF5-50A(7/8)	40.00 - 50.00	0.6000	0.6000
T13	22	LDF2-50(3/8)	40.00 - 50.00	0.6000	0.6000
T13	23	HB158-21U6S24-xxM_TMO (1-5/8)	40.00 - 50.00	0.6000	0.6000
T13	24	LDF4-50A(1/2)	40.00 - 50.00	0.6000	0.6000
T13	25	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T13	26	HCS 6X12 4AWG(1-5/8)	40.00 - 50.00	0.6000	0.6000
T14	1	Safety Line 3/8	30.00 - 40.00	0.6000	0.6000
T14	2	Step Pegs (5/8" SR) 7-in. w/30" step	30.00 - 40.00	0.6000	0.6000
T14	3	Step Pegs (5/8" SR) 7-in. w/30" step	30.00 - 40.00	0.6000	0.6000
T14	4	Step Pegs (5/8" SR) 7-in. w/30" step	30.00 - 40.00	0.6000	0.6000
T14	6	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T14	7	FXL 1873 PE(1-5/8)	30.00 - 40.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T14	8	LDF5-50A(7/8)	30.00 - 40.00	0.6000	0.6000
T14	10	LDF4-50A(1/2)	30.00 - 40.00	0.6000	0.6000
T14	12	7919A(17/64)	30.00 - 40.00	0.6000	0.6000
T14	14	LDF1-50A(1/4)	30.00 - 40.00	0.6000	0.6000
T14	16	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T14	17	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T14	18	HJ7-50A(1-5/8)	30.00 - 40.00	0.6000	0.6000
T14	19	HJ7-50A(1-5/8)	30.00 - 40.00	0.6000	0.6000
T14	20	LDF5-50A(7/8)	30.00 - 40.00	0.6000	0.6000
T14	21	LDF5-50A(7/8)	30.00 - 40.00	0.6000	0.6000
T14	22	LDF2-50(3/8)	30.00 - 40.00	0.6000	0.6000
T14	23	HB158-21U6S24-xxM_TMO (1-5/8)	30.00 - 40.00	0.6000	0.6000
T14	24	LDF4-50A(1/2)	30.00 - 40.00	0.6000	0.6000
T14	25	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T14	26	HCS 6X12 4AWG(1-5/8)	30.00 - 40.00	0.6000	0.6000
T15	1	Safety Line 3/8	20.00 - 30.00	0.6000	0.6000
T15	2	Step Pegs (5/8" SR) 7-in. w/30" step	20.00 - 30.00	0.6000	0.6000
T15	3	Step Pegs (5/8" SR) 7-in. w/30" step	20.00 - 30.00	0.6000	0.6000
T15	4	Step Pegs (5/8" SR) 7-in. w/30" step	20.00 - 30.00	0.6000	0.6000
T15	6	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T15	7	FXL 1873 PE(1-5/8)	20.00 - 30.00	0.6000	0.6000
T15	8	LDF5-50A(7/8)	20.00 - 30.00	0.6000	0.6000
T15	10	LDF4-50A(1/2)	20.00 - 30.00	0.6000	0.6000
T15	12	7919A(17/64)	20.00 - 30.00	0.6000	0.6000
T15	14	LDF1-50A(1/4)	20.00 - 30.00	0.6000	0.6000
T15	16	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T15	17	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T15	18	HJ7-50A(1-5/8)	20.00 - 30.00	0.6000	0.6000
T15	19	HJ7-50A(1-5/8)	20.00 - 30.00	0.6000	0.6000
T15	20	LDF5-50A(7/8)	20.00 - 30.00	0.6000	0.6000
T15	21	LDF5-50A(7/8)	20.00 - 30.00	0.6000	0.6000
T15	22	LDF2-50(3/8)	20.00 - 30.00	0.6000	0.6000
T15	23	HB158-21U6S24-xxM_TMO (1-5/8)	20.00 - 30.00	0.6000	0.6000
T15	24	LDF4-50A(1/2)	20.00 - 30.00	0.6000	0.6000
T15	25	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T15	26	HCS 6X12 4AWG(1-5/8)	20.00 - 30.00	0.6000	0.6000
T16	1	Safety Line 3/8	10.00 - 20.00	0.6000	0.6000
T16	2	Step Pegs (5/8" SR) 7-in. w/30" step	10.00 - 20.00	0.6000	0.6000
T16	3	Step Pegs (5/8" SR) 7-in. w/30" step	10.00 - 20.00	0.6000	0.6000
T16	4	Step Pegs (5/8" SR) 7-in. w/30" step	10.00 - 20.00	0.6000	0.6000
T16	6	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T16	7	FXL 1873 PE(1-5/8)	10.00 - 20.00	0.6000	0.6000
T16	8	LDF5-50A(7/8)	10.00 - 20.00	0.6000	0.6000
T16	10	LDF4-50A(1/2)	10.00 - 20.00	0.6000	0.6000
T16	12	7919A(17/64)	10.00 - 20.00	0.6000	0.6000
T16	14	LDF1-50A(1/4)	10.00 - 20.00	0.6000	0.6000
T16	16	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T16	17	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T16	18	HJ7-50A(1-5/8)	10.00 - 20.00	0.6000	0.6000
T16	19	HJ7-50A(1-5/8)	10.00 - 20.00	0.6000	0.6000
T16	20	LDF5-50A(7/8)	10.00 - 20.00	0.6000	0.6000
T16	21	LDF5-50A(7/8)	10.00 - 20.00	0.6000	0.6000
T16	22	LDF2-50(3/8)	10.00 - 20.00	0.6000	0.6000
T16	23	HB158-21U6S24-xxM_TMO	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
		(1-5/8)			
T16	24	LDF4-50A(1/2)	10.00 - 20.00	0.6000	0.6000
T16	25	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T16	26	HCS 6X12 4AWG(1-5/8)	10.00 - 20.00	0.6000	0.6000
T17	1	Safety Line 3/8	0.00 - 10.00	0.6000	0.6000
T17	2	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 10.00	0.6000	0.6000
T17	3	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 10.00	0.6000	0.6000
T17	4	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 10.00	0.6000	0.6000
T17	6	Feedline Ladder (Af)	0.00 - 10.00	0.6000	0.6000
T17	7	FXL 1873 PE(1-5/8)	0.00 - 10.00	0.6000	0.6000
T17	8	LDF5-50A(7/8)	0.00 - 10.00	0.6000	0.6000
T17	10	LDF4-50A(1/2)	0.00 - 10.00	0.6000	0.6000
T17	12	7919A(17/64)	0.00 - 10.00	0.6000	0.6000
T17	14	LDF1-50A(1/4)	0.00 - 10.00	0.6000	0.6000
T17	16	Feedline Ladder (Af)	0.00 - 10.00	0.6000	0.6000
T17	17	Feedline Ladder (Af)	0.00 - 10.00	0.6000	0.6000
T17	18	HJ7-50A(1-5/8)	0.00 - 10.00	0.6000	0.6000
T17	19	HJ7-50A(1-5/8)	0.00 - 10.00	0.6000	0.6000
T17	20	LDF5-50A(7/8)	0.00 - 10.00	0.6000	0.6000
T17	21	LDF5-50A(7/8)	0.00 - 10.00	0.6000	0.6000
T17	22	LDF2-50(3/8)	0.00 - 10.00	0.6000	0.6000
T17	23	HB158-21U6S24-xxM_TMO (1-5/8)	0.00 - 10.00	0.6000	0.6000
T17	24	LDF4-50A(1/2)	0.00 - 10.00	0.6000	0.6000
T17	25	Feedline Ladder (Af)	0.00 - 10.00	0.6000	0.6000
T17	26	HCS 6X12 4AWG(1-5/8)	0.00 - 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
150									
ANT150F2	A	From Leg	1.00 0' 7'	0.0000	150'	No Ice 1/2" Ice 1" Ice 2" Ice	1.23 1.53 1.84 2.49	1.23 1.53 1.84 2.49	0.01 0.02 0.04 0.07
PTP 400	A	From Leg	1.00 0' 2'	0.0000	150'	No Ice 1/2" Ice 1" Ice 2" Ice	1.75 1.92 2.09 2.46	0.48 0.58 0.69 0.92	0.01 0.02 0.04 0.07
2.5 STD 5' Pipe	A	From Leg	0.50 0' 2'6"	0.0000	150'	No Ice 1/2" Ice 1" Ice 2" Ice	1.19 1.50 1.83 2.54	1.19 1.50 1.83 2.54	0.00 0.00 0.00 0.00
2.5 STD 5' Pipe	B	From Leg	0.50 0' 2'6"	0.0000	150'	No Ice 1/2" Ice 1" Ice	1.19 1.50 1.83	1.19 1.50 1.83	0.00 0.00 0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.54	2.54	0.00
148									
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	7.97 8.73 9.50 11.11	5.99 6.72 7.47 9.02	0.08 0.14 0.22 0.40
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	7.97 8.73 9.50 11.11	5.99 6.72 7.47 9.02	0.08 0.14 0.22 0.40
QUAD656C0000X w/ Mount Pipe	A	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	13.90 14.77 15.64 17.46	6.62 7.39 8.17 9.78	0.10 0.18 0.28 0.52
QUAD656C0000X w/ Mount Pipe	B	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	13.90 14.77 15.64 17.46	6.62 7.39 8.17 9.78	0.10 0.18 0.28 0.52
QUAD656C0000X w/ Mount Pipe	C	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	13.90 14.77 15.64 17.46	6.62 7.39 8.17 9.78	0.10 0.18 0.28 0.52
LNX-6514DS-AIM w/ Mount Pipe	A	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.71	3.30 3.68 4.06 4.87	0.06 0.13 0.20 0.38
LNX-6514DS-AIM w/ Mount Pipe	B	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.71	3.30 3.68 4.06 4.87	0.06 0.13 0.20 0.38
LNX-6514DS-AIM w/ Mount Pipe	C	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.71	3.30 3.68 4.06 4.87	0.06 0.13 0.20 0.38
(2) JAHH-65B-R3B w/ Mount Pipe	B	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	5.50 5.97 6.45 7.44	4.38 4.84 5.30 6.26	0.10 0.17 0.25 0.46
B25 RRH4X30 (UHFA)	A	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	2.11 2.30 2.50 2.91	1.29 1.45 1.61 1.96	0.05 0.07 0.09 0.14
B25 RRH4X30 (UHFA)	B	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	2.11 2.30 2.50 2.91	1.29 1.45 1.61 1.96	0.05 0.07 0.09 0.14
B25 RRH4X30 (UHFA)	C	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	2.11 2.30 2.50 2.91	1.29 1.45 1.61 1.96	0.05 0.07 0.09 0.14
RFV01U-D1A	A	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RFV01U-D1A	B	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.25 1.39 1.54	0.08 0.10 0.12

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.60	1.86	0.18
RFV01U-D1A	C	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
B66A RRH4X45 (UHIE)	A	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	2.54 2.75 2.97 3.43	1.61 1.79 1.98 2.37	0.06 0.08 0.10 0.16
B66A RRH4X45 (UHIE)	B	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	2.54 2.75 2.97 3.43	1.61 1.79 1.98 2.37	0.06 0.08 0.10 0.16
B66A RRH4X45 (UHIE)	C	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	2.54 2.75 2.97 3.43	1.61 1.79 1.98 2.37	0.06 0.08 0.10 0.16
DB-B1-6C-12AB-0Z	A	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	3.79 4.04 4.30 4.84	2.51 2.73 2.95 3.42	0.03 0.06 0.10 0.18
DB-B1-6C-12AB-0Z	C	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	3.79 4.04 4.30 4.84	2.51 2.73 2.95 3.42	0.03 0.06 0.10 0.18
CBC1923T-DS-43	B	From Face	4.00 0' 1'	0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	0.32 0.39 0.47 0.66	0.23 0.30 0.37 0.54	0.01 0.01 0.02 0.03
Sector Mount [SM 510-3]	C	None		0.0000	148'	No Ice 1/2" Ice 1" Ice 2" Ice	39.97 56.45 72.59 104.06	39.97 56.45 72.59 104.06	2.40 3.08 3.96 6.30
146									
WV-CW864	A	From Leg	1.00 0' -1'	0.0000	146'	No Ice 1/2" Ice 1" Ice 2" Ice	0.80 1.44 2.08 3.36	0.80 1.44 2.08 3.36	0.01 0.01 0.02 0.02
133									
800 10504 w/ Mount Pipe	A	From Leg	4.00 0' 1'	0.0000	133'	No Ice 1/2" Ice 1" Ice 2" Ice	2.69 3.12 3.56 4.49	2.26 2.68 3.12 4.03	0.04 0.07 0.11 0.21
800 10504 w/ Mount Pipe	B	From Leg	4.00 0' 1'	0.0000	133'	No Ice 1/2" Ice 1" Ice 2" Ice	2.69 3.12 3.56 4.49	2.26 2.68 3.12 4.03	0.04 0.07 0.11 0.21
800 10504 w/ Mount Pipe	C	From Leg	4.00 0' 1'	0.0000	133'	No Ice 1/2" Ice 1" Ice 2" Ice	2.69 3.12 3.56 4.49	2.26 2.68 3.12 4.03	0.04 0.07 0.11 0.21
2.4" Dia x 6-ft Pipe	A	From Leg	4.00 0' 0'	0.0000	133'	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	0.02 0.03 0.05 0.09
2.4" Dia x 6-ft Pipe	B	From Leg	4.00 0'	0.0000	133'	No Ice 1/2" Ice	1.43 1.93	1.43 1.93	0.02 0.03

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'			1" Ice	2.30	2.30	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia x 6-ft Pipe	C	From Leg	4.00	0.0000	133'	No Ice	1.43	1.43	0.02
			0'			1/2" Ice	1.93	1.93	0.03
			0'			1" Ice	2.30	2.30	0.05
						2" Ice	3.06	3.06	0.09
Pipe Mount [PM 601-3]	C	None		0.0000	133'	No Ice	3.17	3.17	0.20
						1/2" Ice	3.79	3.79	0.23
						1" Ice	4.42	4.42	0.28
						2" Ice	5.76	5.76	0.40
Sector Mount [SM 104-3]	C	None		0.0000	133'	No Ice	30.21	30.21	0.95
						1/2" Ice	38.12	38.12	1.43
						1" Ice	46.01	46.01	2.03
						2" Ice	62.03	62.03	3.58
126									
BCD-87010-EDIN-X	A	From Leg	3.00	0.0000	126'	No Ice	2.90	2.90	0.03
			0'			1/2" Ice	4.05	4.05	0.05
			4'			1" Ice	5.21	5.21	0.08
						2" Ice	7.01	7.01	0.16
PTP 400	A	From Leg	3.00	0.0000	126'	No Ice	1.75	0.48	0.01
			0'			1/2" Ice	1.92	0.58	0.02
			-1'			1" Ice	2.09	0.69	0.04
						2" Ice	2.46	0.92	0.07
SC614	A	From Leg	3.00	0.0000	126'	No Ice	0.00	0.00	0.00
			0'			1/2" Ice	0.00	0.00	0.00
			4'			1" Ice	0.00	0.00	0.00
						2" Ice	0.00	0.00	0.00
Side Arm Mount [SO 305-1]	A	From Leg	1.50	0.0000	126'	No Ice	0.53	1.52	0.03
			0'			1/2" Ice	0.78	2.07	0.04
			0'			1" Ice	1.06	2.66	0.06
						2" Ice	1.73	3.91	0.13
121									
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.00	0.0000	121'	No Ice	5.19	2.71	0.13
			0'			1/2" Ice	5.59	3.04	0.17
			1'			1" Ice	6.02	3.38	0.23
						2" Ice	6.90	4.12	0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.00	0.0000	121'	No Ice	5.19	2.71	0.13
			0'			1/2" Ice	5.59	3.04	0.17
			1'			1" Ice	6.02	3.38	0.23
						2" Ice	6.90	4.12	0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.00	0.0000	121'	No Ice	5.19	2.71	0.13
			0'			1/2" Ice	5.59	3.04	0.17
			1'			1" Ice	6.02	3.38	0.23
						2" Ice	6.90	4.12	0.35
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	A	From Leg	4.00	0.0000	121'	No Ice	14.69	6.87	0.18
			0'			1/2" Ice	15.46	7.55	0.31
			1'			1" Ice	16.23	8.25	0.45
						2" Ice	17.82	9.67	0.78
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	B	From Leg	4.00	0.0000	121'	No Ice	14.69	6.87	0.18
			0'			1/2" Ice	15.46	7.55	0.31
			1'			1" Ice	16.23	8.25	0.45
						2" Ice	17.82	9.67	0.78
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	C	From Leg	4.00	0.0000	121'	No Ice	14.69	6.87	0.18
			0'			1/2" Ice	15.46	7.55	0.31
			1'			1" Ice	16.23	8.25	0.45
						2" Ice	17.82	9.67	0.78
APX16DWV-16DWV-S-E-A	A	From Leg	4.00	0.0000	121'	No Ice	6.29	2.76	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
20 w/ Mount Pipe			0'			1/2" Ice	6.86	3.27	0.11
			1'			1" Ice	7.45	3.79	0.16
						2" Ice	8.68	4.90	0.29
APX16DWV-16DWV-S-E-A	B	From Leg	4.00	0.0000	121'	No Ice	6.29	2.76	0.06
20 w/ Mount Pipe			0'			1/2" Ice	6.86	3.27	0.11
			1'			1" Ice	7.45	3.79	0.16
						2" Ice	8.68	4.90	0.29
APX16DWV-16DWV-S-E-A	C	From Leg	4.00	0.0000	121'	No Ice	6.29	2.76	0.06
20 w/ Mount Pipe			0'			1/2" Ice	6.86	3.27	0.11
			1'			1" Ice	7.45	3.79	0.16
						2" Ice	8.68	4.90	0.29
RADIO 4415 B66A_CCIV3	A	From Leg	4.00	0.0000	121'	No Ice	1.64	0.68	0.05
			0'			1/2" Ice	1.80	0.79	0.06
			1'			1" Ice	1.97	0.91	0.07
						2" Ice	2.32	1.18	0.11
RADIO 4415 B66A_CCIV3	B	From Leg	4.00	0.0000	121'	No Ice	1.64	0.68	0.05
			0'			1/2" Ice	1.80	0.79	0.06
			1'			1" Ice	1.97	0.91	0.07
						2" Ice	2.32	1.18	0.11
RADIO 4415 B66A_CCIV3	C	From Leg	4.00	0.0000	121'	No Ice	1.64	0.68	0.05
			0'			1/2" Ice	1.80	0.79	0.06
			1'			1" Ice	1.97	0.91	0.07
						2" Ice	2.32	1.18	0.11
RADIO 4424 B25_TMOV1	A	From Leg	4.00	0.0000	121'	No Ice	2.05	1.61	0.10
			0'			1/2" Ice	2.23	1.77	0.12
			1'			1" Ice	2.42	1.94	0.14
						2" Ice	2.81	2.30	0.20
RADIO 4424 B25_TMOV1	B	From Leg	4.00	0.0000	121'	No Ice	2.05	1.61	0.10
			0'			1/2" Ice	2.23	1.77	0.12
			1'			1" Ice	2.42	1.94	0.14
						2" Ice	2.81	2.30	0.20
RADIO 4424 B25_TMOV1	C	From Leg	4.00	0.0000	121'	No Ice	2.05	1.61	0.10
			0'			1/2" Ice	2.23	1.77	0.12
			1'			1" Ice	2.42	1.94	0.14
						2" Ice	2.81	2.30	0.20
RADIO 4449 B71	A	From Leg	4.00	0.0000	121'	No Ice	1.97	1.59	0.07
B85A_T-MOBILE			0'			1/2" Ice	2.15	1.75	0.09
			1'			1" Ice	2.33	1.92	0.12
						2" Ice	2.72	2.28	0.17
RADIO 4449 B71	B	From Leg	4.00	0.0000	121'	No Ice	1.97	1.59	0.07
B85A_T-MOBILE			0'			1/2" Ice	2.15	1.75	0.09
			1'			1" Ice	2.33	1.92	0.12
						2" Ice	2.72	2.28	0.17
RADIO 4449 B71	C	From Leg	4.00	0.0000	121'	No Ice	1.97	1.59	0.07
B85A_T-MOBILE			0'			1/2" Ice	2.15	1.75	0.09
			1'			1" Ice	2.33	1.92	0.12
						2" Ice	2.72	2.28	0.17
Sector Mount [SM 505-3]	C	None		0.0000	121'	No Ice	31.66	31.66	1.73
						1/2" Ice	44.64	44.64	2.36
						1" Ice	57.44	57.44	3.19
						2" Ice	82.68	82.68	5.45
103									
APXVAARR24_43-U-NA20	A	From Leg	4.00	0.0000	103'	No Ice	14.69	6.87	0.19
w/ Mount Pipe			0'			1/2" Ice	15.46	7.55	0.31
			0'			1" Ice	16.23	8.25	0.46
						2" Ice	17.82	9.67	0.79
APXVAARR24_43-U-NA20	B	From Leg	4.00	0.0000	103'	No Ice	14.69	6.87	0.19

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
w/ Mount Pipe			0' 0'			1/2" Ice 1" Ice 2" Ice	15.46 16.23 17.82	7.55 8.25 9.67	0.31 0.46 0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	5.19 5.59 6.02 6.90	2.71 3.04 3.38 4.12	0.13 0.17 0.23 0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	5.19 5.59 6.02 6.90	2.71 3.04 3.38 4.12	0.13 0.17 0.23 0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	5.19 5.59 6.02 6.90	2.71 3.04 3.38 4.12	0.13 0.17 0.23 0.35
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	3.76 4.12 4.48 5.24	3.15 3.49 3.84 4.58	0.19 0.25 0.32 0.48
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	3.76 4.12 4.48 5.24	3.15 3.49 3.84 4.58	0.19 0.25 0.32 0.48
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	3.76 4.12 4.48 5.24	3.15 3.49 3.84 4.58	0.19 0.25 0.32 0.48
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RRUS 4415 B25	A	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	0.68 0.79 0.91 1.18	0.04 0.06 0.07 0.11
RRUS 4415 B25	B	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	0.68 0.79 0.91 1.18	0.04 0.06 0.07 0.11
RRUS 4415 B25	C	From Leg	4.00 0' 0'	0.0000	103'	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	0.68 0.79 0.91 1.18	0.04 0.06 0.07 0.11
Sector Mount [SM 701-3]	C	None		0.0000	103'	No Ice 1/2" Ice	19.16 25.62	19.16 25.62	0.82 1.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	32.19	32.19	1.61
						2" Ice	45.91	45.91	2.79
Pipe Mount [PM 601-3]	C	None		0.0000	103'	No Ice	3.17	3.17	0.20
						1/2" Ice	3.79	3.79	0.23
						1" Ice	4.42	4.42	0.28
						2" Ice	5.76	5.76	0.40
90									
ANT150F2	B	From Leg	4.00 0' 3'	0.0000	90'	No Ice	1.23	1.23	0.01
						1/2" Ice	1.53	1.53	0.02
						1" Ice	1.84	1.84	0.04
						2" Ice	2.49	2.49	0.07
2.4" x 6' Stabilizer	B	From Leg	4.00 0' 0'	0.0000	90'	No Ice	1.44	1.44	0.02
						1/2" Ice	1.93	1.93	0.03
						1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
Side Arm Mount [SO 302-1]	B	From Leg	2.00 0' 0'	0.0000	90'	No Ice	0.81	3.31	0.06
						1/2" Ice	1.30	5.00	0.08
						1" Ice	1.81	6.80	0.12
						2" Ice	2.91	10.99	0.23
83									
ANT150D3	A	From Leg	3.00 0' 7'	0.0000	83'	No Ice	1.60	1.60	0.01
						1/2" Ice	3.20	3.20	0.02
						1" Ice	4.80	4.80	0.03
						2" Ice	8.00	8.00	0.05
PTP 400	A	From Leg	3.00 0' 12'	0.0000	83'	No Ice	1.75	0.48	0.01
						1/2" Ice	1.92	0.58	0.02
						1" Ice	2.09	0.69	0.04
						2" Ice	2.46	0.92	0.07
ANT940F10	B	From Leg	3.00 0' 3'	0.0000	83'	No Ice	1.64	1.64	0.02
						1/2" Ice	2.36	2.36	0.03
						1" Ice	2.78	2.78	0.05
						2" Ice	3.65	3.65	0.10
Side Arm Mount [SO 305-1]	A	From Leg	1.50 0' 0'	0.0000	83'	No Ice	0.53	1.52	0.03
						1/2" Ice	0.78	2.07	0.04
						1" Ice	1.06	2.66	0.06
						2" Ice	1.73	3.91	0.13
Side Arm Mount [SO 305-1]	B	From Leg	1.50 0' 0'	0.0000	83'	No Ice	0.53	1.52	0.03
						1/2" Ice	0.78	2.07	0.04
						1" Ice	1.06	2.66	0.06
						2" Ice	1.73	3.91	0.13
61									
BMOY8905	B	From Face	1.00 0' 0'	0.0000	61'	No Ice	0.16	0.16	0.00
						1/2" Ice	0.21	0.21	0.00
						1" Ice	0.26	0.26	0.00
						2" Ice	0.36	0.36	0.00
50									
KS24019-L112A	B	From Leg	3.00 0' 2'	0.0000	50'	No Ice	0.08	0.08	0.01
						1/2" Ice	0.13	0.13	0.01
						1" Ice	0.19	0.19	0.01
						2" Ice	0.35	0.35	0.02
Side Arm Mount [SO 305-1]	B	From Leg	1.50 0' 0'	0.0000	50'	No Ice	0.53	1.52	0.03
						1/2" Ice	0.78	2.07	0.04
						1" Ice	1.06	2.66	0.06
						2" Ice	1.73	3.91	0.13
***									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 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	150 - 145	Leg	Max Tension	15	0.87	0.00	0.00
			Max. Compression	27	-6.07	-0.00	0.17
			Max. Mx	20	-3.01	-1.92	-0.02
			Max. My	3	-0.49	0.00	-2.01
			Max. Vy	20	1.08	0.00	0.00
			Max. Vx	3	1.08	0.00	0.00
		Diagonal	Max Tension	6	1.45	0.00	0.00
			Max. Compression	19	-1.42	0.00	0.00
			Max. Mx	28	0.19	0.03	0.00
			Max. My	20	1.27	0.01	-0.00
			Max. Vy	28	-0.03	0.03	0.00
			Max. Vx	20	-0.00	0.01	-0.00
		Top Girt	Max Tension	3	0.28	0.00	0.00
			Max. Compression	14	-0.33	0.00	0.00
			Max. Mx	26	-0.13	-0.16	0.00
			Max. Vy	26	-0.07	0.00	0.00
T2	145 - 140	Leg	Max Tension	23	3.92	-0.19	-0.03
			Max. Compression	27	-7.73	0.00	-0.02
			Max. Mx	20	2.77	0.85	0.04
			Max. My	2	0.91	0.00	0.88
			Max. Vy	8	-0.26	-0.85	-0.01
			Max. Vx	3	0.25	-0.02	0.87
		Diagonal	Max Tension	17	3.07	0.00	0.00
			Max. Compression	4	-3.13	0.00	0.00
			Max. Mx	36	0.43	0.04	-0.00
			Max. My	16	-3.11	0.01	-0.00
			Max. Vy	36	-0.04	0.04	-0.00
			Max. Vx	16	-0.00	0.01	-0.00
T3	140 - 120	Leg	Max Tension	23	23.29	-0.27	-0.10
			Max. Compression	2	-31.67	0.54	-0.00
			Max. Mx	14	20.62	-0.61	0.00
			Max. My	12	-4.21	-0.03	0.63
			Max. Vy	14	1.18	-0.61	0.00
			Max. Vx	8	-1.19	-0.04	0.59
		Diagonal	Max Tension	17	4.63	0.00	0.00
			Max. Compression	18	-4.82	0.00	0.00
			Max. Mx	28	0.23	0.07	0.01
			Max. My	36	0.82	0.07	-0.01
			Max. Vy	30	0.06	0.07	0.01
			Max. Vx	36	0.00	0.00	0.00
		Top Girt	Max Tension	22	0.78	0.00	0.00
			Max. Compression	11	-0.75	0.00	0.00
			Max. Mx	26	-0.02	-0.16	0.00
			Max. My	26	-0.02	0.00	0.00
			Max. Vy	26	0.07	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T4	120 - 113.333	Leg	Max Tension	23	31.58	0.06	-0.10
			Max. Compression	2	-41.59	-0.05	-0.00
			Max. Mx	14	29.45	-0.61	0.00
			Max. My	8	-5.20	-0.04	0.59
			Max. Vy	14	-0.15	-0.61	0.00
			Max. Vx	8	0.23	-0.04	0.59
		Diagonal	Max Tension	16	6.16	0.00	0.00
			Max. Compression	10	-6.25	0.00	0.00
			Max. Mx	38	1.28	0.08	0.01
			Max. My	35	-1.82	0.07	-0.01
			Max. Vy	30	0.06	0.08	-0.01
			Max. Vx	35	0.00	0.00	0.00
T5	113.333 - 106.667	Leg	Max Tension	23	41.95	-0.10	-0.09

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	2	-52.95	0.09	-0.00
			Max. Mx	33	-10.98	-0.12	0.00
			Max. My	8	-6.03	-0.02	0.27
			Max. Vy	14	0.08	-0.11	0.00
			Max. Vx	8	-0.18	-0.02	0.27
		Diagonal	Max Tension	10	6.25	0.00	0.00
			Max. Compression	16	-6.23	0.00	0.00
			Max. Mx	27	1.27	0.09	-0.01
			Max. My	36	1.26	0.08	-0.01
			Max. Vy	29	0.06	0.08	0.01
			Max. Vx	36	0.00	0.00	0.00
T6	106.667 - 100	Leg	Max Tension	23	51.15	-0.10	-0.09
			Max. Compression	2	-64.25	0.03	-0.01
			Max. Mx	2	-62.89	0.32	0.00
			Max. My	8	-7.66	-0.04	-0.31
			Max. Vy	14	-0.96	-0.27	-0.00
			Max. Vx	20	-0.82	0.02	-0.04
		Diagonal	Max Tension	13	7.33	-0.06	-0.01
			Max. Compression	10	-7.80	0.00	0.00
			Max. Mx	27	0.89	-0.16	-0.02
			Max. My	35	-2.50	-0.13	0.03
			Max. Vy	29	-0.10	-0.14	0.02
			Max. Vx	36	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	23	0.98	0.00	0.00
			Max. Compression	10	-1.03	0.02	0.00
			Max. Mx	32	-0.25	0.07	0.00
			Max. My	24	-0.93	0.02	0.00
			Max. Vy	32	-0.06	0.07	0.00
			Max. Vx	30	0.00	0.00	0.00
T7	100 - 93.3333	Leg	Max Tension	23	61.56	-0.08	-0.06
			Max. Compression	2	-76.98	0.04	-0.03
			Max. Mx	33	-13.66	-0.18	0.01
			Max. My	8	-8.08	-0.04	0.30
			Max. Vy	14	-0.07	-0.09	0.01
			Max. Vx	20	-0.17	-0.04	-0.30
		Diagonal	Max Tension	12	7.84	0.00	0.00
			Max. Compression	12	-7.72	0.00	0.00
			Max. Mx	27	1.71	0.12	-0.02
			Max. My	36	1.73	0.11	-0.02
			Max. Vy	29	0.08	0.11	0.02
			Max. Vx	36	0.00	0.00	0.00
T8	93.3333 - 86.6667	Leg	Max Tension	23	72.28	-0.05	-0.09
			Max. Compression	2	-88.71	-0.16	-0.03
			Max. Mx	2	-88.54	0.39	0.02
			Max. My	8	-8.84	-0.06	0.50
			Max. Vy	2	0.25	0.39	0.02
			Max. Vx	8	-0.24	-0.06	0.50
		Diagonal	Max Tension	13	8.02	0.04	0.00
			Max. Compression	10	-8.47	0.00	0.00
			Max. Mx	27	0.92	0.15	-0.02
			Max. My	30	-2.30	0.13	0.02
			Max. Vy	29	0.08	0.14	-0.02
			Max. Vx	30	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	4	0.30	0.00	0.00
			Max. Compression	5	-0.27	0.00	0.00
			Max. Mx	34	0.04	0.09	0.01
			Max. My	28	-0.04	0.09	0.01
			Max. Vy	34	0.06	0.09	0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	28	0.00	0.00	0.00
T9	86.6667 - 80	Leg	Max Tension	7	83.15	-0.17	0.11
			Max. Compression	2	-101.29	0.15	-0.04
			Max. Mx	2	-100.94	0.44	0.01
			Max. My	8	-9.30	-0.06	0.50
			Max. Vy	2	-0.21	0.44	0.01
			Max. Vx	8	0.26	-0.06	0.50
		Diagonal	Max Tension	12	8.52	0.00	0.00
			Max. Compression	10	-8.81	0.00	0.00
			Max. Mx	27	1.83	-0.19	0.03
			Max. My	37	-1.87	-0.14	0.04
			Max. Vy	29	-0.12	-0.17	-0.03
			Max. Vx	30	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	20	0.29	0.00	0.00
			Max. Compression	9	-0.24	0.02	0.00
			Max. Mx	34	0.07	0.08	0.00
			Max. My	29	0.05	0.08	0.00
			Max. Vy	34	0.06	0.08	0.00
			Max. Vx	27	0.00	0.08	-0.00
T10	80 - 70	Leg	Max Tension	7	96.76	-0.17	0.11
			Max. Compression	2	-117.04	-0.01	-0.04
			Max. Mx	33	-11.08	-0.40	0.01
			Max. My	8	-10.87	-0.07	0.80
			Max. Vy	18	0.11	0.16	-0.10
			Max. Vx	8	-0.28	-0.07	0.80
		Diagonal	Max Tension	12	10.04	0.00	0.00
			Max. Compression	10	-10.06	0.00	0.00
			Max. Mx	29	0.83	-0.28	-0.03
			Max. My	37	-2.23	-0.25	0.04
			Max. Vy	29	-0.14	-0.28	-0.03
			Max. Vx	37	-0.01	0.00	0.00
T11	70 - 60	Leg	Max Tension	7	112.80	-0.07	0.14
			Max. Compression	2	-135.10	-0.58	-0.02
			Max. Mx	2	-134.78	1.00	0.00
			Max. My	8	-11.29	-0.07	0.80
			Max. Vy	10	0.35	1.00	-0.01
			Max. Vx	8	0.31	-0.07	0.80
		Diagonal	Max Tension	13	10.24	-0.12	0.01
			Max. Compression	10	-11.06	0.00	0.00
			Max. Mx	27	2.05	-0.26	-0.04
			Max. My	30	1.94	-0.25	-0.05
			Max. Vy	29	-0.14	-0.26	0.04
			Max. Vx	30	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	8	0.47	0.03	-0.00
			Max. Compression	9	-0.41	0.02	0.01
			Max. Mx	30	0.16	0.12	0.00
			Max. My	22	-0.33	0.03	0.01
			Max. Vy	30	-0.08	0.12	0.00
			Max. Vx	29	0.00	0.00	0.00
T12	60 - 50	Leg	Max Tension	7	128.54	0.42	0.08
			Max. Compression	10	-153.52	-0.94	0.07
			Max. Mx	10	-153.34	1.31	0.01
			Max. My	8	-13.32	-0.18	1.10
			Max. Vy	10	0.48	1.31	0.01
			Max. Vx	8	-0.38	-0.18	1.10
		Diagonal	Max Tension	13	10.47	-0.16	-0.02
			Max. Compression	10	-11.29	0.00	0.00
			Max. Mx	29	0.42	-0.38	-0.05
			Max. My	37	-3.28	-0.34	0.06

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	29	-0.17	-0.38	-0.05
			Max. Vx	37	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	8	0.72	0.04	-0.01
			Max. Compression	9	-0.63	0.05	0.02
			Max. Mx	38	0.01	0.20	0.01
			Max. My	6	-0.46	0.06	0.02
			Max. Vy	38	-0.11	0.20	0.01
			Max. Vx	29	0.00	0.00	0.00
T13	50 - 40	Leg	Max Tension	7	143.74	0.64	0.06
			Max. Compression	10	-171.81	0.09	0.14
			Max. Mx	10	-171.63	1.18	0.00
			Max. My	8	-14.06	-0.18	1.10
			Max. Vy	10	-0.48	1.18	0.00
			Max. Vx	8	0.37	-0.18	1.10
		Diagonal	Max Tension	12	10.83	0.00	0.00
			Max. Compression	10	-11.86	0.00	0.00
			Max. Mx	27	2.44	-0.34	-0.06
			Max. My	30	2.31	-0.33	-0.06
			Max. Vy	29	-0.17	-0.34	0.05
			Max. Vx	30	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	8	0.58	0.07	-0.01
			Max. Compression	9	-0.50	0.04	0.02
			Max. Mx	30	0.26	0.18	0.01
			Max. My	6	-0.37	0.07	0.02
			Max. Vy	30	-0.11	0.18	0.01
			Max. Vx	29	0.00	0.00	0.00
T14	40 - 30	Leg	Max Tension	7	159.29	-0.10	0.10
			Max. Compression	10	-190.90	-0.06	0.14
			Max. Mx	33	-10.74	-1.04	0.01
			Max. My	8	-16.40	-0.13	1.20
			Max. Vy	33	-0.26	-1.04	0.01
			Max. Vx	8	-0.28	-0.13	1.20
		Diagonal	Max Tension	10	11.87	0.00	0.00
			Max. Compression	10	-11.57	0.00	0.00
			Max. Mx	29	0.29	-0.54	-0.06
			Max. My	37	-2.78	-0.49	0.07
			Max. Vy	29	-0.21	-0.54	-0.06
			Max. Vx	37	-0.01	0.00	0.00
T15	30 - 20	Leg	Max Tension	7	173.63	-0.13	0.11
			Max. Compression	10	-208.42	-0.91	0.10
			Max. Mx	27	-98.60	-2.31	0.00
			Max. My	8	-17.09	-0.13	1.20
			Max. Vy	27	0.68	-2.31	0.00
			Max. Vx	8	0.37	-0.13	1.20
		Diagonal	Max Tension	22	11.67	0.00	0.00
			Max. Compression	10	-13.16	0.00	0.00
			Max. Mx	27	2.89	-0.41	-0.08
			Max. My	30	2.78	-0.39	-0.08
			Max. Vy	29	-0.21	-0.41	0.07
			Max. Vx	30	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	8	0.66	0.06	-0.00
			Max. Compression	9	-0.57	0.04	0.01
			Max. Mx	30	0.32	0.19	0.00
			Max. My	28	0.10	0.19	0.01
			Max. Vy	30	-0.10	0.19	0.00
			Max. Vx	28	0.00	0.00	0.00
T16	20 - 10	Leg	Max Tension	7	188.62	0.69	0.08
			Max. Compression	10	-227.48	-1.76	0.06

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	27	-103.01	-2.31	0.00
			Max. My	8	-19.81	-0.34	2.07
			Max. Vy	10	0.82	2.23	-0.01
			Max. Vx	8	-0.58	-0.34	2.07
		Diagonal	Max Tension	10	12.40	0.00	0.00
			Max. Compression	10	-12.89	0.00	0.00
			Max. Mx	28	1.48	-0.75	0.07
			Max. My	37	-4.77	-0.68	0.10
			Max. Vy	29	-0.26	-0.74	-0.08
			Max. Vx	37	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	8	1.09	0.06	-0.00
			Max. Compression	9	-0.93	0.06	0.01
			Max. Mx	27	-0.08	0.25	0.00
			Max. My	28	-0.08	0.25	0.01
			Max. Vy	27	0.11	0.25	0.00
			Max. Vx	28	0.00	0.00	0.00
T17	10 - 0	Leg	Max Tension	7	202.55	1.15	0.07
			Max. Compression	10	-245.19	0.00	-0.00
			Max. Mx	10	-244.94	2.03	0.01
			Max. My	8	-20.72	-0.34	2.07
			Max. Vy	10	-0.82	2.03	0.01
			Max. Vx	8	0.55	-0.34	2.07
		Diagonal	Max Tension	22	12.78	0.00	0.00
			Max. Compression	10	-14.67	0.00	0.00
			Max. Mx	10	11.81	-0.47	0.06
			Max. My	8	8.71	-0.41	-0.11
			Max. Vy	28	-0.22	-0.42	0.09
			Max. Vx	30	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	8	0.91	0.13	-0.01
			Max. Compression	9	-0.78	0.07	0.02
			Max. Mx	29	0.03	0.23	0.01
			Max. My	8	-0.76	0.10	0.02
			Max. Vy	29	-0.12	0.23	0.01
			Max. Vx	28	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	252.75	28.01	-18.18
	Max. H_x	18	252.75	28.01	-18.18
	Max. H_z	7	-210.04	-23.30	15.39
	Min. Vert	7	-210.04	-23.30	15.39
	Min. H_x	7	-210.04	-23.30	15.39
	Min. H_z	18	252.75	28.01	-18.18
Leg B	Max. Vert	10	254.96	-27.66	-18.72
	Max. H_x	23	-208.09	22.90	15.86
	Max. H_z	23	-208.09	22.90	15.86
	Min. Vert	23	-208.09	22.90	15.86
	Min. H_x	10	254.96	-27.66	-18.72
	Min. H_z	10	254.96	-27.66	-18.72
Leg A	Max. Vert	2	252.93	0.54	32.58
	Max. H_x	20	22.39	6.99	2.03
	Max. H_z	2	252.93	0.54	32.58

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Vert	15	-201.10	-0.49	-26.92
	Min. H_x	9	16.68	-6.94	1.54
	Min. H_z	15	-201.10	-0.49	-26.92

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	49.11	0.00	-0.00	-44.09	-22.61	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	58.93	0.02	-52.28	-4602.49	-25.80	20.49
0.9 Dead+1.0 Wind 0 deg - No Ice	44.19	0.02	-52.28	-4589.26	-19.01	20.49
1.2 Dead+1.0 Wind 30 deg - No Ice	58.93	24.83	-43.17	-3850.45	-2206.00	-19.92
0.9 Dead+1.0 Wind 30 deg - No Ice	44.19	24.83	-43.17	-3837.23	-2199.22	-19.92
1.2 Dead+1.0 Wind 60 deg - No Ice	58.93	43.38	-25.16	-2260.55	-3829.92	-66.97
0.9 Dead+1.0 Wind 60 deg - No Ice	44.19	43.38	-25.16	-2247.32	-3823.13	-66.97
1.2 Dead+1.0 Wind 90 deg - No Ice	58.93	52.45	-0.02	-51.57	-4588.81	-103.72
0.9 Dead+1.0 Wind 90 deg - No Ice	44.19	52.45	-0.02	-38.35	-4582.03	-103.72
1.2 Dead+1.0 Wind 120 deg - No Ice	58.93	46.46	26.92	2280.13	-4044.44	-91.71
0.9 Dead+1.0 Wind 120 deg - No Ice	44.19	46.46	26.92	2293.36	-4037.66	-91.71
1.2 Dead+1.0 Wind 150 deg - No Ice	58.93	24.75	43.08	3736.97	-2203.12	-58.01
0.9 Dead+1.0 Wind 150 deg - No Ice	44.19	24.75	43.08	3750.19	-2196.33	-58.01
1.2 Dead+1.0 Wind 180 deg - No Ice	58.93	-0.02	48.59	4244.85	-28.47	-20.49
0.9 Dead+1.0 Wind 180 deg - No Ice	44.19	-0.02	48.59	4258.08	-21.68	-20.49
1.2 Dead+1.0 Wind 210 deg - No Ice	58.93	-24.83	43.17	3744.64	2151.74	19.92
0.9 Dead+1.0 Wind 210 deg - No Ice	44.19	-24.83	43.17	3757.86	2158.52	19.92
1.2 Dead+1.0 Wind 240 deg - No Ice	58.93	-46.58	27.01	2280.64	3993.73	66.97
0.9 Dead+1.0 Wind 240 deg - No Ice	44.19	-46.58	27.01	2293.87	4000.52	66.97
1.2 Dead+1.0 Wind 270 deg - No Ice	58.93	-52.45	0.02	-54.24	4534.55	103.72
0.9 Dead+1.0 Wind 270 deg - No Ice	44.19	-52.45	0.02	-41.02	4541.33	103.72
1.2 Dead+1.0 Wind 300 deg - No Ice	58.93	-43.26	-25.07	-2260.04	3772.10	91.71
0.9 Dead+1.0 Wind 300 deg - No Ice	44.19	-43.26	-25.07	-2246.81	3778.88	91.71
1.2 Dead+1.0 Wind 330 deg - No Ice	58.93	-24.75	-43.08	-3842.79	2148.85	58.01
0.9 Dead+1.0 Wind 330 deg -	44.19	-24.75	-43.08	-3829.56	2155.64	58.01

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	158.60	0.00	-0.00	-233.57	-64.68	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	158.60	0.02	-11.62	-1257.17	-65.63	5.16
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	158.60	5.76	-9.98	-1116.14	-572.87	-8.15
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	158.60	10.14	-5.88	-751.73	-957.90	-21.66
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	158.60	11.93	-0.02	-234.52	-1110.60	-29.57
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	158.60	10.41	6.02	292.99	-974.36	-27.18
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	158.60	5.71	9.94	644.35	-569.09	-17.29
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	158.60	-0.02	11.25	765.64	-63.73	-5.16
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	158.60	-5.76	9.98	648.99	443.51	8.15
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	158.60	-10.46	6.07	296.78	849.66	21.66
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	158.60	-11.93	0.02	-232.62	981.25	29.57
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	158.60	-10.09	-5.83	-747.95	823.90	27.18
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	158.60	-5.71	-9.94	-1111.49	439.73	17.29
Dead+Wind 0 deg - Service	49.11	0.00	-9.01	-825.38	-22.38	3.51
Dead+Wind 30 deg - Service	49.11	4.28	-7.44	-696.31	-396.83	-3.41
Dead+Wind 60 deg - Service	49.11	7.48	-4.34	-423.24	-675.73	-11.47
Dead+Wind 90 deg - Service	49.11	9.04	-0.00	-43.86	-805.97	-17.76
Dead+Wind 120 deg - Service	49.11	8.01	4.64	356.53	-712.46	-15.70
Dead+Wind 150 deg - Service	49.11	4.27	7.43	606.81	-396.34	-9.93
Dead+Wind 180 deg - Service	49.11	-0.00	8.38	694.08	-22.84	-3.51
Dead+Wind 210 deg - Service	49.11	-4.28	7.44	608.13	351.61	3.41
Dead+Wind 240 deg - Service	49.11	-8.03	4.65	356.62	667.85	11.47
Dead+Wind 270 deg - Service	49.11	-9.04	0.00	-44.32	760.75	17.76
Dead+Wind 300 deg - Service	49.11	-7.46	-4.32	-423.15	629.90	15.70
Dead+Wind 330 deg - Service	49.11	-4.27	-7.43	-695.00	351.12	9.93

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-49.11	0.00	-0.00	49.11	0.00	0.000%
2	0.02	-58.93	-52.28	-0.02	58.93	52.28	0.000%
3	0.02	-44.19	-52.28	-0.02	44.19	52.28	0.000%
4	24.83	-58.93	-43.17	-24.83	58.93	43.17	0.000%
5	24.83	-44.19	-43.17	-24.83	44.19	43.17	0.000%
6	43.38	-58.93	-25.16	-43.38	58.93	25.16	0.000%
7	43.38	-44.19	-25.16	-43.38	44.19	25.16	0.000%
8	52.45	-58.93	-0.02	-52.45	58.93	0.02	0.000%
9	52.45	-44.19	-0.02	-52.45	44.19	0.02	0.000%
10	46.46	-58.93	26.92	-46.46	58.93	-26.92	0.000%
11	46.46	-44.19	26.92	-46.46	44.19	-26.92	0.000%
12	24.75	-58.93	43.08	-24.75	58.93	-43.08	0.000%
13	24.75	-44.19	43.08	-24.75	44.19	-43.08	0.000%
14	-0.02	-58.93	48.59	0.02	58.93	-48.59	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
15	-0.02	-44.19	48.59	0.02	44.19	-48.59	0.000%
16	-24.83	-58.93	43.17	24.83	58.93	-43.17	0.000%
17	-24.83	-44.19	43.17	24.83	44.19	-43.17	0.000%
18	-46.58	-58.93	27.01	46.58	58.93	-27.01	0.000%
19	-46.58	-44.19	27.01	46.58	44.19	-27.01	0.000%
20	-52.45	-58.93	0.02	52.45	58.93	-0.02	0.000%
21	-52.45	-44.19	0.02	52.45	44.19	-0.02	0.000%
22	-43.26	-58.93	-25.07	43.26	58.93	25.07	0.000%
23	-43.26	-44.19	-25.07	43.26	44.19	25.07	0.000%
24	-24.75	-58.93	-43.08	24.75	58.93	43.08	0.000%
25	-24.75	-44.19	-43.08	24.75	44.19	43.08	0.000%
26	0.00	-158.60	0.00	-0.00	158.60	0.00	0.000%
27	0.02	-158.60	-11.62	-0.02	158.60	11.62	0.000%
28	5.76	-158.60	-9.98	-5.76	158.60	9.98	0.000%
29	10.14	-158.60	-5.88	-10.14	158.60	5.88	0.000%
30	11.93	-158.60	-0.02	-11.93	158.60	0.02	0.000%
31	10.41	-158.60	6.02	-10.41	158.60	-6.02	0.000%
32	5.71	-158.60	9.94	-5.71	158.60	-9.94	0.000%
33	-0.02	-158.60	11.25	0.02	158.60	-11.25	0.000%
34	-5.76	-158.60	9.98	5.76	158.60	-9.98	0.000%
35	-10.46	-158.60	6.07	10.46	158.60	-6.07	0.000%
36	-11.93	-158.60	0.02	11.93	158.60	-0.02	0.000%
37	-10.09	-158.60	-5.83	10.09	158.60	5.83	0.000%
38	-5.71	-158.60	-9.94	5.71	158.60	9.94	0.000%
39	0.00	-49.11	-9.01	-0.00	49.11	9.01	0.000%
40	4.28	-49.11	-7.44	-4.28	49.11	7.44	0.000%
41	7.48	-49.11	-4.34	-7.48	49.11	4.34	0.000%
42	9.04	-49.11	-0.00	-9.04	49.11	0.00	0.000%
43	8.01	-49.11	4.64	-8.01	49.11	-4.64	0.000%
44	4.27	-49.11	7.43	-4.27	49.11	-7.43	0.000%
45	-0.00	-49.11	8.38	0.00	49.11	-8.38	0.000%
46	-4.28	-49.11	7.44	4.28	49.11	-7.44	0.000%
47	-8.03	-49.11	4.65	8.03	49.11	-4.65	0.000%
48	-9.04	-49.11	0.00	9.04	49.11	-0.00	0.000%
49	-7.46	-49.11	-4.32	7.46	49.11	4.32	0.000%
50	-4.27	-49.11	-7.43	4.27	49.11	7.43	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 145	2.159	39	0.1214	0.0231
T2	145 - 140	2.030	39	0.1211	0.0230
T3	140 - 120	1.900	39	0.1198	0.0227
T4	120 - 113.333	1.404	39	0.1094	0.0197
T5	113.333 - 106.667	1.247	39	0.1041	0.0180
T6	106.667 - 100	1.100	39	0.0975	0.0161
T7	100 - 93.3333	0.965	39	0.0899	0.0150
T8	93.3333 - 86.6667	0.837	39	0.0837	0.0131
T9	86.6667 - 80	0.716	39	0.0769	0.0110
T10	80 - 70	0.610	39	0.0693	0.0100
T11	70 - 60	0.466	39	0.0609	0.0084
T12	60 - 50	0.343	39	0.0519	0.0068
T13	50 - 40	0.238	39	0.0421	0.0056
T14	40 - 30	0.156	39	0.0319	0.0043

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T15	30 - 20	0.091	39	0.0243	0.0032
T16	20 - 10	0.045	39	0.0165	0.0020
T17	10 - 0	0.012	43	0.0083	0.0010

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150'	ANT150F2	39	2.159	0.1214	0.0231	215687
148'	(2) HBXX-6517DS-A2M w/ Mount Pipe	39	2.107	0.1213	0.0231	215687
146'	WV-CW864	39	2.056	0.1212	0.0230	215687
133'	800 10504 w/ Mount Pipe	39	1.722	0.1171	0.0220	112645
126'	BCD-87010-EDIN-X	39	1.549	0.1134	0.0209	146346
121'	AIR6449 B41_T-MOBILE w/ Mount Pipe	39	1.428	0.1102	0.0199	156086
103'	APXVAARR24_43-U-NA20 w/ Mount Pipe	39	1.025	0.0933	0.0155	58689
90'	ANT150F2	39	0.775	0.0805	0.0120	44517
83'	ANT150D3	39	0.656	0.0726	0.0104	46499
61'	BMOY8905	39	0.354	0.0529	0.0070	70555
50'	KS24019-L112A	39	0.238	0.0421	0.0056	46769

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 145	11.988	11	0.6675	0.1351
T2	145 - 140	11.284	11	0.6658	0.1342
T3	140 - 120	10.572	11	0.6593	0.1324
T4	120 - 113.333	7.851	11	0.6037	0.1150
T5	113.333 - 106.667	6.983	11	0.5747	0.1053
T6	106.667 - 100	6.168	11	0.5394	0.0940
T7	100 - 93.3333	5.419	11	0.4979	0.0876
T8	93.3333 - 86.6667	4.702	11	0.4645	0.0763
T9	86.6667 - 80	4.030	11	0.4273	0.0644
T10	80 - 70	3.435	11	0.3855	0.0582
T11	70 - 60	2.632	11	0.3396	0.0493
T12	60 - 50	1.938	11	0.2899	0.0399
T13	50 - 40	1.348	11	0.2356	0.0325
T14	40 - 30	0.888	11	0.1788	0.0250
T15	30 - 20	0.522	11	0.1364	0.0185
T16	20 - 10	0.256	11	0.0927	0.0119
T17	10 - 0	0.069	19	0.0467	0.0060

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150'	ANT150F2	11	11.988	0.6675	0.1351	39326
148'	(2) HBXX-6517DS-A2M w/ Mount Pipe	11	11.707	0.6672	0.1348	39326
146'	WV-CW864	11	11.425	0.6664	0.1344	39326
133'	800 10504 w/ Mount Pipe	11	9.597	0.6449	0.1282	20948
126'	BCD-87010-EDIN-X	11	8.648	0.6252	0.1219	29323
121'	AIR6449 B41_T-MOBILE w/ Mount Pipe	11	7.983	0.6076	0.1163	32657
103'	APXVAARR24_43-U-NA20 w/ Mount Pipe	11	5.750	0.5162	0.0904	10909
90'	ANT150F2	11	4.358	0.4470	0.0698	7981
83'	ANT150D3	11	3.694	0.4038	0.0605	8288
61'	BMOY8905	11	2.003	0.2951	0.0407	12649
50'	KS24019-L112A	11	1.348	0.2356	0.0325	8423

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	150	Diagonal	A325X	0.5000	1	1.45	5.20	0.279	1.05	Member Block Shear
		Top Girt	A325X	0.5000	1	0.28	6.20	0.045	1.05	Member Bearing
T2	145	Leg	A325X	0.6250	4	0.98	20.34	0.048	1.05	Bolt Tension
		Diagonal	A325X	0.5000	1	3.07	7.25	0.423	1.05	Member Block Shear
T3	140	Leg	A325X	0.6250	4	5.82	20.34	0.286	1.05	Bolt Tension
		Diagonal	A325X	0.5000	1	4.63	6.20	0.747	1.05	Member Bearing
		Top Girt	A325X	0.5000	1	0.78	6.20	0.126	1.05	Member Bearing
T4	120	Diagonal	A325X	0.5000	2	3.08	8.30	0.371	1.05	Member Block Shear
T5	113.333	Diagonal	A325X	0.5000	2	3.12	8.30	0.377	1.05	Member Block Shear
T6	106.667	Leg	A325X	0.7500	4	12.77	30.10	0.424	1.05	Bolt Tension
		Diagonal	A325N	0.5000	1	7.33	12.40	0.591	1.05	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	0.98	6.83	0.144	1.05	Member Block Shear
T7	100	Diagonal	A325N	0.5000	2	3.92	8.32	0.471	1.05	Member Bearing
T8	93.3333	Diagonal	A325N	0.5000	2	4.01	8.32	0.482	1.05	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	0.30	6.83	0.044	1.05	Member Block Shear
T9	86.6667	Leg	A325X	0.8750	4	20.79	41.56	0.500	1.05	Bolt Tension
		Diagonal	A325N	0.5000	1	8.52	12.40	0.687	1.05	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	0.29	6.83	0.042	1.05	Member Block Shear
T10	80	Diagonal	A325N	0.6250	1	10.04	13.92	0.722	1.05	Gusset Bearing
T11	70	Leg	A325X	0.8750	4	28.18	41.56	0.678	1.05	Bolt Tension
		Diagonal	A325N	0.6250	1	10.24	13.92	0.735	1.05	Gusset Bearing
		Secondary Horizontal	A325N	0.6250	1	0.47	7.83	0.059	1.05	Member Bearing
T12	60	Diagonal	A325N	0.6250	1	10.47	13.92	0.752	1.05	Gusset Bearing
		Secondary Horizontal	A325N	0.5000	1	0.72	8.84	0.081	1.05	Bolt Shear
T13	50	Leg	A325X	1.0000	4	35.91	54.52	0.659	1.05	Bolt Tension
		Diagonal	A325N	0.6250	1	10.83	20.88	0.519	1.05	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Secondary Horizontal	A325N	0.5000	1	0.58	8.84	0.065	1.05	Bolt Shear
T14	40	Diagonal	A325N	0.6250	1	11.87	20.88	0.568	1.05	Member Bearing
T15	30	Leg	A325X	1.0625	4	43.37	60.26	0.720	1.05	Bolt Tension
		Diagonal	A325N	0.6250	1	11.67	20.88	0.559	1.05	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	0.66	7.83	0.084	1.05	Member Bearing
T16	20	Diagonal	A325N	0.6250	1	12.40	20.88	0.594	1.05	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	1.09	7.83	0.140	1.05	Member Bearing
T17	10	Diagonal	A325N	0.6250	1	12.78	20.88	0.612	1.05	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	0.91	10.44	0.087	1.05	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	150 - 145	ROHN 2.5 STD	5'	5'	63.3 K=1.00	1.7040	-6.07	57.19	0.106 [1]
T2	145 - 140	ROHN 2.5 STD	5'	5'	63.3 K=1.00	1.7040	-7.73	57.19	0.135 [1]
T3	140 - 120	ROHN 2.5 EH	20'3/8"	6'8-5/32"	86.7 K=1.00	2.2535	-31.67	58.52	0.541 [1]
T4	120 - 113.333	ROHN 2.5 EH (GR)	6'8-5/32"	6'8-5/32"	86.7 K=1.00	2.2535	-41.59	64.40	0.646 [1]
T5	113.333 - 106.667	ROHN 2.5 EH (GR)	6'8-5/32"	6'8-5/32"	86.7 K=1.00	2.2535	-52.95	64.40	0.822 [1]
T6	106.667 - 100	ROHN 2.5 EH (GR)	6'8-5/32"	3'5-5/32"	44.6 K=1.00	2.2535	-64.25	100.07	0.642 [1]
T7	100 - 93.3333	ROHN 3 EH (GR)	6'8-5/32"	6'8-5/32"	70.5 K=1.00	3.0159	-76.98	108.23	0.711 [1]
T8	93.3333 - 86.6667	ROHN 3 EH (GR)	6'8-5/32"	3'5-1/32"	36.2 K=1.00	3.0159	-88.71	145.42	0.610 [1]
T9	86.6667 - 80	ROHN 3 EH (GR)	6'8-5/32"	3'5-1/32"	36.1 K=1.00	3.0159	-101.30	145.46	0.696 [1]
T10	80 - 70	ROHN 4 EH (GR)	10'1/4"	10'1/4"	81.4 K=1.00	4.4074	-117.04	142.77	0.820 [1]
T11	70 - 60	ROHN 4 EH (GR)	10'1/4"	5'1-29/32"	42.0 K=1.00	4.4074	-135.10	212.55	0.636 [1]
T12	60 - 50	ROHN 4 EH (GR)	10'1/4"	5'1-29/32"	41.9 K=1.00	4.4074	-153.52	212.59	0.722 [1]
T13	50 - 40	ROHN 4 EH (GR)	10'1/4"	5'1-13/16"	41.9 K=1.00	4.4074	-171.81	212.69	0.808 [1]
T14	40 - 30	ROHN 5 EH (GR)	10'1/4"	10'1/4"	65.4 K=1.00	6.1120	-190.90	246.96	0.773 [1]
T15	30 - 20	ROHN 5 EH (GR)	10'1/4"	5'1-9/16"	33.5 K=1.00	6.1120	-208.42	320.57	0.650 [1]
T16	20 - 10	ROHN 5 EH (GR)	10'1/4"	5'1-9/16'	33.4	6.1120	-227.48	320.65	0.709 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T17	10 - 0	ROHN 5 EH (GR)	10'1/4"	5'1-7/16''	K=1.00 33.4 K=1.00	6.1120	-245.19	320.71	0.765 [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	150 - 145	L1 1/2x1 1/2x3/16	9'11-1/32"	4'8-17/32"	192.9 K=1.00	0.5273	-1.42	4.06	0.351 [1]
T2	145 - 140	L2x2x3/16	9'11-1/32"	4'8-13/32"	143.3 K=1.00	0.7150	-3.13	9.97	0.314 [1]
T3	140 - 120	L2 1/2x2 1/2x3/16	12'2-17/32"	6'23/32"	146.9 K=1.00	0.9023	-4.82	11.97	0.403 [1]
T4	120 - 113.333	L2 1/2x2 1/2x3/16	12'9-3/8''	6'3-3/8"	144.7 K=0.95	0.9023	-6.25	12.34	0.507 [1]
T5	113.333 - 106.667	L2 1/2x2 1/2x3/16	13'4-7/16"	6'6-31/32"	150.1 K=0.94	0.9023	-6.23	11.47	0.543 [1]
T6	106.667 - 100	L2 1/2x2 1/2x3/16x3/16 2L 'a' > 39.6784 in - 69	13'11-17/32"	6'11-5/32"	112.7 K=1.00	1.8047	-7.80	36.74	0.212 [1]
T7	100 - 93.3333	L3x3x3/16	14'6-27/32"	7'1-13/16"	138.3 K=0.96	1.0900	-7.72	16.31	0.473 [1]
T8	93.3333 - 86.6667	L3x3x3/16	15'2-9/32"	7'5-17/32"	143.1 K=0.95	1.0900	-8.47	15.24	0.556 [1]
T9	86.6667 - 80	2L3x3x3/16x1/4 2L 'a' > 44.7872 in - 102	15'9-27/32"	7'10-3/32"	105.9 K=1.00	2.1797	-8.81	45.29	0.195 [1]
T10	80 - 70	2L3x3x3/16x1/4 2L 'a' > 51.7204 in - 114	18'2-13/32"	9'19/32"	122.3 K=1.00	2.1797	-10.06	37.33	0.270 [1]
T11	70 - 60	2L3x3x3/16x1/4 2L 'a' > 54.1213 in - 123	19'15/32"	9'5-5/8"	127.9 K=1.00	2.1797	-11.06	34.22	0.323 [1]
T12	60 - 50	2L3x3x1/4x1/4 2L 'a' > 56.8408 in - 135	19'10-29/32"	9'11-1/32"	134.0 K=1.00	2.8750	-11.29	43.95	0.257 [1]
T13	50 - 40	2L3x3x1/4x1/4 2L 'a' > 59.4205 in - 147	20'9-23/32"	10'4-7/16"	140.1 K=1.00	2.8750	-11.86	40.38	0.294 [1]
T14	40 - 30	2L3 1/2x3 1/2x1/4x1/4 2L 'a' > 61.5464 in - 159	21'8-5/8''	10'9-1/8''	125.1 K=1.00	3.3750	-11.57	57.19	0.202 [1]
T15	30 - 20	2L3 1/2x3 1/2x1/4x1/4 2L 'a' > 64.1103 in - 168	22'7-5/16"	11'2-17/32"	130.3 K=1.00	3.3750	-13.16	53.27	0.247 [1]
T16	20 - 10	2L4x4x1/4x1/4 2L 'a' > 66.6062 in - 180	23'6-1/4''	11'7-29/32"	119.0 K=1.00	3.8750	-12.89	69.52	0.185 [1]
T17	10 - 0	2L4x4x1/4x1/4 2L 'a' > 69.2011 in - 192	24'5-1/32"	12'1-5/16"	123.6 K=1.00	3.8750	-14.67	65.16	0.225 [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	106.667 - 100	L2x2x3/16	12'3"	5'10-11/16"	179.3 K=1.00	0.7150	-1.03	6.36	0.162 [1]
T8	93.3333 - 86.6667	L2x2x3/16	13'7-11/16"	6'6-23/32"	199.7 K=1.00	0.7150	-0.27	5.13	0.052 [1]
T9	86.6667 - 80	L2x2x3/16	14'4-3/32"	6'10-13/16"	210.3 K=1.00	0.7150	-0.24	4.63	0.053 [1]
T11	70 - 60	L2 1/2x2 1/2x3/16	16'2-5/32"	7'9-3/8"	188.7 K=1.00	0.9023	-0.41	7.25	0.056 [1]
T12	60 - 50	L3x3x1/4	17'2-13/32"	8'3-1/4"	169.6 K=1.00	1.4400	-0.63	14.33	0.044 [1]
T13	50 - 40	L3x3x1/4	18'2-7/8"	8'9-15/32"	180.2 K=1.00	1.4400	-0.50	12.69	0.040 [1]
T15	30 - 20	L3x3x3/16	20'3-1/4"	9'9-3/8"	196.9 K=1.00	1.0900	-0.57	8.04	0.071 [1]
T16	20 - 10	L3x3x3/16	21'3-1/4"	10'3-3/8"	207.0 K=1.00	1.0900	-0.93	7.28	0.128 [1]
T17	10 - 0	L3 1/2x3 1/2x1/4	22'3-1/4"	10'9-3/8"	186.5 K=1.00	1.6900	-0.78	13.91	0.056 [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	150 - 145	L2 1/2x2 1/2x3/16	8'6-23/32"	8'1-5/16"	196.8 K=1.00	0.9023	-0.33	6.67	0.049 [1]
T3	140 - 120	L2 1/2x2 1/2x3/16	8'6-23/32"	8'1-5/16"	196.8 K=1.00	0.9023	-0.75	6.67	0.112 [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	150 - 145	ROHN 2.5 STD	5'	5'	63.3	1.7040	0.87	76.68	0.011 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	145 - 140	ROHN 2.5 STD	5'	5'	63.3	1.7040	3.92	76.68	0.051 [1]
T3	140 - 120	ROHN 2.5 EH	20'3/8"	6'8-5/32"	86.7	2.2535	23.29	101.41	0.230 [1]
T4	120 - 113.333	ROHN 2.5 EH (GR)	6'8-5/32"	6'8-5/32"	86.7	2.2535	31.58	101.41	0.311 [1]
T5	113.333 - 106.667	ROHN 2.5 EH (GR)	6'8-5/32"	6'8-5/32"	86.7	2.2535	41.95	101.41	0.414 [1]
T6	106.667 - 100	ROHN 2.5 EH (GR)	6'8-5/32"	3'3"	42.2	2.2535	51.15	101.41	0.504 [1]
T7	100 - 93.3333	ROHN 3 EH (GR)	6'8-5/32"	6'8-5/32"	70.5	3.0159	61.56	135.72	0.454 [1]
T8	93.3333 - 86.6667	ROHN 3 EH (GR)	6'8-5/32"	3'3"	34.4	3.0159	72.28	135.72	0.533 [1]
T9	86.6667 - 80	ROHN 3 EH (GR)	6'8-5/32"	3'5-1/32"	36.1	3.0159	83.15	135.72	0.613 [1]
T10	80 - 70	ROHN 4 EH (GR)	10'1/4"	10'1/4"	81.4	4.4074	96.76	198.34	0.488 [1]
T11	70 - 60	ROHN 4 EH (GR)	10'1/4"	4'10-3/16"	39.4	4.4074	112.80	198.34	0.569 [1]
T12	60 - 50	ROHN 4 EH (GR)	10'1/4"	4'10-5/16"	39.5	4.4074	128.54	198.34	0.648 [1]
T13	50 - 40	ROHN 4 EH (GR)	10'1/4"	4'10-7/16"	39.5	4.4074	143.74	198.34	0.725 [1]
T14	40 - 30	ROHN 5 EH (GR)	10'1/4"	10'1/4"	65.4	6.1120	159.29	275.04	0.579 [1]
T15	30 - 20	ROHN 5 EH (GR)	10'1/4"	4'10-9/16"	31.9	6.1120	173.63	275.04	0.631 [1]
T16	20 - 10	ROHN 5 EH (GR)	10'1/4"	4'10-11/16"	31.9	6.1120	188.63	275.04	0.686 [1]
T17	10 - 0	ROHN 5 EH (GR)	10'1/4"	4'10-13/16"	31.9	6.1120	202.55	275.04	0.736 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 145	L1 1/2x1 1/2x3/16	9'11-1/32"	4'8-17/32"	126.6	0.3076	1.45	13.38	0.108 [1]
T2	145 - 140	L2x2x3/16	9'11-1/32"	4'8-13/32"	93.7	0.4484	3.07	19.50	0.157 [1]
T3	140 - 120	L2 1/2x2 1/2x3/16	12'2-17/32"	6'23/32"	95.0	0.5889	4.63	25.62	0.181 [1]
T4	120 - 113.333	L2 1/2x2 1/2x3/16	12'9-3/8"	6'3-3/8"	99.4	0.5889	6.16	25.62	0.241 [1]
T5	113.333 - 106.667	L2 1/2x2 1/2x3/16	13'4-7/16"	6'6-31/32"	104.0	0.5889	6.25	25.62	0.244 [1]
T6	106.667 - 100	L2 1/2x2 1/2x3/16x3/16 2L 'a' > 39.6784 in - 70	13'11-17/32"	6'11-5/32"	108.5	1.1777	7.33	51.23	0.143 [1]
T7	100 - 93.3333	L3x3x3/16	14'6-27/32"	7'1-13/16"	93.5	0.7296	7.84	31.74	0.247 [1]
T8	93.3333 - 86.6667	L3x3x3/16	15'2-9/32"	7'5-17/32"	97.5	0.7296	8.02	31.74	0.253 [1]
T9	86.6667 - 80	2L3x3x3/16x1/4	15'9-27/32"	7'10-3/32"	101.5	1.4590	8.52	63.47	0.134 [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	80 - 70	2L 'a' > 44.7872 in - 103 2L3x3x3/16x1/4	18'2-13/32"	9'19/32"	117.2	1.4238	10.04	61.94	0.162 [1]
T11	70 - 60	2L 'a' > 51.7204 in - 115 2L3x3x3/16x1/4	19'15/32"	9'5-5/8"	122.5	1.4238	10.24	61.94	0.165 [1]
T12	60 - 50	2L 'a' > 54.1213 in - 124 2L3x3x1/4x1/4	19'10-29/32"	9'11-1/32"	129.5	1.8750	10.47	81.56	0.128 [1]
T13	50 - 40	2L 'a' > 56.8408 in - 136 2L3x3x1/4x1/4	20'9-23/32"	10'4-7/16"	135.3	1.8750	10.83	81.56	0.133 [1]
T14	40 - 30	2L 'a' > 59.4205 in - 148 2L3 1/2x3 1/2x1/4x1/4	21'8-5/8"	10'9-1/8"	119.6	2.2500	11.87	97.88	0.121 [1]
T15	30 - 20	2L 'a' > 61.5464 in - 160 2L3 1/2x3 1/2x1/4x1/4	22'7-5/16"	11'2-17/32"	124.6	2.2500	11.67	97.88	0.119 [1]
T16	20 - 10	2L 'a' > 64.1103 in - 168 2L4x4x1/4x1/4	23'6-1/4"	11'7-29/32"	112.8	2.6250	12.40	114.19	0.109 [1]
T17	10 - 0	2L 'a' > 66.6062 in - 181 2L4x4x1/4x1/4 2L 'a' > 69.2011 in - 192	24'5-1/32"	12'1-5/16"	117.2	2.6250	12.78	114.19	0.112 [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	106.667 - 100	L2x2x3/16	12'3"	5'10-11/16"	233.7	0.4308	0.98	18.74	0.052 [1]
T8	93.3333 - 86.6667	L2x2x3/16	13'7-11/16"	6'6-23/32"	259.7	0.4308	0.30	18.74	0.016 [1]
T9	86.6667 - 80	L2x2x3/16	14'4-3/32"	6'10-13/16"	273.2	0.4308	0.29	18.74	0.015 [1]
T11	70 - 60	L2 1/2x2 1/2x3/16	16'2-5/32"	7'9-3/8"	243.7	0.5713	0.47	24.85	0.019 [1]
T12	60 - 50	L3x3x1/4	17'2-13/32"	8'3-1/4"	218.0	0.9628	0.72	41.88	0.017 [1]
T13	50 - 40	L3x3x1/4	18'2-7/8"	8'9-15/32"	231.5	0.9628	0.58	41.88	0.014 [1]
T15	30 - 20	L3x3x3/16	20'3-1/4"	9'9-3/8"	253.1	0.7120	0.66	30.97	0.021 [1]
T16	20 - 10	L3x3x3/16	21'3-1/4"	10'3-3/8"	265.9	0.7120	1.09	30.97	0.035 [1]
T17	10 - 0	L3 1/2x3 1/2x1/4	22'3-1/4"	10'9-3/8"	240.1	1.1269	0.91	49.02	0.018 [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	150 - 145	L2 1/2x2 1/2x3/16	8'6-23/32"	8'1-5/16'	128.3	0.5889	0.28	25.62	0.011 [1]
T3	140 - 120	L2 1/2x2 1/2x3/16	8'6-23/32"	8'1-5/16'	128.3	0.5889	0.78	25.62	0.031 [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	150 - 145	Leg	ROHN 2.5 STD	3	-6.07	60.05	10.1	Pass
T2	145 - 140	Leg	ROHN 2.5 STD	15	-7.73	60.05	12.9	Pass
T3	140 - 120	Leg	ROHN 2.5 EH	24	-31.67	61.44	51.5	Pass
T4	120 - 113.333	Leg	ROHN 2.5 EH (GR)	48	-41.59	67.62	61.5	Pass
T5	113.333 - 106.667	Leg	ROHN 2.5 EH (GR)	57	-52.95	67.61	78.3	Pass
T6	106.667 - 100	Leg	ROHN 2.5 EH (GR)	66	-64.25	105.07	61.1	Pass
T7	100 - 93.3333	Leg	ROHN 3 EH (GR)	78	-76.98	113.64	67.7	Pass
T8	93.3333 - 86.6667	Leg	ROHN 3 EH (GR)	87	-88.71	152.69	58.1	Pass
T9	86.6667 - 80	Leg	ROHN 3 EH (GR)	99	-101.30	152.73	66.3	Pass
T10	80 - 70	Leg	ROHN 4 EH (GR)	111	-117.04	149.91	78.1	Pass
T11	70 - 60	Leg	ROHN 4 EH (GR)	120	-135.10	223.18	60.5	Pass
T12	60 - 50	Leg	ROHN 4 EH (GR)	131	-153.52	223.22	68.8	Pass
T13	50 - 40	Leg	ROHN 4 EH (GR)	143	-171.81	223.32	76.9	Pass
T14	40 - 30	Leg	ROHN 5 EH (GR)	155	-190.90	259.31	73.6	Pass
T15	30 - 20	Leg	ROHN 5 EH (GR)	164	-208.42	336.60	61.9	Pass
T16	20 - 10	Leg	ROHN 5 EH (GR)	176	-227.48	336.68	67.6	Pass
T17	10 - 0	Leg	ROHN 5 EH (GR)	188	-245.19	336.75	72.8	Pass
T1	150 - 145	Diagonal	L1 1/2x1 1/2x3/16	12	-1.42	4.26	33.4	Pass
T2	145 - 140	Diagonal	L2x2x3/16	20	-3.13	10.47	29.9	Pass
T3	140 - 120	Diagonal	L2 1/2x2 1/2x3/16	33	-4.82	12.57	38.3	Pass
T4-T5	120 - 106.667	Diagonal	L2 1/2x2 1/2x3/16	Note 1	Note 1	Note 1	58.6	Pass
T6	106.667 - 100	Diagonal	L2 1/2x2 1/2x3/16x3/16	69	-7.80	38.58	20.2	Pass
T7-T8	100 - 86.6667	Diagonal	L3x3x3/16	Note 1	Note 1	Note 1	76.3	Pass
T9	86.6667 - 80	Diagonal	2L3x3x3/16x1/4	102	-8.81	47.56	18.5	Pass
T10	80 - 70	Diagonal	2L3x3x3/16x1/4	114	-10.06	39.20	25.7	Pass
T11	70 - 60	Diagonal	2L3x3x3/16x1/4	123	-11.06	35.93	30.8	Pass
T12	60 - 50	Diagonal	2L3x3x1/4x1/4	135	-11.29	46.14	24.5	Pass
T13	50 - 40	Diagonal	2L3x3x1/4x1/4	147	-11.86	42.40	28.0	Pass
T14	40 - 30	Diagonal	2L3 1/2x3 1/2x1/4x1/4	159	-11.57	60.05	19.3	Pass
T15	30 - 20	Diagonal	2L3 1/2x3 1/2x1/4x1/4	168	-13.16	55.93	23.5	Pass
T16	20 - 10	Diagonal	2L4x4x1/4x1/4	180	-12.89	73.00	17.7	Pass
T17	10 - 0	Diagonal	2L4x4x1/4x1/4	192	-14.67	68.42	21.4	Pass
T6	106.667 - 100	Secondary Horizontal	L2x2x3/16	74	-1.03	6.68	15.4	Pass
T8	93.3333 - 86.6667	Secondary Horizontal	L2x2x3/16	94	-0.27	5.39	5.0	Pass
T9	86.6667 - 80	Secondary Horizontal	L2x2x3/16	108	-0.24	4.86	5.0	Pass
T11	70 - 60	Secondary Horizontal	L2 1/2x2 1/2x3/16	129	-0.41	7.61	5.4	Pass
T12	60 - 50	Secondary Horizontal	L3x3x1/4	141	-0.63	15.05	4.2	Pass
T13	50 - 40	Secondary Horizontal	L3x3x1/4	153	-0.50	13.32	3.8	Pass

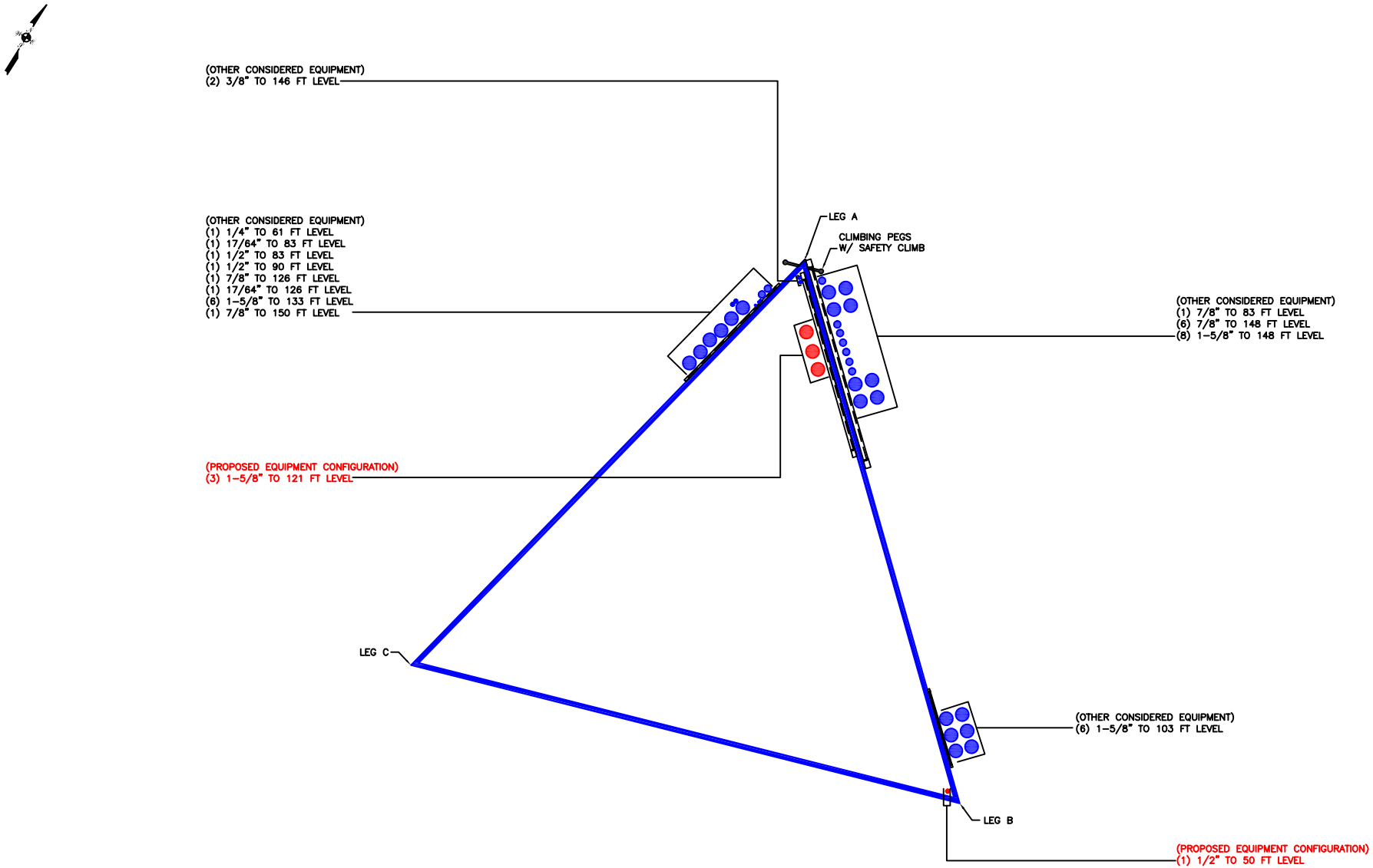
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T15	30 - 20	Secondary Horizontal	L3x3x3/16	174	-0.57	8.45	6.7	Pass
T16	20 - 10	Secondary Horizontal	L3x3x3/16	186	-0.93	7.64	12.2	Pass
T17	10 - 0	Secondary Horizontal	L3 1/2x3 1/2x1/4	198	-0.78	14.61	5.4	Pass
T1	150 - 145	Top Girt	L2 1/2x2 1/2x3/16	4	-0.33	7.00	4.7	Pass
T3	140 - 120	Top Girt	L2 1/2x2 1/2x3/16	27	-0.75	7.00	10.7	Pass
							Summary	
						Leg (T5)	78.3	Pass
						Diagonal (T7-T8)	76.3	Pass
						Secondary Horizontal (T6)	15.4	Pass
						Top Girt (T3)	10.7	Pass
						Bolt Checks	71.6	Pass
						RATING =	**78.3**	**Pass**

Notes:

1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(2) 3/8" TO 146 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1/4" TO 61 FT LEVEL
(1) 17/64" TO 83 FT LEVEL
(1) 1/2" TO 83 FT LEVEL
(1) 1/2" TO 90 FT LEVEL
(1) 7/8" TO 126 FT LEVEL
(1) 17/64" TO 126 FT LEVEL
(6) 1-5/8" TO 133 FT LEVEL
(1) 7/8" TO 150 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(3) 1-5/8" TO 121 FT LEVEL
LEG A
CLIMBING PEGS
W/ SAFETY CLIMB
(OTHER CONSIDERED EQUIPMENT)
(1) 7/8" TO 83 FT LEVEL
(6) 7/8" TO 148 FT LEVEL
(8) 1-5/8" TO 148 FT LEVEL
LEG C
(OTHER CONSIDERED EQUIPMENT)
(6) 1-5/8" TO 103 FT LEVEL
LEG B
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1/2" TO 50 FT LEVEL

APPENDIX C

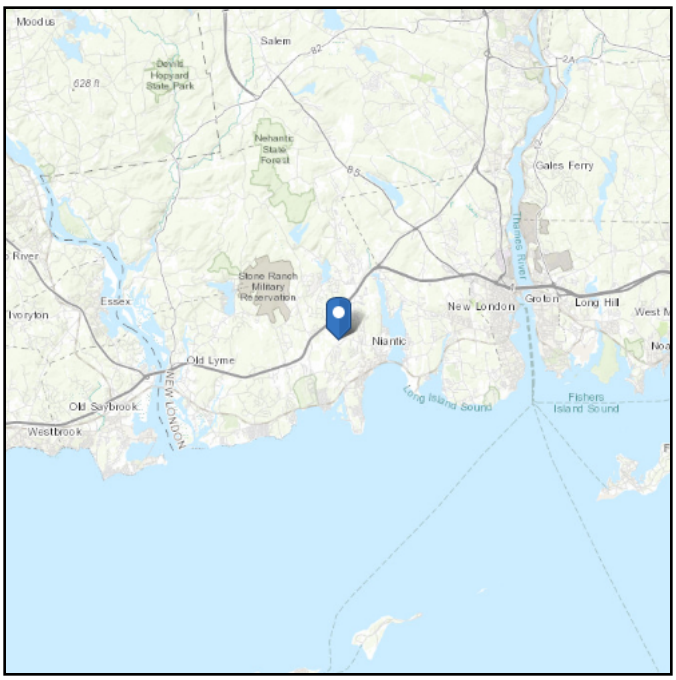
ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: III
Soil Class: D - Stiff Soil

Elevation: 173.19 ft (NAVD 88)
Latitude: 41.335653
Longitude: -72.221744



Wind

Results:

Wind Speed:	144 Vmph	*145 mph per jurisdiction requirements
10-year MRI	79 Vmph	
25-year MRI	89 Vmph	
50-year MRI	98 Vmph	
100-year MRI	108 Vmph	

Data Source: ASCE/SEI 7-10, Fig. 26.5-1B and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

Date Accessed: Thu May 20 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 3% probability of exceedance in 50 years (annual exceedance probability = 0.000588, MRI = 1,700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings in health-care facilities shall be protected against wind-borne debris as specified in Section 26.10.3.

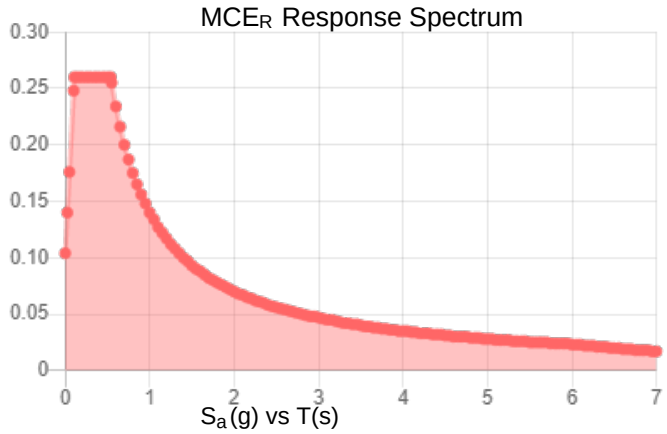
Seismic

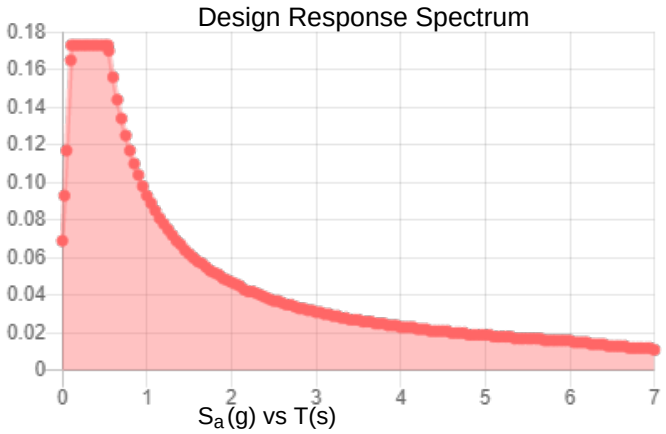
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.162	S_{DS} :	0.173
S_1 :	0.058	S_{D1} :	0.093
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.081
S_{MS} :	0.26	PGA_M :	0.13
S_{M1} :	0.14	F_{PGA} :	1.6
		I_e :	1.25

Seismic Design Category B





Data Accessed: Thu May 20 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Thu May 20 2021

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Project Name:	NLN 136 943455	**Engineer:**	APJ
Project Number:	TEP No. 45439.546124	**Check:**	ZSC
Client Site Number:	BU 806384	**Date:**	5/21/2021

Double Angle Member Connection Check

Input - Properties

Elevation:	106.67-120	ft - elevation of angle brace
F_y:	36.00	ksi - yield stress of angle brace
F_u:	58.00	ksi - tensile stress of angle brace
Member Size:	L2-1/2X2-1/2X3/16	- member considered (connecting leg first)
Type:	Double	- member type (single or double angle)
d_{bolt}:	0.500	in - bolt diameter
Type:	A325-N	- bolt type (X - threads excluded, N - threads included)
n:	1	- number of bolts in a single line
d_{hole}:	0.5625	in - drill hole diameter
Min. Edge:	0.750	in - minimum edge distance (center of hole to edge of member)
Bolt Spacing:		in - minimum bolt spacing (center to center)
Gage:	0.940	in - gage distance (heel of angle to center of hole)
Gusset thickness:	0.250	in
Gusset Min. Edge	0.875	in

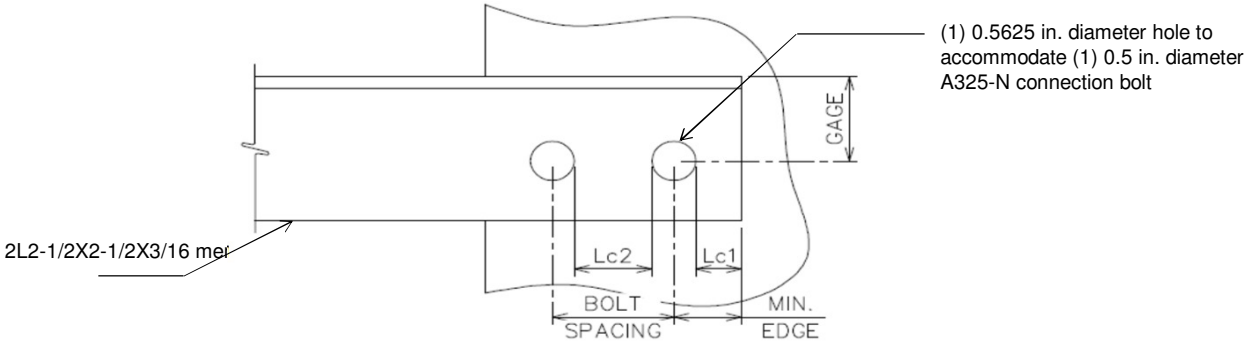
Input - Loads

Code:	TIA-H	- select version of the TIA
T_u:	6.16	kips - maximum leg tension load
P_u:	6.25	kips - maximum leg compression load
ASIF:	1.33	< = = DISREGARD
z	0.75	- shear lag coefficient
U_{bs}:	1.00	- shear lag coefficient for block shear
ϕ_t:	0.90	- tension yielding
ϕ_t:	0.75	- tension rupture
ϕ_{bs}:	0.75	- block shear
ϕ_{br}:	0.80	- bearing/tear out
ϕ_b:	0.75	- bolt shear
AISC Minimums?:	No	- Use AISC Minimums for Min. Edge, Bolt Spacing, and Gage?

Member Properties:

A_g:	0.900	in^2 - gross area of a single angle brace
A_e:	0.587	in^2 - net area of a single angle brace
A_{gv}:	0.141	in^2 - gross area subjected to shear of a single angle brace
A_{nv}:	0.082	in^2 - net area subjected to shear of a single angle brace
A_{nt}:	0.234	in^2 - net area subjected to tension of a single angle brace
L_{c1}:	0.469	in - clear edge distance of a single angle brace
L_{c2}:	0.000	in - clear edge distance between bolts of a single angle brace

D:	2.50	in - width of angle brace
t:	0.1875	in - thickness of angle brace
Min. Edge:	0.750	in - minimum edge distance (center of hole to edge of member)
Bolt Spacing:	0.000	in - minimum edge distance (center of hole to edge of member)
Gage:	0.940	in - gage distance (heel of angle to center of hole)
$L_{c1gusset}$:	0.594	in



Project Name:	NLN 136 943455	**Engineer:**	APJ
Project Number:	TEP No. 45439.546124	**Check:**	ZSC
Client Site Number:	BU 806384	**Date:**	5/21/2021

Double Angle Member Connection Check

Gusset Capacity:

Tension Bearing/Tear Out = (2)ASIF(MIN((Le)(Fu)/(2)(t) , (1.2)(dbolt)(t)(Fu)) =

Bearing/Tear Out = (2)1.333(MIN((0.875 in)(58 ksi)/(2)(0.25 in),(1.2)(0.5 in)(0.25 in)(58 ksi) + (n-1)MIN((0 in)(58 ksi)/(2)(0.25 in),(1.2)(0.5 in)(0.25 in)(58 ksi) = **10.01** kips

Compression Bearing/Tear Out = (2)ASIF(MIN((Le)(Fu)/(2)(t) , (1.2)(dbolt)(t)(Fu)) =

Bearing/Tear Out = (2)1.333((1.2)(0.5 in)(0.1875 in)(58 ksi) + (n-1)MIN((0 in)(58 ksi)/(2)(0.1875 in),(1.2)(0.5 in)(0.1875 in)(58 ksi) = **13.92** kips

Summary:

		Stress Ratio
Gusset Tension:	**6.16 < 10.01 (Pass)**	**58.6%**
Gusset Compression:	**6.25 < 13.92 (Pass)**	42.8%

Project Name:	NLN 136 943455	**Engineer:**	APJ
Project Number:	TEP No. 45439.546124	**Check:**	ZSC
Client Site Number:	BU 806384	**Date:**	5/21/2021

Single Angle Member Connection Check

Input - Properties

Elevation:	86.67-100	ft - elevation of angle brace
F_y:	36.00	ksi - yield stress of angle brace
F_u:	58.00	ksi - tensile stress of angle brace
Member Size:	L3X3X3/16	- member considered (connecting leg first)
Type:	Single	- member type (single or double angle)
d_{bolt}:	0.500	in - bolt diameter
Type:	A325-N	- bolt type (X - threads excluded, N - threads included)
n:	1	- number of bolts in a single line
d_{hole}:	0.5625	in - drill hole diameter
Min. Edge:	0.750	in - minimum edge distance (center of hole to edge of member)
Bolt Spacing:		in - minimum bolt spacing (center to center)
Gage:	1.000	in - gage distance (heel of angle to center of hole)
Gusset thickness:	0.250	in
Gusset Min. Edge	0.875	in

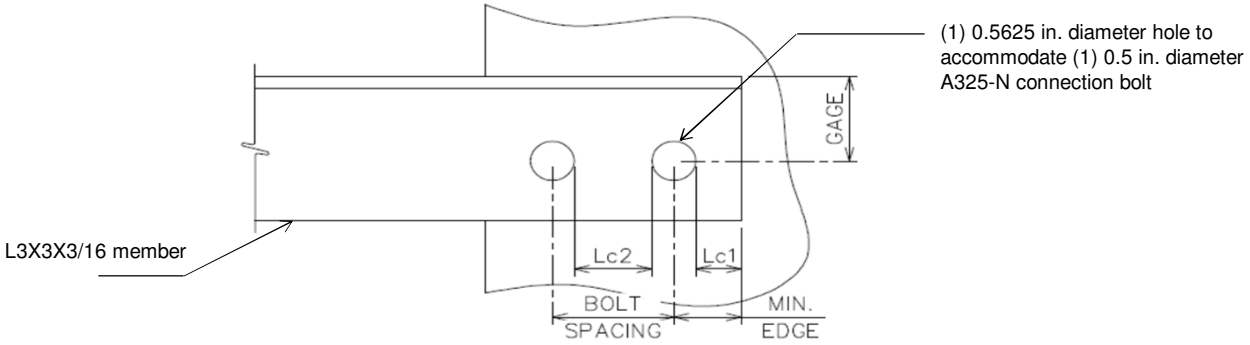
Input - Loads

Code:	TIA-H	- select version of the TIA
T_u:	8.02	kips - maximum leg tension load
P_u:	8.47	kips - maximum leg compression load
ASIF:	1.33	< = = DISREGARD
z	0.75	- shear lag coefficient
U_{bs}:	1.00	- shear lag coefficient for block shear
ϕ_t:	0.90	- tension yielding
ϕ_t:	0.75	- tension rupture
ϕ_{bs}:	0.75	- block shear
ϕ_{br}:	0.80	- bearing/tear out
ϕ_b:	0.75	- bolt shear
AISC Minimums?:	No	- Use AISC Minimums for Min. Edge, Bolt Spacing, and Gage?

Member Properties:

A_g:	1.090	in^2 - gross area of a single angle brace
A_e:	0.730	in^2 - net area of a single angle brace
A_{gv}:	0.141	in^2 - gross area subjected to shear of a single angle brace
A_{nv}:	0.082	in^2 - net area subjected to shear of a single angle brace
A_{nt}:	0.316	in^2 - net area subjected to tension of a single angle brace
L_{c1}:	0.469	in - clear edge distance of a single angle brace
L_{c2}:	0.000	in - clear edge distance between bolts of a single angle brace

D:	3.00	in - width of angle brace
t:	0.1875	in - thickness of angle brace
Min. Edge:	0.750	in - minimum edge distance (center of hole to edge of member)
Bolt Spacing:	0.000	in - minimum edge distance (center of hole to edge of member)
Gage:	1.000	in - gage distance (heel of angle to center of hole)
$L_{c1gusset}$:	0.594	in



Project Name:	NLN 136 943455	**Engineer:**	APJ
Project Number:	TEP No. 45439.546124	**Check:**	ZSC
Client Site Number:	BU 806384	**Date:**	5/21/2021

Single Angle Member Connection Check

Summary:

		Stress Ratio
Gusset Tension:	**8.02 < 10.01 (Pass)**	**76.3%**
Gusset Compression:	**8.47 < 13.92 (Pass)**	58.0%

Self Support Anchor Rod Capacity

Site Info	
BU #	806384
Site Name	NLN 136 943455
Order #	557902 Rev.0

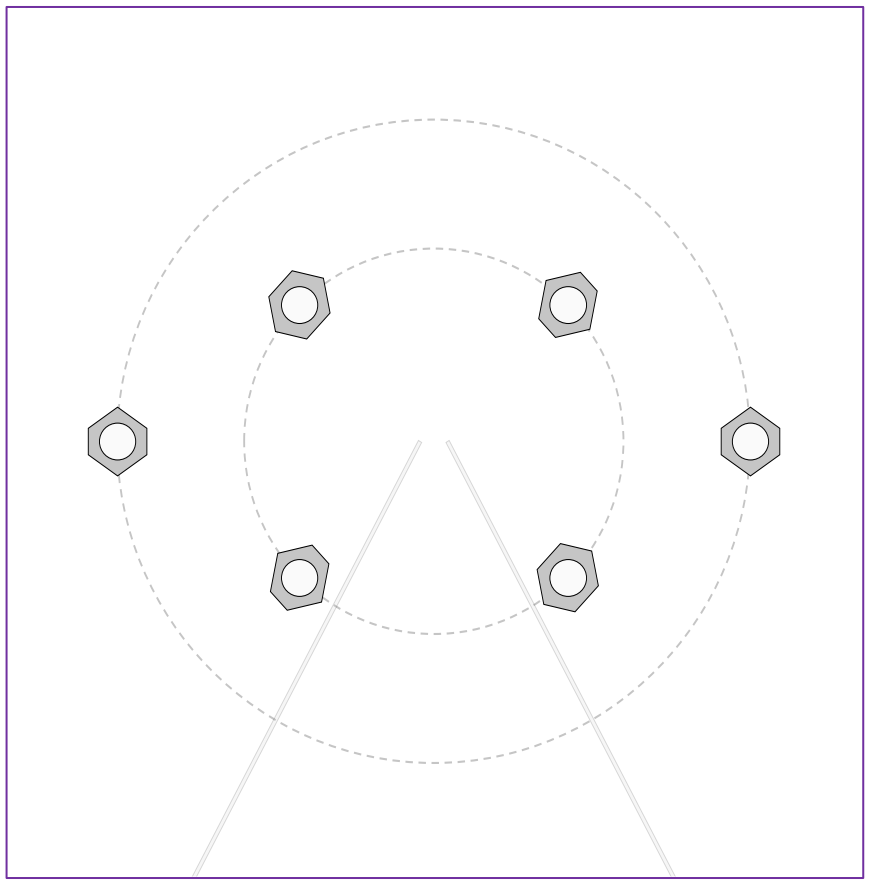
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
l_{ar} (in)	See Custom Sheet

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	255.00	210.00
Shear Force (kips)	33.00	28.00

**TIA-222-H Section 15.5 Applied*

Considered Eccentricity	
Leg Mod Eccentricity (in)	0.000
Anchor Rod N.A Shift (in)	0.000
Total Eccentricity (in)	0.000

**Anchor Rod Eccentricity Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (4) 1" ø bolts (A193 Gr. B7 N; Fy=105 ksi, Fu=125 ksi) on 10.5" BC

l_{ar} (in): 2.5

GROUP 2: (2) 1" ø bolts (A193 Gr. B7 N; Fy=105 ksi, Fu=125 ksi) on 17.5" BC

pos. (deg): 0, 180

l_{ar} (in): 0

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

GROUP 1:

Pu_t = 35	ϕPn_t = 56.81	**Stress Rating**
Vu = 7	ϕVn = 36.82	**58.7%**
Mu = n/a	ϕMn = n/a	**Pass**

GROUP 2:

Pu_t = 35	ϕPn_t = 56.81	**Stress Rating**
Vu = 0	ϕVn = 36.82	**58.7%**
Mu = n/a	ϕMn = n/a	**Pass**

CCIplate

Elevation (ft)	0	*(Base)*

note: Bending interaction not considered when Grout Considered = "Yes"

Bolt Group	Resist Axial	Resist Shear	Grout Considered
1	Yes	Yes	Yes
2	Yes	No	No

Leg Mod Eccentricity (in)

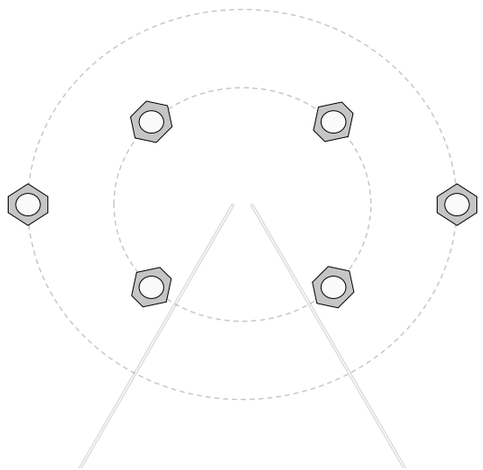
☑ Consider Anchor Rod Eccentricity

Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, η:	l_{ar} (in):	Thread Type	Area Override, in^2	Tension Only
1	1	45	1	A193 Gr. B7	10.5	0.5	2.5	N-Included		No
2	1	135	1	A193 Gr. B7	10.5	0.5	2.5	N-Included		No
3	1	225	1	A193 Gr. B7	10.5	0.5	2.5	N-Included		No
4	1	315	1	A193 Gr. B7	10.5	0.5	2.5	N-Included		No
5	2	0	1	A193 Gr. B7	17.5	0.5	0	N-Included		No
6	2	180	1	A193 Gr. B7	17.5	0.5	0	N-Included		No

note: For Self-Support towers, only one direction is checked (in+out of the tower) so please use the Plot Graphic button to confirm Anchor Rod placement.

Plot Graphic



Pier and Pad Foundation

BU # :	806384
Site Name:	NLN 136 943455
App. Number:	557902 Rev.0

TIA-222 Revision:	H
Tower Type:	Self Support

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐
Rectangular Pad?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	255	kips
Compression Shear, Vu_comp:	33	kips
Uplift, P_{uplift}:	210	kips
Uplift Shear, V_{u_uplift}:	28	kips
Tower Height, **H**:	150	ft
Base Face Width, **BW**:	22.7813	ft
BP Dist. Above Fdn, bp_{dist}:	3.5	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	3	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	9	
Pier Rebar Quantity, **mc**:	12	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	14	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	12	ft
Pad Width, W_1:	8.25	ft
Pad Thickness, **T**:	2	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	7	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	9	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	3	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	131	pcf
Ultimate Gross Bearing, Qult:	12.000	ksf
Cohesion, **Cu**:		ksf
Friction Angle, φ:	31	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.3	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	N/A	ft

<--Toggle between Gross and Net

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Uplift (kips)	245.01	210.00	**81.6%**	**Pass**
Lateral (Sliding) (kips)	96.64	28.00	**27.6%**	**Pass**
Bearing Pressure (ksf)	9.00	5.71	**60.4%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	854.53	346.50	**38.6%**	**Pass**
*Pier Flexure (Tension) (kip*ft)*	516.35	294.00	**54.2%**	**Pass**
Pier Compression (kip)	1708.19	268.36	**15.0%**	**Pass**
*Pad Flexure (kip*ft)*	462.81	107.43	**22.1%**	**Pass**
Pad Shear - 1-way (kips)	160.13	30.69	**18.3%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.059	**34.1%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	925.63	207.90	**21.4%**	**Pass**
Pad Shear - 2-way (Uplift) (ksi)	0.164	0.080	**46.6%**	**Pass**
*Flexural 2-way (Tension) (kip*ft)*	925.63	176.40	**18.1%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Soil Rating*:	**81.6%**
Structural Rating*:	**54.2%**

Exhibit E

Mount Analysis

Date: **April 30, 2021**

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Darcy Tarr
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6589

Infinigy Engineering, PLLC
1033 Watervliet Shaker Road
Albany, NY 12205
518-690-0790
structural@infinigy.com

Subject:	**Mount Analysis Report**	
Carrier Designation:	**T-Mobile Retain**	
	Carrier Site Number:	CTNL037A
	Carrier Site Name:	CTNL037A
Crown Castle Designation:	**Crown Castle BU Number:**	806384
	Crown Castle Site Name:	NLN 136 943455
	Crown Castle JDE Job Number:	650687
	Crown Castle Order Number:	557902 Rev. 0
Engineering Firm Designation:	**Infinigy Engineering, PLLC Report Designation:** 1039-Z0001-B	
Site Data:	**93 Roxbury Road**, **East Lyme**, **New London County**, **CT**, **06357** **Latitude 41°20'8.35", Longitude -72°13'18.28"**	
Structure Information:	**Tower Height & Type:**	**151.3 ft Self Support**
	Mount Elevation:	**121.0 ft**
	Mount Type:	**12.0 ft Sector Frame**

Dear Darcy Tarr,

Infinigy Engineering, PLLC is pleased to submit this **"Mount 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.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Sector Frame **Sufficient**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code and Appendix N based upon an ultimate 3-second gust wind speed of 145 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Jacques S. Grimaldi, M.S., P.E.

Respectfully Submitted by:
Emmanuel Poulin, P.E.
518-690-0790
structural@infinigy.com
CT PE License No. 22947

TABLE OF CONTENTS

1) INTRODUCTION

This is an existing 3 sector 12.0 ft Sector Frame, designed by Rohn.

2) ANALYSIS CRITERIA

Building Code: 2015 IBC / 2018 Connecticut State Building Code and Appendix N
TIA-222 Revision: TIA-222-H
Risk Category: III
Ultimate Wind Speed: 145 mph
Exposure Category: B
Topographic Factor at Base: 1.0
Topographic Factor at Mount: 1.0
Ice Thickness: 1.5 in
Wind Speed with Ice: 50 mph
Seismic S_s: 0.164
Seismic S_1: 0.059
Live Loading Wind Speed: 30 mph
Man Live Load at Mid/End-Points: 250 lb
Man Live Load at Mount Pipes: 500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
121.0	122.0	3	Ericsson	AIR6449 B41_T-MOBILE	12.0 ft Sector Frame
		3	RFS/Celwave	APX16DWV-16DWV-S-E-A20	
		3	RFS/Celwave	APXVAALL24_43-U-NA20_ TMO	
		3	Ericsson	RADIO 4415 B66A_CCIV3	
		3	Ericsson	RADIO 4424 B25_TMOV1	
		3	Ericsson	RADIO 4449 B71 B85A_ T-MOBILE	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	557902 Rev. 0	CCI Sites
Loading Document	T-Mobile	RFDS Version: 1	TSA
Tower Manufacturer Drawings	Rohn	258359	CCI Sites

3.1) Analysis Method

RISA-3D (Version 19.0.1), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

Infinigy Mount Analysis Tool V2.1.6, a tool internally developed by Infinigy, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B “Software Input Calculations”.

This analysis was performed in accordance with Crown Castle’s ENG-SOW-10208 *Tower Mount Analysis* (Revision 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 Table 1 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 analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A307

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

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Sector Frame, All Sectors)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2	Mount Pipe(s)	MP2	121.0	53.1	Pass
	Horizontal(s)	M1		33.1	Pass
	Sidearm(s)	M20		30.9	Pass
	Bracing(s)	M23		40.2	Pass
	Mount Connection(s)	-		23.1	Pass

Structure Rating (max from all components) =	53.1%

Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) See additional documentation in “Appendix D - Additional Calculations” for detailed mount connection calculations.

Table 4 - Tieback Connection Data Table

Tower Connection Node No.	Existing / Proposed	Resultant End Reaction (lb)	Connected Member Type	Connected Member Size	Member Compressive Capacity (lb)	Notes
N51	Existing	1,151.8	Leg	ROHN 2.5 EH	3,072.0	1, 2

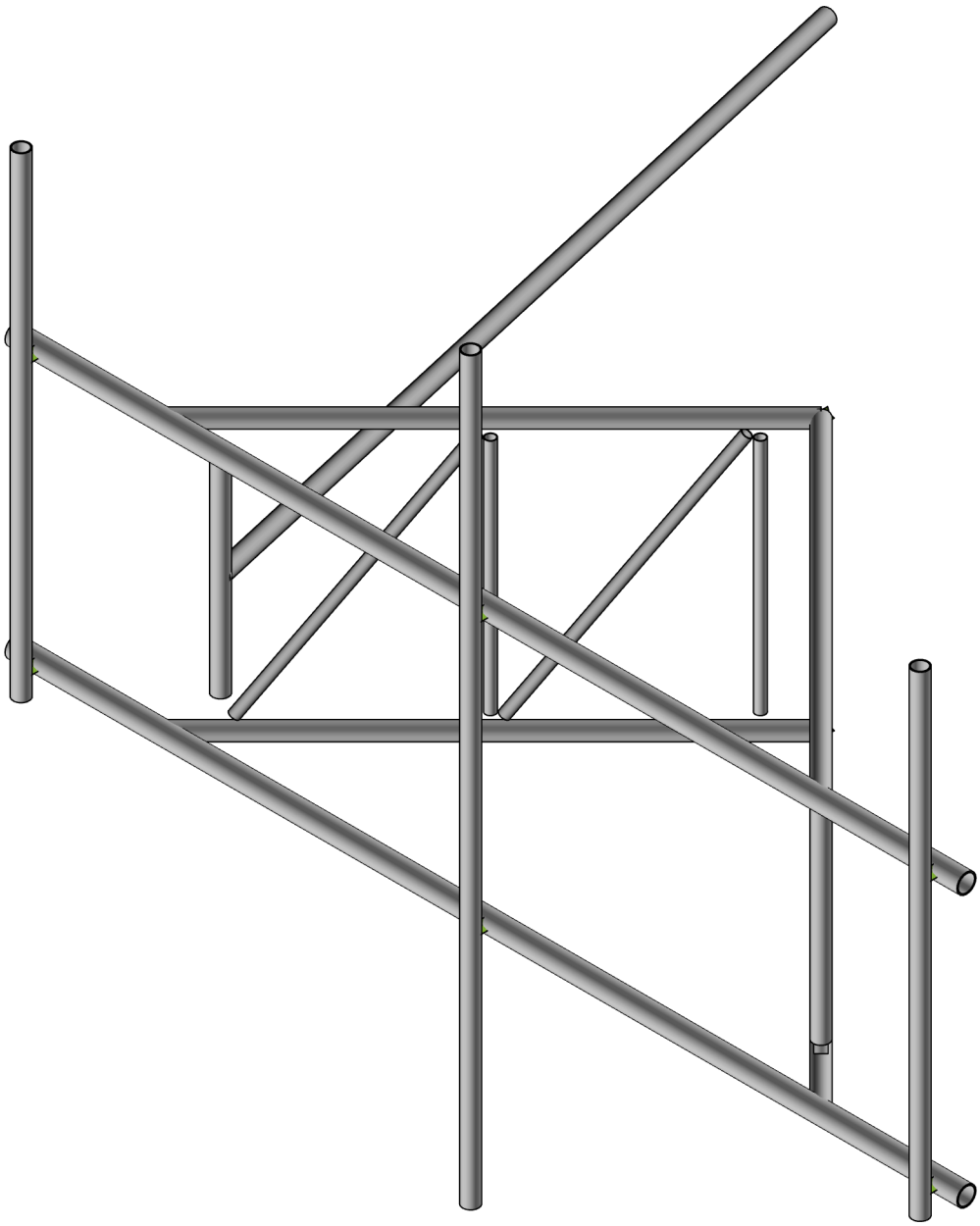
Notes:
1) Tieback connection point is within 25% of either end of the connected tower member.
2) Reduced member compressive capacity according to CED-STD-10294 *Standard for Installation of Mounts and Appurtenances.*

4.1) Recommendations

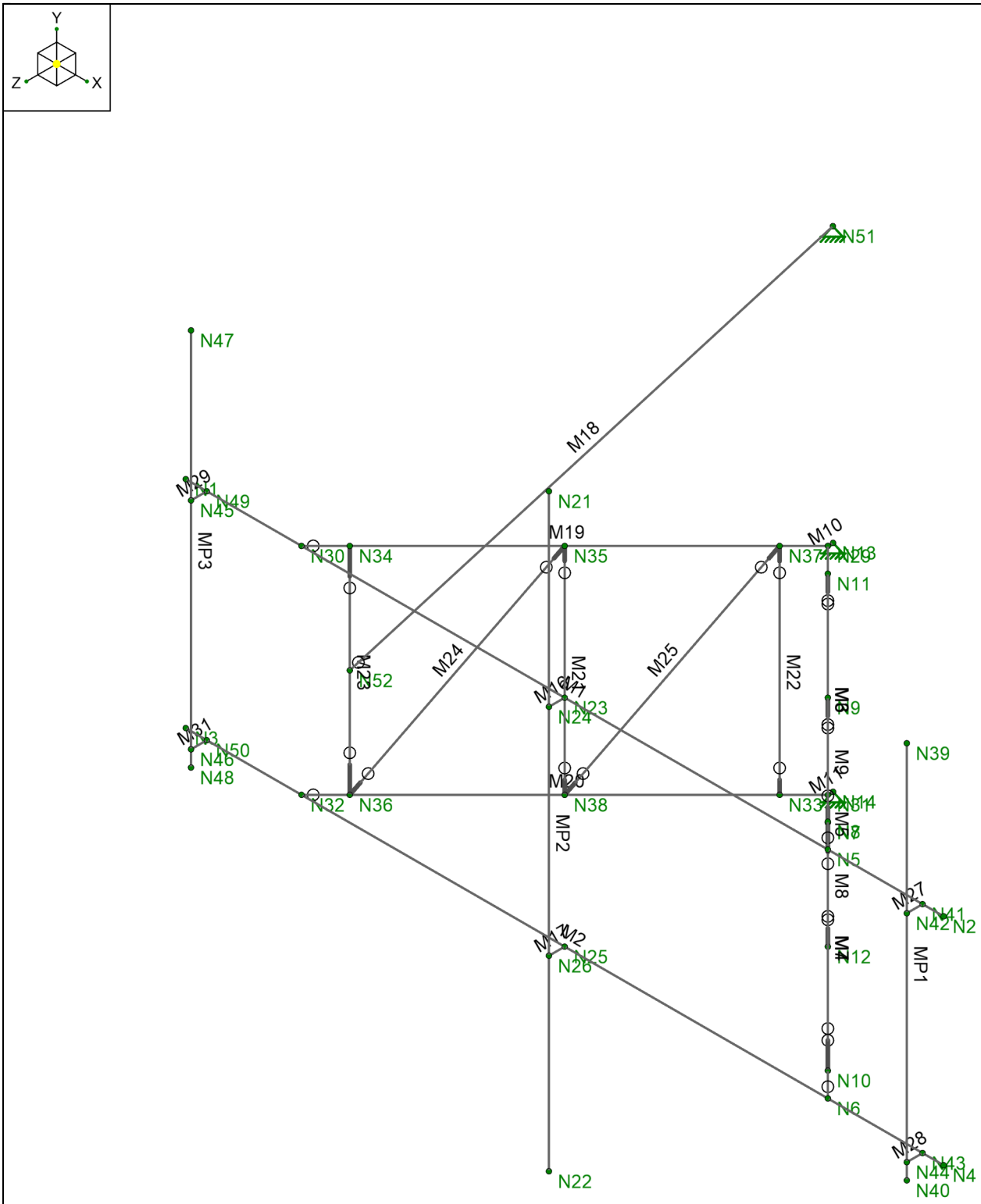
The mount has sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

APPENDIX A

WIRE FRAME AND RENDERED MODELS



Infinigy Engineering, PLLC	806384	Render
JG		Apr 30, 2021
1039-Z0001-B		806384_loaded.r3d



Infinigy Engineering, PLLC	806384	Wireframe
JG		Apr 30, 2021
1039-Z0001-B		806384_loaded.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION	
Client:	Crown Castle
Carrier:	T-Mobile
Engineer:	Jacques Grimaldi

SITE INFORMATION		
Risk Category:	III	
Exposure Category:	B	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	173.19	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Sector Frame	
Num Sectors:	3	
Centerline AGL:	121.00	ft
Tower Height AGL:	151.30	ft

TOPOGRAPHIC DATA		
Topo Feature:	N/A	
Slope Distance:	N/A	ft
Crest Distance:	N/A	ft
Crest Height:	N/A	ft

FACTORS		
Directionality Fact. (K_d):	0.950	
Ground Ele. Factor (K_e):	0.994	*Rev H Only
Rooftop Speed-Up (K_s):	1.000	*Rev H Only
Topographic Factor (K_{zt}):	1.000	
Gust Effect Factor (G_h):	1.000	

CODE STANDARDS		
Building Code:	2015 IBC	
TIA Standard:	TIA-222-H	
ASCE Standard:	ASCE 7-10	

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	145	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	1.5	in
Flat Pressure:	106.052	psf
Round Pressure:	63.631	psf
Ice Wind Pressure:	7.566	psf

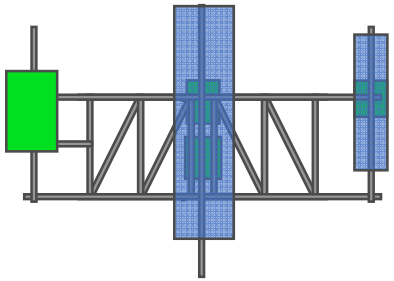
SEISMIC DATA		
Short-Period Accel. (S_s):	0.164	g
1-Second Accel. (S_1):	0.059	g
Short-Period Design (S_{DS}):	0.175	
1-Second Design (S_{D1}):	0.094	
Short-Period Coeff. (F_a):	1.600	
1-Second Coeff. (F_v):	2.400	
Amplification Factor (A_s):	3.000	
Response Mod. Coeff. (R):	2.000	

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

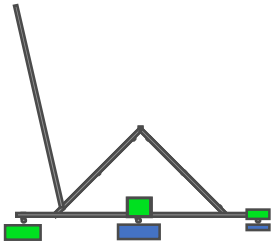
Infinigy Load Calculator V2.1.6

Program Inputs

ELEVATION VIEW



PLAN VIEW



INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Infinigy Load Calculator V2.1.6

APPURTENANCE INFORMATION

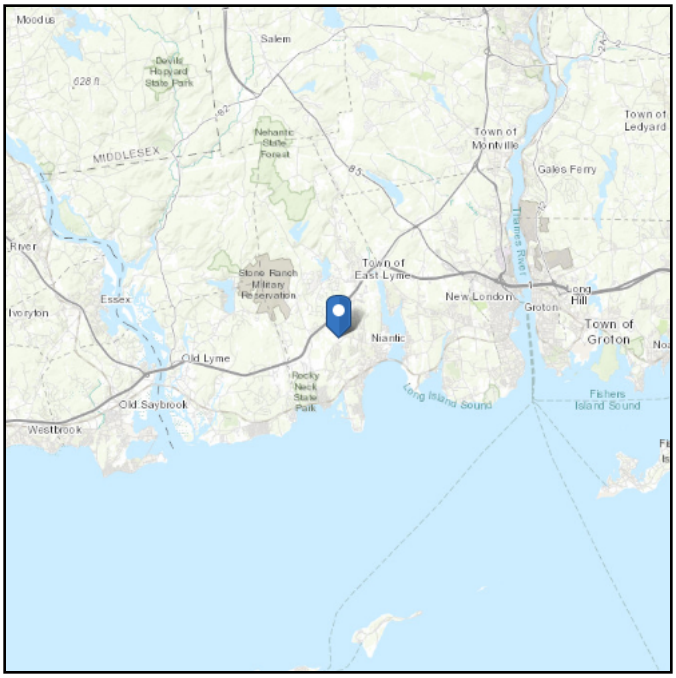
Appurtenance Name	Elevation	Qty.	K_a	q_z (psf)	EPA_N (ft^2)	EPA_T (ft^2)	Wind F_z (lbs)	Wind F_x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)
ERICSSON AIR6449 B41_T-MOBILE	122.0	3	0.90	53.15	5.27	2.03	252.09	97.11	114.63	37.60	MP3
RFS/CELWAVE APX16DWV-16DWV-S-E-A20	122.0	3	0.90	53.15	6.26	1.50	299.45	71.75	40.70	13.35	MP1
RFS/CELWAVE APXVAALL24_43-U-NA20_TMO	122.0	3	0.90	53.15	14.67	5.32	701.75	254.49	149.90	49.17	MP2
ERICSSON RADIO 4415 B66A_CCIV3	122.0	3	0.90	53.15	1.64	0.68	78.40	32.38	46.30	15.19	MP1
ERICSSON RADIO 4424 B25_TMOV1	122.0	3	0.90	53.15	2.05	1.61	98.16	77.03	97.00	31.82	MP2
ERICSSON RADIO 4449 B71 B85A_T-MOBILE	122.0	3	0.90	53.15	1.97	1.59	94.24	75.89	73.21	24.01	MP2

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: III
Soil Class: D - Stiff Soil

Elevation: 173.19 ft (NAVD 88)
Latitude: 41.335653
Longitude: -72.221744



Wind

Results:

Wind Speed:	145 Vmph per East Lyme City Requirements
10-year MRI	79 Vmph
25-year MRI	89 Vmph
50-year MRI	98 Vmph
100-year MRI	108 Vmph

Data Source: ASCE/SEI 7-10, Fig. 26.5-1B and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

Date Accessed: Fri Apr 30 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 3% probability of exceedance in 50 years (annual exceedance probability = 0.000588, MRI = 1,700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings in health-care facilities shall be protected against wind-borne debris as specified in Section 26.10.3.

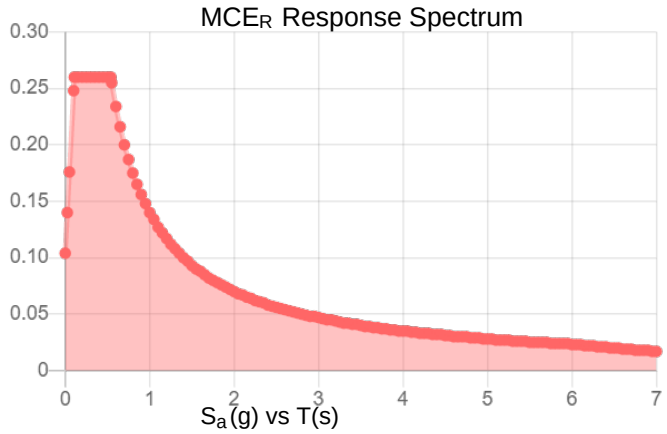
Seismic

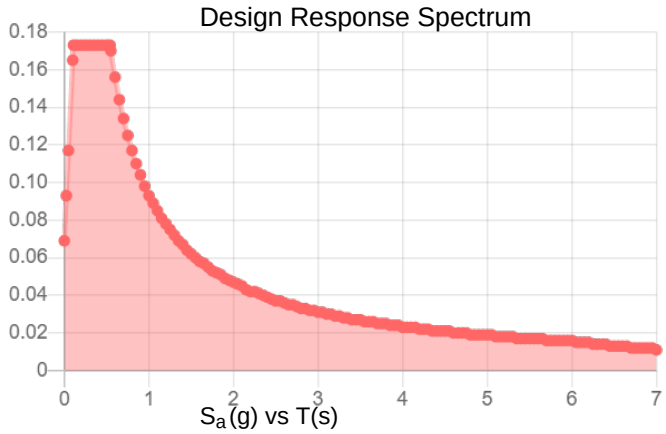
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.164	S_{DS} :	0.173
S_1 :	0.059	S_{D1} :	0.093
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.081
S_{MS} :	0.26	PGA_M :	0.13
S_{M1} :	0.14	F_{PGA} :	1.6
		I_e :	1.25

Seismic Design Category B





Data Accessed: Fri Apr 30 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Fri Apr 30 2021

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N2	Frame Rail	Beam	Pipe	A53 Gr.B	Typical
2	M2	N3	N4	Frame Rail	Beam	Pipe	A53 Gr.B	Typical
3	M3	N29	N5	Sidearms	Beam	Pipe	A53 Gr.B	Typical
4	M4	N31	N6	Sidearms	Beam	Pipe	A53 Gr.B	Typical
5	M5	N9	N12	Diag Bracing	VBrace	Pipe	A53 Gr.B	Typical
6	M6	N11	N7	Diag Bracing	VBrace	Pipe	A53 Gr.B	Typical
7	M7	N8	N10	Vert Bracing	VBrace	Pipe	A53 Gr.B	Typical
8	M8	N9	N10	Diag Bracing	VBrace	Pipe	A53 Gr.B	Typical
9	M9	N11	N12	Diag Bracing	VBrace	Pipe	A53 Gr.B	Typical
10	M10	N13	N29	RIGID	None	None	RIGID	Typical
11	M11	N14	N31	RIGID	None	None	RIGID	Typical
12	MP2	N21	N22	Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
13	M16	N23	N24	RIGID	None	None	RIGID	Typical
14	M17	N25	N26	RIGID	None	None	RIGID	Typical
15	M18	N52	N51	TieBack	HBrace	Pipe	A53 Gr.B	Typical
16	M19	N29	N30	Sidearms	Beam	Pipe	A53 Gr.B	Typical
17	M20	N31	N32	Sidearms	Beam	Pipe	A53 Gr.B	Typical
18	M21	N35	N38	Diag Bracing	VBrace	Pipe	A53 Gr.B	Typical
19	M22	N37	N33	Diag Bracing	VBrace	Pipe	A53 Gr.B	Typical
20	M23	N34	N36	Vert Bracing	VBrace	Pipe	A53 Gr.B	Typical
21	M24	N35	N36	Diag Bracing	VBrace	Pipe	A53 Gr.B	Typical
22	M25	N37	N38	Diag Bracing	VBrace	Pipe	A53 Gr.B	Typical
23	MP1	N39	N40	Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
24	M27	N41	N42	RIGID	None	None	RIGID	Typical
25	M28	N43	N44	RIGID	None	None	RIGID	Typical
26	M29	N49	N45	RIGID	None	None	RIGID	Typical
27	MP3	N47	N48	Mount Pipe 2.0	Column	Pipe	A53 Gr.B	Typical
28	M31	N50	N46	RIGID	None	None	RIGID	Typical

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General Members				
2	RIGID		8	20	0
3	Total General		8	20	0
4					
5	Hot Rolled Steel				
6	A53 Gr.B	PIPE_2.0	10	723	209.114
7	A53 Gr.B	PIPE_2.5	2	288	131.483
8	A53 Gr.B	ROHN 1.5x0.067	8	324.6	27.762
9	Total HR Steel		20	1335.6	368.36

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed
1	Self Weight	DL		-1			12	
2	Wind Load AZI 0	WLZ					24	
3	Wind Load AZI 30	None					24	
4	Wind Load AZI 60	None					24	
5	Wind Load AZI 90	WLX					24	

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed
6	Wind Load AZI 120	None					24	
7	Wind Load AZI 150	None					24	
8	Wind Load AZI 180	None					24	
9	Wind Load AZI 210	None					24	
10	Wind Load AZI 240	None					24	
11	Wind Load AZI 270	None					24	
12	Wind Load AZI 300	None					24	
13	Wind Load AZI 330	None					24	
14	Distr. Wind Load Z	WLZ						28
15	Distr. Wind Load X	WLX						28
16	Ice Weight	OL1					12	28
17	Ice Wind Load AZI 0	OL2					24	
18	Ice Wind Load AZI 30	None					24	
19	Ice Wind Load AZI 60	None					24	
20	Ice Wind Load AZI 90	OL3					24	
21	Ice Wind Load AZI 120	None					24	
22	Ice Wind Load AZI 150	None					24	
23	Ice Wind Load AZI 180	None					24	
24	Ice Wind Load AZI 210	None					24	
25	Ice Wind Load AZI 240	None					24	
26	Ice Wind Load AZI 270	None					24	
27	Ice Wind Load AZI 300	None					24	
28	Ice Wind Load AZI 330	None					24	
29	Distr. Ice Wind Load Z	OL2						28
30	Distr. Ice Wind Load X	OL3						28
31	Seismic Load Z	ELZ			-0.328		12	
32	Seismic Load X	ELX	-0.328				12	
33	Service Live Loads	LL				1		
34	Maintenance Load 1	LL				1		
35	Maintenance Load 2	LL				1		
36	Maintenance Load 3	LL				1		

Load Combinations

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4								
2	1.2DL + 1WL AZI 0	Yes	Y	1	1.2	2	1	14	1	15			
3	1.2DL + 1WL AZI 30	Yes	Y	1	1.2	3	1	14	0.866	15	0.5		
4	1.2DL + 1WL AZI 60	Yes	Y	1	1.2	4	1	14	0.5	15	0.866		
5	1.2DL + 1WL AZI 90	Yes	Y	1	1.2	5	1	14		15	1		
6	1.2DL + 1WL AZI 120	Yes	Y	1	1.2	6	1	14	-0.5	15	0.866		
7	1.2DL + 1WL AZI 150	Yes	Y	1	1.2	7	1	14	-0.866	15	0.5		
8	1.2DL + 1WL AZI 180	Yes	Y	1	1.2	8	1	14	-1	15			
9	1.2DL + 1WL AZI 210	Yes	Y	1	1.2	9	1	14	-0.866	15	-0.5		
10	1.2DL + 1WL AZI 240	Yes	Y	1	1.2	10	1	14	-0.5	15	-0.866		
11	1.2DL + 1WL AZI 270	Yes	Y	1	1.2	11	1	14		15	-1		
12	1.2DL + 1WL AZI 300	Yes	Y	1	1.2	12	1	14	0.5	15	-0.866		
13	1.2DL + 1WL AZI 330	Yes	Y	1	1.2	13	1	14	0.866	15	-0.5		
14	0.9DL + 1WL AZI 0	Yes	Y	1	0.9	2	1	14	1	15			

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
15	0.9DL + 1WL AZI 30	Yes	Y	1	0.9	3	1	14	0.866	15	0.5		
16	0.9DL + 1WL AZI 60	Yes	Y	1	0.9	4	1	14	0.5	15	0.866		
17	0.9DL + 1WL AZI 90	Yes	Y	1	0.9	5	1	14		15	1		
18	0.9DL + 1WL AZI 120	Yes	Y	1	0.9	6	1	14	-0.5	15	0.866		
19	0.9DL + 1WL AZI 150	Yes	Y	1	0.9	7	1	14	-0.866	15	0.5		
20	0.9DL + 1WL AZI 180	Yes	Y	1	0.9	8	1	14	-1	15			
21	0.9DL + 1WL AZI 210	Yes	Y	1	0.9	9	1	14	-0.866	15	-0.5		
22	0.9DL + 1WL AZI 240	Yes	Y	1	0.9	10	1	14	-0.5	15	-0.866		
23	0.9DL + 1WL AZI 270	Yes	Y	1	0.9	11	1	14		15	-1		
24	0.9DL + 1WL AZI 300	Yes	Y	1	0.9	12	1	14	0.5	15	-0.866		
25	0.9DL + 1WL AZI 330	Yes	Y	1	0.9	13	1	14	0.866	15	-0.5		
26	1.2D + 1.0Di	Yes	Y	1	1.2	16	1						
27	1.2D + 1.0Di +1.0Wi AZI 0	Yes	Y	1	1.2	16	1	17	1	29	1	30	
28	1.2D + 1.0Di +1.0Wi AZI 30	Yes	Y	1	1.2	16	1	18	1	29	0.866	30	0.5
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y	1	1.2	16	1	19	1	29	0.5	30	0.866
30	1.2D + 1.0Di +1.0Wi AZI 90	Yes	Y	1	1.2	16	1	20	1	29		30	1
31	1.2D + 1.0Di +1.0Wi AZI 120	Yes	Y	1	1.2	16	1	21	1	29	-0.5	30	0.866
32	1.2D + 1.0Di +1.0Wi AZI 150	Yes	Y	1	1.2	16	1	22	1	29	-0.866	30	0.5
33	1.2D + 1.0Di +1.0Wi AZI 180	Yes	Y	1	1.2	16	1	23	1	29	-1	30	
34	1.2D + 1.0Di +1.0Wi AZI 210	Yes	Y	1	1.2	16	1	24	1	29	-0.866	30	-0.5
35	1.2D + 1.0Di +1.0Wi AZI 240	Yes	Y	1	1.2	16	1	25	1	29	-0.5	30	-0.866
36	1.2D + 1.0Di +1.0Wi AZI 270	Yes	Y	1	1.2	16	1	26	1	29		30	-1
37	1.2D + 1.0Di +1.0Wi AZI 300	Yes	Y	1	1.2	16	1	27	1	29	0.5	30	-0.866
38	1.2D + 1.0Di +1.0Wi AZI 330	Yes	Y	1	1.2	16	1	28	1	29	0.866	30	-0.5
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.235	31	1	32					
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.235	31	0.866	32	0.5				
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.235	31	0.5	32	0.866				
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.235	31		32	1				
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.235	31	-0.5	32	0.866				
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.235	31	-0.866	32	0.5				
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.235	31	-1	32					
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.235	31	-0.866	32	-0.5				
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.235	31	-0.5	32	-0.866				
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.235	31		32	-1				
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.235	31	0.5	32	-0.866				
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.235	31	0.866	32	-0.5				
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.865	31	1	32					
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.865	31	0.866	32	0.5				
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.865	31	0.5	32	0.866				
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.865	31		32	1				
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.865	31	-0.5	32	0.866				
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.865	31	-0.866	32	0.5				
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.865	31	-1	32					
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.865	31	-0.866	32	-0.5				
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.865	31	-0.5	32	-0.866				
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.865	31		32	-1				
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.865	31	0.5	32	-0.866				
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.865	31	0.866	32	-0.5				
63	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 0	Yes	Y	1	1	2	0.171	14	0.171	15		33	1.5

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
64	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 30	Yes	Y	1	1	3	0.171	14	0.148	15	0.086	33	1.5
65	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 60	Yes	Y	1	1	4	0.171	14	0.086	15	0.148	33	1.5
66	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 90	Yes	Y	1	1	5	0.171	14		15	0.171	33	1.5
67	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 120	Yes	Y	1	1	6	0.171	14	-0.086	15	0.148	33	1.5
68	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 150	Yes	Y	1	1	7	0.171	14	-0.148	15	0.086	33	1.5
69	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 180	Yes	Y	1	1	8	0.171	14	-0.171	15		33	1.5
70	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 210	Yes	Y	1	1	9	0.171	14	-0.148	15	-0.086	33	1.5
71	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 240	Yes	Y	1	1	10	0.171	14	-0.086	15	-0.148	33	1.5
72	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 270	Yes	Y	1	1	11	0.171	14		15	-0.171	33	1.5
73	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 300	Yes	Y	1	1	12	0.171	14	0.086	15	-0.148	33	1.5
74	1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 330	Yes	Y	1	1	13	0.171	14	0.148	15	-0.086	33	1.5
75	1.2DL + 1.5LL	Yes	Y	1	1.2	33	1.5						
76	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.043	14	0.043	15	
77	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.043	14	0.037	15	0.021
78	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.043	14	0.021	15	0.037
79	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.043	14		15	0.043
80	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.043	14	-0.021	15	0.037
81	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.043	14	-0.037	15	0.021
82	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.043	14	-0.043	15	
83	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.043	14	-0.037	15	-0.021
84	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.043	14	-0.021	15	-0.037
85	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.043	14		15	-0.043
86	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.043	14	0.021	15	-0.037
87	1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.043	14	0.037	15	-0.021
88	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.043	14	0.043	15	
89	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.043	14	0.037	15	0.021
90	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.043	14	0.021	15	0.037
91	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.043	14		15	0.043
92	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.043	14	-0.021	15	0.037
93	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.043	14	-0.037	15	0.021
94	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.043	14	-0.043	15	
95	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.043	14	-0.037	15	-0.021
96	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.043	14	-0.021	15	-0.037
97	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.043	14		15	-0.043
98	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.043	14	0.021	15	-0.037
99	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.043	14	0.037	15	-0.021
100	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.043	14	0.043	15	
101	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.043	14	0.037	15	0.021
102	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.043	14	0.021	15	0.037
103	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.043	14		15	0.043
104	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.043	14	-0.021	15	0.037
105	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.043	14	-0.037	15	0.021
106	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.043	14	-0.043	15	
107	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.043	14	-0.037	15	-0.021
108	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.043	14	-0.021	15	-0.037
109	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.043	14		15	-0.043
110	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.043	14	0.021	15	-0.037

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N13	max	1354.331	102	1677.723	29	835.097	25	0	110	0	110	0	110
2		min	-1197.438	96	293.177	21	-3961.541	32	0	1	0	1	0	1
3	N14	max	1176.496	91	1474.181	35	3885.874	38	0	110	0	110	0	110
4		min	-1333.321	109	252.363	15	-134.563	19	0	1	0	1	0	1
5	N51	max	308.817	6	74.385	36	1106.998	6	0	110	0	110	0	110
6		min	-310.224	12	15.222	54	-1109.219	12	0	1	0	1	0	1
7	Totals:	max	1304.291	18	3196.279	29	2462.282	14						
8		min	-1304.291	24	769.953	60	-2462.284	8						

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	MP2	PIPE_2.0	0.531	35	8	0.049	35	8	11292.012	32130	1871.625	1871.625	3	H1-1b
2	M23	PIPE_2.0	0.402	15.5	6	0.068	31	12	29659.269	32130	1871.625	1871.625	1.332	H1-1b
3	M1	PIPE_2.5	0.331	72	8	0.104	22.5	8	15797.3	50715	3596.25	3596.25	1.776	H1-1b
4	M20	PIPE_2.0	0.309	6.629	37	0.155	64.818	6	21188.88	32130	1871.625	1871.625	2.057	H1-1b
5	M4	PIPE_2.0	0.301	6.629	38	0.101	0	35	21188.88	32130	1871.625	1871.625	2.037	H1-1b
6	M19	PIPE_2.0	0.291	5.893	31	0.157	70.711	13	21188.88	32130	1871.625	1871.625	2.152	H1-1b
7	M3	PIPE_2.0	0.28	5.893	34	0.116	0	27	21188.88	32130	1871.625	1871.625	2.132	H1-1b
8	M25	ROHN 1.5x0.067	0.267	21.633	31	0.019	45.147	96	6333.703	9501.265	361.421	361.421	1.136	H1-1a
9	M9	ROHN 1.5x0.067	0.257	21.633	36	0.02	45.147	106	6333.703	9501.265	361.421	361.421	1.136	H1-1a
10	M2	PIPE_2.5	0.256	72	37	0.068	22.5	2	15797.3	50715	3596.25	3596.25	1.745	H1-1b
11	M21	ROHN 1.5x0.067	0.249	36	31	0.009	36	12	7341.711	9501.265	361.421	361.421	1	H1-1a
12	MP1	PIPE_2.0	0.24	28.5	8	0.054	28.5	8	20866.733	32130	1871.625	1871.625	2.152	H1-1b
13	M5	ROHN 1.5x0.067	0.238	36	35	0.01	36	6	7341.711	9501.265	361.421	361.421	1	H1-1a
14	M24	ROHN 1.5x0.067	0.228	21.633	30	0.023	45.147	8	6333.703	9501.265	361.421	361.421	1.136	H1-1a
15	M8	ROHN 1.5x0.067	0.222	21.633	37	0.027	45.147	8	6333.703	9501.265	361.421	361.421	1.136	H1-1a
16	MP3	PIPE_2.0	0.184	28.5	8	0.04	28.5	8	20866.733	32130	1871.625	1871.625	2.249	H1-1b
17	M18	PIPE_2.0	0.144	61.072	5	0.008	122.144	36	9494.38	32130	1871.625	1871.625	1.136	H1-1b
18	M22	ROHN 1.5x0.067	0.127	36	33	0.027	36	104	7341.711	9501.265	361.421	361.421	1	H1-1b*
19	M6	ROHN 1.5x0.067	0.124	36	36	0.027	36	104	7341.711	9501.265	361.421	361.421	1	H1-1b*
20	M7	PIPE_2.0	0.028	31	38	0.01	31	7	29659.269	32130	1871.625	1871.625	1.136	H1-1b*

APPENDIX D

ADDITIONAL CALCUATIONS

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

Bolt Calculation Tool, V1.4

PROJECT DATA	
Site Name:	NLN 136 943455
Site Number:	806384
Job Code:	1039-Z0001-B
Connection Description:	Sector Frame to Tower Leg

APPLIED LOADS		
Bolt Tension:	990.39	lbs
Bolt Shear:	408.72	lbs
Sliding Force:	1637.04	lbs
Torsion About Leg:	0.00	lbs-ft

BOLT PROPERTIES		
Bolt Type:	U-Bolt	-
Bolt Diameter:	0.5	in
Bolt Grade:	A307	-
# of U-Bolts:	2	-
Leg Diameter:	2.875	in
Threads Excluded?	No	-

BOLT CHECK		
Tensile Strength	6385.43	
Shear Strength	4417.86	
Tensile Usage	15.5%	
Shear Usage	9.3%	
Interaction Check	0.03	***≤1.05***
Result	Pass	

SLIP CHECK		
Torsional Resistance	848.52	
Sliding Resistance	7083.33	
Torsional Usage	0.0%	
Sliding Usage	23.1%	
Interaction Check	0.05	***≤1.05***
Result	Pass	

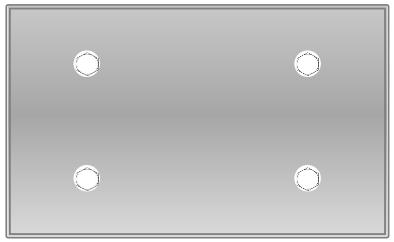


Exhibit F

Power Density/RF Emissions Report

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: CTNL037A

93 Roxbury Road
East Lyme, Connecticut 06357

June 30, 2021

EBI Project Number: 6221003324

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**26.06%**

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

June 30, 2021

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

Emissions Analysis for Site: CTNL037A

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **93 Roxbury Road** in **East Lyme, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 93 Roxbury Road in East Lyme, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. For power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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

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

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

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

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

5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

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

7) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.

8) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.

9) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

10) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

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

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

13) The antennas used in this modeling are the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated

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

14) The antenna mounting height centerline of the proposed antennas is 122 feet above ground level (AGL).

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

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

EBI Consulting

environmental | engineering | due diligence

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	122 feet	Height (AGL):	122 feet	Height (AGL):	122 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE %:	**1.25%**	Antenna B1 MPE %:	**1.25%**	Antenna C1 MPE %:	**1.25%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd
Height (AGL):	122 feet	Height (AGL):	122 feet	Height (AGL):	122 feet
Channel Count:	11	Channel Count:	11	Channel Count:	11
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	12,569.87	ERP (W):	12,569.87	ERP (W):	12,569.87
Antenna A2 MPE %:	**4.89%**	Antenna B2 MPE %:	**4.89%**	Antenna C2 MPE %:	**4.89%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd
Height (AGL):	122 feet	Height (AGL):	122 feet	Height (AGL):	122 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	36,356.09	ERP (W):	36,356.09	ERP (W):	36,356.09
Antenna A3 MPE %:	**9.71%**	Antenna B3 MPE %:	**9.71%**	Antenna C3 MPE %:	**9.71%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	15.85%
T-Mobile (Existing)	4.82%
Verizon	4.89%
Metro PCS	0.48%
Town	0.02%
Site Total MPE % :	26.06%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	15.85%
T-Mobile Sector B Total:	15.85%
T-Mobile Sector C Total:	15.85%
Site Total MPE % :	26.06%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 2100 MHz LTE	2	2334.27	122.0	12.47	2100 MHz LTE	1000	1.25%
T-Mobile 600 MHz LTE	2	591.73	122.0	3.16	600 MHz LTE	400	0.79%
T-Mobile 600 MHz NR	1	1577.94	122.0	4.22	600 MHz NR	400	1.05%
T-Mobile 700 MHz LTE	2	695.22	122.0	3.71	700 MHz LTE	467	0.80%
T-Mobile 1900 MHz GSM	4	1052.26	122.0	11.25	1900 MHz GSM	1000	1.12%
T-Mobile 1900 MHz LTE	2	2104.51	122.0	11.25	1900 MHz LTE	1000	1.12%
T-Mobile 2500 MHz LTE 1C & 2C Traffic	1	11044.63	122.0	29.51	2500 MHz LTE 1C & 2C Traffic	1000	2.95%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	1074.06	122.0	2.87	2500 MHz LTE 1C & 2C Broadcast	1000	0.29%
T-Mobile 2500 MHz NR Traffic	1	22089.26	122.0	59.02	2500 MHz NR Traffic	1000	5.90%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	122.0	5.74	2500 MHz NR Broadcast	1000	0.57%
						Total:	**15.85%**

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

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	15.85%
Sector B:	15.85%
Sector C:	15.85%
T-Mobile Maximum MPE % (Sector A):	15.85%
Site Total:	26.06%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **26.06%** 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.