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

November 15, 2021

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

RE: **Notice of Exempt Modification for T-Mobile: CTNL037A**
Crown Site ID: 806384
93 Roxbury Road, East Lyme, CT 06037
Latitude: 41° 20" 8.35" / Longitude: -72° 13' 18.28"

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 122-foot mount on the existing 151-foot monopole tower located at 93 Roxbury Road, East Lyme, CT. The property is owned by Town of East Lyme, CT and the tower is owned by Crown Castle. T-Mobile now intends to replace six (6) antennas and ancillary equipment at the 122ft level. 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.

Panned Modification:
Tower:

Installed New:
(3) RFS – APXVAALL24_43-U-NA20 Antenna
(3) Ericsson- AIR6449 B41 Antenna
(3) Ericsson Radio 4460 B25 + B66 Remote Radios
(3) Ericsson – Radio 4480 B71+B85
(3) Hybrid Cables

Remove:
(3) RFS/Celwave – APXVSPP18-C-A20 Antennas
(3) RFS/Cellwave – APXVTM14-C-120
(9) Sprint RRU
(4) Hybrid Cable

Ground:

Install New:
(1) 6160 Cabinet
(1) B160 Battery Cabinet
(3.) RBS 6601 IN 6160 Cabinet
(1.) CSR IXRE V2 Transport System
(1) PSU4813 Voltage Booster
(1) DUG20
(3) BB6648

Remove:
(1) MMBS Cabinet
(1) BBU Cabinet

The facility was approved by the Connecticut Siting Council by way of an Application for Certificate of Environmental Compatibility on January 3, 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 Mr. Mark C. Nickerson, First Selectman, Town of East Lyme, Mr. William Mulholland, Zoning Official, Town of East Lyme. The Town of East Lyme is the Property Owner. Crown Castle is the tower owner.

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Site Acquisition Specialist
1800 W. Park Drive
Westborough, MA 01581
(781) 970-0053
Jeff.Barbadora@crowncastle.com

Attachments
cc:

Mark C. Nickerson, First Selectman
Town of East Lyme
108 Pennsylvania Ave
Niantic, CT 06357-1510
860-691-4110

William Mulholland, Zoning Official
Town of East Lyme
108 Pennsylvania Ave
Niantic, CT 06357-1510
860-691-4114

Town of East Lyme, Property Owner

Crown Castle, Tower Owner

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

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
Co-Owner	C/O CROWN ATLANTIC CO
Address	PMB 353 4017 WASHINGTON RD MCMURRAY, PA 15317

Sale Price	$0
Certificate	
Book & Page	0297/0552
Sale Date	03/05/1990

Ownership History

Ownership History
No Data for Ownership History

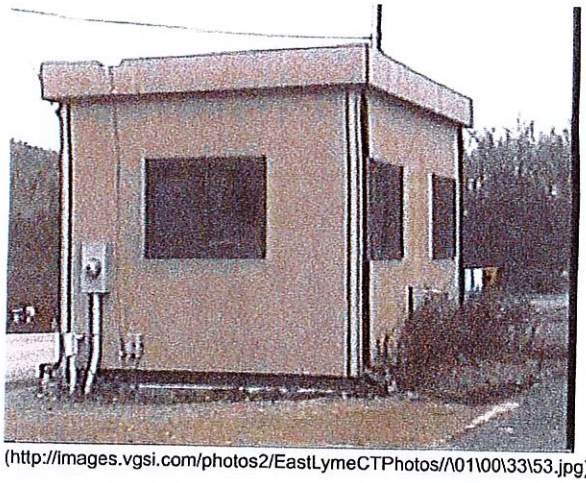
Building Information

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 Layout (ParcelSketch.ashx?pid=4698&bid=4764)

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

Land Line Valuation

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

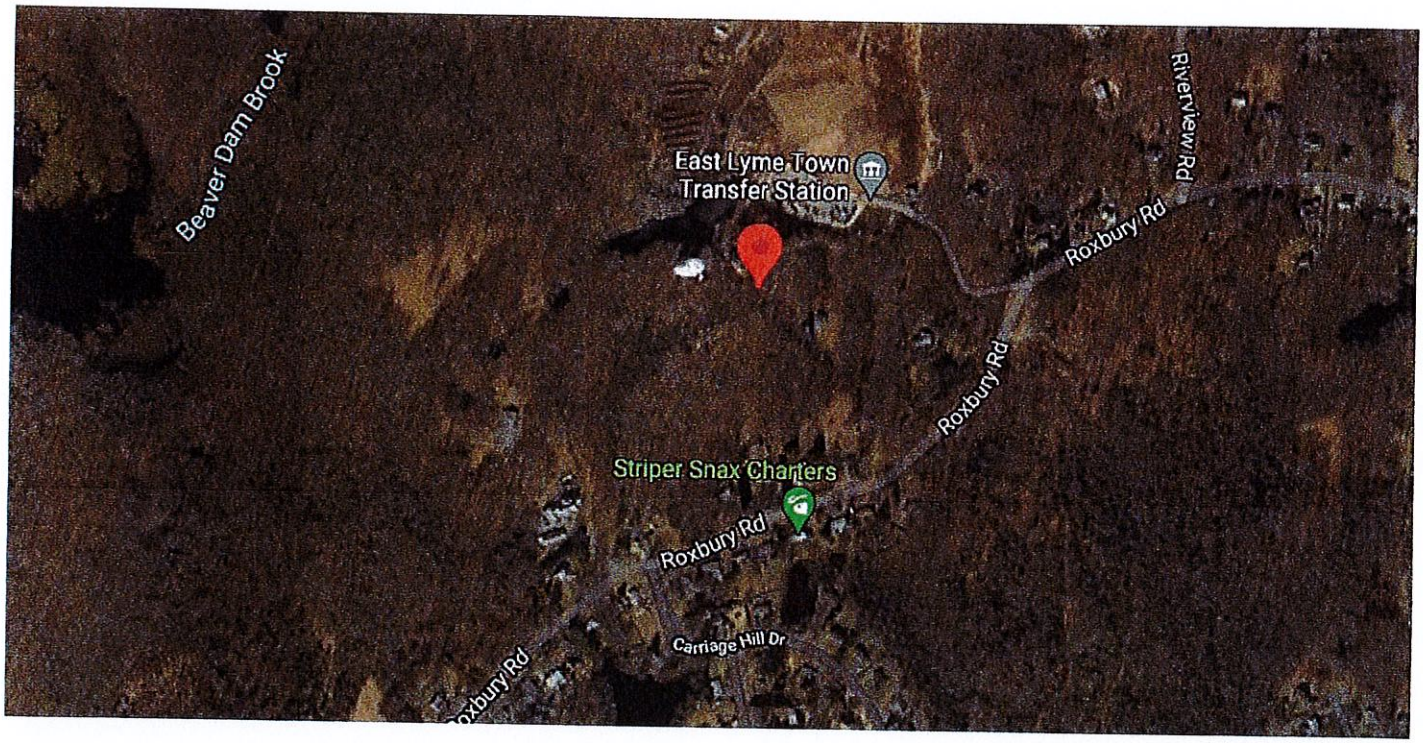
Outbuildings

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

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Tuesday, November 16, 2021 12:29 PM
To: Barbadora, Jeff
Subject: FedEx Shipment 775215718783: Your package has been delivered

FedEx

Hi. Your package was delivered Tue, 11/16/2021 at 12:28pm.

Delivered to 108 PENNSYLVANIA AVE, NIANTIC, CT 06357
Received by K.GALBO

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 775215718783

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of East Lyme Mark Nickerson, First Selectman 108 Pennsylvania Ave NIANTIC, CT, US, 06357
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Mon 11/15/2021 05:57 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	NIANTIC, CT, US, 06357
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Tuesday, November 16, 2021 12:29 PM
To: Barbadora, Jeff
Subject: FedEx Shipment 775215740020: Your package has been delivered

FedEx®

Hi. Your package was delivered Tue, 11/16/2021 at 12:26pm.

Delivered to 108 PENNSYLVANIA AVE, NIANTIC, CT 06357
Received by J.LINDO

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 775215740020

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of East Lyme William Mulholland, Zoning Official 108 Pennsylvania Ave NIANTIC, CT, US, 06357
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Mon 11/15/2021 05:57 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	NIANTIC, CT, US, 06357
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

Date: **September 01, 2021**

MORRISON HERSHFIELD

Morrison Hershfield
1455 Lincoln Parkway, Suite 500
Atlanta, GA 30346
(770) 379-8500

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate**	
	Site Number:	CTNL037A
	Site Name:	CT03XC110
Crown Castle Designation:	**BU Number:**	806384
	Site Name:	NLN 136 943455
	JDE Job Number:	650687
	Work Order Number:	2014866
	Order Number:	557902 Rev. 1
Engineering Firm Designation:	**Morrison Hershfield Project Number:** CN9-034R1 / 2101398	
Site Data:	**Roxbury Road, East Lyme, New London County, CT 06357** **Latitude *41° 20' 8.35"*, Longitude *-72° 13' 18.28"*** **150 Foot – Rohn Self Support Tower**	

Morrison Hershfield 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 utilizes an ultimate 3-second gust wind speed of 145 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. PEN.0028133)
Senior Engineer

Digitally signed by G. Lance Cooke
Date: 2021.09.02 10:23:15-07'00'

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Self Support tower designed by ROHN.

The tower was modified multiple times in the past to accommodate additional loading. All the modifications have been considered in this analysis per their respective post modification inspection reports.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	III
Wind Speed:	145 mph
Exposure Category:	B
Topographic Factor:	1
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	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	ericsson	Radio 4480_TMOV2		
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
	121.0	1	-	Sector Mount [SM 502-3]		
50.0	52.0	1	lucent	KS24019-L112A	1	1/2
	50.0	1	-	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	1-7/8
	152.0	1	motorola	PTP 400		
	150.0	1	-	Pipe Mount [PM 601-1]		
148.0	149.0	1	commscope	CBC1923T-DS-43	8 6	1-5/8 7/8
		2	commscope	CBC78T-DS-43-2X		
		6	commscope	JAHH-65B-R3B w/ Mount Pipe		
		3	commscope	LNX-6514DS-AIM w/ Mount Pipe		
		2	rfs celwave	DB-B1-6C-12AB-0Z		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	samsung telecommunications	RFV01U-D1A		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	samsung telecommunications	RFV01U-D2A		
	148.0	3	-	Side by side Mounting Kit [#BSAMNT-SBS2-2]		
		1	-	Sector Mount [SM 510-3]		
		1	tower mounts	Mount Reinforcement Specifications		
146.0	145.0	1	panasonic	WV-CW864	2	3/8
135.0	135.0	3	fujitsu	TA08025-B604	1	1-1/2
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	-	Commscope MTC3975083 (3)		
126.0	130.0	1	amphenol	BCD-87010-EDIN-X	1 1	7/8 17/64
		1	motorola	SC614		
	126.0	1	-	Side Arm Mount [SO 305-1]		
	125.0	1	motorola	PTP 400		
103.0	103.0	1	-	Sector Mount [SM 701-3]	6	1-5/8
		3	ericsson	AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe		
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RRUS 4415 B25		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
90.0	93.0	1	telewave	ANT150F2	1	1/2
	90.0	1	-	Side Arm Mount [SO 302-1]		
83.0	95.0	1	motorola	PTP 400	1 1 1	17/64 1/2 7/8
	90.0	1	telewave	ANT150D3		
	86.0	1	telewave	ANT940F10		
	83.0	2	-	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
4-GEOTECHNICAL REPORTS	258373	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	958525	CCISITES
4-TOWER MANUFACTURER DRAWINGS	258359	CCISITES

Document	Reference	Source
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2883931	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2457486	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2215933	CCISITES
4-POST-MODIFICATION INSPECTION	2457484	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	801526	CCISITES
4-POST-MODIFICATION INSPECTION	3046703	CCISITES

3.1) Analysis Method

tnxTower (version 8.1.1.0), 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) 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. Morrison Hershfield 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)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	150 - 145	Leg	ROHN 2.5 STD	3	-6.89	60.05	11.5	Pass
T2	145 - 140	Leg	ROHN 2.5 STD	15	-8.66	60.05	14.4	Pass
T3	140 - 120	Leg	ROHN 2.5 EH	24	-32.30	61.44	52.6	Pass
T4	120 - 113.333	Leg	ROHN 2.5 EH (GR)	48	-41.88	68.62	61.0	Pass
T5	113.333 - 106.667	Leg	ROHN 2.5 EH (GR)	57	-52.67	68.62	76.8	Pass
T6	106.667 - 100	Leg	ROHN 2.5 EH (GR)	66	-63.32	107.50	58.9	Pass
T7	100 - 93.3333	Leg	ROHN 3 EH (GR)	76	-75.74	116.03	65.3	Pass
T8	93.3333 - 86.6667	Leg	ROHN 3 EH (GR)	85	-87.15	156.86	55.6	Pass
T9	86.6667 - 80	Leg	ROHN 3 EH (GR)	97	-99.24	156.90	63.2	Pass
T10	80 - 70	Leg	ROHN 4 EH (GR)	109	-114.34	153.02	74.7	Pass
T11	70 - 60	Leg	ROHN 4 EH (GR)	118	-131.73	229.95	57.3	Pass
T12	60 - 50	Leg	ROHN 4 EH (GR)	130	-149.39	229.99	65.0	Pass
T13	50 - 40	Leg	ROHN 4 EH (GR)	142	-166.52	230.11	72.4	Pass
T14	40 - 30	Leg	ROHN 5 EH (GR)	154	-184.38	266.56	69.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T15	30 - 20	Leg	ROHN 5 EH (GR)	163	-200.78	348.34	57.6	Pass
T16	20 - 10	Leg	ROHN 5 EH (GR)	175	-218.58	348.43	62.7	Pass
T17	10 - 0	Leg	ROHN 5 EH (GR)	187	-235.00	348.50	67.4	Pass
T1	150 - 145	Diagonal	L1 1/2x1 1/2x3/16	12	-1.46	4.26	34.2	Pass
T2	145 - 140	Diagonal	L2x2x3/16	20	-2.98	10.47	28.4	Pass
T3	140 - 120	Diagonal	L2 1/2x2 1/2x3/16	33	-4.93	12.57	39.2	Pass
T4	120 - 113.333	Diagonal	L2 1/2x2 1/2x3/16	54	-6.19	12.95	47.8	Pass
T5	113.333 - 106.667	Diagonal	L2 1/2x2 1/2x3/16	63	-6.14	12.04	51.0	Pass
T6	106.667 - 100	Diagonal	L2 1/2x2 1/2x3/16x3/16	72	-7.60	37.78	20.1	Pass
T7	100 - 93.3333	Diagonal	L3x3x3/16	84	-7.49	17.13	43.7	Pass
T8	93.3333 - 86.6667	Diagonal	L3x3x3/16	93	-8.05	13.89	58.0	Pass
T9	86.6667 - 80	Diagonal	2L3x3x3/16x1/4	105	-8.28	46.91	17.6	Pass
T10	80 - 70	Diagonal	2L3x3x3/16x1/4	117	-9.38	39.20	23.9	Pass
T11	70 - 60	Diagonal	2L3x3x3/16x1/4	126	-10.24	35.49	28.9	Pass
T12	60 - 50	Diagonal	2L3x3x1/4x1/4	138	-10.37	45.10	23.0	Pass
T13	50 - 40	Diagonal	2L3x3x1/4x1/4	150	-10.85	41.48	26.2	Pass
T14	40 - 30	Diagonal	2L3 1/2x3 1/2x1/4x1/4	162	-10.59	60.05	17.6	Pass
T15	30 - 20	Diagonal	2L3 1/2x3 1/2x1/4x1/4	171	-12.00	54.85	21.9	Pass
T16	20 - 10	Diagonal	2L4x4x1/4x1/4	183	-11.68	71.81	16.3	Pass
T17	10 - 0	Diagonal	2L4x4x1/4x1/4	195	-13.18	67.18	19.6	Pass
T6	106.667 - 100	Secondary Horizontal	L2x2x3/16	74	-1.10	6.42	17.1	Pass
T8	93.3333 - 86.6667	Secondary Horizontal	L2x2x3/16	96	-1.51	5.20	29.1	Pass
T9	86.6667 - 80	Secondary Horizontal	L2x2x3/16	108	-1.72	4.69	36.7	Pass
T11	70 - 60	Secondary Horizontal	L2 1/2x2 1/2x3/16	129	-2.28	7.38	30.9	Pass
T12	60 - 50	Secondary Horizontal	L3x3x1/4	141	-2.59	14.88	17.4	Pass
T13	50 - 40	Secondary Horizontal	L3x3x1/4	153	-2.89	13.20	21.9	Pass
T15	30 - 20	Secondary Horizontal	L3x3x3/16	174	-3.48	8.24	42.2	Pass
T16	20 - 10	Secondary Horizontal	L3x3x3/16	186	-3.79	7.47	50.8	Pass
T17	10 - 0	Secondary Horizontal	L3 1/2x3 1/2x1/4	198	-4.08	14.29	28.5	Pass
T1	150 - 145	Top Girt	L2 1/2x2 1/2x3/16	5	-0.35	7.01	5.0	Pass
T3	140 - 120	Top Girt	L2 1/2x2 1/2x3/16	27	-0.66	7.01	9.4	Pass
							Summary	
						Leg (T5)	76.8	Pass
						Diagonal (T8)	58.0	Pass
						Secondary Horizontal (T16)	50.8	Pass
						Top Girt (T3)	9.4	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						Bolt Checks	72.7	Pass
						Rating =	76.8	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	55.5	Pass
1	Base Foundation (Structure)	0	49.1	Pass
1	Base Foundation (Soil Interaction)		77.1	Pass

Structure Rating (max from all components) =	77.1%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) *Rating per TIA-222-H, Section 15.5.

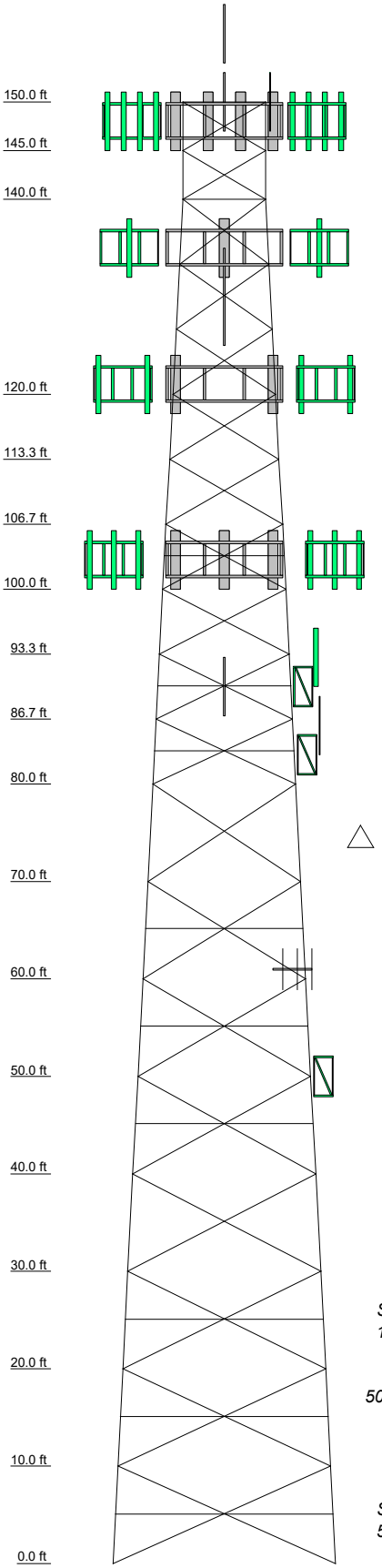
4.1) Recommendations

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		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)	27.9	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



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

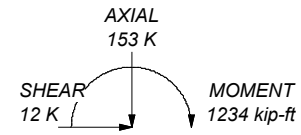
TOWER DESIGN NOTES

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 0.00 ft
8. Grouted pipe f'c is 8 ksi
9. TOWER RATING: 76.8%

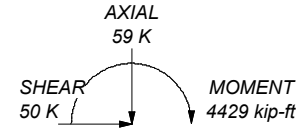
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 244 K
SHEAR: 31 K

UPLIFT: -198 K
SHEAR: 26 K



TORQUE 26 kip-ft
50 mph WIND - 1.5000 in ICE



TORQUE 82 kip-ft
REACTIONS - 145 mph WIND

Morrison Hershfield
Consulting Engineers
1455 Lincoln Parkway, Suite 500
Atlanta, GA 30346
Phone: (770) 379-8500
FAX: (770) 379-8501

Job: ***CN9-034R1 / 2101398***			
Project: ***806384 / NLN 136 943455***			
Client: Crown Castle USA	Drawn by: MK		App'd:
Code: TIA-222-H	Date: 09/01/21		Scale: NTS
Path:			Dwg No. E-1

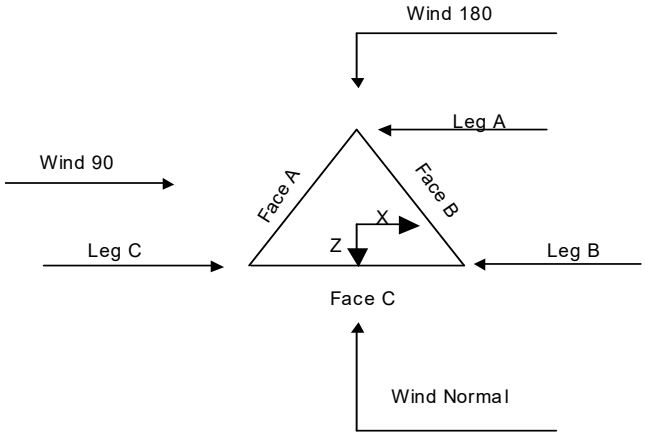
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 8.56 ft at the top and 22.78 ft 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: 173.00 ft.
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: 0.00 ft.
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.
A non-linear (P-delta) analysis was used.
Grouted pipe f'_c is 8 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	150.00-145.00			8.56	1	5.00
T2	145.00-140.00			8.56	1	5.00
T3	140.00-120.00			8.56	1	20.00
T4	120.00-113.33			10.56	1	6.67
T5	113.33-106.67			11.24	1	6.67
T6	106.67-100.00			11.92	1	6.67
T7	100.00-93.33			12.60	1	6.67
T8	93.33-86.67			13.30	1	6.67
T9	86.67-80.00			14.00	1	6.67
T10	80.00-70.00			14.70	1	10.00
T11	70.00-60.00			15.70	1	10.00
T12	60.00-50.00			16.70	1	10.00
T13	50.00-40.00			17.73	1	10.00
T14	40.00-30.00			18.77	1	10.00
T15	30.00-20.00			19.78	1	10.00
T16	20.00-10.00			20.78	1	10.00
T17	10.00-0.00			21.78	1	10.00

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
T1	150.00-145.00	5.00	X Brace	No	No	0.0000	0.0000
T2	145.00-140.00	5.00	X Brace	No	No	0.0000	0.0000
T3	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T4	120.00-113.33	6.67	X Brace	No	No	0.0000	0.0000
T5	113.33-106.67	6.67	X Brace	No	No	0.0000	0.0000
T6	106.67-100.00	6.67	X Brace	No	Yes	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T7	100.00-93.33	6.67	X Brace	No	No	0.0000	0.0000
T8	93.33-86.67	6.67	X Brace	No	Yes	0.0000	0.0000
T9	86.67-80.00	6.67	X Brace	No	Yes	0.0000	0.0000
T10	80.00-70.00	10.00	X Brace	No	No	0.0000	0.0000
T11	70.00-60.00	10.00	X Brace	No	Yes	0.0000	0.0000
T12	60.00-50.00	10.00	X Brace	No	Yes	0.0000	0.0000
T13	50.00-40.00	10.00	X Brace	No	Yes	0.0000	0.0000
T14	40.00-30.00	10.00	X Brace	No	No	0.0000	0.0000
T15	30.00-20.00	10.00	X Brace	No	Yes	0.0000	0.0000
T16	20.00-10.00	10.00	X Brace	No	Yes	0.0000	0.0000
T17	10.00-0.00	10.00	X Brace	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 150.00-145.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 145.00-140.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T3 140.00-120.00	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 120.00-113.33	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 113.33-106.67	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 106.67-100.00	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Double Equal Angle	L2 1/2x2 1/2x3/16x3/16	A36 (36 ksi)
T7 100.00-93.33	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 93.33-86.67	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T9 86.67-80.00	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T10 80.00-70.00	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T11 70.00-60.00	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T12 60.00-50.00	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Equal Angle	2L3x3x1/4x1/4	A36 (36 ksi)
T13 50.00-40.00	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Equal Angle	2L3x3x1/4x1/4	A36 (36 ksi)
T14 40.00-30.00	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x1/4	A36 (36 ksi)
T15 30.00-20.00	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x1/4	A36 (36 ksi)
T16 20.00-10.00	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Equal Angle	2L4x4x1/4x1/4	A36 (36 ksi)
T17 10.00-0.00	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 150.00-145.00	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T3 140.00-120.00	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 106.67-100.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T8 93.33-86.67	Equal Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T9 86.67-80.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T11 70.00-60.00	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T12 60.00-50.00	Equal Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T13 50.00-40.00	Equal Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T15 30.00-20.00	Equal Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 20.00-10.00	Equal Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T17 10.00-0.00	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) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 150.00-145.00	0.00	0.1875	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T2 145.00-140.00	0.00	0.1875	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T3 140.00-120.00	0.00	0.1875	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T4 120.00-113.33	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T5 113.33-106.67	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T6 106.67-100.00	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T7 100.00-93.33	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T8 93.33-86.67	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T9 86.67-80.00	0.00	0.4293	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T10 80.00-70.00	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T11 70.00-60.00	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T12 60.00-50.00	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
T13 50.00-40.00	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T14 40.00-30.00	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T15 30.00-20.00	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T16 20.00-10.00	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000
T17 10.00-0.00	0.00	0.5000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
ft																	
T1 150.00-145.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 145.00-140.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 140.00-120.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 120.00-113.33	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 113.33-106.67	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 106.67-100.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1
T7 100.00-93.33	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 93.33-86.67	No	No	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1
T9 86.67-80.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1
T10 80.00-70.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T11 70.00-60.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1
T12 60.00-50.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1
T13 50.00-40.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1
T14 40.00-30.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T15 30.00-20.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1
T16 20.00-10.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1
T17 10.00-0.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 150.00-145.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 145.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 120.00-113.33	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 113.33-106.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 106.67-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100.00-93.33	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 93.33-86.67	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 86.67-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 80.00-70.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 70.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 60.00-50.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 50.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 40.00-30.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 30.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 20.00-10.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 10.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower 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 150.00-145.00	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 145.00-140.00	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 140.00-120.00	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 120.00-113.33	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 113.33-106.67	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 106.67-100.00	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 100.00-93.33	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 93.33-86.67	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
T9 86.67-80.00	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 80.00-70.00	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 70.00-60.00	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 60.00-50.00	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 50.00-40.00	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 40.00-30.00	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 30.00-20.00	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 20.00-10.00	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
T17 10.00-0.00	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 150.00-145.00	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 145.00-140.00	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 140.00-120.00	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 120.00-113.33	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 113.33-106.67	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 106.67-100.00	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 100.00-93.33	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 93.33-86.67	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 86.67-80.00	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 80.00-70.00	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 70.00-60.00	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 60.00-50.00	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 50.00-40.00	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 40.00-30.00	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 30.00-20.00	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 20.00-10.00	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 10.00-0.00	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	5098	36671	63
ROHN 3 EH (GR)	50	3.0159	6.6052	24.023	5098	37933	65
ROHN 4 EH (GR)	50	4.4074	11.4969	38.949	5098	39639	68
ROHN 5 EH (GR)	50	6.1120	18.1937	58.701	5098	41141	70

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
******													
Step Pegs	A	No	No	Ar (CaAa)	150.00 - 0.00	0.0000	0.5	1	1	0.5000	0.7050		1.80
***													
Feedline Ladder (Af)	A	No	No	Af (CaAa)	150.00 - 6.00	0.0000	0.4	1	1	1.0000	3.0000		8.40
Feedline Ladder (Af)	B	No	No	Af (CaAa)	150.00 - 6.00	0.0000	-0.4	1	1	1.0000	3.0000		8.40
Feedline Ladder (Af)	B	No	No	Af (CaAa)	150.00 - 6.00	-1.0000	-0.4	1	1	1.0000	3.0000		8.40
Feedline Ladder (Af)	C	No	No	Af (CaAa)	100.00 - 6.00	0.0000	0.4	1	1	1.0000	2.0000		8.40
******													
LDF5-50A(7/8)	A	No	No	Ar (CaAa)	150.00 - 6.00	0.0000	0.43	1	1	0.5000	1.0900		0.33
******													
HJ7-50A(1-5/8)	B	No	No	Ar (CaAa)	148.00 - 6.00	0.0000	-0.425	6	3	0.5000	1.9800		1.04
LDF5-50A(7/8)	B	No	No	Ar (CaAa)	148.00 - 6.00	0.0000	-0.375	6	6	0.5000	1.0900		0.33
HB158-1-08U8-S8J18(1-5/8)	B	No	No	Ar (CaAa)	148.00 - 6.00	0.0000	-0.35	2	1	0.5000	1.9800		1.30
******													
LDF2-50(3/8)	B	No	No	Ar (CaAa)	146.00 - 6.00	-0.3000	-0.49	2	2	0.5000	0.4400		0.08
******													
CU12PSM9P6XXX(1-1/2)	A	No	No	Ar (CaAa)	135.00 - 6.00	0.0000	0.38	1	1	0.5000	1.6000		2.35
******													
******													
LDF5-50A(7/8)	A	No	No	Ar (CaAa)	126.00 - 6.00	0.0000	0.42	1	1	0.5000	1.0900		0.33
7919A(17/64)	A	No	No	Ar (CaAa)	126.00 - 6.00	0.0000	0.41	1	1	0.5000	0.2650		0.03
******													
***													
HB158-21U6S24-xxM_TMO(1-5/8)	B	No	No	Ar (CaAa)	121.00 - 6.00	-0.2500	-0.4	3	3	0.5000	1.9960		2.50
******													
HCS 6X12 4AWG(1-5/8)	C	No	No	Ar (CaAa)	103.00 - 6.00	0.0000	0.4	3	3	0.5000	1.6600		2.40

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
***													
******													
LDF4-50A(1/2)	A	No	No	Ar (CaAa)	90.00 - 6.00	0.0000	0.4	1	1	0.6250	0.6250		0.15
******													
7919A(17/64)	A	No	No	Ar (CaAa)	83.00 - 6.00	0.0000	0.39	1	1	0.5000	0.2650		0.03
LDF4-50A(1/2)	A	No	No	Ar (CaAa)	83.00 - 6.00	0.0000	0.38	1	1	0.5000	0.6250		0.15
LDF5-50A(7/8)	B	No	No	Ar (CaAa)	83.00 - 6.00	0.0000	-0.415	1	1	0.5000	1.0300		0.33
******													
LDF1-50A(1/4)	A	No	No	Ar (CaAa)	61.00 - 6.00	0.0000	0.37	1	1	0.5000	0.3450		0.06
******													
LDF4-50A(1/2)	B	No	No	Ar (CaAa)	50.00 - 6.00	-0.3000	0.49	1	1	0.5000	0.6250		0.15
*******													

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	150.00-145.00	A	0.000	0.000	3.398	0.000	0.05
		B	0.000	0.000	11.802	0.000	0.12
		C	0.000	0.000	0.000	0.000	0.00
T2	145.00-140.00	A	0.000	0.000	3.398	0.000	0.05
		B	0.000	0.000	16.630	0.000	0.14
		C	0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	0.000	0.000	16.803	0.000	0.25
		B	0.000	0.000	67.119	0.000	0.56
		C	0.000	0.000	0.000	0.000	0.00
T4	120.00-113.33	A	0.000	0.000	6.500	0.000	0.09
		B	0.000	0.000	26.165	0.000	0.24
		C	0.000	0.000	0.000	0.000	0.00
T5	113.33-106.67	A	0.000	0.000	6.500	0.000	0.09
		B	0.000	0.000	26.165	0.000	0.24
		C	0.000	0.000	0.000	0.000	0.00
T6	106.67-100.00	A	0.000	0.000	6.500	0.000	0.09
		B	0.000	0.000	26.165	0.000	0.24
		C	0.000	0.000	1.494	0.000	0.02
T7	100.00-93.33	A	0.000	0.000	6.500	0.000	0.09
		B	0.000	0.000	26.165	0.000	0.24
		C	0.000	0.000	5.542	0.000	0.10
T8	93.33-86.67	A	0.000	0.000	6.708	0.000	0.09
		B	0.000	0.000	26.165	0.000	0.24
		C	0.000	0.000	5.542	0.000	0.10
T9	86.67-80.00	A	0.000	0.000	7.184	0.000	0.09
		B	0.000	0.000	26.474	0.000	0.24
		C	0.000	0.000	5.542	0.000	0.10
T10	80.00-70.00	A	0.000	0.000	11.265	0.000	0.14
		B	0.000	0.000	40.278	0.000	0.36

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	8.313	0.000	0.16
T11	70.00-60.00	A	0.000	0.000	11.300	0.000	0.14
		B	0.000	0.000	40.278	0.000	0.36
		C	0.000	0.000	8.313	0.000	0.16
T12	60.00-50.00	A	0.000	0.000	11.610	0.000	0.14
		B	0.000	0.000	40.278	0.000	0.36
		C	0.000	0.000	8.313	0.000	0.16
T13	50.00-40.00	A	0.000	0.000	11.610	0.000	0.14
		B	0.000	0.000	40.903	0.000	0.36
		C	0.000	0.000	8.313	0.000	0.16
T14	40.00-30.00	A	0.000	0.000	11.610	0.000	0.14
		B	0.000	0.000	40.903	0.000	0.36
		C	0.000	0.000	8.313	0.000	0.16
T15	30.00-20.00	A	0.000	0.000	11.610	0.000	0.14
		B	0.000	0.000	40.903	0.000	0.36
		C	0.000	0.000	8.313	0.000	0.16
T16	20.00-10.00	A	0.000	0.000	11.610	0.000	0.14
		B	0.000	0.000	40.903	0.000	0.36
		C	0.000	0.000	8.313	0.000	0.16
T17	10.00-0.00	A	0.000	0.000	5.067	0.000	0.07
		B	0.000	0.000	16.361	0.000	0.14
		C	0.000	0.000	3.325	0.000	0.06

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	150.00-145.00	A	2.004	0.000	0.000	9.408	0.000	0.18
		B		0.000	0.000	24.212	0.000	0.43
		C		0.000	0.000	0.000	0.000	0.00
T2	145.00-140.00	A	1.997	0.000	0.000	9.388	0.000	0.18
		B		0.000	0.000	37.198	0.000	0.62
		C		0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	1.978	0.000	0.000	51.229	0.000	0.95
		B		0.000	0.000	149.702	0.000	2.48
		C		0.000	0.000	0.000	0.000	0.00
T4	120.00-113.33	A	1.957	0.000	0.000	22.157	0.000	0.39
		B		0.000	0.000	59.464	0.000	0.98
		C		0.000	0.000	0.000	0.000	0.00
T5	113.33-106.67	A	1.946	0.000	0.000	22.066	0.000	0.39
		B		0.000	0.000	59.302	0.000	0.98
		C		0.000	0.000	0.000	0.000	0.00
T6	106.67-100.00	A	1.934	0.000	0.000	21.969	0.000	0.38
		B		0.000	0.000	59.132	0.000	0.97
		C		0.000	0.000	4.235	0.000	0.07
T7	100.00-93.33	A	1.921	0.000	0.000	21.866	0.000	0.38
		B		0.000	0.000	58.951	0.000	0.96
		C		0.000	0.000	14.164	0.000	0.27
T8	93.33-86.67	A	1.907	0.000	0.000	23.236	0.000	0.40
		B		0.000	0.000	58.758	0.000	0.96
		C		0.000	0.000	14.115	0.000	0.27
T9	86.67-80.00	A	1.892	0.000	0.000	27.117	0.000	0.45
		B		0.000	0.000	59.997	0.000	0.97
		C		0.000	0.000	14.062	0.000	0.27
T10	80.00-70.00	A	1.873	0.000	0.000	44.972	0.000	0.72
		B		0.000	0.000	92.185	0.000	1.48
		C		0.000	0.000	20.986	0.000	0.40
T11	70.00-60.00	A	1.846	0.000	0.000	44.896	0.000	0.71
		B		0.000	0.000	91.570	0.000	1.46
		C		0.000	0.000	20.843	0.000	0.39
T12	60.00-50.00	A	1.815	0.000	0.000	47.918	0.000	0.74
		B		0.000	0.000	90.864	0.000	1.44
		C		0.000	0.000	20.678	0.000	0.39
T13	50.00-40.00	A	1.779	0.000	0.000	47.197	0.000	0.72
		B		0.000	0.000	94.214	0.000	1.46

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	20.483	0.000	0.38
T14	40.00-30.00	A	1.735	0.000	0.000	46.314	0.000	0.70
		B		0.000	0.000	93.107	0.000	1.43
		C		0.000	0.000	20.245	0.000	0.37
T15	30.00-20.00	A	1.678	0.000	0.000	45.165	0.000	0.67
		B		0.000	0.000	91.668	0.000	1.38
		C		0.000	0.000	19.936	0.000	0.36
T16	20.00-10.00	A	1.594	0.000	0.000	43.494	0.000	0.62
		B		0.000	0.000	89.575	0.000	1.32
		C		0.000	0.000	19.486	0.000	0.35
T17	10.00-0.00	A	1.428	0.000	0.000	18.208	0.000	0.25
		B		0.000	0.000	34.171	0.000	0.48
		C		0.000	0.000	7.438	0.000	0.13

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	150.00-145.00	0.9274	-16.1079	0.9419	-19.3183
T2	145.00-140.00	1.5745	-21.6033	1.5746	-25.7852
T3	140.00-120.00	1.3667	-22.9858	1.2845	-29.1168
T4	120.00-113.33	1.5726	-29.1465	1.2834	-36.0160
T5	113.33-106.67	1.6178	-30.3183	1.3323	-37.5817
T6	106.67-100.00	0.0488	-27.3140	-0.4105	-34.4986
T7	100.00-93.33	-3.1111	-27.9551	-4.5377	-34.3184
T8	93.33-86.67	-2.8502	-26.0440	-4.3207	-33.0198
T9	86.67-80.00	-2.9166	-27.2704	-4.4691	-35.6922
T10	80.00-70.00	-3.8089	-35.2863	-5.4147	-44.5480
T11	70.00-60.00	-3.4789	-32.8221	-5.2184	-43.1675
T12	60.00-50.00	-3.5289	-33.3650	-5.4898	-45.2208
T13	50.00-40.00	-3.0929	-33.8888	-3.8694	-45.0746
T14	40.00-30.00	-3.4739	-37.5851	-4.2965	-49.5046
T15	30.00-20.00	-3.0458	-33.6013	-4.0195	-46.3450
T16	20.00-10.00	-2.9568	-32.8378	-4.0451	-46.3916
T17	10.00-0.00	-1.3448	-16.0321	-2.1016	-25.9559

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	Step Pegs	145.00 - 150.00	0.6000	0.5793
T1	4	Feedline Ladder (Af)	145.00 - 150.00	0.6000	0.5793
T1	5	Feedline Ladder (Af)	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	11	HJ7-50A(1-5/8)	145.00 - 148.00	0.6000	0.5793
T1	12	LDF5-50A(7/8)	145.00 - 148.00	0.6000	0.5793
T1	13	HB158-1-08U8-S8J18(1-5/8)	145.00 - 148.00	0.6000	0.5793
T1	15	LDF2-50(3/8)	145.00 - 146.00	0.6000	0.5793

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	2	Step Pegs	140.00 - 145.00	0.6000	0.6000
T2	4	Feedline Ladder (Af)	140.00 - 145.00	0.6000	0.6000
T2	5	Feedline Ladder (Af)	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	11	HJ7-50A(1-5/8)	140.00 - 145.00	0.6000	0.6000
T2	12	LDF5-50A(7/8)	140.00 - 145.00	0.6000	0.6000
T2	13	HB158-1-08U8-S8J18(1-5/8)	140.00 - 145.00	0.6000	0.6000
T2	15	LDF2-50(3/8)	140.00 - 145.00	0.6000	0.6000
T3	2	Step Pegs	120.00 - 140.00	0.6000	0.6000
T3	4	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T3	5	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T3	6	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T3	9	LDF5-50A(7/8)	120.00 - 140.00	0.6000	0.6000
T3	11	HJ7-50A(1-5/8)	120.00 - 140.00	0.6000	0.6000
T3	12	LDF5-50A(7/8)	120.00 - 140.00	0.6000	0.6000
T3	13	HB158-1-08U8-S8J18(1-5/8)	120.00 - 140.00	0.6000	0.6000
T3	15	LDF2-50(3/8)	120.00 - 140.00	0.6000	0.6000
T3	17	CU12PSM9P6XXX(1-1/2)	120.00 - 135.00	0.6000	0.6000
T3	21	LDF5-50A(7/8)	120.00 - 126.00	0.6000	0.6000
T3	22	7919A(17/64)	120.00 - 126.00	0.6000	0.6000
T3	27	HB158-21U6S24-xxM_TMO(1-5/8)	120.00 - 121.00	0.6000	0.6000
T4	2	Step Pegs	113.33 - 120.00	0.6000	0.6000
T4	4	Feedline Ladder (Af)	113.33 - 120.00	0.6000	0.6000
T4	5	Feedline Ladder (Af)	113.33 - 120.00	0.6000	0.6000
T4	6	Feedline Ladder (Af)	113.33 - 120.00	0.6000	0.6000
T4	9	LDF5-50A(7/8)	113.33 - 120.00	0.6000	0.6000
T4	11	HJ7-50A(1-5/8)	113.33 - 120.00	0.6000	0.6000
T4	12	LDF5-50A(7/8)	113.33 - 120.00	0.6000	0.6000
T4	13	HB158-1-08U8-S8J18(1-5/8)	113.33 - 120.00	0.6000	0.6000
T4	15	LDF2-50(3/8)	113.33 - 120.00	0.6000	0.6000
T4	17	CU12PSM9P6XXX(1-1/2)	113.33 - 120.00	0.6000	0.6000
T4	21	LDF5-50A(7/8)	113.33 - 120.00	0.6000	0.6000
T4	22	7919A(17/64)	113.33 - 120.00	0.6000	0.6000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T4	27	HB158-21U6S24-xxM_TMO(1-5/8)	113.33 - 120.00	0.6000	0.6000
T5	2	Step Pegs	106.67 - 113.33	0.6000	0.6000
T5	4	Feedline Ladder (Af)	106.67 - 113.33	0.6000	0.6000
T5	5	Feedline Ladder (Af)	106.67 - 113.33	0.6000	0.6000
T5	6	Feedline Ladder (Af)	106.67 - 113.33	0.6000	0.6000
T5	9	LDF5-50A(7/8)	106.67 - 113.33	0.6000	0.6000
T5	11	HJ7-50A(1-5/8)	106.67 - 113.33	0.6000	0.6000
T5	12	LDF5-50A(7/8)	106.67 - 113.33	0.6000	0.6000
T5	13	HB158-1-08U8-S8J18(1-5/8)	106.67 - 113.33	0.6000	0.6000
T5	15	LDF2-50(3/8)	106.67 - 113.33	0.6000	0.6000
T5	17	CU12PSM9P6XXX(1-1/2)	106.67 - 113.33	0.6000	0.6000
T5	21	LDF5-50A(7/8)	106.67 - 113.33	0.6000	0.6000
T5	22	7919A(17/64)	106.67 - 113.33	0.6000	0.6000
T5	27	HB158-21U6S24-xxM_TMO(1-5/8)	106.67 - 113.33	0.6000	0.6000
T6	2	Step Pegs	100.00 - 106.67	0.6000	0.6000
T6	4	Feedline Ladder (Af)	100.00 - 106.67	0.6000	0.6000
T6	5	Feedline Ladder (Af)	100.00 - 106.67	0.6000	0.6000
T6	6	Feedline Ladder (Af)	100.00 - 106.67	0.6000	0.6000
T6	9	LDF5-50A(7/8)	100.00 - 106.67	0.6000	0.6000
T6	11	HJ7-50A(1-5/8)	100.00 - 106.67	0.6000	0.6000
T6	12	LDF5-50A(7/8)	100.00 - 106.67	0.6000	0.6000
T6	13	HB158-1-08U8-S8J18(1-5/8)	100.00 - 106.67	0.6000	0.6000
T6	15	LDF2-50(3/8)	100.00 - 106.67	0.6000	0.6000
T6	17	CU12PSM9P6XXX(1-1/2)	100.00 - 106.67	0.6000	0.6000
T6	21	LDF5-50A(7/8)	100.00 - 106.67	0.6000	0.6000
T6	22	7919A(17/64)	100.00 - 106.67	0.6000	0.6000
T6	27	HB158-21U6S24-xxM_TMO(1-5/8)	100.00 - 106.67	0.6000	0.6000
T6	30	HCS 6X12 4AWG(1-5/8)	100.00 - 103.00	0.6000	0.6000
T7	2	Step Pegs	93.33 - 100.00	0.6000	0.6000
T7	4	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T7	5	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T7	6	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T7	7	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T7	9	LDF5-50A(7/8)	93.33 - 100.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	11	HJ7-50A(1-5/8)	93.33 - 100.00	0.6000	0.6000
T7	12	LDF5-50A(7/8)	93.33 - 100.00	0.6000	0.6000
T7	13	HB158-1-08U8-S8J18(1-5/8)	93.33 - 100.00	0.6000	0.6000
T7	15	LDF2-50(3/8)	93.33 - 100.00	0.6000	0.6000
T7	17	CU12PSM9P6XXX(1-1/2)	93.33 - 100.00	0.6000	0.6000
T7	21	LDF5-50A(7/8)	93.33 - 100.00	0.6000	0.6000
T7	22	7919A(17/64)	93.33 - 100.00	0.6000	0.6000
T7	27	HB158-21U6S24-xxM_TMO(1-5/8)	93.33 - 100.00	0.6000	0.6000
T7	30	HCS 6X12 4AWG(1-5/8)	93.33 - 100.00	0.6000	0.6000
T8	2	Step Pegs	86.67 - 93.33	0.6000	0.6000
T8	4	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T8	5	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T8	6	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T8	7	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T8	9	LDF5-50A(7/8)	86.67 - 93.33	0.6000	0.6000
T8	11	HJ7-50A(1-5/8)	86.67 - 93.33	0.6000	0.6000
T8	12	LDF5-50A(7/8)	86.67 - 93.33	0.6000	0.6000
T8	13	HB158-1-08U8-S8J18(1-5/8)	86.67 - 93.33	0.6000	0.6000
T8	15	LDF2-50(3/8)	86.67 - 93.33	0.6000	0.6000
T8	17	CU12PSM9P6XXX(1-1/2)	86.67 - 93.33	0.6000	0.6000
T8	21	LDF5-50A(7/8)	86.67 - 93.33	0.6000	0.6000
T8	22	7919A(17/64)	86.67 - 93.33	0.6000	0.6000
T8	27	HB158-21U6S24-xxM_TMO(1-5/8)	86.67 - 93.33	0.6000	0.6000
T8	30	HCS 6X12 4AWG(1-5/8)	86.67 - 93.33	0.6000	0.6000
T8	35	LDF4-50A(1/2)	86.67 - 90.00	0.6000	0.6000
T9	2	Step Pegs	80.00 - 86.67	0.6000	0.6000
T9	4	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T9	5	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T9	6	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T9	7	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T9	9	LDF5-50A(7/8)	80.00 - 86.67	0.6000	0.6000
T9	11	HJ7-50A(1-5/8)	80.00 - 86.67	0.6000	0.6000
T9	12	LDF5-50A(7/8)	80.00 - 86.67	0.6000	0.6000
T9	13	HB158-1-08U8-S8J18(1-5/8)	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
T9	15	LDF2-50(3/8)	80.00 - 86.67	0.6000	0.6000
T9	17	CU12PSM9P6XXX(1-1/2)	80.00 - 86.67	0.6000	0.6000
T9	21	LDF5-50A(7/8)	80.00 - 86.67	0.6000	0.6000
T9	22	7919A(17/64)	80.00 - 86.67	0.6000	0.6000
T9	27	HB158-21U6S24-xxM_TMO(1-5/8)	80.00 - 86.67	0.6000	0.6000
T9	30	HCS 6X12 4AWG(1-5/8)	80.00 - 86.67	0.6000	0.6000
T9	35	LDF4-50A(1/2)	80.00 - 86.67	0.6000	0.6000
T9	37	7919A(17/64)	80.00 - 83.00	0.6000	0.6000
T9	38	LDF4-50A(1/2)	80.00 - 83.00	0.6000	0.6000
T9	39	LDF5-50A(7/8)	80.00 - 83.00	0.6000	0.6000
T10	2	Step Pegs	70.00 - 80.00	0.6000	0.6000
T10	4	Feedline Ladder (Af)	70.00 - 80.00	0.6000	0.6000
T10	5	Feedline Ladder (Af)	70.00 - 80.00	0.6000	0.6000
T10	6	Feedline Ladder (Af)	70.00 - 80.00	0.6000	0.6000
T10	7	Feedline Ladder (Af)	70.00 - 80.00	0.6000	0.6000
T10	9	LDF5-50A(7/8)	70.00 - 80.00	0.6000	0.6000
T10	11	HJ7-50A(1-5/8)	70.00 - 80.00	0.6000	0.6000
T10	12	LDF5-50A(7/8)	70.00 - 80.00	0.6000	0.6000
T10	13	HB158-1-08U8-S8J18(1-5/8)	70.00 - 80.00	0.6000	0.6000
T10	15	LDF2-50(3/8)	70.00 - 80.00	0.6000	0.6000
T10	17	CU12PSM9P6XXX(1-1/2)	70.00 - 80.00	0.6000	0.6000
T10	21	LDF5-50A(7/8)	70.00 - 80.00	0.6000	0.6000
T10	22	7919A(17/64)	70.00 - 80.00	0.6000	0.6000
T10	27	HB158-21U6S24-xxM_TMO(1-5/8)	70.00 - 80.00	0.6000	0.6000
T10	30	HCS 6X12 4AWG(1-5/8)	70.00 - 80.00	0.6000	0.6000
T10	35	LDF4-50A(1/2)	70.00 - 80.00	0.6000	0.6000
T10	37	7919A(17/64)	70.00 - 80.00	0.6000	0.6000
T10	38	LDF4-50A(1/2)	70.00 - 80.00	0.6000	0.6000
T10	39	LDF5-50A(7/8)	70.00 - 80.00	0.6000	0.6000
T11	2	Step Pegs	60.00 - 70.00	0.6000	0.6000
T11	4	Feedline Ladder (Af)	60.00 - 70.00	0.6000	0.6000
T11	5	Feedline Ladder (Af)	60.00 - 70.00	0.6000	0.6000
T11	6	Feedline Ladder (Af)	60.00 - 70.00	0.6000	0.6000
T11	7	Feedline Ladder (Af)	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	9	LDF5-50A(7/8)	60.00 - 70.00	0.6000	0.6000
T11	11	HJ7-50A(1-5/8)	60.00 - 70.00	0.6000	0.6000
T11	12	LDF5-50A(7/8)	60.00 - 70.00	0.6000	0.6000
T11	13	HB158-1-08U8-S8J18(1-5/8)	60.00 - 70.00	0.6000	0.6000
T11	15	LDF2-50(3/8)	60.00 - 70.00	0.6000	0.6000
T11	17	CU12PSM9P6XXX(1-1/2)	60.00 - 70.00	0.6000	0.6000
T11	21	LDF5-50A(7/8)	60.00 - 70.00	0.6000	0.6000
T11	22	7919A(17/64)	60.00 - 70.00	0.6000	0.6000
T11	27	HB158-21U6S24-xxM_TMO(1-5/8)	60.00 - 70.00	0.6000	0.6000
T11	30	HCS 6X12 4AWG(1-5/8)	60.00 - 70.00	0.6000	0.6000
T11	35	LDF4-50A(1/2)	60.00 - 70.00	0.6000	0.6000
T11	37	7919A(17/64)	60.00 - 70.00	0.6000	0.6000
T11	38	LDF4-50A(1/2)	60.00 - 70.00	0.6000	0.6000
T11	39	LDF5-50A(7/8)	60.00 - 70.00	0.6000	0.6000
T11	41	LDF1-50A(1/4)	60.00 - 61.00	0.6000	0.6000
T12	2	Step Pegs	50.00 - 60.00	0.6000	0.6000
T12	4	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T12	5	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T12	6	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T12	7	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T12	9	LDF5-50A(7/8)	50.00 - 60.00	0.6000	0.6000
T12	11	HJ7-50A(1-5/8)	50.00 - 60.00	0.6000	0.6000
T12	12	LDF5-50A(7/8)	50.00 - 60.00	0.6000	0.6000
T12	13	HB158-1-08U8-S8J18(1-5/8)	50.00 - 60.00	0.6000	0.6000
T12	15	LDF2-50(3/8)	50.00 - 60.00	0.6000	0.6000
T12	17	CU12PSM9P6XXX(1-1/2)	50.00 - 60.00	0.6000	0.6000
T12	21	LDF5-50A(7/8)	50.00 - 60.00	0.6000	0.6000
T12	22	7919A(17/64)	50.00 - 60.00	0.6000	0.6000
T12	27	HB158-21U6S24-xxM_TMO(1-5/8)	50.00 - 60.00	0.6000	0.6000
T12	30	HCS 6X12 4AWG(1-5/8)	50.00 - 60.00	0.6000	0.6000
T12	35	LDF4-50A(1/2)	50.00 - 60.00	0.6000	0.6000
T12	37	7919A(17/64)	50.00 - 60.00	0.6000	0.6000
T12	38	LDF4-50A(1/2)	50.00 - 60.00	0.6000	0.6000
T12	39	LDF5-50A(7/8)	50.00 - 60.00	0.6000	0.6000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T12	41	LDF1-50A(1/4)	50.00 - 60.00	0.6000	0.6000
T13	2	Step Pegs	40.00 - 50.00	0.6000	0.6000
T13	4	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T13	5	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T13	6	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T13	7	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T13	9	LDF5-50A(7/8)	40.00 - 50.00	0.6000	0.6000
T13	11	HJ7-50A(1-5/8)	40.00 - 50.00	0.6000	0.6000
T13	12	LDF5-50A(7/8)	40.00 - 50.00	0.6000	0.6000
T13	13	HB158-1-08U8-S8J18(1-5/8)	40.00 - 50.00	0.6000	0.6000
T13	15	LDF2-50(3/8)	40.00 - 50.00	0.6000	0.6000
T13	17	CU12PSM9P6XXX(1-1/2)	40.00 - 50.00	0.6000	0.6000
T13	21	LDF5-50A(7/8)	40.00 - 50.00	0.6000	0.6000
T13	22	7919A(17/64)	40.00 - 50.00	0.6000	0.6000
T13	27	HB158-21U6S24-xxM_TMO(1-5/8)	40.00 - 50.00	0.6000	0.6000
T13	30	HCS 6X12 4AWG(1-5/8)	40.00 - 50.00	0.6000	0.6000
T13	35	LDF4-50A(1/2)	40.00 - 50.00	0.6000	0.6000
T13	37	7919A(17/64)	40.00 - 50.00	0.6000	0.6000
T13	38	LDF4-50A(1/2)	40.00 - 50.00	0.6000	0.6000
T13	39	LDF5-50A(7/8)	40.00 - 50.00	0.6000	0.6000
T13	41	LDF1-50A(1/4)	40.00 - 50.00	0.6000	0.6000
T13	43	LDF4-50A(1/2)	40.00 - 50.00	0.6000	0.6000
T14	2	Step Pegs	30.00 - 40.00	0.6000	0.6000
T14	4	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T14	5	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T14	6	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T14	7	Feedline Ladder (Af)	30.00 - 40.00	0.6000	0.6000
T14	9	LDF5-50A(7/8)	30.00 - 40.00	0.6000	0.6000
T14	11	HJ7-50A(1-5/8)	30.00 - 40.00	0.6000	0.6000
T14	12	LDF5-50A(7/8)	30.00 - 40.00	0.6000	0.6000
T14	13	HB158-1-08U8-S8J18(1-5/8)	30.00 - 40.00	0.6000	0.6000
T14	15	LDF2-50(3/8)	30.00 - 40.00	0.6000	0.6000
T14	17	CU12PSM9P6XXX(1-1/2)	30.00 - 40.00	0.6000	0.6000
T14	21	LDF5-50A(7/8)	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	22	7919A(17/64)	30.00 - 40.00	0.6000	0.6000
T14	27	HB158-21U6S24-xxM_TMO(1-5/8)	30.00 - 40.00	0.6000	0.6000
T14	30	HCS 6X12 4AWG(1-5/8)	30.00 - 40.00	0.6000	0.6000
T14	35	LDF4-50A(1/2)	30.00 - 40.00	0.6000	0.6000
T14	37	7919A(17/64)	30.00 - 40.00	0.6000	0.6000
T14	38	LDF4-50A(1/2)	30.00 - 40.00	0.6000	0.6000
T14	39	LDF5-50A(7/8)	30.00 - 40.00	0.6000	0.6000
T14	41	LDF1-50A(1/4)	30.00 - 40.00	0.6000	0.6000
T14	43	LDF4-50A(1/2)	30.00 - 40.00	0.6000	0.6000
T15	2	Step Pegs	20.00 - 30.00	0.6000	0.6000
T15	4	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T15	5	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T15	6	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T15	7	Feedline Ladder (Af)	20.00 - 30.00	0.6000	0.6000
T15	9	LDF5-50A(7/8)	20.00 - 30.00	0.6000	0.6000
T15	11	HJ7-50A(1-5/8)	20.00 - 30.00	0.6000	0.6000
T15	12	LDF5-50A(7/8)	20.00 - 30.00	0.6000	0.6000
T15	13	HB158-1-08U8-S8J18(1-5/8)	20.00 - 30.00	0.6000	0.6000
T15	15	LDF2-50(3/8)	20.00 - 30.00	0.6000	0.6000
T15	17	CU12PSM9P6XXX(1-1/2)	20.00 - 30.00	0.6000	0.6000
T15	21	LDF5-50A(7/8)	20.00 - 30.00	0.6000	0.6000
T15	22	7919A(17/64)	20.00 - 30.00	0.6000	0.6000
T15	27	HB158-21U6S24-xxM_TMO(1-5/8)	20.00 - 30.00	0.6000	0.6000
T15	30	HCS 6X12 4AWG(1-5/8)	20.00 - 30.00	0.6000	0.6000
T15	35	LDF4-50A(1/2)	20.00 - 30.00	0.6000	0.6000
T15	37	7919A(17/64)	20.00 - 30.00	0.6000	0.6000
T15	38	LDF4-50A(1/2)	20.00 - 30.00	0.6000	0.6000
T15	39	LDF5-50A(7/8)	20.00 - 30.00	0.6000	0.6000
T15	41	LDF1-50A(1/4)	20.00 - 30.00	0.6000	0.6000
T15	43	LDF4-50A(1/2)	20.00 - 30.00	0.6000	0.6000
T16	2	Step Pegs	10.00 - 20.00	0.6000	0.6000
T16	4	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T16	5	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T16	6	Feedline Ladder (Af)	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*
T16	7	Feedline Ladder (Af)	10.00 - 20.00	0.6000	0.6000
T16	9	LDF5-50A(7/8)	10.00 - 20.00	0.6000	0.6000
T16	11	HJ7-50A(1-5/8)	10.00 - 20.00	0.6000	0.6000
T16	12	LDF5-50A(7/8)	10.00 - 20.00	0.6000	0.6000
T16	13	HB158-1-08U8-S8J18(1-5/8)	10.00 - 20.00	0.6000	0.6000
T16	15	LDF2-50(3/8)	10.00 - 20.00	0.6000	0.6000
T16	17	CU12PSM9P6XXX(1-1/2)	10.00 - 20.00	0.6000	0.6000
T16	21	LDF5-50A(7/8)	10.00 - 20.00	0.6000	0.6000
T16	22	7919A(17/64)	10.00 - 20.00	0.6000	0.6000
T16	27	HB158-21U6S24-xxM_TMO(1-5/8)	10.00 - 20.00	0.6000	0.6000
T16	30	HCS 6X12 4AWG(1-5/8)	10.00 - 20.00	0.6000	0.6000
T16	35	LDF4-50A(1/2)	10.00 - 20.00	0.6000	0.6000
T16	37	7919A(17/64)	10.00 - 20.00	0.6000	0.6000
T16	38	LDF4-50A(1/2)	10.00 - 20.00	0.6000	0.6000
T16	39	LDF5-50A(7/8)	10.00 - 20.00	0.6000	0.6000
T16	41	LDF1-50A(1/4)	10.00 - 20.00	0.6000	0.6000
T16	43	LDF4-50A(1/2)	10.00 - 20.00	0.6000	0.6000
T17	2	Step Pegs	0.00 - 10.00	0.6000	0.6000
T17	4	Feedline Ladder (Af)	6.00 - 10.00	0.6000	0.6000
T17	5	Feedline Ladder (Af)	6.00 - 10.00	0.6000	0.6000
T17	6	Feedline Ladder (Af)	6.00 - 10.00	0.6000	0.6000
T17	7	Feedline Ladder (Af)	6.00 - 10.00	0.6000	0.6000
T17	9	LDF5-50A(7/8)	6.00 - 10.00	0.6000	0.6000
T17	11	HJ7-50A(1-5/8)	6.00 - 10.00	0.6000	0.6000
T17	12	LDF5-50A(7/8)	6.00 - 10.00	0.6000	0.6000
T17	13	HB158-1-08U8-S8J18(1-5/8)	6.00 - 10.00	0.6000	0.6000
T17	15	LDF2-50(3/8)	6.00 - 10.00	0.6000	0.6000
T17	17	CU12PSM9P6XXX(1-1/2)	6.00 - 10.00	0.6000	0.6000
T17	21	LDF5-50A(7/8)	6.00 - 10.00	0.6000	0.6000
T17	22	7919A(17/64)	6.00 - 10.00	0.6000	0.6000
T17	27	HB158-21U6S24-xxM_TMO(1-5/8)	6.00 - 10.00	0.6000	0.6000
T17	30	HCS 6X12 4AWG(1-5/8)	6.00 - 10.00	0.6000	0.6000
T17	35	LDF4-50A(1/2)	6.00 - 10.00	0.6000	0.6000
T17	37	7919A(17/64)	6.00 - 10.00	0.6000	0.6000
T17	38	LDF4-50A(1/2)	6.00 - 10.00	0.6000	0.6000
T17	39	LDF5-50A(7/8)	6.00 - 10.00	0.6000	0.6000
T17	41	LDF1-50A(1/4)	6.00 - 10.00	0.6000	0.6000
T17	43	LDF4-50A(1/2)	6.00 - 10.00	0.6000	0.6000

Discrete Tower Loads

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
***									
ANT150F2	A	From Leg	1.00 0.00 7.00	0.0000	150.00	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 0.00 2.00	37.0000	150.00	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 0.00 0.00	0.0000	150.00	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 0.00 0.00	0.0000	150.00	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
Pipe Mount [PM 601-1]	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.32 1.58 1.84 2.40	1.32 1.58 1.84 2.40	0.07 0.08 0.09 0.13
******									
LNX-6514DS-AIM w/ Mount Pipe	A	From Face	4.00 0.00 1.00	-16.0000	148.00	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 0.00 1.00	-36.0000	148.00	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 0.00 1.00	-16.0000	148.00	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 0.00 1.00	-16.0000	148.00	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
RFV01U-D1A	A	From Face	4.00 0.00 1.00	0.0000	148.00	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 0.00 1.00	0.0000	148.00	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	C	From Face	4.00 0.00 1.00	0.0000	148.00	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

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*
DB-B1-6C-12AB-0Z	A	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.36 3.60 3.84 4.34	2.19 2.39 2.61 3.05	0.02 0.05 0.08 0.16
DB-B1-6C-12AB-0Z	C	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.36 3.60 3.84 4.34	2.19 2.39 2.61 3.05	0.02 0.05 0.08 0.16
CBC1923T-DS-43	B	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.32 0.39 0.47 0.65	0.23 0.29 0.37 0.53	0.01 0.01 0.02 0.03
Sector Mount [SM 510-3]	C	None		0.0000	148.00	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
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MT6407-77A w/ Mount Pipe	A	From Face	4.00 0.00 1.00	-16.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	B	From Face	4.00 0.00 1.00	-36.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	C	From Face	4.00 0.00 1.00	-16.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
(2) JAHH-65B-R3B w/ Mount Pipe	A	From Face	4.00 0.00 1.00	-16.0000	148.00	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
(2) JAHH-65B-R3B w/ Mount Pipe	C	From Face	4.00 0.00 1.00	-36.0000	148.00	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
(3) RFV01U-D2A	A	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
(2) CBC78T-DS-43-2X	B	From Face	4.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.37 0.45 0.53 0.72	0.51 0.60 0.70 0.93	0.02 0.03 0.04 0.06
Side by side Mounting Kit [#BSAMNT-SBS2-2]	A	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00
Side by side Mounting Kit [#BSAMNT-SBS2-2]	B	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *K*
						2" Ice			
Side by side Mounting Kit [#BSAMNT-SBS2-2]	C	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00
Mount Reinforcement Specifications	C	None		0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	28.63 37.31 45.80 62.38	28.63 37.31 45.80 62.38	0.28 0.67 0.94 1.63
******									
WV-CW864	A	From Leg	0.50 0.00 -1.00	0.0000	146.00	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
******									
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	14.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	14.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	14.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
TA08025-B604	A	From Leg	4.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	B	From Leg	4.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	C	From Leg	4.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B605	A	From Leg	4.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B605	B	From Leg	4.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B605	C	From Leg	4.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
RDIDC-9181-PF-48	C	From Leg	4.00 0.00	0.0000	135.00	No Ice	2.01 2.19	1.17 1.31	0.02 0.04

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
			0.00			1/2" Ice	2.37	1.46	0.06
						1" Ice	2.76	1.78	0.11
						2" Ice			
(2) 8' x 2" Mount Pipe	A	From Leg	4.00	0.0000	135.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
						2" Ice	4.40	4.40	0.12
(2) 8' x 2" Mount Pipe	B	From Leg	4.00	0.0000	135.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
						2" Ice	4.40	4.40	0.12
(2) 8' x 2" Mount Pipe	C	From Leg	4.00	0.0000	135.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
						2" Ice	4.40	4.40	0.12
Commscope MTC3975083 (3)	C	None		0.0000	135.00	No Ice	23.85	23.85	1.26
						1/2" Ice	34.12	34.12	1.80
						1" Ice	44.39	44.39	2.35
						2" Ice	64.93	64.93	3.43
******									
******									
BCD-87010-EDIN-X	A	From Leg	3.00	0.0000	126.00	No Ice	2.90	2.90	0.03
			0.00			1/2" Ice	4.05	4.05	0.05
			4.00			1" Ice	5.21	5.21	0.08
						2" Ice	7.01	7.01	0.16
PTP 400	A	From Leg	3.00	37.0000	126.00	No Ice	1.75	0.48	0.01
			0.00			1/2" Ice	1.92	0.58	0.02
			-1.00			1" Ice	2.09	0.69	0.04
						2" Ice	2.46	0.92	0.07
SC614	A	From Leg	3.00	0.0000	126.00	No Ice	0.00	0.00	0.00
			0.00			1/2" Ice	0.00	0.00	0.00
			4.00			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	126.00	No Ice	0.53	1.52	0.03
			0.00			1/2" Ice	0.78	2.07	0.04
			0.00			1" Ice	1.06	2.66	0.06
						2" Ice	1.73	3.91	0.13
******									
Sector Mount [SM 502-3]	C	None		0.0000	121.00	No Ice	29.82	29.82	1.67
						1/2" Ice	42.21	42.21	2.27
						1" Ice	54.43	54.43	3.05
						2" Ice	78.49	78.49	5.18
***									
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.00	14.0000	121.00	No Ice	5.19	2.71	0.13
			0.00			1/2" Ice	5.59	3.04	0.17
			1.00			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	14.0000	121.00	No Ice	5.19	2.71	0.13
			0.00			1/2" Ice	5.59	3.04	0.17
			1.00			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	14.0000	121.00	No Ice	5.19	2.71	0.13
			0.00			1/2" Ice	5.59	3.04	0.17

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*
			1.00			1/2" Ice	6.02 6.90	3.38 4.12	0.23 0.35
						1" Ice 2" Ice			
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	14.0000	121.00	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	0.18 0.31 0.45 0.78
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	14.0000	121.00	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	0.18 0.31 0.45 0.78
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	14.0000	121.00	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	0.18 0.31 0.45 0.78
Radio 4480_TMOV2	A	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.88 3.09 3.31 3.78	1.40 1.56 1.73 2.09	0.08 0.10 0.13 0.19
Radio 4480_TMOV2	B	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.88 3.09 3.31 3.78	1.40 1.56 1.73 2.09	0.08 0.10 0.13 0.19
Radio 4480_TMOV2	C	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.88 3.09 3.31 3.78	1.40 1.56 1.73 2.09	0.08 0.10 0.13 0.19
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.14 2.32 2.51 2.91	1.69 1.85 2.02 2.39	0.11 0.13 0.16 0.22
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.14 2.32 2.51 2.91	1.69 1.85 2.02 2.39	0.11 0.13 0.16 0.22
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.14 2.32 2.51 2.91	1.69 1.85 2.02 2.39	0.11 0.13 0.16 0.22
******									
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	44.0000	103.00	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
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	44.0000	103.00	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
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	44.0000	103.00	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

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
Sector Mount [SM 701-3]	C	None		0.0000	103.00	No Ice	19.16	19.16	0.82
						1/2" Ice	25.62	25.62	1.17
						1" Ice	32.19	32.19	1.61
						2" Ice	45.91	45.91	2.79
***									
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	44.0000	103.00	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	1.00 0.00 0.00	44.0000	103.00	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	1.00 0.00 0.00	0.0000	103.00	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	1.00 0.00 0.00	44.0000	103.00	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	1.00 0.00 0.00	44.0000	103.00	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	1.00 0.00 0.00	0.0000	103.00	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
RRUS 4415 B25	A	From Leg	1.00 0.00 0.00	0.0000	103.00	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	1.00 0.00 0.00	0.0000	103.00	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	1.00 0.00 0.00	0.0000	103.00	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
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	1.00 0.00 0.00	0.0000	103.00	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	1.00 0.00 0.00	0.0000	103.00	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	1.00 0.00 0.00	0.0000	103.00	No Ice 1/2" Ice 1" 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

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
						2" Ice			
******									
ANT150F2	B	From Leg	3.00 0.00 3.00	0.0000	90.00	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
Side Arm Mount [SO 302-1]	B	From Leg	1.50 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.81 1.30 1.81 2.91	3.31 5.00 6.80 10.99	0.06 0.08 0.12 0.23
*******									
ANT150D3	A	From Leg	3.00 0.00 7.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.60 3.20 4.80 8.00	1.60 3.20 4.80 8.00	0.01 0.02 0.03 0.05
PTP 400	A	From Leg	3.00 0.00 12.00	0.0000	83.00	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
ANT940F10	B	From Leg	3.00 0.00 3.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 2.36 2.78 3.65	1.64 2.36 2.78 3.65	0.02 0.03 0.05 0.10
Side Arm Mount [SO 305-1]	A	From Leg	1.50 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.53 0.78 1.06 1.73	1.52 2.07 2.66 3.91	0.03 0.04 0.06 0.13
Side Arm Mount [SO 305-1]	B	From Leg	1.50 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.53 0.78 1.06 1.73	1.52 2.07 2.66 3.91	0.03 0.04 0.06 0.13
******									
BMOY8905	B	From Face	1.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.16 0.29 0.42 0.67	0.16 0.29 0.42 0.67	0.00 0.00 0.00 0.00
******									
KS24019-L112A	B	From Leg	3.00 0.00 2.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.14 0.20 0.26 0.41	0.14 0.20 0.26 0.41	0.01 0.01 0.01 0.02
Side Arm Mount [SO 305-1]	B	From Leg	1.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.53 0.78 1.06 1.73	1.52 2.07 2.66 3.91	0.03 0.04 0.06 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	7	0.86	0.00	0.00
			Max. Compression	27	-6.89	0.00	0.17
			Max. Mx	8	-2.24	1.92	-0.01
			Max. My	2	-1.18	0.01	-1.92
			Max. Vy	8	-1.14	0.00	0.00
			Max. Vx	2	1.05	0.00	0.00
		Diagonal	Max Tension	6	1.50	0.00	0.00
			Max. Compression	18	-1.46	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	28	0.21	0.03	-0.00
			Max. My	18	-1.20	0.01	-0.00
			Max. Vy	27	-0.03	0.03	-0.00
			Max. Vx	18	-0.00	0.00	0.00
		Top Girt	Max Tension	3	0.29	0.00	0.00
			Max. Compression	6	-0.35	0.00	0.00
			Max. Mx	26	-0.13	-0.16	0.00
			Max. My	20	-0.03	0.00	0.00
			Max. Vy	26	0.07	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
T2	145 - 140	Leg	Max Tension	23	3.66	0.06	0.08
			Max. Compression	27	-8.66	-0.00	-0.00
			Max. Mx	20	-2.36	0.78	0.01
			Max. My	3	-6.62	-0.00	0.77
			Max. Vy	20	0.20	0.78	0.01
			Max. Vx	2	0.18	-0.00	0.77
		Diagonal	Max Tension	16	2.90	0.00	0.00
			Max. Compression	4	-2.98	0.00	0.00
			Max. Mx	29	0.68	0.04	0.00
			Max. My	6	-2.43	0.01	0.00
			Max. Vy	29	-0.04	0.04	0.00
			Max. Vx	6	-0.00	0.00	0.00
T3	140 - 120	Leg	Max Tension	7	23.52	-0.09	0.08
			Max. Compression	2	-32.30	0.50	-0.00
			Max. Mx	6	7.41	0.74	0.07
			Max. My	12	-2.82	-0.03	0.75
			Max. Vy	14	1.04	-0.57	0.00
			Max. Vx	20	1.04	-0.04	-0.53
		Diagonal	Max Tension	16	4.73	0.00	0.00
			Max. Compression	18	-4.93	0.00	0.00
			Max. Mx	28	0.29	0.07	0.01
			Max. My	29	0.85	0.07	0.01
			Max. Vy	36	0.06	0.07	-0.01
			Max. Vx	29	-0.00	0.00	0.00
		Top Girt	Max Tension	22	0.72	0.00	0.00
			Max. Compression	11	-0.66	0.00	0.00
			Max. Mx	26	-0.03	-0.16	0.00
			Max. My	36	-0.03	0.00	0.00
			Max. Vy	26	-0.07	0.00	0.00
			Max. Vx	36	-0.00	0.00	0.00
T4	120 - 113.333	Leg	Max Tension	7	31.81	0.05	0.08
			Max. Compression	2	-41.88	-0.04	-0.01
			Max. Mx	14	28.23	-0.57	0.00
			Max. My	21	-4.78	-0.03	-0.53
			Max. Vy	14	-0.15	-0.57	0.00
			Max. Vx	20	-0.20	-0.04	-0.53
		Diagonal	Max Tension	16	6.08	0.00	0.00
			Max. Compression	18	-6.19	0.00	0.00
			Max. Mx	28	1.37	0.08	-0.01
			Max. My	6	-5.39	0.01	0.01
			Max. Vy	36	0.06	0.08	0.01
			Max. Vx	36	0.00	0.00	0.00
T5	113.333 - 106.667	Leg	Max Tension	7	41.99	-0.10	0.07
			Max. Compression	2	-52.67	0.08	-0.00
			Max. Mx	33	-10.79	-0.13	0.00
			Max. My	21	-5.42	-0.01	-0.24
			Max. Vy	14	0.08	-0.11	0.00
			Max. Vx	20	0.15	-0.01	-0.24
		Diagonal	Max Tension	18	6.12	0.00	0.00
			Max. Compression	16	-6.14	0.00	0.00
			Max. Mx	27	1.32	0.09	0.01
			Max. My	35	-0.01	0.08	-0.01
			Max. Vy	37	0.06	0.08	-0.01
			Max. Vx	35	0.00	0.00	0.00
T6	106.667 - 100	Leg	Max Tension	7	50.92	-0.27	-0.00
			Max. Compression	2	-63.32	0.03	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. Mx	18	-62.18	0.31	-0.00
			Max. My	20	-8.73	-0.04	0.30
			Max. Vy	6	-0.93	-0.27	-0.00
			Max. Vx	8	0.80	0.03	0.03
		Diagonal	Max Tension	17	7.12	-0.06	0.00
			Max. Compression	18	-7.60	0.00	0.00
			Max. Mx	27	0.92	-0.16	0.02
			Max. My	36	-1.49	-0.13	0.03
			Max. Vy	29	-0.10	-0.15	0.02
			Max. Vx	36	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	7	0.97	0.01	-0.00
			Max. Compression	18	-1.01	0.02	0.00
			Max. Mx	34	-0.25	0.07	0.00
			Max. My	4	-0.92	0.02	0.00
			Max. Vy	34	0.06	0.07	0.00
			Max. Vx	38	-0.00	0.00	0.00
T7	100 - 93.3333	Leg	Max Tension	7	61.06	-0.08	0.05
			Max. Compression	18	-75.74	0.05	-0.06
			Max. Mx	33	-12.85	-0.19	-0.00
			Max. My	20	-9.12	-0.04	-0.29
			Max. Vy	14	-0.07	-0.10	-0.01
			Max. Vx	8	0.15	-0.04	0.29
		Diagonal	Max Tension	16	7.61	0.00	0.00
			Max. Compression	16	-7.49	0.00	0.00
			Max. Mx	27	1.75	0.12	0.01
			Max. My	36	-0.62	0.10	-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	7	71.39	-0.05	0.06
			Max. Compression	18	-87.15	-0.16	-0.06
			Max. Mx	18	-87.09	0.39	0.00
			Max. My	20	-9.83	-0.07	-0.48
			Max. Vy	18	0.24	0.39	0.00
			Max. Vx	20	0.23	-0.07	-0.48
		Diagonal	Max Tension	16	7.60	0.00	0.00
			Max. Compression	18	-8.05	0.00	0.00
			Max. Mx	27	0.98	0.15	-0.02
			Max. My	36	-1.77	0.13	-0.02
			Max. Vy	29	0.08	0.14	-0.02
			Max. Vx	36	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	4	0.24	0.02	-0.00
			Max. Compression	5	-0.24	0.01	0.00
			Max. Mx	34	0.03	0.09	0.01
			Max. My	28	-0.03	0.09	0.01
			Max. Vy	34	0.06	0.09	0.01
			Max. Vx	27	-0.00	0.00	0.00
T9	86.6667 - 80	Leg	Max Tension	7	81.70	0.06	0.07
			Max. Compression	18	-99.24	0.15	-0.11
			Max. Mx	18	-99.11	0.44	0.02
			Max. My	20	-10.20	-0.07	-0.48
			Max. Vy	18	-0.21	0.44	0.02
			Max. Vx	20	-0.25	-0.07	-0.48
		Diagonal	Max Tension	16	8.02	0.00	0.00
			Max. Compression	18	-8.28	0.00	0.00
			Max. Mx	27	1.91	-0.18	0.03
			Max. My	30	-1.20	-0.15	-0.04
			Max. Vy	29	-0.12	-0.17	-0.04
			Max. Vx	36	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	20	0.25	0.02	-0.00
			Max. Compression	9	-0.26	0.02	0.00
			Max. Mx	29	0.05	0.08	0.00
			Max. My	38	0.05	0.08	0.00
			Max. Vy	29	0.06	0.08	0.00
			Max. Vx	38	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T10	80 - 70	Leg	Max Tension	7	94.63	-0.17	0.12
			Max. Compression	18	-114.34	-0.00	-0.14
			Max. Mx	33	-9.83	-0.41	-0.00
			Max. My	20	-11.69	-0.08	-0.75
			Max. Vy	33	-0.12	-0.41	-0.00
			Max. Vx	20	0.25	-0.08	-0.75
		Diagonal	Max Tension	16	9.34	0.00	0.00
			Max. Compression	18	-9.38	0.00	0.00
			Max. Mx	29	0.85	-0.28	-0.04
			Max. My	6	-8.65	-0.06	-0.04
			Max. Vy	29	-0.14	-0.28	-0.04
			Max. Vx	36	-0.01	0.00	0.00
T11	70 - 60	Leg	Max Tension	7	109.60	-0.09	0.15
			Max. Compression	18	-131.73	-0.57	-0.08
			Max. Mx	18	-131.59	0.99	0.01
			Max. My	20	-11.96	-0.08	-0.75
			Max. Vy	18	0.35	0.99	0.01
			Max. Vx	20	-0.29	-0.08	-0.75
		Diagonal	Max Tension	17	9.44	-0.12	-0.01
			Max. Compression	18	-10.24	0.00	0.00
			Max. Mx	27	1.93	-0.26	0.04
			Max. My	36	1.95	-0.25	0.05
			Max. Vy	29	-0.14	-0.26	0.04
			Max. Vx	29	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	8	0.39	0.03	-0.00
			Max. Compression	21	-0.42	0.02	0.01
			Max. Mx	36	0.15	0.12	0.00
			Max. My	20	-0.41	0.03	0.01
			Max. Vy	30	-0.08	0.12	0.00
			Max. Vx	38	-0.00	0.00	0.00
T12	60 - 50	Leg	Max Tension	7	124.18	0.39	0.09
			Max. Compression	18	-149.39	-0.94	-0.05
			Max. Mx	18	-149.25	1.29	-0.01
			Max. My	20	-13.88	-0.20	-1.04
			Max. Vy	18	0.48	1.29	-0.01
			Max. Vx	20	0.35	-0.20	-1.04
		Diagonal	Max Tension	16	9.64	0.00	0.00
			Max. Compression	18	-10.37	0.00	0.00
			Max. Mx	29	0.43	-0.38	-0.05
			Max. My	29	-3.18	-0.35	-0.06
			Max. Vy	29	-0.17	-0.38	-0.05
			Max. Vx	29	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	8	0.61	0.04	-0.01
			Max. Compression	21	-0.62	0.05	0.02
			Max. Mx	28	0.00	0.20	0.02
			Max. My	6	-0.52	0.06	0.02
			Max. Vy	28	0.11	0.20	0.02
			Max. Vx	38	-0.00	0.00	0.00
T13	50 - 40	Leg	Max Tension	7	138.19	0.60	0.07
			Max. Compression	18	-166.52	0.08	-0.11
			Max. Mx	18	-166.37	1.16	-0.00
			Max. My	20	-14.53	-0.20	-1.04
			Max. Vy	18	-0.47	1.16	-0.00
			Max. Vx	20	-0.34	-0.20	-1.04
		Diagonal	Max Tension	16	9.94	0.00	0.00
			Max. Compression	18	-10.85	0.00	0.00
			Max. Mx	27	2.28	-0.34	0.06
			Max. My	36	2.28	-0.33	0.06
			Max. Vy	29	-0.17	-0.33	0.05
			Max. Vx	36	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	6	0.47	0.08	-0.00
			Max. Compression	21	-0.52	0.04	0.02
			Max. Mx	36	0.25	0.18	0.01
			Max. My	20	-0.51	0.06	0.02
			Max. Vy	36	0.11	0.18	0.01
			Max. Vx	38	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T14	40 - 30	Leg	Max Tension	7	152.47	-0.11	0.11
			Max. Compression	18	-184.38	-0.06	-0.10
			Max. Mx	33	-8.93	-1.07	-0.00
			Max. My	20	-16.72	-0.15	-1.12
			Max. Vy	33	-0.27	-1.07	-0.00
			Max. Vx	20	0.26	-0.15	-1.12
		Diagonal	Max Tension	18	10.78	0.00	0.00
			Max. Compression	16	-10.59	0.00	0.00
			Max. Mx	29	0.28	-0.54	-0.06
			Max. My	29	-2.65	-0.49	-0.07
			Max. Vy	29	-0.21	-0.54	-0.06
			Max. Vx	36	-0.01	0.00	0.00
T15	30 - 20	Leg	Max Tension	7	165.53	-0.14	0.12
			Max. Compression	18	-200.77	-0.91	-0.08
			Max. Mx	27	-97.37	-2.36	0.00
			Max. My	20	-17.34	-0.15	-1.12
			Max. Vy	27	0.69	-2.36	0.00
			Max. Vx	20	-0.34	-0.15	-1.12
		Diagonal	Max Tension	16	10.63	0.00	0.00
			Max. Compression	18	-12.00	0.00	0.00
			Max. Mx	27	2.67	-0.40	0.07
			Max. My	36	2.70	-0.39	0.08
			Max. Vy	29	-0.21	-0.40	0.07
			Max. Vx	36	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	20	0.56	0.06	-0.00
			Max. Compression	21	-0.56	0.04	0.01
			Max. Mx	36	0.31	0.19	0.00
			Max. My	38	0.10	0.19	0.01
			Max. Vy	36	0.10	0.19	0.00
			Max. Vx	38	-0.00	0.00	0.00
T16	20 - 10	Leg	Max Tension	7	179.18	0.61	0.09
			Max. Compression	18	-218.58	-1.73	-0.03
			Max. Mx	27	-101.57	-2.36	0.00
			Max. My	20	-19.90	-0.35	-1.91
			Max. Vy	18	0.81	2.19	0.01
			Max. Vx	20	0.54	-0.35	-1.91
		Diagonal	Max Tension	18	11.23	0.00	0.00
			Max. Compression	18	-11.68	0.00	0.00
			Max. Mx	28	1.71	-0.75	0.07
			Max. My	6	-10.79	-0.20	-0.10
			Max. Vy	29	-0.26	-0.74	-0.08
			Max. Vx	29	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	20	0.96	0.06	-0.00
			Max. Compression	21	-0.90	0.06	0.01
			Max. Mx	27	-0.08	0.25	0.00
			Max. My	28	-0.09	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	191.84	1.05	0.07
			Max. Compression	18	-235.00	-0.00	0.00
			Max. Mx	18	-234.76	1.99	0.00
			Max. My	20	-20.73	-0.35	-1.91
			Max. Vy	18	-0.80	1.99	0.00
			Max. Vx	20	-0.48	-0.35	-1.91
		Diagonal	Max Tension	6	11.31	0.00	0.00
			Max. Compression	18	-13.18	0.00	0.00
			Max. Mx	18	10.61	-0.46	-0.06
			Max. My	36	3.82	-0.42	0.10
			Max. Vy	28	-0.22	-0.42	0.09
			Max. Vx	36	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	20	0.73	0.13	-0.00
			Max. Compression	21	-0.70	0.07	0.01
			Max. Mx	29	0.01	0.23	0.01
			Max. My	20	-0.68	0.10	0.02
			Max. Vy	29	-0.12	0.23	0.01
			Max. Vx	38	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	244.00	26.15	-17.14
	Max. H_x	18	244.00	26.15	-17.14
	Max. H_z	7	-198.47	-21.42	14.34
	Min. Vert	7	-198.47	-21.42	14.34
	Min. H_x	7	-198.47	-21.42	14.34
	Min. H_z	18	244.00	26.15	-17.14
Leg B	Max. Vert	10	233.21	-25.08	-16.13
	Max. H_x	23	-189.09	20.36	13.35
	Max. H_z	23	-189.09	20.36	13.35
	Min. Vert	23	-189.09	20.36	13.35
	Min. H_x	10	233.21	-25.08	-16.13
	Min. H_z	10	233.21	-25.08	-16.13
Leg A	Max. Vert	2	236.80	-0.10	29.84
	Max. H_x	20	21.91	5.79	1.83
	Max. H_z	2	236.80	-0.10	29.84
	Min. Vert	15	-184.76	0.08	-24.22
	Min. H_x	8	22.68	-5.81	1.95
	Min. H_z	15	-184.76	0.08	-24.22

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	48.84	0.00	0.00	-45.12	7.65	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	58.60	0.11	-47.50	-4286.39	1.63	-3.11
0.9 Dead+1.0 Wind 0 deg - No Ice	43.95	0.11	-47.50	-4268.09	-0.67	-3.10
1.2 Dead+1.0 Wind 30 deg - No Ice	58.60	23.49	-40.67	-3713.63	-2103.01	-36.53
0.9 Dead+1.0 Wind 30 deg - No Ice	43.95	23.49	-40.67	-3695.96	-2102.98	-36.49
1.2 Dead+1.0 Wind 60 deg - No Ice	58.60	40.03	-23.23	-2158.82	-3619.75	-68.12
0.9 Dead+1.0 Wind 60 deg - No Ice	43.95	40.03	-23.23	-2142.86	-3618.01	-68.05
1.2 Dead+1.0 Wind 90 deg - No Ice	58.60	46.74	-0.11	-62.07	-4219.96	-81.86
0.9 Dead+1.0 Wind 90 deg - No Ice	43.95	46.74	-0.11	-48.44	-4217.55	-81.79
1.2 Dead+1.0 Wind 120 deg - No Ice	58.60	41.15	23.75	2071.22	-3671.88	-55.38
0.9 Dead+1.0 Wind 120 deg - No Ice	43.95	41.15	23.75	2082.49	-3670.10	-55.31
1.2 Dead+1.0 Wind 150 deg - No Ice	58.60	21.46	37.38	3341.13	-1942.04	-19.20
0.9 Dead+1.0 Wind 150 deg - No Ice	43.95	21.46	37.38	3350.97	-1942.16	-19.17
1.2 Dead+1.0 Wind 180 deg - No Ice	58.60	-0.11	43.80	3925.06	16.77	3.10
0.9 Dead+1.0 Wind 180 deg - No Ice	43.95	-0.11	43.80	3934.25	14.46	3.09
1.2 Dead+1.0 Wind 210 deg - No Ice	58.60	-23.49	40.67	3604.97	2121.56	36.53

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
0.9 Dead+1.0 Wind 210 deg - No Ice	43.95	-23.49	40.67	3614.55	2116.91	36.48
1.2 Dead+1.0 Wind 240 deg - No Ice	58.60	-43.23	25.07	2176.31	3857.22	68.13
0.9 Dead+1.0 Wind 240 deg - No Ice	43.95	-43.23	25.07	2187.48	3850.67	68.06
1.2 Dead+1.0 Wind 270 deg - No Ice	58.60	-46.74	0.11	-46.92	4238.35	81.86
0.9 Dead+1.0 Wind 270 deg - No Ice	43.95	-46.74	0.11	-33.30	4231.34	81.79
1.2 Dead+1.0 Wind 300 deg - No Ice	58.60	-37.95	-21.91	-2053.66	3471.23	55.37
0.9 Dead+1.0 Wind 300 deg - No Ice	43.95	-37.95	-21.91	-2037.80	3465.05	55.31
1.2 Dead+1.0 Wind 330 deg - No Ice	58.60	-21.46	-37.38	-3449.75	1960.35	19.20
0.9 Dead+1.0 Wind 330 deg - No Ice	43.95	-21.46	-37.38	-3432.33	1955.87	19.17
1.2 Dead+1.0 Ice+1.0 Temp	152.87	0.00	0.00	-210.92	13.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	152.87	0.03	-11.15	-1233.79	10.79	-1.04
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	152.87	5.62	-9.72	-1105.90	-504.28	-12.94
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	152.87	9.75	-5.66	-732.92	-887.67	-23.41
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	152.87	11.16	-0.03	-213.16	-1018.39	-26.33
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	152.87	9.60	5.54	298.95	-871.17	-20.15
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	152.87	5.31	9.25	646.18	-479.89	-9.84
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	152.87	-0.03	10.78	787.28	15.21	1.04
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	152.87	-5.62	9.72	684.03	530.29	12.94
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	152.87	-10.07	5.84	323.35	935.02	23.41
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	152.87	-11.16	0.03	-208.74	1044.39	26.33
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	152.87	-9.28	-5.35	-708.51	875.82	20.14
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	152.87	-5.31	-9.25	-1068.05	505.88	9.84
Dead+Wind 0 deg - Service	48.84	0.02	-8.19	-771.59	6.37	-0.53
Dead+Wind 30 deg - Service	48.84	4.05	-7.02	-673.29	-354.89	-6.25
Dead+Wind 60 deg - Service	48.84	6.91	-4.01	-406.41	-615.24	-11.66
Dead+Wind 90 deg - Service	48.84	8.06	-0.02	-46.51	-718.23	-14.01
Dead+Wind 120 deg - Service	48.84	7.10	4.10	319.62	-624.13	-9.48
Dead+Wind 150 deg - Service	48.84	3.70	6.45	537.73	-327.33	-3.29
Dead+Wind 180 deg - Service	48.84	-0.02	7.56	637.95	8.96	0.53
Dead+Wind 210 deg - Service	48.84	-4.05	7.02	582.88	370.22	6.25
Dead+Wind 240 deg - Service	48.84	-7.45	4.32	337.61	668.02	11.66
Dead+Wind 270 deg - Service	48.84	-8.06	0.02	-43.92	733.56	14.01
Dead+Wind 300 deg - Service	48.84	-6.55	-3.78	-388.42	602.00	9.48
Dead+Wind 330 deg - Service	48.84	-3.70	-6.45	-628.14	342.65	3.28

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-48.84	0.00	0.00	48.84	0.00	0.000%
2	0.11	-58.60	-47.50	-0.11	58.60	47.50	0.000%
3	0.11	-43.95	-47.50	-0.11	43.95	47.50	0.000%
4	23.49	-58.60	-40.67	-23.49	58.60	40.67	0.000%
5	23.49	-43.95	-40.67	-23.49	43.95	40.67	0.000%
6	40.03	-58.60	-23.23	-40.03	58.60	23.23	0.000%
7	40.03	-43.95	-23.23	-40.03	43.95	23.23	0.000%
8	46.74	-58.60	-0.11	-46.74	58.60	0.11	0.000%
9	46.74	-43.95	-0.11	-46.74	43.95	0.11	0.000%
10	41.15	-58.60	23.75	-41.15	58.60	-23.75	0.000%
11	41.15	-43.95	23.75	-41.15	43.95	-23.75	0.000%
12	21.46	-58.60	37.38	-21.46	58.60	-37.38	0.000%
13	21.46	-43.95	37.38	-21.46	43.95	-37.38	0.000%
14	-0.11	-58.60	43.80	0.11	58.60	-43.80	0.000%
15	-0.11	-43.95	43.80	0.11	43.95	-43.80	0.000%
16	-23.49	-58.60	40.67	23.49	58.60	-40.67	0.000%
17	-23.49	-43.95	40.67	23.49	43.95	-40.67	0.000%
18	-43.23	-58.60	25.07	43.23	58.60	-25.07	0.000%
19	-43.23	-43.95	25.07	43.23	43.95	-25.07	0.000%
20	-46.74	-58.60	0.11	46.74	58.60	-0.11	0.000%
21	-46.74	-43.95	0.11	46.74	43.95	-0.11	0.000%
22	-37.95	-58.60	-21.91	37.95	58.60	21.91	0.000%
23	-37.95	-43.95	-21.91	37.95	43.95	21.91	0.000%
24	-21.46	-58.60	-37.38	21.46	58.60	37.38	0.000%
25	-21.46	-43.95	-37.38	21.46	43.95	37.38	0.000%
26	0.00	-152.87	0.00	0.00	152.87	0.00	0.000%
27	0.03	-152.87	-11.15	-0.03	152.87	11.15	0.000%
28	5.62	-152.87	-9.72	-5.62	152.87	9.72	0.000%
29	9.75	-152.87	-5.66	-9.75	152.87	5.66	0.000%
30	11.16	-152.87	-0.03	-11.16	152.87	0.03	0.000%
31	9.60	-152.87	5.54	-9.60	152.87	-5.54	0.000%
32	5.31	-152.87	9.25	-5.31	152.87	-9.25	0.000%
33	-0.03	-152.87	10.78	0.03	152.87	-10.78	0.000%
34	-5.62	-152.87	9.72	5.62	152.87	-9.72	0.000%
35	-10.07	-152.87	5.84	10.07	152.87	-5.84	0.000%
36	-11.16	-152.87	0.03	11.16	152.87	-0.03	0.000%
37	-9.28	-152.87	-5.35	9.28	152.87	5.35	0.000%
38	-5.31	-152.87	-9.25	5.31	152.87	9.25	0.000%
39	0.02	-48.84	-8.19	-0.02	48.84	8.19	0.000%
40	4.05	-48.84	-7.02	-4.05	48.84	7.02	0.000%
41	6.91	-48.84	-4.01	-6.91	48.84	4.01	0.000%
42	8.06	-48.84	-0.02	-8.06	48.84	0.02	0.000%
43	7.10	-48.84	4.10	-7.10	48.84	-4.10	0.000%
44	3.70	-48.84	6.45	-3.70	48.84	-6.45	0.000%
45	-0.02	-48.84	7.56	0.02	48.84	-7.56	0.000%
46	-4.05	-48.84	7.02	4.05	48.84	-7.02	0.000%
47	-7.45	-48.84	4.32	7.45	48.84	-4.32	0.000%
48	-8.06	-48.84	0.02	8.06	48.84	-0.02	0.000%
49	-6.55	-48.84	-3.78	6.55	48.84	3.78	0.000%
50	-3.70	-48.84	-6.45	3.70	48.84	6.45	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000179
3	Yes	4	0.00000001	0.00000211
4	Yes	4	0.00000001	0.00000443
5	Yes	4	0.00000001	0.00000393
6	Yes	4	0.00000001	0.00000638
7	Yes	4	0.00000001	0.00000551
8	Yes	4	0.00000001	0.00000466
9	Yes	4	0.00000001	0.00000412
10	Yes	4	0.00000001	0.00000174
11	Yes	4	0.00000001	0.00000208
12	Yes	4	0.00000001	0.00000371
13	Yes	4	0.00000001	0.00000328
14	Yes	4	0.00000001	0.00000551
15	Yes	4	0.00000001	0.00000478
16	Yes	4	0.00000001	0.00000423
17	Yes	4	0.00000001	0.00000378
18	Yes	4	0.00000001	0.00000199
19	Yes	4	0.00000001	0.00000236
20	Yes	4	0.00000001	0.00000471
21	Yes	4	0.00000001	0.00000415
22	Yes	4	0.00000001	0.00000593
23	Yes	4	0.00000001	0.00000509
24	Yes	4	0.00000001	0.00000393
25	Yes	4	0.00000001	0.00000344
26	Yes	4	0.00000001	0.00000316
27	Yes	4	0.00000001	0.00000538
28	Yes	4	0.00000001	0.00000542
29	Yes	4	0.00000001	0.00000539
30	Yes	4	0.00000001	0.00000508
31	Yes	4	0.00000001	0.00000458
32	Yes	4	0.00000001	0.00000416
33	Yes	4	0.00000001	0.00000409
34	Yes	4	0.00000001	0.00000429
35	Yes	4	0.00000001	0.00000472
36	Yes	4	0.00000001	0.00000512
37	Yes	4	0.00000001	0.00000534
38	Yes	4	0.00000001	0.00000537
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 145	2.052	39	0.1178	0.0213
T2	145 - 140	1.927	39	0.1173	0.0209
T3	140 - 120	1.801	39	0.1159	0.0204
T4	120 - 113.333	1.323	39	0.1049	0.0171
T5	113.333 - 106.667	1.173	39	0.0994	0.0155
T6	106.667 - 100	1.033	39	0.0929	0.0138

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T7	100 - 93.3333	0.904	39	0.0853	0.0128
T8	93.3333 - 86.6667	0.783	39	0.0792	0.0111
T9	86.6667 - 80	0.669	39	0.0725	0.0093
T10	80 - 70	0.569	39	0.0652	0.0084
T11	70 - 60	0.435	39	0.0572	0.0071
T12	60 - 50	0.319	39	0.0486	0.0057
T13	50 - 40	0.221	39	0.0394	0.0046
T14	40 - 30	0.145	39	0.0298	0.0036
T15	30 - 20	0.084	39	0.0227	0.0026
T16	20 - 10	0.041	39	0.0154	0.0017
T17	10 - 0	0.011	47	0.0077	0.0008

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	ANT150F2	39	2.052	0.1178	0.0213	195570
148.00	LNX-6514DS-AIM w/ Mount Pipe	39	2.002	0.1177	0.0211	195570
146.00	WV-CW864	39	1.952	0.1175	0.0210	195570
135.00	MX08FRO665-21 w/ Mount Pipe	39	1.678	0.1139	0.0197	108710
126.00	BCD-87010-EDIN-X	39	1.462	0.1090	0.0183	127856
121.00	Sector Mount [SM 502-3]	39	1.346	0.1056	0.0173	126285
103.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	39	0.961	0.0886	0.0132	58776
90.00	ANT150F2	39	0.725	0.0761	0.0101	46113
83.00	ANT150D3	39	0.613	0.0684	0.0087	48518
61.00	BMOY8905	39	0.330	0.0495	0.0058	74494
50.00	KS24019-L112A	39	0.221	0.0394	0.0046	49481

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 145	11.524	18	0.6421	0.1245
T2	145 - 140	10.842	18	0.6407	0.1223
T3	140 - 120	10.153	18	0.6350	0.1191
T4	120 - 113.333	7.510	18	0.5814	0.1000
T5	113.333 - 106.667	6.671	18	0.5531	0.0907
T6	106.667 - 100	5.885	18	0.5187	0.0805
T7	100 - 93.3333	5.164	18	0.4784	0.0748
T8	93.3333 - 86.6667	4.476	18	0.4455	0.0648
T9	86.6667 - 80	3.832	18	0.4091	0.0544
T10	80 - 70	3.262	18	0.3684	0.0490
T11	70 - 60	2.496	18	0.3240	0.0413
T12	60 - 50	1.835	18	0.2760	0.0333
T13	50 - 40	1.275	18	0.2239	0.0271
T14	40 - 30	0.838	18	0.1695	0.0208
T15	30 - 20	0.492	18	0.1292	0.0153
T16	20 - 10	0.241	18	0.0876	0.0098
T17	10 - 0	0.064	19	0.0441	0.0049

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	ANT150F2	18	11.524	0.6421	0.1245	43528
148.00	LNX-6514DS-AIM w/ Mount Pipe	18	11.252	0.6418	0.1237	43528
146.00	WV-CW864	18	10.979	0.6412	0.1228	43528
135.00	MX08FRO665-21 w/ Mount Pipe	18	9.474	0.6259	0.1152	21352
126.00	BCD-87010-EDIN-X	18	8.284	0.6024	0.1068	27254
121.00	Sector Mount [SM 502-3]	18	7.638	0.5852	0.1012	27471
103.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	18	5.482	0.4962	0.0773	11184
90.00	ANT150F2	18	4.146	0.4283	0.0591	8180
83.00	ANT150D3	18	3.511	0.3861	0.0511	8513
61.00	BMOY8905	18	1.897	0.2810	0.0340	12916
50.00	KS24019-L112A	18	1.275	0.2239	0.0271	8879

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	5.00	5.00	63.3 K=1.00	1.7040	-6.89	57.19	0.120 [1]
T2	145 - 140	ROHN 2.5 STD	5.00	5.00	63.3 K=1.00	1.7040	-8.66	57.19	0.151 [1]
T3	140 - 120	ROHN 2.5 EH	20.03	6.68	86.7 K=1.00	2.2535	-32.30	58.52	0.552 [1]
T4	120 - 113.333	ROHN 2.5 EH (GR)	6.68	6.68	86.7 K=1.00	2.2535	-41.88	65.35	0.641 [1]
T5	113.333 - 106.667	ROHN 2.5 EH (GR)	6.68	6.68	86.7 K=1.00	2.2535	-52.67	65.35	0.806 [1]
T6	106.667 - 100	ROHN 2.5 EH (GR)	6.68	3.43	44.6 K=1.00	2.2535	-63.32	102.38	0.618 [1]
T7	100 - 93.3333	ROHN 3 EH (GR)	6.68	6.68	70.5 K=1.00	3.0159	-75.74	110.51	0.685 [1]
T8	93.3333 - 86.6667	ROHN 3 EH (GR)	6.68	3.42	36.2 K=1.00	3.0159	-87.15	149.39	0.583 [1]
T9	86.6667 - 80	ROHN 3 EH (GR)	6.68	3.42	36.1 K=1.00	3.0159	-99.24	149.43	0.664 [1]
T10	80 - 70	ROHN 4 EH (GR)	10.02	10.02	81.4 K=1.00	4.4074	-114.34	145.74	0.785 [1]
T11	70 - 60	ROHN 4 EH (GR)	10.02	5.16	42.0 K=1.00	4.4074	-131.73	219.00	0.601 [1]
T12	60 - 50	ROHN 4 EH (GR)	10.02	5.16	41.9 K=1.00	4.4074	-149.39	219.04	0.682 [1]
T13	50 - 40	ROHN 4 EH (GR)	10.02	5.15	41.9 K=1.00	4.4074	-166.52	219.15	0.760 [1]
T14	40 - 30	ROHN 5 EH (GR)	10.02	10.02	65.4 K=1.00	6.1120	-184.38	253.87	0.726 [1]
T15	30 - 20	ROHN 5 EH (GR)	10.02	5.13	33.5 K=1.00	6.1120	-200.78	331.76	0.605 [1]
T16	20 - 10	ROHN 5 EH (GR)	10.02	5.13	33.4 K=1.00	6.1120	-218.58	331.84	0.659 [1]
T17	10 - 0	ROHN 5 EH (GR)	10.02	5.12	33.4 K=1.00	6.1120	-235.00	331.90	0.708 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	150 - 145	L1 1/2x1 1/2x3/16	9.92	4.71	192.9 K=1.00	0.5273	-1.46	4.06	0.359 [1]
T2	145 - 140	L2x2x3/16	9.92	4.70	143.3 K=1.00	0.7150	-2.98	9.97	0.299 [1]
T3	140 - 120	L2 1/2x2 1/2x3/16	12.21	6.06	146.8 K=1.00	0.9020	-4.93	11.97	0.411 [1]
T4	120 - 113.333	L2 1/2x2 1/2x3/16	12.78	6.28	144.7 K=0.95	0.9020	-6.19	12.34	0.502 [1]
T5	113.333 - 106.667	L2 1/2x2 1/2x3/16	13.37	6.58	150.1 K=0.94	0.9020	-6.14	11.47	0.535 [1]
T6	106.667 - 100	L2 1/2x2 1/2x3/16x3/16	13.96	7.04	114.4 K=1.00	1.8047	-7.60	35.98	0.211 [1]
T7	100 - 93.3333	2L 'a' > 40.2746 in - 72 L3x3x3/16	14.57	7.15	138.3 K=0.96	1.0900	-7.49	16.31	0.459 [1]
T8	93.3333 - 86.6667	L3x3x3/16	15.19	7.63	153.6 K=1.00	1.0900	-8.05	13.22	0.609 [1]
T9	86.6667 - 80	2L3x3x3/16x1/4	15.82	7.94	107.3 K=1.00	2.1797	-8.28	44.67	0.185 [1]
T10	80 - 70	2L 'a' > 45.3824 in - 105 2L3x3x3/16x1/4	18.20	9.05	122.3 K=1.00	2.1797	-9.38	37.33	0.251 [1]
T11	70 - 60	2L 'a' > 51.7204 in - 117 2L3x3x3/16x1/4	19.04	9.59	129.5 K=1.00	2.1797	-10.24	33.80	0.303 [1]
T12	60 - 50	2L 'a' > 54.8057 in - 126 2L3x3x1/4x1/4	19.91	10.04	135.6 K=1.00	2.8750	-10.37	42.95	0.241 [1]
T13	50 - 40	2L 'a' > 57.5273 in - 138 2L3x3x1/4x1/4	20.81	10.49	141.7 K=1.00	2.8750	-10.85	39.50	0.275 [1]
T14	40 - 30	2L 'a' > 60.1069 in - 150 2L3 1/2x3 1/2x1/4x1/4	21.72	10.76	125.1 K=1.00	3.3750	-10.59	57.19	0.185 [1]
T15	30 - 20	2L 'a' > 61.5464 in - 162 2L3 1/2x3 1/2x1/4x1/4	22.61	11.33	131.7 K=1.00	3.3750	-12.00	52.24	0.230 [1]
T16	20 - 10	2L 'a' > 64.7955 in - 171 2L4x4x1/4x1/4	23.52	11.78	120.2 K=1.00	3.8750	-11.68	68.39	0.171 [1]
T17	10 - 0	2L 'a' > 67.2906 in - 183 2L4x4x1/4x1/4	24.42	12.23	124.8 K=1.00	3.8750	-13.18	63.98	0.206 [1]
		2L 'a' > 69.8855 in - 195							

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T6	106.667 - 100	L2x2x3/16	12.25	6.01	183.0 K=1.00	0.7150	-1.10	6.11	0.180 [1]
T8	93.3333 - 86.6667	L2x2x3/16	13.64	6.68	203.3 K=1.00	0.7150	-1.51	4.95	0.305 [1]
T9	86.6667 - 80	L2x2x3/16	14.34	7.02	213.9 K=1.00	0.7150	-1.72	4.47	0.385 [1]
T11	70 - 60	L2 1/2x2 1/2x3/16	16.18	7.90	191.6 K=1.00	0.9020	-2.28	7.03	0.325 [1]

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T12	60 - 50	L3x3x1/4	17.20	8.41	170.5 K=1.00	1.4400	-2.59	14.17	0.183 [1]
T13	50 - 40	L3x3x1/4	18.24	8.93	181.0 K=1.00	1.4400	-2.89	12.57	0.230 [1]
T15	30 - 20	L3x3x3/16	20.27	9.90	199.4 K=1.00	1.0900	-3.48	7.85	0.444 [1]
T16	20 - 10	L3x3x3/16	21.27	10.40	209.5 K=1.00	1.0900	-3.79	7.11	0.533 [1]
T17	10 - 0	L3 1/2x3 1/2x1/4	22.27	10.90	188.5 K=1.00	1.6900	-4.08	13.61	0.299 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	150 - 145	L2 1/2x2 1/2x3/16	8.56	8.11	196.7 K=1.00	0.9020	-0.35	6.67	0.053 [1]
T3	140 - 120	L2 1/2x2 1/2x3/16	8.56	8.11	196.7 K=1.00	0.9020	-0.66	6.67	0.098 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	150 - 145	ROHN 2.5 STD	5.00	5.00	63.3	1.7040	0.86	76.68	0.011 [1]
T2	145 - 140	ROHN 2.5 STD	5.00	5.00	63.3	1.7040	3.66	76.68	0.048 [1]
T3	140 - 120	ROHN 2.5 EH	20.03	6.68	86.7	2.2535	23.52	101.41	0.232 [1]
T4	120 - 113.333	ROHN 2.5 EH (GR)	6.68	6.68	86.7	2.2535	31.81	101.41	0.314 [1]
T5	113.333 - 106.667	ROHN 2.5 EH (GR)	6.68	6.68	86.7	2.2535	41.99	101.41	0.414 [1]
T6	106.667 - 100	ROHN 2.5 EH (GR)	6.68	3.25	42.2	2.2535	50.92	101.41	0.502 [1]
T7	100 - 93.3333	ROHN 3 EH (GR)	6.68	6.68	70.5	3.0159	61.06	135.72	0.450 [1]
T8	93.3333 - 86.6667	ROHN 3 EH (GR)	6.68	3.25	34.4	3.0159	71.39	135.72	0.526 [1]
T9	86.6667 - 80	ROHN 3 EH (GR)	6.68	3.26	34.4	3.0159	81.70	135.72	0.602 [1]
T10	80 - 70	ROHN 4 EH (GR)	10.02	10.02	81.4	4.4074	94.63	198.34	0.477 [1]
T11	70 - 60	ROHN 4 EH (GR)	10.02	4.85	39.4	4.4074	109.60	198.34	0.553 [1]
T12	60 - 50	ROHN 4 EH (GR)	10.02	4.86	39.5	4.4074	124.18	198.34	0.626 [1]
T13	50 - 40	ROHN 4 EH (GR)	10.02	4.87	39.5	4.4074	138.19	198.34	0.697 [1]
T14	40 - 30	ROHN 5 EH (GR)	10.02	10.02	65.4	6.1120	152.47	275.04	0.554 [1]
T15	30 - 20	ROHN 5 EH (GR)	10.02	4.88	31.9	6.1120	165.54	275.04	0.602 [1]
T16	20 - 10	ROHN 5 EH (GR)	10.02	4.89	31.9	6.1120	179.19	275.04	0.651 [1]
T17	10 - 0	ROHN 5 EH (GR)	10.02	4.90	31.9	6.1120	191.84	275.04	0.698 [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	9.92	4.71	126.6	0.3076	1.50	13.38	0.112 [1]
T2	145 - 140	L2x2x3/16	9.92	4.70	93.7	0.4484	2.90	19.50	0.149 [1]
T3	140 - 120	L2 1/2x2 1/2x3/16	12.21	6.06	95.0	0.5886	4.73	25.60	0.185 [1]
T4	120 - 113.333	L2 1/2x2 1/2x3/16	12.78	6.28	99.5	0.5886	6.08	25.60	0.237 [1]
T5	113.333 - 106.667	L2 1/2x2 1/2x3/16	13.37	6.58	104.0	0.5886	6.12	25.60	0.239 [1]
T6	106.667 - 100	L2 1/2x2 1/2x3/16x3/16 2L 'a' > 40.2746 in - 71	13.96	7.04	108.5	1.1777	7.12	51.23	0.139 [1]
T7	100 - 93.3333	L3x3x3/16	14.57	7.15	93.5	0.7296	7.61	31.74	0.240 [1]
T8	93.3333 - 86.6667	L3x3x3/16	15.19	7.63	97.5	0.7296	7.60	31.74	0.239 [1]
T9	86.6667 - 80	2L3x3x3/16x1/4 2L 'a' > 45.3824 in - 104	15.82	7.94	101.5	1.4590	8.02	63.47	0.126 [1]
T10	80 - 70	2L3x3x3/16x1/4 2L 'a' > 51.7204 in - 116	18.20	9.05	117.2	1.4238	9.34	61.94	0.151 [1]
T11	70 - 60	2L3x3x3/16x1/4 2L 'a' > 54.8057 in - 125	19.04	9.59	122.5	1.4238	9.44	61.94	0.152 [1]
T12	60 - 50	2L3x3x1/4x1/4 2L 'a' > 57.5273 in - 137	19.91	10.04	129.5	1.8750	9.64	81.56	0.118 [1]
T13	50 - 40	2L3x3x1/4x1/4 2L 'a' > 60.1069 in - 149	20.81	10.49	135.3	1.8750	9.94	81.56	0.122 [1]
T14	40 - 30	2L3 1/2x3 1/2x1/4x1/4 2L 'a' > 61.5464 in - 161	21.72	10.76	119.6	2.2500	10.78	97.88	0.110 [1]
T15	30 - 20	2L3 1/2x3 1/2x1/4x1/4 2L 'a' > 64.7955 in - 170	22.61	11.33	124.6	2.2500	10.63	97.88	0.109 [1]
T16	20 - 10	2L4x4x1/4x1/4 2L 'a' > 67.2906 in - 182	23.52	11.78	112.8	2.6250	11.23	114.19	0.098 [1]
T17	10 - 0	2L4x4x1/4x1/4 2L 'a' > 69.8855 in - 195	24.42	12.23	117.2	2.6250	11.31	114.19	0.099 [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	12.25	6.01	233.7	0.4308	1.10	18.74	0.059 [1]
T8	93.3333 - 86.6667	L2x2x3/16	13.64	6.68	259.7	0.4308	1.51	18.74	0.081 [1]
T9	86.6667 - 80	L2x2x3/16	14.34	7.02	273.2	0.4308	1.72	18.74	0.092 [1]
T11	70 - 60	L2 1/2x2 1/2x3/16	16.18	7.90	243.8	0.5710	2.28	24.84	0.092 [1]
T12	60 - 50	L3x3x1/4	17.20	8.41	217.1	0.9628	2.59	41.88	0.062 [1]
T13	50 - 40	L3x3x1/4	18.24	8.93	230.5	0.9628	2.89	41.88	0.069 [1]
T15	30 - 20	L3x3x3/16	20.27	9.90	253.1	0.7120	3.48	30.97	0.112 [1]
T16	20 - 10	L3x3x3/16	21.27	10.40	265.9	0.7120	3.79	30.97	0.122 [1]
T17	10 - 0	L3 1/2x3 1/2x1/4	22.27	10.90	240.1	1.1269	4.08	49.02	0.083 [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	8.56	8.11	128.4	0.5886	0.29	25.60	0.012 [1]
T3	140 - 120	L2 1/2x2 1/2x3/16	8.56	8.11	128.4	0.5886	0.72	25.60	0.028 [1]

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

[1] P_u / ϕP_n controls

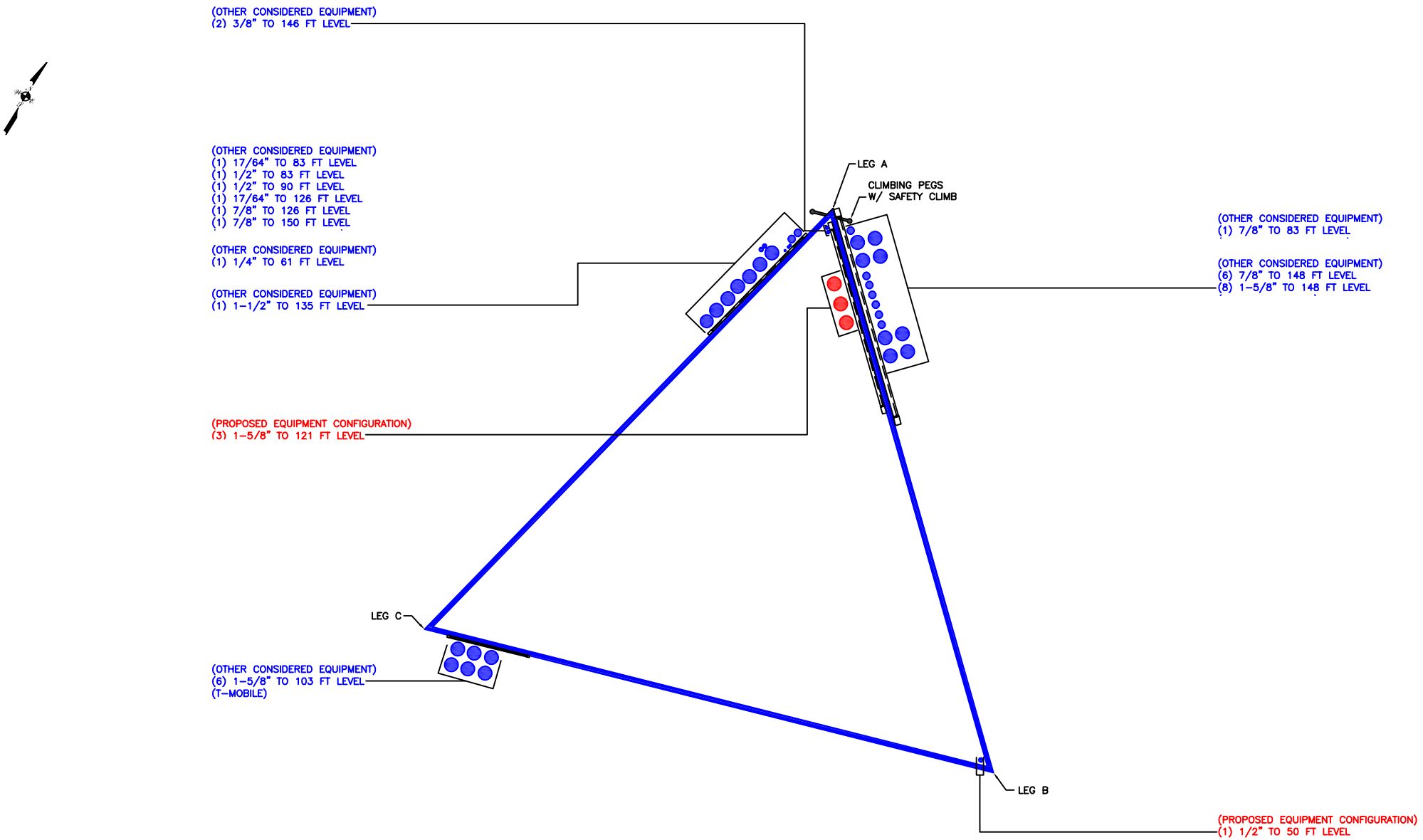
Section Capacity Table

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	-6.89	60.05	11.5	Pass
T2	145 - 140	Leg	ROHN 2.5 STD	15	-8.66	60.05	14.4	Pass
T3	140 - 120	Leg	ROHN 2.5 EH	24	-32.30	61.44	52.6	Pass
T4	120 - 113.333	Leg	ROHN 2.5 EH (GR)	48	-41.88	68.62	61.0	Pass
T5	113.333 - 106.667	Leg	ROHN 2.5 EH (GR)	57	-52.67	68.62	76.8	Pass
T6	106.667 - 100	Leg	ROHN 2.5 EH (GR)	66	-63.32	107.50	58.9	Pass
T7	100 - 93.3333	Leg	ROHN 3 EH (GR)	76	-75.74	116.03	65.3	Pass
T8	93.3333 - 86.6667	Leg	ROHN 3 EH (GR)	85	-87.15	156.86	55.6	Pass
T9	86.6667 - 80	Leg	ROHN 3 EH (GR)	97	-99.24	156.90	63.2	Pass
T10	80 - 70	Leg	ROHN 4 EH (GR)	109	-114.34	153.02	74.7	Pass
T11	70 - 60	Leg	ROHN 4 EH (GR)	118	-131.73	229.95	57.3	Pass
T12	60 - 50	Leg	ROHN 4 EH (GR)	130	-149.39	229.99	65.0	Pass
T13	50 - 40	Leg	ROHN 4 EH (GR)	142	-166.52	230.11	72.4	Pass
T14	40 - 30	Leg	ROHN 5 EH (GR)	154	-184.38	266.56	69.2	Pass
T15	30 - 20	Leg	ROHN 5 EH (GR)	163	-200.78	348.34	57.6	Pass
T16	20 - 10	Leg	ROHN 5 EH (GR)	175	-218.58	348.43	62.7	Pass
T17	10 - 0	Leg	ROHN 5 EH (GR)	187	-235.00	348.50	67.4	Pass
T1	150 - 145	Diagonal	L1 1/2x1 1/2x3/16	12	-1.46	4.26	34.2	Pass
T2	145 - 140	Diagonal	L2x2x3/16	20	-2.98	10.47	28.4	Pass
T3	140 - 120	Diagonal	L2 1/2x2 1/2x3/16	33	-4.93	12.57	39.2	Pass
T4	120 - 113.333	Diagonal	L2 1/2x2 1/2x3/16	54	-6.19	12.95	47.8	Pass
T5	113.333 - 106.667	Diagonal	L2 1/2x2 1/2x3/16	63	-6.14	12.04	51.0	Pass
T6	106.667 - 100	Diagonal	L2 1/2x2 1/2x3/16x3/16	72	-7.60	37.78	20.1	Pass
T7	100 - 93.3333	Diagonal	L3x3x3/16	84	-7.49	17.13	43.7	Pass
T8	93.3333 - 86.6667	Diagonal	L3x3x3/16	93	-8.05	13.89	58.0	Pass
T9	86.6667 - 80	Diagonal	2L3x3x3/16x1/4	105	-8.28	46.91	17.6	Pass
T10	80 - 70	Diagonal	2L3x3x3/16x1/4	117	-9.38	39.20	23.9	Pass
T11	70 - 60	Diagonal	2L3x3x3/16x1/4	126	-10.24	35.49	28.9	Pass
T12	60 - 50	Diagonal	2L3x3x1/4x1/4	138	-10.37	45.10	23.0	Pass
T13	50 - 40	Diagonal	2L3x3x1/4x1/4	150	-10.85	41.48	26.2	Pass
T14	40 - 30	Diagonal	2L3 1/2x3 1/2x1/4x1/4	162	-10.59	60.05	17.6	Pass
T15	30 - 20	Diagonal	2L3 1/2x3 1/2x1/4x1/4	171	-12.00	54.85	21.9	Pass
T16	20 - 10	Diagonal	2L4x4x1/4x1/4	183	-11.68	71.81	16.3	Pass
T17	10 - 0	Diagonal	2L4x4x1/4x1/4	195	-13.18	67.18	19.6	Pass
T6	106.667 - 100	Secondary Horizontal	L2x2x3/16	74	-1.10	6.42	17.1	Pass
T8	93.3333 - 86.6667	Secondary Horizontal	L2x2x3/16	96	-1.51	5.20	29.1	Pass
T9	86.6667 - 80	Secondary Horizontal	L2x2x3/16	108	-1.72	4.69	36.7	Pass
T11	70 - 60	Secondary Horizontal	L2 1/2x2 1/2x3/16	129	-2.28	7.38	30.9	Pass
T12	60 - 50	Secondary Horizontal	L3x3x1/4	141	-2.59	14.88	17.4	Pass
T13	50 - 40	Secondary Horizontal	L3x3x1/4	153	-2.89	13.20	21.9	Pass
T15	30 - 20	Secondary Horizontal	L3x3x3/16	174	-3.48	8.24	42.2	Pass
T16	20 - 10	Secondary Horizontal	L3x3x3/16	186	-3.79	7.47	50.8	Pass
T17	10 - 0	Secondary Horizontal	L3 1/2x3 1/2x1/4	198	-4.08	14.29	28.5	Pass
T1	150 - 145	Top Girt	L2 1/2x2 1/2x3/16	5	-0.35	7.01	5.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
T3	140 - 120	Top Girt	L2 1/2x2 1/2x3/16	27	-0.66	7.01	9.4	Pass
							Summary	
						Leg (T5)	76.8	Pass
						Diagonal (T8)	58.0	Pass
						Secondary Horizontal (T16)	50.8	Pass
						Top Girt (T3)	9.4	Pass
						Bolt Checks	72.7	Pass
						RATING =	**76.8**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(2) 3/8" TO 146 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 17/64" TO 83 FT LEVEL
(1) 1/2" TO 83 FT LEVEL
(1) 1/2" TO 90 FT LEVEL
(1) 17/64" TO 126 FT LEVEL
(1) 7/8" TO 126 FT LEVEL
(1) 7/8" TO 150 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1/4" TO 61 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/2" TO 135 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
(OTHER CONSIDERED EQUIPMENT)
(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
(T-MOBILE)
LEG B
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1/2" TO 50 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Self Support Anchor Rod Capacity

Site Info	
BU #	806384
Site Name	NLN 136 943455
Order #	557902 Rev. 1

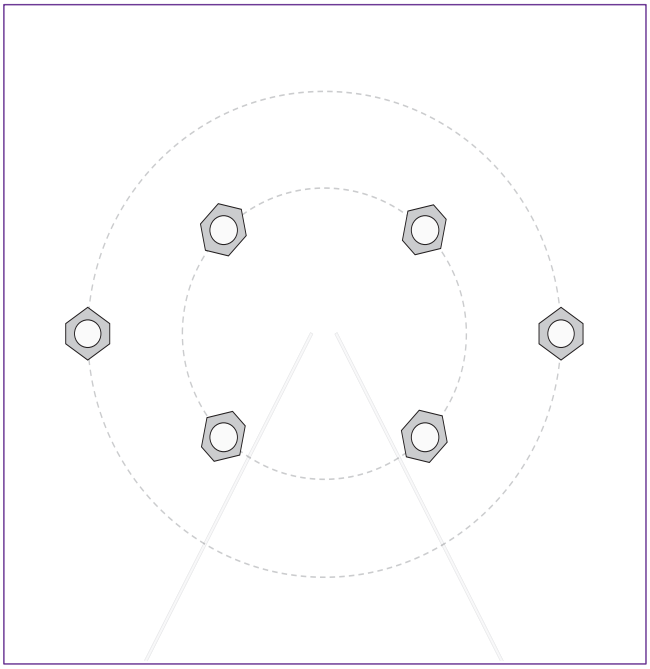
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
l_{ar} (in)	See Custom Sheet

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	244.00	198.47
Shear Force (kips)	31.27	25.78

**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 = 33.08	ϕPn_t = 56.81	**Stress Rating**
Vu = 6.45	ϕVn = 36.82	**55.5%**
Mu = n/a	ϕMn = n/a	**Pass**

GROUP 2:

Pu_t = 33.08	ϕPn_t = 56.81	**Stress Rating**
Vu = 0	ϕVn = 36.82	**55.5%**
Mu = n/a	ϕMn = n/a	**Pass**

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}:	244	kips
Compression Shear, Vu_comp:	31.27	kips
Uplift, P_{uplift}:	198.47	kips
Uplift Shear, V_{u_uplift}:	25.78	kips
Tower Height, **H**:	150	ft
Base Face Width, **BW**:	22.78	ft
BP Dist. Above Fdn, bp_{dist}:	5.25	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	198.47	**77.1%**	**Pass**
Lateral (Sliding) (kips)	96.64	25.78	**25.4%**	**Pass**
Bearing Pressure (ksf)	9.00	5.55	**58.7%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	848.72	328.34	**36.8%**	**Pass**
*Pier Flexure (Tension) (kip*ft)*	525.39	270.69	**49.1%**	**Pass**
Pier Compression (kip)	1708.19	257.36	**14.3%**	**Pass**
*Pad Flexure (kip*ft)*	462.81	102.84	**21.2%**	**Pass**
Pad Shear - 1-way (kips)	160.13	29.38	**17.5%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.056	**32.5%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	925.63	197.00	**20.3%**	**Pass**
Pad Shear - 2-way (Uplift) (ksi)	0.164	0.075	**43.6%**	**Pass**
*Flexural 2-way (Tension) (kip*ft)*	925.63	162.41	**16.7%**	**Pass**

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

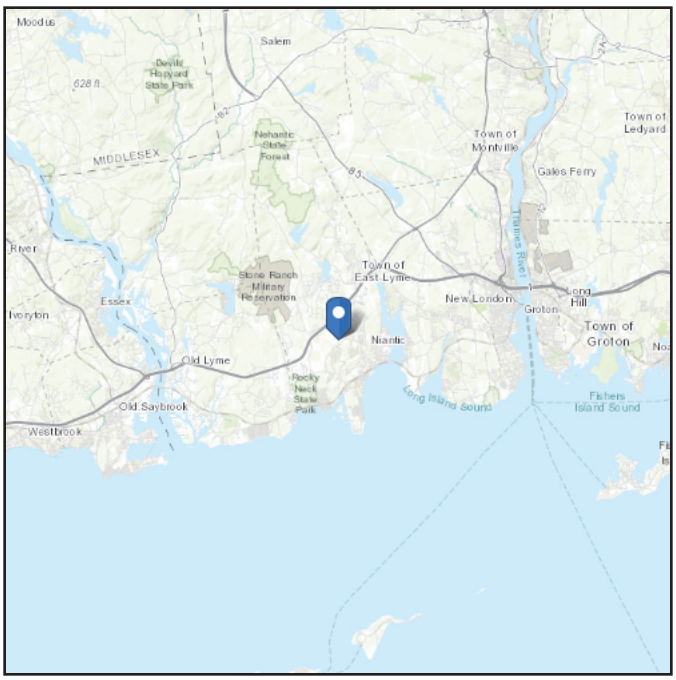
Structural Rating*:	**49.1%**
Soil Rating*:	**77.1%**

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	Considered 145Vmph as per East Lyme City Exception
10-year MRI	79 Vmph	
25-year MRI	89 Vmph	
50-year MRI	98 Vmph	
100-year MRI	108 Vmph	

Data Accessed: Fri Aug 27 2021

Date 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

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.

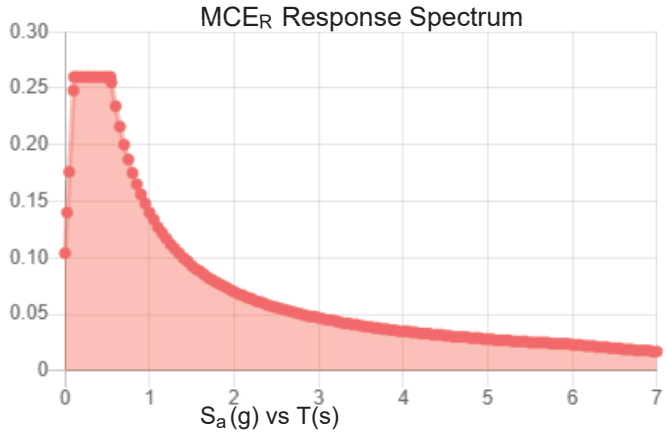
Seismic

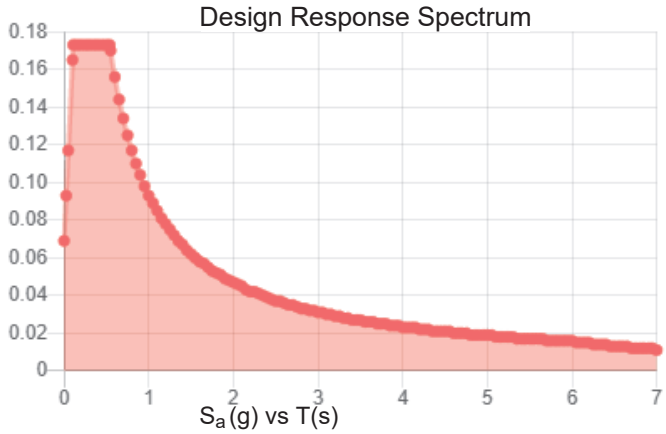
Site Soil Class: D - Stiff Soil

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: Fri Aug 27 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 Aug 27 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.

Date: **September 1, 2021**

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Darcy Tarr
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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:	CT03XC110
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.1
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.

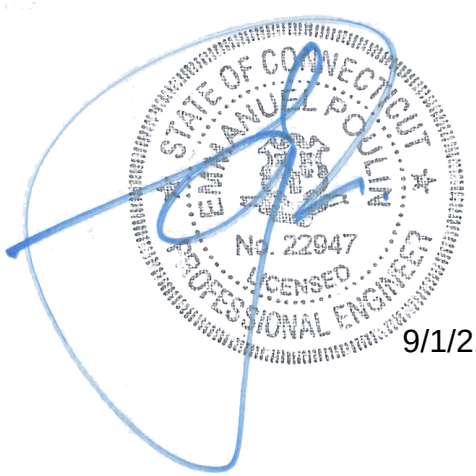
The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Sector Frame **Sufficient**

This analysis utilizes an ultimate 3-second gust wind speed of 145 mph as required by the 2018 Connecticut State Building Code and Appendix N. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Iker Moreno, EIT

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



9/1/21

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 Building Code and Appendix N
TIA-222 Revision:	TIA-222-H
Risk Category:	II
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	RFS/CELWAVE	APXVAALL24_43-U-NA20_TMO	12.0 ft Sector Frame
		3	ERICSSON	AIR6449 B41_T-MOBILE	
		3	ERICSSON	RADIO 4460 B2/B25 B66_TMO	
		3	ERICSSON	Radio 4480_TMOV2	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

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

3.1) Analysis Method

RISA-3D (Version 17.0.4), 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 V2.1.7, 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
1,2,3	Mount Pipe(s)	MP1	121.0	45.3	Pass
	Horizontal(s)	M1		27.3	Pass
	Standoff(s)	M4		35.1	Pass
	Bracing(s)	M23		58.6	Pass
	Mount Connection(s)	--		18.7	Pass

Structure Rating (max from all components) =	58.6%

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.
3) All sectors are typical

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)[2]	Notes
N51	Existing	1,676.0	Leg	ROHN 2.5 EH	3,072	1,2

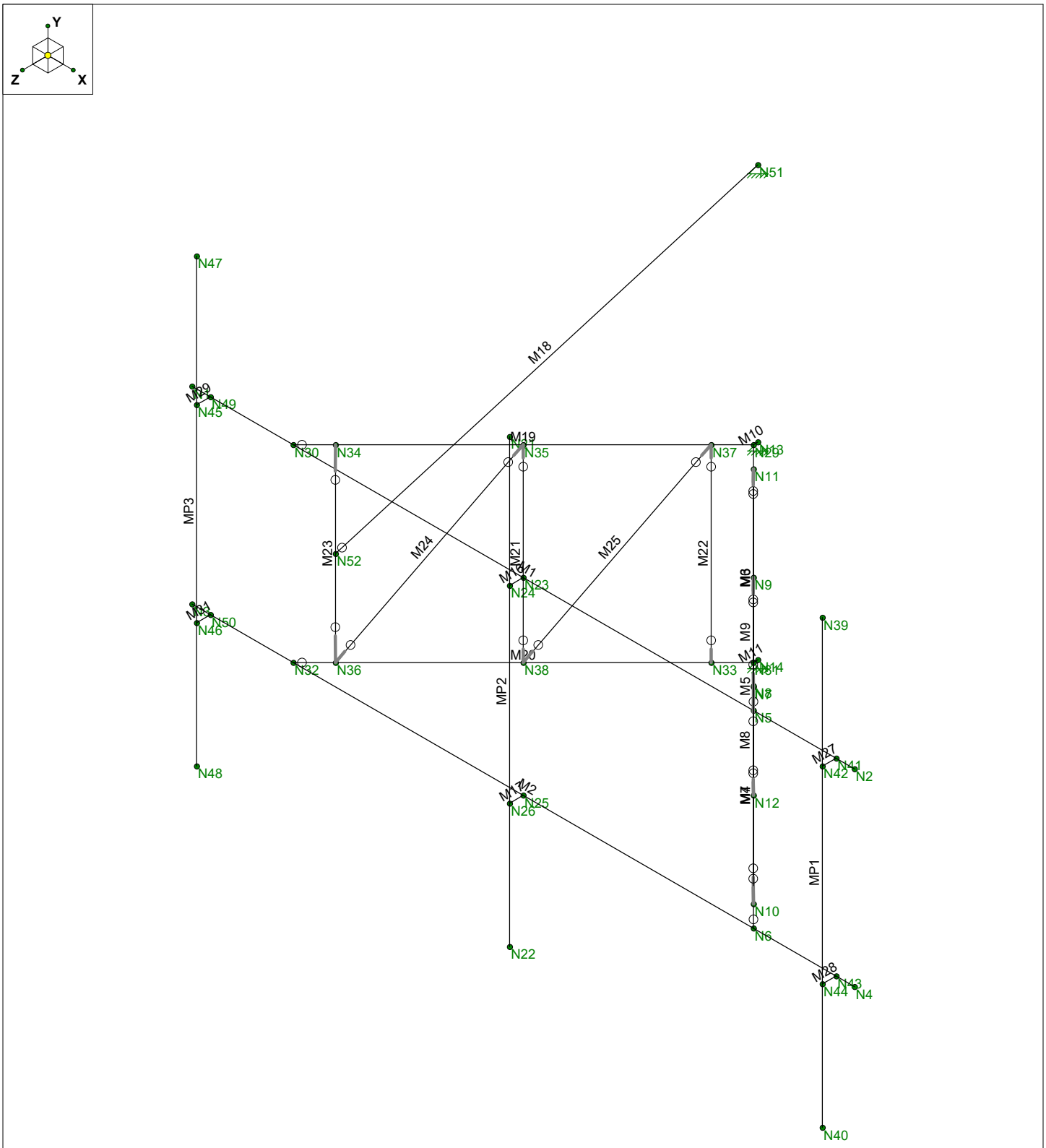
Notes:
1) Tieback connection point is within 25% of either end of the connected tower member
2) Reduced member compressive capacity according to CED-STD-10294 *Standard for Installation of Mounts and Appurtenances*

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



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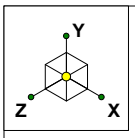

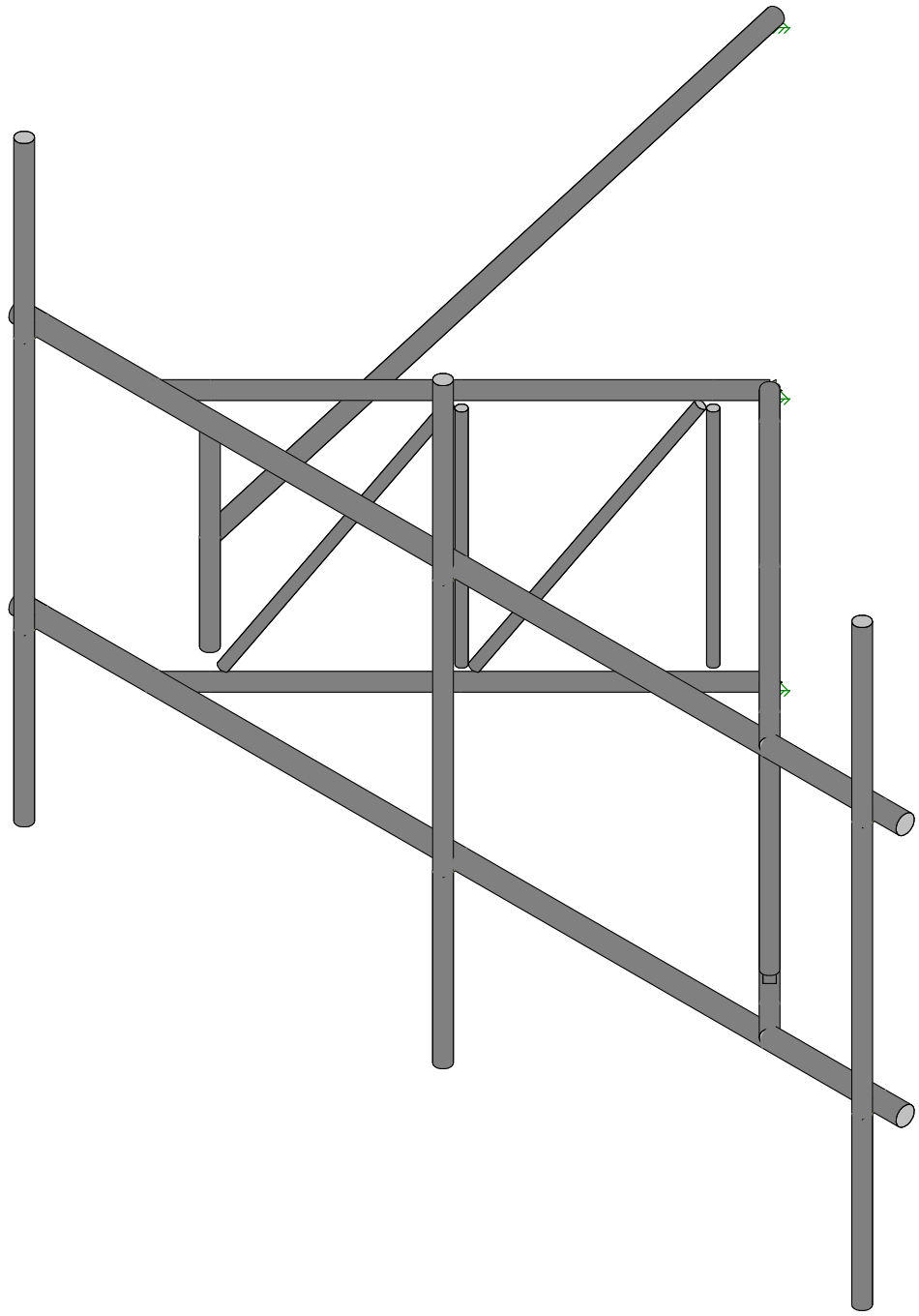

Infinigy Engineering, PLLC	806384	Rendering
IM		Aug 31, 2021 at 3:48 PM
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APPENDIX B

SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION	
Client:	Crown Castle
Carrier:	T-Mobile
Engineer:	Iker Moreno

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	B	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Verified)	
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

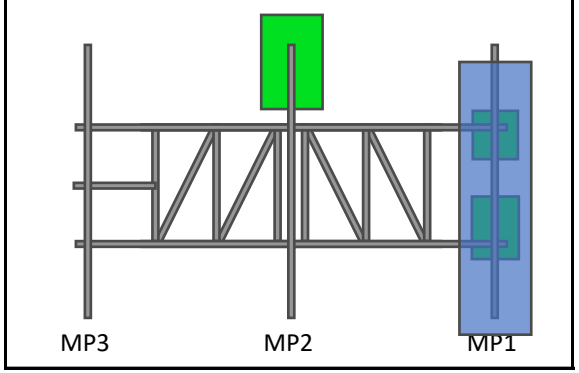
SEISMIC DATA		
Short-Period Accel. (S_s):	0.164	g
1-Second Accel. (S_1):	0.059	g
Short-Period Design (S_{DS}):	0.175	
1-Second Design (S_{D1}):	0.094	
Short-Period Coeff. (F_a):	1.600	
1-Second Coeff. (F_v):	2.400	
Amplification Factor (A_s):	3.000	
Response Mod. Coeff. (R):	2.000	

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

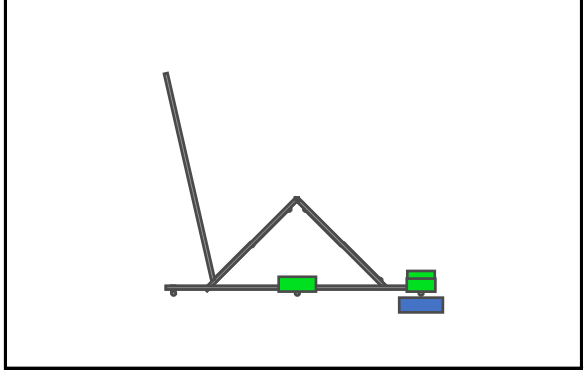
Infinigy Load Calculator V2.1.7

Program Inputs

ELEVATION VIEW



PLAN VIEW



INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Infinigy Load Calculator V2.1.7

APPURTENANCE INFORMATION

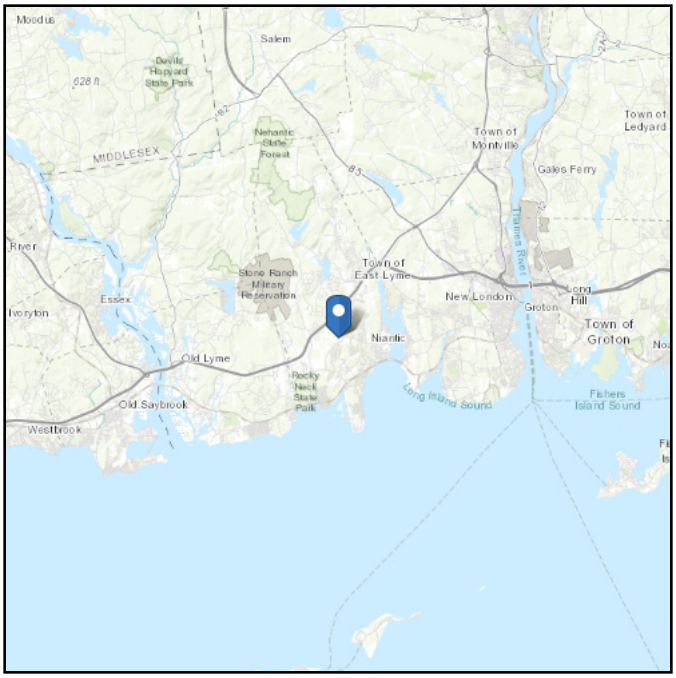
Appurtenance Name	Elevation	Qty.	K_a	q_z (psf)	EPA_N (ft^2)	EPA_T (ft^2)	Wind F_z (lbs)	Wind F_x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)
ERICSSON AIR6449 B41_T-MOBILE	122.0	3	0.90	53.15	5.27	2.03	252.09	97.11	114.63	30.08	MP2
/CELWAVE APXVAALL24_43-U-NA20_TI	122.0	3	0.90	53.15	14.67	5.32	701.75	254.49	149.90	39.33	MP1
RICSSON RADIO 4460 B2/B25 B66_TMC	122.0	3	0.90	53.15	2.14	1.69	102.33	80.64	109.00	28.60	MP1
ERICSSON RADIO 4480_TMOV2	122.0	3	0.90	53.15	2.88	1.40	137.69	66.83	81.00	21.25	MP1

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.

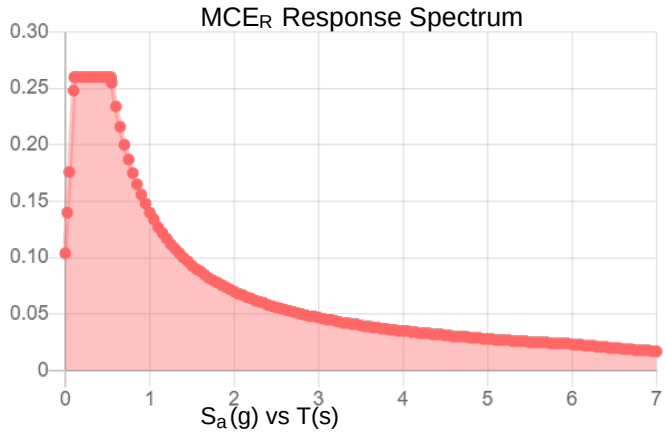
Seismic

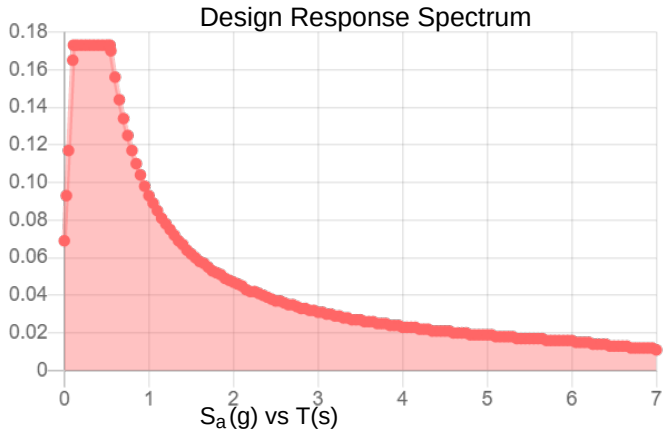
Site Soil Class: D - Stiff Soil

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 Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
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

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E...	Density[lb/f...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	490	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	490	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	490	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	490	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	490	50	1.25	65	1.15
8	A913 Gr.65	29000	11154	.3	.65	490	65	1.1	80	1.1

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mount Pipe 2.0	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	Frame Rail	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
3	Sidearms	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
4	Vert Bracing	PIPE_2.0	VBrace	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
5	Diag Bracing	ROHN 1.5x0.067	VBrace	Pipe	A53 Gr.B	Typical	.302	.078	.078	.155
6	TieBack	PIPE_2.0	HBrace	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	Mount Pipe 2.5	PIPE_2.5	Column	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
1	N1	-160.321261	0	107.095244	0	
2	N2	-16.321261	0	107.095244	0	
3	N3	-160.321261	-41	107.095244	0	
4	N4	-16.321261	-41	107.095244	0	
5	N5	-38.321261	0	107.095244	0	
6	N6	-38.321261	-41	107.095244	0	
7	N7	-83.73897	-41	61.677535	0	
8	N8	-42.903553	0	102.512952	0	
9	N9	-63.321261	0	82.095244	0	
10	N10	-42.903553	-41	102.512952	0	
11	N11	-83.73897	0	61.677535	0	
12	N12	-63.321261	-41	82.095244	0	
13	N13	-88.321261	0	56.095244	0	
14	N14	-88.321261	-41	56.095244	0	
15	N21	-88.321261	28	110.095244	0	
16	N22	-88.321261	-68	110.095244	0	
17	N23	-88.321261	0	107.095244	0	
18	N24	-88.321261	0	110.095244	0	
19	N25	-88.321261	-41	107.095244	0	
20	N26	-88.321261	-41	110.095244	0	
21	N29	-88.321261	0	57.095244	0	
22	N30	-138.321261	0	107.095244	0	
23	N31	-88.321261	-41	57.095244	0	
24	N32	-138.321261	-41	107.095244	0	
25	N33	-92.903553	-41	61.677535	0	
26	N34	-133.73897	0	102.512952	0	
27	N35	-113.321261	0	82.095244	0	
28	N36	-133.73897	-41	102.512952	0	
29	N37	-92.903553	0	61.677535	0	
30	N38	-113.321261	-41	82.095244	0	
31	N39	-20.321261	28	110.095244	0	
32	N40	-20.321261	-68	110.095244	0	
33	N41	-20.321261	0	107.095244	0	
34	N42	-20.321261	0	110.095244	0	
35	N43	-20.321261	-41	107.095244	0	
36	N44	-20.321261	-41	110.095244	0	
37	N45	-156.321261	0	110.095244	0	
38	N46	-156.321261	-41	110.095244	0	
39	N47	-156.321261	28	110.095244	0	
40	N48	-156.321261	-68	110.095244	0	
41	N49	-156.321261	0	107.095244	0	
42	N50	-156.321261	-41	107.095244	0	
43	N51	-161.005862	-20.5	-16.548177	0	
44	N52	-133.73897	-20.5	102.512952	0	

Hot Rolled Steel Design Parameters

	Label	Shape	Length...	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torque[i...	Kyy	Kzz	Cb	Funct...
1	M1	Frame Rail	144			Lbyy						Lateral
2	M2	Frame Rail	144			Lbyy						Lateral
3	M3	Sidearms	70.711			Lbyy						Lateral
4	M4	Sidearms	70.711			Lbyy						Lateral
5	M5	Diag Brac...	41			Lbyy						Lateral
6	M6	Diag Brac...	41			Lbyy						Lateral
7	M7	Vert Braci...	41			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length...	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torque[i...	Kyy	Kzz	Cb	Funct...
8	M8	Diag Brac...	50.147			Lbyy						Lateral
9	M9	Diag Brac...	50.147			Lbyy						Lateral
10	MP2	Mount Pip...	96			Lbyy						Lateral
11	M18	TieBack	122.144			Lbyy						Lateral
12	M19	Sidearms	70.711			Lbyy						Lateral
13	M20	Sidearms	70.711			Lbyy						Lateral
14	M21	Diag Brac...	41			Lbyy						Lateral
15	M22	Diag Brac...	41			Lbyy						Lateral
16	M23	Vert Braci...	41			Lbyy						Lateral
17	M24	Diag Brac...	50.147			Lbyy						Lateral
18	M25	Diag Brac...	50.147			Lbyy						Lateral
19	MP1	Mount Pip...	96			Lbyy						Lateral
20	MP3	Mount Pip...	96			Lbyy						Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Member)	Surface(Plate/Wall)
1	Self Weight	DL		-1			6			
2	Wind Load AZ...	WLZ					12			
3	Wind Load AZ...	None					12			
4	Wind Load AZ...	None					12			
5	Wind Load AZ...	WLX					12			
6	Wind Load AZ...	None					12			
7	Wind Load AZ...	None					12			
8	Wind Load AZ...	None					12			
9	Wind Load AZ...	None					12			
10	Wind Load AZ...	None					12			
11	Wind Load AZ...	None					12			
12	Wind Load AZ...	None					12			
13	Wind Load AZ...	None					12			
14	Distr. Wind Lo...	WLZ						28		
15	Distr. Wind Lo...	WLX						28		
16	Ice Weight	OL1					6	28		
17	Ice Wind Load...	OL2					12			
18	Ice Wind Load...	None					12			
19	Ice Wind Load...	None					12			
20	Ice Wind Load...	OL3					12			
21	Ice Wind Load...	None					12			
22	Ice Wind Load...	None					12			
23	Ice Wind Load...	None					12			
24	Ice Wind Load...	None					12			
25	Ice Wind Load...	None					12			
26	Ice Wind Load...	None					12			
27	Ice Wind Load...	None					12			
28	Ice Wind Load...	None					12			
29	Distr. Ice Wind...	OL2						28		
30	Distr. Ice Wind...	OL3						28		
31	Seismic Load Z	ELZ			-.262		6			
32	Seismic Load X	ELX	-.262				6			
33	Service Live L...	LL				1				
34	Maintenance L...	LL				1				
35	Maintenance L...	LL				1				
36	Maintenance L...	LL				1				

Joint Loads and Enforced Displacements (BLC 33 : Service Live Loads)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N4	L	Y	-250

Joint Loads and Enforced Displacements (BLC 34 : Maintenance Load 1)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N25	L	Y	-500

Joint Loads and Enforced Displacements (BLC 35 : Maintenance Load 2)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N43	L	Y	-500

Joint Loads and Enforced Displacements (BLC 36 : Maintenance Load 3)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N50	L	Y	-500

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	Y	-57.315	6
2	MP2	Y	-57.315	39.11
3	MP1	Y	-74.95	6
4	MP1	Y	-74.95	96
5	MP1	Y	-109	%33
6	MP1	Y	-81	%67

Member Point Loads (BLC 2 : Wind Load AZI 0)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	0	6
2	MP2	Z	-126.05	6
3	MP2	X	0	39.11
4	MP2	Z	-126.05	39.11
5	MP1	X	0	6
6	MP1	Z	-350.87	6
7	MP1	X	0	96
8	MP1	Z	-350.87	96
9	MP1	X	0	%33
10	MP1	Z	-102.33	%33
11	MP1	X	0	%67
12	MP1	Z	-137.69	%67

Member Point Loads (BLC 3 : Wind Load AZI 30)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	-53.34	6
2	MP2	Z	-92.38	6
3	MP2	X	-53.34	39.11
4	MP2	Z	-92.38	39.11
5	MP1	X	-147.48	6
6	MP1	Z	-255.45	6
7	MP1	X	-147.48	96
8	MP1	Z	-255.45	96
9	MP1	X	-48.45	%33
10	MP1	Z	-83.92	%33
11	MP1	X	-59.99	%67
12	MP1	Z	-103.9	%67

Member Point Loads (BLC 4 : Wind Load AZI 60)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	-58.83	6
2	MP2	Z	-33.96	6
3	MP2	X	-58.83	39.11
4	MP2	Z	-33.96	39.11
5	MP1	X	-158.61	6
6	MP1	Z	-91.58	6
7	MP1	X	-158.61	96
8	MP1	Z	-91.58	96
9	MP1	X	-74.53	%33
10	MP1	Z	-43.03	%33
11	MP1	X	-73.22	%67
12	MP1	Z	-42.27	%67

Member Point Loads (BLC 5 : Wind Load AZI 90)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	-48.55	6
2	MP2	Z	0	6
3	MP2	X	-48.55	39.11
4	MP2	Z	0	39.11
5	MP1	X	-127.24	6
6	MP1	Z	0	6
7	MP1	X	-127.24	96
8	MP1	Z	0	96
9	MP1	X	-80.64	%33
10	MP1	Z	0	%33
11	MP1	X	-66.83	%67
12	MP1	Z	0	%67

Member Point Loads (BLC 6 : Wind Load AZI 120)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	-58.83	6
2	MP2	Z	33.96	6
3	MP2	X	-58.83	39.11
4	MP2	Z	33.96	39.11
5	MP1	X	-158.61	6
6	MP1	Z	91.58	6
7	MP1	X	-158.61	96
8	MP1	Z	91.58	96
9	MP1	X	-74.53	%33
10	MP1	Z	43.03	%33
11	MP1	X	-73.22	%67
12	MP1	Z	42.27	%67

Member Point Loads (BLC 7 : Wind Load AZI 150)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	-53.34	6
2	MP2	Z	92.38	6
3	MP2	X	-53.34	39.11
4	MP2	Z	92.38	39.11
5	MP1	X	-147.48	6
6	MP1	Z	255.45	6
7	MP1	X	-147.48	96
8	MP1	Z	255.45	96
9	MP1	X	-48.45	%33
10	MP1	Z	83.92	%33

Member Point Loads (BLC 7 : Wind Load AZI 150) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
11	MP1	X	-59.99	%67
12	MP1	Z	103.9	%67

Member Point Loads (BLC 8 : Wind Load AZI 180)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	0	6
2	MP2	Z	126.05	6
3	MP2	X	0	39.11
4	MP2	Z	126.05	39.11
5	MP1	X	0	6
6	MP1	Z	350.87	6
7	MP1	X	0	96
8	MP1	Z	350.87	96
9	MP1	X	0	%33
10	MP1	Z	102.33	%33
11	MP1	X	0	%67
12	MP1	Z	137.69	%67

Member Point Loads (BLC 9 : Wind Load AZI 210)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	53.34	6
2	MP2	Z	92.38	6
3	MP2	X	53.34	39.11
4	MP2	Z	92.38	39.11
5	MP1	X	147.48	6
6	MP1	Z	255.45	6
7	MP1	X	147.48	96
8	MP1	Z	255.45	96
9	MP1	X	48.45	%33
10	MP1	Z	83.92	%33
11	MP1	X	59.99	%67
12	MP1	Z	103.9	%67

Member Point Loads (BLC 10 : Wind Load AZI 240)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	58.83	6
2	MP2	Z	33.96	6
3	MP2	X	58.83	39.11
4	MP2	Z	33.96	39.11
5	MP1	X	158.61	6
6	MP1	Z	91.58	6
7	MP1	X	158.61	96
8	MP1	Z	91.58	96
9	MP1	X	74.53	%33
10	MP1	Z	43.03	%33
11	MP1	X	73.22	%67
12	MP1	Z	42.27	%67

Member Point Loads (BLC 11 : Wind Load AZI 270)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	48.55	6
2	MP2	Z	0	6
3	MP2	X	48.55	39.11
4	MP2	Z	0	39.11
5	MP1	X	127.24	6

Member Point Loads (BLC 11 : Wind Load AZI 270) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
6	MP1	Z	0	6
7	MP1	X	127.24	96
8	MP1	Z	0	96
9	MP1	X	80.64	%33
10	MP1	Z	0	%33
11	MP1	X	66.83	%67
12	MP1	Z	0	%67

Member Point Loads (BLC 12 : Wind Load AZI 300)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	58.83	6
2	MP2	Z	-33.96	6
3	MP2	X	58.83	39.11
4	MP2	Z	-33.96	39.11
5	MP1	X	158.61	6
6	MP1	Z	-91.58	6
7	MP1	X	158.61	96
8	MP1	Z	-91.58	96
9	MP1	X	74.53	%33
10	MP1	Z	-43.03	%33
11	MP1	X	73.22	%67
12	MP1	Z	-42.27	%67

Member Point Loads (BLC 13 : Wind Load AZI 330)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	53.34	6
2	MP2	Z	-92.38	6
3	MP2	X	53.34	39.11
4	MP2	Z	-92.38	39.11
5	MP1	X	147.48	6
6	MP1	Z	-255.45	6
7	MP1	X	147.48	96
8	MP1	Z	-255.45	96
9	MP1	X	48.45	%33
10	MP1	Z	-83.92	%33
11	MP1	X	59.99	%67
12	MP1	Z	-103.9	%67

Member Point Loads (BLC 16 : Ice Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	Y	-75.413	6
2	MP2	Y	-75.413	39.11
3	MP1	Y	-208.943	6
4	MP1	Y	-208.943	96
5	MP1	Y	-88.733	%33
6	MP1	Y	-88.02	%67

Member Point Loads (BLC 17 : Ice Wind Load AZI 0)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	0	6
2	MP2	Z	-8.63	6
3	MP2	X	0	39.11
4	MP2	Z	-8.63	39.11
5	MP1	X	0	6
6	MP1	Z	-28.23	6

Member Point Loads (BLC 17 : Ice Wind Load AZI 0) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
7	MP1	X	0	96
8	MP1	Z	-28.23	96
9	MP1	X	0	%33
10	MP1	Z	-7.47	%33
11	MP1	X	0	%67
12	MP1	Z	-9.6	%67

Member Point Loads (BLC 18 : Ice Wind Load AZI 30)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	-3.91	6
2	MP2	Z	-6.78	6
3	MP2	X	-3.91	39.11
4	MP2	Z	-6.78	39.11
5	MP1	X	-12.73	6
6	MP1	Z	-22.05	6
7	MP1	X	-12.73	96
8	MP1	Z	-22.05	96
9	MP1	X	-3.64	%33
10	MP1	Z	-6.31	%33
11	MP1	X	-4.48	%67
12	MP1	Z	-7.76	%67

Member Point Loads (BLC 19 : Ice Wind Load AZI 60)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	-5.39	6
2	MP2	Z	-3.11	6
3	MP2	X	-5.39	39.11
4	MP2	Z	-3.11	39.11
5	MP1	X	-17.25	6
6	MP1	Z	-9.96	6
7	MP1	X	-17.25	96
8	MP1	Z	-9.96	96
9	MP1	X	-6	%33
10	MP1	Z	-3.47	%33
11	MP1	X	-6.66	%67
12	MP1	Z	-3.85	%67

Member Point Loads (BLC 20 : Ice Wind Load AZI 90)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	-5.42	6
2	MP2	Z	0	6
3	MP2	X	-5.42	39.11
4	MP2	Z	0	39.11
5	MP1	X	-17.14	6
6	MP1	Z	0	6
7	MP1	X	-17.14	96
8	MP1	Z	0	96
9	MP1	X	-6.75	%33
10	MP1	Z	0	%33
11	MP1	X	-7.06	%67
12	MP1	Z	0	%67

Member Point Loads (BLC 21 : Ice Wind Load AZI 120)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	-5.39	6

Member Point Loads (BLC 21 : Ice Wind Load AZI 120) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
2	MP2	Z	3.11	6
3	MP2	X	-5.39	39.11
4	MP2	Z	3.11	39.11
5	MP1	X	-17.25	6
6	MP1	Z	9.96	6
7	MP1	X	-17.25	96
8	MP1	Z	9.96	96
9	MP1	X	-6	%33
10	MP1	Z	3.47	%33
11	MP1	X	-6.66	%67
12	MP1	Z	3.85	%67

Member Point Loads (BLC 22 : Ice Wind Load AZI 150)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	-3.91	6
2	MP2	Z	6.78	6
3	MP2	X	-3.91	39.11
4	MP2	Z	6.78	39.11
5	MP1	X	-12.73	6
6	MP1	Z	22.05	6
7	MP1	X	-12.73	96
8	MP1	Z	22.05	96
9	MP1	X	-3.64	%33
10	MP1	Z	6.31	%33
11	MP1	X	-4.48	%67
12	MP1	Z	7.76	%67

Member Point Loads (BLC 23 : Ice Wind Load AZI 180)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	0	6
2	MP2	Z	8.63	6
3	MP2	X	0	39.11
4	MP2	Z	8.63	39.11
5	MP1	X	0	6
6	MP1	Z	28.23	6
7	MP1	X	0	96
8	MP1	Z	28.23	96
9	MP1	X	0	%33
10	MP1	Z	7.47	%33
11	MP1	X	0	%67
12	MP1	Z	9.6	%67

Member Point Loads (BLC 24 : Ice Wind Load AZI 210)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	3.91	6
2	MP2	Z	6.78	6
3	MP2	X	3.91	39.11
4	MP2	Z	6.78	39.11
5	MP1	X	12.73	6
6	MP1	Z	22.05	6
7	MP1	X	12.73	96
8	MP1	Z	22.05	96
9	MP1	X	3.64	%33
10	MP1	Z	6.31	%33
11	MP1	X	4.48	%67

Member Point Loads (BLC 24 : Ice Wind Load AZI 210) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
12	MP1	Z	7.76	%67

Member Point Loads (BLC 25 : Ice Wind Load AZI 240)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	5.39	6
2	MP2	Z	3.11	6
3	MP2	X	5.39	39.11
4	MP2	Z	3.11	39.11
5	MP1	X	17.25	6
6	MP1	Z	9.96	6
7	MP1	X	17.25	96
8	MP1	Z	9.96	96
9	MP1	X	6	%33
10	MP1	Z	3.47	%33
11	MP1	X	6.66	%67
12	MP1	Z	3.85	%67

Member Point Loads (BLC 26 : Ice Wind Load AZI 270)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	5.42	6
2	MP2	Z	0	6
3	MP2	X	5.42	39.11
4	MP2	Z	0	39.11
5	MP1	X	17.14	6
6	MP1	Z	0	6
7	MP1	X	17.14	96
8	MP1	Z	0	96
9	MP1	X	6.75	%33
10	MP1	Z	0	%33
11	MP1	X	7.06	%67
12	MP1	Z	0	%67

Member Point Loads (BLC 27 : Ice Wind Load AZI 300)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	5.39	6
2	MP2	Z	-3.11	6
3	MP2	X	5.39	39.11
4	MP2	Z	-3.11	39.11
5	MP1	X	17.25	6
6	MP1	Z	-9.96	6
7	MP1	X	17.25	96
8	MP1	Z	-9.96	96
9	MP1	X	6	%33
10	MP1	Z	-3.47	%33
11	MP1	X	6.66	%67
12	MP1	Z	-3.85	%67

Member Point Loads (BLC 28 : Ice Wind Load AZI 330)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	3.91	6
2	MP2	Z	-6.78	6
3	MP2	X	3.91	39.11
4	MP2	Z	-6.78	39.11
5	MP1	X	12.73	6
6	MP1	Z	-22.05	6

Member Point Loads (BLC 28 : Ice Wind Load AZI 330) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
7	MP1	X	12.73	96
8	MP1	Z	-22.05	96
9	MP1	X	3.64	%33
10	MP1	Z	-6.31	%33
11	MP1	X	4.48	%67
12	MP1	Z	-7.76	%67

Member Point Loads (BLC 31 : Seismic Load Z)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	Z	-15.039	6
2	MP2	Z	-15.039	39.11
3	MP1	Z	-19.667	6
4	MP1	Z	-19.667	96
5	MP1	Z	-28.602	%33
6	MP1	Z	-21.254	%67

Member Point Loads (BLC 32 : Seismic Load X)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP2	X	-15.039	6
2	MP2	X	-15.039	39.11
3	MP1	X	-19.667	6
4	MP1	X	-19.667	96
5	MP1	X	-28.602	%33
6	MP1	X	-21.254	%67

Member Distributed Loads (BLC 14 : Distr. Wind Load Z)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	SZ	-63.631	-63.631	0	%100
2	M2	SZ	-63.631	-63.631	0	%100
3	M3	SZ	-63.631	-63.631	0	%100
4	M4	SZ	-63.631	-63.631	0	%100
5	M5	SZ	-63.631	-63.631	0	%100
6	M6	SZ	-63.631	-63.631	0	%100
7	M7	SZ	-63.631	-63.631	0	%100
8	M8	SZ	-63.631	-63.631	0	%100
9	M9	SZ	-63.631	-63.631	0	%100
10	M10	SZ	0	0	0	%100
11	M11	SZ	0	0	0	%100
12	MP2	SZ	-63.631	-63.631	0	%100
13	M16	SZ	0	0	0	%100
14	M17	SZ	0	0	0	%100
15	M18	SZ	-63.631	-63.631	0	%100
16	M19	SZ	-63.631	-63.631	0	%100
17	M20	SZ	-63.631	-63.631	0	%100
18	M21	SZ	-63.631	-63.631	0	%100
19	M22	SZ	-63.631	-63.631	0	%100
20	M23	SZ	-63.631	-63.631	0	%100
21	M24	SZ	-63.631	-63.631	0	%100
22	M25	SZ	-63.631	-63.631	0	%100
23	MP1	SZ	-63.631	-63.631	0	%100
24	M27	SZ	0	0	0	%100
25	M28	SZ	0	0	0	%100
26	M29	SZ	0	0	0	%100
27	MP3	SZ	-63.631	-63.631	0	%100

Member Distributed Loads (BLC 14 : Distr. Wind Load Z) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
28	M31	SZ	0	0	0	%100

Member Distributed Loads (BLC 15 : Distr. Wind Load X)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	SX	-63.631	-63.631	0	%100
2	M2	SX	-63.631	-63.631	0	%100
3	M3	SX	-63.631	-63.631	0	%100
4	M4	SX	-63.631	-63.631	0	%100
5	M5	SX	-63.631	-63.631	0	%100
6	M6	SX	-63.631	-63.631	0	%100
7	M7	SX	-63.631	-63.631	0	%100
8	M8	SX	-63.631	-63.631	0	%100
9	M9	SX	-63.631	-63.631	0	%100
10	M10	SX	0	0	0	%100
11	M11	SX	0	0	0	%100
12	MP2	SX	-63.631	-63.631	0	%100
13	M16	SX	0	0	0	%100
14	M17	SX	0	0	0	%100
15	M18	SX	-63.631	-63.631	0	%100
16	M19	SX	-63.631	-63.631	0	%100
17	M20	SX	-63.631	-63.631	0	%100
18	M21	SX	-63.631	-63.631	0	%100
19	M22	SX	-63.631	-63.631	0	%100
20	M23	SX	-63.631	-63.631	0	%100
21	M24	SX	-63.631	-63.631	0	%100
22	M25	SX	-63.631	-63.631	0	%100
23	MP1	SX	-63.631	-63.631	0	%100
24	M27	SX	0	0	0	%100
25	M28	SX	0	0	0	%100
26	M29	SX	0	0	0	%100
27	MP3	SX	-63.631	-63.631	0	%100
28	M31	SX	0	0	0	%100

Member Distributed Loads (BLC 16 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	Y	-9.564	-9.564	0	%100
2	M2	Y	-9.564	-9.564	0	%100
3	M3	Y	-8.521	-8.521	0	%100
4	M4	Y	-8.521	-8.521	0	%100
5	M5	Y	-6.695	-6.695	0	%100
6	M6	Y	-6.695	-6.695	0	%100
7	M7	Y	-8.521	-8.521	0	%100
8	M8	Y	-6.695	-6.695	0	%100
9	M9	Y	-6.695	-6.695	0	%100
10	M10	Y	-3.565	-3.565	0	%100
11	M11	Y	-3.565	-3.565	0	%100
12	MP2	Y	-8.521	-8.521	0	%100
13	M16	Y	-3.565	-3.565	0	%100
14	M17	Y	-3.565	-3.565	0	%100
15	M18	Y	-8.521	-8.521	0	%100
16	M19	Y	-8.521	-8.521	0	%100
17	M20	Y	-8.521	-8.521	0	%100
18	M21	Y	-6.695	-6.695	0	%100
19	M22	Y	-6.695	-6.695	0	%100
20	M23	Y	-8.521	-8.521	0	%100
21	M24	Y	-6.695	-6.695	0	%100

Member Distributed Loads (BLC 16 : Ice Weight) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
22	M25	Y	-6.695	-6.695	0	%100
23	MP1	Y	-8.521	-8.521	0	%100
24	M27	Y	-3.565	-3.565	0	%100
25	M28	Y	-3.565	-3.565	0	%100
26	M29	Y	-3.565	-3.565	0	%100
27	MP3	Y	-8.521	-8.521	0	%100
28	M31	Y	-3.565	-3.565	0	%100

Member Distributed Loads (BLC 29 : Distr. Ice Wind Load Z)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	SZ	-16.557	-16.557	0	%100
2	M2	SZ	-16.557	-16.557	0	%100
3	M3	SZ	-18.449	-18.449	0	%100
4	M4	SZ	-18.449	-18.449	0	%100
5	M5	SZ	-24.798	-24.798	0	%100
6	M6	SZ	-24.798	-24.798	0	%100
7	M7	SZ	-18.449	-18.449	0	%100
8	M8	SZ	-24.798	-24.798	0	%100
9	M9	SZ	-24.798	-24.798	0	%100
10	M10	SZ	0	0	0	%100
11	M11	SZ	0	0	0	%100
12	MP2	SZ	-18.449	-18.449	0	%100
13	M16	SZ	0	0	0	%100
14	M17	SZ	0	0	0	%100
15	M18	SZ	-18.449	-18.449	0	%100
16	M19	SZ	-18.449	-18.449	0	%100
17	M20	SZ	-18.449	-18.449	0	%100
18	M21	SZ	-24.798	-24.798	0	%100
19	M22	SZ	-24.798	-24.798	0	%100
20	M23	SZ	-18.449	-18.449	0	%100
21	M24	SZ	-24.798	-24.798	0	%100
22	M25	SZ	-24.798	-24.798	0	%100
23	MP1	SZ	-18.449	-18.449	0	%100
24	M27	SZ	0	0	0	%100
25	M28	SZ	0	0	0	%100
26	M29	SZ	0	0	0	%100
27	MP3	SZ	-18.449	-18.449	0	%100
28	M31	SZ	0	0	0	%100

Member Distributed Loads (BLC 30 : Distr. Ice Wind Load X)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	M1	SX	-16.557	-16.557	0	%100
2	M2	SX	-16.557	-16.557	0	%100
3	M3	SX	-18.449	-18.449	0	%100
4	M4	SX	-18.449	-18.449	0	%100
5	M5	SX	-24.798	-24.798	0	%100
6	M6	SX	-24.798	-24.798	0	%100
7	M7	SX	-18.449	-18.449	0	%100
8	M8	SX	-24.798	-24.798	0	%100
9	M9	SX	-24.798	-24.798	0	%100
10	M10	SX	0	0	0	%100
11	M11	SX	0	0	0	%100
12	MP2	SX	-18.449	-18.449	0	%100
13	M16	SX	0	0	0	%100
14	M17	SX	0	0	0	%100
15	M18	SX	-18.449	-18.449	0	%100

Member Distributed Loads (BLC 30 : Distr. Ice Wind Load X) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
16	M19	SX	-18.449	-18.449	0	%100
17	M20	SX	-18.449	-18.449	0	%100
18	M21	SX	-24.798	-24.798	0	%100
19	M22	SX	-24.798	-24.798	0	%100
20	M23	SX	-18.449	-18.449	0	%100
21	M24	SX	-24.798	-24.798	0	%100
22	M25	SX	-24.798	-24.798	0	%100
23	MP1	SX	-18.449	-18.449	0	%100
24	M27	SX	0	0	0	%100
25	M28	SX	0	0	0	%100
26	M29	SX	0	0	0	%100
27	MP3	SX	-18.449	-18.449	0	%100
28	M31	SX	0	0	0	%100

Load Combinations

	Description	S...	PDel...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
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	.866	15	.5												
4	1.2DL + 1WL AZI 60	Yes	Y		1	1.2	4	1	14	.5	15	.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	-.5	15	.866												
7	1.2DL + 1WL AZI 150	Yes	Y		1	1.2	7	1	14	-.8...	15	.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	-.8...	15	-.5												
10	1.2DL + 1WL AZI 240	Yes	Y		1	1.2	10	1	14	-.5	15	-.8...												
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	.5	15	-.8...												
13	1.2DL + 1WL AZI 330	Yes	Y		1	1.2	13	1	14	.866	15	-.5												
14	0.9DL + 1WL AZI 0	Yes	Y		1	.9	2	1	14	1	15													
15	0.9DL + 1WL AZI 30	Yes	Y		1	.9	3	1	14	.866	15	.5												
16	0.9DL + 1WL AZI 60	Yes	Y		1	.9	4	1	14	.5	15	.866												
17	0.9DL + 1WL AZI 90	Yes	Y		1	.9	5	1	14		15	1												
18	0.9DL + 1WL AZI 120	Yes	Y		1	.9	6	1	14	-.5	15	.866												
19	0.9DL + 1WL AZI 150	Yes	Y		1	.9	7	1	14	-.8...	15	.5												
20	0.9DL + 1WL AZI 180	Yes	Y		1	.9	8	1	14	-1	15													
21	0.9DL + 1WL AZI 210	Yes	Y		1	.9	9	1	14	-.8...	15	-.5												
22	0.9DL + 1WL AZI 240	Yes	Y		1	.9	10	1	14	-.5	15	-.8...												
23	0.9DL + 1WL AZI 270	Yes	Y		1	.9	11	1	14		15	-1												
24	0.9DL + 1WL AZI 300	Yes	Y		1	.9	12	1	14	.5	15	-.8...												
25	0.9DL + 1WL AZI 330	Yes	Y		1	.9	13	1	14	.866	15	-.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	.866	30	.5										
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y		1	1.2	16	1	19	1	29	.5	30	.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	-.5	30	.866										
32	1.2D + 1.0Di +1.0Wi AZI 150	Yes	Y		1	1.2	16	1	22	1	29	-.8...	30	.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	-.8...	30	-.5										
35	1.2D + 1.0Di +1.0Wi AZI 240	Yes	Y		1	1.2	16	1	25	1	29	-.5	30	-.8...										
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	.5	30	-.8...										
38	1.2D + 1.0Di +1.0Wi AZI 330	Yes	Y		1	1.2	16	1	28	1	29	.866	30	-.5										
39	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	1	32															

Load Combinations (Continued)

	Description	S...	PDel...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
40	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	.866	32	.5																
41	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	.5	32	.866																
42	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31		32	1																
43	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	-.5	32	.866																
44	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	-.8...	32	.5																
45	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	-1	32																	
46	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	-.8...	32	-.5																
47	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	-.5	32	-.8...																
48	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31		32	-1																
49	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	.5	32	-.8...																
50	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	.866	32	-.5																
51	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	1	32																	
52	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	.866	32	.5																
53	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	.5	32	.866																
54	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31		32	1																
55	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	-.5	32	.866																
56	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	-.8...	32	.5																
57	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	-1	32																	
58	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	-.8...	32	-.5																
59	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	-.5	32	-.8...																
60	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31		32	-1																
61	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	.5	32	-.8...																
62	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	.866	32	-.5																
63	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	2	.171	14	.171	15		33	1.5												
64	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	3	.171	14	.148	15	.086	33	1.5												
65	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	4	.171	14	.086	15	.148	33	1.5												
66	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	5	.171	14		15	.171	33	1.5												
67	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	6	.171	14	-.0...	15	.148	33	1.5												
68	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	7	.171	14	-.1...	15	.086	33	1.5												
69	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	8	.171	14	-.1...	15		33	1.5												
70	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	9	.171	14	-.1...	15	-.0...	33	1.5												
71	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	10	.171	14	-.0...	15	-.1...	33	1.5												
72	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	11	.171	14		15	-.1...	33	1.5												
73	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	12	.171	14	.086	15	-.1...	33	1.5												
74	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	13	.171	14	.148	15	-.0...	33	1.5												
75	1.2DL + 1.5LL	Yes	Y		1	1.2	33	1.5																		
76	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	2	.043	14	.043	15													
77	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	3	.043	14	.037	15	.021												
78	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	4	.043	14	.021	15	.037												
79	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	5	.043	14		15	.043												
80	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	6	.043	14	-.0...	15	.037												
81	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	7	.043	14	-.0...	15	.021												
82	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	8	.043	14	-.0...	15													
83	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	9	.043	14	-.0...	15	-.0...												
84	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	10	.043	14	-.0...	15	-.0...												
85	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	11	.043	14		15	-.0...												
86	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	12	.043	14	.021	15	-.0...												
87	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	13	.043	14	.037	15	-.0...												
88	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	2	.043	14	.043	15													
89	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	3	.043	14	.037	15	.021												
90	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	4	.043	14	.021	15	.037												
91	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	5	.043	14		15	.043												
92	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	6	.043	14	-.0...	15	.037												
93	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	7	.043	14	-.0...	15	.021												
94	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	8	.043	14	-.0...	15													
95	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	9	.043	14	-.0...	15	-.0...												
96	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	10	.043	14	-.0...	15	-.0...												

Load Combinations (Continued)

	Description	S...	PDel...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
97	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	11	.043	14		15	-.0...										
98	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	12	.043	14	.021	15	-.0...										
99	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	13	.043	14	.037	15	-.0...										
100	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	2	.043	14	.043	15											
101	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	3	.043	14	.037	15	.021										
102	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	4	.043	14	.021	15	.037										
103	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	5	.043	14		15	.043										
104	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	6	.043	14	-.0...	15	.037										
105	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	7	.043	14	-.0...	15	.021										
106	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	8	.043	14	-.0...	15											
107	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	9	.043	14	-.0...	15	-.0...										
108	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	10	.043	14	-.0...	15	-.0...										
109	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	11	.043	14		15	-.0...										
110	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	12	.043	14	.021	15	-.0...										

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-...	LC	MZ [lb-ft]	LC
1	N13	...	618.488	102	1415.264	31	996.378	14	0	110	0	110	0	110
2		...	-1924.055	96	329.28	23	-3337.99	32	0	1	0	1	0	1
3	N14	...	1918.863	90	1245.438	37	3325.104	38	0	110	0	110	0	110
4		...	-613.162	108	290.896	17	-810.935	19	0	1	0	1	0	1
5	N51	...	401.856	7	64.647	37	1609.997	7	0	110	0	110	0	110
6		...	-405.136	13	15.26	55	-1616.118	13	0	1	0	1	0	1
7	Totals:	...	1450.499	17	2696.717	38	2414.86	14						
8		...	-1450.5	11	719.817	60	-2414.861	8						

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

	Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M23	PIPE_2.0	.586	15.5	13	.089	0		7	29659.2...	32130	1871.625	1871.625	1...	H1-1b
2	MP1	PIPE_2.0	.453	69	8	.064	28		2	14916.0...	32130	1871.625	1871.625	3...	H1-1b
3	M4	PIPE_2.0	.351	6.629	27	.132	0		34	21188.88	32130	1871.625	1871.625	1...	H1-1b
4	M9	ROHN 1.5x...	.329	22.103	29	.017	45.1...		103	6333.703	9501.25	361.421	361.421	1...	H1-1a
5	M3	PIPE_2.0	.323	5.893	33	.145	0		30	21188.88	32130	1871.625	1871.625	2...	H1-1b
6	M5	ROHN 1.5x...	.307	19.875	34	.012	0		95	7341.707	9501.25	361.421	361.421	1...	H1-1a
7	M8	ROHN 1.5x...	.299	22.103	29	.042	45.1...		8	6333.703	9501.25	361.421	361.421	1...	H1-1a
8	M1	PIPE_2.5	.273	121.5	8	.096	123		2	15797.3	50715	3596.25	3596.25	1...	H1-1b
9	M19	PIPE_2.0	.246	64.082	13	.235	70.7...		13	21188.88	32130	1871.625	1871.625	2...	H1-1b
10	M2	PIPE_2.5	.244	121.5	8	.149	123		8	15797.3	50715	3596.25	3596.25	2...	H1-1b
11	M20	PIPE_2.0	.230	64.082	25	.230	70.7...		7	21188.88	32130	1871.625	1871.625	2...	H1-1b
12	M21	ROHN 1.5x...	.179	36	105	.013	0		95	7341.707	9501.25	361.421	361.421	1...	H1-1b*
13	M18	PIPE_2.0	.176	0	7	.007	0		36	9494.38	32130	1871.625	1871.625	1...	H1-1b*
14	MP3	PIPE_2.0	.163	28	106	.027	28		76	14916.0...	32130	1871.625	1871.625	4...	H1-1b
15	M6	ROHN 1.5x...	.150	36	38	.041	0		95	7341.707	9501.25	361.421	361.421	1...	H1-1b*
16	MP2	PIPE_2.0	.148	28	8	.032	69		98	14916.0...	32130	1871.625	1871.625	4...	H1-1b
17	M25	ROHN 1.5x...	.092	22.574	38	.034	0		36	6333.703	9501.25	361.421	361.421	1...	H1-1b
18	M24	ROHN 1.5x...	.087	22.574	110	.035	45.1...		8	6333.703	9501.25	361.421	361.421	1...	H1-1b
19	M22	ROHN 1.5x...	.086	36	106	.041	0		95	7341.707	9501.25	361.421	361.421	1	H1-1b*
20	M7	PIPE_2.0	.037	31	28	.005	31		3	29659.2...	32130	1871.625	1871.625	1...	H1-1b*

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General				
2	RIGID		8	20	0
3	Total General		8	20	0
4					
5	Hot Rolled Steel				
6	A53 Gr.B	PIPE_2.0	10	755	218.369
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	1367.6	377.615

APPENDIX D

ADDITIONAL CALCUATIONS

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

Bolt Calculation Tool, V1.5.1

PROJECT DATA	
Site Name:	NLN 136 943455
Site Number:	806384
Connection Description:	Mount to Tower

MAXIMUM BOLT LOADS		
Bolt Tension:	834.50	lbs
Bolt Shear:	552.12	lbs

WORST CASE BOLT LOADS[1]		
Bolt Tension:	834.50	lbs
Bolt Shear:	513.55	lbs

WORST CASE CONNECTION SLIP LOADS[2]		
Sliding Force:	1388.43	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	-

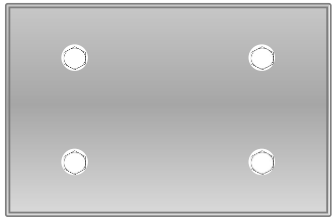
[1] *Worst case bolt loads correspond to Load combination #32 on member M10 in RISA-3D, which causes the maximum demand on the bolts.*

[2] *Worst Case slip loads correspond to Load combination #32 on member M10 in RISA 3D, which causes the maximum slip demand on the connection.*

Member Information
I nodes of M10, M11

BOLT CHECK		
Tensile Strength	6385.43	
Shear Strength	4417.86	
Max Tensile Usage	13.1%	
Max Shear Usage	12.5%	
Interaction Check (Worst Case)	0.03	***≤1.05***
Result	Pass	

SLIP CHECK (WORST CASE)		
Torsional Slip Resistance	889.09	
Sliding Resistance	7421.98	
Torsional Slip Usage	0.0%	
Sliding Usage	18.7%	
Interaction Check	0.03	***≤1.05***
Result	Pass	



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

806384
93 Roxbury Road
East Lyme, Connecticut 06357

November 5, 2021

EBI Project Number: 6221006878

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**26.23%**

November 5, 2021

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

Emissions Analysis for Site: CTNL037A - 806384

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 APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 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.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
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 / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd
Height (AGL):	122 feet	Height (AGL):	122 feet	Height (AGL):	122 feet
Channel Count:	13	Channel Count:	13	Channel Count:	13
Total TX Power (W):	560 Watts	Total TX Power (W):	560 Watts	Total TX Power (W):	560 Watts
ERP (W):	17,868.72	ERP (W):	17,868.72	ERP (W):	17,868.72
Antenna A1 MPE %:	**6.30%**	Antenna B1 MPE %:	**6.30%**	Antenna C1 MPE %:	**6.30%**
Antenna #:	2	Antenna #:	2	Antenna #:	2
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 A2 MPE %:	**9.71%**	Antenna B2 MPE %:	**9.71%**	Antenna C2 MPE %:	**9.71%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	16.02%
T-Mobile (Existing)	4.82%
Verizon	4.89%
Metro PCS	0.48%
Town	0.02%
Site Total MPE % :	26.23%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	16.02%
T-Mobile Sector B Total:	16.02%
T-Mobile Sector C Total:	16.02%
Site Total MPE % :	26.23%

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 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 2100 MHz LTE	2	2649.42	122.0	14.16	2100 MHz LTE	1000	1.42%
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:	**16.02%**

• 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:	16.02%
Sector B:	16.02%
Sector C:	16.02%
T-Mobile Maximum MPE % (Sector A):	16.02%
Site Total:	26.23%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **26.23%** 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.