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

June 29, 2022

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

RE: **Notice of Exempt Modification for T-Mobile: CT11353C**
Crown Site ID# 876345
33 Janoski Road, Ashford, CT 06238
Latitude: 41° 57′ 7.70″ / Longitude: -72° 11′ 43.90″

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 158-foot mount on the existing 192-foot monopole tower located at 33 Janoski Road, Ashford, CT. The property is owned by Martin Carolyn M L/U, and the tower is owned by Crown Castle. T-Mobile now intends to add one (1) new microwave dish and ancillary equipment at the 158ft 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:
(1) Andrew- VHLP2-11WA - MW Dish
(3) Ceragon – Fibeair IP-20A_RFU-D - ODU
(4) Power Cables (21/64", 7/32")

The facility was approved by the Town of Ashford Planning and Zoning Commission on November 12, 1996. The approval was given with conditions which this exempt modification follows.

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 William A. Falletti, First Selectman, Town of Ashford, Michael D'Amato, ZEO, Town of Ashford. Martin Carolyn M L/U, Property Owner and Crown Castle is the tower owner.

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

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

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

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

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

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

Sincerely,

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

Attachments
cc:

William A. Falletti, First Selectman
Town of Ashford
5 Town Hall Road
Ashford, CT 06278
(860) 487-4400

Michael D'Amato, ZEO
Town of Ashford
5 Town Hall Road
Ashford, CT 06278
(860) 487-4415

Martin Carolyn M L/U – Property Owner
33 Janoski Road
Ashford, CT 06278

Crown Castle - Tower Owner

FILE SITE #204
SKY HILL
ZONING

RECEIVED
11-13-96

MINUTES - ASHFORD PLANNING AND ZONING COMMISSION

Annual Meeting - November 12, 1996

Members present: Organ, Lawrence, Nagy, Levaur, Rossman, McCarthy & White.

Alternates present: Bartok & Specyalski.

The meeting was called to order at 9:55 p.m. after the public hearing (Sprint Spectrum, tower & Moratorium, Lake Chaffee).

Specyalski is the voting alternate for this meeting.

At the Annual Town meeting, Alex Hastillo and Kevin McCarthy were elected to 4 year terms on the Commission ending in the year 2000 and Bartok was elected to a 3 year term as Alternate ending in 1999.

Moved and seconded to consider Old and New Business first. Passed without dissent.

The Commission considered the Sprint Spectrum application for a communications tower to be located on Sky Hill. There were no objections at tonights public hearing. The tower will be able to hold three sets of antennas. Sprint Spectrum will operate a PCS digital system. It is regulated by the FCC. There will be no lights on the tower. Access will be off Frontage Road to Janowski Road to avoid the wetlands on the east end of Janowski Road. Moved and seconded to approve with conditions the application for a Special Exception under Section 5.2.3 by Sprint Spectrum L.P., Meriden, CT for a 200' communications tower to be located on land leased from David H. Martin off Janowski Road on Sky Hill.

The conditions are:
1. Utilities to the site which is approximately 2500' from Janowski Road will be located underground in the right of way.
2. Space and installation of fire, emergency and municipal communications equipment to meet present and future needs will be provided at no cost.
3. A copy of the liability insurance will be submitted to the Commission.
4. A site plan including driveway design and sedimentation and erosion control measures will be submitted to the Commission before the construction begins.
5. A copy of the lease will be part of the land records.

Motion passed without dissent.

The Commission considered the proposed Moratorium at Lake Chaffee. Tim Backus, Chairman of the Water Pollution Control Authority was the only person to speak at the public hearing. Moved and seconded to approve the following:

Moratorium at Lake Chaffee

WHEREAS, the Department of Environmental Protection has cited the Town of Ashford and the Lake Chaffee Improvement Association, Inc. to study and report upon potential pollution at Lake Chaffee resulting from construction around the lake; and

WHEREAS, the Department of Environmental Protection has found pollution in the tributaries leading to the lake, and

WHEREAS, there is a reasonable expectation that the recommendation of the study may be to limit new construction in that area, or as an alterative to require that homes in the area be connected to an alternative type of sewage disposal system, and

WHEREAS, this Commission does not want to allow any deterioration of the water in the lake or tributaries;

The Planning and Zoning Commission of the Town of Ashford, pursuant to the authority vested in it by Section 8-2 of Connecticut General Statutes, hereby amends the zoning regulations of the Town of Ashford by adoption of the following Moratorium:

"Until December 31, 1997, there shall be no new house construction allowed within the area of Lake Chaffee Improvement Association, Inc. nor any enclosed addition to any existing house in that area. The Zoning Enforcement Officer may not in that period certify that any new construction is in conformity with the zoning regulations of the town."

Motion passed without dissent.

The reasons for reinstating the moratorium include:
1. There is need for more testing of the water and septic systems in the area.
2. There have been minimal applications for construction since the last moratorium was lifted.
3. The WPCA is seeking on-site solutions.
4. There are several sets of vacant lots that may be valuable for sewage disposal systems.

Specyalski stepped down for the next item of business.

Brialee Campground - Brian Specyalski submitted a plan for a six additional campsites at the campground. It was noted that three of these butt onto adjoining property that is owned by the State of Connecticut. The others have a 100' setback that has been the minimum acceptable to the Commission. Moved and seconded to receive the plan and hold a public hearing on December 9th. Passed without dissent. A new map showing only the three sites that meet the setback requirements will be submitted. The Commission will walk the site a 7 a.m. on Saturday November 16th.

The Commission returned to the top of the agenda.

Moved and seconded to approve the minutes of the October 15th meeting. Passed without dissent.

Moved and seconded to send a letter of appreciation to George Quirk Sr., retiring member for his many years of service to the Commission. Passed without dissent.

There were no bills.

A copy of the revised Small Cities Housing Plan was received from the Office of the Selectmen. It will go to a public hearing in December. Copies will be distributed to the Commission members for review.

The revised fee schedule was approved by Town Meeting in October.

Moved and seconded to add to the agenda the election of officers and reappointment of employees. Passed without dissent.

Moved and seconded to reelect the following officers to serve until the next annual meeting of the Commission: Sidney E. Organ, Chairman, Alex Hastillo, Vice Chairman and John Bartok, Secretary. Passed without dissent. The Secretary will cast one ballot for each.

Moved and seconded to reappoint Rudolph Makray, Zoning Enforcement Officer and John Bartok, Recording Secretary for one year or until the next annual meeting. Passed without dissent.

The Commission agreed to hold a Special Meeting on Monday, December 16th at 7 p.m. to review the draft of the revised Plan of Development.

The meeting adjourned at 10:35 p.m.

Respectfully submitted.

John W. Bartok, Jr.
Recording Secretary

LEGAL NOTICE

Town of Ashford

The Ashford Planning and Zoning Commission at its meeting on November 12, 1996 took the following aotions:

APPROVED with oonditions the applioation of Sprint Speotrum, L.P., Meriden, CT for a 200' communioations tower to be built on the David Matin property looated off Route 89 on Sky Hill.

APPROVED a request by the Ashford Water Pollution Control Authority to reenstate the moratorium at Lake Chaffee until December 31, 1997 that prohibits oonstruction of new houses or enolosed additions to any existing house.

Dated in Ashford, Conneotiout this 14th day of November, 1996.

John W. Bartok,Jr.,Seo.
Ashford Planning and,
Zoning Commission

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2021. A plus sign (+) at the end of a Map Block Lot (e.g., 23 52 7+) means three or more lots have been merged.

Ashford, Connecticut

Information on the Property Records for the Municipality of Ashford was last updated on 6/29/2022.

Parcel Information

Location:	33 JANOSKI RD	Property Use:	Vacant Land	Primary Use:	Commercial Vacant Land
Unique ID:	00007410	Map Block Lot:	02 F 1.1	Acres:	0.7000
490 Acres:	0.00	Zone:		Volume / Page:	200/ 736
Developers Map / Lot:		Census:			

Value Information

	Appraised Value	Assessed Value
Land	401,400	280,980
Buildings	0	0

	Appraised Value	Assessed Value
Detached Outbuildings	111,600	78,120
Total	513,000	359,100

Owner's Information

Owner's Data

MARTIN CAROLYN M L/U
MARTIN STEVEN REMAINDERMAN
C/O SPRINT SPECTRUM CT-03XC04
PO BOX 8430
KANSAS CITY, MO 64114-8430

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
6 Ft Chain Fence	2007	0.00	0.00	260
Cell Shed	2007	0.00	0.00	260
Cell Shed	2001	0.00	0.00	360
Cell Shed	2007	0.00	0.00	240
Cell Tower	2001	0.00	0.00	192

Owner History - Sales

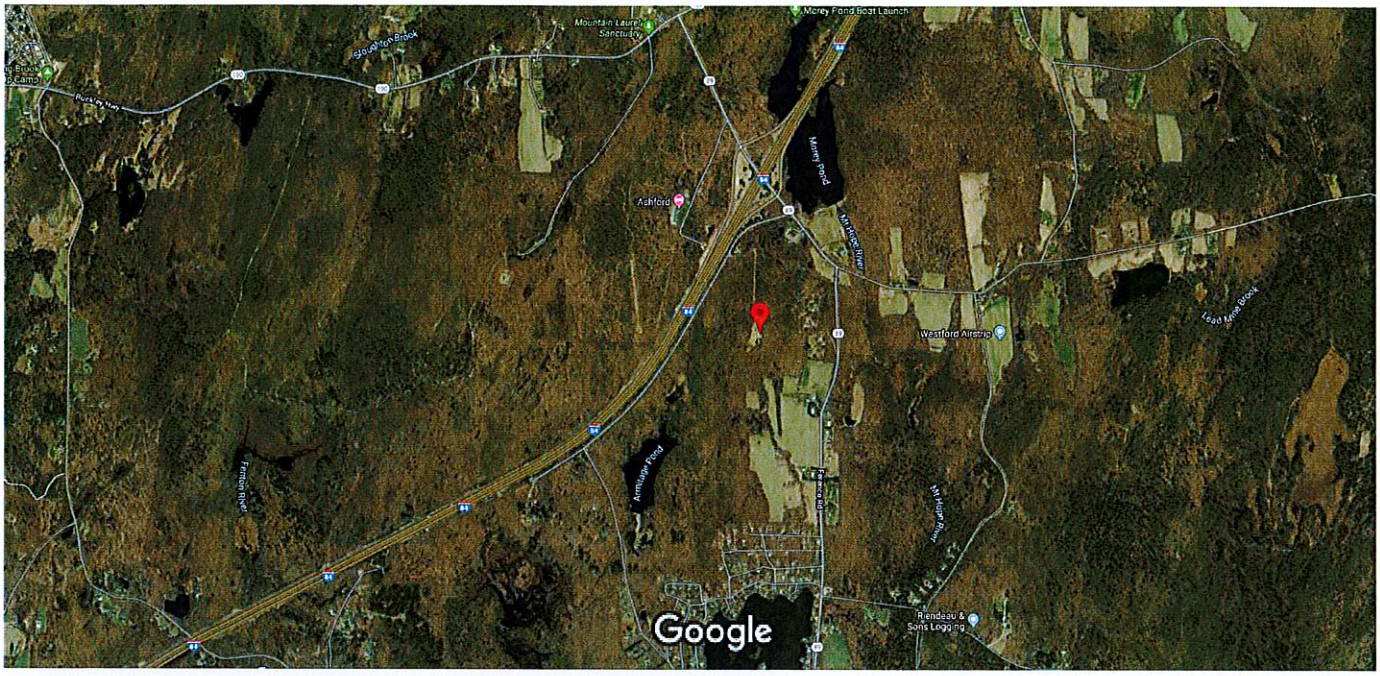
Owner Name	Volume	Page	Sale Date	Deed Type	Sale Price
MARTIN CAROLYN M L/U	0200	0736	12/04/2020	Quit Claim	$0
MARTIN FAMILY LIV TR DTD 6/20/05	0197	0876	01/31/2020		$0
MARTIN FAMILY LIV TR DTD 6/20/05	0194	0885	10/15/2018		$0
MARTIN DAVID H	0109	0811	09/30/1996		$0

Building Permits

Permit Number	Permit Type	Date Opened	Reason
20-39B	Electrical	04/21/2020	T MOBILE REPLACING 6 EXISTING ANTENNAS
20-16B	Commercial	02/26/2020	ADD 3 ANTENNAS TO EXISTING TOWER.
19-129B	Commercial	12/30/2019	REPLACE SIX EXISTING ANTENNALS + REPLACE 2 RRUS, ADD 6 RRUS.
19-13B	Commercial	03/08/2019	UPGRADE EXISTING T-MOBILE EQPMT
18-54E	Generator	11/19/2018	INSTALL CONCRETE PAD + DIESEL GENERATOR.
18-76	Commercial	09/12/2018	SPRINT TO REPLACE 6 ANTENNAS + ADD 12 REMOTE RADIO HEADS.
18-74B	Commercial	09/07/2018	VERIZON TO SWAP OUT EXISTING EQUIPMENT. ALL NEW EQUIPMENT TO MATCH EXISTING CONDITIONS AND HEIGHTS.
18-29E	Electrical	06/11/2018	15 KW GENERATOR
16-11B	Commercial	11/23/2015	REPLACING ANTENNA PANELS & ADDING REMOTE RADIO HEADS
16130	Commercial	05/05/2015	REMOVE 3 ANTENNAS & REPLACE W/ 4 941-308-5986
15801	Commercial	02/11/2014	50KW DIESEL GENERATOR & 2 ACCESS GATES 508-930-0974
15485	Commercial	12/19/2012	RMV/REPLACE 2 CABINETS GROUNDWORK
15315	Commercial	07/02/2012	ADD 3 ANTENNAS, SWAP 3 ANTENNA, ADD EQUIP TO SHELTER
15158	Commercial	11/16/2011	REPL ANTENNA FOR METRO CELL SITE
15101	Addition	09/27/2011	CELL TOWER CO-LOCATION
11695	Miscellaneous	06/21/2002	
EXEMPT	Electrical		TMOBILE TO REPLACE 2 ANTENNAS AND ADD 2 MORE. IT IS REPLACING 2 AMPLIFIERS WITH 6 NEW ONES, 4 COAS +

Google Maps 41°57'07.7"N 72°11'43.9"W

Crown Castle - tower location



Imagery ©2020 CNES / Airbus, MassGIS, Commonwealth of Massachusetts EOEA, Maxar Technologies, U.S. Geological Survey, USDA 1000 ft Farm Service Agency, Map data ©2020

41°57'07.7"N 72°11'43.9"W

41.952139, -72.195528

Directions Save Nearby Send to your phone Share

Ashford School District, Ashford, CT 06278

XR23+VQ Ashford, Connecticut

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7/1/2022 before 4:30 pm
Initially expected: Friday, 7/1/2022

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DELIVERY STATUS

Delay

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TRACKING ID

777259286557

FROM
Jeff Barbadora
1800 W. Park Drive
WESTBOROUGH, MA US 01581
7819700053

Label Created
6/29/2022 09:28

PACKAGE RECEIVED BY FEDEX
FRAMINGHAM, MA
6/29/2022 17:44

DELAY
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6/30/2022 08:44

OUT FOR DELIVERY

TO
William A. Falletti, First Selectma
Town of Ashford
5 Town Hall Road
ASHFORD, CT US 06278
8604874400

UPDATED DELIVERY
7/1/2022 before 4:30 PM

Initially expected
7/1/2022

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UPDATED DELIVERY

Friday

7/1/2022 before 4:30 pm
Initially expected: Friday, 7/1/2022

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DELIVERY STATUS

Delay

Get Status Updates

TRACKING ID

777259307721

FROM
Jeff Barbadora
1800 W. Park Drive
WESTBOROUGH, MA US 01581
7819700053

Label Created
6/29/2022 09:29

PACKAGE RECEIVED BY FEDEX
FRAMINGHAM, MA
6/29/2022 17:44

DELAY
NORWICH, CT
6/30/2022 08:45

OUT FOR DELIVERY

TO
Michael D'Amato, ZEO
Town of Ashford
5 Town Hall Road
ASHFORD, CT US 06278
8604874415

UPDATED DELIVERY
7/1/2022 before 4:30 PM

Initially expected
7/1/2022

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Thursday, June 30, 2022 1:13 PM
To: Barbadora, Jeff
Subject: FedEx Shipment 777259361556: Your package has been delivered

Hi. Your package was delivered Thu, 06/30/2022 at 1:11pm.

Delivered to 33 JANOSKI RD, ASHFORD, CT 06278

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 777259361556

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Martin Carolyn M L/U Property Owner 33 Janoski Road ASHFORD, CT, US, 06278
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Wed 6/29/2022 05:44 PM
DELIVERED TO	Residence
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	ASHFORD, CT, US, 06278
SPECIAL HANDLING	Deliver Weekday Residential Delivery
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	0.50 LB
SERVICE TYPE	FedEx Priority Overnight

Date: **June 03, 2022**

MTS Engineering, P.L.L.C.
1717 S, Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate** **Site Number:**	 CT11353C
Crown Castle Designation:	**BU Number:** **Site Name:** **JDE Job Number:** **Work Order Number:** **Order Number:**	876345 Sky Hill 717187 2115648 617438 Rev. 0
Engineering Firm Designation:	**Project Number:**	77921.017.01
Site Data:	**33 Janowski Road, Ashford, Windham County, CT** **Latitude *41° 57' 7.7"*, Longitude *-72° 11' 43.9"*** **192 Foot - Self Support Tower**	

We are pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

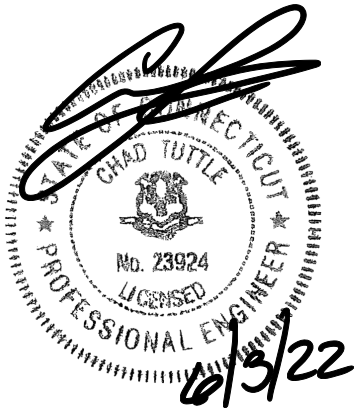
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity – 68.6%**

This analysis utilizes an ultimate 3-second gust wind speed of 118 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Dominique E. Jones

Respectfully submitted by: MTS Engineering, P.L.L.C.
COA: BER. 2386985



Chad E. Tuttle, P.E.

tnxTower Report - version 8.1.1.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 192 ft. Self-Support tower designed by Rohn.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	118 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)
156.0	159.0	3	Ericsson	RADIO 4449 B12/B71	3 2 2	1-5/8 21/64 7/32
		3	Ericsson	RRUS 4415 B25		
	158.0	1	Ceragon	FIBEAIR IP-20A_RFU-D		
		1	Commscope	VHLP2-11W/A		
		3	RFS Celwave	APX16DWV-16DWV-S-E-A20		
		3	RFS Celwave	APXVAARR24_43-U-NA20		
	156.0	3	Ericsson	RADIO 4415 B66A		
		1	--	Sector Mount [SM 503-3]		

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)
190.0	192.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz	4 1	1-1/4 1/2
		6	Alcatel Lucent	RRH2X50-800		
		3	Commscope	NNVV-65B-R4		
		3	Nokia	FZHN		
		3	RFS Celwave	APXVTM14-ALU-I20		
	190.0	1	--	Sector Mount [SM 504-3]		
180.0	184.0	1	Symmetricom	58532A	8 1	1-5/8 1/2
	183.0	3	Samsung Telecom.	MT6407-77A		
	181.0	6	Antel	LPA-80080/4CF		
		6	Commscope	JAHH-65B-R3B		
		2	Commscope	RC3DC-3315-PF-48		
		3	Samsung Telecom.	RFV01U-D1A		
		3	Samsung Telecom.	RFV01U-D2A		
	180.0	1	--	Sector Mount [SM 304-3]		
	179.0	3	Samsung Telecom.	CBRS		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
171.0	172.0	9	Allgon	7130.16.33.00	9	1-5/8
	171.0	1	--	Sector Mount [SM 504-3]		
162.0	162.0	3	Andrew	HBX-6516DS-VTM	6	1-5/8
		1	--	Sector Mount [SM 104-3]		
140.0	142.0	1	Raycap	DC6-48-60-0-8C-EV	14 2 2	7/8 3/4 3/8
		1	Raycap	DC6-48-60-18-8F		
	140.0	4	CCI Antennas	TPA65R-BU4D		
		2	Commscope	NNHH-65B-R4		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 4478 B14		
		3	Ericsson	RRUS 8843 B2/B66A		
		3	Powerwave Tech.	7770.00		
		3	Powerwave Tech.	TT19-08BP111-001		
		1	--	Sector Mount [SM 502-3]		
130.0	130.0	3	Fujitsu	TA08025-B604	1	1-1/2
		3	Fujitsu	TA08025-B605		
		3	JMA Wireless	MX08FRO665-21		
		1	Raycap	RDIDC-9181-PF-48		
		1	--	Commscope MTC3975083 (3)		
98.0	102.0	1	Symmetricom	58532A	1	1/2
	98.0	1	--	Side Arm Mount [SO 305-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Tower Manufacturer Drawing	1631630	CCI Sites
Foundation Drawing	1631622	CCI Sites
Geotech Report	2189896	CCI Sites
Crown CAD Package	Date: 05/17/2022	CCI Sites

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

This analysis may be affected if any assumptions are not valid or have been made in error. We 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	192 - 180	Leg	ROHN 2.5 STD	1	-5.741	66.738	8.6	Pass
T2	180 - 160	Leg	ROHN 2.5 STD	25	-29.819	59.996	49.7	Pass
T3	160 - 140	Leg	ROHN 3 EH	55	-58.941	99.054	59.5	Pass
T4	140 - 120	Leg	ROHN 4 EH	76	-93.750	167.894	55.8	Pass
T5	120 - 100	Leg	ROHN 5 EH	97	-127.325	251.347	50.7	Pass
T6	100 - 80	Leg	ROHN 6 EHS	118	-156.487	256.249	61.1	Pass
T7	80 - 60	Leg	ROHN 6 EH	133	-188.207	318.945	59.0	Pass
T8	60 - 40	Leg	ROHN 8 EHS	148	-218.191	405.672	53.8	Pass
T9	40 - 20	Leg	ROHN 8 EHS	163	-248.178	405.729	61.2	Pass
T10	20 - 0	Leg	ROHN 8 EHS	178	-278.185	405.717	68.6	Pass
T1	192 - 180	Diagonal	L1 3/4x1 3/4x3/16	7	-1.215	11.895	10.2	Pass
T2	180 - 160	Diagonal	L2x2x3/16	36	-3.288	10.392	31.6	Pass
T3	160 - 140	Diagonal	L2 1/2x2 1/2x1/4	63	-4.924	16.480	29.9	Pass
T4	140 - 120	Diagonal	L2 1/2x2 1/2x1/4	81	-6.487	12.587	51.5	Pass
T5	120 - 100	Diagonal	L3x3x1/4	102	-6.831	17.432	39.2	Pass
T6	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	123	-7.978	19.016	42.0	Pass
T7	80 - 60	Diagonal	L4x4x1/4	138	-8.773	24.136	36.4	Pass
T8	60 - 40	Diagonal	L4x4x5/16	153	-8.422	24.922	33.8	Pass
T9	40 - 20	Diagonal	L4x4x5/16	168	-10.012	21.484	46.6	Pass
T10	20 - 0	Diagonal	L4x4x3/8	183	-10.558	21.926	48.2	Pass
T1	192 - 180	Top Girt	L1 3/4x1 3/4x3/16	5	-0.069	4.122	1.7	Pass
T2	180 - 160	Top Girt	L2x2x3/16	29	-0.635	6.245	10.2	Pass
							Summary	
						Leg (T10)	68.6	Pass
						Diagonal (T4)	51.5	Pass
						Top Girt (T2)	10.2	Pass
						Bolt Checks	58.4	Pass
						Rating =	**68.6**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft.)	% Capacity	Pass / Fail
1,2	Anchor Rods	Base	38.7	Pass
1,2	Base Foundation (Structure)	Base	12.1	Pass
1,2	Base Foundation (Soil Interaction)	Base	40.3	Pass

Structure Rating (max from all components) =	68.6%

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.

The results of the tilt and twist values for a 60 mph 3-second gust service wind speed per the TIA-222-H standard are given below:

Table 6 – Proposed Equipment Tilt-Sway Results for 60 mph Service Wind – LC7

Elevation (ft)	*Dish Model*	*Diameter (ft)*	*Tilt (°)*	*Twist (°)*
158.0	VHLP2-11W/A	2.167	0.170	0.019

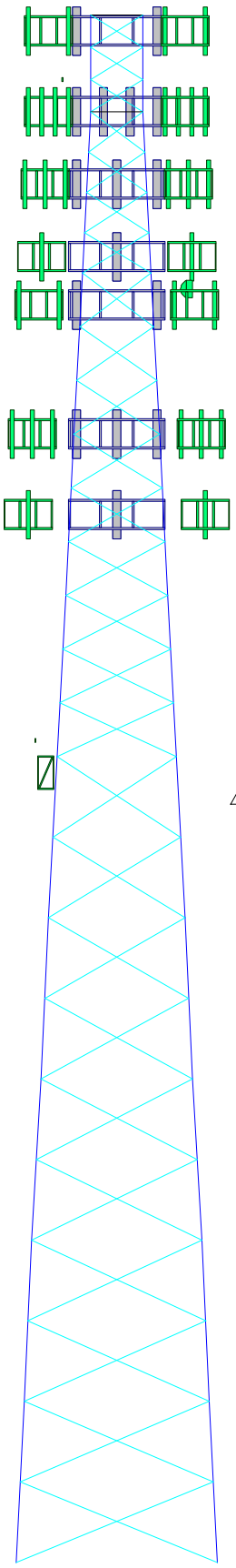
APPENDIX A

TNXTOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Legs	ROHN 2.5 STD	ROHN 2.5 STD	ROHN 3 EH	ROHN 4 EH	ROHN 5 EH	ROHN 6 EHS	ROHN 6 EH	ROHN 8 EHS	ROHN 8 EHS	ROHN 8 EHS
Leg Grade	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50
Diagonals	A	L2x2x3/16	L2 1/2x2 1/2x1/4	L2 1/2x2 1/2x1/4	L3x3x1/4	L3 1/2x3 1/2x1/4	L4x4x1/4	L4x4x5/16	L4x4x5/16	L4x4x3/8
Diagonal Grade	A36	A36	A36	A36	A572-50	A572-50	A572-50	A572-50	A572-50	A572-50
Top Girts	A	L2x2x3/16	8.54	10.61	12.74	14.83	16.92	18.88	21.13	23.05
Face Width (ft)	6.58	4 @ 5	9 @ 6.66667					10 @ 10		
# Panels @ (ft)	3 @ 4									
Weight (K)	0.8	1.0	1.5	2.0	2.7	2.8	3.5	4.4	4.6	5.3

25.05 28.4

192.0 ft
180.0 ft
160.0 ft
140.0 ft
120.0 ft
100.0 ft
80.0 ft
60.0 ft
40.0 ft
20.0 ft
0.0 ft



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 3/4x1 3/4x3/16		

MATERIAL STRENGTH

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

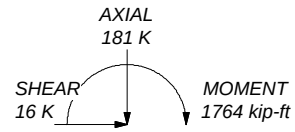
TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 118 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 II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 68.6%

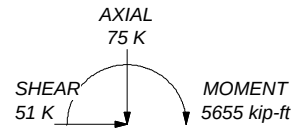
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 286 K
SHEAR: 33 K

UPLIFT: -231 K
SHEAR: 27 K



TORQUE 11 kip-ft
50 mph WIND - 1.500 in ICE

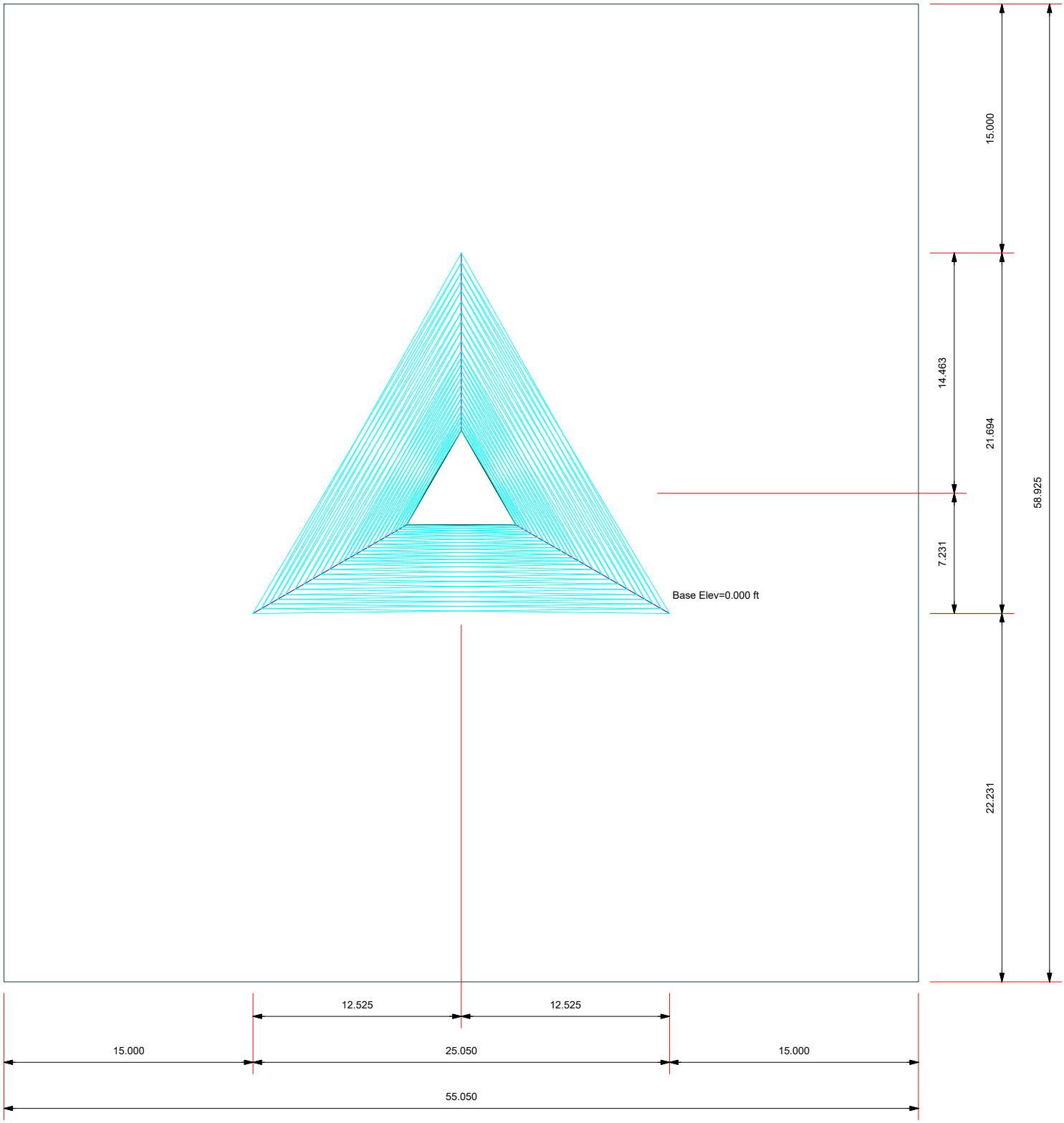


TORQUE 44 kip-ft
REACTIONS - 118 mph WIND

MTS Engineering, P.L.L.C.
1717 S, Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 587-4630

Job: 77921.017.01 - SKY HILL, CT (BU# 876345)			
Project:			
Client: Crown Castle	Drawn by: Nithish Acharya	App'd:	
Code: TIA-222-H	Date: 05/25/22	Scale: NTS	
Path: C:\Users\IND306\Desktop\SAI\May 25\77921_876345_Sky Hill---Nithish---Akshaykumar\Trix_017_01\77921_017_01_SKY HILL_CT.eri		Dwg No. E-1	

Plot Plan
Total Area - 0.07 Acres



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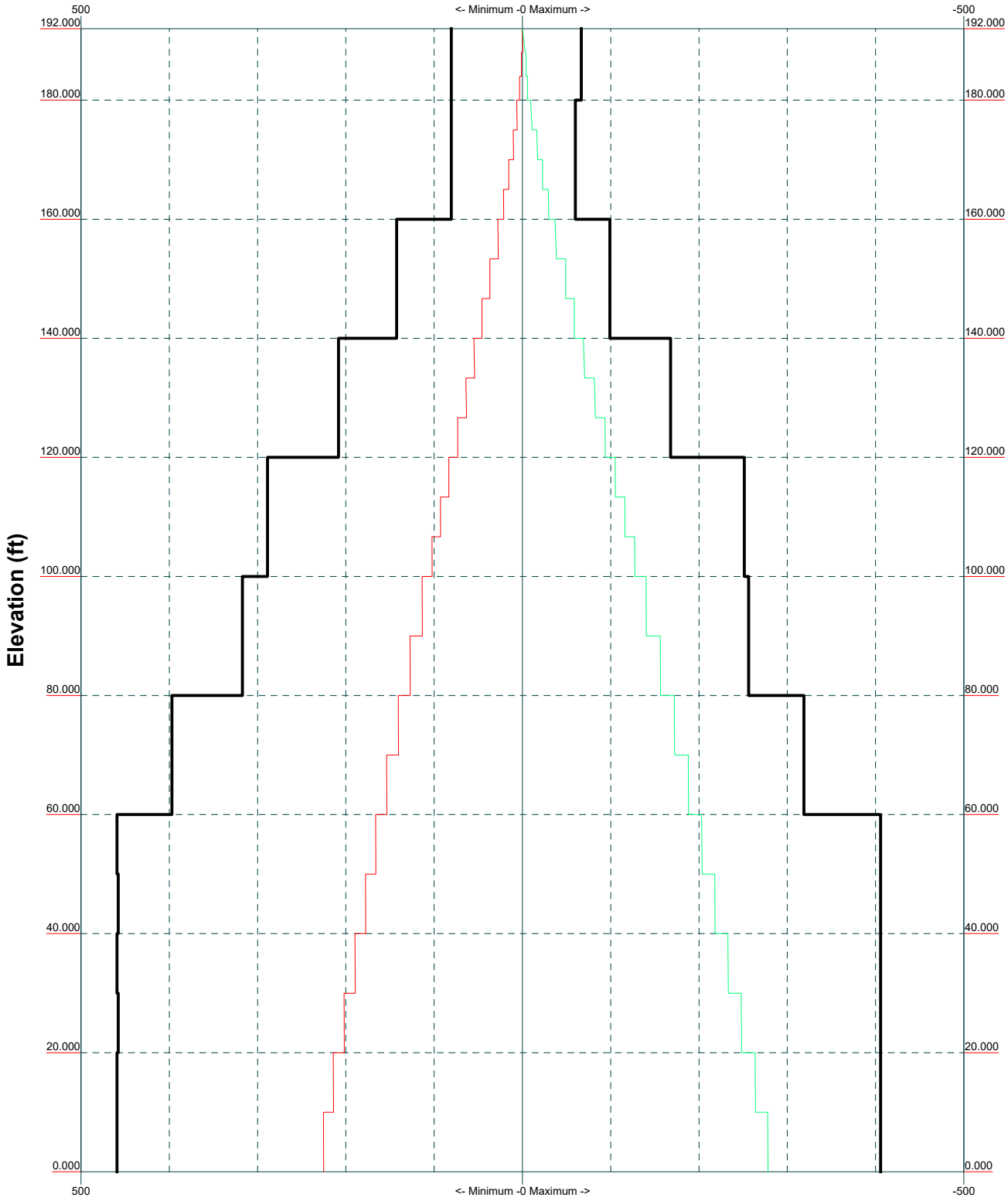
Code: TIA-222-H	Date: 05/25/22	Scale: NTS	
Path: C:\Users\IND306\Desktop\SAI\May 25\77921_876345_Sky Hill---Nithish----Akshaykumar\Tnx_017_01\77921_017_01_SKY HILL_CT.eri		Dwg No. E-2	

TIA-222-H - 118 mph/50 mph 1.500 in Ice Exposure B

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



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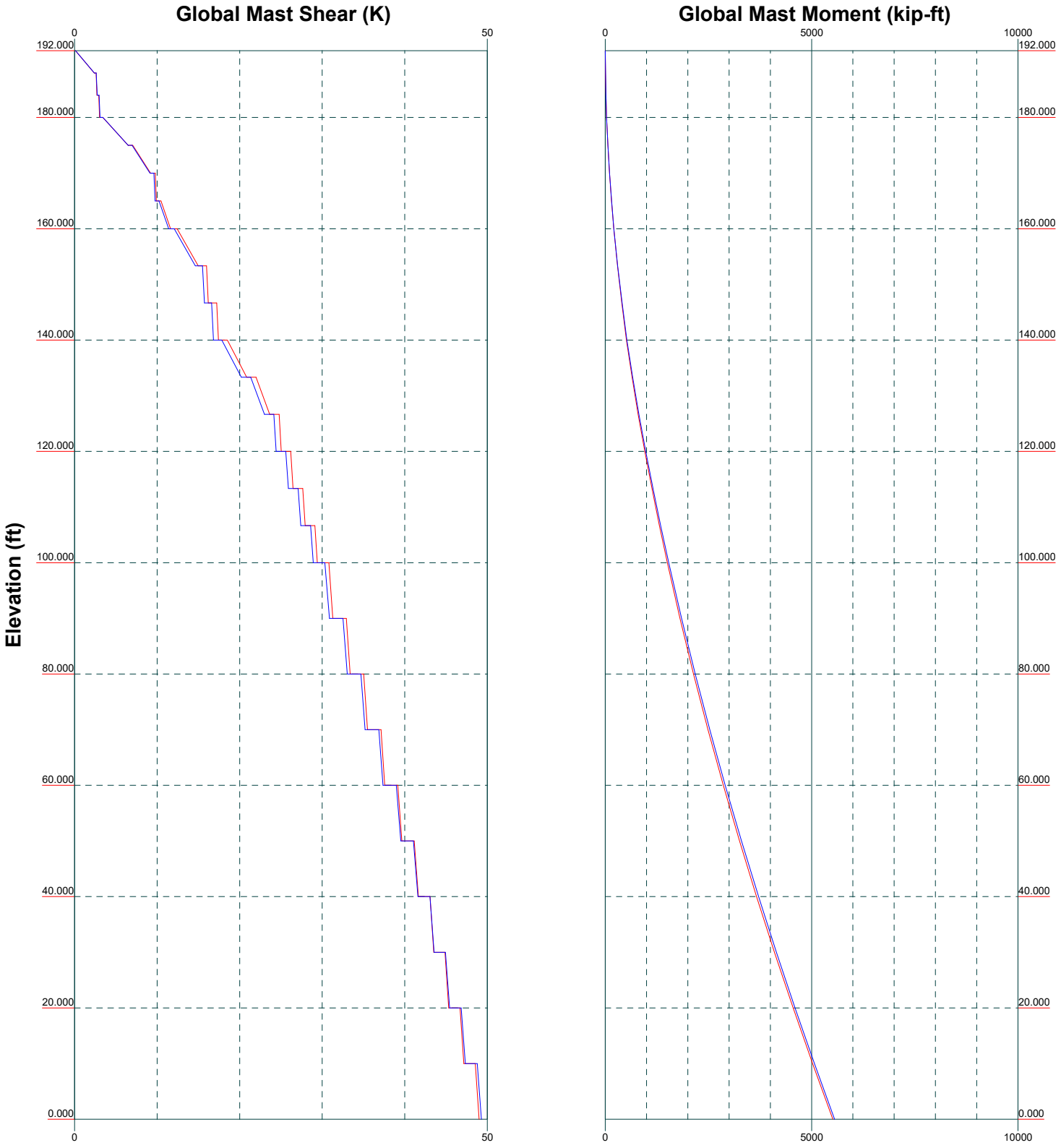
Job: *77921.017.01 - SKY HILL, CT (BU# 876345)*			
Project:			
Client: Crown Castle	Drawn by: Nithish Acharya	App'd:	
Code: TIA-222-H	Date: 05/25/22	Scale: NTS	
Path: C:\Users\IND306\Desktop\SA\May 25\77921_876345_Sky Hill-----Nithish-----Akshaykumar\Trix_017_01\77921_017_01_SKY HILL_CT.eri		Dwg No. E-3	

TIA-222-H - 118 mph/50 mph 1.500 in Ice Exposure B

Maximum Values

Vx Vz Mx Mz



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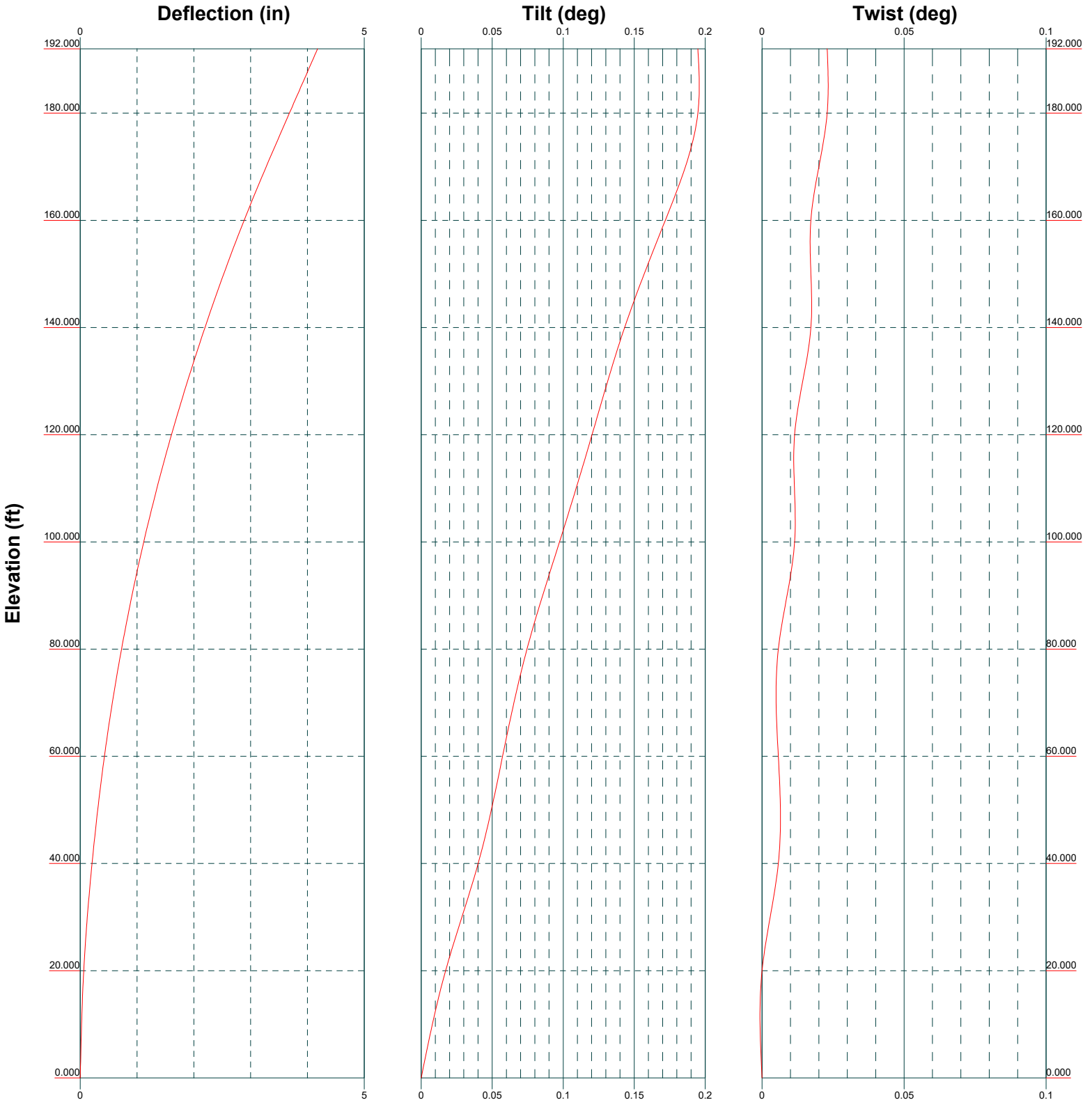
Job: *77921.017.01 - SKY HILL, CT (BU# 876345)*			
Project:			
Client: Crown Castle	Drawn by: Nithish Acharya	App'd:	
Code: TIA-222-H	Date: 05/25/22	Scale: NTS	
Path: C:\Users\IND306\Desktop\SAI\May 25\77921_876345_Sky Hill---Nithish----Akshaykumar\Tnx_017_01\77921_017_01_SKY HILL_CT.eri		Dwg No. E-4	

TIA-222-H - Service - 60 mph

Maximum Values



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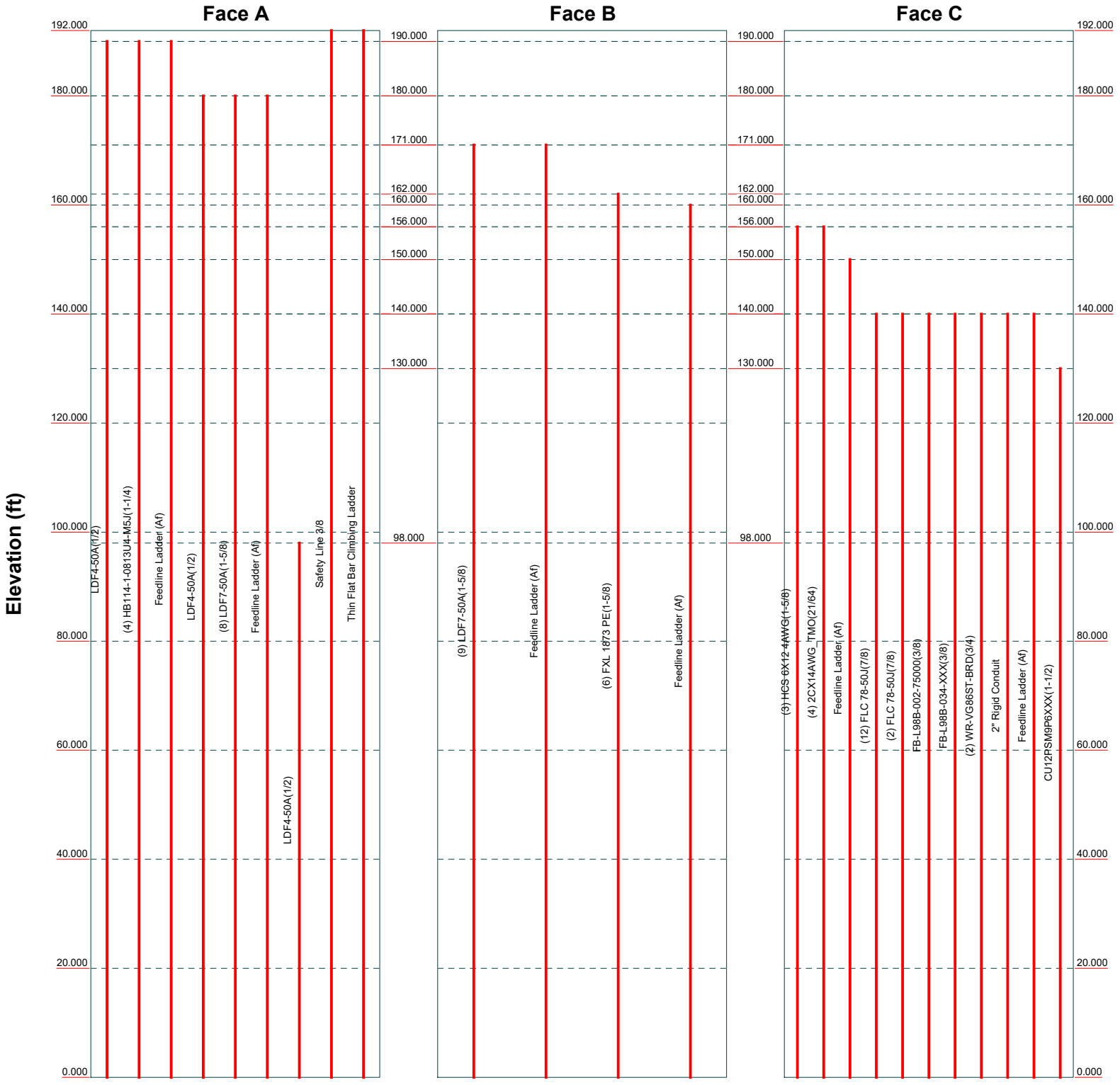
Job: *77921.017.01 - SKY HILL, CT (BU# 876345)*			
Project:			
Client: Crown Castle	Drawn by: Nithish Acharya	App'd:	
Code: TIA-222-H	Date: 05/25/22	Scale: NTS	
Path: C:\Users\IND306\Desktop\SAI\May 25\77921_876345_Sky Hill---Nithish----Akshaykumar\Tnx_017_01\77921_017_01_SKY HILL_CT.eri		Dwg No. E-5	

Feed Line Distribution Chart
0' - 192'

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



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Job: *77921.017.01 - SKY HILL, CT (BU# 876345)*		
Project:		
Client: Crown Castle	Drawn by: Nithish Acharya	App'd:
Code: TIA-222-H	Date: 05/25/22	Scale: NTS
Path: C:\Users\IND306\Desktop\SAI\May 25\77921_876345_Sky Hill---Nithish---Akshaykumar\Trix_017_01\77921_017_01_SKY HILL_CT.eri		Dwg No. E-7

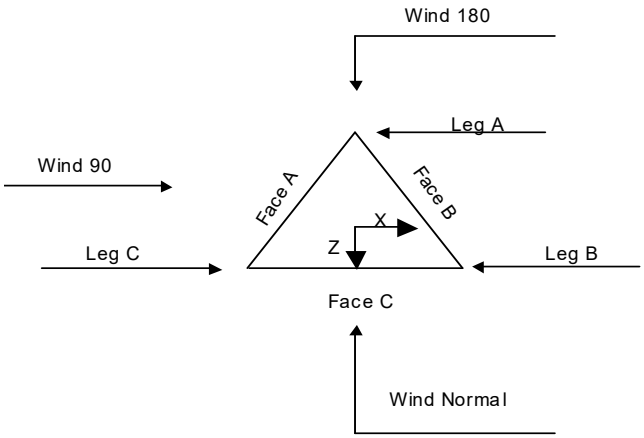
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 192.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 6.580 ft at the top and 25.050 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Windham County, Connecticut.
Tower base elevation above sea level: 1068.000 ft.
Basic wind speed of 118 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.500 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
TIA-222-H Annex S.
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: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
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	192.000-180.000			6.580	1	12.000
T2	180.000-160.000			6.580	1	20.000
T3	160.000-140.000			8.540	1	20.000
T4	140.000-120.000			10.610	1	20.000
T5	120.000-100.000			12.740	1	20.000
T6	100.000-80.000			14.830	1	20.000
T7	80.000-60.000			16.920	1	20.000
T8	60.000-40.000			18.880	1	20.000
T9	40.000-20.000			21.130	1	20.000
T10	20.000-0.000			23.050	1	20.000

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	192.000-180.000	4.000	X Brace	No	No	0.000	0.000
T2	180.000-160.000	5.000	X Brace	No	No	0.000	0.000
T3	160.000-140.000	6.667	X Brace	No	No	0.000	0.000

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
T4	140.000-120.000	6.667	X Brace	No	No	0.000	0.000
T5	120.000-100.000	6.667	X Brace	No	No	0.000	0.000
T6	100.000-80.000	10.000	X Brace	No	No	0.000	0.000
T7	80.000-60.000	10.000	X Brace	No	No	0.000	0.000
T8	60.000-40.000	10.000	X Brace	No	No	0.000	0.000
T9	40.000-20.000	10.000	X Brace	No	No	0.000	0.000
T10	20.000-0.000	10.000	X Brace	No	No	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 192.000-180.000	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 180.000-160.000	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T3 160.000-140.000	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T4 140.000-120.000	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T5 120.000-100.000	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T6 100.000-80.000	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T7 80.000-60.000	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A572-50 (50 ksi)
T8 60.000-40.000	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A572-50 (50 ksi)
T9 40.000-20.000	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A572-50 (50 ksi)
T10 20.000-0.000	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 192.000-180.000	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T2 180.000-160.000	Equal Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 192.000-180.000	0.000	0.250	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T2 180.000-160.000	0.000	0.250	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T3 160.000-140.000	0.000	0.250	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T4 140.000-120.000	0.000	0.250	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T5 120.000-100.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T6 100.000-80.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T7 80.000-60.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T8 60.000-40.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T9 40.000-20.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T10 20.000-0.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 192.000-180.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 180.000-160.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.000-140.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 140.000-120.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 120.000-100.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 100.000-80.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 80.000-60.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T8	Yes	No	1	1	1	1	1	1	1	1
60.000-40.000				1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1
40.000-20.000				1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1
20.000-0.000				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
192.000-180.000														
T2	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
180.000-160.000														
T3	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
160.000-140.000														
T4	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
140.000-120.000														
T5	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
120.000-100.000														
T6	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
100.000-80.000														
T7	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
80.000-60.000														
T8	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
60.000-40.000														
T9	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
40.000-20.000														
T10	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
20.000-0.000														

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 192.000-180.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 180.000-160.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 160.000-140.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 140.000-120.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 120.000-100.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 100.000-80.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 80.000-60.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 60.000-40.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 40.000-20.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 20.000-0.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	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 192.000-180.000	Flange	0.625 A325N	4	0.625 A325N	1	0.625 A325N	1	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0
T2 180.000-160.000	Flange	0.625 A325N	4	0.625 A325N	1	0.625 A325N	1	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0
T3 160.000-140.000	Flange	0.875 A325N	4	0.625 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0
T4 140.000-120.000	Flange	1.000 A325N	4	0.625 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0
T5 120.000-100.000	Flange	1.000 A325N	6	0.750 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0
T6 100.000-80.000	Flange	1.000 A325N	6	0.750 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T7 80.000-60.000	Flange	1.000 A325N	8	0.750 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0
T8 60.000-40.000	Flange	1.000 A325N	8	0.750 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0
T9 40.000-20.000	Flange	1.000 A325N	8	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0
T10 20.000-0.000	Flange	0.000 A354-BC	0	0.750 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325X	0	0.625 A325N	0	0.625 A325X	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF4-50A(1/2)	A	No	No	Ar (CaAa)	190.000 - 0.000	0.000	-0.385	1	1	0.500	0.630		0.000
HB114-1-0813U4-M5J(1-1/4)	A	No	No	Ar (CaAa)	190.000 - 0.000	0.000	-0.405	4	4	0.850 0.750	1.540		0.001
Feedline Ladder (Af) *	A	No	No	Af (CaAa)	190.000 - 0.000	0.000	-0.4	1	1	3.000	3.000		0.008
LDF4-50A(1/2)	A	No	No	Ar (CaAa)	180.000 - 0.000	0.000	0.445	1	1	0.500	0.630		0.000
LDF7-50A(1-5/8)	A	No	No	Ar (CaAa)	180.000 - 0.000	0.000	0.4	8	8	0.850 0.750	1.980		0.001
Feedline Ladder (Af) *	A	No	No	Af (CaAa)	180.000 - 0.000	0.000	0.4	1	1	3.000	3.000		0.008
LDF7-50A(1-5/8)	B	No	No	Ar (CaAa)	171.000 - 0.000	0.000	-0.4	9	9	0.850 0.750	1.980		0.001
Feedline Ladder (Af) *	B	No	No	Af (CaAa)	171.000 - 0.000	0.000	-0.4	1	1	3.000	3.000		0.008
FXL 1873 PE(1-5/8)	B	No	No	Ar (CaAa)	162.000 - 0.000	-3.500	0.4	6	3	0.850 0.750	1.980		0.001
Feedline Ladder (Af) *	B	No	No	Af (CaAa)	160.000 - 0.000	-0.500	0.4	1	1	3.000	3.000		0.008
HCS 6X12 4AWG(1-5/8)	C	No	No	Ar (CaAa)	156.000 - 0.000	0.000	0.4	3	3	0.850 0.750	1.660		0.002
2CX14AWG_TMO(21/64)	C	No	No	Ar (CaAa)	156.000 - 0.000	0.000	0.425	4	3	0.500	0.320		0.000
Feedline Ladder (Af) *	C	No	No	Af (CaAa)	150.000 - 0.000	0.000	0.4	1	1	3.000	3.000		0.008
FLC 78-50J(7/8)	C	No	No	Ar (CaAa)	140.000 - 0.000	0.000	-0.41	12	12	1.000 0.750	1.112		0.000
FLC 78-50J(7/8)	C	No	No	Ar (CaAa)	140.000 - 0.000	0.000	-0.355	2	2	0.750	1.112		0.000
FB-L98B-002-75000(3/8)	C	No	No	Ar (CaAa)	140.000 - 0.000	1.750	-0.355	1	1	0.400	0.394		0.000
FB-L98B-034-	C	No	No	Ar (CaAa)	140.000 -	0.000	-0.37	1	1	0.500	0.394		0.000

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 klf
XXX(3/8)					0.000								
WR-VG86ST-BRD(3/4)	C	No	No	Ar (CaAa)	140.000 - 0.000	0.000	-0.37	2	2	0.500	0.795		0.001
2" Rigid Conduit	C	No	No	Ar (CaAa)	140.000 - 0.000	0.000	-0.37	1	1	2.000	2.000		0.003
Feedline Ladder (Af) *	C	No	No	Af (CaAa)	140.000 - 0.000	0.000	-0.4	1	1	3.000	3.000		0.008
CU12PSM9P6 XXX(1-1/2) *	C	No	No	Ar (CaAa)	130.000 - 0.000	0.000	0.38	1	1	0.850 0.750	1.600		0.002
LDF4-50A(1/2) *	A	No	No	Ar (CaAa)	98.000 - 0.000	0.000	-0.375	1	1	0.500	0.630		0.000
Safety Line 3/8	A	No	No	Ar (CaAa)	192.000 - 0.000	-6.000	0.45	1	1	0.375	0.375		0.000
Thin Flat Bar Climbing Ladder *	A	No	No	Af (CaAa)	192.000 - 0.000	-6.000	0.45	1	1	2.000	2.000		0.004

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 klf
*								

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	192.000-180.000	A	0.000	0.000	16.240	0.000	0.184
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000
T2	180.000-160.000	A	0.000	0.000	73.937	0.000	0.654
		B	0.000	0.000	27.478	0.000	0.182
		C	0.000	0.000	0.000	0.000	0.000
T3	160.000-140.000	A	0.000	0.000	73.937	0.000	0.654
		B	0.000	0.000	79.400	0.000	0.564
		C	0.000	0.000	15.016	0.000	0.204
T4	140.000-120.000	A	0.000	0.000	73.937	0.000	0.654
		B	0.000	0.000	79.400	0.000	0.564
		C	0.000	0.000	74.011	0.000	0.703
T5	120.000-100.000	A	0.000	0.000	73.937	0.000	0.654
		B	0.000	0.000	79.400	0.000	0.564
		C	0.000	0.000	75.611	0.000	0.726
T6	100.000-80.000	A	0.000	0.000	75.071	0.000	0.656

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	79.400	0.000	0.564
		C	0.000	0.000	75.611	0.000	0.726
T7	80.000-60.000	A	0.000	0.000	75.197	0.000	0.657
		B	0.000	0.000	79.400	0.000	0.564
		C	0.000	0.000	75.611	0.000	0.726
T8	60.000-40.000	A	0.000	0.000	75.197	0.000	0.657
		B	0.000	0.000	79.400	0.000	0.564
		C	0.000	0.000	75.611	0.000	0.726
T9	40.000-20.000	A	0.000	0.000	75.197	0.000	0.657
		B	0.000	0.000	79.400	0.000	0.564
		C	0.000	0.000	75.611	0.000	0.726
T10	20.000-0.000	A	0.000	0.000	75.197	0.000	0.657
		B	0.000	0.000	79.400	0.000	0.564
		C	0.000	0.000	75.611	0.000	0.726

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	192.000-180.000	A	1.516	0.000	0.000	39.168	0.000	0.630
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000
T2	180.000-160.000	A	1.502	0.000	0.000	160.625	0.000	2.502
		B		0.000	0.000	50.688	0.000	0.788
		C		0.000	0.000	0.000	0.000	0.000
T3	160.000-140.000	A	1.483	0.000	0.000	159.946	0.000	2.475
		B		0.000	0.000	134.668	0.000	2.224
		C		0.000	0.000	42.193	0.000	0.612
T4	140.000-120.000	A	1.462	0.000	0.000	159.180	0.000	2.446
		B		0.000	0.000	134.230	0.000	2.201
		C		0.000	0.000	204.234	0.000	2.785
T5	120.000-100.000	A	1.438	0.000	0.000	158.300	0.000	2.411
		B		0.000	0.000	133.727	0.000	2.175
		C		0.000	0.000	207.370	0.000	2.821
T6	100.000-80.000	A	1.410	0.000	0.000	163.470	0.000	2.438
		B		0.000	0.000	133.134	0.000	2.145
		C		0.000	0.000	205.732	0.000	2.771
T7	80.000-60.000	A	1.375	0.000	0.000	162.750	0.000	2.394
		B		0.000	0.000	132.407	0.000	2.107
		C		0.000	0.000	203.728	0.000	2.711
T8	60.000-40.000	A	1.329	0.000	0.000	160.918	0.000	2.328
		B		0.000	0.000	131.464	0.000	2.059
		C		0.000	0.000	201.124	0.000	2.634
T9	40.000-20.000	A	1.263	0.000	0.000	158.254	0.000	2.234
		B		0.000	0.000	130.091	0.000	1.990
		C		0.000	0.000	197.337	0.000	2.524
T10	20.000-0.000	A	1.132	0.000	0.000	152.973	0.000	2.054
		B		0.000	0.000	127.371	0.000	1.856
		C		0.000	0.000	189.830	0.000	2.313

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	192.000-180.000	-4.804	0.523	-5.800	-0.754
T2	180.000-160.000	-4.537	-16.388	-5.753	-16.388
T3	160.000-140.000	-2.324	-15.661	-5.246	-15.198
T4	140.000-120.000	5.019	-12.610	5.663	-9.646
T5	120.000-100.000	4.994	-13.198	5.737	-10.272
T6	100.000-80.000	5.411	-14.918	5.639	-11.362
T7	80.000-60.000	5.595	-15.634	6.025	-12.331
T8	60.000-40.000	5.968	-16.704	6.530	-13.314
T9	40.000-20.000	6.307	-17.710	7.184	-14.583
T10	20.000-0.000	6.640	-18.705	8.012	-16.073

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	LDF4-50A(1/2)	180.00 - 190.00	0.6000	0.6000
T1	2	HB114-1-0813U4-M5J(1-1/4)	180.00 - 190.00	0.6000	0.6000
T1	4	Feedline Ladder (Af)	180.00 - 190.00	0.6000	0.6000
T1	35	Safety Line 3/8	180.00 - 192.00	0.6000	0.6000
T1	36	Thin Flat Bar Climbing Ladder	180.00 - 192.00	0.6000	0.6000
T2	1	LDF4-50A(1/2)	160.00 - 180.00	0.6000	0.6000
T2	2	HB114-1-0813U4-M5J(1-1/4)	160.00 - 180.00	0.6000	0.6000
T2	4	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T2	6	LDF4-50A(1/2)	160.00 - 180.00	0.6000	0.6000
T2	7	LDF7-50A(1-5/8)	160.00 - 180.00	0.6000	0.6000
T2	10	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T2	12	LDF7-50A(1-5/8)	160.00 - 171.00	0.6000	0.6000
T2	13	Feedline Ladder (Af)	160.00 - 171.00	0.6000	0.6000
T2	15	FXL 1873 PE(1-5/8)	160.00 - 162.00	0.6000	0.6000
T2	35	Safety Line 3/8	160.00 - 180.00	0.6000	0.6000
T2	36	Thin Flat Bar Climbing Ladder	160.00 - 180.00	0.6000	0.6000
T3	1	LDF4-50A(1/2)	140.00 - 160.00	0.6000	0.6000
T3	2	HB114-1-0813U4-M5J(1-1/4)	140.00 - 160.00	0.6000	0.6000
T3	4	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	6	LDF4-50A(1/2)	140.00 - 160.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	7	LDF7-50A(1-5/8)	140.00 - 160.00	0.6000	0.6000
T3	10	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	12	LDF7-50A(1-5/8)	140.00 - 160.00	0.6000	0.6000
T3	13	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	15	FXL 1873 PE(1-5/8)	140.00 - 160.00	0.6000	0.6000
T3	16	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	18	HCS 6X12 4AWG(1-5/8)	140.00 - 156.00	0.6000	0.6000
T3	19	2CX14AWG_TMO(21/64)	140.00 - 156.00	0.6000	0.6000
T3	21	Feedline Ladder (Af)	140.00 - 150.00	0.6000	0.6000
T3	35	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T3	36	Thin Flat Bar Climbing Ladder	140.00 - 160.00	0.6000	0.6000
T4	1	LDF4-50A(1/2)	120.00 - 140.00	0.6000	0.6000
T4	2	HB114-1-0813U4-M5J(1-1/4)	120.00 - 140.00	0.6000	0.6000
T4	4	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	6	LDF4-50A(1/2)	120.00 - 140.00	0.6000	0.6000
T4	7	LDF7-50A(1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	10	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	12	LDF7-50A(1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	13	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	15	FXL 1873 PE(1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	16	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	18	HCS 6X12 4AWG(1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	19	2CX14AWG_TMO(21/64)	120.00 - 140.00	0.6000	0.6000
T4	21	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	23	FLC 78-50J(7/8)	120.00 - 140.00	0.6000	0.6000
T4	24	FLC 78-50J(7/8)	120.00 - 140.00	0.6000	0.6000
T4	25	FB-L98B-002-75000(3/8)	120.00 - 140.00	0.6000	0.6000
T4	26	FB-L98B-034-XXX(3/8)	120.00 - 140.00	0.0000	0.0000
T4	27	WR-VG86ST-BRD(3/4)	120.00 - 140.00	0.0000	0.0000
T4	28	2" Rigid Conduit	120.00 - 140.00	0.6000	0.6000
T4	29	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	31	CU12PSM9P6XXX(1-1/2)	120.00 - 130.00	0.6000	0.6000
T4	35	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T4	36	Thin Flat Bar Climbing Ladder	120.00 - 140.00	0.6000	0.6000
T5	1	LDF4-50A(1/2)	100.00 - 120.00	0.6000	0.6000
T5	2	HB114-1-0813U4-M5J(1-1/4)	100.00 - 120.00	0.6000	0.6000
T5	4	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	6	LDF4-50A(1/2)	100.00 - 120.00	0.6000	0.6000
T5	7	LDF7-50A(1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	10	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	12	LDF7-50A(1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	13	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	15	FXL 1873 PE(1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	16	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	18	HCS 6X12 4AWG(1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	19	2CX14AWG_TMO(21/64)	100.00 - 120.00	0.6000	0.6000
T5	21	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	23	FLC 78-50J(7/8)	100.00 - 120.00	0.6000	0.6000
T5	24	FLC 78-50J(7/8)	100.00 - 120.00	0.6000	0.6000
T5	25	FB-L98B-002-75000(3/8)	100.00 - 120.00	0.6000	0.6000
T5	26	FB-L98B-034-XXX(3/8)	100.00 - 120.00	0.0000	0.0000
T5	27	WR-VG86ST-BRD(3/4)	100.00 - 120.00	0.0000	0.0000
T5	28	2" Rigid Conduit	100.00 - 120.00	0.6000	0.6000
T5	29	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	31	CU12PSM9P6XXX(1-1/2)	100.00 - 120.00	0.6000	0.6000
T5	35	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T5	36	Thin Flat Bar Climbing Ladder	100.00 - 120.00	0.6000	0.6000
T6	1	LDF4-50A(1/2)	80.00 - 100.00	0.6000	0.6000
T6	2	HB114-1-0813U4-M5J(1-1/4)	80.00 - 100.00	0.6000	0.6000
T6	4	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	6	LDF4-50A(1/2)	80.00 - 100.00	0.6000	0.6000
T6	7	LDF7-50A(1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	10	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	12	LDF7-50A(1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	13	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	15	FXL 1873 PE(1-5/8)	80.00 - 100.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	16	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	18	HCS 6X12 4AWG(1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	19	2CX14AWG_TMO(21/64)	80.00 - 100.00	0.6000	0.6000
T6	21	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	23	FLC 78-50J(7/8)	80.00 - 100.00	0.6000	0.6000
T6	24	FLC 78-50J(7/8)	80.00 - 100.00	0.6000	0.6000
T6	25	FB-L98B-002-75000(3/8)	80.00 - 100.00	0.6000	0.6000
T6	26	FB-L98B-034-XXX(3/8)	80.00 - 100.00	0.0000	0.0000
T6	27	WR-VG86ST-BRD(3/4)	80.00 - 100.00	0.0000	0.0000
T6	28	2" Rigid Conduit	80.00 - 100.00	0.6000	0.6000
T6	29	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	31	CU12PSM9P6XXX(1-1/2)	80.00 - 100.00	0.6000	0.6000
T6	33	LDF4-50A(1/2)	80.00 - 98.00	0.6000	0.6000
T6	35	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T6	36	Thin Flat Bar Climbing Ladder	80.00 - 100.00	0.6000	0.6000
T7	1	LDF4-50A(1/2)	60.00 - 80.00	0.6000	0.6000
T7	2	HB114-1-0813U4-M5J(1-1/4)	60.00 - 80.00	0.6000	0.6000
T7	4	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	6	LDF4-50A(1/2)	60.00 - 80.00	0.6000	0.6000
T7	7	LDF7-50A(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	10	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	12	LDF7-50A(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	13	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	15	FXL 1873 PE(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	16	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	18	HCS 6X12 4AWG(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	19	2CX14AWG_TMO(21/64)	60.00 - 80.00	0.6000	0.6000
T7	21	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	23	FLC 78-50J(7/8)	60.00 - 80.00	0.6000	0.6000
T7	24	FLC 78-50J(7/8)	60.00 - 80.00	0.6000	0.6000
T7	25	FB-L98B-002-75000(3/8)	60.00 - 80.00	0.6000	0.6000
T7	26	FB-L98B-034-XXX(3/8)	60.00 - 80.00	0.0000	0.0000
T7	27	WR-VG86ST-BRD(3/4)	60.00 - 80.00	0.0000	0.0000
T7	28	2" Rigid Conduit	60.00 - 80.00	0.6000	0.6000
T7	29	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	31	CU12PSM9P6XXX(1-1/2)	60.00 - 80.00	0.6000	0.6000
T7	33	LDF4-50A(1/2)	60.00 - 80.00	0.6000	0.6000
T7	35	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T7	36	Thin Flat Bar Climbing Ladder	60.00 - 80.00	0.6000	0.6000
T8	1	LDF4-50A(1/2)	40.00 - 60.00	0.6000	0.6000
T8	2	HB114-1-0813U4-M5J(1-1/4)	40.00 - 60.00	0.6000	0.6000
T8	4	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	6	LDF4-50A(1/2)	40.00 - 60.00	0.6000	0.6000
T8	7	LDF7-50A(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	10	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	12	LDF7-50A(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	13	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	15	FXL 1873 PE(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	16	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	18	HCS 6X12 4AWG(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	19	2CX14AWG_TMO(21/64)	40.00 - 60.00	0.6000	0.6000
T8	21	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	23	FLC 78-50J(7/8)	40.00 - 60.00	0.6000	0.6000
T8	24	FLC 78-50J(7/8)	40.00 - 60.00	0.6000	0.6000
T8	25	FB-L98B-002-75000(3/8)	40.00 - 60.00	0.6000	0.6000
T8	26	FB-L98B-034-XXX(3/8)	40.00 - 60.00	0.0000	0.0000
T8	27	WR-VG86ST-BRD(3/4)	40.00 - 60.00	0.0000	0.0000
T8	28	2" Rigid Conduit	40.00 - 60.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	29	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	31	CU12PSM9P6XXX(1-1/2)	40.00 - 60.00	0.6000	0.6000
T8	33	LDF4-50A(1/2)	40.00 - 60.00	0.6000	0.6000
T8	35	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T8	36	Thin Flat Bar Climbing Ladder	40.00 - 60.00	0.6000	0.6000
T9	1	LDF4-50A(1/2)	20.00 - 40.00	0.6000	0.6000
T9	2	HB114-1-0813U4-M5J(1-1/4)	20.00 - 40.00	0.6000	0.6000
T9	4	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	6	LDF4-50A(1/2)	20.00 - 40.00	0.6000	0.6000
T9	7	LDF7-50A(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	10	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	12	LDF7-50A(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	13	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	15	FXL 1873 PE(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	16	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	18	HCS 6X12 4AWG(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	19	2CX14AWG_TMO(21/64)	20.00 - 40.00	0.6000	0.6000
T9	21	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	23	FLC 78-50J(7/8)	20.00 - 40.00	0.6000	0.6000
T9	24	FLC 78-50J(7/8)	20.00 - 40.00	0.6000	0.6000
T9	25	FB-L98B-002-75000(3/8)	20.00 - 40.00	0.6000	0.6000
T9	26	FB-L98B-034-XXX(3/8)	20.00 - 40.00	0.0000	0.0000
T9	27	WR-VG86ST-BRD(3/4)	20.00 - 40.00	0.0000	0.0000
T9	28	2" Rigid Conduit	20.00 - 40.00	0.6000	0.6000
T9	29	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	31	CU12PSM9P6XXX(1-1/2)	20.00 - 40.00	0.6000	0.6000
T9	33	LDF4-50A(1/2)	20.00 - 40.00	0.6000	0.6000
T9	35	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T9	36	Thin Flat Bar Climbing Ladder	20.00 - 40.00	0.6000	0.6000
T10	1	LDF4-50A(1/2)	0.00 - 20.00	0.6000	0.6000
T10	2	HB114-1-0813U4-M5J(1-1/4)	0.00 - 20.00	0.6000	0.6000
T10	4	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	6	LDF4-50A(1/2)	0.00 - 20.00	0.6000	0.6000
T10	7	LDF7-50A(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	10	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	12	LDF7-50A(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	13	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	15	FXL 1873 PE(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	16	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	18	HCS 6X12 4AWG(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	19	2CX14AWG_TMO(21/64)	0.00 - 20.00	0.6000	0.6000
T10	21	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	23	FLC 78-50J(7/8)	0.00 - 20.00	0.6000	0.6000
T10	24	FLC 78-50J(7/8)	0.00 - 20.00	0.6000	0.6000
T10	25	FB-L98B-002-75000(3/8)	0.00 - 20.00	0.6000	0.6000
T10	26	FB-L98B-034-XXX(3/8)	0.00 - 20.00	0.0000	0.0000
T10	27	WR-VG86ST-BRD(3/4)	0.00 - 20.00	0.0000	0.0000
T10	28	2" Rigid Conduit	0.00 - 20.00	0.6000	0.6000
T10	29	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	31	CU12PSM9P6XXX(1-1/2)	0.00 - 20.00	0.6000	0.6000
T10	33	LDF4-50A(1/2)	0.00 - 20.00	0.6000	0.6000
T10	35	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T10	36	Thin Flat Bar Climbing Ladder	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert (ft / ft / ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft^2)	C_AA_A Side (ft^2)	Weight (K)
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.480 4.880 5.710	2.860 3.230 3.610 4.400	0.077 0.127 0.185 0.331
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.480 4.880 5.710	2.860 3.230 3.610 4.400	0.077 0.127 0.185 0.331
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.480 4.880 5.710	2.860 3.230 3.610 4.400	0.077 0.127 0.185 0.331
NNVV-65B-R4 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.550 8.040 8.530 9.560	4.230 4.670 5.120 6.050	0.110 0.197 0.296 0.529
NNVV-65B-R4 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.550 8.040 8.530 9.560	4.230 4.670 5.120 6.050	0.110 0.197 0.296 0.529
NNVV-65B-R4 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.550 8.040 8.530 9.560	4.230 4.670 5.120 6.050	0.110 0.197 0.296 0.529
FZHN	A	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.020 2.197 2.381 2.772	0.607 0.715 0.829 1.089	0.044 0.058 0.075 0.116
FZHN	B	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.020 2.197 2.381 2.772	0.607 0.715 0.829 1.089	0.044 0.058 0.075 0.116
FZHN	C	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.020 2.197 2.381 2.772	0.607 0.715 0.829 1.089	0.044 0.058 0.075 0.116
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.322 2.527 2.739 3.185	2.238 2.441 2.651 3.093	0.060 0.083 0.110 0.173
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.322 2.527 2.739 3.185	2.238 2.441 2.651 3.093	0.060 0.083 0.110 0.173
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.322 2.527 2.739 3.185	2.238 2.441 2.651 3.093	0.060 0.083 0.110 0.173
(2) RRH2X50-800	A	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice	1.701 1.864 2.035	1.282 1.428 1.580	0.053 0.070 0.090

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.398	1.908	0.138
(2) RRH2X50-800	B	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.701 1.864 2.035 2.398	1.282 1.428 1.580 1.908	0.053 0.070 0.090 0.138
(2) RRH2X50-800	C	From Leg	4.000 0.000 2.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.701 1.864 2.035 2.398	1.282 1.428 1.580 1.908	0.053 0.070 0.090 0.138
5' x 2" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.188 1.496 1.807 2.458	1.188 1.496 1.807 2.458	0.018 0.027 0.040 0.076
5' x 2" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.188 1.496 1.807 2.458	1.188 1.496 1.807 2.458	0.018 0.027 0.040 0.076
5' x 2" Pipe Mount	C	From Leg	4.000 0.000 0.000	0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.188 1.496 1.807 2.458	1.188 1.496 1.807 2.458	0.018 0.027 0.040 0.076
Sector Mount [SM 504-3]	C	None		0.000	190.000	No Ice 1/2" Ice 1" Ice 2" Ice	31.050 43.830 56.440 81.280	31.050 43.830 56.440 81.280	1.708 2.326 3.143 5.358
*									
(2) LPA-80080/4CF	A	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.140 2.580 3.030 3.980	4.920 5.410 5.920 7.000	0.024 0.057 0.095 0.184
(2) LPA-80080/4CF	B	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.140 2.580 3.030 3.980	4.920 5.410 5.920 7.000	0.024 0.057 0.095 0.184
(2) LPA-80080/4CF	C	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.140 2.580 3.030 3.980	4.920 5.410 5.920 7.000	0.024 0.057 0.095 0.184
CBRS w/ Mount Pipe	A	From Leg	4.000 0.000 -1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.450 1.670 1.900 2.420	0.990 1.180 1.390 1.850	0.032 0.048 0.068 0.123
CBRS w/ Mount Pipe	B	From Leg	4.000 0.000 -1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.450 1.670 1.900 2.420	0.990 1.180 1.390 1.850	0.032 0.048 0.068 0.123
CBRS w/ Mount Pipe	C	From Leg	4.000 0.000 -1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.450 1.670 1.900 2.420	0.990 1.180 1.390 1.850	0.032 0.048 0.068 0.123
(2) JAHH-65B-R3B	A	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.290 5.750 6.220 7.200	3.050 3.480 3.930 4.840	0.063 0.121 0.186 0.334
(2) JAHH-65B-R3B	B	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice	5.290 5.750 6.220	3.050 3.480 3.930	0.063 0.121 0.186

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
						2" Ice	7.200	4.840	0.334
(2) JAHH-65B-R3B	C	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.290 5.750 6.220 7.200	3.050 3.480 3.930 4.840	0.063 0.121 0.186 0.334
58532A	C	From Leg	4.000 0.000 4.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.189 0.248 0.315 0.470	0.189 0.248 0.315 0.470	0.000 0.003 0.006 0.017
RFV01U-D1A	A	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D1A	B	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D1A	C	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D2A	A	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
RFV01U-D2A	B	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
RFV01U-D2A	C	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
(2) RC3DC-3315-PF-48	C	From Leg	4.000 0.000 1.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.792 4.044 4.303 4.844	2.512 2.725 2.945 3.414	0.032 0.063 0.099 0.181
MT6407-77A w/ Mount Pipe	A	From Leg	4.000 0.000 3.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.907 5.256 5.615 6.362	2.682 3.145 3.624 4.631	0.096 0.136 0.180 0.288
MT6407-77A w/ Mount Pipe	B	From Leg	4.000 0.000 3.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.907 5.256 5.615 6.362	2.682 3.145 3.624 4.631	0.096 0.136 0.180 0.288
MT6407-77A w/ Mount Pipe	C	From Leg	4.000 0.000 3.000	0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.907 5.256 5.615 6.362	2.682 3.145 3.624 4.631	0.096 0.136 0.180 0.288
Side Arm Mount [SO 102-3]	C	None		0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.600 4.180 4.750 5.900	3.600 4.180 4.750 5.900	0.075 0.105 0.135 0.195
Sector Mount [SM 304-3]	C	None		0.000	180.000	No Ice 1/2" Ice 1" Ice 2" Ice	41.090 57.710 74.010 105.840	41.090 57.710 74.010 105.840	1.920 2.713 3.755 6.565

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
*									
(3) 7130.16.33.00 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	171.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.555 5.968 6.382 7.235	6.584 7.295 7.978 9.391	0.037 0.096 0.162 0.316
(3) 7130.16.33.00 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	171.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.555 5.968 6.382 7.235	6.584 7.295 7.978 9.391	0.037 0.096 0.162 0.316
(3) 7130.16.33.00 w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	171.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.555 5.968 6.382 7.235	6.584 7.295 7.978 9.391	0.037 0.096 0.162 0.316
Sector Mount [SM 504-3]	C	None		0.000	171.000	No Ice 1/2" Ice 1" Ice 2" Ice	31.050 43.830 56.440 81.280	31.050 43.830 56.440 81.280	1.708 2.326 3.143 5.358
*									
HBX-6516DS-VTM w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	162.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.220 2.580 2.960 3.740	1.940 2.290 2.660 3.430	0.029 0.058 0.094 0.191
HBX-6516DS-VTM w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	162.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.220 2.580 2.960 3.740	1.940 2.290 2.660 3.430	0.029 0.058 0.094 0.191
HBX-6516DS-VTM w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	162.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.220 2.580 2.960 3.740	1.940 2.290 2.660 3.430	0.029 0.058 0.094 0.191
6' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	162.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
6' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	162.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
6' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	162.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
Sector Mount [SM 104-3]	C	None		0.000	162.000	No Ice 1/2" Ice 1" Ice 2" Ice	30.210 38.120 46.010 62.030	30.210 38.120 46.010 62.030	0.953 1.432 2.031 3.577
*									
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	156.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.290 6.860 7.450 8.680	2.760 3.270 3.790 4.900	0.061 0.105 0.157 0.290
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	156.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.290 6.860 7.450 8.680	2.760 3.270 3.790 4.900	0.061 0.105 0.157 0.290
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	156.000	No Ice 1/2" Ice	6.290 6.860	2.760 3.270	0.061 0.105

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.000				1" Ice	7.450	3.790	0.157
							2" Ice	8.680	4.900	0.290
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	156.000	No Ice	14.690	6.870	0.186
			0.000				1/2" Ice	15.460	7.550	0.315
			2.000				1" Ice	16.230	8.250	0.458
							2" Ice	17.820	9.670	0.788
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	156.000	No Ice	14.690	6.870	0.186
			0.000				1/2" Ice	15.460	7.550	0.315
			2.000				1" Ice	16.230	8.250	0.458
							2" Ice	17.820	9.670	0.788
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	156.000	No Ice	14.690	6.870	0.186
			0.000				1/2" Ice	15.460	7.550	0.315
			2.000				1" Ice	16.230	8.250	0.458
							2" Ice	17.820	9.670	0.788
RADIO 4415 B66A	A	From Leg	4.000	0.000	0.000	156.000	No Ice	1.856	0.870	0.050
			0.000				1/2" Ice	2.027	0.997	0.064
			0.000				1" Ice	2.204	1.134	0.081
							2" Ice	2.582	1.432	0.124
RADIO 4415 B66A	B	From Leg	4.000	0.000	0.000	156.000	No Ice	1.856	0.870	0.050
			0.000				1/2" Ice	2.027	0.997	0.064
			0.000				1" Ice	2.204	1.134	0.081
							2" Ice	2.582	1.432	0.124
RADIO 4415 B66A	C	From Leg	4.000	0.000	0.000	156.000	No Ice	1.856	0.870	0.050
			0.000				1/2" Ice	2.027	0.997	0.064
			0.000				1" Ice	2.204	1.134	0.081
							2" Ice	2.582	1.432	0.124
RRUS 4415 B25	A	From Leg	4.000	0.000	0.000	156.000	No Ice	1.644	0.679	0.044
			0.000				1/2" Ice	1.804	0.791	0.056
			3.000				1" Ice	1.972	0.913	0.071
							2" Ice	2.329	1.183	0.109
RRUS 4415 B25	B	From Leg	4.000	0.000	0.000	156.000	No Ice	1.644	0.679	0.044
			0.000				1/2" Ice	1.804	0.791	0.056
			3.000				1" Ice	1.972	0.913	0.071
							2" Ice	2.329	1.183	0.109
RRUS 4415 B25	C	From Leg	4.000	0.000	0.000	156.000	No Ice	1.644	0.679	0.044
			0.000				1/2" Ice	1.804	0.791	0.056
			3.000				1" Ice	1.972	0.913	0.071
							2" Ice	2.329	1.183	0.109
RADIO 4449 B12/B71	A	From Leg	4.000	0.000	0.000	156.000	No Ice	1.650	1.163	0.074
			0.000				1/2" Ice	1.810	1.301	0.090
			3.000				1" Ice	1.978	1.447	0.109
							2" Ice	2.336	1.762	0.155
RADIO 4449 B12/B71	B	From Leg	4.000	0.000	0.000	156.000	No Ice	1.650	1.163	0.074
			0.000				1/2" Ice	1.810	1.301	0.090
			3.000				1" Ice	1.978	1.447	0.109
							2" Ice	2.336	1.762	0.155
RADIO 4449 B12/B71	C	From Leg	4.000	0.000	0.000	156.000	No Ice	1.650	1.163	0.074
			0.000				1/2" Ice	1.810	1.301	0.090
			3.000				1" Ice	1.978	1.447	0.109
							2" Ice	2.336	1.762	0.155
FIBEAIR IP-20A_RFU-D	A	From Leg	4.000	0.000	0.000	156.000	No Ice	0.692	0.290	0.014
			0.000				1/2" Ice	0.796	0.366	0.020
			2.000				1" Ice	0.909	0.449	0.027
							2" Ice	1.156	0.636	0.048
8' x 2" Mount Pipe	A	From Leg	4.000	0.000	0.000	156.000	No Ice	1.900	1.900	0.029
			0.000				1/2" Ice	2.728	2.728	0.044
			0.000				1" Ice	3.401	3.401	0.063

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
						2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	156.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.900 2.728 3.401 4.396	1.900 2.728 3.401 4.396	0.029 0.044 0.063 0.119
8' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	156.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.900 2.728 3.401 4.396	1.900 2.728 3.401 4.396	0.029 0.044 0.063 0.119
8' x 2.375" Horizontal Mount Pipe	A	From Leg	2.000 0.000 0.000	0.000	156.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.380 3.410 4.450 5.910	0.010 0.050 0.100 0.240	0.037 0.054 0.079 0.147
8' x 2.375" Horizontal Mount Pipe	B	From Leg	2.000 0.000 0.000	0.000	156.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.380 3.410 4.450 5.910	0.010 0.050 0.100 0.240	0.037 0.054 0.079 0.147
8' x 2.375" Horizontal Mount Pipe	C	From Leg	2.000 0.000 0.000	0.000	156.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.380 3.410 4.450 5.910	0.010 0.050 0.100 0.240	0.037 0.054 0.079 0.147
Sector Mount [SM 503-3]	C	None		0.000	156.000	No Ice 1/2" Ice 1" Ice 2" Ice	30.430 43.020 55.430 79.890	30.430 43.020 55.430 79.890	1.690 2.296 3.097 5.269
*									
7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.390 3.750 4.120 4.890	2.320 2.660 3.020 3.750	0.055 0.098 0.149 0.279
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.390 3.750 4.120 4.890	2.320 2.660 3.020 3.750	0.055 0.098 0.149 0.279
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.390 3.750 4.120 4.890	2.320 2.660 3.020 3.750	0.055 0.098 0.149 0.279
(2) NNHH-65B-R4 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.550 8.040 8.530 9.560	4.230 4.670 5.120 6.050	0.110 0.197 0.296 0.529
(2) TPA65R-BU4D w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.100 8.650 9.210 10.390	4.030 4.500 4.980 5.980	0.080 0.141 0.212 0.379
(2) TPA65R-BU4D w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.100 8.650 9.210 10.390	4.030 4.500 4.980 5.980	0.080 0.141 0.212 0.379
TT19-08BP111-001	A	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.545 0.641 0.743 0.971	0.442 0.530 0.626 0.840	0.016 0.022 0.029 0.049
TT19-08BP111-001	B	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	0.545 0.641 0.743	0.442 0.530 0.626	0.016 0.022 0.029

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
						2" Ice	0.971	0.840	0.049
TT19-08BP111-001	C	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.545 0.641 0.743 0.971	0.442 0.530 0.626 0.840	0.016 0.022 0.029 0.049
RRUS 4478 B14	A	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.843 2.012 2.190 2.566	1.059 1.197 1.342 1.656	0.060 0.076 0.094 0.140
RRUS 4478 B14	B	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.843 2.012 2.190 2.566	1.059 1.197 1.342 1.656	0.060 0.076 0.094 0.140
RRUS 4478 B14	C	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.843 2.012 2.190 2.566	1.059 1.197 1.342 1.656	0.060 0.076 0.094 0.140
RRUS 4449 B5/B12	A	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.968 2.144 2.328 2.718	1.408 1.564 1.727 2.075	0.071 0.090 0.111 0.163
RRUS 4449 B5/B12	B	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.968 2.144 2.328 2.718	1.408 1.564 1.727 2.075	0.071 0.090 0.111 0.163
RRUS 4449 B5/B12	C	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.968 2.144 2.328 2.718	1.408 1.564 1.727 2.075	0.071 0.090 0.111 0.163
RRUS 8843 B2/B66A	A	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	1.353 1.500 1.655 1.986	0.072 0.090 0.110 0.159
RRUS 8843 B2/B66A	C	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	1.353 1.500 1.655 1.986	0.072 0.090 0.110 0.159
RRUS 8843 B2/B66A	B	From Leg	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	1.353 1.500 1.655 1.986	0.072 0.090 0.110 0.159
DC6-48-60-18-8F	A	From Leg	1.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.917 1.458 1.643 2.042	0.917 1.458 1.643 2.042	0.019 0.037 0.057 0.105
DC6-48-60-0-8C-EV	B	From Leg	1.000 0.000 2.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.736 2.962 3.195 3.683	4.783 5.063 5.350 5.947	0.026 0.063 0.104 0.200
Sector Mount [SM 502-3]	C	None		0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice	29.820 42.210 54.430 78.490	29.820 42.210 54.430 78.490	1.673 2.266 3.052 5.180
* MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice	8.010 8.520 9.040	4.230 4.690 5.160	0.108 0.194 0.292

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
						2" Ice	10.110	6.120	0.522
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.010 8.520 9.040 10.110	4.230 4.690 5.160 6.120	0.108 0.194 0.292 0.522
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.010 8.520 9.040 10.110	4.230 4.690 5.160 6.120	0.108 0.194 0.292 0.522
TA08025-B605	A	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.964 2.138 2.320 2.705	1.129 1.267 1.411 1.723	0.075 0.093 0.114 0.164
TA08025-B605	B	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.964 2.138 2.320 2.705	1.129 1.267 1.411 1.723	0.075 0.093 0.114 0.164
TA08025-B605	C	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.964 2.138 2.320 2.705	1.129 1.267 1.411 1.723	0.075 0.093 0.114 0.164
TA08025-B604	A	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.964 2.138 2.320 2.705	0.981 1.112 1.250 1.548	0.064 0.081 0.100 0.148
TA08025-B604	B	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.964 2.138 2.320 2.705	0.981 1.112 1.250 1.548	0.064 0.081 0.100 0.148
TA08025-B604	C	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.964 2.138 2.320 2.705	0.981 1.112 1.250 1.548	0.064 0.081 0.100 0.148
RDIDC-9181-PF-48	B	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.012 2.189 2.373 2.763	1.168 1.311 1.461 1.784	0.022 0.040 0.060 0.110
(2) 8' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.900 2.728 3.401 4.396	1.900 2.728 3.401 4.396	0.029 0.044 0.063 0.119
(2) 8' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.900 2.728 3.401 4.396	1.900 2.728 3.401 4.396	0.029 0.044 0.063 0.119
(2) 8' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.900 2.728 3.401 4.396	1.900 2.728 3.401 4.396	0.029 0.044 0.063 0.119
Commscope MTC3975083 (3)	C	None		0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice	23.850 34.120 44.390 64.930	23.850 34.120 44.390 64.930	1.260 1.803 2.345 3.431
*									
58532A	C	From Leg	3.000 0.000 4.000	0.000	98.000	No Ice 1/2" Ice 1" Ice	0.189 0.248 0.315	0.189 0.248 0.315	0.000 0.003 0.006

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Side Arm Mount [SO 305-1]	C	From Leg	1.500 0.000 0.000	0.000	98.000	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	0.470 0.530 0.780 1.060 1.730	0.470 1.520 2.070 2.660 3.910	0.017 0.030 0.044 0.064 0.125
*									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
*											
VHLP2-11W/A	B	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 2.000	-65.000		156.000	2.167	No Ice 1/2" Ice 1" Ice 2" Ice	3.688 3.977 4.266 4.845	0.018 0.038 0.058 0.099
*											

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

Comb. No.	Description
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	192 - 180	Leg	Max Tension	23	3.178	-0.050	-0.037
			Max. Compression	18	-5.741	0.023	-0.033
			Max. Mx	20	-1.240	-0.612	0.002
			Max. My	2	-0.955	-0.019	-0.611
			Max. Vy	20	-0.452	0.295	-0.026
			Max. Vx	2	-0.458	-0.005	0.311
		Diagonal	Max Tension	16	1.164	0.000	0.000
			Max. Compression	20	-1.215	0.000	0.000
			Max. Mx	36	0.136	0.019	0.000
			Max. My	16	1.159	0.005	-0.001
			Max. Vy	36	-0.021	0.019	0.000
			Max. Vx	16	0.000	0.000	0.000
		Top Girt	Max Tension	22	0.079	0.000	0.000
			Max. Compression	19	-0.069	0.000	0.000
			Max. Mx	26	0.003	-0.054	0.000
			Max. Vy	26	-0.033	0.000	0.000
T2	180 - 160	Leg	Max Tension	23	21.454	-0.009	-0.025
			Max. Compression	18	-29.819	0.511	0.004
			Max. Mx	14	19.017	-0.565	0.031
			Max. My	17	-3.308	-0.028	0.540
			Max. Vy	6	-1.039	-0.004	0.017
			Max. Vx	12	-1.013	0.015	0.053
		Diagonal	Max Tension	16	3.355	0.000	0.000
			Max. Compression	4	-3.391	0.000	0.000
			Max. Mx	27	1.062	0.037	-0.004
			Max. My	34	-1.161	0.024	-0.004

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	27	-0.030	0.037	-0.004
			Max. Vx	34	0.002	0.000	0.000
		Top Girt	Max Tension	19	0.604	0.000	0.000
			Max. Compression	6	-0.635	0.000	0.000
			Max. Mx	26	-0.045	-0.060	0.000
			Max. My	26	-0.046	0.000	0.002
			Max. Vy	26	0.036	0.000	0.000
			Max. Vx	26	-0.001	0.000	0.000
T3	160 - 140	Leg	Max Tension	23	45.804	0.018	-0.034
			Max. Compression	18	-58.941	0.150	-0.026
			Max. Mx	14	25.595	0.819	0.031
			Max. My	16	-4.504	-0.036	-0.814
			Max. Vy	14	0.525	-0.542	0.002
			Max. Vx	9	-0.522	-0.033	0.503
		Diagonal	Max Tension	16	4.967	0.000	0.000
			Max. Compression	16	-4.924	0.000	0.000
			Max. Mx	27	1.205	0.073	-0.008
			Max. My	36	1.355	0.070	-0.009
			Max. Vy	27	-0.048	0.073	-0.008
			Max. Vx	36	0.003	0.000	0.000
T4	140 - 120	Leg	Max Tension	23	73.362	-0.470	-0.018
			Max. Compression	18	-93.750	0.212	-0.013
			Max. Mx	22	60.907	0.492	-0.018
			Max. My	20	-9.465	-0.023	-0.512
			Max. Vy	14	-0.775	-0.144	-0.002
			Max. Vx	16	0.721	-0.001	0.032
		Diagonal	Max Tension	12	6.398	0.000	0.000
			Max. Compression	12	-6.487	0.000	0.000
			Max. Mx	27	1.623	0.087	-0.011
			Max. My	30	-1.362	0.081	0.011
			Max. Vy	37	0.056	0.082	0.010
			Max. Vx	30	-0.003	0.000	0.000
T5	120 - 100	Leg	Max Tension	23	102.401	-0.274	-0.012
			Max. Compression	18	-127.325	0.652	-0.020
			Max. Mx	10	-127.070	0.657	0.028
			Max. My	20	-12.712	0.008	-0.564
			Max. Vy	11	-0.104	0.656	0.028
			Max. Vx	8	-0.127	0.006	0.563
		Diagonal	Max Tension	12	6.871	0.000	0.000
			Max. Compression	12	-6.831	0.000	0.000
			Max. Mx	27	2.040	0.123	-0.015
			Max. My	30	-1.298	0.111	0.017
			Max. Vy	37	0.074	0.119	-0.015
			Max. Vx	30	-0.004	0.000	0.000
T6	100 - 80	Leg	Max Tension	23	127.255	-0.542	-0.028
			Max. Compression	18	-156.487	0.798	-0.021
			Max. Mx	18	-156.487	0.798	-0.021
			Max. My	20	-13.457	-0.066	-0.938
			Max. Vy	10	-0.112	0.796	0.039
			Max. Vx	20	-0.166	-0.066	-0.938
		Diagonal	Max Tension	12	7.937	0.000	0.000
			Max. Compression	12	-7.978	0.000	0.000
			Max. Mx	27	2.241	0.203	-0.026
			Max. My	30	2.155	0.193	0.027
			Max. Vy	29	0.096	0.194	-0.025
			Max. Vx	30	-0.005	0.000	0.000
T7	80 - 60	Leg	Max Tension	23	153.835	-0.513	-0.025
			Max. Compression	18	-188.207	1.068	-0.025
			Max. Mx	18	-188.207	1.068	-0.025
			Max. My	20	-16.470	0.037	-0.931
			Max. Vy	10	-0.139	1.066	0.044

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	20	0.141	-0.070	-0.749
		Diagonal	Max Tension	12	8.628	0.000	0.000
			Max. Compression	12	-8.773	0.000	0.000
			Max. Mx	27	2.411	0.263	-0.032
			Max. My	30	2.684	0.258	0.033
			Max. Vy	29	0.119	0.254	-0.030
			Max. Vx	30	-0.006	0.000	0.000
T8	60 - 40	Leg	Max Tension	23	177.793	-1.152	-0.020
			Max. Compression	18	-218.191	0.994	-0.009
			Max. Mx	37	12.762	-1.985	-0.015
			Max. My	20	-17.647	-0.076	-1.120
			Max. Vy	33	0.301	-1.973	0.010
			Max. Vx	20	0.141	-0.076	-1.120
		Diagonal	Max Tension	12	8.431	0.000	0.000
			Max. Compression	12	-8.422	0.000	0.000
			Max. Mx	29	1.260	0.320	0.042
			Max. My	30	-1.149	0.297	0.048
			Max. Vy	29	0.141	0.318	0.046
			Max. Vx	30	-0.008	0.000	0.000
T9	40 - 20	Leg	Max Tension	7	201.958	-1.043	0.010
			Max. Compression	18	-248.178	1.701	-0.021
			Max. Mx	37	14.751	-4.034	-0.011
			Max. My	20	-21.004	-0.128	-1.381
			Max. Vy	33	0.661	-4.018	0.009
			Max. Vx	20	-0.195	-0.128	-1.381
		Diagonal	Max Tension	12	9.714	0.000	0.000
			Max. Compression	12	-10.012	0.000	0.000
			Max. Mx	27	1.951	0.388	-0.041
			Max. My	30	3.717	0.333	0.046
			Max. Vy	29	0.148	0.387	-0.040
			Max. Vx	30	-0.007	0.000	0.000
T10	20 - 0	Leg	Max Tension	7	225.436	-1.105	0.015
			Max. Compression	18	-278.185	0.000	0.000
			Max. Mx	35	-126.641	4.116	0.006
			Max. My	20	-23.821	-0.216	-2.504
			Max. Vy	33	-0.790	-4.018	0.009
			Max. Vx	20	-0.360	-0.216	-2.504
		Diagonal	Max Tension	12	10.080	0.000	0.000
			Max. Compression	10	-10.558	0.000	0.000
			Max. Mx	29	-0.504	0.517	0.050
			Max. My	30	5.194	0.336	0.059
			Max. Vy	29	0.170	0.517	0.050
			Max. Vx	30	-0.009	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	285.646	28.014	-16.536
	Max. H_x	18	285.646	28.014	-16.536
	Max. H_z	7	-231.136	-23.510	13.924
	Min. Vert	7	-231.136	-23.510	13.924
	Min. H_x	7	-231.136	-23.510	13.924
	Min. H_z	18	285.646	28.014	-16.536
Leg B	Max. Vert	10	284.414	-27.777	-16.608
	Max. H_x	23	-230.731	23.300	14.008

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg A	Max. H_z	23	-230.731	23.300	14.008
	Min. Vert	23	-230.731	23.300	14.008
	Min. H_x	10	284.414	-27.777	-16.608
	Min. H_z	10	284.414	-27.777	-16.608
	Max. Vert	2	279.116	0.293	31.722
	Max. H_x	21	18.500	4.620	1.533
	Max. H_z	2	279.116	0.293	31.722
	Min. Vert	15	-224.091	-0.303	-26.523
	Min. H_x	8	25.836	-4.631	2.138
	Min. H_z	15	-224.091	-0.303	-26.523

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	62.399	0.000	0.000	-7.465	3.767	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	74.878	0.062	-50.002	-5513.664	-6.345	12.940
0.9 Dead+1.0 Wind 0 deg - No Ice	56.159	0.062	-50.002	-5511.424	-7.475	12.940
1.2 Dead+1.0 Wind 30 deg - No Ice	74.878	24.155	-41.744	-4630.251	-2673.220	14.254
0.9 Dead+1.0 Wind 30 deg - No Ice	56.159	24.155	-41.744	-4628.011	-2674.350	14.254
1.2 Dead+1.0 Wind 60 deg - No Ice	74.878	42.163	-24.346	-2719.385	-4688.998	-13.463
0.9 Dead+1.0 Wind 60 deg - No Ice	56.159	42.163	-24.346	-2717.146	-4690.128	-13.463
1.2 Dead+1.0 Wind 90 deg - No Ice	74.878	49.678	-0.057	-19.016	-5543.126	-43.555
0.9 Dead+1.0 Wind 90 deg - No Ice	56.159	49.678	-0.057	-16.776	-5544.256	-43.555
1.2 Dead+1.0 Wind 120 deg - No Ice	74.878	44.269	25.493	2800.956	-4882.201	-21.286
0.9 Dead+1.0 Wind 120 deg - No Ice	56.159	44.269	25.493	2803.196	-4883.331	-21.286
1.2 Dead+1.0 Wind 150 deg - No Ice	74.878	24.208	41.933	4652.079	-2686.084	-7.519
0.9 Dead+1.0 Wind 150 deg - No Ice	56.159	24.208	41.933	4654.319	-2687.215	-7.519
1.2 Dead+1.0 Wind 180 deg - No Ice	74.878	-0.083	47.345	5265.270	18.647	-13.085
0.9 Dead+1.0 Wind 180 deg - No Ice	56.159	-0.083	47.345	5267.509	17.517	-13.085
1.2 Dead+1.0 Wind 210 deg - No Ice	74.878	-24.174	41.762	4615.231	2685.240	-14.462
0.9 Dead+1.0 Wind 210 deg - No Ice	56.159	-24.174	41.762	4617.471	2684.110	-14.462
1.2 Dead+1.0 Wind 240 deg - No Ice	74.878	-44.492	25.693	2819.748	4902.215	13.253
0.9 Dead+1.0 Wind 240 deg - No Ice	56.159	-44.492	25.693	2821.988	4901.085	13.253
1.2 Dead+1.0 Wind 270 deg - No Ice	74.878	-49.700	0.066	2.518	5555.666	43.359
0.9 Dead+1.0 Wind 270 deg - No Ice	56.159	-49.700	0.066	4.758	5554.536	43.359

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
1.2 Dead+1.0 Wind 300 deg - No Ice	74.878	-41.971	-24.144	-2700.443	4692.071	21.094
0.9 Dead+1.0 Wind 300 deg - No Ice	56.159	-41.971	-24.144	-2698.203	4690.941	21.094
1.2 Dead+1.0 Wind 330 deg - No Ice	74.878	-24.197	-41.942	-4671.400	2693.382	7.643
0.9 Dead+1.0 Wind 330 deg - No Ice	56.159	-24.197	-41.942	-4669.160	2692.252	7.643
1.2 Dead+1.0 Ice+1.0 Temp	180.572	0.000	0.000	-46.613	-26.062	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	180.572	0.012	-15.481	-1763.738	-28.213	4.017
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	180.572	7.572	-13.098	-1509.445	-872.483	3.090
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	180.572	13.068	-7.545	-896.594	-1498.061	-6.548
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	180.572	15.298	-0.011	-48.585	-1753.675	-11.220
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	180.572	13.559	7.816	829.032	-1546.627	-4.995
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	180.572	7.632	13.219	1433.417	-880.474	-0.643
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	180.572	-0.016	15.059	1634.961	-23.188	-4.049
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	180.572	-7.576	13.102	1416.861	821.019	-3.136
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	180.572	-13.441	7.761	821.819	1477.740	6.501
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	180.572	-15.303	0.013	-44.326	1702.326	11.177
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	180.572	-13.194	-7.600	-903.775	1463.809	4.952
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	180.572	-7.629	-13.221	-1526.953	827.964	0.670
Dead+Wind 0 deg - Service	62.399	0.017	-13.850	-1518.818	0.810	3.522
Dead+Wind 30 deg - Service	62.399	6.695	-11.570	-1276.622	-731.603	3.876
Dead+Wind 60 deg - Service	62.399	11.684	-6.747	-751.731	-1285.046	-3.670
Dead+Wind 90 deg - Service	62.399	13.762	-0.016	-10.202	-1519.272	-11.860
Dead+Wind 120 deg - Service	62.399	12.257	7.059	763.877	-1337.627	-5.799
Dead+Wind 150 deg - Service	62.399	6.709	11.622	1272.508	-735.105	-2.050
Dead+Wind 180 deg - Service	62.399	-0.023	13.127	1441.162	7.612	-3.561
Dead+Wind 210 deg - Service	62.399	-6.700	11.575	1262.480	739.948	-3.933
Dead+Wind 240 deg - Service	62.399	-12.318	7.113	768.991	1348.147	3.612
Dead+Wind 270 deg - Service	62.399	-13.768	0.018	-4.342	1527.758	11.807
Dead+Wind 300 deg - Service	62.399	-11.632	-6.692	-746.576	1290.955	5.746
Dead+Wind 330 deg - Service	62.399	-6.706	-11.624	-1287.820	742.164	2.083

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-62.399	0.000	0.000	62.399	0.000	0.000%
2	0.062	-74.878	-50.002	-0.062	74.878	50.002	0.000%
3	0.062	-56.159	-50.002	-0.062	56.159	50.002	0.000%
4	24.155	-74.878	-41.744	-24.155	74.878	41.744	0.000%
5	24.155	-56.159	-41.744	-24.155	56.159	41.744	0.000%
6	42.163	-74.878	-24.346	-42.163	74.878	24.346	0.000%
7	42.163	-56.159	-24.346	-42.163	56.159	24.346	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
8	49.678	-74.878	-0.057	-49.678	74.878	0.057	0.000%
9	49.678	-56.159	-0.057	-49.678	56.159	0.057	0.000%
10	44.269	-74.878	25.493	-44.269	74.878	-25.493	0.000%
11	44.269	-56.159	25.493	-44.269	56.159	-25.493	0.000%
12	24.208	-74.878	41.933	-24.208	74.878	-41.933	0.000%
13	24.208	-56.159	41.933	-24.208	56.159	-41.933	0.000%
14	-0.083	-74.878	47.345	0.083	74.878	-47.345	0.000%
15	-0.083	-56.159	47.345	0.083	56.159	-47.345	0.000%
16	-24.174	-74.878	41.762	24.174	74.878	-41.762	0.000%
17	-24.174	-56.159	41.762	24.174	56.159	-41.762	0.000%
18	-44.492	-74.878	25.693	44.492	74.878	-25.693	0.000%
19	-44.492	-56.159	25.693	44.492	56.159	-25.693	0.000%
20	-49.700	-74.878	0.066	49.700	74.878	-0.066	0.000%
21	-49.700	-56.159	0.066	49.700	56.159	-0.066	0.000%
22	-41.971	-74.878	-24.144	41.971	74.878	24.144	0.000%
23	-41.971	-56.159	-24.144	41.971	56.159	24.144	0.000%
24	-24.197	-74.878	-41.942	24.197	74.878	41.942	0.000%
25	-24.197	-56.159	-41.942	24.197	56.159	41.942	0.000%
26	0.000	-180.572	0.000	-0.000	180.572	-0.000	0.000%
27	0.012	-180.572	-15.481	-0.012	180.572	15.481	0.000%
28	7.572	-180.572	-13.098	-7.572	180.572	13.098	0.000%
29	13.068	-180.572	-7.545	-13.068	180.572	7.545	0.000%
30	15.298	-180.572	-0.011	-15.298	180.572	0.011	0.000%
31	13.559	-180.572	7.816	-13.559	180.572	-7.816	0.000%
32	7.632	-180.572	13.219	-7.632	180.572	-13.219	0.000%
33	-0.016	-180.572	15.059	0.016	180.572	-15.059	0.000%
34	-7.576	-180.572	13.102	7.576	180.572	-13.102	0.000%
35	-13.441	-180.572	7.761	13.441	180.572	-7.761	0.000%
36	-15.303	-180.572	0.013	15.303	180.572	-0.013	0.000%
37	-13.194	-180.572	-7.600	13.194	180.572	7.600	0.000%
38	-7.629	-180.572	-13.221	7.629	180.572	13.221	0.000%
39	0.017	-62.399	-13.850	-0.017	62.399	13.850	0.000%
40	6.695	-62.399	-11.570	-6.695	62.399	11.570	0.000%
41	11.684	-62.399	-6.747	-11.684	62.399	6.747	0.000%
42	13.762	-62.399	-0.016	-13.762	62.399	0.016	0.000%
43	12.257	-62.399	7.059	-12.257	62.399	-7.059	0.000%
44	6.709	-62.399	11.622	-6.709	62.399	-11.622	0.000%
45	-0.023	-62.399	13.127	0.023	62.399	-13.127	0.000%
46	-6.700	-62.399	11.575	6.700	62.399	-11.575	0.000%
47	-12.318	-62.399	7.113	12.318	62.399	-7.113	0.000%
48	-13.768	-62.399	0.018	13.768	62.399	-0.018	0.000%
49	-11.632	-62.399	-6.692	11.632	62.399	6.692	0.000%
50	-6.706	-62.399	-11.624	6.706	62.399	11.624	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	192 - 180	4.179	47	0.198	0.021
T2	180 - 160	3.682	47	0.195	0.021
T3	160 - 140	2.885	47	0.173	0.019
T4	140 - 120	2.196	47	0.146	0.017
T5	120 - 100	1.607	47	0.121	0.013
T6	100 - 80	1.118	47	0.099	0.010
T7	80 - 60	0.727	47	0.076	0.008

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T8	60 - 40	0.426	47	0.056	0.005
T9	40 - 20	0.208	47	0.038	0.004
T10	20 - 0	0.062	47	0.019	0.002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.000	APXVTM14-ALU-I20 w/ Mount Pipe	47	4.096	0.197	0.021	609496
180.000	(2) LPA-80080/4CF	47	3.682	0.195	0.021	214941
171.000	(3) 7130.16.33.00 w/ Mount Pipe	47	3.314	0.187	0.020	67872
162.000	HBX-6516DS-VTM w/ Mount Pipe	47	2.961	0.175	0.019	39544
158.000	VHLP2-11W/A	47	2.811	0.170	0.019	37202
156.000	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	47	2.738	0.167	0.019	37962
140.000	7770.00 w/ Mount Pipe	47	2.196	0.146	0.017	49481
130.000	MX08FRO665-21 w/ Mount Pipe	47	1.889	0.133	0.015	48654
98.000	58532A	47	1.074	0.097	0.010	48114

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	192 - 180	15.295	18	0.720	0.076
T2	180 - 160	13.476	19	0.712	0.076
T3	160 - 140	10.558	19	0.631	0.070
T4	140 - 120	8.030	19	0.535	0.061
T5	120 - 100	5.872	19	0.443	0.048
T6	100 - 80	4.081	19	0.362	0.037
T7	80 - 60	2.651	19	0.278	0.028
T8	60 - 40	1.551	19	0.205	0.020
T9	40 - 20	0.755	19	0.139	0.013
T10	20 - 0	0.226	19	0.071	0.006

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.000	APXVTM14-ALU-I20 w/ Mount Pipe	18	14.992	0.720	0.076	188316
180.000	(2) LPA-80080/4CF	19	13.476	0.712	0.076	64373
171.000	(3) 7130.16.33.00 w/ Mount Pipe	19	12.131	0.683	0.074	19071
162.000	HBX-6516DS-VTM w/ Mount Pipe	19	10.835	0.641	0.071	10970
158.000	VHLP2-11W/A	19	10.286	0.621	0.069	10295
156.000	APX16DWV-16DWV-S-E-A20 w/	19	10.019	0.612	0.068	10498

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
	Mount Pipe					
140.000	7770.00 w/ Mount Pipe	19	8.030	0.535	0.061	13600
130.000	MX08FRO665-21 w/ Mount Pipe	19	6.907	0.488	0.055	13331
98.000	58532A	19	3.922	0.354	0.036	13138

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	192	Leg	A325N	0.625	4	0.795	20.340	0.039 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	1.164	7.116	0.164 ✔	1.05	Member Block Shear
		Top Girt	A325N	0.625	1	0.079	7.116	0.011 ✔	1.05	Member Block Shear
T2	180	Leg	A325N	0.625	4	5.363	20.340	0.264 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	3.355	8.135	0.412 ✔	1.05	Member Block Shear
		Top Girt	A325N	0.625	1	0.604	8.135	0.074 ✔	1.05	Member Block Shear
T3	160	Leg	A325N	0.875	4	11.451	41.556	0.276 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	4.967	10.440	0.476 ✔	1.05	Gusset Bearing
T4	140	Leg	A325N	1.000	4	18.340	54.517	0.336 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	6.398	10.440	0.613 ✔	1.05	Gusset Bearing
T5	120	Leg	A325N	1.000	6	17.067	54.517	0.313 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.750	1	6.871	14.137	0.486 ✔	1.05	Member Bearing
T6	100	Leg	A325N	1.000	6	21.209	54.517	0.389 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.750	1	7.937	14.137	0.561 ✔	1.05	Member Bearing
T7	80	Leg	A325N	1.000	8	19.229	54.517	0.353 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.750	1	8.628	14.137	0.610 ✔	1.05	Member Bearing
T8	60	Leg	A325N	1.000	8	22.224	54.517	0.408 ✔	1.05	Bolt Tension
		Diagonal	A325X	0.750	1	8.431	17.672	0.477 ✔	1.05	Member Bearing
T9	40	Leg	A325N	1.000	8	25.245	54.517	0.463 ✔	1.05	Bolt Tension
		Diagonal	A325X	0.750	1	9.714	17.672	0.550 ✔	1.05	Member Bearing
T10	20	Diagonal	A325X	0.750	1	10.080	18.922	0.533 ✔	1.05	Gusset Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	192 - 180	ROHN 2.5 STD	12.000	4.000	50.7 K=1.00	1.704	-5.741	63.560	0.090 [1] ✔
T2	180 - 160	ROHN 2.5 STD	20.032	5.008	63.4 K=1.00	1.704	-29.819	57.139	0.522 [1] ✔
T3	160 - 140	ROHN 3 EH	20.036	6.679	70.5 K=1.00	3.016	-58.941	94.337	0.625 [1] ✔
T4	140 - 120	ROHN 4 EH	20.038	6.679	54.3 K=1.00	4.407	-93.750	159.899	0.586 [1] ✔
T5	120 - 100	ROHN 5 EH	20.036	6.679	43.6 K=1.00	6.112	-127.325	239.378	0.532 [1] ✔
T6	100 - 80	ROHN 6 EHS	20.036	10.018	54.0 K=1.00	6.713	-156.487	244.047	0.641 [1] ✔
T7	80 - 60	ROHN 6 EH	20.032	10.016	54.8 K=1.00	8.405	-188.207	303.757	0.620 [1] ✔
T8	60 - 40	ROHN 8 EHS	20.042	10.021	41.2 K=1.00	9.719	-218.191	386.354	0.565 [1] ✔
T9	40 - 20	ROHN 8 EHS	20.031	10.015	41.2 K=1.00	9.719	-248.178	386.409	0.642 [1] ✔
T10	20 - 0	ROHN 8 EHS	20.033	10.017	41.2 K=1.00	9.719	-278.185	386.397	0.720 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	192 - 180	L1 3/4x1 3/4x3/16	7.700	3.585	125.3 K=1.00	0.621	-1.215	11.328	0.107 [1] ✔
T2	180 - 160	L2x2x3/16	9.686	4.721	143.8 K=1.00	0.715	-3.288	9.897	0.332 [1] ✔
T3	160 - 140	L2 1/2x2 1/2x1/4	12.241	6.028	147.3 K=1.00	1.190	-4.924	15.695	0.314 [1] ✔
T4	140 - 120	L2 1/2x2 1/2x1/4	14.067	6.897	168.6 K=1.00	1.190	-6.487	11.987	0.541 [1] ✔
T5	120 - 100	L3x3x1/4	15.944	7.773	157.6 K=1.00	1.440	-6.831	16.602	0.411 [1] ✔
T6	100 - 80	L3 1/2x3 1/2x1/4	19.209	9.452	163.4 K=1.00	1.690	-7.978	18.110	0.441 [1] ✔
T7	80 - 60	L4x4x1/4	20.935	10.297	155.4 K=1.00	1.940	-8.773	22.986	0.382 [1] ✔
T8	60 - 40	L4x4x5/16	22.872	11.214	170.1 K=1.00	2.400	-8.422	23.735	0.355 [1] ✔
T9	40 - 20	L4x4x5/16	24.688	12.078	183.2 K=1.00	2.400	-10.012	20.461	0.489 [1] ✔
T10	20 - 0	L4x4x3/8	26.510	13.002	198.0 K=1.00	2.860	-10.558	20.882	0.506 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	192 - 180	L1 3/4x1 3/4x3/16	6.580	6.090	212.8 K=1.00	0.621	-0.069	3.926	0.017 [1] ✔
T2	180 - 160	KL/R > 200 (C) - 5 L2x2x3/16	6.580	6.090	185.5 K=1.00	0.715	-0.635	5.948	0.107 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	192 - 180	ROHN 2.5 STD	12.000	4.000	50.7	1.704	3.178	76.682	0.041 [1] ✔
T2	180 - 160	ROHN 2.5 STD	20.032	5.008	63.4	1.704	21.453	76.682	0.280 [1] ✔
T3	160 - 140	ROHN 3 EH	20.036	6.679	70.5	3.016	45.804	135.717	0.338 [1] ✔
T4	140 - 120	ROHN 4 EH	20.038	6.679	54.3	4.407	73.362	198.335	0.370 [1] ✔
T5	120 - 100	ROHN 5 EH	20.036	6.679	43.6	6.112	102.401	275.039	0.372 [1] ✔
T6	100 - 80	ROHN 6 EHS	20.036	10.018	54.0	6.713	127.255	302.097	0.421 [1] ✔
T7	80 - 60	ROHN 6 EH	20.032	10.016	54.8	8.405	153.835	378.222	0.407 [1] ✔
T8	60 - 40	ROHN 8 EHS	20.042	10.021	41.2	9.719	177.793	437.369	0.407 [1] ✔
T9	40 - 20	ROHN 8 EHS	20.031	10.015	41.2	9.719	201.958	437.369	0.462 [1] ✔
T10	20 - 0	ROHN 8 EHS	20.033	10.017	41.2	9.719	225.436	437.369	0.515 [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	192 - 180	L1 3/4x1 3/4x3/16	7.700	3.585	82.9	0.360	1.164	15.675	0.074 [1] ✔
T2	180 - 160	L2x2x3/16	9.686	4.721	94.3	0.431	3.355	18.739	0.179 [1] ✔
T3	160 - 140	L2 1/2x2 1/2x1/4	11.669	5.746	91.6	0.752	4.967	32.707	0.152 [1] ✔
T4	140 - 120	L2 1/2x2 1/2x1/4	14.067	6.897	109.6	0.752	6.398	32.707	0.196 [1] ✔
T5	120 - 100	L3x3x1/4	15.944	7.773	102.0	0.916	6.871	44.652	0.154 [1] ✔
T6	100 - 80	L3 1/2x3 1/2x1/4	19.209	9.452	105.5	1.103	7.937	53.793	0.148 [1] ✔
T7	80 - 60	L4x4x1/4	20.935	10.297	100.1	1.291	8.628	62.933	0.137 [1] ✔
T8	60 - 40	L4x4x5/16	22.872	11.214	109.8	1.595	8.431	77.752	0.108 [1] ✔
T9	40 - 20	L4x4x5/16	24.688	12.078	118.2	1.595	9.714	77.752	0.125 [1] ✔
T10	20 - 0	L4x4x3/8	26.510	13.002	128.2	1.899	10.080	92.572	0.109 [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	192 - 180	L1 3/4x1 3/4x3/16	6.580	6.090	141.7	0.360	0.079	15.675	0.005 [1] ✔
T2	180 - 160	L2x2x3/16	6.580	6.090	123.3	0.431	0.604	18.739	0.032 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

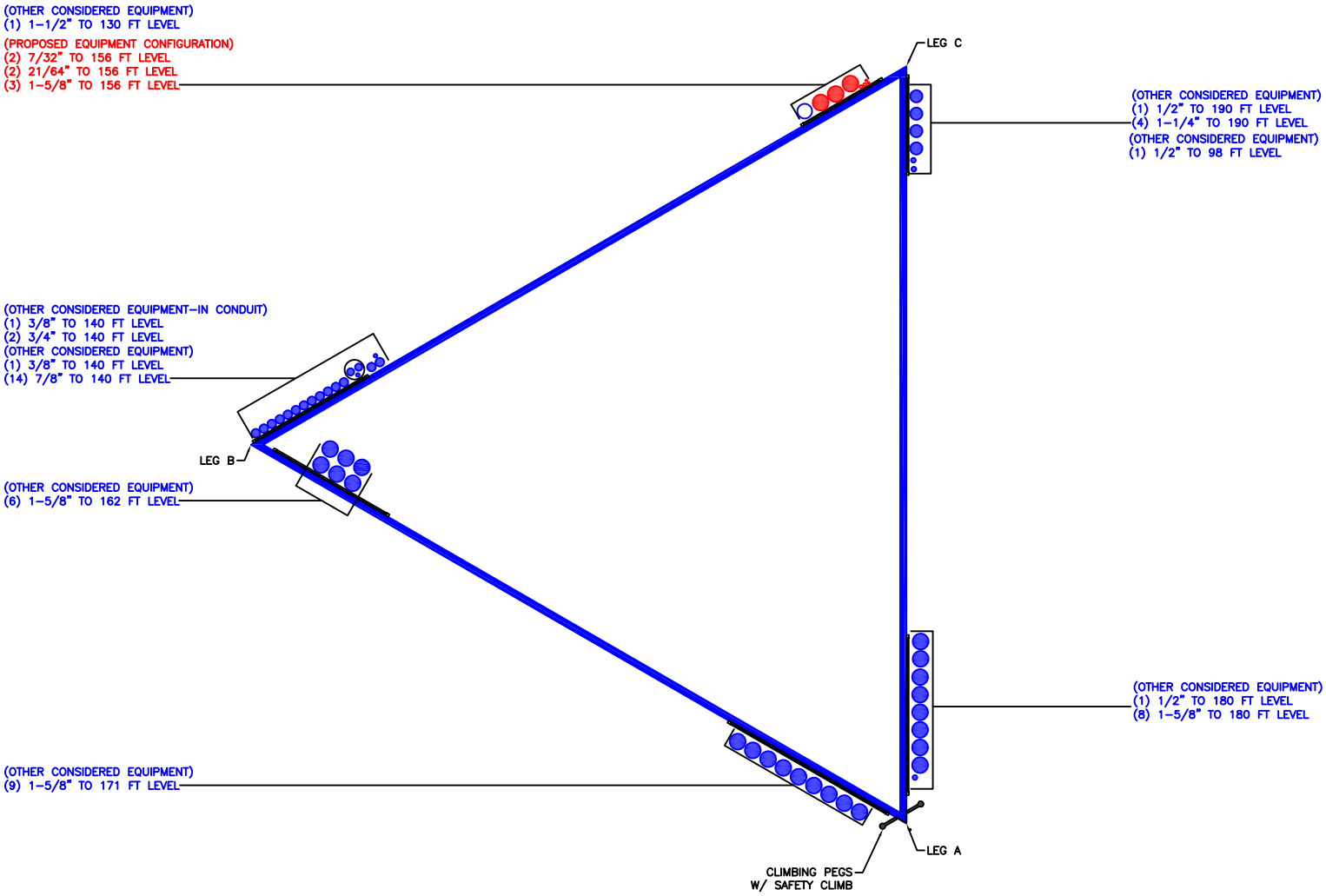
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	192 - 180	Leg	ROHN 2.5 STD	1	-5.741	66.738	8.6	Pass
T2	180 - 160	Leg	ROHN 2.5 STD	25	-29.819	59.996	49.7	Pass
T3	160 - 140	Leg	ROHN 3 EH	55	-58.941	99.054	59.5	Pass
T4	140 - 120	Leg	ROHN 4 EH	76	-93.750	167.894	55.8	Pass
T5	120 - 100	Leg	ROHN 5 EH	97	-127.325	251.347	50.7	Pass
T6	100 - 80	Leg	ROHN 6 EHS	118	-156.487	256.249	61.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T7	80 - 60	Leg	ROHN 6 EH	133	-188.207	318.945	59.0	Pass
T8	60 - 40	Leg	ROHN 8 EHS	148	-218.191	405.672	53.8	Pass
T9	40 - 20	Leg	ROHN 8 EHS	163	-248.178	405.729	61.2	Pass
T10	20 - 0	Leg	ROHN 8 EHS	178	-278.185	405.717	68.6	Pass
T1	192 - 180	Diagonal	L1 3/4x1 3/4x3/16	7	-1.215	11.895	10.2	Pass
T2	180 - 160	Diagonal	L2x2x3/16	36	-3.288	10.392	31.6	Pass
T3	160 - 140	Diagonal	L2 1/2x2 1/2x1/4	63	-4.924	16.480	29.9	Pass
T4	140 - 120	Diagonal	L2 1/2x2 1/2x1/4	81	-6.487	12.587	51.5	Pass
T5	120 - 100	Diagonal	L3x3x1/4	102	-6.831	17.432	39.2	Pass
T6	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	123	-7.978	19.016	42.0	Pass
T7	80 - 60	Diagonal	L4x4x1/4	138	-8.773	24.136	36.4	Pass
T8	60 - 40	Diagonal	L4x4x5/16	153	-8.422	24.922	33.8	Pass
T9	40 - 20	Diagonal	L4x4x5/16	168	-10.012	21.484	46.6	Pass
T10	20 - 0	Diagonal	L4x4x3/8	183	-10.558	21.926	48.2	Pass
T1	192 - 180	Top Girt	L1 3/4x1 3/4x3/16	5	-0.069	4.122	1.7	Pass
T2	180 - 160	Top Girt	L2x2x3/16	29	-0.635	6.245	10.2	Pass
							Summary	
						Leg (T10)	68.6	Pass
						Diagonal (T4)	51.5	Pass
						Top Girt (T2)	10.2	Pass
						Bolt Checks	58.4	Pass
						RATING =	**68.6**	**Pass**

Program Version 8.1.1.0

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876345

APPENDIX C

ADDITIONAL CALCULATIONS

Self Support Anchor Rod Capacity

Site Info	
BU #	876345
Site Name	SKY HILL, CT
Order #	617438, Rev. 0

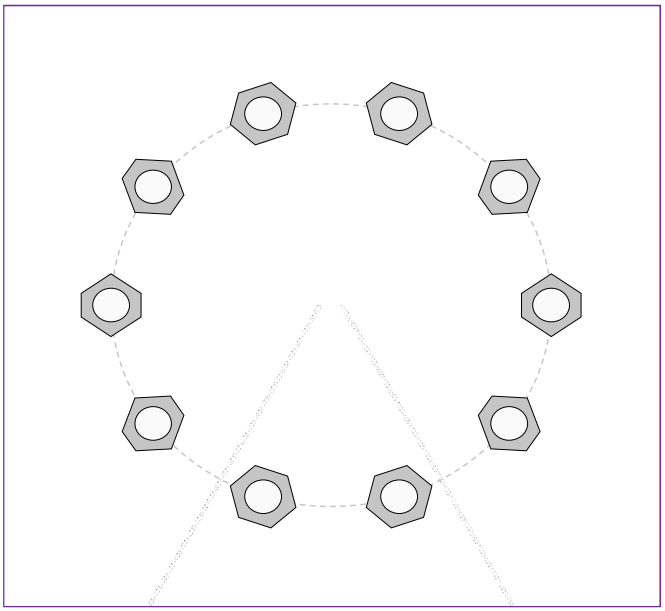
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	0

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	285.65	231.14
Shear Force (kips)	32.53	27.32

**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

(10) 1" ø bolts (A354-BC N; Fy=109 ksi, Fu=125 ksi)

l_{ar} (in): 0

Analysis Results

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

Pu_t = 23.11	ϕPn_t = 56.81	**Stress Rating**
Vu = 2.73	ϕVn = 36.82	**38.7%**
Mu = n/a	ϕMn = n/a	**Pass**

Drilled Pier Foundation

BU # :	876345
Site Name:	SKY HILL, CT
Order Number:	617438, Rev. 0
TIA-222 Revison:	H
Tower Type:	Self Support

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Applied Loads	Comp.	Uplift
Moment (kip-ft)	0	0
Axial Force (kips)	285.65	231.14
Shear Force (kips)	32.53	27.32

Material Properties			Rebar 2, Fy Override (ksi)
Concrete Strength, f'c:	3	ksi	
Rebar Strength, Fy:	60	ksi	
Tie Yield Strength, Fyt:	60	ksi	

Pier Design Data		
Depth	26	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 26' below grade		
Pier Diameter	5	ft
Rebar Quantity	18	
Rebar Size	9	
Rebar Cage Diameter	51	in
Tie Size	5	
Tie Spacing	12	in

Rebar & Pier Options
Embedded Pole Inputs
Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	11.53	11.53
Soil Safety Factor	43.22	51.47
Max Moment (kip-ft)	259.32	217.78
Rating*	*2.9%*	*2.5%*
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	520.43	520.43
End Bearing (kips)	375.00	-
Weight of Concrete (kips)	93.66	70.24
Total Capacity (kips)	895.43	590.68
Axial (kips)	379.31	231.14
Rating*	*40.3%*	*37.3%*
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	11.81	10.89
Critical Moment (kip-ft)	259.14	217.00
Critical Moment Capacity	2311.68	1702.28
Rating*	*10.7%*	*12.1%*
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	19.01	0.00
Critical Shear (kip)	34.64	27.32
Critical Shear Capacity	483.43	278.25
Rating*	*6.8%*	*9.4%*

Structural Foundation Rating*	**12.1%**
Soil Interaction Rating*	**40.3%**

*Rating per TIA-222-H Section 15.5

Soil Profile

Groundwater Depth	N/A	# of Layers	4

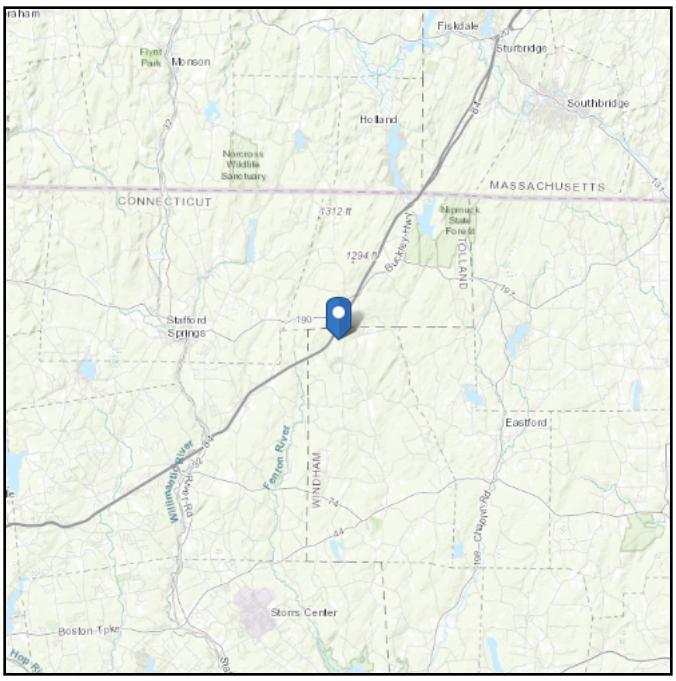
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	120	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2	3.33	1.33	130	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
3	3.33	5	1.67	130	150	3	0	1.650	1.650	0.00	0.00			Cohesive
4	5	26	21	135	150	5	0	2.321	2.321	2.10	2.10	25.46479		Cohesive

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 1068.03 ft (NAVD 88)
Latitude: 41.952139
Longitude: -72.195528



Wind

Results:

Wind Speed	118 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Wed May 25 2022

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 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

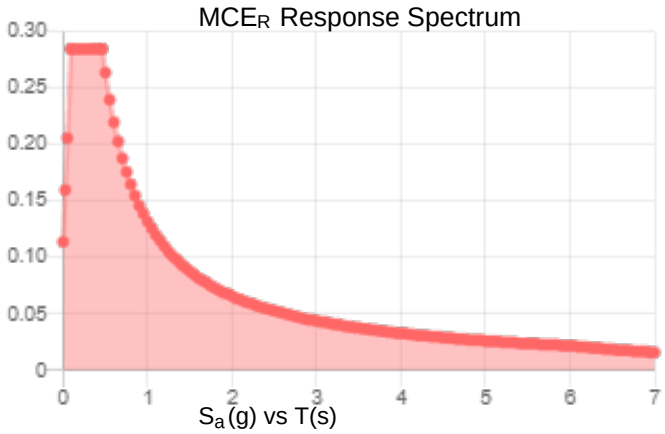
Seismic

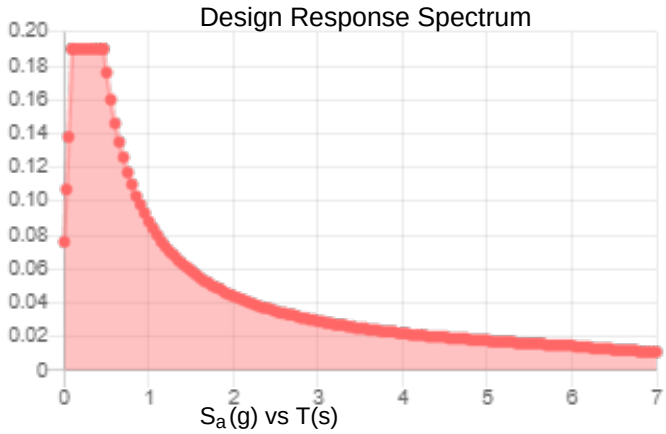
Site Soil Class: D - Default (see Section 11.4.3)

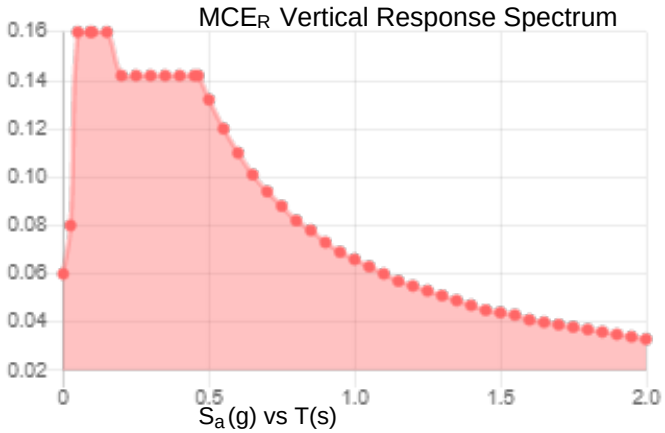
Results:

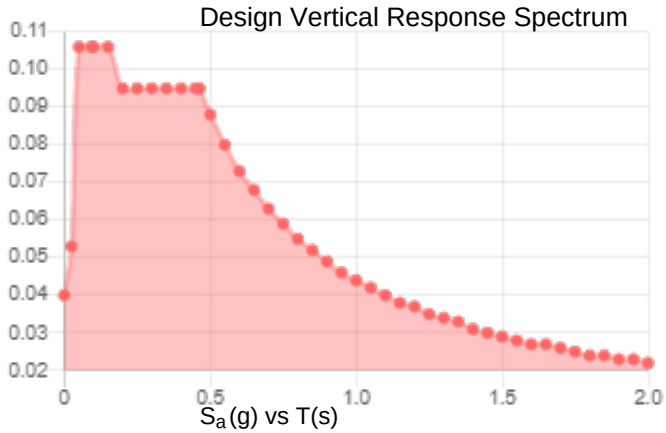
S_S :	0.178	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.095
F_v :	2.4	PGA_M :	0.151
S_{MS} :	0.285	F_{PGA} :	1.6
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.19	C_v :	0.7

Seismic Design Category B









Data Accessed: **Wed May 25 2022**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	5 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed May 25 2022

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 500-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: **May 20, 2022**

Trylon
1825 W. Walnut Hill Lane,
Suite 302
Irving, TX 75038
214-930-1730

Subject:	**Mount Analysis Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CT11353C
	Carrier Site Name:	-
Crown Castle Designation:	**BU Number:**	876345
	Site Name:	Sky Hill
	JDE Job Number:	717187
	Order Number:	617438 Rev. 0
Engineering Firm Designation:	**Trylon Report Designation:**	210071
Site Data:	**33 Janowski Road, Ashford, Windham County, CT, 06278**	
	Latitude 41° 57' 7.70" Longitude -72° 11' 43.90"	
Structure Information:	**Tower Height & Type:**	**192.0 ft Self Support**
	Mount Elevation:	**156.0 ft**
	Mount Width & Type:	**12.5 ft Sector Frame**

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

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

Sector Frame **Sufficient**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 118 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Iolanda Sabau

Respectfully Submitted by:
Cliff Abernathy, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

This is an existing 3 sector 12.5 ft Sector Frame, designed by Site Pro 1.

2) ANALYSIS CRITERIA

Building Code:	2018 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	118 mph
Exposure Category:	B
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	1.50 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.178
Seismic S_1:	0.055
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
156.0	159.0	3	Ericsson	RADIO 4449 B12/B71	12.5 ft Sector Frame
		3	Ericsson	RRUS 4415 B25	
	158.0	1	CommScope	VHLP2-11W/A	
		3	RFS/Celwave	APX16DWV-16DWV-S-E-A20	
		3	RFS/Celwave	APXVAARR24_43-U-NA20	
		1	Ceragon	FIBEAIR IP-20A_RFU-D	
	156.0	3	Ericsson	RADIO 4415 B66A	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	617438, Ref. 0	CCI Sites
Structural Analysis Report	B+T Group	10017763	CCI Sites
Mount Analysis Report	MasTec Network Solutions	8471761	CCI Sites

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.

A tool internally developed, using Microsoft Excel, by Trylon was used to calculate wind loading on all appurtenances, dishes, and mount members for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision E).

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 A325

This analysis may be affected if any assumptions are not valid or have been made in error. Trylon 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, Beta Sector)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2, 3	Mount Pipe(s)	MP1	156.0	32.8	Pass
	Horizontal(s)	M19		62.9	Pass
	Standoff(s)	M21		25.5	Pass
	Bracing(s)	M43		19.5	Pass
	Plate(s)	M13		45.0	Pass
	Tieback(s)	M54		18.9	Pass
	Mount Connection(s)	-		24.7	Pass

Structure Rating (max from all components) =	62.9%

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) Rating per TIA-222-H, Section 15.5

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)[3]	Notes
N79B	Existing	706.9	Leg	ROHN 3 EH	4,716.8	1
N80C	Existing	966.9	Leg	ROHN 3 EH	4,716.8	1

Notes:

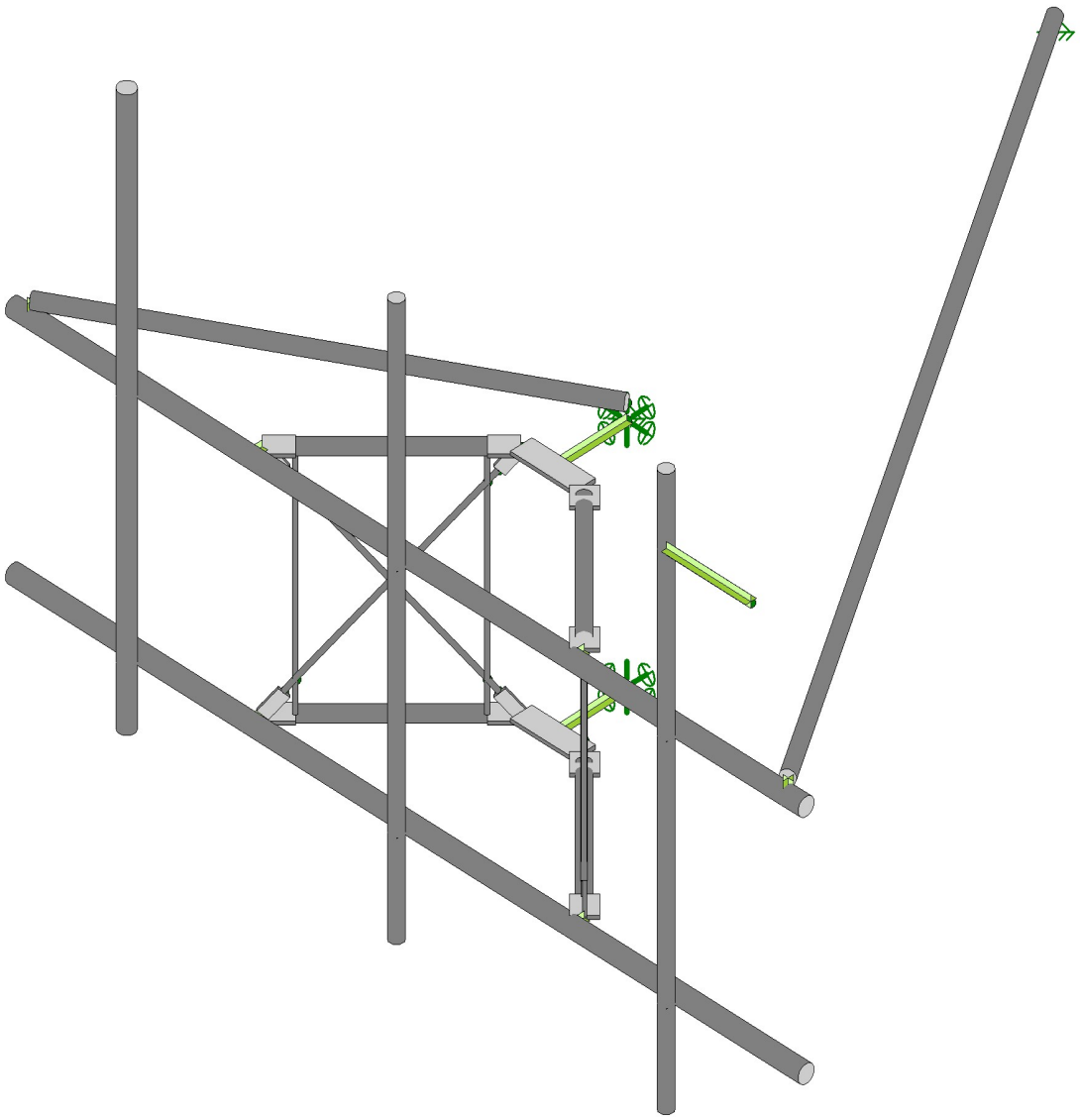
1) Tieback connection point is within 25% of either end of the connected tower member
2) Tieback connection point is NOT within 25% of either end of the connected tower member
3) Reduced member compressive capacity according to CED-STD-10294 *Standard for Installation of Mounts and Appurtenances*

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



Envelope Only Solution

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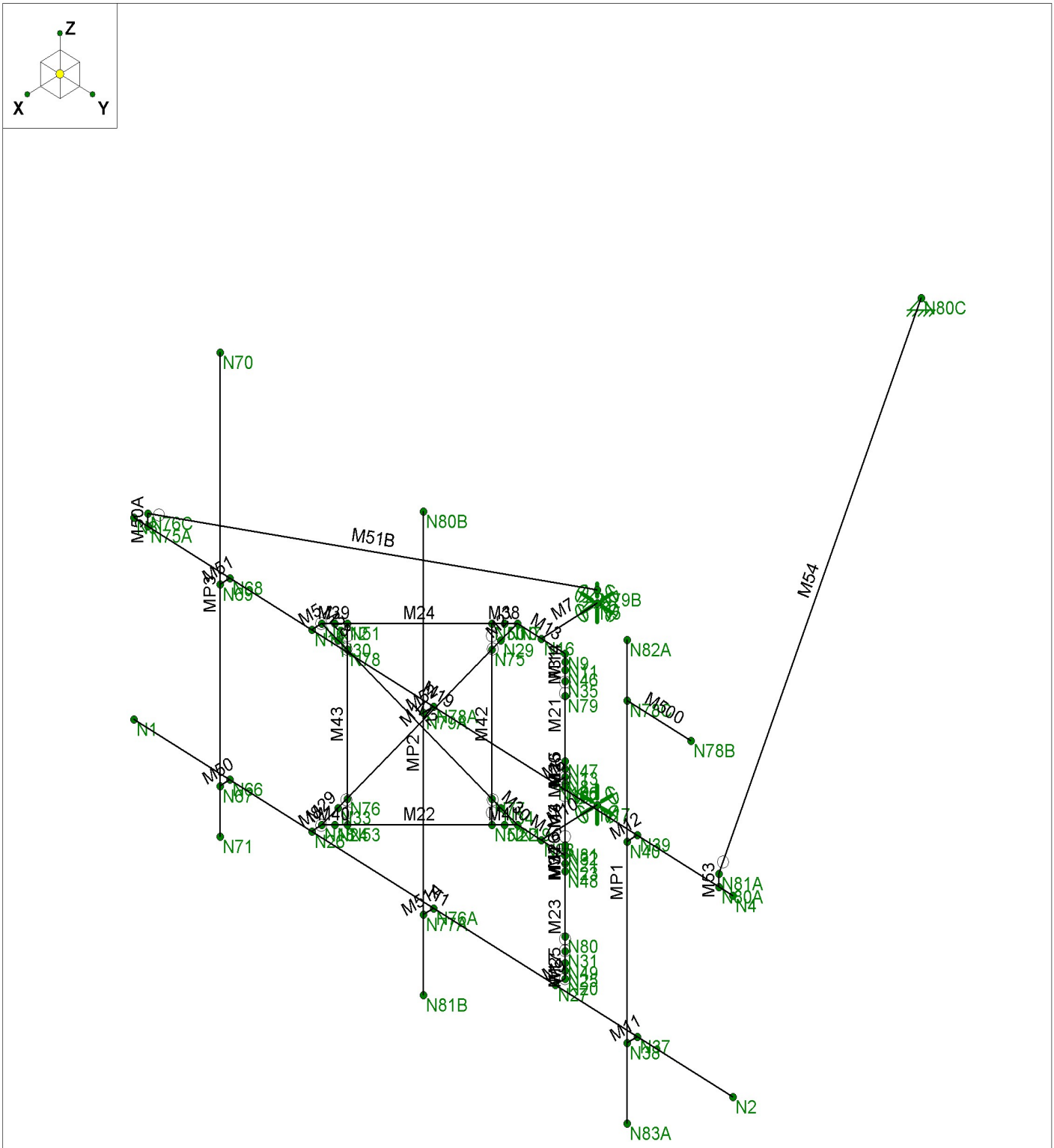

Envelope Only Solution

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APPENDIX B

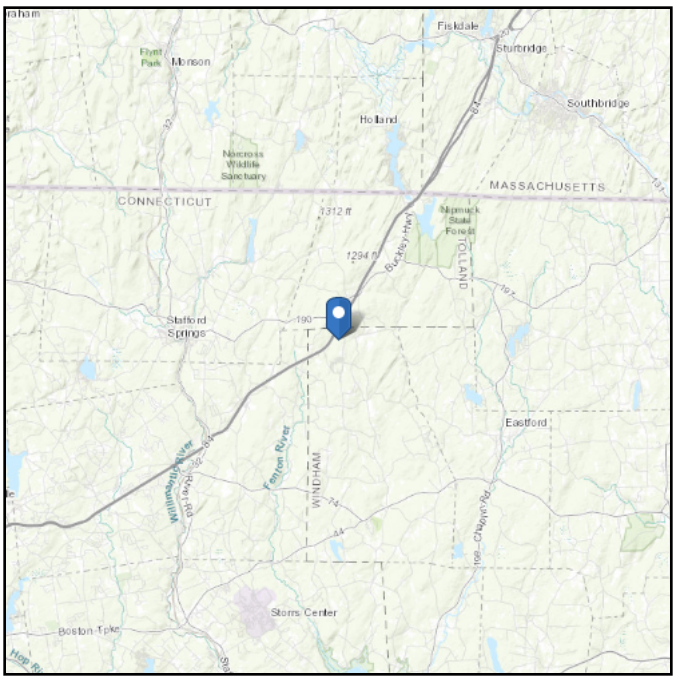
SOFTWARE INPUT CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 1068.03 ft (NAVD 88)
Latitude: 41.952139
Longitude: -72.195528



Wind

Results:

Wind Speed	118 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Wed May 18 2022

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 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

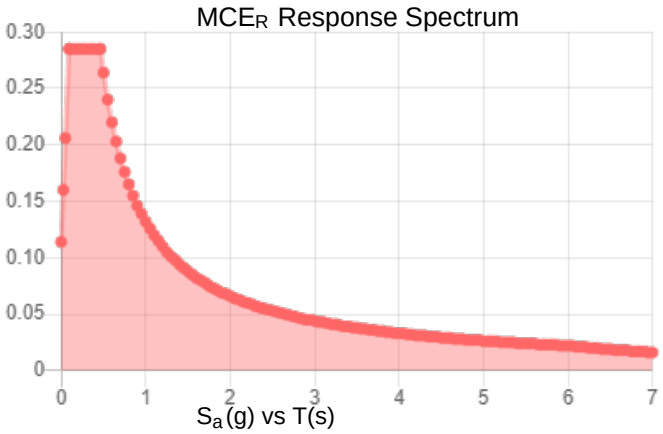
Seismic

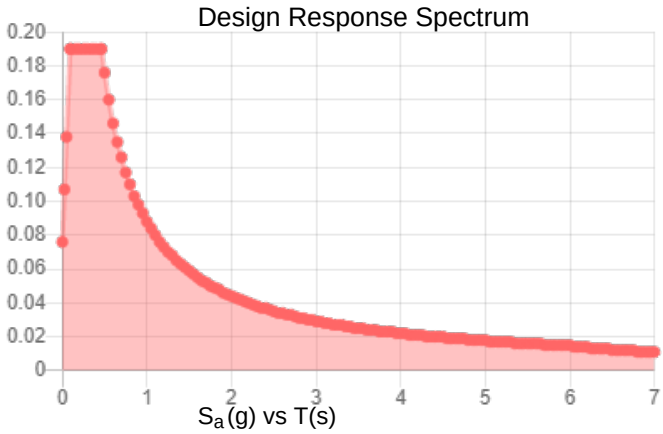
Site Soil Class: D - Default (see Section 11.4.3)

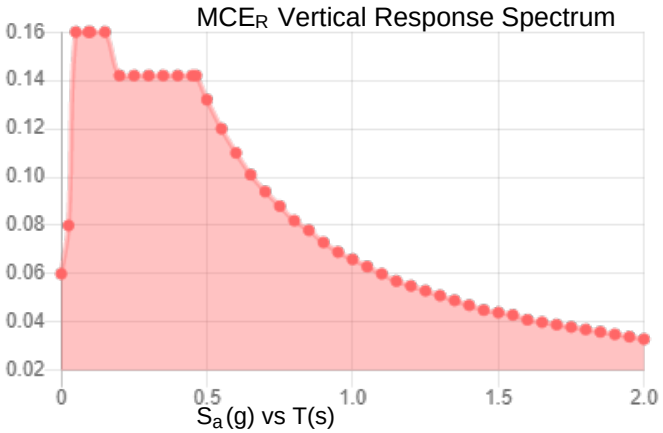
Results:

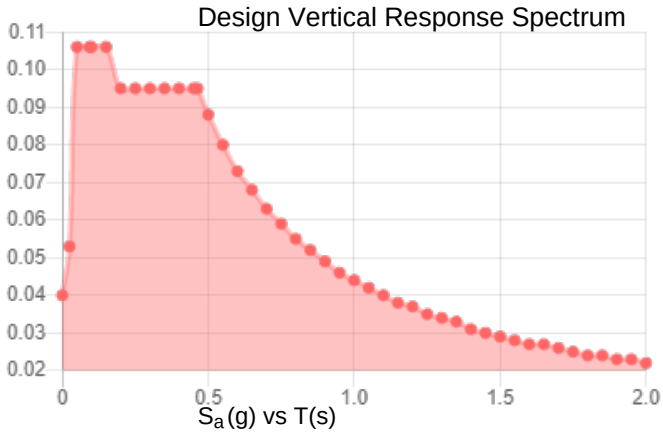
S_S :	0.178	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.095
F_v :	2.4	PGA_M :	0.151
S_{MS} :	0.285	F_{PGA} :	1.6
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.19	C_v :	0.7

Seismic Design Category B









Data Accessed: **Wed May 18 2022**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	5 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed May 18 2022

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 500-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.

Trylon
1825 W. Walnut Hill Lane Suite 120
Irving, TX 75038

TIA LOAD CALCULATOR 2.2

PROJECT DATA	
Job Code:	210071
Carrier Site ID:	CT11353C
Carrier Site Name:	-

CODES AND STANDARDS	
Building Code:	2018 IBC
Local Building Code:	2018 CSBC
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Sector Frame	--
Mount Elevation:	156.0	ft.
Number of Sectors:	3	--
Structure Type:	Self Support Tower	--
Structure Height:	192.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	B	--
Site Class:	D - Default	--
Ground Elevation:	1068.03	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor (K_{zt}):	1.00	--
Mount Topo Factor (K_{zt}):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	118	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.12	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	36.56	psf
Ground Elevation Factor (K_e):	0.96	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	1.50	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	6.83	psf
Mount Ice Thickness (t_{iz}):	1.75	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	65.80	psf
Round Member Pressure:	39.48	psf
Ice Wind Pressure:	7.38	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.178	g
1 Second Accel (S_1):	0.055	g
Short Period Des. (S_{DS}):	0.19	g
1 Second Des. (S_{D1}):	0.09	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (Cs):	0.09	--
Amplification Factor (A_S):	1.20	--

LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1

#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site

EQUIPMENT LOADING

Appurtenance Name	Qty.	Elevation [ft]	--	EPA N (ft2)	EPA T (ft2)	Weight (lbs)
APX16DWV-16DWV-S-E-A20	1	158	No Ice	6.26	1.5	40.70
--	--	--	w/ Ice	8.13	3.10	139.59
APXVAARR24_43-U-NA20	1	158	No Ice	14.67	5.32	128.00
--	--	--	w/ Ice	17.04	7.41	433.02
VHLP2-11W	1	158	No Ice	5.63	2.16	17.60
--	--	--	w/ Ice	6.33	2.66	161.49
RADIO 4415 B66A	1	156	No Ice	1.86	0.87	49.60
--	--	--	w/ Ice	2.28	1.21	62.60
RRUS 4415 B25	1	159	No Ice	1.64	0.68	44.00
--	--	--	w/ Ice	2.04	0.98	54.51
RADIO 4449 B12/B71	1	159	No Ice	1.64	1.15	75.00
--	--	--	w/ Ice	2.04	1.50	68.39
FIBEAIR IP-20A_RFU-D	1	158	No Ice	0.69	0.29	14.33
--	--	--	w/ Ice	0.97	0.50	27.62
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
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			No Ice			
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			No Ice			
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			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT LOADING [CONT.]

Appurtenance Name	Qty.	Elevation [ft]	--	EPA $_N$ (ft2)	EPA $_T$ (ft2)	Weight (lbs)
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT WIND CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	K_{zt}	K_z	K_d	t_d	q_z [psf]	q_{zi} [psf]
PX16DWV-16DWV-S-E-A2	1	158	1.00	1.13	0.95	1.75	36.69	6.59
APXVAARR24_43-U-NA20	1	158	1.00	1.13	0.95	1.75	36.69	6.59
VHLP2-11W	1	158	1.00	1.13	0.95	1.75	36.69	6.59
RADIO 4415 B66A	1	156	1.00	1.12	0.95	1.75	36.56	6.56
RRUS 4415 B25	1	159	1.00	1.13	0.95	1.76	36.76	6.60
RADIO 4449 B12/B71	1	159	1.00	1.13	0.95	1.76	36.76	6.60
FIBEAIR IP-20A_RFU-D	1	158	1.00	1.13	0.95	1.75	36.69	6.59

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	*Qty.*	*--*	*0° 180°*	*30° 210°*	*60° 240°*	*90° 270°*	*120° 300°*	*150° 330°*
APX16DWV-16DWV-S-E-A20	1	No Ice	206.71	88.83	167.42	49.53	167.42	88.83
--	--	w/ Ice	48.18	25.85	40.73	18.41	40.73	25.85
APXVAARR24_43-U-NA20	1	No Ice	484.43	252.86	407.24	175.67	407.24	252.86
--	--	w/ Ice	101.01	58.18	86.74	43.91	86.74	58.18
VHLP2-11W	1	No Ice	202.61	93.46	166.22	57.08	166.22	93.46
--	--	w/ Ice	37.54	21.21	32.10	15.77	32.10	21.21
RADIO 4415 B66A	1	No Ice	61.07	36.74	52.96	28.63	52.96	36.74
--	--	w/ Ice	13.46	8.71	11.88	7.12	11.88	8.71
RRUS 4415 B25	1	No Ice	54.40	30.44	46.41	22.46	46.41	30.44
--	--	w/ Ice	12.14	7.42	10.57	5.85	10.57	7.42
RADIO 4449 B12/B71	1	No Ice	54.36	42.18	50.30	38.12	50.30	42.18
--	--	w/ Ice	12.13	9.73	11.33	8.93	11.33	9.73
FIBEAIR IP-20A_RFU-D	1	No Ice	22.84	12.90	19.52	9.59	19.52	12.90
--	--	w/ Ice	5.72	3.65	5.03	2.96	5.03	3.65
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
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		No Ice						
--	--	w/ Ice						
		No Ice						
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		No Ice						
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		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

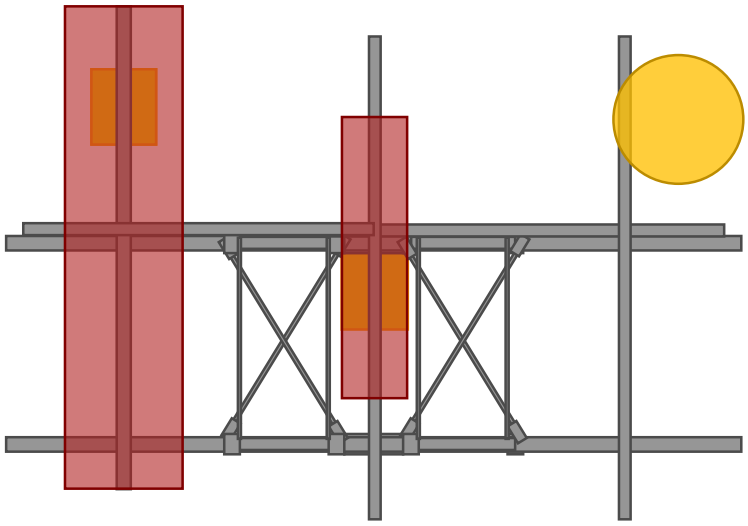
EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT SEISMIC FORCE CALCULATIONS

Appurtenance Name	*Qty.*	*Elevation [ft]*	*Weight [lbs]*	F_p [lbs]
APX16DWV-16DWV-S-E-A20	1	158	40.7	4.64
APXVAARR24_43-U-NA20	1	158	128	14.58
VHLP2-11W	1	158	17.6	2.00
RADIO 4415 B66A	1	156	49.6	5.65
RRUS 4415 B25	1	159	44	5.01
RADIO 4449 B12/B71	1	159	75	8.54
FIBEAIR IP-20A_RFU-D	1	158	14.33	1.63

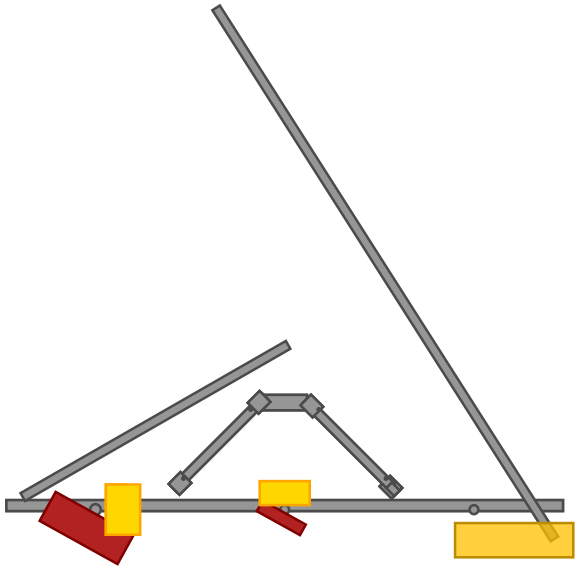
ELEVATION VIEW



MP3 MP2 MP1

*these drawings are intended to show approximate locations of equipment on the mount and should not be used to determine exact placement of equipment or additional hardware

PLAN VIEW



1825 W. Walnut Hill Lane, Suite 120
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Equipment Name	Total Quantity	Antenna Centerline	Mount Pipe Positions	Equipment Azimuths
APX16DWV-16DWV-S-E-A20	1	158	MP2	29
APXVAARR24_43-U-NA20	1	158	MP3	29
VHLP2-11W	1	158	M500	0
RADIO 4415 B66A	1	156	MP2	0
RRUS 4415 B25	1	159	MP3	90
RADIO 4449 B12/B71	1	159	MP3	90
FIBEAIR IP-20A_RFU-D	1	158	M500	0

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APPENDIX C

SOFTWARE ANALYSIS OUTPUT

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Z
Global Member Orientation Plane	XY
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-16: LRFD
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-16
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E...	Densit...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	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	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[ksi]	Fu[ksi]
1	A653 SS Gr33	29500	11346	.3	.65	.49	33	45
2	A653 SS Gr50/1	29500	11346	.3	.65	.49	50	65

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	PIPE 2.0	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	PIPE 2.5	PIPE 2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
3	SR 3/4	SR 3/4	Beam	BAR	A36 Gr.36	Typical	.442	.016	.016	.031
4	Plate	PL 4"x0.625"	Beam	RECT	A36 Gr.36	Typical	2.5	.081	3.333	.293
5	SR 5/8	SR 5/8	Beam	BAR	A36 Gr.36	Typical	.307	.007	.007	.015
6	D Plate	PL 2"x0.625"	Beam	RECT	A36 Gr.36	Typical	1.25	.041	.417	.131

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1	162T125-18	Beam	None	A653 SS Gr33	Typical	.078	.013	.042	9e-6

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N5	Reaction	Reaction	Reaction	Reaction	Reaction	
2	N17	Reaction	Reaction	Reaction	Reaction	Reaction	
3	N80C	Reaction	Reaction	Reaction			
4	N79B	Reaction	Reaction	Reaction			

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL			-1		9			
2	Structure Wind X	WLX						52		
3	Structure Wind Y	WLY						52		
4	Wind Load 0 AZI	WLX					18			
5	Wind Load 30 AZI	None					18			
6	Wind Load 45 AZI	None					18			
7	Wind Load 60 AZI	None					18			
8	Wind Load 90 AZI	WLY					18			
9	Wind Load 120 AZI	None					18			
10	Wind Load 135 AZI	None					18			
11	Wind Load 150 AZI	None					18			
12	Ice Weight	OL1					9	52		
13	Ice Structure Wind X	OL2						52		
14	Ice Structure Wind Y	OL3						52		
15	Ice Wind Load 0 AZI	OL2					18			
16	Ice Wind Load 30 AZI	None					18			
17	Ice Wind Load 45 AZI	None					18			
18	Ice Wind Load 60 AZI	None					18			
19	Ice Wind Load 90 AZI	OL3					18			
20	Ice Wind Load 120 AZI	None					18			
21	Ice Wind Load 135 AZI	None					18			
22	Ice Wind Load 150 AZI	None					18			
23	Seismic Load X	ELX	-.114				9			
24	Seismic Load Y	ELY		-.114			9			
25	Live Load 1 (Lv)	None					1			
26	Live Load 2 (Lv)	None					1			
27	Live Load 3 (Lv)	None					1			
28	Maintenance Load 1 (...	None					1			
29	Maintenance Load 2 (...	None					1			
30	Maintenance Load 3 (...	None					1			

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.4DL	Yes	Y		DL	1.4																		
2	1.2DL + 1WL 0 AZI	Yes	Y		DL	1.2	2	1	3		4	1												
3	1.2DL + 1WL 30 AZI	Yes	Y		DL	1.2	2	.866	3	.5	5	1												
4	1.2DL + 1WL 45 AZI	Yes	Y		DL	1.2	2	.707	3	.707	6	1												
5	1.2DL + 1WL 60 AZI	Yes	Y		DL	1.2	2	.5	3	.866	7	1												
6	1.2DL + 1WL 90 AZI	Yes	Y		DL	1.2	2		3	1	8	1												
7	1.2DL + 1WL 120 ...	Yes	Y		DL	1.2	2	-.5	3	.866	9	1												
8	1.2DL + 1WL 135 ...	Yes	Y		DL	1.2	2	-.707	3	.707	10	1												
9	1.2DL + 1WL 150 ...	Yes	Y		DL	1.2	2	-.866	3	.5	11	1												
10	1.2DL + 1WL 180 ...	Yes	Y		DL	1.2	2	-1	3		4	-1												
11	1.2DL + 1WL 210 ...	Yes	Y		DL	1.2	2	-.866	3	-.5	5	-1												
12	1.2DL + 1WL 225 ...	Yes	Y		DL	1.2	2	-.707	3	-.707	6	-1												
13	1.2DL + 1WL 240 ...	Yes	Y		DL	1.2	2	-.5	3	-.866	7	-1												
14	1.2DL + 1WL 270 ...	Yes	Y		DL	1.2	2		3	-1	8	-1												
15	1.2DL + 1WL 300 ...	Yes	Y		DL	1.2	2	.5	3	-.866	9	-1												

Load Combinations (Continued)

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
16	1.2DL + 1WL 315 ...	Yes	Y		DL	1.2	2	.707	3	-.707	10	-1														
17	1.2DL + 1WL 330 ...	Yes	Y		DL	1.2	2	.866	3	-.5	11	-1														
18	0.9DL + 1WL 0 AZI	Yes	Y		DL	.9	2	1	3		4	1														
19	0.9DL + 1WL 30 AZI	Yes	Y		DL	.9	2	.866	3	.5	5	1														
20	0.9DL + 1WL 45 AZI	Yes	Y		DL	.9	2	.707	3	.707	6	1														
21	0.9DL + 1WL 60 AZI	Yes	Y		DL	.9	2	.5	3	.866	7	1														
22	0.9DL + 1WL 90 AZI	Yes	Y		DL	.9	2		3	1	8	1														
23	0.9DL + 1WL 120 ...	Yes	Y		DL	.9	2	-.5	3	.866	9	1														
24	0.9DL + 1WL 135 ...	Yes	Y		DL	.9	2	-.707	3	.707	10	1														
25	0.9DL + 1WL 150 ...	Yes	Y		DL	.9	2	-.866	3	.5	11	1														
26	0.9DL + 1WL 180 ...	Yes	Y		DL	.9	2	-1	3		4	-1														
27	0.9DL + 1WL 210 ...	Yes	Y		DL	.9	2	-.866	3	-.5	5	-1														
28	0.9DL + 1WL 225 ...	Yes	Y		DL	.9	2	-.707	3	-.707	6	-1														
29	0.9DL + 1WL 240 ...	Yes	Y		DL	.9	2	-.5	3	-.866	7	-1														
30	0.9DL + 1WL 270 ...	Yes	Y		DL	.9	2		3	-1	8	-1														
31	0.9DL + 1WL 300 ...	Yes	Y		DL	.9	2	.5	3	-.866	9	-1														
32	0.9DL + 1WL 315 ...	Yes	Y		DL	.9	2	.707	3	-.707	10	-1														
33	0.9DL + 1WL 330 ...	Yes	Y		DL	.9	2	.866	3	-.5	11	-1														
34	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1												
35	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1												
36	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1												
37	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1												
38	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1												
39	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1												
40	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	.707	21	1												
41	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	.5	22	1												
42	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1												
43	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	-.5	16	-1												
44	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	-.707	17	-1												
45	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.866	18	-1												
46	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1												
47	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.866	20	-1												
48	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.707	21	-1												
49	1.2DL + 1DLi + 1W...	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1												
50	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	1	24																	
51	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	.866	24	.5																
52	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	.707	24	.707																
53	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	.5	24	.866																
54	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23		24	1																
55	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	-.5	24	.866																
56	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	-.707	24	.707																
57	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	-.866	24	.5																
58	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	-1	24																	
59	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	-.866	24	-.5																
60	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	-.707	24	-.707																
61	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	-.5	24	-.866																
62	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23		24	-1																
63	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	.5	24	-.866																
64	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	.707	24	-.707																
65	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.238	23	.866	24	-.5																
66	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	1	24																	
67	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	.866	24	.5																
68	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	.707	24	.707																
69	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	.5	24	.866																
70	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23		24	1																
71	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	-.5	24	.866																
72	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	-.707	24	.707																
73	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	-.866	24	.5																
74	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	-1	24																	

Load Combinations (Continued)

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
75	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	-.866	24	-.5														
76	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	-.707	24	-.707														
77	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	-.5	24	-.866														
78	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23		24	-1														
79	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	.5	24	-.866														
80	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	.707	24	-.707														
81	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.862	23	.866	24	-.5														
82	1.2DL + 1Lv1	Yes	Y		DL	1.2	25	1.5																
83	1.2DL + 1Lv2	Yes	Y		DL	1.2	26	1.5																
84	1.2DL + 1Lv3	Yes	Y		DL	1.2	27	1.5																
85	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.065	3		4	.065										
86	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.056	3	.032	5	.065										
87	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.046	3	.046	6	.065										
88	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.032	3	.056	7	.065										
89	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2		3	.065	8	.065										
90	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.032	3	.056	9	.065										
91	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.046	3	.046	10	.065										
92	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.056	3	.032	11	.065										
93	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.065	3		4	-.065										
94	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.056	3	-.032	5	-.065										
95	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.046	3	-.046	6	-.065										
96	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.032	3	-.056	7	-.065										
97	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2		3	-.065	8	-.065										
98	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.032	3	-.056	9	-.065										
99	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.046	3	-.046	10	-.065										
100	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.056	3	-.032	11	-.065										
101	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.065	3		4	.065										
102	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.056	3	.032	5	.065										
103	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.046	3	.046	6	.065										
104	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.032	3	.056	7	.065										
105	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2		3	.065	8	.065										
106	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.032	3	.056	9	.065										
107	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.046	3	.046	10	.065										
108	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.056	3	.032	11	.065										
109	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.065	3		4	-.065										
110	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.056	3	-.032	5	-.065										
111	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.046	3	-.046	6	-.065										
112	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.032	3	-.056	7	-.065										
113	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2		3	-.065	8	-.065										
114	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.032	3	-.056	9	-.065										
115	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.046	3	-.046	10	-.065										
116	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.056	3	-.032	11	-.065										
117	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.065	3		4	.065										
118	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.056	3	.032	5	.065										
119	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.046	3	.046	6	.065										
120	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.032	3	.056	7	.065										
121	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2		3	.065	8	.065										
122	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.032	3	.056	9	.065										
123	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.046	3	.046	10	.065										
124	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.056	3	.032	11	.065										
125	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.065	3		4	-.065										
126	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.056	3	-.032	5	-.065										
127	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.046	3	-.046	6	-.065										
128	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.032	3	-.056	7	-.065										
129	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2		3	-.065	8	-.065										
130	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.032	3	-.056	9	-.065										
131	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.046	3	-.046	10	-.065										
132	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.056	3	-.032	11	-.065										

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N5	max	947.876	18	1983.112	6	1415.499	42	168.599	113	-337.131	18	0	132
2		min	-2183.389	43	-1572.4	30	284.209	18	-306.563	89	-1582.016	42	0	1
3	N17	max	1889.945	49	550.525	110	1364.334	34	163.259	112	-342.54	25	0	132
4		min	326.3	24	-1086.521	86	277.644	26	-308.224	88	-1533.415	34	0	1
5	N80C	max	821.508	14	485.913	14	89.668	38	0	132	0	132	0	132
6		min	-839.044	6	-480.721	22	20.611	77	0	1	0	1	0	1
7	N79B	max	339.765	18	598.333	10	45.132	42	0	132	0	132	0	132
8		min	-376.464	10	-570.997	18	9.436	19	0	1	0	1	0	1
9	Totals:	max	1621.27	18	1075.741	23	2883.061	45						
10		min	-1621.268	10	-1075.741	15	692.355	69						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	M19	PIPE 2.5	.661	106.25	4	.153	106.25		19	14558.7...	50715	3596.25	3596.25	1	H1-1b
2	M13	PL 4"x0.625"	.473	6	38	.095	6	y	39	76418.78	81000	1054.688	6750	1	H1-1b
3	M16	PL 4"x0.625"	.438	6	35	.091	6	y	49	76418.78	81000	1054.688	6750	1...	H1-1b
4	MP1	PIPE 2.0	.345	40	11	.282	40		4	14916.0...	32130	1871.625	1871.625	1...	H3-6
5	MP3	PIPE 2.5	.327	46	9	.053	46		82	30038.4...	50715	3596.25	3596.25	1	H1-1b
6	MP2	PIPE 2.0	.281	40	2	.085	80		5	14916.0...	32130	1871.625	1871.625	1...	H1-1b
7	M21	PIPE 2.0	.268	2.188	5	.035	27.813		1...	29810.2...	32130	1871.625	1871.625	1	H1-1b
8	M24	PIPE 2.0	.228	27.813	6	.049	2.188		37	29810.2...	32130	1871.625	1871.625	1	H1-1b
9	H1	PIPE 2.5	.207	126....	84	.080	106.25		14	14558.7...	50715	3596.25	3596.25	1	H1-1b
10	M43	SR 5/8	.205	35	100	.052	5		5	2339.328	9946.8	96.768	96.768	1	H1-1b
11	M54	PIPE 2.0	.199	82.692	46	.009	165....		47	5178.703	32130	1871.625	1871.625	1...	H1-1b
12	M37	SR 5/8	.158	35	84	.064	35		34	2339.328	9946.8	96.768	96.768	4...	H1-1b
13	M22	PIPE 2.0	.150	2.188	87	.049	27.813		40	29810.2...	32130	1871.625	1871.625	1	H1-1b
14	M39	PL 4"x0.625"	.145	2.209	100	.083	2.209	y	1...	79311.0...	81000	1054.688	6750	1...	H1-1b
15	M40	PL 4"x0.625"	.145	4.512	39	.083	4.512	y	1...	79311.0...	81000	1054.688	6750	2...	H1-1b
16	M23	PIPE 2.0	.141	2.188	86	.036	27.813		1...	29810.2...	32130	1871.625	1871.625	1	H1-1b
17	M42	SR 5/8	.136	35	42	.049	35		1...	2339.328	9946.8	96.768	96.768	3...	H1-1b
18	M36	SR 5/8	.134	35	41	.084	35		39	2339.328	9946.8	96.768	96.768	1	H1-1b
19	M38	PL 4"x0.625"	.122	2.303	38	.083	0	y	1...	79311.0...	81000	1054.688	6750	1...	H1-1b
20	M41	PL 4"x0.625"	.117	4.512	99	.083	2.209	y	1...	79311.0...	81000	1054.688	6750	1...	H1-1b
21	M17	PL 4"x0.625"	.117	2.209	110	.069	2.209	y	1...	79311.0...	81000	1054.688	6750	2...	H1-1b
22	M15	PL 4"x0.625"	.110	4.512	113	.067	2.209	y	1...	79311.0...	81000	1054.688	6750	1...	H1-1b
23	M14	PL 4"x0.625"	.110	2.303	4	.067	0	y	1...	79311.0...	81000	1054.688	6750	1...	H1-1b
24	M1	SR 3/4	.093	2.75	39	.044	2.292		36	4419.038	14320.8	184.32	184.32	3...	H1-1b*
25	M34	PL 4"x0.625"	.091	2.209	44	.069	4.512	y	1...	79311.0...	81000	1054.688	6750	1...	H1-1b
26	M3	SR 3/4	.066	41.25	111	.029	41.708		1...	4419.038	14320.8	184.32	184.32	3...	H1-1b*
27	M29	PL 2"x0.625"	.049	4.46	37	.013	0	y	6	39953.2...	40500	527.345	1687.5	1...	H1-1b
28	M27	PL 2"x0.625"	.047	0	35	.017	4.46	y	36	39953.2...	40500	527.345	1687.5	1	H1-1b
29	M30	PL 2"x0.625"	.047	4.46	43	.016	0	y	43	39953.2...	40500	527.345	1687.5	1	H1-1b
30	M51B	PIPE 2.0	.046	41.211	43	.005	82.421		43	18250.01	32130	1871.625	1871.625	1...	H1-1b
31	M28	PL 2"x0.625"	.044	0	99	.013	0	y	82	39953.2...	40500	527.345	1687.5	1...	H1-1b
32	M31	PL 2"x0.625"	.043	4.46	49	.012	0	y	1...	39953.2...	40500	527.345	1687.5	1	H1-1b
33	M25	PL 2"x0.625"	.037	0	42	.010	4.46	y	5	39953.2...	40500	527.345	1687.5	1...	H1-1b
34	M26	PL 2"x0.625"	.036	0	40	.011	4.46	y	1...	39953.2...	40500	527.345	1687.5	1	H1-1b
35	M32	PL 2"x0.625"	.030	4.46	34	.009	0	y	82	39953.2...	40500	527.345	1687.5	1...	H1-1b
36	M4	SR 3/4	.005	2.292	26	.028	2.292		1...	4419.038	14320.8	184.32	184.32	3...	H1-1b*
37	M2	SR 3/4	.000	0	132	.041	41.708		43	4419.038	14320.8	184.32	184.32	1	H1-1a

Envelope AISI S100-16: LRFD Cold Formed Steel Code Checks

Member	Shape	Code ...	Loc[in]	LC	Shear ..	Loc[in]	Dir	LC	phi*Pn[lb]	phi*Tn[lb]	phi*Mny...	phi*Mnz...	phi*V...	phi*V...	Cb	Eqn
No Data to Print ...																

APPENDIX D

ADDITIONAL CALCULATIONS

Trylon

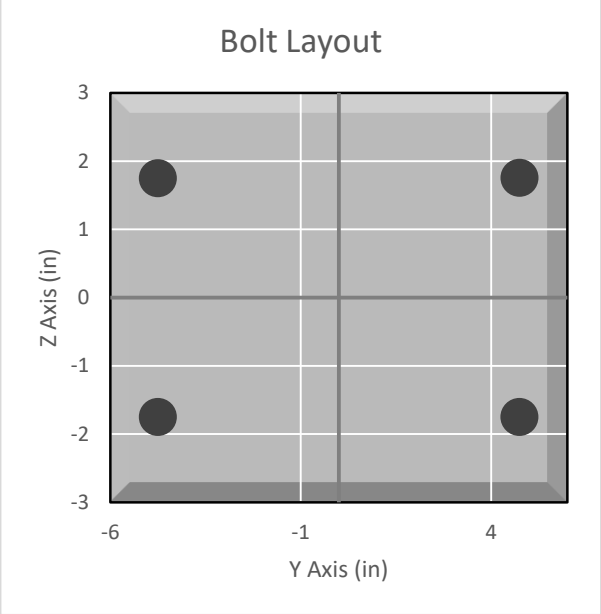
Analysis date: 5/20/2022

BOLT TOOL 1.5.2

Project Data	
Job Code:	210071
Carrier Site ID:	CT11353C
Carrier Site Name:	-

Code	
Design Standard:	TIA-222-H
Slip Check:	Yes
Pretension Standard:	TIA-222-H

Bolt Properties		
Connection Type:	Threaded Rod	
Diameter:	0.625	in
Grade:	AE J429 Gr.	--
Yield Strength (Fy):	57	ksi
Ultimate Strength (Fu):	74	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	9.5	in



Connection Description
Standoff to Tower Leg

Bolt Check*		
Tensile Capacity (ϕT_n):	12543.1	lbs
Shear Capacity (ϕV_n):	8513.6	lbs
Tension Force (T_u):	3256.2	lbs
Shear Force (V_u):	421.9	lbs
Tension Usage:	24.7%	--
Shear Usage:	4.7%	--
Interaction:	24.7%	Pass
Controlling Member:	M7	--
Controlling LC:	43	--

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

Slip Check*		
Sliding Capacity (ϕR_{ns}):	13431.2	lbs
Torsion Capacity (ϕR_{nr}):	5316.5	lb-ft
Sliding Force (V_{us}):	1415.5	lbs
Torsional Force (T_{ur}):	0.0	lb-ft
Sliding Usage:	10.0%	--
Torsion Usage:	0.0%	--
Interaction:	10.0%	Pass
Controlling Member:	M7	--
Controlling LC:	42	--

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

Fox Hill Telecom

Radio Frequency Emissions Analysis Report

T-Mobile

Site ID: CT11353C

33 Janowski Road
Ashford, CT 06278

June 21, 2022

Fox Hill Telecom Project Number: 221375

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**20.26 %**

Fox Hill Telecom

June 21, 2022

T-MOBILE
Attn: RF Manager
35 Griffin Road South
Bloomfield, CT 06009

Emissions Analysis for Site: **CT11353C**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **33 Janowski Road, Ashford, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

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

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

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

General population 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 & 700 MHz 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 microwave 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 performed for the proposed upgrades to the T-MOBILE antenna facility located at **33 Janowski Road, Ashford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel and parabolic dish antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in ***Table 1***, with the exception of the 11 GHz microwave which is located on **Sector B** exclusively. The proposed 11 GHz microwave antenna and its emissions contributions were added to the **Sector B** configuration since this was the closest azimuth to the pointing direction of the microwave antenna listed at an azimuth of **135 degrees** from true north (TN).

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20
LTE	2100 MHz (AWS)	4	40
LTE	1900 MHz (PCS)	4	40
GSM	1900 MHz (PCS)	1	15
Microwave	11 GHz	1	1

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 700 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz Microwave frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas 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. The proposed 11 GHz microwave antenna and its emissions contributions were added to the **Sector B** configuration since this was the closest azimuth to the pointing direction of the microwave antenna listed at an azimuth of **135 degrees** from true north (TN).

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APXVAARR24_43-U-NA20	158
A	2	RFS APX16DWV-16DWV-S-E-A20	158
B	1	RFS APXVAARR24_43-U-NA20	158
B	2	RFS APX16DWV-16DWV-S-E-A20	158
B	3	Commscope VHLP2-11W/A	158
C	1	RFS APXVAARR24_43-U-NA20	158
C	2	RFS APX16DWV-16DWV-S-E-A20	158

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz / 2100 MHz	13.65 / 13.85 / 16.35	8	280	9,347.33	1.97
Antenna A2	RFS APX16DWV-16DWV-S-E-A20	1900 MHz (PCS)	15.9	5	175	6,808.29	1.06
						Sector A Composite MPE%	**3.03**
Antenna B1	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz / 2100 MHz	13.65 / 13.85 / 16.35	8	280	9,347.33	1.97
Antenna B2	RFS APX16DWV-16DWV-S-E-A20	1900 MHz (PCS)	15.9	5	175	6,808.29	1.06
Antenna B3	Commscope VHLP2-11W/A	11 GHz	32.35	1	1	1,717.91	0.03
						Sector B Composite MPE%	**3.06**
Antenna C1	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz / 2100 MHz	13.65 / 13.85 / 16.35	8	280	9,347.33	1.97
Antenna C2	RFS APX16DWV-16DWV-S-E-A20	1900 MHz (PCS)	15.9	5	175	6,808.29	1.06
						Sector C Composite MPE%	**3.03**

Table 3: T-MOBILE Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, the sector with the largest calculated MPE% is **Sector B** due to the proposed 11 GHz microwave antenna broadcasting in this direction. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site. There were no additional carriers listed in the CSC active MPE database for this site.

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Value (Sector B)	**3.06 %**
AT&T	5.19 %
Verizon Wireless	10.21 %
Nextel	0.21 %
Sprint	1.59 %
Site Total MPE %:	**20.26 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	3.03 %
T-MOBILE Sector B Total:	**3.06 %**
T-MOBILE Sector C Total:	3.03 %
Site Total:	20.26 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, the sector with the largest calculated MPE% is **Sector B** due to the proposed 11 GHz microwave antenna broadcasting in this direction.

T-MOBILE _ Frequency Band / Technology Max Power Values (Sector B)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 600 MHz LTE / 5G NR	2	788.97	158	2.46	600 MHz	400	0.61%
T-Mobile 700 MHz LTE	2	432.54	158	1.35	700 MHz	467	0.29%
T-Mobile 2100 MHz (AWS) LTE	4	1,726.08	158	10.74	2100 MHz (AWS)	1000	1.07%
T-Mobile 1900 MHz (PCS) LTE	4	1,556.18	158	9.69	1900 MHz (PCS)	1000	0.97%
T-Mobile 1900 MHz (PCS) GSM	1	583.57	158	0.91	1900 MHz (PCS)	1000	0.09%
T-Mobile 11 GHz Microwave	1	1,717.91	158	0.27	11 GHz	1000	0.03%
						Total:	**3.06%**

Table 6: T-MOBILE Maximum MPE Power Values (Sector B)

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:	3.03 %
Sector B:	3.06 %
Sector C:	3.03 %
T-MOBILE Maximum Total (per sector):	3.06 %
Site Total:	20.26 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **20.26 %** 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.

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Worcester, MA 01605
(978)660-3998

T-Mobile

T-MOBILE SITE NUMBER: CT11353C
T-MOBILE SITE NAME: SKY HILL
SITE TYPE: SELF SUPPORT TOWER
TOWER HEIGHT: 192'-0"

BUSINESS UNIT #: 876345
SITE ADDRESS: 33 JANOWSKI ROAD ASHFORD, CT 06278
COUNTY: WINDHAM
JURISDICTION: WINDHAM COUNTY

T-MOBILE MW ADD SITE CONFIGURATION

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	SKY HILL
SITE ADDRESS:	33 JANOWSKI ROAD ASHFORD, CT 06278
COUNTY:	WINDHAM
MAP/PARCEL #:	VERIFY
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.952139° (41° 57' 7.70")
LONGITUDE:	-72.195528° (-72° 11' 43.90")
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	±1069 FT
CURRENT ZONING:	TBD
JURISDICTION:	WINDHAM COUNTY
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	TBD
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 12920 SE 38TH STREET BELLEVUE, WA 98006
ELECTRIC PROVIDER:	TBD
TELCO PROVIDER:	TBD

PROJECT TEAM

A&E FIRM:	INFINIGY 500 WEST OFFICE CENTER DR. SUITE 150, FORT WASHINGTON, PA 19034
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065
	PATRICIA PELON - PROJECT MANAGER TRICIA.PELON@CROWNCASTLE.COM
	JASON D'AMICO - CONSTRUCTION MANAGER JASON.DAMICO@CROWNCASTLE.COM

DRAWING INDEX

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

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11X17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT DESCRIPTION

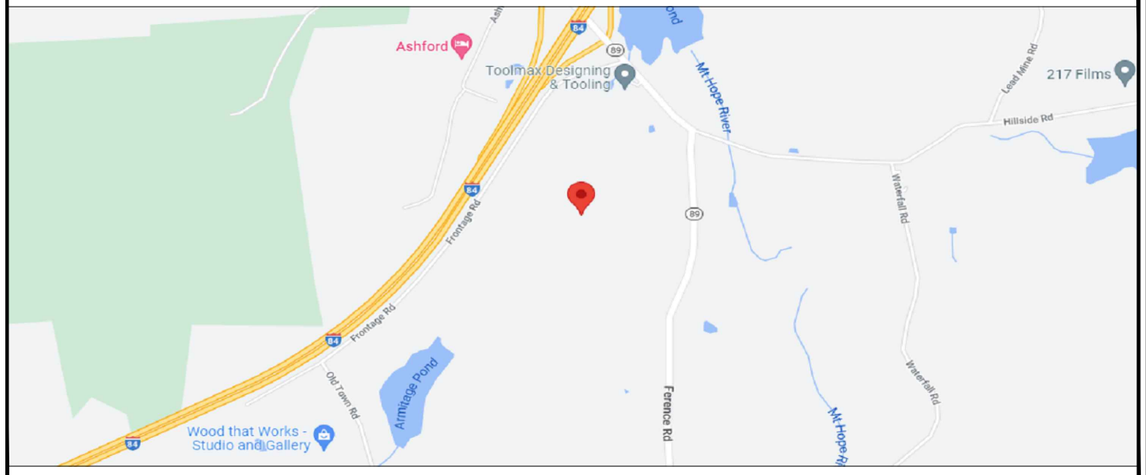
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- INSTALL (1) MW ANTENNAS
- INSTALL (1) ODU
- INSTALL (4) POWER CABLE

GROUND SCOPE OF WORK:
- N/A

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

LOCATION MAP



NO SCALE

APPLICABLE CODES/REFERENCE DOCUMENTS

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

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

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	B+T GROUP
DATED:	06/03/2022
MOUNT ANALYSIS:	TRYLON
DATED:	05/20/2022
RFDS REVISION:	0
DATED:	03/30/2022
ORDER ID:	617438
REVISION:	0

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APPROVALS

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

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

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

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T-MOBILE SITE NUMBER:
CT11353C

BU #: **876345**
SKY HILL

33 JANOWSKI ROAD
ASHFORD, CT 06278

EXISTING 192'-0" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/01/2022	RCD	PRELIMINARY	SS
0	06/08/2022	TJ	100% FINALS	SS

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER

06/08/2022

SHEET NUMBER: T-1
REVISION: 0

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

GREENFIELD GROUNDING NOTES:

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

APWA UNIFORM COLOR CODE:

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

ABBREVIATIONS:

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

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T-MOBILE SITE NUMBER:
CT11353C

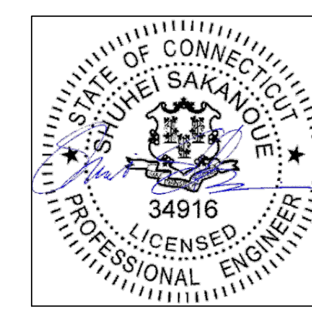
BU #: **876345**
SKY HILL

33 JANOWSKI ROAD
ASHFORD, CT 06278

EXISTING 192'-0" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/01/2022	RCD	PRELIMINARY	SS
0	06/08/2022	TJ	100% FINALS	SS

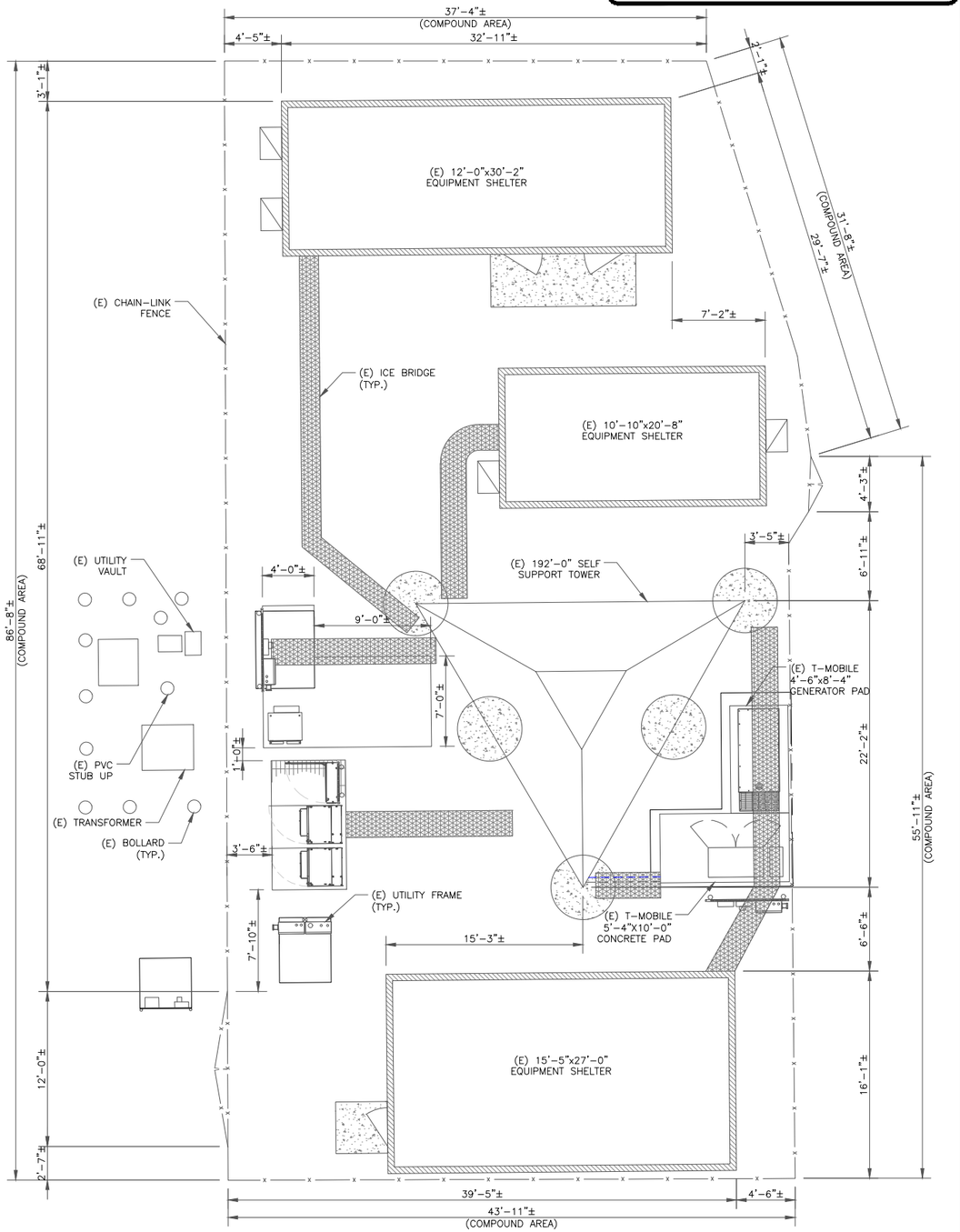


06/08/2022

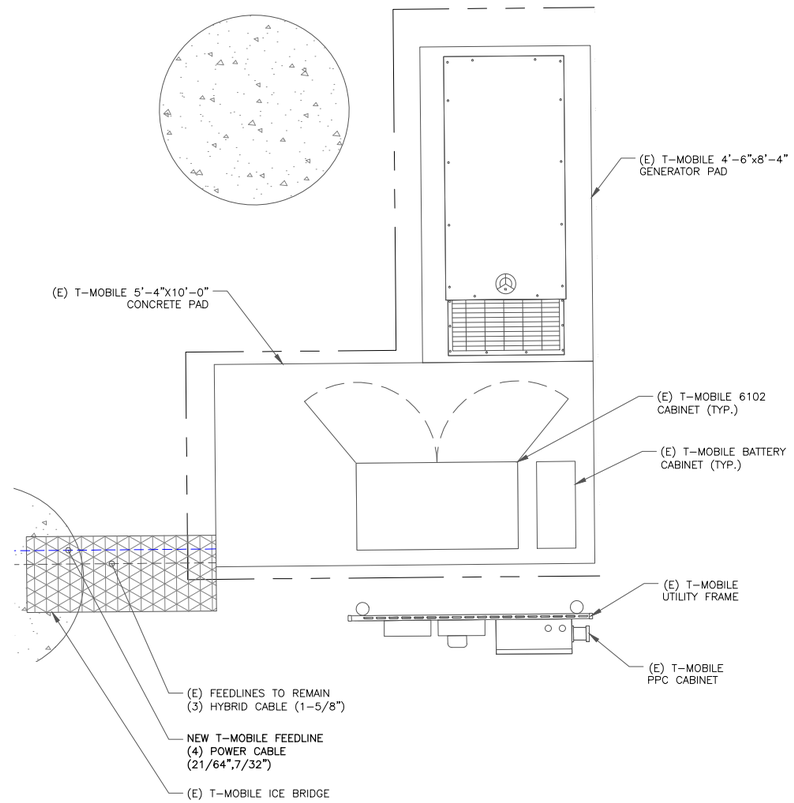
SHEET NUMBER: T-2
REVISION: 0

NOTE:

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



1 SITE PLAN
SCALE: 4' 2' 0 4' 3/16"=1'–0" (FULL SIZE) 3/32"=1'–0" (11x17)



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

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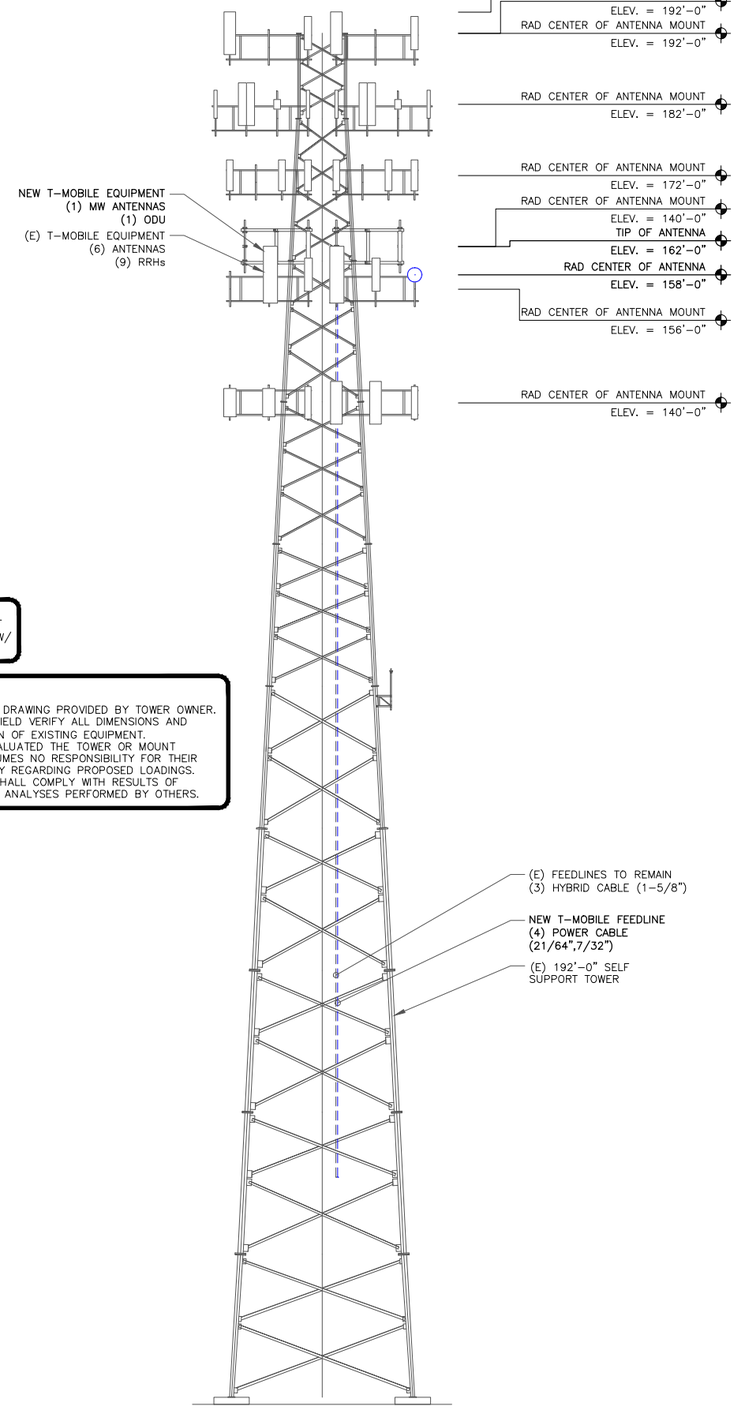
STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER

06/08/2022

SHEET NUMBER: C-1

REVISION: 0



T-MOBILE EQUIPMENT

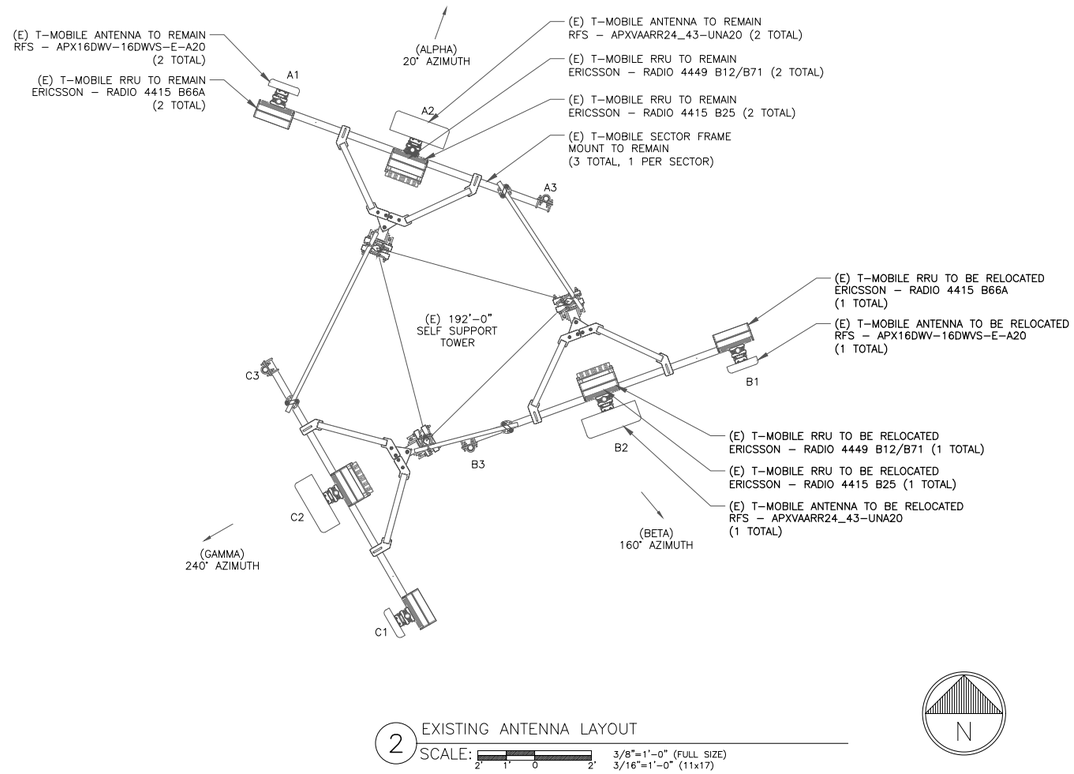
ANTENNA CL: 158'-0"
MOUNT CL: 156'-0"

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

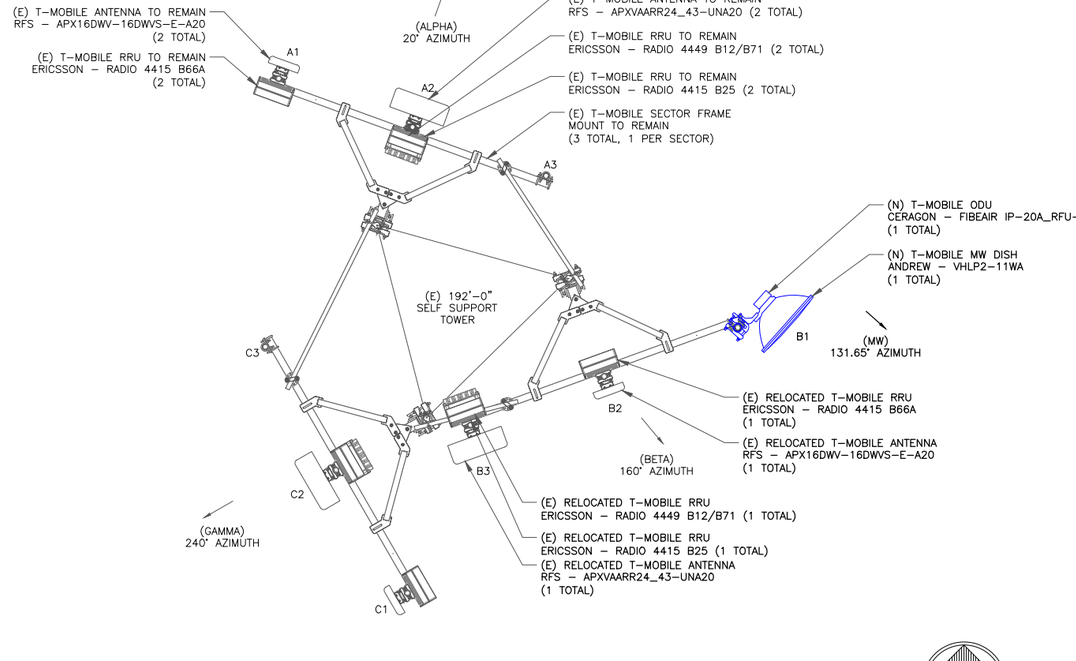
NOTES:

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

1 FINAL ELEVATION
SCALE: 8' 4' 0 8' 3/32"=1'-0" (FULL SIZE) 3/64"=1'-0" (11x17)



2 EXISTING ANTENNA LAYOUT
SCALE: 2' 1' 0 2' 3/8"=1'-0" (FULL SIZE) 3/16"=1'-0" (11x17)



3 FINAL ANTENNA LAYOUT
SCALE: 2' 1' 0 2' 3/8"=1'-0" (FULL SIZE) 3/16"=1'-0" (11x17)

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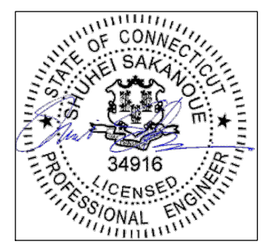


06/08/2022

SHEET NUMBER: C-2

REVISION: 0

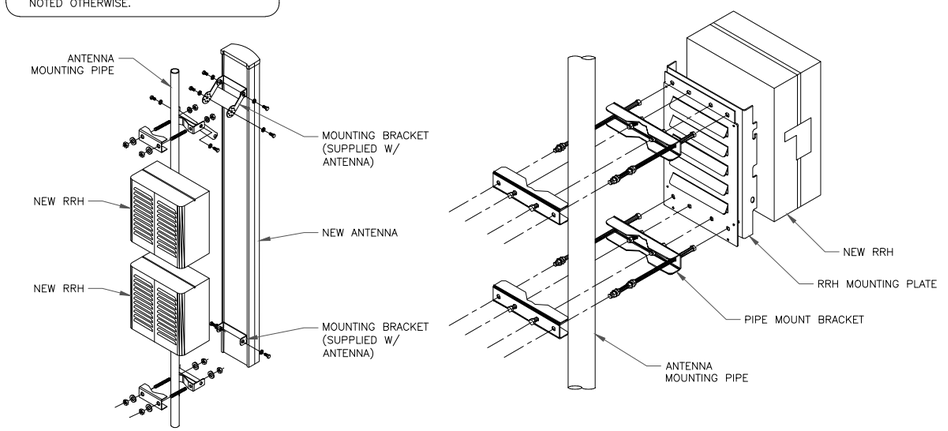
ANTENNA SCHEDULE

SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	L1900, G1900, U2100	158'-0"	20°	RFS	APX16DWV-16DWV-S-E-A20	0	0	(1) ERICSSON – RADIO 4415 B66A	–
ALPHA	A2	L600, L700, N600	158'-0"	20°	RFS	APXVAARR24_43-U-NA20	0	0	(1) ERICSSON – RRUS 4415 B25 (1) ERICSSON – RADIO 4449 B12/B71	(1) 1-5/8" HYBRID
ALPHA	A3	–	–	–	–	–	–	–	–	–
BETA	B1	–	158'-0"	131.65°	ANDREW CORPORATION	VHLP2-11WA	–	–	(1) CERAGON / FIBEAIR IP-20A_RFU-D	(2) 21/64" POWER (2) 7/32" POWER
BETA	B2	L1900, G1900, U2100	158'-0"	160°	RFS	APX16DWV-16DWV-S-E-A20	0	0	(1) ERICSSON – RADIO 4415 B66A	–
BETA	B3	L600, L700, N600	158'-0"	160°	RFS	APXVAARR24_43-U-NA20	0	0	(1) ERICSSON – RRUS 4415 B25 (1) ERICSSON – RADIO 4449 B12/B71	(1) 1-5/8" HYBRID
GAMMA	C1	L1900, G1900, U2100	158'-0"	240°	RFS	APX16DWV-16DWV-S-E-A20	0	0	(1) ERICSSON – RADIO 4415 B66A	–
GAMMA	C2	L600, L700, N600	158'-0"	240°	RFS	APXVAARR24_43-U-NA20	0	0	(1) ERICSSON – RRUS 4415 B25 (1) ERICSSON – RADIO 4449 B12/B71	(1) 1-5/8" HYBRID
GAMMA	C3	–	–	–	–	–	–	–	–	–

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

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



NOTE:

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

2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
CT11353C

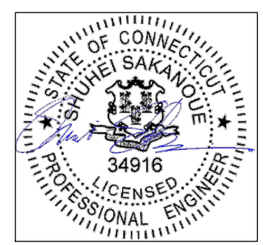
BU #: **876345**
SKY HILL

33 JANOWSKI ROAD
ASHFORD, CT 06278

EXISTING 192'-0" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/01/2022	RCD	PRELIMINARY	SS
0	06/08/2022	TJ	100% FINALS	SS



06/08/2022

SHEET NUMBER: C-3

REVISION: 0

iQ.link — Link Budget Report

Date Printed: 30-MAR-2022
Create Date: 30-MAR-2022
Link ID: 2010002
Link Name: CT11353C_CTHA653A
Region: Northeast
Created By: Ajikia1

Path length (4.92 mi)

CT11353C	
Latitude:	41-57- 7.0 N
Longitude:	72-11-43.0 W
Azimuth:	131.65 Deg
Elevation:	1082.68 ft
Antenna CL:	158.00 ft AGL

Frequency (GHz) = 11.00 GHz	
K1:	1.00
%F1:	0.60
K2:	0.67
%F2:	0.30
K3:	1.33
%F3:	1.00

CTHA653A	
Latitude:	41-54-16.2 N
Longitude:	72-07-26.0 W
Azimuth:	311.70 Deg
Elevation:	688.98 ft
Antenna CL:	177.00 ft AGL

1

Transmission details		
SITE ID:	CT11353C	CTHA653A
[CLUSTER_ID_LABEL]:	[CLUSTER_ID_A]	[CLUSTER_ID_B]
[CALL_SIGN_LABEL]:	[CALL_SIGN_A]	[CALL_SIGN_B]
ASR #:		
AAV_CONTRACT_ID:	CRN14B	TMW01
AAV_CONTRACT_STATUS:	Selected	Selected
Ethernet Installed:	Ethernet	No
Latitude:	41-57- 7.0 N	41-54-16.2 N
Longitude:	72-11-43.0 W	72-07-26.0 W
Azimuth (deg):	131.65 Deg	311.70 Deg
Vertical angle (deg):	0.85 Down	0.80 Up
Elevation:	1082.68 ft	688.98 ft
Antenna model:	VHLP2-11WA	VHLP2-11WA
Antenna manufacturer:	ANDREW CORPORATION	ANDREW CORPORATION
Antenna Id:	207	207
Antenna gain (dBi):	34.70 dBi	34.70 dBi
Antenna diameter:	1.97 ft	1.97 ft
Antenna CL:	158.00 ft AGL	177.00 ft AGL
Diversity Antenna model:		
Diversity Antenna manufacturer:		
Diversity Antenna Id:		
Diversity Antenna gain (dBi):		
Diversity Antenna diameter:		
Diversity Antenna CL:		
Branch Loss Tx/Rx (dB):	4.60/4.60	4.60/4.60
Attenuator Common/Tx/Rx (dB):		
Waveguide #1 Model, Len, Loss(dB):		
Waveguide #2 Model, Len, Loss(dB):		
Waveguide #3 Model, Len, Loss(dB):		
Total Waveguide Loss (dB):		
Other Losses (dB):	0.00	0.00
Frequency (GHz):	11.00 GHz	
Path length:	4.92 mi	
Free space loss (dB):	131.26 dB	
Atmospheric absorption loss (dB):	0.12 dB	
Obstruction Loss (dB):	0.00 dB (cLOS)	
Field margin (dB):	1.00 dB	
Net path loss (dB):	67.57 dB	67.57 dB
Configuration:	4+0/DP/DM	4+0/DP/DM
Radio model:	IP20D-HP11-80X-A_4501	IP20D-HP11-80X-A_4501
Radio manufacturer:	Ceragon Networks	Ceragon Networks
Radio Id:	754	754
Frequency Plan: Frequency (MHz):	High: N/A	Low: N/A
Polarization:	N/A	N/A
Emission designator:	80M0D7W	80M0D7W
Climatic factor:	1.00	

2

1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
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BU #: **876345**
SKY HILL

33 JANOWSKI ROAD
ASHFORD, CT 06278

EXISTING 192'-0" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	06/01/2022	RCD	PRELIMINARY	SS
0	06/08/2022	TJ	100% FINALS	SS

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER

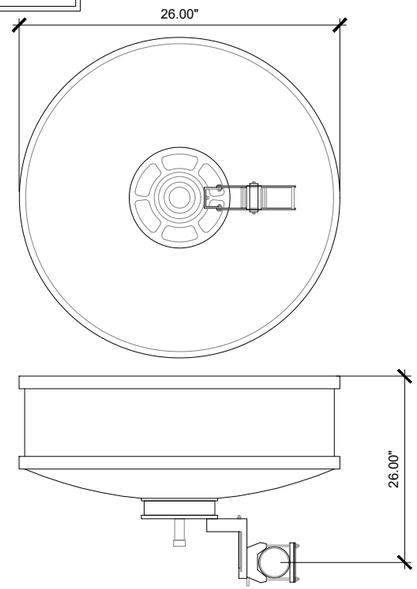
06/08/2022

SHEET NUMBER: C-4
REVISION: 0

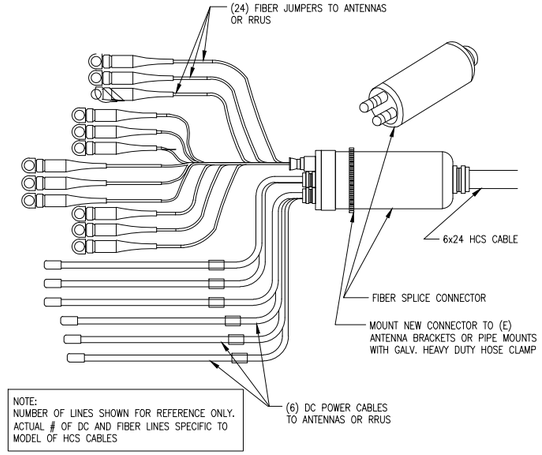
MANUFACTURER: CERAGON
MODEL: IP-20A_RFU-D
HEIGHT: 9.05"
WIDTH: 9.17"
DEPTH: 3.85"
WEIGHT: 14.33 LBS
OPERATING RANGE: -40.5 TO -72 VDC

1 (N) IP-20A_RFU-D ODU SPEC
SCALE: NOT TO SCALE

MANUFACTURER: COMMSCOPE
PART # VHLP2-11W/A
DIAMETER: 26.00"
DEPTH: 26.00"
OFFSET: 9.90"
WEIGHT: 17.60 LBS



2 (N) VHLP2-11W/A DISH SPEC
SCALE: NOT TO SCALE



3 (N) AMPHENOL FIBER OPTIC CABLE DETAIL
SCALE: NOT TO SCALE

4 NOT USED
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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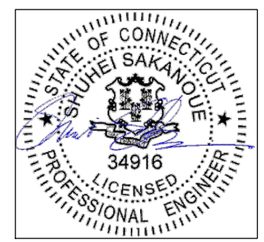


06/08/2022

SHEET NUMBER: C-5
REVISION: 0

T-MOBILE PANEL SCHEDULE

MAIN: 200A MAIN BREAKER			**VOTAGE/PHASE:** 120/240V, 1-PHASE, 3-WIRE						**SHORT CIRCUIT CURRENT RATING:** --		
MOUNTING: INSIDE PPC ENCLOSURE			**ENCLOSURE:** NEMA 3R						**SURGE PROTECTION DEVICE:** YES		
					PHASE LOADS (VA)						
DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	A	B	CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
SURGE	1	C	60	1	181		2	20	C	180	TELCO PLUG
	1	C		3		3001	4	125	C	3000	6102
SITE LIGHT	100	C	15	5	3100		6		C	3000	
BLANK				7		1000	8	20	C	1000	EMERSON
				9	0		10				BLANK
				11		0	12				
				13	0		14				
				15		0	16				
				17	0		18				
				19		0	20				
				21	0		22				
				23		0	24				
BASE LOAD (VA) =					3281	4001					
25% OF CONTINUOUS LOAD (VA) =					2125	2125					
TOTAL LOAD (VA) =					5406	6126					
TOTAL LOAD (A) =					45	51					

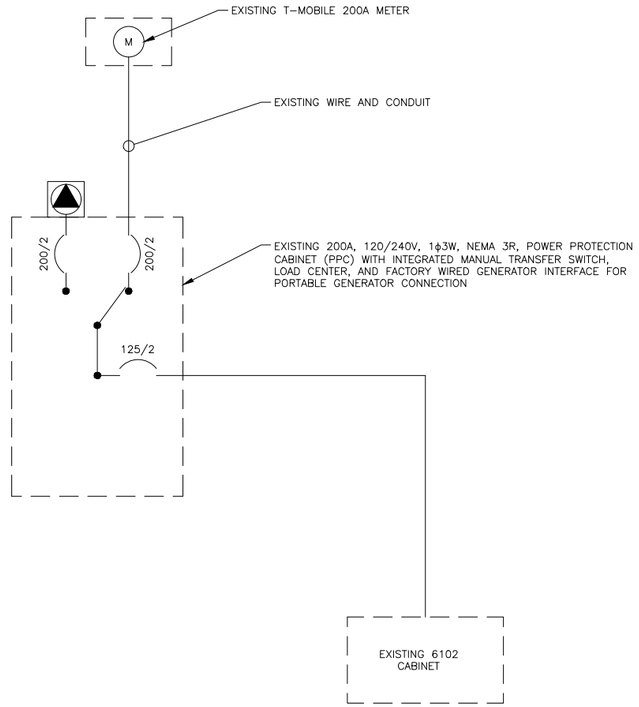
C = CONTINUOUS LOAD; NC = NON-CONTINUOUS LOAD

NEW BREAKER TO BE SAME TYPE AND HAVE SAME AIC RATING AS EXISTING. CUSTOMER HAS NOT PROVIDED LOADS FOR EQUIPMENT CABINETS THEREFORE THE CABINET LOADS SHOWN ARE ESTIMATED VALUES.

1 AC PANEL SCHEDULE
SCALE: NOT TO SCALE

NOTES:

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



2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

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SKY HILL

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ASHFORD, CT 06278

EXISTING 192'-0" SELF SUPPORT TOWER

ISSUED FOR:

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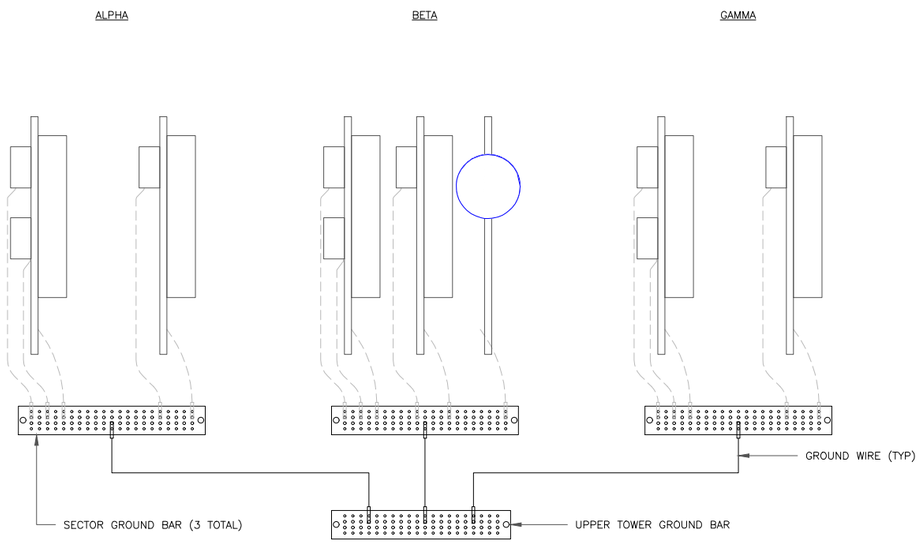
0	06/08/2022	TJ	100% FINALS	SS

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER

06/08/2022

SHEET NUMBER: E-1
REVISION: 0



NOTE:

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

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

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BU #: **876345**
SKY HILL

33 JANOWSKI ROAD
ASHFORD, CT 06278

EXISTING 192'-0" SELF SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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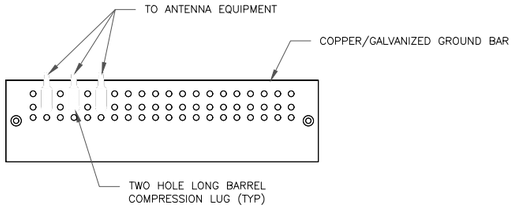
STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER

06/08/2022

SHEET NUMBER: G-1

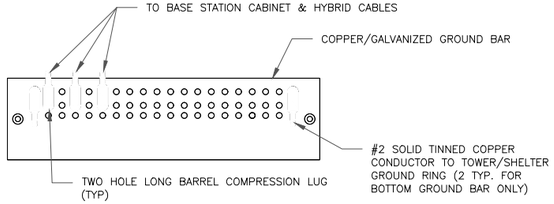
REVISION: 0



NOTES:

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

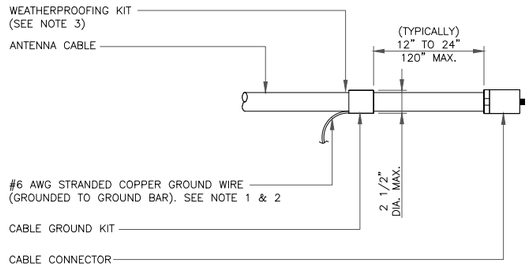
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

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

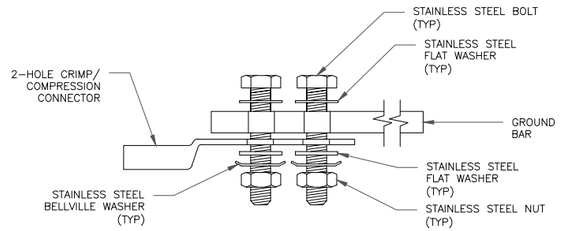
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



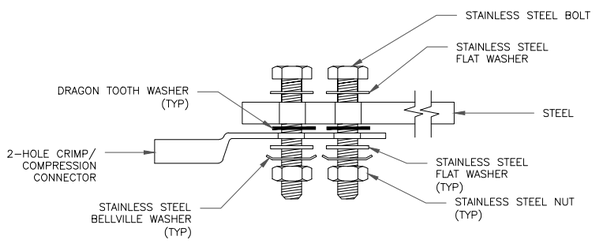
NOTES:

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

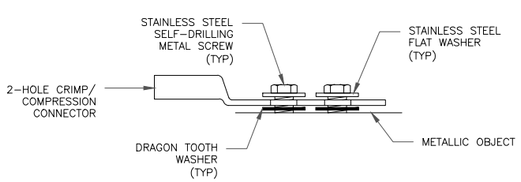
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS



SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

4 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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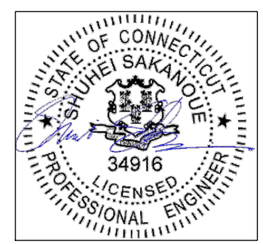

06/08/2022

SHEET NUMBER: G-2

REVISION: 0