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

February 9, 2024

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

RE: **Notice of Exempt Modification for Dish Wireless: NJJER01094A**
Crown Site ID# 841294
230 Guinea Road Monroe, CT 06468
Latitude: 41° 20′ 30.68″ / Longitude: -73° 16′ 28.28″

Dear Ms. Bachman:

Dish Wireless currently maintains Three (3) antennas at the 165-ft mount on the existing 240-ft lattice tower located at 230 Guinea Road, Monroe, CT. The property is owned by the Town of Monroe, and the tower is owned by Crown Castle. Dish Wireless now intends to add one (1) microwave dish and ancillary equipment at the 165-ft 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:

Install New:
(1) Commscope – VHLP2-11W/A – Microwave Dish
(1) Ceragon IP-50C ODU
(1) Power Cable
(1) Fiber Cable

The facility was approved by the Connecticut Siting Council on January 16, 1990.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Terry Rooney, First Selectman, Town of Monroe, Karen Gallagher, Planning & Zoning Administrator, Town of Monroe. Crown Castle is the tower owner and Town of Monroe is the property owner.

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

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

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

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

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

For the foregoing reasons, Dish Wireless 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
Permitting Specialist
1800 W. Park Drive
Westborough, MA 01581
(781) 970-0053
Jeff.Barbadora@crowncastle.com

Attachments
cc:

Terry Rooney, First Selectman
Town of Monroe
7 Fan Hill Road
Monroe, CT 06468
(203) 452-2821

Karen Gallagher, Planning & Zoning Administrator
Town of Monroe
7 Fan Hill Road
Monroe, CT 06468
(203) 452-2809

Crown Castle - Tower Owner

DOCKET NO. 114 - An application of SNET Cellular, Inc., for a Certificate of Environmental Compatibility and Public Need for a cellular telephone tower and associated equipment in the Town of Monroe, Connecticut.	:	Connecticut Siting Council January 16, 1990

DECISION AND ORDER

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

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

1. All SNET cellular antennas shall extend no higher than 252 feet above ground level (AGL). If the Town of Monroe and SNET reach an agreement to place the Town of Monroe's antennas for public radio station WMNR on the tower, then the tower shall be no higher than 260 feet AGL for the attachment of such town antennas; otherwise the tower shall be no higher than 240 feet AGL. Prior to the raising of the tower from 240 feet AGL to 260 feet AGL, notice of such sharing and raising of the tower shall be provided to the Council.

2. The facility shall be constructed in accordance with the State of Connecticut Basic Building Code.

3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies. The D&M plan shall include detailed plans for site preparation including a profile and cross-section of the proposed access road, placement of the proposed tower and equipment building within the leased parcel, and erosion and sedimentation control.

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

5. The Certificate Holder or its successor shall provide the Council a recalculated report of power density if and when additional channels over the proposed 45 channels, higher wattage over the proposed 100 watts per channel, or other circumstances in operation cause a change in power density above the levels originally calculated in the application.

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

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

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

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

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

The parties or intervenors to this proceeding are:

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

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

Metro Mobile CTS of (Intervenor)
Fairfield County, Inc.

Micheal W. Riley (Its Representatives)
Vice-President North East Region
Metro Mobile CTS, Inc.
110 East 59th Street
New York, New York 10022

Philip Mayberry, General Manager
David S. Malko
Metro Mobile CTS of
Fairfield County, Inc.
50 Rockland Road
South Norwalk, Connecticut 06854

Paul M. Hancock, General Partner (Party)
Housatonic Cable Vision Company
2 East Street
P.O. Box 1540
New Milford, Connecticut 06766

Howard L. Slater, Esq. (Its Representative)
Bryne, Slater, Sandler,
Shulman, & Rouse, P.C.
330 Main Street
P.O. Box 3216
Hartford, Connecticut 06103
Attn: Jennifer Young Gaudet, Esq.

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case in Docket 114 or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut the 16 day of January, 1990.

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

230 GUINEA RD

Location	230 GUINEA RD	**Map/Lot**	081/ 008/ 00/ /
Acct#	08100800	**Owner**	MONROE TOWN OF (OPEN SPACE)
Assessment	$16,400	**Appraisal**	$23,400
PID	11950	**Building Count**	1
Survey	1814 C	**Affordable**	

Current Value

Appraisal

Valuation Year	Improvements	Land	Total
2019	$0	$23,400	$23,400

Assessment

Valuation Year	Improvements	Land	Total
2019	$0	$16,400	$16,400

Owner of Record

Owner	MONROE TOWN OF (OPEN SPACE)	**Sale Price**	$0
Co-Owner		**Certificate**	1
Address	7 FAN HILL RD MONROE, CT 06468-1800	**Book & Page**	0297/0119
		Sale Date	10/30/1985
		Instrument	

Ownership History

Ownership History

Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
MONROE TOWN OF (OPEN SPACE)	$0	1	0297/0119		10/30/1985

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0

Building Attributes

Field	Description
Style:	Vacant Land
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Fireplace(s)	
Cndtn	
Wdstv Flues	
Basement Gar.	
Num Park	
Fireplaces	
Attic	
CNS_USRFLD_102	
Accessory Apt	
Fndtn Cndtn	
Basement	

Building Photo

(https://images.vgsi.com/photos/MonroeCTPhotos//default.jpg)

Building Layout

(ParcelSketch.ashx?pid=11950&bid=11950)

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Parcel Information

Use Code	903
Description	Municipal
Deeded Acres	3.02

Land

Land Use

Use Code	903
Description	Municipal
Zone	RF2
Neighborhood	Stepney
Alt Land Approved	No
Category	

Land Line Valuation

Size (Acres)	3.02
Appraised Value	$23,400

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

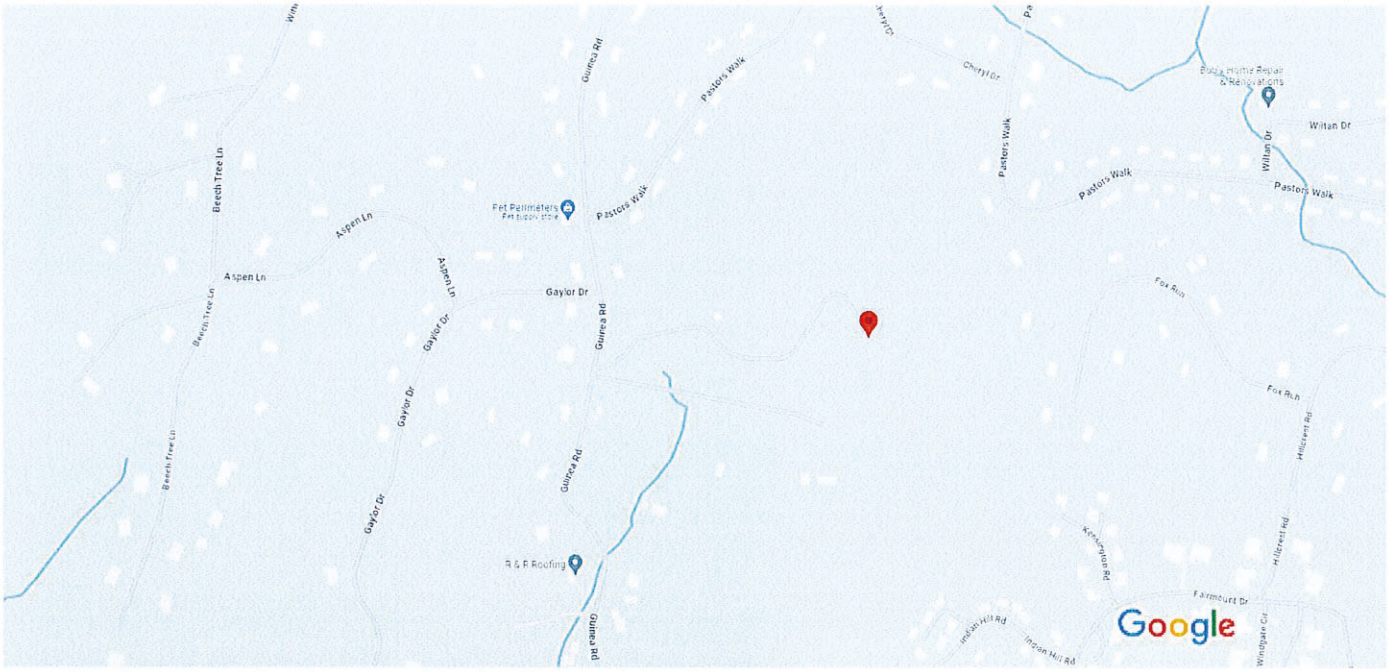
Appraisal

Valuation Year	Improvements	Land	Total
2020	$0	$23,400	$23,400

Assessment

Valuation Year	Improvements	Land	Total
2020	$0	$16,400	$16,400

230 Guinea Rd



Map data ©2024 Google 200 ft

230 Guinea Rd

Building

Directions Save Nearby Send to phone Share

230 Guinea Rd, Monroe, CT 06468

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Monday, February 12, 2024 10:33 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 775132849204: Your package has been delivered

Hi. Your package was delivered Mon, 02/12/2024 at 10:26am.

Delivered to 7 FAN HILL RD, MONROE, CT 06468
Received by M.MORLEY

OBTAIN PROOF OF DELIVERY

How was your delivery ?

TRACKING NUMBER	775132849204
FROM	Crown Castle 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Monroe Terry Rooney, First Selectman 7 Fan Hill Road MONROE, CT, US, 06468
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Fri 2/09/2024 06:17 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	MONROE, CT, US, 06468
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	SOS

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Monday, February 12, 2024 10:34 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 775132968029: Your package has been delivered

Hi. Your package was delivered Mon, 02/12/2024 at 10:26am.

Delivered to 7 FAN HILL RD, MONROE, CT 06468
Received by K.KALAKAY

OBTAIN PROOF OF DELIVERY

How was your delivery ?

TRACKING NUMBER	775132968029
FROM	Crown Castle 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Monroe K. Gallagher, Planning/Zoning Admin 7 Fan Hill Road MONROE, CT, US, 06468
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Fri 2/09/2024 06:17 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	MONROE, CT, US, 06468
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	0.50 LB
SERVICE TYPE	SOS

Date: **November 02, 2023**

MORRISON HERSHFIELD

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***DISH Network* Co-Locate**	
	Site Number:	NJJER01094A
	Site Name:	CT-CCI-T-841294
Crown Castle Designation:	**BU Number:**	841294
	Site Name:	Monroe-Guinea Road
	JDE Job Number:	2103977
	Work Order Number:	2267375
	Order Number:	659187 Rev. 0
Engineering Firm Designation:	**Morrison Hershfield Project Number:** CN12-879 / 2400001	
Site Data:	**230 Guinea Road, Monroe, Fairfield County, CT 06468**	
	Latitude *41° 20' 30.68"*, Longitude *-73° 16' 28.28"*	
	240 Foot – Rohn Self Support Tower	

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

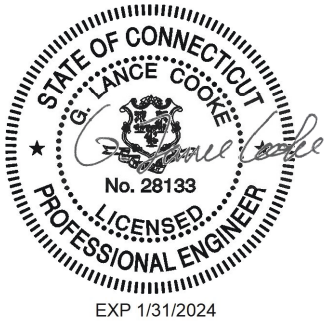
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity- 82.0%**

This analysis utilizes an ultimate 3-second gust wind speed of 117 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 – Analysis Criteria.

Respectfully submitted by:

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



EXP 1/31/2024

Digitally signed by G. Lance Cooke
Date: 2023.11.02 19:16:14+05'30'

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 240 ft Self Support tower designed by Rohn Industries, Inc.

The tower has been modified multiple times to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	117 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1 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)
165.0	165.0	1	Commscope	VHLP2-11W/A	2	1/4
		1	ceragon	IP-50C		

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)
240.0	242.0	1	decibel	DB806-XC	1	1/2
		1	kathrein	FMO		
	240.0	1	-	Side Arm Mount [SO 302-3]		
236.0	236.0	3	powerwave tech.	7770.00	12 4 1	1 5/8 3/4 3/8
		3	cci antennas	HPA-65R-BUU-H6		
		3	cci antennas	OPA65R-BU6D		
		3	cci antennas	DMP65R-BU6D		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 4478 B14		
		3	ericsson	RADIO 4449 B5/B12		
		6	powerwave tech.	LGP13519		
		2	raycap	DC6-48-60-18-8F		
		1	-	Sector Mount [SM 201-3]		
215.0	212.0	3	andrew	LNX-8514DS-A1M w/ Mount Pipe	8	1-5/8
		6	jma wireless	MX06FRO660-03 w/ Mount Pipe		
		3	samsung telecom.	MT6407-77A w/ Mount Pipe		
		2	raycap	RRFDC-3315-PF-48		
		4	kaelus	BSF0020F3V1		
		3	samsung telecom.	RFV01U-D1A		
		3	samsung telecom.	RFV01U-D2A		
	215.0	1	-	Sector Mount [SM 505-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
201.0	207.0	2	kathrein	OG-4	2	1-1/4
	201.0	2	-	Side Arm Mount [SO 306-1]		
186.0	188.0	1	andrew	DB589-A	2 1	7/8 1/2
	186.0	1	-	Side Arm Mount [SO 306-1]		
	184.0	1	andrew	DB589-A		
165.0	165.0	3	jma wireless	MX08FRO665-21 w/ Mount Pipe	1	1-3/4
		3	fujitsu	TA08025-B605		
		3	fujitsu	TA08025-B604		
		1	raycap	RDIDC-9181-PF-48		
		1	-	Commscope MTC3975083 (3)		
12.0	12.0	1	kathrein	TY-840	1	1/2

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	4468666	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	4468667	CCISITES
4-TOWER MANUFACTURER DRAWINGS	4841385	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	4601540	CCISITES
4-POST-MODIFICATION INSPECTION	4601541	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	5306639	CCISITES
4-POST-MODIFICATION INSPECTION	5750961	CCISITES

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	242 - 222	Leg	ROHN 2.5 STD	1	-12.43	66.74	18.6	Pass
T2	222 - 202	Leg	ROHN 3 EH	37	-33.67	116.14	29.0	Pass
T3	202 - 182	Leg	ROHN 3.5 EH	69	-55.53	132.01	42.1	Pass
T4	182 - 162	Leg	ROHN 4 EH	90	-78.90	167.90	47.0	Pass
T5	162 - 142	Leg	ROHN 5 EH	111	-103.89	251.36	41.3	Pass
T6	142 - 122	Leg	ROHN 5 EH	132	-125.77	211.29	59.5	Pass
T7	122 - 102	Leg	ROHN 6 EH	147	-149.55	318.94	46.9	Pass
T8	102 - 82	Leg	ROHN 6 EH	162	-173.34	318.93	54.4	Pass
T9	82 - 62	Leg	ROHN 6 EH	177	-196.57	318.90	61.6	Pass
T10	62 - 42	Leg	ROHN 8 EHS	192	-219.31	405.69	54.1	Pass
T11	42 - 22	Leg	ROHN 8 EHS	207	-223.94	405.62	55.2	Pass
T12	22 - 2	Leg	ROHN 8 EH	240	-243.59	530.71	45.9	Pass
T1	242 - 222	Diagonal	L1 3/4x1 3/4x3/16	11	-2.35	11.69	20.1	Pass
T2	222 - 202	Diagonal	L1 3/4x1 3/4x3/16	47	-3.31	6.76	48.9	Pass
T3	202 - 182	Diagonal	L2 1/2x2 1/2x3/16	71	-3.86	12.60	30.6	Pass
T4	182 - 162	Diagonal	L2 1/2x2 1/2x1/4	92	-4.50	12.50	36.0	Pass
T5	162 - 142	Diagonal	L2 1/2x2 1/2x5/16	113	-5.13	12.08	42.5	Pass
T6	142 - 122	Diagonal	L3x3x5/16	134	-5.89	14.36	41.0	Pass
T7	122 - 102	Diagonal	L3 1/2x3 1/2x1/4	149	-6.57	16.02	41.0	Pass
T8	102 - 82	Diagonal	L3 1/2x3 1/2x1/4	164	-7.08	13.59	52.1	Pass
T9	82 - 62	Diagonal	L4x4x5/16	179	-7.44	21.23	35.1	Pass
T10	62 - 42	Diagonal	L4x4x5/16	194	-7.99	18.36	43.5	Pass
T11	42 - 22	Diagonal	ROHN 3 STD	212	-12.68	33.58	37.8	Pass
T12	22 - 2	Diagonal	ROHN 3 STD	245	-11.98	31.65	37.9	Pass
T11	42 - 22	Horizontal	ROHN 2.5 STD	208	-6.34	16.85	37.7	Pass
T12	22 - 2	Horizontal	ROHN 3 STD	241	-6.73	27.36	24.6	Pass
T1	242 - 222	Top Girt	L2x2x1/8	5	-0.06	4.27	1.4	Pass
T2	222 - 202	Top Girt	L2x2x1/8	42	-0.58	4.29	13.6	Pass
T11	42 - 22	Redund Horz 1 Bracing	ROHN 1.5 TUBE (11ga)	220	-3.89	5.84	66.6	Pass
T12	22 - 2	Redund Horz 1 Bracing	ROHN 1.5 STD	253	-4.23	11.86	35.6	Pass
T11	42 - 22	Redund Diag 1 Bracing	ROHN 1.5 STD	221	-3.55	4.40	80.7	Pass
T12	22 - 2	Redund Diag 1 Bracing	ROHN 2.25 TUBE (14GA)	254	-3.61	4.40	82.0	Pass
T11	42 - 22	Redund Hip 1 Bracing	ROHN 1.5 TUBE (11ga)	233	-0.02	5.19	0.4	Pass
T12	22 - 2	Redund Hip 1 Bracing	ROHN 1.5 STD	266	-0.02	10.66	0.2	Pass
T11	42 - 22	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	234	-0.07	11.09	0.6	Pass
T12	22 - 2	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	267	-0.06	9.97	0.6	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T11	42 - 22	Inner Bracing	ROHN 2 STD	236	-0.01	6.92	0.4	Pass
T12	22 - 2	Inner Bracing	ROHN 3 STD	268	-0.01	25.95	0.3	Pass
				Summary				
				Leg (T9)			61.6	Pass
				Diagonal (T8)			52.1	Pass
				Horizontal (T11)			37.7	Pass
				Top Girt (T2)			13.6	Pass
				Redund Horz 1 Bracing (T11)			66.6	Pass
				Redund Diag 1 Bracing (T12)			82.0	Pass
				Redund Hip 1 Bracing (T11)			0.4	Pass
				Redund Hip Diagonal 1 Bracing (T12)			0.6	Pass
				Inner Bracing (T11)			0.4	Pass
				Bolt Checks			58.5	Pass
				Rating =			82.0	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	35.3	Pass
1	Base Foundation (Structure)	0	43.0	Pass
1	Base Foundation (Soil Interaction)		42.2	Pass

Structure Rating (max from all components) =	82.0%*

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:

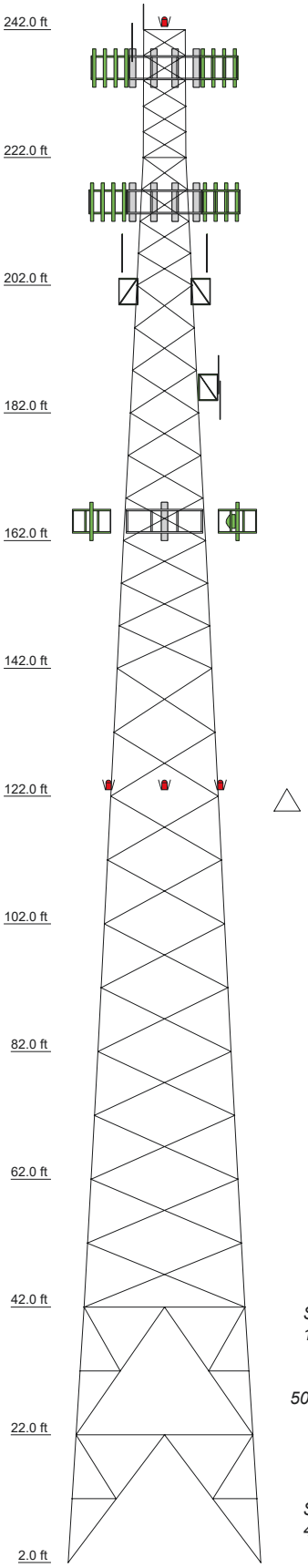
Table 6 - Tilt & Twist Values for Dishes (60 mph Service Wind)

Elevation (ft)	Appurtenance	Deflection (in)	Tilt (°)	Twist (°)
165.0	VHLP2-11W/A	2.288	0.1370	0.0157

APPENDIX A

TNXTOWER OUTPUT

Section	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	ROHN 8 EH	ROHN 8 EHS			ROHN 6 EH		ROHN 5 EH		ROHN 4 EH	ROHN 3.5 EH	ROHN 3 EH	ROHN 2.5 STD
Leg Grade						A572-50						
Diagonals	ROHN 3 STD		L4x4x5/16		L3 1/2x3 1/2x1/4		L3x3x5/16	L2 1/2x2 1/2x5/16	L2 1/2x2 1/2x1/4	L2 1/2x2 1/2x3/16	L1 3/4x1 3/4x3/16	
Diagonal Grade			A572-50			N.A.			A36			
Top Girts												L2x2x1/8
Horizontals	ROHN 3 STD	ROHN 2.5 STD						N.A.				
Red. Horizontals	ROHN 1.5 STD	A						N.A.				
Red. Diagonals	B	ROHN 1.5 STD						N.A.				
Red. Hips	ROHN 1.5 STD	A						N.A.				
Inner Bracing	ROHN 3 STD	ROHN 2 STD						N.A.				
Face Width (ft)	30.1771	27.6771	25.1771	23	20.8646	18.8542	16.8542	14.7708	12.75	10.6771	8.63542	6.60417	6.5625
# Panels @ (ft)		2 @ 20			10 @ 10				9 @ 6.66667		4 @ 5	5 @ 4
Weight (K)	36.8	5.5	4.4	4.8	4.3	3.4	3.3	2.7	2.0	1.5	1.2	0.9



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 1.5 TUBE (11ga)	B	ROHN 2.25 TUBE (14GA)

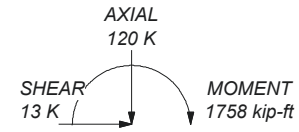
TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 117 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0'
8. TOWER RATING: 82%

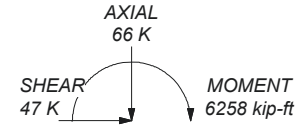
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 261 K
SHEAR: 29 K

UPLIFT: -210 K
SHEAR: 24 K



TORQUE 9 kip-ft
50 mph WIND - 1.0000 in ICE



TORQUE 39 kip-ft
REACTIONS - 117 mph WIND

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

Job: **CN12-879 / 2400001**			
Project: ***841294 / Monroe-Guinea Road***			
Client: Crown Castle USA	Drawn by: PKD	App'd:	
Code: TIA-222-H	Date: 11/02/23	Scale: NTS	
Path:		Dwg No. E-1	

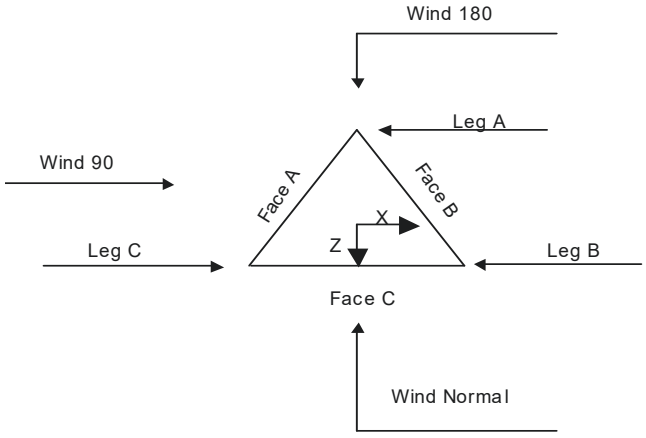
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 242' above the ground line.
The base of the tower is set at an elevation of 2' above the ground line.
The face width of the tower is 6'6-3/4'' at the top and 30'2-1/8'' at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Tower base elevation above sea level: 585'.
Basic wind speed of 117 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0'.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
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	242'-222'			6'6-23/32"	1	20'
T2	222'-202'			6'7-3/16"	1	20'
T3	202'-182'			8'7-11/16"	1	20'
T4	182'-162'			10'8-5/32"	1	20'
T5	162'-142'			12'9"	1	20'
T6	142'-122'			14'9-1/4"	1	20'
T7	122'-102'			16'10-3/16"	1	20'
T8	102'-82'			18'10-3/16"	1	20'
T9	82'-62'			20'10-5/16"	1	20'
T10	62'-42'			23'	1	20'
T11	42'-22'			25'2-5/32"	1	20'
T12	22'-2'			27'8-5/32"	1	20'

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	242'-222'	4'	X Brace	No	No	0.0000	0.0000
T2	222'-202'	5'	X Brace	No	No	0.0000	0.0000
T3	202'-182'	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T4	182'-162'	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T5	162'-142'	6'8-1/32"	X Brace	No	No	0.0000	0.0000
T6	142'-122'	10'	X Brace	No	No	0.0000	0.0000
T7	122'-102'	10'	X Brace	No	No	0.0000	0.0000
T8	102'-82'	10'	X Brace	No	No	0.0000	0.0000
T9	82'-62'	10'	X Brace	No	No	0.0000	0.0000
T10	62'-42'	10'	X Brace	No	No	0.0000	0.0000
T11	42'-22'	20'	K1 Down	No	Yes	0.0000	0.0000
T12	22'-2'	20'	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 242'-222'	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 222'-202'	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 202'-182'	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 182'-162'	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T5 162'-142'	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T6 142'-122'	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T7 122'-102'	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T8 102'-82'	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T9 82'-62'	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A572-50 (50 ksi)
T10 62'-42'	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A572-50 (50 ksi)
T11 42'-22'	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T12 22'-2'	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	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 242'-222'	Equal Angle	L2x2x1/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T2 222'-202'	Equal Angle	L2x2x1/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T11 42'-22'	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T12 22'-2'	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T11 42'-22'	Solid Round		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T12 22'-2'	Solid Round		A36 (36 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T11 42'-22'	A572-50 (50 ksi)	Horizontal (1)	Pipe	ROHN 1.5 TUBE (11ga)	1
		Diagonal (1)	Pipe	ROHN 1.5 STD	1
		Hip (1)	Pipe	ROHN 1.5 TUBE (11ga)	1
		Hip Diagonal (1)	Pipe	ROHN 2.5 STD	1
T12 22'-2'	A572-50 (50 ksi)	Horizontal (1)	Pipe	ROHN 1.5 STD	1
		Diagonal (1)	Pipe	ROHN 2.25 TUBE (14GA)	1
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip Diagonal (1)	Pipe	ROHN 2.5 STD	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 242'-222'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T2 222'-202'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T3 202'-182'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T4 182'-162'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T5 162'-142'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T6 142'-122'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T7 122'-102'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T8 102'-82'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T9 82'-62'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T10 62'-42'	0.00	0.2500	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T11 42'-22'	0.00	0.2500	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T12 22'-2'	0.00	0.2500	A36 (36 ksi)	1	1.03	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 242'-222'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 222'-202'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 202'-182'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 182'-162'	Yes	No	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
				1	1	1	1	1	1	1
T5 162'-142'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 142'-122'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 122'-102'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 102'-82'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 82'-62'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 62'-42'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 42'-22'	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T12 22'-2'	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 242'-222'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 222'-202'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 202'-182'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 182'-162'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 162'-142'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 142'-122'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 122'-102'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 102'-82'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 82'-62'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 62'-42'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 42'-22'	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T12 22'-2'	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

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 242'-222'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 222'-202'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 202'-182'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 182'-162'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 162'-142'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 142'-122'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 122'-102'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 102'-82'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 82'-62'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 62'-42'	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 42'-22'	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T12 22'-2'	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1

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 242'-222'	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 222'-202'	Flange	0.8750 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 202'-182'	Flange	0.8750 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 182'-162'	Flange	1.0000 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 162'-142'	Flange	1.0000 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 142'-122'	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 122'-102'	Flange	1.0000 A325N	6	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 102'-82'	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 82'-62'	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 62'-42'	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 42'-22'	Flange	1.0000 A325N	8	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.0000 A325X	0	0.7500 A325N	2	0.6250 A325X	1
T12 22'-2'	Flange	1.0000 A325N	0	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.0000 A325X	0	0.7500 A325N	2	0.6250 A325X	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	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 242'-222'	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 222'-202'	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 202'-182'	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 182'-162'	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 162'-142'	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 142'-122'	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 122'-102'	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 102'-82'	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 82'-62'	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 62'-42'	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 42'-22'	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	1	0.6250 A325N	1
T12 22'-2'	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	1	0.6250 A325N	1

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A(1-5/8)	A	No	No	Ar (CaAa)	238' - 2'	0.0000	-0.37	12	4	0.5000	1.9800		0.82
FB-L98B-034-XXX(3/8)	A	No	No	Ar (CaAa)	238' - 2'	1.0000	-0.35	1	1	0.3937	0.3937		0.06
WR-VG86ST-BRD(3/4) ***	A	No	No	Ar (CaAa)	238' - 2'	0.0000	-0.35	4	2	0.5000	0.7950		0.58
AVA5-50(7/8)	A	No	No	Ar (CaAa)	188' - 2'	0.0000	-0.43	2	1	0.5000	1.1020		0.30
LDF4-50A(1/2) ***	A	No	No	Ar (CaAa)	188' - 2'	1.0000	-0.43	1	1	0.6250	0.6250		0.15
Feedline Ladder (Af) ***	A	No	No	Af (CaAa)	238' - 2'	0.0000	-0.4	1	1	3.0000	3.0000		8.40
LDF4-50A(1/2) ***	A	No	No	Ar (CaAa)	242' - 2'	0.0000	0.1	1	1	0.5000	0.6250		0.15
CU12PSM6P4XXX(1-3/4) ***	A	No	No	Ar (CaAa)	167' - 2'	0.0000	-0.33	1	1	0.5000	1.7500		2.72
RJF SFTP 5E XXXX(1/4)	B	No	No	Ar (CaAa)	167' - 2'	0.0000	-0.37	1	1	0.5000	0.2800		0.04
CKLCULCU363U8495CBCXXXXM(1/4) ***	B	No	No	Ar (CaAa)	167' - 2'	1.0000	-0.37	1	1	0.5000	0.2560		0.05
LDF6-50A(1-1/4) ***	B	No	No	Ar (CaAa)	203' - 2'	0.0000	0.49	2	2	0.5000	1.5500		0.60
LDF4-50A(1/2) ***	B	No	No	Ar (CaAa)	14' - 2'	0.0000	0.48	1	1	0.6250	0.6250		0.15
AVA7-50(1-5/8)	C	No	No	Ar (CaAa)	217' - 2'	0.0000	-0.4	8	8	0.5000	2.0100		0.70
Feedline Ladder (Af) ***	C	No	No	Af (CaAa)	217' - 2'	0.0000	-0.4	1	1	3.0000	3.0000		8.40
Thin Flat Bar Climbing Ladder	A	No	No	Af (CaAa)	242' - 2'	9.0000	0.5	1	1	2.0000	2.0000		4.00
Safety Line 3/8 ***	A	No	No	Ar (CaAa)	242' - 2'	10.0000	0.5	1	1	0.3750	0.3750		0.22

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	242'-222'	A	0.000	0.000	60.401	0.000	0.42
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	222'-202'	A	0.000	0.000	73.334	0.000	0.50
		B	0.000	0.000	0.310	0.000	0.00
		C	0.000	0.000	31.620	0.000	0.21
T3	202'-182'	A	0.000	0.000	75.031	0.000	0.50
		B	0.000	0.000	6.200	0.000	0.02

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	42.160	0.000	0.28
T4	182'-162'	A	0.000	0.000	79.867	0.000	0.53
		B	0.000	0.000	6.468	0.000	0.02
		C	0.000	0.000	42.160	0.000	0.28
T5	162'-142'	A	0.000	0.000	82.492	0.000	0.57
		B	0.000	0.000	7.272	0.000	0.03
		C	0.000	0.000	42.160	0.000	0.28
T6	142'-122'	A	0.000	0.000	82.492	0.000	0.57
		B	0.000	0.000	7.272	0.000	0.03
		C	0.000	0.000	42.160	0.000	0.28
T7	122'-102'	A	0.000	0.000	82.492	0.000	0.57
		B	0.000	0.000	7.272	0.000	0.03
		C	0.000	0.000	42.160	0.000	0.28
T8	102'-82'	A	0.000	0.000	82.492	0.000	0.57
		B	0.000	0.000	7.272	0.000	0.03
		C	0.000	0.000	42.160	0.000	0.28
T9	82'-62'	A	0.000	0.000	82.492	0.000	0.57
		B	0.000	0.000	7.272	0.000	0.03
		C	0.000	0.000	42.160	0.000	0.28
T10	62'-42'	A	0.000	0.000	82.492	0.000	0.57
		B	0.000	0.000	7.272	0.000	0.03
		C	0.000	0.000	42.160	0.000	0.28
T11	42'-22'	A	0.000	0.000	82.492	0.000	0.57
		B	0.000	0.000	7.272	0.000	0.03
		C	0.000	0.000	42.160	0.000	0.28
T12	22'-2'	A	0.000	0.000	82.492	0.000	0.57
		B	0.000	0.000	8.022	0.000	0.03
		C	0.000	0.000	42.160	0.000	0.28

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	242'-222'	A	1.033	0.000	0.000	77.251	0.000	1.20
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	222'-202'	A	1.024	0.000	0.000	90.982	0.000	1.42
		B		0.000	0.000	0.837	0.000	0.01
		C		0.000	0.000	51.830	0.000	0.65
T3	202'-182'	A	1.014	0.000	0.000	96.484	0.000	1.46
		B		0.000	0.000	16.670	0.000	0.13
		C		0.000	0.000	69.008	0.000	0.86
T4	182'-162'	A	1.003	0.000	0.000	111.503	0.000	1.59
		B		0.000	0.000	18.867	0.000	0.14
		C		0.000	0.000	68.899	0.000	0.85
T5	162'-142'	A	0.990	0.000	0.000	116.532	0.000	1.67
		B		0.000	0.000	25.503	0.000	0.19
		C		0.000	0.000	68.778	0.000	0.85
T6	142'-122'	A	0.976	0.000	0.000	115.852	0.000	1.66
		B		0.000	0.000	25.296	0.000	0.19
		C		0.000	0.000	68.642	0.000	0.84
T7	122'-102'	A	0.960	0.000	0.000	115.072	0.000	1.64
		B		0.000	0.000	25.059	0.000	0.18
		C		0.000	0.000	68.485	0.000	0.83
T8	102'-82'	A	0.942	0.000	0.000	114.155	0.000	1.62
		B		0.000	0.000	24.781	0.000	0.18
		C		0.000	0.000	68.302	0.000	0.82
T9	82'-62'	A	0.919	0.000	0.000	113.038	0.000	1.59
		B		0.000	0.000	24.441	0.000	0.17
		C		0.000	0.000	68.078	0.000	0.81
T10	62'-42'	A	0.890	0.000	0.000	111.596	0.000	1.56
		B		0.000	0.000	24.003	0.000	0.17
		C		0.000	0.000	67.790	0.000	0.79
T11	42'-22'	A	0.847	0.000	0.000	109.530	0.000	1.51
		B		0.000	0.000	23.376	0.000	0.16

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
T12	22'-2'	C	0.768	0.000	0.000	67.377	0.000	0.77
		A		0.000	0.000	105.653	0.000	1.43
		B		0.000	0.000	24.793	0.000	0.16
		C		0.000	0.000	66.603	0.000	0.73

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	242'-222'	-9.0056	0.4600	-9.7428	-1.7003
T2	222'-202'	-1.9588	3.5061	-1.9839	1.7101
T3	202'-182'	1.3027	5.8956	1.4719	4.7817
T4	182'-162'	0.0800	7.1139	-0.7416	5.8641
T5	162'-142'	-0.5589	7.6299	-1.4707	4.9594
T6	142'-122'	-0.5546	8.7464	-1.5371	5.8128
T7	122'-102'	-0.4955	8.8263	-1.4410	6.0573
T8	102'-82'	-0.4726	9.3873	-1.3914	6.5578
T9	82'-62'	-0.4244	9.3264	-1.2610	6.7982
T10	62'-42'	-0.4015	9.6754	-1.1007	7.0273
T11	42'-22'	-0.5590	14.0063	-1.1257	9.1648
T12	22'-2'	0.0113	14.8154	0.6299	10.5966

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	LDF7-50A(1-5/8)	222.00 - 238.00	0.6000	0.6000
T1	2	FB-L98B-034-XXX(3/8)	222.00 - 238.00	0.6000	0.6000
T1	3	WR-VG86ST-BRD(3/4)	222.00 - 238.00	0.6000	0.6000
T1	8	Feedline Ladder (Af)	222.00 - 238.00	0.6000	0.6000
T1	10	LDF4-50A(1/2)	222.00 - 242.00	0.6000	0.6000
T1	26	Thin Flat Bar Climbing Ladder	222.00 - 242.00	0.6000	0.6000
T1	27	Safety Line 3/8	222.00 - 242.00	0.6000	0.6000
T2	1	LDF7-50A(1-5/8)	202.00 - 222.00	0.6000	0.6000
T2	2	FB-L98B-034-XXX(3/8)	202.00 - 222.00	0.6000	0.6000
T2	3	WR-VG86ST-BRD(3/4)	202.00 - 222.00	0.6000	0.6000
T2	8	Feedline Ladder (Af)	202.00 - 222.00	0.6000	0.6000
T2	10	LDF4-50A(1/2)	202.00 - 222.00	0.6000	0.6000
T2	17	LDF6-50A(1-1/4)	202.00 - 203.00	0.6000	0.6000
T2	21	AVA7-50(1-5/8)	202.00 - 217.00	0.6000	0.6000
T2	24	Feedline Ladder (Af)	202.00 - 217.00	0.6000	0.6000
T2	26	Thin Flat Bar Climbing Ladder	202.00 - 222.00	0.6000	0.6000
T2	27	Safety Line 3/8	202.00 - 222.00	0.6000	0.6000
T3	1	LDF7-50A(1-5/8)	182.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	2	FB-L98B-034-XXX(3/8)	202.00 182.00 - 202.00	0.6000	0.6000
T3	3	WR-VG86ST-BRD(3/4)	182.00 - 202.00	0.6000	0.6000
T3	5	AVA5-50(7/8)	182.00 - 188.00	0.6000	0.6000
T3	6	LDF4-50A(1/2)	182.00 - 188.00	0.6000	0.6000
T3	8	Feedline Ladder (Af)	182.00 - 202.00	0.6000	0.6000
T3	10	LDF4-50A(1/2)	182.00 - 202.00	0.6000	0.6000
T3	17	LDF6-50A(1-1/4)	182.00 - 202.00	0.6000	0.6000
T3	21	AVA7-50(1-5/8)	182.00 - 202.00	0.6000	0.6000
T3	24	Feedline Ladder (Af)	182.00 - 202.00	0.6000	0.6000
T3	26	Thin Flat Bar Climbing Ladder	182.00 - 202.00	0.6000	0.6000
T3	27	Safety Line 3/8	182.00 - 202.00	0.6000	0.6000
T4	1	LDF7-50A(1-5/8)	162.00 - 182.00	0.6000	0.6000
T4	2	FB-L98B-034-XXX(3/8)	162.00 - 182.00	0.6000	0.6000
T4	3	WR-VG86ST-BRD(3/4)	162.00 - 182.00	0.6000	0.6000
T4	5	AVA5-50(7/8)	162.00 - 182.00	0.6000	0.6000
T4	6	LDF4-50A(1/2)	162.00 - 182.00	0.6000	0.6000
T4	8	Feedline Ladder (Af)	162.00 - 182.00	0.6000	0.6000
T4	10	LDF4-50A(1/2)	162.00 - 182.00	0.6000	0.6000
T4	12	CU12PSM6P4XXX(1-3/4)	162.00 - 167.00	0.6000	0.6000
T4	14	RJF SFTP 5E XXXX(1/4)	162.00 - 167.00	0.6000	0.6000
T4	15	CKLCULCU363U8495CBC XXXXM(1/4)	162.00 - 167.00	0.6000	0.6000
T4	17	LDF6-50A(1-1/4)	162.00 - 182.00	0.6000	0.6000
T4	21	AVA7-50(1-5/8)	162.00 - 182.00	0.6000	0.6000
T4	24	Feedline Ladder (Af)	162.00 - 182.00	0.6000	0.6000
T4	26	Thin Flat Bar Climbing Ladder	162.00 - 182.00	0.6000	0.6000
T4	27	Safety Line 3/8	162.00 - 182.00	0.6000	0.6000
T5	1	LDF7-50A(1-5/8)	142.00 - 162.00	0.6000	0.6000
T5	2	FB-L98B-034-XXX(3/8)	142.00 - 162.00	0.6000	0.6000
T5	3	WR-VG86ST-BRD(3/4)	142.00 - 162.00	0.6000	0.6000
T5	5	AVA5-50(7/8)	142.00 - 162.00	0.6000	0.6000
T5	6	LDF4-50A(1/2)	142.00 - 162.00	0.6000	0.6000
T5	8	Feedline Ladder (Af)	142.00 - 162.00	0.6000	0.6000
T5	10	LDF4-50A(1/2)	142.00 - 162.00	0.6000	0.6000
T5	12	CU12PSM6P4XXX(1-3/4)	142.00 - 162.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	14	RJF SFTP 5E XXXX(1/4)	142.00 - 162.00	0.6000	0.6000
T5	15	CKLCULCU363U8495CBC XXXXM(1/4)	142.00 - 162.00	0.6000	0.6000
T5	17	LDF6-50A(1-1/4)	142.00 - 162.00	0.6000	0.6000
T5	21	AVA7-50(1-5/8)	142.00 - 162.00	0.6000	0.6000
T5	24	Feedline Ladder (Af)	142.00 - 162.00	0.6000	0.6000
T5	26	Thin Flat Bar Climbing Ladder	142.00 - 162.00	0.6000	0.6000
T5	27	Safety Line 3/8	142.00 - 162.00	0.6000	0.6000
T6	1	LDF7-50A(1-5/8)	122.00 - 142.00	0.6000	0.6000
T6	2	FB-L98B-034-XXX(3/8)	122.00 - 142.00	0.6000	0.6000
T6	3	WR-VG86ST-BRD(3/4)	122.00 - 142.00	0.6000	0.6000
T6	5	AVA5-50(7/8)	122.00 - 142.00	0.6000	0.6000
T6	6	LDF4-50A(1/2)	122.00 - 142.00	0.6000	0.6000
T6	8	Feedline Ladder (Af)	122.00 - 142.00	0.6000	0.6000
T6	10	LDF4-50A(1/2)	122.00 - 142.00	0.6000	0.6000
T6	12	CU12PSM6P4XXX(1-3/4)	122.00 - 142.00	0.6000	0.6000
T6	14	RJF SFTP 5E XXXX(1/4)	122.00 - 142.00	0.6000	0.6000
T6	15	CKLCULCU363U8495CBC XXXXM(1/4)	122.00 - 142.00	0.6000	0.6000
T6	17	LDF6-50A(1-1/4)	122.00 - 142.00	0.6000	0.6000
T6	21	AVA7-50(1-5/8)	122.00 - 142.00	0.6000	0.6000
T6	24	Feedline Ladder (Af)	122.00 - 142.00	0.6000	0.6000
T6	26	Thin Flat Bar Climbing Ladder	122.00 - 142.00	0.6000	0.6000
T6	27	Safety Line 3/8	122.00 - 142.00	0.6000	0.6000
T7	1	LDF7-50A(1-5/8)	102.00 - 122.00	0.6000	0.6000
T7	2	FB-L98B-034-XXX(3/8)	102.00 - 122.00	0.6000	0.6000
T7	3	WR-VG86ST-BRD(3/4)	102.00 - 122.00	0.6000	0.6000
T7	5	AVA5-50(7/8)	102.00 - 122.00	0.6000	0.6000
T7	6	LDF4-50A(1/2)	102.00 - 122.00	0.6000	0.6000
T7	8	Feedline Ladder (Af)	102.00 - 122.00	0.6000	0.6000
T7	10	LDF4-50A(1/2)	102.00 - 122.00	0.6000	0.6000
T7	12	CU12PSM6P4XXX(1-3/4)	102.00 - 122.00	0.6000	0.6000
T7	14	RJF SFTP 5E XXXX(1/4)	102.00 - 122.00	0.6000	0.6000
T7	15	CKLCULCU363U8495CBC XXXXM(1/4)	102.00 - 122.00	0.6000	0.6000
T7	17	LDF6-50A(1-1/4)	102.00 - 122.00	0.6000	0.6000
T7	21	AVA7-50(1-5/8)	102.00 - 122.00	0.6000	0.6000
T7	24	Feedline Ladder (Af)	102.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	26	Thin Flat Bar Climbing Ladder	122.00 102.00 - 122.00	0.6000	0.6000
T7	27	Safety Line 3/8	102.00 - 122.00	0.6000	0.6000
T8	1	LDF7-50A(1-5/8)	82.00 - 102.00	0.6000	0.6000
T8	2	FB-L98B-034-XXX(3/8)	82.00 - 102.00	0.6000	0.6000
T8	3	WR-VG86ST-BRD(3/4)	82.00 - 102.00	0.6000	0.6000
T8	5	AVA5-50(7/8)	82.00 - 102.00	0.6000	0.6000
T8	6	LDF4-50A(1/2)	82.00 - 102.00	0.6000	0.6000
T8	8	Feedline Ladder (Af)	82.00 - 102.00	0.6000	0.6000
T8	10	LDF4-50A(1/2)	82.00 - 102.00	0.6000	0.6000
T8	12	CU12PSM6P4XXX(1-3/4)	82.00 - 102.00	0.6000	0.6000
T8	14	RJF SFTP 5E XXXX(1/4)	82.00 - 102.00	0.6000	0.6000
T8	15	CKLCULCU363U8495CBC XXXXM(1/4)	82.00 - 102.00	0.6000	0.6000
T8	17	LDF6-50A(1-1/4)	82.00 - 102.00	0.6000	0.6000
T8	21	AVA7-50(1-5/8)	82.00 - 102.00	0.6000	0.6000
T8	24	Feedline Ladder (Af)	82.00 - 102.00	0.6000	0.6000
T8	26	Thin Flat Bar Climbing Ladder	82.00 - 102.00	0.6000	0.6000
T8	27	Safety Line 3/8	82.00 - 102.00	0.6000	0.6000
T9	1	LDF7-50A(1-5/8)	62.00 - 82.00	0.6000	0.6000
T9	2	FB-L98B-034-XXX(3/8)	62.00 - 82.00	0.6000	0.6000
T9	3	WR-VG86ST-BRD(3/4)	62.00 - 82.00	0.6000	0.6000
T9	5	AVA5-50(7/8)	62.00 - 82.00	0.6000	0.6000
T9	6	LDF4-50A(1/2)	62.00 - 82.00	0.6000	0.6000
T9	8	Feedline Ladder (Af)	62.00 - 82.00	0.6000	0.6000
T9	10	LDF4-50A(1/2)	62.00 - 82.00	0.6000	0.6000
T9	12	CU12PSM6P4XXX(1-3/4)	62.00 - 82.00	0.6000	0.6000
T9	14	RJF SFTP 5E XXXX(1/4)	62.00 - 82.00	0.6000	0.6000
T9	15	CKLCULCU363U8495CBC XXXXM(1/4)	62.00 - 82.00	0.6000	0.6000
T9	17	LDF6-50A(1-1/4)	62.00 - 82.00	0.6000	0.6000
T9	21	AVA7-50(1-5/8)	62.00 - 82.00	0.6000	0.6000
T9	24	Feedline Ladder (Af)	62.00 - 82.00	0.6000	0.6000
T9	26	Thin Flat Bar Climbing Ladder	62.00 - 82.00	0.6000	0.6000
T9	27	Safety Line 3/8	62.00 - 82.00	0.6000	0.6000
T10	1	LDF7-50A(1-5/8)	42.00 - 62.00	0.6000	0.6000
T10	2	FB-L98B-034-XXX(3/8)	42.00 - 62.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	3	WR-VG86ST-BRD(3/4)	42.00 - 62.00	0.6000	0.6000
T10	5	AVA5-50(7/8)	42.00 - 62.00	0.6000	0.6000
T10	6	LDF4-50A(1/2)	42.00 - 62.00	0.6000	0.6000
T10	8	Feedline Ladder (Af)	42.00 - 62.00	0.6000	0.6000
T10	10	LDF4-50A(1/2)	42.00 - 62.00	0.6000	0.6000
T10	12	CU12PSM6P4XXX(1-3/4)	42.00 - 62.00	0.6000	0.6000
T10	14	RJF SFTP 5E XXXX(1/4)	42.00 - 62.00	0.6000	0.6000
T10	15	CKLCULCU363U8495CBC XXXXM(1/4)	42.00 - 62.00	0.6000	0.6000
T10	17	LDF6-50A(1-1/4)	42.00 - 62.00	0.6000	0.6000
T10	21	AVA7-50(1-5/8)	42.00 - 62.00	0.6000	0.6000
T10	24	Feedline Ladder (Af)	42.00 - 62.00	0.6000	0.6000
T10	26	Thin Flat Bar Climbing Ladder	42.00 - 62.00	0.6000	0.6000
T10	27	Safety Line 3/8	42.00 - 62.00	0.6000	0.6000
T11	1	LDF7-50A(1-5/8)	22.00 - 42.00	0.6000	0.6000
T11	2	FB-L98B-034-XXX(3/8)	22.00 - 42.00	0.6000	0.6000
T11	3	WR-VG86ST-BRD(3/4)	22.00 - 42.00	0.6000	0.6000
T11	5	AVA5-50(7/8)	22.00 - 42.00	0.6000	0.6000
T11	6	LDF4-50A(1/2)	22.00 - 42.00	0.6000	0.6000
T11	8	Feedline Ladder (Af)	22.00 - 42.00	0.6000	0.6000
T11	10	LDF4-50A(1/2)	22.00 - 42.00	0.6000	0.6000
T11	12	CU12PSM6P4XXX(1-3/4)	22.00 - 42.00	0.6000	0.6000
T11	14	RJF SFTP 5E XXXX(1/4)	22.00 - 42.00	0.6000	0.6000
T11	15	CKLCULCU363U8495CBC XXXXM(1/4)	22.00 - 42.00	0.6000	0.6000
T11	17	LDF6-50A(1-1/4)	22.00 - 42.00	0.6000	0.6000
T11	21	AVA7-50(1-5/8)	22.00 - 42.00	0.6000	0.6000
T11	24	Feedline Ladder (Af)	22.00 - 42.00	0.6000	0.6000
T11	26	Thin Flat Bar Climbing Ladder	22.00 - 42.00	0.6000	0.6000
T11	27	Safety Line 3/8	22.00 - 42.00	0.6000	0.6000
T12	1	LDF7-50A(1-5/8)	2.00 - 22.00	0.6000	0.6000
T12	2	FB-L98B-034-XXX(3/8)	2.00 - 22.00	0.6000	0.6000
T12	3	WR-VG86ST-BRD(3/4)	2.00 - 22.00	0.6000	0.6000
T12	5	AVA5-50(7/8)	2.00 - 22.00	0.6000	0.6000
T12	6	LDF4-50A(1/2)	2.00 - 22.00	0.6000	0.6000
T12	8	Feedline Ladder (Af)	2.00 - 22.00	0.6000	0.6000
T12	10	LDF4-50A(1/2)	2.00 - 22.00	0.6000	0.6000
T12	12	CU12PSM6P4XXX(1-3/4)	2.00 - 22.00	0.6000	0.6000
T12	14	RJF SFTP 5E XXXX(1/4)	2.00 - 22.00	0.6000	0.6000
T12	15	CKLCULCU363U8495CBC XXXXM(1/4)	2.00 - 22.00	0.6000	0.6000
T12	17	LDF6-50A(1-1/4)	2.00 - 22.00	0.6000	0.6000
T12	19	LDF4-50A(1/2)	2.00 - 14.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T12	21	AVA7-50(1-5/8)	2.00 - 22.00	0.6000	0.6000
T12	24	Feedline Ladder (Af)	2.00 - 22.00	0.6000	0.6000
T12	26	Thin Flat Bar Climbing Ladder	2.00 - 22.00	0.6000	0.6000
T12	27	Safety Line 3/8	2.00 - 22.00	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
Side Light	A	From Leg	0.50 0' 0'	0.0000	123'	No Ice 1/2" Ice 1" Ice	0.29 0.44 0.54	0.29 0.44 0.54	0.01 0.01 0.02
Side Light	B	From Leg	0.50 0' 0'	0.0000	123'	No Ice 1/2" Ice 1" Ice	0.29 0.44 0.54	0.29 0.44 0.54	0.01 0.01 0.02
Side Light	C	From Leg	0.50 0' 0'	0.0000	123'	No Ice 1/2" Ice 1" Ice	0.29 0.44 0.54	0.29 0.44 0.54	0.01 0.01 0.02
LED Strobe	A	From Leg	0.00 0' 6"	0.0000	242'	No Ice 1/2" Ice 1" Ice	0.42 0.70 0.83	0.42 0.70 0.83	0.03 0.04 0.05
Lightning Rod 5/8" x 4'	C	From Leg	0.00 0' 2'	0.0000	242'	No Ice 1/2" Ice 1" Ice	0.25 0.66 0.97	0.25 0.66 0.97	0.03 0.03 0.04
***									
DB806-XC	C	From Leg	2.00 0' -2'	0.0000	242'	No Ice 1/2" Ice 1" Ice	1.14 1.68 2.03	1.14 1.68 2.03	0.02 0.03 0.04
FMO	C	From Leg	2.00 0' -2'	0.0000	242'	No Ice 1/2" Ice 1" Ice	8.40 8.81 9.24	8.40 8.81 9.24	0.01 0.18 0.36
Side Arm Mount [SO 302-3]	C	None		0.0000	240'	No Ice 1/2" Ice 1" Ice	4.94 7.56 10.33	4.94 7.56 10.33	0.17 0.25 0.37
***									
7770.00	A	From Leg	4.00 0' 0'	0.0000	236'	No Ice 1/2" Ice 1" Ice	3.42 3.80 4.19	1.56 1.91 2.26	0.04 0.07 0.11
7770.00	B	From Leg	4.00 0' 0'	0.0000	236'	No Ice 1/2" Ice 1" Ice	3.42 3.80 4.19	1.56 1.91 2.26	0.04 0.07 0.11
7770.00	C	From Leg	4.00 0' 0'	0.0000	236'	No Ice 1/2" Ice 1" Ice	3.42 3.80 4.19	1.56 1.91 2.26	0.04 0.07 0.11
DMP65R-BU6D	A	From Leg	4.00 0' 0'	0.0000	236'	No Ice 1/2" Ice 1" Ice	11.93 12.68 13.45	4.48 5.12 5.78	0.09 0.16 0.24
DMP65R-BU6D	B	From Leg	4.00 0' 0'	0.0000	236'	No Ice 1/2" Ice 1" Ice	11.93 12.68 13.45	4.48 5.12 5.78	0.09 0.16 0.24
DMP65R-BU6D	C	From Leg	4.00 0' 0'	0.0000	236'	No Ice 1/2" Ice 1" Ice	11.93 12.68 13.45	4.48 5.12 5.78	0.09 0.16 0.24
OPA65R-BU6D	A	From Leg	4.00 0' 0'	0.0000	236'	No Ice 1/2" Ice 1" Ice	12.22 12.98 13.75	4.54 5.19 5.86	0.06 0.14 0.22
OPA65R-BU6D	B	From Leg	4.00 0' 0'	0.0000	236'	No Ice 1/2" Ice 1" Ice	12.22 12.98 13.75	4.54 5.19 5.86	0.06 0.14 0.22
OPA65R-BU6D	C	From Leg	4.00	0.0000	236'	No Ice	12.22	4.54	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'			1/2" Ice	12.98	5.19	0.14
			0'			1" Ice	13.75	5.86	0.22
HPA-65R-BUU-H6	A	From Leg	4.00	0.0000	236'	No Ice	9.22	4.65	0.05
			0'			1/2" Ice	10.00	5.36	0.11
			0'			1" Ice	10.79	6.09	0.17
HPA-65R-BUU-H6	B	From Leg	4.00	0.0000	236'	No Ice	9.22	4.65	0.05
			0'			1/2" Ice	10.00	5.36	0.11
			0'			1" Ice	10.79	6.09	0.17
HPA-65R-BUU-H6	C	From Leg	4.00	0.0000	236'	No Ice	9.22	4.65	0.05
			0'			1/2" Ice	10.00	5.36	0.11
			0'			1" Ice	10.79	6.09	0.17
(2) LGP13519	A	From Leg	4.00	0.0000	236'	No Ice	0.29	0.18	0.01
			0'			1/2" Ice	0.36	0.24	0.01
			0'			1" Ice	0.44	0.31	0.01
(2) LGP13519	B	From Leg	4.00	0.0000	236'	No Ice	0.29	0.18	0.01
			0'			1/2" Ice	0.36	0.24	0.01
			0'			1" Ice	0.44	0.31	0.01
(2) LGP13519	C	From Leg	4.00	0.0000	236'	No Ice	0.29	0.18	0.01
			0'			1/2" Ice	0.36	0.24	0.01
			0'			1" Ice	0.44	0.31	0.01
RRUS 32 B2	A	From Leg	4.00	0.0000	236'	No Ice	2.73	1.67	0.05
			0'			1/2" Ice	2.95	1.86	0.07
			0'			1" Ice	3.18	2.05	0.10
RRUS 32 B2	B	From Leg	4.00	0.0000	236'	No Ice	2.73	1.67	0.05
			0'			1/2" Ice	2.95	1.86	0.07
			0'			1" Ice	3.18	2.05	0.10
RRUS 32 B2	C	From Leg	4.00	0.0000	236'	No Ice	2.73	1.67	0.05
			0'			1/2" Ice	2.95	1.86	0.07
			0'			1" Ice	3.18	2.05	0.10
RRUS 4478 B14	A	From Leg	4.00	0.0000	236'	No Ice	1.84	1.06	0.06
			0'			1/2" Ice	2.01	1.20	0.08
			0'			1" Ice	2.19	1.34	0.09
RRUS 4478 B14	B	From Leg	4.00	0.0000	236'	No Ice	1.84	1.06	0.06
			0'			1/2" Ice	2.01	1.20	0.08
			0'			1" Ice	2.19	1.34	0.09
RRUS 4478 B14	C	From Leg	4.00	0.0000	236'	No Ice	1.84	1.06	0.06
			0'			1/2" Ice	2.01	1.20	0.08
			0'			1" Ice	2.19	1.34	0.09
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	236'	No Ice	0.92	0.92	0.02
			0'			1/2" Ice	1.46	1.46	0.04
			0'			1" Ice	1.64	1.64	0.06
DC6-48-60-18-8F	C	From Leg	4.00	0.0000	236'	No Ice	0.92	0.92	0.02
			0'			1/2" Ice	1.46	1.46	0.04
			0'			1" Ice	1.64	1.64	0.06
RADIO 4449 B5/B12	A	From Leg	4.00	0.0000	236'	No Ice	1.64	1.30	0.07
			0'			1/2" Ice	1.80	1.45	0.09
			0'			1" Ice	1.97	1.60	0.11
RADIO 4449 B5/B12	B	From Leg	4.00	0.0000	236'	No Ice	1.64	1.30	0.07
			0'			1/2" Ice	1.80	1.45	0.09
			0'			1" Ice	1.97	1.60	0.11
RADIO 4449 B5/B12	C	From Leg	4.00	0.0000	236'	No Ice	1.64	1.30	0.07
			0'			1/2" Ice	1.80	1.45	0.09
			0'			1" Ice	1.97	1.60	0.11
8' x 2" Mount Pipe	A	From Leg	4.00	0.0000	236'	No Ice	1.90	1.90	0.03
			0'			1/2" Ice	2.73	2.73	0.04
			0'			1" Ice	3.40	3.40	0.06
8' x 2" Mount Pipe	C	From Leg	4.00	0.0000	236'	No Ice	1.90	1.90	0.03
			0'			1/2" Ice	2.73	2.73	0.04
			0'			1" Ice	3.40	3.40	0.06
Sector Mount [SM 201-3]	C	None		0.0000	236'	No Ice	24.76	24.76	1.08
						1/2" Ice	33.89	33.89	1.52
						1" Ice	43.00	43.00	2.10
***									
LNX-8514DS-A1M w/ Mount Pipe	A	From Leg	4.00	0.0000	212'	No Ice	5.56	4.47	0.08
			0'			1/2" Ice	6.07	4.97	0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'			1" Ice	6.59	5.47	0.26
LNX-8514DS-A1M w/ Mount Pipe	B	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	5.56 6.07	4.47 4.97	0.08 0.17
			0'			1" Ice	6.59	5.47	0.26
LNX-8514DS-A1M w/ Mount Pipe	C	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	5.56 6.07	4.47 4.97	0.08 0.17
			0'			1" Ice	6.59	5.47	0.26
6' x 2" Mount Pipe	A	From Leg	4.00 0'	0.0000	215'	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	0.02 0.03
			0'			1" Ice	2.29	2.29	0.05
6' x 2" Mount Pipe	B	From Leg	4.00 0'	0.0000	215'	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	0.02 0.03
			0'			1" Ice	2.29	2.29	0.05
6' x 2" Mount Pipe	C	From Leg	4.00 0'	0.0000	215'	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	0.02 0.03
			0'			1" Ice	2.29	2.29	0.05
Sector Mount [SM 505-3]	C	None		0.0000	215'	No Ice 1/2" Ice	31.66 44.64	31.66 44.64	1.73 2.36
						1" Ice	57.44	57.44	3.19
***									
MT6407-77A w/ Mount Pipe	A	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	5.94 6.47	3.10 3.55	0.10 0.13
			0'			1" Ice	7.02	4.02	0.18
MT6407-77A w/ Mount Pipe	B	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	5.94 6.47	3.10 3.55	0.10 0.13
			0'			1" Ice	7.02	4.02	0.18
MT6407-77A w/ Mount Pipe	C	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	5.94 6.47	3.10 3.55	0.10 0.13
			0'			1" Ice	7.02	4.02	0.18
(2) MX06FRO660-03 w/ Mount Pipe	A	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	6.54 7.06	5.55 6.05	0.10 0.18
			0'			1" Ice	7.60	6.57	0.28
(2) MX06FRO660-03 w/ Mount Pipe	B	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	6.54 7.06	5.55 6.05	0.10 0.18
			0'			1" Ice	7.60	6.57	0.28
(2) MX06FRO660-03 w/ Mount Pipe	C	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	6.54 7.06	5.55 6.05	0.10 0.18
			0'			1" Ice	7.60	6.57	0.28
RFV01U-D1A	A	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	1.88 2.05	1.25 1.39	0.08 0.10
			0'			1" Ice	2.22	1.54	0.12
RFV01U-D1A	B	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	1.88 2.05	1.25 1.39	0.08 0.10
			0'			1" Ice	2.22	1.54	0.12
RFV01U-D1A	C	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	1.88 2.05	1.25 1.39	0.08 0.10
			0'			1" Ice	2.22	1.54	0.12
BSF0020F3V1	A	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	0.96 1.09	0.29 0.36	0.02 0.02
			0'			1" Ice	1.22	0.45	0.03
(2) BSF0020F3V1	B	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	0.96 1.09	0.29 0.36	0.02 0.02
			0'			1" Ice	1.22	0.45	0.03
BSF0020F3V1	C	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	0.96 1.09	0.29 0.36	0.02 0.02
			0'			1" Ice	1.22	0.45	0.03
RRFDC-3315-PF-48	A	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	3.79 4.04	2.51 2.73	0.03 0.06
			0'			1" Ice	4.30	2.95	0.10
RRFDC-3315-PF-48	B	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	3.79 4.04	2.51 2.73	0.03 0.06
			0'			1" Ice	4.30	2.95	0.10
RFV01U-D2A	A	From Leg	4.00 0'	0.0000	212'	No Ice 1/2" Ice	1.88 2.05	1.01 1.14	0.07 0.09
			0'			1" Ice	2.22	1.28	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RFV01U-D2A	B	From Leg	4.00 0' 0'	0.0000	212'	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	0.07 0.09 0.11
RFV01U-D2A	C	From Leg	4.00 0' 0'	0.0000	212'	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	0.07 0.09 0.11
***									
OG-4	B	From Leg	3.00 0' 0'	0.0000	207'	No Ice 1/2" Ice 1" Ice	4.40 7.14 7.86	4.40 7.14 7.86	0.02 0.06 0.11
OG-4	C	From Leg	3.00 0' 0'	0.0000	207'	No Ice 1/2" Ice 1" Ice	4.40 7.14 7.86	4.40 7.14 7.86	0.02 0.06 0.11
Side Arm Mount [SO 306-1]	B	From Leg	1.50 0' 0'	0.0000	201'	No Ice 1/2" Ice 1" Ice	0.41 0.81 1.23	2.26 3.83 5.48	0.04 0.06 0.09
Side Arm Mount [SO 306-1]	C	From Leg	1.50 0' 0'	0.0000	201'	No Ice 1/2" Ice 1" Ice	0.41 0.81 1.23	2.26 3.83 5.48	0.04 0.06 0.09
***									
DB589-A	B	From Leg	4.00 0' 0'	0.0000	188'	No Ice 1/2" Ice 1" Ice	2.76 4.17 5.59	2.76 4.17 5.59	0.01 0.03 0.06
DB589-A	B	From Leg	4.00 0' 0'	0.0000	184'	No Ice 1/2" Ice 1" Ice	2.76 4.17 5.59	2.76 4.17 5.59	0.01 0.03 0.06
Side Arm Mount [SO 306-1]	B	From Leg	2.00 0' 0'	0.0000	186'	No Ice 1/2" Ice 1" Ice	0.41 0.81 1.23	2.26 3.83 5.48	0.04 0.06 0.09
***									
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	165'	No Ice 1/2" Ice 1" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.11 0.19 0.29
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	165'	No Ice 1/2" Ice 1" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.11 0.19 0.29
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	165'	No Ice 1/2" Ice 1" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.11 0.19 0.29
TA08025-B605	A	From Leg	4.00 0' 0'	0.0000	165'	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
TA08025-B605	B	From Leg	4.00 0' 0'	0.0000	165'	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
TA08025-B605	C	From Leg	4.00 0' 0'	0.0000	165'	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
TA08025-B604	A	From Leg	4.00 0' 0'	0.0000	165'	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
TA08025-B604	B	From Leg	4.00 0' 0'	0.0000	165'	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
TA08025-B604	C	From Leg	4.00 0' 0'	0.0000	165'	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
RDIDC-9181-PF-48	A	From Leg	4.00 0' 0'	0.0000	165'	No Ice 1/2" Ice 1" Ice	2.01 2.19 2.37	1.17 1.31 1.46	0.02 0.04 0.06
(2) 8' x 2" Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	165'	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	0.03 0.04 0.06
(2) 8' x 2" Mount Pipe	B	From Leg	4.00 0'	0.0000	165'	No Ice 1/2" Ice	1.90 2.73	1.90 2.73	0.03 0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'			1" Ice	3.40	3.40	0.06
(2) 8' x 2" Mount Pipe	C	From Leg	4.00	0.0000	165'	No Ice	1.90	1.90	0.03
			0'			1/2" Ice	2.73	2.73	0.04
			0'			1" Ice	3.40	3.40	0.06
Commscope MTC3975083 (3)	C	None		0.0000	165'	No Ice	23.85	23.85	1.26
						1/2" Ice	34.12	34.12	1.80
						1" Ice	44.39	44.39	2.35
***									
IP-50C	B	From Leg	4.00	0.0000	165'	No Ice	1.12	0.37	0.01
			0'			1/2" Ice	1.25	0.46	0.02
			0'			1" Ice	1.39	0.56	0.03
***									
TY-840	B	From Face	1.00	0.0000	12'	No Ice	0.08	0.11	0.00
			0'			1/2" Ice	0.25	0.24	0.01
			0'			1" Ice	0.42	0.37	0.02
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral 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	4.00	18.0000		165'	2.16	No Ice	3.66	0.03
				0'					1/2" Ice	3.95	0.05
				0'					1" Ice	4.23	0.07
***											

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp

Comb. No.	Description
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	242 - 222	Leg	Max Tension	23	9.47	-0.02	0.02
			Max. Compression	18	-12.43	0.04	0.00
			Max. Mx	10	-1.06	-0.73	-0.01
			Max. My	12	-0.36	0.00	0.75
			Max. Vy	6	0.54	-0.34	0.02
			Max. Vx	12	-0.57	0.00	-0.35
		Diagonal	Max Tension	17	2.30	0.00	0.00
			Max. Compression	4	-2.35	0.00	0.00
			Max. Mx	35	0.46	0.01	0.00
			Max. My	14	-1.85	0.00	-0.00
			Max. Vy	35	-0.02	0.01	0.00
			Max. Vx	14	-0.00	0.00	0.00
		Top Girt	Max Tension	23	0.05	0.00	0.00
			Max. Compression	18	-0.06	0.00	0.00
			Max. Mx	26	-0.01	-0.04	0.00
			Max. My	26	-0.01	0.00	0.00
			Max. Vy	26	0.02	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T2	222 - 202	Leg	Max Tension	23	26.40	-0.00	0.00
			Max. Compression	18	-33.67	0.17	0.02
			Max. Mx	6	15.68	0.30	0.00
			Max. My	24	-2.17	-0.03	0.28
			Max. Vy	22	-0.75	-0.19	0.02
			Max. Vx	16	0.68	-0.01	0.06
		Diagonal	Max Tension	4	3.35	0.00	0.00
			Max. Compression	4	-3.36	0.00	0.00
			Max. Mx	35	0.76	0.02	-0.00
			Max. My	38	0.84	0.02	0.00
			Max. Vy	37	0.02	0.02	0.00
			Max. Vx	38	-0.00	0.00	0.00
		Top Girt	Max Tension	7	0.04	0.00	0.00
			Max. Compression	18	-0.05	0.00	0.00
			Max. Mx	26	-0.02	-0.04	0.00
			Max. My	26	-0.01	0.00	0.00
			Max. Vy	26	0.02	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T3	202 - 182	Leg	Max Tension	15	46.16	-0.15	0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	2	-55.53	0.22	-0.04
			Max. Mx	14	45.05	-0.23	0.04
			Max. My	16	-4.59	-0.01	0.31
			Max. Vy	2	0.08	0.18	0.00
			Max. Vx	16	-0.15	-0.01	0.31
		Diagonal	Max Tension	8	3.81	0.00	0.00
			Max. Compression	8	-3.86	0.00	0.00
			Max. Mx	35	0.78	0.04	0.01
			Max. My	31	-1.15	0.03	-0.01
			Max. Vy	33	0.03	0.04	0.01
			Max. Vx	31	0.00	0.00	0.00
T4	182 - 162	Leg	Max Tension	15	65.89	-0.41	0.02
			Max. Compression	2	-78.90	0.66	-0.04
			Max. Mx	22	62.39	-0.70	0.01
			Max. My	16	-6.68	-0.02	0.59
			Max. Vy	22	0.42	-0.70	0.01
			Max. Vx	17	-0.38	-0.01	0.59
		Diagonal	Max Tension	8	4.35	0.00	0.00
			Max. Compression	10	-4.50	0.00	0.00
			Max. Mx	35	0.88	0.06	0.01
			Max. My	37	0.80	0.06	0.01
			Max. Vy	33	0.04	0.06	0.01
			Max. Vx	31	0.00	0.00	0.00
T5	162 - 142	Leg	Max Tension	15	86.71	-0.31	-0.00
			Max. Compression	2	-103.89	0.48	0.00
			Max. Mx	22	69.28	-0.70	0.01
			Max. My	16	-7.03	-0.02	0.59
			Max. Vy	22	-0.13	-0.70	0.01
			Max. Vx	4	-0.10	-0.04	-0.59
		Diagonal	Max Tension	8	5.13	0.00	0.00
			Max. Compression	8	-5.13	0.00	0.00
			Max. Mx	33	1.12	0.09	-0.01
			Max. My	37	-1.14	0.08	0.01
			Max. Vy	33	0.05	0.09	-0.01
			Max. Vx	37	-0.00	0.00	0.00
T6	142 - 122	Leg	Max Tension	15	105.27	-0.34	-0.00
			Max. Compression	2	-125.77	0.50	0.00
			Max. Mx	2	-125.77	0.50	0.00
			Max. My	12	-9.97	-0.04	-0.59
			Max. Vy	3	-0.10	0.50	0.00
			Max. Vx	10	-0.13	-0.21	-0.55
		Diagonal	Max Tension	8	5.86	0.00	0.00
			Max. Compression	8	-5.89	0.00	0.00
			Max. Mx	33	1.26	0.15	0.02
			Max. My	31	1.30	0.15	-0.02
			Max. Vy	33	0.07	0.15	0.02
			Max. Vx	31	0.00	0.00	0.00
T7	122 - 102	Leg	Max Tension	15	125.07	-0.56	-0.00
			Max. Compression	2	-149.55	0.64	-0.00
			Max. Mx	2	-149.55	0.64	-0.00
			Max. My	12	-11.25	-0.05	-0.65
			Max. Vy	6	0.11	-0.56	-0.02
			Max. Vx	10	0.14	-0.33	-0.59
		Diagonal	Max Tension	8	6.38	0.00	0.00
			Max. Compression	10	-6.57	0.00	0.00
			Max. Mx	33	1.34	0.18	0.02
			Max. My	37	-1.78	0.17	0.02
			Max. Vy	33	0.08	0.18	0.02
			Max. Vx	37	-0.00	0.00	0.00
T8	102 - 82	Leg	Max Tension	15	144.60	-0.48	-0.00
			Max. Compression	2	-173.34	0.96	0.00
			Max. Mx	2	-173.34	0.96	0.00
			Max. My	12	-13.46	-0.08	-0.73
			Max. Vy	2	-0.14	0.96	0.00
			Max. Vx	10	-0.13	-0.31	-0.66
		Diagonal	Max Tension	8	6.77	0.00	0.00
			Max. Compression	10	-7.08	0.00	0.00
			Max. Mx	33	1.36	0.22	0.03
			Max. My	31	1.08	0.21	-0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	33	0.09	0.22	0.03
			Max. Vx	31	0.00	0.00	0.00
T9	82 - 62	Leg	Max Tension	15	162.94	-0.41	-0.00
			Max. Compression	2	-196.57	0.99	0.00
			Max. Mx	2	-196.57	0.99	0.00
			Max. My	12	-14.96	-0.12	-1.02
			Max. Vy	2	-0.15	0.99	0.00
			Max. Vx	12	-0.20	-0.12	-1.02
		Diagonal	Max Tension	8	7.08	0.00	0.00
			Max. Compression	10	-7.44	0.00	0.00
			Max. Mx	33	1.33	0.33	0.04
			Max. My	31	1.02	0.33	-0.04
			Max. Vy	33	0.13	0.33	0.04
			Max. Vx	31	0.01	0.00	0.00
T10	62 - 42	Leg	Max Tension	15	180.33	-1.21	-0.00
			Max. Compression	2	-219.31	-1.88	-0.01
			Max. Mx	2	-219.31	-1.88	-0.01
			Max. My	12	-18.40	-0.44	-2.36
			Max. Vy	2	0.39	1.19	-0.01
			Max. Vx	12	0.27	-0.05	-1.67
		Diagonal	Max Tension	8	7.54	0.00	0.00
			Max. Compression	10	-7.99	0.00	0.00
			Max. Mx	34	1.48	0.38	0.05
			Max. My	32	1.45	0.38	-0.05
			Max. Vy	34	0.14	0.38	0.05
			Max. Vx	32	0.01	0.00	0.00
T11	42 - 22	Leg	Max Tension	15	182.91	1.11	-0.00
			Max. Compression	2	-223.94	-6.55	0.02
			Max. Mx	2	-223.60	7.63	-0.02
			Max. My	24	-19.52	-0.99	3.51
			Max. Vy	2	1.46	7.63	-0.02
			Max. Vx	24	-0.59	-0.99	3.51
		Diagonal	Max Tension	9	11.18	-0.16	0.08
			Max. Compression	10	-12.68	0.00	0.00
			Max. Mx	14	10.07	-0.21	0.07
			Max. My	20	-11.78	0.01	-0.09
			Max. Vy	33	0.06	-0.16	0.01
			Max. Vx	20	-0.01	0.01	-0.09
		Horizontal	Max Tension	8	6.22	0.00	0.00
			Max. Compression	11	-6.34	0.00	0.00
			Max. Mx	33	0.07	-0.25	-0.00
			Max. My	2	0.24	-0.11	0.01
			Max. Vy	33	0.09	-0.25	-0.00
			Max. Vx	2	0.00	-0.11	0.01
		Redund Horz 1 Bracing	Max Tension	12	1.56	0.00	0.00
			Max. Compression	13	-1.30	0.00	0.00
			Max. Mx	26	0.21	0.02	0.00
			Max. Vy	26	-0.01	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	24	1.33	0.00	0.00
			Max. Compression	16	-1.35	0.00	0.00
			Max. Mx	26	0.07	0.05	0.00
			Max. Vy	26	0.02	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	19	0.01	0.00	0.00
			Max. Compression	8	-0.02	0.00	0.00
			Max. Mx	26	-0.01	0.02	0.00
			Max. Vy	26	-0.01	0.00	0.00
		Redund Hip Diagonal 1 Bracing	Max Tension	31	0.06	0.00	0.00
			Max. Compression	37	-0.07	0.00	0.00
			Max. Mx	26	0.05	0.24	0.00
			Max. Vy	26	-0.06	0.00	0.00
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	33	-0.01	0.00	0.00
			Max. Mx	26	-0.01	0.16	0.00
			Max. Vy	26	0.05	0.00	0.00
T12	22 - 2	Leg	Max Tension	15	197.07	4.74	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	2	-243.59	0.00	-0.00
			Max. Mx	2	-243.12	6.65	-0.03
			Max. My	24	-20.83	-0.99	3.51
			Max. Vy	2	-1.36	6.65	-0.03
			Max. Vx	24	0.57	-0.99	3.51
		Diagonal	Max Tension	9	10.62	-0.14	0.06
			Max. Compression	10	-11.98	0.00	0.00
			Max. Mx	22	7.68	-0.19	0.04
			Max. My	20	-11.30	-0.04	-0.07
			Max. Vy	33	0.06	-0.17	0.01
			Max. Vx	20	-0.01	0.00	0.00
		Horizontal	Max Tension	9	6.22	0.00	0.00
			Max. Compression	10	-6.73	0.00	0.00
			Max. Mx	33	-0.32	-0.32	-0.00
			Max. My	2	0.74	-0.18	0.02
			Max. Vy	33	-0.12	-0.32	-0.00
			Max. Vx	2	-0.00	-0.18	0.02
		Redund Horz 1 Bracing	Max Tension	12	1.22	0.00	0.00
			Max. Compression	13	-1.03	0.00	0.00
			Max. Mx	26	0.15	0.04	0.00
			Max. Vy	26	-0.02	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	24	1.04	0.00	0.00
			Max. Compression	11	-0.95	0.00	0.00
			Max. Mx	26	0.14	0.05	0.00
			Max. Vy	26	-0.02	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	21	0.01	0.00	0.00
			Max. Compression	8	-0.02	0.00	0.00
			Max. Mx	26	-0.01	0.04	0.00
			Max. Vy	26	-0.02	0.00	0.00
		Redund Hip Diagonal 1 Bracing	Max Tension	31	0.05	0.00	0.00
			Max. Compression	37	-0.06	0.00	0.00
			Max. Mx	26	0.05	0.26	0.00
			Max. Vy	26	-0.07	0.00	0.00
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	32	-0.01	0.00	0.00
			Max. Mx	26	-0.01	0.32	0.00
			Max. Vy	26	-0.09	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	252.64	24.52	-13.71
	Max. H_x	18	252.64	24.52	-13.71
	Max. H_z	5	-180.22	-17.64	11.64
	Min. Vert	7	-197.78	-20.04	11.15
	Min. H_x	7	-197.78	-20.04	11.15
	Min. H_z	18	252.64	24.52	-13.71
Leg B	Max. Vert	10	253.90	-24.93	-13.50
	Max. H_x	23	-201.81	20.50	10.99
	Max. H_z	25	-183.84	17.90	11.73
	Min. Vert	23	-201.81	20.50	10.99
	Min. H_x	10	253.90	-24.93	-13.50
	Min. H_z	10	253.90	-24.93	-13.50
Leg A	Max. Vert	2	261.27	-0.04	29.42
	Max. H_x	21	16.16	2.58	1.49
	Max. H_z	2	261.27	-0.04	29.42
	Min. Vert	15	-210.50	0.02	-24.33
	Min. H_x	8	20.66	-2.61	1.90
	Min. H_z	15	-210.50	0.02	-24.33

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	55.23	0.00	-0.00	24.17	18.82	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	66.28	-0.06	-46.58	-6250.73	32.56	-1.48
0.9 Dead+1.0 Wind 0 deg - No Ice	49.71	-0.06	-46.58	-6257.98	26.92	-1.48
1.2 Dead+1.0 Wind 30 deg - No Ice	66.28	22.05	-38.35	-5154.63	-2952.81	23.35
0.9 Dead+1.0 Wind 30 deg - No Ice	49.71	22.05	-38.35	-5161.88	-2958.45	23.35
1.2 Dead+1.0 Wind 60 deg - No Ice	66.28	35.78	-20.67	-2787.58	-4849.26	19.66
0.9 Dead+1.0 Wind 60 deg - No Ice	49.71	35.78	-20.67	-2794.83	-4854.91	19.66
1.2 Dead+1.0 Wind 90 deg - No Ice	66.28	40.83	0.05	37.38	-5561.55	24.99
0.9 Dead+1.0 Wind 90 deg - No Ice	49.71	40.83	0.05	30.13	-5567.20	24.99
1.2 Dead+1.0 Wind 120 deg - No Ice	66.28	38.65	22.39	3070.33	-5222.71	39.29
0.9 Dead+1.0 Wind 120 deg - No Ice	49.71	38.65	22.39	3063.08	-5228.36	39.29
1.2 Dead+1.0 Wind 150 deg - No Ice	66.28	22.31	38.69	5264.45	-2993.48	27.23
0.9 Dead+1.0 Wind 150 deg - No Ice	49.71	22.31	38.69	5257.20	-2999.13	27.23
1.2 Dead+1.0 Wind 180 deg - No Ice	66.28	0.05	43.68	5941.41	14.53	1.57
0.9 Dead+1.0 Wind 180 deg - No Ice	49.71	0.05	43.68	5934.16	8.89	1.57
1.2 Dead+1.0 Wind 210 deg - No Ice	66.28	-22.06	38.35	5212.04	2999.52	-23.39
0.9 Dead+1.0 Wind 210 deg - No Ice	49.71	-22.06	38.35	5204.79	2993.88	-23.39
1.2 Dead+1.0 Wind 240 deg - No Ice	66.28	-38.27	22.11	3027.78	5209.24	-19.63
0.9 Dead+1.0 Wind 240 deg - No Ice	49.71	-38.27	22.11	3020.53	5203.59	-19.63
1.2 Dead+1.0 Wind 270 deg - No Ice	66.28	-40.85	-0.07	17.98	5609.18	-24.89
0.9 Dead+1.0 Wind 270 deg - No Ice	49.71	-40.85	-0.07	10.73	5603.54	-24.89
1.2 Dead+1.0 Wind 300 deg - No Ice	66.28	-36.18	-20.97	-2833.25	4955.64	-39.21
0.9 Dead+1.0 Wind 300 deg - No Ice	49.71	-36.18	-20.97	-2840.50	4949.99	-39.21
1.2 Dead+1.0 Wind 330 deg - No Ice	66.28	-22.32	-38.71	-5209.70	3041.45	-27.15
0.9 Dead+1.0 Wind 330 deg - No Ice	49.71	-22.32	-38.71	-5216.95	3035.81	-27.15
1.2 Dead+1.0 Ice+1.0 Temp	120.12	0.00	-0.00	77.43	51.31	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	120.12	-0.01	-12.94	-1662.86	52.49	-0.78
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	120.12	6.13	-10.67	-1362.93	-775.57	3.04
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	120.12	10.06	-5.82	-714.47	-1315.24	2.95
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	120.12	11.45	0.01	78.27	-1510.37	5.27
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	120.12	10.45	6.06	900.48	-1367.70	9.31
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	120.12	6.13	10.64	1518.12	-776.96	7.61
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	120.12	0.00	12.45	1757.00	50.54	0.80
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	120.12	-6.13	10.66	1517.67	878.52	-3.05

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	120.12	-10.47	6.06	899.39	1469.76	-2.94
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	120.12	-11.45	-0.01	76.03	1613.52	-5.25
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	120.12	-10.04	-5.82	-716.21	1418.97	-9.29
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	120.12	-6.13	-10.65	-1363.94	880.17	-7.59
Dead+Wind 0 deg - Service	55.23	-0.02	-13.28	-1745.33	21.58	-0.42
Dead+Wind 30 deg - Service	55.23	6.30	-10.95	-1437.73	-820.40	6.51
Dead+Wind 60 deg - Service	55.23	10.24	-5.92	-771.09	-1356.77	5.52
Dead+Wind 90 deg - Service	55.23	11.69	0.01	26.49	-1558.12	7.01
Dead+Wind 120 deg - Service	55.23	11.03	6.39	881.64	-1460.15	10.96
Dead+Wind 150 deg - Service	55.23	6.37	11.04	1500.41	-831.66	7.59
Dead+Wind 180 deg - Service	55.23	0.01	12.48	1691.98	16.59	0.44
Dead+Wind 210 deg - Service	55.23	-6.30	10.95	1485.91	858.46	-6.52
Dead+Wind 240 deg - Service	55.23	-10.93	6.31	869.86	1481.56	-5.51
Dead+Wind 270 deg - Service	55.23	-11.69	-0.02	21.12	1596.44	-6.98
Dead+Wind 300 deg - Service	55.23	-10.35	-6.00	-783.73	1411.35	-10.94
Dead+Wind 330 deg - Service	55.23	-6.37	-11.05	-1452.98	870.07	-7.57

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-55.23	0.00	-0.00	55.23	0.00	0.000%
2	-0.06	-66.28	-46.58	0.06	66.28	46.58	0.000%
3	-0.06	-49.71	-46.58	0.06	49.71	46.58	0.000%
4	22.05	-66.28	-38.35	-22.05	66.28	38.35	0.000%
5	22.05	-49.71	-38.35	-22.05	49.71	38.35	0.000%
6	35.78	-66.28	-20.67	-35.78	66.28	20.67	0.000%
7	35.78	-49.71	-20.67	-35.78	49.71	20.67	0.000%
8	40.83	-66.28	0.05	-40.83	66.28	-0.05	0.000%
9	40.83	-49.71	0.05	-40.83	49.71	-0.05	0.000%
10	38.65	-66.28	22.39	-38.65	66.28	-22.39	0.000%
11	38.65	-49.71	22.39	-38.65	49.71	-22.39	0.000%
12	22.31	-66.28	38.69	-22.31	66.28	-38.69	0.000%
13	22.31	-49.71	38.69	-22.31	49.71	-38.69	0.000%
14	0.05	-66.28	43.68	-0.05	66.28	-43.68	0.000%
15	0.05	-49.71	43.68	-0.05	49.71	-43.68	0.000%
16	-22.06	-66.28	38.35	22.06	66.28	-38.35	0.000%
17	-22.06	-49.71	38.35	22.06	49.71	-38.35	0.000%
18	-38.27	-66.28	22.11	38.27	66.28	-22.11	0.000%
19	-38.27	-49.71	22.11	38.27	49.71	-22.11	0.000%
20	-40.85	-66.28	-0.07	40.85	66.28	0.07	0.000%
21	-40.85	-49.71	-0.07	40.85	49.71	0.07	0.000%
22	-36.18	-66.28	-20.97	36.18	66.28	20.97	0.000%
23	-36.18	-49.71	-20.97	36.18	49.71	20.97	0.000%
24	-22.32	-66.28	-38.71	22.32	66.28	38.71	0.000%
25	-22.32	-49.71	-38.71	22.32	49.71	38.71	0.000%
26	0.00	-120.12	0.00	-0.00	120.12	0.00	0.000%
27	-0.01	-120.12	-12.94	0.01	120.12	12.94	0.000%
28	6.13	-120.12	-10.67	-6.13	120.12	10.67	0.000%
29	10.06	-120.12	-5.82	-10.06	120.12	5.82	0.000%
30	11.45	-120.12	0.01	-11.45	120.12	-0.01	0.000%
31	10.45	-120.12	6.06	-10.45	120.12	-6.06	0.000%
32	6.13	-120.12	10.64	-6.13	120.12	-10.64	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
33	0.00	-120.12	12.45	-0.00	120.12	-12.45	0.000%
34	-6.13	-120.12	10.66	6.13	120.12	-10.66	0.000%
35	-10.47	-120.12	6.06	10.47	120.12	-6.06	0.000%
36	-11.45	-120.12	-0.01	11.45	120.12	0.01	0.000%
37	-10.04	-120.12	-5.82	10.04	120.12	5.82	0.000%
38	-6.13	-120.12	-10.65	6.13	120.12	10.65	0.000%
39	-0.02	-55.23	-13.28	0.02	55.23	13.28	0.000%
40	6.30	-55.23	-10.95	-6.30	55.23	10.95	0.000%
41	10.24	-55.23	-5.92	-10.24	55.23	5.92	0.000%
42	11.69	-55.23	0.01	-11.69	55.23	-0.01	0.000%
43	11.03	-55.23	6.39	-11.03	55.23	-6.39	0.000%
44	6.37	-55.23	11.04	-6.37	55.23	-11.04	0.000%
45	0.01	-55.23	12.48	-0.01	55.23	-12.48	0.000%
46	-6.30	-55.23	10.95	6.30	55.23	-10.95	0.000%
47	-10.93	-55.23	6.31	10.93	55.23	-6.31	0.000%
48	-11.69	-55.23	-0.02	11.69	55.23	0.02	0.000%
49	-10.35	-55.23	-6.00	10.35	55.23	6.00	0.000%
50	-6.37	-55.23	-11.05	6.37	55.23	11.05	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	242 - 222	5.217	39	0.2047	0.0313
T2	222 - 202	4.363	39	0.1963	0.0273
T3	202 - 182	3.554	39	0.1793	0.0223
T4	182 - 162	2.828	39	0.1569	0.0183
T5	162 - 142	2.199	39	0.1338	0.0153
T6	142 - 122	1.656	39	0.1147	0.0129
T7	122 - 102	1.203	39	0.0935	0.0111
T8	102 - 82	0.823	39	0.0773	0.0092
T9	82 - 62	0.511	39	0.0602	0.0072
T10	62 - 42	0.278	39	0.0423	0.0058
T11	42 - 22	0.113	39	0.0267	0.0044
T12	22 - 2	0.031	39	0.0114	0.0021

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
242'	LED Strobe	39	5.217	0.2047	0.0313	376586
240'	Side Arm Mount [SO 302-3]	39	5.131	0.2041	0.0310	376586
236'	7770.00	39	4.959	0.2027	0.0302	313822
215'	6' x 2" Mount Pipe	39	4.073	0.1914	0.0256	74868
212'	LNX-8514DS-A1M w/ Mount Pipe	39	3.950	0.1889	0.0249	68461
207'	OG-4	39	3.750	0.1843	0.0236	59863
201'	Side Arm Mount [SO 306-1]	39	3.515	0.1782	0.0221	52946
188'	DB589-A	39	3.035	0.1639	0.0194	46758
186'	Side Arm Mount [SO 306-1]	39	2.965	0.1616	0.0190	45971
184'	DB589-A	39	2.896	0.1592	0.0186	45376
165'	VHLP2-11W/A	39	2.288	0.1370	0.0157	57339
123'	Side Light	39	1.223	0.0945	0.0112	64267
12'	TY-840	39	0.012	0.0053	0.0010	190574

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	242 - 222	18.836	3	0.7340	0.1107
T2	222 - 202	15.747	3	0.7069	0.0962
T3	202 - 182	12.817	3	0.6480	0.0786
T4	182 - 162	10.189	3	0.5676	0.0647
T5	162 - 142	7.917	3	0.4838	0.0543
T6	142 - 122	5.956	3	0.4145	0.0458
T7	122 - 102	4.318	3	0.3376	0.0394
T8	102 - 82	2.951	3	0.2788	0.0325
T9	82 - 62	1.827	3	0.2170	0.0256
T10	62 - 42	0.988	3	0.1527	0.0205
T11	42 - 22	0.395	2	0.0963	0.0155
T12	22 - 2	0.107	2	0.0412	0.0072

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
242'	LED Strobe	3	18.836	0.7340	0.1107	114766
240'	Side Arm Mount [SO 302-3]	3	18.524	0.7320	0.1093	114766
236'	7770.00	3	17.902	0.7278	0.1066	95638
215'	6' x 2" Mount Pipe	3	14.695	0.6900	0.0901	21775
212'	LNX-8514DS-A1M w/ Mount Pipe	3	14.252	0.6814	0.0874	19718
207'	OG-4	3	13.526	0.6655	0.0829	17037
201'	Side Arm Mount [SO 306-1]	3	12.677	0.6444	0.0778	14946
188'	DB589-A	3	10.940	0.5931	0.0684	13176
186'	Side Arm Mount [SO 306-1]	3	10.686	0.5847	0.0671	12953
184'	DB589-A	3	10.435	0.5762	0.0659	12769
165'	VHLP2-11W/A	3	8.237	0.4953	0.0557	16008
123'	Side Light	3	4.393	0.3412	0.0397	17731
12'	TY-840	2	0.042	0.0192	0.0034	52948

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	242	Leg	A325N	0.7500	4	2.37	30.10	0.079	1.05	Bolt Tension
		Diagonal	A325N	0.5000	1	2.30	6.20	0.371	1.05	Member Bearing
		Top Girt	A325N	0.5000	1	0.05	4.13	0.013	1.05	Member Bearing
T2	222	Leg	A325N	0.8750	4	6.59	41.56	0.159	1.05	Bolt Tension
		Diagonal	A325N	0.5000	1	3.35	6.20	0.540	1.05	Member Bearing
		Top Girt	A325N	0.5000	1	0.58	4.13	0.141	1.05	Member Bearing
T3	202	Leg	A325N	0.8750	4	11.54	41.56	0.278	1.05	Bolt Tension
		Diagonal	A325N	0.5000	1	3.81	6.20	0.615	1.05	Member Bearing
T4	182	Leg	A325N	1.0000	4	16.47	54.52	0.302	1.05	Bolt Tension
		Diagonal	A325X	0.5000	1	4.35	8.27	0.526	1.05	Member Bearing
T5	162	Leg	A325N	1.0000	4	21.68	54.52	0.398	1.05	Bolt Tension
		Diagonal	A325X	0.5000	1	5.13	11.04	0.465	1.05	Bolt Shear
T6	142	Leg	A325N	1.0000	6	17.54	54.52	0.322	1.05	Bolt Tension
		Diagonal	A325N	0.6250	1	5.89	13.81	0.427	1.05	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T7	122	Leg	A325N	1.0000	6	20.85	54.52	0.382	1.05	Bolt Tension
		Diagonal	A325X	0.6250	1	6.38	12.68	0.503	1.05	Member Bearing
T8	102	Leg	A325N	1.0000	6	24.10	54.52	0.442	1.05	Bolt Tension
		Diagonal	A325N	0.7500	1	6.77	13.48	0.502	1.05	Gusset Bearing
T9	82	Leg	A325N	1.0000	8	20.37	54.52	0.374	1.05	Bolt Tension
		Diagonal	A325N	0.7500	1	7.08	13.48	0.525	1.05	Gusset Bearing
T10	62	Leg	A325N	1.0000	8	22.54	54.52	0.413	1.05	Bolt Tension
		Diagonal	A325N	0.7500	1	7.54	13.48	0.559	1.05	Gusset Bearing
T11	42	Leg	A325N	1.0000	8	22.82	54.52	0.419	1.05	Bolt Tension
		Diagonal	A325N	0.7500	3	4.23	19.88	0.213	1.05	Bolt Shear
		Horizontal	A325N	0.7500	2	3.11	17.18	0.181	1.05	Gusset Bearing
		Redund Horz 1 Bracing	A325N	0.6250	1	3.89	11.23	0.346	1.05	Member Bearing
		Redund Diag 1 Bracing	A325N	0.6250	1	3.55	13.57	0.262	1.05	Member Bearing
		Redund Hip 1 Bracing	A325N	0.6250	1	0.02	13.81	0.002	1.05	Bolt Shear
		Redund Hip Diagonal 1 Bracing	A325N	0.6250	1	0.07	13.81	0.005	1.05	Bolt Shear
T12	22	Diagonal	A325N	0.7500	3	3.99	19.88	0.201	1.05	Bolt Shear
		Horizontal	A325N	0.7500	2	3.11	17.18	0.181	1.05	Gusset Bearing
		Redund Horz 1 Bracing	A325N	0.6250	1	4.23	13.57	0.311	1.05	Member Bearing
		Redund Diag 1 Bracing	A325N	0.6250	1	3.61	7.77	0.465	1.05	Member Bearing
		Redund Hip 1 Bracing	A325N	0.6250	1	0.02	13.81	0.001	1.05	Bolt Shear
		Redund Hip Diagonal 1 Bracing	A325N	0.6250	1	0.06	13.81	0.005	1.05	Bolt Shear

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	242 - 222	ROHN 2.5 STD	20'	4'	50.7 K=1.00	1.7040	-12.43	63.56	0.196 [1]
T2	222 - 202	ROHN 3 EH	20'3/8"	5'1/8"	52.9 K=1.00	3.0159	-33.67	110.61	0.304 [1]
T3	202 - 182	ROHN 3.5 EH	20'3/8"	6'8-5/32"	61.3 K=1.00	3.6784	-55.53	125.73	0.442 [1]
T4	182 - 162	ROHN 4 EH	20'15/32"	6'8-5/32"	54.3 K=1.00	4.4074	-78.90	159.91	0.493 [1]
T5	162 - 142	ROHN 5 EH	20'3/8"	6'8-5/32"	43.6 K=1.00	6.1120	-103.89	239.39	0.434 [1]
T6	142 - 122	ROHN 5 EH	20'15/32"	10'1/4"	65.4 K=1.00	6.1120	-125.77	201.23	0.625 [1]
T7	122 - 102	ROHN 6 EH	20'3/8"	10'1/4"	54.8 K=1.00	8.4049	-149.55	303.75	0.492 [1]
T8	102 - 82	ROHN 6 EH	20'3/8"	10'1/4"	54.8 K=1.00	8.4049	-173.34	303.75	0.571 [1]
T9	82 - 62	ROHN 6 EH	20'15/32"	10'1/4"	54.8 K=1.00	8.4049	-196.57	303.72	0.647 [1]
T10	62 - 42	ROHN 8 EHS	20'15/32"	10'1/4"	41.2 K=1.00	9.7193	-219.31	386.37	0.568 [1]
T11	42 - 22	ROHN 8 EHS	20'19/32"	10'3/8"	41.2 K=1.00	9.7193	-223.94	386.31	0.580 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T12	22 - 2	ROHN 8 EH	20'19/32"	10'3/8"	41.8 K=1.00	12.7627	-243.59	505.43	0.482 [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	242 - 222	L1 3/4x1 3/4x3/16	7'8-5/8"	3'7-7/16"	126.4 K=1.00	0.6211	-2.35	11.13	0.211 [1]
T2	222 - 202	L1 3/4x1 3/4x3/16	9'9-1/8"	4'9"	166.1 K=1.00	0.6211	-3.31	6.44	0.514 [1]
T3	202 - 182	L2 1/2x2 1/2x3/16	12'3-19/32"	6'19/32"	146.7 K=1.00	0.9020	-3.86	12.00	0.322 [1]
T4	182 - 162	L2 1/2x2 1/2x1/4	14'31/32"	6'11-1/32"	169.1 K=1.00	1.1900	-4.50	11.90	0.378 [1]
T5	162 - 142	L2 1/2x2 1/2x5/16	15'10-13/16"	7'9-1/4"	190.6 K=1.00	1.4600	-5.13	11.51	0.446 [1]
T6	142 - 122	L3x3x5/16	19'1-13/16"	9'5-3/4"	193.0 K=1.00	1.7800	-5.89	13.67	0.431 [1]
T7	122 - 102	L3 1/2x3 1/2x1/4	20'10-13/16"	10'3-19/32"	178.0 K=1.00	1.6900	-6.57	15.26	0.430 [1]
T8	102 - 82	L3 1/2x3 1/2x1/4	22'8-9/32"	11'2-5/32"	193.3 K=1.00	1.6900	-7.08	12.94	0.547 [1]
T9	82 - 62	L4x4x5/16	24'7-3/32"	12'1-13/16"	184.3 K=1.00	2.4000	-7.44	20.21	0.368 [1]
T10	62 - 42	L4x4x5/16	26'7-3/32"	13'23/32"	198.2 K=1.00	2.4000	-7.99	17.49	0.457 [1]
T11	42 - 22	ROHN 3 STD	24'3-31/32"	12'2-1/32"	125.5 K=1.00	2.2285	-12.68	31.98	0.397 [1]
T12	22 - 2	ROHN 3 STD	25'23/32"	12'6-3/8"	129.2 K=1.00	2.2285	-11.98	30.14	0.398 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T11	42 - 22	ROHN 2.5 STD	25'2-5/32"	12'2-3/4"	154.9 K=1.00	1.7040	-6.34	16.05	0.395 [1]
T12	22 - 2	ROHN 3 STD	27'8-5/32"	13'5-3/4"	139.0 K=1.00	2.2285	-6.73	26.05	0.258 [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	242 - 222	L2x2x1/8	6'6-	6'1-	184.6	0.4844	-0.06	4.07	0.014 [1]

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T2	222 - 202	L2x2x1/8	23/32" 6'7-3/16"	5/16" 6'1-3/16"	K=1.00 184.3 K=1.00	0.4844	-0.58	4.08	0.143 [1]

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T11	42 - 22	ROHN 1.5 TUBE (11ga)	6'3-15/32"	5'11-5/32"	145.4 K=1.00	0.5202	-3.89	5.56	0.699 [1]
T12	22 - 2	ROHN 1.5 STD	6'11-1/32"	6'6-23/32"	126.4 K=1.00	0.7995	-4.23	11.30	0.374 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T11	42 - 22	ROHN 1.5 STD	11'6"	10'9-1/4"	207.6 K=1.00	0.7995	-3.55	4.19	0.848 [1]
T12	22 - 2	ROHN 2.25 TUBE (14GA)	11'9-27/32"	11'1-13/16"	174.5 K=1.00	0.5651	-3.61	4.19	0.861 [1]

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T11	42 - 22	ROHN 1.5 TUBE (11ga)	6'3-15/32"	6'3-15/32"	154.2 K=1.00	0.5202	-0.02	4.94	0.005 [1]
T12	22 - 2	ROHN 1.5 STD	6'11-1/32"	6'11-1/32"	133.4 K=1.00	0.7995	-0.02	10.15	0.002 [1]

[1] P_u / ϕP_n controls

Redundant Hip Diagonal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T11	42 - 22	ROHN 2.5 STD	15'27/32"	15'27/32"	190.9 K=1.00	1.7040	-0.07	10.56	0.006 [1]
T12	22 - 2	ROHN 2.5 STD	15'10-13/16"	15'10-13/16"	201.4 K=1.00	1.7040	-0.06	9.49	0.007 [1]

Inner Bracing 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 $\frac{P_u}{\phi P_n}$
T11	42 - 22	ROHN 2 STD	12'7-3/32"	12'7-3/32"	191.9 K=1.00	1.0745	-0.01	6.59	0.002 [1]
T12	22 - 2	ROHN 3 STD	13'10-3/32"	13'10-3/32"	142.7 K=1.00	2.2285	-0.01	24.72	0.001 [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	242 - 222	ROHN 2.5 STD	20'	4'	50.7	1.7040	9.47	76.68	0.124 [1]
T2	222 - 202	ROHN 3 EH	20'3/8"	5'1/8"	52.9	3.0159	26.38	135.72	0.194 [1]
T3	202 - 182	ROHN 3.5 EH	20'3/8"	6'8-5/32"	61.3	3.6784	46.16	165.53	0.279 [1]
T4	182 - 162	ROHN 4 EH	20'15/32"	6'8-5/32"	54.3	4.4074	65.89	198.34	0.332 [1]
T5	162 - 142	ROHN 5 EH	20'3/8"	6'8-5/32"	43.6	6.1120	86.71	275.04	0.315 [1]
T6	142 - 122	ROHN 5 EH	20'15/32"	10'1/4"	65.4	6.1120	105.27	275.04	0.383 [1]
T7	122 - 102	ROHN 6 EH	20'3/8"	10'1/4"	54.8	8.4049	125.07	378.22	0.331 [1]
T8	102 - 82	ROHN 6 EH	20'3/8"	10'1/4"	54.8	8.4049	144.60	378.22	0.382 [1]
T9	82 - 62	ROHN 6 EH	20'15/32"	10'1/4"	54.8	8.4049	162.94	378.22	0.431 [1]
T10	62 - 42	ROHN 8 EHS	20'15/32"	10'1/4"	41.2	9.7193	180.34	437.37	0.412 [1]
T11	42 - 22	ROHN 8 EHS	20'19/32"	10'3/8"	41.2	9.7193	182.91	437.37	0.418 [1]
T12	22 - 2	ROHN 8 EH	20'19/32"	10'3/8"	41.8	12.7627	197.07	574.32	0.343 [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	242 - 222	L1 3/4x1 3/4x3/16	7'8-5/8"	3'7-7/16"	83.2	0.3779	2.30	16.44	0.140 [1]
T2	222 - 202	L1 3/4x1 3/4x3/16	9'9-1/8"	4'9"	108.6	0.3779	3.35	16.44	0.204 [1]
T3	202 - 182	L2 1/2x2 1/2x3/16	12'3-19/32"	6'19/32"	94.9	0.5886	3.81	25.60	0.149 [1]
T4	182 - 162	L2 1/2x2 1/2x1/4	14'31/32"	6'11-1/32"	109.6	0.7753	4.35	33.73	0.129 [1]
T5	162 - 142	L2 1/2x2 1/2x5/16	15'10-13/16"	7'9-1/4"	124.3	0.9485	5.13	41.26	0.124 [1]
T6	142 - 122	L3x3x5/16	19'1-13/16"	9'5-3/4"	125.1	1.1592	5.86	50.43	0.116 [1]
T7	122 - 102	L3 1/2x3 1/2x1/4	20'10-	10'3-	114.7	1.1269	6.38	54.94	0.116 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	102 - 82	L3 1/2x3 1/2x1/4	13/16" 22'8-9/32"	19/32" 11'2-5/32"	124.6	1.1034	6.77	53.79	0.126 [1]
T9	82 - 62	L4x4x5/16	24'7-3/32"	12'1-13/16"	118.9	1.5949	7.08	77.75	0.091 [1]
T10	62 - 42	L4x4x5/16	26'7-3/32"	13'23/32"	127.7	1.5949	7.54	77.75	0.097 [1]
T11	42 - 22	ROHN 3 STD	24'3-31/32"	12'2-1/32"	125.5	2.2285	11.18	100.28	0.111 [1]
T12	22 - 2	ROHN 3 STD	25'23/32"	12'6-3/8"	129.2	2.2285	10.62	100.28	0.106 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T11	42 - 22	ROHN 2.5 STD	25'2-5/32"	12'2-3/4"	154.9	1.7040	6.22	76.68	0.081 [1]
T12	22 - 2	ROHN 3 STD	27'8-5/32"	13'5-3/4"	139.0	2.2285	6.22	100.28	0.062 [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	242 - 222	L2x2x1/8	6'6-23/32"	6'1-5/16"	121.2	0.3047	0.05	13.25	0.004 [1]
T2	222 - 202	L2x2x1/8	6'7-3/16"	6'1-3/16"	121.0	0.3047	0.58	13.25	0.044 [1]

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T11	42 - 22	ROHN 1.5 TUBE (11ga)	6'3-15/32"	5'11-5/32"	145.4	0.5202	3.89	23.41	0.166 [1]
T12	22 - 2	ROHN 1.5 STD	6'11-1/32"	6'6-23/32"	126.4	0.7995	4.23	35.98	0.118 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T11	42 - 22	ROHN 1.5 STD	11'6"	10'9-1/4"	207.6	0.7995	3.55	35.98	0.099 [1]
T12	22 - 2	ROHN 2.25 TUBE (14GA)	11'9-27/32"	11'1-13/16"	174.5	0.5651	3.61	25.43	0.142 [1]

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T11	42 - 22	ROHN 1.5 TUBE (11ga)	6'3-15/32"	6'3-15/32"	154.2	0.5202	0.01	23.41	0.001 [1]
T12	22 - 2	ROHN 1.5 STD	6'11-1/32"	6'11-1/32"	133.4	0.7995	0.01	35.98	0.000 [1]

[1] P_u / ϕP_n controls

Redundant Hip Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T11	42 - 22	ROHN 2.5 STD	15'27/32"	15'27/32"	190.9	1.7040	0.06	76.68	0.001 [1]
T12	22 - 2	ROHN 2.5 STD	15'10-13/16"	15'10-13/16"	201.4	1.7040	0.05	76.68	0.001 [1]

[1] P_u / ϕP_n controls

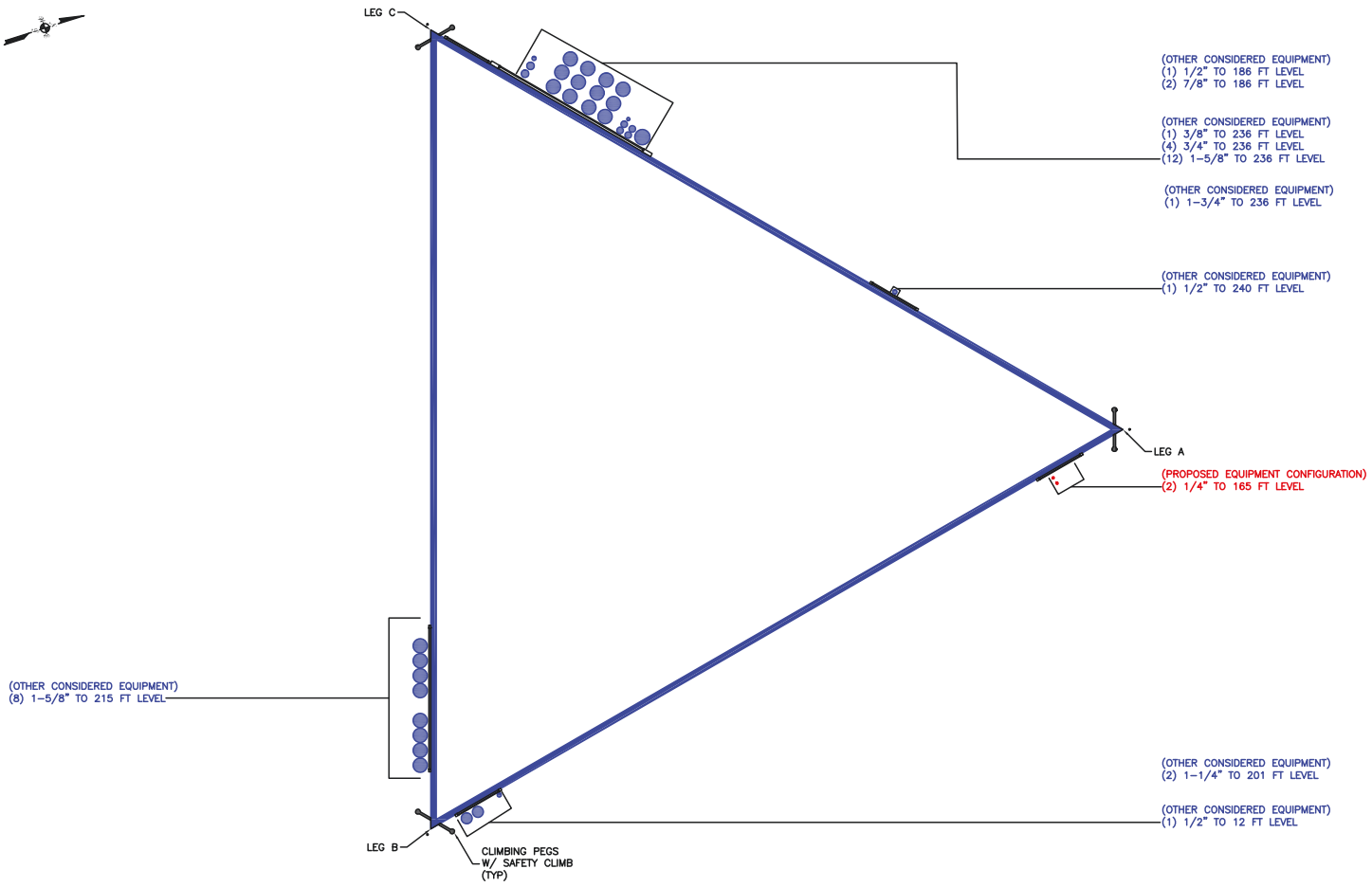
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	242 - 222	Leg	ROHN 2.5 STD	1	-12.43	66.74	18.6	Pass
T2	222 - 202	Leg	ROHN 3 EH	37	-33.67	116.14	29.0	Pass
T3	202 - 182	Leg	ROHN 3.5 EH	69	-55.53	132.01	42.1	Pass
T4	182 - 162	Leg	ROHN 4 EH	90	-78.90	167.90	47.0	Pass
T5	162 - 142	Leg	ROHN 5 EH	111	-103.89	251.36	41.3	Pass
T6	142 - 122	Leg	ROHN 5 EH	132	-125.77	211.29	59.5	Pass
T7	122 - 102	Leg	ROHN 6 EH	147	-149.55	318.94	46.9	Pass
T8	102 - 82	Leg	ROHN 6 EH	162	-173.34	318.93	54.4	Pass
T9	82 - 62	Leg	ROHN 6 EH	177	-196.57	318.90	61.6	Pass
T10	62 - 42	Leg	ROHN 8 EHS	192	-219.31	405.69	54.1	Pass
T11	42 - 22	Leg	ROHN 8 EHS	207	-223.94	405.62	55.2	Pass
T12	22 - 2	Leg	ROHN 8 EH	240	-243.59	530.71	45.9	Pass
T1	242 - 222	Diagonal	L1 3/4x1 3/4x3/16	11	-2.35	11.69	20.1	Pass
T2	222 - 202	Diagonal	L1 3/4x1 3/4x3/16	47	-3.31	6.76	48.9	Pass
T3	202 - 182	Diagonal	L2 1/2x2 1/2x3/16	71	-3.86	12.60	30.6	Pass
T4	182 - 162	Diagonal	L2 1/2x2 1/2x1/4	92	-4.50	12.50	36.0	Pass
T5	162 - 142	Diagonal	L2 1/2x2 1/2x5/16	113	-5.13	12.08	42.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T6	142 - 122	Diagonal	L3x3x5/16	134	-5.89	14.36	41.0	Pass
T7	122 - 102	Diagonal	L3 1/2x3 1/2x1/4	149	-6.57	16.02	41.0	Pass
T8	102 - 82	Diagonal	L3 1/2x3 1/2x1/4	164	-7.08	13.59	52.1	Pass
T9	82 - 62	Diagonal	L4x4x5/16	179	-7.44	21.23	35.1	Pass
T10	62 - 42	Diagonal	L4x4x5/16	194	-7.99	18.36	43.5	Pass
T11	42 - 22	Diagonal	ROHN 3 STD	212	-12.68	33.58	37.8	Pass
T12	22 - 2	Diagonal	ROHN 3 STD	245	-11.98	31.65	37.9	Pass
T11	42 - 22	Horizontal	ROHN 2.5 STD	208	-6.34	16.85	37.7	Pass
T12	22 - 2	Horizontal	ROHN 3 STD	241	-6.73	27.36	24.6	Pass
T1	242 - 222	Top Girt	L2x2x1/8	5	-0.06	4.27	1.4	Pass
T2	222 - 202	Top Girt	L2x2x1/8	42	-0.58	4.29	13.6	Pass
T11	42 - 22	Redund Horz 1 Bracing	ROHN 1.5 TUBE (11ga)	220	-3.89	5.84	66.6	Pass
T12	22 - 2	Redund Horz 1 Bracing	ROHN 1.5 STD	253	-4.23	11.86	35.6	Pass
T11	42 - 22	Redund Diag 1 Bracing	ROHN 1.5 STD	221	-3.55	4.40	80.7	Pass
T12	22 - 2	Redund Diag 1 Bracing	ROHN 2.25 TUBE (14GA)	254	-3.61	4.40	82.0	Pass
T11	42 - 22	Redund Hip 1 Bracing	ROHN 1.5 TUBE (11ga)	233	-0.02	5.19	0.4	Pass
T12	22 - 2	Redund Hip 1 Bracing	ROHN 1.5 STD	266	-0.02	10.66	0.2	Pass
T11	42 - 22	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	234	-0.07	11.09	0.6	Pass
T12	22 - 2	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	267	-0.06	9.97	0.6	Pass
T11	42 - 22	Inner Bracing	ROHN 2 STD	236	-0.01	6.92	0.4	Pass
T12	22 - 2	Inner Bracing	ROHN 3 STD	268	-0.01	25.95	0.3	Pass
							Summary	
							Leg (T9) 61.6	Pass
							Diagonal (T8) 52.1	Pass
							Horizontal (T11) 37.7	Pass
							Top Girt (T2) 13.6	Pass
							Redund Horz 1 Bracing (T11) 66.6	Pass
							Redund Diag 1 Bracing (T12) 82.0	Pass
							Redund Hip 1 Bracing (T11) 0.4	Pass
							Redund Hip Diagonal 1 Bracing (T12) 0.6	Pass
							Inner Bracing (T11) 0.4	Pass
							Bolt Checks 58.5	Pass
							RATING = **82.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 841294 TOWER ID:C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Self Support Anchor Rod Capacity

Site Info	
BU #	841294
Site Name	Monroe-Guinea Road
Order #	659187 Rev. 0

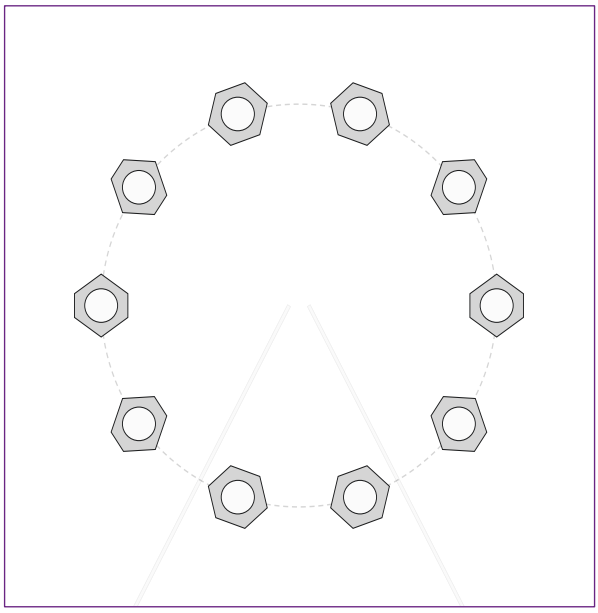
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	0.75

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	261.27	210.50
Shear Force (kips)	29.42	24.33

**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): 0.75

Analysis Results

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

Pu_t = 21.05	ϕPn_t = 56.81	**Stress Rating**
Vu = 2.43	ϕVn = 36.82	**35.3%**
Mu = n/a	ϕMn = n/a	**Pass**

Drilled Pier Foundation

BU # :	841294
Site Name:	Monroe-Guinea Road
Order Number:	659187 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)	261.27	210.5
Shear Force (kips)	29.42	24.33

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	40	ksi

Pier Design Data		
Depth	20	ft
Ext. Above Grade	2	ft
Pier Section 1		
From 2' above grade to 20' below grade		
Pier Diameter	3.5	ft
Rebar Quantity	12	
Rebar Size	9	
Clear Cover to Ties	5.5	in
Tie Size	3	
Tie Spacing	18	in

Rebar & Pier Options
Embedded Pole Inputs
Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	11.46	11.46
Soil Safety Factor	26.93	32.57
Max Moment (kip-ft)	288.62	238.68
Rating*	*4.7%*	*3.9%*
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	669.22	446.15
End Bearing (kips)	453.08	-
Weight of Concrete (kips)	38.10	28.57
Total Capacity (kips)	1122.30	474.72
Axial (kips)	299.37	210.50
Rating*	*25.4%*	*42.2%*
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	11.73	10.82
Critical Moment (kip-ft)	288.25	236.93
Critical Moment Capacity	1001.56	651.52
Rating*	*27.4%*	*34.6%*
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	16.73	16.73
Critical Shear (kip)	54.78	45.30
Critical Shear Capacity	203.42	100.34
Rating*	*25.6%*	*43.0%*

Structural Foundation Rating*	**43.0%**
Soil Interaction Rating*	**42.2%**

*Rating per TIA-222-H Section 15.5

Soil Profile

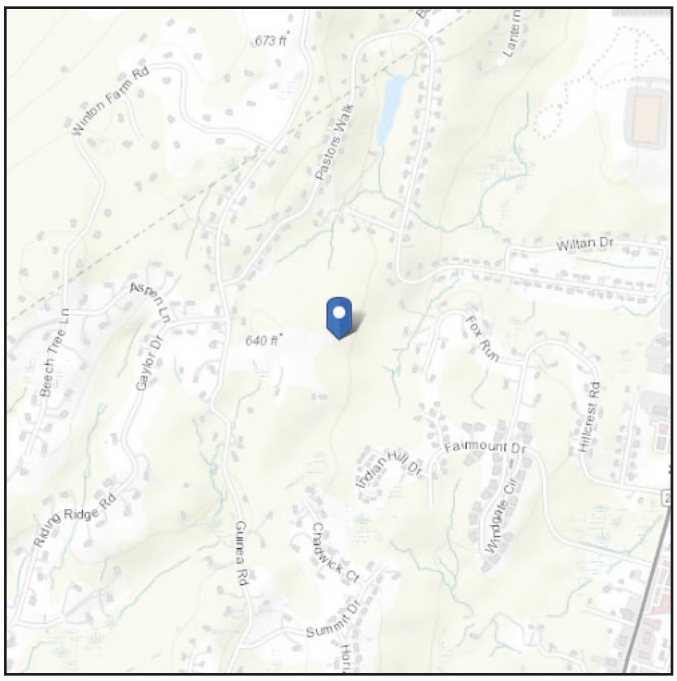
Groundwater Depth	N/A	# of Layers	4

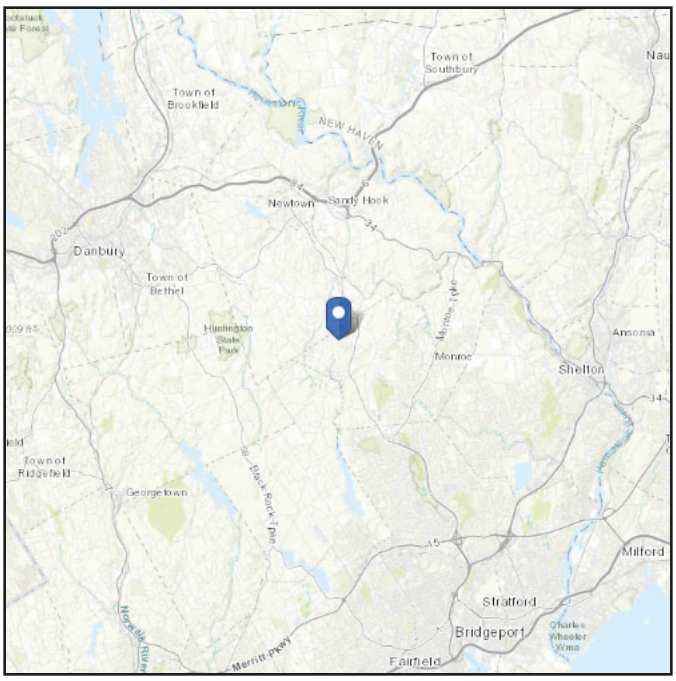
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Net Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	1.75	1.75	120	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	1.75	3.5	1.75	120	150	0	34	0.000	0.000	0.60	0.40			Cohesionless
3	3.5	7	3.5	120	150	0	34	0.000	0.000	0.60	0.40			Cohesionless
4	7	20	13	150	150	10	0	4.500	4.500	6.00	4.00	60		Cohesive

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.341856
Risk Category:	II	**Longitude:**	-73.274522
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	582.2926805264099 ft (NAVD 88)





Wind

Results:

Wind Speed	117 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 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:	Thu Nov 02 2023

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

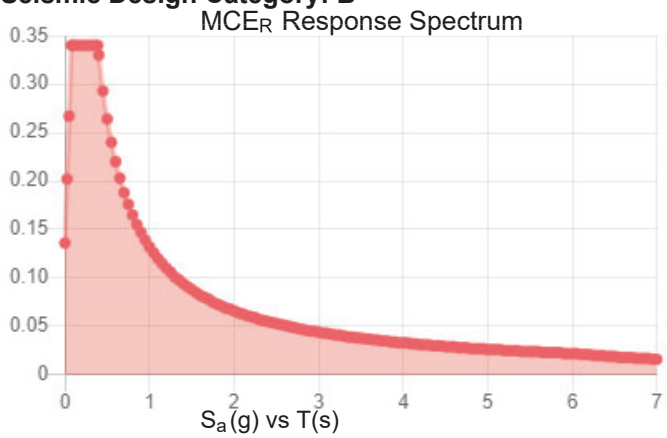
D - Default (see Section 11.4.3)

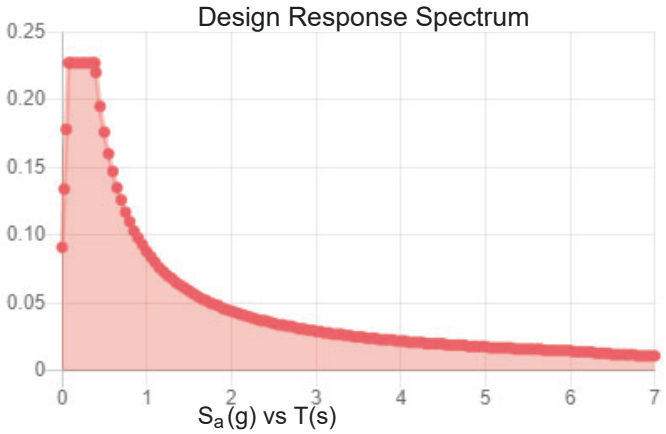
Site Soil Class:

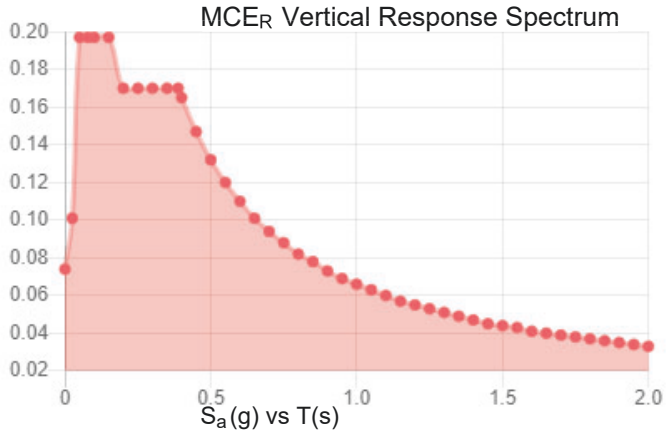
Results:

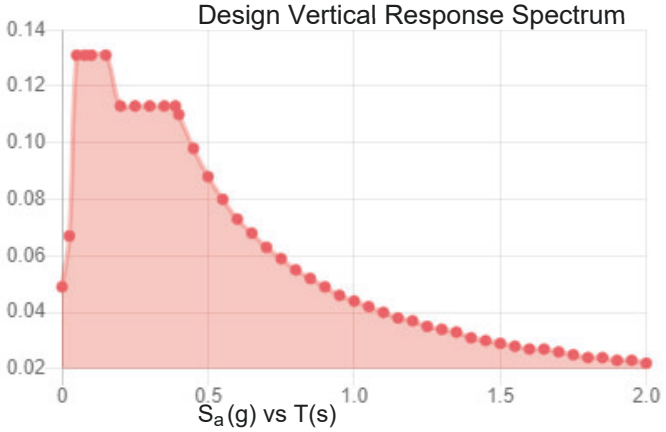
S_S :	0.212	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.121
F_v :	2.4	PGA_M :	0.188
S_{MS} :	0.34	F_{PGA} :	1.558
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.227	C_v :	0.725

Seismic Design Category: B









Data Accessed: **Thu Nov 02 2023**

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:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu Nov 02 2023

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: **January 24, 2024**

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

Subject:	**Mount Analysis – Conditional Passing Report**	
Carrier Designation:	**Dish Network Equipment Change-Out**	
	Carrier Site Number:	NJJER01094A
	Carrier Site Name:	CT-CCI-T-841294
Crown Castle Designation:	**BU Number:**	841294
	Site Name:	MONROE-GUINEA ROAD
	JDE Job Number:	2103977
	Order Number:	659187 Rev. 3
Engineering Firm Designation:	**Trylon Report Designation:**	235623
Site Data:	**230 Guinea Road, Monroe, Fairfield County, CT, 06468**	
	Latitude 41°20'30.68" Longitude -73°16'28.28"	
Structure Information:	**Tower Height & Type:**	**240.0 ft Self Support Tower**
	Mount Elevation:	**165.0 ft**
	Mount Width & Type:	**8.0 ft Sector Frames**

Trylon is pleased to submit this **"Mount Analysis – Conditional Passing Report"** to determine the structural integrity of Dish Network'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 Frames	**Sufficient***

***Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 117 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Steve Mustaro, P.E.

Respectfully Submitted by:
Cliff Abernathy, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

This is an existing three sector 8.0 ft Sector Frames, designed by Commscope.

2) ANALYSIS CRITERIA

Building Code:	2021 IBC / 2022 Connecticut State Building Code
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	117 mph
Exposure Category:	B
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	1.0 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.212
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
165.0	165.0	1	COMMSCOPE	VHLP2-11W/A	8.0 ft Sector Frames
		3	JMA WIRELESS	MX08FRO665-21	
		1	CERAGON	IP-50C	
		3	FUJITSU	TA08025-B604	
		3	FUJITSU	TA08025-B605	
		1	RAYCAP	RDIDC-9181-PF-48	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	Dish Network Application	659187 Rev. 3	CCI Sites
Mount Manufacturer Drawings	Commscope	MTC3975083	Trylon

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 Frames, Worst Case Sector)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2, 3	Mount Pipe(s)	MP2	12.9	10.6	Pass
	Horizontal(s)	H1		12.3	Pass
	Standoff(s)	M1		16.4	Pass
	Bracing(s)	M23		36.4	Pass
	Tieback(s)	M31A		8.8	Pass
	Mount Connection(s)	-		19.3	Pass

Structure Rating (max from all components) =	36.4%

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
N47A	Proposed	574.0	Leg	ROHN 4 EH	6,286.5	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

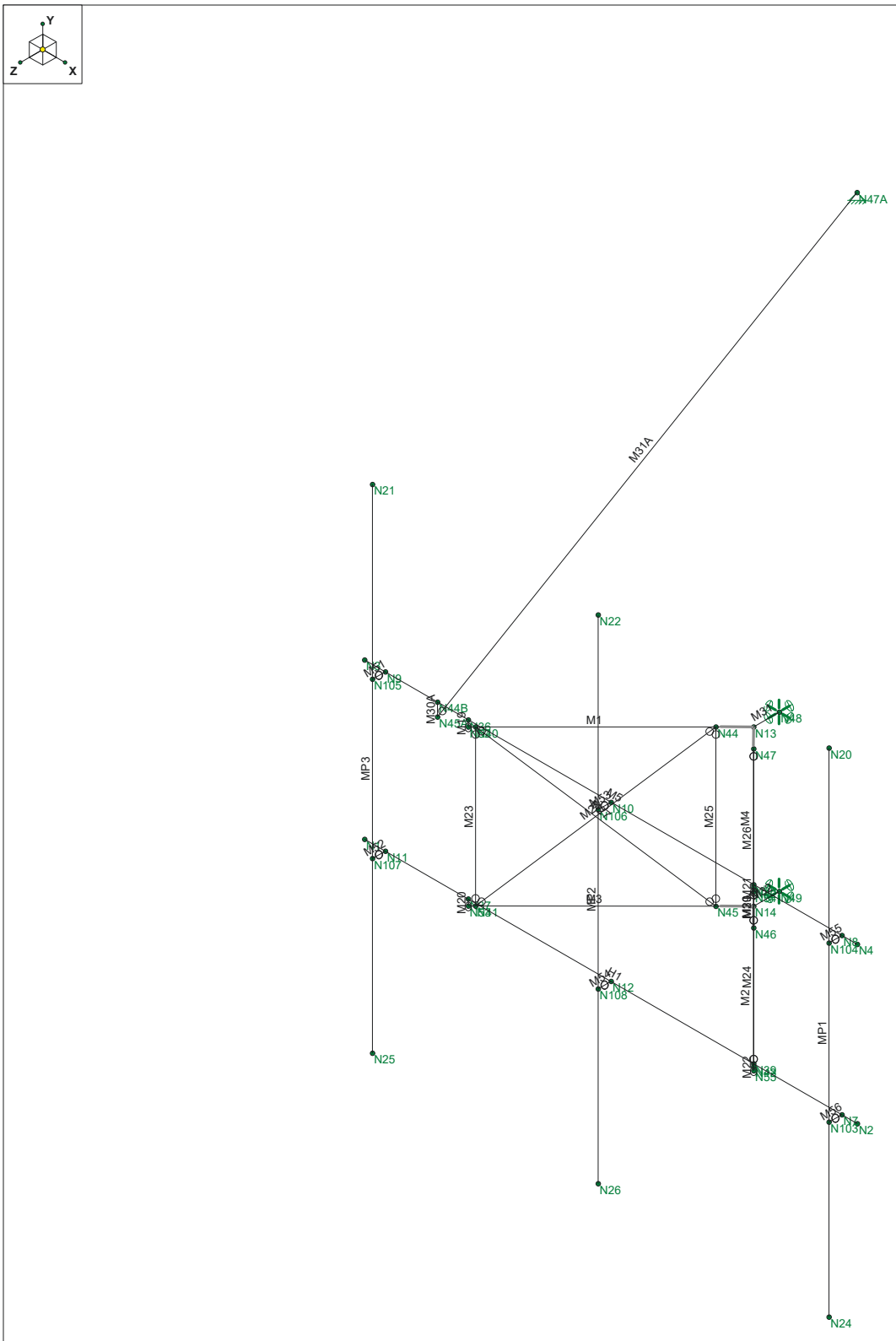
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

1. Replace tieback pipes with 14’-0” long, 2.375” O.D., Sch. 40 pipes and relocate connection to tower from diagonal bracing to tower legs.

No structural modifications are required at this time, provided that the above-listed changes are implemented.

APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Trylon	841294	Wireframe
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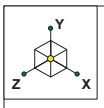

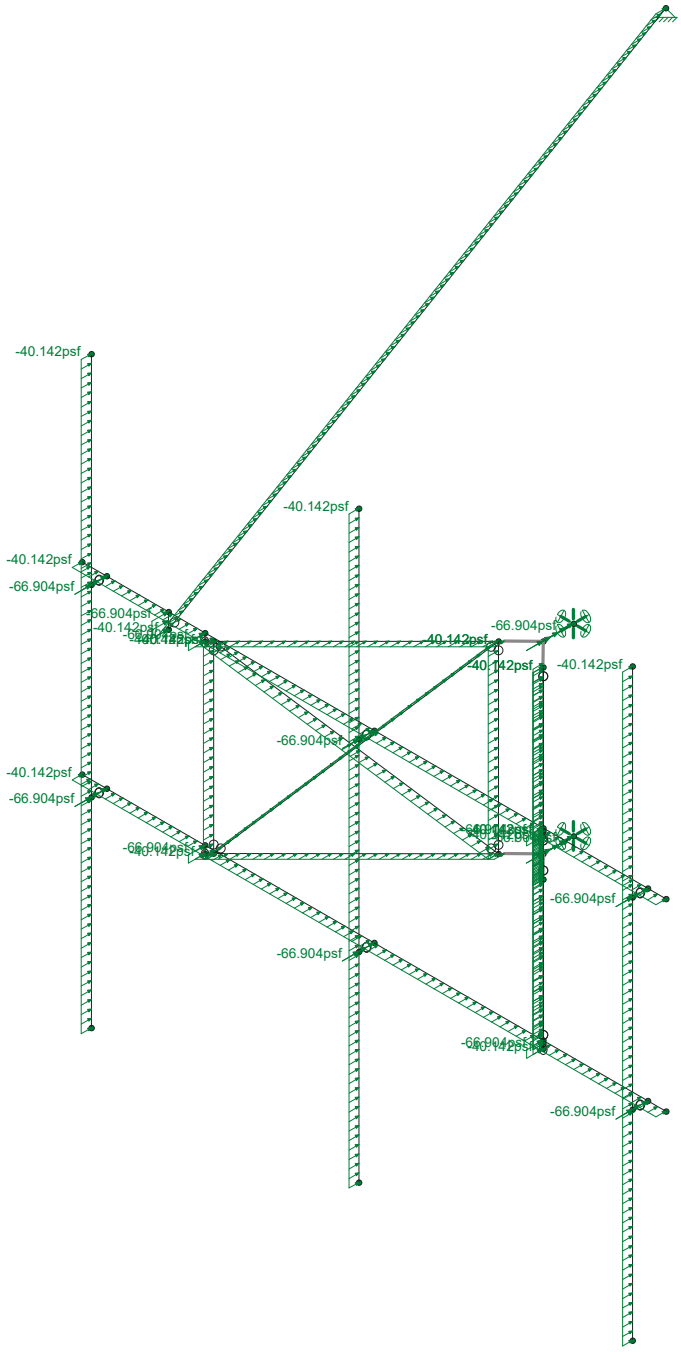

Loads: BLC 2, Structure Wind Z
Envelope Only Solution

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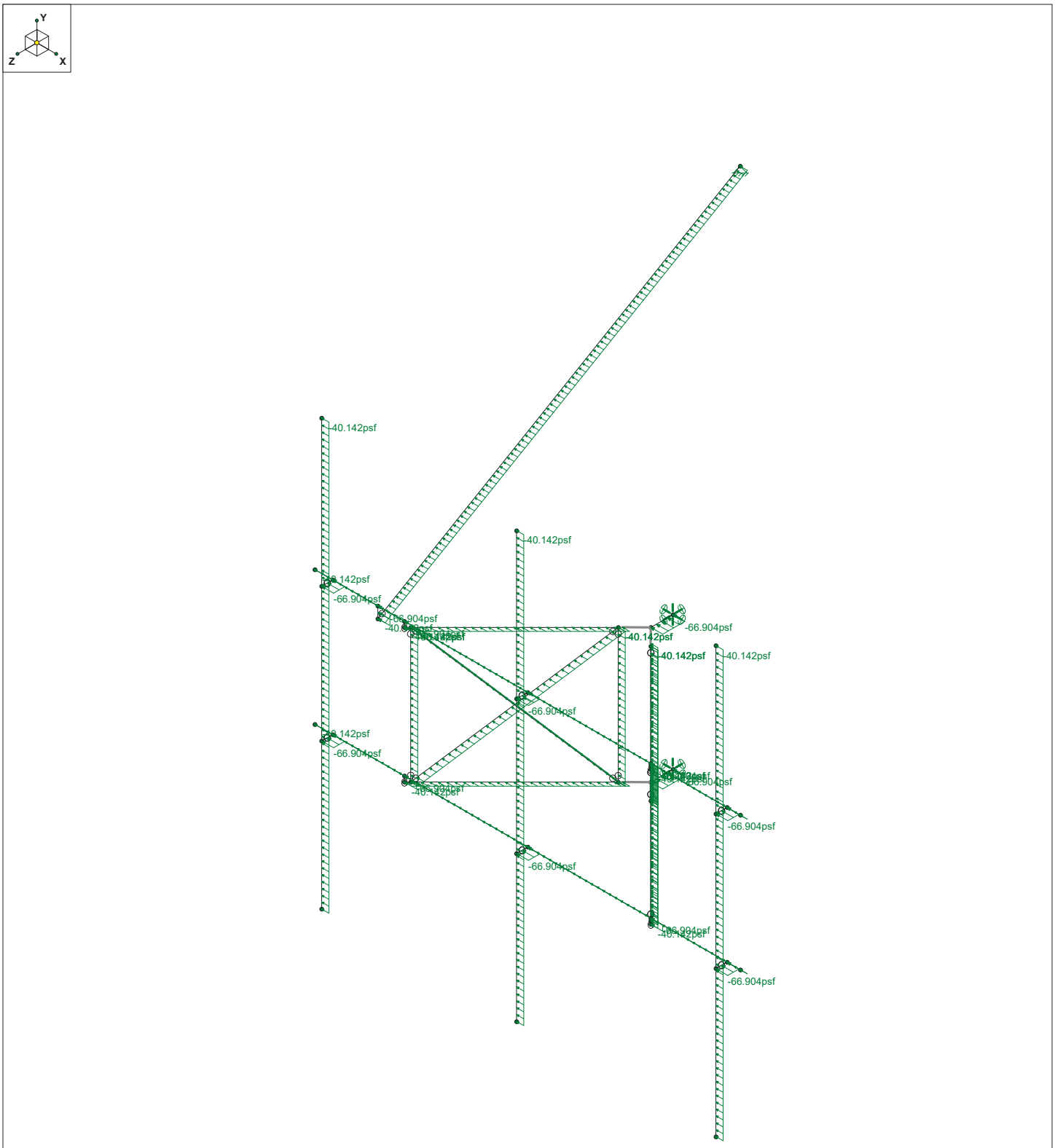

Loads: BLC 3, Structure Wind X
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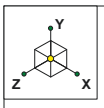

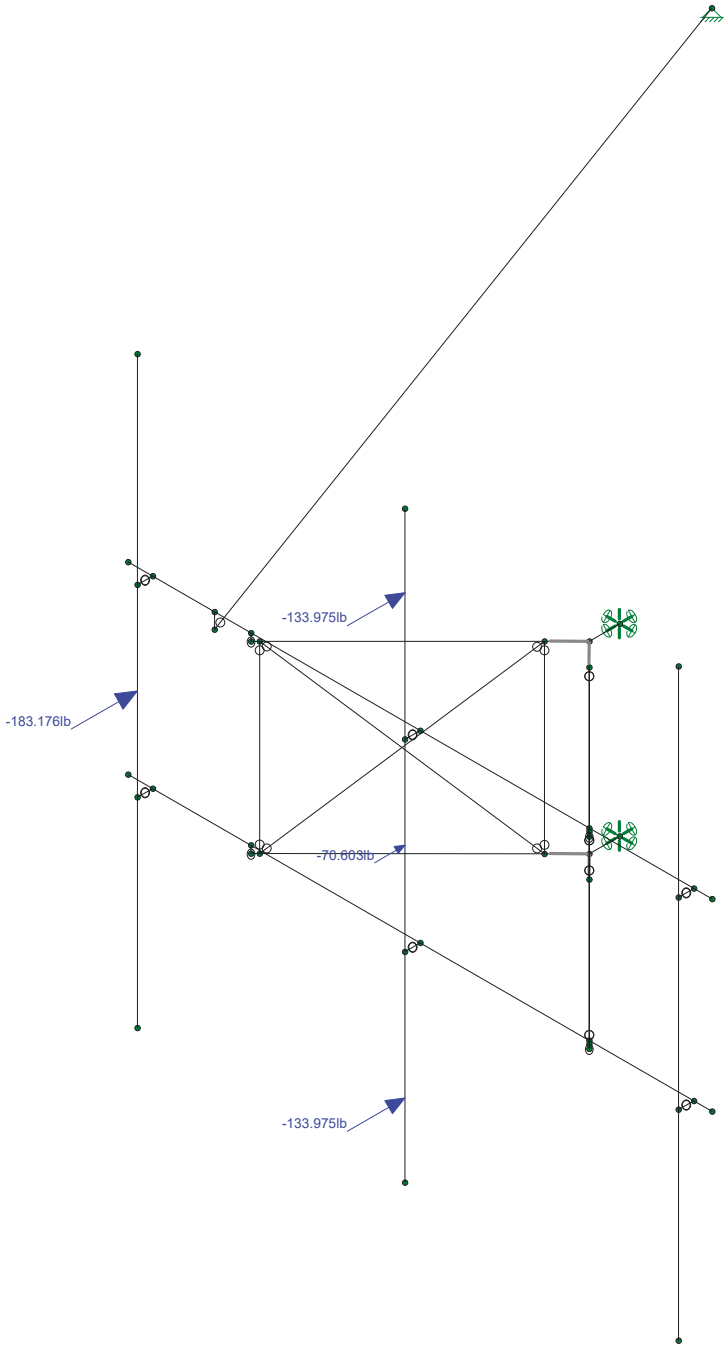

Loads: BLC 4, Wind Load 0 AZI
Envelope Only Solution

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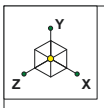

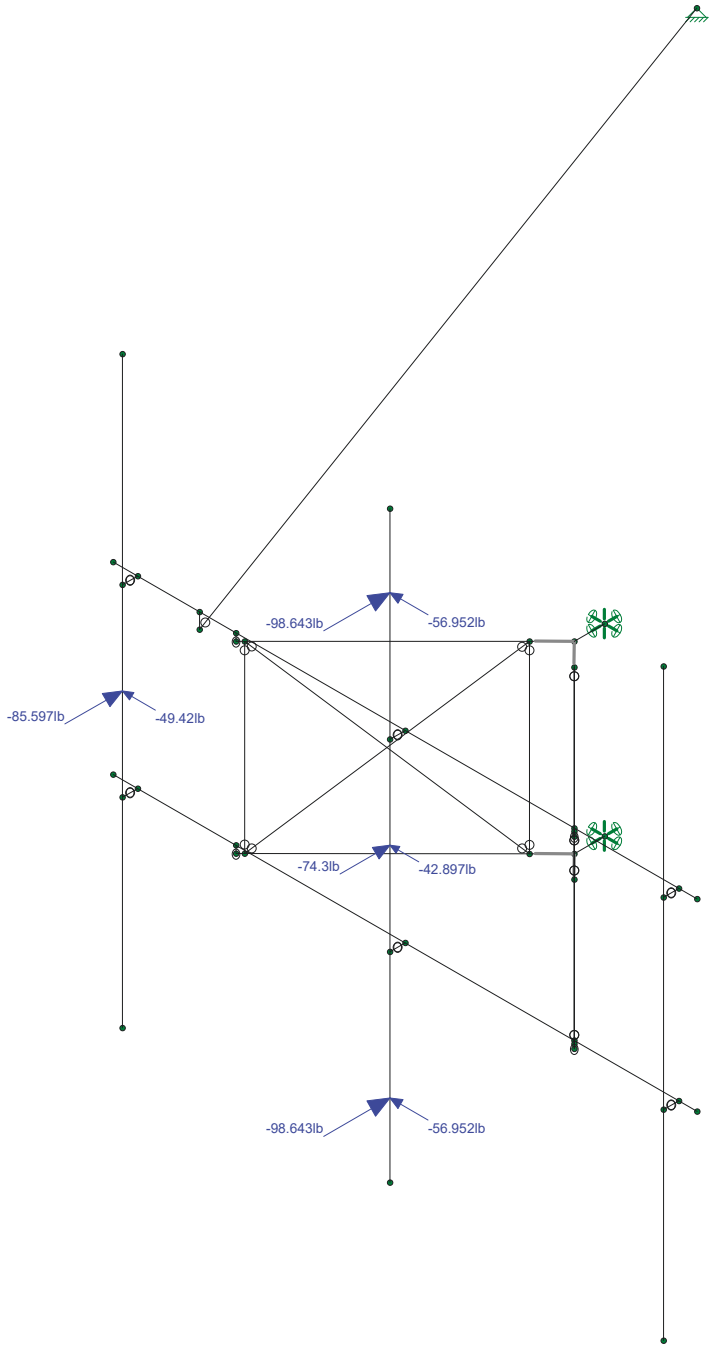

Loads: BLC 5, Wind Load 30 AZI
Envelope Only Solution

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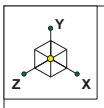

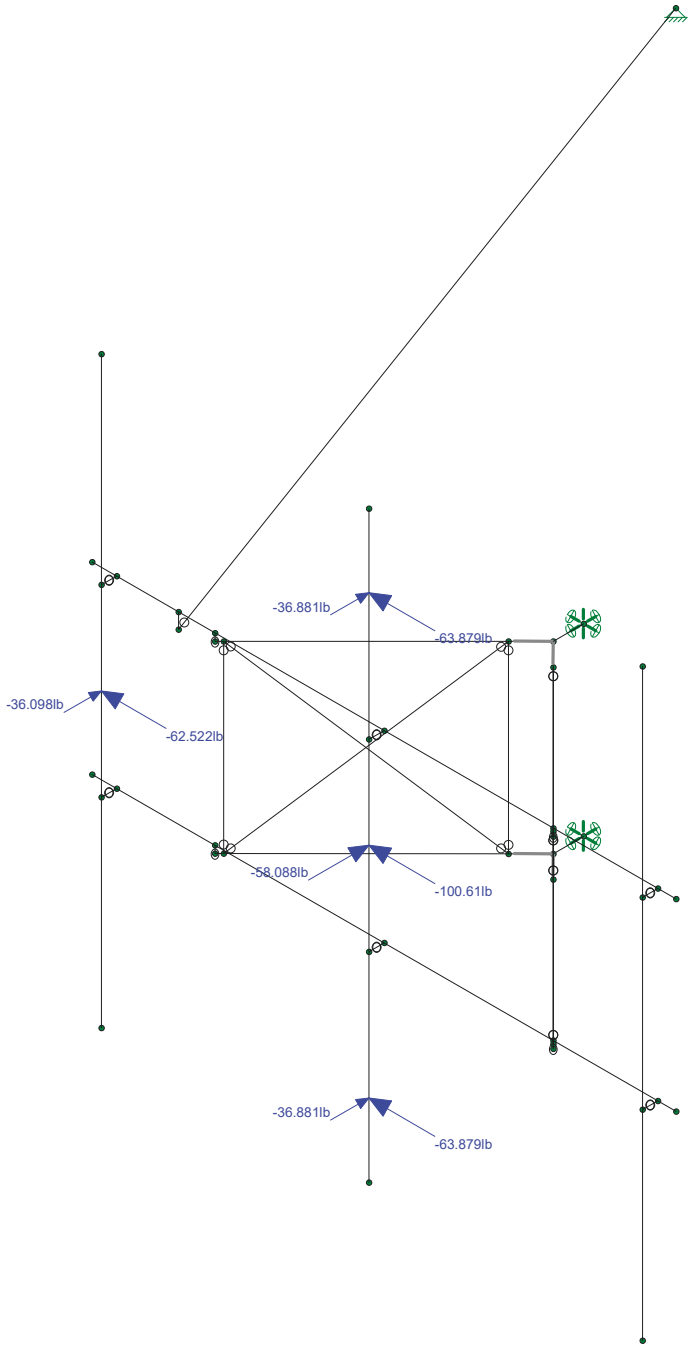

Loads: BLC 7, Wind Load 60 AZI
Envelope Only Solution

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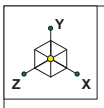

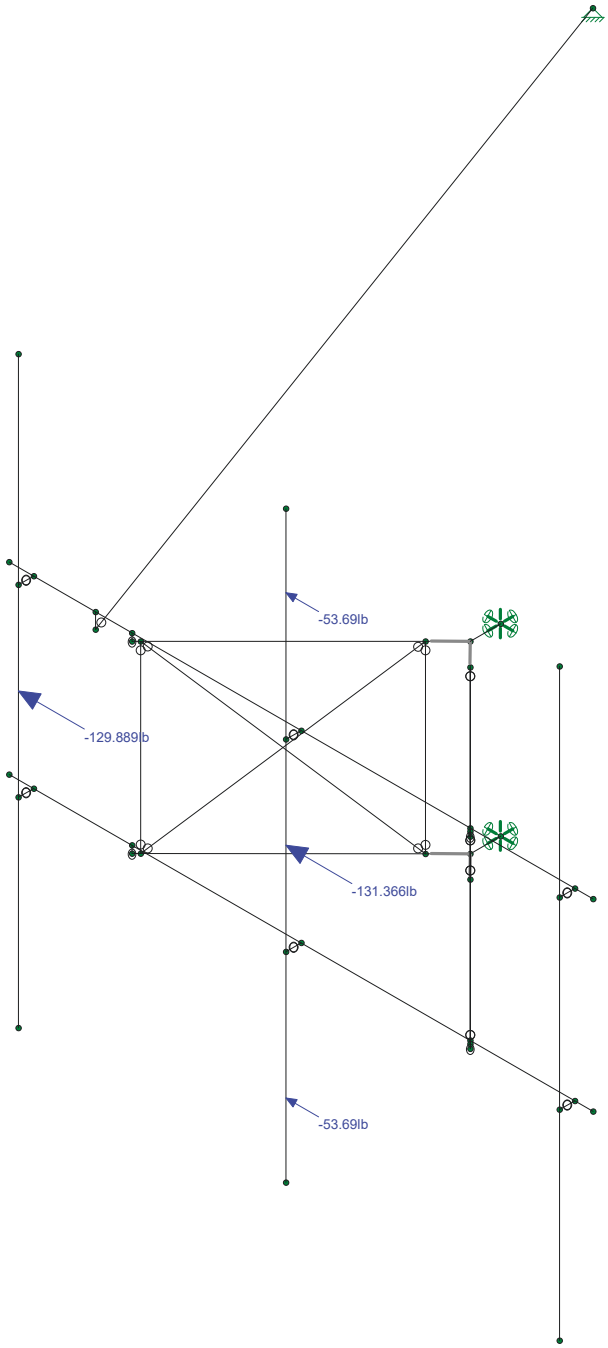

Loads: BLC 8, Wind Load 90 AZI
Envelope Only Solution

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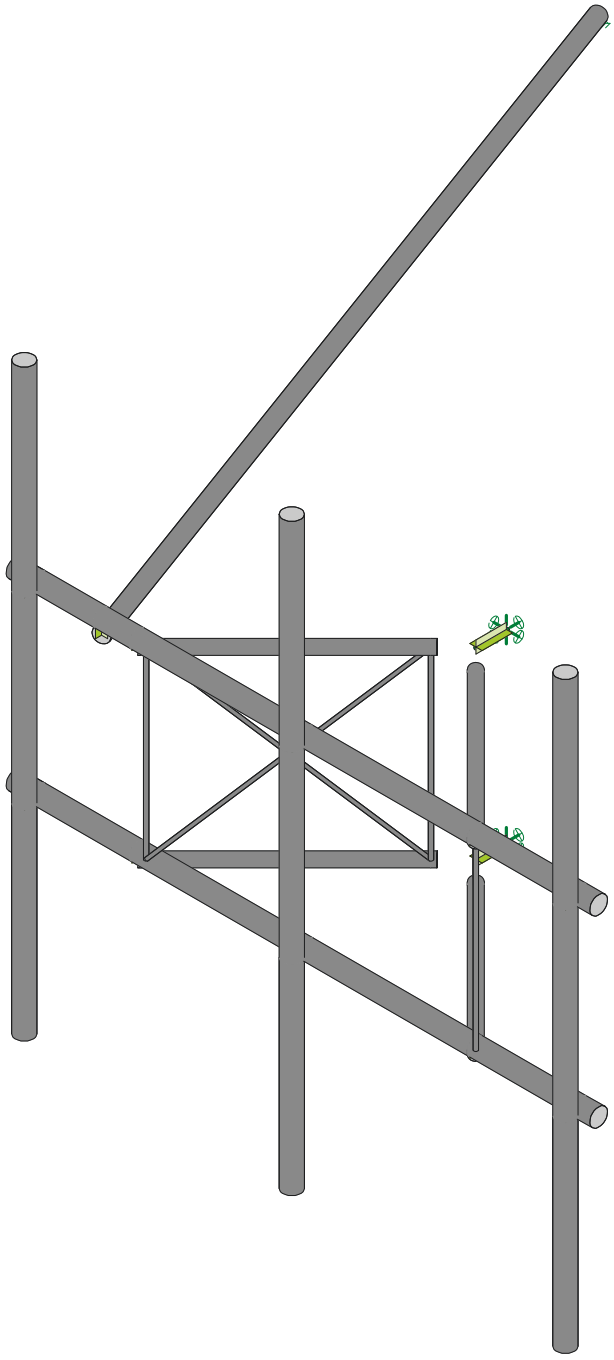


Envelope Only Solution

Trylon	841294	Render
SMM		Jan 24, 2024 at 2:24 PM
235623		841294_loaded.r3d

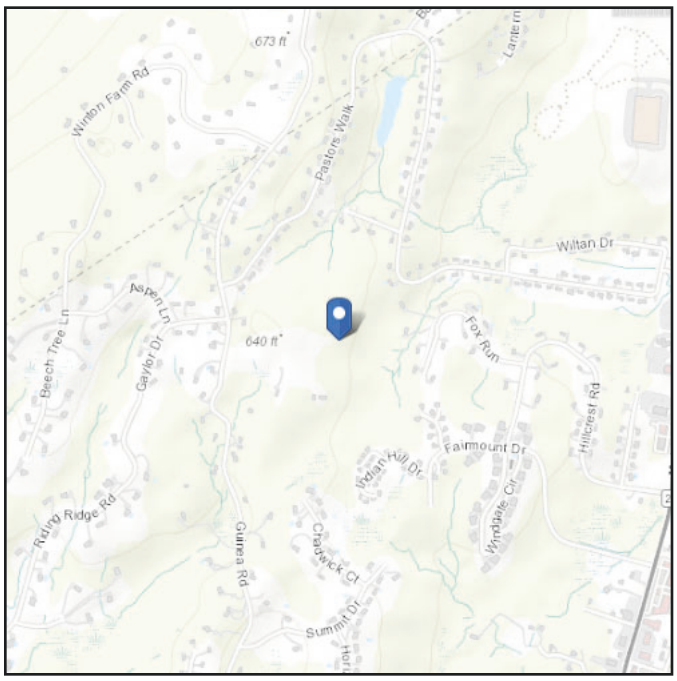
APPENDIX B

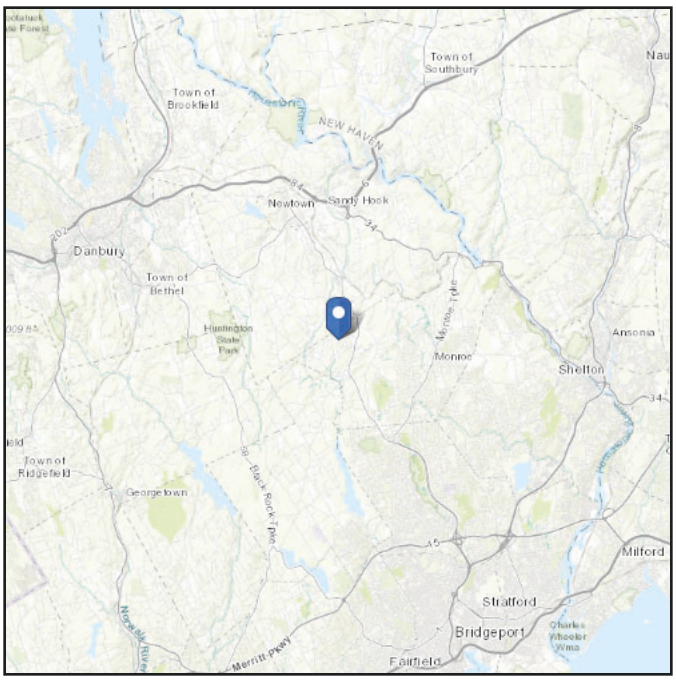
SOFTWARE INPUT CALCULATIONS

ASCE Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.341856
Risk Category:	II	**Longitude:**	-73.274522
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	582.2926805264099 ft (NAVD 88)





Wind

Results:

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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 Jan 24 2024

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.

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

Results:

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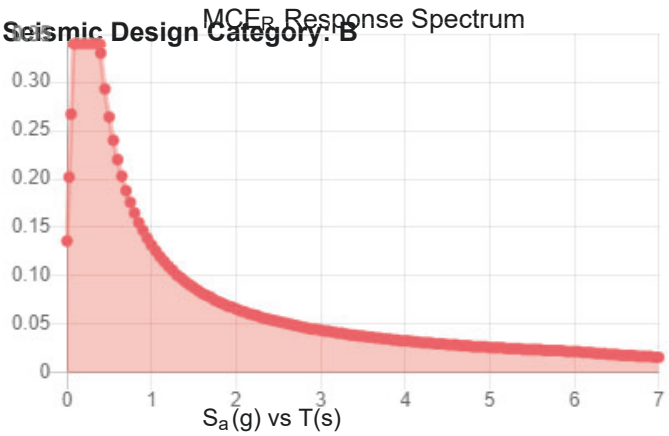
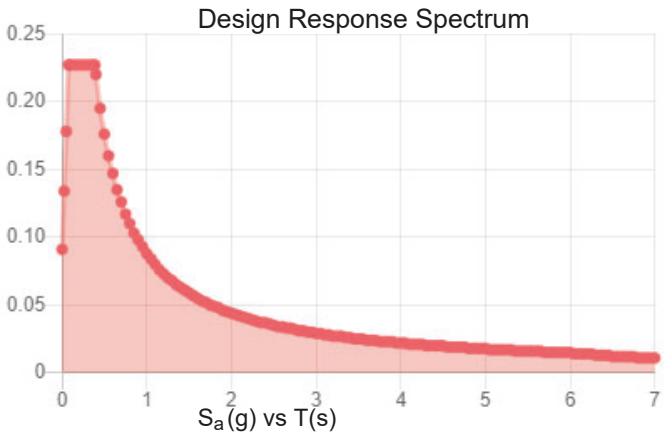
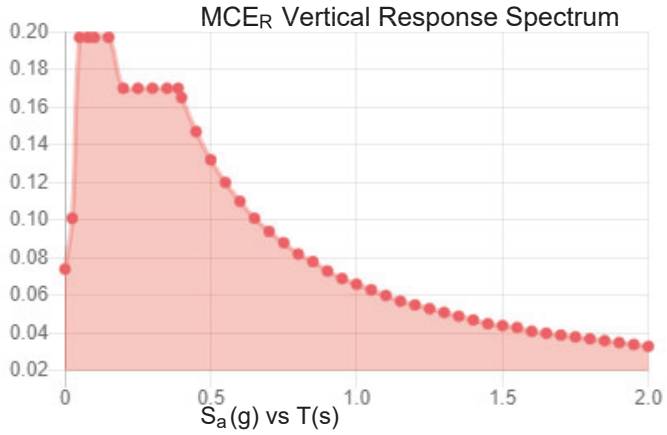
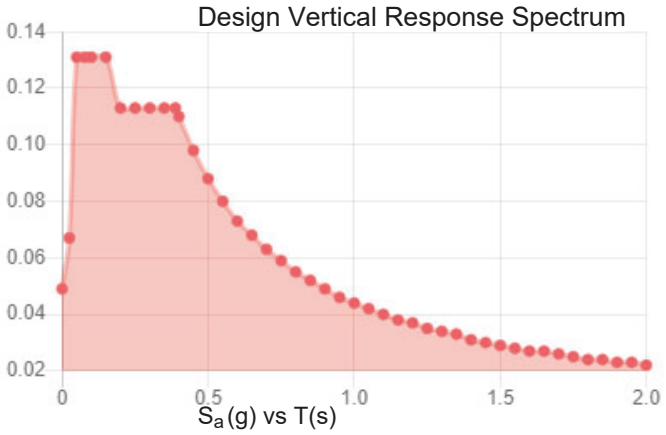
Seismic Design Category: B









Data Accessed: **Wed Jan 24 2024**

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.

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Results:

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Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed Jan 24 2024

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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, Texas 75038

TIA LOAD CALCULATOR 2.2

PROJECT DATA	
Job Code:	235623
Carrier Site ID:	BU 841294
Carrier Site Name:	MONROE-GUINEA ROAD

CODES AND STANDARDS	
Building Code:	2021 IBC
Local Building Code:	2022 CTBC
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Sector Frame	--
Mount Elevation:	165.0	ft.
Number of Sectors:	3	--
Structure Type:	Self Support Tower	--
Structure Height:	240.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	B	--
Site Class:	D - Default	--
Ground Elevation:	582.3	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:	117	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.14	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	37.17	psf
Ground Elevation Factor (K_e):	0.98	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	1.00	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	6.99	psf
Mount Ice Thickness (t_{iz}):	1.17	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	66.90	psf
Round Member Pressure:	40.14	psf
Ice Wind Pressure:	7.55	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.21	g
1 Second Accel (S_1):	0.06	g
Short Period Des. (S_{DS}):	0.23	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):	0.11	--
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)
MX08FRO665-21	1	165	No Ice	8.01	3.21	64.50
--	--	--	w/ Ice	9.06	4.13	183.97
TA08025-B604	1	165	No Ice	1.96	0.98	63.90
--	--	--	w/ Ice	2.24	1.20	43.66
TA08025-B605	1	165	No Ice	1.96	1.13	74.96
--	--	--	w/ Ice	2.24	1.35	46.65
VHLP2-11W/A	1	165	No Ice	5.63	2.16	17.60
--	--	--	w/ Ice	6.09	2.48	102.15
IP-50C	1	165	No Ice	1.12	0.37	13.20
--	--	--	w/ Ice	1.34	0.53	21.43
			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			
--	--	--	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]
MX08FRO665-21	1	165	1.00	1.14	0.95	1.17	37.17	6.79
TA08025-B604	1	165	1.00	1.14	0.95	1.17	37.17	6.79
TA08025-B605	1	165	1.00	1.14	0.95	1.17	37.17	6.79
VHLP2-11W/A	1	165	1.00	1.14	0.95	1.17	37.17	6.79
IP-50C	1	165	1.00	1.14	0.95	1.17	37.17	6.79

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
MX08FRO665-21	1	No Ice	267.95	147.52	227.81	107.38	227.81	147.52
--	--	w/ Ice	55.35	32.75	47.81	25.21	47.81	32.75
TA08025-B604	1	No Ice	65.68	41.04	57.47	32.82	57.47	41.04
--	--	w/ Ice	13.70	8.90	12.10	7.30	12.10	8.90
TA08025-B605	1	No Ice	65.68	44.76	58.71	37.78	58.71	44.76
--	--	w/ Ice	13.70	9.63	12.34	8.27	12.34	9.63
VHLP2-11W/A	1	No Ice	205.25	94.68	168.39	57.82	168.39	94.68
--	--	w/ Ice	37.21	20.68	31.70	15.18	31.70	20.68
IP-50C	1	No Ice	37.51	18.74	31.25	12.49	31.25	18.74
--	--	w/ Ice	8.17	4.48	6.94	3.25	6.94	4.48
		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						
--	--	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						
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		No Ice						
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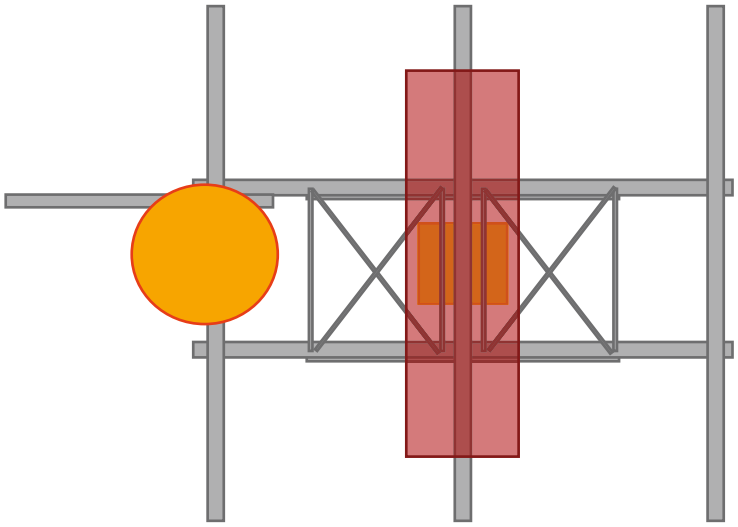
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

EQUIPMENT SEISMIC FORCE CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	Weight [lbs]	F_p [lbs]
MX08FRO665-21	1	165	64.5	8.75
TA08025-B604	1	165	63.9	8.67
TA08025-B605	1	165	74.96	10.17
VHLP2-11W/A	1	165	17.6	2.39
IP-50C	1	165	13.2	1.79

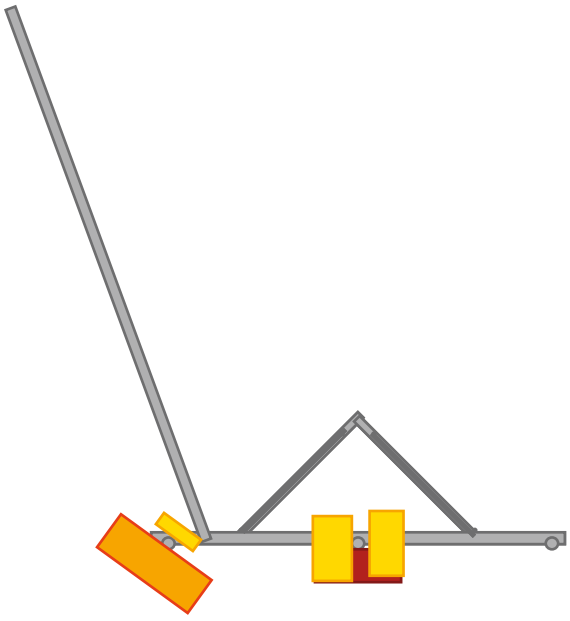
ELEVATION VIEW



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
Irving, Texas 75038

Equipment Name	Total Quantity	Antenna Centerline	Mount Pipe Positions	Equipment Azimuths
MX08FRO665-21	1	165	MP2	120
TA08025-B604	1	165	MP2	210
TA08025-B605	1	165	MP2	30
VHLP2-11W/A	1	165	MP3	156
IP-50C	1	165	MP3	156

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	Y
Global Member Orientation Plane	XZ
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	None

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (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 (/1...	Density[k/ft^3]	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
8	A500 Gr. C - 46	29000	11154	.3	.65	.49	46	1.3	62	1.4
9	A529 Gr. 50	29000	11154	.3	.65	.49	50	1.3	65	1.4

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_2.5	PIPE_2.5	Beam	None	A500 Gr. C - 46	Typical	1.61	1.45	1.45	2.89
2	PIPE_1.5	PIPE_1.5	Beam	None	A500 Gr. C - 46	Typical	.749	.293	.293	.586
3	PIPE_2.0	PIPE_2.0	Beam	None	A500 Gr. C - 46	Typical	1.02	.627	.627	1.25
4	SR 5/8	SR 5/8	Beam	None	A529 Gr. 50	Typical	.307	.007	.007	.015
5	PIPE_3.0	PIPE_3.0	Beam	None	A500 Gr. C - 46	Typical	2.07	2.85	2.85	5.69

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
6	SR 1/2"	SR 1/2"	Beam	None	A529 Gr. 50	Typical	.196	.003	.003	.006

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8CU1.25X0...	Beam	None	A653 SS Gr33	Typical	.581	.057	4.41	.00063

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	N13						
2	N14						
3	N48	Reaction	Reaction	Reaction	Reaction		Reaction
4	N49	Reaction	Reaction	Reaction	Reaction		Reaction
5	N47A	Reaction	Reaction	Reaction			

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight	DL		-1			6			
2	Structure Wind Z	WLZ						31		
3	Structure Wind X	WLX						31		
4	Wind Load 0 AZI	WLZ					12			
5	Wind Load 30 AZI	None					12			
6	Wind Load 45 AZI	None					12			
7	Wind Load 60 AZI	None					12			
8	Wind Load 90 AZI	WLX					12			
9	Wind Load 120 AZI	None					12			
10	Wind Load 135 AZI	None					12			
11	Wind Load 150 AZI	None					12			
12	Ice Weight	OL1					6	31		
13	Ice Structure Wind Z	OL2						31		
14	Ice Structure Wind X	OL3						31		
15	Ice Wind Load 0 AZI	OL2					12			
16	Ice Wind Load 30 AZI	None					12			
17	Ice Wind Load 45 AZI	None					12			
18	Ice Wind Load 60 AZI	None					12			
19	Ice Wind Load 90 AZI	OL3					12			
20	Ice Wind Load 120 AZI	None					12			
21	Ice Wind Load 135 AZI	None					12			
22	Ice Wind Load 150 AZI	None					12			
23	Seismic Load Z	ELZ			-.136		6			
24	Seismic Load X	ELX	-.136				6			
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 (Lm)	None					1			
29	Maintenance Load 2 (Lm)	None					1			
30	Maintenance Load 3 (Lm)	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..	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 AZI	Yes	Y		DL	1.2	2	-.5	3	.866	9	1														
8	1.2DL + 1WL 135 AZI	Yes	Y		DL	1.2	2	-.707	3	.707	10	1														
9	1.2DL + 1WL 150 AZI	Yes	Y		DL	1.2	2	-.866	3	.5	11	1														
10	1.2DL + 1WL 180 AZI	Yes	Y		DL	1.2	2	-1	3		4	-1														
11	1.2DL + 1WL 210 AZI	Yes	Y		DL	1.2	2	-.866	3	-.5	5	-1														
12	1.2DL + 1WL 225 AZI	Yes	Y		DL	1.2	2	-.707	3	-.707	6	-1														
13	1.2DL + 1WL 240 AZI	Yes	Y		DL	1.2	2	-.5	3	-.866	7	-1														
14	1.2DL + 1WL 270 AZI	Yes	Y		DL	1.2	2		3	-1	8	-1														
15	1.2DL + 1WL 300 AZI	Yes	Y		DL	1.2	2	.5	3	-.866	9	-1														
16	1.2DL + 1WL 315 AZI	Yes	Y		DL	1.2	2	.707	3	-.707	10	-1														
17	1.2DL + 1WL 330 AZI	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 AZI	Yes	Y		DL	.9	2	-.5	3	.866	9	1														
24	0.9DL + 1WL 135 AZI	Yes	Y		DL	.9	2	-.707	3	.707	10	1														
25	0.9DL + 1WL 150 AZI	Yes	Y		DL	.9	2	-.866	3	.5	11	1														
26	0.9DL + 1WL 180 AZI	Yes	Y		DL	.9	2	-1	3		4	-1														
27	0.9DL + 1WL 210 AZI	Yes	Y		DL	.9	2	-.866	3	-.5	5	-1														
28	0.9DL + 1WL 225 AZI	Yes	Y		DL	.9	2	-.707	3	-.707	6	-1														
29	0.9DL + 1WL 240 AZI	Yes	Y		DL	.9	2	-.5	3	-.866	7	-1														
30	0.9DL + 1WL 270 AZI	Yes	Y		DL	.9	2		3	-1	8	-1														
31	0.9DL + 1WL 300 AZI	Yes	Y		DL	.9	2	.5	3	-.866	9	-1														
32	0.9DL + 1WL 315 AZI	Yes	Y		DL	.9	2	.707	3	-.707	10	-1														
33	0.9DL + 1WL 330 AZI	Yes	Y		DL	.9	2	.866	3	-.5	11	-1														
34	1.2DL + 1DLi + 1W Li 0 ...	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1												
35	1.2DL + 1DLi + 1W Li 3...	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1												
36	1.2DL + 1DLi + 1W Li 4...	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1												
37	1.2DL + 1DLi + 1W Li 6...	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1												
38	1.2DL + 1DLi + 1W Li 9...	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1												
39	1.2DL + 1DLi + 1W Li 1...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1												
40	1.2DL + 1DLi + 1W Li 1...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	.707	21	1												
41	1.2DL + 1DLi + 1W Li 1...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	.5	22	1												
42	1.2DL + 1DLi + 1W Li 1...	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1												
43	1.2DL + 1DLi + 1W Li 2...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	-.5	16	-1												
44	1.2DL + 1DLi + 1W Li 2...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	-.707	17	-1												
45	1.2DL + 1DLi + 1W Li 2...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.866	18	-1												
46	1.2DL + 1DLi + 1W Li 2...	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1												
47	1.2DL + 1DLi + 1W Li 3...	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.866	20	-1												
48	1.2DL + 1DLi + 1W Li 3...	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.707	21	-1												
49	1.2DL + 1DLi + 1W Li 3...	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1												
50	(1.2+0.2Sds)DL + 1E 0 ...	Yes	Y		DL	1.2...	23	1	24																	
51	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.866	24	.5																

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...
52	(1.2+0.2Sds)DL + 1E 4...	Yes	Y		DL	1.2...	23	.707	24	.707																
53	(1.2+0.2Sds)DL + 1E 6...	Yes	Y		DL	1.2...	23	.5	24	.866																
54	(1.2+0.2Sds)DL + 1E 9...	Yes	Y		DL	1.2...	23		24	1																
55	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-.5	24	.866																
56	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-.707	24	.707																
57	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-.866	24	.5																
58	(1.2+0.2Sds)DL + 1E 1...	Yes	Y		DL	1.2...	23	-1	24																	
59	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23	-.866	24	-.5																
60	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23	-.707	24	-.707																
61	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23	-.5	24	-.866																
62	(1.2+0.2Sds)DL + 1E 2...	Yes	Y		DL	1.2...	23		24	-1																
63	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.5	24	-.866																
64	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.707	24	-.707																
65	(1.2+0.2Sds)DL + 1E 3...	Yes	Y		DL	1.2...	23	.866	24	-.5																
66	(0.9-0.2Sds)DL + 1E 0 ...	Yes	Y		DL	.855	23	1	24																	
67	(0.9-0.2Sds)DL + 1E 3...	Yes	Y		DL	.855	23	.866	24	.5																
68	(0.9-0.2Sds)DL + 1E 4...	Yes	Y		DL	.855	23	.707	24	.707																
69	(0.9-0.2Sds)DL + 1E 6...	Yes	Y		DL	.855	23	.5	24	.866																
70	(0.9-0.2Sds)DL + 1E 9...	Yes	Y		DL	.855	23		24	1																
71	(0.9-0.2Sds)DL + 1E 1...	Yes	Y		DL	.855	23	-.5	24	.866																
72	(0.9-0.2Sds)DL + 1E 1...	Yes	Y		DL	.855	23	-.707	24	.707																
73	(0.9-0.2Sds)DL + 1E 1...	Yes	Y		DL	.855	23	-.866	24	.5																
74	(0.9-0.2Sds)DL + 1E 1...	Yes	Y		DL	.855	23	-1	24																	
75	(0.9-0.2Sds)DL + 1E 2...	Yes	Y		DL	.855	23	-.866	24	-.5																
76	(0.9-0.2Sds)DL + 1E 2...	Yes	Y		DL	.855	23	-.707	24	-.707																
77	(0.9-0.2Sds)DL + 1E 2...	Yes	Y		DL	.855	23	-.5	24	-.866																
78	(0.9-0.2Sds)DL + 1E 2...	Yes	Y		DL	.855	23		24	-1																
79	(0.9-0.2Sds)DL + 1E 3...	Yes	Y		DL	.855	23	.5	24	-.866																
80	(0.9-0.2Sds)DL + 1E 3...	Yes	Y		DL	.855	23	.707	24	-.707																
81	(0.9-0.2Sds)DL + 1E 3...	Yes	Y		DL	.855	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 + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	.066	3		4	.066												
86	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	.057	3	.033	5	.066												
87	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	.046	3	.046	6	.066												
88	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	.033	3	.057	7	.066												
89	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2		3	.066	8	.066												
90	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	-.033	3	.057	9	.066												
91	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	-.046	3	.046	10	.066												
92	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	-.057	3	.033	11	.066												
93	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	-.066	3		4	-.066												
94	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	-.057	3	-.033	5	-.066												
95	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	-.046	3	-.046	6	-.066												
96	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	-.033	3	-.057	7	-.066												
97	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2		3	-.066	8	-.066												
98	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	.033	3	-.057	9	-.066												
99	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	.046	3	-.046	10	-.066												
100	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	28	1.5	2	.057	3	-.033	11	-.066												
101	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	.066	3		4	.066												
102	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	.057	3	.033	5	.066												
103	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	.046	3	.046	6	.066												

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...
104	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	.033	3	.057	7	.066												
105	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2		3	.066	8	.066												
106	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	-.033	3	.057	9	.066												
107	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	-.046	3	.046	10	.066												
108	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	-.057	3	.033	11	.066												
109	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	-.066	3		4	-.066												
110	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	-.057	3	-.033	5	-.066												
111	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	-.046	3	-.046	6	-.066												
112	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	-.033	3	-.057	7	-.066												
113	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2		3	-.066	8	-.066												
114	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	.033	3	-.057	9	-.066												
115	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	.046	3	-.046	10	-.066												
116	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	29	1.5	2	.057	3	-.033	11	-.066												
117	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	.066	3		4	.066												
118	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	.057	3	.033	5	.066												
119	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	.046	3	.046	6	.066												
120	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	.033	3	.057	7	.066												
121	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2		3	.066	8	.066												
122	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	-.033	3	.057	9	.066												
123	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	-.046	3	.046	10	.066												
124	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	-.057	3	.033	11	.066												
125	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	-.066	3		4	-.066												
126	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	-.057	3	-.033	5	-.066												
127	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	-.046	3	-.046	6	-.066												
128	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	-.033	3	-.057	7	-.066												
129	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2		3	-.066	8	-.066												
130	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	.033	3	-.057	9	-.066												
131	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	.046	3	-.046	10	-.066												
132	1.2DL + 1.5Lm + 1Wm ...	Yes	Y		DL	1.2	30	1.5	2	.057	3	-.033	11	-.066												

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	N48	max	935.149	90	1356.39	42	303.427	32	-161.787	30	0	132	467.456	121
2		min	-830.599	130	203.172	30	-1282.677	40	-1083.445	110	0	1	-512.44	97
3	N49	max	829.254	122	267.677	30	1227.333	117	-8.872	91	0	132	101.543	121
4		min	-933.641	98	-2.128	11	-76.049	26	-211.606	30	0	1	-126.999	97
5	N47A	max	235.002	6	53.227	46	522.626	6	0	132	0	132	0	132
6		min	-235.429	14	17.038	70	-523.505	14	0	1	0	1	0	1
7	Totals:	max	754.973	22	1453.894	38	1028.859	18						
8		min	-754.976	30	464.35	78	-1028.859	10						

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

	Member	Shape	Cod...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [...	phi*Pnt [l...	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	M23	SR 5/8	.382	30.25	90	.025	0		6	1728.173	13815	134.4	134.4	1	H1-1a
2	M24	SR 5/8	.360	26.154	126	.024	0		6	1728.173	13815	134.4	134.4	1	H1-1a
3	M28	SR 1/2"	.243	22.427	100	.009	44.854		14	336.867	8820	72	72	1	H1-1a
4	M29	SR 1/2"	.232	22.427	119	.007	0		105	336.867	8820	72	72	1	H1-1a
5	M1	PIPE_1.5	.172	34.81	90	.154	34.81		89	23772.804	31008.6	1452.45	1452.45	1....	H1-1b
6	M3	PIPE_1.5	.156	34.81	98	.094	.725		109	23772.804	31008.6	1452.45	1452.45	1....	H1-1b

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

	Member	Shape	Cod...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [..	phi*Pnt [l..	phi*Mn y...	phi*Mn z...	Cb	Eqn
7	M4	PIPE_1.5	.153	34.81	132	.147	34.81		120	23772.804	31008.6	1452.45	1452.45	1....	H1-1b
8	M2	PIPE_1.5	.139	34.81	121	.093	.725		112	23772.804	31008.6	1452.45	1452.45	1....	H1-1b
9	H1	PIPE_2.5	.129	20	98	.045	20		98	45255.275	66654	4726.5	4726.5	2....	H1-1b
10	M5	PIPE_2.5	.119	76	121	.054	20		14	45255.275	66654	4726.5	4726.5	2....	H1-1b
11	M31A	PIPE_2.0	.092	68.92	6	.004	0		46	7455.132	42228	2459.85	2459.85	1....	H1-1b
12	MP2	PIPE_2.5	.058	63	10	.111	33		14	33487.322	66654	4726.5	4726.5	1	H1-1b
13	M25	SR 5/8	.032	30.25	89	.036	0		97	1728.173	13815	134.4	134.4	1	H1-1b*
14	M26	SR 5/8	.030	30.25	127	.036	0		97	1728.173	13815	134.4	134.4	1	H1-1b*
15	MP3	PIPE_2.5	.026	48	25	.071	33		14	33487.322	66654	4726.5	4726.5	1....	H1-1b
16	MP1	PIPE_2.5	.012	63	122	.050	33		14	33487.322	66654	4726.5	4726.5	1	H1-1b*
17	M27	SR 1/2"	.000	0	132	.014	0		30	336.867	8820	72	72	1	H1-1a
18	M30	SR 1/2"	.000	0	132	.012	0		6	336.867	8820	72	72	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

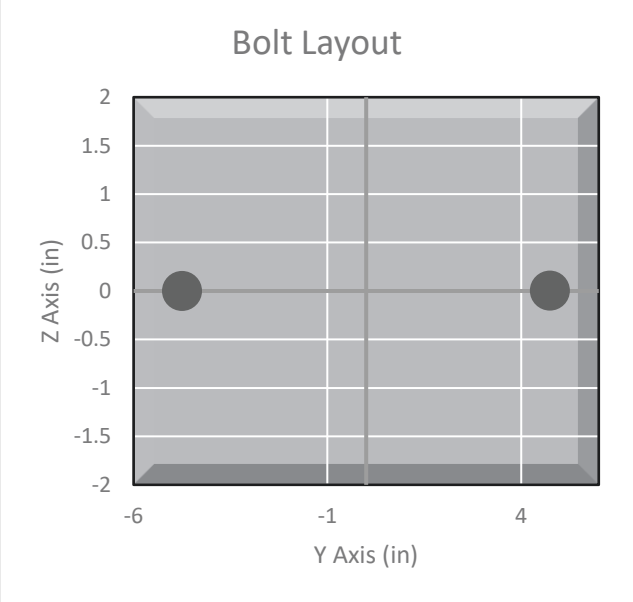
Analysis date: 1/24/2024

BOLT TOOL 1.5.3

Project Data	
Job Code:	235623
Carrier Site ID:	BU 841294
Carrier Site Name:	MONROE-GUINEA ROAD

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:	A307	--
Yield Strength (Fy):	36	ksi
Ultimate Strength (Fu):	60	ksi
Number of Bolts:	2	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	9.5	in



Connection Description
Standoff to Tower Leg

Bolt Check*		
Tensile Capacity (ϕT_n):	10170.1	lbs
Shear Capacity (ϕV_n):	6902.9	lbs
Tension Force (T_u):	618.4	lbs
Shear Force (V_u):	1377.2	lbs
Tension Usage:	5.8%	--
Shear Usage:	19.0%	--
Interaction:	19.0%	Pass
Controlling Member:	M31	--
Controlling LC:	91	--

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

Slip Check*		
Sliding Capacity (ϕR_{ns}):	6585.5	lbs
Torsion Capacity (ϕR_{nr}):	2606.8	lb-ft
Sliding Force (V_{us}):	1334.3	lbs
Torsional Force (T_{ur}):	0.0	lb-ft
Sliding Usage:	19.3%	--
Torsion Usage:	0.0%	--
Interaction:	19.3%	Pass
Controlling Member:	M31	--
Controlling LC:	40	--

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

1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

Dish Existing Facility

Site ID: NJJER01094A

Monroe-Guinea Road
230 Guinea Road
Monroe, Connecticut 06468

February 6, 2024

EBI Project Number: 006845

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**0.39%**

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

February 6, 2024

Attn: DISH Wireless

Emissions Analysis for Site: NJJER01094A - Monroe-Guinea Road

EBI Consulting was directed to analyze the proposed Dish facility located at **230 Guinea Road** in **Monroe, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Antenna Installation located on this property are within specified federal limits.

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

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

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

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

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless antenna facility located at 230 Guinea Road in Monroe, Connecticut using the equipment information listed below. Modeling of the antennas and associated equipment was completed using RoofMaster™ software, which is a widely-used predictive modeling program that has been developed to predict RF power density values for rooftop and tower telecommunications sites produced by vertical collinear antennas that are typically used in the cellular, PCS, paging and other communications services. Using the computational methods set forth in Federal Communications (FCC) Office of Engineering & Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" (OET-65), RoofMaster™ calculates predicted power density in a scalable grid based on the contributions of all RF sources characterized in the study scenario. At each grid location, the cumulative power density is expressed as a percentage of the FCC limits. Manufacturer antenna pattern data is utilized in these calculations. RoofMaster™ models consist of the Far Field model as specified in OET-65 and an implementation of the OET-65 Cylindrical Model (Sula9). The models utilize several operational specifications for different types of antennas to produce a plot of spatially-averaged power densities that can be expressed as a percentage of the applicable exposure limit.

Since Dish is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, telecommunications equipment was modeled using the following assumptions:

1) 4 n71 channels (600 MHz Band) were considered for each sector of the existing installation. These Channels have a transmit power of 30 Watts per Channel.

2) 4 n29 channels (700 MHz Band) were considered for each sector of the existing installation. These Channels have a transmit power of 30 Watts per Channel.

3) 4 n70 channels (2007 MHz Band) were considered for each sector of the existing installation. This Channel has a transmit power of 40 Watts.

4) 4 n66 channels (2100 MHz Band) were considered for each sector of the existing installation. These Channels have a transmit power of 40 Watts per Channel.

5) 1 microwave backhaul channel (11 GHz) was considered for the proposed facility. This channel has a transmit power of 0.5 Watts.

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

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

8) The antennas used in this modeling are the JMA MX08FRO665-21 NJ 600 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz channel(s) in Sector A, the JMA MX08FRO665-21 NJ 600 for the 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the JMA MX08FRO665-21 NJ 600 for the 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C, the COMMSCOPE VHLP2-11 11000 for the 11000 MHz channel(s) in Sector D. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications 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.

9) The antenna mounting height centerline of the proposed antennas (both microwave and panel antennas) is 165 feet above ground level (AGL).

10) Emissions values for additional carriers were calculated in Far Field utilizing the antenna models provided in the structural analysis.

11) All calculations were done in Far Field mode with respect to uncontrolled / general population threshold limits.

Dish Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C	Sector:	D
Antenna #:	1	Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-21 NJ 600	Make / Model:	JMA MX08FRO665-21 NJ 600	Make / Model:	JMA MX08FRO665-21 NJ 600	Make / Model:	COMMSCOPE VHLP2-11 11000
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz	Frequency Bands:	600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	11000 MHz
Gain:	11.46 dBd / 12.66 dBd / 16.16 dBd / 16.66 dBd	Gain:	11.46 dBd / 12.66 dBd / 16.16 dBd / 16.66 dBd	Gain:	11.46 dBd / 12.66 dBd / 16.16 dBd / 16.66 dBd	Gain:	32.35 dBd
Height (AGL):	165 feet	Height (AGL):	165 feet	Height (AGL):	165 feet	Height (AGL):	165 feet
Channel Count:	16	Channel Count:	16	Channel Count:	16	Channel Count:	1
Total TX Power (W):	560.00 Watts	Total TX Power (W):	560.00 Watts	Total TX Power (W):	560.00 Watts	Total TX Power (W):	0.50 Watts
ERP (W):	15,968.93	ERP (W):	15,968.93	ERP (W):	15,968.93	ERP (W):	858.95
Antenna A1 MPE %:	**2.91%**	Antenna B1 MPE %:	**2.91%**	Antenna C1 MPE %:	**2.91%**	Antenna D1 MPE %:	**0.12%**

Site Composite MPE %	
Carrier	MPE %
Dish (Combined Sectors):	0.01%
AT&T	0.03%
Verizon	0.17%
Unknown	0.18%
Site Total MPE % :	0.39%

Dish MPE % Per Sector	
Dish Sector A Total:	0.01%
Dish Sector B Total:	0.01%
Dish Sector C Total:	0.01%
Dish Sector D Total:	0.00%
Dish Total MPE % :	0.01%

Dish Maximum MPE Power Values (Sector A)

Dish Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Dish 600 MHz n71	4	374.2150543	165	2.12864647	600 MHz n71	400.0	0.53%
Dish 700 MHz n29	4	493.311517	165	2.806102553	700 MHz n29	467.0	0.60%
Dish 1900 MHz n70	4	1472.515895	165	8.376108136	1900 MHz n70	1000.0	0.84%
Dish 2100 MHz n66	4	1652.190008	165	9.398147904	2100 MHz n66	1000.0	0.94%
						Dish Total:	**0.01%**

• NOTE: Total Dish MPE values reflect all Dish antennas as reported by RoofMaster™ combined modeling.

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

Summary

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

The anticipated maximum composite contributions from the Dish 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:

Dish Sector	Power Density Value (%)
Sector A:	0.01%
Sector B:	0.01%
Sector C:	0.01%
Sector D:	0.00%
Dish Maximum MPE % (Sector A):	0.01%
Dish Combined Sectors MPE %:	0.01%
Site Total:	0.39%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **0.39%** 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 or documents available on the Connecticut Siting Council website.

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.

dish wireless™

SITE NAME:

MONROE-GUINEA ROAD

DISH Wireless L.L.C. SITE ID:

NJJER01094A

DISH Wireless L.L.C. SITE ADDRESS:

230 GUINEA ROAD
MONROE, CT 06468

SCOPE OF WORK

THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:

TOWER SCOPE OF WORK:
- INSTALL (1) PROPOSED MICROWAVE DISH
- INSTALL (1) PROPOSED ODU
- INSTALL PROPOSED JUMPERS
- INSTALL (1) PROPOSED COAX CABLE
- INSTALL (1) PROPOSED FIBER CABLE

GROUND SCOPE OF WORK:
- NONE

SITE INFORMATION

PROPERTY OWNER:	VERIZON WIRELESS
ADDRESS:	PO BOX 2549 ADDISON, TX 75001
TOWER TYPE:	SELF SUPPORT TOWER
TOWER CO SITE ID:	841294
TOWER APP NUMBER:	659187
COUNTY:	FAIRFIELD
LATITUDE (NAD 83):	41° 20' 30.68" N 41.341856
LONGITUDE (NAD 83):	-73° 16' 28.28" W -73.274522
ZONING JURISDICTION:	TOWN OF MONROE
ZONING DISTRICT:	RF2
PARCEL NUMBER:	080 013 00
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	CONNECTICUT LIGHT & POWER CO
TELEPHONE COMPANY:	AT&T

PROJECT DIRECTORY

APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	CROWN CASTLE USA INC. 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (877) 486-9377
SITE DESIGNER:	POD 11490 BLUEGRASS PARKWAY LOUISVILLE, KY 40299 (502) 437-5252
SITE ACQUISITION:	DANIEL ANDERSON (248) 431-9030

CONNECTICUT CODE OF COMPLIANCE

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	2022 CT STATE BUILDING CODE/2021 IBC W/ CT AMENDMENTS
MECHANICAL	2022 CT STATE BUILDING CODE/2021 IMC W/ CT AMENDMENTS
ELECTRICAL	2022 CT STATE BUILDING CODE/2020 NEC W/ CT AMENDMENTS

SITE PHOTO

DIRECTIONS

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT (SCHOEPHOESTER RD, WINDSOR LOCKS, CT 06096):

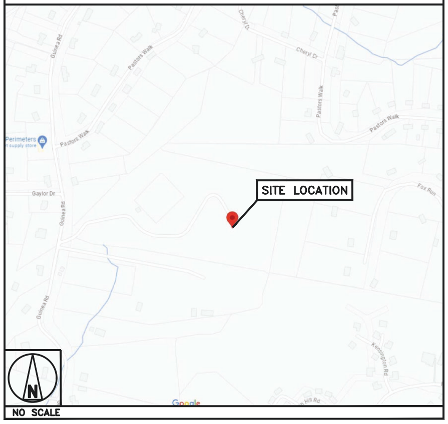
GET ON BRADLEY INTERNATIONAL AIRPORT CON FROM BRADLEY INTERNATIONAL AIRPORT.
FOLLOW I-91 S AND I-84 TO WASSERMAN WAY IN NEWTOWN. TAKE EXIT 11 FROM I-84.
TAKE TODDY HILL RD, BOTSFORD HILL RD AND PINE TREE HILL RD TO YOUR DESTINATION IN MONROE.

SHEET INDEX

UNDERGROUND SERVICE ALERT CBYD 811
UTILITY NOTIFICATION CENTER OF CONNECTICUT
(800) 922-4455
WWW.CBYD.COM
CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

811

VICINITY MAP



GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE. NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

POD
POWER OF DESIGN
11490 BLUEGRASS PKWY
LOUISVILLE, KY 40299

AARON ... NHOFF
36141
LICENSED
PROFESSIONAL ENGINEER
11/14/2023

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DRAWN BY:	CHECKED BY:	APPROVED BY:
TB	EEW	AH

RFDS REV #/DATE: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/14/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
841294

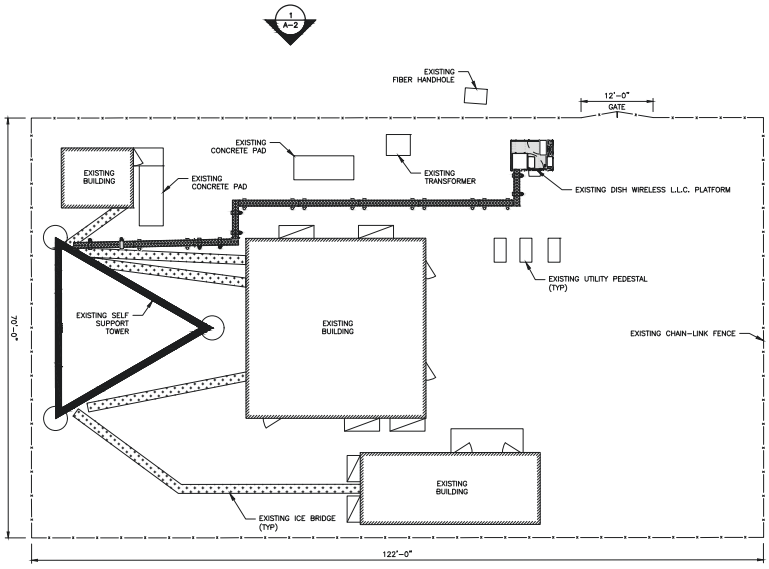
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01094A
230 GUINEA ROAD
MONROE, CT 06468

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



OVERALL SITE PLAN

8' 4' 0 8' 16'
1/8"=1'-0"

1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

NOT USED

2

NOT USED

NO SCALE

3

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

POD
POWER OF DESIGN
11490 BLUEGRASS PKWY
LOUISVILLE, KY 40299

STATE OF CONNECTICUT
AARON M. HILKOFF
36141
LICENSED PROFESSIONAL ENGINEER
11/14/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
TB	EEW	AH

RFDS REV #/DATE: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/14/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

841294

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01094A
230 GUINEA ROAD
MONROE, CT 06468

SHEET TITLE

OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

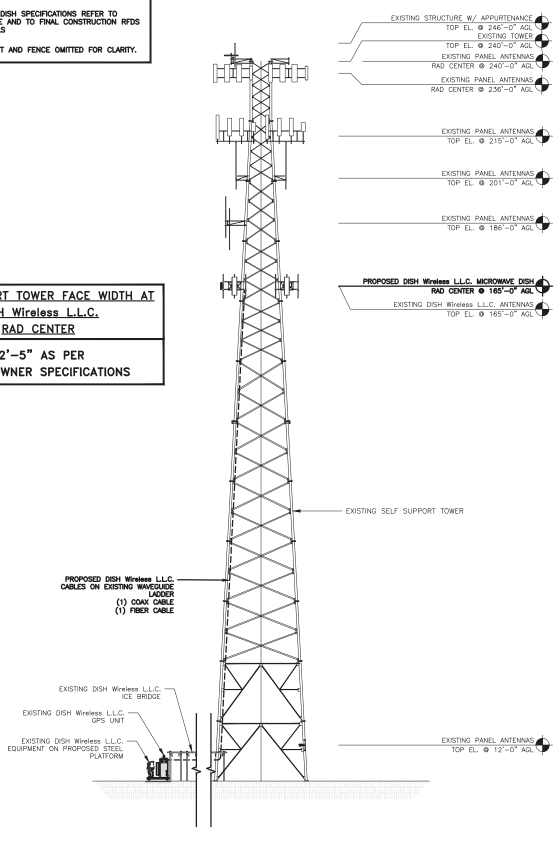
A-1

NOTES

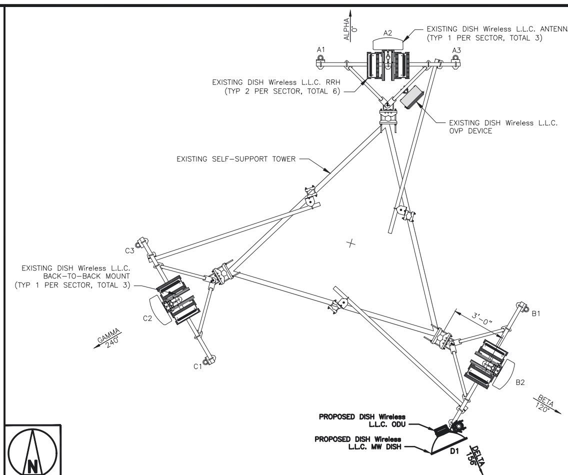
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.

SELF SUPPORT TOWER FACE WIDTH AT DISH Wireless L.L.C. RAD CENTER

12'-5" AS PER TOWER OWNER SPECIFICATIONS



PROPOSED NORTHEAST ELEVATION — 16' 12' 8' 4' 0 16' 32' — 1/16"=1'-0" — 1



ANTENNA LAYOUT — 12" 6" 0 1' 2' 3' 4' 5' 6' 7' — 3/8"=1'-0" — 2

SECTOR POS.	ANTENNA					TRANSMISSION CABLE	RRH			OVP
	EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECH	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH	MANUFACTURER – MODEL NUMBER	TECH	POS.	MANUFACTURER MODEL
A1	--	--	--	--	--	(1) HIGH-CAPACITY HYBRID CABLE (280'-0" LONG)	FUJITSU – TA08025-B604	5G	A2	RAYCAP – RDIDC-9181-PF-48
A2	EXISTING	JMA – MX08FRO665-21	5G	0°	165'-0"		FUJITSU – TA08025-B605	5G	A2	
A3	--	--	--	--	--		--	--	--	
B1	--	--	--	--	--	SHARED W/ALPHA	FUJITSU – TA08025-B604	5G	B2	SHARED W/ALPHA
B2	EXISTING	JMA – MX08FRO665-21	5G	120°	165'-0"		FUJITSU – TA08025-B605	5G	B2	
B3	--	--	--	--	--		--	--	--	
C1	--	--	--	--	--	SHARED W/ALPHA	FUJITSU – TA08025-B604	5G	C2	SHARED W/ALPHA
C2	EXISTING	JMA – MX08FRO665-21	5G	240°	165'-0"		FUJITSU – TA08025-B605	5G	C2	
C3	--	--	--	--	--		--	--	--	

SECTOR POS.	MICROWAVE DISH					TRANSMISSION CABLE
	EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECH	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
D1	PROPOSED	COMMSCOPE – VHLP2-11W/A	--	156°	165'-0"	(1) COAX CABLE (1) FIBER CABLE (280'-0" LONG)
	--	--	--	--	--	
	--	--	--	--	--	

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.

ANTENNA SCHEDULE — NO SCALE — 3

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

POD
POWER OF DESIGN
11490 BLUEGRASS PKWY
LOUISVILLE, KY 40299

STATE OF CONNECTICUT — AARON T. NHOFF — 36141 — LICENSED PROFESSIONAL ENGINEER
11/14/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
TB	EEW	AH

RFDS REV #/DATE: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/14/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
841294

DISH Wireless L.L.C. PROJECT INFORMATION
NJJER01094A
230 GUINEA ROAD
MONROE, CT 06468

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2

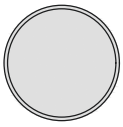
CERAGON IP-50C	
DIMENSIONS (HxWxD)	12.7"x8.93"x3.38"
WEIGHT	13.2 lbs

FRONT

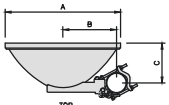
IP-50 UNIVERSAL RADIO DETAIL | NO SCALE | 1

VHLP2-11W/A MICROWAVE DISH				
SIZE	A	B	C	D
	26"	11.9"	9.9"	1.8"

"D" IS WIDTH OF MOUNTING CLAMP



FRONT



TOP

TOTAL WEIGHT: 17.6 LBS

MICROWAVE DETAIL | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

DISH WIRELESS L.L.C. TEMPLATE VERSION 55 – 10/23/2023

dish wireless.
5701 SOUTH SANTA FE DRIVE
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DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01094A
230 GUINEA ROAD
MONROE, CT 06468

SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

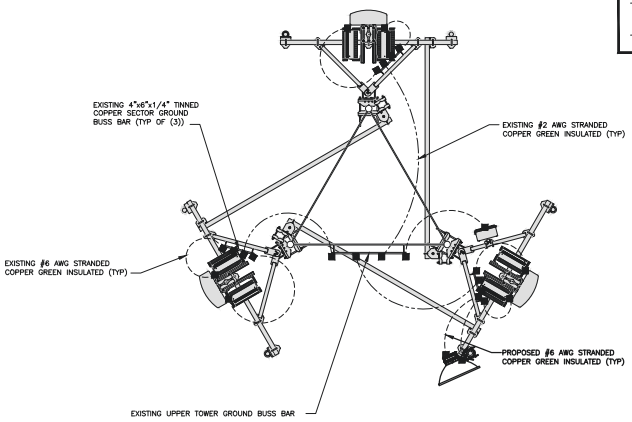
A-3

NOT USED

NO SCALE | 1

NOTES

- ANTENNAS AND OVP SHOWN ARE GENERIC AND NOT REFERENCING TO A SPECIFIC MANUFACTURER. THIS LAYOUT IS FOR REFERENCE PURPOSES ONLY
- UPPER TOWER BUSSBAR SHALL BE INSTALLED WITHOUT INSULATORS



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- GROUND BUS BAR
- GROUND ROD
- TEST GROUND ROD WITH INSPECTION SLEEVE
- #6 AWG STRANDED & INSULATED
- #2 AWG SOLID COPPER TINNED
- BUSS BAR INSULATOR

GROUNDING LEGEND

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
2. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH Wireless L.L.C. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

(A) EXTERIOR GROUND RING: #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.

(B) TOWER GROUND RING: THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.

(C) INTERIOR GROUND RING: #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.

(D) BOND TO INTERIOR GROUND RING: #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.

(E) GROUND ROD: UL LISTED COPPER CLAD STEEL. MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.

(F) CELL REFERENCE GROUND BAR: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.

(G) HATCH PLATE GROUND BAR: BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.

(H) EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.

(I) TELCO GROUND BAR: BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.

(J) FRAME BONDING: THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.

(K) INTERIOR UNIT BONDS: METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.

(L) FENCE AND GATE GROUNDING: METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.

(M) EXTERIOR UNIT BONDS: METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE

(N) ICE BRIDGE SUPPORTS: EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.

(O) DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR

(P) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO TOWER STEEL.

REFER TO DISH Wireless L.L.C. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE | 3

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LITTLETON, CO 80120

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11/14/2023

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TB	EEW	AH

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DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01094A
230 GUINEA ROAD
MONROE, CT 06468

SHEET TITLE

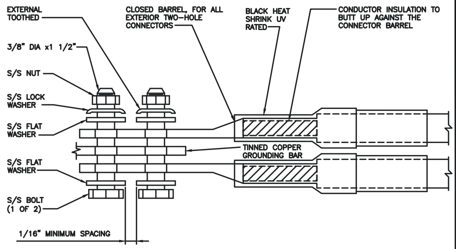
GROUNDING PLANS AND NOTES

SHEET NUMBER

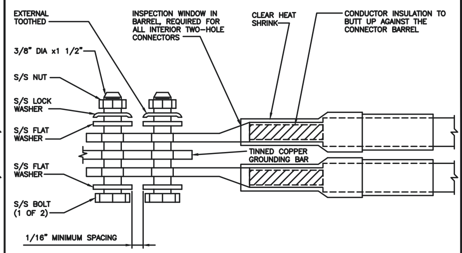
G-1

1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUND BAR. ROUTE CONDUCTORS TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. ALL EXTERIOR GROUNDING HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18–8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI–OXIDANT COMPOUND BEFORE MATING.
3. FOR GROUND BOND TO STEEL ONLY: COAT ALL SURFACES WITH AN ANTI–OXIDANT COMPOUND BEFORE MATING.
4. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUNDING BUS.
5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE.
6. ALL GROUNDING PARTS AND EQUIPMENT TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED.
8. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).

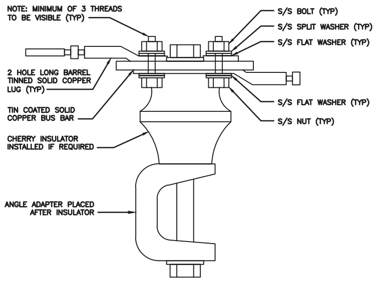
TYPICAL GROUNDING NOTES — NO SCALE — 1



TYPICAL EXTERIOR TWO HOLE LUG — NO SCALE — 2



TYPICAL INTERIOR TWO HOLE LUG — NO SCALE — 3



LUG DETAIL — NO SCALE — 4

NOT USED — NO SCALE — 5

NOT USED — NO SCALE — 6

NOT USED — NO SCALE — 7

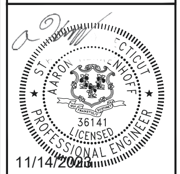
NOT USED — NO SCALE — 8

NOT USED — NO SCALE — 9

DISH WIRELESS L.L.C. TEMPLATE VERSION 55 – 10/23/2023

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

POWER OF DESIGN
11490 BLUEGRASS PKWY
LOUISVILLE, KY 40299



11/14/2023

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

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TB	EEW	AH

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PROJECT INFORMATION

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230 GUINEA ROAD
MONROE, CT 06468

SHEET TITLE

GROUNDING DETAILS

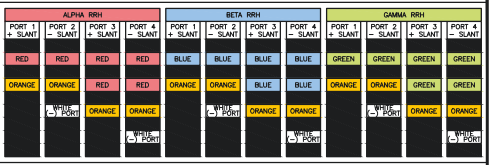
SHEET NUMBER

G-3

HYBRID/DISCREET CABLES — 3/4" TAPE WIDTHS WITH 3/4" SPACING

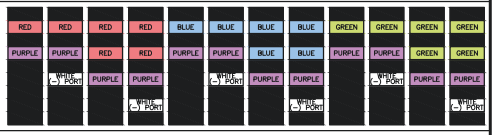
LOW-BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) – OPTIONAL PER MARKET

ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BAND)



MID-BAND RRH
(AWS BANDS N66+N70)

ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BANDS)



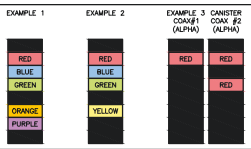
HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.

EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS.

EXAMPLE 2 – HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS.

EXAMPLE 3 – MAIN COAX WITH GROUND MOUNTED RRHs.



FIBER JUMPERS TO RRHs

LOW-BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.

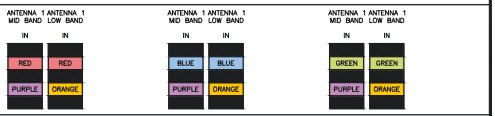
POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY

RET MOTORS AT ANTENNAS

RET CONTROL IS HANDLED BY THE MID-BAND RRH WHEN ONE SET OF RET PORTS EXIST ON ANTENNA.

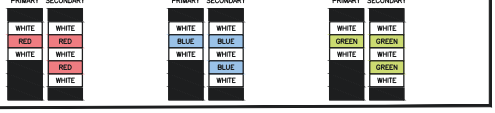
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



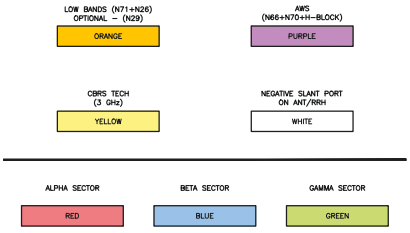
MICROWAVE RADIO LINKS

LINKS WILL HAVE A 1.5-2 INCH WHITE WRAP WITH THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE.
ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH ADDITIONAL MW RADIO.

MICROWAVE CABLES WILL REQUIRE P-TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE ID's.



RF CABLE COLOR CODES | NO SCALE | 1



COLOR IDENTIFIER | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

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230 GUINEA ROAD
MONROE, CT 06468

SHEET TITLE
RF
CABLE COLOR CODE

SHEET NUMBER
RF-1

LEGEND

EXOTHERMIC CONNECTION
MECHANICAL CONNECTION
BUSS BAR INSULATOR
CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
EXOTHERMIC WITH INSPECTION SLEEVE
GROUNDING BAR
GROUND ROD
TEST GROUND ROD WITH INSPECTION SLEEVE
SINGLE POLE SWITCH
DUPLEX RECEPTACLE
DUPLEX GFCI RECEPTACLE
FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8
SMOKE DETECTION (DC)
EMERGENCY LIGHTING (DC)
SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED-1-25A400/51K-SR4-120-PE-DDBTXD
CHAIN LINK FENCE
WOOD/WROUGHT IRON FENCE
WALL STRUCTURE
LEASE AREA
PROPERTY LINE (PL)
SETBACKS
ICE BRIDGE
CABLE TRAY
WATER LINE
UNDERGROUND POWER
UNDERGROUND TELCO
OVERHEAD POWER
OVERHEAD TELCO
UNDERGROUND TELCO/POWER
ABOVE GROUND POWER
ABOVE GROUND TELCO
ABOVE GROUND TELCO/POWER
WORKPOINT
SECTION REFERENCE
DETAIL REFERENCE

ABBREVIATIONS

AB	ANCHOR BOLT
ABV	ABOVE
AC	ALTERNATING CURRENT
ADDL	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AGL	ABOVE GROUND LEVEL
AIC	AMPERAGE INTERRUPTION CAPACITY
ALUM	ALUMINUM
ALT	ALTERNATE
ANT	ANTENNA
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BTC	BARE TINNED COPPER CONDUCTOR
BOF	BOTTOM OF FOOTING
CAB	CABINET
CANT	CANTILEVERED
CHG	CHARGING
CLG	CEILING
CLR	CLEAR
COL	COLUMN
COMM	COMMON
CONC	CONCRETE
CONSTR	CONSTRUCTION
DBL	DOUBLE
DC	DIRECT CURRENT
DEPT	DEPARTMENT
DF	DOUGLAS FIR
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DWG	DRAWING
DWL	DOWEL
EA	EACH
EC	ELECTRICAL CONDUCTOR
EL.	ELEVATION
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ENG	ENGINEER
EQ	EQUAL
EXP	EXPANSION
EXT	EXTERIOR
EW	EACH WAY
FAB	FABRICATION
FF	FINISH FLOOR
FG	FINISH GRADE
FIF	FACILITY INTERFACE FRAME
FIN	FINISH(ED)
FLR	FLOOR
FDN	FOUNDATION
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FOW	FACE OF WALL
FS	FINISH SURFACE
FT	FOOT
FTG	FOOTING
GA	GAUGE
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GLB	GLUE LAMINATED BEAM
GLV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE
HDG	HOT DIPPED GALVANIZED
HDR	HEADER
HGR	HANGER
HVAC	HEAT/VENTILATION/AIR CONDITIONING
HT	HEIGHT
IGR	INTERIOR GROUND RING
IN	INCH
INT	INTERIOR
LB(S)	POUND(S)
LF	LINEAR FEET
LTE	LONG TERM EVOLUTION
MAS	MASONRY
MAX	MAXIMUM
MB	MACHINE BOLT
MECH	MECHANICAL
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MW	MICROWAVE
NEC	NATIONAL ELECTRIC CODE
NM	NEWTON METERS
NO.	NUMBER
#	NUMBER
NTS	NOT TO SCALE
OC	ON-CENTER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OPNG	OPENING
P/C	PRECAST CONCRETE
PCS	PERSONAL COMMUNICATION SERVICES
PCU	PRIMARY CONTROL UNIT
PRC	PRIMARY RADIO CABINET
PP	POLARIZING PRESERVING
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PWR	POWER CABINET
QTY	QUANTITY
RAD	RADIUS
RECT	RECTIFIER
REF	REFERENCE
REINF	REINFORCEMENT
REQ'D	REQUIRED
RET	REMOTE ELECTRIC TILT
RF	RADIO FREQUENCY
RMC	RIGID METALLIC CONDUIT
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
RWY	RACEWAY
SCH	SCHEDULE
SHT	SHEET
SIAD	SMART INTEGRATED ACCESS DEVICE
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
TEMP	TEMPORARY
THK	THICKNESS
TMA	TOWER MOUNTED AMPLIFIER
TN	TOE NAIL
TOA	TOP OF ANTENNA
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOP	TOP OF PLATE (PARAPET)
TOS	TOP OF STEEL
TOW	TOP OF WALL
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
UPS	UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

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MONROE, CT 06468

SHEET TITLE
LEGEND AND ABBREVIATIONS

SHEET NUMBER
GN-1

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH Wireless L.L.C. AND TOWER OWNER NOC & THE DISH Wireless L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.

2. "LOOK UP" – DISH Wireless L.L.C. AND TOWER OWNER 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 DISH Wireless L.L.C. AND DISH Wireless L.L.C. AND TOWER OWNER 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 DISH Wireless L.L.C. AND TOWER OWNER STANDARDS, 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 DISH Wireless L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH Wireless L.L.C. AND TOWER OWNER TOWER SITE 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 DISH Wireless L.L.C. AND TOWER OWNER 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 INCLUDING PRIVATE LOCATES 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 DISH 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 DISH Wireless L.L.C. AND TOWER OWNER, 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 AND RADIOS 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:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

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 CARRIER POC AND TOWER OWNER.

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 TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.

11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, 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 DISH Wireless L.L.C. AND TOWER OWNER

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.

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

POD
POWER OF DESIGN
11490 BLUEGRASS PKWY
LOUISVILLE, KY 40299

ST. AARON CTICUT NIKOFF
36141
LICENSED
PROFESSIONAL ENGINEER
11/14/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
TB	EEW	AH

RFDS REV #/DATE: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/14/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

841294

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01094A
230 GUINEA ROAD
MONROE, CT 06468

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.

2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.

3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.

4. CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.

5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

- CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
- CONCRETE EXPOSED TO EARTH OR WEATHER:
- #6 BARS AND LARGER 2"
- #5 BARS AND SMALLER 1-1/2"
- CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
- SLAB AND WALLS 3/4"
- BEAMS AND COLUMNS 1-1/2"

7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.

2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.

3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.

4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.

4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.

4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY 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. TIE WRAPS ARE NOT ALLOWED.

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 3 (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 DISH Wireless L.L.C. AND TOWER OWNER 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.

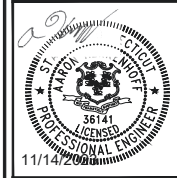
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH Wireless L.L.C.".

30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

POD
POWER OF DESIGN
11490 BLUEGRASS PKWY
LOUISVILLE, KY 40299



DRAWN BY:	CHECKED BY:	APPROVED BY:
TB	EEW	AH

RFDS REV #/DATE: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/14/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

841294

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01094A
230 GUINEA ROAD
MONROE, CT 06468

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

2. THE CONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.

4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.

7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.

8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.

11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.

13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY 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). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.

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11/14/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
TB	EEW	AH

RFDS REV #/DATE: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/14/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
841294

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01094A
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SHEET TITLE
GENERAL NOTES

SHEET NUMBER
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