STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:	:	
	:	
A PETITION FOR A DECLARATORY	:	PETITION NO. ____
RULING ON THE NEED TO OBTAIN A	:	
SITING COUNCIL CERTIFICATE FOR THE	:	
PROPOSED MODIFICATION OF AN	:	
EXISTING WIRELESS	:	
TELECOMMUNICATIONS FACILITY AT	:	
41 MANITOCK HILL ROAD,	:	JUNE 21, 2022
WATERFORD, CONNECTICUT		

PETITION FOR A DECLARATORY RULING:
INSTALLATION HAVING NO
SUBSTANTIAL ADVERSE ENVIRONMENTAL EFFECT

I. Introduction

Pursuant to Sections 16-50j-38 and 16-50j-39 of the Regulations of Connecticut State Agencies ("R.C.S.A."), DISH Wireless, LLC ("DISH") hereby petitions the Connecticut Siting Council (the "Council") for a declaratory ruling ("Petition") that no Certificate of Environmental Compatibility and Public Need ("Certificate") is required under Section 16-50k(a) of the Connecticut General Statutes ("C.G.S.") for the modification of an existing wireless telecommunications facility at 41 Manitock Hill Road in Waterford, Connecticut (the "Existing Facility").

II. Existing Facility

The Existing Facility is located on an approximately 5-acre wooded parcel that is owned by the City of New London and is the site of a Water Tank. The Facility consists of a 136-foot self-support tower and associated compound, which is owned by Crown Castle, and currently includes the telecommunications equipment of several wireless carriers. **Attachment 1** contains the owner's authorization permitting DISH to file this Petition. The Facility was originally approved by the Town of Waterford Planning & Zoning Commission on September 29, 1997, as documented in **Attachment 2**.

III. DISH Facility

DISH's proposed facility is illustrated on the plans submitted as **Attachment 3**. DISH proposes the shared use of the Existing Facility to provide FCC licensed services. DISH will install three (3)) 600/1900 MHz 5G antennas and six (6) remote radiohead units (RRH) on a new platform mount installed at the centerline height of approximately 87' AGL.

DISH has confirmed that the Existing Facility is capable of supporting the addition of DISH's antennas and tower mounted equipment, as documented in the tower Structural Analysis Report annexed hereto as **Attachment 4**, and once new mounts are installed as documented in the Mount Analysis Report annexed hereto as **Attachment 5**.

DISH's 5' x 7' lease area is located to the West of the tower and adjacent to an existing covered equipment pad. In order to fully enclose its ground equipment, DISH will install a 9'-0" x 9'-0" fence extension. The new section of fence will match the existing compound fence. Within its lease area, DISH will install a 5' x 7' steel platform for its ground equipment, supported by four (4) 12" x 12" footpads at grade.

Installation of DISH's facility will cost approximately $48,000 and will take approximately two (2) weeks to complete. Construction will occur during normal business hours, or as allowed by the tower and/or property owner.

IV. The Proposed Modification Will Not Have A Substantial Adverse Environmental Effect

1. Physical Environmental Effects

The attachment of DISH's antennas to the existing tower, and the installation of radio and electrical equipment within the expanded compound will not involve a significant alteration to the physical and environmental characteristics of the Property. No native trees will need to be removed and no on-site or off-site wetlands or watercourses will be impacted by the proposed facility expansion.

2. Visual Effects

Given the height of the existing tower, 136' AGL, which has existing antennas at multiple levels, DISH's proposed antenna installation at a centerline height of approximately 87' AGL would have a minimal visual impact. The proposed compound expansion will impact only a portion of the existing fenced perimeter and will also have a minimal visual impact.

3. FCC Compliance

Radio frequency ("RF") emissions resulting from DISH's shared use of the Existing Facility will be well below the standards adopted by the Federal Communications Commission ("FCC"). Included in **Attachment 6** is a Radio Frequency Emissions Analysis Report prepared by EBI Consulting. This report confirms that the modified facility will operate well within the RF emission standards established by the FCC.

V. Notice to the City, Property Owner and Abutting Landowners

On June 21, 2022, a copy of this Petition was sent to Robert Brule, First Selectman and Abby Piersall, Planning Director for the Town of Waterford. A notice of DISH's intent to file this Petition was also sent to the owners of land that may be considered to abut the Property. Included in **Attachment 7** is a sample abutter's letter and the list of those abutting landowners who were sent notice.

VI. Conclusion

Based on the information provided above, the Petitioners respectfully requests that the Council issue a determination in the form of a declaratory ruling that the installation of a temporary tower at the Property will not have a substantial adverse environmental effect and does not require the issuance of a Certificate of Environmental Compatibility and Public Need pursuant to § 16-50k of the General Statutes.

Respectfully submitted,

Denise Sabo
Northeast Site Solutions
Agent for DISH Wireless
(860) 209-4690
denise@northeastsitesolutions.com

Attachments

Cc: Robert Brule, First Selectman &
Waterford Town Hall
15 Rope Ferry Road
Waterford, CT 06385

Abby Piersall, Planning Director
Waterford Town Hall
15 Rope Ferry Road
Waterford, CT 06385

City of New London - Property Owner
Water Department
15 Masonic Street
New London, CT 06320

Crown Atlantic Company – Tower Owner

ATTACHMENT 1

4545 E River Rd, Suite 320
West Henrietta, NY 14586

Phone: (585) 445-5896
Fax: (724) 416-4461
www.crowncastle.com

Crown Castle Letter of Authorization

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

Re: Tower Share Application
Crown Castle telecommunications site at:
41 MANITOCK HILL ROAD, WATERFORD, CT 06385-2000

GLOBAL SIGNAL ACQUISITIONS II LLC ("Crown Castle") hereby authorizes DISH Wireless LLC, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CT - CONNECTICUT SITING COUNCIL for the existing wireless communications site described below:

Crown Site ID/Name: **876338/WATERFORD**
Customer Site ID: **BOBOS00882A/**
Site Address: **41 Manitock Hill Road, Waterford, CT 06385-2000**

Crown Castle

By: _____ Date: 6/10/2022

Richard Zajac
Site Acquisition Specialist

41 MANITOCK HILL ROAD

Location	41 MANITOCK HILL ROAD	**Mblu**	117/ / 4375/ /
Acct#	00395700	**Owner**	NEW LONDON CITY OF
Assessment	$9,180	**Appraisal**	$13,110
PID	4375	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$2,250	$10,860	$13,110

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$1,580	$7,600	$9,180

Parcel Addreses

Additional Addresses
No Additional Addresses available for this parcel

Owner of Record

Owner NEW LONDON CITY OF
Co-Owner WATER DEPT

Sale Price $0
Certificate
Book & Page 0173/0256
Sale Date 06/11/1968
Instrument 00

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
NEW LONDON CITY OF	$0		0173/0256	00	06/11/1968

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: $0
Building Percent Good:

Building Attributes	
Field	**Description**
Style	Outbuildings
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 Percent	
Total Bedrooms:	
Full Bthrms:	
Half Baths:	
Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Fireplace(s)	
Extra Opening(s)	
Gas Fireplace(s)	
% Attic Fin	
LF Dormer	
Foundation	
Bsmt Gar(s)	
Bsmt %	
SF FBM	
SF Rec Rm	

Building Photo

(http://images.vgsi.com/photos/WaterfordCTPhotos//default.jpg)

Building Layout

Building Layout
(http://images.vgsi.com/photos/WaterfordCTPhotos//Sketches/4375_4375.j

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

Fin Bsmt Qual	
Bsmt Access	
Usrfld 300	
Usrfld 301	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	109
Description	Vacant W/ OB
Zone	R-40
Neighborhood	600
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	5.5
Frontage	0
Depth	0
Assessed Value	$7,600
Appraised Value	$10,860

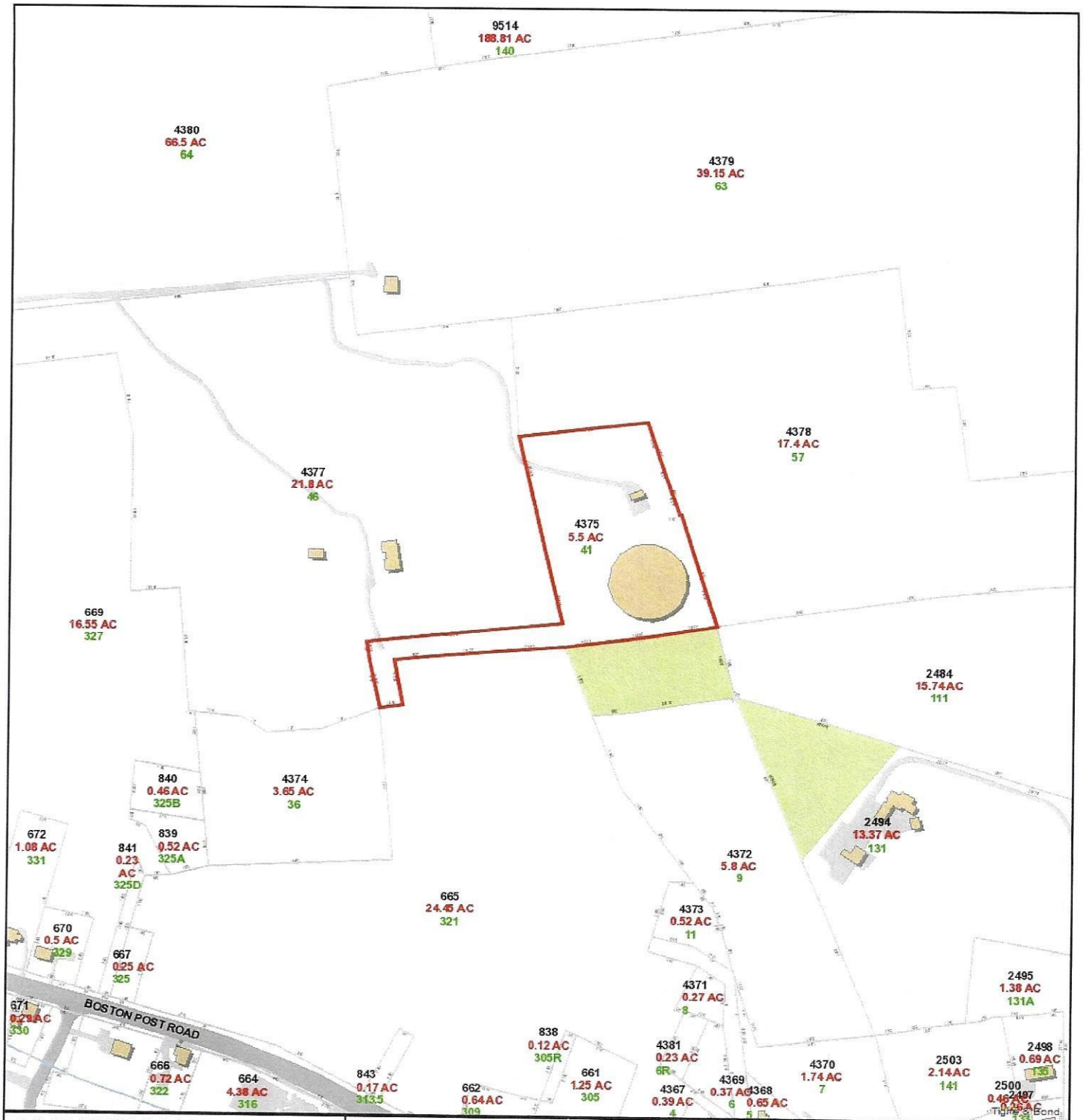
Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD1	Shed	FR	Frame	200.00 S.F.	$2,250	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$2,250	$10,860	$13,110
4000	$2,250	$10,860	$13,110

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$1,580	$7,600	$9,180
4000	$1,580	$7,600	$9,180



41 MANITOCK HILL

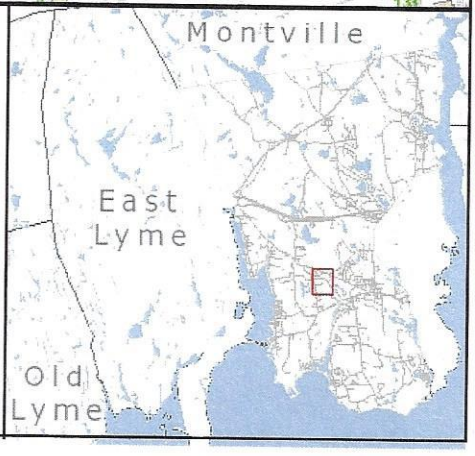
3/16/2021 3:40:44

1"=333'

Property Information

AV PID	undefined
Street Address	undefined
Total Appraised Parcel	undefined

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.



ATTACHMENT 2

VOL. 496 PAGE 0358

TOWN OF WATERFORD
PLANNING & ZONING COMMISSION

NOTICE OF GRANT OF A SPECIAL PERMIT

This is to certify that on September 29, 1997 the Waterford Planning & Zoning Commission granted Special Permit #97-112/304.

Owner of Record: City of New London

Address: 41 Manitock Hill Road

Description of Premises:

As recorded in Volume 173, Page 256 of the Waterford Land Records.

Nature of Special Permit: Special Permit granted for the construction of a 140 foot lattice design communications tower by Sprint. Co-location for additional carriers is provided for on this tower.

Applicable Zoning Regulations: Section 3.6, 5.2.1, 5.2.3 and 23.

Permit findings, stipulations and conditions are filed in the office of the Town Clerk as stated in the minutes of the Planning & Zoning Commission meeting of September 29, 1997.

PLANNING & ZONING COMMISSION

By: Pam Hagerman
Pamela Hagerman
Recording Secretary
Planning & Zoning Commission

This notice is to be recorded on the land records of the Town of Waterford, indexed in the Grantor's Index under the name of the record owner.

RECEIVED FOR RECORD March 16, 1999
4:02 P M. ATTEST
TOWN CLERK

ATTACHMENT 3

DISH Wireless L.L.C. SITE ID:

BOBOS00882A

DISH Wireless L.L.C. SITE ADDRESS:

41 MANITOCK HILL ROAD
WATERFORD, CT 06385-2000

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	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

SHEET INDEX

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 (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (3) PROPOSED SECTOR FRAMES
- INSTALL PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRUs (2 PER SECTOR)
- INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
- INSTALL (1) PROPOSED HYBRID CABLE
- INSTALL (3) DOUBLE Z-BRACKETS (1 PER SECTOR)
- REMOVE EXISTING ABANDONED ANTENNA MOUNT

GROUND SCOPE OF WORK:
- INSTALL (1) PROPOSED METAL PLATFORM
- INSTALL (1) PROPOSED ICE BRIDGE
- INSTALL (1) PROPOSED PPC CABINET
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED POWER CONDUIT
- INSTALL (1) PROPOSED TELCO CONDUIT
- INSTALL (1) PROPOSED TELCO-FIBER BOX
- INSTALL (1) PROPOSED GPS UNIT
- INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)
- INSTALL PROPOSED FENCE EXPANSION
- INSTALL PROPOSED 9'-0" GATE
- UTILIZE EXISTING METER AND DISCONNECT

SITE PHOTO

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

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.

SITE INFORMATION

PROPERTY OWNER:	CITY OF NEW LONDON WATER DEPT
ADDRESS:	15 MASONIC ST NEW LONDON, CT 06320
TOWER TYPE:	SELF-SUPPORT
TOWER CO SITE ID:	876338
TOWER APP NUMBER:	572906
COUNTY:	NEW LONDON
LATITUDE (NAD 83):	41° 21' 16.70" N 41.354639 N
LONGITUDE (NAD 83):	-72° 9' 1.60" W -72.150444 W
ZONING JURISDICTION:	TOWN OF WATERFORD
ZONING DISTRICT:	R-40 - LOW DENSITY RESIDENTIAL
PARCEL NUMBER:	152-0395700
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	NORTHEAST UTILITIES
TELEPHONE COMPANY:	COMCAST

PROJECT DIRECTORY

APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	CROWN CASTLE USA INC. 2000 CORPORATE DR. CANONSBURG, PA 15317 (877) 486-9377
SITE DESIGNER:	NB+C ENGINEERING SERVICES, LLC 6095 MARSHALEE DRIVE, SUITE 300 ELKRIDGE, MD 21075 (410) 712-7092
SITE ACQUISITION:	CORWIN DIXON CORWIN.DIXON@CROWNCASTLE.COM
CONSTRUCTION MANAGER:	JAVIER SOTO JAVIER.SOTO@DISH.COM
RF ENGINEER:	ARVIN SEBASTIAN ARVIN.SEBASTIAN@DISH.COM

DIRECTIONS

DIRECTIONS FROM GROTON - NEW LONDON AIRPORT:
START OUT GOING NORTHWEST ON TOWER AVE. TURN LEFT ONTO POQUONNOCK RD. TURN LEFT ONTO RAINVILLE AVE. TAKE THE 1ST RIGHT ONTO CLARENCE B SHARP HWY/CT-349. MERGE ONTO I-95 S VIA THE RAMP ON THE LEFT. TAKE EXIT 81. TURN LEFT ONTO WATERFORD PKWY. TURN LEFT ONTO CROSS RD. TURN LEFT ONTO ROCK RIDGE RD. FOLLOW ROAD TO END AND TAKE ACCESS ROAD TO SITE AT BASE OF WATER TOWER

VICINITY MAP

NO SCALE

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C TOTALLY COMMITTED.
NB+C ENGINEERING SERVICES, LLC.
6095 MARSHALEE DRIVE, SUITE 300
ELKRIDGE, MD 21075
(410) 712-7092

STATE OF CONNECTICUT · KRUPAKARAN KOLANDAIVELU · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

06/08/2022

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	11/12/2021	ISSUED FOR CONSTRUCTION
1	03/11/2022	ISSUED FOR CONSTRUCTION
2	06/08/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

876338

DISH Wireless L.L.C.
PROJECT INFORMATION

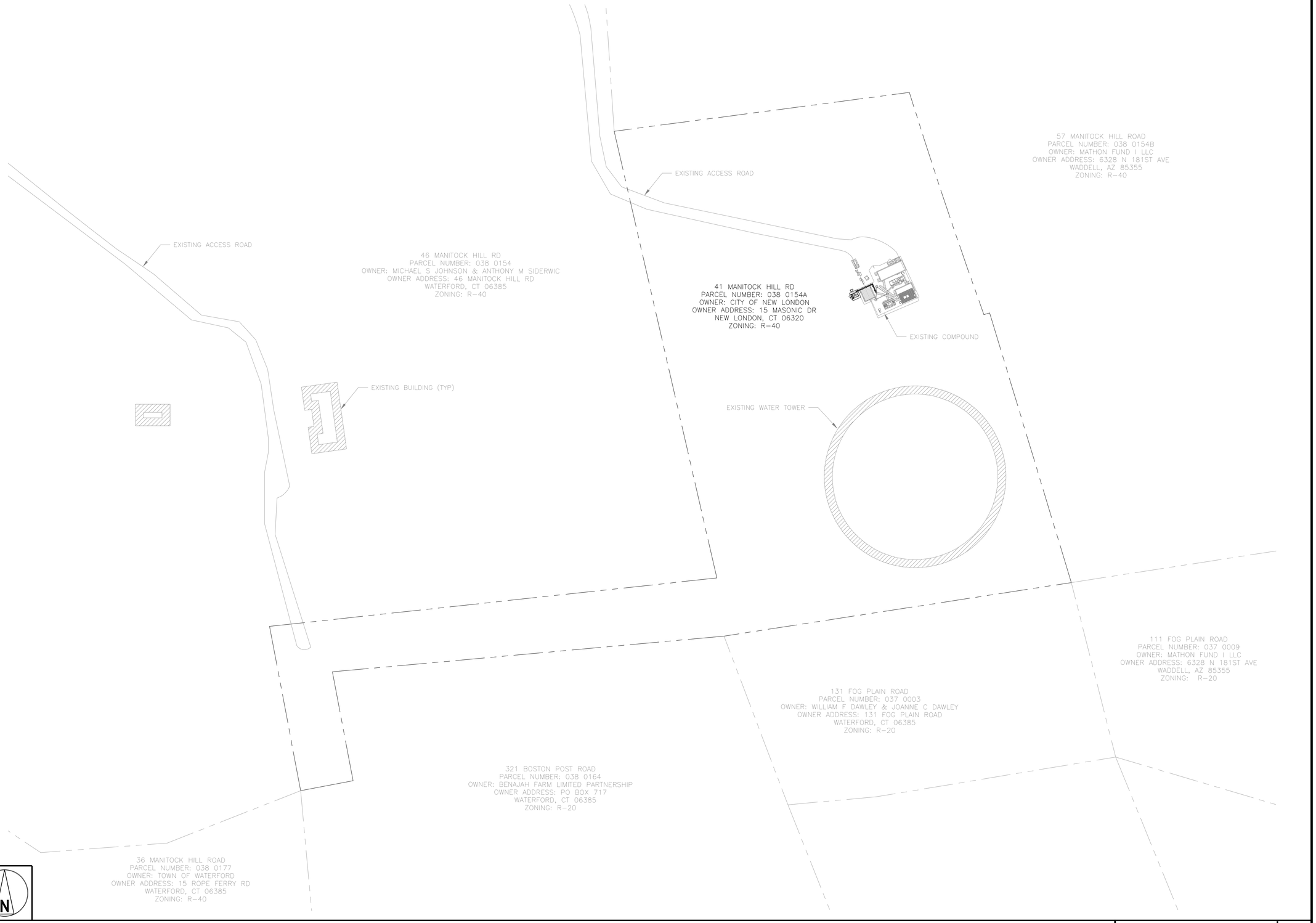
BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



ABUTTER MAP

4' 2' 0 4' 8'
1/4"=1'-0"

1

dish wireless.

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LITTLETON, CO 80120

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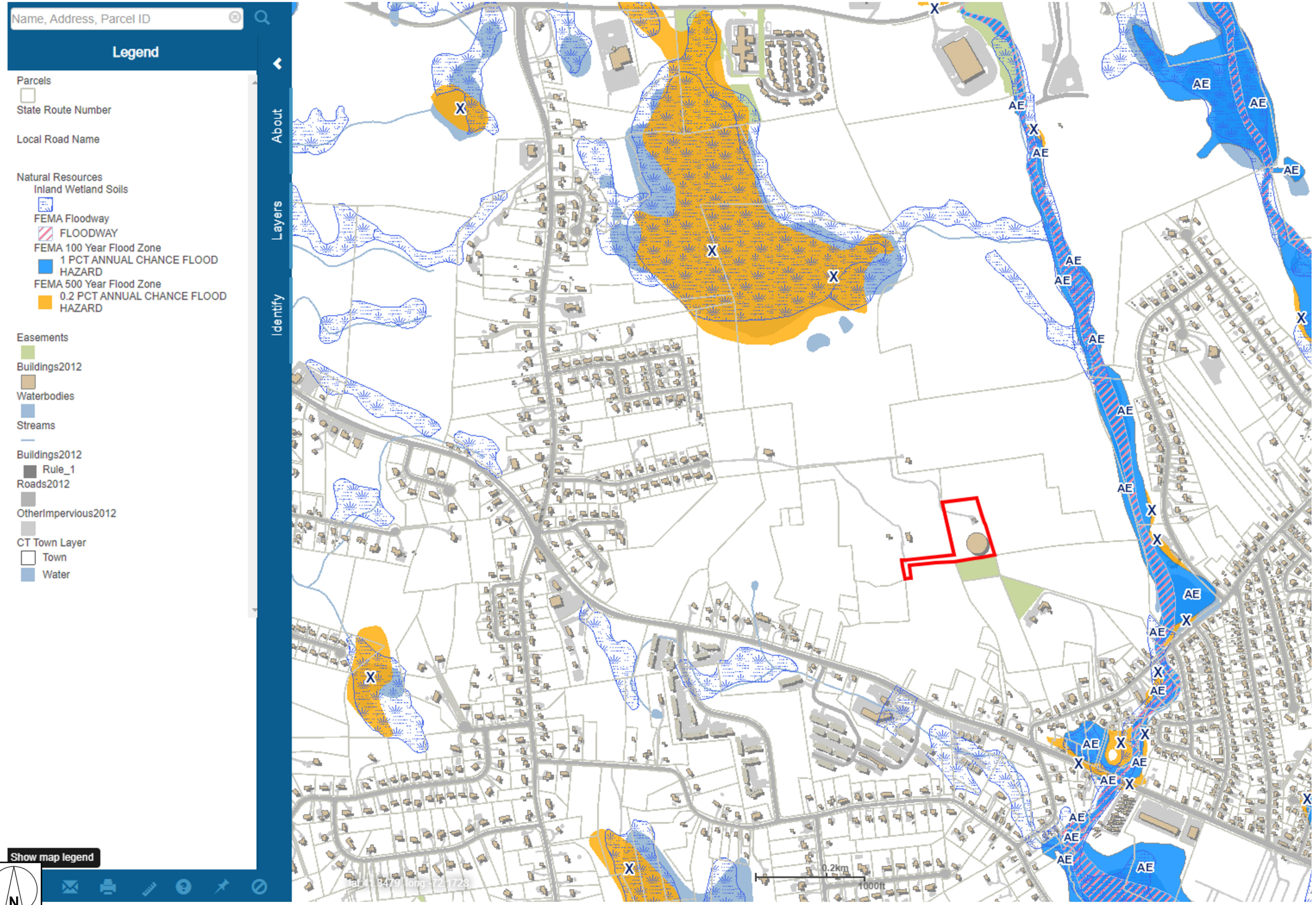
SHEET TITLE

ABUTTER MAP

SHEET NUMBER

Z-1



WETLANDS MAP

4' 2' 0 4' 8'
1/4"=1'-0"

1

dish wireless.

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LITTLETON, CO 80120

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STATE OF CONNECTICUT · KRISHNAN KOLANDAIVELU · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

06/08/2022

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

SHEET TITLE

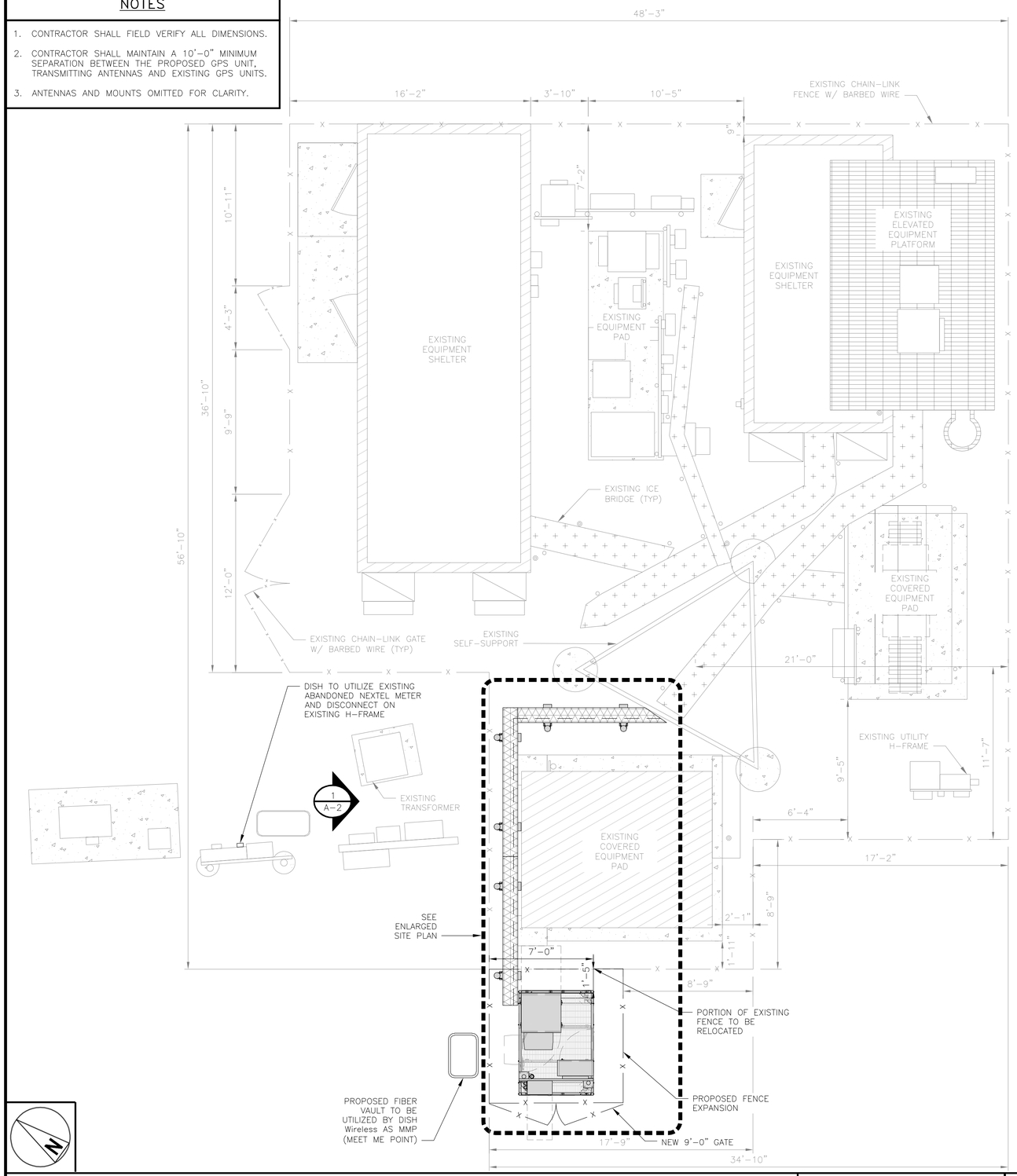
WETLANDS MAP

SHEET NUMBER

Z-2

NOTES

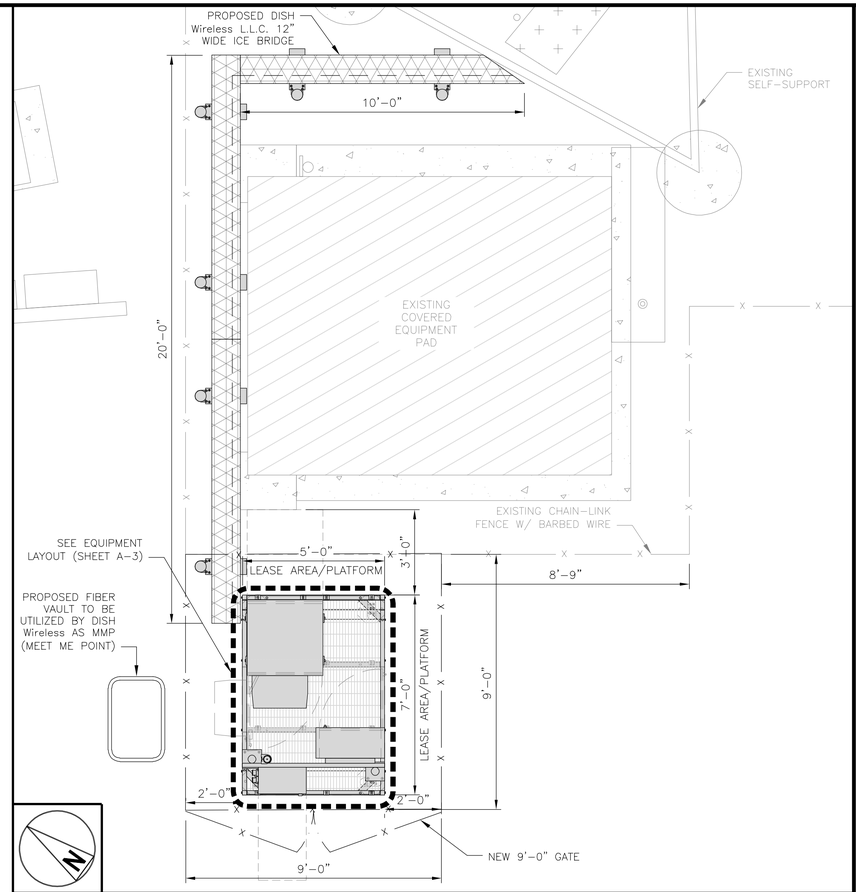
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



OVERALL SITE PLAN

4' 2' 0 4' 8'
1/4"=1'-0"

1



ENLARGED SITE PLAN

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

2

AERIAL VIEW

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C TOTALLY COMMITTED.
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STATE OF CONNECTICUT · KRISHNA KOLANDAIVELU · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

06/08/2022

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

SHEET TITLE

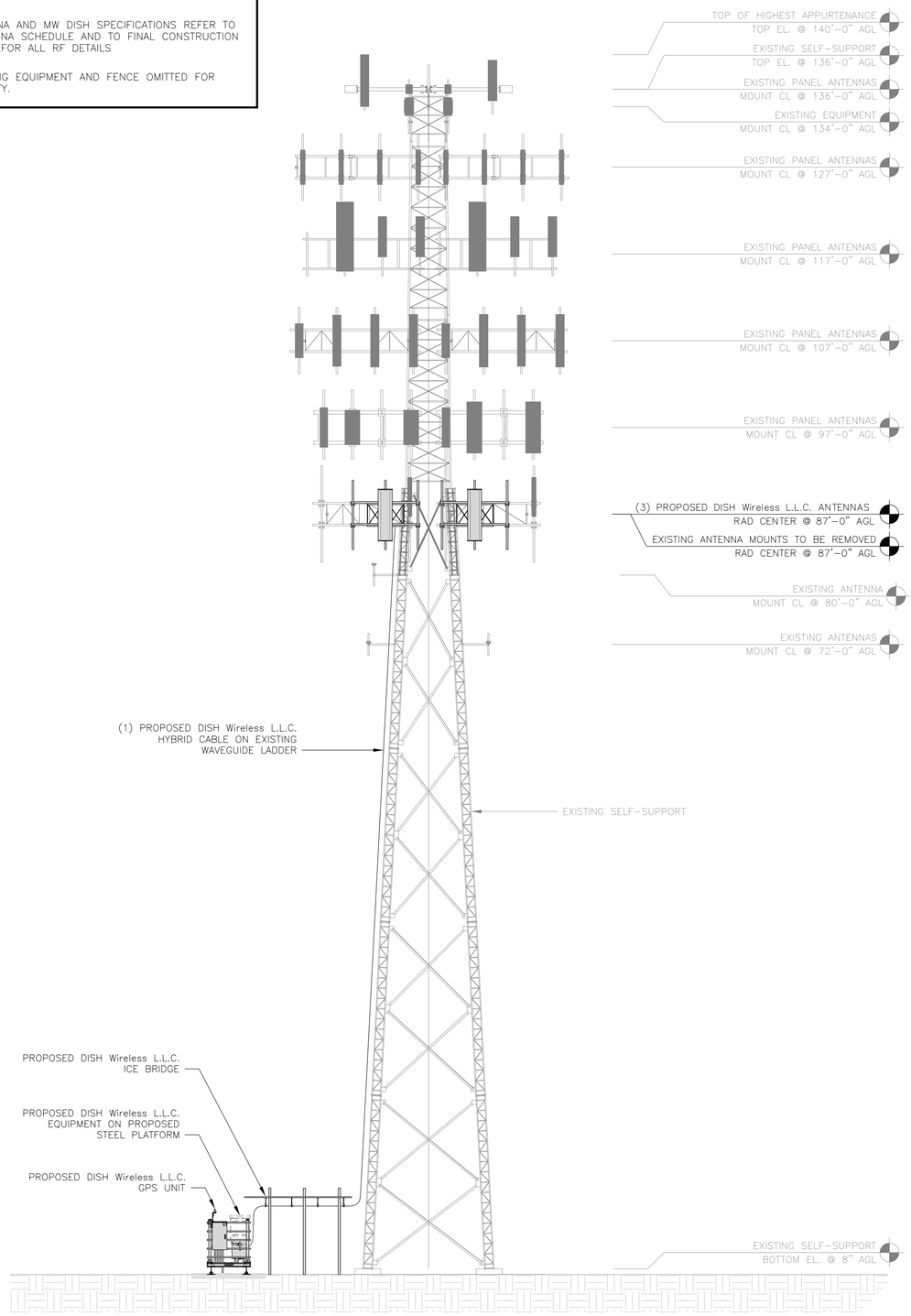
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

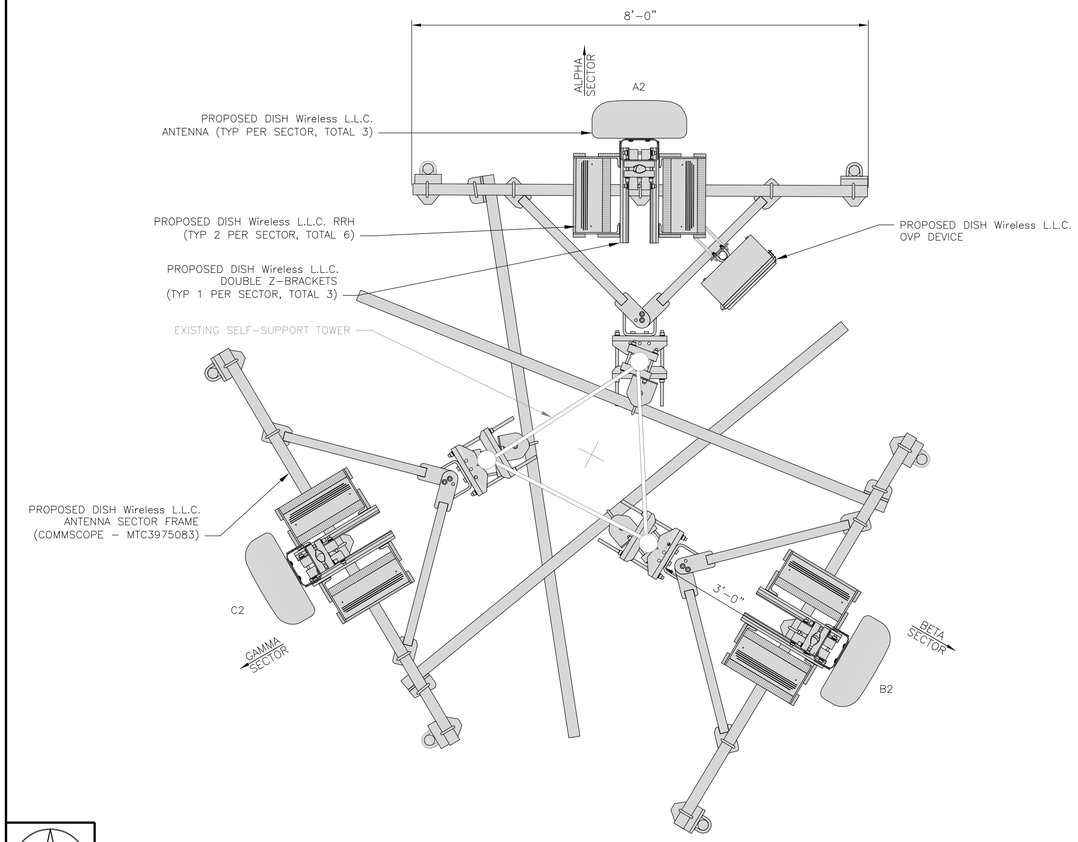
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED NORTH ELEVATION

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

1



N

ANTENNA LAYOUT

12" 6" 0 1' 2' 3'
3/4"=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 1.375" DIA. HYBRID CABLE (148' LONG)	FUJITSU - TA08025-B604	5G	A2	RAYCAP - RDIDC-9181 -PF-48
A2	PROPOSED	JMA - MX08FRO665-21	5G	0°	87'-0"		FUJITSU - TA08025-B605	5G	A2	
A3	--	--	--	--	--		--	--	--	
B1	--	--	--	--	--	SHARED W/ALPHA	FUJITSU - TA08025-B604	5G	B2	SHARED W/ALPHA
B2	PROPOSED	JMA - MX08FRO665-21	5G	120°	87'-0"		FUJITSU - TA08025-B605	5G	B2	
B3	--	--	--	--	--		--	--	--	
C1	--	--	--	--	--	SHARED W/ALPHA	FUJITSU - TA08025-B604	5G	C2	SHARED W/ALPHA
C2	PROPOSED	JMA - MX08FRO665-21	5G	240°	87'-0"		FUJITSU - TA08025-B605	5G	C2	
C3	--	--	--	--	--		--	--	--	

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

NB+C TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, LLC.
6095 MARSHALEE DRIVE, SUITE 300
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(410) 712-7092

STATE OF CONNECTICUT
KRUPAKARAN KOLANDAIVELU
PEN.0028997
LICENSED
PROFESSIONAL ENGINEER

06/08/2022

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LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

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A&E PROJECT NUMBER

876338

DISH Wireless L.L.C.
PROJECT INFORMATION

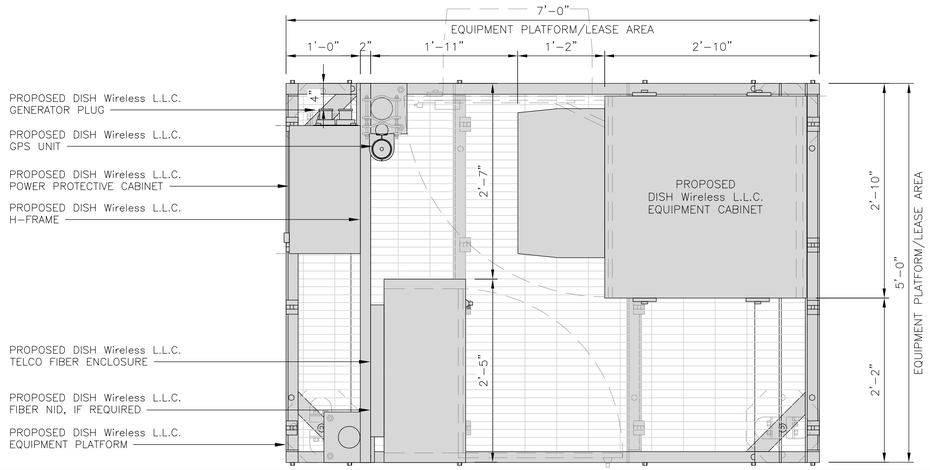
BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



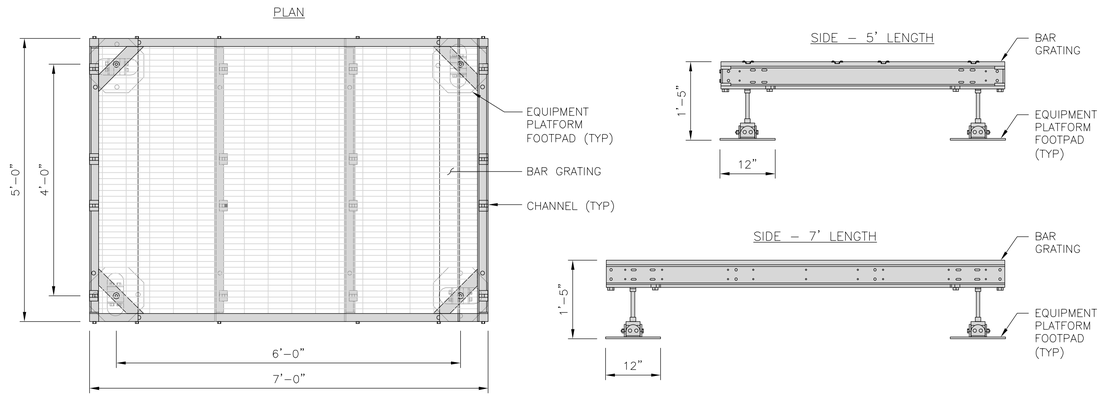
PLATFORM EQUIPMENT PLAN

12" 9" 6" 3" 0 1' 2'
1"=1'-0"

1

COMMSCOPE MTC4045LP 5X7 PLATFORM	
DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

NOTE:
GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"

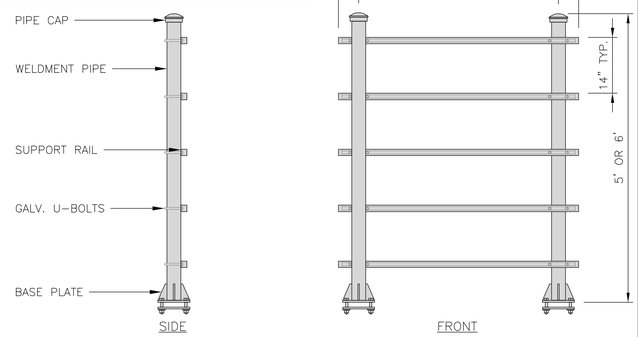


PLATFORM DETAIL

NO SCALE

2

COMMSCOPE MTC4045HFLD H-FRAME	
UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs



H-FRAME DETAIL

NO SCALE

3

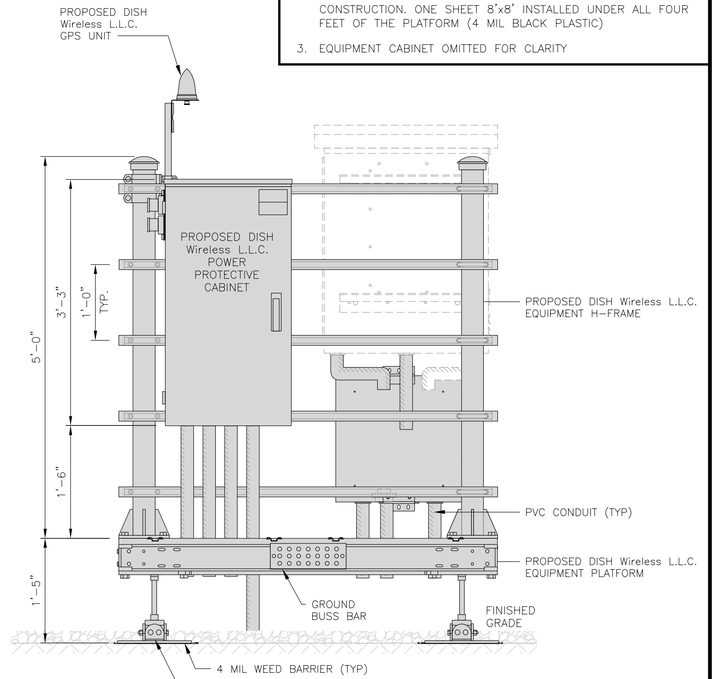
NOT USED

NO SCALE

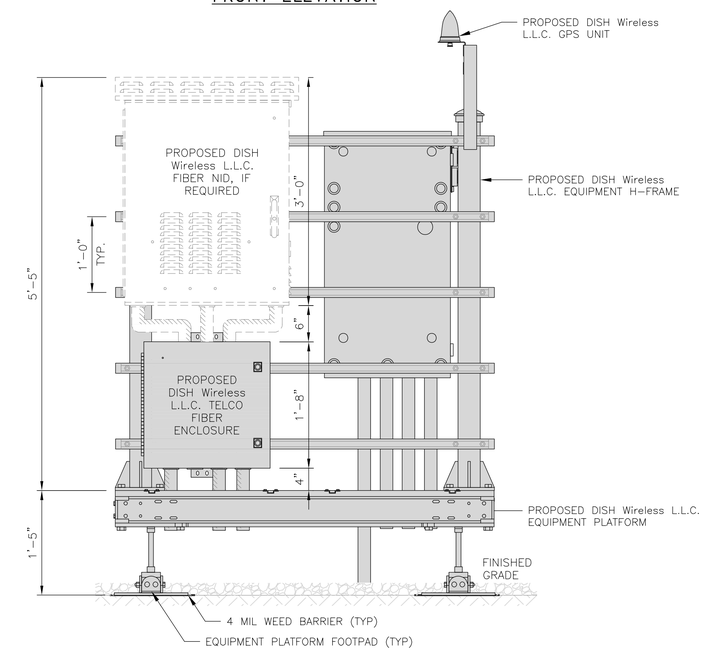
4

NOTES

1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
2. WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH Wireless L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. EQUIPMENT CABINET OMITTED FOR CLARITY



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION

12" 9" 6" 3" 0 1' 2'
1"=1'-0"

5

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

SHEET TITLE

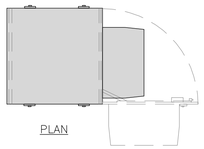
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER

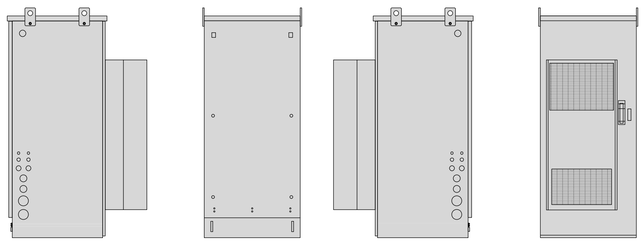
A-3

CHARLES INDUSTRY HEX CUBE–PM639155N4

DIMENSIONS (HxWxD):	74"x32"x32"
POWER PLANT:	–48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 LBS



PLAN



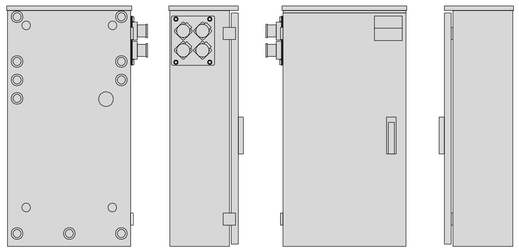
SIDE BACK SIDE FRONT

CABINET DETAIL | NO SCALE | 1

RAYCAP PPC RDIAC–2465–P–240–MTS

ENCLOSURE DIMENSIONS (HxWxD):	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G

TOP



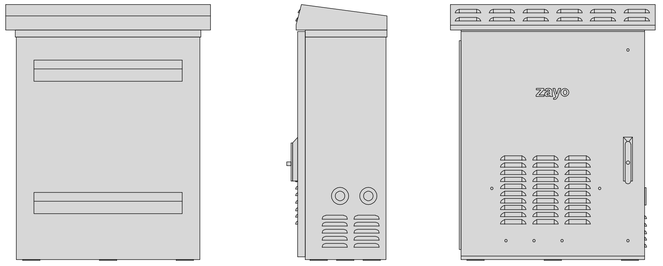
BACK SIDE FRONT SIDE

POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

ZAYO 5RU (LEFT SWING DOOR) FIBER NID ENCLOSURE

DIMENSIONS (HxWxD)	36.1"x29"x12.9"
WEIGHT	85 lbs

BOTTOM

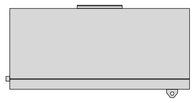


BACK SIDE FRONT

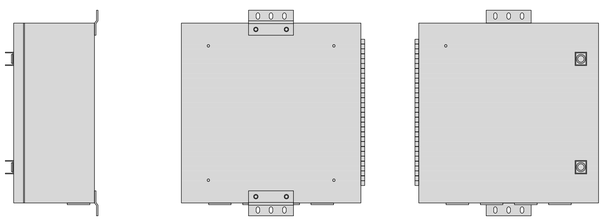
FIBER NID ENCLOSURE DETAIL | NO SCALE | 3

CHARLES CFIT–PF2020DSH1 FIBER TELCO ENCLOSURE

ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



FRONT



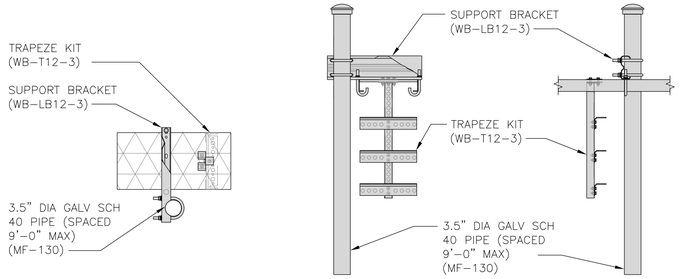
SIDE BACK FRONT

FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 4

COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT

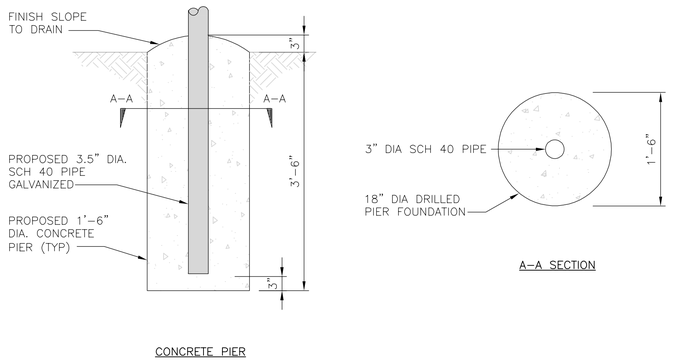
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

INCLUDED PRODUCTS:
- WB–T12–3 TRAPEZE KIT, 3 RUNGS
- WB–LB12–3 SUPPORT BRACKET
- MF–130 DIRECT BURIAL PIPE COLUMN, 13'–4"



PLAN FRONT SIDE

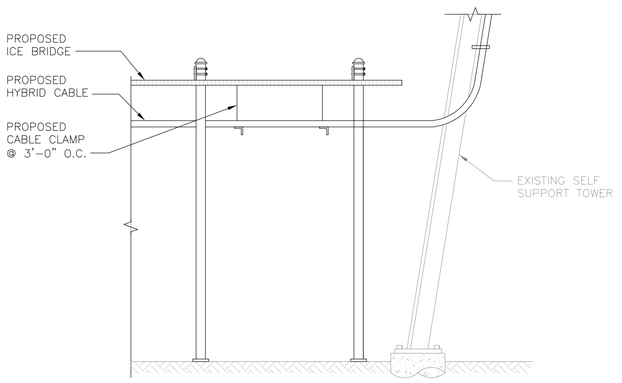
ICE BRIDGE DETAIL | NO SCALE | 5



CONCRETE PIER

A–A SECTION

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 6



HYBRID CABLE RUN | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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876338

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385–2000

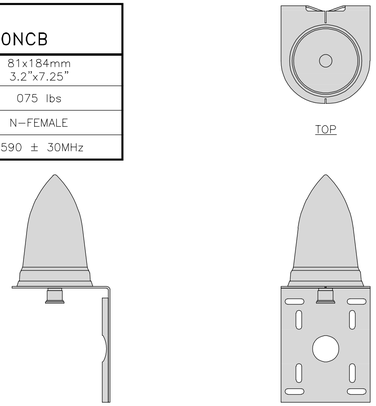
SHEET TITLE

EQUIPMENT DETAILS

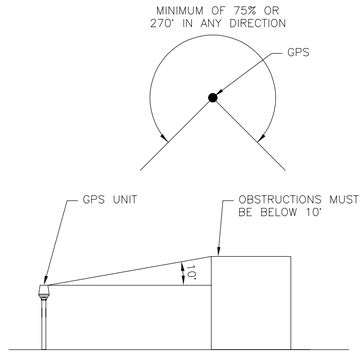
SHEET NUMBER

A-4

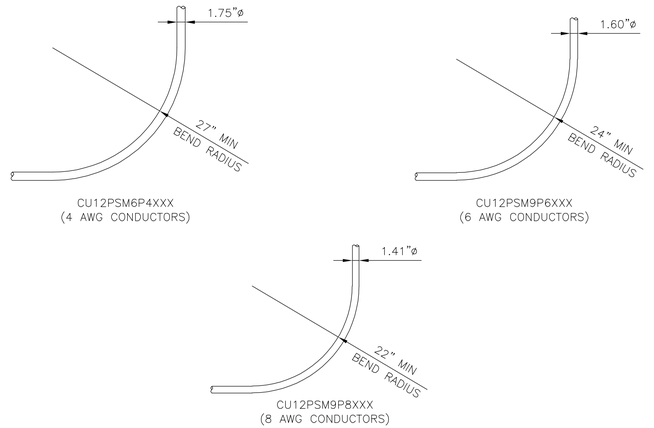
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS DETAIL | NO SCALE | 1



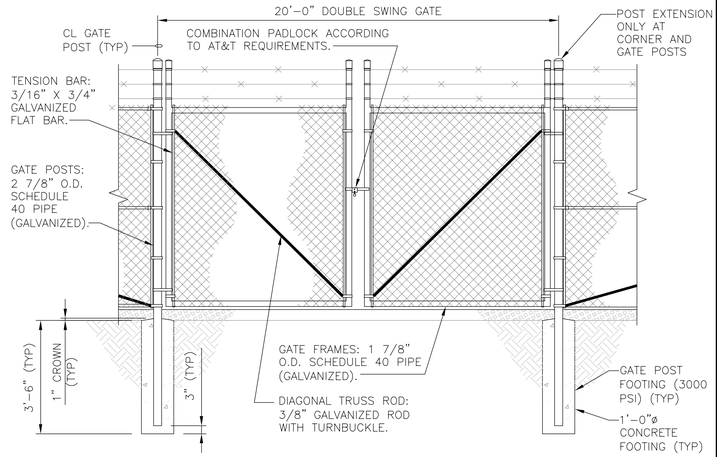
GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2



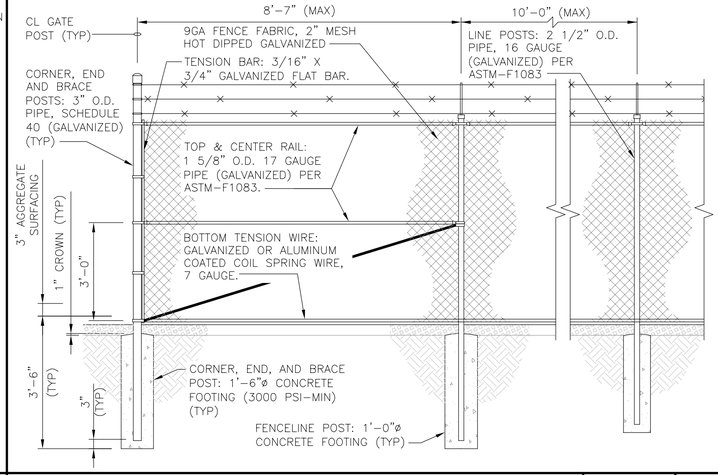
CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUSES | NO SCALE | 3

DESC	QTY	
SITE ID #:	BOBOS00882A	
TWR TYPE:	SELF-SUPPORT	
HYBRID BEND RADIUS	30"	The preparer must determine the lengths below.
RAD CENTER (ft)	87.0	This is the RAD center for the antennas on towers. For a rooftop, this is the total length of all vertical sections of the hybrid.
ICE BRIDGE HEIGHT (ft)	10.0	This is the height of the bridge coverings.
ICE BRIDGE LENGTH (ft)	30.0	This is the length of the total ice bridge coverings, if more than one ice bridge is used or total horizontal lengths of hybrid if this is inside a building.
LENGTH ACROSS PLATFORM (ft)	6.0	This is the length from the cabinet to the first bend up the ice bridge or inside a radio room.
LENGTH FROM TOWER TOP TO OVP (ft)	6.0	This is the horizontal length from the tower to the OVP at the antenna level or the total horizontal lengths of hybrid on a building or large self supporting tower.
VERTICAL LENGTH OF HYBRID INTO TOWER TOP OVP (ft)	3.0	This is the vertical length of hybrid that comes out to the tower top OVP to the beginning of the first bend that is going into the monopole port.
	LENGTH (ft)	
Additional Excess Hybrid to be added (To be determined by preparer)	0	
Total Hybrid Length to Order (Rounded up to nearest whole number)	148	

HYBRID CABLE CALCULATOR | NO SCALE | 4



TYPICAL GATE ELEVATION DETAIL | NO SCALE | 5



TYPICAL FENCE DETAIL | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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PROJECT INFORMATION

BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

SHEET TITLE

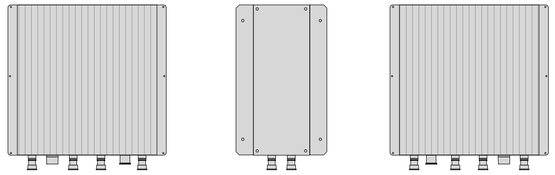
EQUIPMENT DETAILS

SHEET NUMBER

A-5

FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

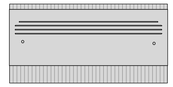
PLAN



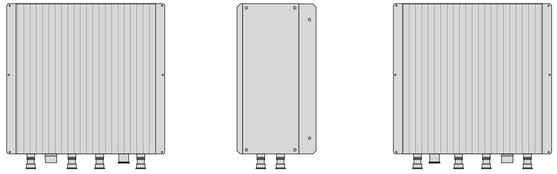
BACK SIDE FRONT

RRH DETAIL | NO SCALE | 1

FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



PLAN

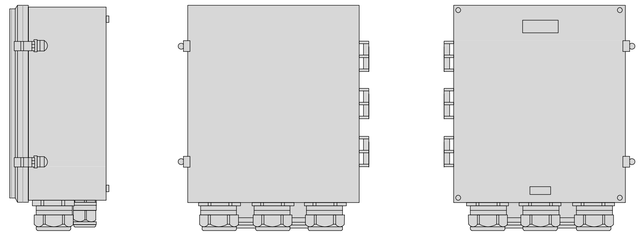


BACK SIDE FRONT

RRH DETAIL | NO SCALE | 2

RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS

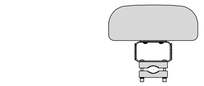
PLAN



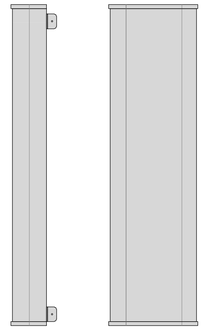
SIDE BACK FRONT

SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 3

JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs



PLAN



SIDE FRONT

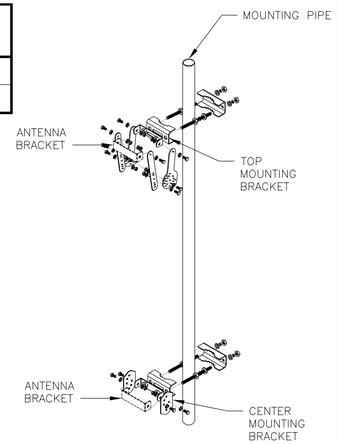
ANTENNA DETAIL | NO SCALE | 4

JMA ANTENNA MOUNT BRACKET #91900318	
TOTAL WEIGHT (WITH BRACKETS)	18 lbs (8.18 Kg)
POLE DIAMETER RANGE	2.5" TO 4.5"

NOTE:
KIT #91900318: TOP AND BOTTOM BRACKETS FOR 4-,6-, AND 8-FOOT ANTENNAS

ANTENNA BRACKET NOT PART OF KIT

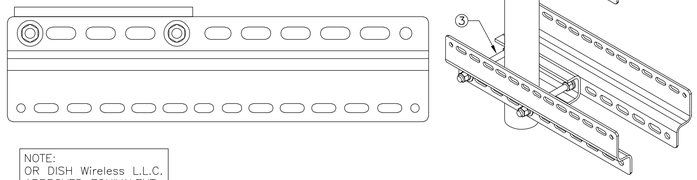
NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT



ANTENNA BRACKET DETAIL | NO SCALE | 5

SABRE DOUBLE Z-BRACKET C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"

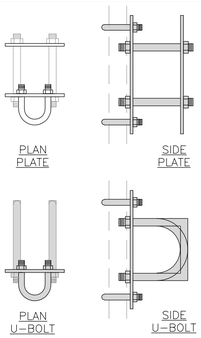


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

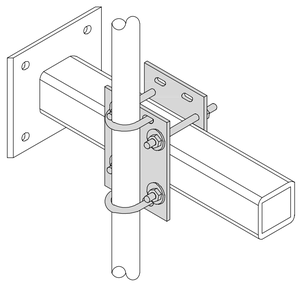
RRH MOUNT DETAIL | NO SCALE | 6

COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT



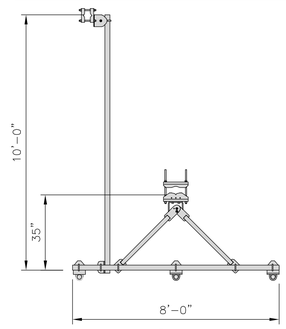
PLAN PLATE SIDE PLATE
PLAN U-BOLT SIDE U-BOLT



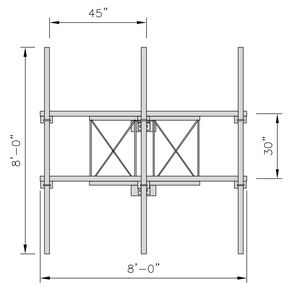
RRH/OVP MOUNT DETAIL | NO SCALE | 7

COMMSCOPE V-FRAME MTC3975083	
FACE SIZE	8'-0"
WEIGHT	352.136 lbs

NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT



PLAN



FRONT

ANTENNA FRAME DETAIL | NO SCALE | 8

NOT USED | NO SCALE | 9

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STATE OF CONNECTICUT · KRISHNA KOLANDAIVELU · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

06/08/2022

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

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REV	DATE	DESCRIPTION
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1	03/11/2022	ISSUED FOR CONSTRUCTION
2	06/08/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

876338

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

SHEET TITLE

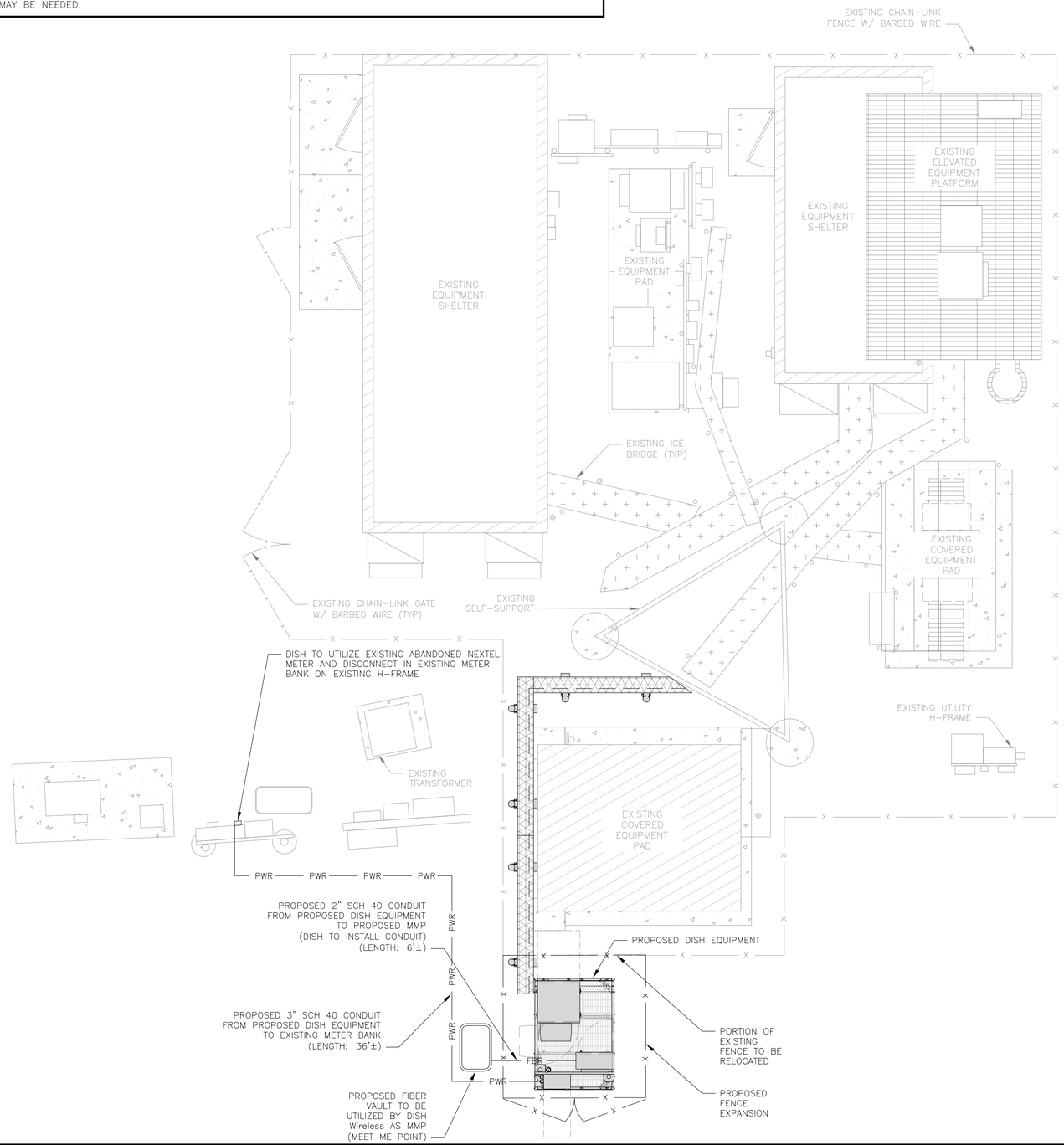
EQUIPMENT DETAILS

SHEET NUMBER

A-6

EASEMENT RIGHTS

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. DUE TO UTILITY EASEMENT RIGHTS SPECIFIED IN THE GROUND LEASE, CUSTOMER MAY INSTALL EQUIPMENT WITHIN SPECIFIED UTILITY EASEMENT AREA. "PWR" AND "FBR" PATH DEPICTED ON A-1 AND E-1 REPRESENT PLANNED ROUTING BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO A SURVEY, EXHIBITS, METES AND BOUNDS OF THE UTILITY EASEMENT, FIELD VERIFICATION, PRIOR PROJECT DOCUMENTATION AND OTHER REAL PROPERTY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS MATERIALLY INCONSISTENT WITH THE "PWR" AND "FBR" PATH DEPICTED ON A-1 AND E-1 AND SAID VARIANCE IS NOT NOTED ON CDS, PLEASE NOTIFY CROWN CASTLE REAL ESTATE AS FURTHER COORDINATION MAY BE NEEDED.



UTILITY ROUTE PLAN

4' 2' 0 4' 8'
1/4"=1'-0"

DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

1. CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
2. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRICAL CODES AND ALL STATE AND LOCAL CODES, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC STANDARDS.
3. LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO CONSTRUCTION.
4. CONDUIT ROUGH-IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION CONFLICTS. VERIFY WITH THE MECHANICAL EQUIPMENT CONTRACTOR AND COMPLY AS REQUIRED.
5. CONTRACTOR SHALL PROVIDE ALL BREAKERS, CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETE SYSTEM.
6. CONTRACTOR SHALL PROVIDE PULL BOXES AND JUNCTION BOXES AS REQUIRED BY THE NEC ARTICLE 314.
7. CONTRACTOR SHALL PROVIDE ALL STRAIN RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
8. ALL DISCONNECTS AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PHENOLIC NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM.
9. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC 250. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT SWITCHES, AND EQUIPMENT CABINETS.
10. ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
11. PANEL SCHEDULE LOADING AND CIRCUIT ARRANGEMENTS REFLECT POST-CONSTRUCTION EQUIPMENT.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR AS-BUILT PANEL SCHEDULE AND SITE DRAWINGS.
13. ALL TRENCHES IN COMPOUND TO BE HAND DUG

ELECTRICAL NOTES

NO SCALE

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41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

SHEET TITLE

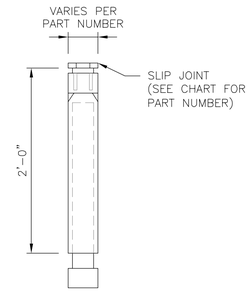
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER

E-1

CARLON EXPANSION FITTINGS

COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N	E945NX	4"	5	8"
E945P	E945PX	5"	1	8"
E945R	E945RX	6"	1	8"

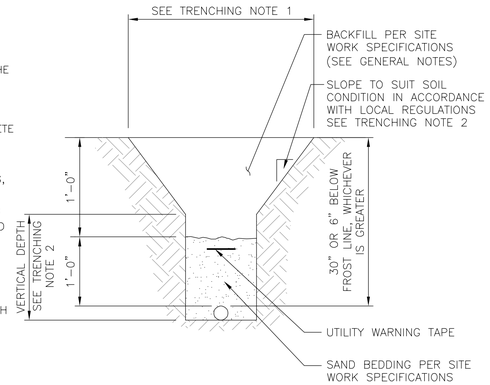


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

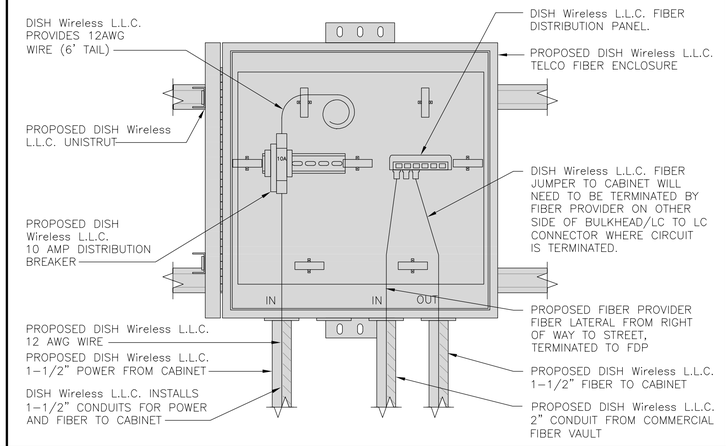
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

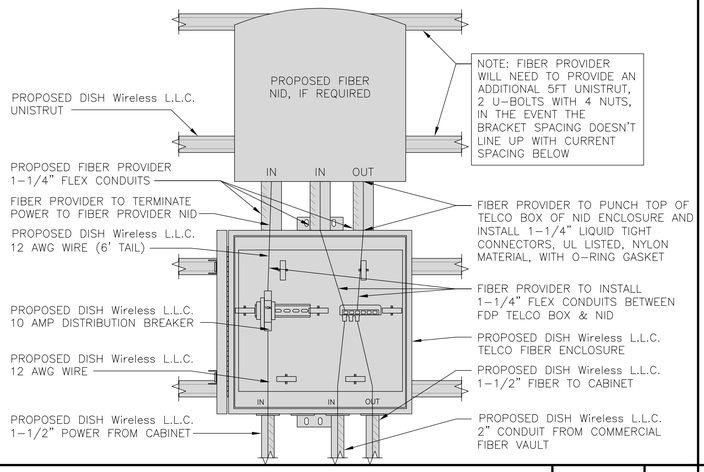
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
3. ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE CURRENT NATIONAL ELECTRIC CODE (NEC) OR AS REQUIRED BY THE LOCAL JURISDICTION, WHICHEVER IS THE MOST STRINGENT.



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



DARK TELCO BOX – INTERIOR WIRING LAYOUT | NO SCALE | 3



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL) | 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

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PROJECT INFORMATION

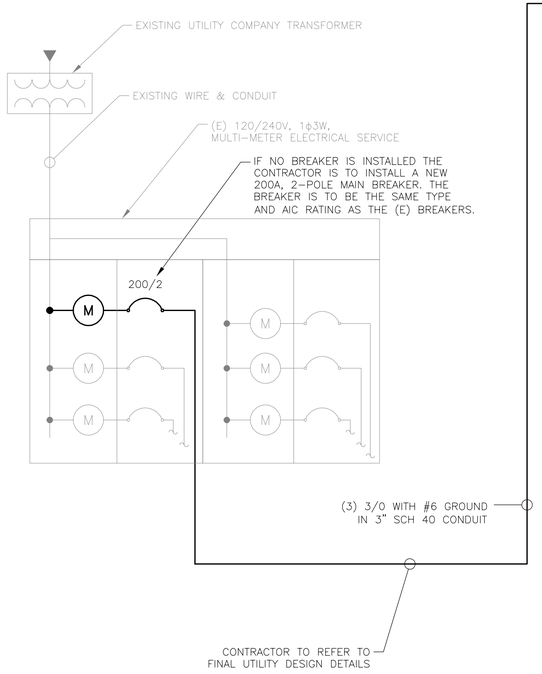
BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

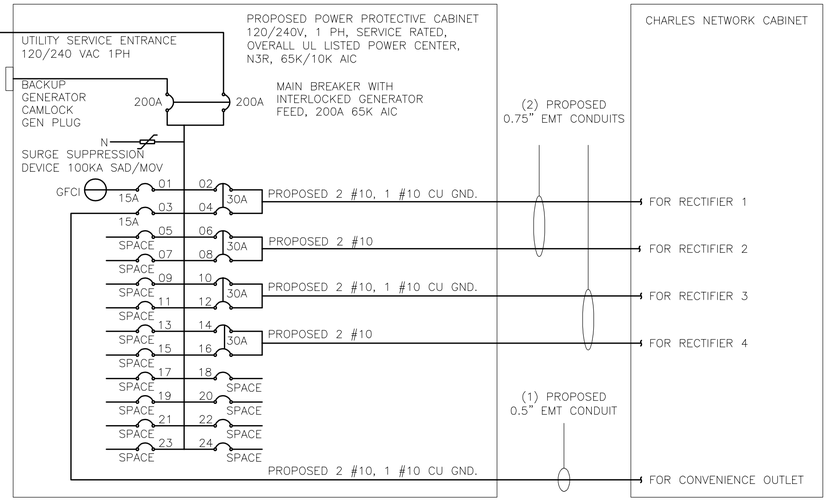
SHEET TITLE

ELECTRICAL DETAILS

SHEET NUMBER

E-2





NOTE:
BRANCH CIRCUIT WIRING SUPPLYING RECTIFIERS ARE TO BE RATED UL1015, 105°C, 600V, AND PVC INSULATED, IN THE SIZES SHOWN IN THE ONE-LINE DIAGRAM. CONTRACTOR MAY SUBSTITUTE UL1015 WIRE FOR THWN-2 FOR CONVENIENCE OUTLET BRANCH CIRCUIT.

BREAKERS REQUIRED:
(4) 30A, 2P BREAKER – SQUARE D P/N:QO230
(1) 15A, 1P BREAKER – SQUARE D P/N:QO115

NOTES

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED SHORT CIRCUIT CALCULATIONS AND THE AIC RATINGS FOR EACH DEVICE IS ADEQUATE TO PROTECT THE EQUIPMENT AND THE ELECTRICAL SYSTEM.

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED VOLTAGE DROP CALCULATIONS AND ALL BRANCH CIRCUIT AND FEEDERS COMPLY WITH THE NEC (LISTED ON T-1) ARTICLE 210.19(A)(1) FPN NO. 4.

THE (2) CONDUITS WITH (4) CURRENT CARRYING CONDUCTORS EACH, SHALL APPLY THE ADJUSTMENT FACTOR OF 80% PER 2014/17 NEC TABLE 310.15(B)(3)(a) OR 2020 NEC TABLE 310.15(C)(1) FOR UL1015 WIRE.

#12 FOR 15A-20A/1P BREAKER: 0.8 x 30A = 24.0A
#10 FOR 25A-30A/2P BREAKER: 0.8 x 40A = 32.0A
#8 FOR 35A-40A/2P BREAKER: 0.8 x 55A = 44.0A
#6 FOR 45A-60A/2P BREAKER: 0.8 x 75A = 60.0A

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 358.
0.5" CONDUIT – 0.122 SQ. IN AREA
0.75" CONDUIT – 0.213 SQ. IN AREA
2.0" CONDUIT – 1.316 SQ. IN AREA
3.0" CONDUIT – 2.907 SQ. IN AREA

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.

#10 – 0.0211 SQ. IN X 2 = 0.0422 SQ. IN
#10 – 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND
TOTAL = 0.0633 SQ. IN

0.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

RECTIFIER CONDUCTORS (2 CONDUITS): USING UL1015, CU.

#10 – 0.0266 SQ. IN X 4 = 0.1064 SQ. IN
#10 – 0.0082 SQ. IN X 1 = 0.0082 SQ. IN <BARE GROUND
TOTAL = 0.1146 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (5) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.

3/0 – 0.2679 SQ. IN X 3 = 0.8037 SQ. IN
#6 – 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND
TOTAL = 0.8544 SQ. IN

3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC ONE-LINE DIAGRAM | NO SCALE | 1

PROPOSED CHARLES PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	LOAD SERVED
PPC GFCI OUTLET	180		15A	1	A	2	30A	2880		ABB/GE INFINITY RECTIFIER 1
CHARLES GFCI OUTLET		180	15A	3	B	4			2880	
-SPACE-				5	A	6	30A	2880		ABB/GE INFINITY RECTIFIER 2
-SPACE-				7	B	8			2880	
-SPACE-				9	A	10	30A	2880		ABB/GE INFINITY RECTIFIER 3
-SPACE-				11	B	12			2880	
-SPACE-				13	A	14	30A	2880		ABB/GE INFINITY RECTIFIER 4
-SPACE-				15	B	16			2880	
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS	180	180						11520	11520	
200A MCB, 1ϕ, 24 SPACE, 120/240V			L1		L2					
MB RATING: 65,000 AIC			11700		11700		VOLTAGE AMPS			
			98		98		AMPS			
			98				MAX AMPS			
			123				MAX 125%			

PANEL SCHEDULE | NO SCALE | 2

NOT USED | NO SCALE | 3

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PROJECT INFORMATION
BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
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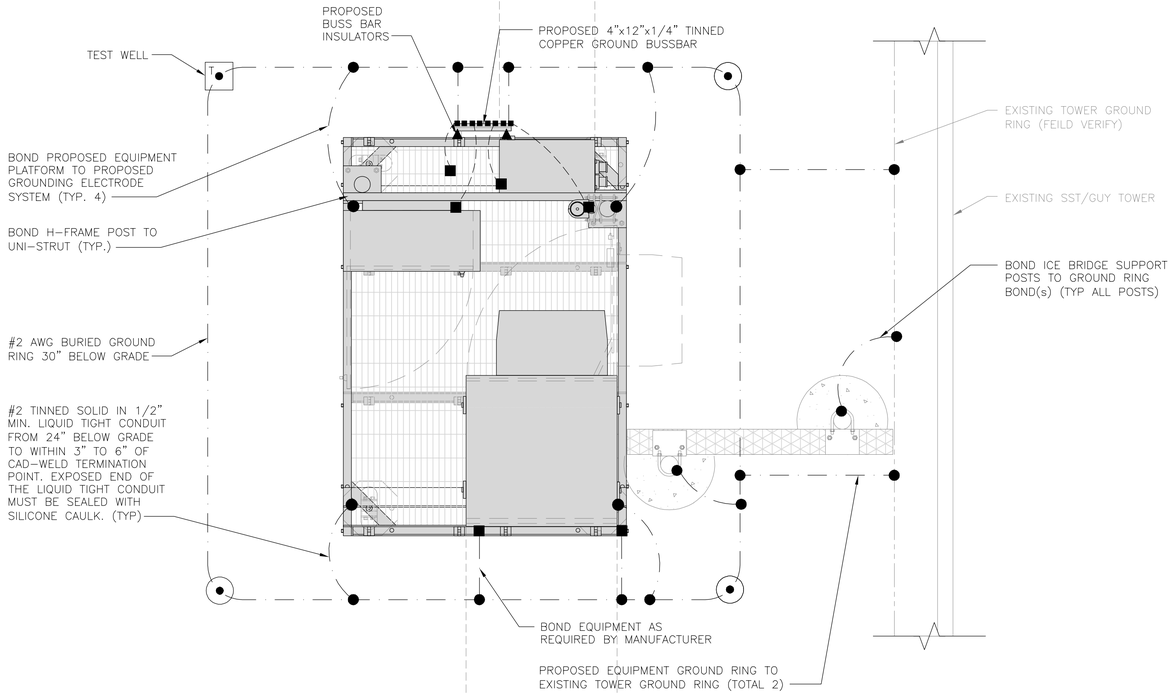
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3

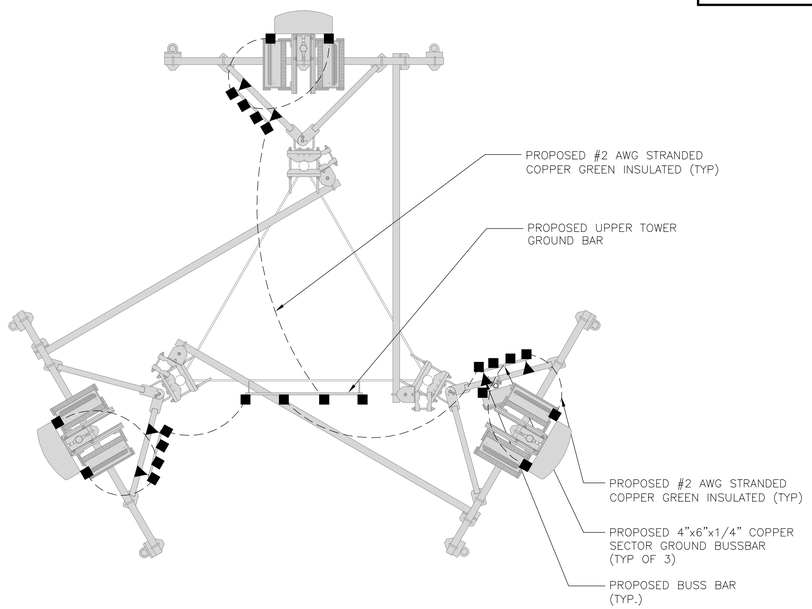


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1

NOTES

ANTENNAS AND OVP SHOWN ARE GENERIC AND NOT REFERENCING TO A SPECIFIC MANUFACTURER. THIS LAYOUT IS FOR REFERENCE PURPOSES ONLY



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 PROPOSED ANTENNA MOUNT COLLAR.

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

GROUNDING KEY NOTES

NO SCALE | 3

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LICENSE #PEN.0028997

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BPC	BRN	TA

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

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1	03/11/2022	ISSUED FOR CONSTRUCTION
2	06/08/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

876338

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

SHEET TITLE

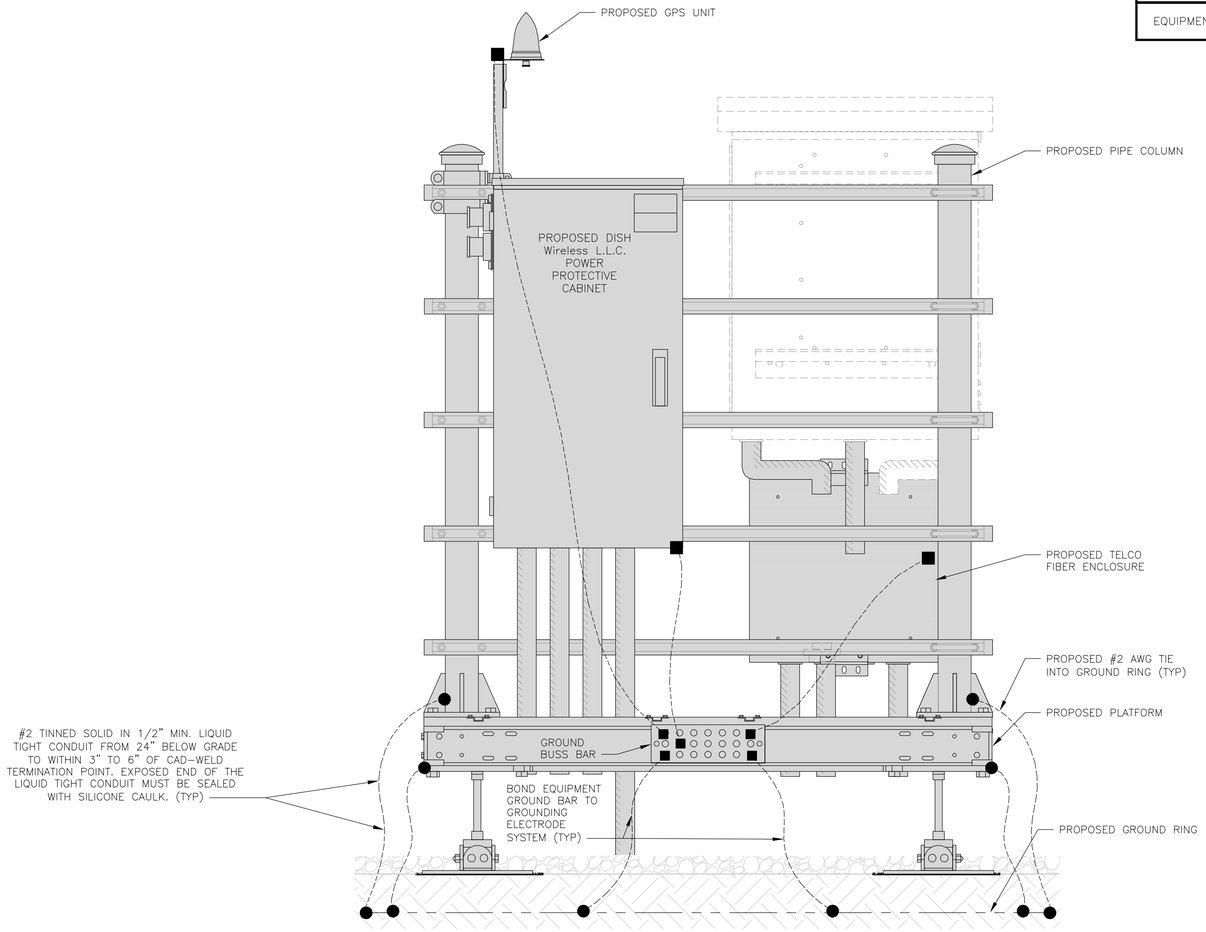
GROUNDING PLANS AND NOTES

SHEET NUMBER

G-1

NOTES

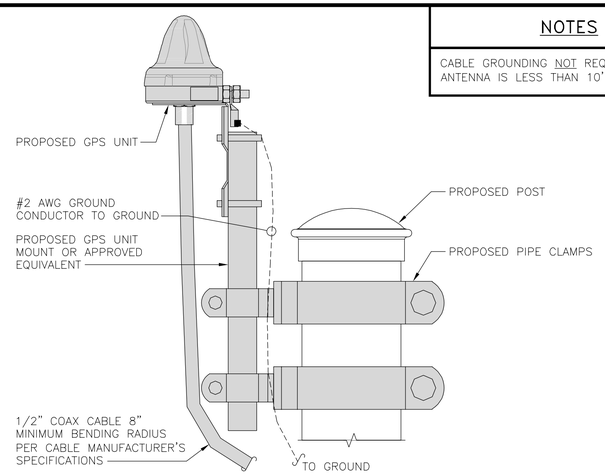
EQUIPMENT CABINET OMITTED FOR CLARITY



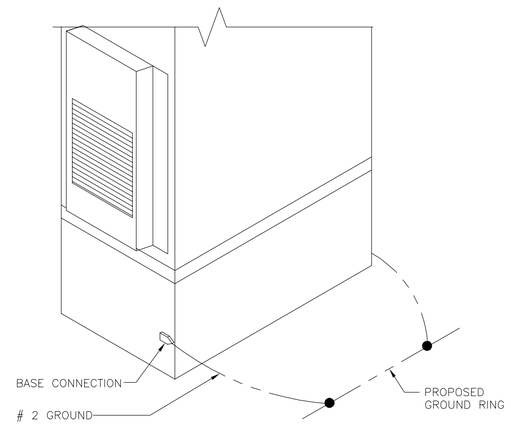
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

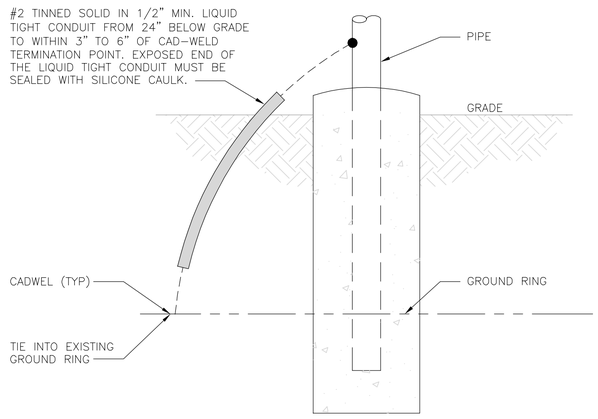
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



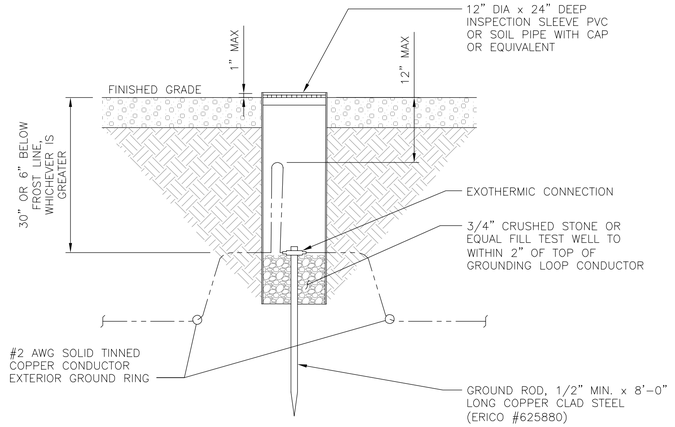
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



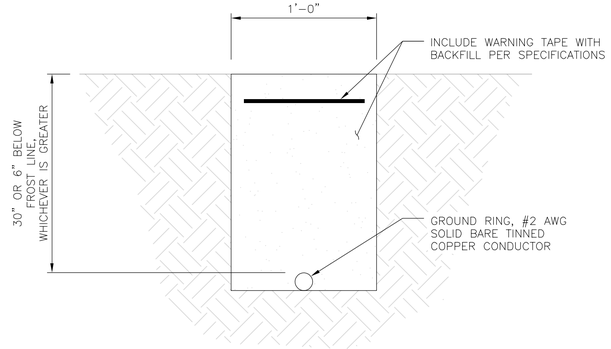
OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE | NO SCALE | 5



TYPICAL GROUND RING TRENCH | NO SCALE | 6

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NB+C ENGINEERING SERVICES, LLC.
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ELKRIDGE, MD 21075
(410) 712-7092

STATE OF CONNECTICUT — KRUPAKARAN KOLANDAIVELU — PEN.0028997 — LICENSED PROFESSIONAL ENGINEER

06/08/2022

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

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WATERFORD, CT
06385-2000

SHEET TITLE

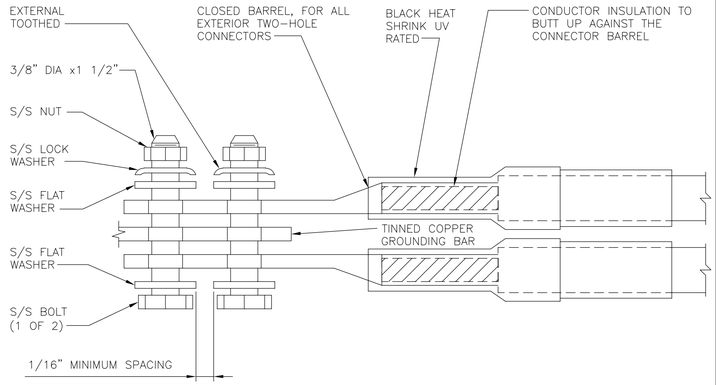
GROUNDING DETAILS

SHEET NUMBER

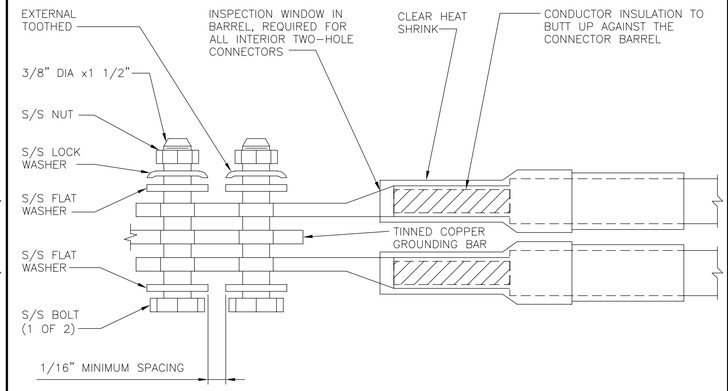
G-2

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).

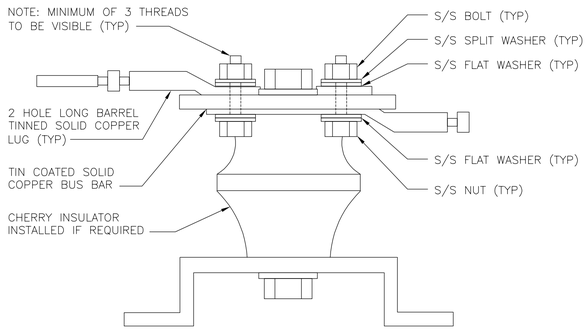
TYPICAL GROUNDING NOTES | NO SCALE | 1



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

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06/08/2022

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WATERFORD, CT
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SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

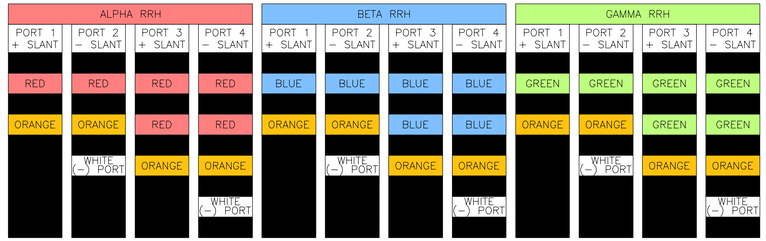
G-3

HYBRID/DISCREET CABLES

3/4" TAPE WIDTHS WITH 3/4" SPACING

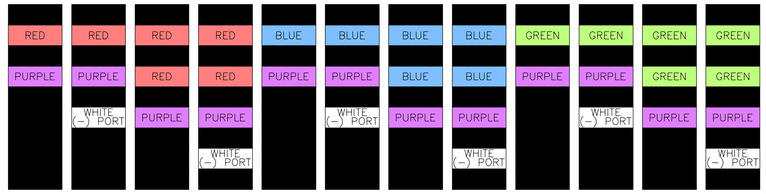
LOW-BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) - OPTIONAL PER MARKET

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)



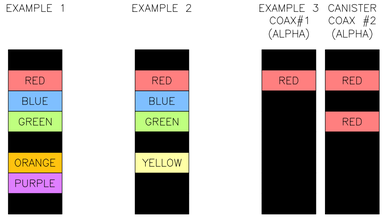
HYBRID/DISCREET CABLES

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.

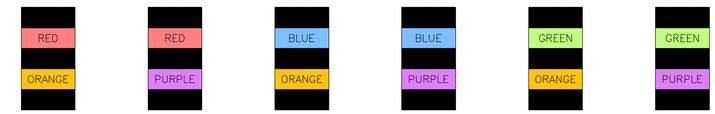


FIBER JUMPERS TO RRHs

LOW-BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.

POWER CABLES TO RRHs

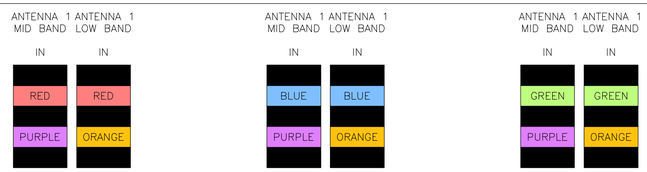
LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



RET MOTORS AT ANTENNAS

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

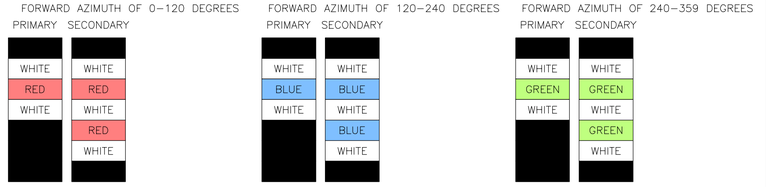
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



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.



LOW BANDS (N71+N26) OPTIONAL - (N29): ORANGE

AWS (N66+N70+H-BLOCK): PURPLE

CBRS TECH (3 GHz): YELLOW

NEGATIVE SLANT PORT ON ANT/RRH: WHITE

ALPHA SECTOR: RED

BETA SECTOR: BLUE

GAMMA SECTOR: GREEN

COLOR IDENTIFIER | | 2

NOT USED | | 3

RF CABLE COLOR CODES | | 1

NOT USED | | 4

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PROJECT INFORMATION

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41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

SHEET TITLE

RF
CABLE COLOR CODES

SHEET NUMBER

RF-1

LEGEND

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM — T

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE — T

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE — GFCI

FLUORESCENT LIGHTING FIXTURE
(2) TWO LAMPS 48–T8 — F

SMOKE DETECTION (DC) — SD

EMERGENCY LIGHTING (DC)

SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW
LED–1–25A400/51K–SR4–120–PE–DDBTXD

CHAIN LINK FENCE — X X X X

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE — W W W W W

UNDERGROUND POWER — UGP UGP UGP UGP UGP

UNDERGROUND TELCO — UGT UGT UGT UGT UGT

OVERHEAD POWER — OHP OHP OHP OHP

OVERHEAD TELCO — OHT OHT OHT OHT

UNDERGROUND TELCO/POWER — UGT/P UGT/P UGT/P UGT/P

ABOVE GROUND POWER — AGP AGP AGP AGP AGP

ABOVE GROUND TELCO — AGT AGT AGT AGT AGT

ABOVE GROUND TELCO/POWER — AGT/P AGT/P AGT/P AGT/P

WORKPOINT — W.P.

SECTION REFERENCE — XX / X–X

DETAIL REFERENCE — XX / X–X

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	UNITERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

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06385–2000

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.

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STATE OF CONNECTICUT · KRUPAKARAN KOLANDAIVELU · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

06/08/2022

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
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RFDS REV #: ---

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A&E PROJECT NUMBER

876338

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385–2000

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.

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STATE OF CONNECTICUT · KRUPAKARAN KOLANDAIVELU · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

06/08/2022

KRUPAKARAN KOLANDAIVELU, P.E.
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LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
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A&E PROJECT NUMBER

876338

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00882A
41 MANITOCK HILL ROAD
WATERFORD, CT
06385-2000

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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SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

ATTACHMENT 4

Date: **November 26, 2021**

MORRISON HERSHFIELD

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Subject:	**Structural Analysis Report**	
Carrier Designation:	***DISH Network* Co-Locate**	
	Site Number:	BOBOS00882A
Crown Castle Designation:	**BU Number:**	876338
	Site Name:	Waterford
	JDE Job Number:	671529
	Work Order Number:	2048514
	Order Number:	572906 Rev. 2
Engineering Firm Designation:	**Morrison Hershfield Project Number:** CN8-185R3 / 2200039	
Site Data:	**41 Manitock Hill Road, Waterford, New London County, CT 06385-2000** **Latitude *41° 21' 16.7"*, Longitude *-72° 9' 1.6"*** **136 Foot – PiRod 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– 66.9%**

This analysis utilizes an ultimate 3-second gust wind speed of 126 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 – Analysis Criteria.

Respectfully submitted by:

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

Digitally signed by G. Lance Cooke
Date: 2021.11.26 11:53:53-08'00'

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 136 ft self-support tower designed by PiRod Manufactures, Inc.

The tower has been modified per reinforcement drawings prepared by Vertical Structures, Inc. in January 2009. Reinforcement consists of secondary horizontal members between the elevations 90’ and 95’ and 1-1/4” tie-rod assemblies for tower legs from 80’ to 90’.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	126 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)
87.0	87.0	3	jma wireless	MX08FRO665-21 w/ Mount Pipe	1	1-3/8
		3	fujitsu	TA08025-B604		
		3	fujitsu	TA08025-B605		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MTC3975083 (3)		

Table 2 - Non-Carrier Equipment To Be Removed

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
87.0	89.0	3	kathrein	800 10504 w/ Mount Pipe	6	7/8
		3	kathrein	860 10118		
	87.0	1	-	Sector Mount [SM 104-3]		

Table 3 - 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)
136.0	137.0	3	rfs/celwave	APXVSPP18-C-A20 w/ Mount Pipe	4	1-1/4
		3	rfs/celwave	APXVTM14-C-120 w/ Mount Pipe		
		3	alcatel lucent	TD-RRH8X20-25		
	136.0	1	-	Platform Mount [LP 405-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
134.0	136.0	3	rfs/celwave	IBC1900BB-1	-	-
		3	rfs/celwave	IBC1900HG-2A		
	134.0	2	alcatel lucent	1900MHZ RRH (65MHZ)		
		1	alcatel lucent	1900MHz RRH (65MHz)		
		3	alcatel lucent	800MHZ 2X50W RRH W/FILTER		
		1	-	Pipe Mount [PM 601-3]		
127.0	127.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	1-1/4
		1	-	Sector Mount [SM 411-3]		
117.0	119.0	3	ericsson	AIR6449 B41_T-MOBILE	4	1-5/8
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	rfs/celwave	APXVAALL24_43-U-NA20_TMO		
	117.0	3	site pro 1	12' HD V-Frame [#VFA12-HD]		
		9	site pro 1	8' Antenna Pipe [#P2STD]		
107.0	107.0	3	antel	BXA-80063/4CF w/ Mount Pipe	14	1-5/8
		6	jma wireless	MX06FRO660-03 w/ Mount Pipe		
		3	vzw	Sub6 Antenna - VZS01 w/ Mount Pipe		
		3	samsung telecommunications	RFV01U-D1A		
		3	samsung telecommunications	RFV01U-D2A		
		12	site pro 1	Crossover Plate [#VZWSMART-MSK1]		
		3	site pro 1	Tieback Assembly [#VZWSMART-SFK1]		
		3	site pro 1	V-Bracing Kit [#VZWSMART-SFK3]		
		1	commscope	RC2DC-3315-PF-48		
		1	tower mounts	Sector Mount [SM 402-3]		
97.0	97.0	1	cci antennas	DMP65R-BU4D w/ Mount Pipe	6 4 2	1-1/4 7/8 3/8
		1	cci antennas	DMP65R-BU6D w/ Mount Pipe		
		1	cci antennas	DMP65R-BU8D w/ Mount Pipe		
		1	cci antennas	OPA65R-BU4D w/ Mount Pipe		
		1	cci antennas	OPA65R-BU6D w/ Mount Pipe		
		1	cci antennas	OPA65R-BU8D w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14_CCIV2		
		3	ericsson	RRUS 8843 B2/B66A_CCIV2		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
97.0	97.0	6	powerwave technologies	LGP21401	-	-
		1	raycap	DC6-48-60-18-8F		
		1	raycap	DC9-48-60-24-8C-EV		
		3	kathrein	860 10118		
80.0	81.0	1	gps	GPS_A	1	1/2
	80.0	1	tower mounts	Side Arm Mount [SO 701-1]		
72.0	72.0	2	gps	GPS_A	2	1/2
		2	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	2035622	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	2068030	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1441523	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2125417	CCISITES
4-POST-MODIFICATION INSPECTION	2376132	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 3 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 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	136 - 133.625	Leg	1 1/2	2	-2.24	54.73	4.1	Pass
T2	133.625 - 130	Leg	1 1/2	14	-4.06	49.84	8.1	Pass
T3	130 - 110	Leg	2	29	-35.06	117.05	30.0	Pass
T4	110 - 94.9427	Leg	2 1/4	107	-76.51	156.33	48.9	Pass
T5	94.9427 - 92.5938	Leg	2 1/4	149	-84.53	179.34	47.1	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T6	92.5938 - 90	Leg	2 1/4	161	-96.34	185.75	51.9	Pass
T7	90 - 80	Leg	Pirod 105244 w/ (2) 1-1/4" Tie Rod	176	-104.30	265.00	39.4	Pass
T8	80 - 60	Leg	Pirod 105217	184	-145.68	225.60	64.6	Pass
T9	60 - 40	Leg	Pirod 105218	199	-179.88	315.72	57.0	Pass
T10	40 - 20	Leg	Pirod 105218	214	-209.37	315.72	66.3	Pass
T11	20 - 0	Leg	Pirod 105219	229	-236.35	419.86	56.3	Pass
T1	136 - 133.625	Diagonal	3/4	8	-0.92	5.77	15.9	Pass
T2	133.625 - 130	Diagonal	3/4	24	-1.33	5.88	22.7	Pass
T3	130 - 110	Diagonal	7/8	40	-3.87	9.77	39.6	Pass
T4	110 - 94.9427	Diagonal	1	115	-5.08	14.70	34.6	Pass
T5	94.9427 - 92.5938	Diagonal	1	151	-5.36	14.41	37.2	Pass
T6	92.5938 - 90	Diagonal	1	166	-6.30	14.87	42.4	Pass
T7	90 - 80	Diagonal	L3x3x3/16	180	-7.52	25.34	29.7 66.4 (b)	Pass
T8	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	187	-6.33	14.57	43.5 58.1 (b)	Pass
T9	60 - 40	Diagonal	L3x3x3/16	202	-5.81	20.18	28.8 48.1 (b)	Pass
T10	40 - 20	Diagonal	L3x3x3/16	217	-5.86	16.11	36.4 46.1 (b)	Pass
T11	20 - 0	Diagonal	L3x3x5/16	232	-7.84	20.97	37.4	Pass
T2	133.625 - 130	Horizontal	3/4	16	-0.18	3.48	5.2	Pass
T3	130 - 110	Horizontal	3/4	43	-0.66	2.88	23.0	Pass
T5	94.9427 - 92.5938	Secondary Horizontal	1 1/2	157	-1.46	50.44	2.9	Pass
T6	92.5938 - 90	Secondary Horizontal	1 1/2	172	-1.67	49.85	3.3	Pass
T1	136 - 133.625	Top Girt	6x3/8	4	-0.65	5.14	12.7	Pass
T3	130 - 110	Top Girt	7/8	31	-0.66	6.54	10.1	Pass
T4	110 - 94.9427	Top Girt	1	111	-1.58	8.78	18.1	Pass
T2	133.625 - 130	Bottom Girt	7/8	19	-0.56	6.44	8.7	Pass
T3	130 - 110	Bottom Girt	7/8	36	-1.66	5.18	32.0	Pass
T6	92.5938 - 90	Bottom Girt	1	163	-1.67	7.17	23.3	Pass
							Summary	
						Leg (T10)	66.3	Pass
						Diagonal (T7)	66.4	Pass
						Horizontal (T3)	23.0	Pass
						Secondary Horizontal (T6)	3.3	Pass
						Top Girt (T4)	18.1	Pass
						Bottom Girt (T3)	32.0	Pass
						Bolt Checks	63.2	Pass
						Rating =	66.4	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	37.1	Pass
1	Base Foundation (Structure)	0	19.5	Pass
1	Base Foundation (Soil Interaction)		66.9	Pass

Structure Rating (max from all components) =	66.9%*

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

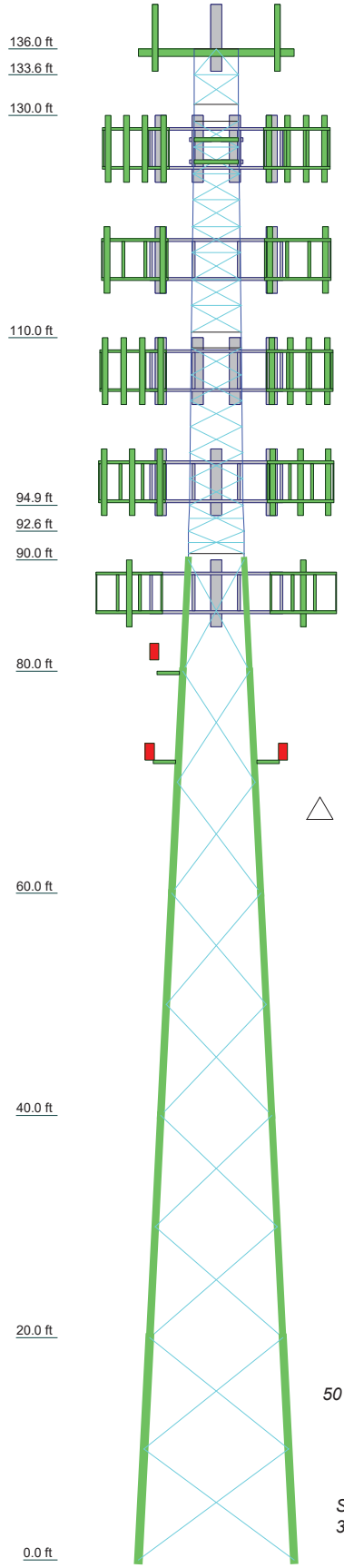
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	Pirod 105219		Pirod 105218	Pirod 105217	A			SR 2 1/4	SR 2	SR 1 1/2	
Leg Grade	A572-50										
Diagonals	L3x3x5/16		L3x3x3/16	L2 1/2x2 1/2x3/16	L3x3x3/16			SR 1	SR 7/8	SR 3/4	
Diagonal Grade	A36								A572-50		
Top Girts			N.A.					SR 1	SR 7/8	N.A.	B
Bottom Girts			N.A.			C		N.A.	SR 7/8	N.A.	
Horizontals			N.A.						SR 3/4	N.A.	
Sec. Horizontals			N.A.			SR 1 1/2	5/8	4.5	N.A.		4
Face Width (ft)	14	12	10	8	6	4.5	3.4375	6 @ 2.34983	8 @ 2.375	E	D
# Panels @ (ft)			9 @ 10				G	F			
Weight (K)	17.3	4.5	2.9	2.8	2.2	1.4	0.3	0.3	1.2	1.4	0.2	0.2



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105244 w/ (2) 1-1/4" Tie Rod	E	1 @ 2.625
B	6x3/8	F	1 @ 2.34896
C	SR 1	G	1 @ 2.01042
D	1 @ 2.375		

MATERIAL STRENGTH

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

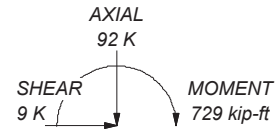
TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 126 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 0.00 ft
8. TOWER RATING: 66.4%

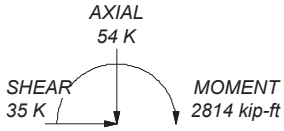
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 245 K
SHEAR: 24 K

UPLIFT: -212 K
SHEAR: 21 K



TORQUE 3 kip-ft
50 mph WIND - 1.0000 in ICE



TORQUE 14 kip-ft
REACTIONS - 126 mph WIND

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

Job: CN8-185R3/ 2200039			
Project: 876338 / Waterford			
Client: Crown Castle USA	Drawn by: CSA	App'd:	
Code: TIA-222-H	Date: 11/26/21	Scale: NTS	
Path: C:\Users\CAsritha\Desktop\CN8-185R3 Re- run SA\Analysis\CN8-185R3 BU_876338 WO_2048514.eri		Dwg No. E-1	

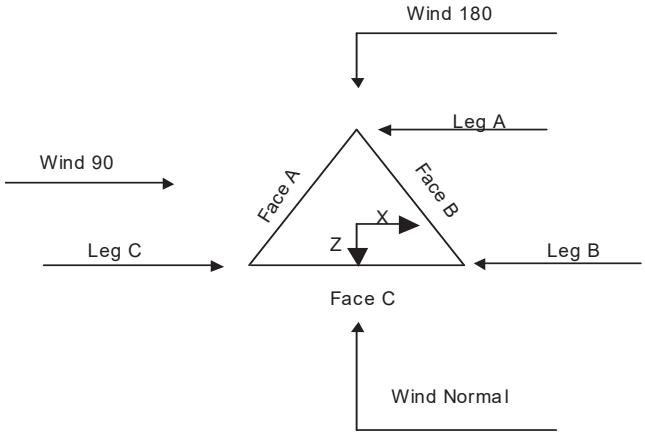
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 136.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and 14.00 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
Tower base elevation above sea level: 242.00 ft.
Basic wind speed of 126 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.0000 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.
A non-linear (P-delta) analysis was used.
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	136.00-133.63			4.00	1	2.38
T2	133.63-130.00			4.00	1	3.63
T3	130.00-110.00			4.00	1	20.00
T4	110.00-94.94			4.50	1	15.06
T5	94.94-92.59			4.88	1	2.35
T6	92.59-90.00			4.93	1	2.59
T7	90.00-80.00			5.00	1	10.00
T8	80.00-60.00			6.00	1	20.00
T9	60.00-40.00			8.00	1	20.00
T10	40.00-20.00			10.00	1	20.00
T11	20.00-0.00			12.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	136.00-133.63	2.38	K Brace Down	No	Yes	0.0000	0.0000
T2	133.63-130.00	2.63	X Brace	No	Yes	0.0000	12.0000
T3	130.00-110.00	2.38	X Brace	No	Yes	6.0000	6.0000
T4	110.00-94.94	2.35	X Brace	No	No	11.5000	0.0000
T5	94.94-92.59	2.35	X Brace	No	Yes	0.0000	0.0000
T6	92.59-90.00	2.01	X Brace	No	Yes	0.0000	7.0000
T7	90.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T8	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T9	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T10	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T11	20.00-0.00	10.00	X Brace	No	No	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 136.00-133.63	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 133.63-130.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 130.00-110.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110.00-94.94	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T5 94.94-92.59	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T6 92.59-90.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T7 90.00-80.00	Truss Leg	Pirod 105244 w/ (2) 1-1/4" Tie Rod	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 80.00-60.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 60.00-40.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T10 40.00-20.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T11 20.00-0.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 136.00-133.63	Flat Bar	6x3/8	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T2 133.63-130.00	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 130.00-110.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110.00-94.94	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T6 92.59-90.00	Solid Round		A572-50 (50 ksi)	Solid Round	1	A572-50 (50 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
T1 136.00-133.63	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 133.63-130.00	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 130.00-110.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	3/4	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
T5 94.94-92.59	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T6 92.59-90.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 136.00-133.63	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T2 133.63-130.00	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T3 130.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T4 110.00-94.94	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T5 94.94-92.59	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T6 92.59-90.00	0.00	0.0000	A36 (36 ksi)	1	1.03	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T7 90.00-80.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T8 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T9 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T10 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T11 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 136.00-133.63	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 133.63-130.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 130.00-110.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 110.00-94.94	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 94.94-92.59	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 0.5	1 1
T6 92.59-90.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 0.5	1 1
T7 90.00-80.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 80.00-	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
60.00				1	1	1	1	1	1	1
T9 60.00-40.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 40.00-20.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 20.00-0.00	Yes	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	Truss-Leg K Factors: Truss-Legs Used As Leg Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals
T7 90.00-80.00	0.999	0.5	0.85	1	1	1
T8 80.00-60.00	1	0.5	0.85	1	1	1
T9 60.00-40.00	1	0.5	0.85	1	1	1
T10 40.00-20.00	1	0.5	0.85	1	1	1
T11 20.00-0.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 136.00-133.63	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	1
T2 133.63-130.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	1
T3 130.00-110.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 110.00-94.94	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 94.94-92.59	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 92.59-90.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 90.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T11 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	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 136.00-133.63	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 133.63-130.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 130.00-110.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 110.00-94.94	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 94.94-92.59	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 92.59-90.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 90.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 60.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 40.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 20.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 136.00-133.63	Flange	0.6250 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0
T2 133.63-130.00	Sleeve DS	0.6250 A325N	5	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0
T3 130.00-110.00	Sleeve DS	0.7500 A325N	5	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.5000 A325N	0	0.0000 A325N	0	0.5000 A325N	0
T4 110.00-94.94	Flange	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.5000 A325N	0	0.0000 A325N	0	0.5000 A325N	0
T5 94.94-92.59	Flange	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.5000 A325N	0	0.0000 A325N	0	0.5000 A325N	0
T6 92.59-90.00	Flange	1.0000 A325N	6	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.5000 A325N	0	0.0000 A325N	0	0.5000 A325N	0
T7 90.00-80.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.5000 A325N	0	0.0000 A325N	0	0.5000 A325N	0
T8 80.00-60.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.5000 A325N	0	0.0000 A325N	0	0.5000 A325N	0
T9 60.00-40.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.5000 A325N	0	0.0000 A325N	0	0.5000 A325N	0
T10 40.00-20.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.5000 A325N	0	0.0000 A325N	0	0.5000 A325N	0
T11 20.00-0.00	Flange	1.2500 A-687	0	1.2500 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
*****													
Safety Line 3/8	C	No	No	Ar (CaAa)	90.00 - 0.00	0.0000	0.48	1	1	0.3750	0.3750		0.22
Safety Line 3/8	C	No	No	Ar (CaAa)	136.00 - 90.00	0.0000	0	1	1	0.3750	0.3750		0.22
Ladder Rung SR 3/4 (48"w 26"s)	C	No	No	Af (CaAa)	136.00 - 90.00	0.0000	0	1	1	1.3500	1.3500		2.71
*****													
HB114-1-08U4-M5J(1-1/4)	C	No	No	Ar (CaAa)	136.00 - 0.00	-5.0000	-0.3	3	3	0.5000	1.5400		1.08
HB114-21U3M12-XXXF(1-1/4)	C	No	No	Ar (CaAa)	136.00 - 0.00	-5.0000	-0.3	1	1	0.5000	1.5400		1.22
T-Brackets (Af)	C	No	No	Af (CaAa)	136.00 - 0.00	-7.0000	-0.35	1	1	1.0000	1.0000		8.40
*****													
LDF6-50A(1-1/4)	B	No	No	Ar (CaAa)	127.00 - 0.00	-1.0000	-0.4	6	6	0.5000	1.5500		0.60
LDF6-50A(1-1/4)	A	No	No	Ar (CaAa)	127.00 - 0.00	-1.0000	0.4	6	6	0.5000	1.5500		0.60
T-Brackets (Af)	C	No	No	Af (CaAa)	127.00 - 0.00	-4.0000	-0.35	1	1	1.0000	1.0000		8.40
*****													
*****													
HCS 6X12 4AWG(1-5/8)	A	No	No	Ar (CaAa)	117.00 - 0.00	-3.0000	-0.4	3	3	0.5000	1.6600		2.40
HB158-21U6S24-xxM_TMO(1-5/8)	C	No	No	Ar (CaAa)	117.00 - 0.00	-3.0000	0.4	1	1	0.5000	1.9960		2.50
T-Brackets (Af)	C	No	No	Af (CaAa)	117.00 - 0.00	-5.0000	-0.35	1	1	1.0000	1.0000		8.40
*****													
LDF7-50A(1-5/8)	B	No	No	Ar (CaAa)	107.00 - 0.00	-4.0000	0.37	12	6	0.5000	1.9800		0.82
HB158-1-08U8-S8J18(1-5/8)	B	No	No	Ar (CaAa)	107.00 - 0.00	-4.0000	0.37	2	1	0.5000	1.9800		1.30
Feedline Ladder (Af)	B	No	No	Af (CaAa)	107.00 - 0.00	-4.0000	0.4	1	1	3.0000	3.0000		8.40
*****													
LDF6-50A(1-1/4)	B	No	No	Ar (CaAa)	97.00 - 0.00	-2.0000	0.4	6	6	0.5000	1.5500		0.60
FB-L98-002-XXX(3/8)	B	No	No	Ar (CaAa)	97.00 - 0.00	-8.0000	0	2	2	0.5000	0.3937		0.06
WR-VG86ST-BRDA(7/8)	B	No	No	Ar (CaAa)	97.00 - 0.00	-8.0000	0	4	2	0.5000	0.8800		0.68
*****													
***													
CU12PSM9P8XXX(1-3/8)	A	No	No	Ar (CaAa)	87.00 - 0.00	0.0000	0	1	1	0.5000	1.4110		1.66
Feedline Ladder (Af)	A	No	No	Af (CaAa)	87.00 - 0.00	0.0000	0	1	1	3.0000	3.0000		8.40
*****													
FLC 12-50J(1/2)	C	No	No	Ar (CaAa)	80.00 - 0.00	-2.0000	-0.45	1	1	0.5000	0.6400		0.17
*****													
LDF4-50A(1/2)	B	No	No	Ar (CaAa)	72.00 - 0.00	-3.0000	-0.4	2	2	0.5000	0.6250		0.15
*****													

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	136.00-133.63	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.482	0.000	0.04
T2	133.63-130.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.789	0.000	0.06
T3	130.00-110.00	A	0.000	0.000	19.296	0.000	0.11
		B	0.000	0.000	15.810	0.000	0.06
		C	0.000	0.000	26.301	0.000	0.53
T4	110.00-94.94	A	0.000	0.000	21.502	0.000	0.16
		B	0.000	0.000	56.254	0.000	0.32
		C	0.000	0.000	23.762	0.000	0.53
T5	94.94-92.59	A	0.000	0.000	3.354	0.000	0.03
		B	0.000	0.000	13.067	0.000	0.07
		C	0.000	0.000	3.707	0.000	0.08
T6	92.59-90.00	A	0.000	0.000	3.704	0.000	0.03
		B	0.000	0.000	14.428	0.000	0.08
		C	0.000	0.000	4.093	0.000	0.09
T7	90.00-80.00	A	0.000	0.000	18.768	0.000	0.18
		B	0.000	0.000	55.627	0.000	0.31
		C	0.000	0.000	13.531	0.000	0.32
T8	80.00-60.00	A	0.000	0.000	41.382	0.000	0.42
		B	0.000	0.000	112.755	0.000	0.62
		C	0.000	0.000	28.342	0.000	0.65
T9	60.00-40.00	A	0.000	0.000	41.382	0.000	0.42
		B	0.000	0.000	113.755	0.000	0.62
		C	0.000	0.000	28.342	0.000	0.65
T10	40.00-20.00	A	0.000	0.000	41.382	0.000	0.42
		B	0.000	0.000	113.755	0.000	0.62
		C	0.000	0.000	28.342	0.000	0.65
T11	20.00-0.00	A	0.000	0.000	41.382	0.000	0.42
		B	0.000	0.000	113.755	0.000	0.62
		C	0.000	0.000	28.342	0.000	0.65

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	136.00-133.63	A	0.978	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.721	0.000	0.08
T2	133.63-130.00	A	0.976	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	8.724	0.000	0.12
T3	130.00-110.00	A	0.967	0.000	0.000	37.716	0.000	0.39
		B		0.000	0.000	30.110	0.000	0.29
		C		0.000	0.000	59.318	0.000	0.95
T4	110.00-94.94	A	0.952	0.000	0.000	42.884	0.000	0.47
		B		0.000	0.000	78.671	0.000	0.98
		C		0.000	0.000	52.448	0.000	0.90
T5	94.94-92.59	A	0.944	0.000	0.000	6.677	0.000	0.07
		B		0.000	0.000	20.084	0.000	0.23
		C		0.000	0.000	8.148	0.000	0.14
T6	92.59-90.00	A	0.941	0.000	0.000	7.369	0.000	0.08
		B		0.000	0.000	22.163	0.000	0.26
		C		0.000	0.000	8.986	0.000	0.15
T7	90.00-80.00	A	0.934	0.000	0.000	35.473	0.000	0.42
		B		0.000	0.000	85.302	0.000	0.98
		C		0.000	0.000	30.408	0.000	0.53
T8	80.00-60.00	A	0.916	0.000	0.000	76.663	0.000	0.93
		B		0.000	0.000	176.339	0.000	1.98

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	65.212	0.000	1.10
T9	60.00-40.00	A	0.886	0.000	0.000	76.037	0.000	0.92
		B		0.000	0.000	179.154	0.000	1.97
		C		0.000	0.000	64.162	0.000	1.08
T10	40.00-20.00	A	0.842	0.000	0.000	75.127	0.000	0.89
		B		0.000	0.000	176.932	0.000	1.91
		C		0.000	0.000	62.636	0.000	1.05
T11	20.00-0.00	A	0.754	0.000	0.000	73.325	0.000	0.84
		B		0.000	0.000	172.528	0.000	1.79
		C		0.000	0.000	59.607	0.000	0.99

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	136.00-133.63	2.1792	1.1890	2.5820	1.9381
T2	133.63-130.00	4.4504	2.4199	4.1132	3.0537
T3	130.00-110.00	2.2404	-10.3744	2.6918	-6.7936
T4	110.00-94.94	4.7427	-5.5013	5.0030	-3.5992
T5	94.94-92.59	6.3140	-3.2110	5.8891	-2.5515
T6	92.59-90.00	6.2575	-3.2002	5.4374	-3.0406
T7	90.00-80.00	5.1746	-3.4083	4.1905	-3.9574
T8	80.00-60.00	6.5829	-4.5584	5.9562	-4.1884
T9	60.00-40.00	7.9022	-5.7721	7.9735	-4.6924
T10	40.00-20.00	9.3731	-6.9307	9.6747	-5.7397
T11	20.00-0.00	10.5727	-7.9147	11.0921	-6.8677

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	3	Safety Line 3/8	133.63 - 136.00	0.6000	0.4702
T1	4	Ladder Rung SR 3/4 (48"w 26"s)	133.63 - 136.00	0.6000	0.4702
T1	6	HB114-1-08U4-M5J(1-1/4)	133.63 - 136.00	0.6000	0.4702
T1	7	HB114-21U3M12-XXXF(1-1/4)	133.63 - 136.00	0.6000	0.4702
T1	8	T-Brackets (Af)	133.63 - 136.00	0.6000	0.4702
T2	3	Safety Line 3/8	130.00 - 133.63	0.6000	0.6000
T2	4	Ladder Rung SR 3/4 (48"w 26"s)	130.00 - 133.63	0.6000	0.6000
T2	6	HB114-1-08U4-M5J(1-1/4)	130.00 - 133.63	0.6000	0.6000
T2	7	HB114-21U3M12-XXXF(1-1/4)	130.00 - 133.63	0.6000	0.6000
T2	8	T-Brackets (Af)	130.00 - 133.63	0.6000	0.6000
T3	3	Safety Line 3/8	110.00 - 130.00	0.6000	0.5619
T3	4	Ladder Rung SR 3/4 (48"w 26"s)	110.00 - 130.00	0.6000	0.5619
T3	6	HB114-1-08U4-M5J(1-1/4)	110.00 - 130.00	0.6000	0.5619
T3	7	HB114-21U3M12-XXXF(1-1/4)	110.00 - 130.00	0.6000	0.5619
T3	8	T-Brackets (Af)	110.00 -	0.6000	0.5619

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			130.00		
T3	10	LDF6-50A(1-1/4)	110.00 - 127.00	1.0000	1.0000
T3	11	LDF6-50A(1-1/4)	110.00 - 127.00	1.0000	1.0000
T3	12	T-Brackets (Af)	110.00 - 127.00	0.6000	0.5619
T3	18	HCS 6X12 4AWG(1-5/8)	110.00 - 117.00	0.6000	0.5619
T3	19	HB158-21U6S24-xxM_TMO(1-5/8)	110.00 - 117.00	0.6000	0.5619
T3	20	T-Brackets (Af)	110.00 - 117.00	0.6000	0.5619
T4	3	Safety Line 3/8	94.94 - 110.00	0.6000	0.6000
T4	4	Ladder Rung SR 3/4 (48"w 26"s)	94.94 - 110.00	0.6000	0.6000
T4	6	HB114-1-08U4-M5J(1-1/4)	94.94 - 110.00	0.6000	0.6000
T4	7	HB114-21U3M12-XXXF(1-1/4)	94.94 - 110.00	0.6000	0.6000
T4	8	T-Brackets (Af)	94.94 - 110.00	0.6000	0.6000
T4	10	LDF6-50A(1-1/4)	94.94 - 110.00	1.0000	1.0000
T4	11	LDF6-50A(1-1/4)	94.94 - 110.00	1.0000	1.0000
T4	12	T-Brackets (Af)	94.94 - 110.00	0.6000	0.6000
T4	18	HCS 6X12 4AWG(1-5/8)	94.94 - 110.00	0.6000	0.6000
T4	19	HB158-21U6S24-xxM_TMO(1-5/8)	94.94 - 110.00	0.6000	0.6000
T4	20	T-Brackets (Af)	94.94 - 110.00	0.6000	0.6000
T4	22	LDF7-50A(1-5/8)	94.94 - 107.00	0.6000	0.6000
T4	23	HB158-1-08U8-S8J18(1-5/8)	94.94 - 107.00	0.6000	0.6000
T4	24	Feedline Ladder (Af)	94.94 - 107.00	0.6000	0.6000
T4	26	LDF6-50A(1-1/4)	94.94 - 97.00	0.6000	0.6000
T4	27	FB-L98-002-XXX(3/8)	94.94 - 97.00	0.6000	0.6000
T4	28	WR-VG86ST-BRDA(7/8)	94.94 - 97.00	0.6000	0.6000
T5	3	Safety Line 3/8	92.59 - 94.94	0.6000	0.5433
T5	4	Ladder Rung SR 3/4 (48"w 26"s)	92.59 - 94.94	0.6000	0.5433
T5	6	HB114-1-08U4-M5J(1-1/4)	92.59 - 94.94	0.6000	0.5433
T5	7	HB114-21U3M12-XXXF(1-1/4)	92.59 - 94.94	0.6000	0.5433
T5	8	T-Brackets (Af)	92.59 - 94.94	0.6000	0.5433
T5	10	LDF6-50A(1-1/4)	92.59 - 94.94	1.0000	1.0000
T5	11	LDF6-50A(1-1/4)	92.59 - 94.94	1.0000	1.0000
T5	12	T-Brackets (Af)	92.59 - 94.94	0.6000	0.5433
T5	18	HCS 6X12 4AWG(1-5/8)	92.59 - 94.94	0.6000	0.5433
T5	19	HB158-21U6S24-xxM_TMO(1-5/8)	92.59 - 94.94	0.6000	0.5433
T5	20	T-Brackets (Af)	92.59 - 94.94	0.6000	0.5433

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	22	LDF7-50A(1-5/8)	92.59 - 94.94	0.6000	0.5433
T5	23	HB158-1-08U8-S8J18(1-5/8)	92.59 - 94.94	0.6000	0.5433
T5	24	Feedline Ladder (Af)	92.59 - 94.94	0.6000	0.5433
T5	26	LDF6-50A(1-1/4)	92.59 - 94.94	0.6000	0.5433
T5	27	FB-L98-002-XXX(3/8)	92.59 - 94.94	0.6000	0.5433
T5	28	WR-VG86ST-BRDA(7/8)	92.59 - 94.94	0.6000	0.5433
T6	3	Safety Line 3/8	90.00 - 92.59	0.6000	0.4948
T6	4	Ladder Rung SR 3/4 (48"w 26"s)	90.00 - 92.59	0.6000	0.4948
T6	6	HB114-1-08U4-M5J(1-1/4)	90.00 - 92.59	0.6000	0.4948
T6	7	HB114-21U3M12-XXXF(1-1/4)	90.00 - 92.59	0.6000	0.4948
T6	8	T-Brackets (Af)	90.00 - 92.59	0.6000	0.4948
T6	10	LDF6-50A(1-1/4)	90.00 - 92.59	1.0000	1.0000
T6	11	LDF6-50A(1-1/4)	90.00 - 92.59	1.0000	1.0000
T6	12	T-Brackets (Af)	90.00 - 92.59	0.6000	0.4948
T6	18	HCS 6X12 4AWG(1-5/8)	90.00 - 92.59	0.6000	0.4948
T6	19	HB158-21U6S24-xxM_TMO(1-5/8)	90.00 - 92.59	0.6000	0.4948
T6	20	T-Brackets (Af)	90.00 - 92.59	0.6000	0.4948
T6	22	LDF7-50A(1-5/8)	90.00 - 92.59	0.6000	0.4948
T6	23	HB158-1-08U8-S8J18(1-5/8)	90.00 - 92.59	0.6000	0.4948
T6	24	Feedline Ladder (Af)	90.00 - 92.59	0.6000	0.4948
T6	26	LDF6-50A(1-1/4)	90.00 - 92.59	0.6000	0.4948
T6	27	FB-L98-002-XXX(3/8)	90.00 - 92.59	0.6000	0.4948
T6	28	WR-VG86ST-BRDA(7/8)	90.00 - 92.59	0.6000	0.4948
T7	2	Safety Line 3/8	80.00 - 90.00	0.6000	0.4512
T7	6	HB114-1-08U4-M5J(1-1/4)	80.00 - 90.00	0.6000	0.4512
T7	7	HB114-21U3M12-XXXF(1-1/4)	80.00 - 90.00	0.6000	0.4512
T7	8	T-Brackets (Af)	80.00 - 90.00	0.6000	0.4512
T7	10	LDF6-50A(1-1/4)	80.00 - 90.00	1.0000	1.0000
T7	11	LDF6-50A(1-1/4)	80.00 - 90.00	1.0000	1.0000
T7	12	T-Brackets (Af)	80.00 - 90.00	0.6000	0.4512
T7	18	HCS 6X12 4AWG(1-5/8)	80.00 - 90.00	0.6000	0.4512
T7	19	HB158-21U6S24-xxM_TMO(1-5/8)	80.00 - 90.00	0.6000	0.4512
T7	20	T-Brackets (Af)	80.00 - 90.00	0.6000	0.4512
T7	22	LDF7-50A(1-5/8)	80.00 - 90.00	0.6000	0.4512
T7	23	HB158-1-08U8-S8J18(1-	80.00 -	0.6000	0.4512

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		5/8)	90.00		
T7	24	Feedline Ladder (Af)	80.00 - 90.00	0.6000	0.4512
T7	26	LDF6-50A(1-1/4)	80.00 - 90.00	0.6000	0.4512
T7	27	FB-L98-002-XXX(3/8)	80.00 - 90.00	0.6000	0.4512
T7	28	WR-VG86ST-BRDA(7/8)	80.00 - 90.00	0.6000	0.4512
T7	32	CU12PSM9P8XXX(1-3/8)	80.00 - 87.00	0.6000	0.4512
T7	33	Feedline Ladder (Af)	80.00 - 87.00	0.6000	0.4512
T8	2	Safety Line 3/8	60.00 - 80.00	0.6000	0.5294
T8	6	HB114-1-08U4-M5J(1-1/4)	60.00 - 80.00	0.6000	0.5294
T8	7	HB114-21U3M12-XXXF(1-1/4)	60.00 - 80.00	0.6000	0.5294
T8	8	T-Brackets (Af)	60.00 - 80.00	0.6000	0.5294
T8	10	LDF6-50A(1-1/4)	60.00 - 80.00	1.0000	1.0000
T8	11	LDF6-50A(1-1/4)	60.00 - 80.00	1.0000	1.0000
T8	12	T-Brackets (Af)	60.00 - 80.00	0.6000	0.5294
T8	18	HCS 6X12 4AWG(1-5/8)	60.00 - 80.00	0.6000	0.5294
T8	19	HB158-21U6S24-xxM_TMO(1-5/8)	60.00 - 80.00	0.6000	0.5294
T8	20	T-Brackets (Af)	60.00 - 80.00	0.6000	0.5294
T8	22	LDF7-50A(1-5/8)	60.00 - 80.00	0.6000	0.5294
T8	23	HB158-1-08U8-S8J18(1-5/8)	60.00 - 80.00	0.6000	0.5294
T8	24	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5294
T8	26	LDF6-50A(1-1/4)	60.00 - 80.00	0.6000	0.5294
T8	27	FB-L98-002-XXX(3/8)	60.00 - 80.00	0.6000	0.5294
T8	28	WR-VG86ST-BRDA(7/8)	60.00 - 80.00	0.6000	0.5294
T8	32	CU12PSM9P8XXX(1-3/8)	60.00 - 80.00	0.6000	0.5294
T8	33	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5294
T8	35	FLC 12-50J(1/2)	60.00 - 80.00	0.6000	0.5294
T8	37	LDF4-50A(1/2)	60.00 - 72.00	0.6000	0.5294
T9	2	Safety Line 3/8	40.00 - 60.00	0.6000	0.5970
T9	6	HB114-1-08U4-M5J(1-1/4)	40.00 - 60.00	0.6000	0.5970
T9	7	HB114-21U3M12-XXXF(1-1/4)	40.00 - 60.00	0.6000	0.5970
T9	8	T-Brackets (Af)	40.00 - 60.00	0.6000	0.5970
T9	10	LDF6-50A(1-1/4)	40.00 - 60.00	1.0000	1.0000
T9	11	LDF6-50A(1-1/4)	40.00 - 60.00	1.0000	1.0000
T9	12	T-Brackets (Af)	40.00 - 60.00	0.6000	0.5970
T9	18	HCS 6X12 4AWG(1-5/8)	40.00 - 60.00	0.6000	0.5970

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	19	HB158-21U6S24-xxM_TMO(1-5/8)	40.00 - 60.00	0.6000	0.5970
T9	20	T-Brackets (Af)	40.00 - 60.00	0.6000	0.5970
T9	22	LDF7-50A(1-5/8)	40.00 - 60.00	0.6000	0.5970
T9	23	HB158-1-08U8-S8J18(1-5/8)	40.00 - 60.00	0.6000	0.5970
T9	24	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.5970
T9	26	LDF6-50A(1-1/4)	40.00 - 60.00	0.6000	0.5970
T9	27	FB-L98-002-XXX(3/8)	40.00 - 60.00	0.6000	0.5970
T9	28	WR-VG86ST-BRDA(7/8)	40.00 - 60.00	0.6000	0.5970
T9	32	CU12PSM9P8XXX(1-3/8)	40.00 - 60.00	0.6000	0.5970
T9	33	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.5970
T9	35	FLC 12-50J(1/2)	40.00 - 60.00	0.6000	0.5970
T9	37	LDF4-50A(1/2)	40.00 - 60.00	0.6000	0.5970
T10	2	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T10	6	HB114-1-08U4-M5J(1-1/4)	20.00 - 40.00	0.6000	0.6000
T10	7	HB114-21U3M12-XXXF(1-1/4)	20.00 - 40.00	0.6000	0.6000
T10	8	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T10	10	LDF6-50A(1-1/4)	20.00 - 40.00	1.0000	1.0000
T10	11	LDF6-50A(1-1/4)	20.00 - 40.00	1.0000	1.0000
T10	12	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T10	18	HCS 6X12 4AWG(1-5/8)	20.00 - 40.00	0.6000	0.6000
T10	19	HB158-21U6S24-xxM_TMO(1-5/8)	20.00 - 40.00	0.6000	0.6000
T10	20	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T10	22	LDF7-50A(1-5/8)	20.00 - 40.00	0.6000	0.6000
T10	23	HB158-1-08U8-S8J18(1-5/8)	20.00 - 40.00	0.6000	0.6000
T10	24	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	26	LDF6-50A(1-1/4)	20.00 - 40.00	0.6000	0.6000
T10	27	FB-L98-002-XXX(3/8)	20.00 - 40.00	0.6000	0.6000
T10	28	WR-VG86ST-BRDA(7/8)	20.00 - 40.00	0.6000	0.6000
T10	32	CU12PSM9P8XXX(1-3/8)	20.00 - 40.00	0.6000	0.6000
T10	33	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	35	FLC 12-50J(1/2)	20.00 - 40.00	0.6000	0.6000
T10	37	LDF4-50A(1/2)	20.00 - 40.00	0.6000	0.6000
T11	2	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T11	6	HB114-1-08U4-M5J(1-1/4)	0.00 - 20.00	0.6000	0.6000
T11	7	HB114-21U3M12-XXXF(1-1/4)	0.00 - 20.00	0.6000	0.6000
T11	8	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	10	LDF6-50A(1-1/4)	0.00 - 20.00	1.0000	1.0000
T11	11	LDF6-50A(1-1/4)	0.00 - 20.00	1.0000	1.0000
T11	12	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T11	18	HCS 6X12 4AWG(1-5/8)	0.00 - 20.00	0.6000	0.6000
T11	19	HB158-21U6S24-xxM_TMO(1-5/8)	0.00 - 20.00	0.6000	0.6000
T11	20	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T11	22	LDF7-50A(1-5/8)	0.00 - 20.00	0.6000	0.6000
T11	23	HB158-1-08U8-S8J18(1-5/8)	0.00 - 20.00	0.6000	0.6000
T11	24	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T11	26	LDF6-50A(1-1/4)	0.00 - 20.00	0.6000	0.6000
T11	27	FB-L98-002-XXX(3/8)	0.00 - 20.00	0.6000	0.6000
T11	28	WR-VG86ST-BRDA(7/8)	0.00 - 20.00	0.6000	0.6000
T11	32	CU12PSM9P8XXX(1-3/8)	0.00 - 20.00	0.6000	0.6000
T11	33	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T11	35	FLC 12-50J(1/2)	0.00 - 20.00	0.6000	0.6000
T11	37	LDF4-50A(1/2)	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
*****									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	80.0000	136.00	No Ice 1/2" Ice 1" Ice	4.60 5.05 5.50	4.01 4.45 4.89	0.10 0.16 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	90.0000	136.00	No Ice 1/2" Ice 1" Ice	4.60 5.05 5.50	4.01 4.45 4.89	0.10 0.16 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	60.0000	136.00	No Ice 1/2" Ice 1" Ice	4.60 5.05 5.50	4.01 4.45 4.89	0.10 0.16 0.23
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	80.0000	136.00	No Ice 1/2" Ice 1" Ice	4.09 4.48 4.88	2.86 3.23 3.61	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	80.0000	136.00	No Ice 1/2" Ice 1" Ice	4.09 4.48 4.88	2.86 3.23 3.61	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	80.0000	136.00	No Ice 1/2" Ice 1" Ice	4.09 4.48 4.88	2.86 3.23 3.61	0.08 0.13 0.19
TD-RRH8X20-25	A	From Leg	4.00 0.00 1.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8X20-25	B	From Leg	4.00 0.00 1.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8X20-25	C	From Leg	4.00 0.00 1.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13

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
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Platform Mount [LP 405-1]	A	None		0.0000	136.00	No Ice 1/2" Ice 1" Ice	20.88 28.89 37.04	20.88 28.89 37.04	1.80 2.28 2.87
*****									
1900MHz RRH (65MHz)	A	From Leg	1.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
1900MHZ RRH (65MHZ)	B	From Leg	1.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
1900MHZ RRH (65MHZ)	C	From Leg	1.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
800MHZ 2X50W RRH W/FILTER	A	From Leg	1.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
800MHZ 2X50W RRH W/FILTER	B	From Leg	1.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
800MHZ 2X50W RRH W/FILTER	C	From Leg	1.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
IBC1900BB-1	A	From Leg	1.00 0.00 2.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900BB-1	B	From Leg	1.00 0.00 2.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900BB-1	C	From Leg	1.00 0.00 2.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900HG-2A	A	From Leg	1.00 0.00 2.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900HG-2A	B	From Leg	1.00 0.00 2.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900HG-2A	C	From Leg	1.00 0.00 2.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 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
Pipe Mount [PM 601-3]	A	None		0.0000	134.00	No Ice	3.17	3.17	0.20
						1/2" Ice	3.79	3.79	0.23
						1" Ice	4.42	4.42	0.28
*****									
(4) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	50.0000	127.00	No Ice	2.24	3.34	0.04
						1/2" Ice	2.61	3.73	0.08
						1" Ice	2.99	4.13	0.12
(4) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	50.0000	127.00	No Ice	2.24	3.34	0.04
						1/2" Ice	2.61	3.73	0.08
						1" Ice	2.99	4.13	0.12
(4) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	50.0000	127.00	No Ice	2.24	3.34	0.04
						1/2" Ice	2.61	3.73	0.08
						1" Ice	2.99	4.13	0.12
HSS 4"x4"x4'	A	From Face	0.50 0.00 1.00	0.0000	127.00	No Ice	2.09	0.00	0.04
						1/2" Ice	2.39	0.00	0.05
						1" Ice	2.70	0.00	0.07
HSS 4"x4"x4'	A	From Face	0.50 0.00 -1.00	0.0000	127.00	No Ice	2.09	0.00	0.04
						1/2" Ice	2.39	0.00	0.05
						1" Ice	2.70	0.00	0.07
HSS 4"x4"x4'	B	From Face	0.50 0.00 1.00	0.0000	127.00	No Ice	2.09	0.00	0.04
						1/2" Ice	2.39	0.00	0.05
						1" Ice	2.70	0.00	0.07
HSS 4"x4"x4'	B	From Face	0.50 0.00 -1.00	0.0000	127.00	No Ice	2.09	0.00	0.04
						1/2" Ice	2.39	0.00	0.05
						1" Ice	2.70	0.00	0.07
HSS 4"x4"x4'	C	From Face	0.50 0.00 1.00	0.0000	127.00	No Ice	2.09	0.00	0.04
						1/2" Ice	2.39	0.00	0.05
						1" Ice	2.70	0.00	0.07
HSS 4"x4"x4'	C	From Face	0.50 0.00 -1.00	0.0000	127.00	No Ice	2.09	0.00	0.04
						1/2" Ice	2.39	0.00	0.05
						1" Ice	2.70	0.00	0.07
Sector Mount [SM 411-3]	A	None		0.0000	127.00	No Ice	20.53	20.53	1.07
						1/2" Ice	28.62	28.62	1.46
						1" Ice	36.63	36.63	1.97
*****									
APXVAALL24_43-U-NA20_TMO	A	From Leg	4.00 0.00 2.00	80.0000	117.00	No Ice	14.67	5.32	0.15
						1/2" Ice	15.43	5.99	0.26
						1" Ice	16.21	6.68	0.38
APXVAALL24_43-U-NA20_TMO	B	From Leg	4.00 0.00 2.00	80.0000	117.00	No Ice	14.67	5.32	0.15
						1/2" Ice	15.43	5.99	0.26
						1" Ice	16.21	6.68	0.38
APXVAALL24_43-U-NA20_TMO	C	From Leg	4.00 0.00 2.00	80.0000	117.00	No Ice	14.67	5.32	0.15
						1/2" Ice	15.43	5.99	0.26
						1" Ice	16.21	6.68	0.38
*****									
AIR6449 B41_T-MOBILE	A	From Leg	4.00 0.00 2.00	80.0000	117.00	No Ice	5.27	2.03	0.11
						1/2" Ice	5.70	2.36	0.15
						1" Ice	6.14	2.70	0.20
AIR6449 B41_T-MOBILE	B	From Leg	4.00 0.00	80.0000	117.00	No Ice	5.27	2.03	0.11
						1/2"	5.70	2.36	0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.00			Ice	6.14	2.70	0.20
						1" Ice			
AIR6449 B41_T-MOBILE	C	From Leg	4.00	80.0000	117.00	No Ice	5.27	2.03	0.11
			0.00			1/2"	5.70	2.36	0.15
			2.00			Ice	6.14	2.70	0.20
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00	0.0000	117.00	No Ice	1.97	1.59	0.07
			0.00			1/2"	2.15	1.75	0.09
			2.00			Ice	2.33	1.92	0.12
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00	0.0000	117.00	No Ice	1.97	1.59	0.07
			0.00			1/2"	2.15	1.75	0.09
			2.00			Ice	2.33	1.92	0.12
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00	0.0000	117.00	No Ice	1.97	1.59	0.07
			0.00			1/2"	2.15	1.75	0.09
			2.00			Ice	2.33	1.92	0.12
						1" Ice			
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00	0.0000	117.00	No Ice	2.14	1.69	0.11
			0.00			1/2"	2.32	1.85	0.13
			2.00			Ice	2.51	2.02	0.16
						1" Ice			
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00	0.0000	117.00	No Ice	2.14	1.69	0.11
			0.00			1/2"	2.32	1.85	0.13
			2.00			Ice	2.51	2.02	0.16
						1" Ice			
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00	0.0000	117.00	No Ice	2.14	1.69	0.11
			0.00			1/2"	2.32	1.85	0.13
			2.00			Ice	2.51	2.02	0.16
						1" Ice			
(3) 8' Antenna Pipe [#P2STD]	A	From Leg	4.00	0.0000	117.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice			
(3) 8' Antenna Pipe [#P2STD]	B	From Leg	4.00	0.0000	117.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice			
(3) 8' Antenna Pipe [#P2STD]	C	From Leg	4.00	0.0000	117.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice			
12' HD V-Frame [#VFA12-HD]	A	From Leg	2.00	0.0000	117.00	No Ice	13.20	9.20	0.66
			0.00			1/2"	19.50	14.60	0.80
			0.00			Ice	25.80	19.50	1.01
						1" Ice			
12' HD V-Frame [#VFA12-HD]	B	From Leg	2.00	0.0000	117.00	No Ice	13.20	9.20	0.66
			0.00			1/2"	19.50	14.60	0.80
			0.00			Ice	25.80	19.50	1.01
						1" Ice			
12' HD V-Frame [#VFA12-HD]	C	From Leg	2.00	0.0000	117.00	No Ice	13.20	9.20	0.66
			0.00			1/2"	19.50	14.60	0.80
			0.00			Ice	25.80	19.50	1.01
						1" Ice			
***									
BXA-80063/4CF w/ Mount Pipe	A	From Leg	4.00	50.0000	107.00	No Ice	4.83	3.65	0.03
			0.00			1/2"	5.35	4.14	0.06
			0.00			Ice	5.88	4.64	0.11
						1" Ice			
BXA-80063/4CF w/ Mount Pipe	B	From Leg	4.00	50.0000	107.00	No Ice	4.83	3.65	0.03
			0.00			1/2"	5.35	4.14	0.06
			0.00			Ice	5.88	4.64	0.11
						1" Ice			
BXA-80063/4CF w/ Mount Pipe	C	From Leg	4.00	50.0000	107.00	No Ice	4.83	3.65	0.03
			0.00			1/2"	5.35	4.14	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
			0.00			Ice	5.88	4.64	0.11
						1" Ice			
RC2DC-3315-PF-48	A	From Leg	4.00	0.0000	107.00	No Ice	3.79	2.51	0.03
			0.00			1/2"	4.04	2.72	0.06
			0.00			Ice	4.30	2.94	0.10
						1" Ice			
Sector Mount [SM 402-3]	A	None		0.0000	107.00	No Ice	18.87	18.87	0.85
						1/2"	26.47	26.47	1.21
						Ice	33.99	33.99	1.70
						1" Ice			
***									
(2) MX06FRO660-03 w/ Mount Pipe	A	From Leg	4.00	50.0000	107.00	No Ice	6.54	5.55	0.10
			0.00			1/2"	7.06	6.05	0.18
			0.00			Ice	7.60	6.57	0.28
						1" Ice			
(2) MX06FRO660-03 w/ Mount Pipe	B	From Leg	4.00	50.0000	107.00	No Ice	6.54	5.55	0.10
			0.00			1/2"	7.06	6.05	0.18
			0.00			Ice	7.60	6.57	0.28
						1" Ice			
(2) MX06FRO660-03 w/ Mount Pipe	C	From Leg	4.00	30.0000	107.00	No Ice	6.54	5.55	0.10
			0.00			1/2"	7.06	6.05	0.18
			0.00			Ice	7.60	6.57	0.28
						1" Ice			
Sub6 Antenna - VZS01 w/ Mount Pipe	A	From Leg	4.00	50.0000	107.00	No Ice	4.92	2.69	0.10
			0.00			1/2"	5.26	3.15	0.14
			0.00			Ice	5.62	3.63	0.19
						1" Ice			
Sub6 Antenna - VZS01 w/ Mount Pipe	B	From Leg	4.00	50.0000	107.00	No Ice	4.92	2.69	0.10
			0.00			1/2"	5.26	3.15	0.14
			0.00			Ice	5.62	3.63	0.19
						1" Ice			
Sub6 Antenna - VZS01 w/ Mount Pipe	C	From Leg	4.00	30.0000	107.00	No Ice	4.92	2.69	0.10
			0.00			1/2"	5.26	3.15	0.14
			0.00			Ice	5.62	3.63	0.19
						1" Ice			
RFV01U-D1A	A	From Leg	4.00	0.0000	107.00	No Ice	1.88	1.25	0.08
			0.00			1/2"	2.05	1.39	0.10
			0.00			Ice	2.22	1.54	0.12
						1" Ice			
RFV01U-D1A	B	From Leg	4.00	0.0000	107.00	No Ice	1.88	1.25	0.08
			0.00			1/2"	2.05	1.39	0.10
			0.00			Ice	2.22	1.54	0.12
						1" Ice			
RFV01U-D1A	C	From Leg	4.00	0.0000	107.00	No Ice	1.88	1.25	0.08
			0.00			1/2"	2.05	1.39	0.10
			0.00			Ice	2.22	1.54	0.12
						1" Ice			
RFV01U-D2A	A	From Leg	4.00	0.0000	107.00	No Ice	1.88	1.01	0.07
			0.00			1/2"	2.05	1.14	0.09
			0.00			Ice	2.22	1.28	0.11
						1" Ice			
RFV01U-D2A	B	From Leg	4.00	0.0000	107.00	No Ice	1.88	1.01	0.07
			0.00			1/2"	2.05	1.14	0.09
			0.00			Ice	2.22	1.28	0.11
						1" Ice			
RFV01U-D2A	C	From Leg	4.00	0.0000	107.00	No Ice	1.88	1.01	0.07
			0.00			1/2"	2.05	1.14	0.09
			0.00			Ice	2.22	1.28	0.11
						1" Ice			
(4) Crossover Plate [#VZWSMART-MSK1]	A	From Leg	4.00	0.0000	107.00	No Ice	0.05	0.05	0.01
			0.00			1/2"	0.07	0.07	0.02
			0.00			Ice	0.09	0.09	0.02
						1" Ice			
(4) Crossover Plate [#VZWSMART-MSK1]	B	From Leg	4.00	0.0000	107.00	No Ice	0.05	0.05	0.01
			0.00			1/2"	0.07	0.07	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	0.09	0.09	0.02
						1" Ice			
(4) Crossover Plate [#VZWSMART-MSK1]	C	From Leg	4.00	0.0000	107.00	No Ice	0.05	0.05	0.01
			0.00			1/2"	0.07	0.07	0.02
			0.00			Ice	0.09	0.09	0.02
						1" Ice			
Tieback Assembly [#VZWSMART-SFK1]	A	From Leg	2.00	0.0000	107.00	No Ice	2.38	1.19	0.08
			0.00			1/2"	3.41	1.71	0.11
			0.00			Ice	4.45	2.22	0.13
						1" Ice			
Tieback Assembly [#VZWSMART-SFK1]	B	From Leg	2.00	0.0000	107.00	No Ice	2.38	1.19	0.08
			0.00			1/2"	3.41	1.71	0.11
			0.00			Ice	4.45	2.22	0.13
						1" Ice			
Tieback Assembly [#VZWSMART-SFK1]	C	From Leg	2.00	0.0000	107.00	No Ice	2.38	1.19	0.08
			0.00			1/2"	3.41	1.71	0.11
			0.00			Ice	4.45	2.22	0.13
						1" Ice			
V-Bracing Kit [#VZWSMART-SFK3]	A	From Leg	2.00	0.0000	107.00	No Ice	4.24	3.96	0.13
			0.00			1/2"	4.78	4.46	0.18
			0.00			Ice	5.44	5.06	0.22
						1" Ice			
V-Bracing Kit [#VZWSMART-SFK3]	B	From Leg	2.00	0.0000	107.00	No Ice	4.24	3.96	0.13
			0.00			1/2"	4.78	4.46	0.18
			0.00			Ice	5.44	5.06	0.22
						1" Ice			
V-Bracing Kit [#VZWSMART-SFK3]	C	From Leg	2.00	0.0000	107.00	No Ice	4.24	3.96	0.13
			0.00			1/2"	4.78	4.46	0.18
			0.00			Ice	5.44	5.06	0.22
						1" Ice			
***									
DMP65R-BU4D w/ Mount Pipe	A	From Leg	4.00	85.0000	97.00	No Ice	7.53	3.79	0.09
			0.00			1/2"	8.04	4.23	0.16
			0.00			Ice	8.57	4.68	0.22
						1" Ice			
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.00	90.0000	97.00	No Ice	11.96	5.97	0.11
			0.00			1/2"	12.70	6.63	0.20
			0.00			Ice	13.46	7.30	0.30
						1" Ice			
DMP65R-BU8D w/ Mount Pipe	C	From Leg	4.00	85.0000	97.00	No Ice	15.89	7.89	0.14
			0.00			1/2"	16.81	8.74	0.25
			0.00			Ice	17.76	9.60	0.38
						1" Ice			
OPA65R-BU4D w/ Mount Pipe	A	From Leg	4.00	85.0000	97.00	No Ice	8.10	4.03	0.08
			0.00			1/2"	8.65	4.50	0.14
			0.00			Ice	9.21	4.98	0.21
						1" Ice			
OPA65R-BU6D w/ Mount Pipe	B	From Leg	4.00	90.0000	97.00	No Ice	12.25	6.05	0.09
			0.00			1/2"	13.00	6.71	0.18
			0.00			Ice	13.76	7.39	0.27
						1" Ice			
OPA65R-BU8D w/ Mount Pipe	C	From Leg	4.00	90.0000	97.00	No Ice	17.46	8.58	0.11
			0.00			1/2"	18.46	9.49	0.22
			0.00			Ice	19.48	10.42	0.35
						1" Ice			
7770.00 w/ Mount Pipe	A	From Leg	4.00	90.0000	97.00	No Ice	5.75	4.25	0.06
			0.00			1/2"	6.18	5.01	0.10
			0.00			Ice	6.61	5.71	0.16
						1" Ice			
7770.00 w/ Mount Pipe	B	From Leg	4.00	90.0000	97.00	No Ice	5.75	4.25	0.06
			0.00			1/2"	6.18	5.01	0.10
			0.00			Ice	6.61	5.71	0.16
						1" Ice			
7770.00 w/ Mount Pipe	C	From Leg	4.00	90.0000	97.00	No Ice	5.75	4.25	0.06
			0.00			1/2"	6.18	5.01	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	6.61	5.71	0.16
						1" Ice			
RRUS 4449 B5/B12	A	From Leg	4.00	0.0000	97.00	No Ice	1.97	1.41	0.07
			0.00			1/2"	2.14	1.56	0.09
			0.00			Ice	2.33	1.73	0.11
						1" Ice			
RRUS 4449 B5/B12	B	From Leg	4.00	0.0000	97.00	No Ice	1.97	1.41	0.07
			0.00			1/2"	2.14	1.56	0.09
			0.00			Ice	2.33	1.73	0.11
						1" Ice			
RRUS 4449 B5/B12	C	From Leg	4.00	0.0000	97.00	No Ice	1.97	1.41	0.07
			0.00			1/2"	2.14	1.56	0.09
			0.00			Ice	2.33	1.73	0.11
						1" Ice			
RRUS 4478 B14_CCIV2	A	From Leg	4.00	0.0000	97.00	No Ice	2.02	1.25	0.06
			0.00			1/2"	2.20	1.40	0.08
			0.00			Ice	2.39	1.55	0.10
						1" Ice			
RRUS 4478 B14_CCIV2	B	From Leg	4.00	0.0000	97.00	No Ice	2.02	1.25	0.06
			0.00			1/2"	2.20	1.40	0.08
			0.00			Ice	2.39	1.55	0.10
						1" Ice			
RRUS 4478 B14_CCIV2	C	From Leg	4.00	0.0000	97.00	No Ice	2.02	1.25	0.06
			0.00			1/2"	2.20	1.40	0.08
			0.00			Ice	2.39	1.55	0.10
						1" Ice			
RRUS 8843 B2/B66A_CCIV2	A	From Leg	4.00	0.0000	97.00	No Ice	1.98	1.70	0.08
			0.00			1/2"	2.16	1.86	0.10
			0.00			Ice	2.34	2.04	0.12
						1" Ice			
RRUS 8843 B2/B66A_CCIV2	B	From Leg	4.00	0.0000	97.00	No Ice	1.98	1.70	0.08
			0.00			1/2"	2.16	1.86	0.10
			0.00			Ice	2.34	2.04	0.12
						1" Ice			
RRUS 8843 B2/B66A_CCIV2	C	From Leg	4.00	0.0000	97.00	No Ice	1.98	1.70	0.08
			0.00			1/2"	2.16	1.86	0.10
			0.00			Ice	2.34	2.04	0.12
						1" Ice			
(2) LGP21401	A	From Leg	4.00	0.0000	97.00	No Ice	1.10	0.21	0.01
			0.00			1/2"	1.24	0.27	0.02
			0.00			Ice	1.38	0.35	0.03
						1" Ice			
(2) LGP21401	B	From Leg	4.00	0.0000	97.00	No Ice	1.10	0.21	0.01
			0.00			1/2"	1.24	0.27	0.02
			0.00			Ice	1.38	0.35	0.03
						1" Ice			
(2) LGP21401	C	From Leg	4.00	0.0000	97.00	No Ice	1.10	0.21	0.01
			0.00			1/2"	1.24	0.27	0.02
			0.00			Ice	1.38	0.35	0.03
						1" Ice			
DC9-48-60-24-8C-EV	A	From Leg	4.00	0.0000	97.00	No Ice	2.74	4.78	0.03
			0.00			1/2"	2.96	5.06	0.06
			0.00			Ice	3.20	5.35	0.10
						1" Ice			
DC6-48-60-18-8F	B	From Leg	4.00	0.0000	97.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04
			0.00			Ice	1.64	1.64	0.06
						1" Ice			
8' x 2" Mount Pipe	A	From Leg	4.00	0.0000	97.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice			
8' x 2" Mount Pipe	B	From Leg	4.00	0.0000	97.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	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
						1" Ice			
8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	97.00	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
Sector Mount [SM 504-3]	A	None		0.0000	97.00	No Ice 1/2" Ice 1" Ice	31.05 43.83 56.44	31.05 43.83 56.44	1.71 2.33 3.14
***									
***									
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	20.0000	87.00	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 0.00 0.00	20.0000	87.00	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 0.00 0.00	20.0000	87.00	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-B604	A	From Leg	4.00 0.00 0.00	0.0000	87.00	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 0.00 0.00	0.0000	87.00	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 0.00 0.00	0.0000	87.00	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-B605	A	From Leg	4.00 0.00 0.00	0.0000	87.00	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 0.00 0.00	0.0000	87.00	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 0.00 0.00	0.0000	87.00	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
RDIDC-9181-PF-48	A	From Leg	4.00 0.00 0.00	0.0000	87.00	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
***									
Commscope MTC3975083 (3)	C	None		0.0000	87.00	No Ice 1/2" Ice 1" Ice	23.85 34.12 44.39	23.85 34.12 44.39	1.26 1.80 2.35
(2) 8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	87.00	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 0.00 0.00	0.0000	87.00	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	C	From Leg	4.00	0.0000	87.00	No Ice	1.90	1.90	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
*****									
GPS_A	C	From Leg	3.00	20.0000	80.00	No Ice	0.26	0.26	0.00
			0.00			1/2" Ice	0.32	0.32	0.00
			1.00			1" Ice	0.39	0.39	0.01
Side Arm Mount [SO 701-1]	C	From Leg	1.50	0.0000	80.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
***									
GPS_A	B	From Leg	3.00	20.0000	72.00	No Ice	0.26	0.26	0.00
			0.00			1/2" Ice	0.32	0.32	0.00
			0.00			1" Ice	0.39	0.39	0.01
GPS_A	C	From Leg	3.00	20.0000	72.00	No Ice	0.26	0.26	0.00
			0.00			1/2" Ice	0.32	0.32	0.00
			0.00			1" Ice	0.39	0.39	0.01
Side Arm Mount [SO 701-1]	B	From Leg	1.50	0.0000	72.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
Side Arm Mount [SO 701-1]	C	From Leg	1.50	0.0000	72.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
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Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
Pirod 105244 w/ (2) 1-1/4" Tie Rod	1076.4663	2409.8852	0.73	0.26	7.4755	16.7353	6.1379
Pirod 105217	2296.2363	5394.9595	0.59	0.36	7.9730	18.7325	5.3014
Pirod 105218	2425.3141	5485.0952	0.72	0.35	8.4212	19.0455	7.2158
Pirod 105218	2425.3141	5246.1889	0.72	0.33	8.4212	18.2159	7.2158
Pirod 105219	2597.9095	5150.1891	1.09	0.31	9.0205	17.8826	9.4248

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

Comb. No.	Description
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	136 - 133.625	Leg	Max Tension	1	0.00	0.000	0.000
			Max. Compression	31	-2.24	-0.028	-0.016
			Max. Mx	8	-1.59	-0.138	-0.002
			Max. My	2	-1.60	0.004	0.141
			Max. Vy	8	0.21	-0.138	-0.002
			Max. Vx	2	-0.21	0.004	0.141
		Diagonal	Max Tension	9	0.84	0.000	0.000
			Max. Compression	8	-0.92	0.000	0.000
			Max. Mx	30	0.14	0.003	0.000
			Max. My	10	-0.01	0.000	0.000
			Max. Vy	30	-0.00	0.000	0.000
			Max. Vx	10	-0.00	0.000	0.000
		Top Girt	Max Tension	6	0.66	-0.018	-0.000
			Max. Compression	18	-0.65	-0.049	0.000
			Max. Mx	14	-0.33	-0.066	0.001
			Max. My	6	-0.33	-0.065	0.002
			Max. Vy	33	0.05	-0.062	0.000
			Max. Vx	6	0.00	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T2	133.625 - 130	Leg	Max Tension	7	2.77	0.372	-0.205
			Max. Compression	10	-5.38	-0.419	-0.238
			Max. Mx	8	-4.84	-0.469	-0.013
			Max. My	2	-5.31	0.010	0.485
			Max. Vy	8	0.90	-0.469	-0.013
			Max. Vx	2	-0.93	0.010	0.485
		Diagonal	Max Tension	13	1.22	0.000	0.000
			Max. Compression	12	-1.33	0.000	0.000
			Max. Mx	33	0.17	-0.002	0.000
			Max. My	6	-1.16	-0.001	0.000
			Max. Vy	30	0.01	-0.002	0.000
			Max. Vx	6	0.00	0.000	0.000
		Horizontal	Max Tension	2	0.32	0.000	0.000
			Max. Compression	15	-0.18	0.000	0.000
			Max. Mx	26	0.12	0.008	0.000
			Max. My	8	0.07	0.000	-0.000
			Max. Vy	26	-0.01	0.000	0.000
			Max. Vx	8	0.00	0.000	0.000
		Bottom Girt	Max Tension	14	0.64	0.000	0.000
			Max. Compression	3	-0.56	0.000	0.000
			Max. Mx	26	0.09	0.010	0.000
			Max. My	8	0.07	0.000	-0.000
			Max. Vy	26	-0.01	0.000	0.000
			Max. Vx	8	0.00	0.000	0.000
T3	130 - 110	Leg	Max Tension	7	30.04	1.556	-0.053
			Max. Compression	10	-38.25	-0.227	-0.013
			Max. Mx	10	-38.24	-1.608	-0.081
			Max. My	20	-4.23	0.011	1.548
			Max. Vy	10	-2.76	-0.227	-0.013
			Max. Vx	20	2.62	0.004	0.240
		Diagonal	Max Tension	24	3.80	0.000	0.000
			Max. Compression	24	-3.87	0.000	0.000
			Max. Mx	30	0.79	-0.004	-0.000
			Max. My	22	-3.44	-0.001	0.001
			Max. Vy	30	0.01	-0.004	-0.000
			Max. Vx	22	-0.00	0.000	0.000
		Horizontal	Max Tension	6	0.55	0.000	0.000
			Max. Compression	11	-0.37	0.000	0.000
			Max. Mx	26	0.21	0.010	0.000
			Max. My	8	0.11	0.000	-0.000
			Max. Vy	26	-0.01	0.000	0.000
			Max. Vx	8	0.00	0.000	0.000
		Top Girt	Max Tension	2	0.59	0.000	0.000
			Max. Compression	14	-0.54	0.000	0.000
			Max. Mx	26	0.02	0.010	0.000
			Max. My	8	-0.00	0.000	-0.000
			Max. Vy	26	0.01	0.000	0.000
			Max. Vx	8	0.00	0.000	0.000
		Bottom Girt	Max Tension	22	1.70	0.000	0.000
			Max. Compression	11	-1.66	0.000	0.000
			Max. Mx	26	0.13	0.012	0.000
			Max. My	8	0.25	0.000	-0.000
			Max. Vy	26	-0.01	0.000	0.000
			Max. Vx	8	0.00	0.000	0.000
T4	110 - 94.9427	Leg	Max Tension	7	63.23	-0.178	-0.006
			Max. Compression	10	-76.51	0.009	-0.009
			Max. Mx	10	-38.29	2.422	0.123
			Max. My	20	-4.34	-0.011	-2.278
			Max. Vy	10	-2.77	2.422	0.123
			Max. Vx	20	2.63	-0.011	-2.278
		Diagonal	Max Tension	24	5.02	0.000	0.000
			Max. Compression	24	-5.08	0.000	0.000
			Max. Mx	8	2.68	-0.006	-0.000
			Max. My	12	-4.43	-0.001	-0.002
			Max. Vy	31	0.01	-0.006	0.000
			Max. Vx	12	0.00	-0.001	-0.002
		Top Girt	Max Tension	10	1.72	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	22	-1.58	0.000	0.000
			Max. Mx	26	0.03	0.014	0.000
			Max. My	8	-0.17	0.000	-0.000
			Max. Vy	26	-0.01	0.000	0.000
			Max. Vx	8	0.00	0.000	0.000
T5	94.9427 - 92.5938	Leg	Max Tension	7	69.94	-0.028	-0.005
			Max. Compression	10	-84.53	-0.233	-0.000
			Max. Mx	10	-84.48	0.291	0.001
			Max. My	12	-7.68	-0.012	-0.216
			Max. Vy	10	0.45	0.291	0.001
			Max. Vx	12	-0.23	0.033	0.047
		Diagonal	Max Tension	24	5.23	-0.004	0.000
			Max. Compression	20	-5.36	0.000	0.000
			Max. Mx	18	4.54	-0.007	-0.001
			Max. My	18	4.44	-0.007	0.001
			Max. Vy	31	0.01	-0.006	0.000
			Max. Vx	18	-0.00	-0.007	0.001
		Secondary Horizontal	Max Tension	22	0.55	-0.008	0.001
			Max. Compression	9	-0.45	-0.003	-0.002
			Max. Mx	20	0.40	-0.008	0.000
			Max. My	20	-0.43	-0.004	-0.002
			Max. Vy	34	0.02	-0.008	-0.000
			Max. Vx	8	0.00	0.000	0.000
T6	92.5938 - 90	Leg	Max Tension	7	81.26	1.100	-0.009
			Max. Compression	10	-96.34	3.001	0.051
			Max. Mx	18	-96.05	3.055	-0.009
			Max. My	8	-8.11	0.050	1.326
			Max. Vy	18	-7.21	3.055	-0.009
			Max. Vx	8	-3.06	0.050	1.326
		Diagonal	Max Tension	20	6.09	-0.005	0.000
			Max. Compression	20	-6.30	0.000	0.000
			Max. Mx	10	4.09	-0.007	0.001
			Max. My	8	-3.21	-0.003	-0.001
			Max. Vy	31	0.01	-0.006	0.000
			Max. Vx	8	-0.00	0.000	0.000
		Secondary Horizontal	Max Tension	20	1.34	-0.005	0.001
			Max. Compression	7	-1.21	-0.006	-0.001
			Max. Mx	31	-0.15	-0.010	-0.000
			Max. My	20	-0.90	-0.007	-0.001
			Max. Vy	31	0.02	-0.010	-0.000
			Max. Vx	8	0.00	0.000	0.000
		Bottom Girt	Max Tension	6	0.72	0.000	0.000
			Max. Compression	11	-0.67	0.000	0.000
			Max. Mx	26	0.04	0.017	0.000
			Max. My	16	-0.01	0.000	-0.000
			Max. Vy	26	-0.01	0.000	0.000
			Max. Vx	16	0.00	0.000	0.000
T7	90 - 80	Leg	Max Tension	7	89.00	-2.867	0.007
			Max. Compression	10	-104.30	3.162	0.025
			Max. Mx	6	86.54	-3.936	-0.037
			Max. My	8	-8.99	-0.381	6.514
			Max. Vy	18	0.39	3.055	-0.009
			Max. Vx	16	-0.80	-0.359	6.380
		Diagonal	Max Tension	23	6.75	0.099	-0.016
			Max. Compression	10	-7.52	0.000	0.000
			Max. Mx	6	6.48	0.101	-0.014
			Max. My	12	-6.65	-0.081	0.039
			Max. Vy	8	-0.02	0.092	-0.012
			Max. Vx	12	-0.01	0.000	0.000
T8	80 - 60	Leg	Max Tension	7	126.02	-5.521	-0.023
			Max. Compression	18	-145.68	5.519	-0.012
			Max. Mx	18	-127.75	5.692	-0.037
			Max. My	8	-10.39	-0.381	6.514
			Max. Vy	2	-0.36	5.574	0.009
			Max. Vx	4	-0.24	-0.360	-6.375
		Diagonal	Max Tension	24	6.19	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	20	-6.41	0.000	0.000
			Max. Mx	18	5.77	0.082	0.002
			Max. My	5	-5.79	-0.040	-0.009
			Max. Vy	31	-0.02	0.050	0.006
			Max. Vx	33	-0.00	0.000	0.000
T9	60 - 40	Leg	Max Tension	7	156.58	-5.281	-0.024
			Max. Compression	18	-179.88	5.222	-0.030
			Max. Mx	6	140.07	-5.576	-0.049
			Max. My	8	-11.55	-0.038	5.478
			Max. Vy	22	-0.14	-5.452	-0.061
			Max. Vx	16	0.20	0.004	5.326
		Diagonal	Max Tension	20	5.62	0.000	0.000
			Max. Compression	20	-5.96	0.000	0.000
			Max. Mx	18	4.97	0.099	0.005
			Max. My	16	-3.12	0.014	0.009
			Max. Vy	31	-0.03	0.067	0.007
			Max. Vx	28	0.00	0.000	0.000
T10	40 - 20	Leg	Max Tension	7	182.59	-4.663	-0.021
			Max. Compression	18	-209.37	6.530	0.047
			Max. Mx	18	-209.37	6.530	0.047
			Max. My	8	-13.53	-0.238	5.766
			Max. Vy	37	0.44	-3.994	-0.043
			Max. Vx	16	0.27	-0.190	5.535
		Diagonal	Max Tension	20	5.39	0.000	0.000
			Max. Compression	18	-5.86	0.000	0.000
			Max. Mx	18	4.30	0.092	0.005
			Max. My	16	-3.29	0.017	0.009
			Max. Vy	29	0.04	0.062	0.008
			Max. Vx	28	0.00	0.000	0.000
T11	20 - 0	Leg	Max Tension	7	205.14	-4.904	-0.035
			Max. Compression	18	-236.35	0.000	-0.000
			Max. Mx	18	-224.01	6.530	0.047
			Max. My	8	-15.61	-0.530	8.761
			Max. Vy	37	-0.75	-3.994	-0.043
			Max. Vx	8	0.99	-0.530	8.761
		Diagonal	Max Tension	7	6.94	0.000	0.000
			Max. Compression	18	-7.84	0.000	0.000
			Max. Mx	8	1.43	0.132	-0.012
			Max. My	2	3.27	0.099	-0.017
			Max. Vy	29	0.05	0.111	0.012
			Max. Vx	28	0.00	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	245.21	20.83	-11.76
	Max. H_x	18	245.21	20.83	-11.76
	Max. H_z	7	-212.15	-18.36	10.40
	Min. Vert	7	-212.15	-18.36	10.40
	Min. H_x	7	-212.15	-18.36	10.40
	Min. H_z	18	245.21	20.83	-11.76
Leg B	Max. Vert	10	240.47	-19.79	-11.87
	Max. H_x	23	-203.27	17.23	10.42
	Max. H_z	23	-203.27	17.23	10.42
	Min. Vert	23	-203.27	17.23	10.42
	Min. H_x	10	240.47	-19.79	-11.87
	Min. H_z	10	240.47	-19.79	-11.87
Leg A	Max. Vert	2	233.07	0.44	22.39
	Max. H_x	21	12.73	0.76	1.06
	Max. H_z	2	233.07	0.44	22.39
	Min. Vert	15	-200.42	-0.40	-19.56
	Min. H_x	9	12.64	-0.71	1.05
	Min. H_z	15	-200.42	-0.40	-19.56

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	44.60	0.00	0.00	9.416	-13.779	-0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	53.52	-0.01	-31.76	-2609.524	-16.126	10.098
0.9 Dead+1.0 Wind 0 deg - No Ice	40.14	-0.01	-31.76	-2605.174	-11.932	10.073
1.2 Dead+1.0 Wind 30 deg - No Ice	53.52	16.28	-28.32	-2308.740	-1351.047	14.480
0.9 Dead+1.0 Wind 30 deg - No Ice	40.14	16.28	-28.32	-2305.250	-1343.181	14.450
1.2 Dead+1.0 Wind 60 deg - No Ice	53.52	29.11	-16.86	-1359.722	-2383.583	4.720
0.9 Dead+1.0 Wind 60 deg - No Ice	40.14	29.11	-16.86	-1358.847	-2372.922	4.691
1.2 Dead+1.0 Wind 90 deg - No Ice	53.52	34.62	0.01	11.885	-2814.010	-9.654
0.9 Dead+1.0 Wind 90 deg - No Ice	40.14	34.62	0.01	9.023	-2802.221	-9.673
1.2 Dead+1.0 Wind 120 deg - No Ice	53.52	28.36	16.44	1354.840	-2334.586	-9.621
0.9 Dead+1.0 Wind 120 deg - No Ice	40.14	28.36	16.44	1348.294	-2324.044	-9.628
1.2 Dead+1.0 Wind 150 deg - No Ice	53.52	15.35	26.68	2241.497	-1299.612	-5.832
0.9 Dead+1.0 Wind 150 deg - No Ice	40.14	15.35	26.68	2232.431	-1291.859	-5.819
1.2 Dead+1.0 Wind 180 deg - No Ice	53.52	0.01	31.10	2602.265	-17.229	-10.096
0.9 Dead+1.0 Wind 180 deg - No Ice	40.14	0.01	31.10	2592.208	-13.036	-10.071
1.2 Dead+1.0 Wind 210 deg - No Ice	53.52	-16.28	28.32	2331.580	1317.618	-14.479
0.9 Dead+1.0 Wind 210 deg - No Ice	40.14	-16.28	28.32	2322.345	1318.155	-14.449
1.2 Dead+1.0 Wind 240 deg - No Ice	53.52	-29.67	17.18	1397.526	2376.272	-4.721
0.9 Dead+1.0 Wind 240 deg - No Ice	40.14	-29.67	17.18	1390.899	2373.969	-4.692
1.2 Dead+1.0 Wind 270 deg - No Ice	53.52	-34.62	-0.01	10.757	2780.704	9.653
0.9 Dead+1.0 Wind 270 deg - No Ice	40.14	-34.62	-0.01	7.901	2777.296	9.672
1.2 Dead+1.0 Wind 300 deg - No Ice	53.52	-27.79	-16.11	-1317.097	2275.251	9.625
0.9 Dead+1.0 Wind 300 deg - No Ice	40.14	-27.79	-16.11	-1316.302	2273.121	9.628
1.2 Dead+1.0 Wind 330 deg - No Ice	53.52	-15.35	-26.68	-2218.709	1266.337	5.832
0.9 Dead+1.0 Wind 330 deg - No Ice	40.14	-15.35	-26.68	-2215.386	1266.958	5.819
1.2 Dead+1.0 Ice+1.0 Temp	92.22	-0.00	-0.00	12.542	-33.919	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	92.22	-0.00	-7.93	-640.999	-33.911	2.757
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	92.22	4.09	-7.10	-567.263	-367.847	3.227
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	92.22	7.39	-4.28	-333.079	-631.430	0.847
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	92.22	8.60	0.00	12.807	-729.219	-2.080
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	92.22	7.22	4.18	353.376	-622.497	-2.470
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	92.22	3.95	6.86	580.292	-361.026	-1.877
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	92.22	0.00	7.85	662.451	-34.306	-2.757
1.2 Dead+1.0 Wind 210	92.22	-4.09	7.10	592.490	299.624	-3.227

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	92.22	-7.46	4.32	360.186	566.479	-0.847
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	92.22	-8.60	-0.00	12.404	661.006	2.080
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	92.22	-7.15	-4.14	-326.272	551.018	2.470
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	92.22	-3.95	-6.86	-555.068	292.817	1.878
Dead+Wind 0 deg - Service	44.60	-0.00	-7.58	-615.097	-13.728	2.412
Dead+Wind 30 deg - Service	44.60	3.89	-6.76	-543.414	-331.827	3.452
Dead+Wind 60 deg - Service	44.60	6.95	-4.02	-317.260	-577.886	1.127
Dead+Wind 90 deg - Service	44.60	8.27	0.00	9.603	-680.469	-2.298
Dead+Wind 120 deg - Service	44.60	6.77	3.92	329.621	-566.218	-2.298
Dead+Wind 150 deg - Service	44.60	3.66	6.37	540.878	-319.577	-1.398
Dead+Wind 180 deg - Service	44.60	0.00	7.43	626.856	-13.990	-2.412
Dead+Wind 210 deg - Service	44.60	-3.89	6.76	562.361	304.107	-3.452
Dead+Wind 240 deg - Service	44.60	-7.08	4.10	339.792	556.385	-1.128
Dead+Wind 270 deg - Service	44.60	-8.27	-0.00	9.335	652.755	2.298
Dead+Wind 300 deg - Service	44.60	-6.64	-3.85	-307.092	532.290	2.298
Dead+Wind 330 deg - Service	44.60	-3.66	-6.37	-521.937	291.858	1.398

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-44.60	0.00	0.00	44.60	0.00	0.000%
2	-0.01	-53.52	-31.76	0.01	53.52	31.76	0.000%
3	-0.01	-40.14	-31.76	0.01	40.14	31.76	0.000%
4	16.28	-53.52	-28.32	-16.28	53.52	28.32	0.000%
5	16.28	-40.14	-28.32	-16.28	40.14	28.32	0.000%
6	29.11	-53.52	-16.86	-29.11	53.52	16.86	0.000%
7	29.11	-40.14	-16.86	-29.11	40.14	16.86	0.000%
8	34.62	-53.52	0.01	-34.62	53.52	-0.01	0.000%
9	34.62	-40.14	0.01	-34.62	40.14	-0.01	0.000%
10	28.36	-53.52	16.44	-28.36	53.52	-16.44	0.000%
11	28.36	-40.14	16.44	-28.36	40.14	-16.44	0.000%
12	15.35	-53.52	26.68	-15.35	53.52	-26.68	0.000%
13	15.35	-40.14	26.68	-15.35	40.14	-26.68	0.000%
14	0.01	-53.52	31.10	-0.01	53.52	-31.10	0.000%
15	0.01	-40.14	31.10	-0.01	40.14	-31.10	0.000%
16	-16.28	-53.52	28.32	16.28	53.52	-28.32	0.000%
17	-16.28	-40.14	28.32	16.28	40.14	-28.32	0.000%
18	-29.67	-53.52	17.18	29.67	53.52	-17.18	0.000%
19	-29.67	-40.14	17.18	29.67	40.14	-17.18	0.000%
20	-34.62	-53.52	-0.01	34.62	53.52	0.01	0.000%
21	-34.62	-40.14	-0.01	34.62	40.14	0.01	0.000%
22	-27.79	-53.52	-16.11	27.79	53.52	16.11	0.000%
23	-27.79	-40.14	-16.11	27.79	40.14	16.11	0.000%
24	-15.35	-53.52	-26.68	15.35	53.52	26.68	0.000%
25	-15.35	-40.14	-26.68	15.35	40.14	26.68	0.000%
26	0.00	-92.22	0.00	0.00	92.22	0.00	0.000%
27	-0.00	-92.22	-7.93	0.00	92.22	7.93	0.000%
28	4.09	-92.22	-7.10	-4.09	92.22	7.10	0.000%
29	7.39	-92.22	-4.28	-7.39	92.22	4.28	0.000%
30	8.60	-92.22	0.00	-8.60	92.22	-0.00	0.000%
31	7.22	-92.22	4.18	-7.22	92.22	-4.18	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
32	3.95	-92.22	6.86	-3.95	92.22	-6.86	0.000%
33	0.00	-92.22	7.85	-0.00	92.22	-7.85	0.000%
34	-4.09	-92.22	7.10	4.09	92.22	-7.10	0.000%
35	-7.46	-92.22	4.32	7.46	92.22	-4.32	0.000%
36	-8.60	-92.22	-0.00	8.60	92.22	0.00	0.000%
37	-7.15	-92.22	-4.14	7.15	92.22	4.14	0.000%
38	-3.95	-92.22	-6.86	3.95	92.22	6.86	0.000%
39	-0.00	-44.60	-7.58	0.00	44.60	7.58	0.000%
40	3.89	-44.60	-6.76	-3.89	44.60	6.76	0.000%
41	6.95	-44.60	-4.02	-6.95	44.60	4.02	0.000%
42	8.27	-44.60	0.00	-8.27	44.60	-0.00	0.000%
43	6.77	-44.60	3.92	-6.77	44.60	-3.92	0.000%
44	3.66	-44.60	6.37	-3.66	44.60	-6.37	0.000%
45	0.00	-44.60	7.43	-0.00	44.60	-7.43	0.000%
46	-3.89	-44.60	6.76	3.89	44.60	-6.76	0.000%
47	-7.08	-44.60	4.10	7.08	44.60	-4.10	0.000%
48	-8.27	-44.60	-0.00	8.27	44.60	0.00	0.000%
49	-6.64	-44.60	-3.85	6.64	44.60	3.85	0.000%
50	-3.66	-44.60	-6.37	3.66	44.60	6.37	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000594
3	Yes	4	0.00000001	0.00000240
4	Yes	4	0.00000001	0.00000769
5	Yes	4	0.00000001	0.00000395
6	Yes	4	0.00000001	0.00000788
7	Yes	4	0.00000001	0.00000348
8	Yes	4	0.00000001	0.00000735
9	Yes	4	0.00000001	0.00000372
10	Yes	4	0.00000001	0.00000586
11	Yes	4	0.00000001	0.00000233
12	Yes	4	0.00000001	0.00000722
13	Yes	4	0.00000001	0.00000339
14	Yes	4	0.00000001	0.00000790
15	Yes	4	0.00000001	0.00000348
16	Yes	4	0.00000001	0.00000769
17	Yes	4	0.00000001	0.00000394
18	Yes	4	0.00000001	0.00000587
19	Yes	4	0.00000001	0.00000232
20	Yes	4	0.00000001	0.00000738
21	Yes	4	0.00000001	0.00000375
22	Yes	4	0.00000001	0.00000789
23	Yes	4	0.00000001	0.00000347
24	Yes	4	0.00000001	0.00000722
25	Yes	4	0.00000001	0.00000339
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00002655
28	Yes	4	0.00000001	0.00002757
29	Yes	4	0.00000001	0.00002851
30	Yes	4	0.00000001	0.00002811
31	Yes	4	0.00000001	0.00002745
32	Yes	4	0.00000001	0.00002768
33	Yes	4	0.00000001	0.00002799
34	Yes	4	0.00000001	0.00002742
35	Yes	4	0.00000001	0.00002678
36	Yes	4	0.00000001	0.00002720
37	Yes	4	0.00000001	0.00002757
38	Yes	4	0.00000001	0.00002686
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000405
42	Yes	4	0.00000001	0.00000001

43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
T1	136 - 133.625	4.054	42	0.2578	0.0285
T2	133.625 - 130	3.925	42	0.2577	0.0285
T3	130 - 110	3.706	42	0.2564	0.0294
T4	110 - 94.9427	2.624	42	0.2372	0.0244
T5	94.9427 - 92.5938	1.877	42	0.2038	0.0168
T6	92.5938 - 90	1.775	42	0.1962	0.0166
T7	90 - 80	1.664	42	0.1870	0.0163
T8	80 - 60	1.279	42	0.1638	0.0142
T9	60 - 40	0.683	42	0.1086	0.0094
T10	40 - 20	0.293	42	0.0682	0.0056
T11	20 - 0	0.071	42	0.0290	0.0021

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
136.00	APXVSPP18-C-A20 w/ Mount Pipe	42	4.054	0.2578	0.0285	27167
134.00	1900MHz RRH (65MHz)	42	3.946	0.2578	0.0285	27167
127.00	(4) DB844H90E-XY w/ Mount Pipe	42	3.527	0.2548	0.0298	13619
117.00	APXVAALL24_43-U-NA20_TMO	42	2.983	0.2464	0.0281	41526
107.00	BXA-80063/4CF w/ Mount Pipe	42	2.469	0.2323	0.0225	133547
97.00	DMP65R-BU4D w/ Mount Pipe	42	1.971	0.2098	0.0170	14234
87.00	MX08FRO665-21 w/ Mount Pipe	42	1.541	0.1785	0.0157	16966
80.00	GPS_A	42	1.279	0.1638	0.0142	21001
72.00	GPS_A	42	1.014	0.1431	0.0122	21893

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
T1	136 - 133.625	16.810	8	1.0677	0.1199
T2	133.625 - 130	16.275	8	1.0674	0.1201
T3	130 - 110	15.366	8	1.0621	0.1236
T4	110 - 94.9427	10.880	8	0.9828	0.1029
T5	94.9427 - 92.5938	7.784	8	0.8443	0.0704
T6	92.5938 - 90	7.359	8	0.8127	0.0695
T7	90 - 80	6.899	8	0.7748	0.0680
T8	80 - 60	5.304	8	0.6787	0.0595
T9	60 - 40	2.831	8	0.4495	0.0394
T10	40 - 20	1.215	8	0.2822	0.0233
T11	20 - 0	0.294	8	0.1199	0.0088

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
136.00	APXVSPP18-C-A20 w/ Mount Pipe	8	16.810	1.0677	0.1199	6453
134.00	1900MHz RRH (65MHz)	8	16.363	1.0676	0.1200	6453
127.00	(4) DB844H90E-XY w/ Mount Pipe	8	14.626	1.0553	0.1255	3225
117.00	APXVAALL24_43-U-NA20_TMO	8	12.372	1.0209	0.1181	10039
107.00	BXA-80063/4CF w/ Mount Pipe	8	10.238	0.9623	0.0946	34516
97.00	DMP65R-BU4D w/ Mount Pipe	8	8.172	0.8692	0.0711	3415
87.00	MX08FRO665-21 w/ Mount Pipe	8	6.391	0.7395	0.0658	4085
80.00	GPS_A	8	5.304	0.6787	0.0595	5066
72.00	GPS_A	8	4.205	0.5926	0.0514	5279

Bolt Design Data

Section No.	Elevation	Component Type	Bolt Grade	Bolt Size	Number Of Bolts	Maximum Load per Bolt	Allowable Load per Bolt	Ratio Load / Allowable	Allowable Ratio	Criteria
	ft			in		K	K			
T2	133.625	Leg	A325N	0.6250	5	1.08	27.61	0.039	1.05	Bolt DS
T3	130	Leg	A325N	0.7500	5	7.65	39.76	0.192	1.05	Bolt DS
T6	92.5938	Leg	A325N	1.0000	6	13.54	54.52	0.248	1.05	Bolt Tension
T7	90	Leg	A325N	1.0000	6	14.83	54.52	0.272	1.05	Bolt Tension
		Diagonal	A325N	1.0000	1	6.75	10.16	0.664	1.05	Member Block Shear
T8	80	Leg	A325N	1.0000	6	21.00	54.52	0.385	1.05	Bolt Tension
		Diagonal	A325N	1.0000	1	6.19	10.66	0.581	1.05	Member Block Shear
T9	60	Leg	A325N	1.0000	6	26.10	54.52	0.479	1.05	Bolt Tension
		Diagonal	A325N	1.0000	1	5.62	11.68	0.481	1.05	Member Block Shear
T10	40	Leg	A325N	1.0000	6	30.43	54.52	0.558	1.05	Bolt Tension
		Diagonal	A325N	1.0000	1	5.39	11.68	0.461	1.05	Member Block Shear
T11	20	Diagonal	A325N	1.2500	1	6.94	23.70	0.293	1.05	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	136 - 133.625	1 1/2	2.38	2.38	76.0 K=1.00	1.7672	-2.24	52.13	0.043 [1]
T2	133.625 - 130	1 1/2	3.63	2.63	84.0 K=1.00	1.7672	-4.06	47.47	0.085 [1]
T3	130 - 110	2	20.00	2.38	57.0 K=1.00	3.1416	-35.06	111.47	0.314 [1]
T4	110 - 94.9427	2 1/4	15.06	2.35	50.1 K=1.00	3.9761	-76.51	148.89	0.514 [1]
T5	94.9427 - 92.5938	2 1/4	2.35	1.18	25.2 K=1.00	3.9761	-84.53	170.80	0.495 [1]
T6	92.5938 - 90	2 1/4	2.59	0.58	12.4	3.9761	-96.34	176.91	0.545 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	90 - 80	Pirod 105244 w/ (2) 1-1/4" Tie Rod	10.02	10.02	K=1.00 35.1 K=1.00	6.1379	-104.30	252.38	0.413 [1]
T8	80 - 60	Pirod 105217	20.03	10.02	37.8 K=1.00	5.3014	-145.68	214.86	0.678 [1]
T9	60 - 40	Pirod 105218	20.03	10.02	32.4 K=1.00	7.2158	-179.88	300.68	0.598 [1]
T10	40 - 20	Pirod 105218	20.03	10.02	32.4 K=1.00	7.2158	-209.37	300.68	0.696 [1]
T11	20 - 0	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-236.35	399.87	0.591 [1]

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T7	90 - 80	0.5	1.35	109.8	276.20	0.1963	0.81	3.48	0.232
T8	80 - 60	0.5	1.47	120.0	238.57	0.1963	0.36	3.34	0.108
T9	60 - 40	0.5	1.46	119.0	324.71	0.1963	0.20	3.38	0.059
T10	40 - 20	0.5	1.46	119.0	324.71	0.1963	0.44	3.38	0.129
T11	20 - 0	0.625	1.45	94.4	424.12	0.3068	0.99	6.96	0.143

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	136 - 133.625	3/4	3.10	3.01	134.8 K=0.70	0.4418	-0.92	5.50	0.167 [1]
T2	133.625 - 130	3/4	4.78	2.32	133.5 K=0.90	0.4418	-1.33	5.60	0.238 [1]
T3	130 - 110	7/8	5.05	2.45	120.9 K=0.90	0.6013	-3.87	9.30	0.416 [1]
T4	110 - 94.9427	1	5.39	2.60	112.5 K=0.90	0.7854	-5.08	14.00	0.363 [1]
T5	94.9427 - 92.5938	1	5.44	2.63	113.7 K=0.90	0.7854	-5.36	13.73	0.391 [1]
T6	92.5938 - 90	1	5.35	2.59	111.8 K=0.90	0.7854	-6.30	14.17	0.445 [1]
T7	90 - 80	L3x3x3/16	11.42	5.26	109.4 K=1.03	1.0900	-7.52	24.13	0.312 [1]
T8	80 - 60	L2 1/2x2 1/2x3/16	12.50	5.63	136.4 K=1.00	0.9020	-6.33	13.87	0.456 [1]
T9	60 - 40	L3x3x3/16	13.80	6.33	127.4 K=1.00	1.0900	-5.81	19.22	0.302 [1]
T10	40 - 20	L3x3x3/16	15.24	7.08	142.6 K=1.00	1.0900	-5.86	15.35	0.382 [1]
T11	20 - 0	L3x3x5/16	16.80	7.84	159.7 K=1.00	1.7800	-7.84	19.97	0.393 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T2	133.625 - 130	3/4	4.00	3.88	173.6 K=0.70	0.4418	-0.18	3.31	0.055 [1]
T3	130 - 110	3/4	4.43	4.26	190.9 K=0.70	0.4418	-0.66	2.74	0.242 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T5	94.9427 - 92.5938	1 1/2	4.90	2.36	83.0 K=1.10	1.7672	-1.46	48.04	0.030 [1]
T6	92.5938 - 90	1 1/2	4.96	2.39	84.0 K=1.10	1.7672	-1.67	47.47	0.035 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	136 - 133.625	6x3/8	4.00	2.91	322.2 K=1.00	2.2500	-0.65	4.90	0.133 [1]
		KL/R > 200 (C) - 4							
T3	130 - 110	7/8	4.01	3.85	147.7 K=0.70	0.6013	-0.66	6.23	0.106 [1]
T4	110 - 94.9427	1	4.52	4.34	145.7 K=0.70	0.7854	-1.58	8.36	0.190 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T2	133.625 - 130	7/8	4.00	3.88	148.8 K=0.70	0.6013	-0.56	6.14	0.091 [1]
T3	130 - 110	7/8	4.49	4.32	165.9 K=0.70	0.6013	-1.66	4.93	0.336 [1]
T6	92.5938 - 90	1	4.99	4.80	161.2 K=0.70	0.7854	-1.67	6.83	0.244 [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 $\frac{P_u}{\phi P_n}$
T2	133.625 - 130	1 1/2	3.63	1.00	32.0	1.7672	2.77	79.52	0.035 [1]
T3	130 - 110	2	20.00	0.50	12.0	2.1885	30.04	106.69	0.282 [1] [#]
T4	110 - 94.9427	2 1/4	15.06	2.35	50.1	3.9761	63.23	178.92	0.353 [1]
T5	94.9427 - 92.5938	2 1/4	2.35	1.17	24.9	3.9761	69.94	178.92	0.391 [1]
T6	92.5938 - 90	2 1/4	2.59	0.58	12.4	3.9761	81.26	178.92	0.454 [1]
T7	90 - 80	Pirod 105244 w/ (2) 1-1/4" Tie Rod	10.02	10.02	35.1	6.1379	89.00	276.20	0.322 [1]
T8	80 - 60	Pirod 105217	20.03	10.02	37.8	5.3014	126.02	238.57	0.528 [1]
T9	60 - 40	Pirod 105218	20.03	10.02	32.4	7.2158	156.58	324.71	0.482 [1]
T10	40 - 20	Pirod 105218	20.03	10.02	32.4	7.2158	182.59	324.71	0.562 [1]
T11	20 - 0	Pirod 105219	20.03	10.02	28.4	9.4248	205.14	424.12	0.484 [1]

[1] P_u / ϕP_n controls
[#] Based on net area of leg in section below

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T7	90 - 80	0.5	1.35	109.8	276.20	0.1963	0.81	3.48	0.232
T8	80 - 60	0.5	1.47	120.0	238.57	0.1963	0.36	3.34	0.108
T9	60 - 40	0.5	1.46	119.0	324.71	0.1963	0.20	3.38	0.059
T10	40 - 20	0.5	1.46	119.0	324.71	0.1963	0.44	3.38	0.129
T11	20 - 0	0.625	1.45	94.4	424.12	0.3068	0.99	6.96	0.143

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	136 - 133.625	3/4	3.10	3.01	192.5	0.4418	0.84	19.88	0.042 [1]
T2	133.625 - 130	3/4	4.78	2.32	148.3	0.4418	1.22	19.88	0.061 [1]
T3	130 - 110	7/8	5.05	2.45	134.3	0.6013	3.80	27.06	0.140 [1]
T4	110 - 94.9427	1	5.39	2.60	125.0	0.7854	5.02	35.34	0.142 [1]
T5	94.9427 - 92.5938	1	5.44	2.63	126.3	0.7854	5.23	35.34	0.148 [1]
T6	92.5938 - 90	1	5.35	2.59	124.2	0.7854	6.09	35.34	0.172 [1]
T7	90 - 80	L3x3x3/16	11.42	5.26	69.3	0.6593	6.75	28.68	0.235 [1]
T8	80 - 60	L2 1/2x2 1/2x3/16	11.93	5.38	86.2	0.5183	6.19	22.55	0.275 [1]
T9	60 - 40	L3x3x3/16	13.13	6.02	79.5	0.6593	5.62	28.68	0.196 [1]
T10	40 - 20	L3x3x3/16	14.50	6.73	88.6	0.6593	5.39	28.68	0.188 [1]
T11	20 - 0	L3x3x5/16	16.80	7.84	105.3	1.0127	6.94	44.05	0.157 [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 $\frac{P_u}{\phi P_n}$
T2	133.625 - 130	3/4	4.00	3.88	248.0	0.4418	0.32	19.88	0.016 [1]
T3	130 - 110	3/4	4.37	4.20	268.9	0.4418	0.66	19.88	0.033 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	94.9427 - 92.5938	1 1/2	4.90	2.36	151.0	1.7672	1.46	79.52	0.018 [1]
T6	92.5938 - 90	1 1/2	4.96	2.39	152.7	1.7672	1.67	79.52	0.021 [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	136 - 133.625	6x3/8	4.00	2.91	322.2	2.2500	0.66	72.90	0.009 [1]
T3	130 - 110	7/8	4.01	3.85	211.0	0.6013	0.66	27.06	0.024 [1]
T4	110 - 94.9427	1	4.52	4.34	208.1	0.7854	1.72	35.34	0.049 [1]

[1] P_u / ϕP_n controls

Bottom 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 $\frac{P_u}{\phi P_n}$
T2	133.625 - 130	7/8	4.00	3.88	212.6	0.6013	0.64	27.06	0.024 [1]
T3	130 - 110	7/8	4.49	4.32	237.0	0.6013	1.70	27.06	0.063 [1]
T6	92.5938 - 90	1	4.99	4.80	230.3	0.7854	1.67	35.34	0.047 [1]

[1] P_u / ϕP_n controls

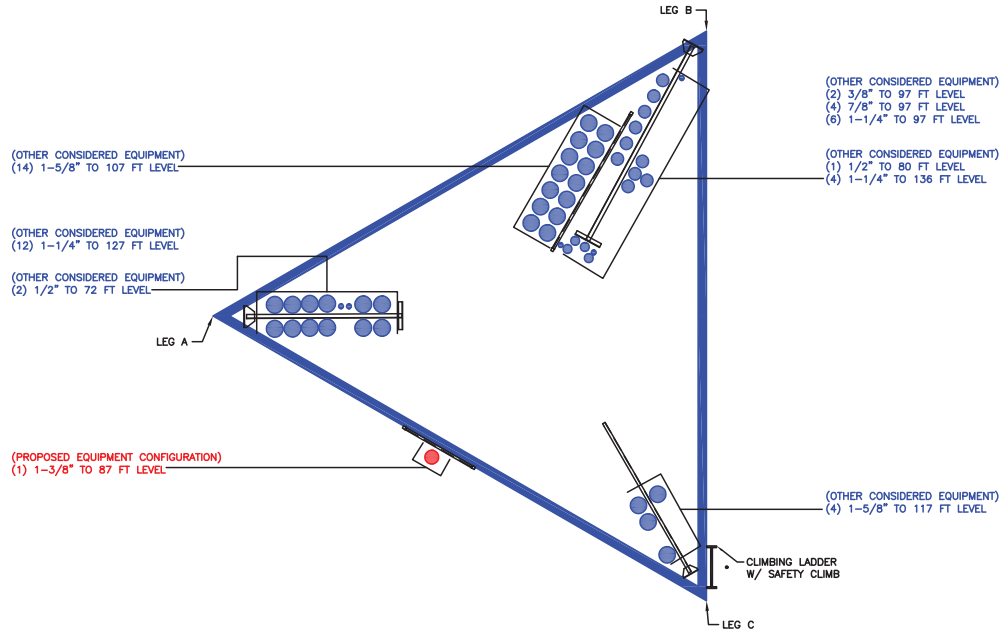
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	136 - 133.625	Leg	1 1/2	2	-2.24	54.73	4.1	Pass
T2	133.625 - 130	Leg	1 1/2	14	-4.06	49.84	8.1	Pass
T3	130 - 110	Leg	2	29	-35.06	117.05	30.0	Pass
T4	110 - 94.9427	Leg	2 1/4	107	-76.51	156.33	48.9	Pass
T5	94.9427 -	Leg	2 1/4	149	-84.53	179.34	47.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
	92.5938							
T6	92.5938 - 90	Leg	2 1/4	161	-96.34	185.75	51.9	Pass
T7	90 - 80	Leg	Pirod 105244 w/ (2) 1-1/4" Tie Rod	176	-104.30	265.00	39.4	Pass
T8	80 - 60	Leg	Pirod 105217	184	-145.68	225.60	64.6	Pass
T9	60 - 40	Leg	Pirod 105218	199	-179.88	315.72	57.0	Pass
T10	40 - 20	Leg	Pirod 105218	214	-209.37	315.72	66.3	Pass
T11	20 - 0	Leg	Pirod 105219	229	-236.35	419.86	56.3	Pass
T1	136 - 133.625	Diagonal	3/4	8	-0.92	5.77	15.9	Pass
T2	133.625 - 130	Diagonal	3/4	24	-1.33	5.88	22.7	Pass
T3	130 - 110	Diagonal	7/8	40	-3.87	9.77	39.6	Pass
T4	110 - 94.9427	Diagonal	1	115	-5.08	14.70	34.6	Pass
T5	94.9427 - 92.5938	Diagonal	1	151	-5.36	14.41	37.2	Pass
T6	92.5938 - 90	Diagonal	1	166	-6.30	14.87	42.4	Pass
T7	90 - 80	Diagonal	L3x3x3/16	180	-7.52	25.34	29.7 66.4 (b)	Pass
T8	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	187	-6.33	14.57	43.5 58.1 (b)	Pass
T9	60 - 40	Diagonal	L3x3x3/16	202	-5.81	20.18	28.8 48.1 (b)	Pass
T10	40 - 20	Diagonal	L3x3x3/16	217	-5.86	16.11	36.4 46.1 (b)	Pass
T11	20 - 0	Diagonal	L3x3x5/16	232	-7.84	20.97	37.4	Pass
T2	133.625 - 130	Horizontal	3/4	16	-0.18	3.48	5.2	Pass
T3	130 - 110	Horizontal	3/4	43	-0.66	2.88	23.0	Pass
T5	94.9427 - 92.5938	Secondary Horizontal	1 1/2	157	-1.46	50.44	2.9	Pass
T6	92.5938 - 90	Secondary Horizontal	1 1/2	172	-1.67	49.85	3.3	Pass
T1	136 - 133.625	Top Girt	6x3/8	4	-0.65	5.14	12.7	Pass
T3	130 - 110	Top Girt	7/8	31	-0.66	6.54	10.1	Pass
T4	110 - 94.9427	Top Girt	1	111	-1.58	8.78	18.1	Pass
T2	133.625 - 130	Bottom Girt	7/8	19	-0.56	6.44	8.7	Pass
T3	130 - 110	Bottom Girt	7/8	36	-1.66	5.18	32.0	Pass
T6	92.5938 - 90	Bottom Girt	1	163	-1.67	7.17	23.3	Pass
							Summary	
						Leg (T10)	66.3	Pass
						Diagonal (T7)	66.4	Pass
						Horizontal (T3)	23.0	Pass
						Secondary Horizontal (T6)	3.3	Pass
						Top Girt (T4)	18.1	Pass
						Bottom Girt (T3)	32.0	Pass
						Bolt Checks	63.2	Pass
						RATING =	**66.4**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


LEG B
(OTHER CONSIDERED EQUIPMENT)
(2) 3/8" TO 97 FT LEVEL
(4) 7/8" TO 97 FT LEVEL
(6) 1-1/4" TO 97 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(14) 1-5/8" TO 107 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 80 FT LEVEL
(4) 1-1/4" TO 136 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(12) 1-1/4" TO 127 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(2) 1/2" TO 72 FT LEVEL
LEG A
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-3/8" TO 87 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(4) 1-5/8" TO 117 FT LEVEL
CLIMBING LADDER
W/ SAFETY CLIMB
LEG C

APPENDIX C

ADDITIONAL CALCULATIONS

Truss Leg Reinforcement

BU # :	876338
Site Name:	Waterford
Order:	572906 Rev.2
Elevation:	90'-80'
TIA-222 Revision:	H

Existing Tie Rods		
Diameter, de:	1.25	in
Unbraced Length, Le:	14.18	in
Yield Strength, Fye:	50	ksi

New Tie Rods		
Diameter, dn:	1.25	in
Unbraced Length, Ln:	14.18	in
Offset, X:	0.625	in
Yield Strength, Fyn:	50	ksi

Truss Leg		
Width, w:	12	in
Unbraced Length, Lleg:	10	ft

Reactions from tnx		
Compression, C:	101.18	kip
Tension, T:	86.92	kip

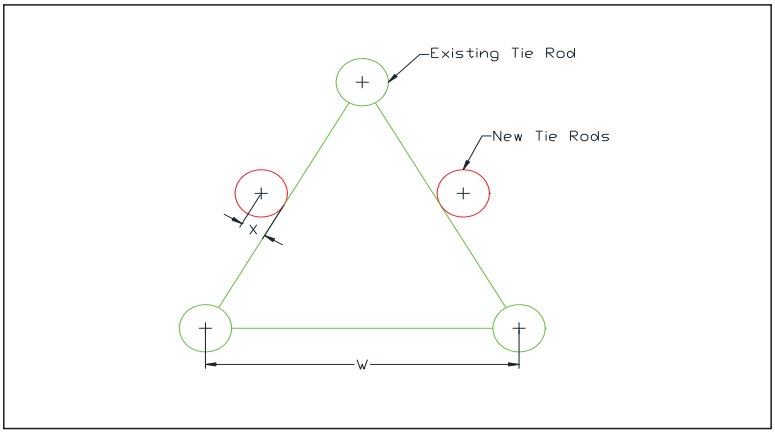
Output from tnx		
KL/r Modified Leg, KLtnx:	45.4	

Length Factors		
Length Factor of Existing Tie Rods, Ke:	1	
Length Factor of New Tie Rods, Kn:	1	
Length Factor of the Leg, Kleg:	1	

Results				
	Demand	Capacity	Rating*	Check
Compression (Existing Tie Rods), kip:	20.24	47.51	40.6%	**Pass**
Compression (New Tie Rods), kip:	20.24	47.51	40.6%	**Pass**
Compression (Modified Tie Rods), kip:	101.18	257.98	37.4%	**Pass**
Tension (Existing Tie Rods), kip:	17.38	55.22	30.0%	**Pass**
Tension (New Tie Rods), kip:	17.38	55.22	30.0%	**Pass**
Tension (Modified Tie Rods), kip:	86.92	276.12	30.0%	**Pass**

**Section 15.5 Applied*

Adjustments for tnx		
Diameter of modified truss leg, Deqv:	1.614	in
Leg K Factor Adjustment, K:	0.999	



Self Support Anchor Rod Capacity

Site Info	
BU #	876338
Site Name	Waterford
Order #	572906 Rev. 2

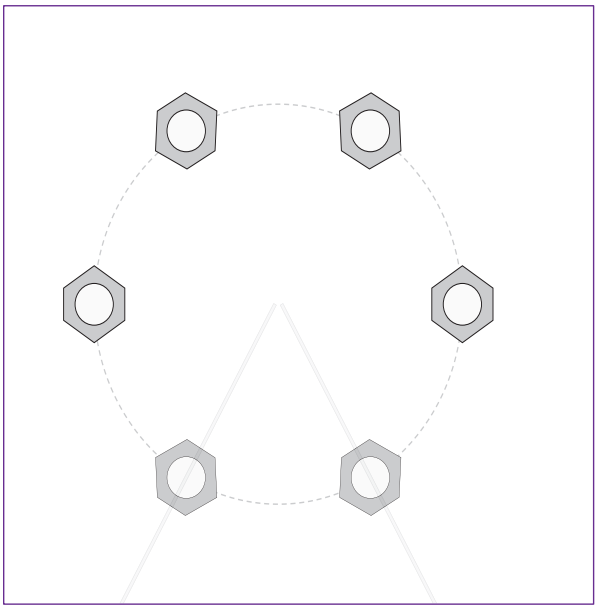
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	1.75

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	245.21	212.15
Shear Force (kips)	23.92	21.10

**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

(6) 1-1/4" ø bolts (A687 N; Fy=105 ksi, Fu=125 ksi)

l_{ar} (in): 1.75

Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu_t = 35.36	ϕPn_t = 90.84	**Stress Rating**
Vu = 3.52	ϕVn = 57.52	**37.1%**
Mu = n/a	ϕMn = n/a	**Pass**

SST Unit Base Foundation

BU # :	876338
Site Name:	Waterford
App. Number:	572906 Rev. 2
TIA-222 Revision:	H

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

Superstructure Analysis Reactions		
Global Moment, **M**:	2814.04	ft-kips
Global Axial, **P**:	53.52	kips
Global Shear, **V**:	34.62	kips
Leg Compression, $\mathbf{P_{comp}}$:	245.21	kips
Leg Comp. Shear, $\mathbf{V_{u\_comp}}$:	23.92	kips
Leg Uplift, $\mathbf{P_{uplift}}$:	212.15	kips
Leg Uplift. Shear, $\mathbf{V_{u\_uplift}}$:	21.1	kips
Tower Height, **H**:	136	ft
Base Face Width, **BW**:	14	ft
BP Dist. Above Fdn, $\mathbf{bp_{dist}}$:	2.5	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	3.0	ft
Ext. Above Grade, **E**:	0.50	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	15	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	7	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $\mathbf{cc_{pier}}$:	3	in

Pad Properties		
Depth, **D**:	6.00	ft
Pad Width, $\mathbf{W_1}$:	23.00	ft
Pad Thickness, **T**:	3.25	ft
Pad Rebar Size (Bottom dir. 2), $\mathbf{Sp_2}$:	9	
Pad Rebar Quantity (Bottom dir. 2), $\mathbf{mp_2}$:	46	
Pad Clear Cover, $\mathbf{cc_{pad}}$:	3	in

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

Soil Properties		
Total Soil Unit Weight, γ:	120	pcf
Ultimate Gross Bearing, Qult:	8.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	36	degrees
SPT Blow Count, $\mathbf{N_{blows}}$:	25	
Base Friction, μ:		
Neglected Depth, **N**:	3.3	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	N/A	ft

<-- Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating***	**Check**
Lateral (Sliding) (kips)	244.48	34.62	**13.5%**	**Pass**
Bearing Pressure (ksf)	6.00	2.42	**40.4%**	**Pass**
*Overturning (kip*ft)*	4550.85	3046.28	**66.9%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	847.27	77.74	**8.7%**	**Pass**
*Pier Flexure (Tension) (kip*ft)*	505.31	68.58	**12.9%**	**Pass**
Pier Compression (kip)	3374.26	249.35	**7.0%**	**Pass**
*Pad Flexure (kip*ft)*	6695.87	795.60	**11.3%**	**Pass**
Pad Shear - 1-way (kips)	777.96	125.51	**15.4%**	**Pass**
Pad Shear - Comp 2-way (ksi)	0.164	0.034	**19.5%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	5260.90	46.64	**0.8%**	**Pass**
Pad Shear - Tension 2-way (ksi)	0.164	0.033	**18.9%**	**Pass**
*Flexural 2-way (Tension) (kip*ft)*	5260.90	41.15	**0.7%**	**Pass**

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

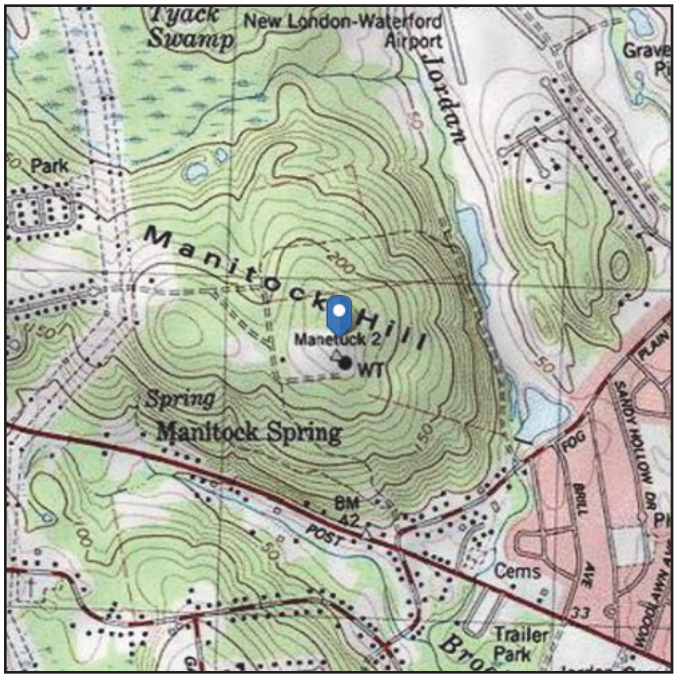
Structural Rating*:	**19.5%**
Soil Rating*:	**66.9%**

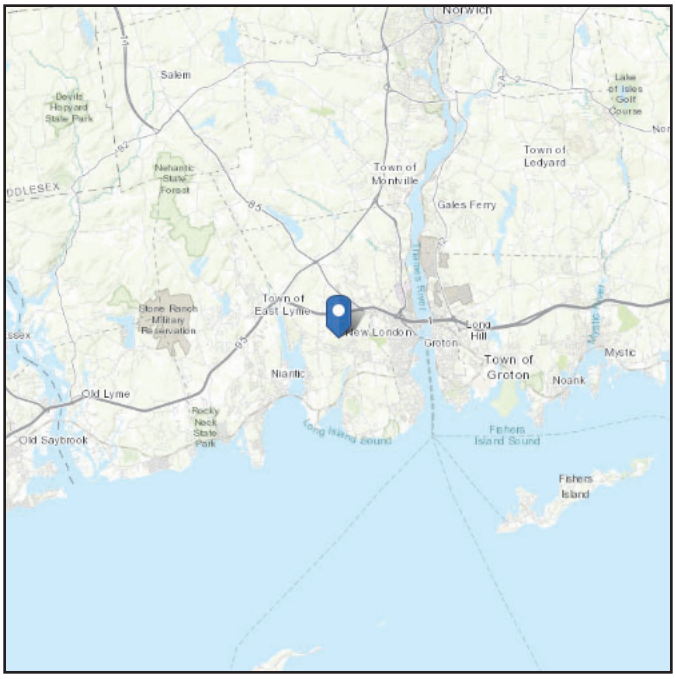
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 242 ft (NAVD 88)
Latitude: 41.354639
Longitude: -72.150444





Wind

Results:

Wind Speed:	126 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	98 Vmph
100-year MRI	104 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 25 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

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

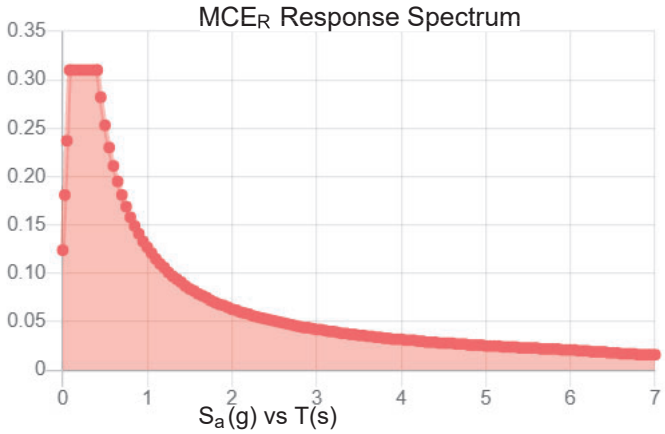
Seismic

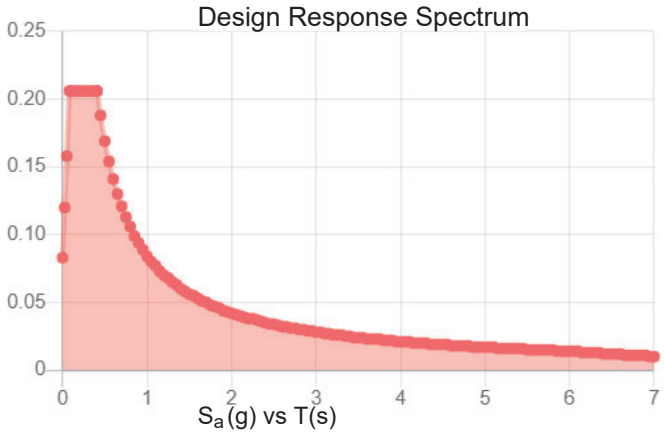
Site Soil Class: D - Default (see Section 11.4.3)

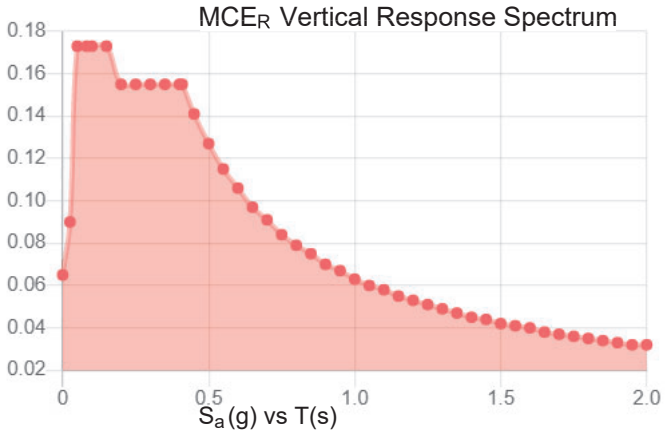
Results:

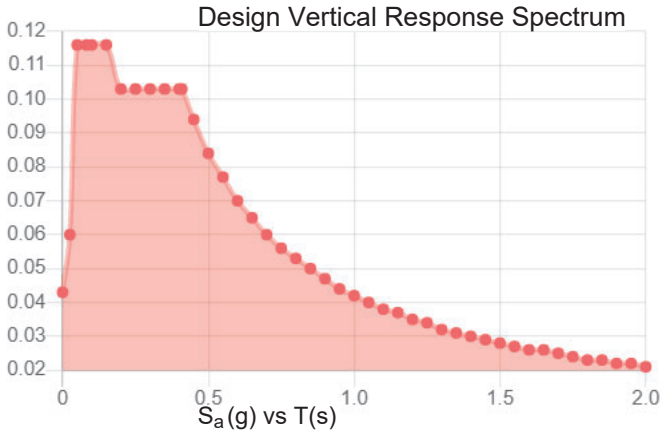
S_S :	0.194	S_{D1} :	0.084
S_1 :	0.053	T_L :	6
F_a :	1.6	PGA :	0.107
F_v :	2.4	PGA_M :	0.17
S_{MS} :	0.31	F_{PGA} :	1.586
S_{M1} :	0.127	I_e :	1
S_{DS} :	0.206	C_v :	0.7

Seismic Design Category B









Data Accessed: Thu Nov 25 2021

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 25 2021

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 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.

ATTACHMENT 5

Date: **November 10, 2021**

Michael McWilliams
Crown Castle
8000 Avalon Blvd, Suite 700
Alpharetta, GA 30009
770-375-4936

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

Subject:	**Mount Replacement Analysis Report**	
Carrier Designation:	**Dish Network 5G**	
	Carrier Site Number:	BOBOS00882A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876338
	Crown Castle Site Name:	WATERFORD
	Crown Castle JDE Job Number:	671529
	Crown Castle Order Number:	572906 Rev.1
Engineering Firm Designation:	**Infinigy Engineering, PLLC Report Designation:** 1039-Z0001-B	
Site Data:	**41 Manitock Hill Road, Waterford, New London County, CT, 06385-2000** **Latitude 41°21'16.70" Longitude -72°9'1.60"**	
Structure Information:	**Tower Height & Type:**	**136.0 ft Self Support**
	Mount Elevation:	**87.0 ft**
	Mount Type:	**10.5 ft Sector Frame**

Dear Michael McWilliams,

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

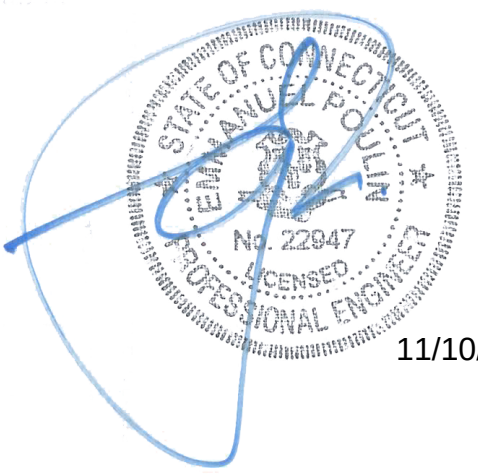
The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Sector Frame **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 126 mph as required by the 2015 International Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Iker Moreno, EIT

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



11/10/21

TABLE OF CONTENTS

1) INTRODUCTION

This is a proposed 3 sector 10.5 ft Sector Frame, designed by Commscope.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	126 mph
Exposure Category:	B
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.162
Seismic S_1:	0.058
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
87.0	87.0	3	JMA WIRELESS	MX08FRO665-21	10.5 ft Sector Frame {Commscope SFG21HD-10-3-126}
		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	572906 Rev.1	CCI Sites
Mount Manufacturer Drawings	Commscope	SFG21HD-10-3-126	Infinigy

3.1) Analysis Method

RISA-3D (Version 17.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

Infinigy Mount Analysis Tool V2.1.7, a tool internally developed by Infinigy, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B “Software Input Calculations”.

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

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
6) Steel grades have been assumed as follows, unless noted otherwise:

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

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

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Sector Frame, Worst Case Sector)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2	Mount Pipe(s)	MP1	87.0	27.5	Pass
	Horizontal(s)	HOR2		15.8	Pass
	Standoff(s)	M19A		27.2	Pass
	Bracing(s)	M23B		36.4	Pass
	Mount Connection(s)	--		32.4	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.

Table 4 - Tieback Connection Data Table

Tower Connection Node No.	Existing / Proposed	Resultant End Reaction (lb)	Connected Member Type	Connected Member Size	Member Compressive Capacity (lb)[2]	Notes
N31	Proposed	773.6	Leg	Pirod 105244 w/ (2) 1-1/4” Tie Rod	12,478.5	1,2

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

4.1) Recommendations

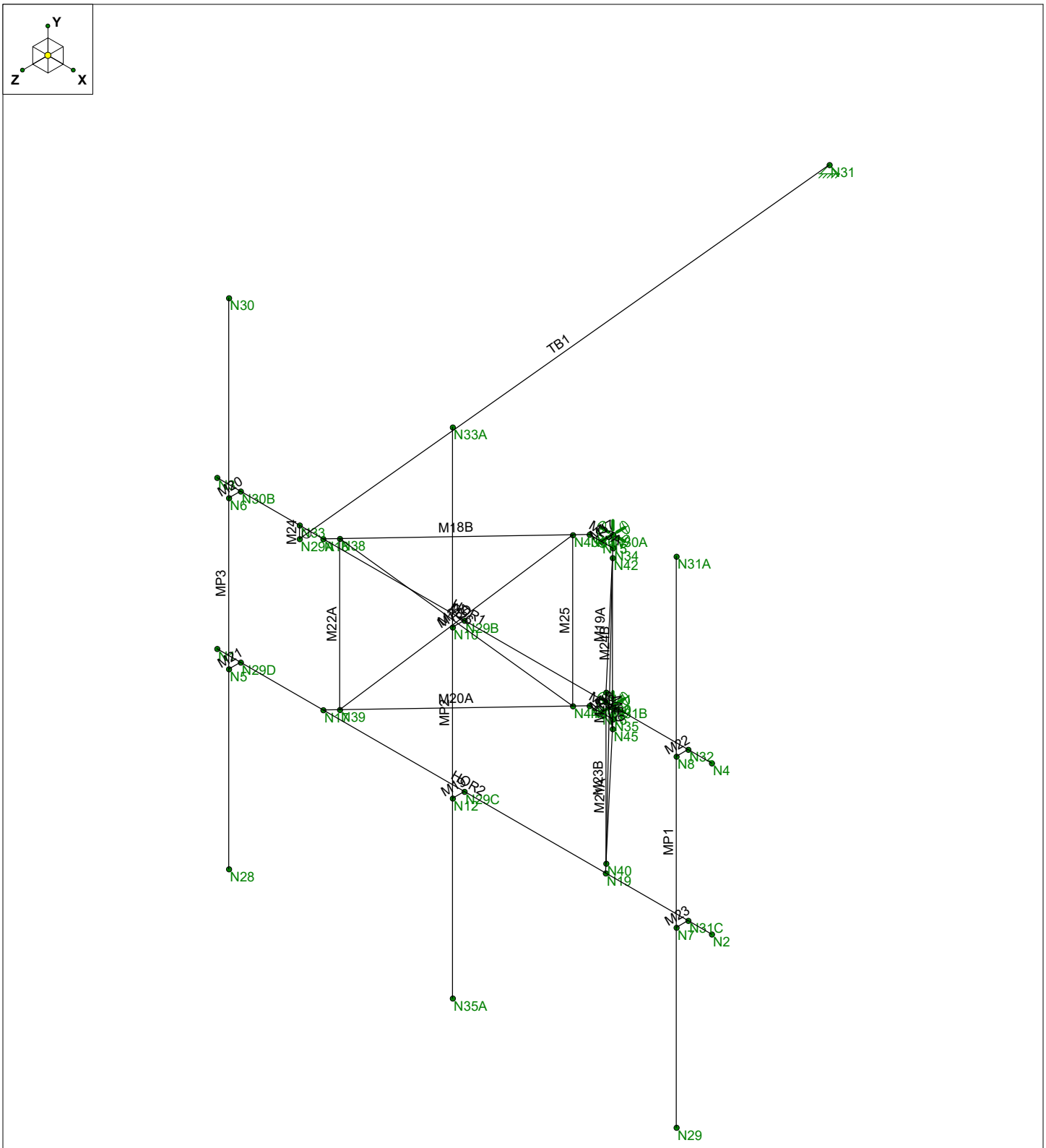
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

1. Commscope SFG21HD-10-3-126

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

APPENDIX A

WIRE FRAME AND RENDERED MODELS



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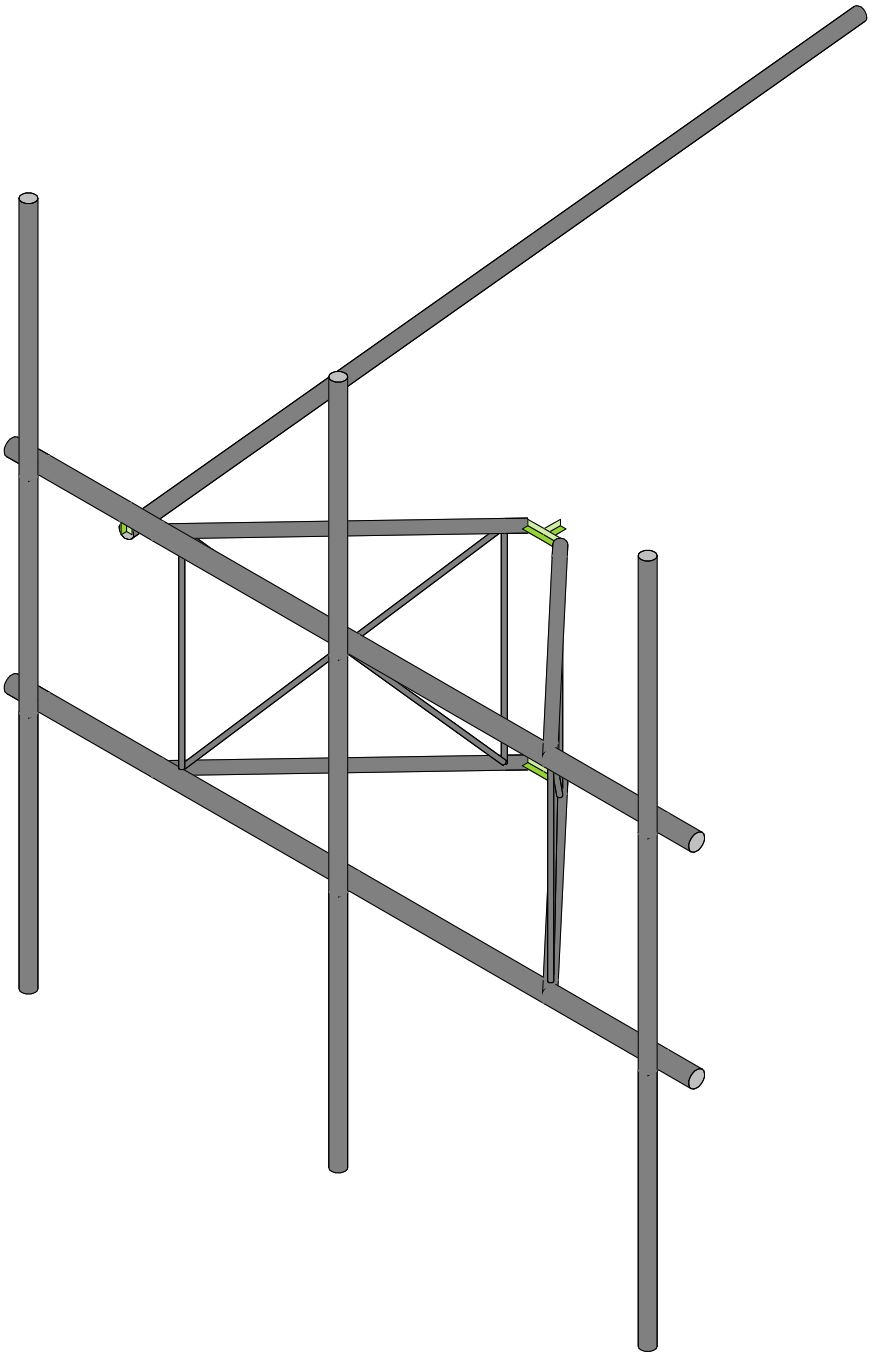

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APPENDIX B

SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION	
Client:	Crown Castle
Carrier:	Dish Network
Engineer:	Iker Moreno

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	B	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	242.00	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Sector Frame	
Num Sectors:	3	
Centerline AGL:	87.00	ft
Tower Height AGL:	136.00	ft

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

FACTORS		
Directionality Fact. (K_d):	0.950	
Ground Ele. Factor (K_e):	0.991	*Rev H Only
Rooftop Speed-Up (K_s):	1.000	*Rev H Only
Topographic Factor (K_{zt}):	1.000	
Gust Effect Factor (G_h):	1.000	

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

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	126	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	1.5	in
Flat Pressure:	72.696	psf
Round Pressure:	43.617	psf
Ice Wind Pressure:	6.868	psf

SEISMIC DATA		
Short-Period Accel. (S_s):	0.162	g
1-Second Accel. (S_1):	0.058	g
Short-Period Design (S_{DS}):	0.173	
1-Second Design (S_{D1}):	0.093	
Short-Period Coeff. (F_a):	1.600	
1-Second Coeff. (F_v):	2.400	
Amplification Factor (A_s):	3.000	
Response Mod. Coeff. (R):	2.000	

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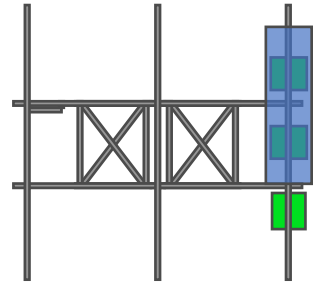
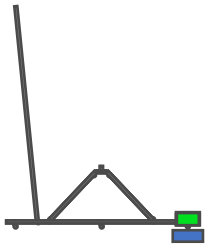
Infinigy Load Calculator V2.1.7

Program Inputs

ELEVATION VIEW



PLAN VIEW



INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Infinigy Load Calculator V2.1.7

APPURTENANCE INFORMATION

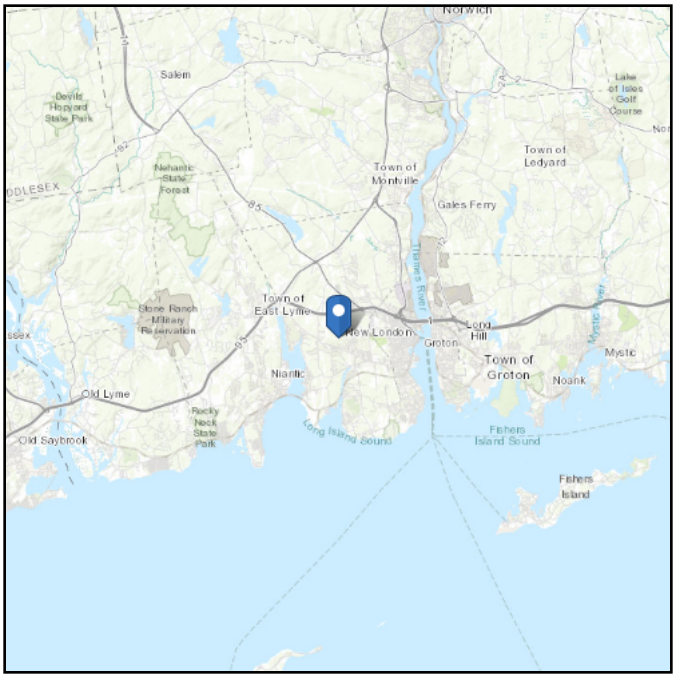
Appurtenance Name	Elevation	Qty.	K_a	q_z (psf)	EPA_N (ft^2)	EPA_T (ft^2)	Wind F_z (lbs)	Wind F_x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)
JMA WIRELESS MX08FRO665-21	87.0	3	0.90	36.35	8.01	3.21	262.03	105.01	82.50	21.38	MP1
FUJITSU TA08025-B604	87.0	3	0.90	36.35	1.96	0.98	64.23	32.10	63.90	16.56	MP1
FUJITSU TA08025-B605	87.0	3	0.90	36.35	1.96	1.13	64.23	36.95	75.00	19.44	MP1
RAYCAP RDIDC-9181-PF-48	87.0	1	0.90	36.35	2.01	1.17	65.81	38.21	21.85	5.66	MP1

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 242 ft (NAVD 88)
Latitude: 41.354639
Longitude: -72.150444



Wind

Results:

Wind Speed:	126 Vmph per the State of Connecticut allows ASCE 7-16 wind speed values
10-year MRI	79 Vmph
25-year MRI	89 Vmph
50-year MRI	99 Vmph
100-year MRI	109 Vmph

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

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 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 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

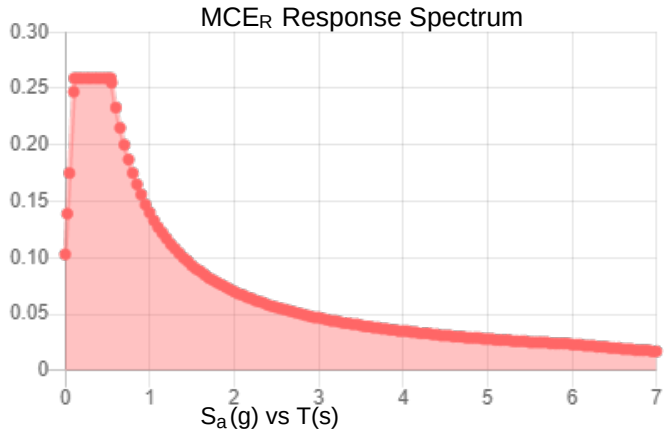
Seismic

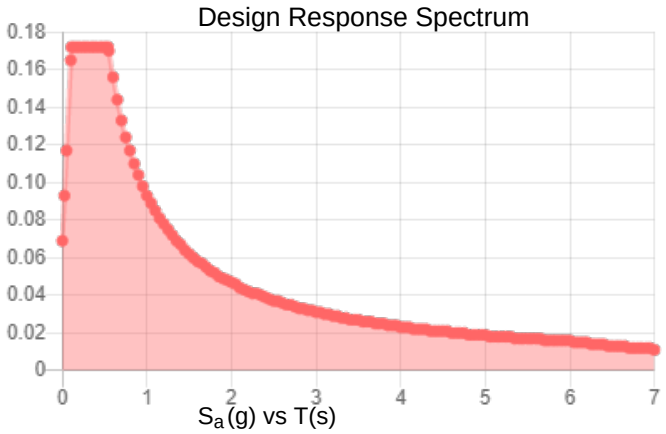
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.162	S_{DS} :	0.172
S_1 :	0.058	S_{D1} :	0.093
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.081
S_{MS} :	0.259	PGA_M :	0.129
S_{M1} :	0.14	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Tue Nov 09 2021

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

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Nov 09 2021

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

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

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	HOR1	N3	N4			2.5" STD pipe	Beam	Pipe	A53 Gr.B	Typical
2	HOR2	N1	N2			2.5" STD pipe	Beam	Pipe	A53 Gr.B	Typical
3	TB1	N29A	N31			2" STD Pipe	Column	Pipe	A53 Gr.B	Typical
4	MP4	N28	N30			2" STD Pipe	Column	Pipe	A53 Gr.B	Typical
5	MP2	N35A	N33A			2" STD Pipe	Column	Pipe	A53 Gr.B	Typical
6	MP1	N29	N31A			2" STD Pipe	Column	Pipe	A53 Gr.B	Typical
7	M17	N15	N30A			RIGID	None	None	RIGID	Typical
8	M18	N16	N31B			RIGID	None	None	RIGID	Typical
9	M18A	N10	N29B			RIGID	None	None	RIGID	Typical
10	M19	N12	N29C			RIGID	None	None	RIGID	Typical
11	M20	N30B	N6			RIGID	None	None	RIGID	Typical
12	M21	N29D	N5			RIGID	None	None	RIGID	Typical
13	M22	N32	N8			RIGID	None	None	RIGID	Typical
14	M23	N31C	N7			RIGID	None	None	RIGID	Typical
15	M24	N29A	N33			RIGID	None	None	RIGID	Typical
16	M23A	N36	N34			RIGID	None	None	RIGID	Typical
17	M24A	N37	N35			RIGID	None	None	RIGID	Typical
18	M18B	N18	N36			1.5" STD pire	Beam	Pipe	A53 Gr.B	Typical
19	M19A	N20	N34			1.5" STD pire	Beam	Pipe	A53 Gr.B	Typical
20	M20A	N17	N37			1.5" STD pire	Beam	Pipe	A53 Gr.B	Typical
21	M21A	N19	N35			1.5" STD pire	Beam	Pipe	A53 Gr.B	Typical
22	M22A	N38	N39			3/4" solid round	Beam	Pipe	A36 Gr.36	Typical
23	M23B	N41	N40			3/4" solid round	Beam	Pipe	A36 Gr.36	Typical
24	M24B	N42	N45			3/4" solid round	Beam	Pipe	A36 Gr.36	Typical
25	M25	N43	N44			3/4" solid round	Beam	Pipe	A36 Gr.36	Typical
26	M26	N38	N44			3/4" solid round	Beam	Pipe	A36 Gr.36	Typical
27	M27	N43	N39			3/4" solid round	Beam	Pipe	A36 Gr.36	Typical
28	M28	N42	N40			3/4" solid round	Beam	Pipe	A36 Gr.36	Typical
29	M29	N45	N41			3/4" solid round	Beam	Pipe	A36 Gr.36	Typical

Hot Rolled Steel Properties

	Label	E [psi]	G [psi]	Nu	Therm (/1...	Density[k/...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	2.9e+7	1.115e+7	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	2.9e+7	1.115e+7	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	2.9e+7	1.115e+7	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	2.9e+7	1.115e+7	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	2.9e+7	1.115e+7	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	2.9e+7	1.115e+7	.3	.65	.49	35	1.6	60	1.2
7	A1085	2.9e+7	1.115e+7	.3	.65	.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	1.5" STD pire	PIPE_1.5	Beam	Pipe	A53 Gr.B	Typical	.749	.293	.293	.586
2	2" STD Pipe	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	3/4" solid round	3/4" Solid Rod	Beam	Pipe	A36 Gr.36	Typical	.442	.016	.016	.031
4	2.5" STD pipe	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
5	3.5" STD	PIPE_3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
1	N1	12	0	0	0	
2	N2	138	0	0	0	
3	N3	12	37.75	0	0	
4	N4	138	37.75	0	0	
5	N5	18	0	3	0	
6	N6	18	37.75	3	0	
7	N7	132	0	3	0	
8	N8	132	37.75	3	0	
9	N10	75	37.75	3	0	
10	N12	75	0	3	0	
11	N15	75	37.75	-34.87	0	
12	N16	75	0	-34.87	0	
13	N17	39	0	0	0	
14	N18	39	37.75	0	0	
15	N19	111	0	0	0	
16	N20	111	37.75	0	0	
17	N29A	33	34.75	0	0	
18	N31	18	34.75	-150	0	
19	N29B	75	37.75	0	0	
20	N28	18	-44.12	3	0	
21	N29	132	-44.12	3	0	
22	N30	18	81.88	3	0	
23	N31A	132	81.88	3	0	
24	N33A	75	81.88	3	0	
25	N35A	75	-44.12	3	0	
26	N30A	75	37.75	-37.87	0	
27	N31B	75	0	-37.87	0	
28	N29C	75	0	0	0	
29	N29D	18	0	0	0	
30	N30B	18	37.75	0	0	
31	N31C	132	0	0	0	
32	N32	132	37.75	0	0	
33	N33	33	37.75	0	0	
34	N34	78	37.75	-34.87	0	
35	N35	78	0	-34.87	0	
36	N36	72	37.75	-34.87	0	
37	N37	72	0	-34.87	0	
38	N38	41.06209	37.75	-2.178941	0	
39	N39	41.06209	0	-2.178941	0	
40	N40	108.93791	0	-2.178941	0	
41	N41	108.93791	37.75	-2.178941	0	
42	N42	80.068654	37.75	-32.684122	0	
43	N43	69.931346	37.75	-32.684122	0	
44	N44	69.931346	0	-32.684122	0	
45	N45	80.068654	0	-32.684122	0	

Hot Rolled Steel Design Parameters

	Label	Shape	Length...	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torque[i...	Kyy	Kzz	Cb	Funct...
1	HOR1	2.5" STD ...	126	50	50	Lbyy	50	50				Lateral
2	HOR2	2.5" STD ...	126	50	50	50		50				Lateral
3	TB1	2" STD Pi...	150.748			Lbyy						Lateral
4	MP4	2" STD Pi...	126	37.75	37.75	Lbyy		37.75				Lateral
5	MP2	2" STD Pi...	126	37.75	37.75	Lbyy		37.75				Lateral
6	MP1	2" STD Pi...	126	37.75	37.75	Lbyy		37.75				Lateral
7	M18B	1.5" STD ...	48.01			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length...	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torque[i...	Kyy	Kzz	Cb	Funct...
8	M19A	1.5" STD ...	48.01			Lbyy						Lateral
9	M20A	1.5" STD ...	48.01			Lbyy						Lateral
10	M21A	1.5" STD ...	48.01			Lbyy						Lateral
11	M22A	3/4" solid ...	37.75			Lbyy						Lateral
12	M23B	3/4" solid ...	37.75			Lbyy						Lateral
13	M24B	3/4" solid ...	37.75			Lbyy						Lateral
14	M25	3/4" solid ...	37.75			Lbyy						Lateral
15	M26	3/4" solid ...	56.472			Lbyy						Lateral
16	M27	3/4" solid ...	56.472			Lbyy						Lateral
17	M28	3/4" solid ...	56.472			Lbyy						Lateral
18	M29	3/4" solid ...	56.472			Lbyy						Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Member)	Surface(Plate/Wall)
1	Self Weight	DL		-1			5			
2	Wind Load AZ...	WLZ					10			
3	Wind Load AZ...	None					10			
4	Wind Load AZ...	None					10			
5	Wind Load AZ...	WLX					10			
6	Wind Load AZ...	None					10			
7	Wind Load AZ...	None					10			
8	Wind Load AZ...	None					10			
9	Wind Load AZ...	None					10			
10	Wind Load AZ...	None					10			
11	Wind Load AZ...	None					10			
12	Wind Load AZ...	None					10			
13	Wind Load AZ...	None					10			
14	Distr. Wind Lo...	WLZ						29		
15	Distr. Wind Lo...	WLX						29		
16	Ice Weight	OL1					5	29		
17	Ice Wind Load...	OL2					10			
18	Ice Wind Load...	None					10			
19	Ice Wind Load...	None					10			
20	Ice Wind Load...	OL3					10			
21	Ice Wind Load...	None					10			
22	Ice Wind Load...	None					10			
23	Ice Wind Load...	None					10			
24	Ice Wind Load...	None					10			
25	Ice Wind Load...	None					10			
26	Ice Wind Load...	None					10			
27	Ice Wind Load...	None					10			
28	Ice Wind Load...	None					10			
29	Distr. Ice Wind...	OL2						29		
30	Distr. Ice Wind...	OL3						29		
31	Seismic Load Z	ELZ			-.259		5			
32	Seismic Load X	ELX	-.259				5			
33	Service Live L...	LL				1				
34	Maintenance L...	LL				1				
35	Maintenance L...	LL				1				
36	Maintenance L...	LL				1				

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

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N2	L	Y	-250

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

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N29D	L	Y	-500

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

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N29C	L	Y	-500

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

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N31C	L	Y	-500

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-41.25	10
2	MP1	Y	-41.25	82
3	MP1	Y	-63.9	%25
4	MP1	Y	-75	%50
5	MP1	Y	-21.85	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	10
2	MP1	Z	-131.02	10
3	MP1	X	0	82
4	MP1	Z	-131.02	82
5	MP1	X	0	%25
6	MP1	Z	-64.23	%25
7	MP1	X	0	%50
8	MP1	Z	-64.23	%50
9	MP1	X	0	%75
10	MP1	Z	-65.81	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-55.69	10
2	MP1	Z	-96.46	10
3	MP1	X	-55.69	82
4	MP1	Z	-96.46	82
5	MP1	X	-28.1	%25
6	MP1	Z	-48.67	%25
7	MP1	X	-28.71	%50
8	MP1	Z	-49.72	%50
9	MP1	X	-29.46	%75
10	MP1	Z	-51.02	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-62.47	10

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
2	MP1	Z	-36.07	10
3	MP1	X	-62.47	82
4	MP1	Z	-36.07	82
5	MP1	X	-34.75	%25
6	MP1	Z	-20.06	%25
7	MP1	X	-37.91	%50
8	MP1	Z	-21.88	%50
9	MP1	X	-39.07	%75
10	MP1	Z	-22.56	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-52.5	10
2	MP1	Z	0	10
3	MP1	X	-52.5	82
4	MP1	Z	0	82
5	MP1	X	-32.1	%25
6	MP1	Z	0	%25
7	MP1	X	-36.95	%50
8	MP1	Z	0	%50
9	MP1	X	-38.21	%75
10	MP1	Z	0	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-62.47	10
2	MP1	Z	36.07	10
3	MP1	X	-62.47	82
4	MP1	Z	36.07	82
5	MP1	X	-34.75	%25
6	MP1	Z	20.06	%25
7	MP1	X	-37.91	%50
8	MP1	Z	21.88	%50
9	MP1	X	-39.07	%75
10	MP1	Z	22.56	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-55.69	10
2	MP1	Z	96.46	10
3	MP1	X	-55.69	82
4	MP1	Z	96.46	82
5	MP1	X	-28.1	%25
6	MP1	Z	48.67	%25
7	MP1	X	-28.71	%50
8	MP1	Z	49.72	%50
9	MP1	X	-29.46	%75
10	MP1	Z	51.02	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	10
2	MP1	Z	131.02	10
3	MP1	X	0	82
4	MP1	Z	131.02	82

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
5	MP1	X	0	%25
6	MP1	Z	64.23	%25
7	MP1	X	0	%50
8	MP1	Z	64.23	%50
9	MP1	X	0	%75
10	MP1	Z	65.81	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	55.69	10
2	MP1	Z	96.46	10
3	MP1	X	55.69	82
4	MP1	Z	96.46	82
5	MP1	X	28.1	%25
6	MP1	Z	48.67	%25
7	MP1	X	28.71	%50
8	MP1	Z	49.72	%50
9	MP1	X	29.46	%75
10	MP1	Z	51.02	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	62.47	10
2	MP1	Z	36.07	10
3	MP1	X	62.47	82
4	MP1	Z	36.07	82
5	MP1	X	34.75	%25
6	MP1	Z	20.06	%25
7	MP1	X	37.91	%50
8	MP1	Z	21.88	%50
9	MP1	X	39.07	%75
10	MP1	Z	22.56	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	52.5	10
2	MP1	Z	0	10
3	MP1	X	52.5	82
4	MP1	Z	0	82
5	MP1	X	32.1	%25
6	MP1	Z	0	%25
7	MP1	X	36.95	%50
8	MP1	Z	0	%50
9	MP1	X	38.21	%75
10	MP1	Z	0	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	62.47	10
2	MP1	Z	-36.07	10
3	MP1	X	62.47	82
4	MP1	Z	-36.07	82
5	MP1	X	34.75	%25
6	MP1	Z	-20.06	%25
7	MP1	X	37.91	%50

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
8	MP1	Z	-21.88	%50
9	MP1	X	39.07	%75
10	MP1	Z	-22.56	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	55.69	10
2	MP1	Z	-96.46	10
3	MP1	X	55.69	82
4	MP1	Z	-96.46	82
5	MP1	X	28.1	%25
6	MP1	Z	-48.67	%25
7	MP1	X	28.71	%50
8	MP1	Z	-49.72	%50
9	MP1	X	29.46	%75
10	MP1	Z	-51.02	%75

Member Point Loads (BLC 16 : Ice Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-134.834	10
2	MP1	Y	-134.834	82
3	MP1	Y	-65.959	%25
4	MP1	Y	-70.295	%50
5	MP1	Y	-69.273	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	10
2	MP1	Z	-16.21	10
3	MP1	X	0	82
4	MP1	Z	-16.21	82
5	MP1	X	0	%25
6	MP1	Z	-6.27	%25
7	MP1	X	0	%50
8	MP1	Z	-6.27	%50
9	MP1	X	0	%75
10	MP1	Z	-6.6	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-7.49	10
2	MP1	Z	-12.97	10
3	MP1	X	-7.49	82
4	MP1	Z	-12.97	82
5	MP1	X	-2.95	%25
6	MP1	Z	-5.1	%25
7	MP1	X	-2.98	%50
8	MP1	Z	-5.16	%50
9	MP1	X	-3.14	%75
10	MP1	Z	-5.44	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-10.84	10

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
2	MP1	Z	-6.26	10
3	MP1	X	-10.84	82
4	MP1	Z	-6.26	82
5	MP1	X	-4.45	%25
6	MP1	Z	-2.57	%25
7	MP1	X	-4.62	%50
8	MP1	Z	-2.66	%50
9	MP1	X	-4.89	%75
10	MP1	Z	-2.82	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-11.29	10
2	MP1	Z	0	10
3	MP1	X	-11.29	82
4	MP1	Z	0	82
5	MP1	X	-4.76	%25
6	MP1	Z	0	%25
7	MP1	X	-5.02	%50
8	MP1	Z	0	%50
9	MP1	X	-5.32	%75
10	MP1	Z	0	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-10.84	10
2	MP1	Z	6.26	10
3	MP1	X	-10.84	82
4	MP1	Z	6.26	82
5	MP1	X	-4.45	%25
6	MP1	Z	2.57	%25
7	MP1	X	-4.62	%50
8	MP1	Z	2.66	%50
9	MP1	X	-4.89	%75
10	MP1	Z	2.82	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-7.49	10
2	MP1	Z	12.97	10
3	MP1	X	-7.49	82
4	MP1	Z	12.97	82
5	MP1	X	-2.95	%25
6	MP1	Z	5.1	%25
7	MP1	X	-2.98	%50
8	MP1	Z	5.16	%50
9	MP1	X	-3.14	%75
10	MP1	Z	5.44	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	0	10
2	MP1	Z	16.21	10
3	MP1	X	0	82
4	MP1	Z	16.21	82

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
5	MP1	X	0	%25
6	MP1	Z	6.27	%25
7	MP1	X	0	%50
8	MP1	Z	6.27	%50
9	MP1	X	0	%75
10	MP1	Z	6.6	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	7.49	10
2	MP1	Z	12.97	10
3	MP1	X	7.49	82
4	MP1	Z	12.97	82
5	MP1	X	2.95	%25
6	MP1	Z	5.1	%25
7	MP1	X	2.98	%50
8	MP1	Z	5.16	%50
9	MP1	X	3.14	%75
10	MP1	Z	5.44	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	10.84	10
2	MP1	Z	6.26	10
3	MP1	X	10.84	82
4	MP1	Z	6.26	82
5	MP1	X	4.45	%25
6	MP1	Z	2.57	%25
7	MP1	X	4.62	%50
8	MP1	Z	2.66	%50
9	MP1	X	4.89	%75
10	MP1	Z	2.82	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	11.29	10
2	MP1	Z	0	10
3	MP1	X	11.29	82
4	MP1	Z	0	82
5	MP1	X	4.76	%25
6	MP1	Z	0	%25
7	MP1	X	5.02	%50
8	MP1	Z	0	%50
9	MP1	X	5.32	%75
10	MP1	Z	0	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	10.84	10
2	MP1	Z	-6.26	10
3	MP1	X	10.84	82
4	MP1	Z	-6.26	82
5	MP1	X	4.45	%25
6	MP1	Z	-2.57	%25
7	MP1	X	4.62	%50

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
8	MP1	Z	-2.66	%50
9	MP1	X	4.89	%75
10	MP1	Z	-2.82	%75

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

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	7.49	10
2	MP1	Z	-12.97	10
3	MP1	X	7.49	82
4	MP1	Z	-12.97	82
5	MP1	X	2.95	%25
6	MP1	Z	-5.1	%25
7	MP1	X	2.98	%50
8	MP1	Z	-5.16	%50
9	MP1	X	3.14	%75
10	MP1	Z	-5.44	%75

Member Point Loads (BLC 31 : Seismic Load Z)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-10.692	10
2	MP1	Z	-10.692	82
3	MP1	Z	-16.563	%25
4	MP1	Z	-19.44	%50
5	MP1	Z	-5.664	%75

Member Point Loads (BLC 32 : Seismic Load X)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-10.692	10
2	MP1	X	-10.692	82
3	MP1	X	-16.563	%25
4	MP1	X	-19.44	%50
5	MP1	X	-5.664	%75

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	HOR1	SZ	-43.617	-43.617	0	%100
2	HOR2	SZ	-43.617	-43.617	0	%100
3	TB1	SZ	-43.617	-43.617	0	%100
4	MP4	SZ	-43.617	-43.617	0	%100
5	MP2	SZ	-43.617	-43.617	0	%100
6	MP1	SZ	-43.617	-43.617	0	%100
7	M17	SZ	0	0	0	%100
8	M18	SZ	0	0	0	%100
9	M18A	SZ	0	0	0	%100
10	M19	SZ	0	0	0	%100
11	M20	SZ	0	0	0	%100
12	M21	SZ	0	0	0	%100
13	M22	SZ	0	0	0	%100
14	M23	SZ	0	0	0	%100
15	M24	SZ	0	0	0	%100
16	M23A	SZ	0	0	0	%100
17	M24A	SZ	0	0	0	%100
18	M18B	SZ	-43.617	-43.617	0	%100
19	M19A	SZ	-43.617	-43.617	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
20	M20A	SZ	-43.617	-43.617	0	%100
21	M21A	SZ	-43.617	-43.617	0	%100
22	M22A	SZ	-43.617	-43.617	0	%100
23	M23B	SZ	-43.617	-43.617	0	%100
24	M24B	SZ	-43.617	-43.617	0	%100
25	M25	SZ	-43.617	-43.617	0	%100
26	M26	SZ	-43.617	-43.617	0	%100
27	M27	SZ	-43.617	-43.617	0	%100
28	M28	SZ	-43.617	-43.617	0	%100
29	M29	SZ	-43.617	-43.617	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	HOR1	SX	-43.617	-43.617	0	%100
2	HOR2	SX	-43.617	-43.617	0	%100
3	TB1	SX	-43.617	-43.617	0	%100
4	MP4	SX	-43.617	-43.617	0	%100
5	MP2	SX	-43.617	-43.617	0	%100
6	MP1	SX	-43.617	-43.617	0	%100
7	M17	SX	0	0	0	%100
8	M18	SX	0	0	0	%100
9	M18A	SX	0	0	0	%100
10	M19	SX	0	0	0	%100
11	M20	SX	0	0	0	%100
12	M21	SX	0	0	0	%100
13	M22	SX	0	0	0	%100
14	M23	SX	0	0	0	%100
15	M24	SX	0	0	0	%100
16	M23A	SX	0	0	0	%100
17	M24A	SX	0	0	0	%100
18	M18B	SX	-43.617	-43.617	0	%100
19	M19A	SX	-43.617	-43.617	0	%100
20	M20A	SX	-43.617	-43.617	0	%100
21	M21A	SX	-43.617	-43.617	0	%100
22	M22A	SX	-43.617	-43.617	0	%100
23	M23B	SX	-43.617	-43.617	0	%100
24	M24B	SX	-43.617	-43.617	0	%100
25	M25	SX	-43.617	-43.617	0	%100
26	M26	SX	-43.617	-43.617	0	%100
27	M27	SX	-43.617	-43.617	0	%100
28	M28	SX	-43.617	-43.617	0	%100
29	M29	SX	-43.617	-43.617	0	%100

Member Distributed Loads (BLC 16 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	HOR1	Y	-9.142	-9.142	0	%100
2	HOR2	Y	-9.142	-9.142	0	%100
3	TB1	Y	-8.132	-8.132	0	%100
4	MP4	Y	-8.132	-8.132	0	%100
5	MP2	Y	-8.132	-8.132	0	%100
6	MP1	Y	-8.132	-8.132	0	%100
7	M17	Y	-3.337	-3.337	0	%100
8	M18	Y	-3.337	-3.337	0	%100
9	M18A	Y	-3.337	-3.337	0	%100
10	M19	Y	-3.337	-3.337	0	%100
11	M20	Y	-3.337	-3.337	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
12	M21	Y	-3.337	-3.337	0	%100
13	M22	Y	-3.337	-3.337	0	%100
14	M23	Y	-3.337	-3.337	0	%100
15	M24	Y	-3.337	-3.337	0	%100
16	M23A	Y	-3.337	-3.337	0	%100
17	M24A	Y	-3.337	-3.337	0	%100
18	M18B	Y	-7.173	-7.173	0	%100
19	M19A	Y	-7.173	-7.173	0	%100
20	M20A	Y	-7.173	-7.173	0	%100
21	M21A	Y	-7.173	-7.173	0	%100
22	M22A	Y	-4.851	-4.851	0	%100
23	M23B	Y	-4.851	-4.851	0	%100
24	M24B	Y	-4.851	-4.851	0	%100
25	M25	Y	-4.851	-4.851	0	%100
26	M26	Y	-4.851	-4.851	0	%100
27	M27	Y	-4.851	-4.851	0	%100
28	M28	Y	-4.851	-4.851	0	%100
29	M29	Y	-4.851	-4.851	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	HOR1	SZ	-14.765	-14.765	0	%100
2	HOR2	SZ	-14.765	-14.765	0	%100
3	TB1	SZ	-16.428	-16.428	0	%100
4	MP4	SZ	-16.428	-16.428	0	%100
5	MP2	SZ	-16.428	-16.428	0	%100
6	MP1	SZ	-16.428	-16.428	0	%100
7	M17	SZ	0	0	0	%100
8	M18	SZ	0	0	0	%100
9	M18A	SZ	0	0	0	%100
10	M19	SZ	0	0	0	%100
11	M20	SZ	0	0	0	%100
12	M21	SZ	0	0	0	%100
13	M22	SZ	0	0	0	%100
14	M23	SZ	0	0	0	%100
15	M24	SZ	0	0	0	%100
16	M23A	SZ	0	0	0	%100
17	M24A	SZ	0	0	0	%100
18	M18B	SZ	-18.817	-18.817	0	%100
19	M19A	SZ	-18.817	-18.817	0	%100
20	M20A	SZ	-18.817	-18.817	0	%100
21	M21A	SZ	-18.817	-18.817	0	%100
22	M22A	SZ	-37.139	-37.139	0	%100
23	M23B	SZ	-37.139	-37.139	0	%100
24	M24B	SZ	-37.139	-37.139	0	%100
25	M25	SZ	-37.139	-37.139	0	%100
26	M26	SZ	-37.139	-37.139	0	%100
27	M27	SZ	-37.139	-37.139	0	%100
28	M28	SZ	-37.139	-37.139	0	%100
29	M29	SZ	-37.139	-37.139	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	HOR1	SX	-14.765	-14.765	0	%100
2	HOR2	SX	-14.765	-14.765	0	%100
3	TB1	SX	-16.428	-16.428	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
4	MP4	SX	-16.428	-16.428	0	%100
5	MP2	SX	-16.428	-16.428	0	%100
6	MP1	SX	-16.428	-16.428	0	%100
7	M17	SX	0	0	0	%100
8	M18	SX	0	0	0	%100
9	M18A	SX	0	0	0	%100
10	M19	SX	0	0	0	%100
11	M20	SX	0	0	0	%100
12	M21	SX	0	0	0	%100
13	M22	SX	0	0	0	%100
14	M23	SX	0	0	0	%100
15	M24	SX	0	0	0	%100
16	M23A	SX	0	0	0	%100
17	M24A	SX	0	0	0	%100
18	M18B	SX	-18.817	-18.817	0	%100
19	M19A	SX	-18.817	-18.817	0	%100
20	M20A	SX	-18.817	-18.817	0	%100
21	M21A	SX	-18.817	-18.817	0	%100
22	M22A	SX	-37.139	-37.139	0	%100
23	M23B	SX	-37.139	-37.139	0	%100
24	M24B	SX	-37.139	-37.139	0	%100
25	M25	SX	-37.139	-37.139	0	%100
26	M26	SX	-37.139	-37.139	0	%100
27	M27	SX	-37.139	-37.139	0	%100
28	M28	SX	-37.139	-37.139	0	%100
29	M29	SX	-37.139	-37.139	0	%100

Load Combinations

	Description	S...	PDel...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4DL	Yes	Y		1	1.4																		
2	1.2DL + 1WL AZI 0	Yes	Y		1	1.2	2	1	14	1	15													
3	1.2DL + 1WL AZI 30	Yes	Y		1	1.2	3	1	14	.866	15	.5												
4	1.2DL + 1WL AZI 60	Yes	Y		1	1.2	4	1	14	.5	15	.866												
5	1.2DL + 1WL AZI 90	Yes	Y		1	1.2	5	1	14		15	1												
6	1.2DL + 1WL AZI 120	Yes	Y		1	1.2	6	1	14	-.5	15	.866												
7	1.2DL + 1WL AZI 150	Yes	Y		1	1.2	7	1	14	-.8...	15	.5												
8	1.2DL + 1WL AZI 180	Yes	Y		1	1.2	8	1	14	-1	15													
9	1.2DL + 1WL AZI 210	Yes	Y		1	1.2	9	1	14	-.8...	15	-.5												
10	1.2DL + 1WL AZI 240	Yes	Y		1	1.2	10	1	14	-.5	15	-.8...												
11	1.2DL + 1WL AZI 270	Yes	Y		1	1.2	11	1	14		15	-1												
12	1.2DL + 1WL AZI 300	Yes	Y		1	1.2	12	1	14	.5	15	-.8...												
13	1.2DL + 1WL AZI 330	Yes	Y		1	1.2	13	1	14	.866	15	-.5												
14	0.9DL + 1WL AZI 0	Yes	Y		1	.9	2	1	14	1	15													
15	0.9DL + 1WL AZI 30	Yes	Y		1	.9	3	1	14	.866	15	.5												
16	0.9DL + 1WL AZI 60	Yes	Y		1	.9	4	1	14	.5	15	.866												
17	0.9DL + 1WL AZI 90	Yes	Y		1	.9	5	1	14		15	1												
18	0.9DL + 1WL AZI 120	Yes	Y		1	.9	6	1	14	-.5	15	.866												
19	0.9DL + 1WL AZI 150	Yes	Y		1	.9	7	1	14	-.8...	15	.5												
20	0.9DL + 1WL AZI 180	Yes	Y		1	.9	8	1	14	-1	15													
21	0.9DL + 1WL AZI 210	Yes	Y		1	.9	9	1	14	-.8...	15	-.5												
22	0.9DL + 1WL AZI 240	Yes	Y		1	.9	10	1	14	-.5	15	-.8...												
23	0.9DL + 1WL AZI 270	Yes	Y		1	.9	11	1	14		15	-1												
24	0.9DL + 1WL AZI 300	Yes	Y		1	.9	12	1	14	.5	15	-.8...												
25	0.9DL + 1WL AZI 330	Yes	Y		1	.9	13	1	14	.866	15	-.5												
26	1.2D + 1.0Di	Yes	Y		1	1.2	16	1																

Load Combinations (Continued)

	Description	S...	PDel...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
27	1.2D + 1.0Di +1.0Wi AZI 0	Yes	Y		1	1.2	16	1	17	1	29	1	30											
28	1.2D + 1.0Di +1.0Wi AZI 30	Yes	Y		1	1.2	16	1	18	1	29	.866	30	.5										
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y		1	1.2	16	1	19	1	29	.5	30	.866										
30	1.2D + 1.0Di +1.0Wi AZI 90	Yes	Y		1	1.2	16	1	20	1	29		30	1										
31	1.2D + 1.0Di +1.0Wi AZI 120	Yes	Y		1	1.2	16	1	21	1	29	-.5	30	.866										
32	1.2D + 1.0Di +1.0Wi AZI 150	Yes	Y		1	1.2	16	1	22	1	29	-.8...	30	.5										
33	1.2D + 1.0Di +1.0Wi AZI 180	Yes	Y		1	1.2	16	1	23	1	29	-1	30											
34	1.2D + 1.0Di +1.0Wi AZI 210	Yes	Y		1	1.2	16	1	24	1	29	-.8...	30	-.5										
35	1.2D + 1.0Di +1.0Wi AZI 240	Yes	Y		1	1.2	16	1	25	1	29	-.5	30	-.8...										
36	1.2D + 1.0Di +1.0Wi AZI 270	Yes	Y		1	1.2	16	1	26	1	29		30	-1										
37	1.2D + 1.0Di +1.0Wi AZI 300	Yes	Y		1	1.2	16	1	27	1	29	.5	30	-.8...										
38	1.2D + 1.0Di +1.0Wi AZI 330	Yes	Y		1	1.2	16	1	28	1	29	.866	30	-.5										
39	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	1	32															
40	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	.866	32	.5														
41	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	.5	32	.866														
42	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31		32	1														
43	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	-.5	32	.866														
44	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	-.8...	32	.5														
45	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	-1	32															
46	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	-.8...	32	-.5														
47	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	-.5	32	-.8...														
48	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31		32	-1														
49	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	.5	32	-.8...														
50	(1.2 + 0.2Sds)DL + 1.0E AZ...	Yes	Y		1	1.2...	31	.866	32	-.5														
51	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	1	32															
52	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	.866	32	.5														
53	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	.5	32	.866														
54	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31		32	1														
55	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	-.5	32	.866														
56	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	-.8...	32	.5														
57	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	-1	32															
58	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	-.8...	32	-.5														
59	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	-.5	32	-.8...														
60	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31		32	-1														
61	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	.5	32	-.8...														
62	(0.9 - 0.2Sds)DL + 1.0E AZI...	Yes	Y		1	.865	31	.866	32	-.5														
63	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	2	.227	14	.227	15		33	1.5										
64	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	3	.227	14	.196	15	.113	33	1.5										
65	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	4	.227	14	.113	15	.196	33	1.5										
66	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	5	.227	14		15	.227	33	1.5										
67	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	6	.227	14	-.1...	15	.196	33	1.5										
68	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	7	.227	14	-.1...	15	.113	33	1.5										
69	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	8	.227	14	-.2...	15		33	1.5										
70	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	9	.227	14	-.1...	15	-.1...	33	1.5										
71	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	10	.227	14	-.1...	15	-.1...	33	1.5										
72	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	11	.227	14		15	-.2...	33	1.5										
73	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	12	.227	14	.113	15	-.1...	33	1.5										
74	1.0DL + 1.5LL + 1.0SWL (6...	Yes	Y		1	1	13	.227	14	.196	15	-.1...	33	1.5										
75	1.2DL + 1.5LL	Yes	Y		1	1.2	33	1.5																
76	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	2	.057	14	.057	15											
77	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	3	.057	14	.049	15	.028										
78	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	4	.057	14	.028	15	.049										
79	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	5	.057	14		15	.057										
80	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	6	.057	14	-.0...	15	.049										
81	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	7	.057	14	-.0...	15	.028										
82	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	8	.057	14	-.0...	15											
83	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	9	.057	14	-.0...	15	-.0...										

Load Combinations (Continued)

	Description	S...	PDel...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
84	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	10	.057	14	-.0...	15	-.0...										
85	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	11	.057	14		15	-.0...										
86	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	12	.057	14	.028	15	-.0...										
87	1.2DL + 1.5LM-MP1 + 1SW...	Yes	Y		1	1.2	34	1.5	13	.057	14	.049	15	-.0...										
88	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	2	.057	14	.057	15											
89	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	3	.057	14	.049	15	.028										
90	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	4	.057	14	.028	15	.049										
91	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	5	.057	14		15	.057										
92	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	6	.057	14	-.0...	15	.049										
93	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	7	.057	14	-.0...	15	.028										
94	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	8	.057	14	-.0...	15											
95	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	9	.057	14	-.0...	15	-.0...										
96	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	10	.057	14	-.0...	15	-.0...										
97	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	11	.057	14		15	-.0...										
98	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	12	.057	14	.028	15	-.0...										
99	1.2DL + 1.5LM-MP2 + 1SW...	Yes	Y		1	1.2	35	1.5	13	.057	14	.049	15	-.0...										
100	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	2	.057	14	.057	15											
101	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	3	.057	14	.049	15	.028										
102	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	4	.057	14	.028	15	.049										
103	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	5	.057	14		15	.057										
104	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	6	.057	14	-.0...	15	.049										
105	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	7	.057	14	-.0...	15	.028										
106	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	8	.057	14	-.0...	15											
107	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	9	.057	14	-.0...	15	-.0...										
108	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	10	.057	14	-.0...	15	-.0...										
109	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	11	.057	14		15	-.0...										
110	1.2DL + 1.5LM-MP3 + 1SW...	Yes	Y		1	1.2	36	1.5	12	.057	14	.028	15	-.0...										

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-...	LC	MZ [lb-ft]	LC
1	N31	...	113.998	6	77.261	37	763.168	7	0	110	0	110	0	110
2		...	-114.137	12	18.865	55	-764.426	13	0	1	0	1	0	1
3	N30A	...	636.802	79	1451.737	33	632.243	25	-150.409	54	0	110	472.785	105
4		...	-1356.633	109	360.022	14	-1870.619	32	-592.433	38	0	1	-238.108	87
5	N31B	...	1358.288	102	521.108	27	1792.076	27	-21.672	19	0	110	176.673	105
6		...	-638.321	84	39.413	19	-265.143	20	-208.318	31	0	1	-88.021	87
7	Totals:	...	709.639	17	2022.606	27	1104.021	14						
8		...	-709.639	23	518.6	58	-1104.021	8						

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

	Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M23B	3/4" Solid R...	.364	37.75	28	.009	0		7	2462.257	14313.8...	178.929	178.929	2...	H1-1a
2	MP1	PIPE_2.0	.275	44.625	101	.044	81.3...		106	28535.1...	32130	1871.625	1871.625	1	H1-1b
3	M19A	PIPE_1.5	.272	48.01	31	.185	48.01		105	17451.0...	23593.5	1105.125	1105.125	3...	H1-1b
4	M22A	3/4" Solid R...	.267	37.75	76	.013	37.75		7	2462.257	14313.8...	178.929	178.929	2...	H1-1a
5	MP4	PIPE_2.0	.216	44.625	81	.037	44.6...		86	28535.1...	32130	1871.625	1871.625	4...	H1-1b
6	M18B	PIPE_1.5	.185	48.01	87	.136	48.01		87	17451.0...	23593.5	1105.125	1105.125	2...	H1-1b
7	M21A	PIPE_1.5	.184	0	8	.153	2.5		106	17451.0...	23593.5	1105.125	1105.125	3...	H1-1b
8	M28	3/4" Solid R...	.160	0	105	.006	56.4...		2	1100.282	14313.8...	178.929	178.929	3...	H1-1b*
9	HOR2	PIPE_2.5	.158	99.75	8	.103	99.75		8	43998.1...	50715	3596.25	3596.25	1...	H1-1b
10	M24B	3/4" Solid R...	.154	37.75	29	.010	0		7	2462.257	14313.8...	178.929	178.929	2...	H1-1b*
11	MP2	PIPE_2.0	.153	44.625	7	.047	81.3...		7	28535.1...	32130	1871.625	1871.625	4...	H1-1b
12	TB1	PIPE_2.0	.148	75.374	30	.008	150....		36	6233.091	32130	1871.625	1871.625	1...	H1-1b
13	HOR1	PIPE_2.5	.144	99.75	8	.113	21		7	43998.1...	50715	3596.25	3596.25	1	H1-1b

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

	Member	Shape	Code ...	Loc[in]	LC	Shear ..	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [..	phi*Mn ...	phi*Mn ...	Cb	Eqn
14	M27	3/4" Solid R...	.118	0	87	.006	56.4...		87	1100.282	14313.8...	178.929	178.929	2...	H1-1b*
15	M25	3/4" Solid R...	.110	37.75	87	.010	37.75		7	2462.257	14313.8...	178.929	178.929	2...	H1-1b*
16	M20A	PIPE_1.5	.104	0	8	.115	2.5		84	17451.0...	23593.5	1105.125	1105.125	2...	H1-1b
17	M26	3/4" Solid R...	.015	56.472	19	.010	56.4...		7	1100.282	14313.8...	178.929	178.929	2...	H1-1b*
18	M29	3/4" Solid R...	.000	0	110	.000	0		110	1100.282	14313.8...	178.929	178.929	1	H1-1a

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		11	39	0
3	Total General		11	39	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	3/4" Solid Rod	8	376.9	.047
7	A53 Gr.B	PIPE_1.5	4	192	.041
8	A53 Gr.B	PIPE_2.0	4	528.7	.153
9	A53 Gr.B	PIPE_2.5	2	252	.115
10	Total HR Steel		18	1349.7	.356

APPENDIX D

ADDITIONAL CALCUATIONS

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

Bolt Calculation Tool, V1.5.1

PROJECT DATA	
Site Name:	WATERFORD
Site Number:	876338
Connection Description:	Mount to Tower

MAXIMUM BOLT LOADS		
Bolt Tension:	3292.22	lbs
Bolt Shear:	1649.32	lbs

WORST CASE BOLT LOADS[1]		
Bolt Tension:	3292.22	lbs
Bolt Shear:	443.69	lbs

WORST CASE CONNECTION SLIP LOADS[2]		
Sliding Force:	1448.87	lbs
Torsion About Leg:	0.00	lbs-ft

BOLT PROPERTIES		
Bolt Type:	Threaded Rod	-
Bolt Diameter:	0.625	in
Bolt Grade:	A307	-
# of Threaded Rods:	2	-
Leg Diameter:	1.25	in
Threads Excluded?	No	-

[1] *Worst case bolt loads correspond to Load combination #32 on member M17 in RISA-3D, which causes the maximum demand on the bolts.*

[2] *Worst Case slip loads correspond to Load combination #32 on member M17 in RISA 3D, which causes the maximum slip demand on the connection.*

Member Information
J nodes of M17, M18

BOLT CHECK		
Tensile Strength	10170.07	
Shear Strength	6902.91	
Max Tensile Usage	32.4%	
Max Shear Usage	23.9%	
Interaction Check (Worst Case)	0.11	***≤1.05***
Result	Pass	

SLIP CHECK (WORST CASE)		
Torsional Slip Resistance	325.04	
Sliding Resistance	6240.74	
Torsional Slip Usage	0.0%	
Sliding Usage	23.2%	
Interaction Check	0.05	***≤1.05***
Result	Pass	

ATTACHMENT 6

EBI Consulting

environmental | engineering | due diligence

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

Dish Wireless Existing Facility

Site ID: 876338

BOBOS00882A
41 Manitock Hill Road
Waterford, Connecticut 06385

May 22, 2022

EBI Project Number: 6222003236

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**34.93%**

May 22, 2022

Attn: Dish Wireless

Emissions Analysis for Site: 876338 - BOBOS00882A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **41 Manitock Hill Road** in **Waterford, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless 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 Wireless antenna facility located at 41 Manitock Hill Road in Waterford, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

2) 4 n70 channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

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

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

5) The antennas used in this modeling are the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector A, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector B, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antenna mounting height centerline of the proposed antennas is 87 feet above ground level (AGL).

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

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

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21
Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz
Gain:	11.35 dBd / 15.75 dBd	Gain:	11.35 dBd / 15.75 dBd	Gain:	11.35 dBd / 15.75 dBd
Height (AGL):	87 feet	Height (AGL):	87 feet	Height (AGL):	87 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	280.00 Watts	Total TX Power (W):	280.00 Watts	Total TX Power (W):	280.00 Watts
ERP (W):	1,424.17	ERP (W):	1,424.17	ERP (W):	1,424.17
Antenna A1 MPE %:	**1.14%**	Antenna B1 MPE %:	**1.14%**	Antenna C1 MPE %:	**1.14%**

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	1.14%
Nextel	0.39%
Sprint	3.09%
Metro PCS	0.69%
AT&T	8.75%
Verizon	17.15%
T-Mobile	3.72%
Site Total MPE % :	34.93%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	1.14%
Dish Wireless Sector B Total:	1.14%
Dish Wireless Sector C Total:	1.14%
Site Total MPE % :	34.93%

Dish Wireless Maximum MPE Power Values (Sector A)

Dish Wireless 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 Wireless 600 MHz n71	4	110.82	87.0	2.43	600 MHz n71	400	0.61%
Dish Wireless 1900 MHz n70	4	245.22	87.0	5.37	1900 MHz n70	1000	0.54%
						Total:	**1.14%**

• 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 Wireless 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 Wireless Sector	Power Density Value (%)
Sector A:	1.14%
Sector B:	1.14%
Sector C:	1.14%
Dish Wireless Maximum MPE % (Sector A):	1.14%
Site Total:	34.93%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **34.93%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

ATTACHMENT 7

CERTIFICATION OF SERVICE

I hereby certify that on the 21st day of June 2022, DISH Wireless, LLC provided notice of its intent to file a Petition for a declaratory ruling that a Certificate of Environmental Compatibility and Public Need is not required for the modification of a wireless telecommunications facility at 41 Manitock Hill Road in Waterford, Connecticut, to the following:

Abutters

Michael S Johnson & Anthony M Siderwic
46 Manitock Hill Rd
Waterford, CT 06385

Mathon Fund I LLC
6328 N 181ST Ave
Waddell, AZ 85355

Town Of Waterford
15 Rope Ferry Rd
Waterford, CT 06385

Benajah Farm Limited Partnership
PO Box 717
Waterford, CT 06385

William F Dawley & Joanne C Dawley
131 Fog Plain Road
Waterford, CT 06385

Owner

City of New London
15 Masonic Dr
New London, CT 06320

Respectfully Submitted,

Victoria Masse
Northeast Site Solutions
420 Main Street #2
Sturbridge, MA 01566

June 21, 2022

VIA USPS CERTIFIED MAIL/
RETURN RECEIPT REQUESTED

City of New London
15 Masonic Dr
New London, CT 06320

RE: Proposed Modification to Existing Wireless Telecommunications Facility at 41 Manitock Hill Road in Waterford, Connecticut

To Whom It May Concern:

I am writing to you on behalf of DISH Wireless, LLC ("DISH"). DISH intends to file with the Connecticut Siting Council ("Council") a petition for declaratory ruling ("Petition") that a Certificate of Environmental Compatibility and Public Need is not required.

The Petition will provide details of the Existing Facility modification and explain why it will have no significant adverse environmental effect.

This letter serves as notice to you as an abutting property owner pursuant to § 16-50j-40 of the Regulations of Connecticut State Agencies. DISH will file the Petition on or about June 21, 2022 and will request that the Council place the Petition on some future agenda.

You may review the Petition at the office of the Council, which is located at Ten Franklin Square, New Britain, Connecticut, 06051, or at the Office of the Town Clerk at the Waterford Town Hall. All inquiries should be addressed to Council or to the undersigned.

Sincerely,

Victoria Masse
Northeast Site Solutions
420 Main Street #2
Sturbridge, MA 01566

7021 2720 0001 5746 2518

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Postage	$0.58
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06/23/2022

Sent To: Michael Johnson / Anthony Sidorwic
Street and Apt. No., or PO Box No.: 46 Manitock Hill Road
City, State, ZIP+4®: Waterford CT 06385

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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City, State, ZIP+4®: Waterford, CT 06385

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Street and Apt. No., or PO Box No.: 15 Masonic Drive
City, State, ZIP+4®: New London, CT 06320

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Postage	$0.58
Total Postage and Fees	$7.38

Postmark Here
06/23/2022

Sent To: Town of Waterford
Street and Apt. No., or PO Box No.: 15 Rope Ferry Road
City, State, ZIP+4®: Waterford, CT 06385

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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Certified Mail Fee	$3.75
Extra Services & Fees (check box, add fee as appropriate)	
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$
Postage	$0.58
Total Postage and Fees	$7.38

Postmark Here
06/23/2022

Sent To: Mathon Fund LLC
Street and Apt. No., or PO Box No.: 0328 N. 181st Ave
City, State, ZIP+4®: Waddell, AZ 85355

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

Text your tracking number to 28777 (2USPS)
to get the latest status. Standard M...

CR DISH

876358 WATERFORD

LINCOLN MALL
560 LINCOLN ST STE 8
WORCESTER, MA 01605-1925
(800)275-8777

06/23/2022 09:49 AM

Product	Qty	Unit Price	Price
First-Class Mail® Letter Waterford, CT 06385 Weight: 0 lb 0.40 oz Estimated Delivery Date Sat 06/25/2022	1		$0.58
Certified Mail® Tracking #: 70212720000157462518			$3.75
Return Receipt Tracking #: 9590 9402 7040 1225 8324 19			$3.05
Total			$7.38
First-Class Mail® Letter Waterford, CT 06385 Weight: 0 lb 0.40 oz Estimated Delivery Date Sat 06/25/2022	1		$0.58
Certified Mail® Tracking #: 70212720000157462501			$3.75
Return Receipt Tracking #: 9590 9402 7040 1225 8324 26			$3.05
Total			$7.38
First-Class Mail® Letter Waterford, CT 06385 Weight: 0 lb 0.40 oz Estimated Delivery Date Sat 06/25/2022	1		$0.58
Certified Mail® Tracking #: 70212720000157462495			$3.75
Return Receipt Tracking #: 9590 9402 7040 1225 8324 40			$3.05
Total			$7.38

First-Class Mail® 1 $0.58
Letter
New London, CT 06320
Weight: 0 lb 0.40 oz
Estimated Delivery Date
Sat 06/25/2022
Certified Mail® $3.75
Tracking #:
70212720000157462464
Return Receipt $3.05
Tracking #:
9590 9402 7040 1225 8324 57
Total $7.38

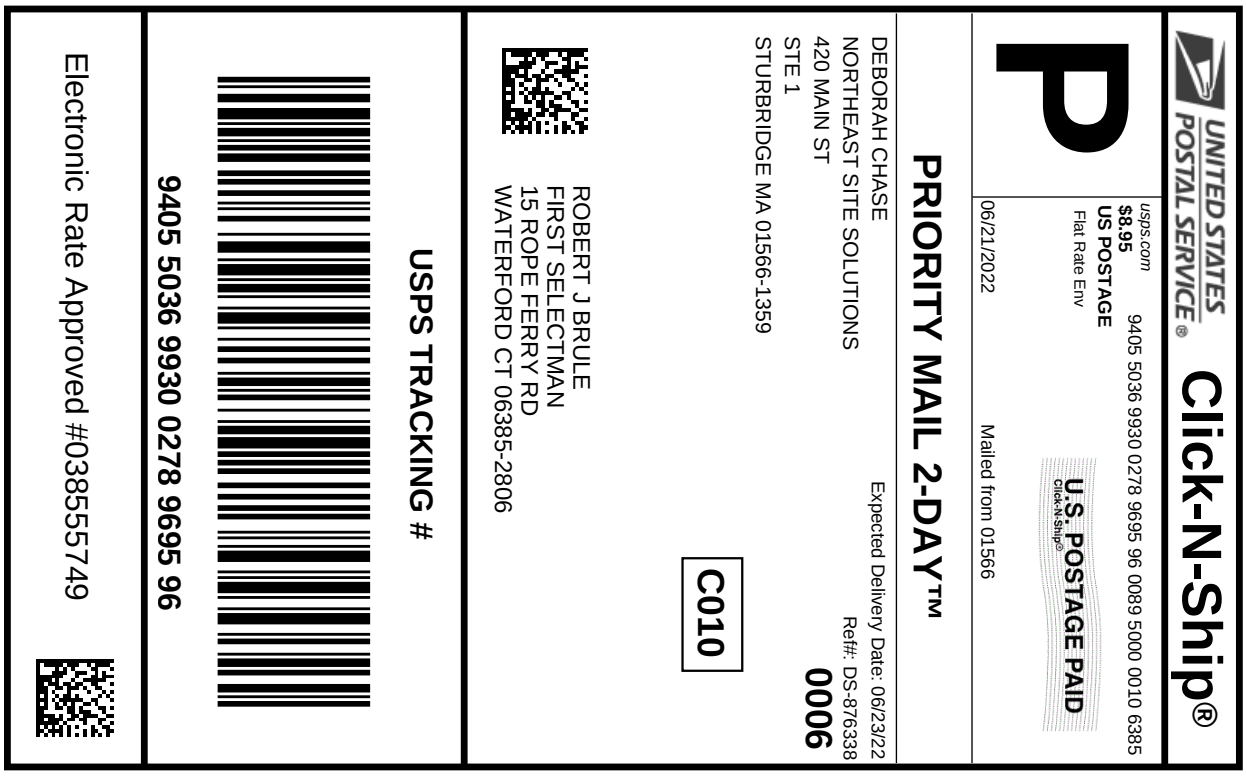
First-Class Mail® 1 $0.58
Letter
Waddell, AZ 85355
Weight: 0 lb 0.40 oz
Estimated Delivery Date
Tue 06/28/2022
Certified Mail® $3.75
Tracking #:
70212720000157462471
Return Receipt $3.05
Tracking #:
9590 9402 6930 1104 6427 85
Total $7.38

First-Class Mail® 1 $0.58
Letter
Waterford, CT 06385
Weight: 0 lb 0.40 oz
Estimated Delivery Date
Sat 06/25/2022
Certified Mail® $3.75
Tracking #:
70212720000157462488
Return Receipt $3.05
Tracking #:
9590 9402 7040 1225 8324 33
Total $7.38

Grand Total: $44.28

Credit Card Remitted $44.28
Card Name: VISA
Account #: XXXXXXXXXXXX7594
Approval #: 08056G
Transaction #: 508
AID: A0000000031010 Chip
AL: VISA CREDIT
PIN: Not Required CHASE VISA

Every household in the U.S. is now eligible to receive a third set of 8 free test kits.
Go to www.covidtests.gov



Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0278 9695 96

Trans. #:	566086187
Print Date:	06/21/2022
Ship Date:	06/21/2022
Expected Delivery Date:	06/23/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

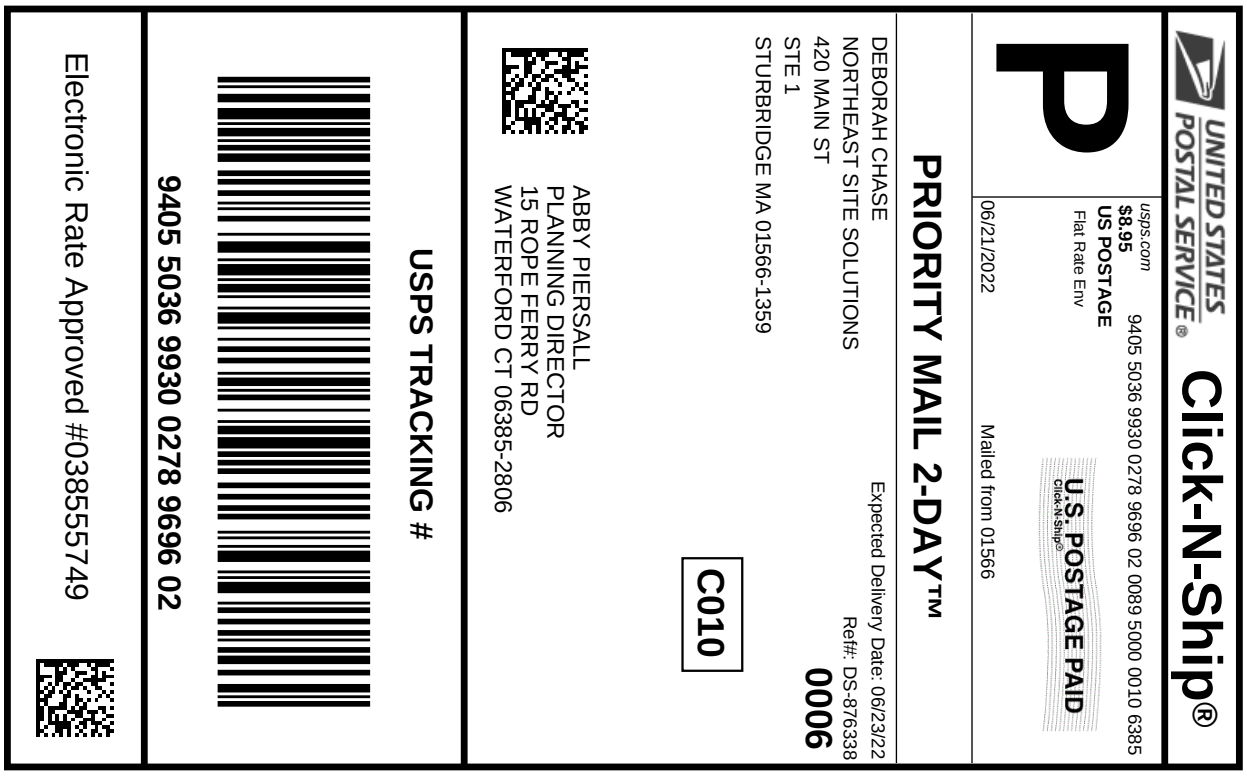
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DS-876338

To: ROBERT J BRULE
FIRST SELECTMAN
15 ROPE FERRY RD
WATERFORD CT 06385-2806

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com



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5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0278 9696 02

Trans. #:	566086187
Print Date:	06/21/2022
Ship Date:	06/21/2022
Expected Delivery Date:	06/23/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DS-876338

To: ABBY PIERSALL
PLANNING DIRECTOR
15 ROPE FERRY RD
WATERFORD CT 06385-2806

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Thank you for shipping with the United States Postal Service!
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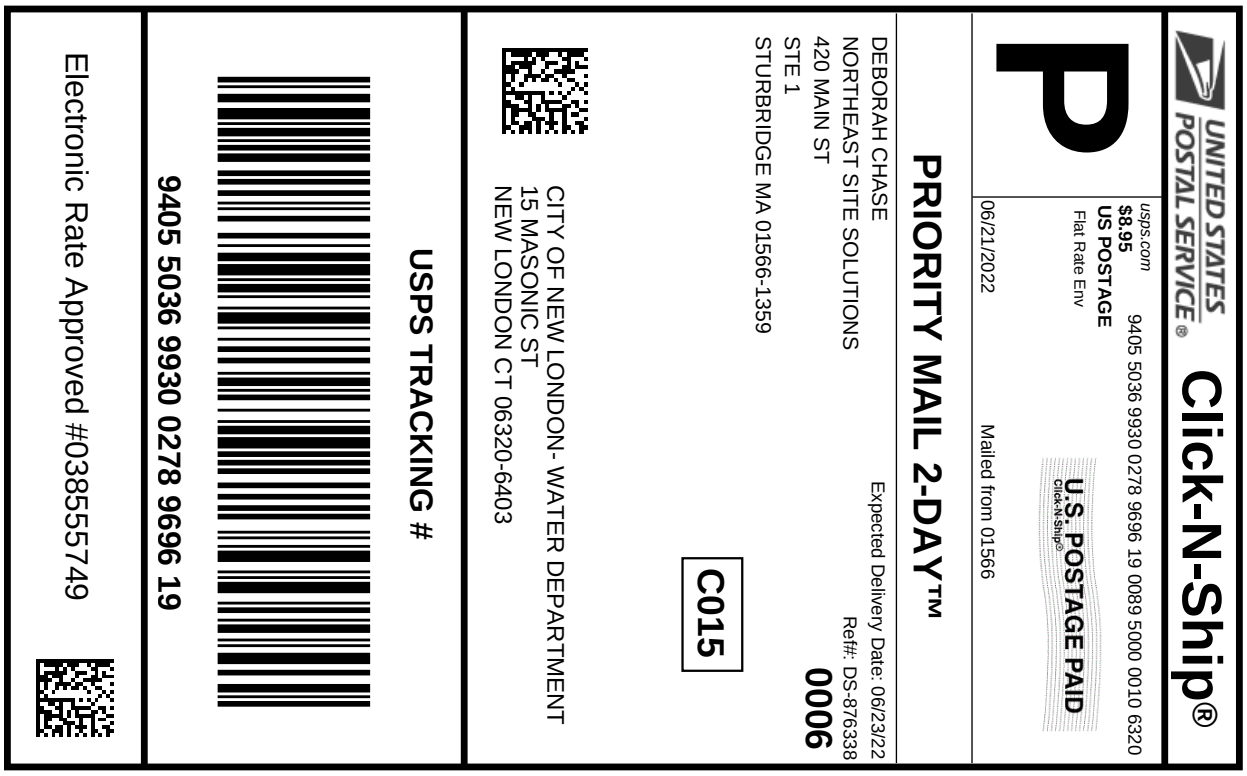

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0278 9696 19

Trans. #:	566086187
Print Date:	06/21/2022
Ship Date:	06/21/2022
Expected Delivery Date:	06/23/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DS-876338

To: CITY OF NEW LONDON- WATER DEPARTMENT
15 MASONIC ST
NEW LONDON CT 06320-6403

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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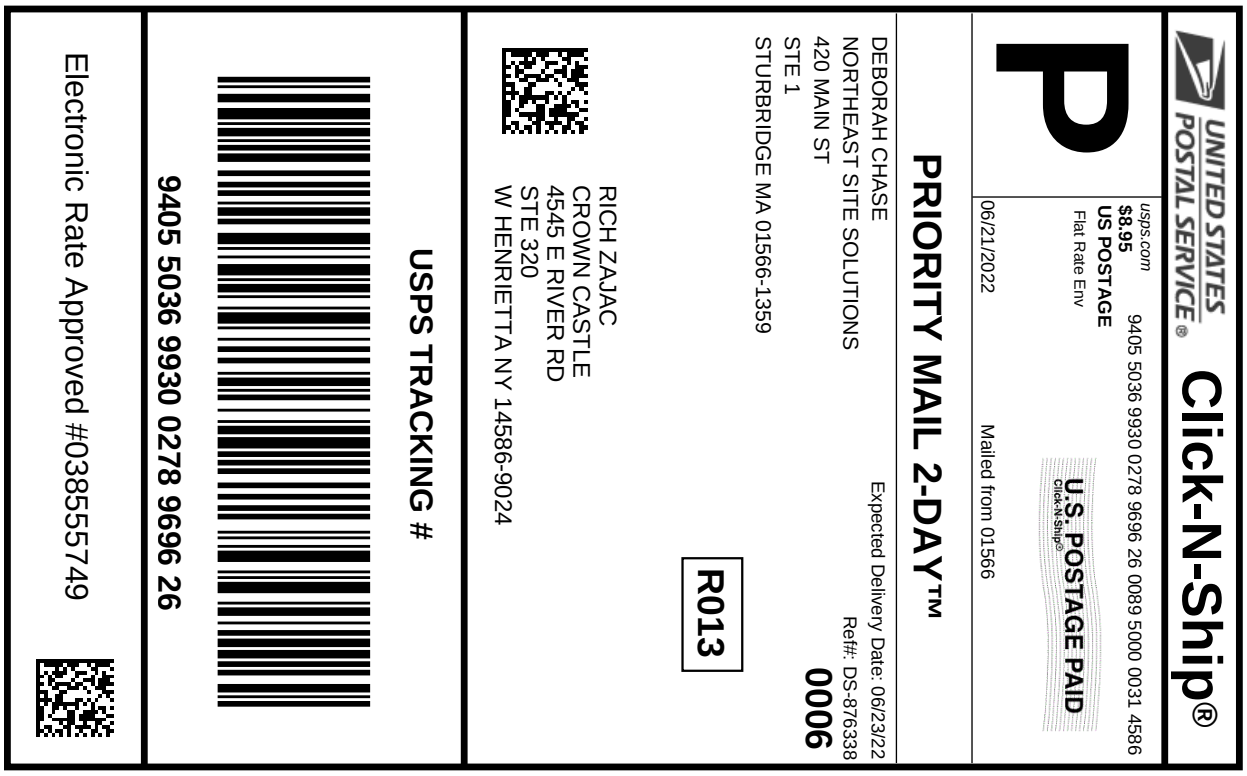

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0278 9696 26

Trans. #:	566086187
Print Date:	06/21/2022
Ship Date:	06/21/2022
Expected Delivery Date:	06/23/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DS-876338

To: RICH ZAJAC
CROWN CASTLE
4545 E RIVER RD
STE 320
W HENRIETTA NY 14586-9024

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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UNITED STATES POSTAL SERVICE.

FARMINGTON
210 MAIN ST
FARMINGTON, CT 06032-9998
(800)275-8777

06/23/2022 04:39 PM

Product	Qty	Unit Price	Price
Prepaid Mail West Henrietta, NY 14586 Weight: 0 lb 2.00 oz Acceptance Date: Thu 06/23/2022 Tracking #: 9405 5036 9930 0278 9696 26	1		$0.00
Prepaid Mail Waterford, CT 06385 Weight: 0 lb 12.80 oz Acceptance Date: Thu 06/23/2022 Tracking #: 9405 5036 9930 0278 9696 02	1		$0.00
Prepaid Mail New London, CT 06320 Weight: 0 lb 12.90 oz Acceptance Date: Thu 06/23/2022 Tracking #: 9405 5036 9930 0278 9696 19	1		$0.00
Prepaid Mail Waterford, CT 06385 Weight: 0 lb 12.90 oz Acceptance Date: Thu 06/23/2022 Tracking #: 9405 5036 9930 0278 9695 96	1		$0.00
Grand Total:			$0.00

****
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eligible to receive a third set
of 8 free test kits.
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