NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
4 Angela's Way, Burlington CT 06013
203-435-3640
denise@northeastsitesolutions.com

May 18, 2022

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Tower Share Application
1440 Main Street North, Woodbury, CT 06798
Latitude: 41.589936
Longitude: -73.169872
Site #: 876379_Crown_Dish

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 1440 Main Street North, Woodbury, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 MHz 5G antennas and six (6) RRUs, at the 140-foot level of the existing 163-foot tower, one (1) Fiber cable will also be installed. Dish Wireless LLC equipment cabinets will be placed within a 7' x 5' lease area within the existing fenced compound. Included are plans by NB+C, dated February 24, 2022, Exhibit C. Also included is a structural analysis prepared by Crown Castle, dated August 27, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was originally approved by the Town of Woodbury Zoning Commission on August 10, 1999, see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Barbara Perkinson, First Selectman and William Agresta, Town Planner for the Town of Woodbury, as well as the tower owner (Crown Castle) and property owner (Tikva Wolff).

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the existing tower is 163-feet and the Dish Wireless LLC antennas will be located at a centerline height of 140-feet.

2. The proposed modifications will not result in an increase of the site boundary as depicted on the attached site plan.

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3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. The combined site operations will result in a total power density of 24.54% as evidenced by Exhibit F.

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, Dish Wireless LLC respectfully submits that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing tower has been deemed structurally capable of supporting Dish Wireless LLC proposed loading. The structural analysis is included as Exhibit D.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this tower in Woodbury. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish Wireless LLC to obtain a building permit for the proposed installation. Further, a Letter of Authorization is included as Exhibit G, authorizing Dish Wireless LLC to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 140-foot level of the existing 163-foot tower would have an insignificant visual impact on the area around the tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. Dish Wireless LLC will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist Dish Wireless LLC with this tower sharing application.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Dish Wireless LLC proposed loading. Dish Wireless LLC is not aware of any public safety concerns relative to the proposed sharing of the existing tower. Dish Wireless LLC intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Woodbury.

Sincerely,

Denise Sabo

Denise Sabo
Mobile: 203-435-3640
Fax: 413-521-0558
Office: 4 Angela's Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com

NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

Attachments

Cc: Barbara Perkinson, First Selectman
281 Main St South
Woodbury, CT 06798

William Agresta, Town Planner
281 Main St South
Woodbury, CT 06798

Tikva Wolff - Property Owner
c/o Crown Castle
4017 Washington Road
McMurray, PA 15317

Crown Castle- Tower Owner

Exhibit A

Original Facility Approval

Zoning Commission

P.O. Box 369
Town of Woodbury - Woodbury, Connecticut 06798-0369

First land deed from the Indians
April 12th 1659

Telephone: (203) 263-3467
Fax: (203) 263-5076

VOICES
Middle Quarter Mall
Main Street South
Woodbury, CT 06798

Kindly publish the following legal notice in VOICES on Sunday, August 22, 1999. The invoice should be sent to the Accounting Office, 281 Main Street S. Box #369, Woodbury, CT 06798 with a tear-sheet copy for the Town Planner's Office.

LEGAL NOTICE

At its regular meeting held on Tuesday, August 10, 1999, the Woodbury Zoning Commission took the following actions:

X APPROVED: With conditions, Application #969 submitted by Sprint Spectrum, LP, d/b/a Sprint PCS to construct a radio · tower/wireless telecommunications facility at 1440 Main St. N., Richard Wolff, property owner. (Map 12/Lot 54)

APPROVED: With conditions, Application #973 submitted by Watertown Fire District for an Earth Materials Permit for gravel excavation from Nonnewaug River, Hart Farm Wellfield on Rte. 61. (Map 14/Lots 10, 32, 32A –B, 33)

DENIED: To deny without prejudice Application #971 for lack of information submitted by Woodbury Fire Dept. for Earth Materials Permit for a fire pond at 274 Grassy Hill Rd., Richard Wolff, property owner. (Map 64/Lot 12).

APPROVED: With conditions, Application #976 submitted by Flanders Nature Center, Inc. for a Special Permit to hold a fall festival at the Van Vleck Farm Sanctuary on Flanders Rd and Church Hill Rd on October 3, 1999. (Map 96/Lots 21, 22, 23)

Dated this 20th day of August, 1999.

Sue Bartlett

Sue Bartlett, Admin. Asst.

A letter of 8/10/99 from Ken Faroni of O & G was submitted granting a 65-day extension.

(Tietz unseated, Alt. Leach seated)
#969/Sprint Spectrum/Wolff/1440 Main St. N/Wireless TeleComm. Facility
MOTION:
WHEREAS, the WOODBURY ZONING COMMISSION has received Application #969 submitted by Sprint Spectrum, L.P., d/b/a Sprint PCS for a Special Permit pursuant to Section 5.2.4 of the Woodbury Zoning Regulations to construct a radio tower/wireless telecommunications facility and associated radio equipment on property owned by Richard Wolff at 1440 Main Street North (Tax Assessor's Map 12/Lot 54); and

WHEREAS, members of the Commission inspected the site at a duly noticed special meeting on July 6, 1999; and

WHEREAS, a duly called public hearing was held June 22, 1999 and July 13, 1999 to consider the application and to receive public comments; and

WHEREAS, the Commission has carefully considered all the information and testimony received during the duly called public hearing; and

WHEREAS, the Commission has determined that the proposed radio tower/telecommunications facility and associated radio equipment are in conformance with Section 5.2.4 of the Woodbury Zoning Regulations after conditions 6 and 7 below, are met;

NOW THEREFORE BE IT RESOLVED that the WOODBURY ZONING COMMISSION approves Application #969 submitted by Sprint Spectrum, L.P., d/b/a Sprint PCS for a Special Permit pursuant to Section 5.2.4 of the Woodbury Zoning Regulations to construct a radio tower/telecommunications facility and associated radio equipment on property owned by Richard Wolff at 1440 Main Street North (Tax Assessor's Map 12/Lot 54) as depicted on the site plans and accompanying materials dated June 17, 1999, with the following conditions:

1. A final site development plan, annotated with all conditions herein, shall be filed with the Town Planner prior to commencement of construction;
2. An itemized estimate of costs for soil erosion and sedimentation control, screening, landscaping, and tower removal and site restoration must be provided to the Woodbury Town Planner (Town Planner) for determination of an appropriate bond and such bond shall be posted in a form and amount determined by the Town Planner, prior to commencement of construction;
3. The Town Planner shall be notified 48 hours prior to commencement of construction to permit inspection of soil erosion and sedimentation control devices;

4. The tower and enclosure area shall be designed to accommodate up to six providers of telecommunications services, with all ground equipment enclosed in a single building and the enclosure secured and screened in manner that is architecturally compatible with surrounding farm;
5. All electric and telephone service to the tower and building shall be installed below ground.
6. The galvanized steel tower shall not exceed 160 feet above grade in height, shall have no lights above the height of the building, screening, or fence, and shall not be painted. Any future extension of the tower to accommodate additional antennas or addition of any facilities other than shown on the approved site plan shall require an amendment to this Special Permit as provided in Section 10.6 of the Woodbury Zoning Regulations, however, an extension of the tower from 160 feet to 190 feet shall be deemed to be of a minor nature;
7. The tower shall be located no closer than 190 feet from any property line along Main Street North and Swamp Road.
8. Sprint shall use best efforts to make the tower available to other telecommunications carriers and promote co-location on this tower on a commercially reasonable basis;
9. In the event the wireless telecommunications facility ceases to be used by Sprint PCS or any bona fide tenant providers of telecommunication services for a period of a year, the tower and all associated equipment and structures shall be removed by Sprint PCS within 90 days.;
10. Construction shall not commence until all applicable appeal periods have terminated and this permit will expire if construction is not completed by August 10, 2001; and
11. An A2, as-built survey shall be filed with the Town Planner upon completion of construction.

Made by Kelly, seconded by Alt. Leach.
Vote 5-0 in favor.

(Tietz unseated, Alt. Leach seated)

#973/Watertown Fire District/Hart Farm Wellfield/Rte 61/EM Permit

MOTION:

WHEREAS, the WOODBURY ZONING COMMISSION has received Application #973 submitted by the Watertown Fire District for an Earth Materials Permit pursuant to Section 15.3 of the Woodbury Zoning Regulations to excavate up to 4500 cubic yards of gravel from the Nonnewaug River (Tax Assessor's Map 14/Lots 10, 32, 32A, 32B, 33); and

WHEREAS, the Woodbury Inland Wetlands Agency approved the regulated activity on August 9, 1999; and

WHEREAS, a duly called public hearing was held July 27, 1999 and August 10, 1999 to consider the application and to receive public comments; and

Exhibit B

Property Card

Town of Woodbury, CT

Property Listing Report

Map Block Lot	012-054	Building #	Unique Identifier	390820

Property Information

Property Location	1440 MAIN ST NORTH
Mailing Address	4017 WASHINGTON ROAD MCMURRAY PA 15317
Land Use	Utility Building
Zoning Code	OS60
Neighborhood	26

Owner	WOLFF TIKVA
Co-Owner	
Book / Page	0384/1171
Land Class	Industrial
Census Tract	3621
Acreage	1.38

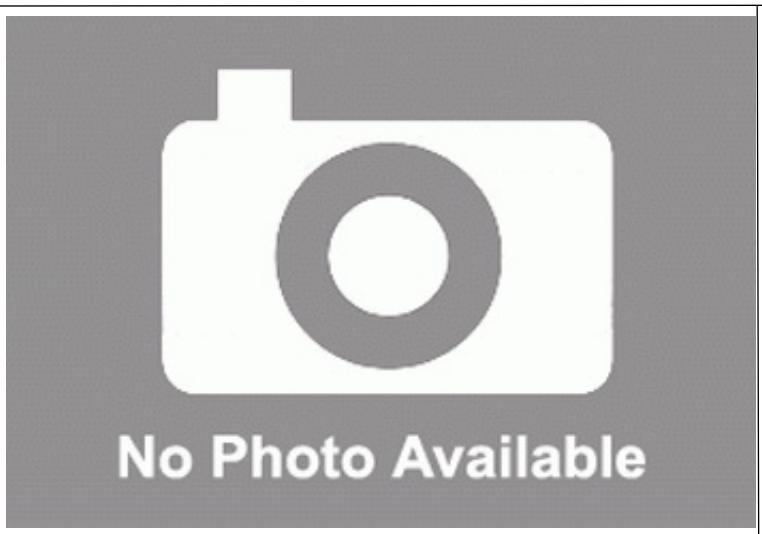
Valuation Summary

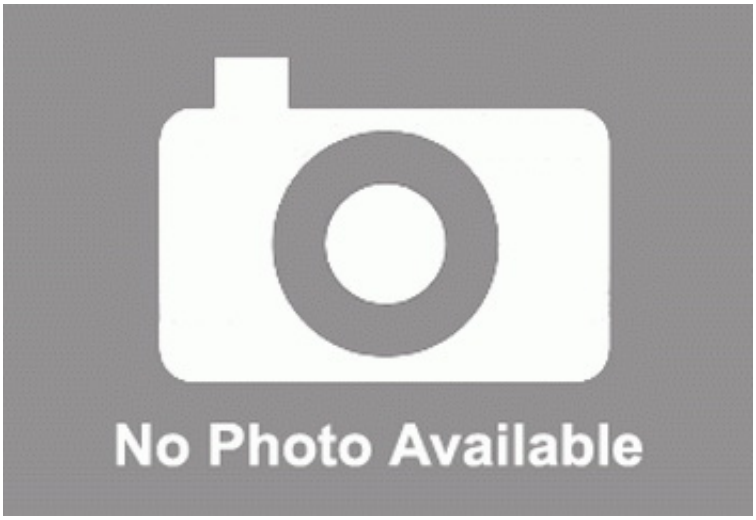
(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Outbuildings	384068	268850
Land	131100	91770
Total	515168	0

Utility Information

Electric	No
Gas	No
Sewer	No
Public Water	No
Well	No





Primary Construction Details

Year Built	
Building Desc.	
Building Style	
Stories	
Exterior Walls	
Exterior Walls 2	
Interior Walls	
Interior Walls 2	
Interior Floors 1	
Interior Floors 2	

Heating Fuel	
Heating Type	
AC Type	
Bedrooms	
Full Bathrooms	
Half Bathrooms	
Extra Fixtures	
Total Rooms	
Bath Style	
Kitchen Style	
Occupancy	

Building Use	
Building Condition	
Frame Type	
Fireplaces	
Bsmt Gar	
Fin Bsmt Area	
Fin Bsmt Quality	
Building Grade	
Roof Style	
Roof Cover	

Report Created On 8/12/2021

Town of Woodbury, CT

Property Listing Report | Map Block Lot: 012-054 | Building #: | Unique Identifier: 390820

Detached Outbuildings

Type	Description	Area (sq ft)	Condition	Year Built
Cell Towers	Building/Equipment	300	Average	2000
Cell Towers	Building/Equipment	392	Average	2000
Cell Towers	Mono Pole	120	Average	2000
Cell Towers	Building/Equipment	420	Average	2000
Cell Towers	Building/Equipment	400	Average	2000
Cell Towers	Fencing	400	Average	2000

Attached Extra Features

Type	Description	Area (sq ft)	Condition	Year Built

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
WOLFF TIKVA	0384_1171	9/29/2011	0
WOLFF RICHARD ESTATE OF	343_ 526	5/25/2006	0

Report Created On 8/12/2021

Exhibit C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

BOHVN00030A

DISH Wireless L.L.C. SITE ADDRESS:

1440 MAIN STREET NORTH
WOODBURY, CT 06798

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 (1) PROPOSED ANTENNA PLATFORM MOUNT
- 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 FIF RACK
- 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)

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

811

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:	TIKVA WOLFF
ADDRESS:	1514 MAIN ST. NORTH WOODBURY, CT 06798
TOWER TYPE:	MONOPOLE
TOWER CO SITE ID:	876379
TOWER APP NUMBER:	553370
COUNTY:	LITCHFIELD
LATITUDE (NAD 83):	41° 35' 23.81" N 41.58995 N
LONGITUDE (NAD 83):	-73° 10' 11.52" W -73.16987 W
ZONING JURISDICTION:	TOWN OF WOODBURY
ZONING DISTRICT:	OS-60 - OPEN SPACE RESIDENCE
PARCEL NUMBER:	WOOD-000012-000000 -000054-390820
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	CONNECTICUT LIGHT & POWER CO
TELEPHONE COMPANY:	TBD

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:	DIPESH PARIKH DIPESH.PARIKH@DISH.COM

DIRECTIONS

DIRECTIONS FROM WATERBURY-OXFORD AIRPORT:

START OUT GOING NORTHEAST ON CHRISTIAN ST TOWARD JULIANO DR. TURN SLIGHT RIGHT ONTO CHRISTIAN RD. TURN RIGHT ONTO SOUTHFORD RD/CT-188. TURN LEFT ONTO MIDDLEBURY RD/CT-64. STAY STRAIGHT TO GO ONTO TRANQUILITY RD. TRANQUILITY RD BECOMES OLD WATERTOWN RD. OLD WATERTOWN RD BECOMES QUASSAPAUG RD. TURN LEFT ONTO SWAMP RD. TURN LEFT ONTO MAIN ST/US-6 W. 1440 MAIN ST N IS ON THE LEFT.

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

02/24/2022

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	01/31/2022	ISSUED FOR CONSTRUCTION
1	02/24/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

876379

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE

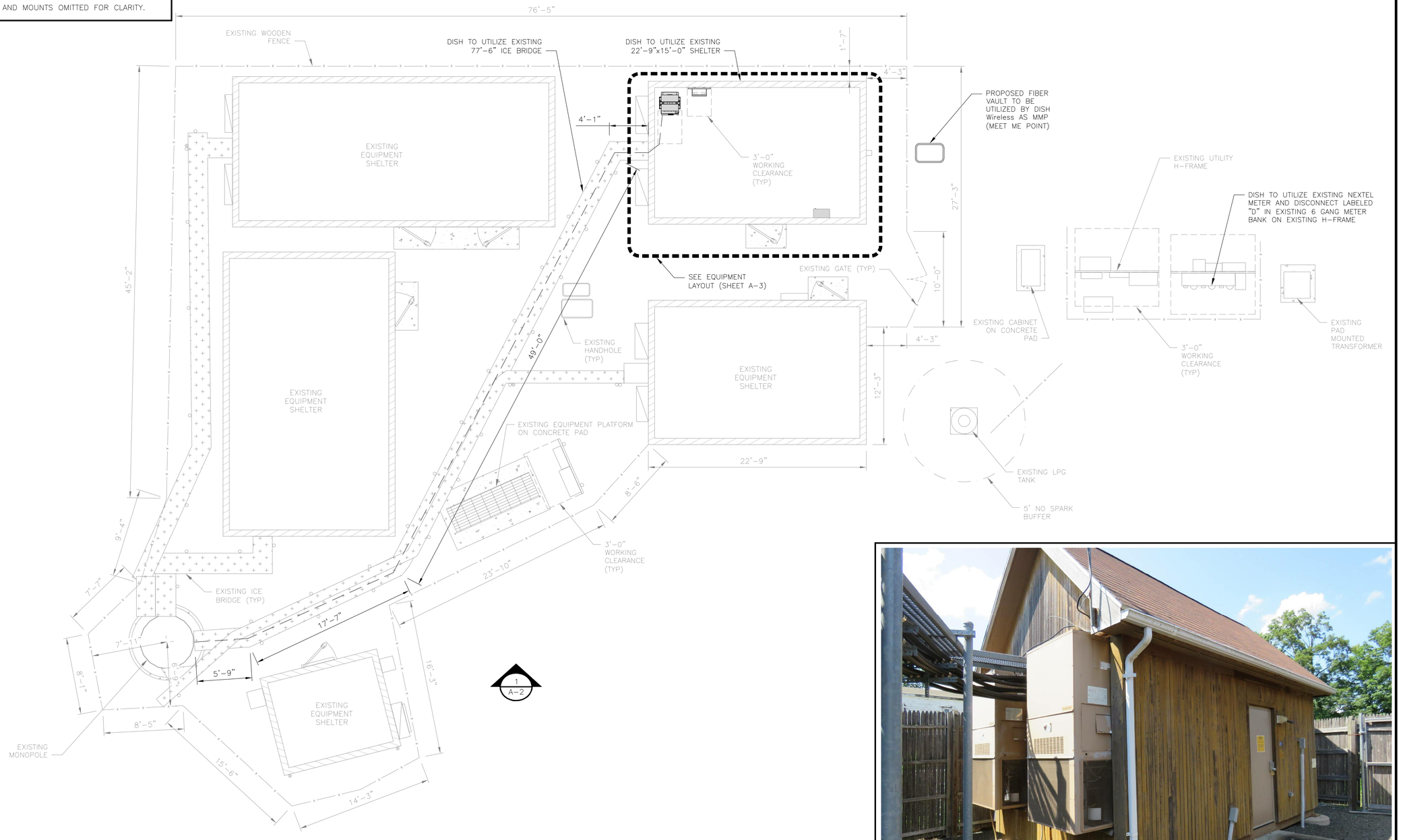
TITLE SHEET

SHEET NUMBER

T-1

NOTES

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



N

OVERALL SITE PLAN

6' 4' 2' 0 5' 10'
3/16"=1'-0"

1

AERIAL VIEW

1

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

02/24/2022

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

BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE

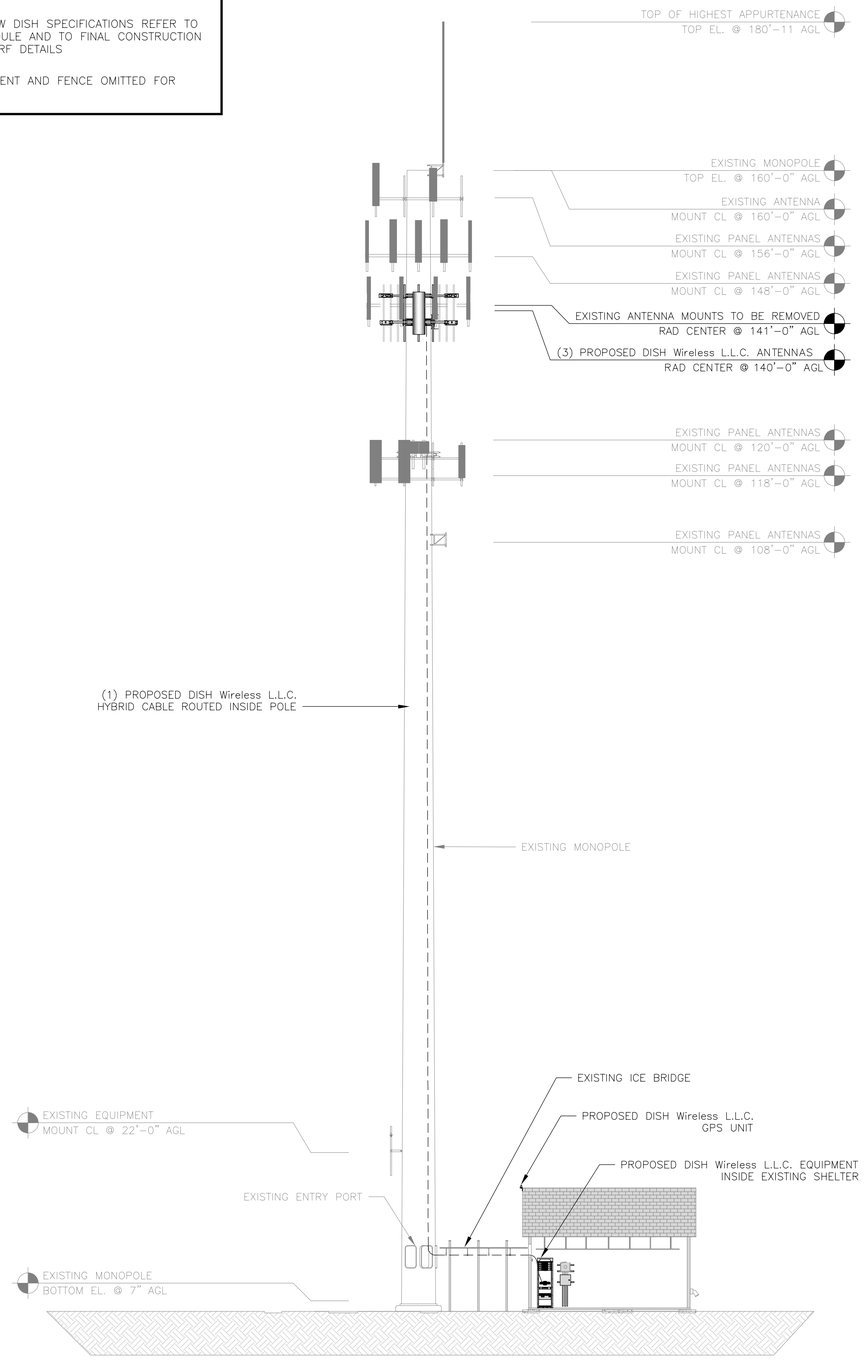
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

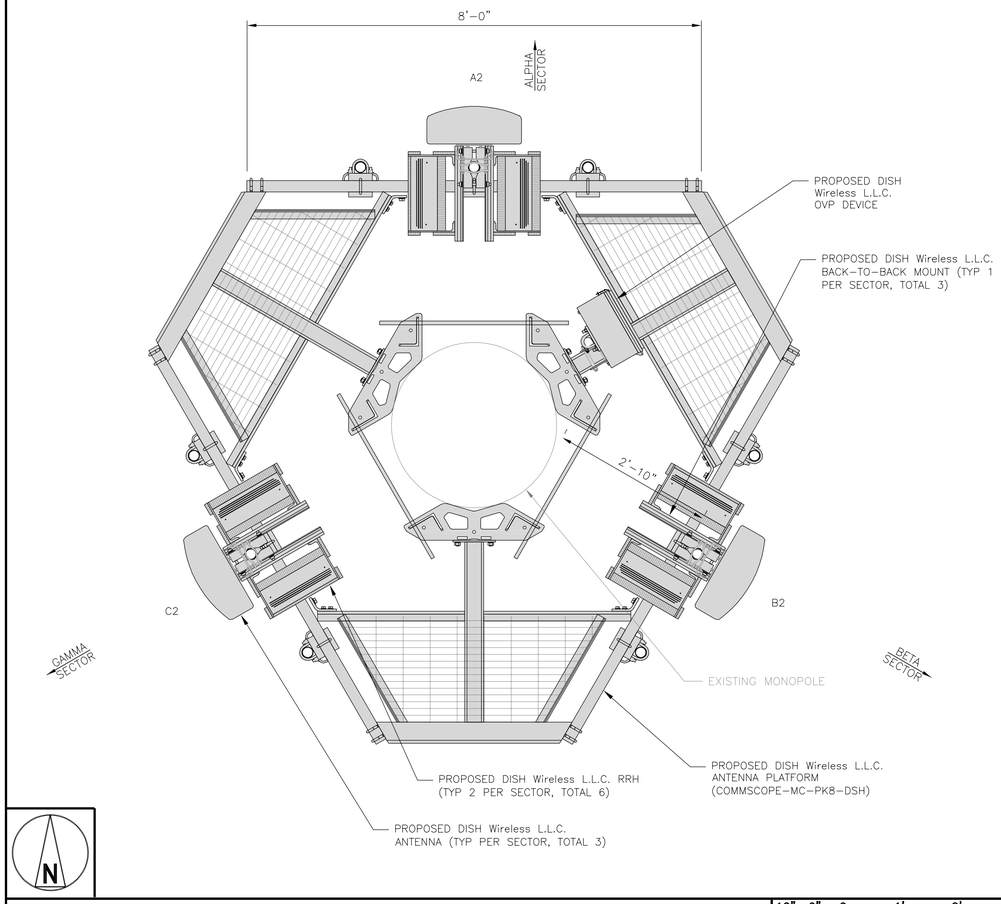
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED EAST ELEVATION

6' 4' 2' 0 5' 10'
3/16"=1'-0"

1



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 1.5" DIA. HYBRID CABLE (249' LONG)	FUJITSU – TA08025-B604	5G	A2	RAYCAP – RDIDC-9181-PF-48
A2	PROPOSED	JMA – MX08FR0665-21	5G	0°	140'-0"		FUJITSU – TA08025-B605	5G	A2	
A3	--	--	--	--	--		--	--	--	
B1	--	--	--	--	--	SHARED W/ALPHA	FUJITSU – TA08025-B604	5G	B2	SHARED W/ALPHA
B2	PROPOSED	JMA – MX08FR0665-21	5G	120°	140'-0"		FUJITSU – TA08025-B605	5G	B2	
B3	--	--	--	--	--		--	--	--	
C1	--	--	--	--	--	SHARED W/ALPHA	FUJITSU – TA08025-B604	5G	C2	SHARED W/ALPHA
C2	PROPOSED	JMA – MX08FR0665-21	5G	240°	140'-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
ELKRIDGE, MD 21075
(410) 712-7092

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

02/24/2022

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

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A&E PROJECT NUMBER

876379

DISH Wireless L.L.C.
PROJECT INFORMATION

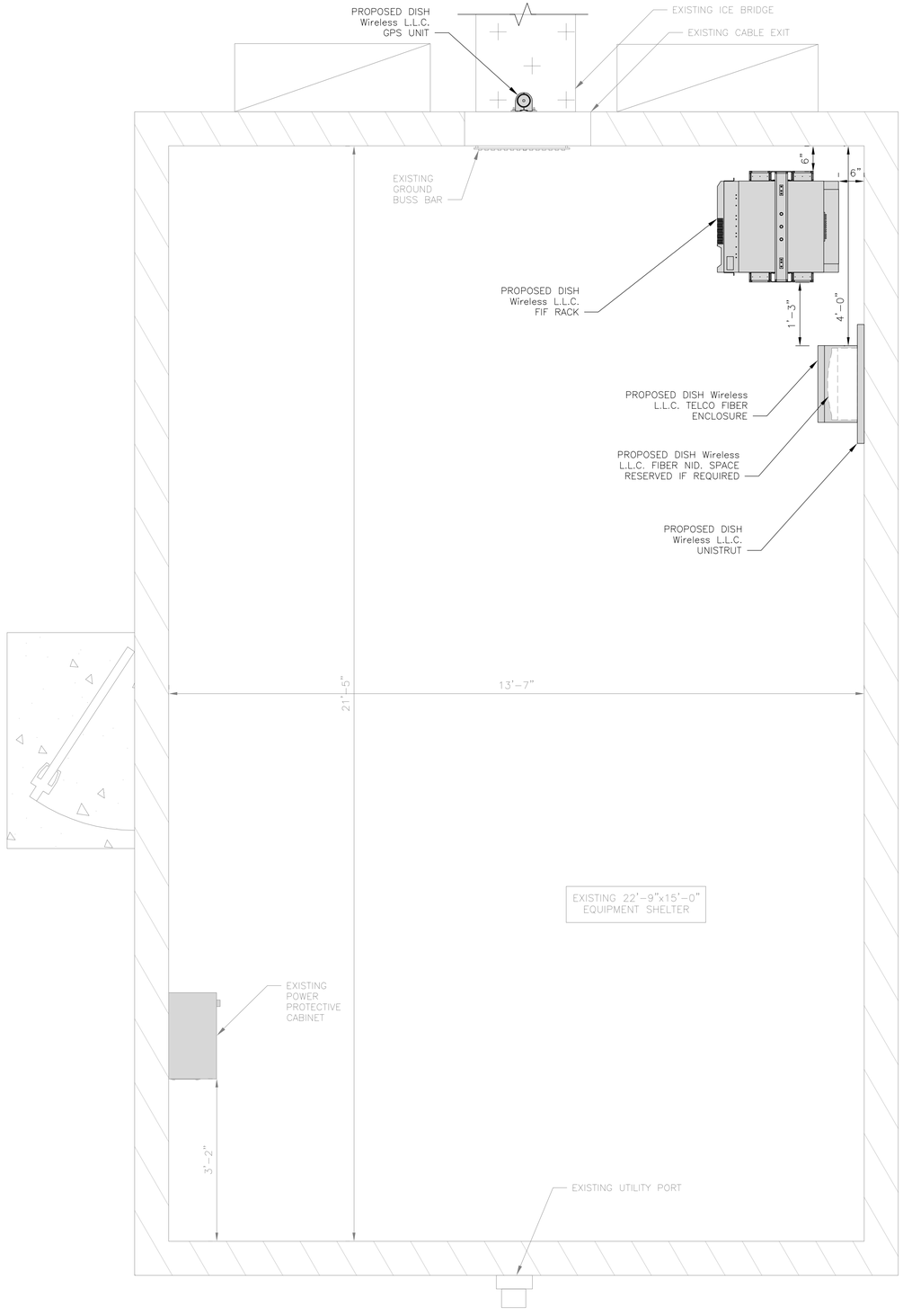
BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

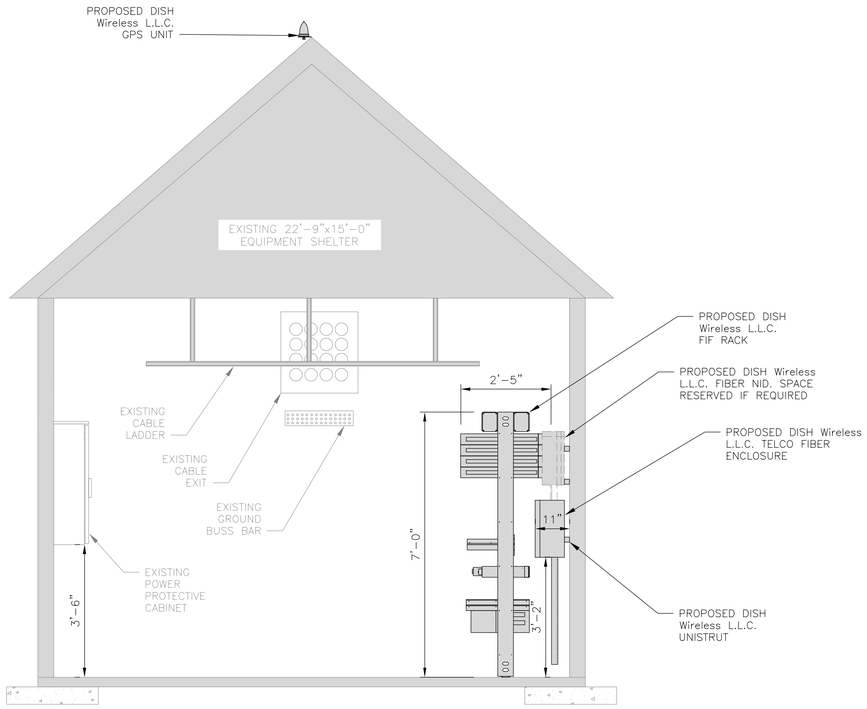
A-2



EQUIPMENT PLAN

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

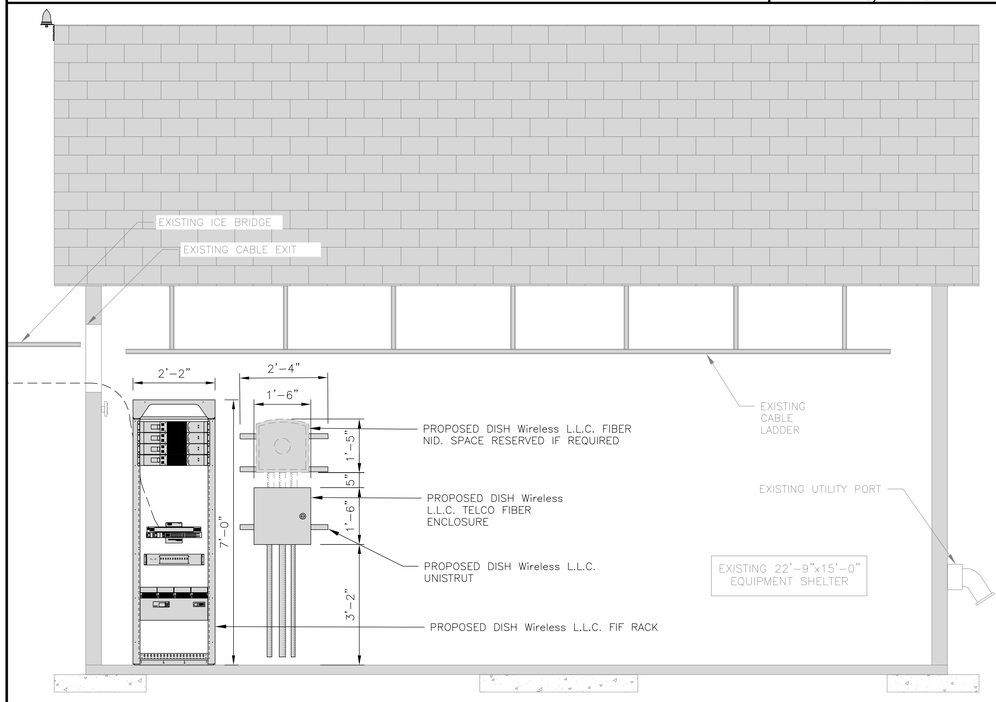
1



NORTH EQUIPMENT ELEVATION

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

2



EAST EQUIPMENT ELEVATION

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

3

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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

02/24/2022

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
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1	02/24/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

876379

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE

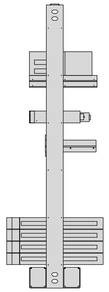
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER

A-3

FIF RACK LOADED	
DIMENSIONS (HxWxD):	83.99"x26"x28.5"
WEIGHT:	±800 lbs

PLAN



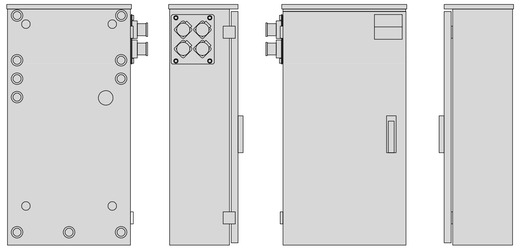
SIDE

FRONT

FIF RACK 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

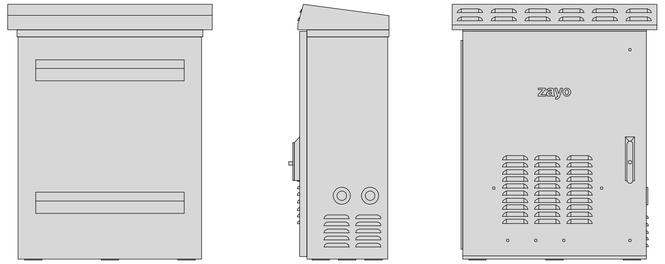


BACK SIDE FRONT SIDE

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

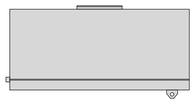
BOTTOM



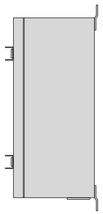
BACK SIDE FRONT

FIBER NID ENCLOSURE DETAIL | NO SCALE | 3

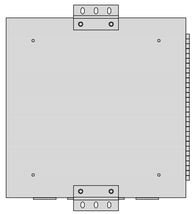
CHARLES CFIT-PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



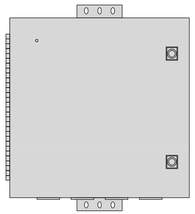
FRONT



SIDE

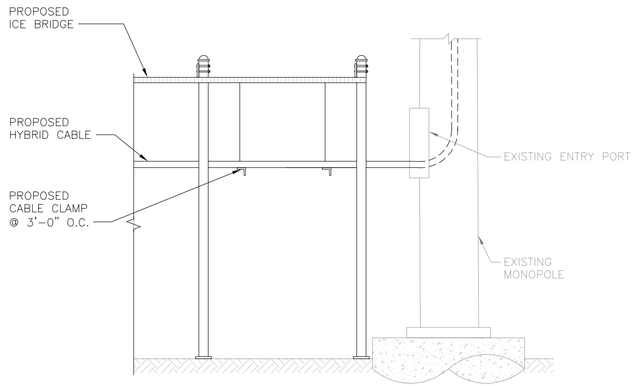


BACK



FRONT

FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 4



HYBRID CABLE RUN | 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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STATE OF CONNECTICUT
PEN.0028997
LICENSED PROFESSIONAL ENGINEER

02/24/2022

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

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

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

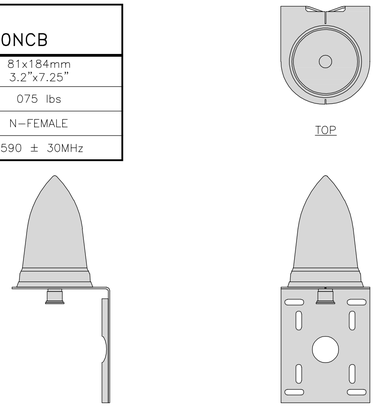
SHEET TITLE

EQUIPMENT DETAILS

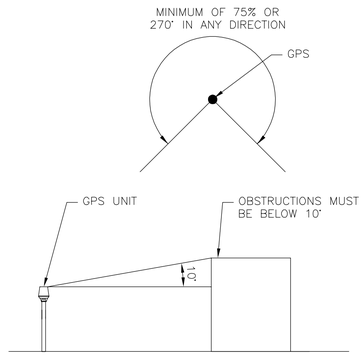
SHEET NUMBER

A-4

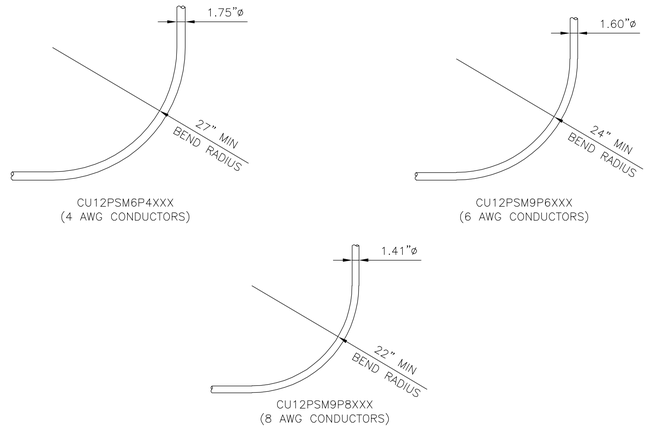
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



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 #:	BOHVN00030A	
TWR TYPE:	MONOPOLE	
HYBRID BEND RADIUS	30"	The preparer must determine the lengths below.
RAD CENTER (ft)	140.0	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)	77.5	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)	249	

HYBRID CABLE CALCULATOR | 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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DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

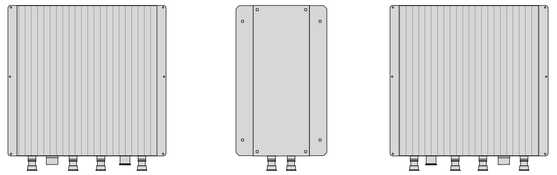
SHEET TITLE
EQUIPMENT DETAILS

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

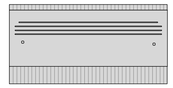


BACK SIDE FRONT

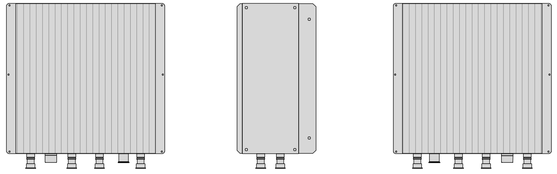
RRH DETAIL | NO SCALE | 1

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



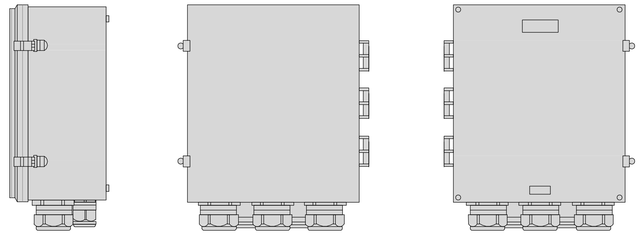
BACK SIDE FRONT

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

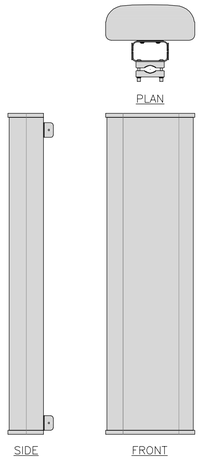


SIDE BACK FRONT

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

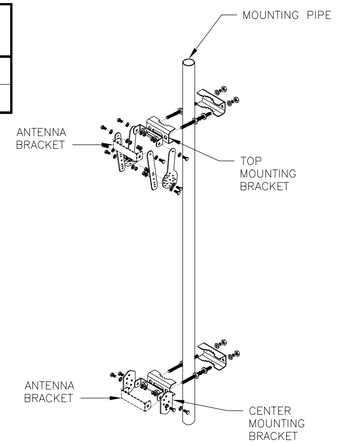
JMA ANTENNA MOUNT BRACKET #91900318

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

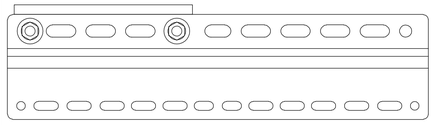


ANTENNA BRACKET DETAIL | NO SCALE | 5

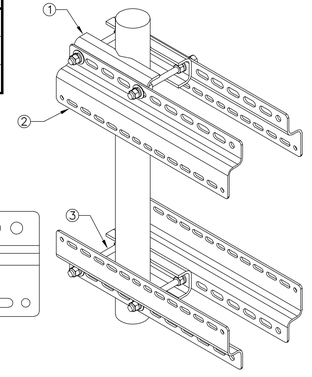
SABRE DOUBLE Z-BRACKET C10123155

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"



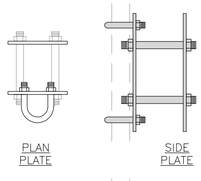
NOTE:
OR DISH Wireless L.L.C. APPROVED EQUIVALENT



RRH MOUNT DETAIL | NO SCALE | 6

COMMSCOPE XP-2040 CROSSOVER PLATE

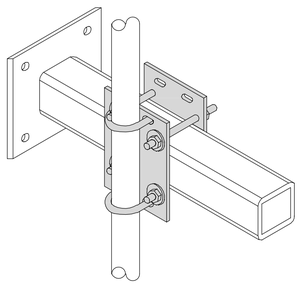
DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs



PLAN PLATE SIDE PLATE

PLAN U-BOLT SIDE U-BOLT

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

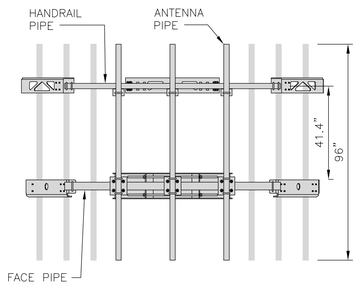


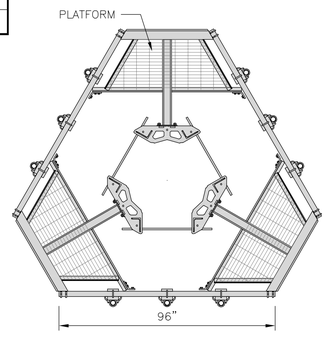
RRH/OVP MOUNT DETAIL | NO SCALE | 7

COMMSCOPE MC-PK8-DSH

FACE WIDTH	96"
WEIGHT	1373.08 lbs
NOTE: 15" TO 38" O.D.	

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





ANTENNA PLATFORM DETAIL | NO SCALE | 8

NOT USED | NO SCALE | 9

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STATE OF CONNECTICUT KRUPAKARAN KOLANDAIVELU PEN.0028997 LICENSED PROFESSIONAL ENGINEER

02/24/2022

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PROJECT INFORMATION

BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE

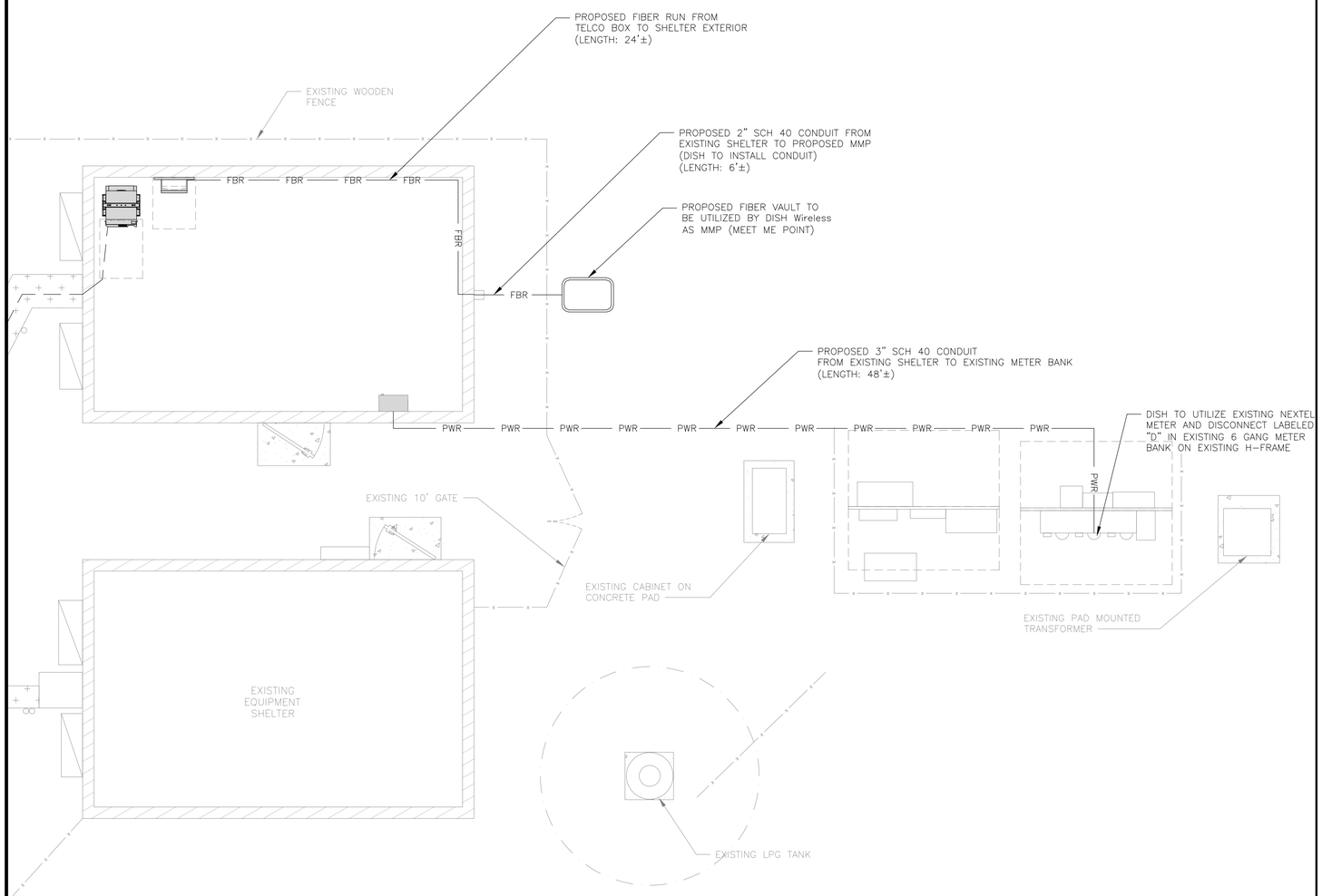
EQUIPMENT DETAILS

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"

1

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

2

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A&E PROJECT NUMBER

876379

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE

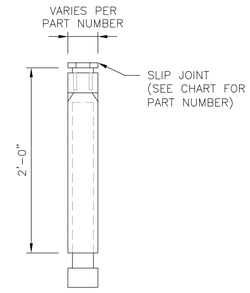
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

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"

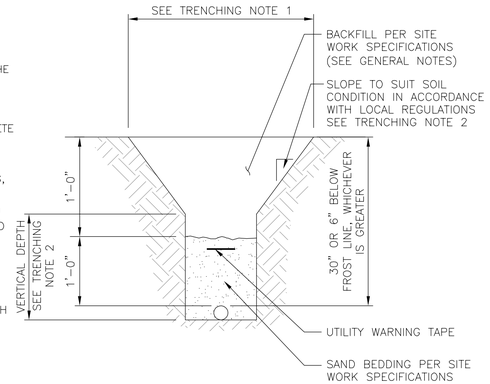


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

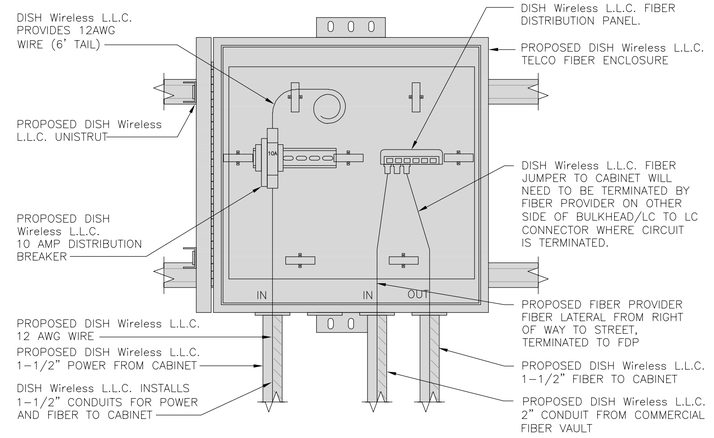
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

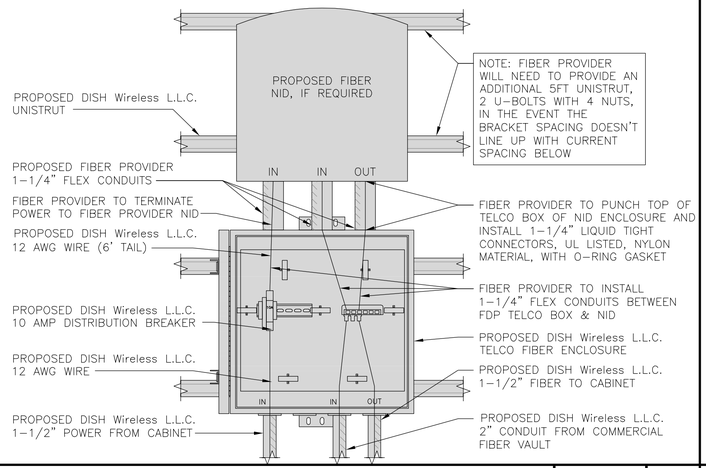
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT 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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STATE OF CONNECTICUT
KRUPAKARAN KOLANDAIVELU
PEN.0028997
LICENSED PROFESSIONAL ENGINEER

02/24/2022

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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PROJECT INFORMATION

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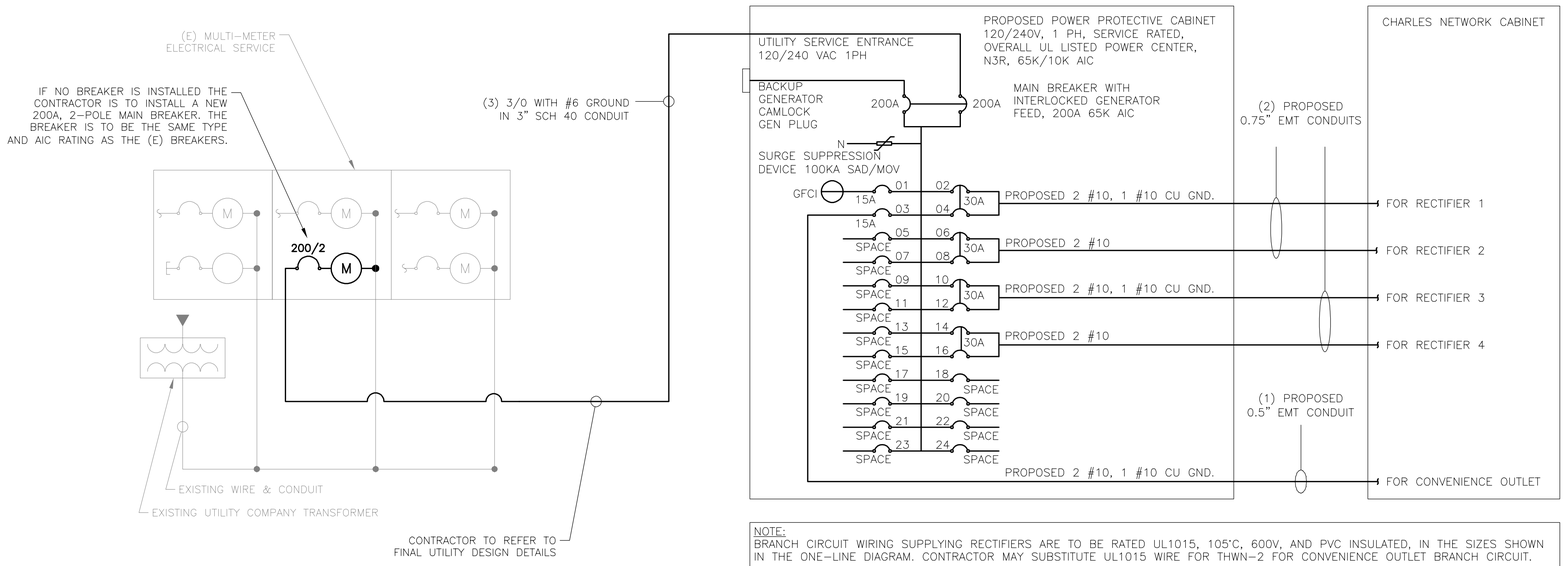
1440 MAIN STREET NORTH
WOODBURY, CT 06798

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

PPC ONE-LINE DIAGRAM

NO SCALE | 1

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.

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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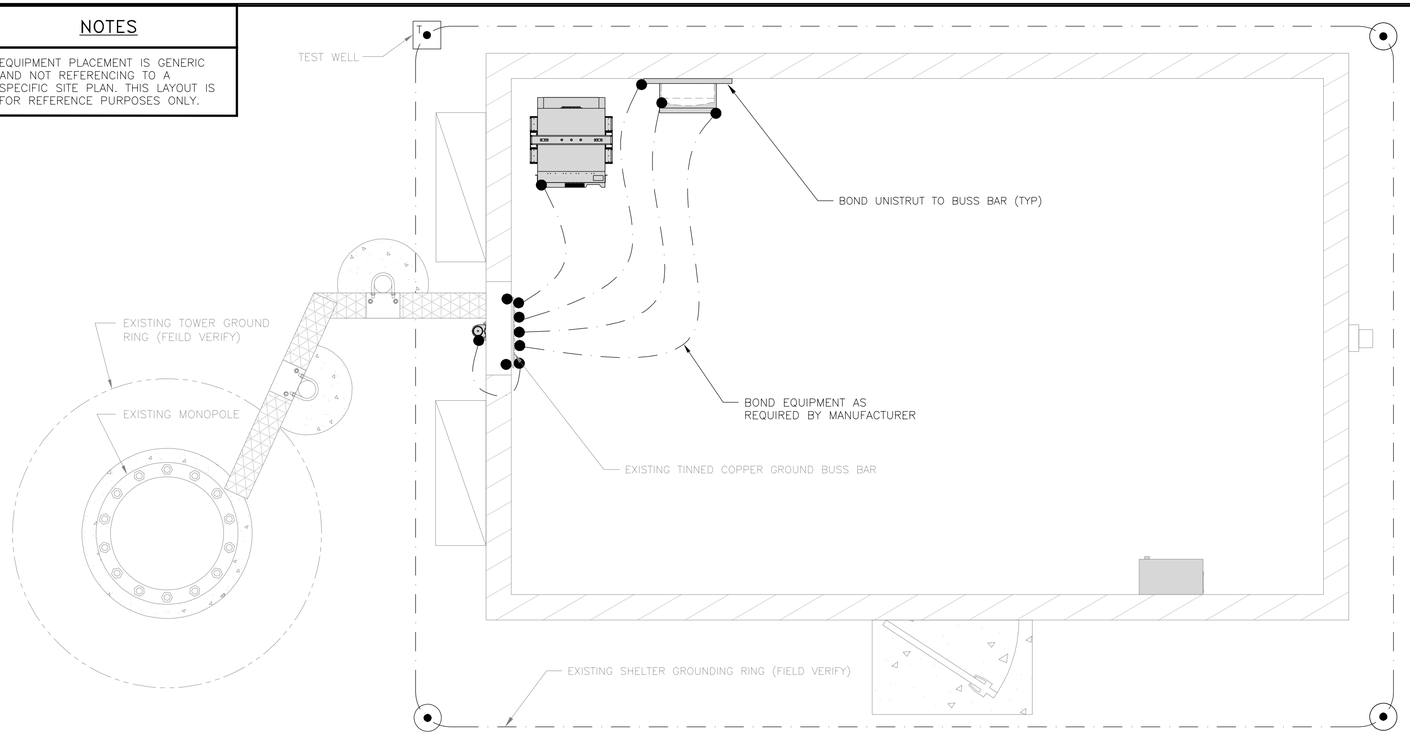
PROJECT INFORMATION
BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3

NOTES

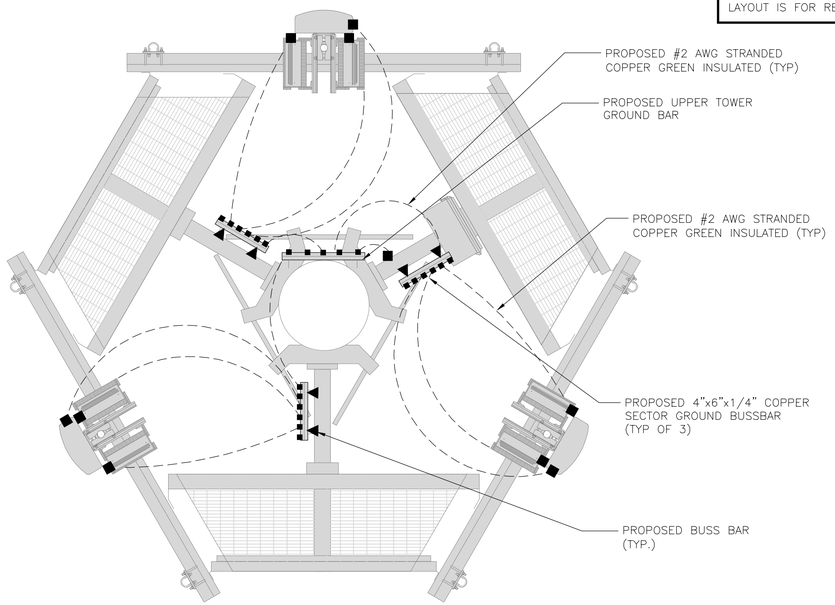
EQUIPMENT PLACEMENT IS GENERIC AND NOT REFERENCING TO A SPECIFIC SITE PLAN. THIS LAYOUT IS FOR REFERENCE PURPOSES ONLY.



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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02/24/2022

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LICENSE #PEN.0028997

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WOODBURY, CT 06798

SHEET TITLE

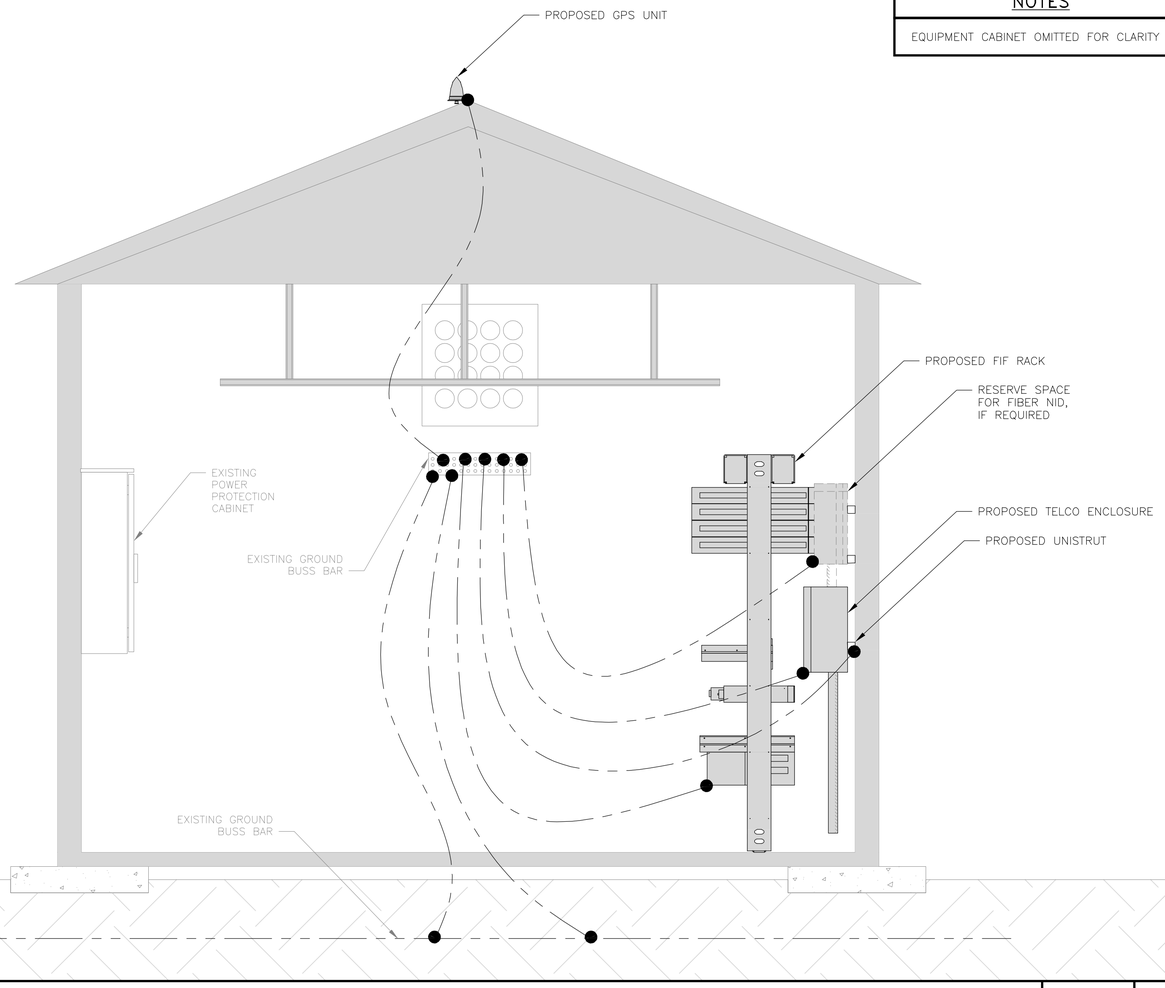
GROUNDING PLANS AND NOTES

SHEET NUMBER

G-1

NOTES

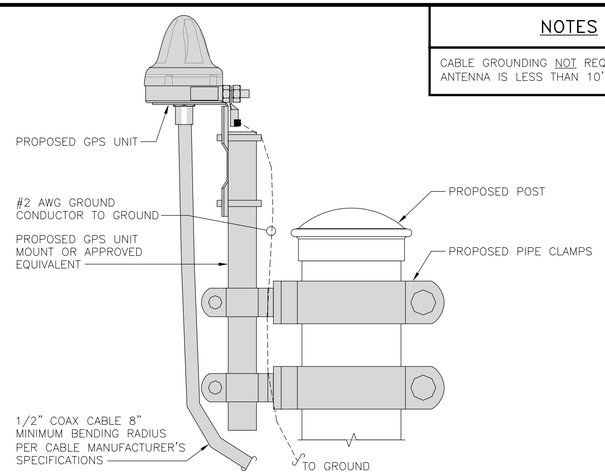
EQUIPMENT CABINET OMITTED FOR CLARITY



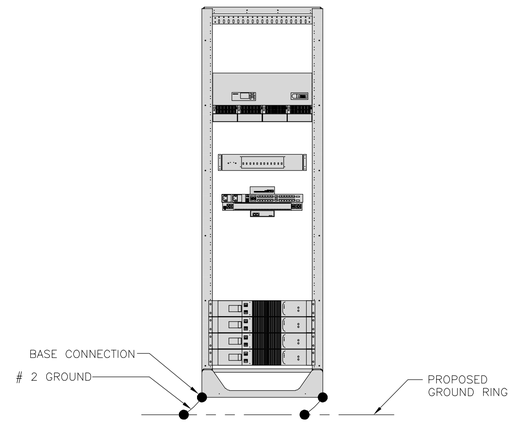
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

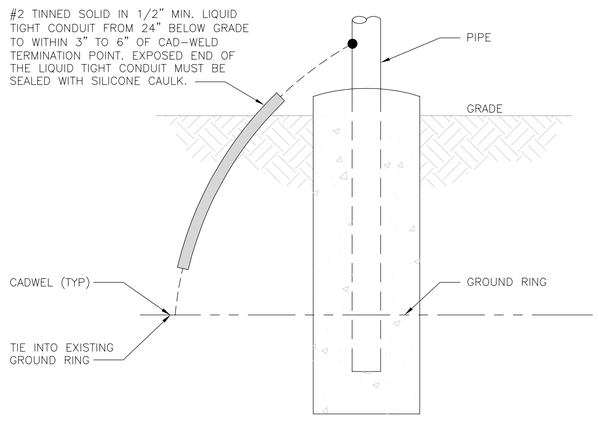
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



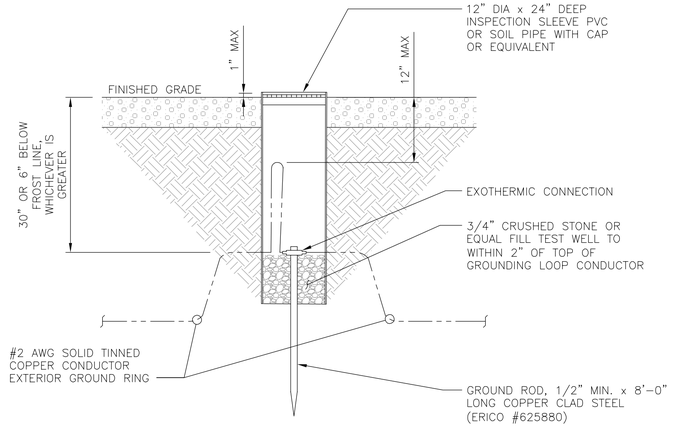
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



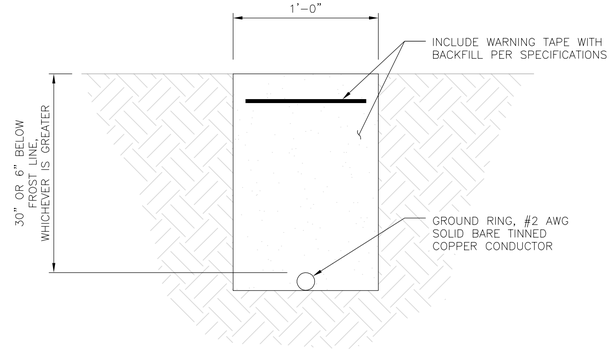
INDOOR RACK GROUNDING | NO SCALE | 3



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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SHEET TITLE

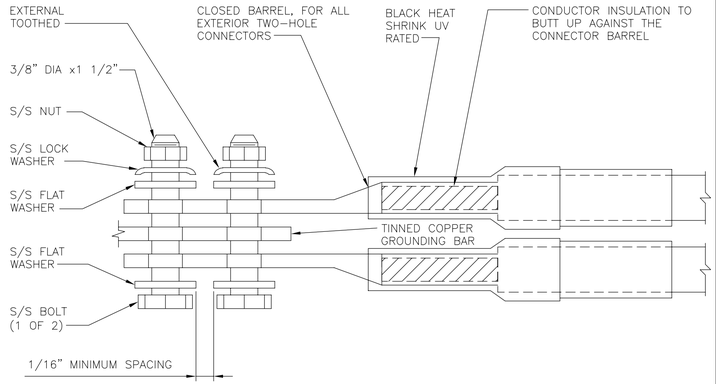
GROUNDING DETAILS

SHEET NUMBER

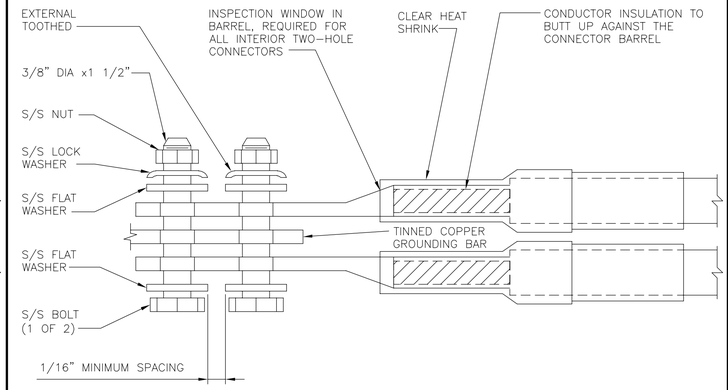
G-2

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).

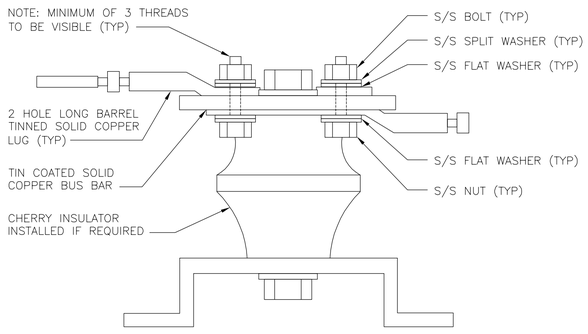
TYPICAL GROUNDING NOTES | NO SCALE | 1



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

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

02/24/2022

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	01/31/2022	ISSUED FOR CONSTRUCTION
1	02/24/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

876379

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

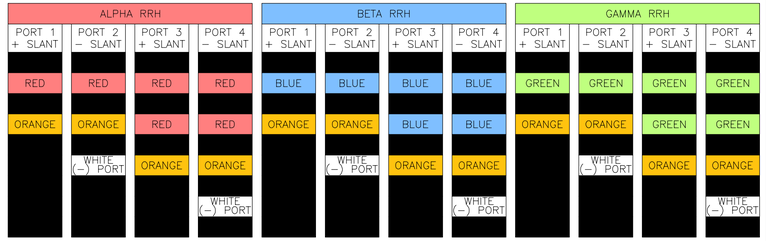
G-3

HYBRID/DISCREET CABLES

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

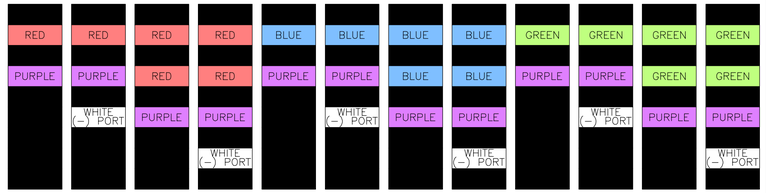
LOW-BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) - OPTIONAL PER MARKET

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



MID-BAND RRH
(AWS BANDS N66+N70)

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



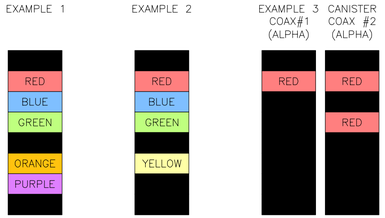
HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.

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

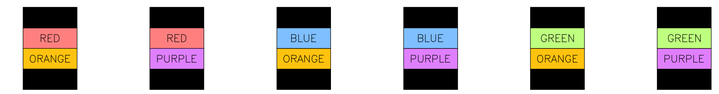
EXAMPLE 2 - HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS.

EXAMPLE 3 - MAIN COAX WITH GROUND MOUNTED RRHs.



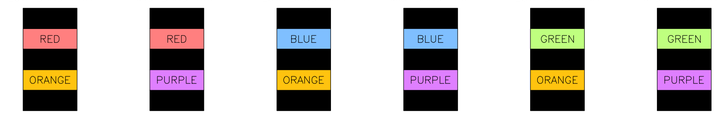
FIBER JUMPERS TO RRHs

LOW-BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.



POWER CABLES TO RRHs

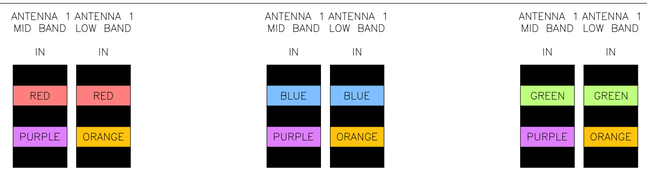
LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



RET MOTORS AT ANTENNAS

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

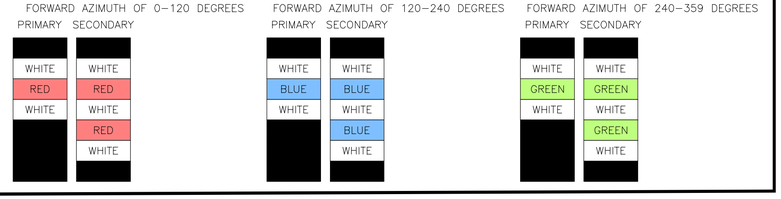
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



MICROWAVE RADIO LINKS

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

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



RF CABLE COLOR CODES | | 1

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

NOT USED | | 4

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

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

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE
(2) TWO LAMPS 48–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE

UNDERGROUND POWER

UNDERGROUND TELCO

OVERHEAD POWER

OVERHEAD TELCO

UNDERGROUND TELCO/POWER

ABOVE GROUND POWER

ABOVE GROUND TELCO

ABOVE GROUND TELCO/POWER

WORKPOINT

SECTION REFERENCE

DETAIL REFERENCE

ABBREVIATIONS

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

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PROJECT INFORMATION

BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SIGN TYPES		
TYPE	COLOR	COLOR CODE PURPOSE
INFORMATION	GREEN	"INFORMATIONAL SIGN" TO NOTIFY OTHERS OF SITE OWNERSHIP & CONTACT NUMBER AND POTENTIAL RF EXPOSURE.
NOTICE	BLUE	"NOTICE BEYOND THIS POINT" RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)
CAUTION	YELLOW	"CAUTION BEYOND THIS POINT" RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)
WARNING	ORANGE/RED	"WARNING BEYOND THIS POINT" RF FIELDS AT THIS SITE EXCEED FCC RULES FOR HUMAN EXPOSURE. FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS COULD RESULT IN SERIOUS INJURY. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)

SIGN PLACEMENT:

- RF SIGNAGE PLACEMENT SHALL FOLLOW THE RECOMMENDATIONS OF AN EXISTING EME REPORT, CREATED BY A THIRD PARTY PREVIOUSLY AUTHORIZED BY DISH Wireless L.L.C.
- INFORMATION SIGN (GREEN) SHALL BE LOCATED ON EXISTING DISH Wireless L.L.C EQUIPMENT.
  A) IF THE INFORMATION SIGN IS A STICKER, IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C EQUIPMENT CABINET.
  B) IF THE INFORMATION SIGH IS A METAL SIGN IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C H-FRAME WITH A SECURE ATTACH METHOD.
- IF EME REPORT IS NOT AVAILABLE AT THE TIME OF CREATION OF CONSTRUCTION DOCUMENTS; PLEASE CONTACT DISH Wireless L.L.C. CONSTRUCTION MANAGER FOR FURTHER INSTRUCTION ON HOW TO PROCEED.

NOTES:

1. FOR DISH Wireless L.L.C. LOGO, SEE DISH Wireless L.L.C. DESIGN SPECIFICATIONS (PROVIDED BY DISH Wireless L.L.C.)
2. SITE ID SHALL BE APPLIED TO SIGNS USING "LASER ENGRAVING" OR ANY OTHER WEATHER RESISTANT METHOD (DISH Wireless L.L.C. APPROVAL REQUIRED)
3. TEXT FOR SIGNAGE SHALL INDICATE CORRECT SITE NAME AND NUMBER AS PER DISH Wireless L.L.C. CONSTRUCTION MANAGER RECOMMENDATIONS.
4. CABINET/SHELTER MOUNTING APPLICATION REQUIRES ANOTHER PLATE APPLIED TO THE FACE OF THE CABINET WITH WATER PROOF POLYURETHANE ADHESIVE
5. ALL SIGNS WILL BE SECURED WITH EITHER STAINLESS STEEL ZIP TIES OR STAINLESS STEEL TECH SCREWS
6. ALL SIGNS TO BE 8.5"x11" AND MADE WITH 0.04" OF ALUMINUM MATERIAL

INFORMATION

This is an access point to an area with transmitting antennas.

Obey all signs and barriers beyond this point.
Call the DISH Wireless L.L.C. NOC at 1-866-624-6874

Site ID: _____

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

NOTICE

Transmitting Antenna(s)

Radio frequency fields beyond this point MAY *EXCEED* the FCC Occupational exposure limit.

Obey all posted signs and site guidelines for working in radio frequency environments.

Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

Site ID: _____

dish

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

CAUTION

Transmitting Antenna(s)

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RF SIGNAGE

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1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE
RF SIGNAGE

SHEET NUMBER
GN-2

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

02/24/2022

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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A&E PROJECT NUMBER

876379

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

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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NB+C ENGINEERING SERVICES, LLC.
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02/24/2022

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STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

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

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00030A
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

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-5

Exhibit D

Structural Analysis Report

Date: **August 27, 2021**

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

Subject: Structural Analysis Report

Carrier Designation:	***DISH Network* Co-Locate**	
	Site Number:	BOHVN00030A
	Site Name:	CT-CCI-T-876379
Crown Castle Designation:	**BU Number:**	876379
	Site Name:	N. Woodbury / Wolff Parcel
	JDE Job Number:	645193
	Work Order Number:	1966274
	Order Number:	553370 Rev. 0
Engineering Firm Designation:	**TEP Project Number:**	25647.591403
Site Data:	**1440 Main Street North, Woodbury, Litchfield County, CT 06798** **Latitude *41° 35' 23.81"*, Longitude *-73° 10' 11.52"*** **163 Foot - Monopole Tower**	

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

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

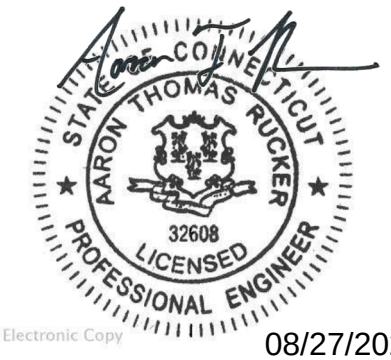
LC7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code. PIlicable Standard references and design criteria are listed in section 2 – Analysis Criteria.

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

Respectfully submitted by:

Aaron T. Rucker, P.E.



Electronic Copy

08/27/2021

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 163-ft monopole tower designed by Engineered Endeavors, Inc.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	120 mph
Exposure Category:	C
Topographic Factor:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
140.0	140.0	3	JMA Wireless	MX08FRO665-21 w/ Mount Pipe	1	1-1/2
		3	Fujitsu	TA08025-B605		
		3	Fujitsu	TA08025-B604		
		1	Raycap	RDIDC-9181-PF-48		
		1	Tower Mounts	Commscope MC-PK8-DSH		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
160.0	171.0	1	Sinclair	SC229-SFXLDF	1	1/2
	160.0	1	Tower Mounts	Pipe Mount [PM 601-1]		
156.0	158.0	3	RFS Celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	4	1-5/8
		3	RFS Celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		3	Ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	Ericsson	RADIO 4415 B66A_CCIV3		
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	Ericsson	RADIO 4424 B25_TMO		
	156.0	1	Tower Mounts	Platform Mount [LP 602-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
148.0	150.0	6	Antel	LPA-80080/6CF w/ Mount Pipe	7	1-5/8
		6	Andrew	SBNHH-1D65B w/ Mount Pipe		
		3	VZW	Sub6 Antenna – Samsung MT6407-77A w/ Mount Pipe		
		1	RFS Celwave	DB-C1-12C-24AB-0Z		
		3	Samsung Telecom.	RFV01U-D1A		
		3	Samsung Telecom.	RFV01U-D2A		
	148.0	1	Tower Mounts	Platform Mount [LP 401-1]		
120.0	121.0	6	Ericsson	TME-RRUS-11	-	-
118.0	119.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	2 4 12	3/8 7/8 1-5/8
		6	Commscope	NNHH-65B-R4 w/ Mount Pipe		
		3	Ericsson	RRUS 4478 B14		
		3	Powerwave Technologies	TT19-08BP111-001		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 8843 B2/B66A		
		1	Raycap	DC6-48-60-18-8F		
		1	Raycap	DC6-48-60-0-8C-EV		
	118.0	1	Tower Mounts	Platform Mount [LP 401-1_KCKR]		
		1	Tower Mounts	Miscellaneous [NA 510-1]		
108.0	110.0	1	Telewave	ANT150D6-9	-	-
22.0	24.0	1	Lucent	KS24019-L112A	1	1/2
	22.0	1	Tower Mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	1531966	CCISites
Tower Foundation Drawings	1614612	CCISites
Tower Manufacturer Drawings	1613543	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) The tower and structures were maintained in accordance with the TIA-222 Standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (k)	ϕP_{allow} (k)	% Capacity	Pass / Fail
L1	163.007 - 121.587	Pole	TP42.37x34.28x0.3125	1	-16.25	2492.97	17.5	Pass
L2	121.587 - 84.67	Pole	TP48.83x40.6057x0.375	2	-30.99	3448.83	34.7	Pass
L3	84.67 - 42.2067	Pole	TP56.25x46.7975x0.4375	3	-46.41	4636.15	44.5	Pass
L4	42.2067 - 0	Pole	TP63.5x53.916x0.5	4	-70.32	6141.33	49.5	Pass
							Summary	
						Pole (L4)	49.5	Pass
						RATING =	**49.5**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	51.3	Pass
1,2	Base Plate	-	48.8	Pass
1,2	Base Foundation Structural	-	48.9	Pass
1,2	Base Foundation Soil Interaction	-	27.1	Pass

Structure Rating (max from all components) =	**51.3%**

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

4.1) Recommendations

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

APPENDIX A

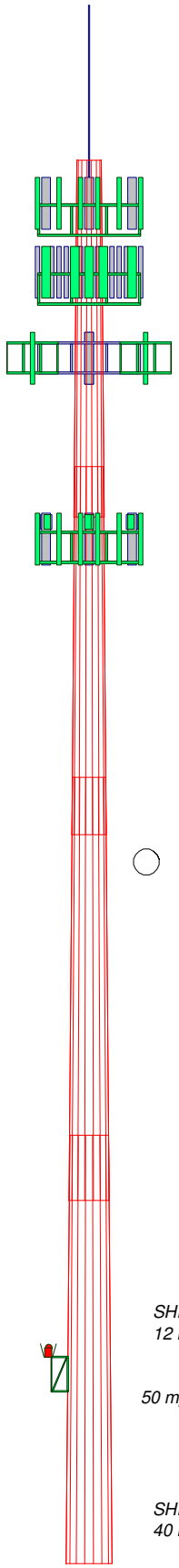
TNXTOWER OUTPUT

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 49.5%



ALL REACTIONS ARE FACTORED

AXIAL 106 K

SHEAR 12 K

MOMENT 1333 kip-ft

TORQUE 1 kip-ft
50 mph WIND - 1.5000 in ICE

AXIAL 70 K

SHEAR 40 K

MOMENT 4501 kip-ft

TORQUE 2 kip-ft
REACTIONS - 120 mph WIND

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	41.42	18	0.3125	5.83	34.2800	42.3700	A572-65	5.3
2	42.75	18	0.3750	6.67	40.6057	48.8300		7.7
3	49.13	18	0.4375	7.58	46.7975	56.2500		11.9
4	49.79	18	0.5000		53.9160	63.5000		15.7
								40.5

Tower Engineering Professionals, Inc.
326 Tryon Road
Raleigh, NC 27603-5263
Phone: (919) 661-6351
FAX: (919) 661-6350
Tower Engineering Professionals

Job: ***N. Woodbury / Wolff Parcel (BU 876379)***			
Project: ***TEP No. 25647.591403***			
Client: Crown Castle	Drawn by: SMA	App'd:	
Code: TIA-222-H	Date: 08/27/21	Scale: NTS	
Path: C:\Users\smansenuit\Desktop\N Woodbury (876379) MP Review\Issued Docs\Pre-Seal\876379_1966274_LC7.eri		Dwg No. E-1	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Litchfield County, Connecticut.
Tower base elevation above sea level: 490.00 ft.
Basic wind speed of 120 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole 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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	163.01-121.59	41.42	5.83	18	34.2800	42.3700	0.3125	1.2500	A572-65 (65 ksi)
L2	121.59-84.67	42.75	6.67	18	40.6057	48.8300	0.3750	1.5000	A572-65 (65 ksi)
L3	84.67-42.21	49.13	7.58	18	46.7975	56.2500	0.4375	1.7500	A572-65 (65 ksi)
L4	42.21-0.00	49.79		18	53.9160	63.5000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	34.7606	33.6915	4911.1720	12.0585	17.4142	282.0205	9828.8063	16.8490	5.4833	17.546
	42.9754	41.7158	9322.3361	14.9304	21.5240	433.1144	18656.9387	20.8619	6.9071	22.103
L2	42.3138	47.8845	9791.4486	14.2819	20.6277	474.6754	19595.7811	23.9468	6.4866	17.298
	49.5254	57.6736	17107.6924	17.2015	24.8056	689.6695	34237.8956	28.8423	7.9341	21.158
L3	48.7543	64.3766	17480.3987	16.4578	23.7731	735.3015	34983.7986	32.1944	7.4664	17.066
	57.0503	77.5026	30501.1953	19.8134	28.5750	1067.4084	61042.5248	38.7587	9.1300	20.869
L4	56.1528	84.7712	30558.2079	18.9627	27.3893	1115.6981	61156.6251	42.3936	8.6092	17.218
	64.4025	99.9810	50134.4235	22.3650	32.2580	1554.1702	100334.8152	50.0000	10.2960	20.592

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
L1 163.01-121.59				1	1	1			
L2 121.59-84.67				1	1	1			
L3 84.67-42.21				1	1	1			
L4 42.21-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
******										
Safety Line 3/8	C	No	Surface Ar (CaAa)	163.00 - 0.00	1	1	-0.167 -0.167	0.3750		0.22
22										
LDF4-50A(1/2)	C	No	Surface Ar (CaAa)	22.00 - 0.00	1	1	0.167 0.167	0.6250		0.15
******										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
160									
LDF4-50A(1/2)	B	No	No	Inside Pole	160.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
165									
HB158-21U6S24-xx M_TMO(1-5/8)	A	No	No	Inside Pole	156.00 - 0.00	4	No Ice	0.00	2.50
							1/2" Ice	0.00	2.50
							1" Ice	0.00	2.50
							2" Ice	0.00	2.50
148									
LDF7-50A(1-5/8)	A	No	No	Inside Pole	148.00 - 0.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
HB158-1-13U6-S6F 18(1-5/8)	A	No	No	Inside Pole	148.00 - 0.00	1	No Ice	0.00	1.90
							1/2" Ice	0.00	1.90
							1" Ice	0.00	1.90
							2" Ice	0.00	1.90
141									
140									
CU12PSM9P6XXX(1-1/2)	B	No	No	Inside Pole	140.00 - 0.00	1	No Ice	0.00	2.35
							1/2" Ice	0.00	2.35
							1" Ice	0.00	2.35
							2" Ice	0.00	2.35
118									
2" Flexible Conduit	C	No	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.34
							1/2" Ice	0.00	0.34
							1" Ice	0.00	0.34
							2" Ice	0.00	0.34
FB-L98B-002-75000 (3/8)	C	No	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG66ST-BRD(7/8)	C	No	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.91
							1/2" Ice	0.00	0.91
							1" Ice	0.00	0.91
							2" Ice	0.00	0.91
WR-VG86ST-BRD A(7/8)	C	No	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.68
							1/2" Ice	0.00	0.68
							1" Ice	0.00	0.68
							2" Ice	0.00	0.68
LCF158-50A(1-5/8)	C	No	No	Inside Pole	118.00 - 0.00	12	No Ice	0.00	0.80
							1/2" Ice	0.00	0.80
							1" Ice	0.00	0.80
							2" Ice	0.00	0.80
108									
LDF4-50A(1/2)	B	No	No	Inside Pole	108.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							2" Ice	0.00	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
L1	163.01-121.59	A	0.000	0.000	0.000	0.000	0.52
		B	0.000	0.000	0.000	0.000	0.05
		C	0.000	0.000	1.553	0.000	0.01
L2	121.59-84.67	A	0.000	0.000	0.000	0.000	0.62
		B	0.000	0.000	0.000	0.000	0.10
		C	0.000	0.000	1.384	0.000	0.46
L3	84.67-42.21	A	0.000	0.000	0.000	0.000	0.71
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	1.592	0.000	0.59
L4	42.21-0.00	A	0.000	0.000	0.000	0.000	0.71
		B	0.000	0.000	0.000	0.000	0.11
		C	0.000	0.000	2.958	0.000	0.59

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
L1	163.01-121.59	A	1.475	0.000	0.000	0.000	0.000	0.52
		B		0.000	0.000	0.000	0.000	0.05
		C		0.000	0.000	13.770	0.000	0.15
L2	121.59-84.67	A	1.428	0.000	0.000	0.000	0.000	0.62
		B		0.000	0.000	0.000	0.000	0.10
		C		0.000	0.000	12.275	0.000	0.58
L3	84.67-42.21	A	1.361	0.000	0.000	0.000	0.000	0.71
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	13.724	0.000	0.72
L4	42.21-0.00	A	1.221	0.000	0.000	0.000	0.000	0.71
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	20.431	0.000	0.78

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	163.01-121.59	0.1035	0.2838	0.4883	1.3388
L2	121.59-84.67	0.1036	0.2841	0.4992	1.3686
L3	84.67-42.21	0.1037	0.2843	0.4943	1.3552

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L4	42.21-0.00	0.0102	0.5359	0.1954	2.0397

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	Safety Line 3/8	121.59 - 163.00	1.0000	1.0000
L2	2	Safety Line 3/8	84.67 - 121.59	1.0000	1.0000
L3	2	Safety Line 3/8	42.21 - 84.67	1.0000	1.0000
L4	2	Safety Line 3/8	0.00 - 42.21	1.0000	1.0000
L4	28	LDF4-50A(1/2)	0.00 - 22.00	1.0000	1.0000

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
******									
SC229-SFXLDF	A	From Leg	1.00 0.00 11.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.95 7.97 10.00 14.12	5.95 7.97 10.00 14.12	0.03 0.07 0.13 0.28
Pipe Mount [PM 601-1]	A	From Leg	0.50 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.32 1.58 1.84 2.40	1.32 1.58 1.84 2.40	0.07 0.08 0.09 0.13
156									
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APXVAALL24_43-U-NA20	A	From	4.00	0.0000	156.00	No Ice	14.69	6.87	0.18

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
_TMO w/ Mount Pipe		Centroid-Leg	0.00 2.00			1/2" Ice 1" Ice 2" Ice	15.46 16.23 17.82	7.55 8.25 9.67	0.31 0.45 0.78
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.18 0.31 0.45 0.78
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.18 0.31 0.45 0.78
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.19 5.59 6.02 6.90	2.71 3.04 3.38 4.12	0.13 0.17 0.23 0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.19 5.59 6.02 6.90	2.71 3.04 3.38 4.12	0.13 0.17 0.23 0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.19 5.59 6.02 6.90	2.71 3.04 3.38 4.12	0.13 0.17 0.23 0.35
RADIO 4415 B66A_CCIV3	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	0.68 0.79 0.91 1.18	0.05 0.06 0.07 0.11
RADIO 4415 B66A_CCIV3	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	0.68 0.79 0.91 1.18	0.05 0.06 0.07 0.11
RADIO 4415 B66A_CCIV3	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	0.68 0.79 0.91 1.18	0.05 0.06 0.07 0.11
RADIO 4449 B71 B85A_T-MOBILE	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4424 B25_TMO	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.05 2.23 2.42 2.81	1.61 1.77 1.94 2.30	0.09 0.11 0.13 0.19
RADIO 4424 B25_TMO	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.05 2.23 2.42 2.81	1.61 1.77 1.94 2.30	0.09 0.11 0.13 0.19
RADIO 4424 B25_TMO	C	From Centroid-Leg	4.00 0.00	0.0000	156.00	No Ice 1/2" Ice	2.05 2.23	1.61 1.77	0.09 0.11

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
		g	2.00			1" Ice	2.42	1.94	0.13
						2" Ice	2.81	2.30	0.19
Platform Mount [LP 602-1]	C	None		0.0000	156.00	No Ice	31.07	31.07	1.34
						1/2" Ice	34.82	34.82	1.97
						1" Ice	38.48	38.48	2.67
						2" Ice	45.60	45.60	4.31
8' Ladder	C	From Centroid-Face	2.00 0.00 -4.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.53 4.36 7.19 12.86	5.33 8.08 10.83 16.33	0.10 0.11 0.13 0.16
2.4" Dia. x 6-ft	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
2.4" Dia. x 6-ft	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
2.4" Dia. x 6-ft	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
148									
LPA-80080/6CF w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.93 5.58 6.16 7.33	10.92 12.21 13.16 15.11	0.07 0.14 0.22 0.41
(2) LPA-80080/6CF w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.93 5.58 6.16 7.33	10.92 12.21 13.16 15.11	0.07 0.14 0.22 0.41
(3) LPA-80080/6CF w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.93 5.58 6.16 7.33	10.92 12.21 13.16 15.11	0.07 0.14 0.22 0.41
(3) SBNHH-1D65B w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) SBNHH-1D65B w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
SBNHH-1D65B w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
MT6407-77A w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	C	From Centroid-Fa	4.00 0.00	0.0000	148.00	No Ice 1/2" Ice	4.91 5.26	2.68 3.14	0.10 0.14

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
		ce	2.00			1" Ice	5.61	3.62	0.18
						2" Ice	6.36	4.63	0.29
DB-C1-12C-24AB-0Z	B	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.06 4.32 4.58 5.14	3.10 3.34 3.58 4.09	0.03 0.07 0.11 0.20
RFV01U-D1A	A	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RFV01U-D1A	B	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RFV01U-D1A	C	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RFV01U-D2A	A	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
RFV01U-D2A	B	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
RFV01U-D2A	C	From Centroid-Face	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
Platform Mount [LP 401-1]	C	None		0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	24.04 28.93 33.88 43.93	24.04 28.93 33.88 43.93	1.65 2.17 2.76 4.16
141 **140**									
MX08FRO665-21 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
(2) TA08025-B605	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B605	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
(3) TA08025-B604	A	From	4.00	0.0000	140.00	No Ice	1.96	0.98	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*
		Centroid-Le	0.00			1/2" Ice	2.14	1.11	0.08
		g	0.00			1" Ice	2.32	1.25	0.10
						2" Ice	2.71	1.55	0.15
RDIDC-9181-PF-48	C	From	4.00	0.0000	140.00	No Ice	2.01	1.17	0.02
		Centroid-Le	0.00			1/2" Ice	2.19	1.31	0.04
		g	0.00			1" Ice	2.37	1.46	0.06
						2" Ice	2.76	1.78	0.11
(2) 2.4" Dia x 8-ft Mount Pipe	A	From	4.00	0.0000	140.00	No Ice	1.90	1.90	0.03
		Centroid-Le	0.00			1/2" Ice	2.73	2.73	0.04
		g	0.00			1" Ice	3.40	3.40	0.06
						2" Ice	4.40	4.40	0.12
(2) 2.4" Dia x 8-ft Mount Pipe	A	From	4.00	0.0000	140.00	No Ice	1.90	1.90	0.03
		Centroid-Le	0.00			1/2" Ice	2.73	2.73	0.04
		g	0.00			1" Ice	3.40	3.40	0.06
						2" Ice	4.40	4.40	0.12
(2) 2.4" Dia x 8-ft Mount Pipe	A	From	4.00	0.0000	140.00	No Ice	1.90	1.90	0.03
		Centroid-Le	0.00			1/2" Ice	2.73	2.73	0.04
		g	0.00			1" Ice	3.40	3.40	0.06
						2" Ice	4.40	4.40	0.12
Commscope MC-PK8-DSH	C	None		0.0000	140.00	No Ice	34.24	34.24	1.75
						1/2" Ice	62.95	62.95	2.10
						1" Ice	91.66	91.66	2.45
						2" Ice	149.08	149.08	3.15
120									
(2) TME-RRUS-11	A	From Leg	1.00	0.0000	120.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.09
						2" Ice	3.66	1.83	0.15
(2) TME-RRUS-11	B	From Leg	1.00	0.0000	120.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.09
						2" Ice	3.66	1.83	0.15
(2) TME-RRUS-11	C	From Leg	1.00	0.0000	120.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.09
						2" Ice	3.66	1.83	0.15
2.4" Dia. x 6-ft	A	From Leg	0.50	0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia. x 6-ft	B	From Leg	0.50	0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia. x 6-ft	C	From Leg	0.50	0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
118									
7770.00 w/ Mount Pipe	A	From	4.00	0.0000	118.00	No Ice	5.75	4.25	0.06
		Centroid-Le	0.00			1/2" Ice	6.18	5.01	0.10
		g	1.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
7770.00 w/ Mount Pipe	B	From	4.00	0.0000	118.00	No Ice	5.75	4.25	0.06
		Centroid-Le	0.00			1/2" Ice	6.18	5.01	0.10
		g	1.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29

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
7770.00 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
(2) NNHH-65B-R4 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.55 8.04 8.53 9.56	4.23 4.67 5.12 6.05	0.11 0.20 0.30 0.53
(2) NNHH-65B-R4 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.55 8.04 8.53 9.56	4.23 4.67 5.12 6.05	0.11 0.20 0.30 0.53
(2) NNHH-65B-R4 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.55 8.04 8.53 9.56	4.23 4.67 5.12 6.05	0.11 0.20 0.30 0.53
RRUS 4478 B14	A	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 4478 B14	B	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 4478 B14	C	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
TT19-08BP111-001	A	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.55 0.64 0.74 0.97	0.44 0.53 0.63 0.84	0.02 0.02 0.03 0.05
TT19-08BP111-001	B	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.55 0.64 0.74 0.97	0.44 0.53 0.63 0.84	0.02 0.02 0.03 0.05
TT19-08BP111-001	C	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.55 0.64 0.74 0.97	0.44 0.53 0.63 0.84	0.02 0.02 0.03 0.05
RRUS 4449 B5/B12	A	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	B	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	C	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	A	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	B	From	4.00	0.0000	118.00	No Ice	1.64	1.35	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Leg	0.00 1.00			1/2" Ice 1" Ice	1.80 1.97	1.50 1.65	0.09 0.11
						2" Ice	2.32	1.99	0.16
RRUS 8843 B2/B66A	C	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	1.35 1.50 1.65	0.07 0.09 0.11
						2" Ice	2.32	1.99	0.16
DC6-48-60-18-8F	B	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	1.21 1.89 2.11	1.21 1.89 2.11	0.03 0.05 0.08
						2" Ice	2.57	2.57	0.14
DC6-48-60-0-8C-EV	C	From Centroid-Leg	4.00 0.00 1.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	1.14 1.79 2.00	1.14 1.79 2.00	0.03 0.05 0.07
						2" Ice	2.45	2.45	0.13
Platform Mount [LP 401-1_KCKR]	C	None		0.0000	118.00	No Ice 1/2" Ice 1" Ice	35.26 43.15 51.27	35.26 43.15 51.27	1.92 2.58 3.36
						2" Ice	68.18	68.18	5.24
Miscellaneous [NA 510-1]	C	None		0.0000	118.00	No Ice 1/2" Ice 1" Ice	6.36 8.52 10.62	6.36 8.52 10.62	0.26 0.34 0.46
						2" Ice	14.64	14.64	0.77
2.4" Dia. x 6-ft	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	118.00	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
						2" Ice	3.06	3.06	0.09
2.4" Dia. x 6-ft	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	118.00	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
						2" Ice	3.06	3.06	0.09
2.4" Dia. x 6-ft	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	118.00	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
						2" Ice	3.06	3.06	0.09
108									
ANT150D6-9	A	From Leg	2.00 0.00 2.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	5.00 7.03 9.07	5.00 7.03 9.07	0.03 0.06 0.11
						2" Ice	13.22	13.22	0.25
22									
KS24019-L112A	C	From Leg	3.00 0.00 2.00	0.0000	22.00	No Ice 1/2" Ice 1" Ice	0.08 0.13 0.19	0.08 0.13 0.19	0.01 0.01 0.01
						2" Ice	0.35	0.35	0.02
Side Arm Mount [SO 701-1]	C	From Leg	1.50 0.00 0.00	0.0000	22.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
						2" Ice	2.01	4.35	0.12
******									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

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

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	163.007 - 121.587	Pole	Max Tension	8	0.00	0.00	-0.00
			Max. Compression	26	-33.39	-0.88	3.27
			Max. Mx	8	-16.25	-407.72	-1.18
			Max. My	2	-16.30	1.98	394.55
			Max. Vy	8	18.69	-407.72	-1.18
			Max. Vx	2	-18.11	1.98	394.55
			Max. Torque	4			-1.90
L2	121.587 - 84.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.23	-0.92	3.29
			Max. Mx	8	-30.99	-1323.79	-4.95
			Max. My	2	-31.03	5.71	1289.48
			Max. Vy	8	29.16	-1323.79	-4.95
			Max. Vx	2	-28.57	5.71	1289.48
			Max. Torque	13			1.98
L3	84.67 - 42.2067	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.71	-0.92	2.98
			Max. Mx	8	-46.41	-2647.52	-9.27
			Max. My	2	-46.43	10.01	2588.87
			Max. Vy	8	34.44	-2647.52	-9.27
			Max. Vx	2	-33.86	10.01	2588.87
			Max. Torque	13			1.98
L4	42.2067 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-106.43	-0.48	2.15
			Max. Mx	8	-70.32	-4501.38	-14.81
			Max. My	2	-70.32	15.64	4414.54
			Max. Vy	8	39.67	-4501.38	-14.81
			Max. Vx	2	-39.13	15.64	4414.54
			Max. Torque	13			1.98

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	106.43	-11.56	-0.03
	Max. H_x	20	70.34	39.64	0.11
	Max. H_z	2	70.34	0.11	39.09
	Max. M_x	2	4414.54	0.11	39.09
	Max. M_z	8	4501.38	-39.64	-0.11
	Max. Torsion	13	1.74	-19.92	-33.91
	Min. Vert	17	52.76	19.72	-33.80
	Min. H_x	8	70.34	-39.64	-0.11
	Min. H_z	14	70.34	-0.11	-39.09
	Min. M_x	14	-4412.67	-0.11	-39.09
	Min. M_z	20	-4501.16	39.64	0.11
	Min. Torsion	25	-1.70	19.92	33.91

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	58.62	0.00	0.00	-0.74	-0.08	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	70.34	-0.11	-39.09	-4414.54	15.64	1.26
0.9 Dead+1.0 Wind 0 deg - No Ice	52.76	-0.11	-39.09	-4380.07	15.54	1.26
1.2 Dead+1.0 Wind 30 deg - No Ice	70.34	19.72	-33.80	-3815.36	-2237.15	0.49
0.9 Dead+1.0 Wind 30 deg - No Ice	52.76	19.72	-33.80	-3785.54	-2219.74	0.49
1.2 Dead+1.0 Wind 60 deg - No Ice	70.34	34.27	-19.45	-2194.08	-3890.49	-0.42
0.9 Dead+1.0 Wind 60 deg - No Ice	52.76	34.27	-19.45	-2176.84	-3860.22	-0.42
1.2 Dead+1.0 Wind 90 deg - No Ice	70.34	39.64	0.11	14.81	-4501.38	-1.23
0.9 Dead+1.0 Wind 90 deg - No Ice	52.76	39.64	0.11	14.92	-4466.35	-1.24
1.2 Dead+1.0 Wind 120 deg - No Ice	70.34	34.38	19.64	2219.47	-3906.21	-1.72
0.9 Dead+1.0 Wind 120 deg - No Ice	52.76	34.38	19.64	2202.48	-3875.80	-1.73
1.2 Dead+1.0 Wind 150 deg - No Ice	70.34	19.92	33.91	3829.20	-2264.41	-1.74
0.9 Dead+1.0 Wind 150 deg - No Ice	52.76	19.92	33.91	3799.74	-2246.76	-1.74
1.2 Dead+1.0 Wind 180 deg - No Ice	70.34	0.11	39.09	4412.67	-15.85	-1.28
0.9 Dead+1.0 Wind 180 deg - No Ice	52.76	0.11	39.09	4378.69	-15.69	-1.28
1.2 Dead+1.0 Wind 210 deg - No Ice	70.34	-19.72	33.80	3813.48	2236.94	-0.46
0.9 Dead+1.0 Wind 210 deg - No Ice	52.76	-19.72	33.80	3784.15	2219.58	-0.46
1.2 Dead+1.0 Wind 240 deg - No Ice	70.34	-34.27	19.45	2192.20	3890.27	0.46
0.9 Dead+1.0 Wind 240 deg - No Ice	52.76	-34.27	19.45	2175.45	3860.06	0.47
1.2 Dead+1.0 Wind 270 deg - No Ice	70.34	-39.64	-0.11	-16.68	4501.16	1.25
0.9 Dead+1.0 Wind 270 deg - No Ice	52.76	-39.64	-0.11	-16.30	4466.20	1.25
1.2 Dead+1.0 Wind 300 deg - No Ice	70.34	-34.38	-19.64	-2221.33	3905.99	1.70
0.9 Dead+1.0 Wind 300 deg - No Ice	52.76	-34.38	-19.64	-2203.86	3875.65	1.70
1.2 Dead+1.0 Wind 330 deg - No Ice	70.34	-19.92	-33.91	-3831.08	2264.20	1.70
0.9 Dead+1.0 Wind 330 deg - No Ice	52.76	-19.92	-33.91	-3801.12	2246.61	1.70
1.2 Dead+1.0 Ice+1.0 Temp	106.43	0.00	-0.00	-2.15	-0.48	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	106.43	-0.03	-11.45	-1317.20	2.97	0.26
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	106.43	5.76	-9.91	-1139.29	-663.66	-0.08
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	106.43	10.00	-5.70	-656.75	-1152.60	-0.39
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	106.43	11.56	0.03	1.12	-1332.85	-0.61
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	106.43	10.02	5.75	658.04	-1156.12	-0.65
1.2 Dead+1.0 Wind 150	106.43	5.80	9.93	1138.00	-669.75	-0.53

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	106.43	0.03	11.45	1312.40	-4.07	-0.26
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	106.43	-5.76	9.91	1134.49	662.55	0.08
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	106.43	-10.00	5.70	651.95	1151.49	0.40
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	106.43	-11.56	-0.03	-5.92	1331.75	0.61
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	106.43	-10.02	-5.75	-662.85	1155.01	0.65
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	106.43	-5.80	-9.93	-1142.81	668.64	0.53
Dead+Wind 0 deg - Service	58.62	-0.03	-9.21	-1035.37	3.60	0.30
Dead+Wind 30 deg - Service	58.62	4.65	-7.96	-894.91	-524.47	0.12
Dead+Wind 60 deg - Service	58.62	8.07	-4.58	-514.88	-912.03	-0.10
Dead+Wind 90 deg - Service	58.62	9.34	0.03	2.91	-1055.23	-0.29
Dead+Wind 120 deg - Service	58.62	8.10	4.63	519.71	-915.71	-0.40
Dead+Wind 150 deg - Service	58.62	4.69	7.99	897.05	-530.86	-0.40
Dead+Wind 180 deg - Service	58.62	0.03	9.21	1033.82	-3.78	-0.30
Dead+Wind 210 deg - Service	58.62	-4.65	7.96	893.36	524.29	-0.11
Dead+Wind 240 deg - Service	58.62	-8.07	4.58	513.32	911.85	0.10
Dead+Wind 270 deg - Service	58.62	-9.34	-0.03	-4.46	1055.05	0.29
Dead+Wind 300 deg - Service	58.62	-8.10	-4.63	-521.27	915.54	0.40
Dead+Wind 330 deg - Service	58.62	-4.69	-7.99	-898.60	530.68	0.40

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-58.62	0.00	0.00	58.62	0.00	0.000%
2	-0.11	-70.34	-39.09	0.11	70.34	39.09	0.000%
3	-0.11	-52.76	-39.09	0.11	52.76	39.09	0.000%
4	19.72	-70.34	-33.80	-19.72	70.34	33.80	0.000%
5	19.72	-52.76	-33.80	-19.72	52.76	33.80	0.000%
6	34.27	-70.34	-19.45	-34.27	70.34	19.45	0.000%
7	34.27	-52.76	-19.45	-34.27	52.76	19.45	0.000%
8	39.64	-70.34	0.11	-39.64	70.34	-0.11	0.000%
9	39.64	-52.76	0.11	-39.64	52.76	-0.11	0.000%
10	34.38	-70.34	19.64	-34.38	70.34	-19.64	0.000%
11	34.38	-52.76	19.64	-34.38	52.76	-19.64	0.000%
12	19.92	-70.34	33.91	-19.92	70.34	-33.91	0.000%
13	19.92	-52.76	33.91	-19.92	52.76	-33.91	0.000%
14	0.11	-70.34	39.09	-0.11	70.34	-39.09	0.000%
15	0.11	-52.76	39.09	-0.11	52.76	-39.09	0.000%
16	-19.72	-70.34	33.80	19.72	70.34	-33.80	0.000%
17	-19.72	-52.76	33.80	19.72	52.76	-33.80	0.000%
18	-34.27	-70.34	19.45	34.27	70.34	-19.45	0.000%
19	-34.27	-52.76	19.45	34.27	52.76	-19.45	0.000%
20	-39.64	-70.34	-0.11	39.64	70.34	0.11	0.000%
21	-39.64	-52.76	-0.11	39.64	52.76	0.11	0.000%
22	-34.38	-70.34	-19.64	34.38	70.34	19.64	0.000%
23	-34.38	-52.76	-19.64	34.38	52.76	19.64	0.000%
24	-19.92	-70.34	-33.91	19.92	70.34	33.91	0.000%
25	-19.92	-52.76	-33.91	19.92	52.76	33.91	0.000%
26	0.00	-106.43	0.00	0.00	106.43	0.00	0.000%
27	-0.03	-106.43	-11.45	0.03	106.43	11.45	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
28	5.76	-106.43	-9.91	-5.76	106.43	9.91	0.000%
29	10.00	-106.43	-5.70	-10.00	106.43	5.70	0.000%
30	11.56	-106.43	0.03	-11.56	106.43	-0.03	0.000%
31	10.02	-106.43	5.75	-10.02	106.43	-5.75	0.000%
32	5.80	-106.43	9.93	-5.80	106.43	-9.93	0.000%
33	0.03	-106.43	11.45	-0.03	106.43	-11.45	0.000%
34	-5.76	-106.43	9.91	5.76	106.43	-9.91	0.000%
35	-10.00	-106.43	5.70	10.00	106.43	-5.70	0.000%
36	-11.56	-106.43	-0.03	11.56	106.43	0.03	0.000%
37	-10.02	-106.43	-5.75	10.02	106.43	5.75	0.000%
38	-5.80	-106.43	-9.93	5.80	106.43	9.93	0.000%
39	-0.03	-58.62	-9.21	0.03	58.62	9.21	0.000%
40	4.65	-58.62	-7.96	-4.65	58.62	7.96	0.000%
41	8.07	-58.62	-4.58	-8.07	58.62	4.58	0.000%
42	9.34	-58.62	0.03	-9.34	58.62	-0.03	0.000%
43	8.10	-58.62	4.63	-8.10	58.62	-4.63	0.000%
44	4.69	-58.62	7.99	-4.69	58.62	-7.99	0.000%
45	0.03	-58.62	9.21	-0.03	58.62	-9.21	0.000%
46	-4.65	-58.62	7.96	4.65	58.62	-7.96	0.000%
47	-8.07	-58.62	4.58	8.07	58.62	-4.58	0.000%
48	-9.34	-58.62	-0.03	9.34	58.62	0.03	0.000%
49	-8.10	-58.62	-4.63	8.10	58.62	4.63	0.000%
50	-4.69	-58.62	-7.99	4.69	58.62	7.99	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	0.00030786
3	Yes	4	0.00000001	0.00019632
4	Yes	5	0.00000001	0.00022330
5	Yes	5	0.00000001	0.00010660
6	Yes	5	0.00000001	0.00022345
7	Yes	5	0.00000001	0.00010648
8	Yes	4	0.00000001	0.00025280
9	Yes	4	0.00000001	0.00015638
10	Yes	5	0.00000001	0.00021940
11	Yes	5	0.00000001	0.00010424
12	Yes	5	0.00000001	0.00023261
13	Yes	5	0.00000001	0.00011110
14	Yes	4	0.00000001	0.00040935
15	Yes	4	0.00000001	0.00026534
16	Yes	5	0.00000001	0.00021712
17	Yes	5	0.00000001	0.00010359
18	Yes	5	0.00000001	0.00022040
19	Yes	5	0.00000001	0.00010503
20	Yes	4	0.00000001	0.00035499
21	Yes	4	0.00000001	0.00022675
22	Yes	5	0.00000001	0.00023482
23	Yes	5	0.00000001	0.00011194
24	Yes	5	0.00000001	0.00021810
25	Yes	5	0.00000001	0.00010373
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00015842
28	Yes	5	0.00000001	0.00018118

29	Yes	5	0.00000001	0.00018255
30	Yes	5	0.00000001	0.00016039
31	Yes	5	0.00000001	0.00018156
32	Yes	5	0.00000001	0.00018137
33	Yes	5	0.00000001	0.00015688
34	Yes	5	0.00000001	0.00017903
35	Yes	5	0.00000001	0.00017993
36	Yes	5	0.00000001	0.00015997
37	Yes	5	0.00000001	0.00018377
38	Yes	5	0.00000001	0.00018169
39	Yes	4	0.00000001	0.00003383
40	Yes	4	0.00000001	0.00010814
41	Yes	4	0.00000001	0.00010674
42	Yes	4	0.00000001	0.00003249
43	Yes	4	0.00000001	0.00009970
44	Yes	4	0.00000001	0.00011695
45	Yes	4	0.00000001	0.00003453
46	Yes	4	0.00000001	0.00010042
47	Yes	4	0.00000001	0.00010289
48	Yes	4	0.00000001	0.00003319
49	Yes	4	0.00000001	0.00011829
50	Yes	4	0.00000001	0.00009987

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	163.007 - 121.587	14.444	42	0.6892	0.0012
L2	127.42 - 84.67	9.398	42	0.6440	0.0009
L3	91.3367 - 42.2067	4.991	42	0.4978	0.0005
L4	49.79 - 0	1.535	42	0.2746	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	SC229-SFXLDF	42	14.007	0.6873	0.0012	147339
156.00	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	42	13.427	0.6847	0.0011	105142
148.00	LPA-80080/6CF w/ Mount Pipe	42	12.273	0.6782	0.0011	49091
140.00	MX08FRO665-21 w/ Mount Pipe	42	11.135	0.6687	0.0010	32020
120.00	(2) TME-RRUS-11	42	8.414	0.6220	0.0008	18198
118.00	7770.00 w/ Mount Pipe	42	8.154	0.6152	0.0008	17624
108.00	ANT150D6-9	42	6.900	0.5761	0.0007	15222
22.00	KS24019-L112A	42	0.458	0.1212	0.0001	18100

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	163.007 - 121.587	61.643	8	2.9420	0.0052
L2	127.42 - 84.67	40.113	8	2.7494	0.0038
L3	91.3367 - 42.2067	21.305	8	2.1254	0.0020
L4	49.79 - 0	6.549	8	1.1722	0.0008

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	SC229-SFXLDF	8	59.781	2.9340	0.0051	34747
156.00	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	8	57.306	2.9228	0.0050	24796
148.00	LPA-80080/6CF w/ Mount Pipe	8	52.383	2.8951	0.0046	11576
140.00	MX08FRO665-21 w/ Mount Pipe	8	47.528	2.8547	0.0043	7550
120.00	(2) TME-RRUS-11	8	35.912	2.6556	0.0034	4285
118.00	7770.00 w/ Mount Pipe	8	34.805	2.6265	0.0033	4149
108.00	ANT150D6-9	8	29.453	2.4597	0.0028	3579
22.00	KS24019-L112A	8	1.953	0.5172	0.0003	4240

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	163.007 - 121.587 (1)	TP42.37x34.28x0.3125	41.42	0.00	0.0	40.5857	-16.25	2374.26	0.007
L2	121.587 - 84.67 (2)	TP48.83x40.6057x0.375	42.75	0.00	0.0	56.1470	-30.99	3284.60	0.009
L3	84.67 - 42.2067 (3)	TP56.25x46.7975x0.4375	49.13	0.00	0.0	75.4766	-46.41	4415.38	0.011
L4	42.2067 - 0 (4)	TP63.5x53.916x0.5	49.79	0.00	0.0	99.9810	-70.32	5848.89	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	163.007 - 121.587 (1)	TP42.37x34.28x0.3125	407.72	2309.38	0.177	0.00	2309.38	0.000
L2	121.587 - 84.67 (2)	TP48.83x40.6057x0.375	1323.80	3734.23	0.355	0.00	3734.23	0.000
L3	84.67 - 42.2067 (3)	TP56.25x46.7975x0.4375	2647.54	5807.86	0.456	0.00	5807.86	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L4	42.2067 - 0 (4)	TP63.5x53.916x0.5	4501.41	8875.75	0.507	0.00	8875.75	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	163.007 - 121.587 (1)	TP42.37x34.28x0.3125	18.69	712.28	0.026	0.64	2552.38	0.000
L2	121.587 - 84.67 (2)	TP48.83x40.6057x0.375	29.16	985.38	0.030	1.35	4070.72	0.000
L3	84.67 - 42.2067 (3)	TP56.25x46.7975x0.4375	34.44	1324.61	0.026	1.35	6305.17	0.000
L4	42.2067 - 0 (4)	TP63.5x53.916x0.5	39.67	1754.67	0.023	1.23	9680.92	0.000

Pole Interaction Design Data

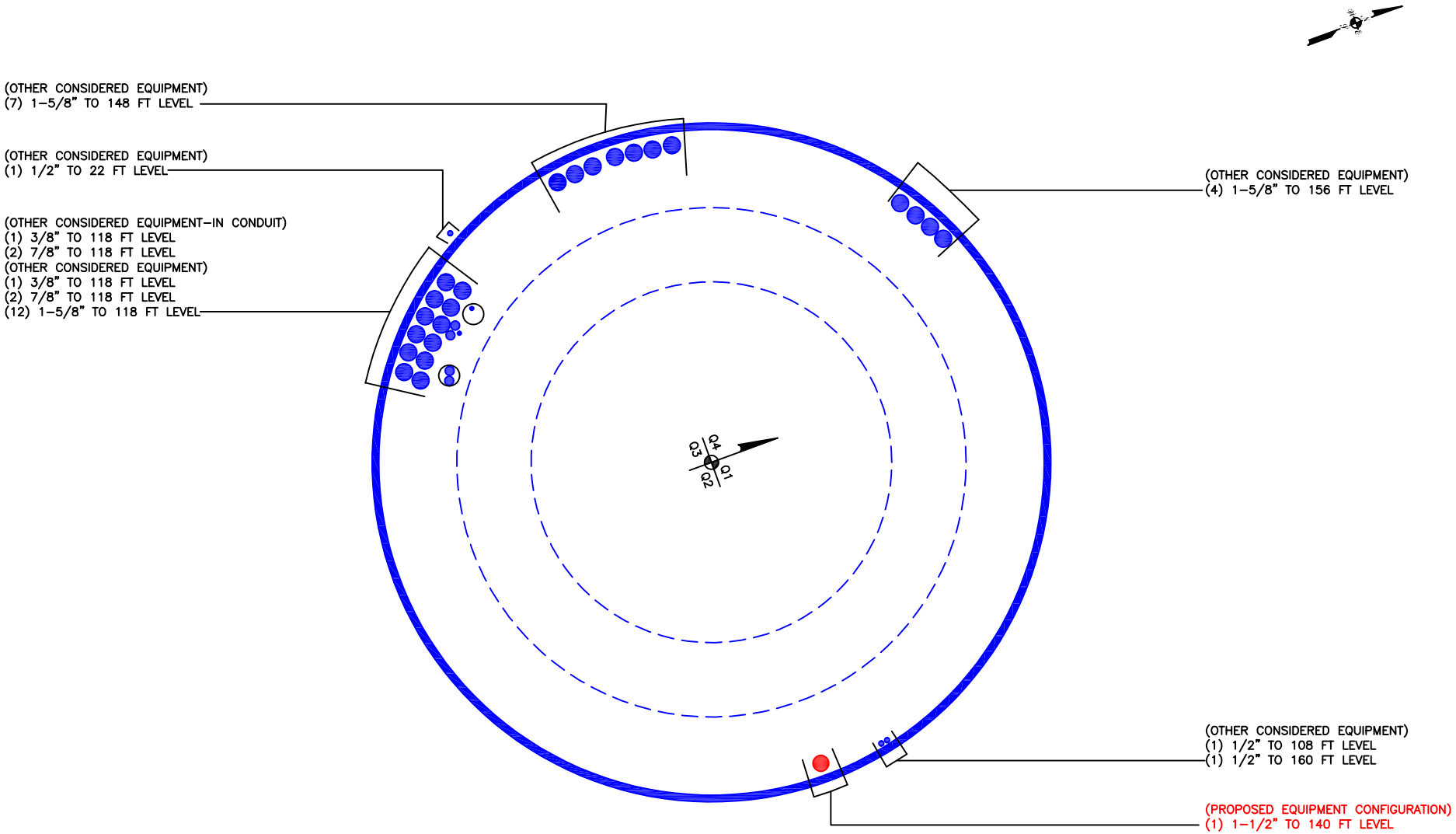
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	163.007 - 121.587 (1)	0.007	0.177	0.000	0.026	0.000	0.184	1.050	4.8.2
L2	121.587 - 84.67 (2)	0.009	0.355	0.000	0.030	0.000	0.365	1.050	4.8.2
L3	84.67 - 42.2067 (3)	0.011	0.456	0.000	0.026	0.000	0.467	1.050	4.8.2
L4	42.2067 - 0 (4)	0.012	0.507	0.000	0.023	0.000	0.520	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	163.007 - 121.587	Pole	TP42.37x34.28x0.3125	1	-16.25	2492.97	17.5	Pass
L2	121.587 - 84.67	Pole	TP48.83x40.6057x0.375	2	-30.99	3448.83	34.7	Pass
L3	84.67 - 42.2067	Pole	TP56.25x46.7975x0.4375	3	-46.41	4636.15	44.5	Pass
L4	42.2067 - 0	Pole	TP63.5x53.916x0.5	4	-70.32	6141.33	49.5	Pass
							Summary	
						Pole (L4)	49.5	Pass
						RATING =	**49.5**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(7) 1-5/8" TO 148 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 22 FT LEVEL
(OTHER CONSIDERED EQUIPMENT-IN CONDUIT)
(1) 3/8" TO 118 FT LEVEL
(2) 7/8" TO 118 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 118 FT LEVEL
(2) 7/8" TO 118 FT LEVEL
(12) 1-5/8" TO 118 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(4) 1-5/8" TO 156 FT LEVEL
Q4
Q3
Q1
Q2
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 108 FT LEVEL
(1) 1/2" TO 160 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-1/2" TO 140 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 490.19 ft (NAVD 88)
Latitude: 41.589947
Longitude: -73.169867

Wind

Results:

Wind Speed:	118 Vmph	120 Vmph per jurisdiction
10-year MRI	76 Vmph	
25-year MRI	85 Vmph	
50-year MRI	90 Vmph	
100-year MRI	97 Vmph	

Data Accessed: Sun Aug 22 2021

Date 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.

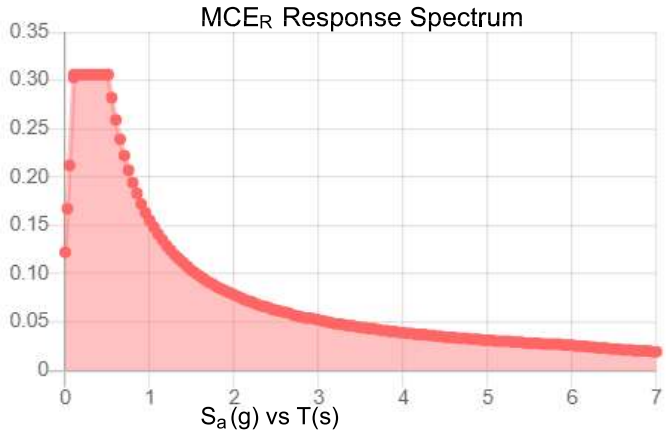
Seismic

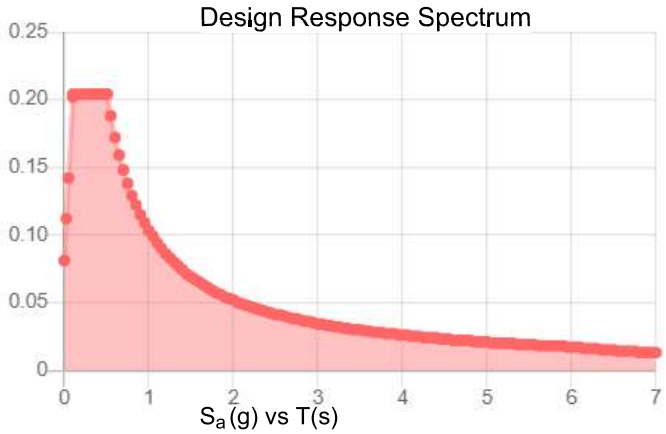
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.191	S_{DS} :	0.204
S_1 :	0.065	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.099
S_{MS} :	0.306	PGA_M :	0.159
S_{M1} :	0.155	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Fri Aug 20 2021

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

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Fri Aug 20 2021

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

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

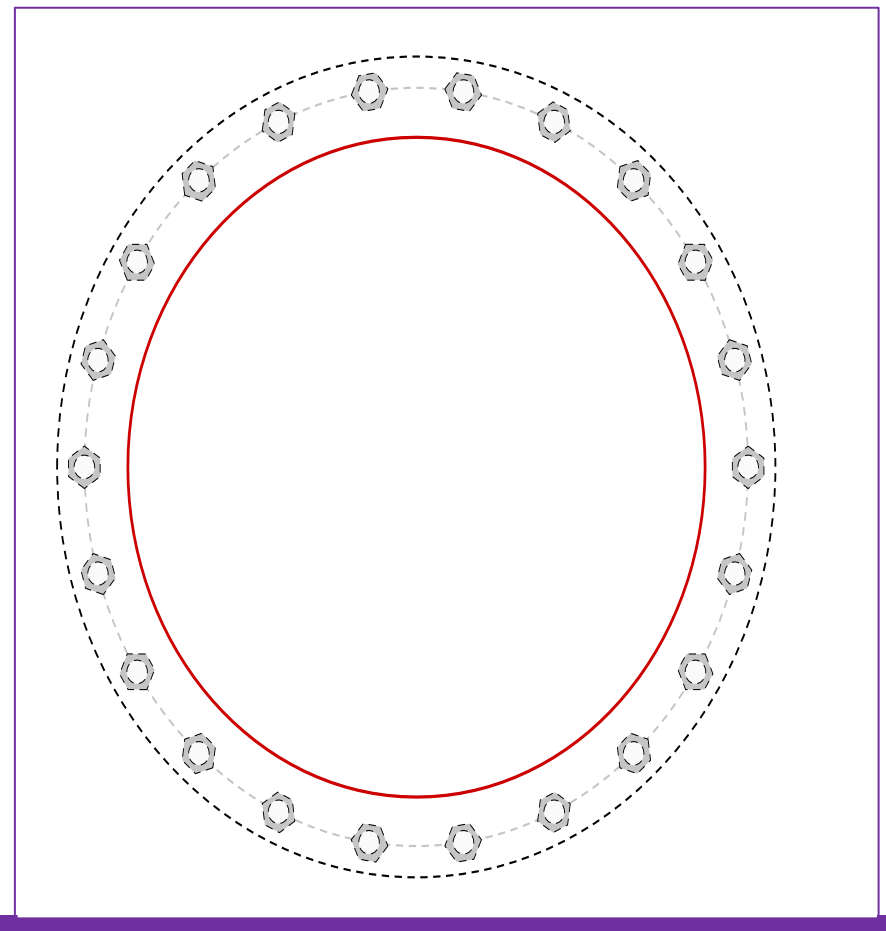
Monopole Base Plate Connection

Site Info	
BU #	876379
Site Name	Woodbury / Wolff Par
Order #	553370 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.75

Applied Loads	
Moment (kip-ft)	4501.00
Axial Force (kips)	70.00
Shear Force (kips)	40.00

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(22) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 73" BC

Base Plate Data

79" OD x 2.5" Plate (A871 Gr. 60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

63.5" x 0.5" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_t = 131.29	ϕPn_t = 243.75	**Stress Rating**
Vu = 1.82	ϕVn = 149.1	**51.3%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	27.69	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**48.8%**	**Pass**

Drilled Pier Foundation

BU # :	876379
Site Name:	N. Woodbury / Wolff Parcel
Order Number:	553370 Rev. 0
TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	4501	
Axial Force (kips)	70	
Shear Force (kips)	40	

Material Properties			Rebar 2, Fy Override (ksi)	Rebar 3, Fy Override (ksi)
Concrete Strength, f'c:	4	ksi		
Rebar Strength, Fy:	60	ksi		
Tie Yield Strength, Fyt:	60	ksi		

Pier Design Data		
Depth	28	ft
Ext. Above Grade	1	ft
Pier Section 1		
From 1' above grade to 28' below grade		
Pier Diameter	8	ft
Rebar Quantity	32	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	
Tie Spacing	12	in

Rebar & Pier Options
Embedded Pole Inputs
Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	7.60	-
Soil Safety Factor	4.68	-
Max Moment (kip-ft)	4759.32	-
Rating*	*27.1%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	542.87	-
End Bearing (kips)	1318.34	-
Weight of Concrete (kips)	211.52	-
Total Capacity (kips)	1861.21	-
Axial (kips)	281.52	-
Rating*	*14.4%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	7.28	-
Critical Moment (kip-ft)	4758.32	-
Critical Moment Capacity	9265.50	-
Rating*	*48.9%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	25.42	-
Critical Shear (kip)	217.07	-
Critical Shear Capacity	1230.12	-
Rating*	*16.8%*	-

Shear-Friction Methodology is Applied

Structural Foundation Rating*	**48.9%**
Soil Interaction Rating*	**27.1%**

*Rating per TIA-222-H Section 15.5

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

Go to Soil Calculations

Soil Profile

Groundwater Depth	14.5	# of Layers	5

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Net Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	4	4	135	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	4	5	1	135	150	0	38	0.000	0.000	0.00	0.00			Cohesionless
3	5	14.5	9.5	135	150	0	38	0.000	0.000	0.80	0.80			Cohesionless
4	14.5	15	0.5	75	87.6	0	38	0.000	0.000	0.80	0.80			Cohesionless
5	15	28	13	75	87.6	0	38	0.000	0.000	1.60	1.60	32		Cohesionless

Exhibit E

Mount Analysis

Date: **November 3, 2021**

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

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

Subject:	**Mount Replacement Analysis Report**	
Carrier Designation:	**DISH Wireless Dish 5G**	
	Carrier Site Number:	BOHVN00030A
	Carrier Site Name:	CT-CCI-T-876379
Crown Castle Designation:	**Crown Castle BU Number:**	876379
	Crown Castle Site Name:	N. WOODBURY / WOLFF PARCEL
	Crown Castle JDE Job Number:	645193
	Crown Castle Order Number:	553370 Rev. 2
Engineering Firm Designation:	**Trylon Report Designation:**	195375
Site Data:	**1440 Main Street North, Woodbury, Litchfield County, CT, 06798 Latitude 41°35'23.81" Longitude -73°10'11.52"**	
Structure Information:	**Tower Height & Type:**	**160.0 ft Monopole**
	Mount Elevation:	**140.0 ft**
	Mount Type:	**8.0 ft Platform**

Dear Darcy Tarr,

Trylon is pleased to submit this **"Mount Replacement Analysis Report"** to determine the structural integrity of DISH Wireless'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:

Platform **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 120 mph as required by the 2018 Connecticut State Building Code . Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Vlad Barbu

Respectfully Submitted by:
Cliff Abernathy, P.E.

11/03/2021

TABLE OF CONTENTS

1) INTRODUCTION

This is a proposed 3 sector 8.0 ft Platform, designed by Commscope.

2) ANALYSIS CRITERIA

Building Code:	2015IBC/2018 CTSBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	120 mph
Exposure Category:	C
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	1.5 in
Wind Speed with Ice:	40 mph
Seismic S_s:	0.194
Seismic S_1:	0.065
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
140.0	140.0	3	JMA WIRELESS	MX08FRO665-21	8.0 ft Platform **[Commscope, MC-PK8-C]**
		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 Wireless Application	572910, Rev. 2	CCI Sites
Mount Manufacturer Drawings	Commscope	MC-PK8-C	Trylon

3.1) Analysis Method

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

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

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision 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 A325

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

4) ANALYSIS RESULTS

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

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2	Mount Pipe(s)	MP9	140.0	36.8	Pass
	Horizontal(s)	H1		11.0	Pass
	Standoff(s)	M2		49.0	Pass
	Bracing(s)	M1		37.6	Pass
	Handrail(s)	M19		17.7	Pass
	Plate(s)	M10		26.8	Pass
	Mount Connection(s)	-		13.1	Pass

Structure Rating (max from all components) =	49.0%

Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H, Section 15.5

4.1) Recommendations

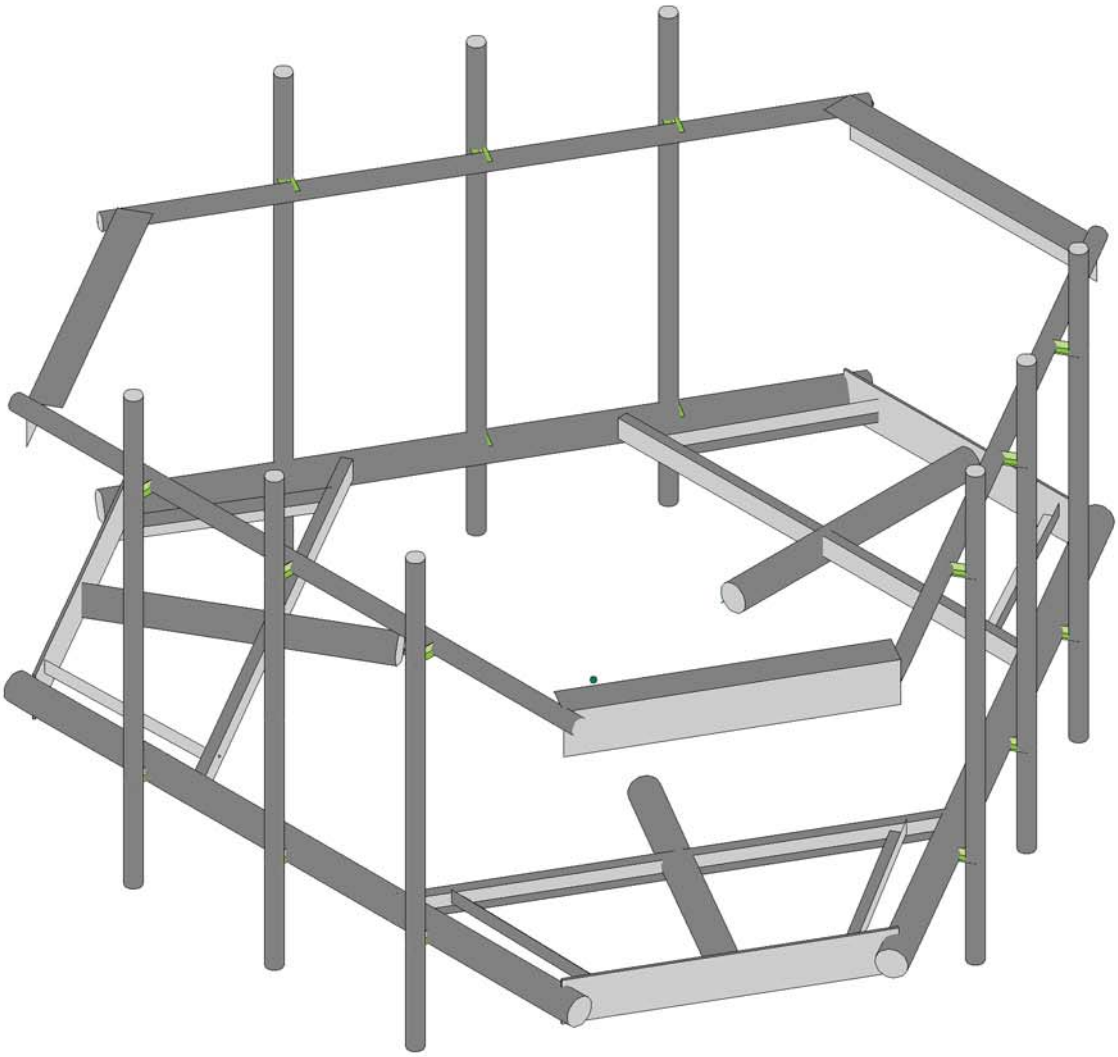
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

1. Commscope, MC-PK8-C

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

APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

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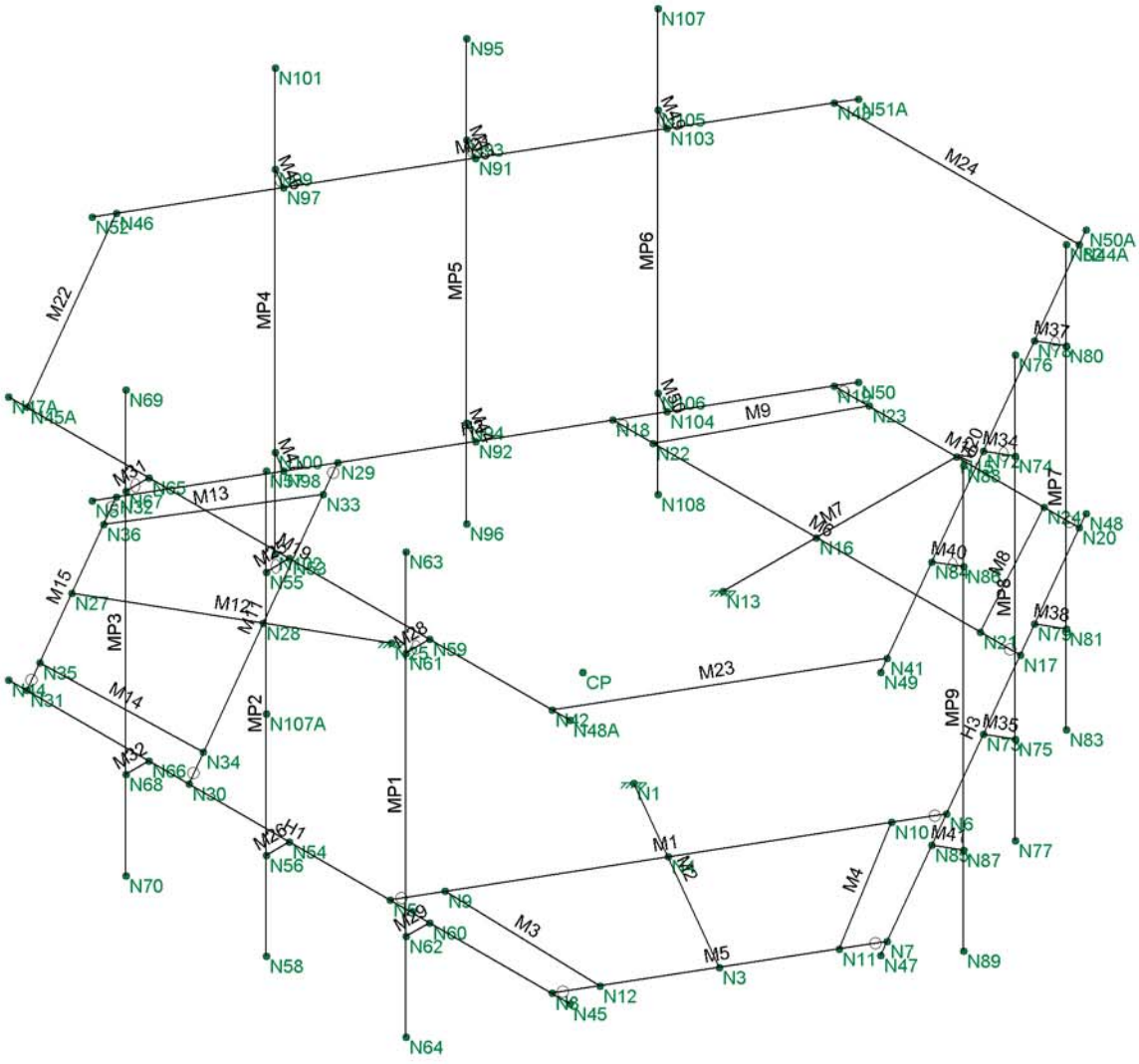

Envelope Only Solution

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APPENDIX B

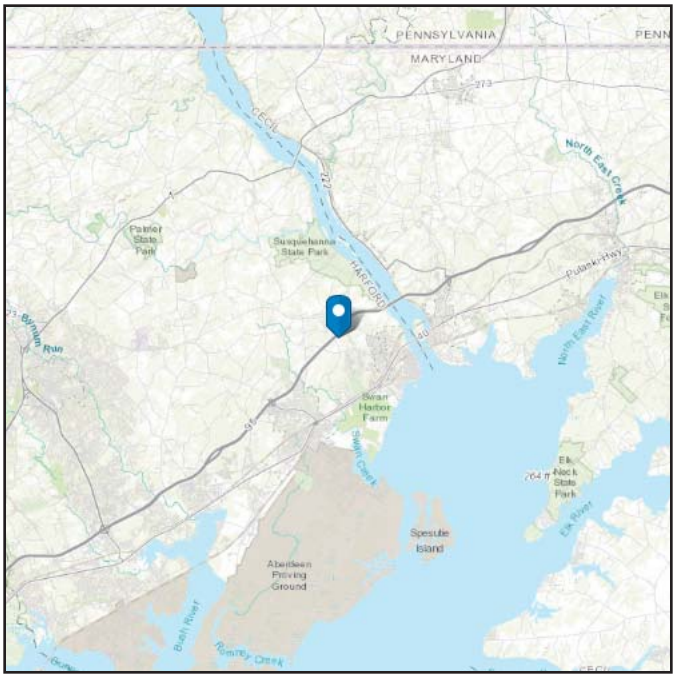
SOFTWARE INPUT CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 347.29 ft (NAVD 88)
Latitude: 39.561386
Longitude: -76.143906



Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	40 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Wed Nov 03 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.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

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

TIA LOAD CALCULATOR 2.1

PROJECT DATA	
Job Code:	195375
Carrier Site ID:	BOHVN00030A
Carrier Site Name:	CT-CCI-T-876379

CODES AND STANDARDS	
Building Code:	2015 IBC
Local Building Code:	Connecticut State Building
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	140.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	163.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Default	--
Ground Elevation:	490.19	ft.

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

WIND PARAMETERS		
Design Wind Speed:	120	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.36	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	46.74	psf
Ground Elevation Factor (K_e):	0.98	--

ICE PARAMETERS		
Design Ice Wind Speed:	40	mph
Design Ice Thickness (t_i):	1.50	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	46.74	psf
Mount Ice Thickness (t_{iz}):	1.73	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	84.13	psf
Round Member Pressure:	50.48	psf
Ice Wind Pressure:	4.77	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.194	g
1 Second Accel (S_1):	0.065	g
Short Period Des. (S_{DS}):	0.21	g
1 Second Des. (S_{D1}):	0.10	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (Cs):	0.10	--
Amplification Factor (A_S):	1.20	--

LOAD COMBINATIONS [LRFD]

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

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

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

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

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

EQUIPMENT LOADING

Appurtenance Name	Qty.	Elevation [ft]	--	EPA$_N$ (ft2)	EPA$_T$ (ft2)	Weight (lbs)
MX08FRO665-21	1	140	No Ice	8.01	3.21	82.50
--	--	--	w/ Ice	9.62	4.62	284.74
TA08025-B604	1	140	No Ice	1.96	0.98	63.90
--	--	--	w/ Ice	2.39	1.31	69.99
TA08025-B604	2	140	No Ice	1.96	0.98	63.90
--	--	--	w/ Ice	2.39	1.31	69.99
TA08025-B605	3	140	No Ice	1.96	1.13	75.00
--	--	--	w/ Ice	2.39	1.47	74.56
RDIDC-9181-PF-48	1	140	No Ice	2.01	1.17	21.85
--	--	--	w/ Ice	2.44	1.53	73.49
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT LOADING [CONT.]

Appurtenance Name	Qty.	Elevation [ft]	--	EPA_N (ft2)	EPA_T (ft2)	Weight (lbs)
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			

EQUIPMENT WIND CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	K_{zt}	K_z	K_d	t_d	q_z [psf]	q_{zi} [psf]
MX08FRO665-21	1	140	1.00	1.36	0.95	1.73	46.74	5.19
TA08025-B604	1	140	1.00	1.36	0.95	1.73	46.74	5.19
TA08025-B604	2	140	1.00	1.36	0.95	1.73	46.74	5.19
TA08025-B605	3	140	1.00	1.36	0.95	1.73	46.74	5.19
RDIDC-9181-PF-48	1	140	1.00	1.36	0.95	1.73	46.74	5.19

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
MX08FRO665-21	1	No Ice	336.95	185.51	286.47	135.03	286.47	185.51
--	--	w/ Ice	44.97	27.45	39.13	21.61	39.13	27.45
TA08025-B604	1	No Ice	82.60	51.60	72.27	41.27	72.27	51.60
--	--	w/ Ice	11.16	7.39	9.90	6.13	9.90	7.39
TA08025-B604	2	No Ice	82.60	51.60	72.27	41.27	72.27	51.60
--	--	w/ Ice	11.16	7.39	9.90	6.13	9.90	7.39
TA08025-B605	3	No Ice	82.60	56.28	73.83	47.51	73.83	56.28
--	--	w/ Ice	11.16	7.96	10.09	6.89	10.09	7.96
RDIDC-9181-PF-48	1	No Ice	84.63	58.01	75.76	49.14	75.76	58.01
--	--	w/ Ice	11.42	8.21	10.35	7.13	10.35	8.21
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
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		No Ice						
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		No Ice						
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		No Ice						
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		No Ice						
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		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						

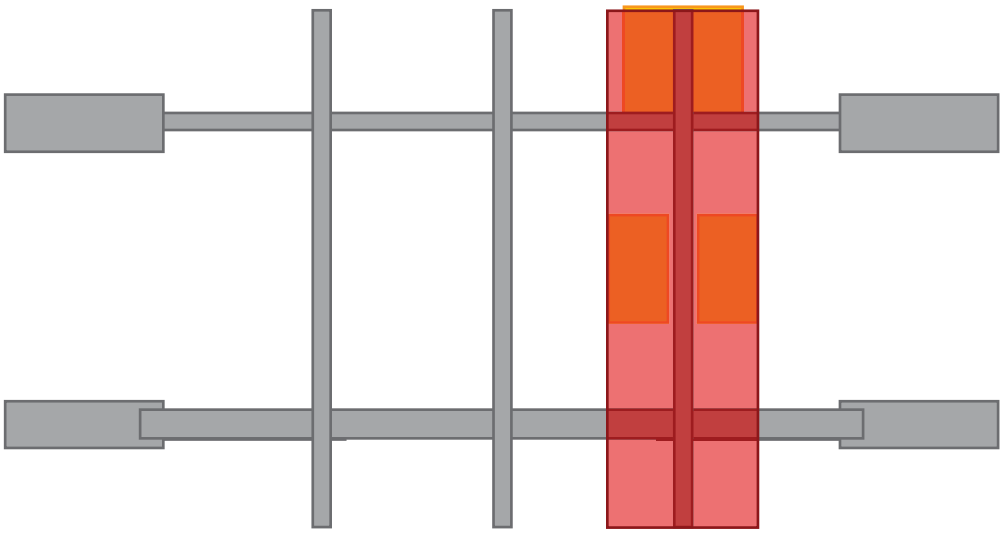
EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

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

EQUIPMENT SEISMIC FORCE CALCULATIONS

Appurtenance Name	*Qty.*	*Elevation [ft]*	*Weight [lbs]*	F_p [lbs]
MX08FRO665-21	1	140	82.5	10.24
TA08025-B604	1	140	63.9	7.93
TA08025-B604	2	140	63.9	7.93
TA08025-B605	3	140	75	9.31
RDIDC-9181-PF-48	1	140	21.85	2.71

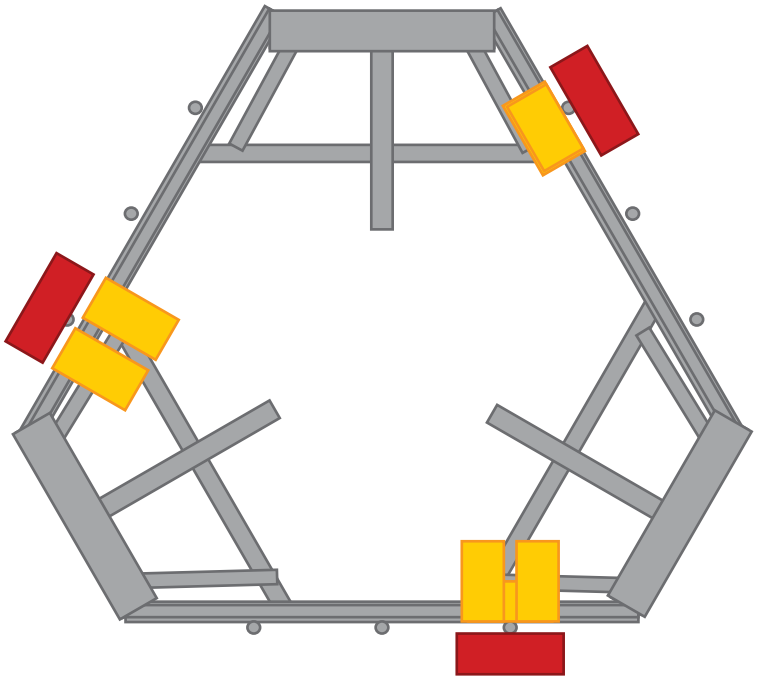
ELEVATION VIEW



MP3 MP2 MP1

*Elevation View Shows Alpha Sector Only

PLAN VIEW



1825 W. Walnut Hill Lane, Suite 120
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Equipment Name	Total Quantity	Antenna Centerline	Mount Pipe Positions	Equipment Azimuths
MX08FRO665-21	3	140	MP1/MP4/MP7	0/120/240
TA08025-B604	1	140	MP1	0
TA08025-B604	2	140	MP1	0
TA08025-B605	3	140	MP4/MP7	120/240
RDIDC-9181-PF-48	1	140	MP7	240

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Irving, Texas 75038

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

(Global) Model Settings

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

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-12: LRFD
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E..	Density[k/ft...	Yield[psi]	Ry	Fu[psi]	Rt
1	A992	29000	11154	.3	.65	.49	50000	1.1	65000	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36000	1.5	58000	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50000	1.1	65000	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42000	1.4	58000	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46000	1.4	58000	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35000	1.6	60000	1.2
7	A1085	29000	11154	.3	.65	.49	50000	1.4	65000	1.3

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[psi]	Fu[psi]
1	A653 SS Gr33	29500	11346	.3	.65	.49	33000	45000
2	A653 SS Gr50/1	29500	11346	.3	.65	.49	50000	65000

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design ...	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Plates	6.5"x0.37" Plate	Beam	RECT	A53 Gr.B	Typical	2.405	.027	8.468	.106
2	Grating Brac...	L2x2x3	Beam	Single A...	A36 Gr.36	Typical	.722	.271	.271	.009
3	Standoffs	PIPE_3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
4	Standoff Bra...	C3X5	Beam	Channel	A36 Gr.36	Typical	1.47	.241	1.85	.043
5	Handrails	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	Handrail Cor...	L6.6"X4.46"X0.25"	Beam	Single A...	A36 Gr.36	Typical	2.703	4.759	12.473	.055
7	Horizontals	PIPE_3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design ...	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
8	Mount Pipes	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8CU1.25X057	Beam	None	A653 SS Gr33	Typical	.581	.057	4.41	.00063

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N25	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N13	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL			-1		11		3	
2	Structure Wind X	WLX						51		
3	Structure Wind Y	WLY						51		
4	Wind Load 0 AZI	WLX					22			
5	Wind Load 30 AZI	None					22			
6	Wind Load 45 AZI	None					22			
7	Wind Load 60 AZI	None					22			
8	Wind Load 90 AZI	WLY					22			
9	Wind Load 120 AZI	None					22			
10	Wind Load 135 AZI	None					22			
11	Wind Load 150 AZI	None					22			
12	Ice Weight	OL1					11	51	3	
13	Ice Structure Wind X	OL2						51		
14	Ice Structure Wind Y	OL3						51		
15	Ice Wind Load 0 AZI	OL2					22			
16	Ice Wind Load 30 AZI	None					22			
17	Ice Wind Load 45 AZI	None					22			
18	Ice Wind Load 60 AZI	None					22			
19	Ice Wind Load 90 AZI	OL3					22			
20	Ice Wind Load 120 AZI	None					22			
21	Ice Wind Load 135 AZI	None					22			
22	Ice Wind Load 150 AZI	None					22			
23	Seismic Load X	ELX	-.124				11			
24	Seismic Load Y	ELY		-.124			11			
25	Live Load 1 (Lv)	None					1			
26	Live Load 2 (Lv)	None					1			
27	Live Load 3 (Lv)	None					1			
28	Live Load 4 (Lv)	None					1			
29	Live Load 5 (Lv)	None					1			
30	Live Load 6 (Lv)	None					1			
31	Live Load 7 (Lv)	None					1			
32	Live Load 8 (Lv)	None					1			
33	Live Load 9 (Lv)	None					1			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
34	Maintenance Load 1 (...	None					1			
35	Maintenance Load 2 (...	None					1			
36	Maintenance Load 3 (...	None					1			
37	Maintenance Load 4 (...	None					1			
38	Maintenance Load 5 (...	None					1			
39	Maintenance Load 6 (...	None					1			
40	Maintenance Load 7 (...	None					1			
41	Maintenance Load 8 (...	None					1			
42	Maintenance Load 9 (...	None					1			
43	BLC 1 Transient Area...	None						9		
44	BLC 12 Transient Are...	None						9		

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.4DL	Yes	Y		DL	1.4																		
2	1.2DL + 1...	Yes	Y		DL	1.2	2	1	3		4	1												
3	1.2DL + 1...	Yes	Y		DL	1.2	2	.866	3	.5	5	1												
4	1.2DL + 1...	Yes	Y		DL	1.2	2	.707	3	.707	6	1												
5	1.2DL + 1...	Yes	Y		DL	1.2	2	.5	3	.866	7	1												
6	1.2DL + 1...	Yes	Y		DL	1.2	2		3	1	8	1												
7	1.2DL + 1...	Yes	Y		DL	1.2	2	-.5	3	.866	9	1												
8	1.2DL + 1...	Yes	Y		DL	1.2	2	-.707	3	.707	10	1												
9	1.2DL + 1...	Yes	Y		DL	1.2	2	-.866	3	.5	11	1												
10	1.2DL + 1...	Yes	Y		DL	1.2	2	-1	3		4	-1												
11	1.2DL + 1...	Yes	Y		DL	1.2	2	-.866	3	-.5	5	-1												
12	1.2DL + 1...	Yes	Y		DL	1.2	2	-.707	3	-.707	6	-1												
13	1.2DL + 1...	Yes	Y		DL	1.2	2	-.5	3	-.866	7	-1												
14	1.2DL + 1...	Yes	Y		DL	1.2	2		3	-1	8	-1												
15	1.2DL + 1...	Yes	Y		DL	1.2	2	.5	3	-.866	9	-1												
16	1.2DL + 1...	Yes	Y		DL	1.2	2	.707	3	-.707	10	-1												
17	1.2DL + 1...	Yes	Y		DL	1.2	2	.866	3	-.5	11	-1												
18	0.9DL + 1...	Yes	Y		DL	.9	2	1	3		4	1												
19	0.9DL + 1...	Yes	Y		DL	.9	2	.866	3	.5	5	1												
20	0.9DL + 1...	Yes	Y		DL	.9	2	.707	3	.707	6	1												
21	0.9DL + 1...	Yes	Y		DL	.9	2	.5	3	.866	7	1												
22	0.9DL + 1...	Yes	Y		DL	.9	2		3	1	8	1												
23	0.9DL + 1...	Yes	Y		DL	.9	2	-.5	3	.866	9	1												
24	0.9DL + 1...	Yes	Y		DL	.9	2	-.707	3	.707	10	1												
25	0.9DL + 1...	Yes	Y		DL	.9	2	-.866	3	.5	11	1												
26	0.9DL + 1...	Yes	Y		DL	.9	2	-1	3		4	-1												
27	0.9DL + 1...	Yes	Y		DL	.9	2	-.866	3	-.5	5	-1												
28	0.9DL + 1...	Yes	Y		DL	.9	2	-.707	3	-.707	6	-1												
29	0.9DL + 1...	Yes	Y		DL	.9	2	-.5	3	-.866	7	-1												
30	0.9DL + 1...	Yes	Y		DL	.9	2		3	-1	8	-1												
31	0.9DL + 1...	Yes	Y		DL	.9	2	.5	3	-.866	9	-1												
32	0.9DL + 1...	Yes	Y		DL	.9	2	.707	3	-.707	10	-1												
33	0.9DL + 1...	Yes	Y		DL	.9	2	.866	3	-.5	11	-1												
34	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1										
35	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1										
36	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1										

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
37	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1												
38	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1												
39	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1												
40	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	.707	21	1												
41	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	.5	22	1												
42	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1												
43	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.866	14	-.5	16	-1												
44	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.707	14	-.707	17	-1												
45	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.866	18	-1												
46	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1												
47	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.866	20	-1												
48	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.707	21	-1												
49	1.2DL + 1...	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1												
50	(1.2+0.2S...	Yes	Y		DL	1.241	23	1	24																	
51	(1.2+0.2S...	Yes	Y		DL	1.241	23	.866	24	.5																
52	(1.2+0.2S...	Yes	Y		DL	1.241	23	.707	24	.707																
53	(1.2+0.2S...	Yes	Y		DL	1.241	23	.5	24	.866																
54	(1.2+0.2S...	Yes	Y		DL	1.241	23		24	1																
55	(1.2+0.2S...	Yes	Y		DL	1.241	23	-.5	24	.866																
56	(1.2+0.2S...	Yes	Y		DL	1.241	23	-.707	24	.707																
57	(1.2+0.2S...	Yes	Y		DL	1.241	23	-.866	24	.5																
58	(1.2+0.2S...	Yes	Y		DL	1.241	23	-1	24																	
59	(1.2+0.2S...	Yes	Y		DL	1.241	23	-.866	24	-.5																
60	(1.2+0.2S...	Yes	Y		DL	1.241	23	-.707	24	-.707																
61	(1.2+0.2S...	Yes	Y		DL	1.241	23	-.5	24	-.866																
62	(1.2+0.2S...	Yes	Y		DL	1.241	23		24	-1																
63	(1.2+0.2S...	Yes	Y		DL	1.241	23	.5	24	-.866																
64	(1.2+0.2S...	Yes	Y		DL	1.241	23	.707	24	-.707																
65	(1.2+0.2S...	Yes	Y		DL	1.241	23	.866	24	-.5																
66	(0.9-0.2Sd...	Yes	Y		DL	.859	23	1	24																	
67	(0.9-0.2Sd...	Yes	Y		DL	.859	23	.866	24	.5																
68	(0.9-0.2Sd...	Yes	Y		DL	.859	23	.707	24	.707																
69	(0.9-0.2Sd...	Yes	Y		DL	.859	23	.5	24	.866																
70	(0.9-0.2Sd...	Yes	Y		DL	.859	23		24	1																
71	(0.9-0.2Sd...	Yes	Y		DL	.859	23	-.5	24	.866																
72	(0.9-0.2Sd...	Yes	Y		DL	.859	23	-.707	24	.707																
73	(0.9-0.2Sd...	Yes	Y		DL	.859	23	-.866	24	.5																
74	(0.9-0.2Sd...	Yes	Y		DL	.859	23	-1	24																	
75	(0.9-0.2Sd...	Yes	Y		DL	.859	23	-.866	24	-.5																
76	(0.9-0.2Sd...	Yes	Y		DL	.859	23	-.707	24	-.707																
77	(0.9-0.2Sd...	Yes	Y		DL	.859	23	-.5	24	-.866																
78	(0.9-0.2Sd...	Yes	Y		DL	.859	23		24	-1																
79	(0.9-0.2Sd...	Yes	Y		DL	.859	23	.5	24	-.866																
80	(0.9-0.2Sd...	Yes	Y		DL	.859	23	.707	24	-.707																
81	(0.9-0.2Sd...	Yes	Y		DL	.859	23	.866	24	-.5																
82	1.2DL + 1...	Yes	Y		DL	1.2	25	1.5																		
83	1.2DL + 1...	Yes	Y		DL	1.2	26	1.5																		
84	1.2DL + 1...	Yes	Y		DL	1.2	27	1.5																		
85	1.2DL + 1...	Yes	Y		DL	1.2	28	1.5																		
86	1.2DL + 1...	Yes	Y		DL	1.2	29	1.5																		
87	1.2DL + 1...	Yes	Y		DL	1.2	30	1.5																		
88	1.2DL + 1...	Yes	Y		DL	1.2	31	1.5																		

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
89	1.2DL + 1...	Yes	Y		DL	1.2	32	1.5																		
90	1.2DL + 1...	Yes	Y		DL	1.2	33	1.5																		
91	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.063	3		4	.063												
92	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.054	3	.031	5	.063												
93	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.044	3	.044	6	.063												
94	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.031	3	.054	7	.063												
95	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2		3	.063	8	.063												
96	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.031	3	.054	9	.063												
97	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.044	3	.044	10	.063												
98	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.054	3	.031	11	.063												
99	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.063	3		4	-.063												
100	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.054	3	-.031	5	-.063												
101	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.044	3	-.044	6	-.063												
102	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	-.031	3	-.054	7	-.063												
103	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2		3	-.063	8	-.063												
104	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.031	3	-.054	9	-.063												
105	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.044	3	-.044	10	-.063												
106	1.2DL + 1...	Yes	Y		DL	1.2	34	1.5	2	.054	3	-.031	11	-.063												
107	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.063	3		4	.063												
108	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.054	3	.031	5	.063												
109	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.044	3	.044	6	.063												
110	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.031	3	.054	7	.063												
111	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2		3	.063	8	.063												
112	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.031	3	.054	9	.063												
113	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.044	3	.044	10	.063												
114	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.054	3	.031	11	.063												
115	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.063	3		4	-.063												
116	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.054	3	-.031	5	-.063												
117	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.044	3	-.044	6	-.063												
118	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	-.031	3	-.054	7	-.063												
119	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2		3	-.063	8	-.063												
120	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.031	3	-.054	9	-.063												
121	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.044	3	-.044	10	-.063												
122	1.2DL + 1...	Yes	Y		DL	1.2	35	1.5	2	.054	3	-.031	11	-.063												
123	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.063	3		4	.063												
124	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.054	3	.031	5	.063												
125	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.044	3	.044	6	.063												
126	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.031	3	.054	7	.063												
127	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2		3	.063	8	.063												
128	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.031	3	.054	9	.063												
129	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.044	3	.044	10	.063												
130	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.054	3	.031	11	.063												
131	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.063	3		4	-.063												
132	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.054	3	-.031	5	-.063												
133	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.044	3	-.044	6	-.063												
134	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	-.031	3	-.054	7	-.063												
135	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2		3	-.063	8	-.063												
136	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.031	3	-.054	9	-.063												
137	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.044	3	-.044	10	-.063												
138	1.2DL + 1...	Yes	Y		DL	1.2	36	1.5	2	.054	3	-.031	11	-.063												
139	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.063	3		4	.063												
140	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.054	3	.031	5	.063												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
141	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.044	3	.044	6	.063												
142	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.031	3	.054	7	.063												
143	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2		3	.063	8	.063												
144	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.031	3	.054	9	.063												
145	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.044	3	.044	10	.063												
146	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.054	3	.031	11	.063												
147	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.063	3		4	-.063												
148	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.054	3	-.031	5	-.063												
149	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.044	3	-.044	6	-.063												
150	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	-.031	3	-.054	7	-.063												
151	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2		3	-.063	8	-.063												
152	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.031	3	-.054	9	-.063												
153	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.044	3	-.044	10	-.063												
154	1.2DL + 1...	Yes	Y		DL	1.2	37	1.5	2	.054	3	-.031	11	-.063												
155	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.063	3		4	.063												
156	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.054	3	.031	5	.063												
157	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.044	3	.044	6	.063												
158	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.031	3	.054	7	.063												
159	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2		3	.063	8	.063												
160	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.031	3	.054	9	.063												
161	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.044	3	.044	10	.063												
162	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.054	3	.031	11	.063												
163	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.063	3		4	-.063												
164	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.054	3	-.031	5	-.063												
165	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.044	3	-.044	6	-.063												
166	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	-.031	3	-.054	7	-.063												
167	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2		3	-.063	8	-.063												
168	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.031	3	-.054	9	-.063												
169	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.044	3	-.044	10	-.063												
170	1.2DL + 1...	Yes	Y		DL	1.2	38	1.5	2	.054	3	-.031	11	-.063												
171	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.063	3		4	.063												
172	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.054	3	.031	5	.063												
173	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.044	3	.044	6	.063												
174	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.031	3	.054	7	.063												
175	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2		3	.063	8	.063												
176	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.031	3	.054	9	.063												
177	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.044	3	.044	10	.063												
178	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.054	3	.031	11	.063												
179	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.063	3		4	-.063												
180	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.054	3	-.031	5	-.063												
181	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.044	3	-.044	6	-.063												
182	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	-.031	3	-.054	7	-.063												
183	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2		3	-.063	8	-.063												
184	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.031	3	-.054	9	-.063												
185	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.044	3	-.044	10	-.063												
186	1.2DL + 1...	Yes	Y		DL	1.2	39	1.5	2	.054	3	-.031	11	-.063												
187	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.063	3		4	.063												
188	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.054	3	.031	5	.063												
189	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.044	3	.044	6	.063												
190	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.031	3	.054	7	.063												
191	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2		3	.063	8	.063												
192	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.031	3	.054	9	.063												

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
193	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.044	3	.044	10	.063												
194	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.054	3	.031	11	.063												
195	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.063	3		4	-.063												
196	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.054	3	-.031	5	-.063												
197	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.044	3	-.044	6	-.063												
198	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	-.031	3	-.054	7	-.063												
199	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2		3	-.063	8	-.063												
200	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.031	3	-.054	9	-.063												
201	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.044	3	-.044	10	-.063												
202	1.2DL + 1...	Yes	Y		DL	1.2	40	1.5	2	.054	3	-.031	11	-.063												
203	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.063	3		4	.063												
204	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.054	3	.031	5	.063												
205	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.044	3	.044	6	.063												
206	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.031	3	.054	7	.063												
207	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2		3	.063	8	.063												
208	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.031	3	.054	9	.063												
209	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.044	3	.044	10	.063												
210	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.054	3	.031	11	.063												
211	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.063	3		4	-.063												
212	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.054	3	-.031	5	-.063												
213	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.044	3	-.044	6	-.063												
214	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	-.031	3	-.054	7	-.063												
215	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2		3	-.063	8	-.063												
216	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.031	3	-.054	9	-.063												
217	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.044	3	-.044	10	-.063												
218	1.2DL + 1...	Yes	Y		DL	1.2	41	1.5	2	.054	3	-.031	11	-.063												
219	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.063	3		4	.063												
220	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.054	3	.031	5	.063												
221	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.044	3	.044	6	.063												
222	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.031	3	.054	7	.063												
223	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2		3	.063	8	.063												
224	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.031	3	.054	9	.063												
225	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.044	3	.044	10	.063												
226	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.054	3	.031	11	.063												
227	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.063	3		4	-.063												
228	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.054	3	-.031	5	-.063												
229	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.044	3	-.044	6	-.063												
230	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	-.031	3	-.054	7	-.063												
231	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2		3	-.063	8	-.063												
232	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.031	3	-.054	9	-.063												
233	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.044	3	-.044	10	-.063												
234	1.2DL + 1...	Yes	Y		DL	1.2	42	1.5	2	.054	3	-.031	11	-.063												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N25	max	1580.373	3	1042.089	20	1924.316	39	371.517	31	403.121	33	1871.588	19
2		min	-1575.751	27	-1045.918	12	-45.71	31	-3526.338	39	-2015.365	130	-1875.937	11
3	N1	max	1648.59	17	939.302	8	1948.978	45	3380.322	45	423.062	19	1904.306	25
4		min	-1645.354	25	-930.732	32	-46.844	21	-358.367	21	-2371.293	43	-1910.258	17
5	N13	max	426.208	18	1610.994	22	1806.386	34	710.286	167	3744.409	34	1576.025	30

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
6		min	-434.519	10	-1615.468	14	-140.742	26	-679.47	223	-632.037	26	-1575.896	6
7	Totals:	max	3263.223	18	3032.771	22	5423.23	42						
8		min	-3263.227	10	-3032.772	14	1362.469	67						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc...	phi*Pnt ...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M2	PIPE_3.5	.515	40	45	.204	40		9	64491.4...	78750	7953.75	7953.75	2...	H1-1b
2	M12	PIPE_3.5	.504	40	39	.183	40		3	64491.4...	78750	7953.75	7953.75	2...	H1-1b
3	M7	PIPE_3.5	.471	40	34	.165	40		14	64491.4...	78750	7953.75	7953.75	2...	H1-1b
4	MP9	PIPE_2.0	.387	57	2	.031	57		3	20866.7...	32130	1871.625	1871.625	1	H1-1b
5	M1	C3X5	.386	34.8...	45	.138	63.1...	y	41	32858.7...	47628	981.263	4104	1...	H1-1b
6	M11	C3X5	.381	34.8...	40	.139	63.1...	y	35	32858.7...	47628	981.263	4104	1...	H1-1b
7	MP1	PIPE_2.0	.378	57	16	.049	57		17	20866.7...	32130	1871.625	1871.625	1...	H1-1b
8	MP3	PIPE_2.0	.373	57	5	.045	57		10	20866.7...	32130	1871.625	1871.625	1	H1-1b
9	MP8	PIPE_2.0	.372	57	10	.041	57		14	20866.7...	32130	1871.625	1871.625	1...	H1-1b
10	MP4	PIPE_2.0	.360	57	11	.052	57		11	20866.7...	32130	1871.625	1871.625	1...	H1-1b
11	MP2	PIPE_2.0	.358	57	5	.058	57		9	20866.7...	32130	1871.625	1871.625	1	H1-1b
12	M6	C3X5	.355	34.8...	34	.130	63.1...	y	46	32858.7...	47628	981.263	4104	1...	H1-1b
13	MP7	PIPE_2.0	.340	57	10	.042	15		17	20866.7...	32130	1871.625	1871.625	1...	H1-1b
14	MP6	PIPE_2.0	.335	57	15	.032	57		9	20866.7...	32130	1871.625	1871.625	1...	H1-1b
15	MP5	PIPE_2.0	.331	57	16	.049	57		3	20866.7...	32130	1871.625	1871.625	1...	H1-1b
16	M15	6.5"x0.37" ...	.282	21	7	.097	21	y	37	27548.2...	75757.5	583.963	6290.07	1...	H1-1b
17	M10	6.5"x0.37" ...	.271	21	2	.091	21	y	48	27548.2...	75757.5	583.963	6305.372	1...	H1-1b
18	M5	6.5"x0.37" ...	.267	21	12	.101	21	y	42	27548.2...	75757.5	583.963	6633.798	1...	H1-1b
19	M13	L2x2x3	.194	0	14	.027	0	z	43	18084.2	23392.8	557.717	1182.442	1	H2-1
20	M19	PIPE_2.0	.186	72	10	.173	72		2	14916.0...	32130	1871.625	1871.625	1...	H1-1b
21	M3	L2x2x3	.185	0	3	.027	0	z	49	18084.2	23392.8	557.717	1182.442	1	H2-1
22	M20	PIPE_2.0	.171	72	15	.164	72		8	14916.0...	32130	1871.625	1871.625	1...	H1-1b
23	M8	L2x2x3	.160	0	10	.026	0	z	38	18084.2	23392.8	557.717	1182.442	1	H2-1
24	M21	PIPE_2.0	.154	72	5	.147	72		13	14916.0...	32130	1871.625	1871.625	1...	H1-1b
25	M4	L2x2x3	.149	0	13	.029	0	y	41	18084.2	23392.8	557.717	1182.442	1	H2-1
26	M9	L2x2x3	.136	0	2	.028	0	y	47	18084.2	23392.8	557.717	1182.442	1	H2-1
27	M14	L2x2x3	.122	0	7	.030	0	y	36	18084.2	23392.8	557.717	1182.442	1	H2-1
28	H1	PIPE_3.5	.113	72	121	.116	24		10	60666.1...	78750	7953.75	7953.75	1	H1-1b
29	H3	PIPE_3.5	.112	31	10	.111	24		16	60666.1...	78750	7953.75	7953.75	1...	H1-1b
30	H2	PIPE_3.5	.108	72	212	.100	24		5	60666.1...	78750	7953.75	7953.75	1	H1-1b
31	M23	L6.6"X4.46...	.082	0	26	.045	0	y	9	51170.9...	87561	2464.809	7125.374	1	H2-1
32	M22	L6.6"X4.46...	.076	0	21	.042	42	z	4	51170.9...	87561	2464.809	7125.374	1	H2-1
33	M24	L6.6"X4.46...	.072	0	32	.041	0	y	14	51170.9...	87561	2464.809	7125.374	1	H2-1

Envelope AISI S100-12: LRFD Cold Formed Steel Code Checks

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

APPENDIX D

ADDITIONAL CALCUATIONS

Trylon

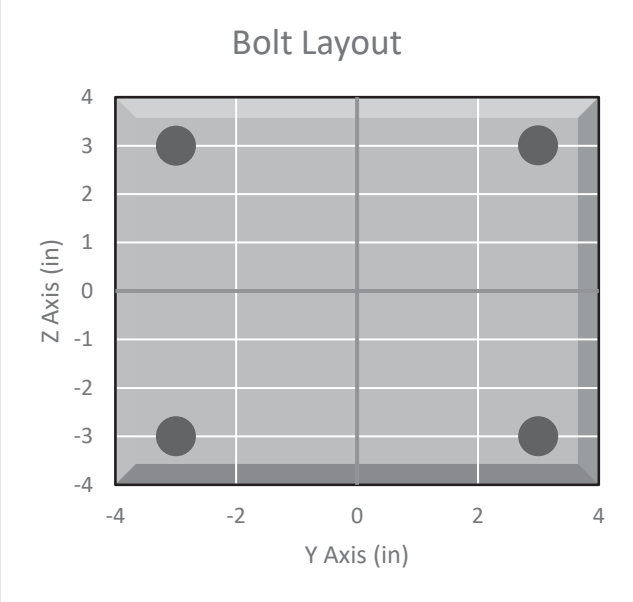
Analysis date: 11/3/2021

BOLT TOOL 1.5.2

Project Data	
Job Code:	195375
Carrier Site ID:	BOHVN00030A
Carrier Site Name:	CT-CCI-T-876379

Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	AISC

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in



Connection Description
Standoff to Tower Collar

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	13805.8	lbs
Tension Force (T_u):	2793.5	lbs
Shear Force (V_u):	236.2	lbs
Tension Usage:	13.1%	--
Shear Usage:	1.6%	--
Interaction:	13.1%	Pass
Controlling Member:	M7	--
Controlling LC:	2	--

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

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

APPENDIX E

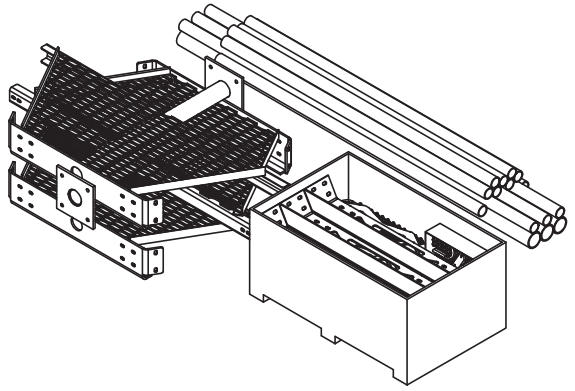
SUPPLEMENTAL DRAWINGS

ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT	NOTE NO.
1	MTC3006SB	STEEL BUNDLE FOR SNUB NOSE PLATFORM	1	402.64 LBS	
2	MCPK8CSB	PIPE STEEL BUNDLE FOR MC-PK8-C	1	464.27 LBS	
3	MCPK8CHWK	HARDWARE KIT FOR MC-PK8-C	1	543.22 LBS	

C

REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
A		INITIAL RELEASE	DRR	12/27/11
B	8000005979	CHANGE NOSE CORNER BRKT, ADD GUB-4240	MSM	11/25/14
C	8000007579	NEW RINGMOUNT WELDMENT DESIGN	RJC	04/07/15

FOR BOM ENTRY ONLY



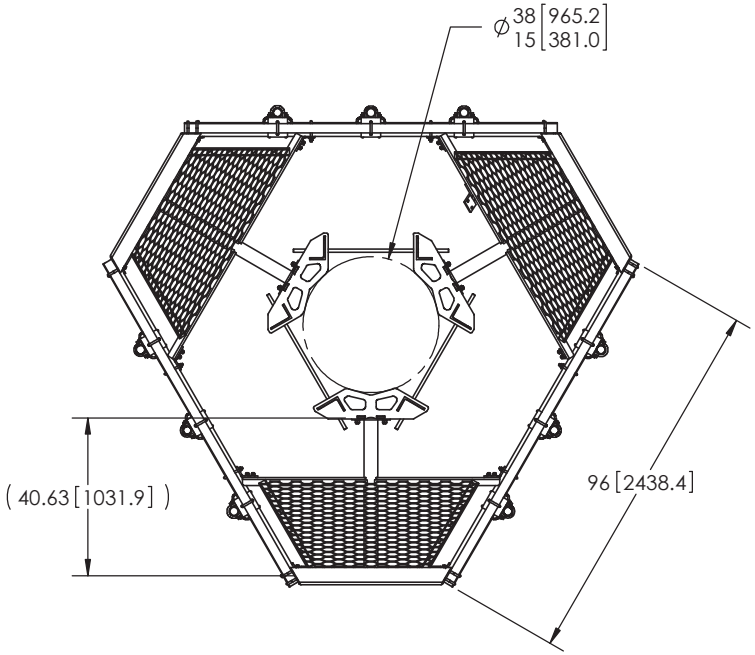
NOTES:
1. CUSTOMER ASSEMBLY SHEETS 2–3.

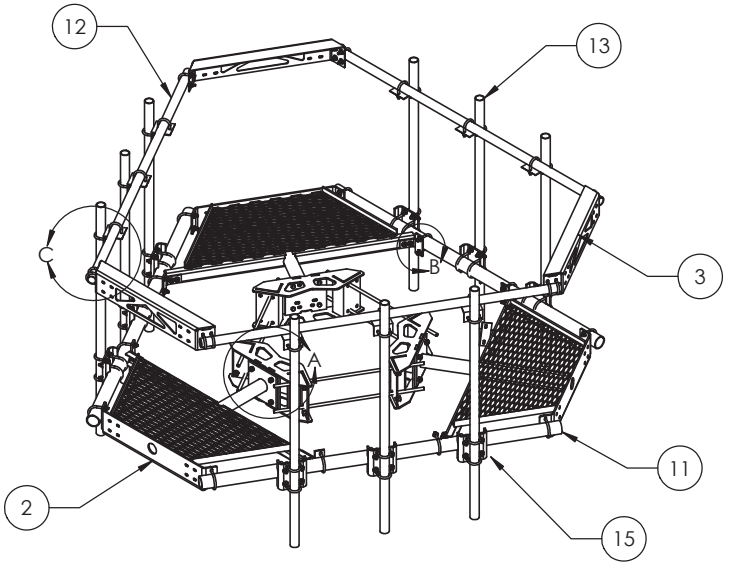
ALL DIMENSIONS ARE IN INCHES U.O.S.
TOLERANCES UNLESS OTHERWISE SPECIFIED:
.X = ± .12 ANGLES ±2°
.XX = ± .06 FRACTIONS ±1/32
.XXX= ± .03

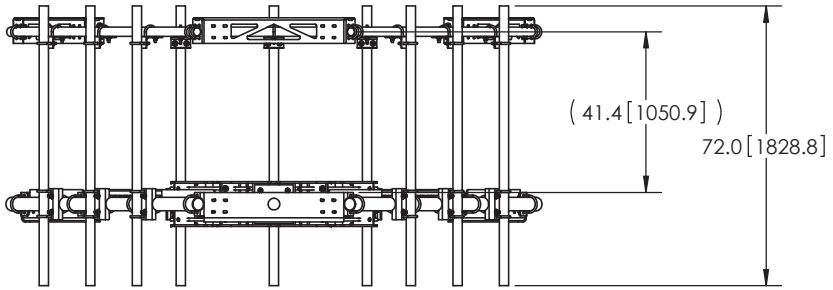
REMOVE BURRS AND BREAK EDGES .005

DO NOT SCALE THIS PRINT

DRAWN BY: MSM	SHEET: 1 of 3	PART NUMBER: MC-PK8-C	
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: LOW PROFILE PLATFORM KIT 8' FACE	
DATE: 10/18/11	MATERIAL: A36, A500	DRAWING TYPE: ASSEMBLY DRAWING	
REVISION: C	FINISH: GALV A123	ANDREW® WESTCHESTER, IL. 60154 U.S.A.	
	WEIGHT: 1410.14 LBS		





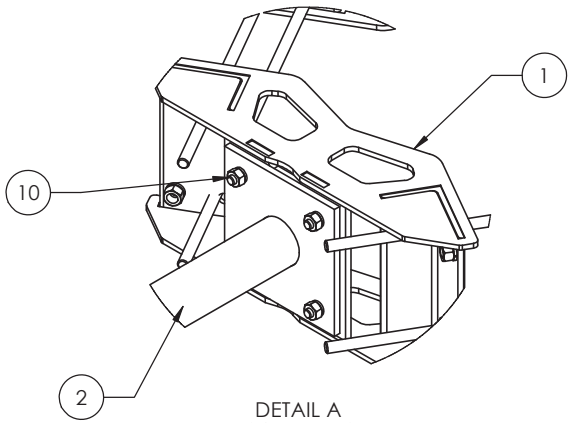


ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
C 1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1	230.42 LBS
2	MTC300601	Low Profile Co-Location Platform Snub Nose	3	134.21 LBS
3	MT195801	Corner Weldment Snub Nose Handrail	3	27.10 LBS
4	XA2020.01	CROSS OVER ANGLE	9	2.65 LBS
5	GUB-4356	1/2" X 3-5/8" X 6" GALV U-BOLT	18	0.82 LBS
6	GUB-4355	1/2" X 3-5/8" X 5" GALV U-BOLT	12	0.71 LBS
7	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	48	0.56 LBS
8	GB-04145	1/2" X 1-1/2" GALV BOLT KIT	12	0.13 LBS
9	GWF-04	1/2" GALV FLAT WASHER	24	0.03 LBS
10	GB-0520A	5/8" X 2" GALV BOLT KIT (A325)	12	0.27 LBS
11	MT54796	3.50" OD X 96" GALV PIPE	3	60.28 LBS
12	MT-651-96	Ø2.375" OD X 96" PIPE	3	29.07 LBS
13	MT-651	2.375" OD x 72" PIPE	9	21.80 LBS
14	MT19617	MT196 Pipe Mount Plate	6	2.49 LBS
15	MT21701	PIPE MOUNT PLATE	9	7.93 LBS

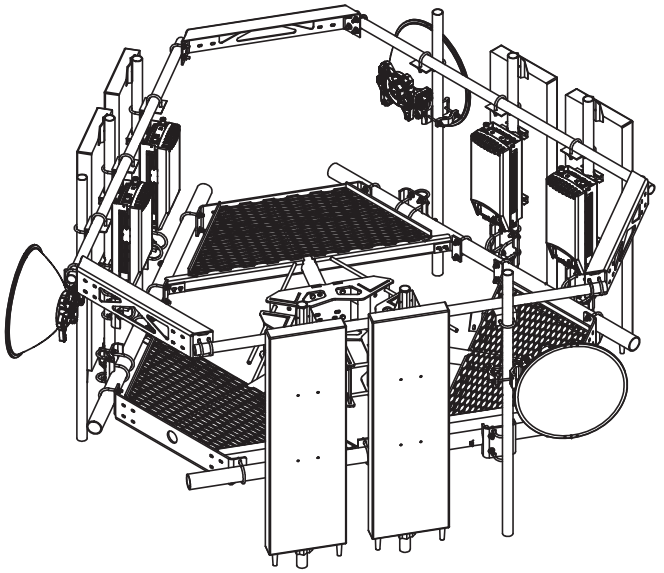
NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.
2. WILL FIT MONOPOLES 15"–38" OD.

ALL DIMENSIONS ARE IN INCHES U.O.S.
TOLERANCES UNLESS OTHERWISE SPECIFIED:
.X = ± .12 ANGLES ±2°
.XX = ± .06 FRACTIONS ±1/32
.XXX= ± .03
REMOVE BURRS AND BREAK EDGES .005
DO NOT SCALE THIS PRINT

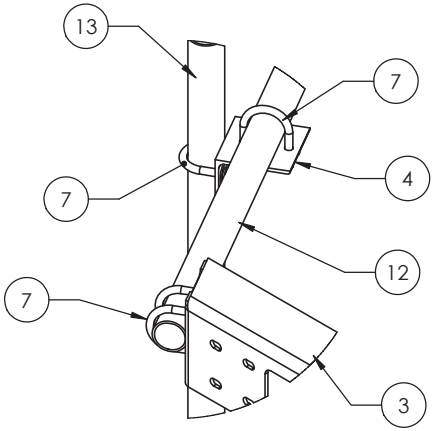
DRAWN BY: MSM	SHEET: 2 of 3	PART NUMBER: MC-PK8-C	
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: 25" OD Snub Nose MT-196	
DATE: 10/18/11	MATERIAL: A36, A53	DRAWING TYPE: ASSEMBLY DRAWING	
REVISION: C	FINISH: GALV A123	ANDREW® WESTCHESTER, IL. 60154 U.S.A.	
	WEIGHT: 1361.27 LBS		



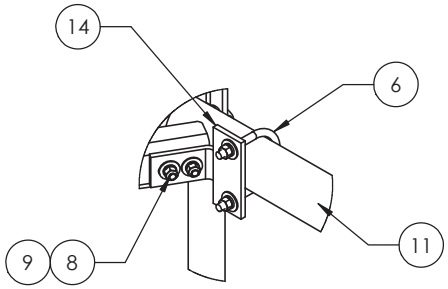
DETAIL A
SCALE 1 : 8



WITH ANTENNAS



DETAIL C
SCALE 1 : 8



DETAIL B
SCALE 1 : 8

NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.

ALL DIMENSIONS ARE IN INCHES U.O.S.
TOLERANCES UNLESS OTHERWISE SPECIFIED:
.X = ± .12 ANGLES ±2°
.XX = ± .06 FRACTIONS ±1/32
.XXX= ± .03
REMOVE BURRS AND BREAK EDGES .005
DO NOT SCALE THIS PRINT

DRAWN BY: MSM	SHEET: 3 of 3	PART NUMBER: MC-PK8-C	
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: 25" OD Snub Nose MT-196	
DATE: 10/18/11	MATERIAL: A36, A53	DRAWING TYPE: ASSEMBLY DRAWING	
REVISION: C	FINISH: GALV A123	WEIGHT: 1361.27 LBS	ANDREW® WESTCHESTER, IL. 60154 U.S.A.

Exhibit F

Power Density/RF Emissions Report

EBI Consulting

environmental | engineering | due diligence

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

Dish Wireless Existing Facility

Site ID: 876379

BOHVN00030A
1440 Main Street North
Woodbury, Connecticut 06798

May 17, 2022

EBI Project Number: 6222003250

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**24.54%**

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

May 17, 2022

Attn: Dish Wireless

Emissions Analysis for Site: 876379 - BOHVN00030A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **1440 Main Street North** in **Woodbury, 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 1440 Main Street North in Woodbury, 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 140 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):	140 feet	Height (AGL):	140 feet	Height (AGL):	140 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 %:	**0.42%**	Antenna B1 MPE %:	**0.42%**	Antenna C1 MPE %:	**0.42%**

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	0.42%
Sprint	2.3%
T-Mobile	5.58%
Verizon	8.92%
AT&T	7.32%
Site Total MPE % :	24.54%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	0.42%
Dish Wireless Sector B Total:	0.42%
Dish Wireless Sector C Total:	0.42%
Site Total MPE % :	24.54%

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	140.0	0.89	600 MHz n71	400	0.22%
Dish Wireless 1900 MHz n70	4	245.22	140.0	1.96	1900 MHz n70	1000	0.20%
						Total:	**0.42%**

• 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:	0.42%
Sector B:	0.42%
Sector C:	0.42%
Dish Wireless Maximum MPE % (Sector A):	0.42%
Site Total:	24.54%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **24.54%** 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.

Exhibit G

Letter of Authorization

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:
1440 MAIN STREET NORTH, WOODBURY, CT 06798

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:	**876379/N. WOODBURY / WOLFF PARCEL**
Customer Site ID:	**BOHVN00030A/CT-CCI-T-876379**
Site Address:	**1440 Main Street North, WOODBURY, CT 06798**

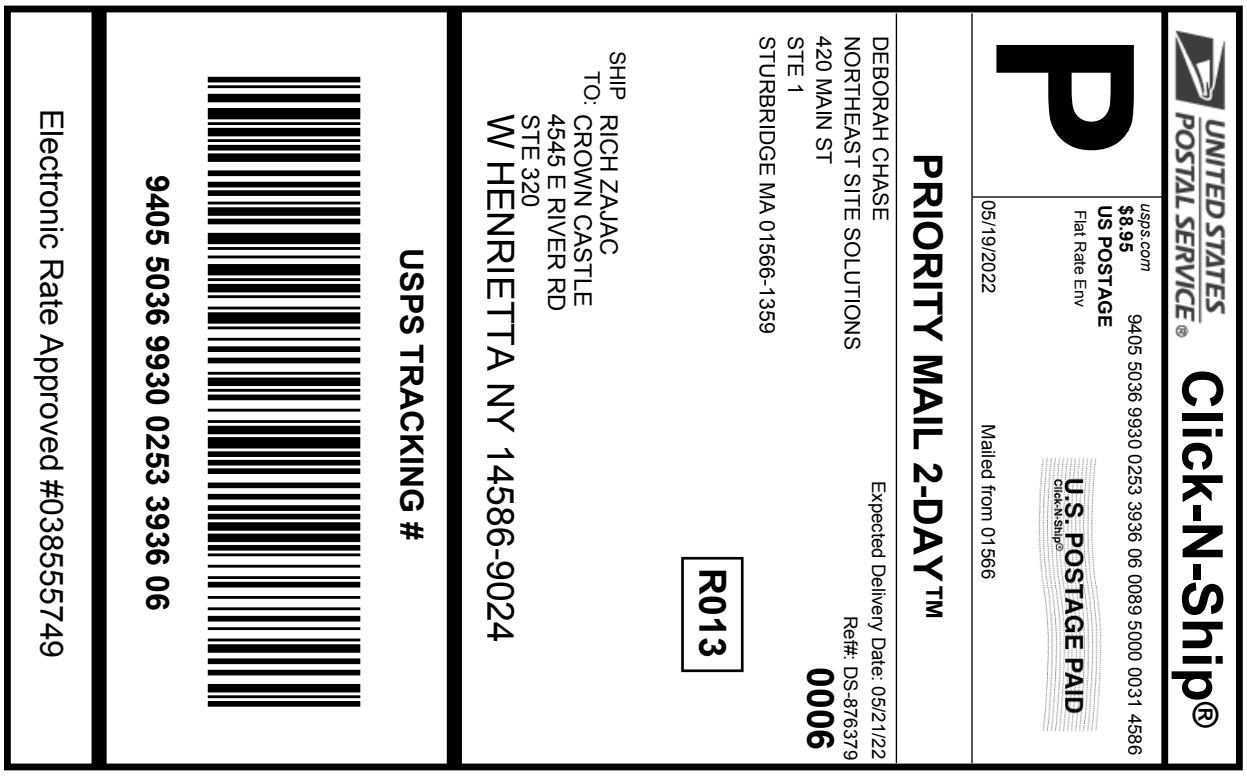
Crown Castle

By: _____ Date: 5/17/2022

Richard Zajac
Site Acquisition Specialist

Exhibit H

Recipient Mailings



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Instructions

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2. **Place your label so it does not wrap around the edge of the package.**
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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.**
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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0253 3936 06

Trans. #:	563888623
Print Date:	05/19/2022
Ship Date:	05/19/2022
Expected Delivery Date:	05/21/2022

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-876379

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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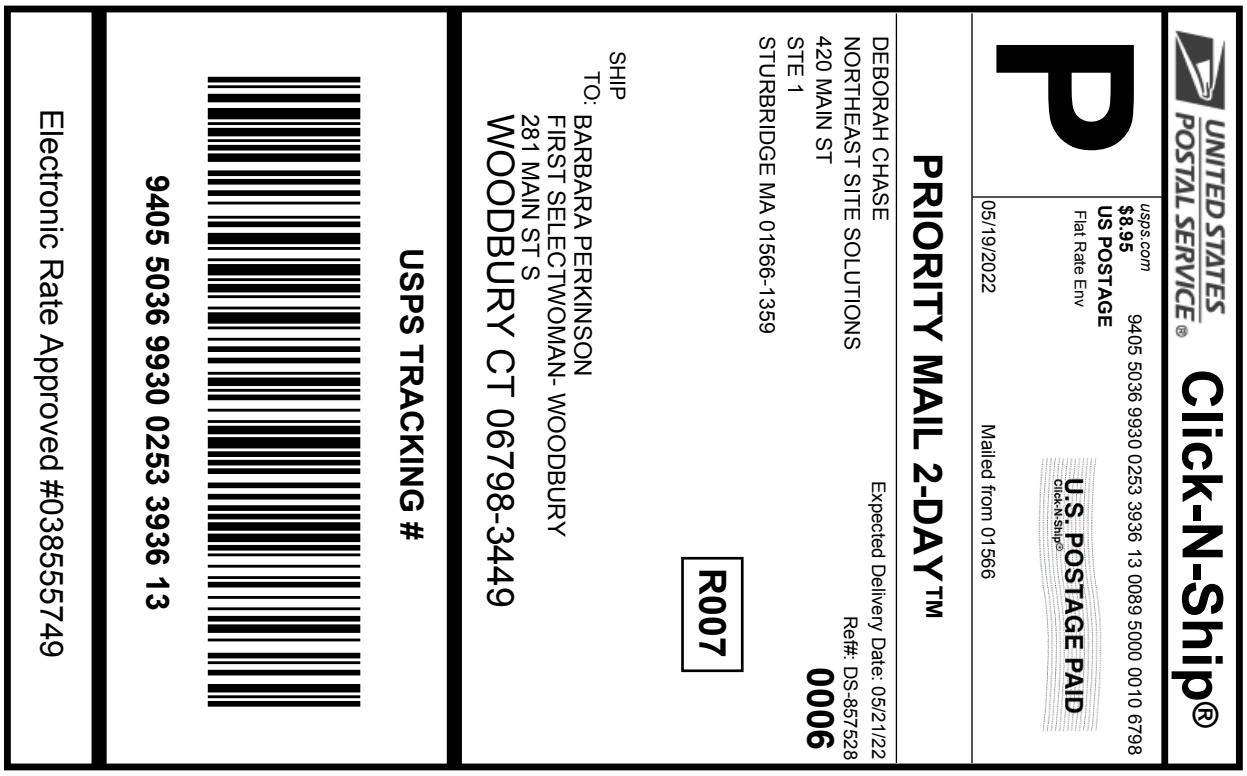

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Trans. #:	563888623
Print Date:	05/19/2022
Ship Date:	05/19/2022
Expected Delivery Date:	05/21/2022

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-857528

To: BARBARA PERKINSON
FIRST SELECTWOMAN- WOODBURY
281 MAIN ST S
WOODBURY CT 06798-3449

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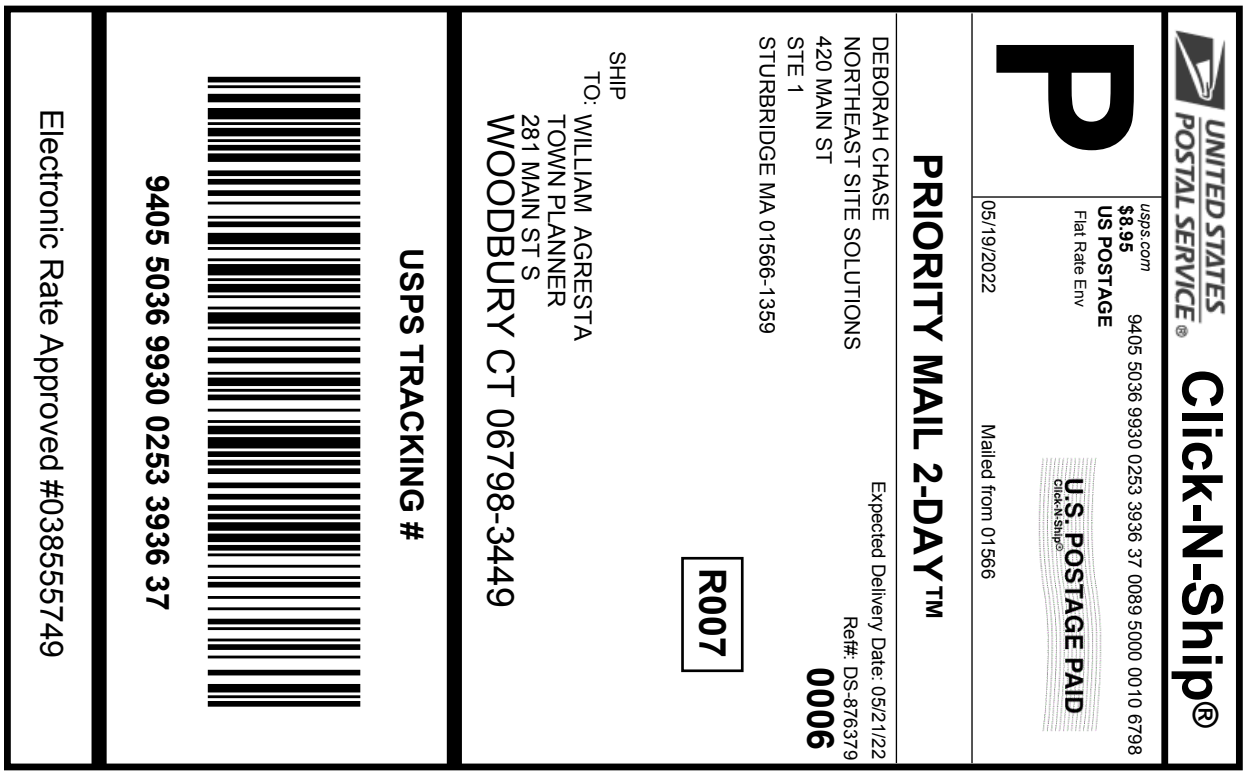

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0253 3936 37

Trans. #:	563888623
Print Date:	05/19/2022
Ship Date:	05/19/2022
Expected Delivery Date:	05/21/2022

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-876379

To: WILLIAM AGRESTA
TOWN PLANNER
281 MAIN ST S
WOODBURY CT 06798-3449

* 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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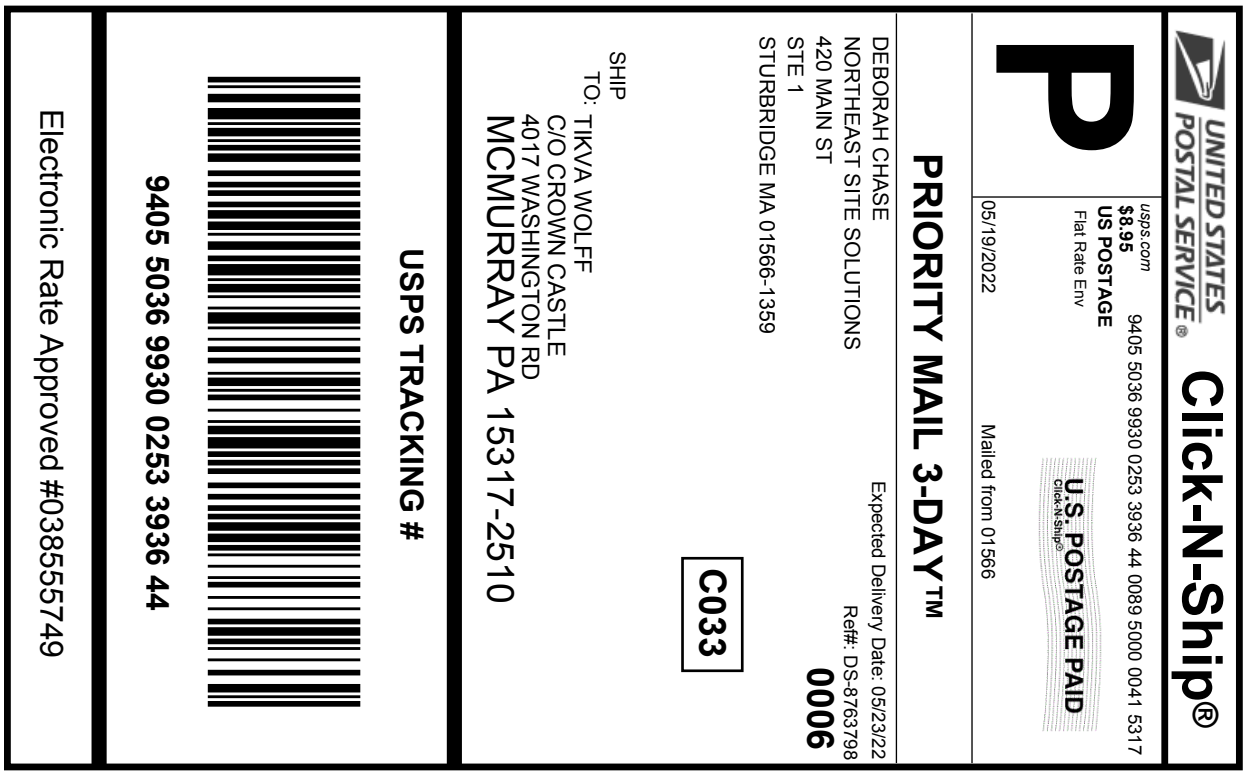

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0253 3936 44

Trans. #:	563888623
Print Date:	05/19/2022
Ship Date:	05/19/2022
Expected Delivery Date:	05/23/2022

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-8763798

To: TIKVA WOLFF
C/O CROWN CASTLE
4017 WASHINGTON RD
MCMURRAY PA 15317-2510

* 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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Check the status of your shipment on the USPS Tracking® page at usps.com

876379 Crown Dr

UNITED STATES POSTAL SERVICE.

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

05/20/2022 08:43 AM

Product	Qty	Unit Price	Price
Prepaid Mail West Henrietta, NY 14586 Weight: 0 lb 2.00 oz Acceptance Date: Fri 05/20/2022 Tracking #: 9405 5036 9930 0253 3936 06	1		$0.00
Prepaid Mail Woodbury, CT 06798 Weight: 0 lb 10.90 oz Acceptance Date: Fri 05/20/2022 Tracking #: 9405 5036 9930 0253 3936 37	1		$0.00
Prepaid Mail Canonsburg, PA 15317 Weight: 1 lb 3.70 oz Acceptance Date: Fri 05/20/2022 Tracking #: 9405 5036 9930 0253 3936 44	1		$0.00
Prepaid Mail Woodbury, CT 06798 Weight: 1 lb 12.60 oz Acceptance Date: Fri 05/20/2022 Tracking #: 9405 5036 9930 0253 3936 13	1		$0.00
Grand Total:			$0.00

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or call 1-800-410-7420.