



NSS **NORTHEAST**
SITE SOLUTIONS
Turnkey Wireless Development

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

June 15, 2022

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

RE: Tower Share Application
31 Yurechko Drive, Griswold, CT 06351
Latitude: 41.594083
Longitude: -71.933194
Site #: 842863_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 31 Yurechko Drive, Griswold, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 MHz 5G antennas and six (6) RRUs, at the 109-foot level of the existing 118-foot monopole 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 Hudson Design Group, dated June 9, 2022, Exhibit C. Also included is a structural analysis prepared by Crown Castle, dated December 20, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the Connecticut Siting Council, Docket No. 246 on July 22, 2003. Please see attached Exhibit A.

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 Dana Bennet, First Selectman, and Mario Tristany Jr., Town Planner for the Town of Griswold, as well as the tower owner (Crown Castle) and property owner (Philip Yurechko Jr.).

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 118-feet and the Dish Wireless LLC antennas will be located at a centerline height of 109-feet.
2. The proposed modifications will not result in an increase of the site boundary as depicted on the attached site plan.



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 10.98% 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 Griswold. 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 109-foot level of the existing 118-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 Griswold.

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



NSS

NORTHEAST
SITE SOLUTIONS

Turnkey Wireless Development

Attachments

Cc: Dana Bennet, First Selectman
Griswold Town Hall
28 Main Street
Jewett City, CT 06351

Mario Tristany Jr., Town Planner
Griswold Town Hall
28 Main Street
Jewett City, CT 06351

Philip Yurechko Jr. - Property Owner
31 Yurechko Drive
Griswold, CT 06351

Crown Castle, Tower Owner

Exhibit A

Original Facility Approval

Connecticut Siting Council ^(/CSC)

[CT.gov Home](#) [\(/\)](#) [Connecticut Siting Council](#) [\(/CSC\)](#) DO 246 Decision

<p>DOCKET NO. 246 – AT&T Wireless PCS, LLC d/b/a AT&T Wireless application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility at 31 Yurechko Drive, Griswold, Connecticut.</p>	}	Connecticut
	}	Siting
	}	Council
		July 22, 2003

FEEDBACK +

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to AT&T Wireless PCS, LLC (AT&T) for the construction, maintenance and operation of a wireless telecommunications facility at proposed Site A located at 31 Yurechko Drive, Griswold, Connecticut. We deny certification of proposed Site B located on the same property in Griswold.

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

1. The tower shall be constructed as a monopole not exceed a height of 120 feet above ground level in order to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T and other entities, both public and private. The Council may allow said tower to be extended to a height of not more than 160 feet, upon petition to the Council, if it can be demonstrated that such an extension of height would be necessary the co-location of other wireless carriers.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of any facility construction and shall include:
 - a. a detailed site development plan depicting the location of the access road, compound, tower, and underground utility line;
 - b. specifications for the tower, tower foundation, antennas, equipment building, and security fence;
 - c. construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the [2002 Connecticut Guidelines for Soil Erosion and Sediment Control](#), as amended.
3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power densities of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.
4. Upon the establishment of any new state or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

- 5. The Certificate Holder shall permit private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
- 6. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.
- 7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.
- 8. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Hartford Courant and the Norwich Bulletin.

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

The parties and intervenors to this proceeding are:

<u>Applicant</u>	<u>Its Representative</u>
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Christopher B. Fisher, Esq. Cuddy & Feder LLP 90 Maple Avenue White Plains, NY 10601 (914) 761-1300 (914) 761-6405 - fax

Exhibit B

Property Card



Summary

ParcelId 101378
Account Number Y0453201
Location Address 31 A YURECHKO DR
Map-Block-Lot 48 /100 /110.1A

Use Class/Description 4310 TEL REL TW
Assessing Neighborhood 0050A
Census Tract
Acreage 0.11
Utilities



Owner

YURECHKO PHILIP JR
 55 YURECHKO DR
 GRISWOLD, CT 06351

Current Appraised Value

	2017	2015
+ Building Value	\$0	\$0
+ XF Value	\$0	\$0
+ OB Value	\$98,600	\$98,600
+ Land Value	\$156,500	\$150,000
+ Special Land Value		
+ Total Appraised Value	\$255,100	\$248,600
+ Net Appraised Value	\$255,100	\$248,600
+ Current Assessment	\$178,570	\$174,020

Assessment History

	2017	2015
+ Building Value	\$0	\$0
+ OB/Misc	\$69,020	\$69,020
+ Land	\$109,550	\$105,000
+ Total Assessment	\$178,570	\$174,020

Land

Use	Class	Zoning	Area	Value
4310 TEL REL TW	I	R40	4608 SF	\$156,500

Out Buildings\Extra Features

Description	Sub Description	Area	Year Built	Value
CELL TOWER		160HEIGHT	2004	\$93,600
FENCE-6' CHAIN		272L.F.	2004	\$4,800
CONC PAD/CELL SITES		126S.F.	2004	\$200

Sales History

Sale Date	Type of Document	Grantee	Vacant/Improved	Book/Page	Amount
04-18-2016		YURECHKO PHILIP JR	Vacant	367/ 705	\$0
01-09-2008		YURECHKO PHILIP & PHILIP JR	Improved	310/ 131	\$0

Permit Information

Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
145-13	03-11-2013	AD	3ANT/6REMOTE RADIO	\$25,000		100	07-23-2013	
106-04	10-22-2003		TOWER	\$0	2/23/2004 12:00:00 AM	100	02-23-2004	131-04 CO

Sketch



Photos



No data available for the following modules: Building Data, Building Data, Commercial Building.

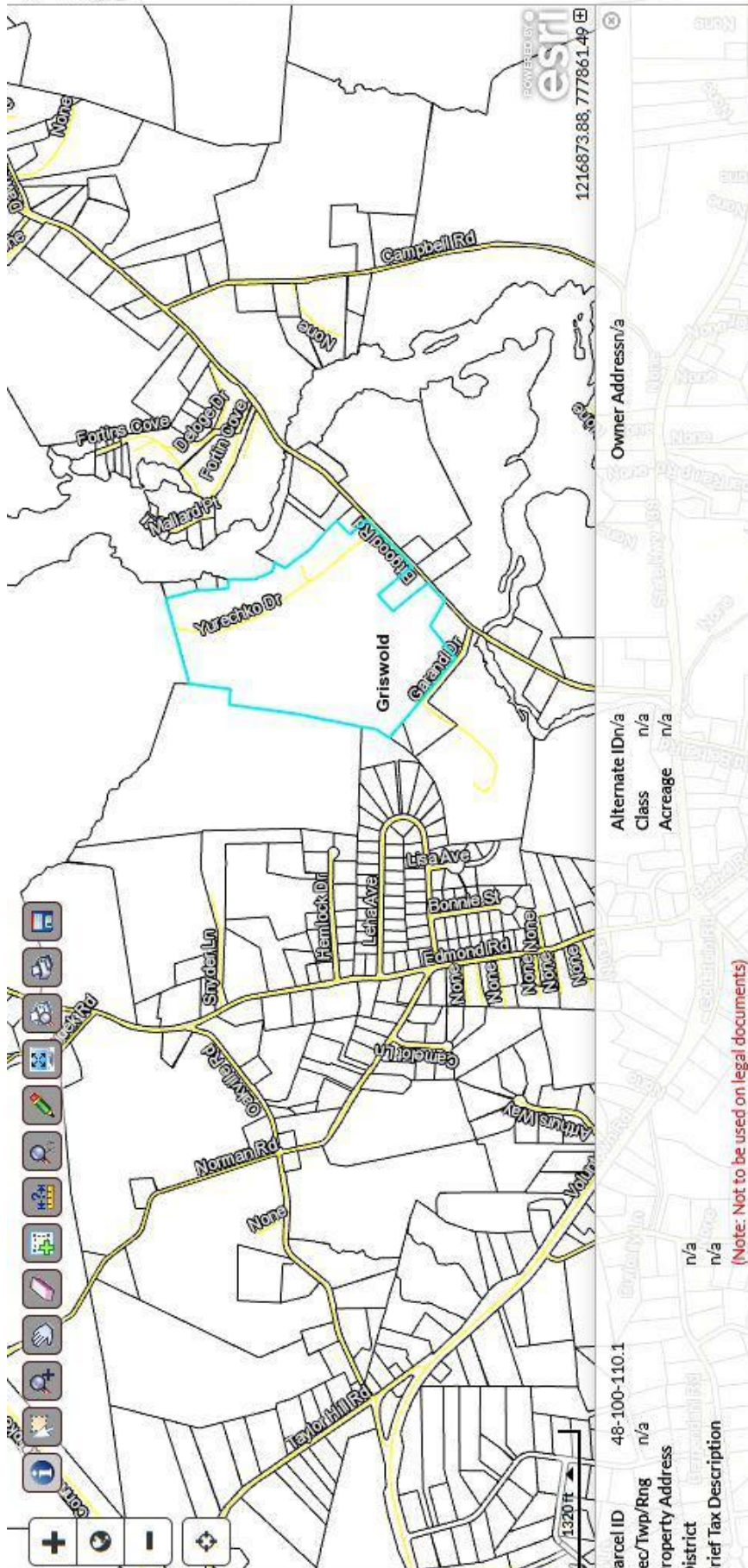
The Town of Griswold Assessor makes every effort to produce the most accurate information possible. No warranties, expressed or implied are provided for the data herein, its use or interpretation. The assessment information is from the last certified tax roll. All other data is subject to change.

[User Privacy Policy](#)
[GDPR Privacy Notice](#)

[Last Data Upload: 3/23/2021, 8:37:47 PM](#)

Developed by
 Schneider
GEOSPATIAL

Version 2.3.112



1216873.88, 777861.49

Alternate IDn/a
 Class n/a
 Acreage n/a

Owner Addressn/a

Parcel ID	Sec/Twp/Rng	Property Address	District	Brief Tax Description
48-100-110.1	n/a		n/a	n/a

(Note: Not to be used on legal documents)

Exhibit C

Construction Drawings



DISH Wireless L.L.C. SITE ID:
BOBOS01001A

DISH Wireless L.L.C. SITE ADDRESS:
**31 YURECHKO DRIVE
JEWETT CITY, CT 06351**

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 (1) PROPOSED CABLE ENTRY PORT

- GROUND SCOPE OF WORK:**
- INSTALL (1) PROPOSED METAL PLATFORM
 - INSTALL (1) PROPOSED ICE BRIDGE
 - INSTALL (1) PROPOSED PPC CABINET
 - INSTALL (1) PROPOSED EQUIPMENT CABINET
 - INSTALL (1) PROPOSED POWER CONDUIT
 - INSTALL (1) PROPOSED TELCO CONDUIT
 - INSTALL (1) PROPOSED TELCO-FIBER BOX
 - INSTALL (1) PROPOSED GPS UNIT
 - INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)
 - INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)
 - INSTALL (1) PROPOSED 200A METER IN EXISTING SOCKET

SITE INFORMATION

PROPERTY OWNER: YURECHKO PHILIP JR
PROPERTY OWNER: 55 YURECHKO DRIVE
ADDRESS: GRISWOLD, CT 06351

TOWER TYPE: MONOPOLE

TOWER CO SITE ID: 842863

TOWER APP NUMBER: 584378

COUNTY: NEW LONDON

LATITUDE (NAD 83): 41° 35' 38.58" N
41.59405

LONGITUDE (NAD 83): 71° 55' 59.37" W
-71.93316

ZONING JURISDICTION: BOROUGH OF JEWETT CITY-CT

ZONING DISTRICT: R40

PARCEL NUMBER: 48-100-110.1A

OCCUPANCY GROUP: U

CONSTRUCTION TYPE: II-B

POWER COMPANY: EVERSOURCE

TELEPHONE COMPANY: TBD

PROJECT DIRECTORY

APPLICANT: DISH Wireless L.L.C.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

TOWER OWNER: CROWN CASTLE
2000 CORPORATE DRIVE
CANONSBURG, PA 15317
(877) 486-9377

SITE DESIGNER: HUDSON DESIGN GROUP, LLC.
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
(978) 557-5553

SITE ACQUISITION: COURTNEY PRESTON
COURTNEY.PRESTON.CONTRACTOR
@CROWNCastle.COM

CONSTRUCTION MANAGER: JAVIER SOTO
JAVIER.SOTO@DISH.COM

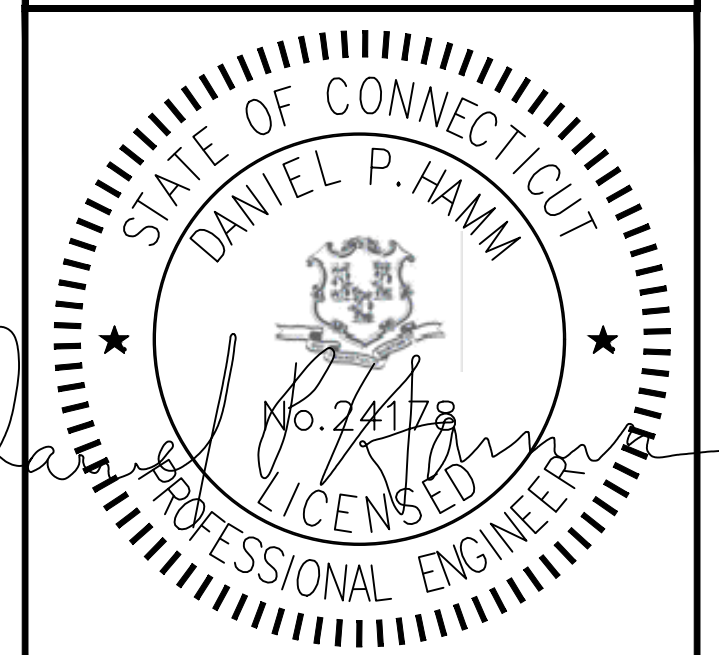
RF ENGINEER: ARVIN SEBASTIAN
ARVIN.SEBASTIAN@DISH.COM



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



45 BEECHWOOD DRIVE N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



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

DRAWN BY: JJ
CHECKED BY: SMA
APPROVED BY: DPH

RFDS REV #: 2

PRELIMINARY DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/24/2022	ISSUED FOR REVIEW
B	04/04/2022	ISSUED FOR REVIEW
C	06/06/2022	ISSUED FOR REVIEW

A&E PROJECT NUMBER
BOBOS01001A

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01001A
CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

CONNECTICUT CODE OF COMPLIANCE

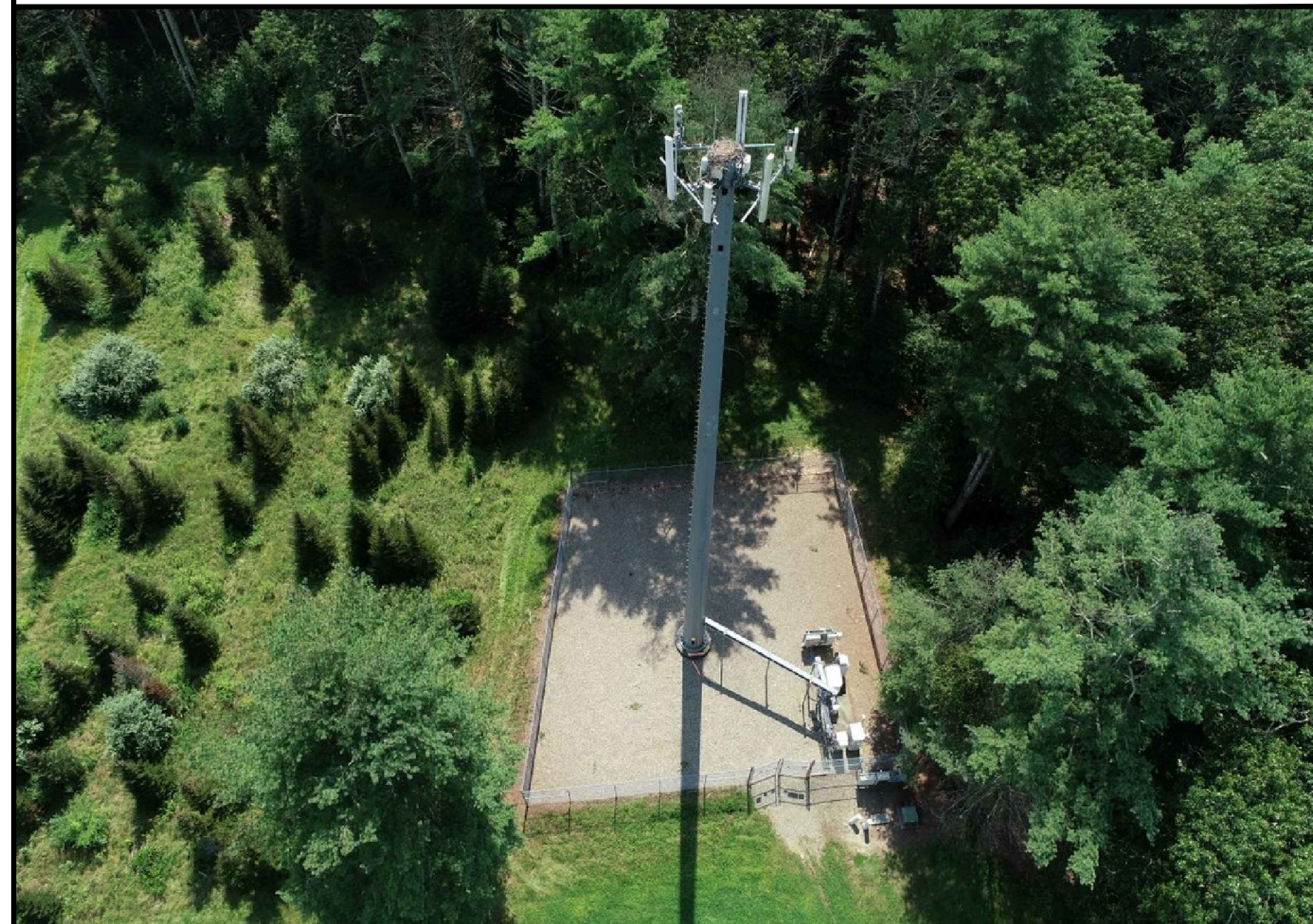
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES

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

SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
A-1	OVERALL AND ENLARGED SITE PLAN
A-2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A-3	EQUIPMENT PLATFORM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
E-1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE
G-1	GROUNDING PLANS AND NOTES
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
RF-1	RF CABLE COLOR CODE
GN-1	LEGEND AND ABBREVIATIONS
GN-2	RF SIGNAGE
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES
GN-5	GENERAL NOTES

SITE PHOTO



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



GENERAL NOTES

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

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

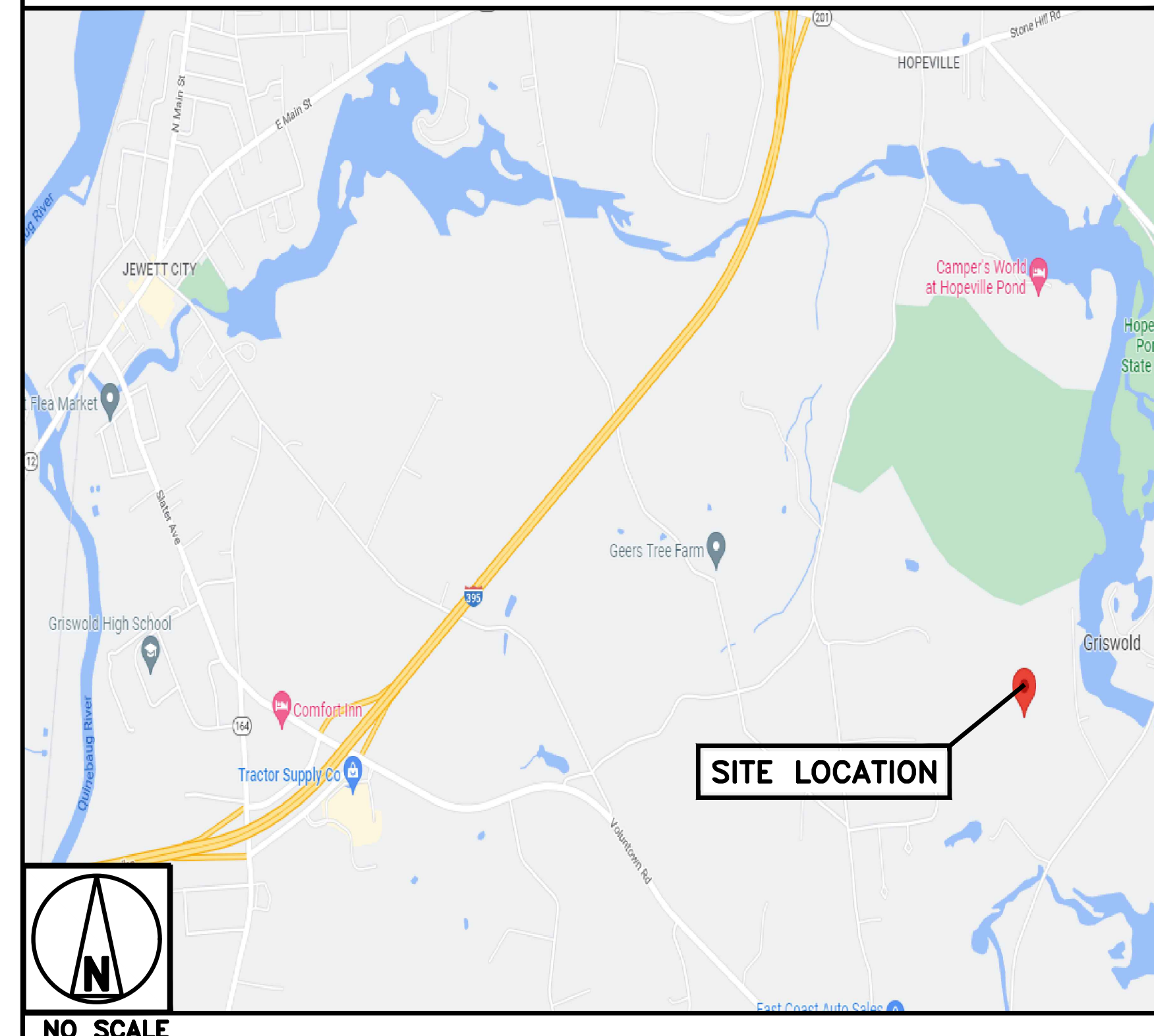
CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

DIRECTIONS

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:

GET ON BRADLEY INTERNATIONAL AIRPORT CON IN EAST GRANBY FROM BRADLEY INTERNATIONAL AIRPORT. HEAD NORTH TOWARD BRADLEY INTERNATIONAL AIRPORT. SLIGHT LEFT ONTO BRADLEY INTERNATIONAL AIRPORT. CONTINUE STRAIGHT. KEEP RIGHT TO CONTINUE TOWARD BRADLEY INTERNATIONAL AIRPORT CON. TAKE I-91 S, CT-2 E AND I-395 N TO GRISWOLD EXPY IN GRISWOLD. TAKE EXIT 22 FROM I-395 N. CONTINUE ONTO BRADLEY INTERNATIONAL AIRPORT CON. CONTINUE ONTO CT-20 E/BRADLEY INTERNATIONAL AIRPORT CON. TAKE THE EXIT ONTO I-91 S TOWARD HARTFORD. TAKE EXIT 30 ON THE LEFT TO MERGE ONTO I-84 E. TAKE EXIT 55 FOR CT-2 E TOWARD NORWICH/NEW LONDON/I-84 E. CONTINUE ONTO CT-2 E. KEEP LEFT AT THE FORK TO STAY ON CT-2 E, FOLLOW SIGNS FOR 2 E. TAKE EXIT 28N TO MERGE ONTO I-395 N TOWARD PROVIDENCE. TAKE EXIT 22 FOR CT-164 TOWARD CT-138/PRESTON CITY/PACHAUG. TAKE CT-138 E TO YURECHKO DR. CONTINUE STRAIGHT ONTO GRISWOLD EXPY. TURN RIGHT ONTO CT-138 E. TURN LEFT ONTO BITGOOD RD. TURN LEFT ONTO YURECHKO DR. TURN RIGHT TO STAY ON YURECHKO DR. YURECHKO'S TREE FARM. 55 YURECHKO DR, GRISWOLD, CT 06351.

VICINITY MAP



NOTES

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

NOTES

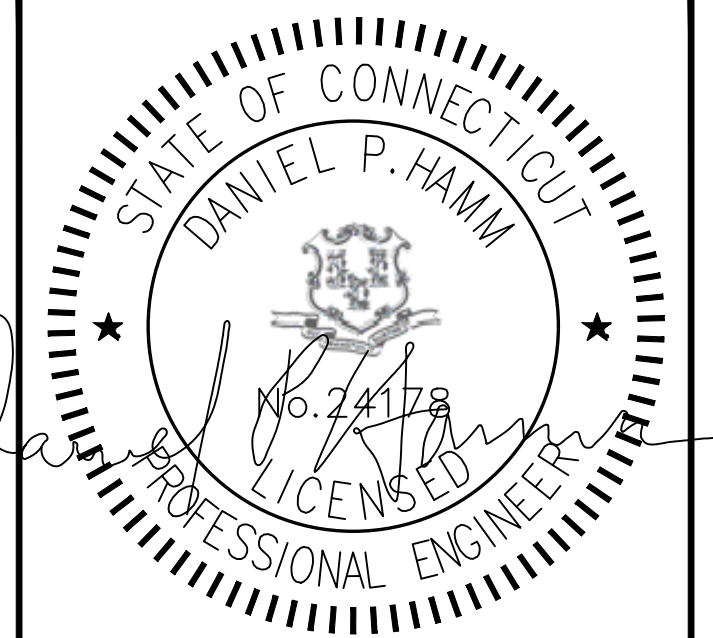
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

HG HUDSON Design Group LLC

45 BEECHWOOD DRIVE N. ANDOVER, MA 01845 TEL: (978) 557-5553 FAX: (978) 336-5586



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DRAWN BY: JJ CHECKED BY: SMA APPROVED BY: DPH

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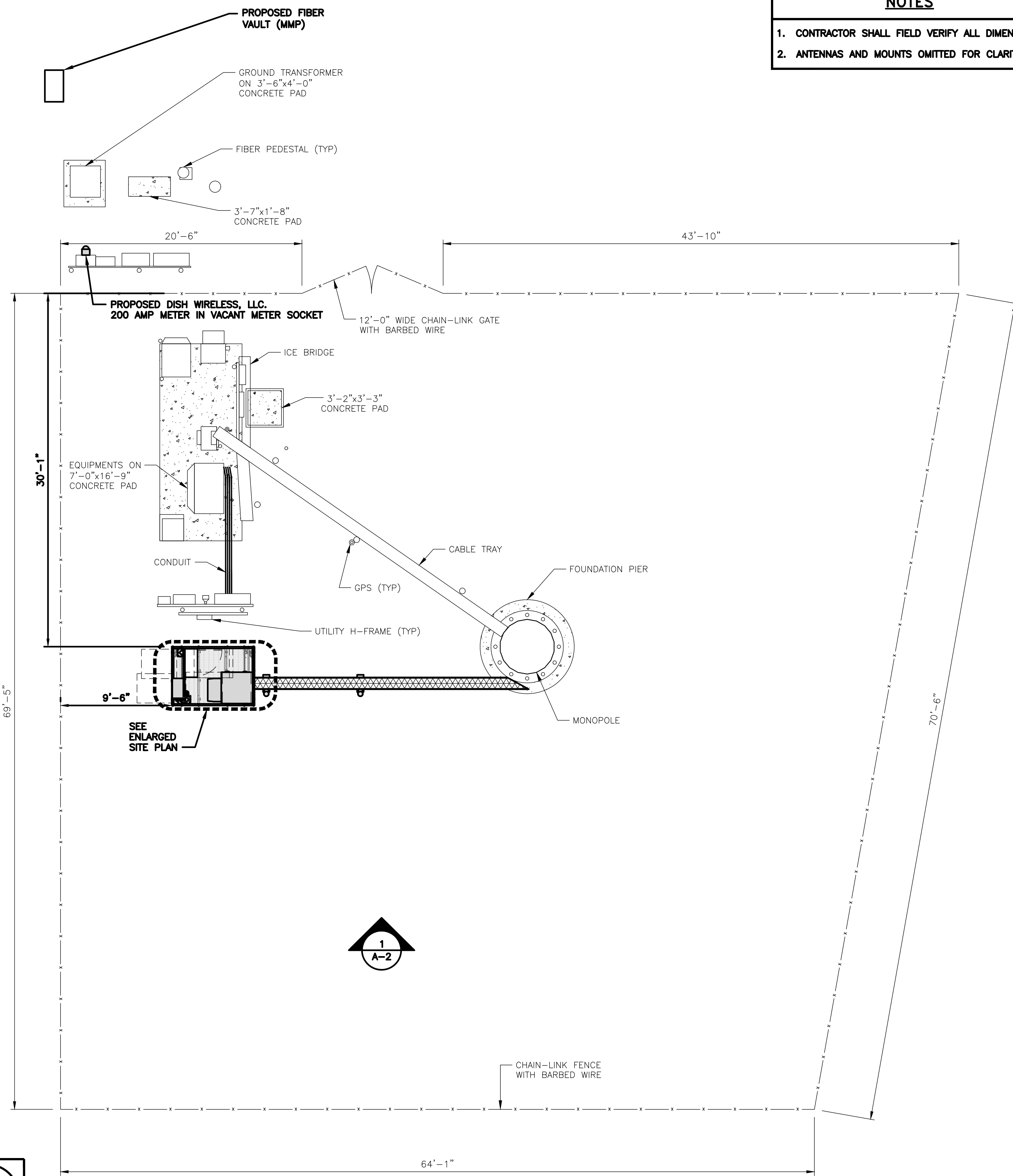
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DISH Wireless L.L.C.
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JEWETT CITY, CT 06351

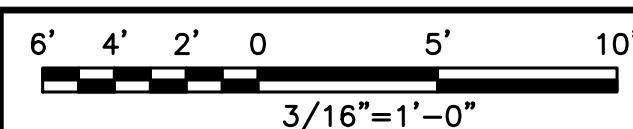
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OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

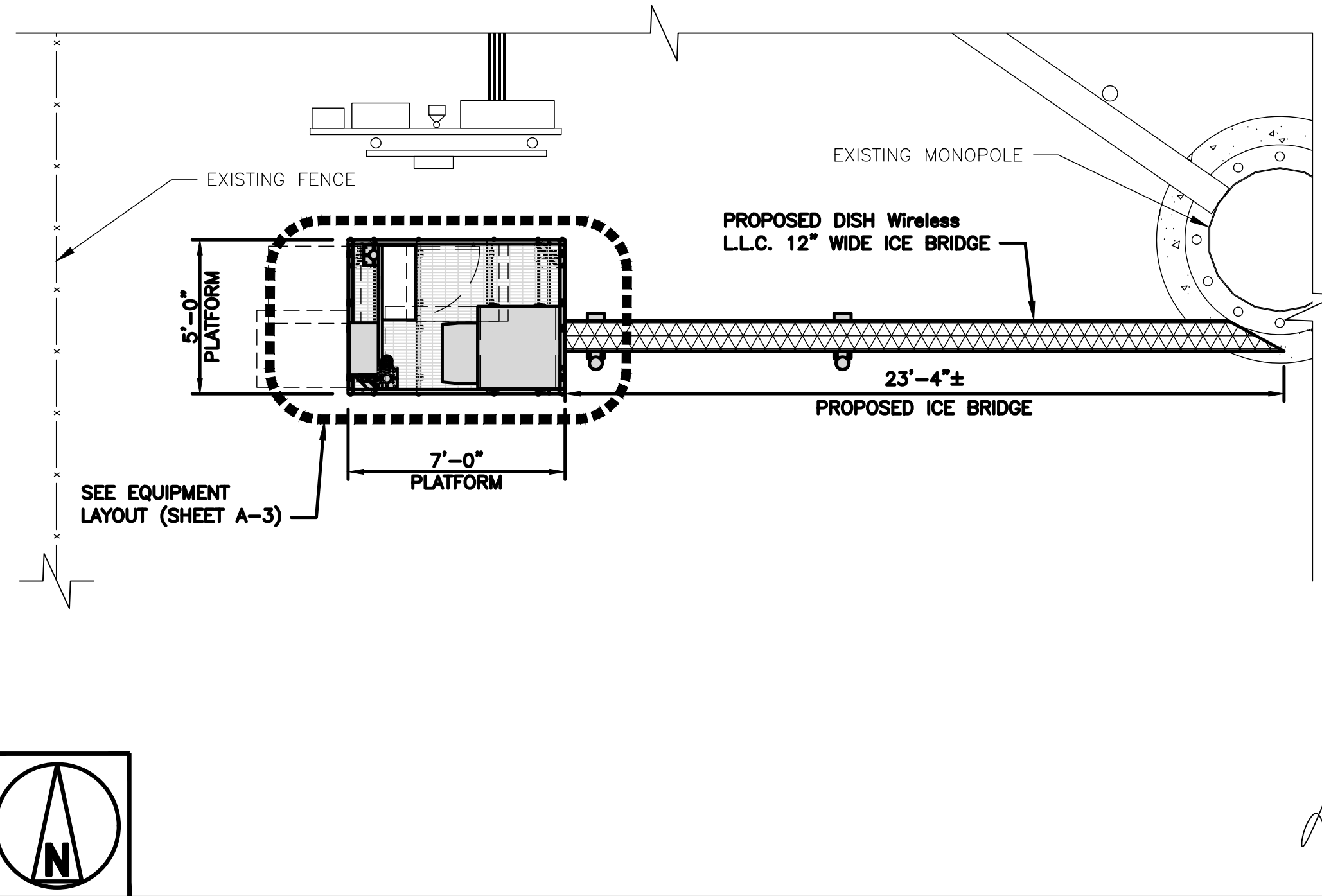
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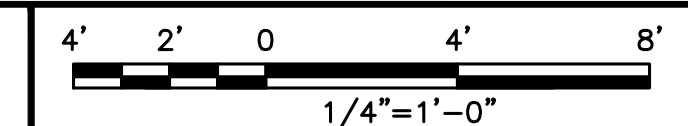
OVERALL SITE PLAN



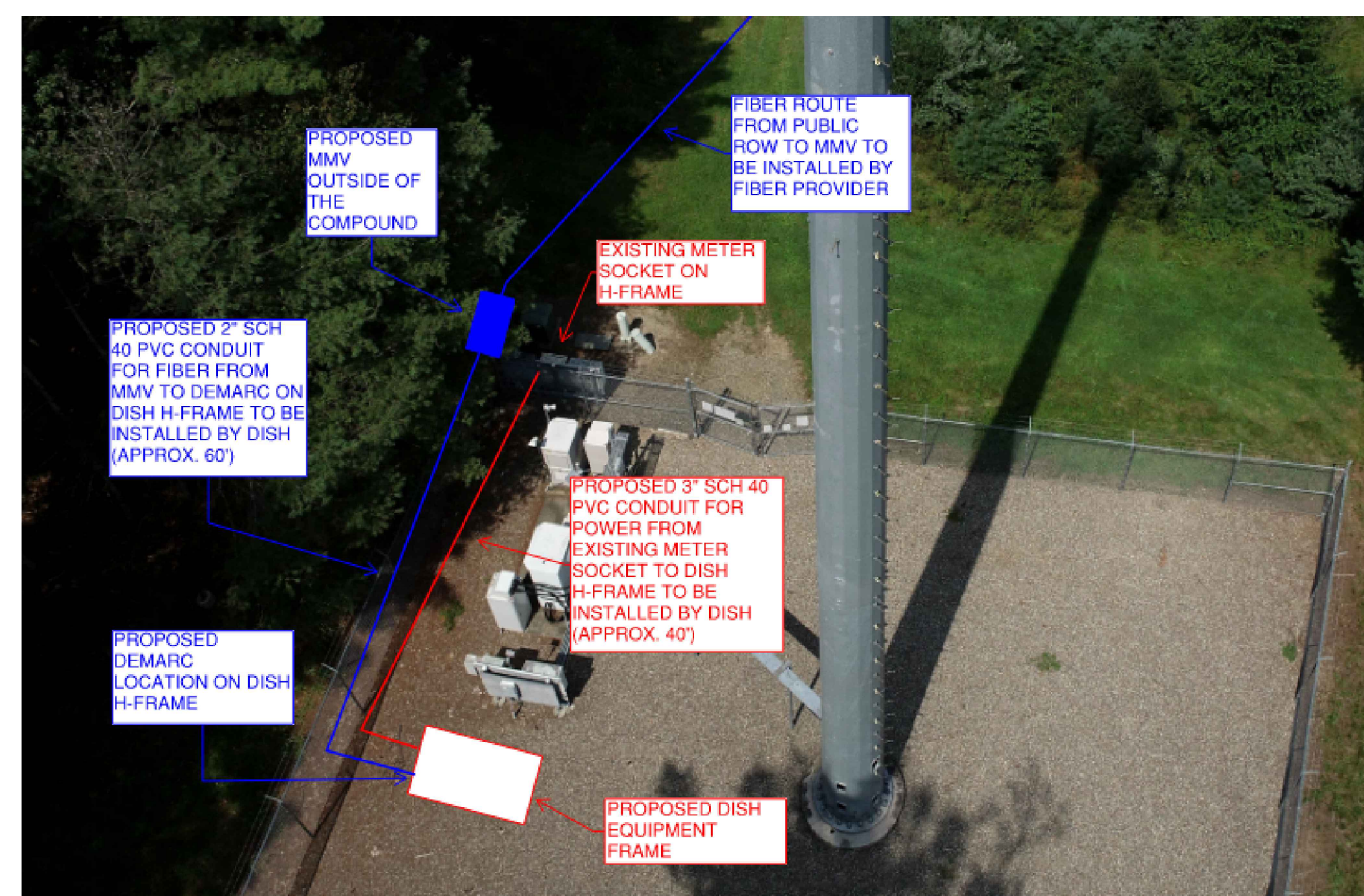
1



ENLARGED SITE PLAN



2



OVERALL UTILITY ROUTE PLAN

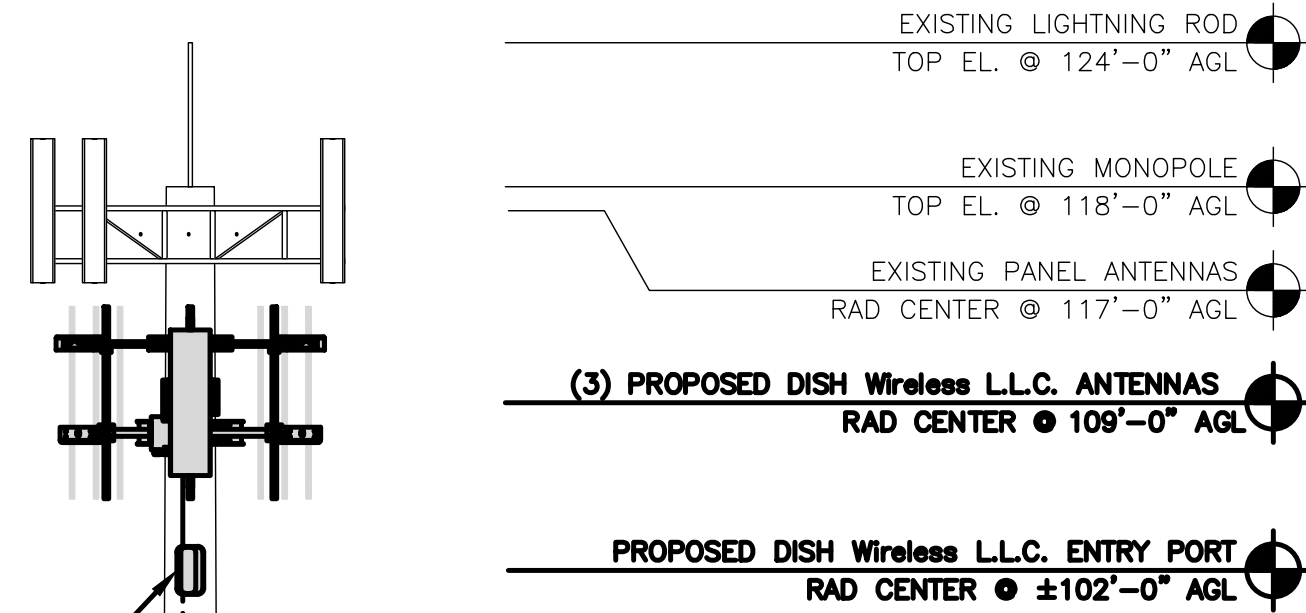
NO SCALE

3

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 DISH Wireless L.L.C. 6"x9" O.D. HAND HOLE RIM BY SITEPRO1 P/N HHR69-G (WELD PER MANUFACTURERS INSTRUCTIONS)



(1) PROPOSED DISH Wireless L.L.C. HYBRID CABLE ROUTED INSIDE POLE

EXISTING MONOPOLE

PROPOSED DISH Wireless L.L.C. ICE BRIDGE

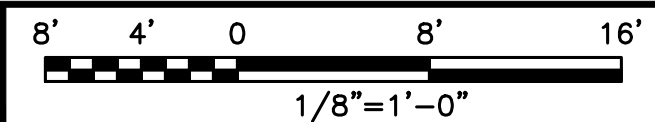
PROPOSED DISH Wireless L.L.C. GPS UNIT

PROPOSED DISH Wireless L.L.C. EQUIPMENT ON PROPOSED STEEL PLATFORM

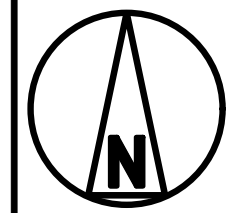
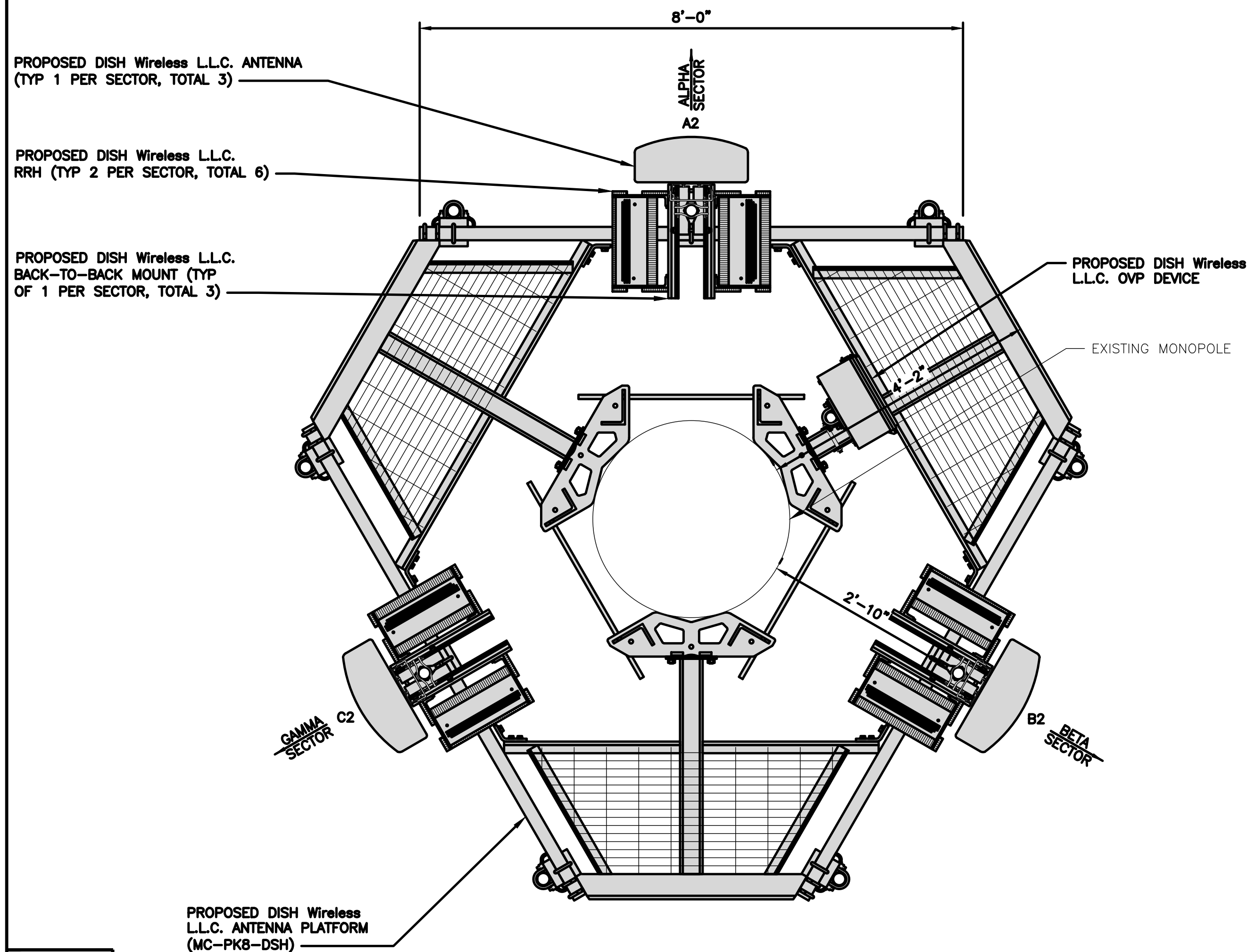
EXISTING ENTRY PORT

EXISTING TOWER BOTTOM EL. @ 0'-0" AGL

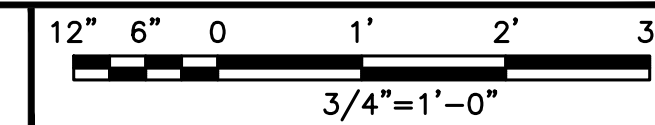
PROPOSED ELEVATION



1



ANTENNA LAYOUT



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	
A1	---	---	---	---	---	(1) HIGH-CAPACITY HYBRID CABLE (155' LONG)	FUJITSU / TA08025-B604	5G	A2	RAYCAP / RDIDC-9181 -PF-48
A2	PROPOSED	JMA WIRELESS/MX08FR0665-21	5G	0°	109'-0"		FUJITSU / TA08025-B605	5G	A2	
A3	---	---	---	---	---		---	---	---	
B1	---	---	---	---	---	SHARED W/ALPHA	FUJITSU / TA08025-B604	5G	B2	SHARED W/ALPHA
B2	PROPOSED	JMA WIRELESS/MX08FR0665-21	5G	120°	109'-0"		FUJITSU / TA08025-B605	5G	B2	
B3	---	---	---	---	---		---	---	---	
C1	---	---	---	---	---	SHARED W/ALPHA	FUJITSU / TA08025-B604	5G	C2	SHARED W/ALPHA
C2	PROPOSED	JMA WIRELESS/MX08FR0665-21	5G	240°	109'-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



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



45 BEECHWOOD DRIVE N. ANDOVER, MA 01845 TEL: (978) 557-5553 FAX: (978) 336-5586



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DRAWN BY: JJ CHECKED BY: SMA APPROVED BY: DPH

RFDS REV #: 2

PRELIMINARY DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	01/24/2022	ISSUED FOR REVIEW
B	04/04/2022	ISSUED FOR REVIEW
C	06/06/2022	ISSUED FOR REVIEW

A&E PROJECT NUMBER

BOBOS01001A

DISH Wireless L.L.C. PROJECT INFORMATION

BOBOS01001A
CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

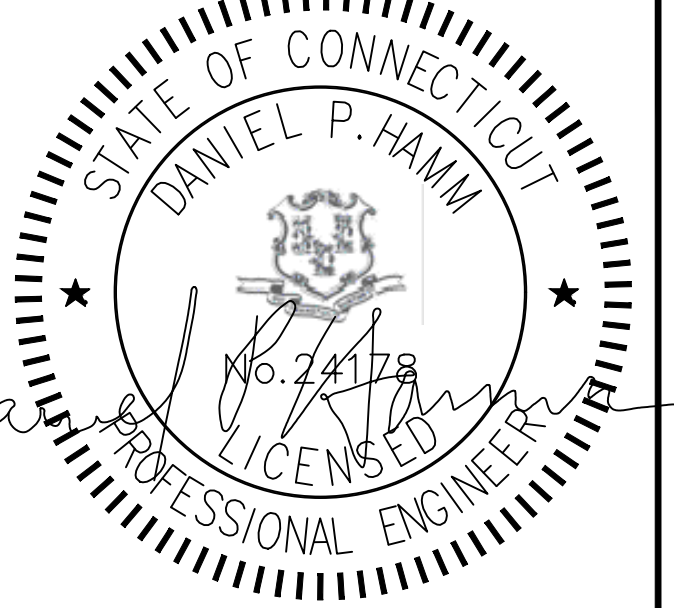
A-2



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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N. ANDOVER, MA 01845 FAX: (978) 336-5586



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BOBOS01001A

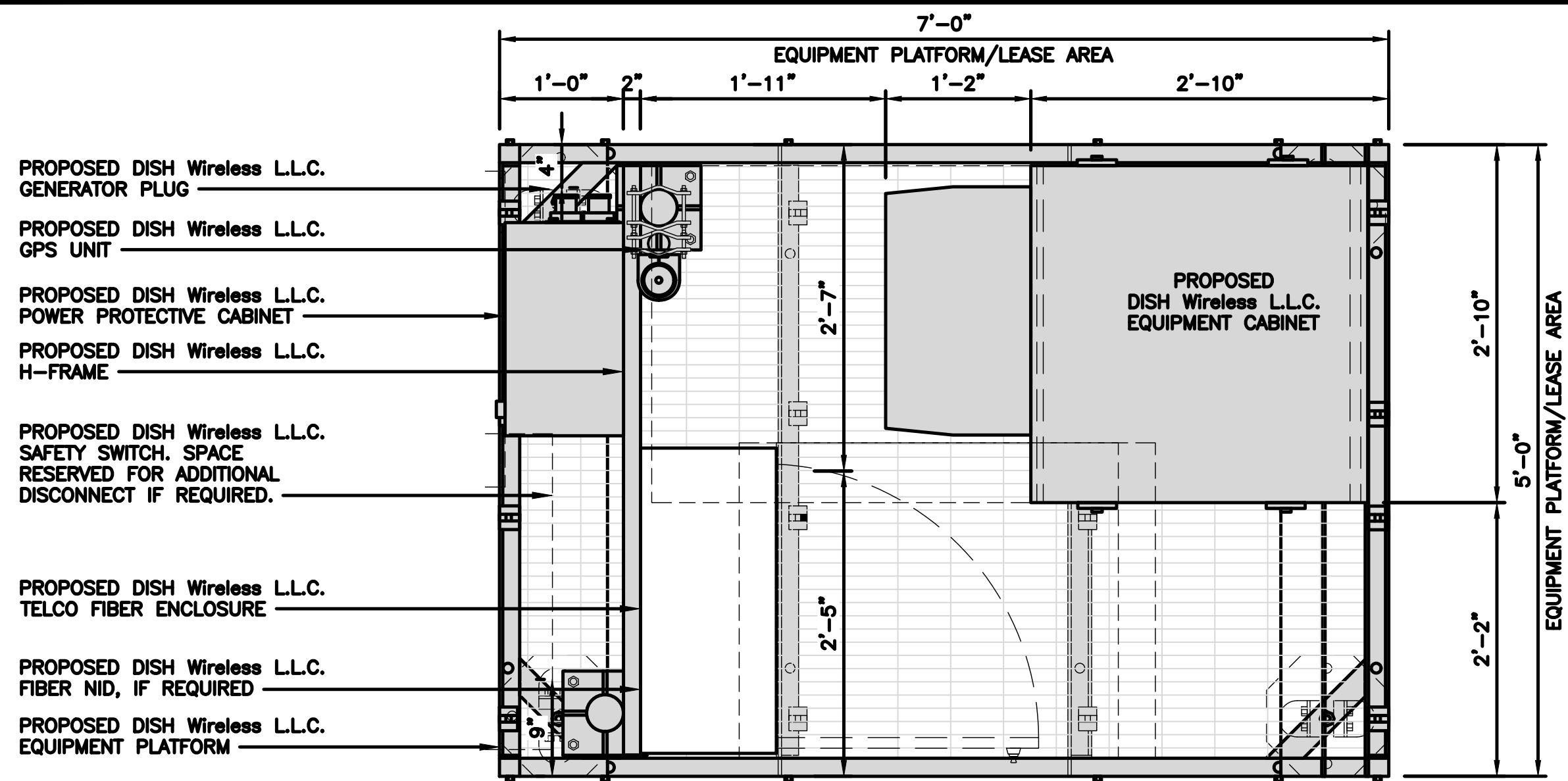
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01001A
CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

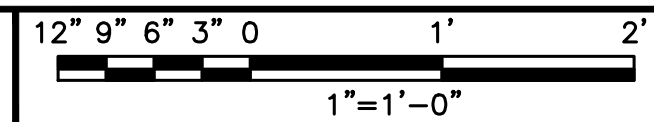
SHEET NUMBER
A-3

NOTES

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



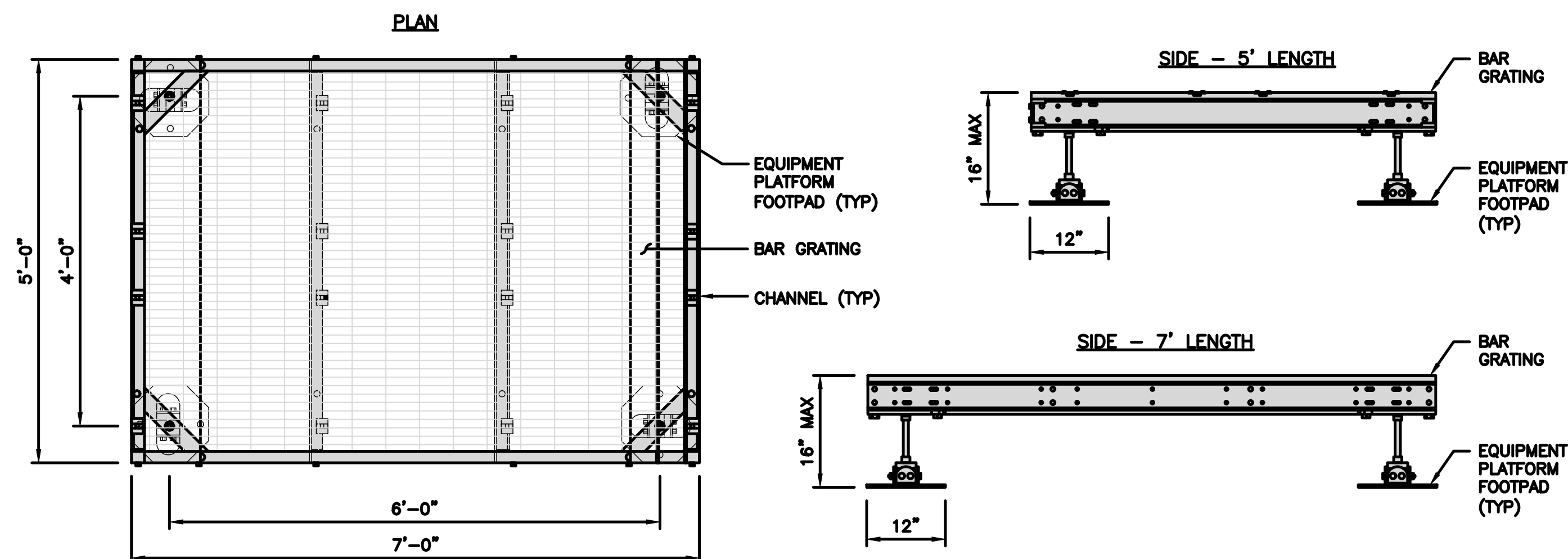
PLATFORM EQUIPMENT PLAN



1

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

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

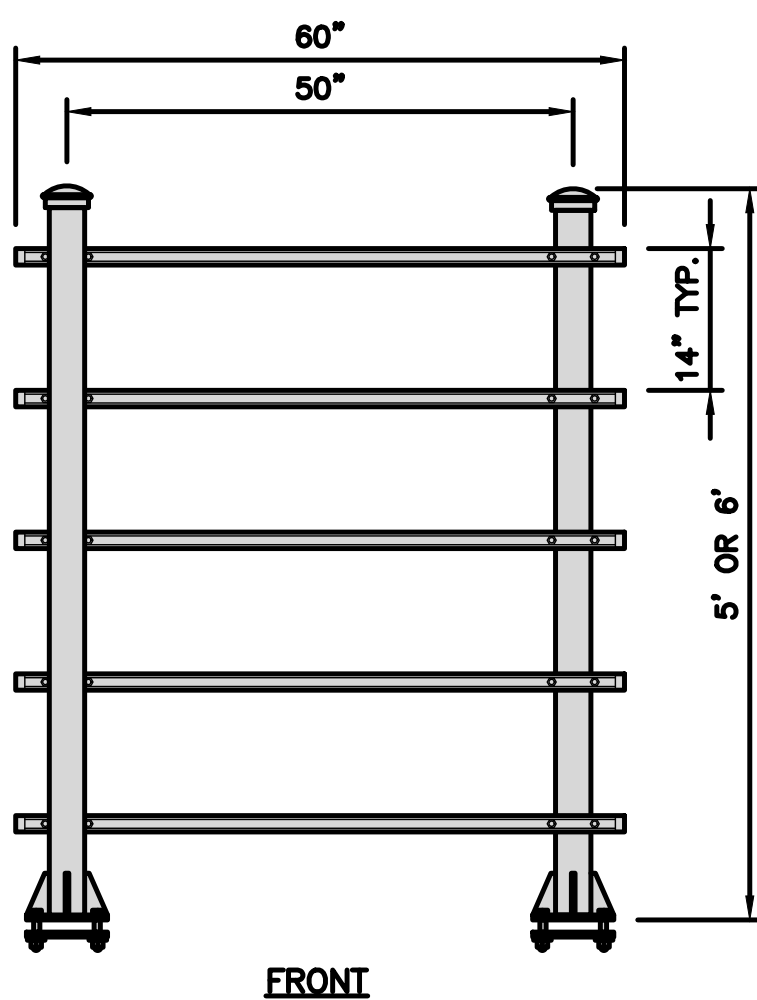
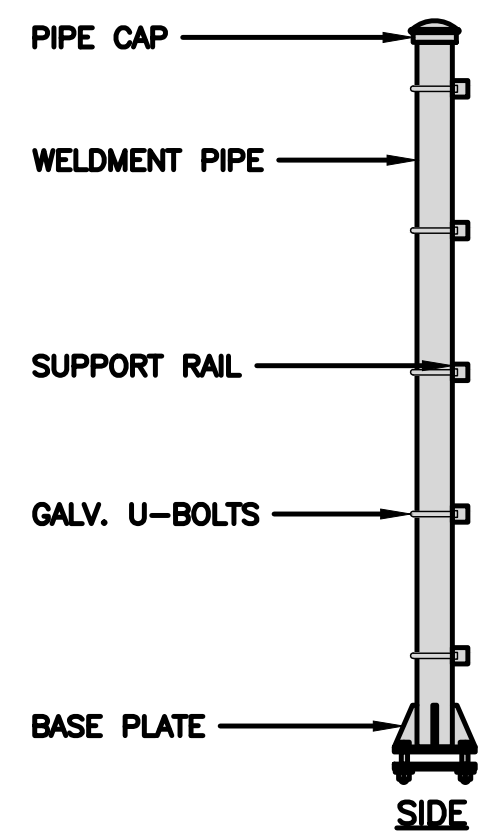


PLATFORM DETAIL

NO SCALE 2

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

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

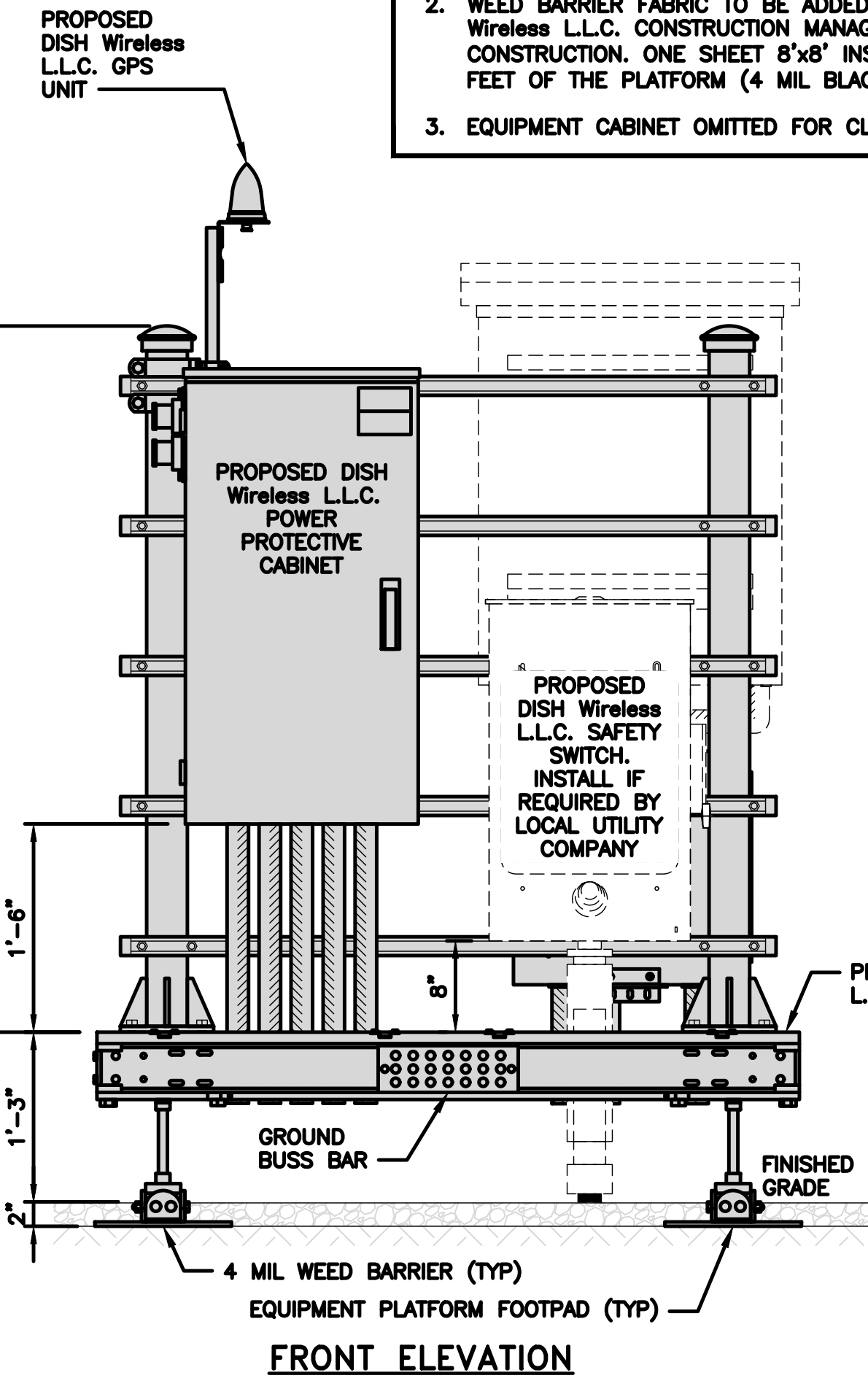


H-FRAME DETAIL

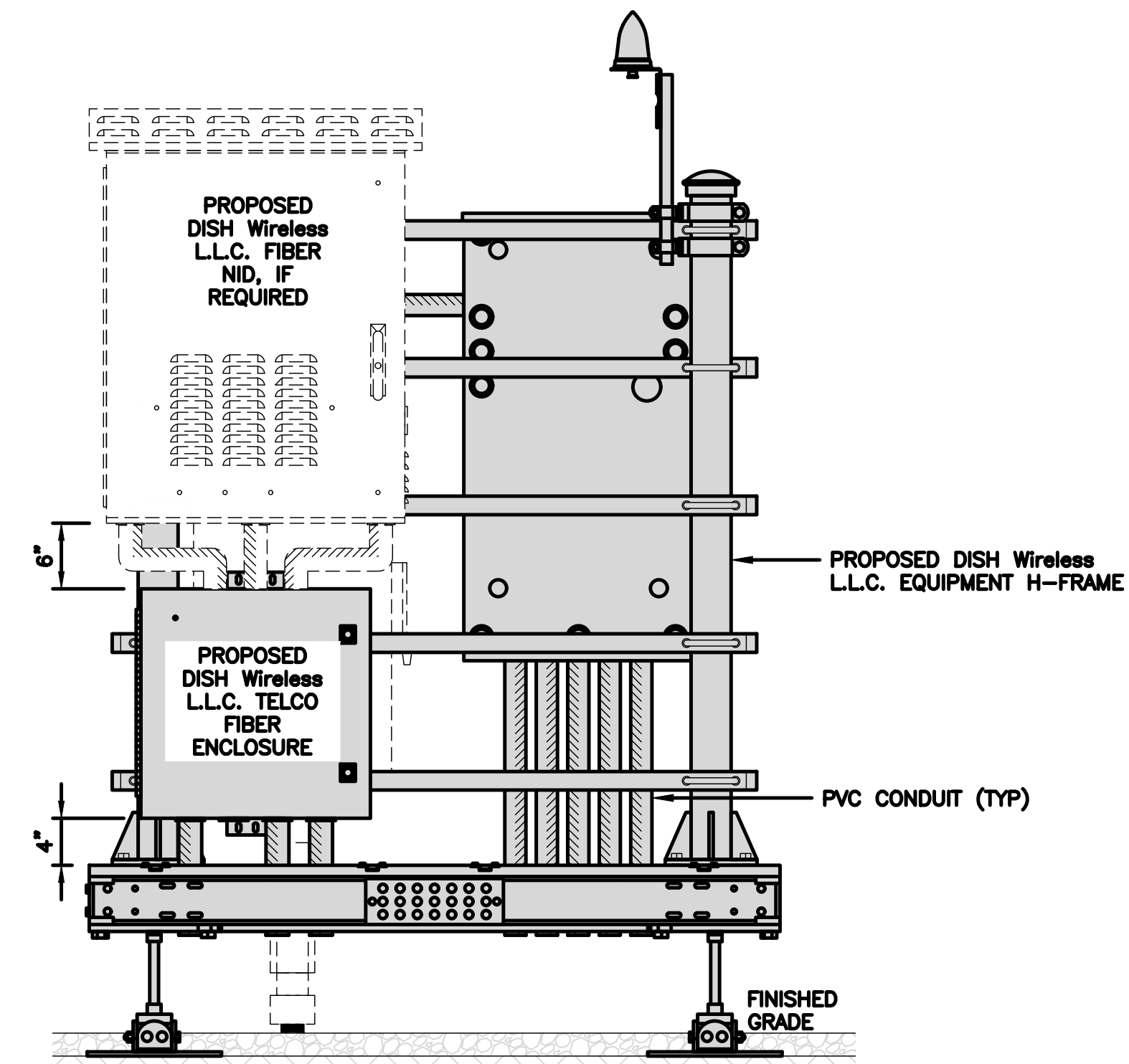
NO SCALE 3

NOT USED

NO SCALE 4

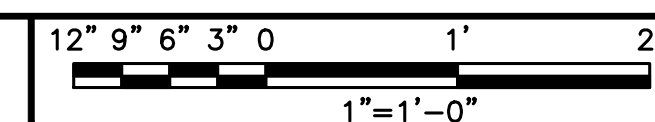


FRONT ELEVATION



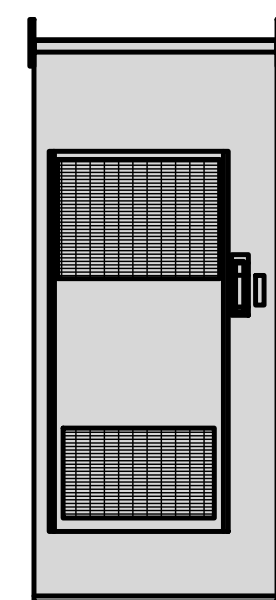
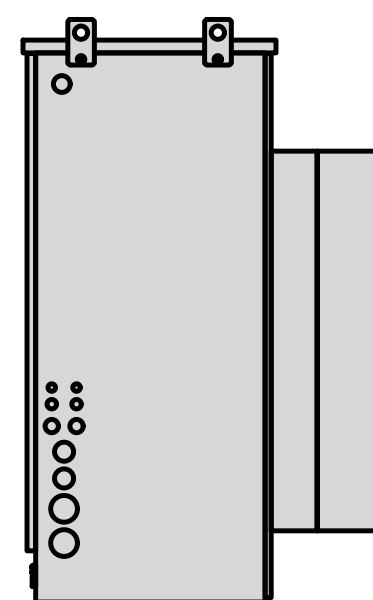
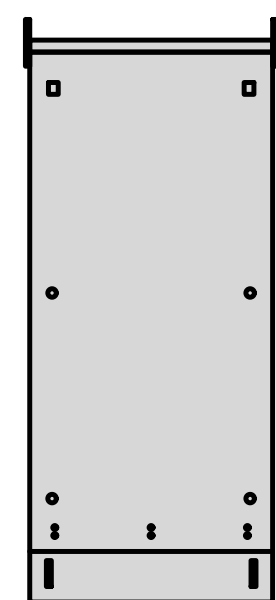
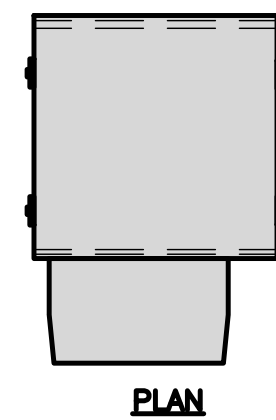
BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION



5

CHARLES INDUSTRY HEX CUBE-PM639155N4	
DIMENSIONS (HxWxD)	74"x32"x32"
POWER PLANT	-48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 lbs



BACK

SIDE

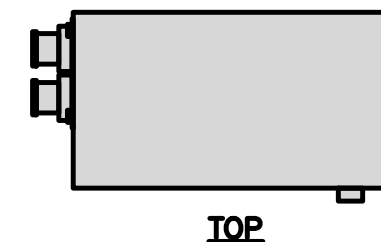
FRONT

CABINET DETAIL

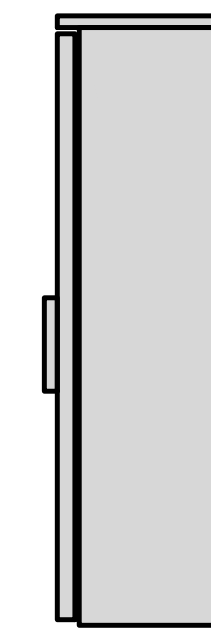
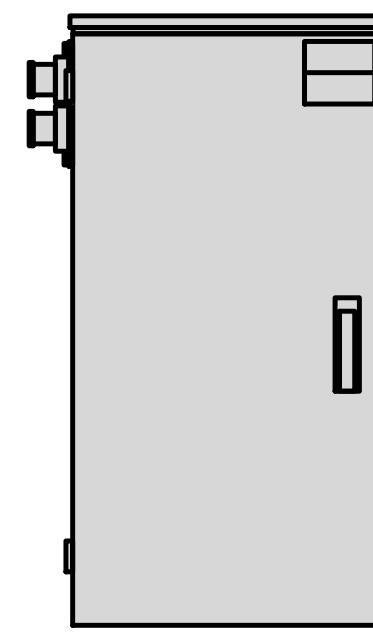
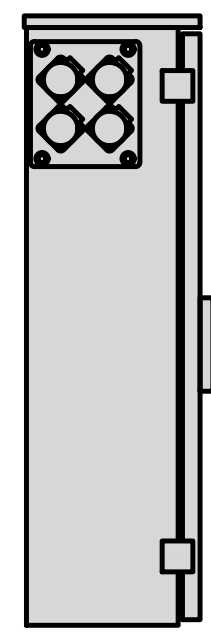
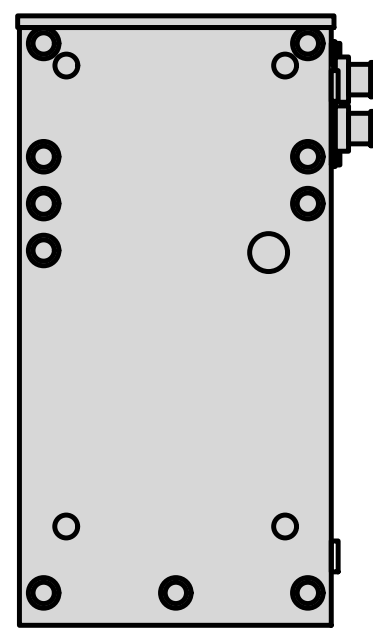
NO SCALE

1

RAYCAP PPC RDIAC-2465-P-240-MTS	
ENCLOSURE DIMENSIONS (HxWxD)	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G



TOP



BACK

SIDE

FRONT

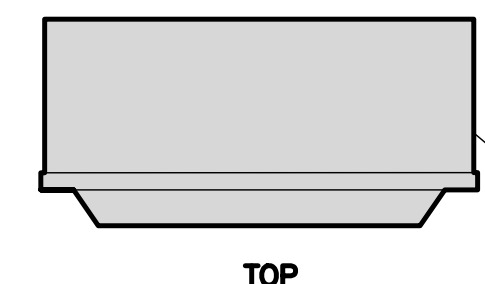
SIDE

POWER PROTECTION CABINET (PPC) DETAIL

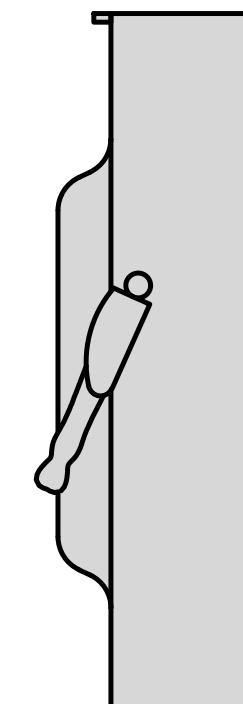
NO SCALE

2

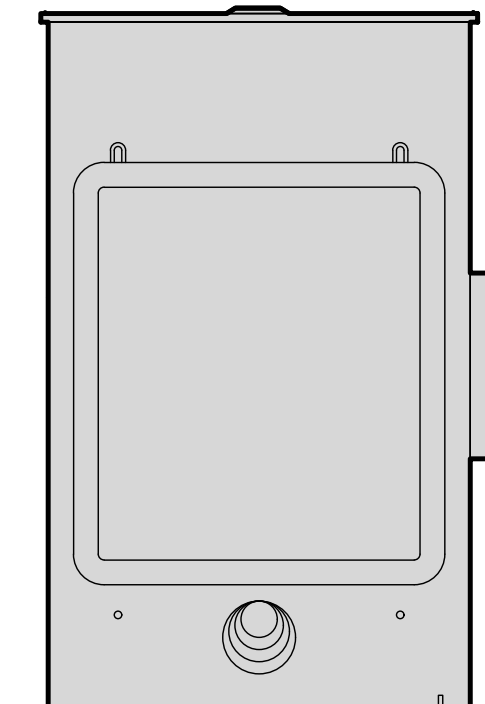
SQUARE D SAFETY SWITCHES D224NRB	
ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E-2875



TOP



SIDE



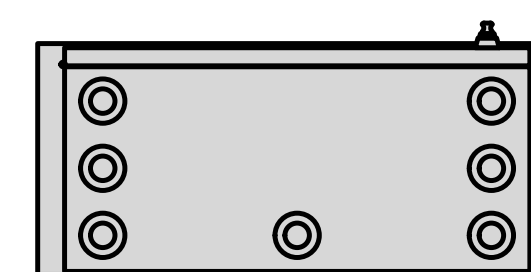
FRONT

SAFETY SWITCH DETAIL

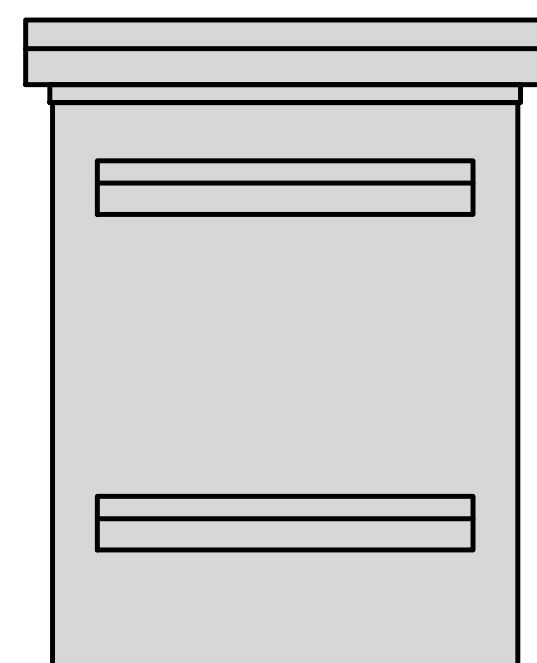
NO SCALE

3

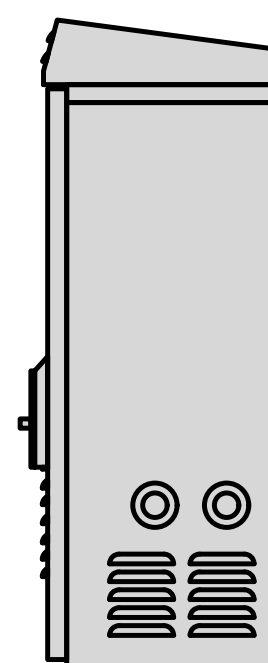
ZAYO 5RU (LEFT SWING DOOR) FIBER NID ENCLOSURE	
DIMENSIONS (HxWxD)	36.1"x29"x12.9"
WEIGHT	85 lbs



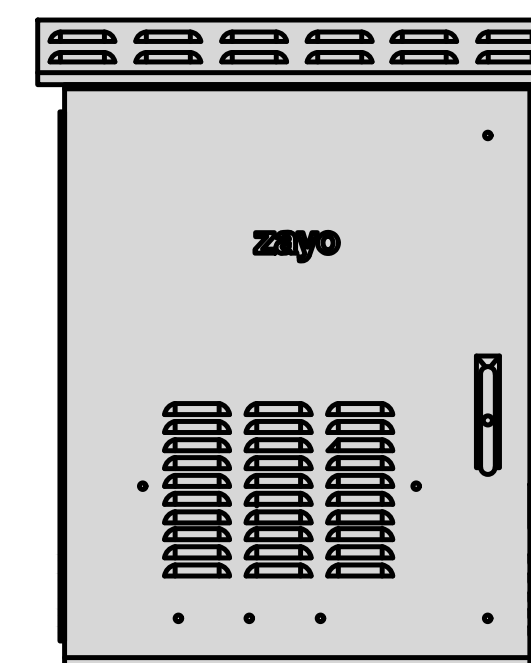
BOTTOM



BACK



SIDE



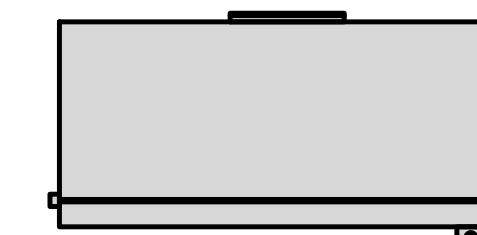
FRONT

FIBER NID ENCLOSURE DETAIL

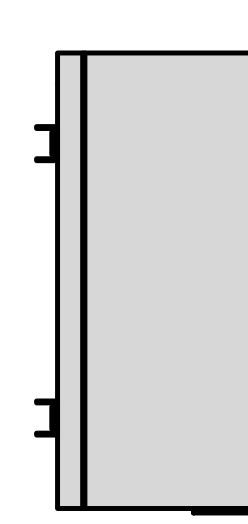
NO SCALE

5

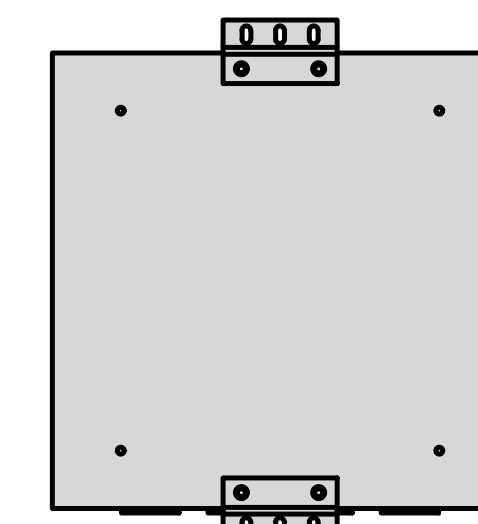
CHARLES CFIT-PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



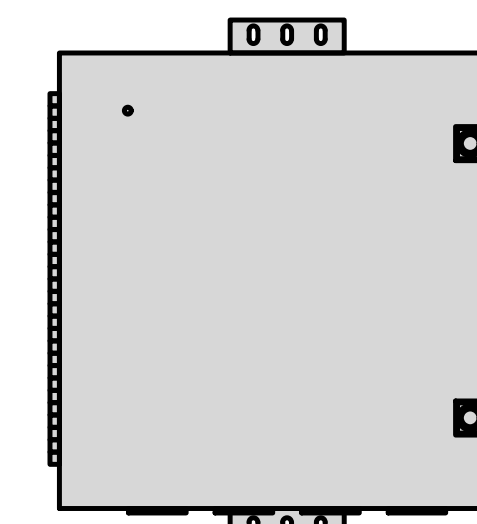
FRONT



SIDE



BACK



FRONT

FIBER TELCO ENCLOSURE DETAIL

NO SCALE

6

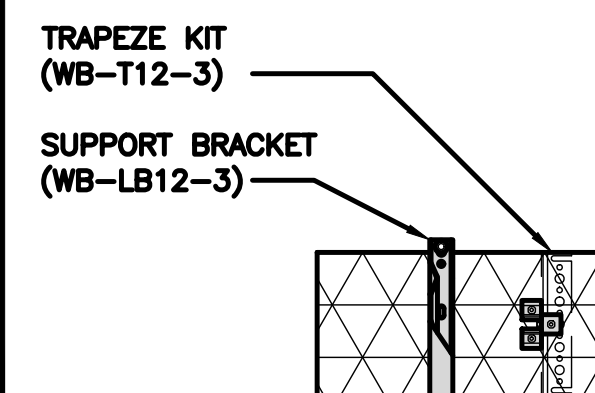
NOT USED

NO SCALE

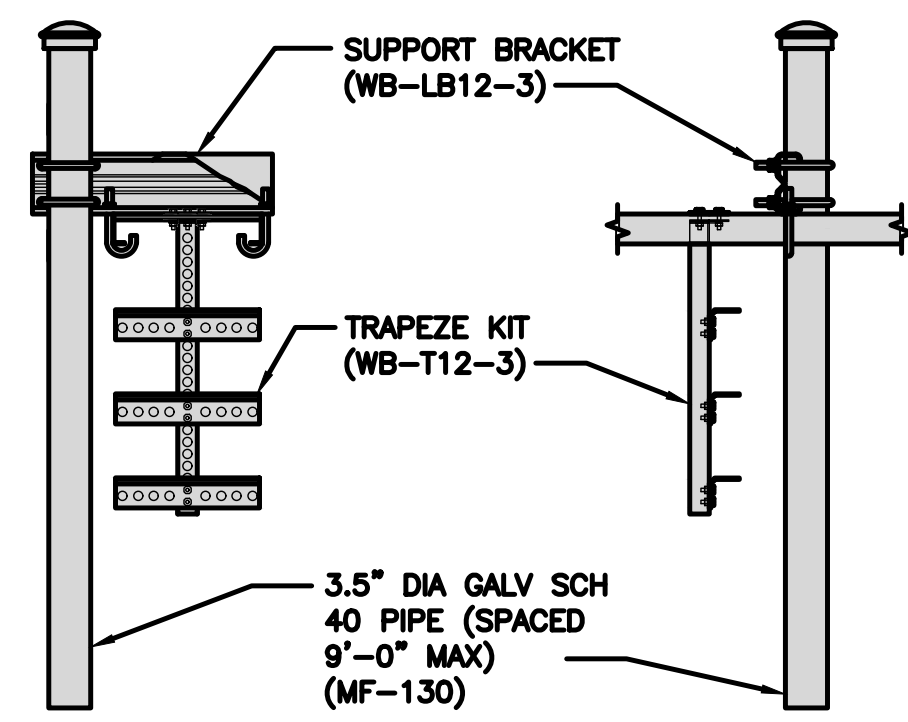
4

COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT	
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

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



PLAN



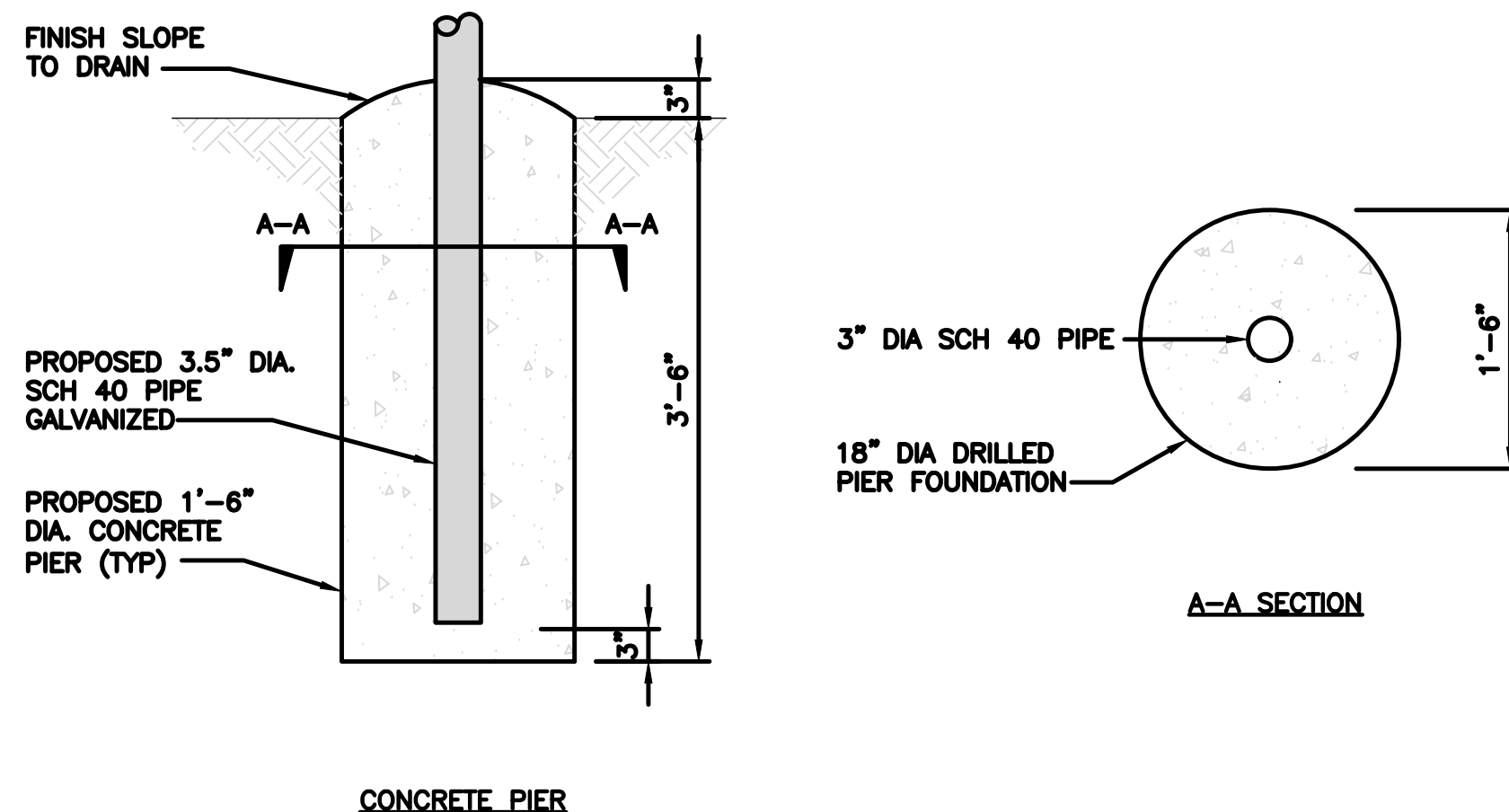
FRONT

SIDE

ICE BRIDGE DETAIL

NO SCALE

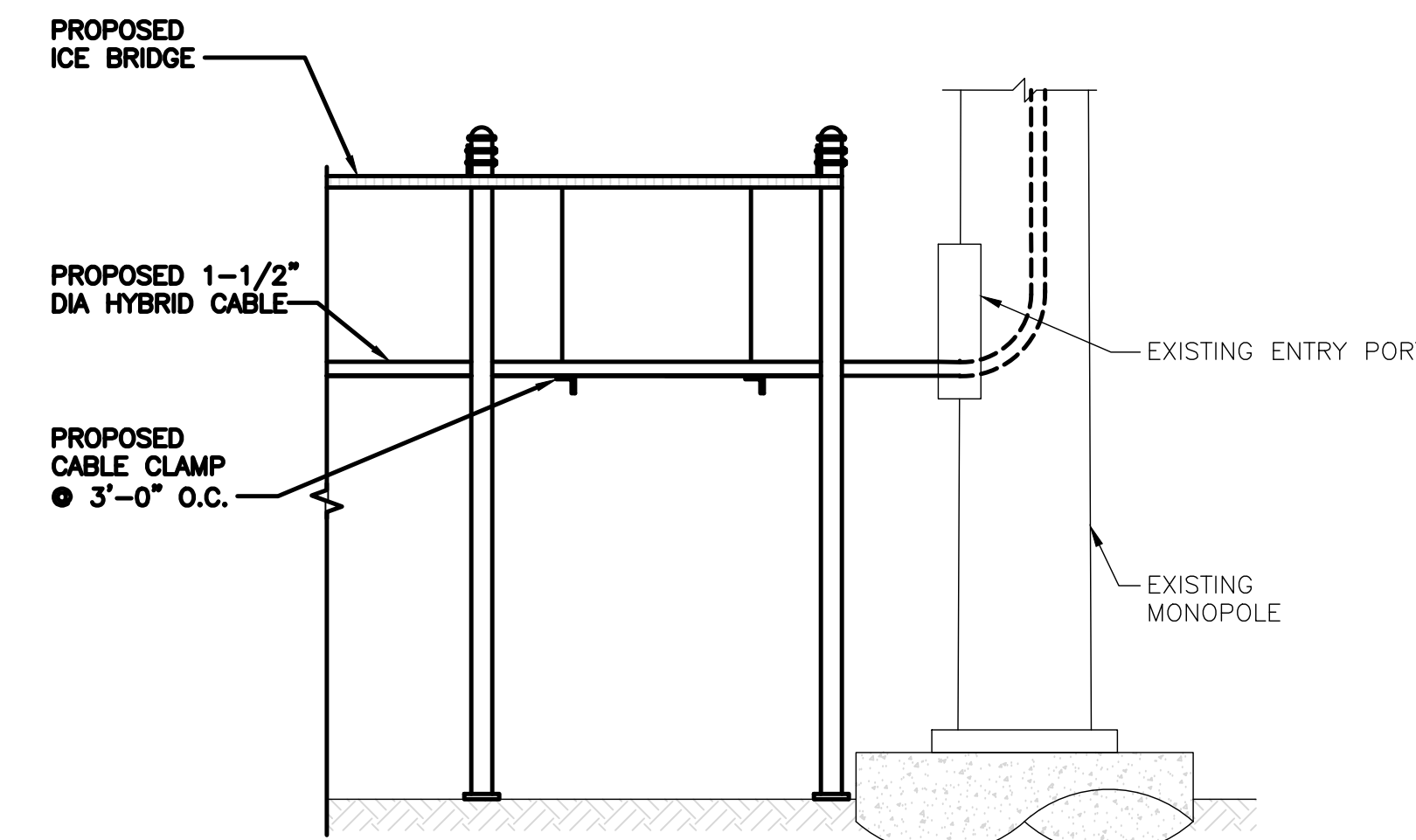
7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

8



HYBRID CABLE RUN

NO SCALE

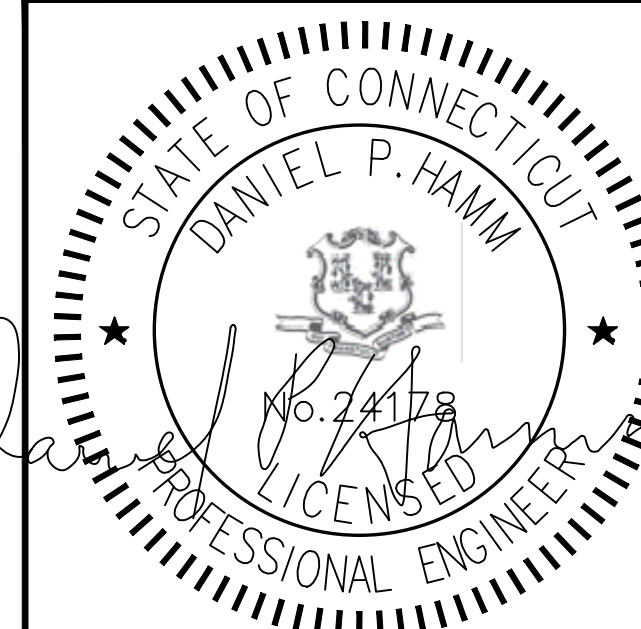
9

dish
wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

HG
HUDSON
Design Group LLC

45 BEECHWOOD DRIVE TEL: (978) 557-5553
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DRAWN BY: CHECKED BY: APPROVED BY:
JJ SMA DPH

RFDS REV #: 2

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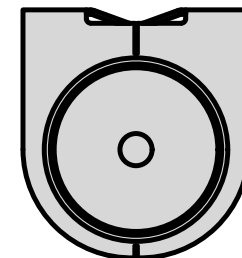
A&E PROJECT NUMBER
BOBOS01001A

DISH Wireless L.L.C.
PROJECT INFORMATION
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CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

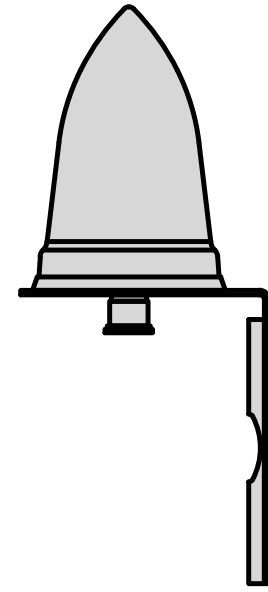
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

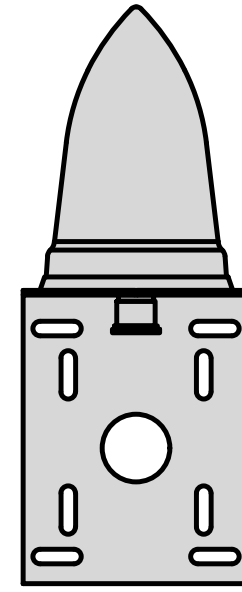
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



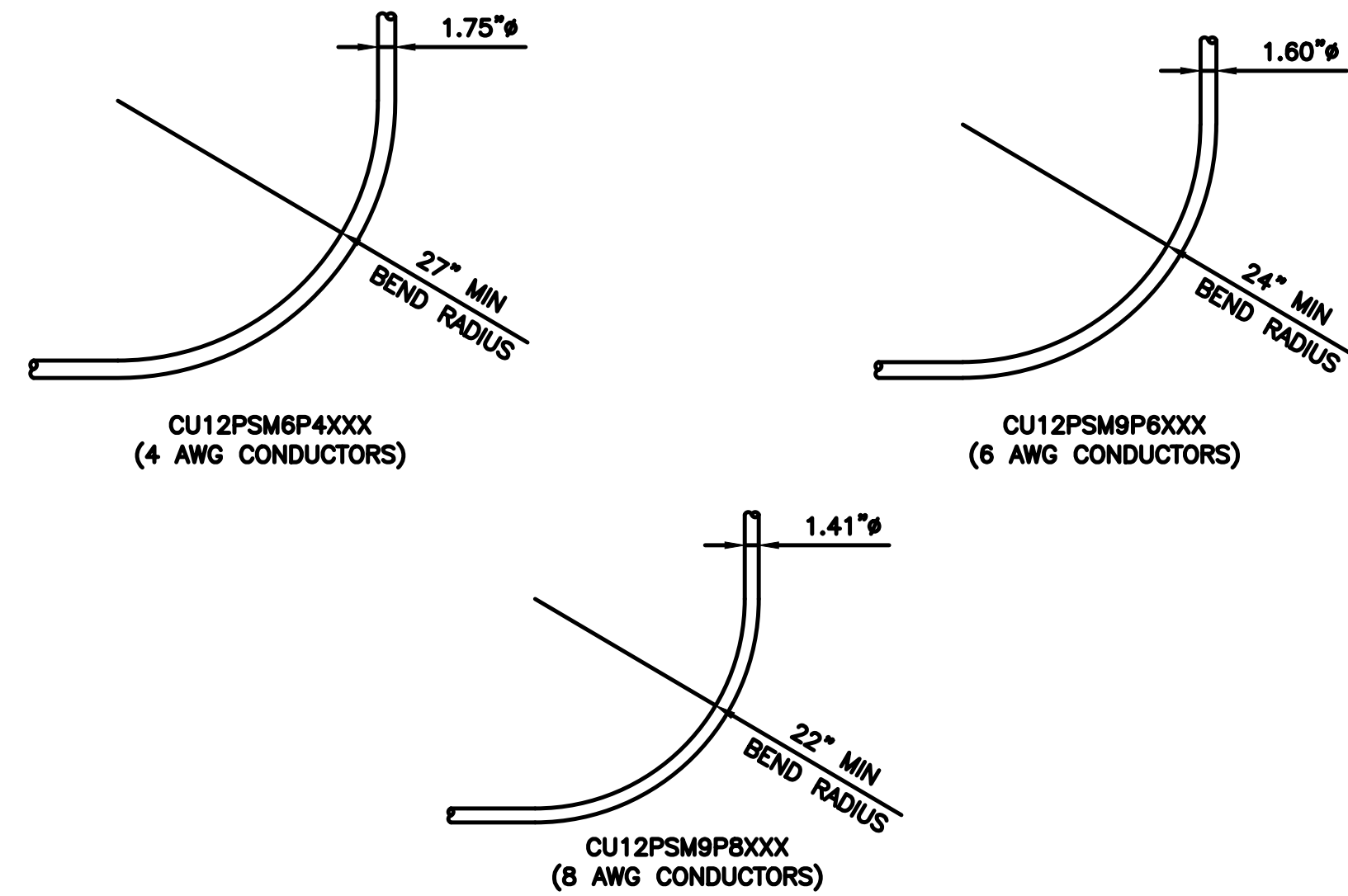
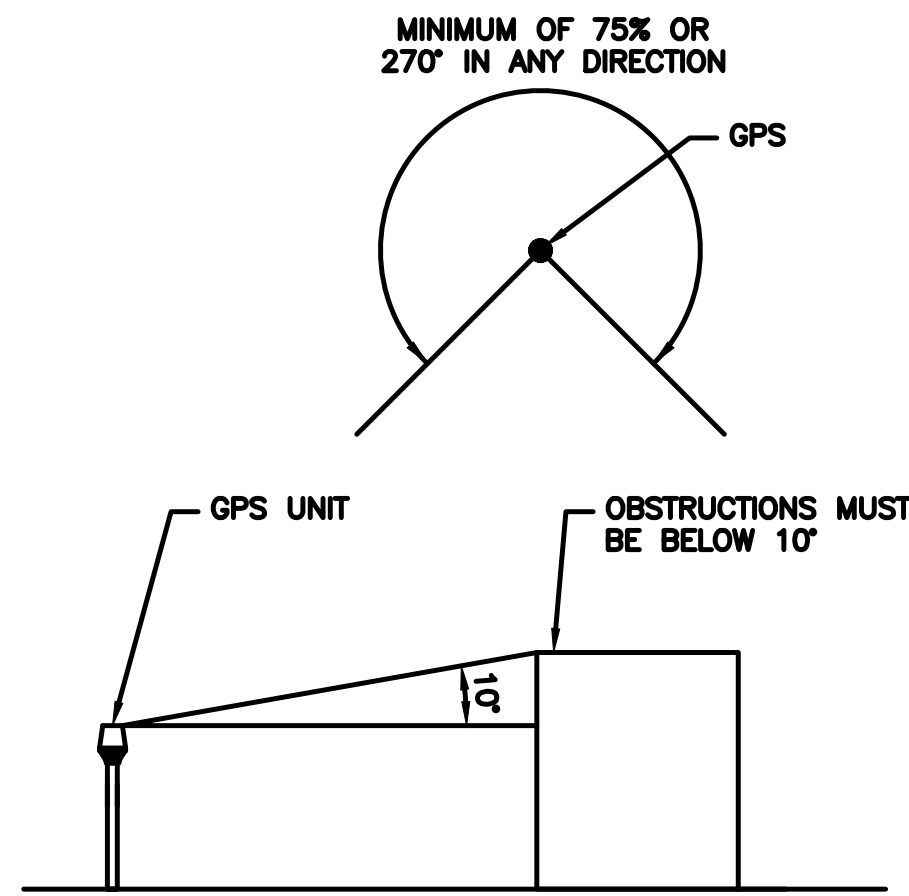
TOP



BACK



SIDE



GPS DETAIL

NO SCALE

1

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

2

CABLES UNLIMITED HYBRID CABLE
MINIMUM BEND RADIUSES

NO SCALE

3

NOT USED

NO SCALE

4

NOT USED

NO SCALE

5

NOT USED

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

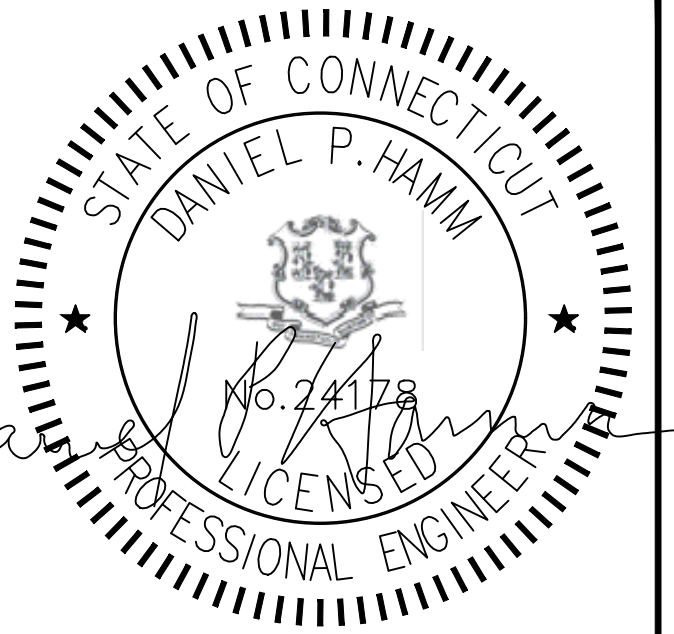
9

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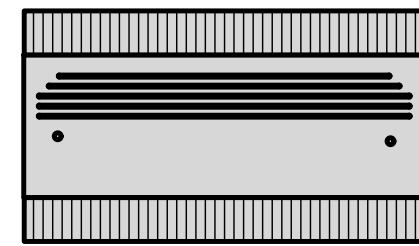
A&E PROJECT NUMBER
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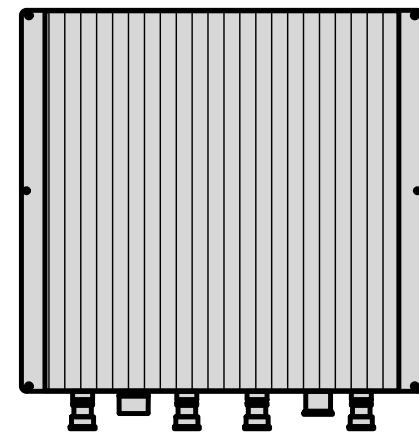
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

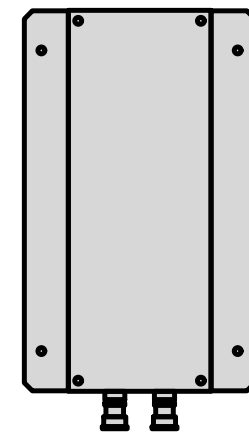
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



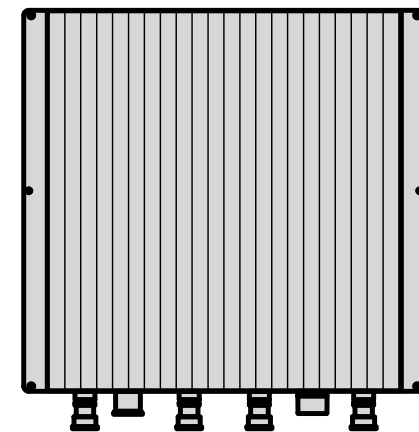
PLAN



BACK

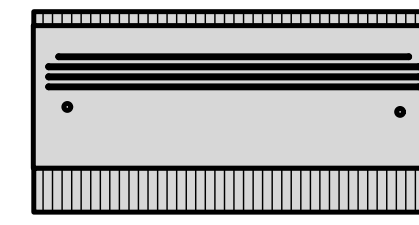


SIDE

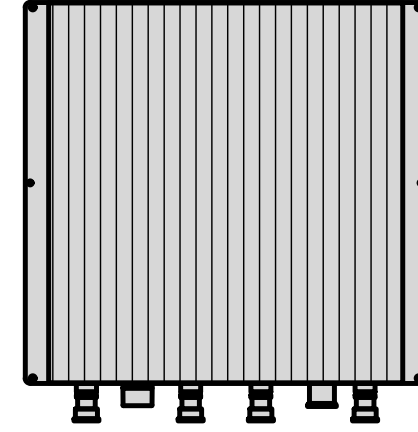


FRONT

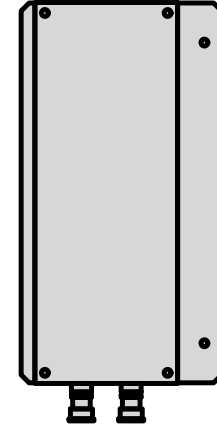
FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



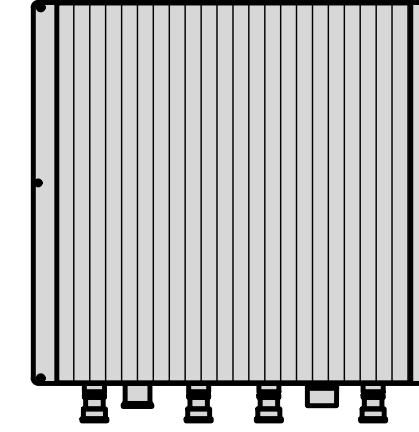
PLAN



BACK



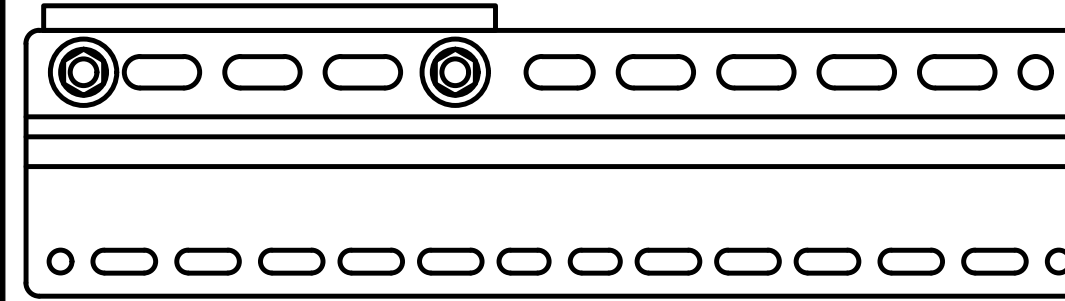
SIDE



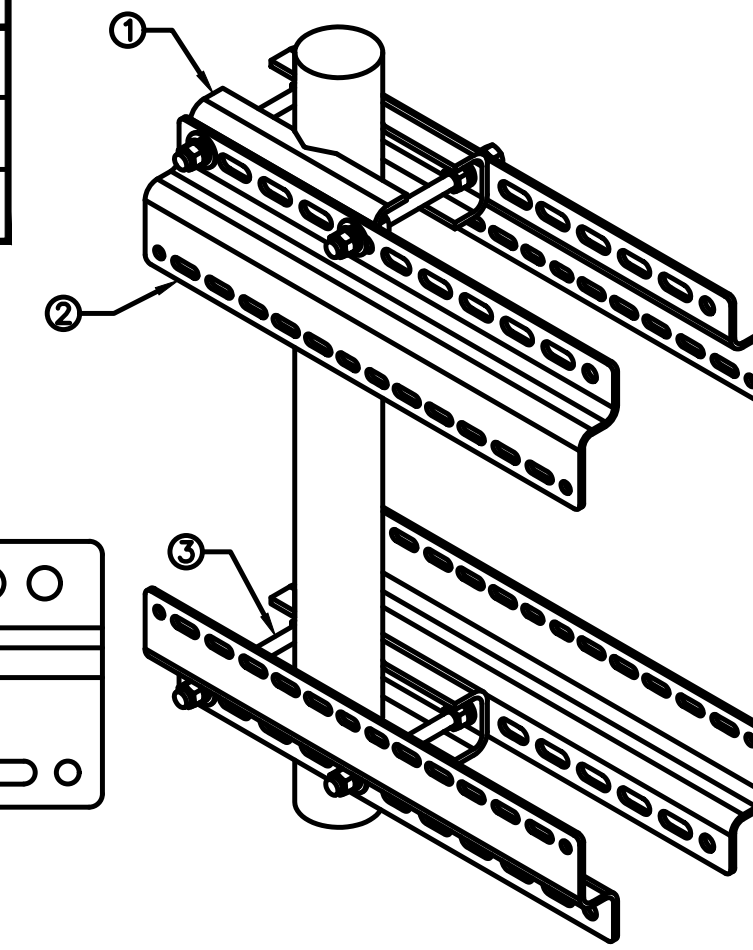
FRONT

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 DETAIL

NO SCALE

1

RRH DETAIL

NO SCALE

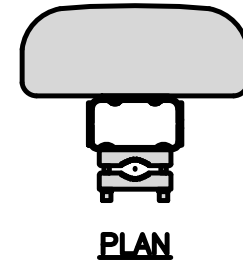
2

RRH MOUNT DETAIL

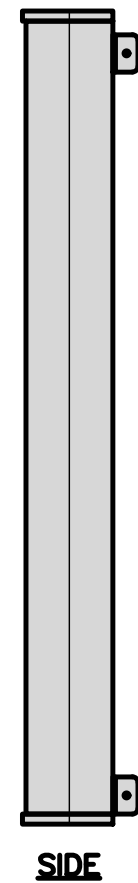
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3

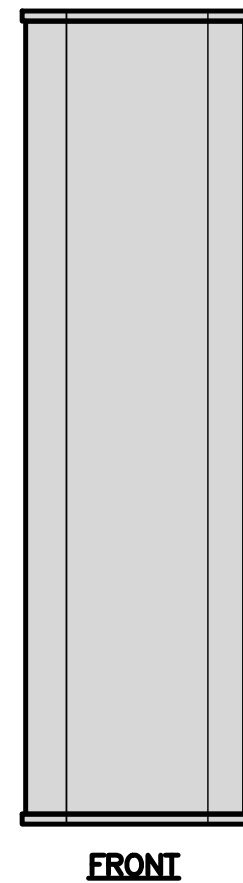
JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs



PLAN



SIDE



FRONT

ANTENNA DETAIL

NO SCALE

4

NOT USED

NO SCALE

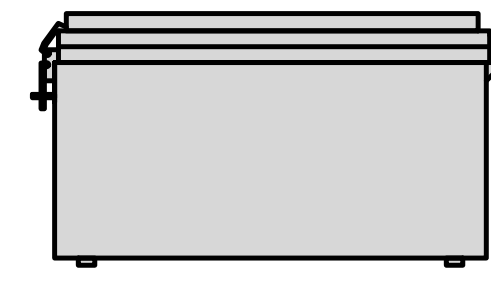
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ANTENNA BRACKET DETAIL

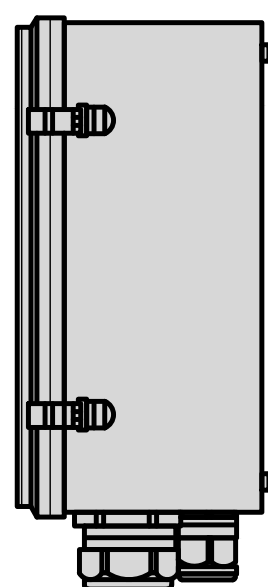
NO SCALE

6

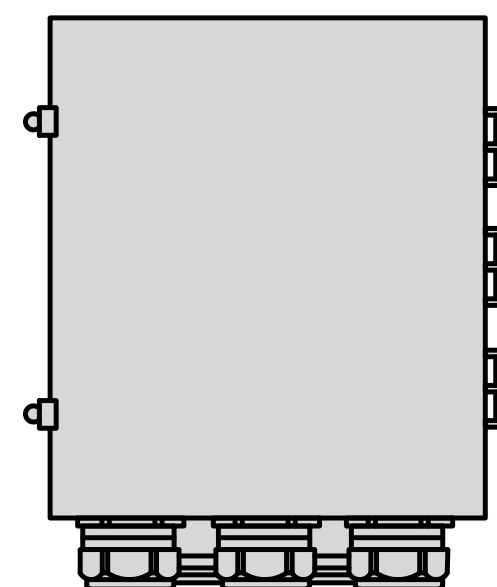
RAYCAP RDIC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



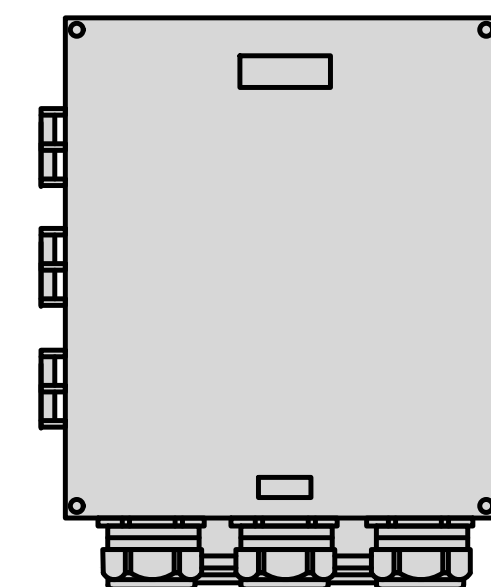
PLAN



SIDE



BACK



FRONT

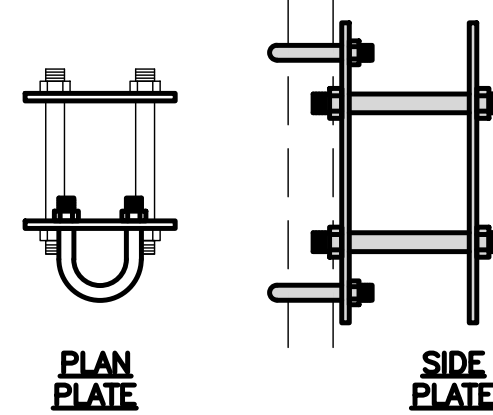
SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

7

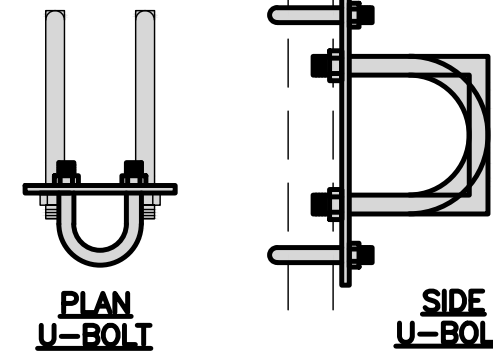
COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

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



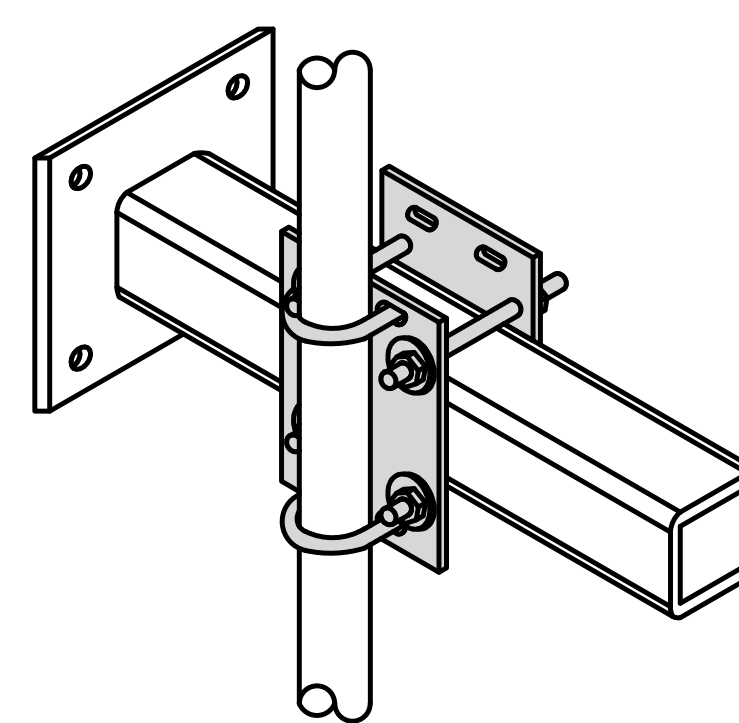
PLAN
U-BOLT

SIDE
U-BOLT



PLAN
U-BOLT

SIDE
U-BOLT



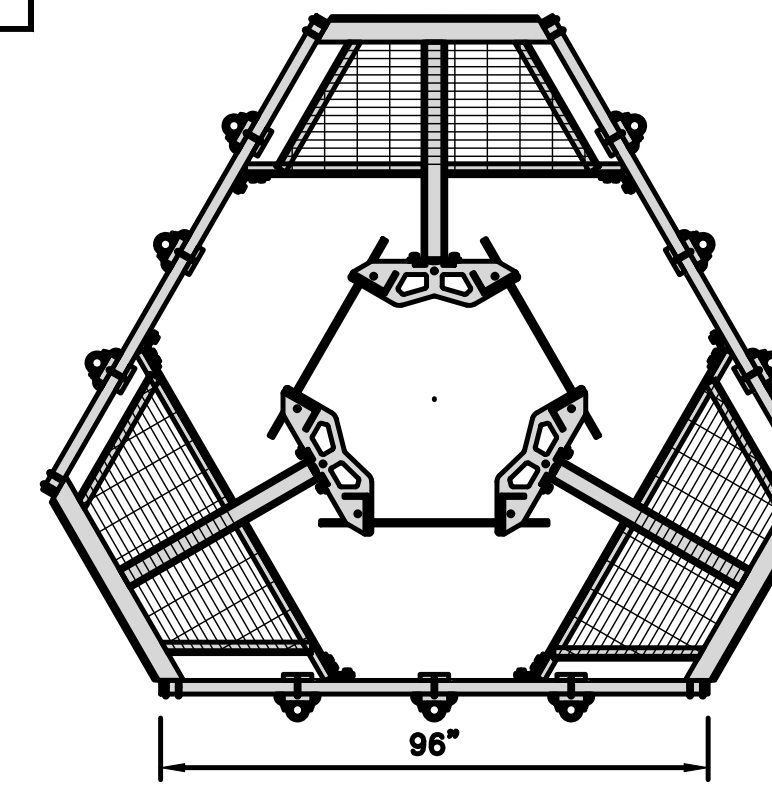
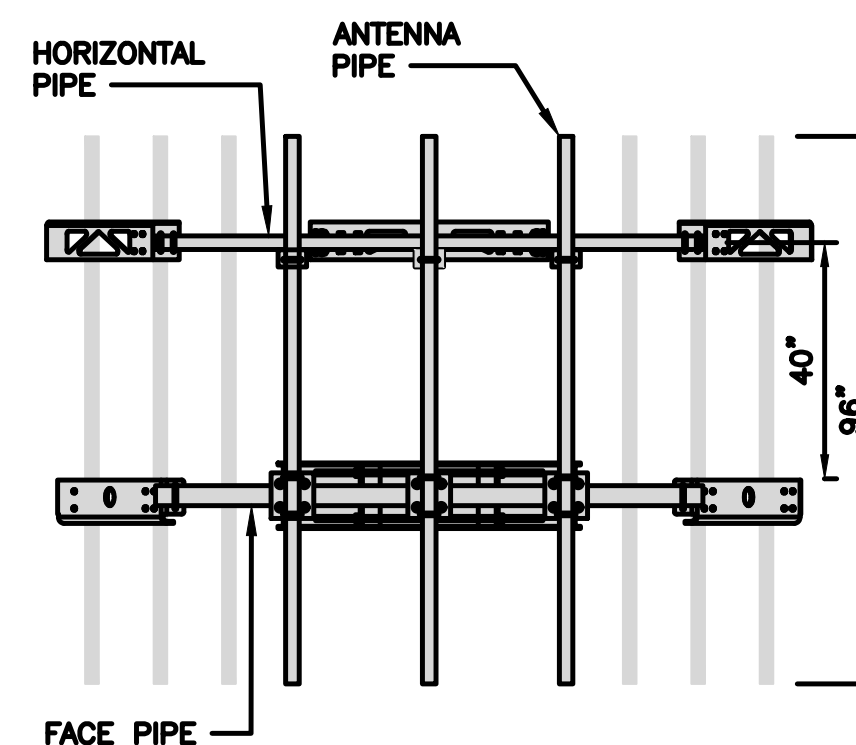
RRH/OVP MOUNT DETAIL

NO SCALE

8

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

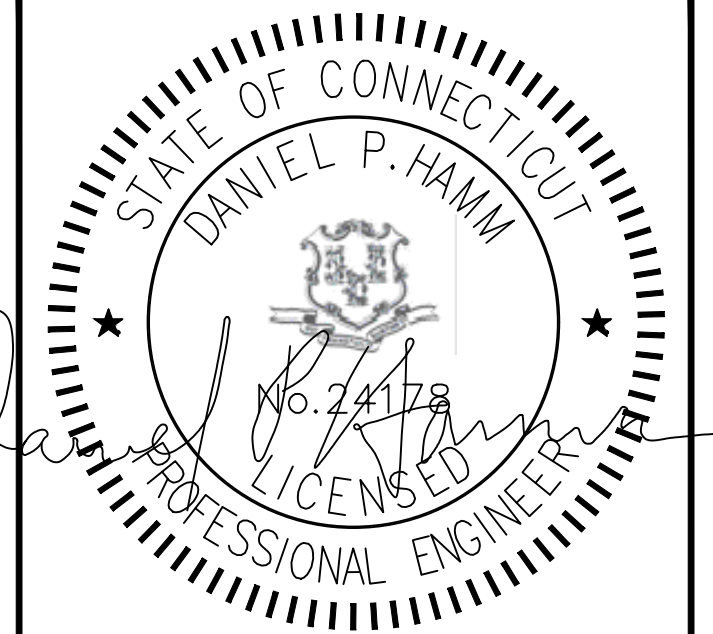
9

dish
wireless.

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HG
HUDSON
Design Group LLC

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RFDS REV #: 2

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DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01001A
CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

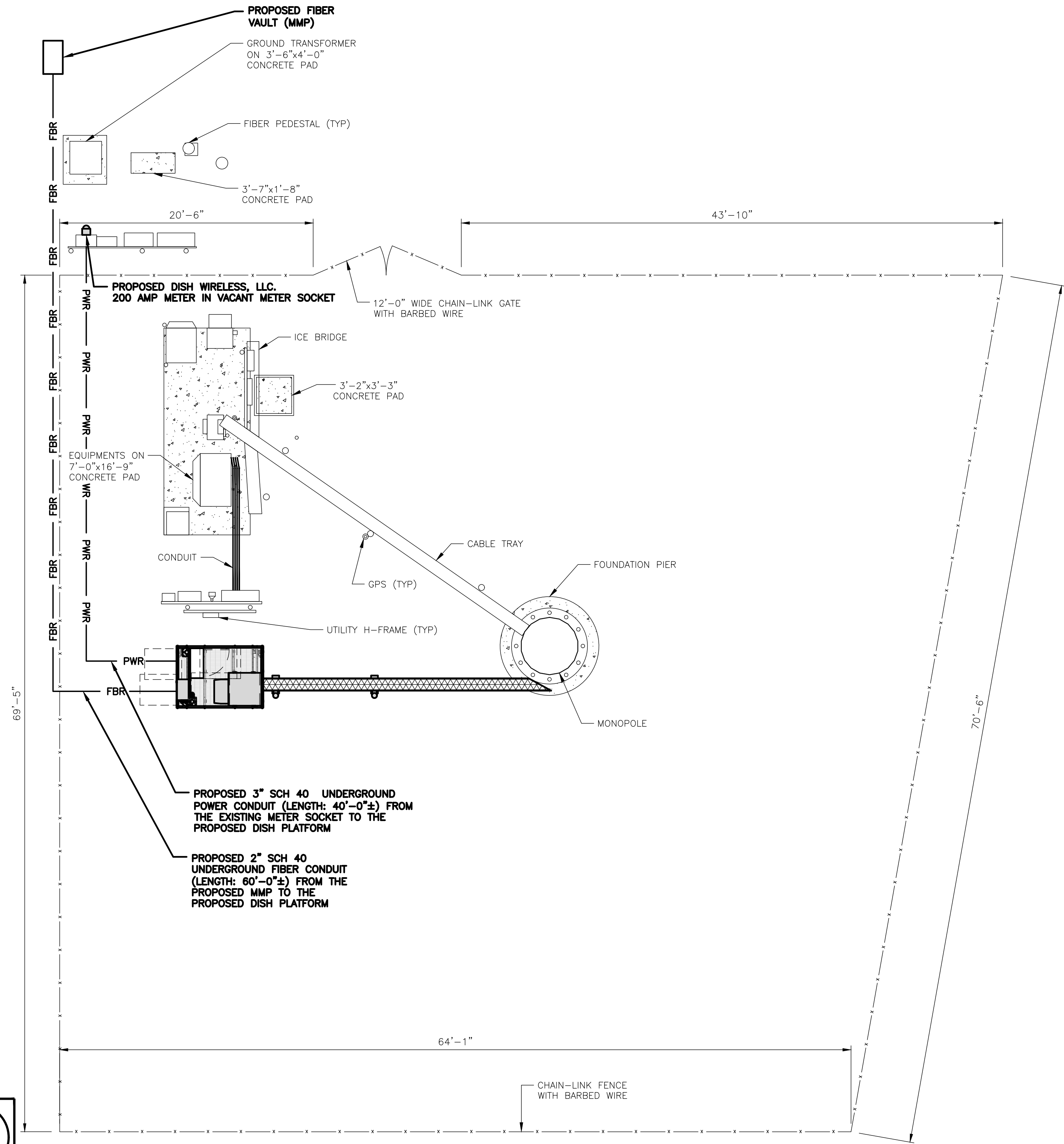
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER

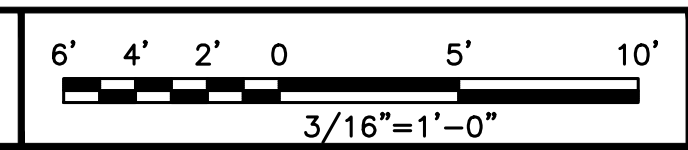
A-6

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. THE GROUND LEASE PROVIDES BROAD/BLANKET UTILITY RIGHTS. "PWR" AND "FBR" PATH DEPICTED ON A-1 AND E-1 ARE BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO 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 NOT AN OPTION, PLEASE NOTIFY TOWER OWNER AS FURTHER COORDINATION MAY BE NEEDED.



UTILITY ROUTE PLAN

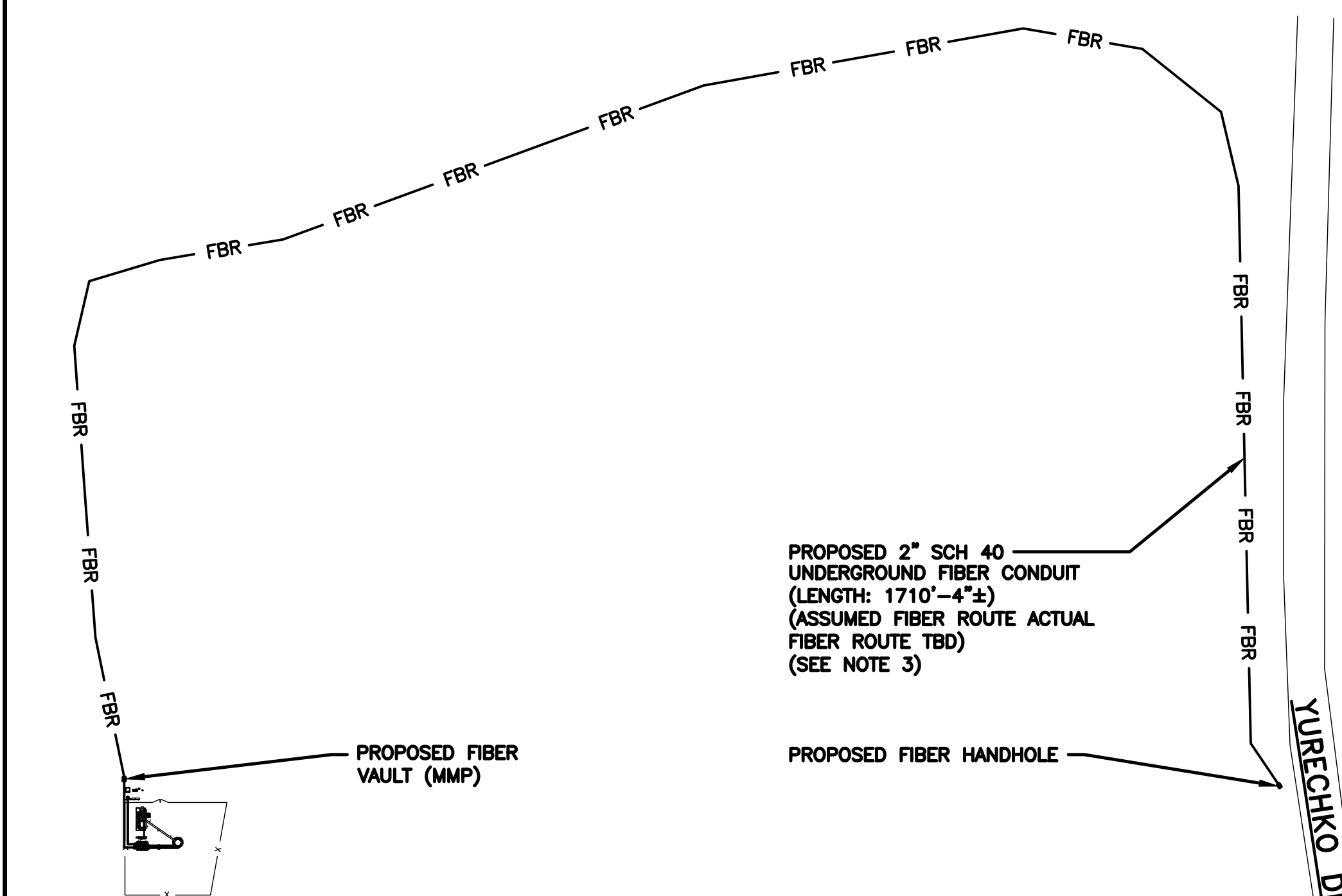


DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

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

2



OVERALL UTILITY ROUTE PLAN

NO SCALE

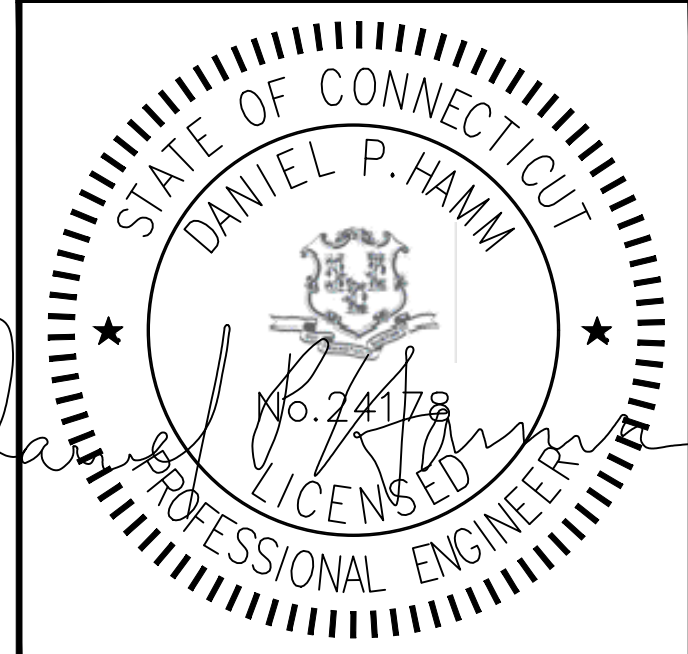
3



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JJ SMA DPH

RFDS REV #: 2

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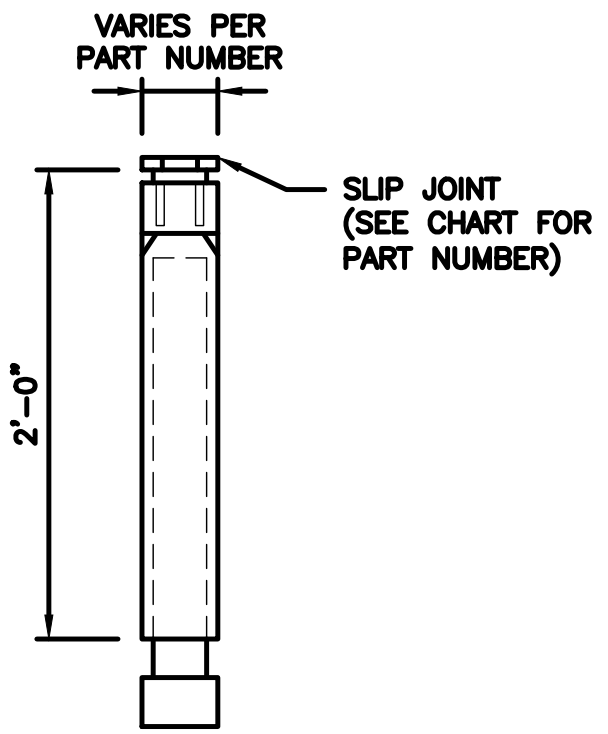
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BOBOS01001A

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01001A
CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

SHEET TITLE
ELECTRICAL/FIBER ROUTE
PLAN AND NOTES

SHEET NUMBER
E-1

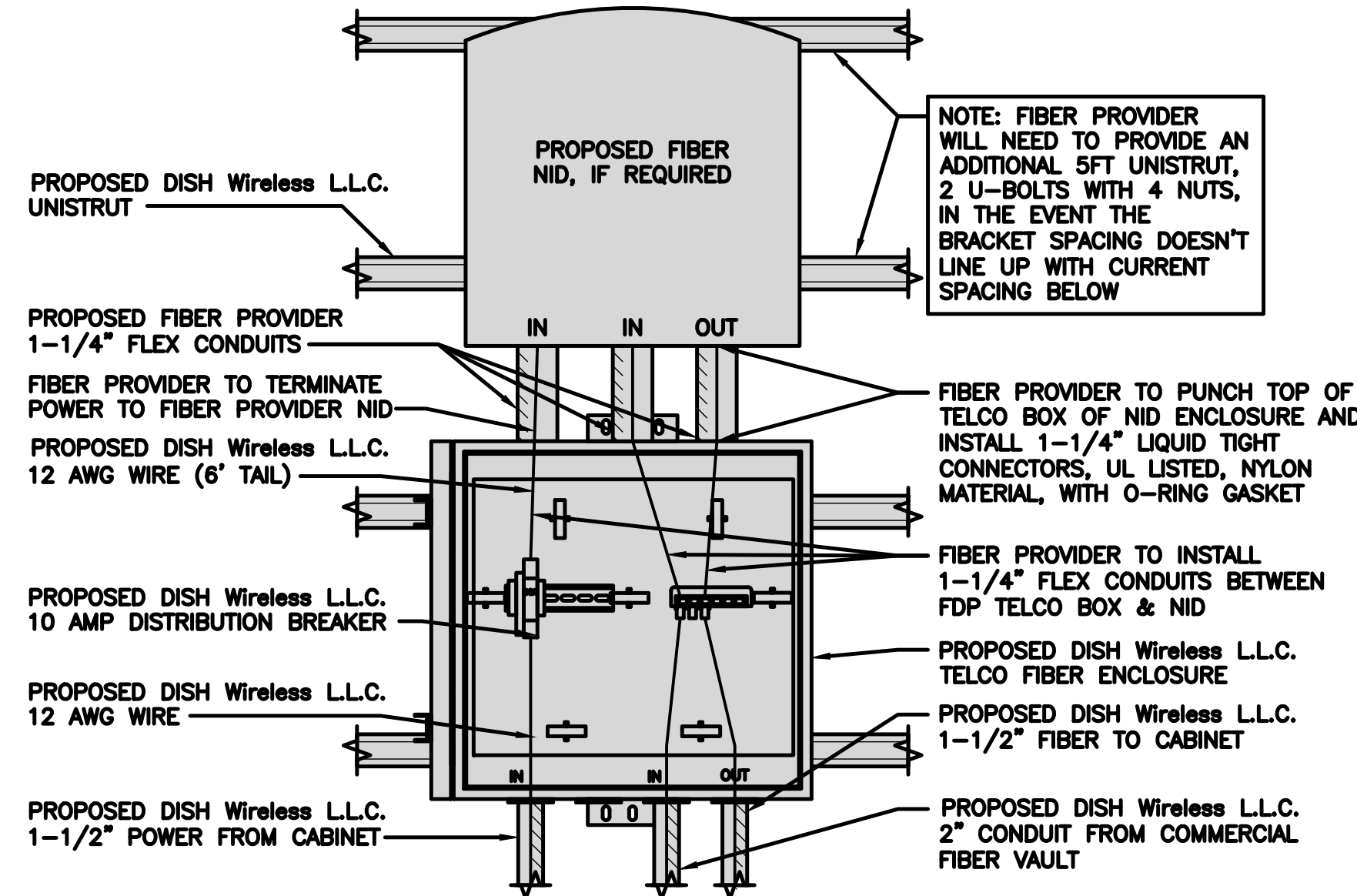
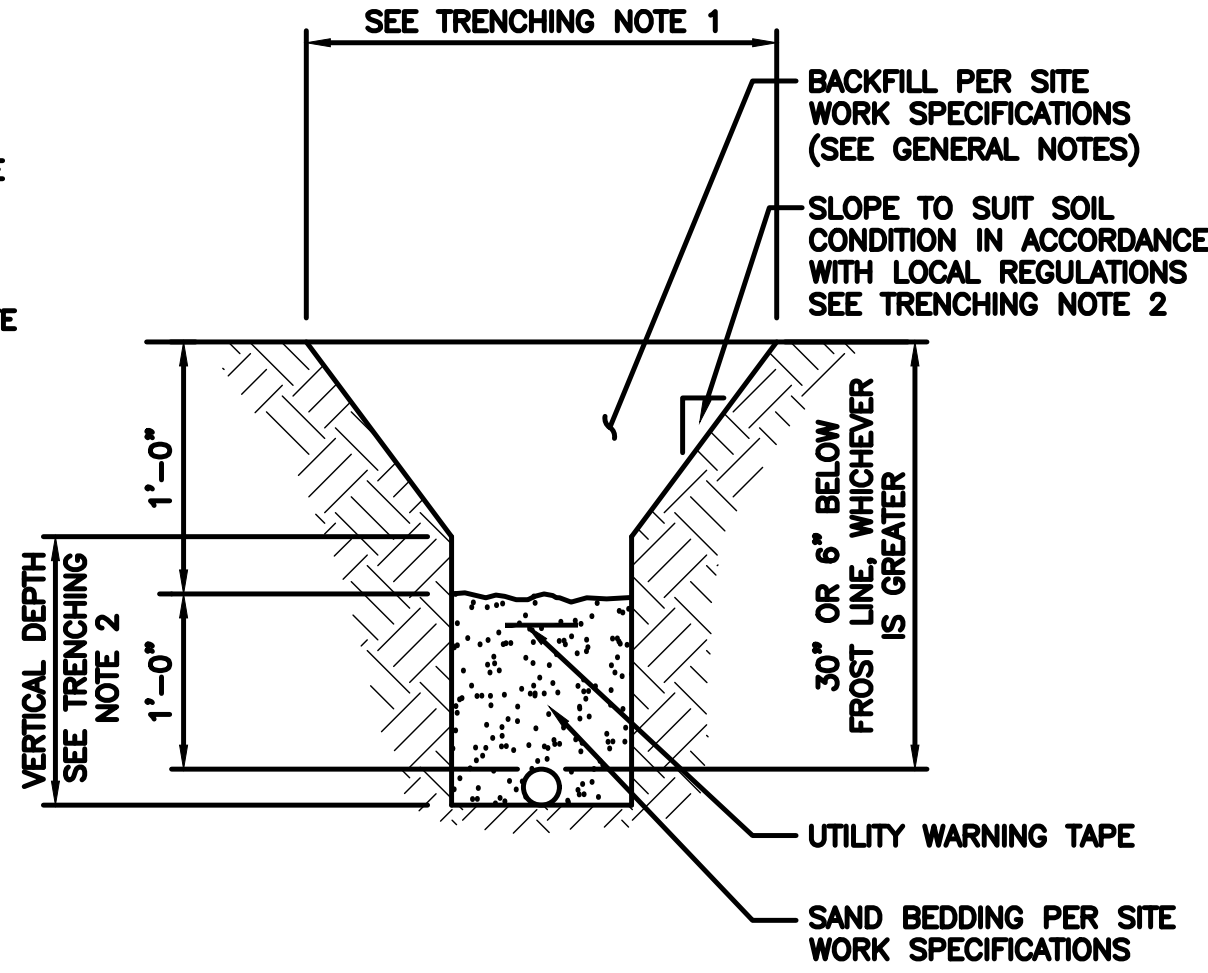
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
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.

TRENCHING NOTES

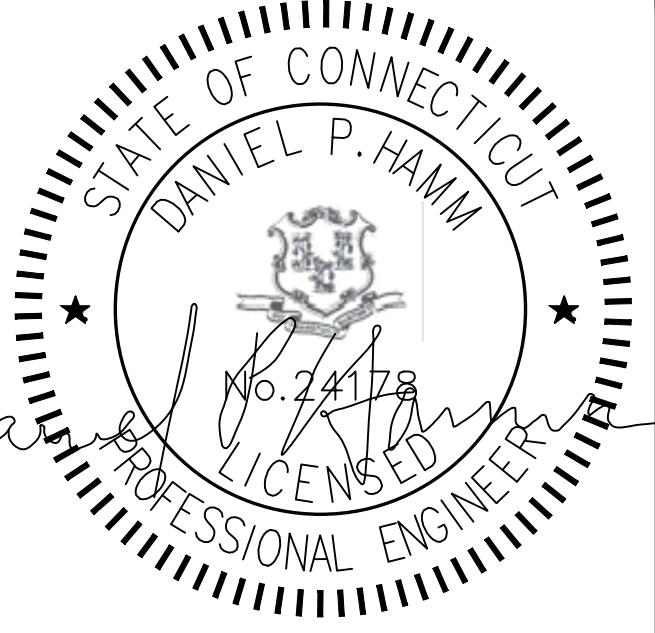
- CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
- TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
- 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.



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DISH Wireless L.L.C.
PROJECT INFORMATION
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CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER
E-2

EXPANSION JOINT DETAIL NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL NO SCALE 2

LIT TELCO BOX - INTERIOR WIRING LAYOUT (OPTIONAL) NO SCALE 3

NOT USED NO SCALE 4

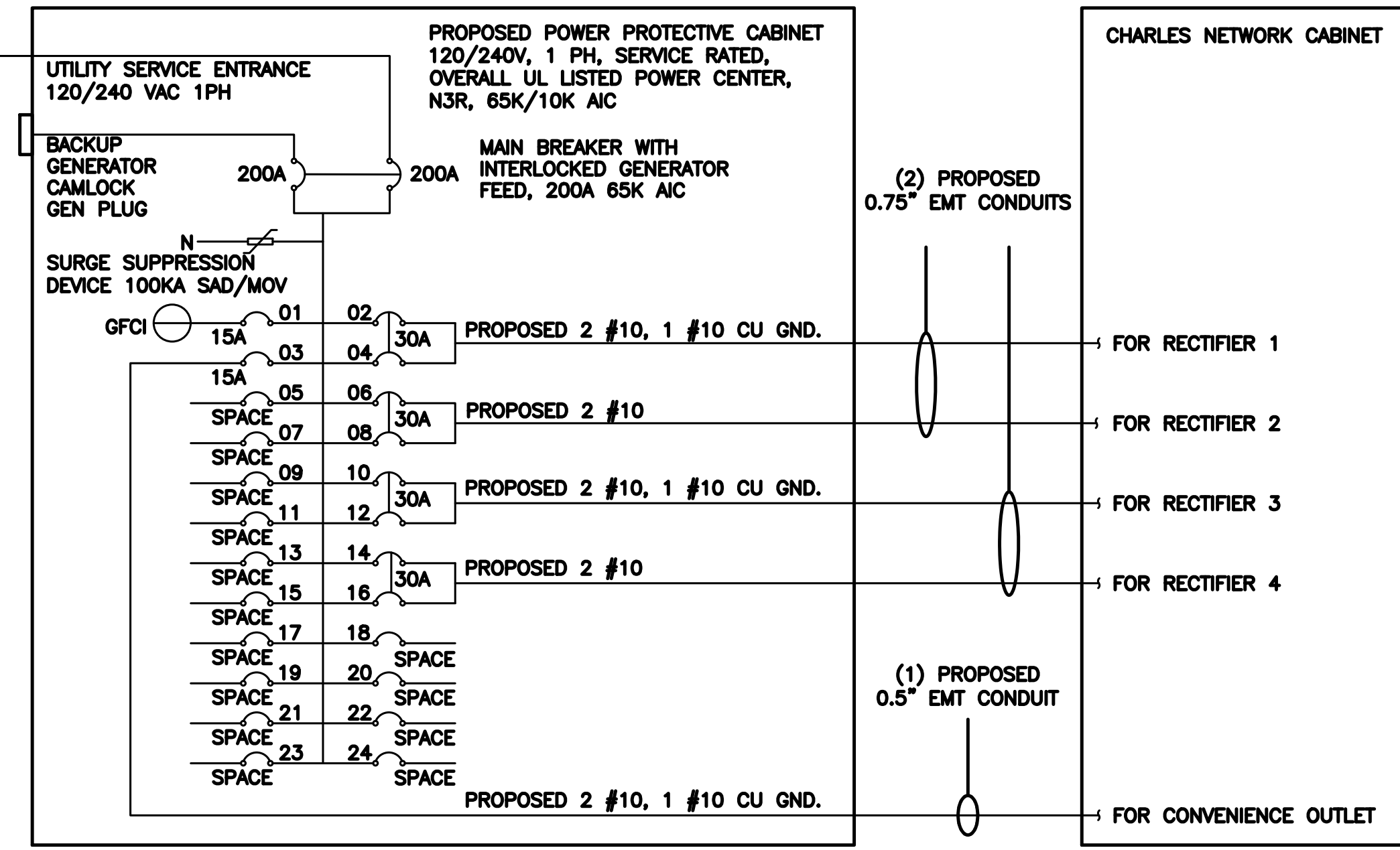
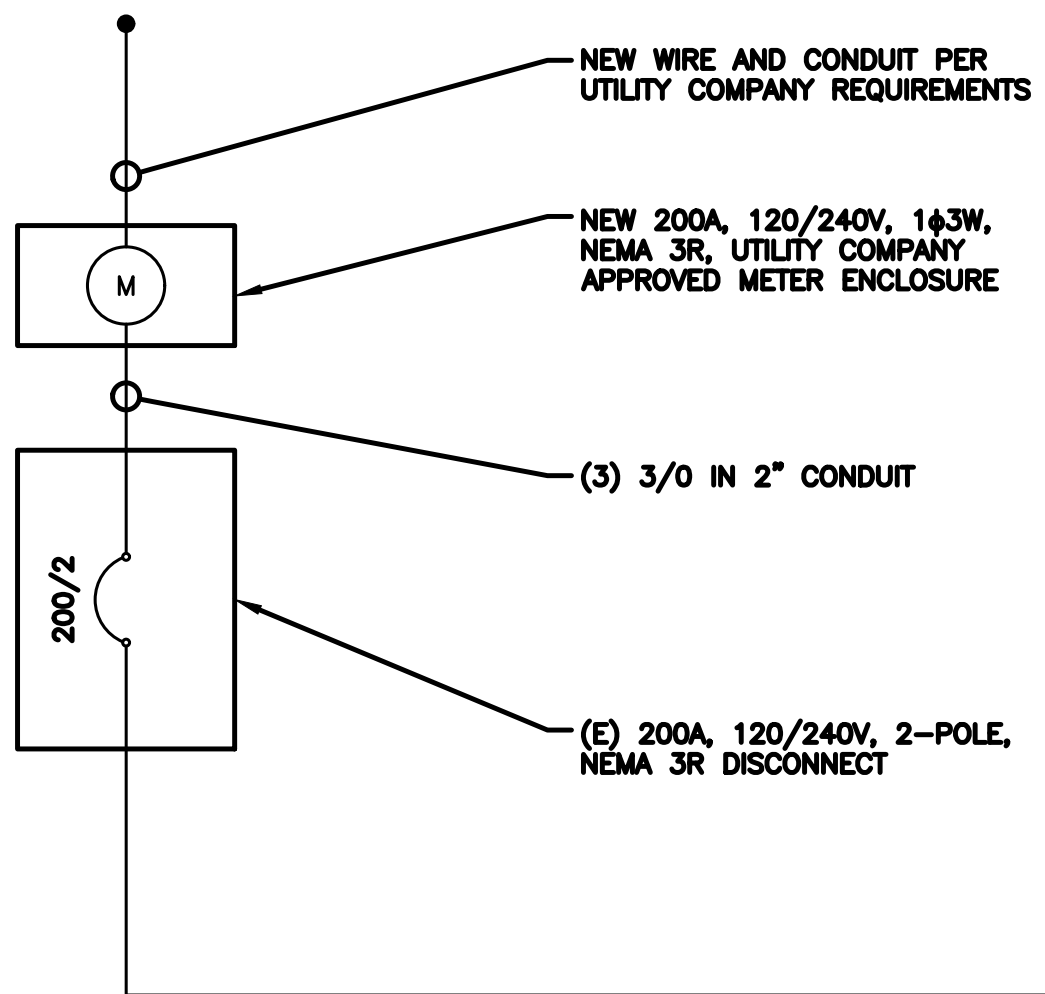
NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



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:Q0230
 (1) 15A, 1P BREAKER - SQUARE D P/N:Q0115

PPC ONE-LINE DIAGRAM

NO SCALE 1

PROPOSED CHARLES PANEL SCHEDULE										
LOAD SERVED	VOLT AMPS (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS)		LOAD SERVED
	L1	L2						L1	L2	
PPC GFCI OUTLET	180	180	15A	1	A	2	30A	2880	2880	ABB/GE INFINITY RECTIFIER 1
CHARLES GFCI OUTLET			15A	3	B	4				
-SPACE-				5	A	6	30A	2880	2880	ABB/GE INFINITY RECTIFIER 2
-SPACE-				7	B	8				
-SPACE-				9	A	10	30A	2880	2880	ABB/GE INFINITY RECTIFIER 3
-SPACE-				11	B	12				
-SPACE-				13	A	14	30A	2880	2880	ABB/GE INFINITY RECTIFIER 4
-SPACE-				15	B	16				
-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					
				98	98					
				98						
				123						

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3

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

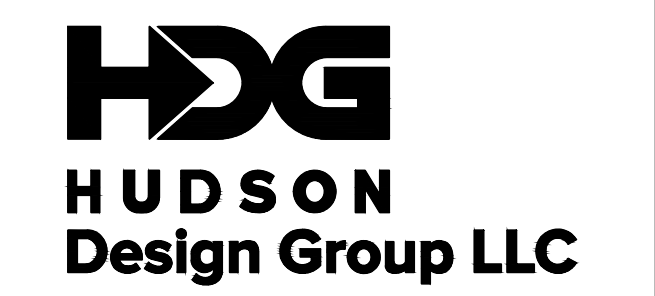
0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (5) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

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

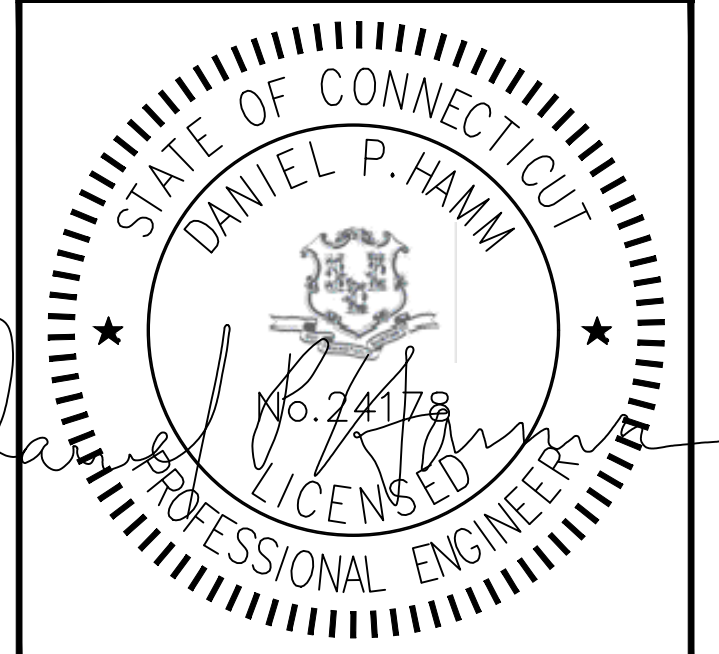
3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.



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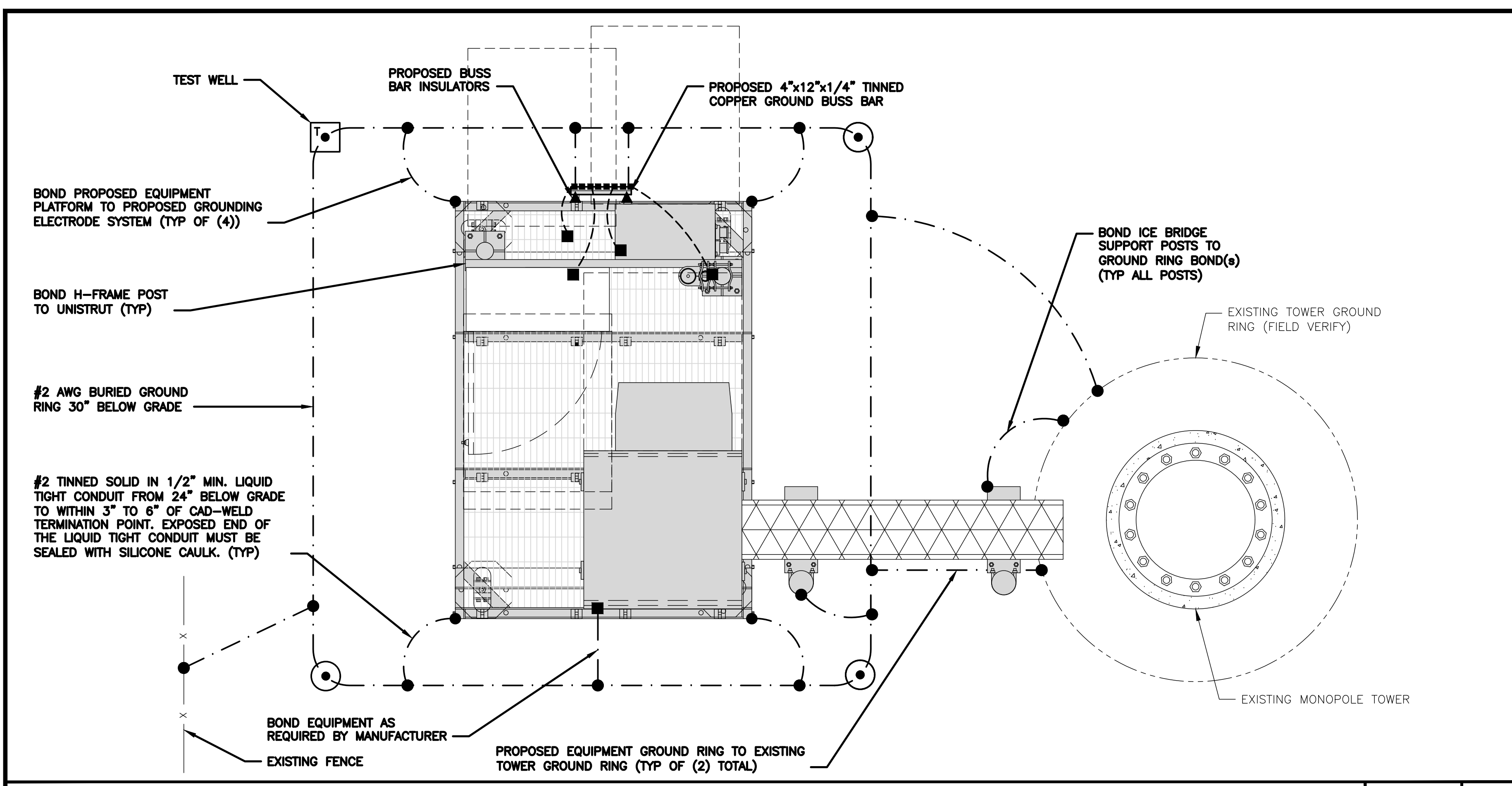
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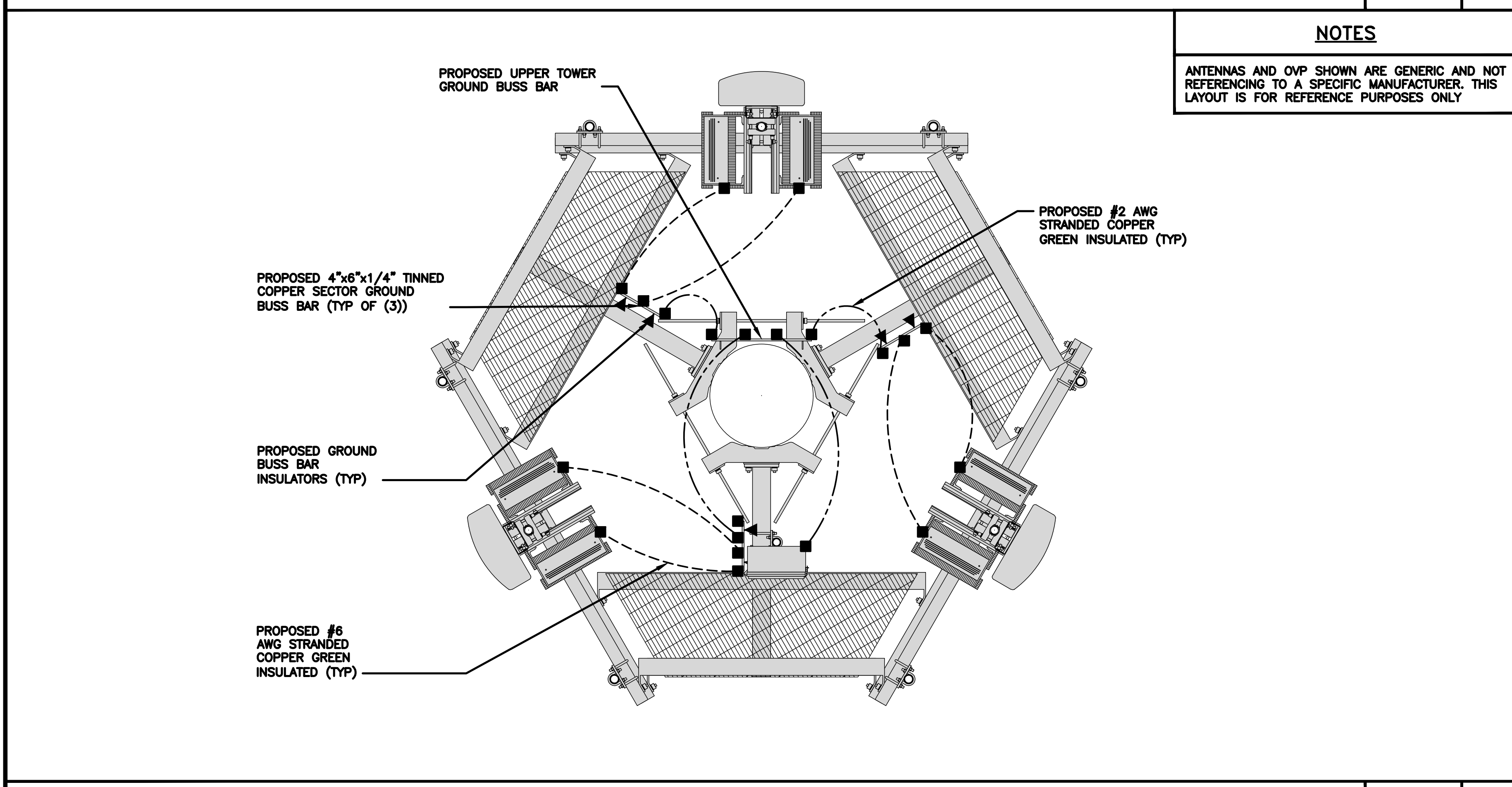
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT
CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3



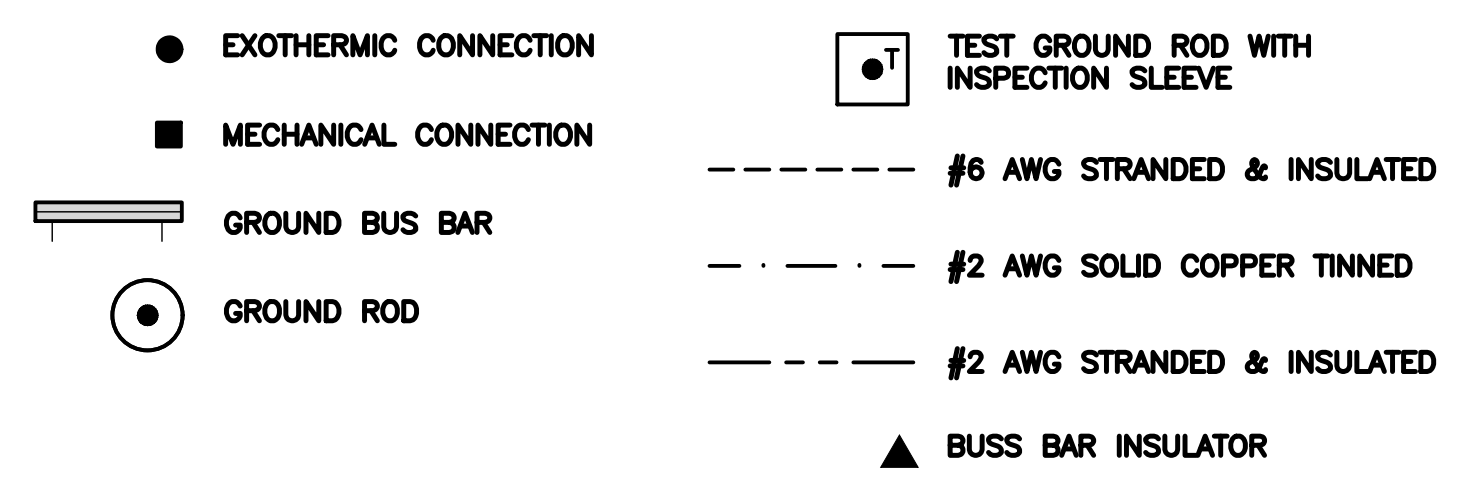
TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2



GROUNDING LEGEND

- GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
- 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.
- 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

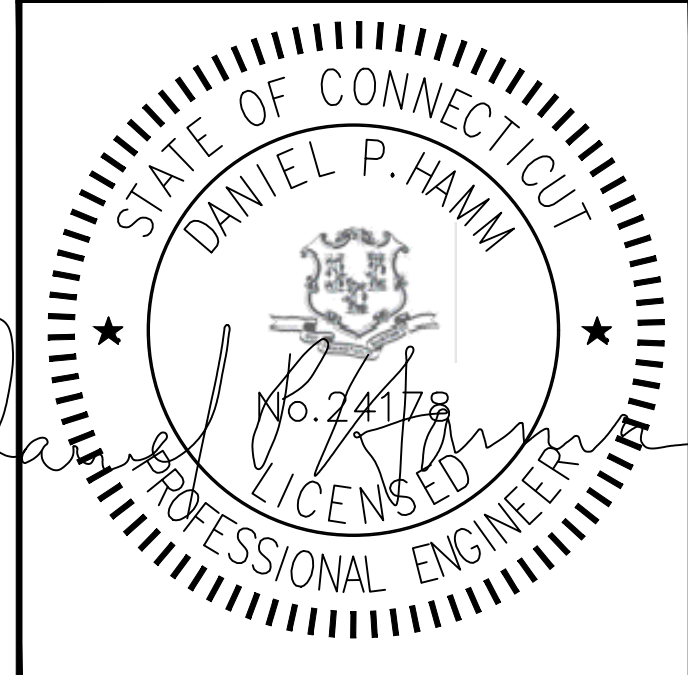
NO SCALE 3



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RFDS REV #: 2

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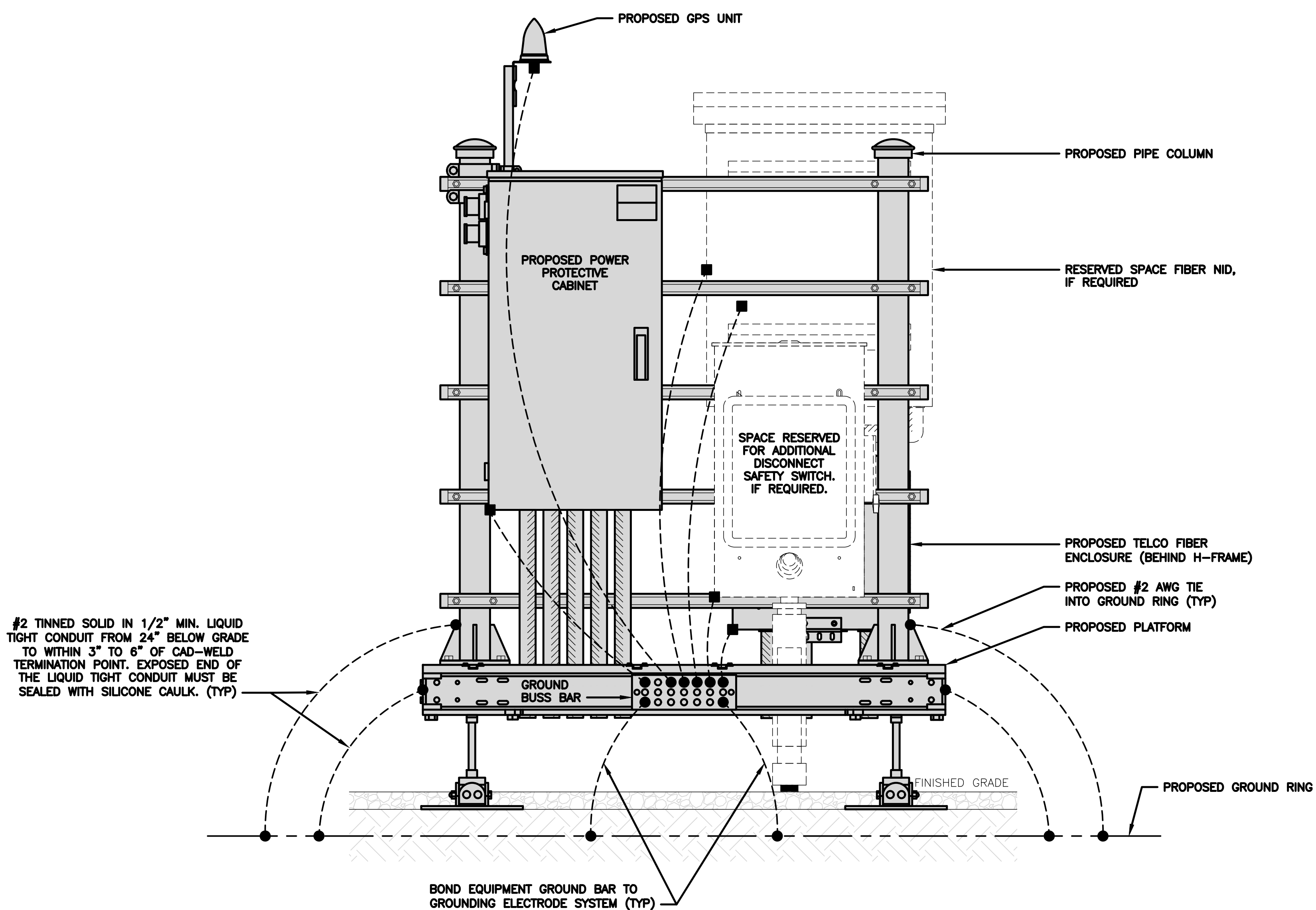
A&E PROJECT NUMBER
BOBOS01001A

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01001A
CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

SHEET TITLE
GROUNDING PLANS AND NOTES

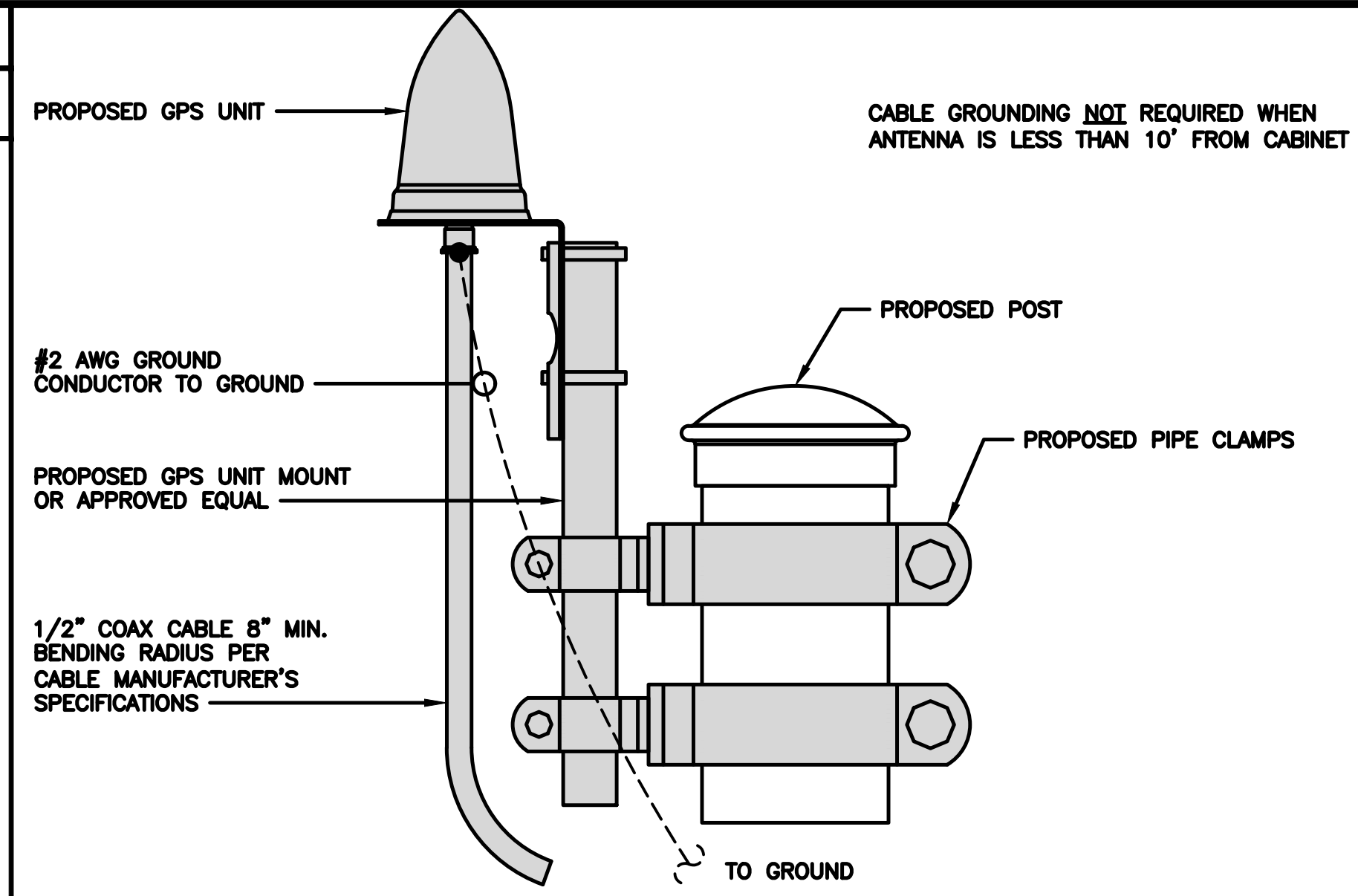
SHEET NUMBER
G-1

NOTES
EQUIPMENT CABINET OMITTED FOR CLARITY



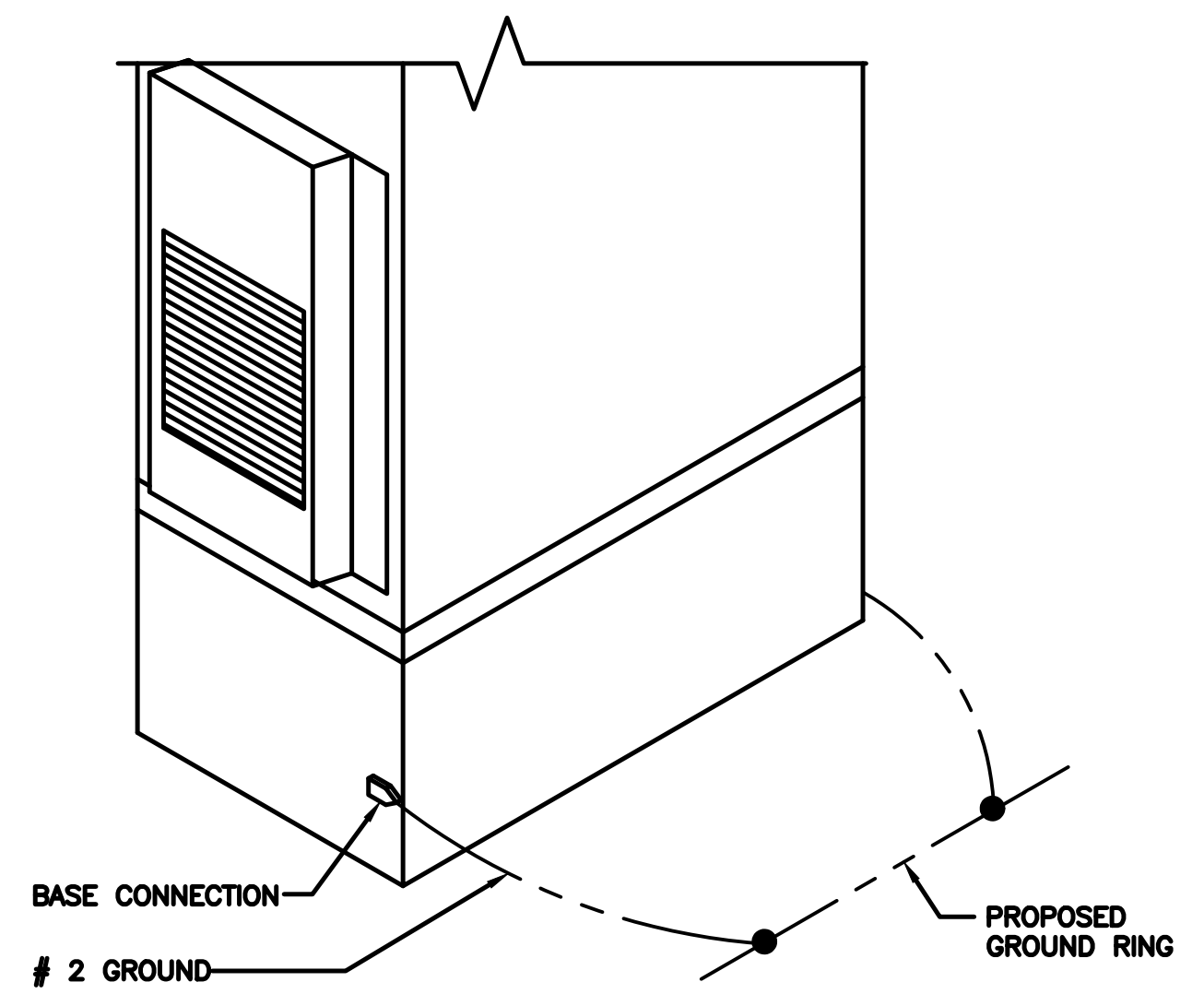
H-FRAME GROUNDING DETAIL

NO SCALE 1



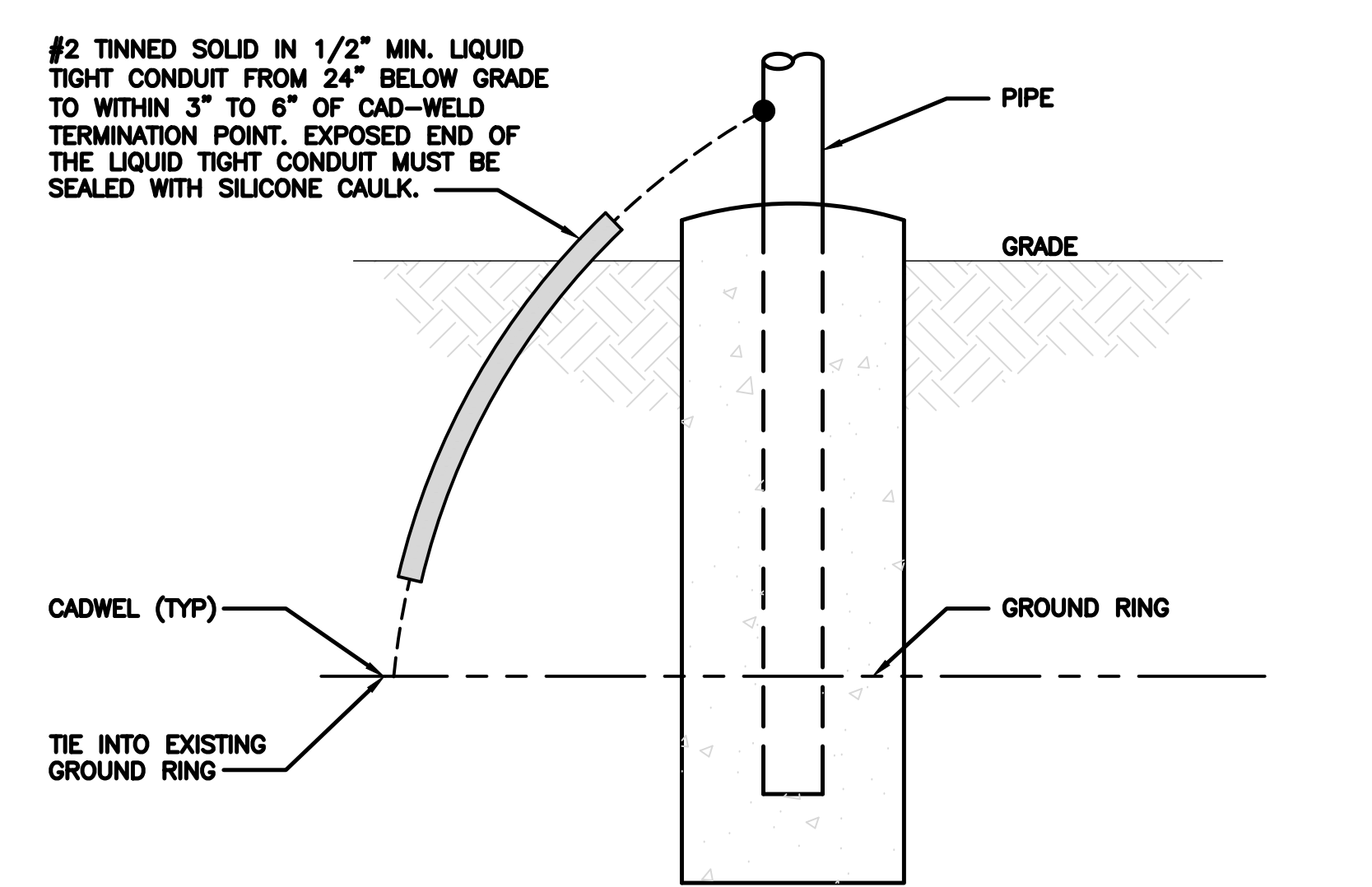
TYPICAL GPS UNIT GROUNDING

NO SCALE 2



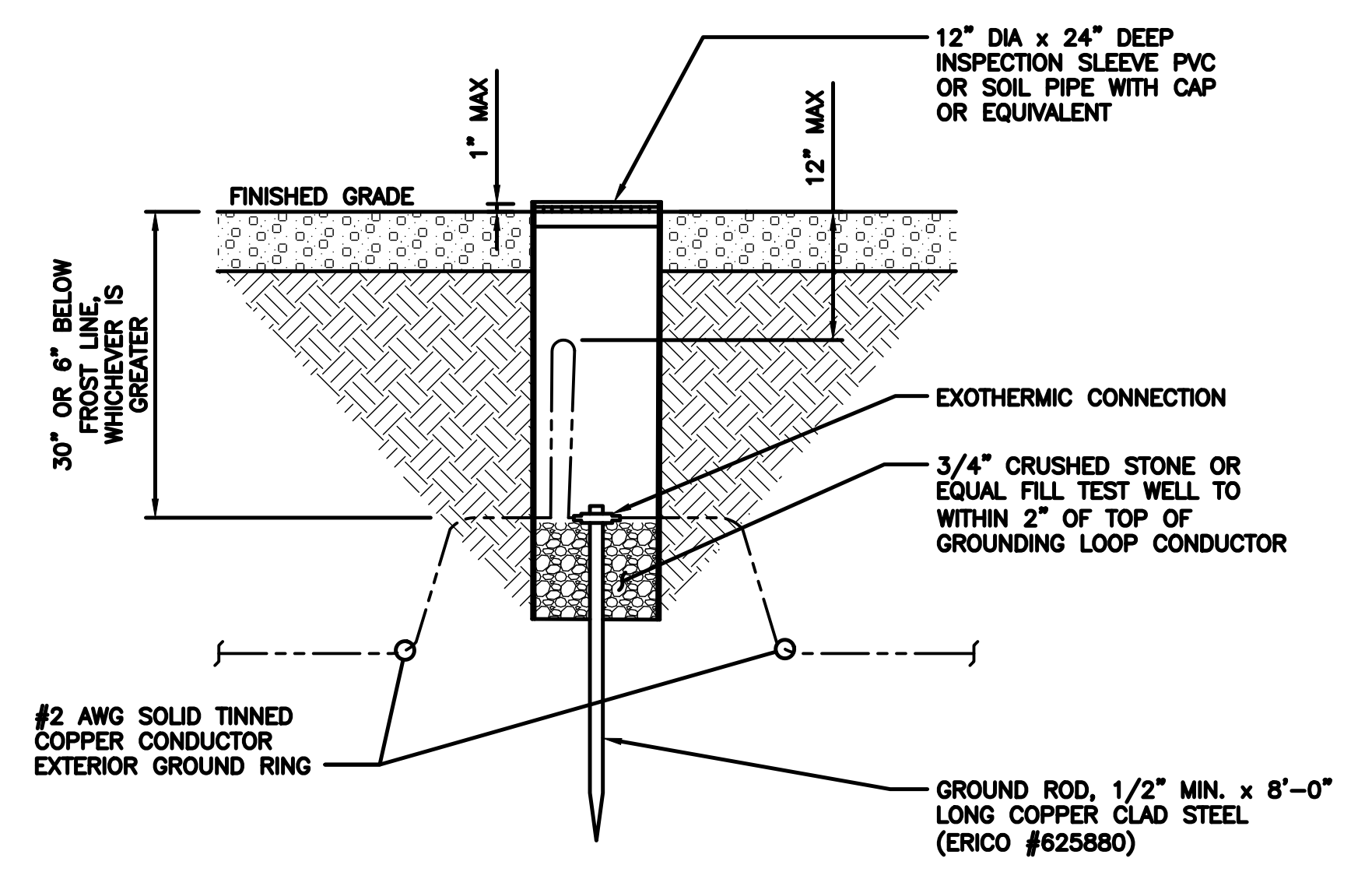
OUTDOOR CABINET GROUNDING

NO SCALE 3



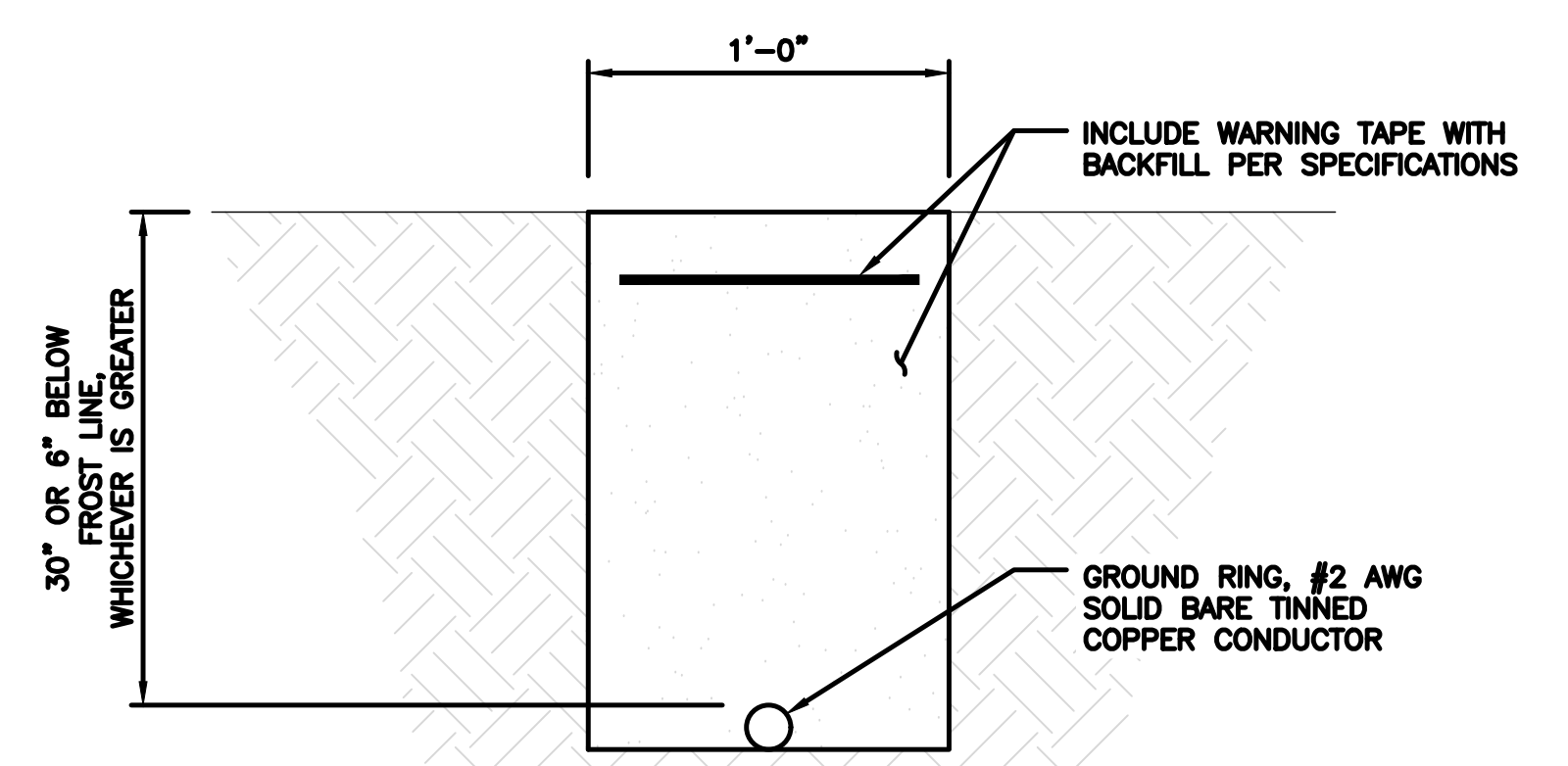
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5

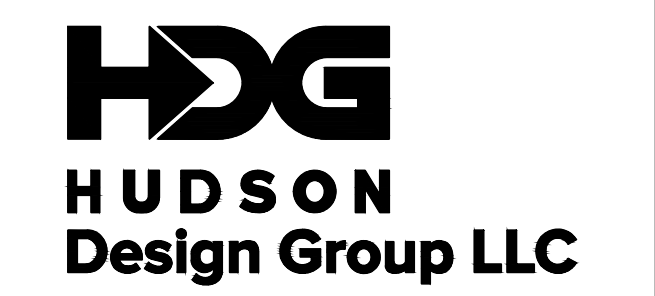


TYPICAL GROUND RING TRENCH

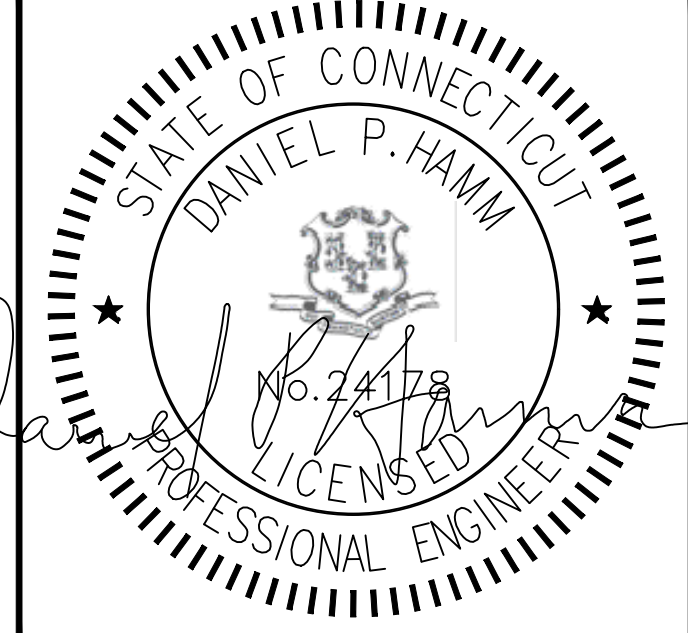
NO SCALE 6



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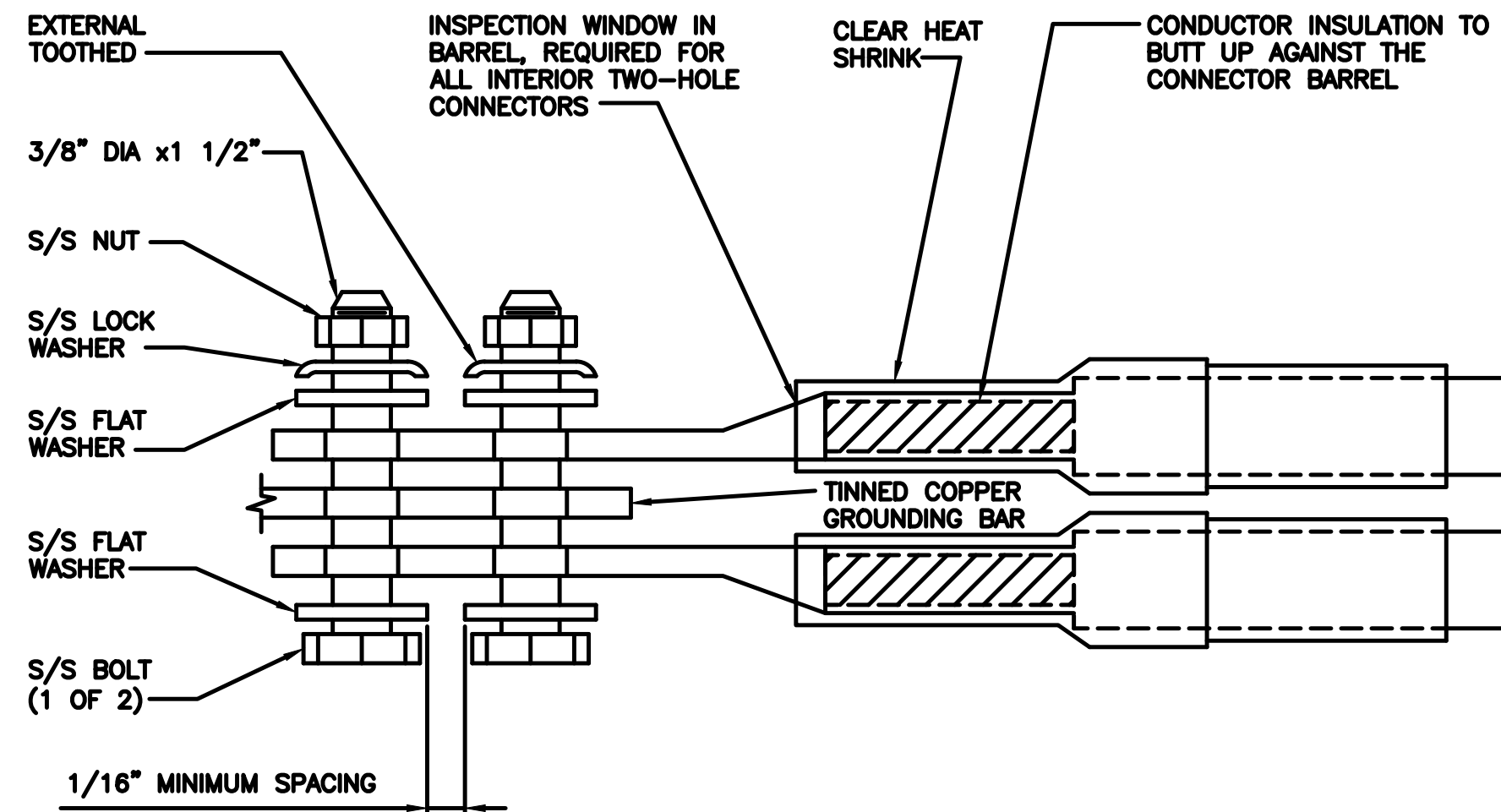
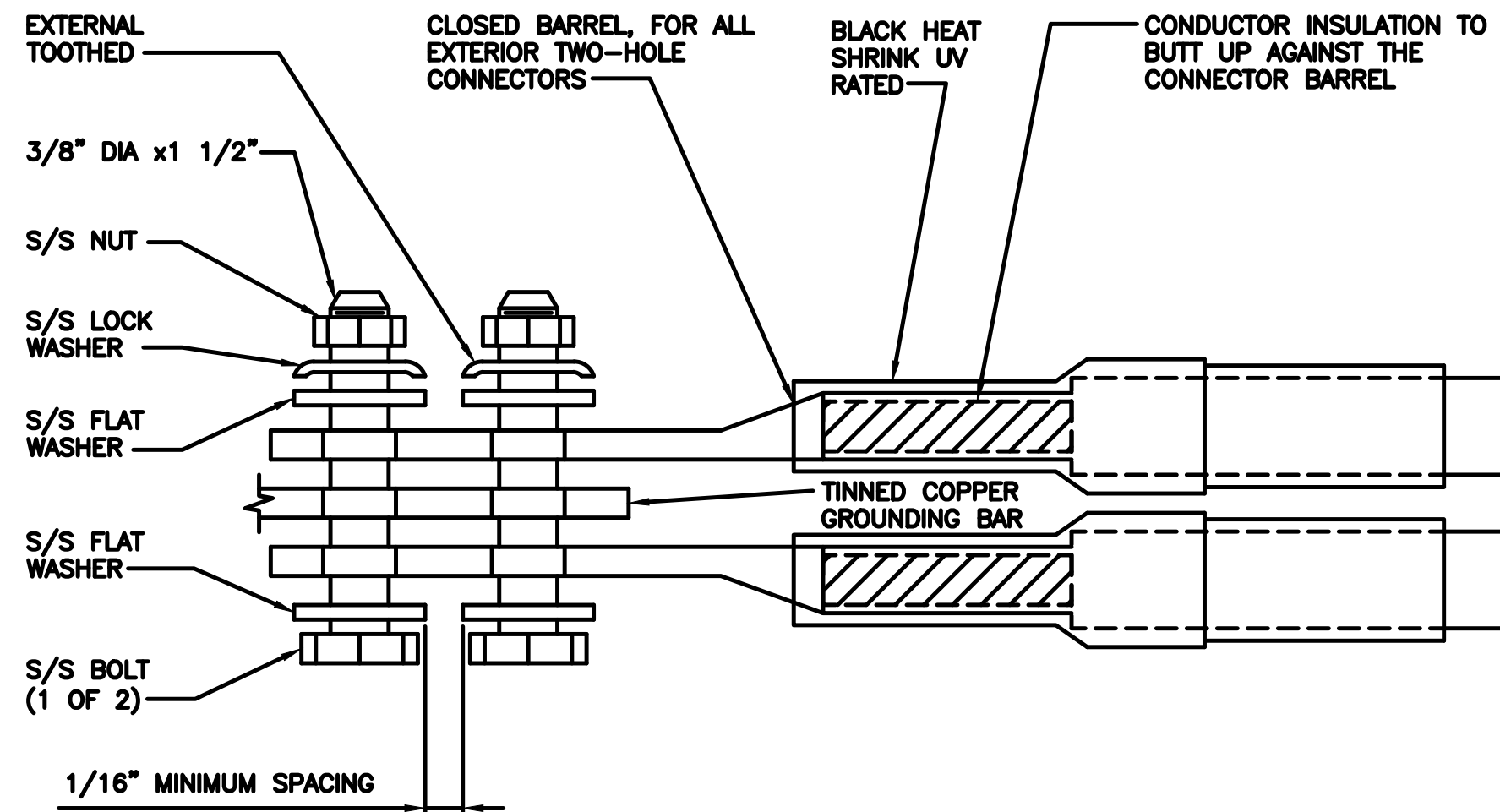
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SHEET TITLE
GROUNDING DETAILS

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).



dish
wireless.

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HG
HUDSON
Design Group LLC

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TYPICAL GROUNDING NOTES

NO SCALE

1

TYPICAL EXTERIOR TWO HOLE LUG

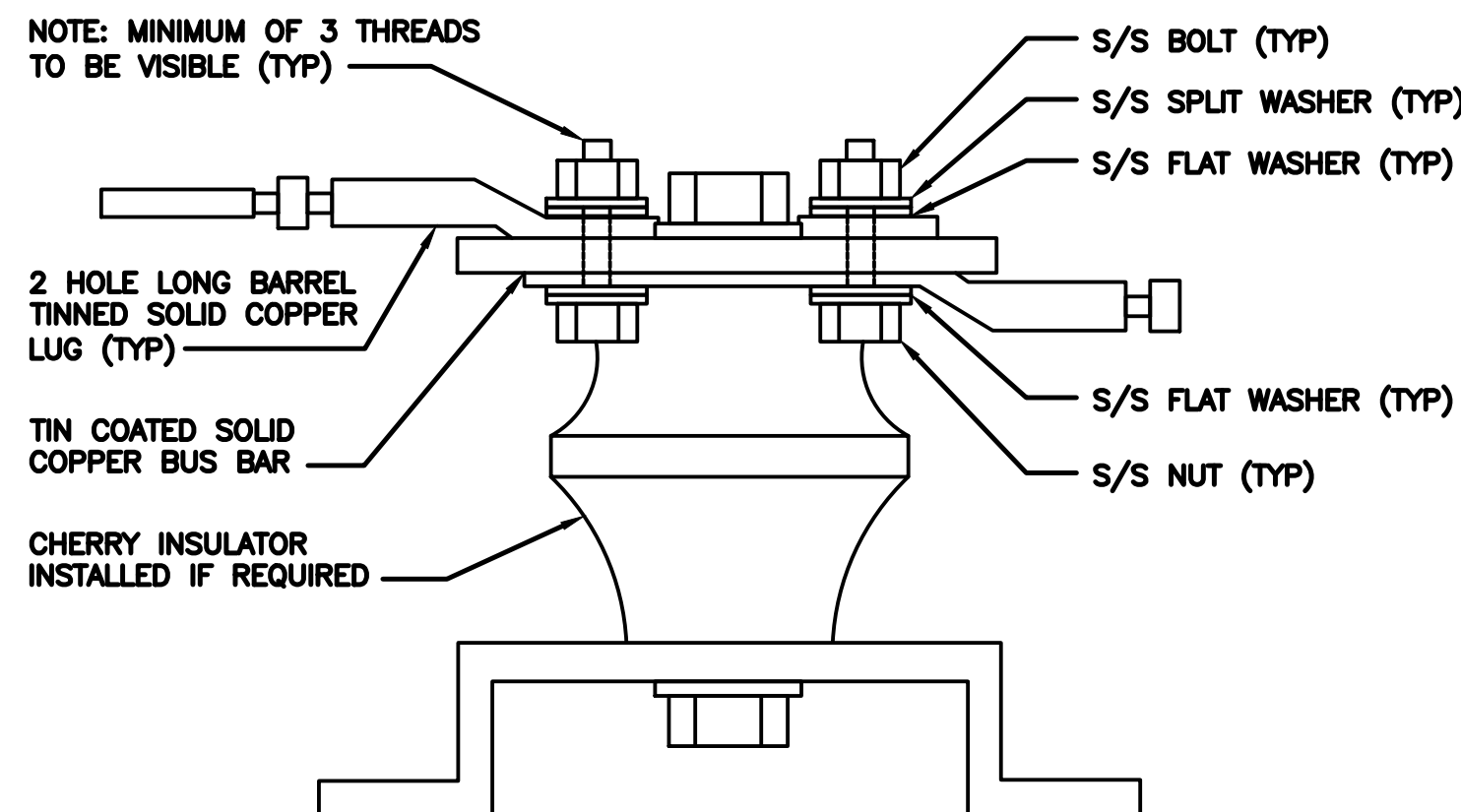
NO SCALE

2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE

3



LUG DETAIL

NO SCALE

4

NOT USED

NO SCALE

5

NOT USED

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

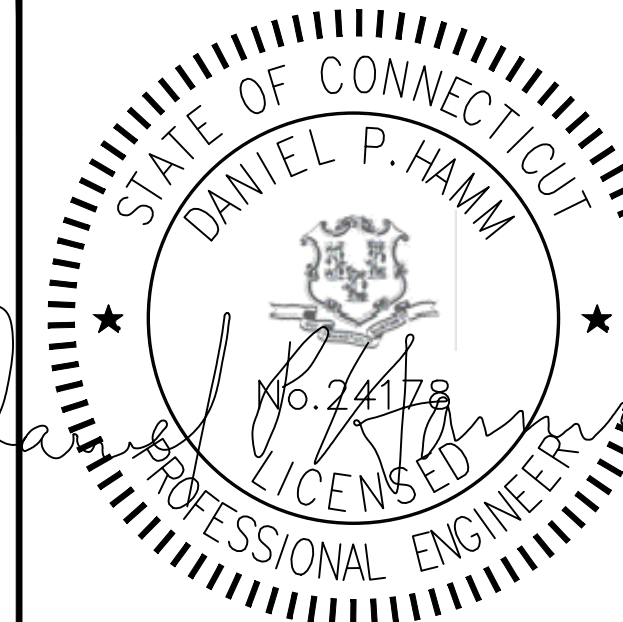
NO SCALE

8

NOT USED

NO SCALE

9



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31 YURECHKO DRIVE
JEWETT CITY, CT 06351

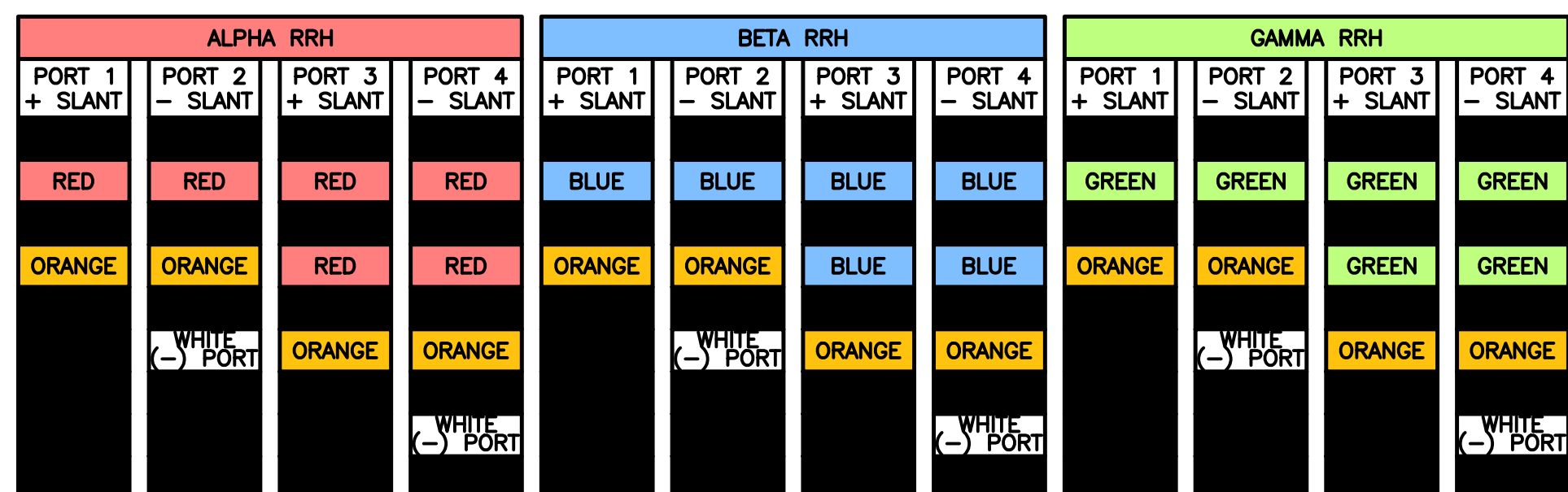
SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-3

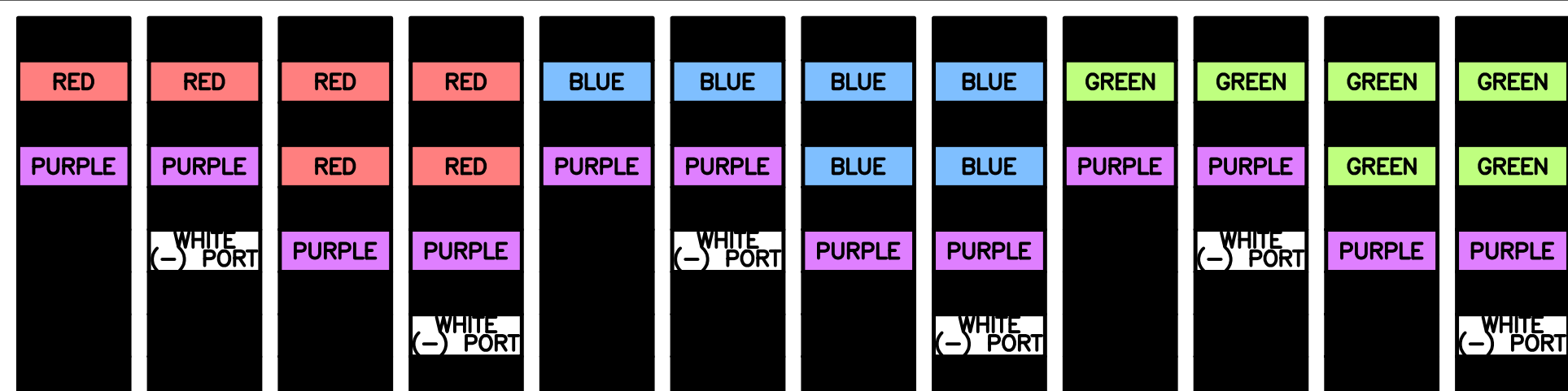
HYBRID/DISCREET CABLES

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)

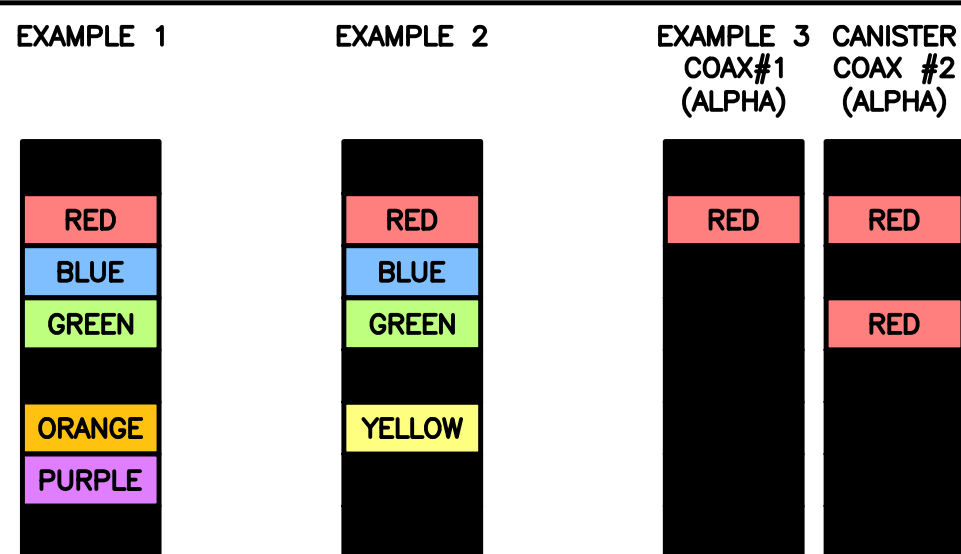


MID-BAND RRH
(AWS BANDS N66+N70)
ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BANDS)



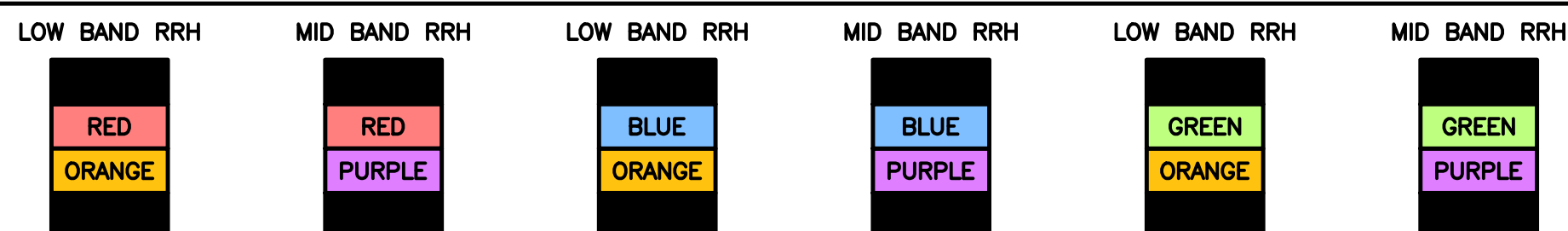
HYBRID/DISCREET CABLES

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.



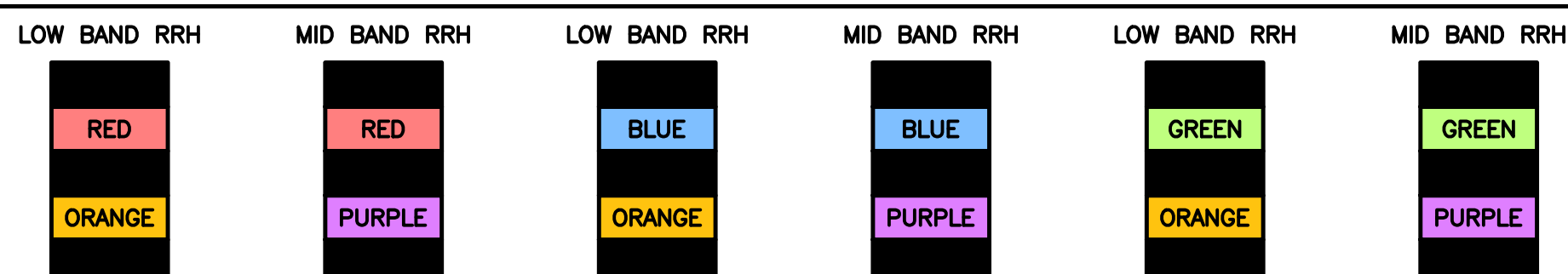
FIBER JUMPERS TO RRHS

LOW-BAND HHR FIBER CABLES HAVE SECTOR
STRIPE ONLY.



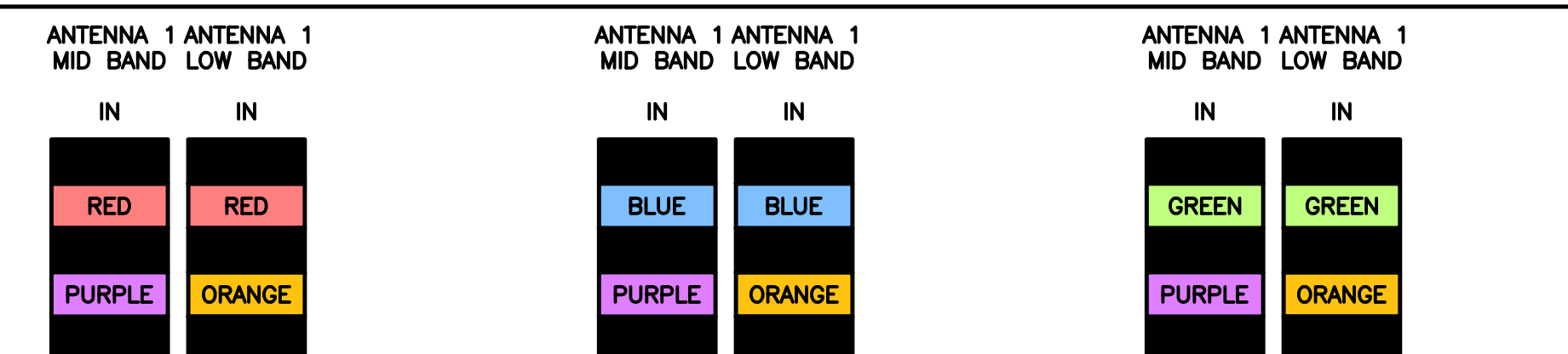
POWER CABLES TO RRHS

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY.



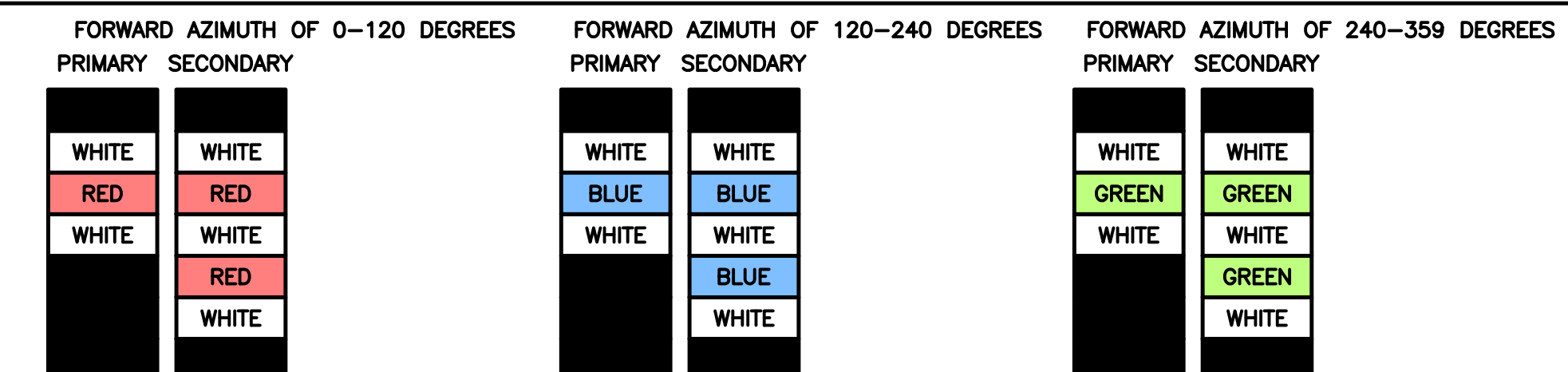
RET MOTORS AT ANTENNAS

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.



RF CABLE COLOR CODES

NO SCALE

1

NOT USED

NO SCALE

4

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



AWS
(N66+N70+H-BLOCK)



CBRS TECH
(3 GHz)



NEGATIVE SLANT PORT
ON ANT/RRH



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

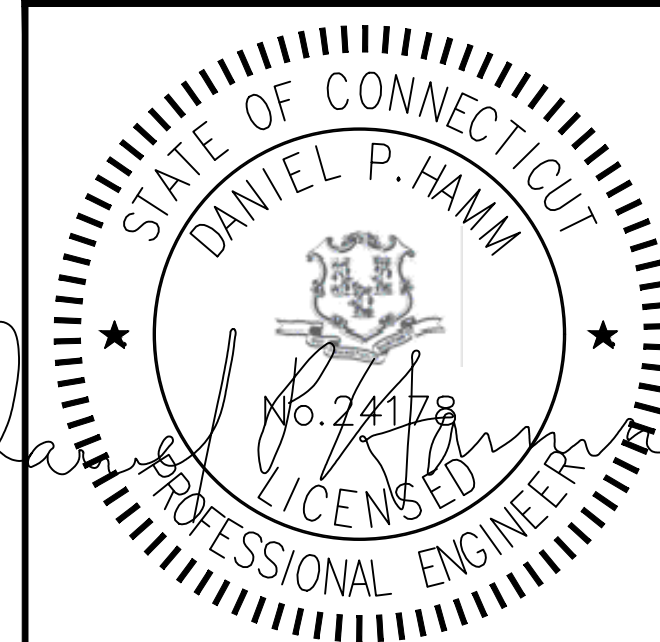
3



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DISH Wireless L.L.C.
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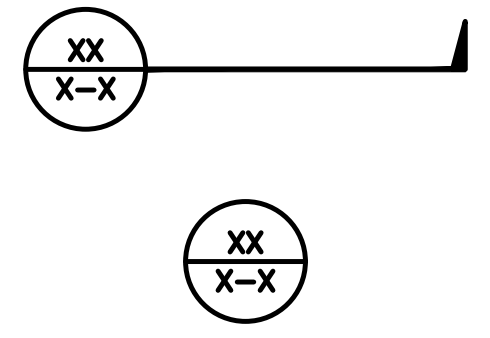
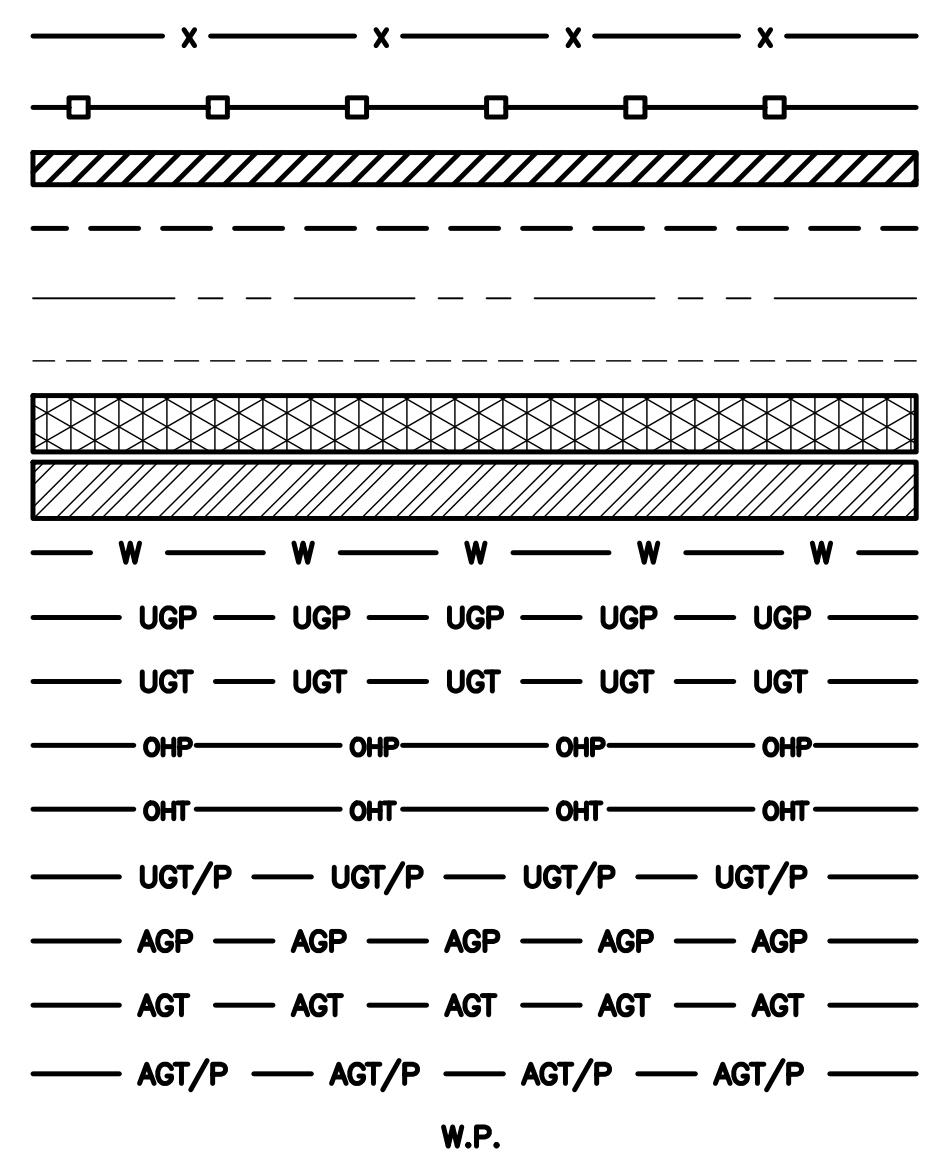
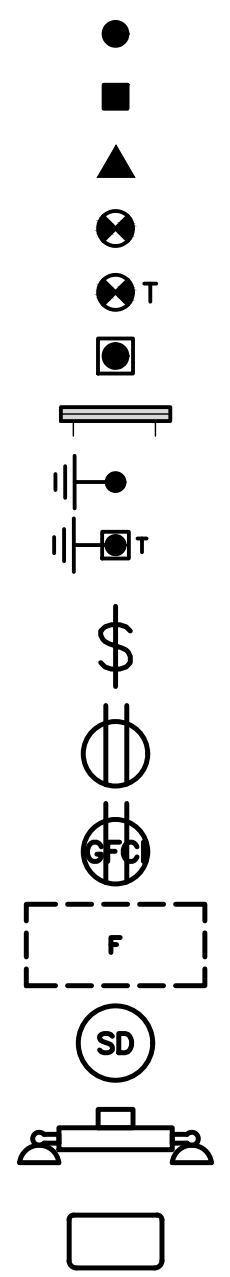
BOBOS01001A
CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER

RF-1

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-DBBTXD
 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

LEGEND

AB	ANCHOR BOLT	IN	INCH	INT	INTERIOR
ABV	ABOVE	INT	INTERIOR	LB(S)	POUND(S)
AC	ALTERNATING CURRENT	LF	LINEAR FEET	LTE	LONG TERM EVOLUTION
ADDL	ADDITIONAL	MAS	MASONRY	MAX	MAXIMUM
AFF	ABOVE FINISHED FLOOR	MB	MACHINE BOLT	MECH	MECHANICAL
AFG	ABOVE FINISHED GRADE	MFR	MANUFACTURER	MGB	MASTER GROUND BAR
AGL	ABOVE GROUND LEVEL	MIN	MINIMUM	MISC	MISCELLANEOUS
AIC	AMPERAGE INTERRUPTION CAPACITY	MTL	METAL	MTS	MANUAL TRANSFER SWITCH
ALUM	ALUMINUM	MW	MICROWAVE	NEC	NATIONAL ELECTRIC CODE
ALT	ALTERNATE	NM	NEWTON METERS	NO.	NUMBER
ANT	ANTENNA	#	NUMBER	NTS	NOT TO SCALE
APPROX	APPROXIMATE	OC	ON-CENTER	OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
ARCH	ARCHITECTURAL	OPNG	OPENING	P/C	PRECAST CONCRETE
ATS	AUTOMATIC TRANSFER SWITCH	PCS	PERSONAL COMMUNICATION SERVICES	PCU	PRIMARY CONTROL UNIT
AWG	AMERICAN WIRE GAUGE	PP	POLARIZING PRESERVING	PRC	PRIMARY RADIO CABINET
BATT	BATTERY	PSF	POUNDS PER SQUARE FOOT	PP	POLARIZING PRESERVING
BLDG	BUILDING	PSI	POUNDS PER SQUARE INCH	PT	PRESSURE TREATED
BLK	BLOCK	PWR	POWER CABINET	QTY	QUANTITY
BLKG	BLOCKING	RAD	RADIUS	RECT	RECTIFIER
BM	BEAM	REF	REFERENCE	REINF	REINFORCEMENT
BTC	BARE TINNED COPPER CONDUCTOR	REQ'D	REQUIRED	RET	REMOTE ELECTRIC TILT
BOF	BOTTOM OF FOOTING	RMC	RIGID METALLIC CONDUIT	RF	RADIO FREQUENCY
CAB	CABINET	RRH	REMOTE RADIO HEAD	RRU	REMOTE RADIO UNIT
CANT	CANTILEVERED	RWY	RACEWAY	SCH	SCHEDULE
CHG	CHARGING	SHT	SHEET	SIAD	SMART INTEGRATED ACCESS DEVICE
CLG	CEILING	SIM	SIMILAR	SPEC	SPECIFICATION
CLR	CLEAR	SQ	SQUARE	SS	STAINLESS STEEL
COL	COLUMN	STD	STANDARD	STL	STEEL
COMM	COMMON	TEMP	TEMPORARY	THK	THICKNESS
CONC	CONCRETE	TMA	TOWER MOUNTED AMPLIFIER	TN	TOE NAIL
CONSTR	CONSTRUCTION	TOA	TOP OF ANTENNA	TOC	TOP OF CURB
DBL	DOUBLE	TOF	TOP OF FOUNDATION	TOP	TOP OF PLATE (PARAPET)
DC	DIRECT CURRENT	TOS	TOP OF STEEL	TOW	TOP OF WALL
DEPT	DEPARTMENT	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION	TYP	TYPICAL
DF	DOUGLAS FIR	UG	UNDERGROUND	UL	UNDERWRITERS LABORATORY
DIA	DIAMETER	UNO	UNLESS NOTED OTHERWISE	UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
DIAG	DIAGONAL	UPS	UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)	VIF	VERIFIED IN FIELD
DIM	DIMENSION	W	WIDE	W/	WITH
DWG	DRAWING	WD	WOOD	WP	WEATHERPROOF
DWL	DOWEL	WT	WEIGHT		
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				

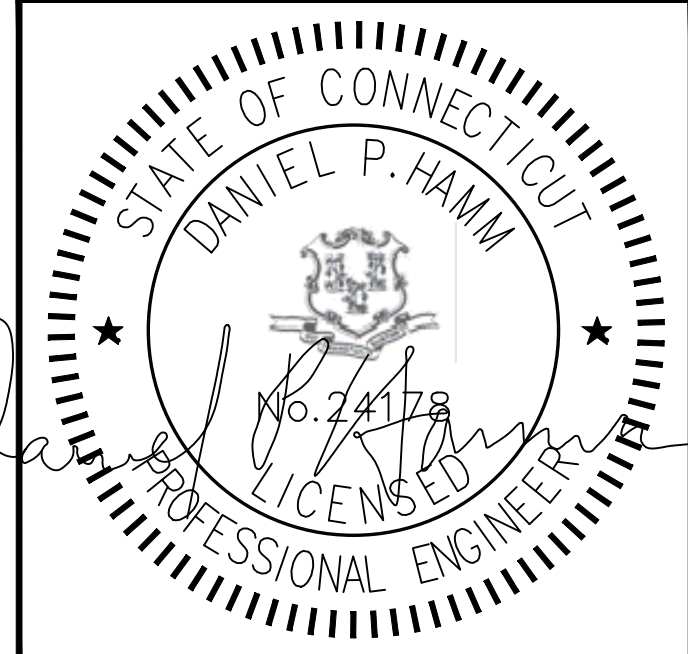
ABBREVIATIONS



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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 SIGN 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:

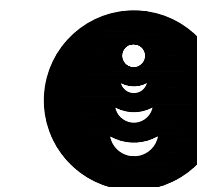
1. FOR DISH Wireless L.L.C. LOGO, SEE DISH Wireless L.L.C. DESIGN SPECIFICATIONS (PROVIDED BY DISH Wireless L.L.C.)
2. SITE ID SHALL BE APPLIED TO SIGNS USING "LASER ENGRAVING" OR ANY OTHER WEATHER RESISTANT METHOD (DISH Wireless L.L.C. APPROVAL REQUIRED)
3. TEXT FOR SIGNAGE SHALL INDICATE CORRECT SITE 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: _____



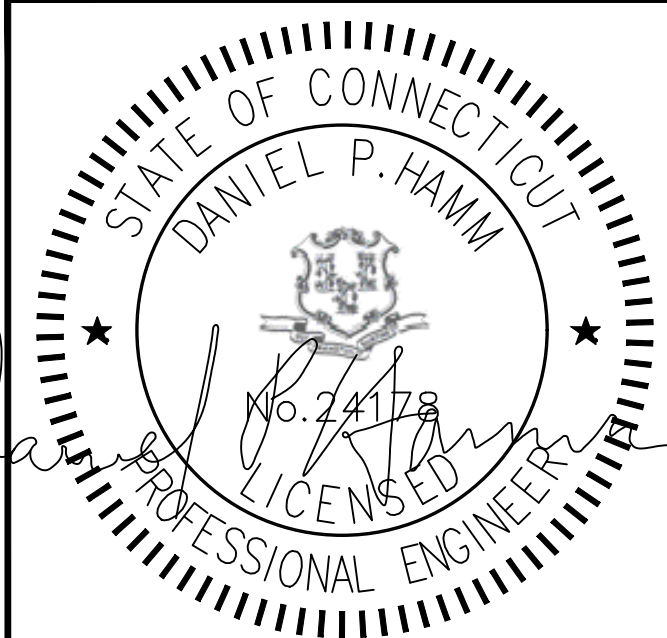
THIS SIGN IS FOR REFERENCE PURPOSES ONLY



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



45 BEECHWOOD DRIVE TEL: (978) 557-5553
N. ANDOVER, MA 01845 FAX: (978) 336-5586



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

DRAWN BY:	CHECKED BY:	APPROVED BY:
JJ	SMA	DPH

RFDS REV #: 2

PRELIMINARY DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/24/2022	ISSUED FOR REVIEW
B	04/04/2022	ISSUED FOR REVIEW
C	06/06/2022	ISSUED FOR REVIEW

A&E PROJECT NUMBER
BOBOSO1001A

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOSO1001A
CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

SHEET TITLE
RF
SIGNAGE

SHEET NUMBER
GN-2

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

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Site ID: _____

dish

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WARNING

Transmitting Antenna(s)

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

Site ID: _____

dish

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RF SIGNAGE

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:

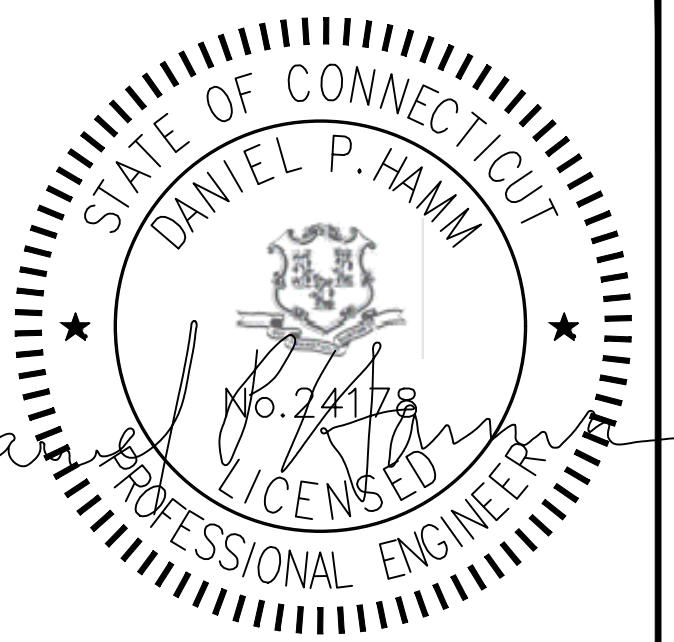
1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
CARRIER: DISH Wireless L.L.C.
TOWER OWNER: TOWER OWNER
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED 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.



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RFDS REV #: 2

PRELIMINARY DOCUMENTS

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A&E PROJECT NUMBER
BOBOS01001A

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01001A
CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

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.

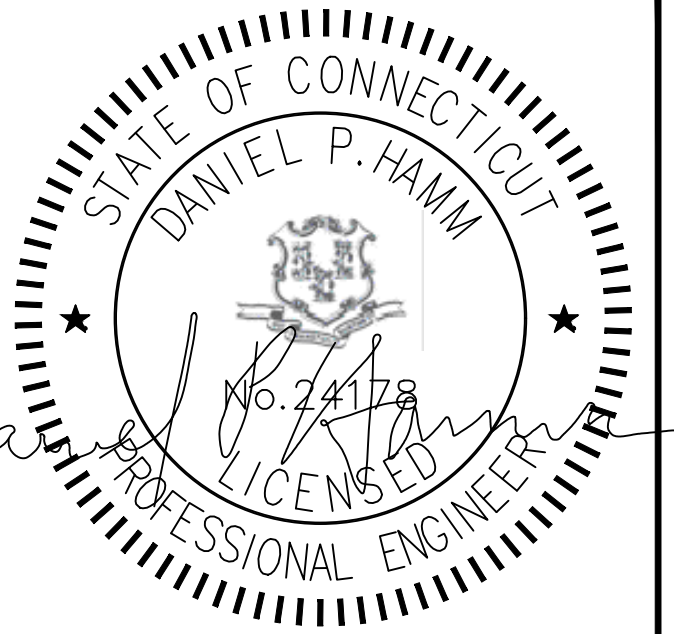
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL 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.



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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DRAWN BY:	CHECKED BY:	APPROVED BY:
JJ	SMA	DPH

RFDS REV #: 2

PRELIMINARY DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/24/2022	ISSUED FOR REVIEW
B	04/04/2022	ISSUED FOR REVIEW
C	06/06/2022	ISSUED FOR REVIEW

A&E PROJECT NUMBER
BOBOS01001A

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01001A
CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

GROUNDING NOTES:

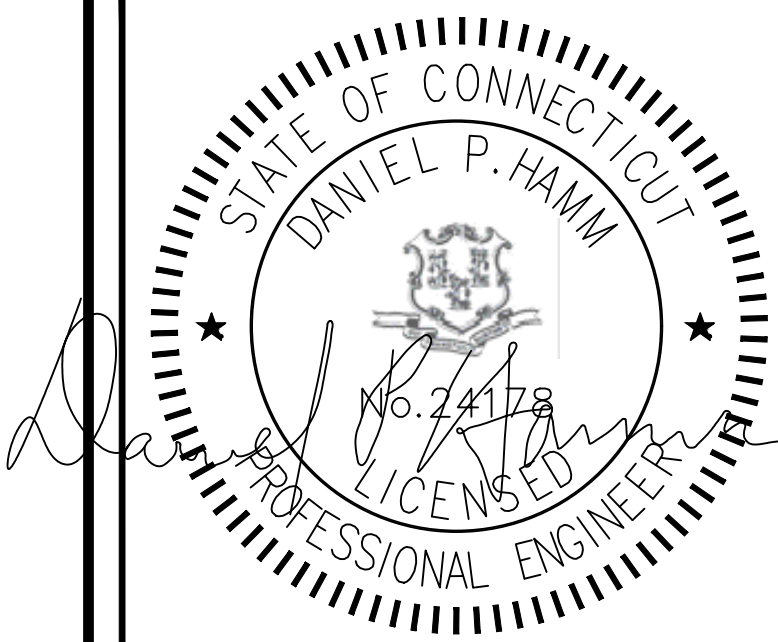
1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (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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JJ	SMA	DPH

RFDS REV #: 2

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DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS01001A
CROWN CASTLE BU#842863
31 YURECHKO DRIVE
JEWETT CITY, CT 06351

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-5

Exhibit D

Structural Analysis Report

Date: December 17, 2021



Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject: Structural Analysis Report

Carrier Designation: DISH Network Co-Locate
Site Number: BOBOS01001A

Crown Castle Designation: BU Number: 842863
Site Name: GRISWOLD CENTRAL
JDE Job Number: 684525
Work Order Number: 2013153
Order Number: 584378 Rev. 2

Engineering Firm Designation: Crown Castle Project Number: 2013153

Site Data: 31 YURECHKO DRIVE, JEWETT CITY, NEW LONDON County, CT
Latitude 41° 35' 38.58", Longitude -71° 55' 59.37"
118 Foot - Monopole Tower

Crown Castle 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:

LC5: Proposed Equipment Configuration

Sufficient Capacity

This analysis utilizes an ultimate 3-second gust wind speed of 135 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Abigail Ruiz

Respectfully submitted by:

 Digitally signed by Maham Barimani
Date: 2021.12.20 13:43:34

Maham Barimani, P.E.
Senior Project Engineer



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1) INTRODUCTION

This tower is a 118 ft Monopole tower designed by Glen Martin Engineering, Inc. and mapped by FDH Velocitel, Inc., in March of 2016.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	135 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
109.0	109.0	3	fujitsu	TA08025-B604	1	1-1/2
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	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)
117.0	119.0	2	raycap	DC6-48-60-18-8F	6 2 2 2 1	1-5/8 3/8 3/4 7/8 Conduit
	118.0	3	cci antennas	DMP65R-BU8D		
		3	cci antennas	OPA65R-BU8D		
		3	ericsson	RADIO 4449 B5/B12		
		3	ericsson	RADIO 4478 B14		
		3	ericsson	RRUS 8843 B2/B66A		
	117.0	1	site pro 1	RMQLP-4120-H10		
		3	powerwave tech.	7770.00		
	116.0	6	powerwave tech.	LGP21401		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	6125333	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	5142129	CCISITES
4-TOWER MANUFACTURER DRAWINGS	6644519	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	118 - 74.5	Pole	TP37.08x25.77x0.2188	1	-11.99	1528.34	47.7	Pass
L2	74.5 - 35	Pole	TP46.5x35.4374x0.2813	2	-18.85	2466.82	54.7	Pass
L3	35 - 0	Pole	TP55.3x44.4806x0.3438	3	-29.73	3701.65	52.4	Pass
							Summary	
						Pole (L2)	54.7	Pass
						Rating =	54.7	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	32.1	Pass
1	Base Plate		21.8	Pass
1	Base Foundation (Structure)		32.2	Pass
1	Base Foundation (Soil Interaction)		17.8	Pass

Structure Rating (max from all components) =	54.7%
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

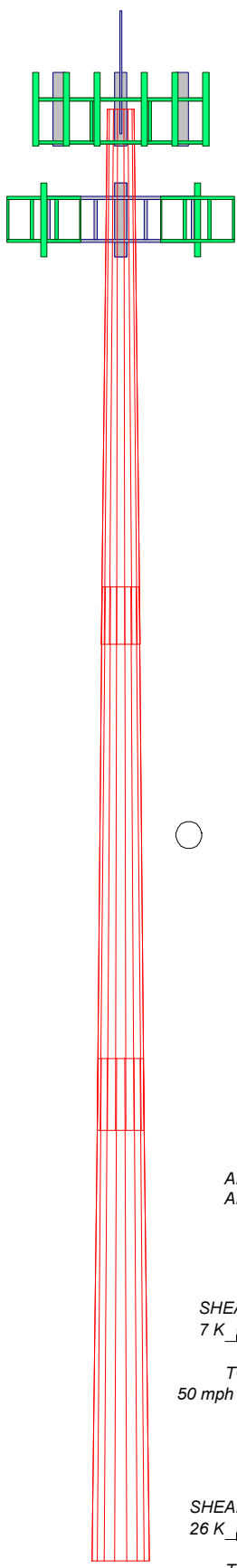
4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3	
Length (ft)	43.50	44.14	40.81	
Number of Sides	16	16	16	
Thickness (in)	0.2188	0.2813	0.3438	
Socket Length (ft)	4.64	5.81	44.4806	
Top Dia (in)	25.7700	35.4374	44.4806	
Bot Dia (in)	37.0800	46.5000	55.3000	
Grade		A572-65		
Weight (K)	3.2	5.5	7.5	16.3

118.0 ft
74.5 ft
35.0 ft
0.0 ft



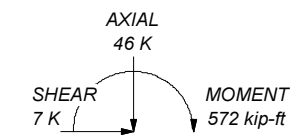
MATERIAL STRENGTH

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

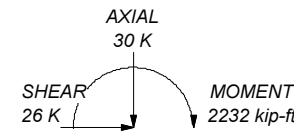
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 135 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 54.7%

ALL REACTIONS ARE FACTORED



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



TORQUE 1 kip-ft
REACTIONS - 135 mph WIND

Crown Castle
 2000 Corporate Drive
 Canonsburg, PA 15317
 The Pathway to Possible Phone: (724) 416-2000 FAX:

Job:	BU 842863		
Project:			
Client:	Crown Castle USA	Drawn by:	abruiz
Code:	TIA-222-H	Date:	12/17/21
Path:			Scale: NTS
			Dwg No. E-1

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Tower Input Data

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

- Tower base elevation above sea level: 202.00 ft.
- Basic wind speed of 135 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 Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets ✓ Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	

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	118.00-74.50	43.50	4.64	16	25.7700	37.0800	0.2188	0.8750	A572-65 (65 ksi)
L2	74.50-35.00	44.14	5.81	16	35.4374	46.5000	0.2813	1.1250	A572-65 (65 ksi)
L3	35.00-0.00	40.81		16	44.4806	55.3000	0.3438	1.3750	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	26.2320	17.8300	1470.5831	9.0962	13.1427	111.8935	2963.4326	8.8160	4.6929	21.453
	37.7636	25.7222	4415.3312	13.1226	18.9108	233.4820	8897.5158	12.7183	6.9436	31.742
L2	37.2611	31.5417	4924.9463	12.5156	18.0731	272.5019	9924.4624	15.5957	6.4924	23.084
	47.3559	41.4669	11190.568	16.4539	23.7150	471.8772	22550.576	20.5032	8.6938	30.911
L3	46.8557	48.3988	11911.077	15.7127	22.6851	525.0619	24002.503	23.9307	8.1676	23.76
	56.3160	60.2630	22993.179	19.5644	28.2030	815.2742	46334.503	29.7969	10.3206	30.024

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 118.00- 74.50				1	1	1			
L2 74.50- 35.00				1	1	1			
L3 35.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Componen t Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diamete r in	Perimete r in	Weight plf

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Componen t Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf
5/8 rod/step	C	No	No	CaAa (Out Of Face)	118.00 - 0.00	1	No Ice	0.02
							1/2" Ice	0.12
							1" Ice	0.22
							2" Ice	0.42
Safety Line 3/8	C	No	No	CaAa (Out Of Face)	118.00 - 0.00	1	No Ice	0.04
							1/2" Ice	0.14
							1" Ice	0.24
							2" Ice	0.44

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
LDF7-50A(1-5/8)	A	No	No	Inside Pole	117.00 - 9.50	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
							No Ice	0.00	0.06
FB-L98B-034-XXX(3/8)	A	No	No	Inside Pole	117.00 - 9.50	2	1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
							No Ice	0.00	0.91
							1/2" Ice	0.00	0.91
WR-VG66ST-BRD(7/8)	A	No	No	Inside Pole	117.00 - 9.50	2	1" Ice	0.00	0.91
							2" Ice	0.00	0.91
							No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
WR-VG86ST-BRD(3/4)	A	No	No	Inside Pole	117.00 - 9.50	2	2" Ice	0.00	0.58
							No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58

CU12PSM9P6XXX (1-1/2)	A	No	No	Inside Pole	109.00 - 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
							No Ice	0.00	2.35

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	118.00-74.50	A	0.000	0.000	0.000	0.000	0.42
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.501	0.02
L2	74.50-35.00	A	0.000	0.000	0.000	0.000	0.41
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.271	0.02
L3	35.00-0.00	A	0.000	0.000	0.000	0.000	0.29
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.013	0.02

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} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	118.00-74.50	A	1.418	0.000	0.000	0.000	0.000	0.42
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	27.166	0.22
L2	74.50-35.00	A	1.340	0.000	0.000	0.000	0.000	0.41
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	24.668	0.20
L3	35.00-0.00	A	1.196	0.000	0.000	0.000	0.000	0.29
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	20.775	0.16

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	118.00-74.50	-0.4369	0.2523	-2.2260	1.2852
L2	74.50-35.00	-0.4404	0.2542	-2.3662	1.3661
L3	35.00-0.00	-0.4423	0.2554	-2.3497	1.3566

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
*** Lightning Rod 1" x 6'	A	From Leg	0.00 0.00 3.00	0.0000	118.00	No Ice 0.50 1/2" 1.02 Ice 1.43 1" Ice 2.06 2" Ice 2.06	0.50 1.02 1.43 2.06 2.06	0.03 0.03 0.04 0.07
*** 7770.00	A	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 5.51 1/2" 5.87 Ice 6.23 1" Ice 6.99 2" Ice 4.35	2.93 3.27 3.63 4.35	0.04 0.07 0.11 0.20
7770.00	B	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 5.51 1/2" 5.87 Ice 6.23 1" Ice 6.99 2" Ice 4.35	2.93 3.27 3.63 4.35	0.04 0.07 0.11 0.20
7770.00	C	From Leg	4.00 0.00 0.00	0.0000	117.00	No Ice 5.51 1/2" 5.87 Ice 6.23 1" Ice 6.99 2" Ice 4.35	2.93 3.27 3.63 4.35	0.04 0.07 0.11 0.20
OPA65R-BU8D	A	From Leg	4.00 0.00 1.00	0.0000	117.00	No Ice 17.42 1/2" 18.44 Ice 19.47 1" Ice 21.59 2" Ice 10.19	6.48 7.38 8.30 10.19	0.08 0.18 0.28 0.52
OPA65R-BU8D	B	From Leg	4.00 0.00 1.00	0.0000	117.00	No Ice 17.42 1/2" 18.44 Ice 19.47 1" Ice 21.59 2" Ice 10.19	6.48 7.38 8.30 10.19	0.08 0.18 0.28 0.52
OPA65R-BU8D	C	From Leg	4.00 0.00 1.00	0.0000	117.00	No Ice 17.42 1/2" 18.44 Ice 19.47 1" Ice 21.59 2" Ice 10.19	6.48 7.38 8.30 10.19	0.08 0.18 0.28 0.52
DMP65R-BU8D	A	From Leg	4.00 0.00 1.00	0.0000	117.00	No Ice 15.86 1/2" 16.80 Ice 17.75 1" Ice 19.71 2" Ice 9.39	5.95 6.78 7.64 9.39	0.11 0.20 0.31 0.55
DMP65R-BU8D	B	From Leg	4.00 0.00 1.00	0.0000	117.00	No Ice 15.86 1/2" 16.80 Ice 17.75 1" Ice 19.71 2" Ice 9.39	5.95 6.78 7.64 9.39	0.11 0.20 0.31 0.55

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
DMP65R-BU8D	C	From Leg	4.00	0.0000	117.00	No Ice	15.86	5.95	0.11
			0.00			1/2"	16.80	6.78	0.20
			1.00			Ice	17.75	7.64	0.31
						1" Ice	19.71	9.39	0.55
						2" Ice			
(2) LGP21401	A	From Leg	4.00	0.0000	117.00	No Ice	1.10	0.21	0.01
			0.00			1/2"	1.24	0.27	0.02
			-1.00			Ice	1.38	0.35	0.03
						1" Ice	1.69	0.52	0.05
						2" Ice			
(2) LGP21401	B	From Leg	4.00	0.0000	117.00	No Ice	1.10	0.21	0.01
			0.00			1/2"	1.24	0.27	0.02
			-1.00			Ice	1.38	0.35	0.03
						1" Ice	1.69	0.52	0.05
						2" Ice			
(2) LGP21401	C	From Leg	4.00	0.0000	117.00	No Ice	1.10	0.21	0.01
			0.00			1/2"	1.24	0.27	0.02
			-1.00			Ice	1.38	0.35	0.03
						1" Ice	1.69	0.52	0.05
						2" Ice			
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	117.00	No Ice	1.21	1.21	0.02
			0.00			1/2"	1.89	1.89	0.04
			2.00			Ice	2.11	2.11	0.07
						1" Ice	2.57	2.57	0.13
						2" Ice			
DC6-48-60-18-8F	C	From Leg	4.00	0.0000	117.00	No Ice	1.21	1.21	0.02
			0.00			1/2"	1.89	1.89	0.04
			2.00			Ice	2.11	2.11	0.07
						1" Ice	2.57	2.57	0.13
						2" Ice			
RADIO 4478 B14	A	From Leg	4.00	0.0000	117.00	No Ice	2.02	1.25	0.06
			0.00			1/2"	2.20	1.40	0.08
			1.00			Ice	2.39	1.55	0.10
						1" Ice	2.78	1.89	0.15
						2" Ice			
RADIO 4478 B14	B	From Leg	4.00	0.0000	117.00	No Ice	2.02	1.25	0.06
			0.00			1/2"	2.20	1.40	0.08
			1.00			Ice	2.39	1.55	0.10
						1" Ice	2.78	1.89	0.15
						2" Ice			
RADIO 4478 B14	C	From Leg	4.00	0.0000	117.00	No Ice	2.02	1.25	0.06
			0.00			1/2"	2.20	1.40	0.08
			1.00			Ice	2.39	1.55	0.10
						1" Ice	2.78	1.89	0.15
						2" Ice			
RRUS 8843 B2/B66A	A	From Leg	4.00	0.0000	117.00	No Ice	1.64	1.35	0.07
			0.00			1/2"	1.80	1.50	0.09
			1.00			Ice	1.97	1.65	0.11
						1" Ice	2.32	1.99	0.16
						2" Ice			
RRUS 8843 B2/B66A	B	From Leg	4.00	0.0000	117.00	No Ice	1.64	1.35	0.07
			0.00			1/2"	1.80	1.50	0.09
			1.00			Ice	1.97	1.65	0.11
						1" Ice	2.32	1.99	0.16
						2" Ice			
RRUS 8843 B2/B66A	C	From Leg	4.00	0.0000	117.00	No Ice	1.64	1.35	0.07
			0.00			1/2"	1.80	1.50	0.09
			1.00			Ice	1.97	1.65	0.11
						1" Ice	2.32	1.99	0.16
						2" Ice			
RADIO 4449 B5/B12	A	From Leg	4.00	0.0000	117.00	No Ice	1.64	1.30	0.07
			0.00			1/2"	1.80	1.45	0.09
			1.00			Ice	1.97	1.60	0.11
						1" Ice	2.33	1.92	0.16
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
RADIO 4449 B5/B12	B	From Leg	4.00		0.0000	117.00	No Ice	1.64	1.30	0.07
			0.00				1/2"	1.80	1.45	0.09
			1.00				Ice	1.97	1.60	0.11
							1" Ice	2.33	1.92	0.16
							2" Ice			
RADIO 4449 B5/B12	C	From Leg	4.00		0.0000	117.00	No Ice	1.64	1.30	0.07
			0.00				1/2"	1.80	1.45	0.09
			1.00				Ice	1.97	1.60	0.11
							1" Ice	2.33	1.92	0.16
							2" Ice			
site pro 1 RMQLP-4120-H10	C	None			0.0000	117.00	No Ice	42.20	39.62	3.27
							1/2"	51.14	48.52	3.66
							Ice	60.14	57.81	4.18
							1" Ice	77.96	75.22	4.83
							2" Ice			

MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00		0.0000	109.00	No Ice	8.01	4.23	0.11
			0.00				1/2"	8.52	4.69	0.19
			0.00				Ice	9.04	5.16	0.29
							1" Ice	10.11	6.12	0.52
							2" Ice			
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00		0.0000	109.00	No Ice	8.01	4.23	0.11
			0.00				1/2"	8.52	4.69	0.19
			0.00				Ice	9.04	5.16	0.29
							1" Ice	10.11	6.12	0.52
							2" Ice			
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00		0.0000	109.00	No Ice	8.01	4.23	0.11
			0.00				1/2"	8.52	4.69	0.19
			0.00				Ice	9.04	5.16	0.29
							1" Ice	10.11	6.12	0.52
							2" Ice			
TA08025-B604	A	From Leg	4.00		0.0000	109.00	No Ice	1.96	0.98	0.06
			0.00				1/2"	2.14	1.11	0.08
			0.00				Ice	2.32	1.25	0.10
							1" Ice	2.71	1.55	0.15
							2" Ice			
TA08025-B604	B	From Leg	4.00		0.0000	109.00	No Ice	1.96	0.98	0.06
			0.00				1/2"	2.14	1.11	0.08
			0.00				Ice	2.32	1.25	0.10
							1" Ice	2.71	1.55	0.15
							2" Ice			
TA08025-B604	C	From Leg	4.00		0.0000	109.00	No Ice	1.96	0.98	0.06
			0.00				1/2"	2.14	1.11	0.08
			0.00				Ice	2.32	1.25	0.10
							1" Ice	2.71	1.55	0.15
							2" Ice			
TA08025-B605	A	From Leg	4.00		0.0000	109.00	No Ice	1.96	1.13	0.08
			0.00				1/2"	2.14	1.27	0.09
			0.00				Ice	2.32	1.41	0.11
							1" Ice	2.71	1.72	0.16
							2" Ice			
TA08025-B605	B	From Leg	4.00		0.0000	109.00	No Ice	1.96	1.13	0.08
			0.00				1/2"	2.14	1.27	0.09
			0.00				Ice	2.32	1.41	0.11
							1" Ice	2.71	1.72	0.16
							2" Ice			
TA08025-B605	C	From Leg	4.00		0.0000	109.00	No Ice	1.96	1.13	0.08
			0.00				1/2"	2.14	1.27	0.09
			0.00				Ice	2.32	1.41	0.11
							1" Ice	2.71	1.72	0.16
							2" Ice			
RDIDC-9181-PF-48	A	From Leg	4.00		0.0000	109.00	No Ice	2.31	1.29	0.02
			0.00				1/2"	2.50	1.45	0.04
			0.00				Ice	2.70	1.61	0.06
							1" Ice	3.12	1.96	0.12
							2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	CAAA Front ft²	CAAA Side ft²	Weight K	
(2) 8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	109.00	2" Ice			
						No Ice	1.90	1.90	0.03
						1/2"	2.73	2.73	0.04
						Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
(2) 8' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	109.00	2" Ice			
						No Ice	1.90	1.90	0.03
						1/2"	2.73	2.73	0.04
						Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
(2) 8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	109.00	2" Ice			
						No Ice	1.90	1.90	0.03
						1/2"	2.73	2.73	0.04
						Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
Commscope MC-PK8-DSH	C	None		0.0000	109.00	2" Ice			
						No Ice	34.24	34.24	1.75
						1/2"	62.95	62.95	2.10
						Ice	91.66	91.66	2.45
						1" Ice	149.08	149.08	3.15
						2" Ice			

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

Comb. No.	Description
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
L1	118 - 74.5	Pole	Max Tension	26	0.00	0.00	0.00
			Max. Compression	26	-22.04	0.66	0.65
			Max. M _x	20	-12.00	535.20	0.17
			Max. M _y	2	-11.99	0.09	536.72
			Max. V _y	20	-16.86	535.20	0.17
			Max. V _x	2	-16.91	0.09	536.72
			Max. Torque	5			0.65
L2	74.5 - 35	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-31.80	0.95	0.48
			Max. M _x	20	-18.86	1265.51	0.12
			Max. M _y	2	-18.85	0.10	1268.84
			Max. V _y	20	-21.26	1265.51	0.12
			Max. V _x	2	-21.31	0.10	1268.84
			Max. Torque	5			0.74
L3	35 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.00	1.30	0.28
			Max. M _x	20	-29.73	2227.25	0.06
			Max. M _y	2	-29.73	0.10	2232.46
			Max. V _y	20	-25.76	2227.25	0.06
			Max. V _x	2	-25.81	0.10	2232.46
			Max. Torque	38			0.85

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	38	46.00	3.33	5.78
	Max. H _x	20	29.74	25.75	-0.00
	Max. H _z	2	29.74	-0.00	25.79
	Max. M _x	2	2232.46	-0.00	25.79
	Max. M _z	8	2226.82	-25.75	0.00
	Max. Torsion	38	0.85	3.33	5.78
	Min. Vert	11	22.30	-22.30	-12.90
	Min. H _x	8	29.74	-25.75	0.00
	Min. H _z	14	29.74	0.00	-25.79

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. M _x	14	-2232.12	0.00	-25.79
	Min. M _z	20	-2227.25	25.75	-0.00
	Min. Torsion	32	-0.85	-3.33	-5.78

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	24.78	0.00	0.00	-0.14	0.17	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	29.74	0.00	-25.79	-2232.46	0.10	-0.84
0.9 Dead+1.0 Wind 0 deg - No Ice	22.30	0.00	-25.79	-2220.39	0.05	-0.84
1.2 Dead+1.0 Wind 30 deg - No Ice	29.74	12.87	-22.34	-1933.45	-1113.40	-0.84
0.9 Dead+1.0 Wind 30 deg - No Ice	22.30	12.87	-22.34	-1922.98	-1107.45	-0.84
1.2 Dead+1.0 Wind 60 deg - No Ice	29.74	22.30	-12.90	-1116.41	-1928.51	-0.62
0.9 Dead+1.0 Wind 60 deg - No Ice	22.30	22.30	-12.90	-1110.35	-1918.17	-0.62
1.2 Dead+1.0 Wind 90 deg - No Ice	29.74	25.75	-0.00	-0.28	-2226.82	-0.23
0.9 Dead+1.0 Wind 90 deg - No Ice	22.30	25.75	-0.00	-0.24	-2214.88	-0.23
1.2 Dead+1.0 Wind 120 deg - No Ice	29.74	22.30	12.90	1115.88	-1928.40	0.22
0.9 Dead+1.0 Wind 120 deg - No Ice	22.30	22.30	12.90	1109.91	-1918.07	0.22
1.2 Dead+1.0 Wind 150 deg - No Ice	29.74	12.87	22.34	1932.99	-1113.21	0.61
0.9 Dead+1.0 Wind 150 deg - No Ice	22.30	12.87	22.34	1922.62	-1107.27	0.61
1.2 Dead+1.0 Wind 180 deg - No Ice	29.74	-0.00	25.79	2232.12	0.32	0.84
0.9 Dead+1.0 Wind 180 deg - No Ice	22.30	-0.00	25.79	2220.13	0.27	0.84
1.2 Dead+1.0 Wind 210 deg - No Ice	29.74	-12.87	22.34	1933.10	1113.82	0.84
0.9 Dead+1.0 Wind 210 deg - No Ice	22.30	-12.87	22.34	1922.73	1107.77	0.84
1.2 Dead+1.0 Wind 240 deg - No Ice	29.74	-22.30	12.90	1116.07	1928.94	0.62
0.9 Dead+1.0 Wind 240 deg - No Ice	22.30	-22.30	12.90	1110.10	1918.49	0.62
1.2 Dead+1.0 Wind 270 deg - No Ice	29.74	-25.75	0.00	-0.06	2227.25	0.23
0.9 Dead+1.0 Wind 270 deg - No Ice	22.30	-25.75	0.00	-0.02	2215.20	0.23
1.2 Dead+1.0 Wind 300 deg - No Ice	29.74	-22.30	-12.90	-1116.23	1928.83	-0.22
0.9 Dead+1.0 Wind 300 deg - No Ice	22.30	-22.30	-12.90	-1110.17	1918.38	-0.22
1.2 Dead+1.0 Wind 330 deg - No Ice	29.74	-12.87	-22.34	-1933.34	1113.64	-0.61
0.9 Dead+1.0 Wind 330 deg - No Ice	22.30	-12.87	-22.34	-1922.88	1107.58	-0.61
1.2 Dead+1.0 Ice+1.0 Temp	46.00	0.00	0.00	-0.28	1.30	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	46.00	0.00	-6.67	-571.09	1.35	-0.80
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	46.00	3.33	-5.78	-494.63	-283.63	-0.55
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	46.00	5.77	-3.34	-285.72	-492.24	-0.14

Load Combination	Vertical	Shear _x	Shear _z	Overtuning Moment, M _x	Overtuning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	46.00	6.66	-0.00	-0.34	-568.60	0.30
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	46.00	5.77	3.34	285.05	-492.23	0.66
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	46.00	3.33	5.78	493.97	-283.60	0.85
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	46.00	-0.00	6.67	570.45	1.38	0.80
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	46.00	-3.33	5.78	493.99	286.36	0.55
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	46.00	-5.77	3.34	285.08	494.98	0.14
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	46.00	-6.66	0.00	-0.30	571.33	-0.30
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	46.00	-5.77	-3.34	-285.69	494.96	-0.66
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	46.00	-3.33	-5.78	-494.61	286.33	-0.85
Dead+Wind 0 deg - Service	24.78	0.00	-4.80	-414.51	0.16	-0.16
Dead+Wind 30 deg - Service	24.78	2.40	-4.16	-359.00	-206.53	-0.17
Dead+Wind 60 deg - Service	24.78	4.15	-2.40	-207.34	-357.84	-0.12
Dead+Wind 90 deg - Service	24.78	4.79	-0.00	-0.16	-413.21	-0.05
Dead+Wind 120 deg - Service	24.78	4.15	2.40	207.02	-357.82	0.04
Dead+Wind 150 deg - Service	24.78	2.40	4.16	358.70	-206.50	0.12
Dead+Wind 180 deg - Service	24.78	-0.00	4.80	414.22	0.20	0.16
Dead+Wind 210 deg - Service	24.78	-2.40	4.16	358.72	206.89	0.16
Dead+Wind 240 deg - Service	24.78	-4.15	2.40	207.06	358.19	0.12
Dead+Wind 270 deg - Service	24.78	-4.79	0.00	-0.12	413.57	0.05
Dead+Wind 300 deg - Service	24.78	-4.15	-2.40	-207.31	358.17	-0.04
Dead+Wind 330 deg - Service	24.78	-2.40	-4.16	-358.98	206.85	-0.12

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-24.78	0.00	0.00	24.78	0.00	0.000%
2	0.00	-29.74	-25.79	-0.00	29.74	25.79	0.000%
3	0.00	-22.30	-25.79	-0.00	22.30	25.79	0.000%
4	12.87	-29.74	-22.34	-12.87	29.74	22.34	0.000%
5	12.87	-22.30	-22.34	-12.87	22.30	22.34	0.000%
6	22.30	-29.74	-12.90	-22.30	29.74	12.90	0.000%
7	22.30	-22.30	-12.90	-22.30	22.30	12.90	0.000%
8	25.75	-29.74	-0.00	-25.75	29.74	0.00	0.000%
9	25.75	-22.30	-0.00	-25.75	22.30	0.00	0.000%
10	22.30	-29.74	12.90	-22.30	29.74	-12.90	0.000%
11	22.30	-22.30	12.90	-22.30	22.30	-12.90	0.000%
12	12.87	-29.74	22.34	-12.87	29.74	-22.34	0.000%
13	12.87	-22.30	22.34	-12.87	22.30	-22.34	0.000%
14	-0.00	-29.74	25.79	0.00	29.74	-25.79	0.000%
15	-0.00	-22.30	25.79	0.00	22.30	-25.79	0.000%
16	-12.87	-29.74	22.34	12.87	29.74	-22.34	0.000%
17	-12.87	-22.30	22.34	12.87	22.30	-22.34	0.000%
18	-22.30	-29.74	12.90	22.30	29.74	-12.90	0.000%
19	-22.30	-22.30	12.90	22.30	22.30	-12.90	0.000%
20	-25.75	-29.74	0.00	25.75	29.74	-0.00	0.000%
21	-25.75	-22.30	0.00	25.75	22.30	-0.00	0.000%
22	-22.30	-29.74	-12.90	22.30	29.74	12.90	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
23	-22.30	-22.30	-12.90	22.30	22.30	12.90	0.000%
24	-12.87	-29.74	-22.34	12.87	29.74	22.34	0.000%
25	-12.87	-22.30	-22.34	12.87	22.30	22.34	0.000%
26	0.00	-46.00	0.00	0.00	46.00	0.00	0.000%
27	0.00	-46.00	-6.67	-0.00	46.00	6.67	0.000%
28	3.33	-46.00	-5.78	-3.33	46.00	5.78	0.000%
29	5.77	-46.00	-3.34	-5.77	46.00	3.34	0.000%
30	6.66	-46.00	-0.00	-6.66	46.00	0.00	0.000%
31	5.77	-46.00	3.34	-5.77	46.00	-3.34	0.000%
32	3.33	-46.00	5.78	-3.33	46.00	-5.78	0.000%
33	-0.00	-46.00	6.67	0.00	46.00	-6.67	0.000%
34	-3.33	-46.00	5.78	3.33	46.00	-5.78	0.000%
35	-5.77	-46.00	3.34	5.77	46.00	-3.34	0.000%
36	-6.66	-46.00	0.00	6.66	46.00	-0.00	0.000%
37	-5.77	-46.00	-3.34	5.77	46.00	3.34	0.000%
38	-3.33	-46.00	-5.78	3.33	46.00	5.78	0.000%
39	0.00	-24.78	-4.80	-0.00	24.78	4.80	0.000%
40	2.40	-24.78	-4.16	-2.40	24.78	4.16	0.000%
41	4.15	-24.78	-2.40	-4.15	24.78	2.40	0.000%
42	4.79	-24.78	-0.00	-4.79	24.78	0.00	0.000%
43	4.15	-24.78	2.40	-4.15	24.78	-2.40	0.000%
44	2.40	-24.78	4.16	-2.40	24.78	-4.16	0.000%
45	-0.00	-24.78	4.80	0.00	24.78	-4.80	0.000%
46	-2.40	-24.78	4.16	2.40	24.78	-4.16	0.000%
47	-4.15	-24.78	2.40	4.15	24.78	-2.40	0.000%
48	-4.79	-24.78	0.00	4.79	24.78	-0.00	0.000%
49	-4.15	-24.78	-2.40	4.15	24.78	2.40	0.000%
50	-2.40	-24.78	-4.16	2.40	24.78	4.16	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	0.00008293
3	Yes	4	0.00000001	0.00004987
4	Yes	5	0.00000001	0.00004437
5	Yes	4	0.00000001	0.00099705
6	Yes	5	0.00000001	0.00004675
7	Yes	5	0.00000001	0.00002064
8	Yes	4	0.00000001	0.00006063
9	Yes	4	0.00000001	0.00003523
10	Yes	5	0.00000001	0.00004547
11	Yes	5	0.00000001	0.00002004
12	Yes	5	0.00000001	0.00004497
13	Yes	5	0.00000001	0.00001980
14	Yes	4	0.00000001	0.00008330
15	Yes	4	0.00000001	0.00005011
16	Yes	5	0.00000001	0.00004693
17	Yes	5	0.00000001	0.00002072
18	Yes	5	0.00000001	0.00004447
19	Yes	4	0.00000001	0.00099959
20	Yes	4	0.00000001	0.00006030
21	Yes	4	0.00000001	0.00003501
22	Yes	5	0.00000001	0.00004565
23	Yes	5	0.00000001	0.00002012
24	Yes	5	0.00000001	0.00004621
25	Yes	5	0.00000001	0.00002038
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00067442
28	Yes	4	0.00000001	0.00072144
29	Yes	4	0.00000001	0.00072155
30	Yes	4	0.00000001	0.00066828
31	Yes	4	0.00000001	0.00071993
32	Yes	4	0.00000001	0.00071816

33	Yes	4	0.00000001	0.00067110
34	Yes	4	0.00000001	0.00072463
35	Yes	4	0.00000001	0.00072268
36	Yes	4	0.00000001	0.00067317
37	Yes	4	0.00000001	0.00072486
38	Yes	4	0.00000001	0.00072854
39	Yes	4	0.00000001	0.00000775
40	Yes	4	0.00000001	0.00001777
41	Yes	4	0.00000001	0.00002047
42	Yes	4	0.00000001	0.00000726
43	Yes	4	0.00000001	0.00001872
44	Yes	4	0.00000001	0.00001820
45	Yes	4	0.00000001	0.00000774
46	Yes	4	0.00000001	0.00002072
47	Yes	4	0.00000001	0.00001784
48	Yes	4	0.00000001	0.00000727
49	Yes	4	0.00000001	0.00001898
50	Yes	4	0.00000001	0.00001970

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	118 - 74.5	7.986	39	0.6037	0.0010
L2	79.135 - 35	3.559	39	0.4366	0.0004
L3	40.8125 - 0	0.919	39	0.2055	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	Lightning Rod 1" x 6'	39	7.986	0.6037	0.0010	66797
117.00	7770.00	39	7.863	0.5999	0.0010	66797
109.00	MX08FRO665-21 w/ Mount Pipe	39	6.884	0.5695	0.0008	37109

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	118 - 74.5	43.013	2	3.2509	0.0050
L2	79.135 - 35	19.175	2	2.3530	0.0019
L3	40.8125 - 0	4.950	2	1.1072	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	Lightning Rod 1" x 6'	2	43.013	3.2509	0.0050	12474
117.00	7770.00	2	42.351	3.2307	0.0049	12474
109.00	MX08FRO665-21 w/ Mount Pipe	2	37.079	3.0674	0.0042	6930

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	118 - 74.5 (1)	TP37.08x25.77x0.2188	43.50	0.00	0.0	24.8813	-11.99	1455.56	0.008
L2	74.5 - 35 (2)	TP46.5x35.4374x0.2813	44.13	0.00	0.0	40.1598	-18.85	2349.35	0.008
L3	35 - 0 (3)	TP55.3x44.4806x0.3438	40.81	0.00	0.0	60.2630	-29.73	3525.38	0.008

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	118 - 74.5 (1)	TP37.08x25.77x0.2188	536.72	1093.80	0.491	0.00	1093.80	0.000
L2	74.5 - 35 (2)	TP46.5x35.4374x0.2813	1268.84	2244.72	0.565	0.00	2244.72	0.000
L3	35 - 0 (3)	TP55.3x44.4806x0.3438	2232.46	4125.74	0.541	0.00	4125.74	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	118 - 74.5 (1)	TP37.08x25.77x0.2188	16.91	430.15	0.039	0.50	1365.28	0.000
L2	74.5 - 35 (2)	TP46.5x35.4374x0.2813	21.31	697.42	0.031	0.66	2766.38	0.000
L3	35 - 0 (3)	TP55.3x44.4806x0.3438	25.81	1048.22	0.025	0.84	5096.61	0.000

Pole Interaction Design Data

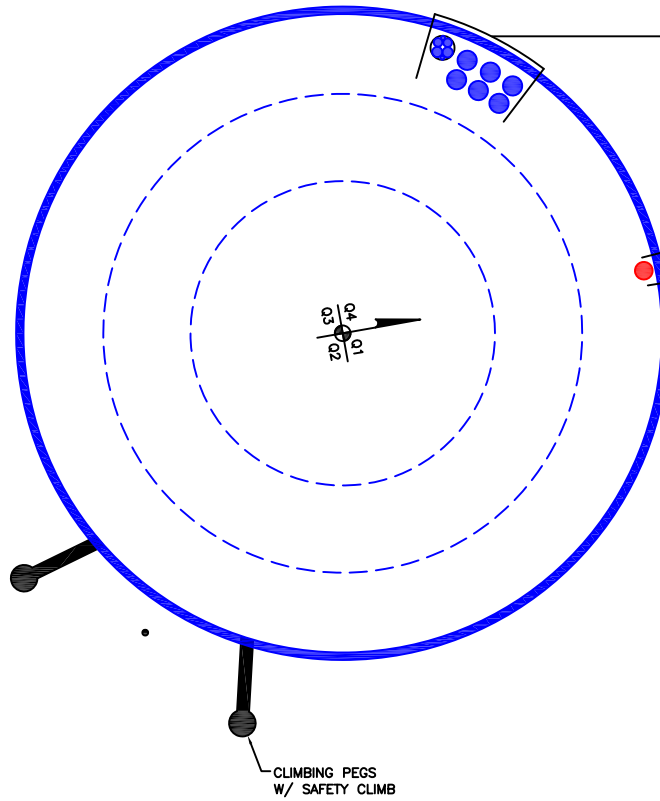
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	118 - 74.5 (1)	0.008	0.491	0.000	0.039	0.000	0.501	1.050	4.8.2
L2	74.5 - 35 (2)	0.008	0.565	0.000	0.031	0.000	0.574	1.050	4.8.2
L3	35 - 0 (3)	0.008	0.541	0.000	0.025	0.000	0.550	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
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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L1	118 - 74.5	Pole	TP37.08x25.77x0.2188	1	-11.99	1528.34	47.7	Pass	
L2	74.5 - 35	Pole	TP46.5x35.4374x0.2813	2	-18.85	2466.82	54.7	Pass	
L3	35 - 0	Pole	TP55.3x44.4806x0.3438	3	-29.73	3701.65	52.4	Pass	
							Summary		
							Pole (L2)	54.7	Pass
							RATING =	54.7	Pass

APPENDIX B
BASE LEVEL DRAWING



(OTHER CONSIDERED EQUIPMENT—IN 2" CONDUIT)
(2) 3/8" TO 117 FT LEVEL
(2) 3/4" TO 117 FT LEVEL
(2) 7/8" TO 117 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 1-5/8" TO 117 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-1/2" TO 109 FT LEVEL

CLIMBING PEGS
W/ SAFETY CLIMB

APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

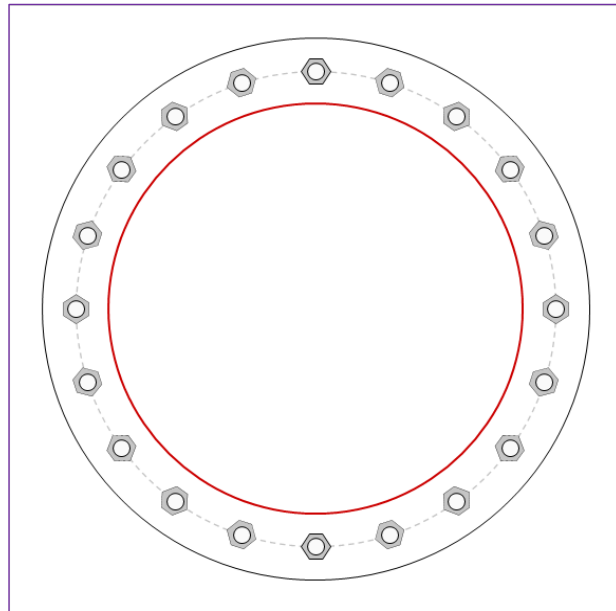


Site Info	
BU #	842863
Site Name	GRISWOLD CENTRAL
Order #	584378 rev.2

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
I_{ar} (in)	0

Applied Loads	
Moment (kip-ft)	2232.46
Axial Force (kips)	29.73
Shear Force (kips)	25.81

*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
-----------------------	------------------

Anchor Rod Data
(20) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 64" BC
Base Plate Data
73" OD x 3" Plate (A572-55; $F_y=55$ ksi, $F_u=70$ ksi)
Stiffener Data
N/A
Pole Data
55.3" x 0.34375" 16-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary		<i>(units of kips, kip-in)</i>	
$Pu_t = 82.19$	$\phi Pn_t = 243.75$	Stress Rating	
$Vu = 1.29$	$\phi Vn = 149.1$		32.1%
$Mu = n/a$	$\phi Mn = n/a$		Pass
Base Plate Summary			
Max Stress (ksi):	11.34		(Flexural)
Allowable Stress (ksi):	49.5		
Stress Rating:	21.8%		Pass

Drilled Pier Foundation

BU # :	842863
Site Name:	GRISWOLD CENTRAL
Order Number:	584378 rev.2
TIA-222 Revison:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	2232.46	
Axial Force (kips)	29.74	
Shear Force (kips)	25.79	

Material Properties		
Concrete Strength, f _c :	3	ksi
Rebar Strength, F _y :	60	ksi
Tie Yield Strength, F _y :	40	ksi

Pier Design Data		
Depth	35	ft
Ext. Above Grade	1	ft
Pier Section 1		
<i>From 1' above grade to 35' below grade</i>		
Pier Diameter	8	ft
Rebar Quantity	25	
Rebar Size	11	
Clear Cover to Ties	3	in
Tie Size	4	
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)	9.95	-	
Soil Safety Factor	17.18	-	
Max Moment (kip-ft)	2451.79	-	
Rating*	7.4%	-	
Soil Vertical Check			
	Compression	Uplift	
Skin Friction (kips)	1203.17	-	
End Bearing (kips)	693.66	-	
Weight of Concrete (kips)	325.72	-	
Total Capacity (kips)	1896.83	-	
Axial (kips)	355.46	-	
Rating*	17.8%	-	
Reinforced Concrete Flexure			
	Compression	Uplift	
Critical Depth (ft from TOC)	10.06	-	
Critical Moment (kip-ft)	2451.75	-	
Critical Moment Capacity	7262.67	-	
Rating*	32.2%	-	
Reinforced Concrete Shear			
	Compression	Uplift	
Critical Depth (ft from TOC)	26.55	-	
Critical Shear (kip)	198.82	-	
Critical Shear Capacity	679.23	-	
Rating*	27.9%	-	
Structural Foundation Rating*		32.2%	
Soil Interaction Rating*		17.8%	

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
N/A	<input type="checkbox"/>
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	<input type="checkbox"/>
Shear Design Options	
Check Shear along Depth of Pier:	<input checked="" type="checkbox"/>
Utilize Shear-Friction Methodology:	<input type="checkbox"/>
Override Critical Depth:	<input type="checkbox"/>

[Go to Soil Calculations](#)

Soil Profile			
Groundwater Depth	39	# of Layers	9

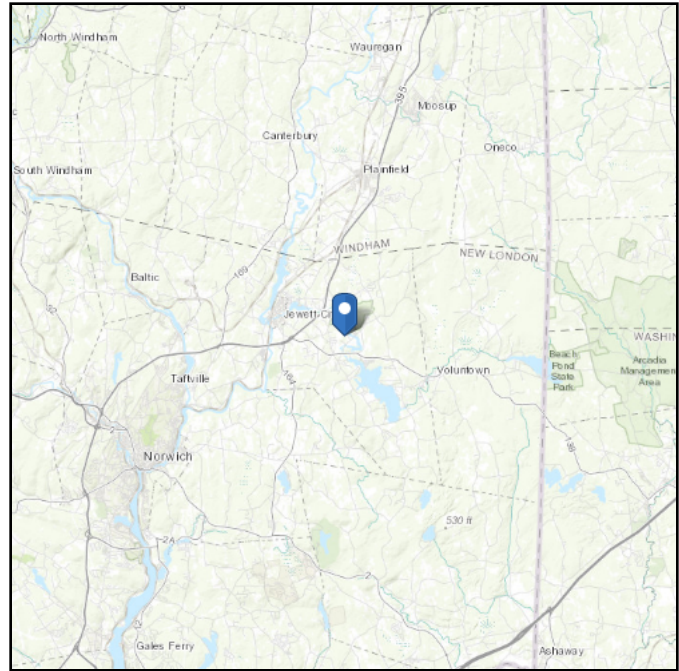
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	Y _{soil} (pcf)	Y _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	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	8	3	135	150	0	38	0.000	0.000	1.22	1.22			Cohesionless
4	8	10	2	140	150	0	39	0.000	0.000	2.16	2.16			Cohesionless
5	10	15	5	130	150	0	36	0.000	0.000	1.89	1.89			Cohesionless
6	15	20	5	130	150	0	36	0.000	0.000	2.16	2.16			Cohesionless
7	20	25	5	125	150	0	34	0.00	0.00	1.98	1.98			Cohesionless
8	25	30	5	125	150	0	34	0.00	0.00	2.16	2.16			Cohesionless
9	30	35	5	130	150	0	37	0.00	0.00	2.98	2.98	18.4		Cohesionless

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 202.05 ft (NAVD 88)
Latitude: 41.59405
Longitude: -71.933158



Wind

Results:

Wind Speed:	132 Vmph	135 mph per jurisdiction
10-year MRI	79 Vmph	
25-year MRI	89 Vmph	
50-year MRI	98 Vmph	
100-year MRI	107 Vmph	

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

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

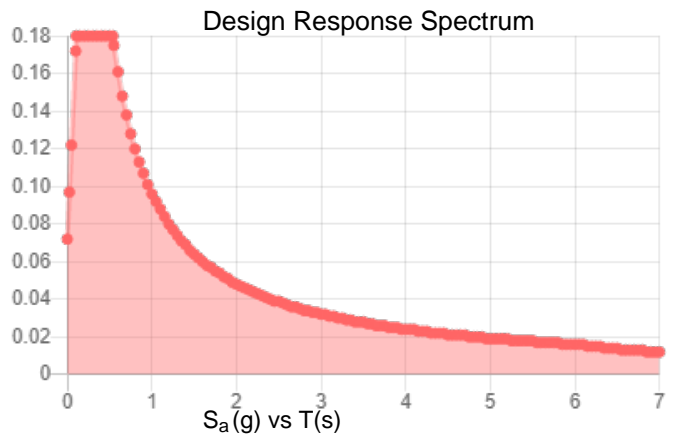
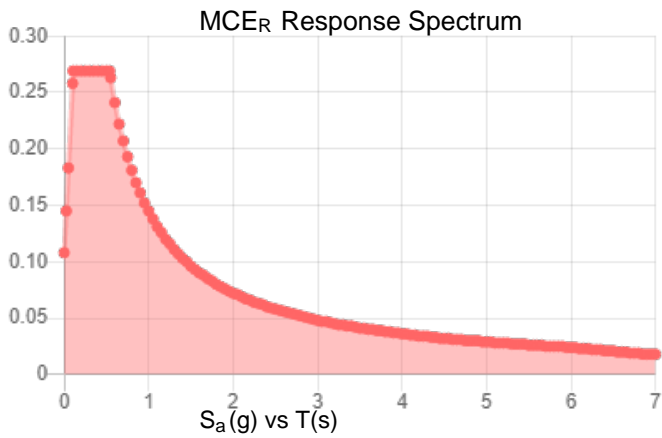
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.168	S_{DS} :	0.18
S_1 :	0.06	S_{D1} :	0.096
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.084
S_{MS} :	0.269	PGA_M :	0.135
S_{M1} :	0.145	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Wed Feb 10 2021

Date Source:

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

Ice

Results:

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

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

Date Accessed: Wed Feb 10 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.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

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Exhibit E

Mount Analysis

Date: April 4, 2022



Black & Veatch Corp.
11401 Lamar Avenue
Overland Park, KS 66211
(913) 458-9263

Subject: Mount Analysis Report

Carrier Designation: DISH Wireless Equipment Change-Out
Carrier Site Number: BOBOS01001A

Crown Castle Designation: Crown Castle BU Number: 842863
Crown Castle Site Name: GRISWOLD CENTRAL
Crown Castle JDE Number: 684525
Crown Castle Order Number: 584378 Revision 2

Engineering Firm Designation: Black & Veatch Corp. Project Number: 406642

Site Data: 31 Yurechko Drive, Jewett City, New London County, CT 06351
Latitude: 41° 35' 38.58" Longitude: -71° 55' 59.37"

Structure Information Tower Height & Type: 118 ft Monopole
Mount Elevation: 109 ft
Mount Width & Type: 8.0 ft Platform Mount

Black & Veatch Corp. is pleased to submit this "Mount Analysis Report" to determine the structural integrity of DISH Wireless's antenna mounting system with the proposed appurtenance and equipment addition on the above mentioned 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:

Commscope P/N: MC-PK8-DSH Platform Mount

Sufficient – 40.1%

This analysis utilizes an ultimate 3-second gust wind speed of 135 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: Jeerawadee Jirapo / Joochwan Jung

Respectfully Submitted by:

Ping Jiang, P.E.
Professional Engineer



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1) INTRODUCTION

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

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	135 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Live Loading Wind Speed:	30 mph
Live Loading at Mid/End-Points:	250 lb
Man Live Loading at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount Details
109.0	109.0	3	jma wireless	MX08FRO665-21	8ft Platform Mount (MC-PK8-DSH)
		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
4-MOUNT MANUFACTURER DRAWING	Date 08/17/2018	-	Internal
4-MOUNT APPLICATION	APP. 584378 Rev. 2	-	CCISites

3.1) Analysis Method

RISA-3D (Version No. 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 Black & Veatch Corp. 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 D).

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 Tables 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) This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, existing/proposed appurtenance loading. The existing/proposed loading on the structure is based on CAD level drawings and carrier orders provided by the owner. If any of this information is not current and correct, this report should be considered obsolete and further analysis will be required.
- 5) 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.
- 6) Commscope MC-PK8-DSH Platform members shall use steel grade and dimensions specified on mount manufacturing drawings.
- 7) Proposed Raycap RDIDC-9181-PF-48 is assumed to be installed on pos. 1 mount pipe in alpha sector.
- 8) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR B-35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Black & Veatch 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 Mount)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1	Perimeter Corner Plate	3	109	40.1	Pass
	Grating Angle	6		39.0	Pass
	Perimeter	11		19.1	Pass
	Cross Arm	16		39.2	Pass
	Arm	21		31.1	Pass
	Support Rail Corner	23		31.5	Pass
	Support Rail	25		16.3	Pass
	Mount Pipe	33		25.5	Pass
2	Bolt Connection Check	21		29.4	Pass
	Weld Connection Check	21		35.8	Pass

Structure Rating (max from all components) =	40.1%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) See additional documentation in "Appendix D - Additional Calculations" for detailed mount connection calculations.

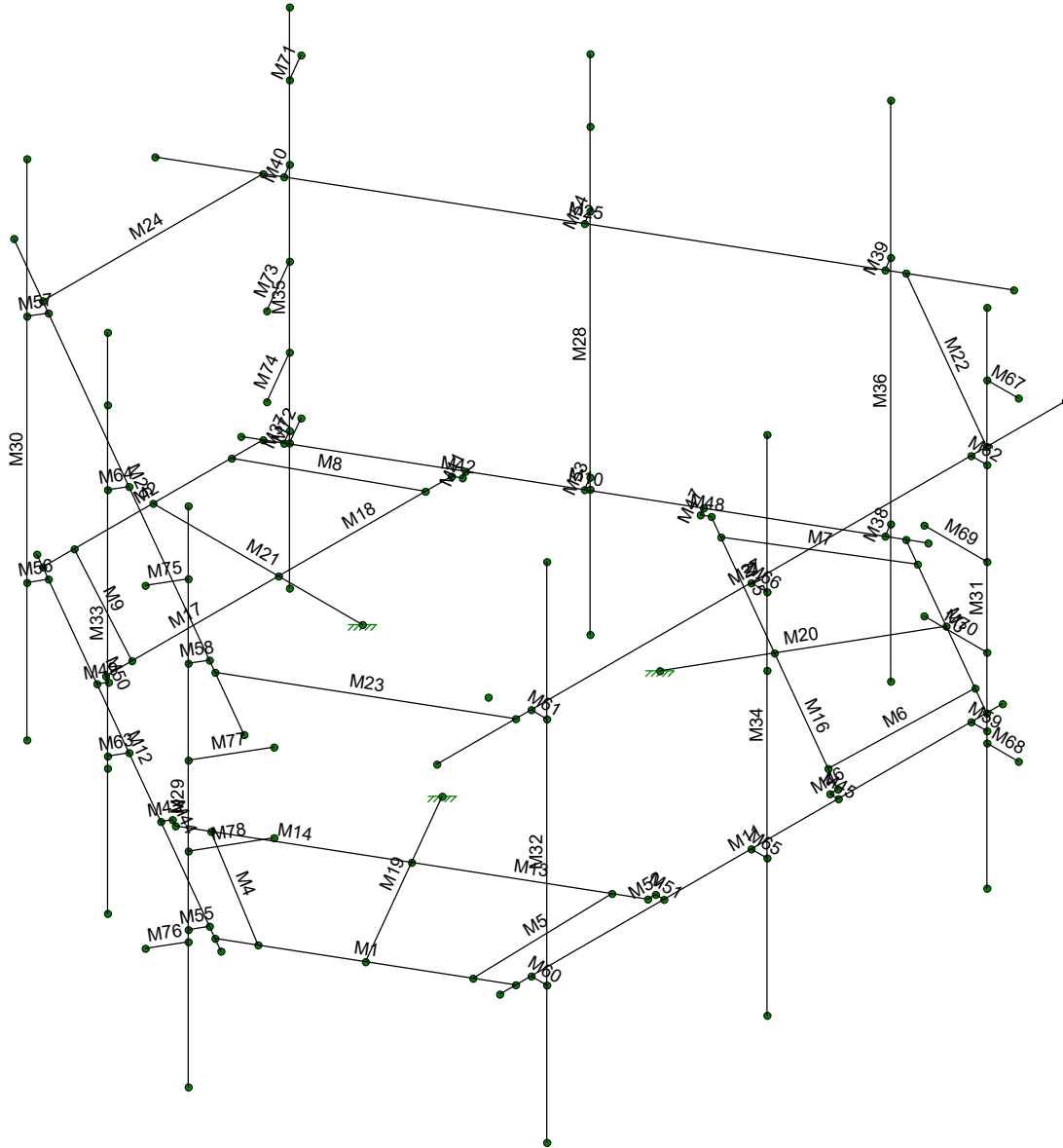
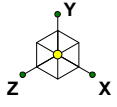
4.1) Recommendations

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

1. Install Commscope P/N: MC-PK8-DSH Platform Mount.
2. Install proposed antennas such that they are vertically centered in between the platform base and support rail.

Beyond the proposed mount installation, 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

Black & Veatch Corp.

Jeerawadee Jirapo

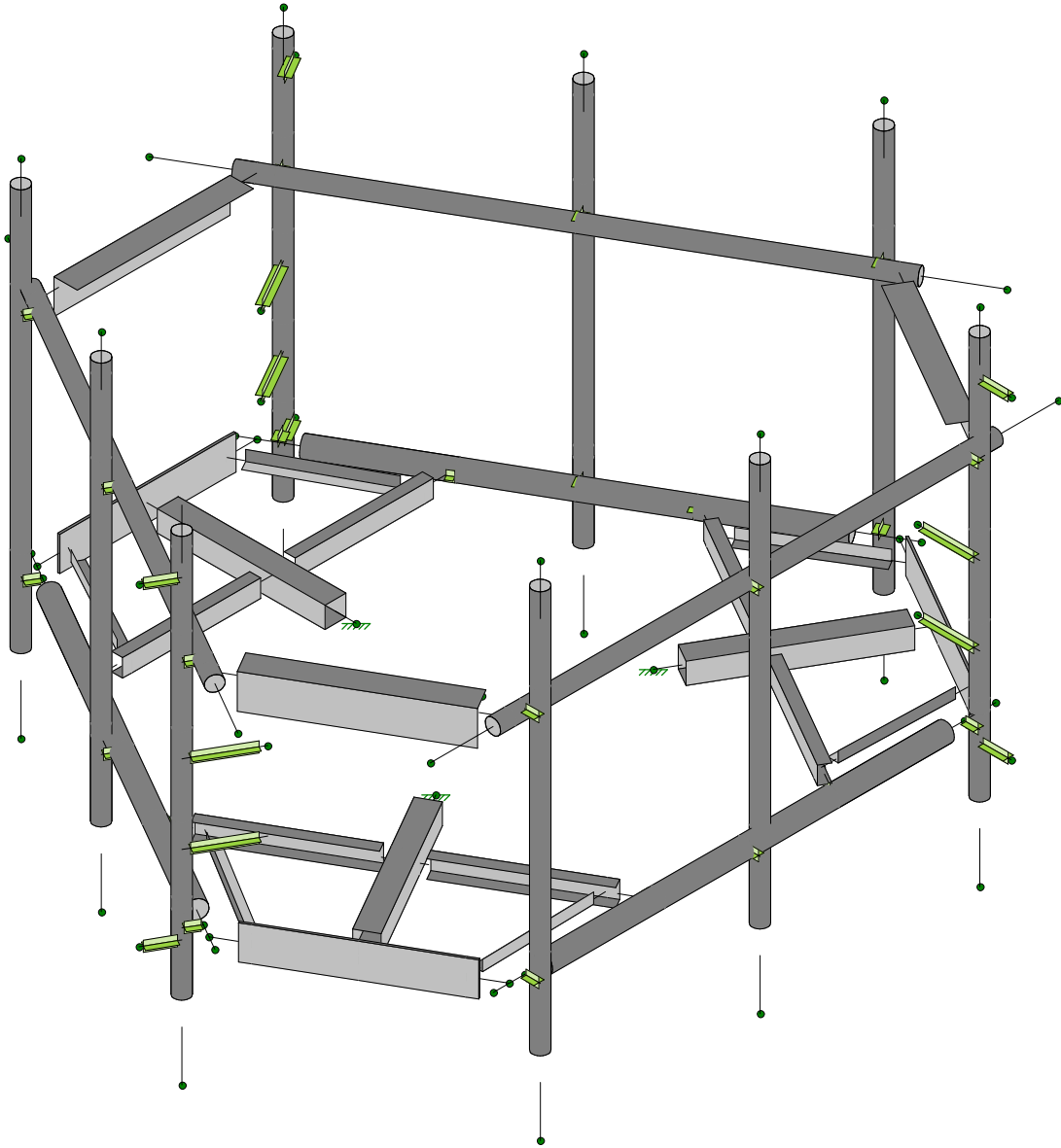
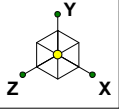
406642.6056

842863 Risa Model

SK - 1

Apr 4, 2022 at 2:03 PM

842863.20220331584378 RISA M...



Envelope Only Solution

Black & Veatch Corp.

Jeerawadee Jirapo

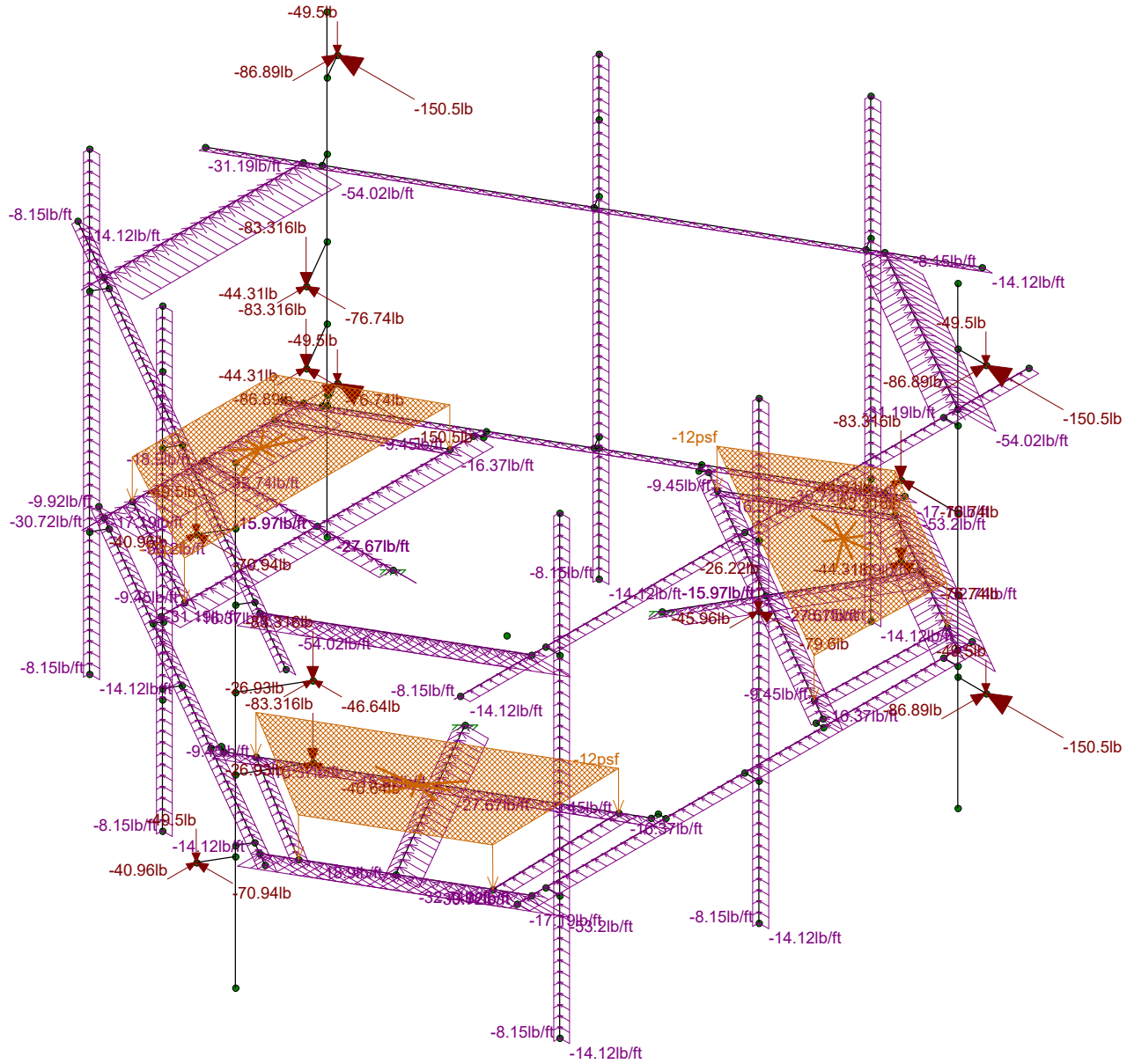
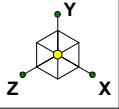
406642.6056

842863 Risa Model

SK - 2

Apr 4, 2022 at 2:03 PM

842863.20220331584378 RISA M...



Loads: LC 3, 1.2DL + WL (30 DEG)
Envelope Only Solution

Black & Veatch Corp.	842863 Risa Model	SK - 4
Jeerawadee Jirapo		Apr 4, 2022 at 2:04 PM
406642.6056		842863.20220331584378 RISA M...

APPENDIX B
SOFTWARE INPUT CALCULATIONS

Bookm2



BLACK & VEATCH

Client: CCI

Site Name: GRISWOLD CENTRAL (BOBOS01001A)

Work Order: 842863.584378

Title: MOUNT ANALYSIS REPORT

Computed By: Jeerawadee J.

Date: 4/4/2022

Verified By: Joohwan Jung

Date: 4/4/2022

Dead and Live Loads

Grating Dead Load: DL = 10 psf

Maintenance Live Load: L_v = 250 lb

Installation Live Load: L_M = 500 lb

Appurtenance Dead Loads	
Name	Weight (lb)
MX08FRO665-21	82.5
TA08025-B604	63.9
TA08025-B605	74.96
RDIDC-9181-PF-48	21.85



BLACK & VEATCH

Client: CCI

Site Name: GRISWOLD CENTRAL (BOBOS01001A)

Work Order: 842863.584378

Title: MOUNT ANALYSIS REPORT

Computed By: Jeerawadee J.

Date: 4/4/2022

Verified By: Joohwan Jung

Date: 4/4/2022

Member Wind Loading

Exposure Category = C
 Risk Category = II
 Topographic Category = 1
 Basic Wind Speed, V = 135 mph
 Height Above Ground, z = 109 ft
 Crest Height, H = N/A ft
 Velocity Pressure Coefficient, K_z = 1.29
 Topographic Factor, K_{zt} = 1.00
 Wind Directionality Factor, K_d = 0.95
 Shielding Factor, K_a = 0.90
 Ground Elevation Factor, K_e = 0.993
 Wind Velocity Pressure, q_z = 56.71 psf
 Gust Effect Factor, G_h = 1.00

Equations

$K_z = 2.01 (z / z_g)^{2/\alpha}$
 $K_h = e^{(f \cdot z / H)}$
 $K_{zt} = [1 + K_c K_t / K_h]^2$
 $K_e = e^{-0.0005z^{0.25}}$
 $q_z = 0.00256 K_z K_{zt} K_e K_d V^2$
 $F_A = q_z G_h (EPA)$
 $F_M = q_z G_h C_f D_p$

TIA-222-H
 2.6.5.2
 2.6.6.2.1
 2.6.6.2.1
 2.6.8
 2.6.11.6
 2.6.11.2
 2.6.11.2

Member Wind Loads					
Name	Depth (ft)	Width (ft)	C_f	D_p (ft)	F_M (lb/ft)
Perimeter Corner Plate: PL6.5x0.375	0.54	0.03	2	0.54	61.43
Grating Angle: L2x2x4	0.17	0.17	2	0.17	18.90
Perimeter: HSS3.500x0.165	0.29		1.2	0.29	19.85
Cross Arm: C3.38x2.06x0.25	0.28	0.17	2	0.28	31.94
Arm: HSS4X4X6	0.33	0.33	2	0.33	37.80
Support rail corner: L6.6x4.46x0.25	0.55	0.37	2	0.55	62.38
Support rail: Pipe 2.5 Std	0.24		1.2	0.24	16.30
Mount Pipes: Pipe 2.5 Std	0.24		1.2	0.24	16.30



BLACK & VEATCH

Client: CCI

Site Name: GRISWOLD CENTRAL (BOBOS01001A)

Work Order: 842863.584378

Title: MOUNT ANALYSIS REPORT

Computed By: Jeerawadee J.

Date: 4/4/2022

Verified By: JooHwan Jung

Date: 4/4/2022

Appurtenance Ice Dead Loading

Exposure Category = C
 Risk Category = II
 Topographic Category = 1
 Height Above Ground, z = 109 ft
 Crest Height, H = N/A ft
 Design Ice Thickness, T_i = 1.50 in
 Importance Factor, I = 1
 Topographic Factor, K_{zt} = 1.00
 Height Escalation Factor, K_{iz} = 1.13
 Factored Ice Thickness, T_{iz} = 1.69 in
 Grating Ice Dead Load, D_{Gice} = 7.89 psf

Equations

$$K_h = e^{(f \cdot z / H)}$$

$$K_{zt} = [1 + K_c K_t / K_h]^2$$

$$K_{iz} = (z/33)^{0.10}$$

$$T_{iz} = T_i I K_{iz} (K_{zt})^{0.30}$$

$$DL_{ice} = [(H_{ice} * D_{ice} * W_{ice}) - (H * W * D)] * 56 pcf$$

TIA-222-H

2.6.6.2.1

2.6.6.2.1

2.6.10

2.6.10

Appurtenance Ice Dead Loads

Name	Height w/ ice (ft)	Width w/ice (ft)	Depth w/ ice (ft)	V _{ice} (ft ³)	DL _{ice} (lb)
MX08FRO665-21	6.28	1.95	0.95	4.94	327.63
TA08025-B604	1.53	1.59	0.94	1.21	67.84
TA08025-B605	1.53	1.59	1.04	1.29	72.28
RDIDC-9181-PF-48	1.66	1.50	0.99	1.27	71.23



BLACK & VEATCH

Client: CCI

Site Name: GRISWOLD CENTRAL (BOBOS01001A)

Work Order: 842863.584378

Title: MOUNT ANALYSIS REPORT

Computed By: Jeerawadee J.

Date: 4/4/2022

Verified By: Joohwan Jung

Date: 4/4/2022

Member Ice Dead Loading

Exposure Category = C
 Risk Category = II
 Topographic Category = 1
 Height Above Ground, z = 109 ft
 Crest Height, H = N/A ft
 Design Ice Thickness, T_i = 1.50 in
 Importance Factor, I = 1
 Topographic Factor, K_{zt} = 1.00
 Height Escalation Factor, K_{iz} = 1.13
 Factored Ice Thickness, T_{iz} = 1.69 in
 Grating Ice Dead Load, D_{Gice} = 7.89 psf

Equations

$$K_h = e^{(f \cdot z / H)}$$

$$K_{zt} = [1 + K_c K_t / K_h]^2$$

$$K_{iz} = (z/33)^{0.10}$$

$$T_{iz} = T_i | K_{iz} (K_{zt})^{0.35}$$

$$A_{iz} = \pi \cdot T_{iz} \cdot (D_c + T_{iz})$$

$$DL_{ice} = A_{iz} \cdot 56 \text{pcf}$$

TIA-222-H

2.6.6.2.1

2.6.6.2.1

2.6.10

2.6.10

2.6.10

Member Ice Dead Loads					
Name	Depth w/ ice (ft)	Width w/ ice (ft)	Dc (ft)	Aiz (ft ²)	DL _{ice} (lb/ft)
Perimeter Corner Plate: PL6.5x0.375	0.82	0.31	0.54	0.30	16.94
Grating Angle: L2x2x4	0.45	0.45	0.24	0.17	9.33
Perimeter: HSS3.500x0.165	0.57		0.29	0.19	10.72
Cross Arm: C3.38x2.06x0.25	0.56	0.45	0.33	0.21	11.67
Arm: HSS4X4X6	0.62	0.62	0.47	0.27	15.17
Support rail corner: L6.6x4.46x0.25	0.83	0.65	0.66	0.36	19.94
Support rail: Pipe 2.5 Std	0.52		0.24	0.17	9.43
Mount Pipes: Pipe 2.5 Std	0.52		0.24	0.17	9.43



BLACK & VEATCH

Client: CCI

Site Name: GRISWOLD CENTRAL (BOBOS01001A)

Work Order: 842863.584378

Title: MOUNT ANALYSIS REPORT

Computed By: Jeerawadee J.

Date: 4/4/2022

Verified By: Joohwan Jung

Date: 4/4/2022

Member Ice Wind Loading

Equations

TIA-222-H

Exposure Category =	C	$K_z = 2.01 (z / z_g)^{2/\alpha}$	2.6.5.2
Risk Category =	II		
Topographic Category =	1	$K_h = e^{(f \cdot z/H)}$	2.6.6.2.1
Ice Wind Speed, V_{ice} =	50 mph		
Height Above Ground, z =	109 ft	$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
Crest Height, H =	N/A ft		
Velocity Pressure Coefficient, K_z =	1.29 psf	$K_e = e^{-0.00005z^{0.25}}$	2.6.8
Topographic Factor, K_{zt} =	1.00		
Wind Directionality Factor, K_d =	0.95	$q_z = 0.00256 K_z K_{zt} K_e K_d V^2$	2.6.11.6
Shielding Factor, K_a =	0.90		
Ground Elevation Factory, K_e =	0.993	$F_{A(ice)} = q_{z(ice)} G_h (EPA)_{A(ice)}$	2.6.11.2
Ice Wind Velocity Pressure, $q_{z(ice)}$ =	7.779		
Factored Ice Thickness, T_{iz} =	1.69 in	$F_{M(ice)} = q_{z(ice)} G_h C_f D_{p(ice)}$	2.6.11.2
Gust Effect Factor, G_h =	1		

Member Ice Wind Loads

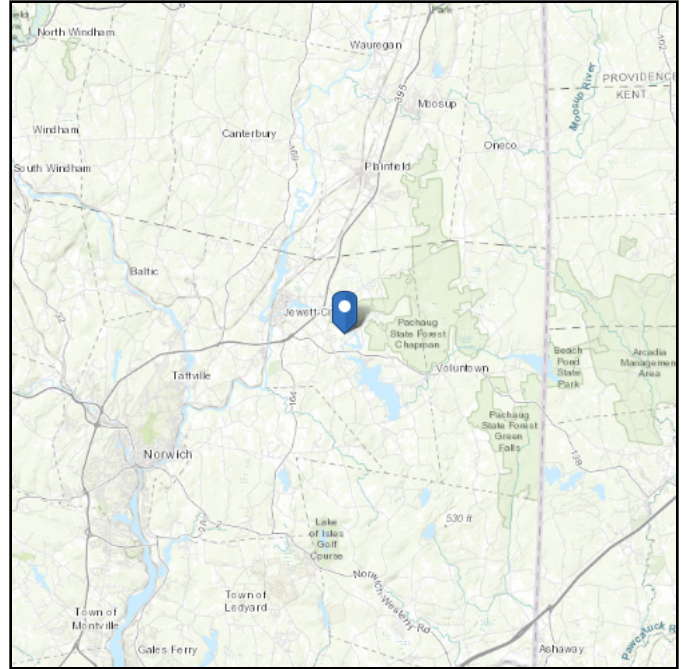
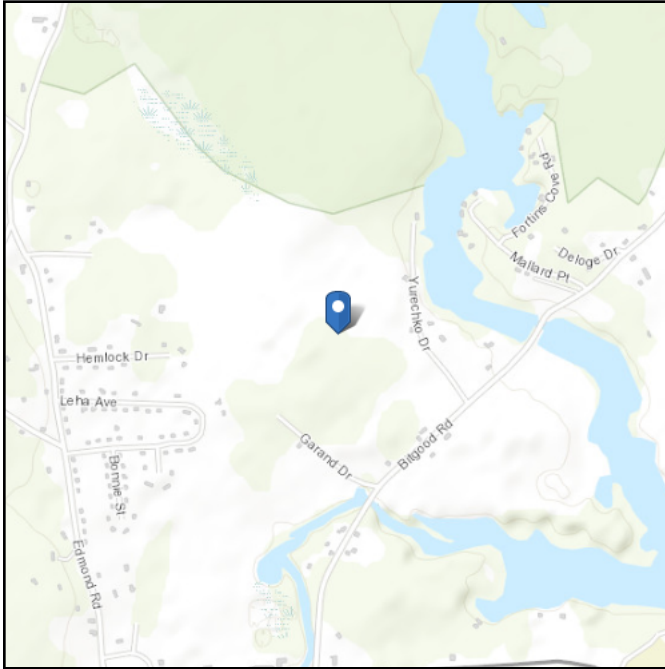
Name	Depth w/ Ice (ft)	Width w/ Ice (ft)	C_f	$D_{p(ice)}$ (ft)	$F_{M(ice)}$ (lb/ft)
Perimeter Corner Plate: PL6.5x0.375	0.82	0.31	2	0.82	12.81
Grating Angle: L2x2x4	0.45	0.45	2	0.45	6.98
Perimeter: HSS3.500x0.165	0.57		1.2	0.57	5.35
Cross Arm: C3.38x2.06x0.25	0.56	0.45	2	0.56	8.77
Arm: HSS4X4X6	0.62	0.62	2	0.62	9.57
Support rail corner: L6.6x4.46x0.25	0.83	0.65	2	0.83	12.94
Support rail: Pipe 2.5 Std	0.52		1.2	0.52	4.87
Mount Pipes: Pipe 2.5 Std	0.52		1.2	0.52	4.87

ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 202.05 ft (NAVD 88)
Latitude: 41.59405
Longitude: -71.933158



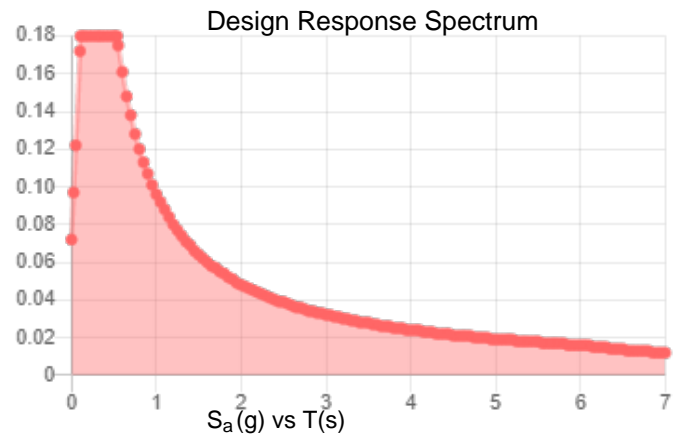
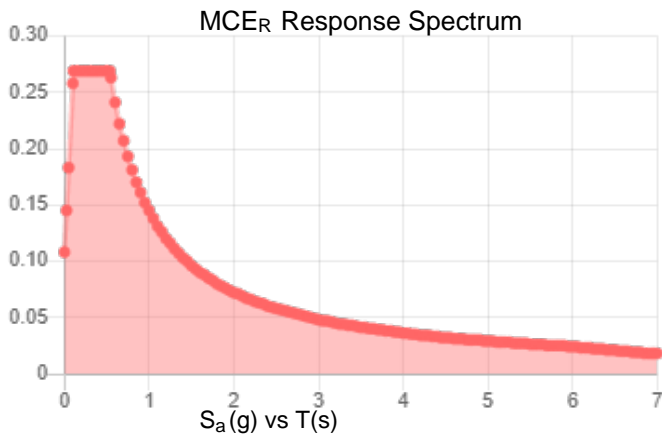
Wind

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.168	S_{DS} :	0.18
S_1 :	0.06	S_{D1} :	0.096
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.084
S_{MS} :	0.269	PGA _M :	0.135
S_{M1} :	0.145	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed: Mon Apr 04 2022

Date Source:

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

Ice

Results:

Ice Thickness: 0.75 in.
Concurrent Temperature: 15 F
Gust Speed 50 mph

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

Date Accessed: Mon Apr 04 2022

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

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

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ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

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.

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 (ft/sec^2)	32.2
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

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

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parame 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	None
Seismic Base Elevation (ft)	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

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[k/f...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A529 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A500 Gr. C	29000	11154	.3	.65	.49	46	1.6	60	1.2
4	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Perimeter Corner Plate	PL6.5x0.375	Beam	None	A36 Gr.36	Typical	2.438	.029	8.582	.11
2	Grating Angle	L2x2x4	Beam	None	A36 Gr.36	Typical	.944	.346	.346	.021
3	Perimeter	HSS3.500x0.1...	Beam	None	A500 Gr. C	Typical	1.729	2.409	2.409	4.819
4	Cross Arm	C3.38x2.06x0...	Beam	None	A36 Gr.36	Typical	1.75	.715	3.026	.034
5	Arm	HSS4X4X6	Beam	None	A500 Gr. C	Typical	4.78	10.3	10.3	17.5
6	Support rail corner	L6.6x4.46x0.25	Beam	None	A36 Gr.36	Typical	2.703	4.759	12.473	.055
7	Support rail	PIPE 2.5	Beam	None	A500 Gr. C	Typical	1.61	1.45	1.45	2.89
8	Mount Pipes	PIPE 2.5	Column	None	A500 Gr. C	Typical	1.61	1.45	1.45	2.89

General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]
1	RIGID	1e+6		.3	0	0

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	N20	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N11	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N5	N6			Perimeter Cor...	Beam	None	A36 Gr.36	Typical
2	M2	N23	N24			Perimeter Cor...	Beam	None	A36 Gr.36	Typical
3	M3	N14	N15			Perimeter Cor...	Beam	None	A36 Gr.36	Typical
4	M4	N7	N10		270	Grating Angle	Beam	None	A36 Gr.36	Typical
5	M5	N8	N9			Grating Angle	Beam	None	A36 Gr.36	Typical
6	M6	N16	N19		270	Grating Angle	Beam	None	A36 Gr.36	Typical
7	M7	N17	N18			Grating Angle	Beam	None	A36 Gr.36	Typical
8	M8	N25	N28		270	Grating Angle	Beam	None	A36 Gr.36	Typical
9	M9	N26	N27			Grating Angle	Beam	None	A36 Gr.36	Typical
10	M10	N29	N30			Perimeter	Beam	None	A500 Gr. C	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
11	M11	N87	N88			Perimeter	Beam	None	A500 Gr. C	Typical
12	M12	N73	N74			Perimeter	Beam	None	A500 Gr. C	Typical
13	M13	N4	N49			Cross Arm	Beam	None	A36 Gr.36	Typical
14	M14	N4	N50		180	Cross Arm	Beam	None	A36 Gr.36	Typical
15	M15	N13	N51			Cross Arm	Beam	None	A36 Gr.36	Typical
16	M16	N13	N52		180	Cross Arm	Beam	None	A36 Gr.36	Typical
17	M17	N22	N53			Cross Arm	Beam	None	A36 Gr.36	Typical
18	M18	N22	N54		180	Cross Arm	Beam	None	A36 Gr.36	Typical
19	M19	N3	N1			Arm	Beam	None	A500 Gr. C	Typical
20	M20	N12	N11			Arm	Beam	None	A500 Gr. C	Typical
21	M21	N21	N20			Arm	Beam	None	A500 Gr. C	Typical
22	M22	N42	N41		180	Support rail co...	Beam	None	A36 Gr.36	Typical
23	M23	N40	N39		180	Support rail co...	Beam	None	A36 Gr.36	Typical
24	M24	N44	N43		180	Support rail co...	Beam	None	A36 Gr.36	Typical
25	M25	N115	N116			Support rail	Beam	None	A500 Gr. C	Typical
26	M26	N117	N118			Support rail	Beam	None	A500 Gr. C	Typical
27	M27	N97	N98			Support rail	Beam	None	A500 Gr. C	Typical
28	M28	N69	N70			Mount Pipes	Column	None	A500 Gr. C	Typical
29	M29	N80	N82			Mount Pipes	Column	None	A500 Gr. C	Typical
30	M30	N79	N81			Mount Pipes	Column	None	A500 Gr. C	Typical
31	M31	N94	N96			Mount Pipes	Column	None	A500 Gr. C	Typical
32	M32	N93	N95			Mount Pipes	Column	None	A500 Gr. C	Typical
33	M33	N105	N106			Mount Pipes	Column	None	A500 Gr. C	Typical
34	M34	N111	N112			Mount Pipes	Column	None	A500 Gr. C	Typical
35	M35	N36	N38			Mount Pipes	Column	None	A500 Gr. C	Typical
36	M36	N35	N37			Mount Pipes	Column	None	A500 Gr. C	Typical
37	M37	N32	N46			RIGID	None	None	RIGID	Typical
38	M38	N31	N45			RIGID	None	None	RIGID	Typical
39	M39	N33	N47			RIGID	None	None	RIGID	Typical
40	M40	N34	N48			RIGID	None	None	RIGID	Typical
41	M41	N56	N55			RIGID	None	None	RIGID	Typical
42	M42	N54	N55			RIGID	None	None	RIGID	Typical
43	M43	N58	N57			RIGID	None	None	RIGID	Typical
44	M44	N50	N57			RIGID	None	None	RIGID	Typical
45	M45	N60	N59			RIGID	None	None	RIGID	Typical
46	M46	N52	N59			RIGID	None	None	RIGID	Typical
47	M47	N62	N61			RIGID	None	None	RIGID	Typical
48	M48	N51	N61			RIGID	None	None	RIGID	Typical
49	M49	N64	N63			RIGID	None	None	RIGID	Typical
50	M50	N53	N63			RIGID	None	None	RIGID	Typical
51	M51	N66	N65			RIGID	None	None	RIGID	Typical
52	M52	N49	N65			RIGID	None	None	RIGID	Typical
53	M53	N67	N71			RIGID	None	None	RIGID	Typical
54	M54	N68	N72			RIGID	None	None	RIGID	Typical
55	M55	N76	N84			RIGID	None	None	RIGID	Typical
56	M56	N75	N83			RIGID	None	None	RIGID	Typical
57	M57	N77	N85			RIGID	None	None	RIGID	Typical
58	M58	N78	N86			RIGID	None	None	RIGID	Typical
59	M59	N90	N100			RIGID	None	None	RIGID	Typical
60	M60	N89	N99			RIGID	None	None	RIGID	Typical
61	M61	N91	N101			RIGID	None	None	RIGID	Typical
62	M62	N92	N102			RIGID	None	None	RIGID	Typical
63	M63	N103	N107			RIGID	None	None	RIGID	Typical
64	M64	N104	N108			RIGID	None	None	RIGID	Typical
65	M65	N109	N113			RIGID	None	None	RIGID	Typical
66	M66	N110	N114			RIGID	None	None	RIGID	Typical
67	M67	N121	N123			RIGID	None	None	RIGID	Typical



Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
68	M68	N120	N122			RIGID	None	None	RIGID	Typical
69	M69	N125	N119			RIGID	None	None	RIGID	Typical
70	M70	N126	N124			RIGID	None	None	RIGID	Typical
71	M71	N134	N136			RIGID	None	None	RIGID	Typical
72	M72	N133	N135			RIGID	None	None	RIGID	Typical
73	M73	N138	N132			RIGID	None	None	RIGID	Typical
74	M74	N139	N137			RIGID	None	None	RIGID	Typical
75	M75	N142	N144			RIGID	None	None	RIGID	Typical
76	M76	N141	N143			RIGID	None	None	RIGID	Typical
77	M77	N146	N140			RIGID	None	None	RIGID	Typical
78	M78	N147	N145			RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat..	Analysis ...	Inactive	Seismic...
1	M1	BenPIN	BenPIN				Yes	Default			None
2	M2	BenPIN	BenPIN				Yes	Default			None
3	M3	BenPIN	BenPIN				Yes	Default			None
4	M4						Yes				None
5	M5						Yes				None
6	M6						Yes				None
7	M7						Yes				None
8	M8						Yes				None
9	M9						Yes				None
10	M10						Yes				None
11	M11						Yes				None
12	M12						Yes				None
13	M13						Yes	Default			None
14	M14						Yes	Default			None
15	M15						Yes	Default			None
16	M16						Yes	Default			None
17	M17						Yes	Default			None
18	M18						Yes	Default			None
19	M19						Yes				None
20	M20						Yes				None
21	M21						Yes	Default			None
22	M22	OOOOOX	OOOOOX				Yes				None
23	M23	OOOOOX	OOOOOX				Yes				None
24	M24	OOOOOX	OOOOOX				Yes	Default			None
25	M25						Yes				None
26	M26						Yes				None
27	M27						Yes				None
28	M28						Yes	** NA **	+y+3		None
29	M29						Yes	** NA **	+y+3		None
30	M30						Yes	** NA **	+y+3		None
31	M31						Yes	** NA **	+y+3		None
32	M32						Yes	** NA **	+y+3		None
33	M33						Yes	** NA **	+y+3		None
34	M34						Yes	** NA **	+y+3		None
35	M35						Yes	** NA **	+y+3		None
36	M36						Yes	** NA **	+y+3		None
37	M37						Yes	** NA **			None
38	M38						Yes	** NA **			None
39	M39						Yes	** NA **			None
40	M40						Yes	** NA **			None
41	M41	BenPIN					Yes	** NA **			None



Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
42	M42						Yes	** NA **			None
43	M43	BenPIN					Yes	** NA **			None
44	M44						Yes	** NA **			None
45	M45	BenPIN					Yes	** NA **			None
46	M46						Yes	** NA **			None
47	M47	BenPIN					Yes	** NA **			None
48	M48						Yes	** NA **			None
49	M49	BenPIN					Yes	** NA **			None
50	M50						Yes	** NA **			None
51	M51	BenPIN					Yes	** NA **			None
52	M52						Yes	** NA **			None
53	M53						Yes	** NA **			None
54	M54						Yes	** NA **			None
55	M55						Yes	** NA **			None
56	M56						Yes	** NA **			None
57	M57						Yes	** NA **			None
58	M58						Yes	** NA **			None
59	M59						Yes	** NA **			None
60	M60						Yes	** NA **			None
61	M61						Yes	** NA **			None
62	M62						Yes	** NA **			None
63	M63						Yes	** NA **			None
64	M64						Yes	** NA **			None
65	M65						Yes	** NA **			None
66	M66						Yes	** NA **			None
67	M67						Yes	** NA **			None
68	M68						Yes	** NA **			None
69	M69						Yes	** NA **			None
70	M70						Yes	** NA **			None
71	M71						Yes	** NA **			None
72	M72						Yes	** NA **			None
73	M73						Yes	** NA **			None
74	M74						Yes	** NA **			None
75	M75						Yes	** NA **			None
76	M76						Yes	** NA **			None
77	M77						Yes	** NA **			None
78	M78						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Perimeter C...	3.5									Lateral
2	M2	Perimeter C...	3.5									Lateral
3	M3	Perimeter C...	3.5									Lateral
4	M4	Grating Angle	2.275									Lateral
5	M5	Grating Angle	2.275									Lateral
6	M6	Grating Angle	2.275									Lateral
7	M7	Grating Angle	2.275									Lateral
8	M8	Grating Angle	2.275									Lateral
9	M9	Grating Angle	2.275									Lateral
10	M10	Perimeter	8	2.773	3.5							Lateral
11	M11	Perimeter	8	2.773	3.5							Lateral
12	M12	Perimeter	8	2.773	3.5							Lateral
13	M13	Cross Arm	2.75									Lateral
14	M14	Cross Arm	2.75									Lateral
15	M15	Cross Arm	2.75									Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
16	M16	Cross Arm	2.75									Lateral
17	M17	Cross Arm	2.75									Lateral
18	M18	Cross Arm	2.75									Lateral
19	M19	Arm	3.333									Lateral
20	M20	Arm	3.333									Lateral
21	M21	Arm	3.333									Lateral
22	M22	Support rail ...	3.5									Lateral
23	M23	Support rail ...	3.5									Lateral
24	M24	Support rail ...	3.5									Lateral
25	M25	Support rail	10		3.5							Lateral
26	M26	Support rail	10		3.5							Lateral
27	M27	Support rail	10		3.5							Lateral
28	M28	Mount Pipes	8									Lateral
29	M29	Mount Pipes	8									Lateral
30	M30	Mount Pipes	8									Lateral
31	M31	Mount Pipes	8									Lateral
32	M32	Mount Pipes	8									Lateral
33	M33	Mount Pipes	8									Lateral
34	M34	Mount Pipes	8									Lateral
35	M35	Mount Pipes	8									Lateral
36	M36	Mount Pipes	8									Lateral

Member Area Loads (BLC 1 : DL)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N17	N16	N19	N18	Y	Two Way	-10
2	N8	N7	N10	N9	Y	Two Way	-10
3	N26	N25	N28	N27	Y	Two Way	-10

Member Area Loads (BLC 28 : Ice DL)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N17	N16	N19	N18	Y	Two Way	-7.888
2	N8	N7	N10	N9	Y	Two Way	-7.888
3	N26	N25	N28	N27	Y	Two Way	-7.888

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
1	DL	DL		-1		19		3	
2	Maintenance LL - LV	LL				1			
3	Installation LL - LM	LL				1			
4	Wind - 0 Deg (X)	WL				19		33	
5	Wind - 30 Deg (X)	WL				19		33	
6	Wind - 60 Deg (X)	WL				19		33	
7	Wind - 90 Deg (X)	WL				19		33	
8	Wind - 120 Deg (X)	WL				19		33	
9	Wind - 150 Deg (X)	WL				19		33	
10	Wind - 180 Deg (X)	WL				19		33	
11	Wind - 210 Deg (X)	WL				19		33	
12	Wind - 240 Deg (X)	WL				19		33	
13	Wind - 270 Deg (X)	WL				19		33	
14	Wind - 300 Deg (X)	WL				19		33	
15	Wind - 330 Deg (X)	WL				19		33	
16	Wind - 0 Deg (Z)	WL				19		33	
17	Wind - 30 Deg (Z)	WL				19		33	



Company : Black & Veatch Corp.
 Designer : Jeerawadee Jirapo
 Job Number : 406642.6056
 Model Name : 842863 Risa Model

Apr 4, 2022
 2:04 PM
 Checked By: Joohwan Jung

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
18	Wind - 60 Deg (Z)	WL				19		33	
19	Wind - 90 Deg (Z)	WL				19		33	
20	Wind - 120 Deg (Z)	WL				19		33	
21	Wind - 150 Deg (Z)	WL				19		33	
22	Wind - 180 Deg (Z)	WL				19		33	
23	Wind - 210 Deg (Z)	WL				19		33	
24	Wind - 240 Deg (Z)	WL				19		33	
25	Wind - 270 Deg (Z)	WL				19		33	
26	Wind - 300 Deg (Z)	WL				19		33	
27	Wind - 330 Deg (Z)	WL				19		33	
28	Ice DL	DL				19		33	3
29	Ice Wind - 0 Deg (X)	WL				19		33	
30	Ice Wind - 30 Deg (X)	WL				19		33	
31	Ice Wind - 60 Deg (X)	WL				19		33	
32	Ice Wind - 90 Deg (X)	WL				19		33	
33	Ice Wind - 120 Deg (X)	WL				19		33	
34	Ice Wind - 150 Deg (X)	WL				19		33	
35	Ice Wind - 180 Deg (X)	WL				19		33	
36	Ice Wind - 210 Deg (X)	WL				19		33	
37	Ice Wind - 240 Deg (X)	WL				19		33	
38	Ice Wind - 270 Deg (X)	WL				19		33	
39	Ice Wind - 300 Deg (X)	WL				19		33	
40	Ice Wind - 330 Deg (X)	WL				19		33	
41	Ice Wind - 0 Deg (Z)	WL				19		33	
42	Ice Wind - 30 Deg (Z)	WL				19		33	
43	Ice Wind - 60 Deg (Z)	WL				19		33	
44	Ice Wind - 90 Deg (Z)	WL				19		33	
45	Ice Wind - 120 Deg (Z)	WL				19		33	
46	Ice Wind - 150 Deg (Z)	WL				19		33	
47	Ice Wind - 180 Deg (Z)	WL				19		33	
48	Ice Wind - 210 Deg (Z)	WL				19		33	
49	Ice Wind - 240 Deg (Z)	WL				19		33	
50	Ice Wind - 270 Deg (Z)	WL				19		33	
51	Ice Wind - 300 Deg (Z)	WL				19		33	
52	Ice Wind - 330 Deg (Z)	WL				19		33	
53	BLC 1 Transient Area...	None						9	
54	BLC 28 Transient Are...	None						9	

Load Combinations

	Description	S...	P...	SR...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	WIND LOAD COMBOS (135 MPH)																			
2	1.2DL + WL (0 DEG)	Yes	Y	1	1.2	4	1	16	1											
3	1.2DL + WL (30 DEG)	Yes	Y	1	1.2	5	1	17	1											
4	1.2DL + WL (60 DEG)	Yes	Y	1	1.2	6	1	18	1											
5	1.2DL + WL (90 DEG)	Yes	Y	1	1.2	7	1	19	1											
6	1.2DL + WL (120 DEG)	Yes	Y	1	1.2	8	1	20	1											
7	1.2DL + WL (150 DEG)	Yes	Y	1	1.2	9	1	21	1											
8	1.2DL + WL (180 DEG)	Yes	Y	1	1.2	10	1	22	1											
9	1.2DL + WL (210 DEG)	Yes	Y	1	1.2	11	1	23	1											
10	1.2DL + WL (240 DEG)	Yes	Y	1	1.2	12	1	24	1											
11	1.2DL + WL (270 DEG)	Yes	Y	1	1.2	13	1	25	1											
12	1.2DL + WL (300 DEG)	Yes	Y	1	1.2	14	1	26	1											
13	1.2DL + WL (330 DEG)	Yes	Y	1	1.2	15	1	27	1											
14																				
15	MOUNT LOAD COMBOS (30 MPH)																			



Load Combinations (Continued)

	Description	S...	P...	SR...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...
16	1.4DL	Yes	Y		1	1.4													
17	1.2DL + 1.5LV	Yes	Y		1	1.2	2	1.5											
18	1.2DL + 1.5LM + WL (0 DEG)	Yes	Y		1	1.2	3	1.5	4	.049	16	.049							
19	1.2DL + 1.5LM + WL (30 DEG)	Yes	Y		1	1.2	3	1.5	5	.049	17	.049							
20	1.2DL + 1.5LM + WL (60 DEG)	Yes	Y		1	1.2	3	1.5	6	.049	18	.049							
21	1.2DL + 1.5LM + WL (90 DEG)	Yes	Y		1	1.2	3	1.5	7	.049	19	.049							
22	1.2DL + 1.5LM + WL (120 DEG)	Yes	Y		1	1.2	3	1.5	8	.049	20	.049							
23	1.2DL + 1.5LM + WL (150 DEG)	Yes	Y		1	1.2	3	1.5	9	.049	21	.049							
24	1.2DL + 1.5LM + WL (180 DEG)	Yes	Y		1	1.2	3	1.5	10	.049	22	.049							
25	1.2DL + 1.5LM + WL (210 DEG)	Yes	Y		1	1.2	3	1.5	11	.049	23	.049							
26	1.2DL + 1.5LM + WL (240 DEG)	Yes	Y		1	1.2	3	1.5	12	.049	24	.049							
27	1.2DL + 1.5LM + WL (270 DEG)	Yes	Y		1	1.2	3	1.5	13	.049	25	.049							
28	1.2DL + 1.5LM + WL (300 DEG)	Yes	Y		1	1.2	3	1.5	14	.049	26	.049							
29	1.2DL + 1.5LM + WL (330 DEG)	Yes	Y		1	1.2	3	1.5	15	.049	27	.049							
30																			
31	ICE LOAD COMBOS (1", 50 MPH)																		
32	1.2DL + Ice DL + Ice WL (0 DEG)	Yes	Y		1	1.2	28	1	29	1	41	1							
33	1.2DL + Ice DL + Ice WL (30 DEG)	Yes	Y		1	1.2	28	1	30	1	42	1							
34	1.2DL + Ice DL + Ice WL (60 DEG)	Yes	Y		1	1.2	28	1	31	1	43	1							
35	1.2DL + Ice DL + Ice WL (90 DEG)	Yes	Y		1	1.2	28	1	32	1	44	1							
36	1.2DL + Ice DL + Ice WL (120 DEG)	Yes	Y		1	1.2	28	1	33	1	45	1							
37	1.2DL + Ice DL + Ice WL (150 DEG)	Yes	Y		1	1.2	28	1	34	1	46	1							
38	1.2DL + Ice DL + Ice WL (180 DEG)	Yes	Y		1	1.2	28	1	35	1	47	1							
39	1.2DL + Ice DL + Ice WL (210 DEG)	Yes	Y		1	1.2	28	1	36	1	48	1							
40	1.2DL + Ice DL + Ice WL (240 DEG)	Yes	Y		1	1.2	28	1	37	1	49	1							
41	1.2DL + Ice DL + Ice WL (270 DEG)	Yes	Y		1	1.2	28	1	38	1	50	1							
42	1.2DL + Ice DL + Ice WL (300 DEG)	Yes	Y		1	1.2	28	1	39	1	51	1							
43	1.2DL + Ice DL + Ice WL (330 DEG)	Yes	Y		1	1.2	28	1	40	1	52	1							

Envelope Joint Reactions

Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-in]	LC	MY [k-in]	LC	MZ [k-in]	LC	
1	N20	max	1209.726	2	2297.564	32	2609.383	5	12.011	41	38.685	5	22.779	8
2		min	-1218.085	8	-412.071	8	-2606.791	11	-2.697	5	-38.551	11	-70.016	2
3	N11	max	2335.444	2	2287.392	36	1523.769	4	55.734	6	39.193	9	43.613	36
4		min	-2328.872	8	-411.864	12	-1536.495	10	-21.232	12	-39.086	3	-8.317	12
5	N1	max	2259.727	13	2287.054	40	1735.688	6	18.509	4	39.062	13	29.25	10
6		min	-2262.14	7	-412.389	4	-1725.325	12	-61.487	40	-39.142	7	-13.553	4
7	Totals:	max	5634.534	2	6002.95	33	5591.431	5						
8		min	-5634.55	8	2507.168	9	-5591.421	11						

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

Member	Shape	Code Check	Loc[ft]	LC	Shear	Loc[ft]	Dir	LC	phi*Pnc	phi*Pnt	phi*Mn	phi*Mn	Cb	Eqn
1	M1	PL6.5x0.375	.381	1.75	10	.171	3.026	y	6	3658.14	78975	7.404	93.995	1... H1-1b
2	M2	PL6.5x0.375	.396	1.75	2	.165	3.026	y	10	3658.14	78975	7.404	94.305	1... H1-1b
3	M3	PL6.5x0.375	.401	1.75	6	.174	3.026	y	2	3658.14	78975	7.404	94.788	1... H1-1b
4	M4	L2x2x4	.347	0	10	.026	0	y	4	23539....	30585.6	8.291	18.922	2... H2-1
5	M5	L2x2x4	.347	0	10	.031	0	z	4	23539....	30585.6	8.291	18.922	2... H2-1
6	M6	L2x2x4	.390	0	6	.028	0	y	12	23539....	30585.6	8.291	18.922	2... H2-1
7	M7	L2x2x4	.310	0	12	.031	2.275	y	33	23539....	30585.6	8.291	18.922	2... H2-1
8	M8	L2x2x4	.363	0	2	.026	0	y	8	23539....	30585.6	8.291	18.922	2... H2-1
9	M9	L2x2x4	.323	0	8	.030	0	z	8	23539....	30585.6	8.291	18.922	2... H2-1
10	M10	HSS3.500x0.165	.180	2.583	2	.070	4		8	65728....	71569....	76.038	76.038	1... H1-1b
11	M11	HSS3.500x0.165	.191	2.583	6	.085	4		12	65728....	71569....	76.038	76.038	1... H1-1b
12	M12	HSS3.500x0.165	.176	2.583	10	.073	4		4	65728....	71569....	76.038	76.038	1... H1-1b



Company : Black & Veatch Corp.
 Designer : Jeerawadee Jirapo
 Job Number : 406642.6056
 Model Name : 842863 Risa Model

Apr 4, 2022
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 Checked By: JooHwan Jung

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

Member	Shape	Code Check	Loc[ft]	LC	Shear	Loc[ft]	Dir	LC	phi*Pnc...	phi*Pnt...	phi*Mn...	phi*Mn...Cb	Eqn	
13	M13	C3.38x2.06x0.25	.387	0	10	.049	2.349	y	34	47760....	56700	26.434	69.023	1... H1-1b
14	M14	C3.38x2.06x0.25	.376	0	10	.040	2.349	z	4	47760....	56700	26.434	69.023	1... H1-1b
15	M15	C3.38x2.06x0.25	.367	0	6	.047	2.349	y	42	47760....	56700	26.434	69.023	1... H1-1b
16	M16	C3.38x2.06x0.25	.392	0	6	.043	2.349	z	12	47760....	56700	26.434	69.023	1... H1-1b
17	M17	C3.38x2.06x0.25	.371	0	2	.047	2.349	y	38	47760....	56700	26.434	69.023	1... H1-1b
18	M18	C3.38x2.06x0.25	.373	0	2	.040	2.349	z	8	47760....	56700	26.434	69.023	1... H1-1b
19	M19	HSS4X4X6	.304	3.333	12	.101	3.333	z	7	188250...	197892	264.546	264.546	1... H1-1b
20	M20	HSS4X4X6	.306	3.333	7	.116	3.333	y	20	188250...	197892	264.546	264.546	1... H1-1b
21	M21	HSS4X4X6	.311	3.333	3	.099	3.333	z	11	188250...	197892	264.546	264.546	1... H1-1b
22	M22	L6.6x4.46x0.25	.313	3.464	2	.035	3.5	z	8	51170....	87561	29.578	85.504	1... H2-1
23	M23	L6.6x4.46x0.25	.315	3.464	6	.036	3.5	z	12	51170....	87561	29.578	85.504	1... H2-1
24	M24	L6.6x4.46x0.25	.300	3.464	10	.035	3.5	z	4	51170....	87561	29.578	85.504	1... H2-1
25	M25	PIPE 2.5	.163	1.562	13	.078	1.458		2	22748....	66654	56.718	56.718	1... H1-1b
26	M26	PIPE 2.5	.156	8.437	3	.077	1.458		4	22748....	66654	56.718	56.718	1... H1-1b
27	M27	PIPE 2.5	.162	1.354	6	.077	8.646		3	22748....	66654	56.718	56.718	1... H1-1b
28	M28	PIPE 2.5	.251	2.167	7	.085	2.167		13	33487....	66654	56.718	56.718	4... H1-1b
29	M29	PIPE 2.5	.195	2.167	9	.092	2.167		2	33487....	66654	56.718	56.718	3... H1-1b
30	M30	PIPE 2.5	.173	2.167	9	.090	2.167		10	33487....	66654	56.718	56.718	4... H1-1b
31	M31	PIPE 2.5	.184	2.167	5	.089	2.167		9	33487....	66654	56.718	56.718	2... H1-1b
32	M32	PIPE 2.5	.191	2.167	5	.089	2.167		13	33487....	66654	56.718	56.718	3... H1-1b
33	M33	PIPE 2.5	.255	2.167	3	.083	2.167		9	33487....	66654	56.718	56.718	4... H1-1b
34	M34	PIPE 2.5	.239	2.167	11	.100	2.167		5	33487....	66654	56.718	56.718	3... H1-1b
35	M35	PIPE 2.5	.172	2.167	13	.103	2.167		5	33487....	66654	56.718	56.718	3... H1-1b
36	M36	PIPE 2.5	.181	2.167	13	.090	2.167		2	33487....	66654	56.718	56.718	4... H1-1b



Company : Black & Veatch Corp.
Designer : Jeerawadee Jirapo
Job Number : 406642.6056
Model Name : 842863 Risa Model

Apr 4, 2022
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Checked By: Joohwan Jung

Member End Reactions

	LC	Member Label	Me...	Axial[k]	y Shear[k]	z Shear[k]	Torque[k-in]	y-y Moment[k-in]	z-z Moment[k-in]
1	3	M21	I	-0.366	-1.354	.059	-3.415	.055	-.232
2			J	-1.077	-1.945	-1.184	-3.012	-17.421	64.151

APPENDIX D
ADDITIONAL CALCUATIONS



Client: CCI

Computed By: Jeerawadee J.

Site Name: GRISWOLD CENTRAL (BOBOS01001A)

Date: 4/4/2022

Work Order: 842863.584378

Verified By: JooHwan Jung

BLACK & VEATCH

Title: MOUNT ANALYSIS REPORT

Date: 4/4/2022

Rectangular Weld Analysis for Antenna Mount to Tower Connection

The forces acting on the plate are from M21 from RISA-3D Load Combination 3

Design Method: LRFD

Applied Loads:

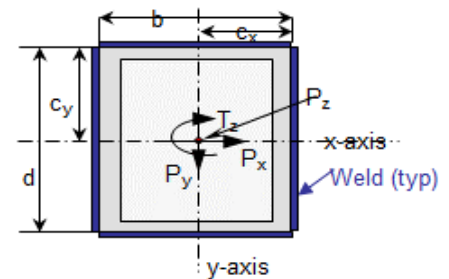
$P_x =$	1.184	kip	$M_x =$	64.151	kip-in
$P_y =$	1.945	kip	$M_y =$	17.421	kip-in
$P_z =$	1.077	kip	$M_z =$	3.012	kip-in
$\phi F_w =$	1.392	$(\frac{\text{kip}}{\text{in}}) / (\frac{1}{16}'' \text{ weld})$		AISC Eq. (8-2a)	

Base Metal Properties:

$d_{(arm)} =$	4	in	$t_{(arm)} =$	0.25	in
$b_{(arm)} =$	4	in	$t_{(plate)} =$	0.625	in
$F_{y(arm)} =$	46	ksi	$F_{y(plate)} =$	50	ksi
$F_{u(arm)} =$	58	ksi	$F_{u(plate)} =$	65	ksi

CALCULATIONS

Distance from y-axis to Edge of Weld, $c_x =$	2	in
Distance from x-axis to Edge of Weld, $c_y =$	2	in
Total Length of Weld in x-direction, $L_x =$	8	in
Total Length of Weld in y-direction, $L_y =$	8	in
Total Length of Weld, $L_w =$	16	in
Section Modulus of Weld About x-axis, $S_x =$	21.333	in ²
Section Modulus of Weld About y-axis, $S_y =$	21.333	in ²
Polar Moment of Inertia About z-axis, $I_z =$	85.333	in ³
Shear Stress on x-axis of Weld, $f_{vx} =$	0.148	kip/in
Shear Stress on y-axis of Weld, $f_{vy} =$	0.243	kip/in
Torsional Stress on x-axis of Weld, $f_{tx} =$	0.071	kip/in
Torsional Stress on y-axis of Weld, $f_{ty} =$	0.071	kip/in
Axial Stress on Weld, $f_a =$	0.067	kip/in
Bending Stress about x-axis of Weld, $f_{bx} =$	3.007	kip/in
Bending Stress about y-axis of Weld, $f_{by} =$	0.817	kip/in
Total Force Acting in x-direction, $f_1 =$	0.219	kip/in
Total Force Acting in y-direction, $f_2 =$	0.314	kip/in
Total Force Acting in z-direction, $f_3 =$	3.891	kip/in
Resultant Force on Weld, $f_r =$	3.91	kip/in



Weld Strength Check

Existing Weld Size, $t_w =$	0.5	in
Weld Stress Ratio, $SR_w =$	35.11%	

Base Metal Check

Arm Tensile Rupture Strength, $\phi T_{arm} =$	174	kip
Arm Shear Rupture Strength, $\phi V_{arm} =$	41.4	kip
Plate Tensile Rupture Strength, $\phi T_{plate} =$	487.5	kip
Plate Shear Rupture Strength, $\phi V_{plate} =$	112.5	kip
Base Metal Stress Ratio, $SR_b =$	35.78%	

$P_x =$ Major axis load (x-axis)	$P_y =$ Minor axis load (y-axis)	$P_z =$ Axial Load (z-axis)	$F_{EXX} = 70$ ksi Assumed
$M_x =$ Moment about x-axis	$M_y =$ Moment about y-axis	$T_z =$ Torque about z-axis	

$c_x = b/2$	$L_y = 2d$	$f_{vy} = P_y/L_y$	$f_{by} = M_y/S_y$	$S_y = b/3(3d + b)$	$f_1 = f_{vx} + f_{tx}$	$f_r = (f_1^2 + f_2^2 + f_3^2)^{1/2}$
$c_y = d/2$	$L_w = L_x + L_y$	$f_a = P_z/L_w$	$f_{tx} = T_z(c_y/I_z)$	$S_x = d/3(3b + d)$	$f_2 = f_{vy} + f_{ty}$	$\phi T = 0.75(F_u t L_w)$
$L_x = 2b$	$f_{vx} = P_x/L_x$	$f_{bx} = M_x/S_x$	$f_{ty} = T_z(c_x/I_z)$	$I_z = [(b + d)^3]/6$	$f_3 = f_a + f_{bx} + f_{by}$	$\phi V = 0.75(0.6 F_y t L_x)$
$SR_T = f_3 L_w / \phi T_{plate}$		$SR_w = f_r / (\phi F_w t_w 16)$		$SR_V = f_2 L_w / \phi V_{plate}$		



Client: CCI

Computed By: Jeerawadee J.

Site Name: GRISWOLD CENTRAL (BOBOS01001A)

Date: 4/4/2022

Work Order: 842863.584378

Verified By: JooHwan Jung

BLACK & VEATCH

Title: MOUNT ANALYSIS REPORT

Date: 4/4/2022

Bolt Analysis of Antenna Mount Arm to Tower Connection

The forces acting on the plate are from M21 from RISA-3D Load Combination 3

Design Method: LRFD

Applied Loads:

$P_x =$	1.184	kip
$P_y =$	1.945	kip
$P_z =$	1.077	kip
$M_x =$	64.151	kip-in
$M_y =$	17.421	kip-in
$M_z =$	3.012	kip-in

Bolt Properties:

$d_b =$	0.625	in
$A_b =$	0.307	in ²
$N_b =$	4	

Load Location Coordinates:

$X_o =$	4.5	in
$Y_o =$	4.5	in

Bolt Strength:

$F_{nt} =$	90	ksi
$F_{nv} =$	54	ksi

AISC Table (J3.2)

Bolt Location Coordinates (in):

Bolt #	X_b	Y_b
#1	1	1
#2	1	8
#3	8	8
#4	8	1

CALCULATIONS

Bolt Group Centroid y-coordinate, $Y_c = 4.5$ in

Bolt Group Centroid x-coordinate, $X_c = 4.5$ in

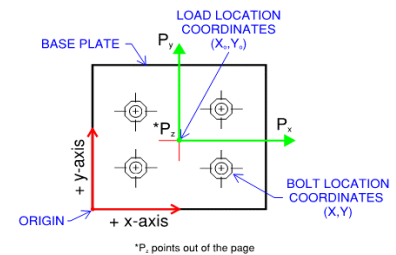
Load Eccentricity in x-direction, $e_x = 0$ in

Load Eccentricity in y-direction, $e_y = 0$ in

Total Moment Including Load Eccentricity, $\Sigma M_x = 64.15$ kip-in

Total Moment Including Load Eccentricity, $\Sigma M_y = 17.42$ kip-in

Total Moment Including Load Eccentricity, $\Sigma M_z = 3.01$ kip-in



Bolt #	Centroid Dist. (in)		Polar Moments of Inertia (in ⁴ /in ²)			Force per Bolt (kip)	
	d_x	d_y	I_x	I_y	I_{xy}	Tension	Shear
#1	-3.5	-3.5	12.25	12.25	12.25	3.069	0.553
#2	-3.5	3.5	12.25	12.25	-12.25	6.096	0.423
#3	3.5	3.5	12.25	12.25	12.25	3.607	0.623
#4	3.5	-3.5	12.25	12.25	-12.25	5.557	0.718
SUM:			49	49	0		

Bolt Shear Strength Check

Available Shear Strength per Bolt, $\phi V_n = 12.43$ kip

AISC Eq. (J3-1)

Bolt Shear Stress Ratio, $SR_v = 5.78\%$

Bolt Tensile Strength Check

Nom. Tensile Stress (Including Effects of Shear), $F'_{nt} = 90$ ksi

AISC Eq. (J3-3a)

Available Tensile Strength per Bolt, $\phi T_n = 20.72$ kip

AISC Eq. (J3-2)

Bolt Tension Stress Ratio, $SR_T = 29.42\%$

$P_x =$ Major Axis Load (X-Axis)

$M_x =$ Moment About X-Axis

$d_b =$ Diameter of Bolt

$P_y =$ Minor Axis Load (Y-Axis)

$M_y =$ Moment About Y-Axis

$A_b =$ Cross-Sectional Area of Bolt

$P_z =$ Axial Load (Z-Axis)

$M_z =$ Torque About Z-Axis

$N_b =$ Number of Bolts

$d_x = Y_b - Y_c$	$I_{xy} = d_x d_y$	$SR_v = V_u / \phi V_n$	$F'_{nt} = 1.3F_{nt} - (F_{nt} / \phi F_{nv})(V_u / A_b) \leq F_{nt}$
$d_y = X_b - X_c$	$\Sigma M_x = M_x + P_z(e_y)$	$SR_T = T_u / \phi T_n$	$T_{ui} = \Sigma P_z / N_b - [(\Sigma M_x \Sigma I_y + \Sigma M_y \Sigma I_{xy}) / (\Sigma I_x \Sigma I_y - \Sigma I_{xy}^2)] d_x$
$I_x = d_y^2$	$\Sigma M_y = M_y + P_x(e_x)$	$\phi V_n = 0.75 F_{nv} A_b$	$+ [(\Sigma M_y \Sigma I_x + \Sigma M_x \Sigma I_{xy}) / (\Sigma I_x \Sigma I_y - \Sigma I_{xy}^2)] d_y$
$I_y = d_x^2$	$\Sigma M_z = M_z + P_x(e_y) + P_y(e_x)$	$\phi T_n = 0.75 F'_{nt} A_b$	$V_{ui} = [(\Sigma P_x / N_b - \Sigma M_z d_y / (\Sigma I_x + \Sigma I_y))^2 + (\Sigma P_y / N_b - \Sigma M_z d_x / (\Sigma I_x + \Sigma I_y))^2]^{1/2}$

Exhibit F

Power Density/RF Emissions Report

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

Dish Wireless Existing Facility

Site ID: 842863

BOBOS01001A
31 Yurechko Drive
Jewett City, Connecticut 06351

May 25, 2022

EBI Project Number: 6222003244

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	10.98%

May 25, 2022

Attn: Dish Wireless

Emissions Analysis for Site: 842863 - BOBOS01001A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **31 Yurechko Drive in Jewett City, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is $1000 \mu\text{W}/\text{cm}^2$. 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 31 Yurechko Drive in Jewett City, 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 109 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):	109 feet	Height (AGL):	109 feet	Height (AGL):	109 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 AI MPE %:	0.71%	Antenna BI MPE %:	0.71%	Antenna CI MPE %:	0.71%

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	0.71%
AT&T	10.27%
Site Total MPE % :	10.98%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	0.71%
Dish Wireless Sector B Total:	0.71%
Dish Wireless Sector C Total:	0.71%
Site Total MPE % :	
	10.98%

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 ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Dish Wireless 600 MHz n71	4	110.82	109.0	1.50	600 MHz n71	400	0.38%
Dish Wireless 1900 MHz n70	4	245.22	109.0	3.32	1900 MHz n70	1000	0.33%
						Total:	0.71%

• 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:	0.71%
Sector B:	0.71%
Sector C:	0.71%
Dish Wireless Maximum MPE % (Sector A):	0.71%
Site Total:	10.98%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **10.98%** 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:
31 YURECHKO DRIVE, JEWETT CITY, CT 06351**

CCATT 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: 842863/GRISWOLD CENTRAL
Customer Site ID: BOBOS01001A/
Site Address: 31 YURECHKO DRIVE, JEWETT CITY, CT 06351**

Crown Castle

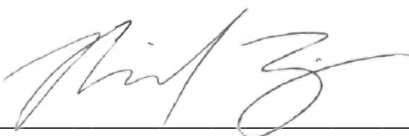

By:  _____ Date: 6/3/22
Richard Zajac
Site Acquisition Specialist

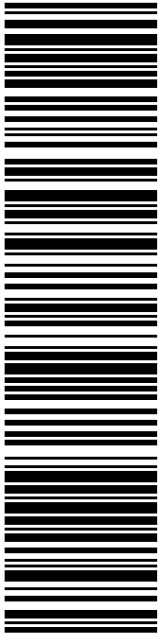
Exhibit H

Recipient Mailings



DANA BENNETT
FIRST SELECTMAN-JEWETT CITY
28 MAIN ST
JEWETT CITY CT 06351-2204

USPS TRACKING #



9405 5036 9930 0275 7777 29

P

06/16/2022

Expected Delivery Date: 06/21/22

Ref#: DS-842863

0006


C004

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

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9405 5036 9930 0275 7777 29 0089 5000 0010 6351
\$8.95
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Trans. #: 565812739	Priority Mail® Postage: \$8.95
Print Date: 06/16/2022	Total: \$8.95
Ship Date: 06/16/2022	
Expected Delivery Date: 06/21/2022	

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


To: DANA BENNETT
FIRST SELECTMAN-JEWETT CITY
28 MAIN ST
JEWETT CITY CT 06351-2204

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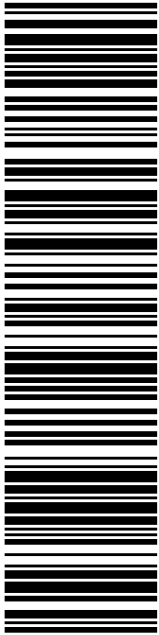


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MARIO TRISTANY JR.
TOWN PLANNER
28 MAIN ST
JEWETT CITY CT 06351-2204

USPS TRACKING #



9405 5036 9930 0275 7777 36

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06/16/2022

Expected Delivery Date: 06/21/22

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STURBRIDGE MA 01566-1359

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Trans. #: 565812739	Priority Mail® Postage: \$8.95
Print Date: 06/16/2022	Total: \$8.95
Ship Date: 06/16/2022	
Expected Delivery Date: 06/21/2022	

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

To: MARIO TRISTANY JR.
TOWN PLANNER
28 MAIN ST
JEWETT CITY CT 06351-2204


Ref#: DS-842863

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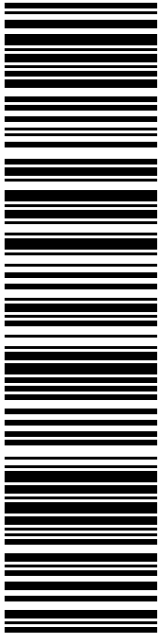
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PHILIP YURECHKO
55 YURECHKO DR
GRISWOLD CT 06351-1540

USPS TRACKING #



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P

06/16/2022

Expected Delivery Date: 06/21/22
Ref#: DS-842863
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R001

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06/16/2022

Mailed from 01566

Click-N-Ship®

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USPS TRACKING # :	
9405 5036 9930 0275 7777 43	
Trans. #:	565812739
Print Date:	06/16/2022
Ship Date:	06/16/2022
Expected Delivery Date:	06/21/2022
Priority Mail® Postage:	\$8.95
Total:	\$8.95
From:	DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359
To:	PHILIP YURECHKO 55 YURECHKO DR GRISWOLD CT 06351-1540
Ref#:	DS-842863
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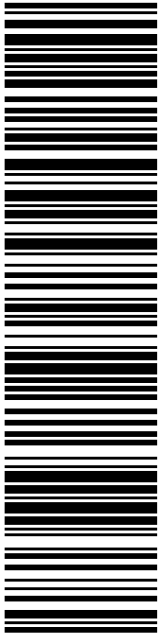
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RICH ZAJAC
CROWN CASTLE
4545 E RIVER RD
STE 320
W HENRIETTA NY 14586-9024

USPS TRACKING #




9405 5036 9930 0275 7777 67

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

Expected Delivery Date: 06/21/22
Ref#: DS-842863
0006

R013



Click-N-Ship®


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 Flat Rate Env
U.S. POSTAGE PAID
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USPS TRACKING # :
9405 5036 9930 0275 7777 67

Trans. #: 565812739	Priority Mail® Postage: \$8.95
Print Date: 06/16/2022	Total: \$8.95
Ship Date: 06/16/2022	
Expected Delivery Date: 06/21/2022	

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

Ref#: DS-842863

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

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842863 Crown Dish



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

06/21/2022 09:33 AM

Product	Qty	Unit Price	Price
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Prepaid Mail	1		\$0.00
West Henrietta, NY 14586			
Weight: 0 lb 2.00 oz			
Acceptance Date:			
Tue 06/21/2022			
Tracking #:			
9405 5036 9930 0275 7777 67			

Prepaid Mail	1		\$0.00
Jewett City, CT 06351			
Weight: 0 lb 9.60 oz			
Acceptance Date:			
Tue 06/21/2022			
Tracking #:			
9405 5036 9930 0275 7777 29			

Prepaid Mail	1		\$0.00
Jewett City, CT 06351			
Weight: 0 lb 9.70 oz			
Acceptance Date:			
Tue 06/21/2022			
Tracking #:			
9405 5036 9930 0275 7777 36			

Prepaid Mail	1		\$0.00
Jewett City, CT 06351			
Weight: 0 lb 11.70 oz			
Acceptance Date:			
Tue 06/21/2022			
Tracking #:			
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Grand Total:			\$0.00
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