



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

June 2, 2022

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

RE: Tower Share Application  
1875 Noble Avenue, Bridgeport, CT 06610  
Latitude: 41.210308  
Longitude: -73.181116  
Site #: 822779\_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 1875 Noble Avenue (a/k/a 1 Beardsley Park), Bridgeport, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 MHz 5G antennas at the 86-foot level of the existing 120-foot flagpole 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 base of the stealth structure. Included are plans by French & Parrello, dated April 29, 2022, Exhibit C. Also included is a structural analysis prepared by Crown Castle, dated February 2, 2022, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the City of Bridgeport Planning & Zoning Commission on March 27, 2000. 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 Mayor Joseph Ganim and Dennis Buckley, Zoning Administrator for the City of Bridgeport, as well as the tower owner (Crown Castle) and property owner (Connecticut Zoological Society).

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 120-feet and the Dish Wireless LLC antennas will be located at a centerline height of 86-feet.
2. The proposed modifications will not result in an increase of the site boundary as depicted on the attached site plan.



**NSS** **NORTHEAST**  
SITE SOLUTIONS

*Turnkey Wireless Development*

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 16.90% 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 Bridgeport. 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 86-foot level of the existing 120-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 Bridgeport.

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](mailto:denise@northeastsitesolutions.com)



**NSS** **NORTHEAST**  
SITE SOLUTIONS  
*Turnkey Wireless Development*

Attachments

Cc: Mayor Joseph Ganim  
City of Bridgeport  
Margaret E. Morton Government Center  
999 Broad Street  
Bridgeport, CT 06604

Dennis Buckley, Zoning Administrator  
Bridgeport City Hall  
Zoning Department  
45 Lyon Terrace, Room 210  
Bridgeport, CT 06604

Connecticut Zoological Society, Property Owner  
1875 Noble Avenue  
Bridgeport, CT 06610

Crown Castle, Tower Owner

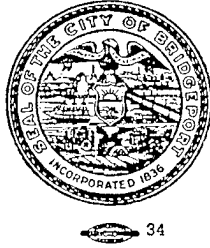
# Exhibit A

## **Original Facility Approval**



ZONING DEPARTMENT  
DEVELOPMENT ADMINISTRATION

City of Bridgeport



DATE: March 31, 2000

OUR FILE: # 2K-07

Attorney J. Brendan Sharkey  
100 Filley Street  
Bloomfield, CT 06002

RE: Site Plan Review  
1875 Noble Avenue  
Bridgeport, CT

Dear Attorney Sharkey:

At its meeting held on Monday, March 27, 2000, the Planning & Zoning Commission voted to approve conditionally the application submitted by you which sought a Site Plan Review under Sec. 14-2 of the Bridgeport Zoning Regulations to permit the installation of a 120' high flagpole which will house telecommunications antennas & associated equipment within the Beardsley Zoo pavilion in a ZOOLOGICAL PARK ZONE.

The Commission stipulated the following conditions for its approval:

1. Stockade fencing not less than 6' high shall be installed to encompass & enclose the proposed equipment area.
2. No equipment shall exceed the height of the fencing required in condition No. 1 above.
3. Arborvitae trees no less than 6' high shall be planted at 6' intervals around the perimeter of the equipment enclosure area.
4. All required fencing & landscape trees are to be maintained at all times.
5. A "Removal Bond" as determined by the City Attorney's Office shall be filed with the Bridgeport Zoning Department prior to the Certification Of An Application For Zoning Compliance.

The Commission assigned the following reason for its action:

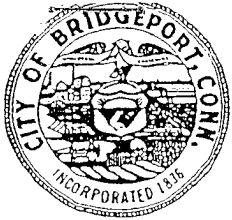
1. As to the Site Plan Review, the project, as approved, complies with the standards of Sec. 14-2-5 of the Bridgeport Zoning Regulations.

Very truly yours,

A handwritten signature in cursive script that reads "William A. Shaw".

William A. Shaw, Clerk  
Planning & Zoning Commission

WAS:map



NO. ....  
**APPLICATION FOR CERTIFICATE OF ZONING COMPLIANCE**  
**ZONING COMMISSION**  
**CITY OF BRIDGEPORT, CONN.**

CT11-240A  
**CITY HALL**  
 45 Lyon Terrace  
 Room No. 206  
 Bridgeport, Conn.

Applicant Omnipoint Communications, Inc. Date 5/17/00 19.....

Address of Work 1875 Noble Ave <sup>Owner or Tenant Only</sup>  
45 Lyons Terrace  
 Number

on the owner of Noble East main St side of the above street about ..... feet  
 North, South, East, West

from Beardsley Zoo Lot No. 9-9A-9-B-9C  
 North, South, East, West Street

Block No. 3000 as shown on Tax Assessor's Maps. C.A.M. Area NO Wetlands NO  
 Yes - No Yes - No

Dimension of Lot: Entire city Block

Size of Proposed Building or Addition ..... No. Stories .....

Wood Frame ..... Brick Veneer ..... Masonry .....

Other Work (Describe in Detail) Installation of telecommunication antennas and associated equipment. (flagpole)

Proposed Use of Above (Describe in Detail) Telecommunication antenna for cell phones. as approved by Z.B.P. 1/11/00 P.Z. approval 3/27/00

Presently Existing Use 200 Zone ZP

Previous use and date discontinued (if applicable) .....

Is pre-existing right claimed yes  
 Yes - No

Signature J. Brendan Sharkey Print Name J. Brendan Sharkey, Esq.

If signed by agent state capacity (attorney, builder, etc.) ..... Attorney for Omnipoint Communications (The Applicant)

Mailing Address 100 Filley Street, Bloomfield, CT 06002 Phone No. 860/692-7100

**INSTRUCTIONS**  
 Fill Out This Application In Ink or Type

A detailed plot plan must be submitted with this application showing the proposed or existing lot and building dimensions and the location of all buildings in relation to the street line, side lot lines and rear lot line. NOTE: The occupancy and use of land, buildings and structures prior to the issuance of a Certificate of Zoning Compliance is prohibited. This is not the said certificate. Fees, payable at the time of making application, are not returnable and, are in an amount established by the Zoning Commission.

Fee received 100 Date 5/17/00 By aud.

PLAN AND APPLICATION

C.A.M. APPROVAL

FINAL INSPECTION

APPROVED FOR  
 ZONING COMPLIANCE ONLY  
 ZONING DEPARTMENT  
 CITY OF BRIDGEPORT, CONN.  
 BY pac DATE: 10/6/00

Certificate Issued Date ..... 19.....

# Exhibit B

## Property Card

# 1 BEARDSLEY PARK NA

**Location** 1 BEARDSLEY PARK NA

**Mblu** 76/ 3000/ 9/A /

**Acct#** EI-0000231

**Owner** STATE OF CONNECTICUT &

**Assessment** \$18,125,650

**Appraisal** \$25,893,770

**PID** 34492

**Building Count** 14

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2021	\$3,393,770	\$22,500,000	\$25,893,770

Assessment			
Valuation Year	Improvements	Land	Total
2021	\$2,375,650	\$15,750,000	\$18,125,650

## Owner of Record

**Owner** STATE OF CONNECTICUT &  
**Co-Owner** CT ZOOLOGICAL SOCIETY  
**Address** EXEMPT PARCEL N/A  
BRIDGEPORT, CT 00000

**Sale Price** \$0  
**Certificate**  
**Book & Page** 3716/0210  
**Sale Date** 05/27/1997  
**Instrument**

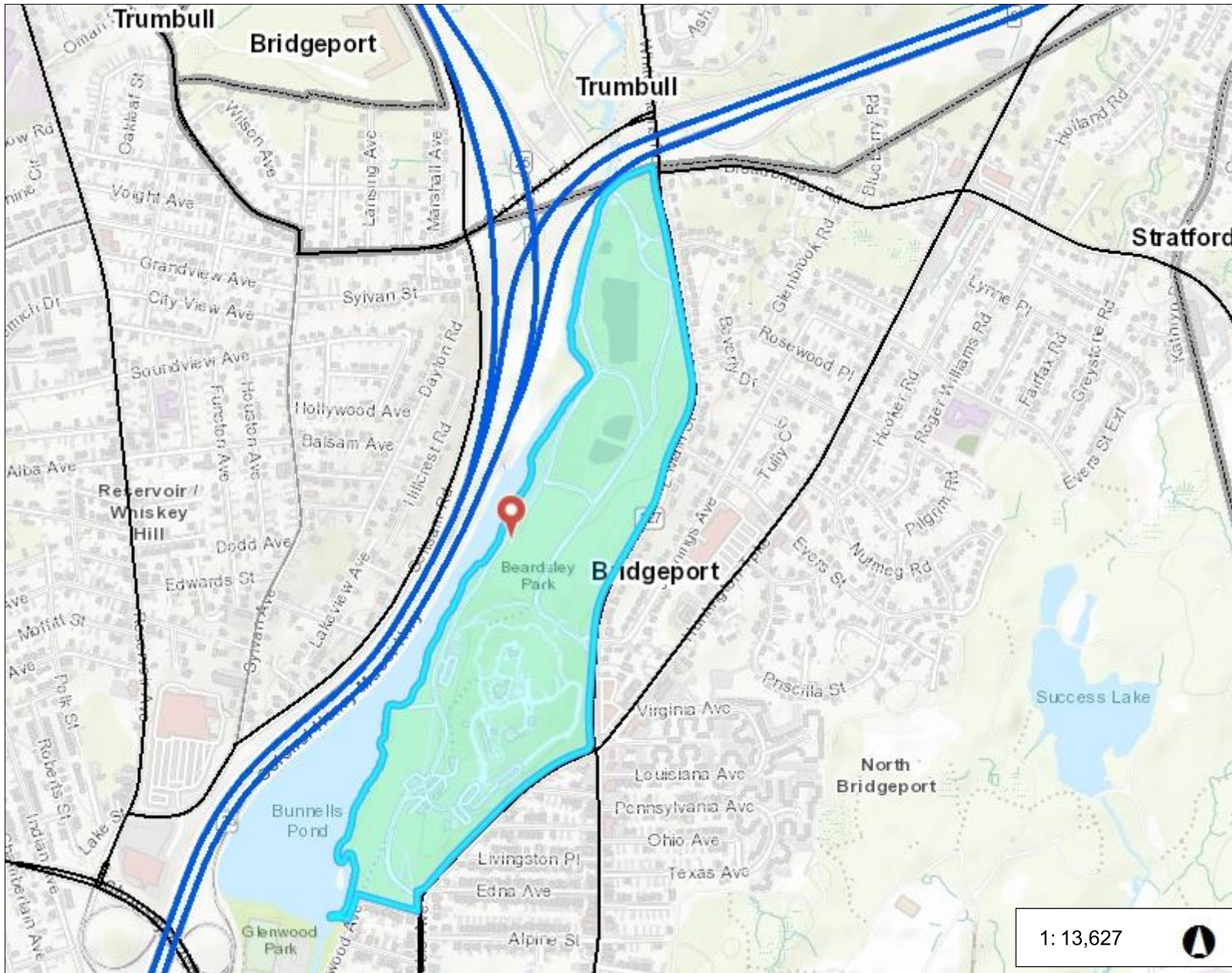
## Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
STATE OF CONNECTICUT &	\$0		3716/0210		05/27/1997
STATE OF CONNECTICUT	\$0		3716/0203		05/27/1997
STATE OF CONNECTICUT &	\$0		3716/0198		05/27/1997

## Building Information

### Building 1 : Section 1

**Year Built:** 1922  
**Living Area:** 4,041  
**Replacement Cost:** \$435,259  
**Building Percent Good:** 60



Legend

Streetname

Roadways

Local

Collector

Minor Collector

Minor Arterial

Major Collector

PA Other

PA Other Expwy

PA Interstate

Town Boundary

1: 13,627



2,271.2 0 1,135.58 2,271.2 Feet

# Exhibit C

## **Construction Drawings**





DISH Wireless L.L.C. SITE ID:

**NJJER01106A**

DISH Wireless L.L.C. SITE ADDRESS:

**1875 NOBLE AVE,  
BRIDGEPORT, CT 06610**

**SCOPE OF WORK**

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

- TOWER SCOPE OF WORK:**
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
  - INSTALL (3) PROPOSED ANTENNA MOUNTS (1 PER SECTOR)
  - 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 CLAMP
  - INSTALL (6) PROPOSED DIPLEXERS
  - INSTALL (1) PROPOSED BIAS-T

- 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 METER SOCKET

**STRUCTURAL NOTE:**  
STRUCTURAL ANALYSIS COMPLETED BY  
TOWER ENGINEERING PROFESSIONALS  
DATED (2/2/22).

**SITE INFORMATION**

PROPERTY OWNER: CT ZOOLOGICAL SOCIETY  
ADDRESS: 1875 NOBLE AVE  
BRIDGEPORT, CT 06610

TOWER TYPE: MONOPOLE

TOWER CO SITE ID: 822779

TOWER APP NUMBER: 548693

COUNTY: FAIRFIELD

LATITUDE (NAD 83): 41° 12' 37.27" N  
41.210353 N

LONGITUDE (NAD 83): -73° 10' 52.26" W  
-73.181183 W

ZONING JURISDICTION: CONNECTICUT SITING COUNCIL

ZONING DISTRICT: CITY

PARCEL NUMBER: 3000-9A

OCCUPANCY GROUP: U

CONSTRUCTION TYPE: II-B

POWER COMPANY: TBD

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,  
CANONSBURGE, PA 15317  
(877) 486-9377

SITE DESIGNER: FRENCH & PARRELLO ASSOCIATES  
1800 ROUTE 34, SUITE 101  
WALL, NJ 07719  
732-312-9800

SITE ACQUISITION: NICHOLAS CURRY  
(908) 430-8582

CONSTRUCTION MANAGER: JOSEPH DIPIAZZA  
TBD

RF ENGINEER: MURUGABIRAN JAYAPAL  
TBD

**CONNECTICUT CODE 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

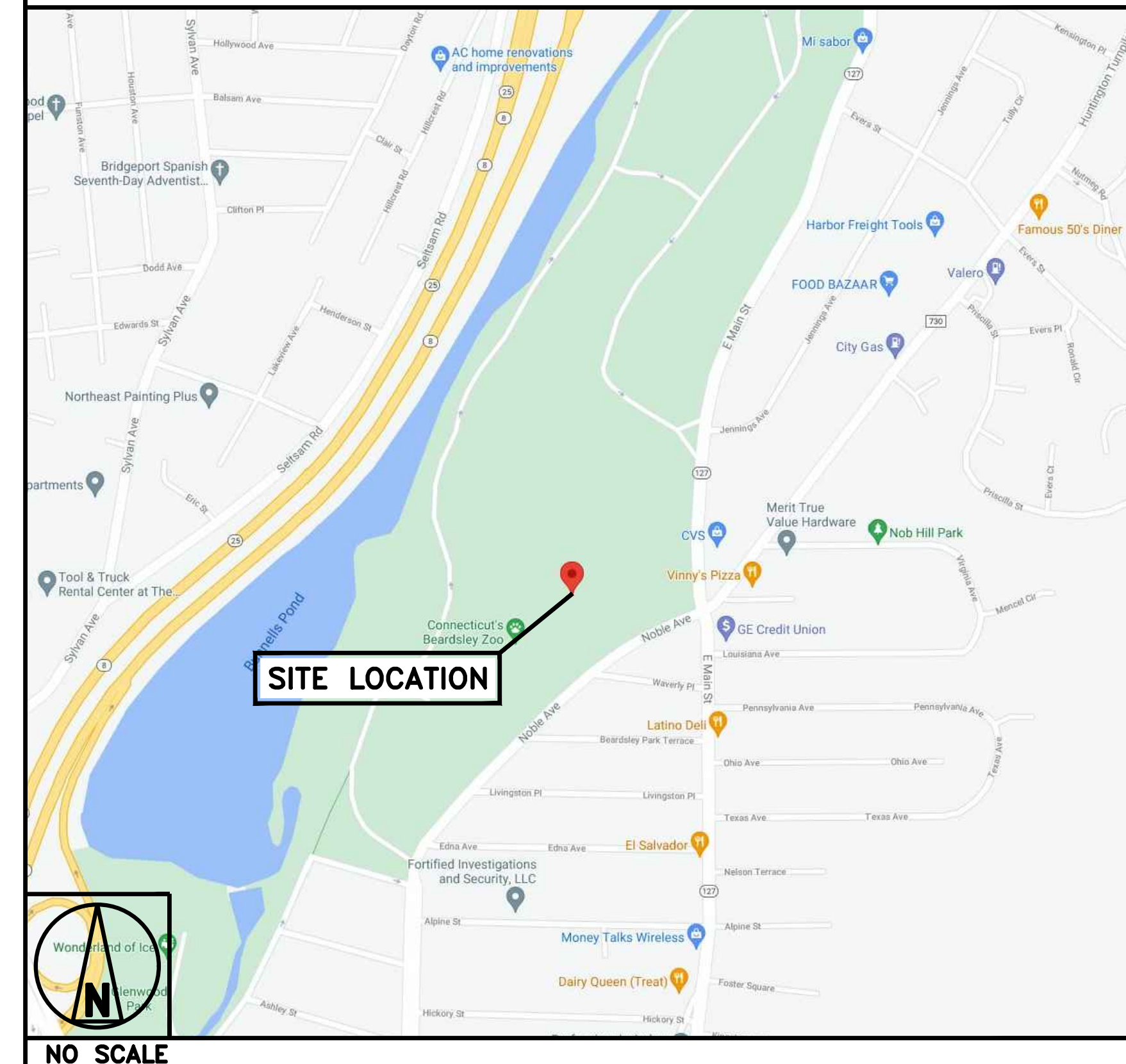
**SITE PHOTO**



**DIRECTIONS**

**DIRECTIONS FROM DISH Wireless L.L.C. OFFICE/AIRPORT/DOWNTOWN:**  
TURN LEFT ONTO ADP BLVD, TURN RIGHT ONTO CHOCTAW WAY, USE THE LEFT LANE TO TURN RIGHT ONTO LIVINGSTON AVE. USE THE RIGHT LANE TO TAKE THE RAMP ONTO I-280 E, TAKE EXIT 12 TOWARD ORATON PKWY, KEEP RIGHT TO STAY ON GARDEN STATE PKWY, CONTINUE ONTO NJ-44/GARDEN STATE PKWY, USE ANY LANE TO TAKE EXIT 1-14 TO MERGE ONTO I-287 E/I-87 S, KEEP LEFT AT THE FORK TO CONTINUE ON I-287 E, FOLLOW SIGNS FOR WHITE PLAINS/RYE, KEEP LEFT TO STAY ON I-287 E, MERGE ONTO I-95 N, TAKE EXIT 27A FOR CT-25/CT-8 TOWARD TRUMBULL/WATERBURY, TAKE EXIT 5 TOWARD US-1/BOSTON AVE/NORTH AVE. USE THE LEFT LANE TO TURN LEFT ONTO CHOPSEY HILL RD, TURN LEFT ONTO GLENWOOD AVE, TURN LEFT ONTO NOBLE AVE, TURN LEFT TO BEARDSLEY ZOO.

**VICINITY MAP**



**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
RF-2	RF PLUMBING DIAGRAM
GN-1	LEGEND AND ABBREVIATIONS
GN-2	GENERAL NOTES
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES



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.



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



1800 Route 34, Suite 101 • Wall, New Jersey 07719  
o: 732.312.9800 f: 732.312.9801



JOHN BOSCO, CT P.E. LICENSE NO. 25605

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:

T.J.A. J.B. ---

RFDS REV #: ---

**CONSTRUCTION DOCUMENTS**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	07/21/21	ISSUED FOR REVIEW
B	04/29/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
2438H.001.031

DISH Wireless L.L.C.  
PROJECT INFORMATION  
NJJER01106A  
1875 NOBLE AVENUE  
BRIDGEPORT, CT 06610

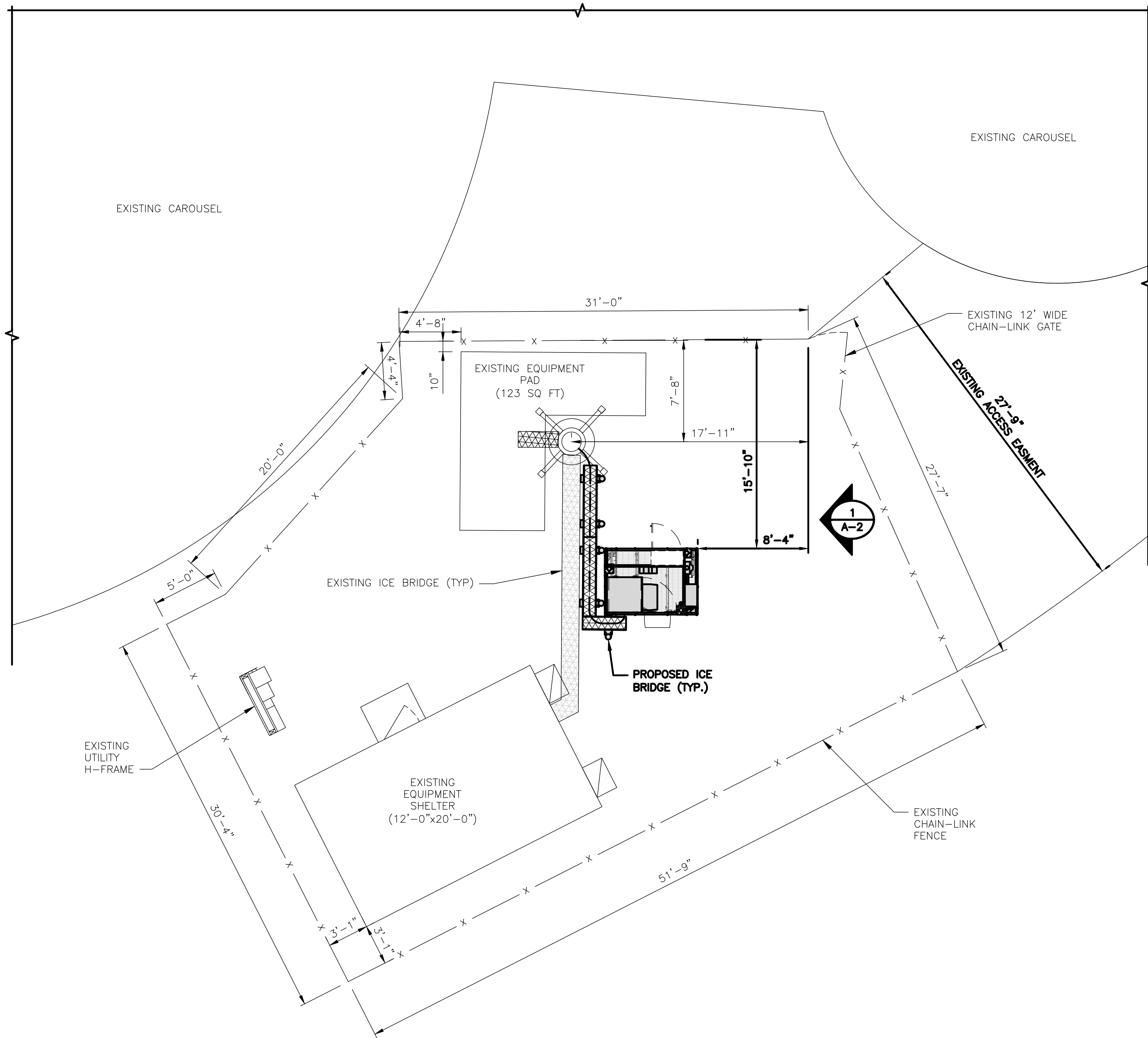
SHEET TITLE  
TITLE SHEET

SHEET NUMBER  
**T-1**

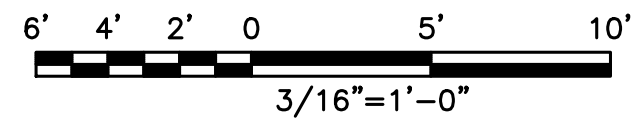


**NOTES**

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



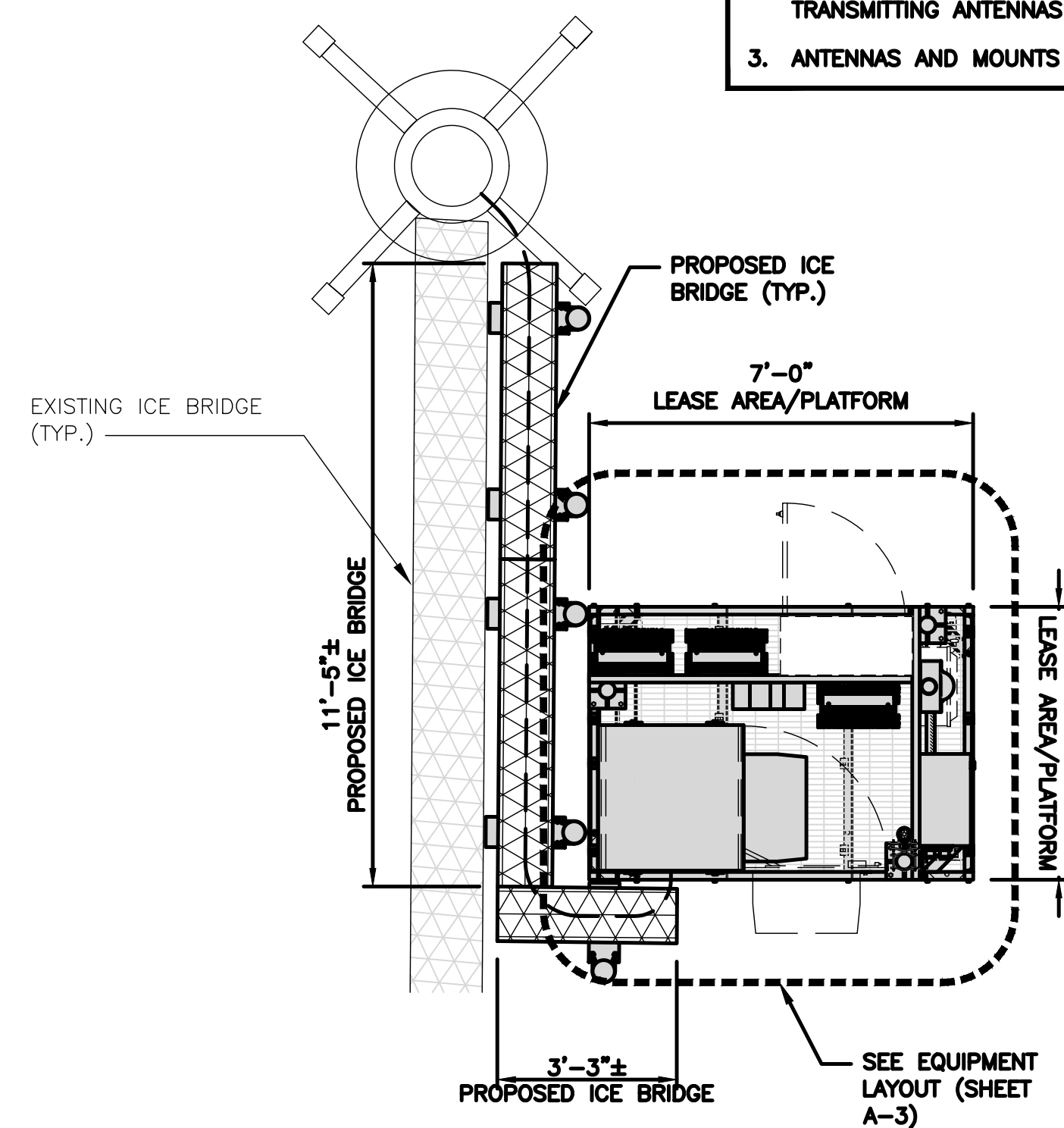
**OVERALL SITE PLAN**



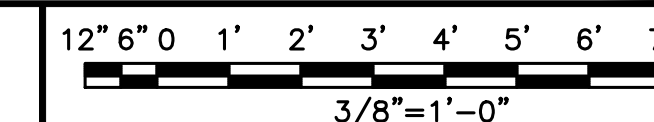
1

**NOTES**

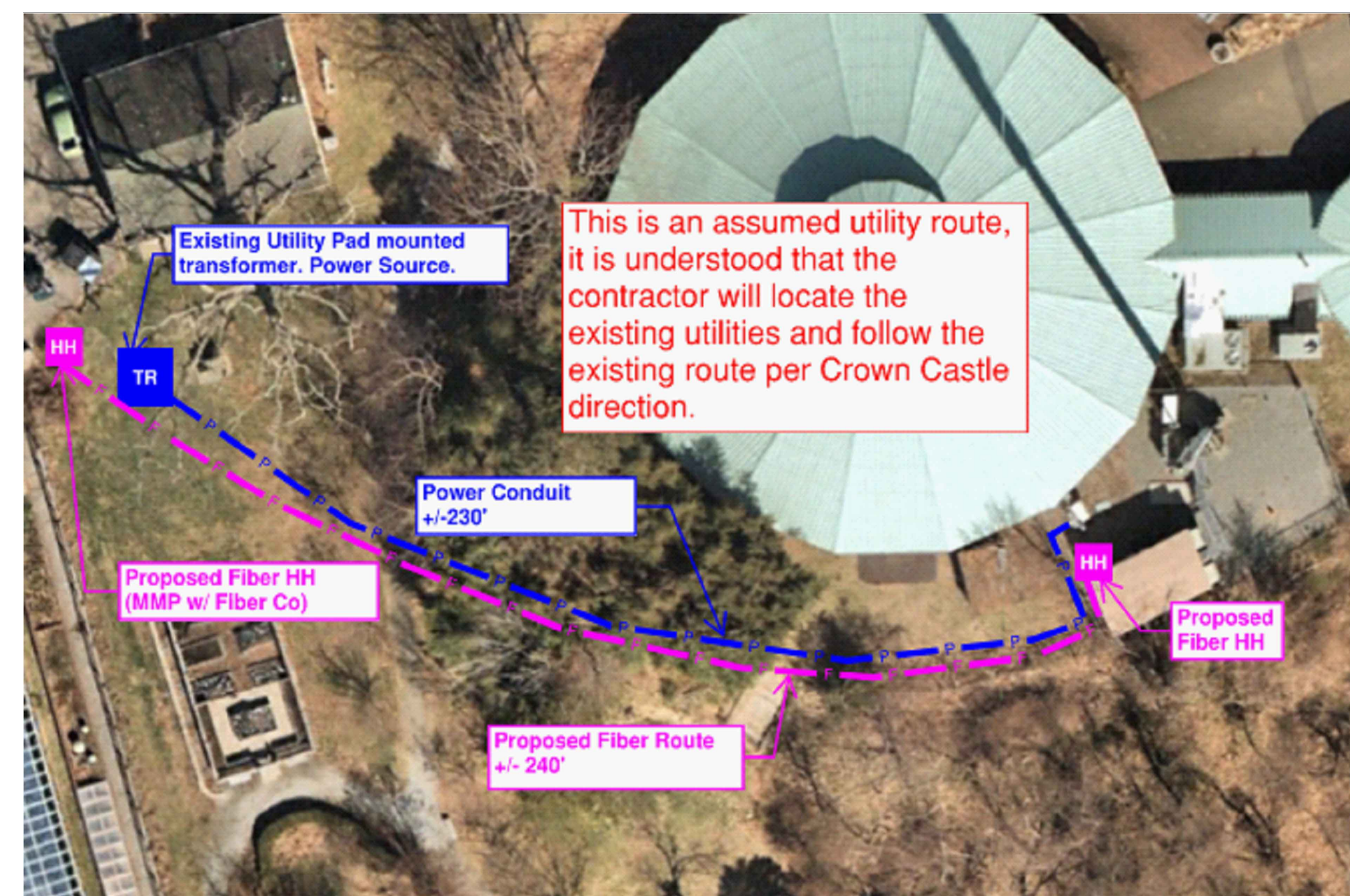
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



**ENLARGED SITE PLAN**



2

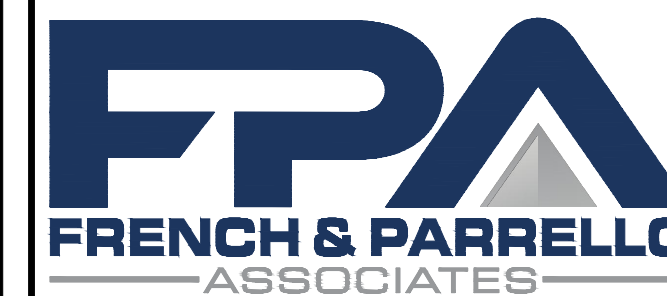


**NOT USED**

3



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



1800 Route 34, Suite 101 • Wall, New Jersey 07719  
o: 732.312.9800 f: 732.312.9801



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SHEET TITLE  
OVERALL AND ENLARGED  
SITE PLAN

SHEET NUMBER  
**A-1**

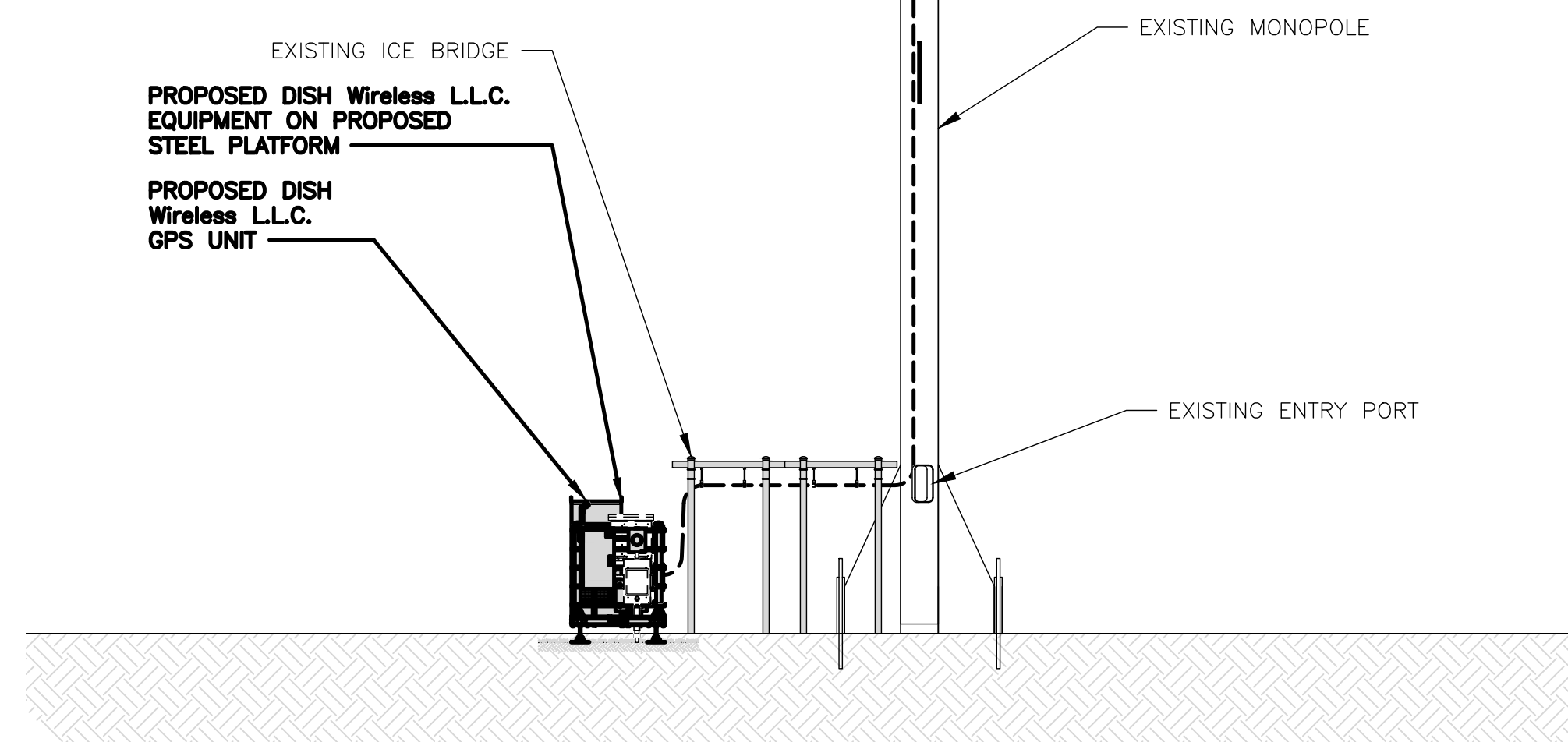


**NOTES**

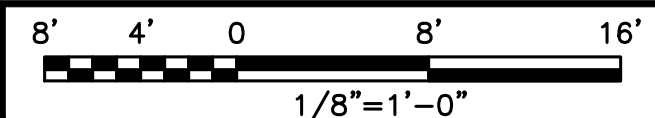
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.

- EXISTING DECORITIVE BALL  
TOP EL. @ 122'-0" AGL
- EXISTING CONCEALMENT MONOPOLE  
TOP EL. @ 120'-0" AGL
- EXISTING PANEL ANTENNA  
TOP EL. @ 115'-0" AGL
- EXISTING PANEL ANTENNA  
TOP EL. @ 105'-0" AGL
- EXISTING PANEL ANTENNA  
TOP EL. @ 95'-0" AGL
- (3) PROPOSED DISH Wireless L.L.C. ANTENNAS  
RAD CENTER @ 86'-0" AGL

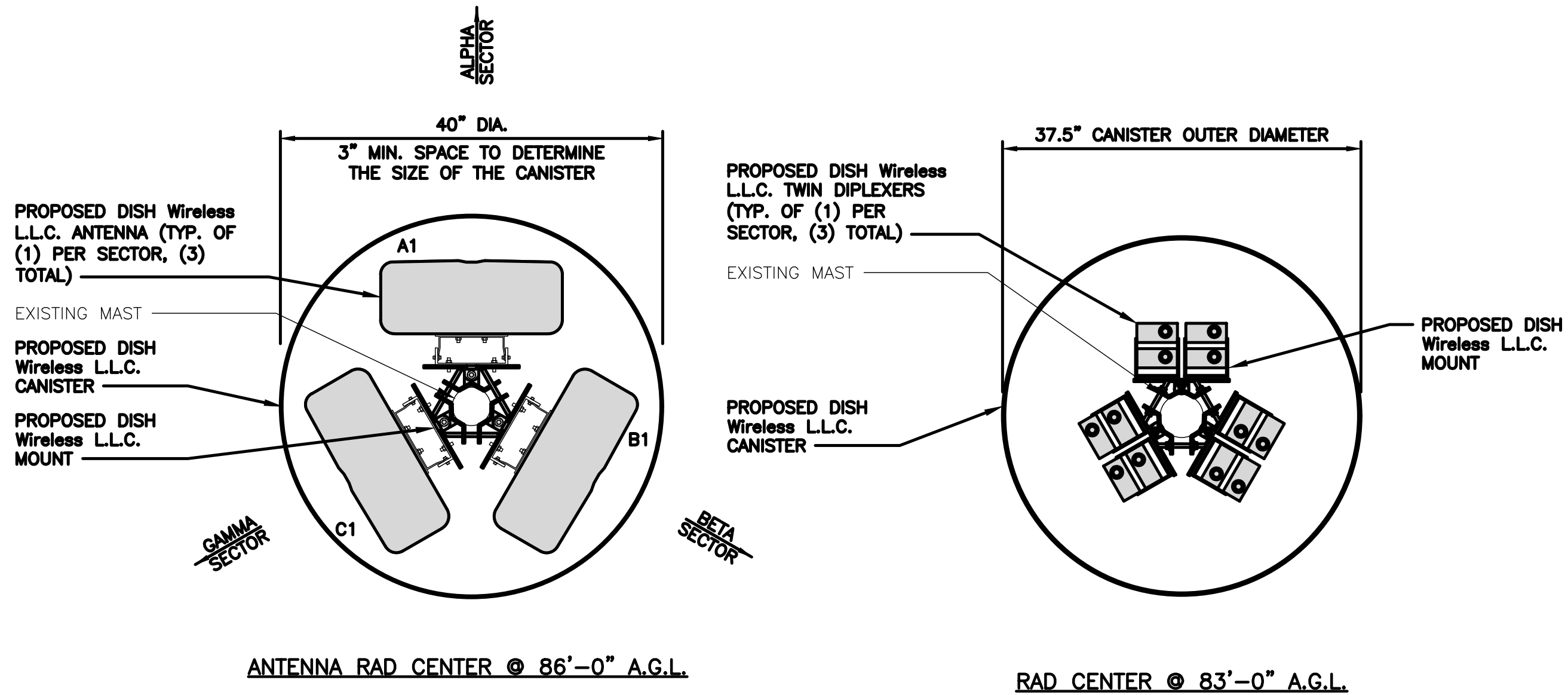
(1) PROPOSED DISH Wireless L.L.C. HYBRID CABLE INSIDE EXISTING MONOPOLE



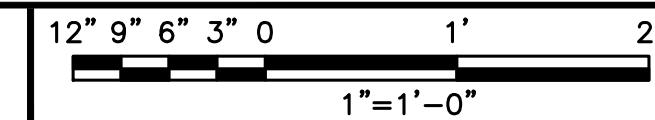
**PROPOSED NORTH ELEVATION**



1



**ANTENNA LAYOUT**



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS/MX08FR0665-21	5G	72.0" x 20.0"	0°	86'-0"	(1) HIGH-CAPACITY HYBRID CABLE (119' LONG)
BETA	B1	PROPOSED	JMA WIRELESS/MX08FR0665-21	5G	72.0" x 20.0"	120°	86'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS/MX08FR0665-21	5G	72.0" x 20.0"	240°	86'-0"	
		PROPOSED	COMMSCOPE CDX623T-DS-T (6)		8.86" x 4.96"		83'-0"	
		PROPOSED	KAEIUS BIAS-T		5.41" x 3.27"		86'-0"	

SECTOR	POSITION	RRH		NOTES
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY	
ALPHA	A1	FUJITSU - TA08025-B805	n71	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.
	A1	FUJITSU - TA08025-B804	n70/n66	
BETA	B1	FUJITSU - TA08025-B805	n71	
	B1	FUJITSU - TA08025-B804	n70/n66	
GAMMA	C1	FUJITSU - TA08025-B805	n71	
	C1	FUJITSU - TA08025-B804	n70/n66	

**ANTENNA SCHEDULE**

NO SCALE

3



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



1800 Route 34, Suite 101 • Wall, New Jersey 07719  
o: 732.312.9800 f: 732.312.9801



*John B. Bosco*  
JOHN BOSCO, CT P.E. LICENSE NO. 25605

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DRAWN BY: T.J.A. CHECKED BY: J.B. APPROVED BY: ---

RFDS REV #: ---

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A	07/21/21	ISSUED FOR REVIEW
B	04/29/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
2438H.001.031

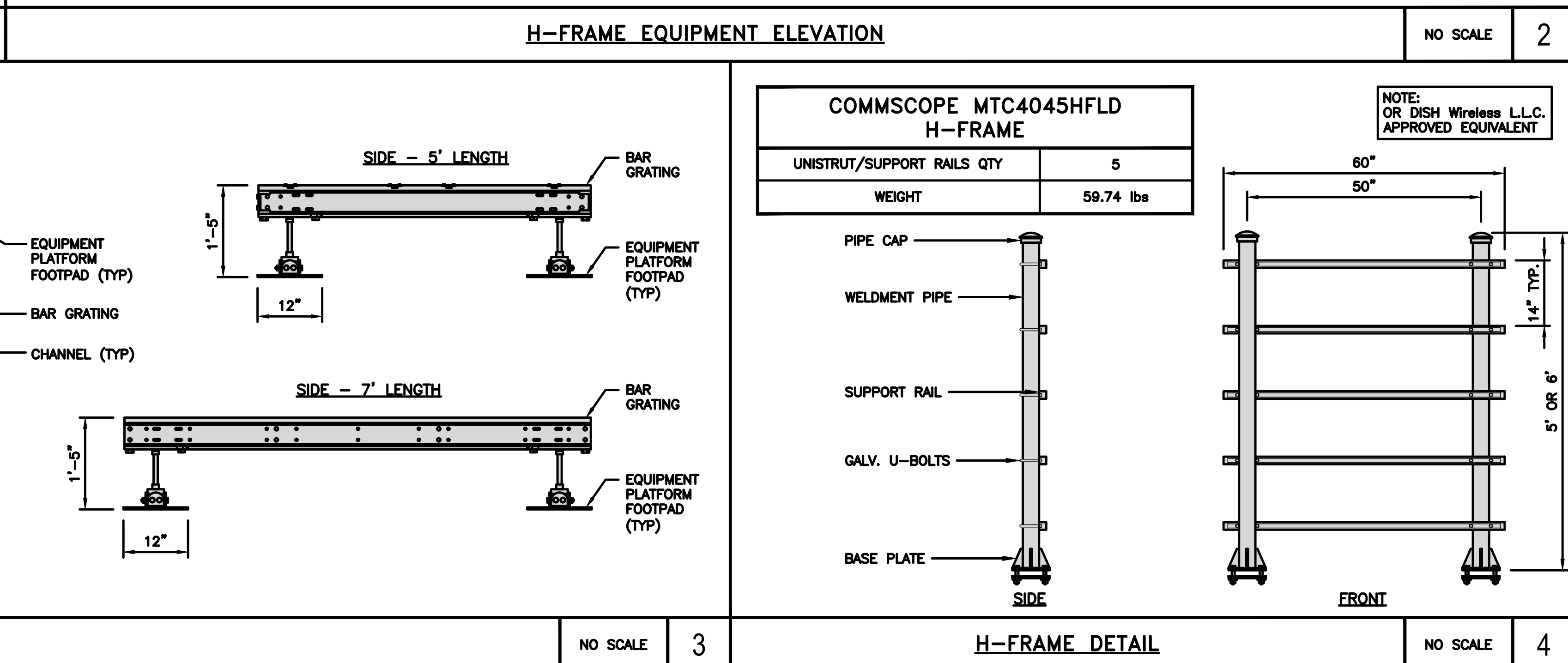
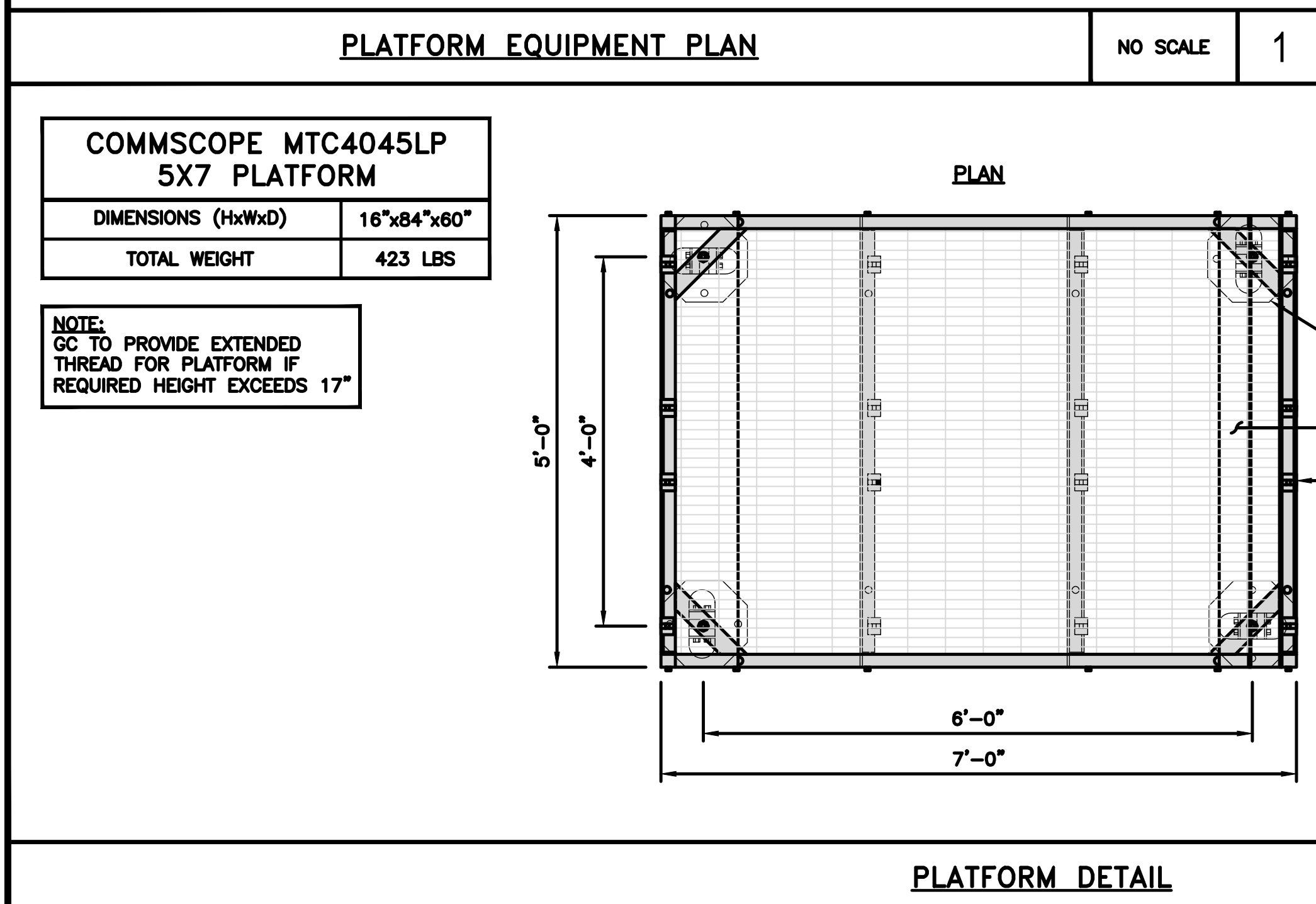
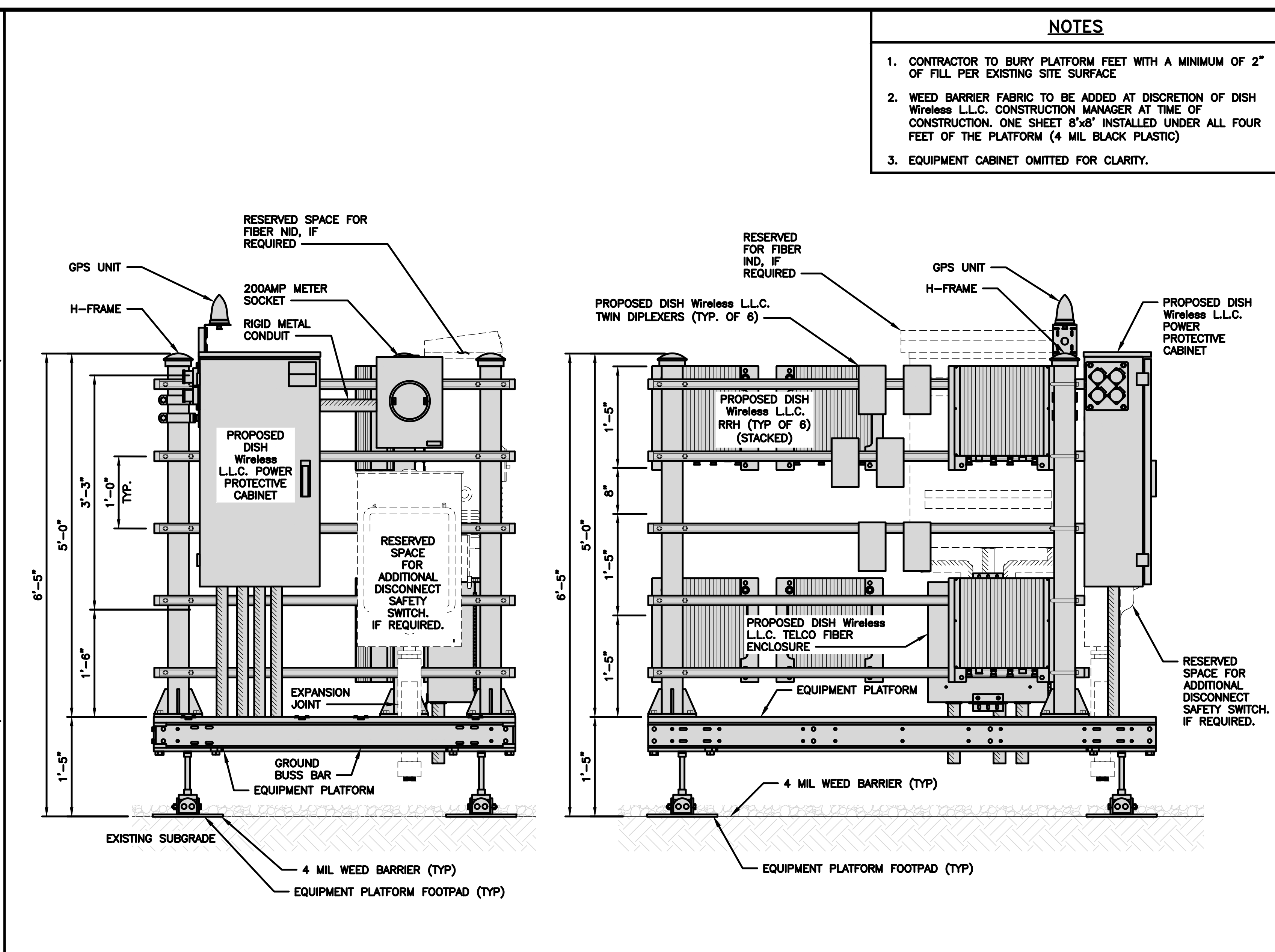
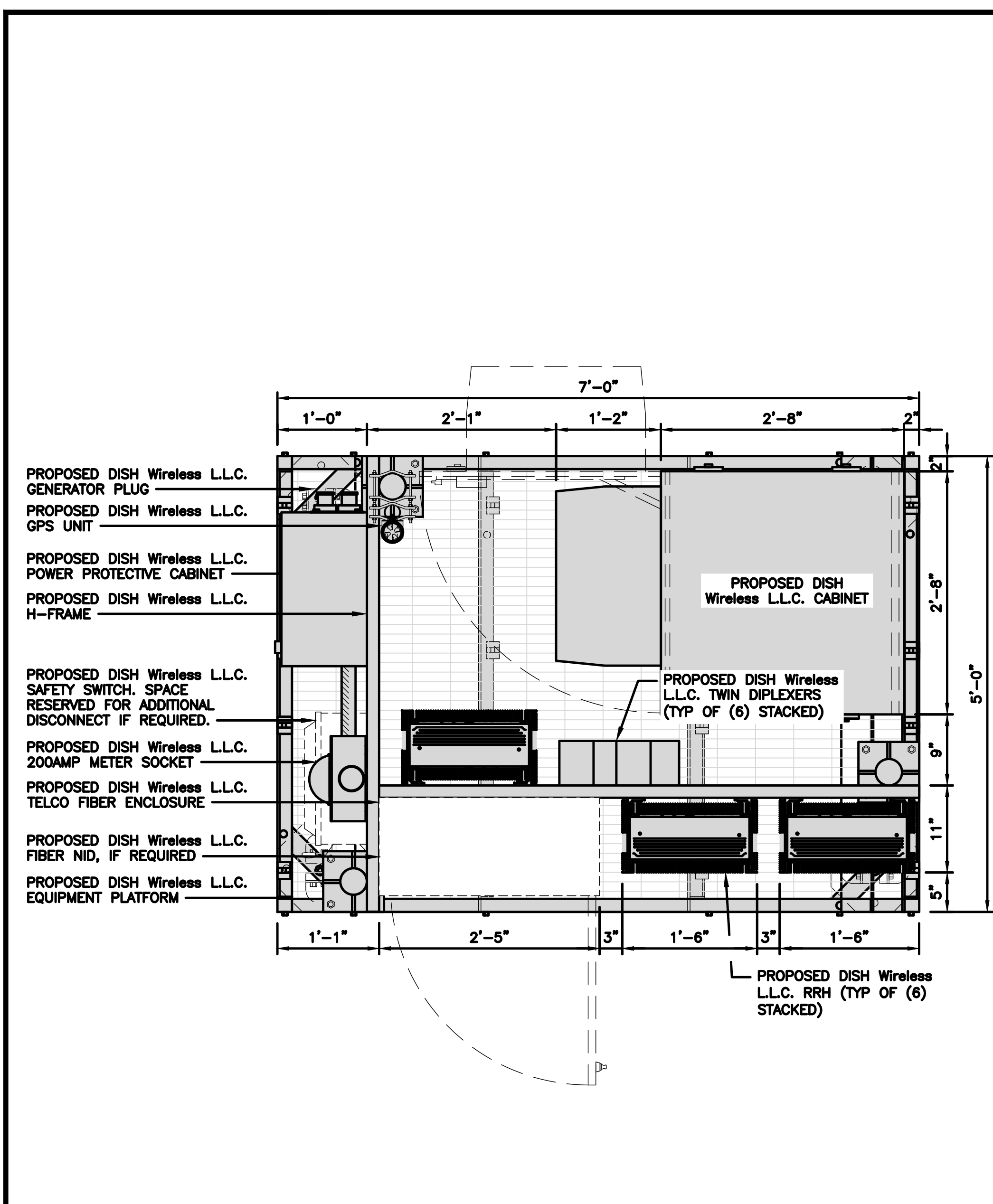
DISH Wireless L.L.C. PROJECT INFORMATION  
NJJER01106A  
1875 NOBLE AVENUE  
BRIDGEPORT, CT 06610

SHEET TITLE  
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

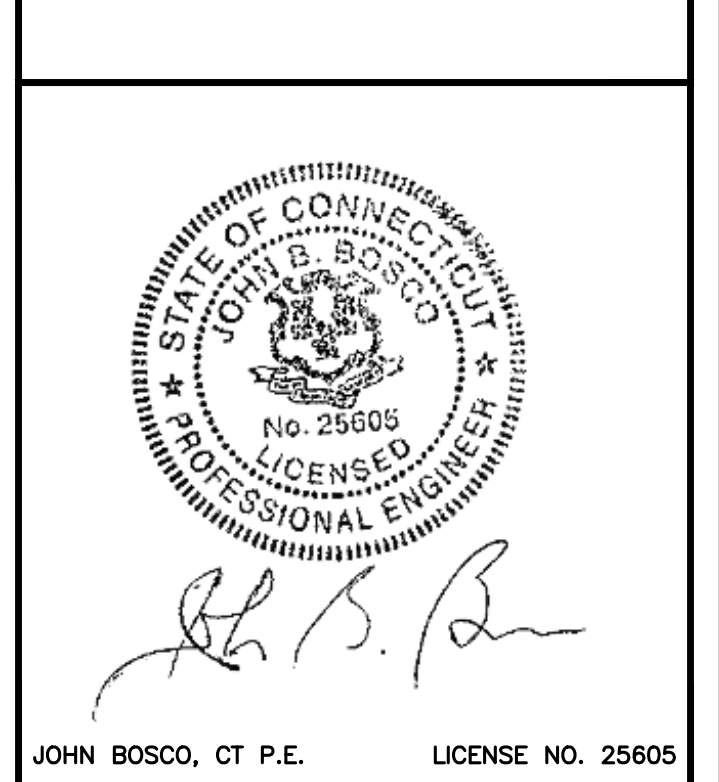
SHEET NUMBER

**A-2**





- NOTES**
- CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
  - 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)
  - EQUIPMENT CABINET OMITTED FOR CLARITY.



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DRAWN BY:	CHECKED BY:	APPROVED BY:
T.J.A.	J.B.	---
RFDS REV #:	---	

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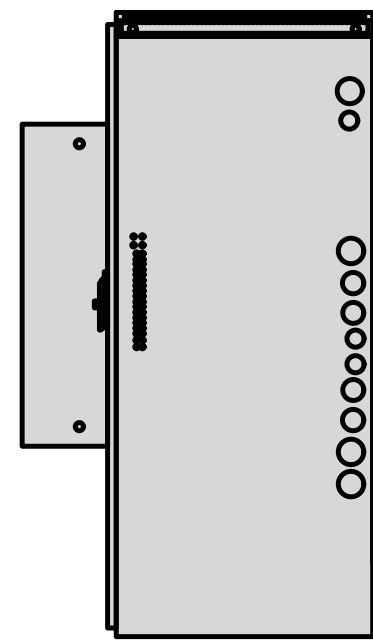
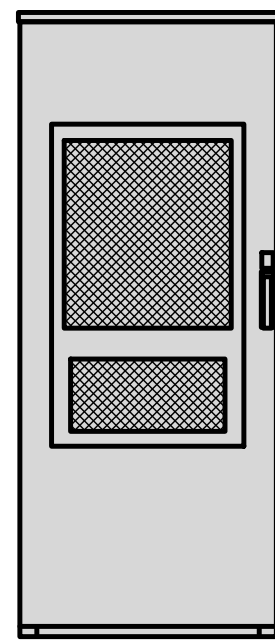
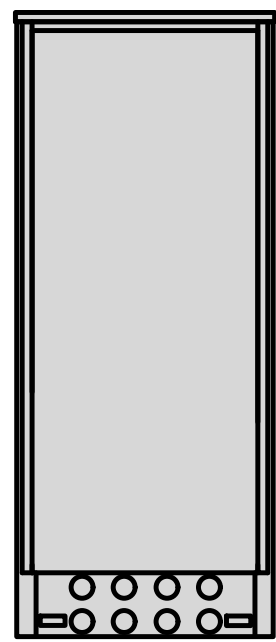
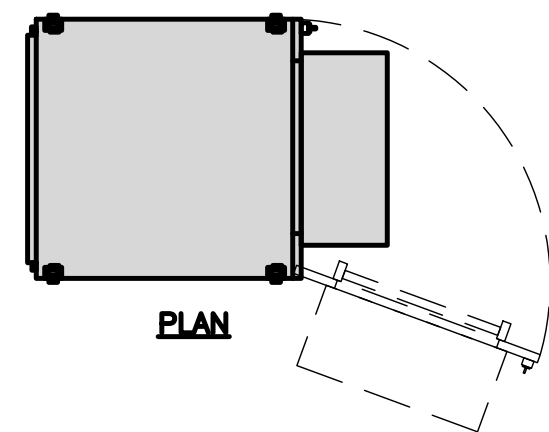
DISH Wireless L.L.C. PROJECT INFORMATION  
NJER01106A  
1875 NOBLE AVENUE  
BRIDGEPORT, CT 06610

SHEET TITLE  
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER  
**A-3**



ENERSYS HEX CABINET 2000005996	
DIMENSIONS (HxWxD):	73"x30"x32"
WEIGHT EMPTY:	376 lbs
HEATER	800W
POWER SYSTEM	-48V ALPHA/600A

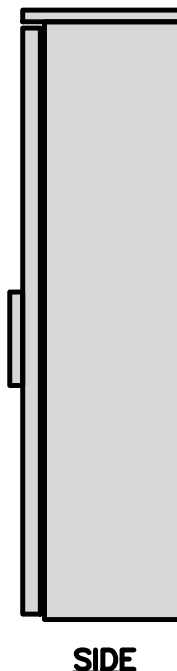
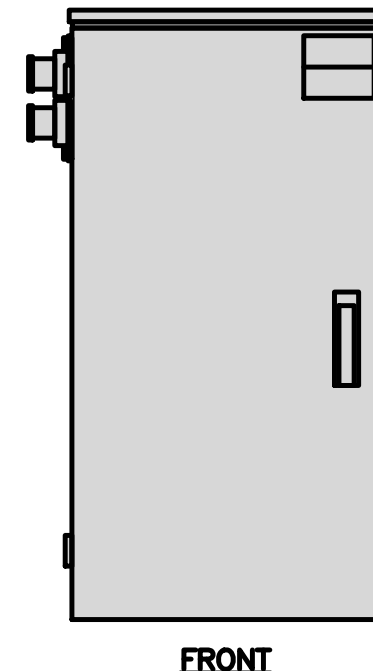
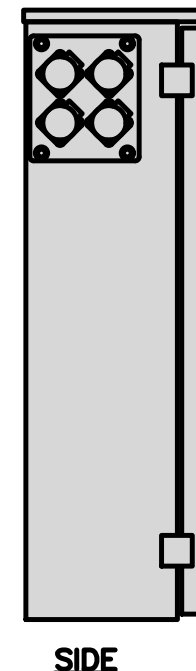
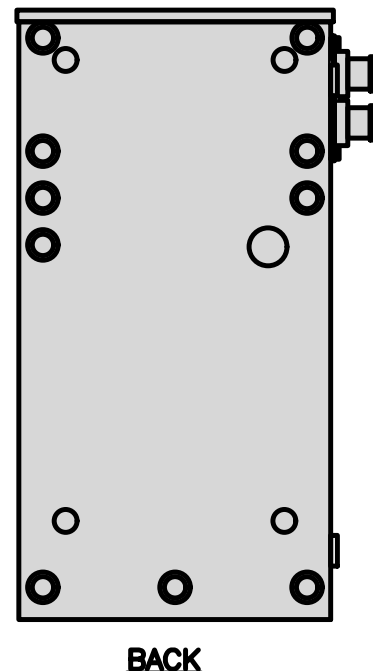
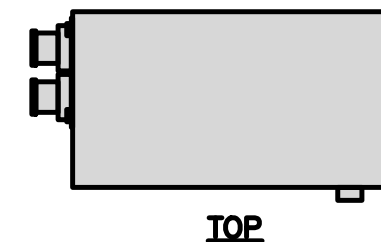


CABINET DETAIL

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

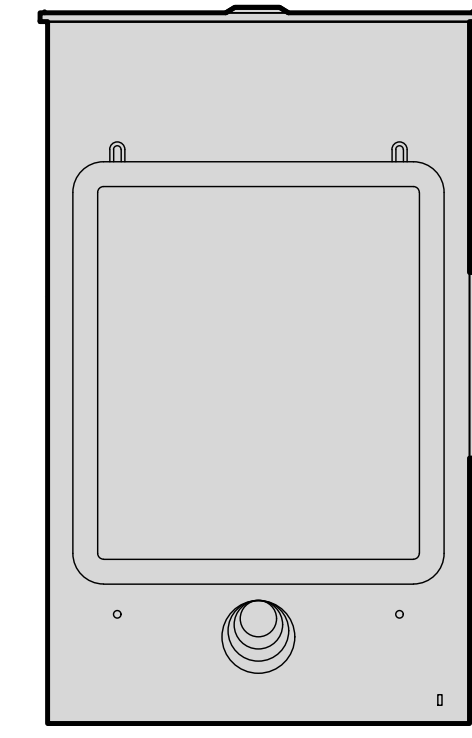
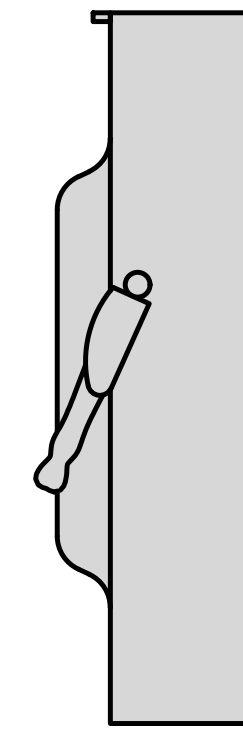
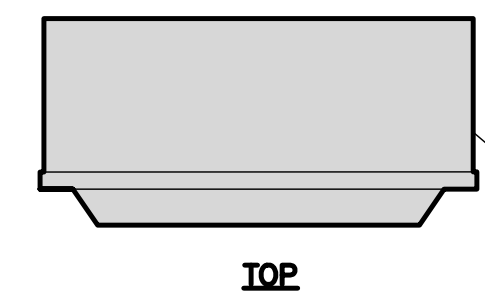


POWER PROTECTION CABINET (PPC) DETAIL

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

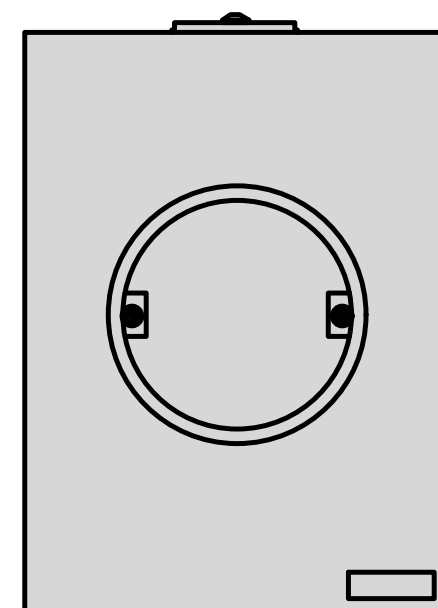
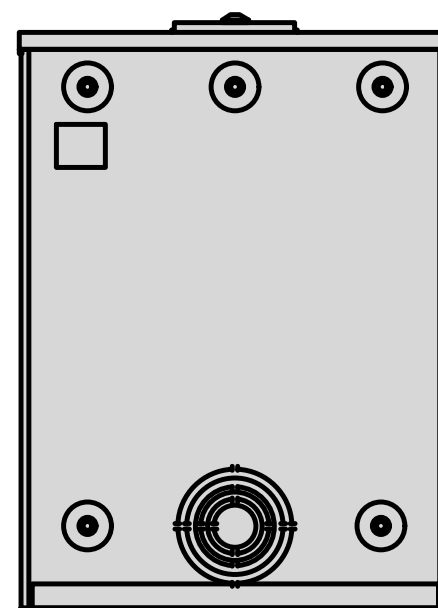
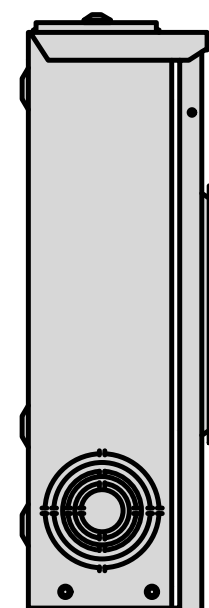
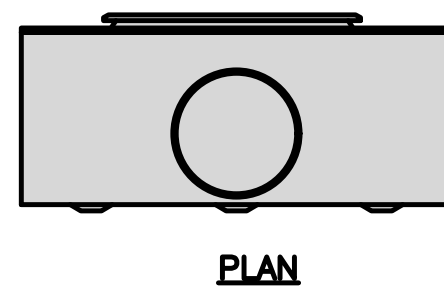


SAFETY SWITCH DETAIL

NO SCALE

3

EATON METER SOCKET UNRRS213BEUSE	
METER SOCKET TYPE	RING
ENCLOSURE DIM (HxWxD)	16"x12"x6"
MAIN AMPERE RATING	200A
WEIGHT	18 LBS

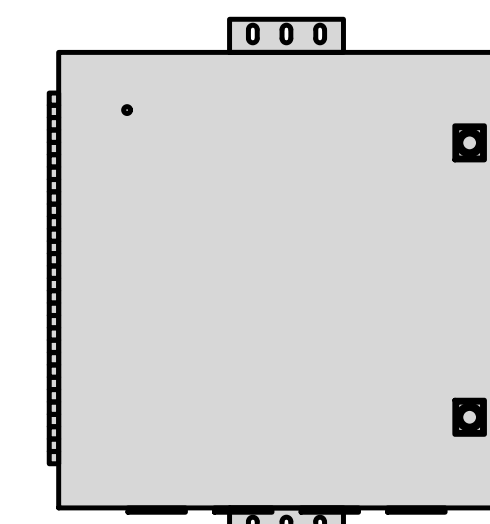
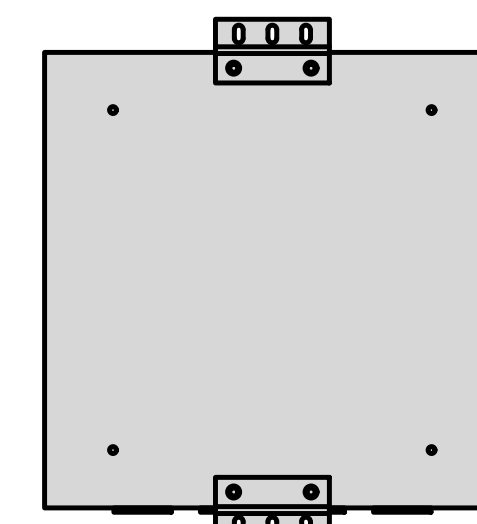
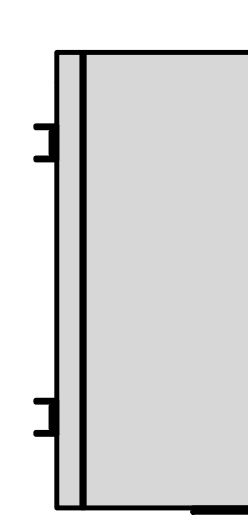
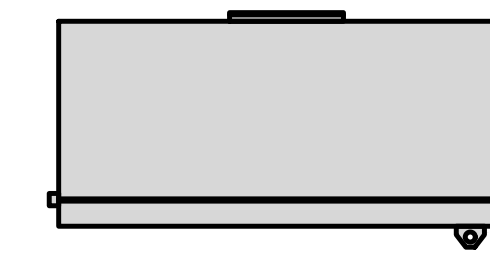


METER SOCKET DETAIL

NO SCALE

4

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



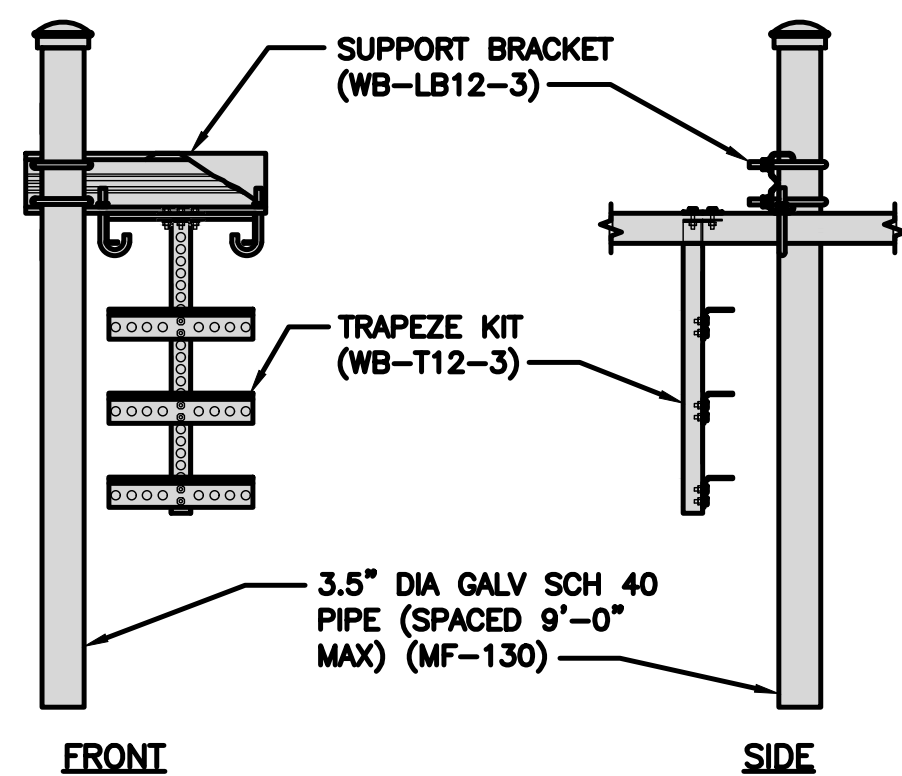
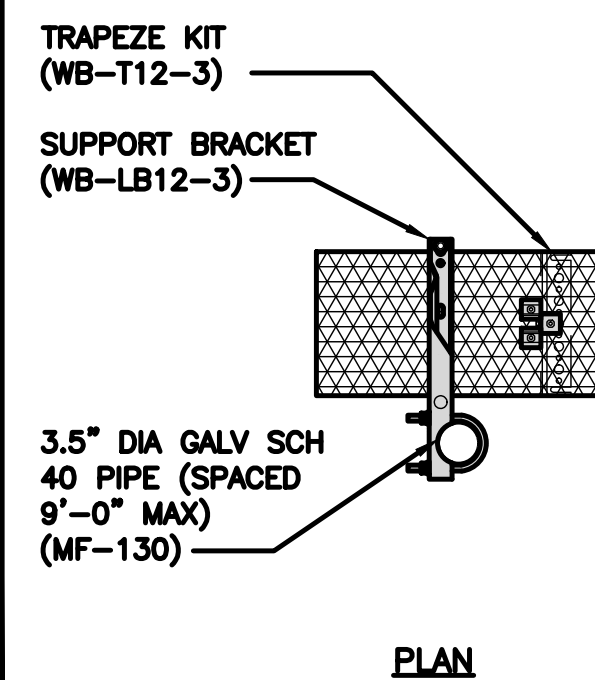
FIBER TELCO ENCLOSURE DETAIL

NO SCALE

5

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

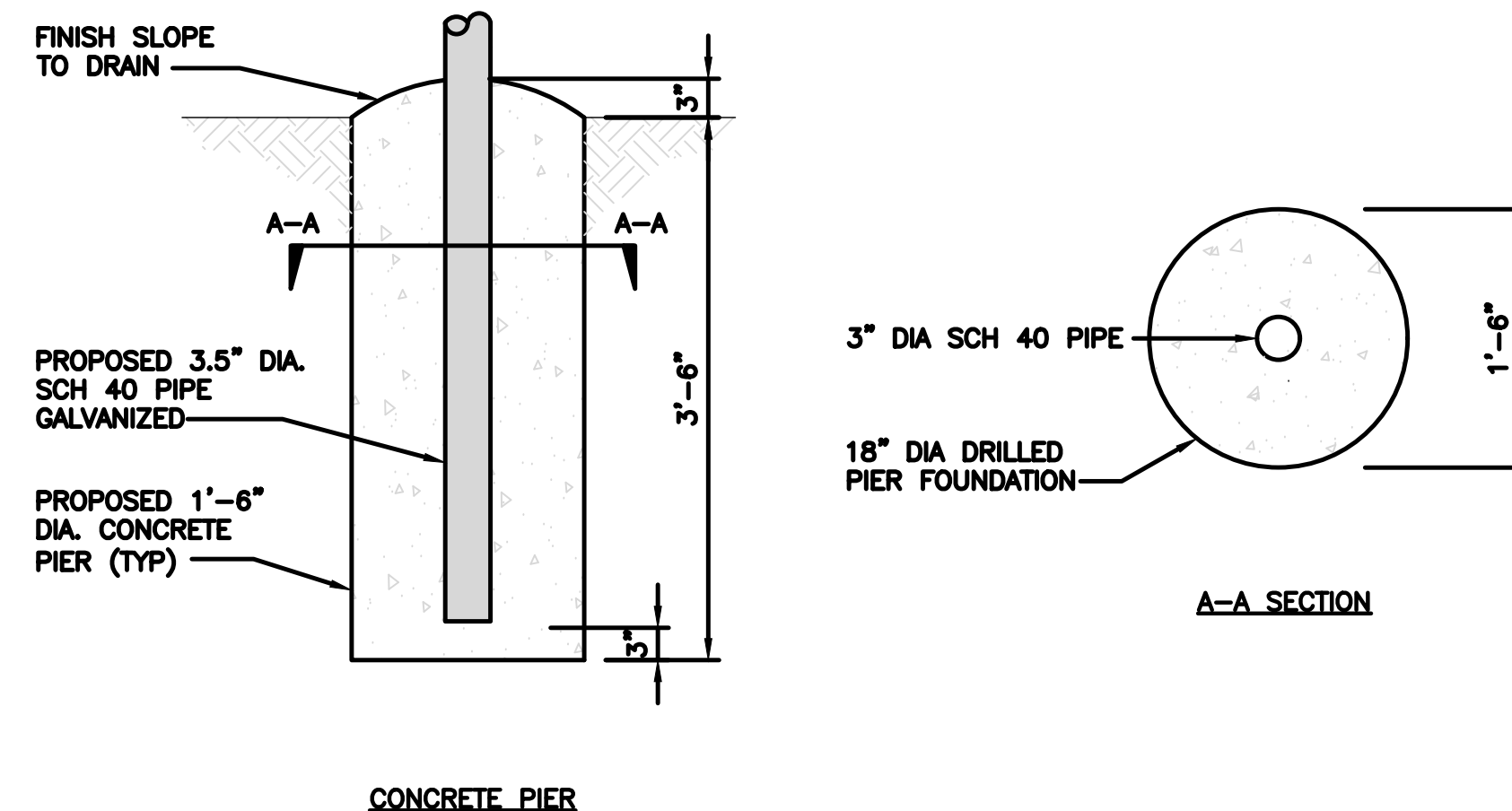
INCLUDED PRODUCTS:  
WB-T12-3 TRAPEZE KIT,  
3 RUNGS  
WB-LB12-3 SUPPORT BRACKET  
MF-130 DIRECT BURIAL PIPE  
COLUMN, 13'-4"



ICE BRIDGE DETAIL

NO SCALE

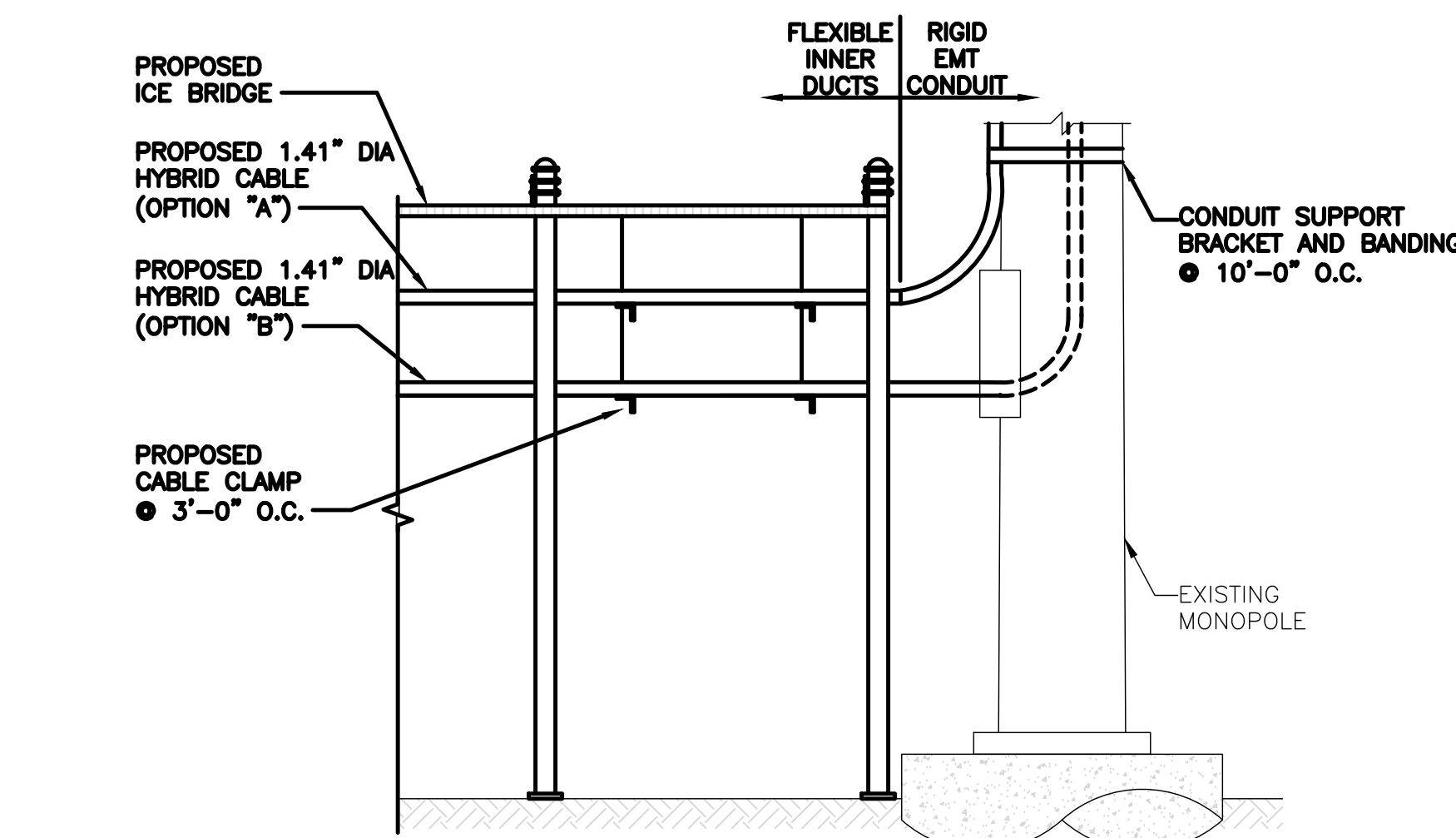
7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

8



HYBRID CABLE RUN

NO SCALE

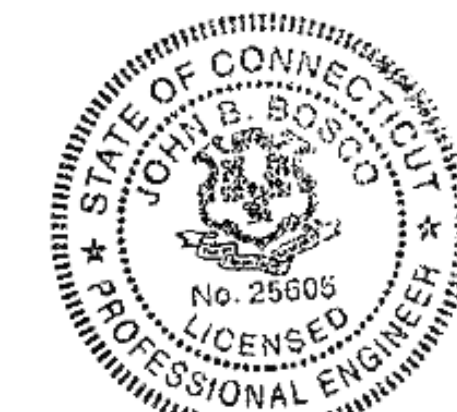
9

**dish**  
wireless.

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LITTLETON, CO 80120

**FPA**  
FRENCH & PARRELLO  
ASSOCIATES

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T.J.A. J.B. ---

RFDS REV #: ---

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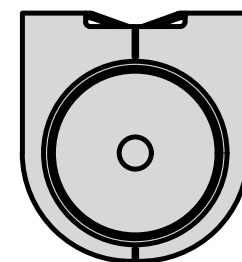
DISH Wireless L.L.C.  
PROJECT INFORMATION  
NJER01106A  
1875 NOBLE AVENUE  
BRIDGEPORT, CT 06610

SHEET TITLE  
EQUIPMENT DETAILS

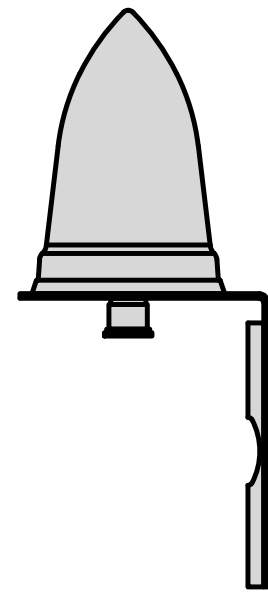
SHEET NUMBER

**A-4**

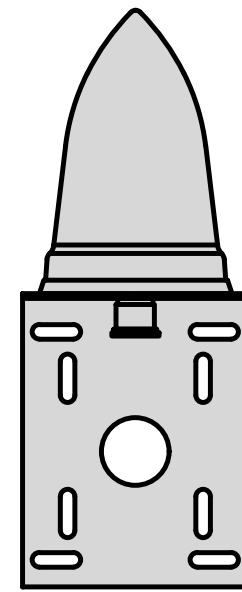
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



TOP



BACK

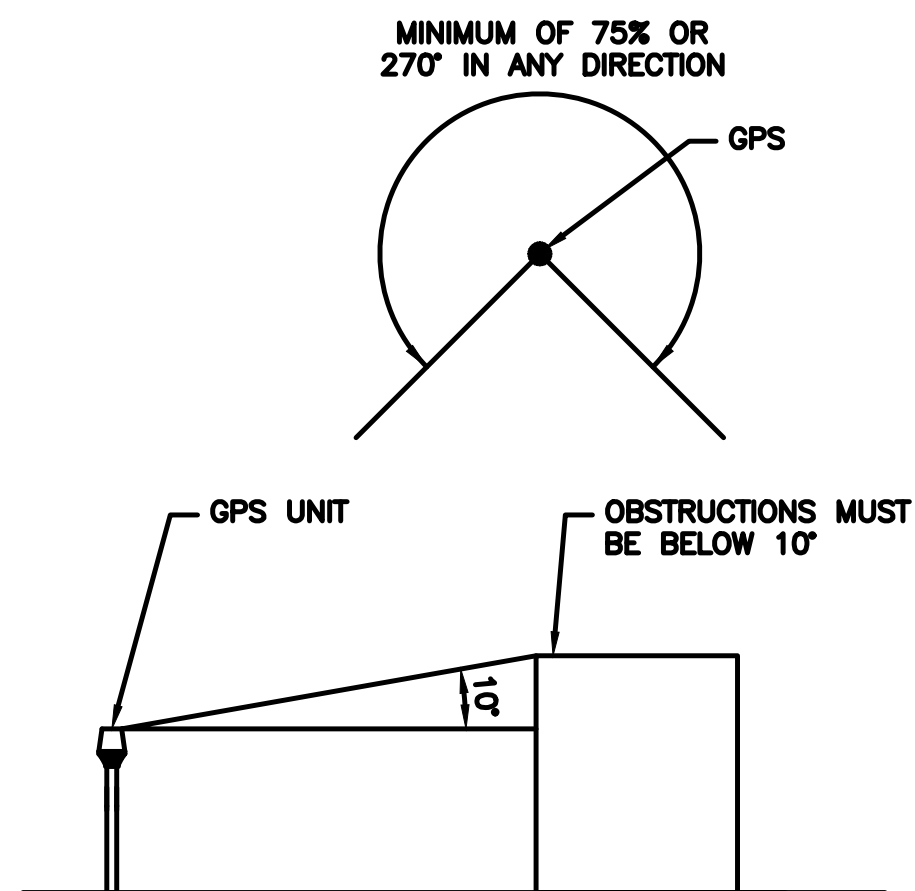


SIDE

GPS DETAIL

NO SCALE

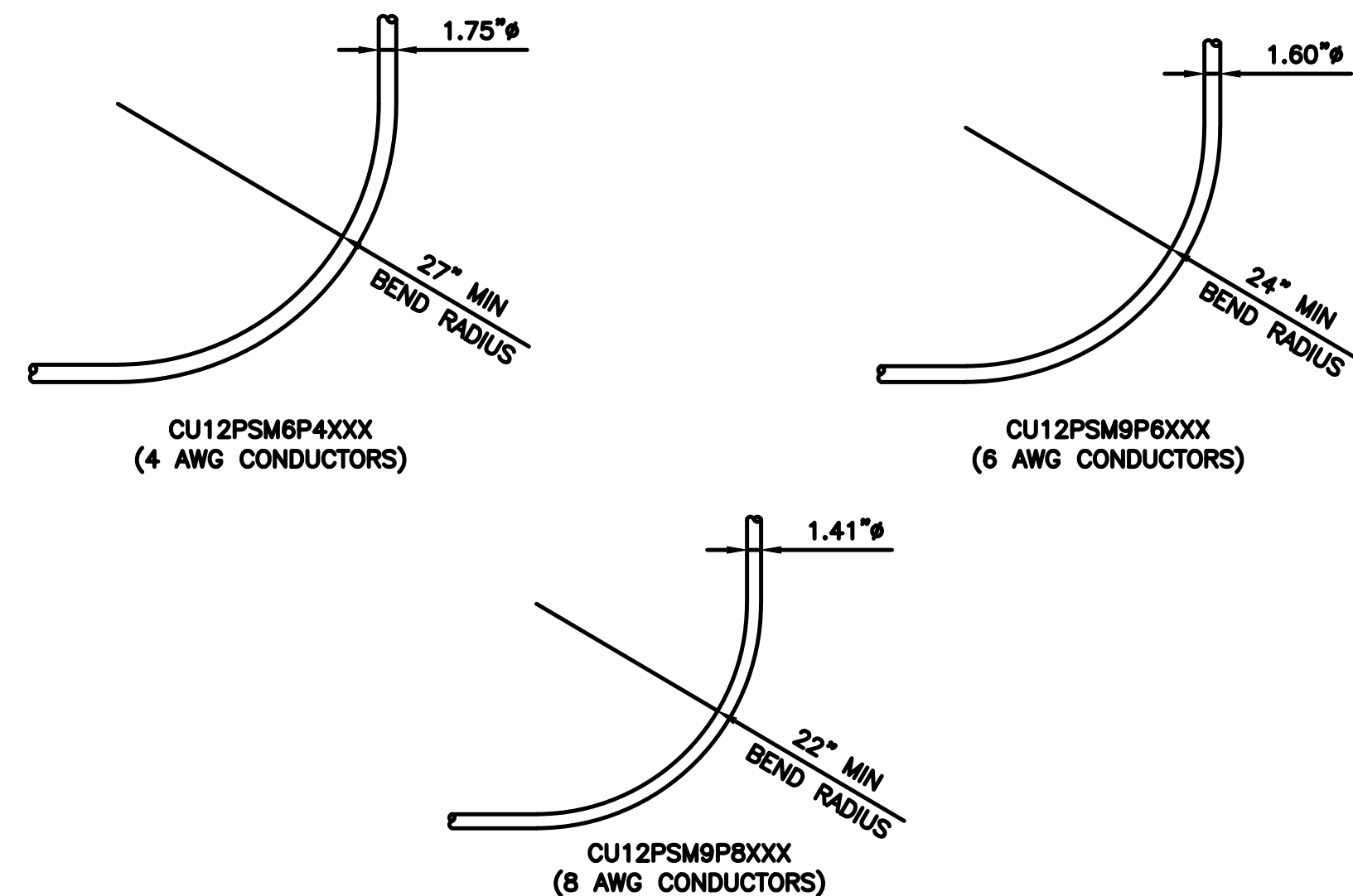
1



GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

2



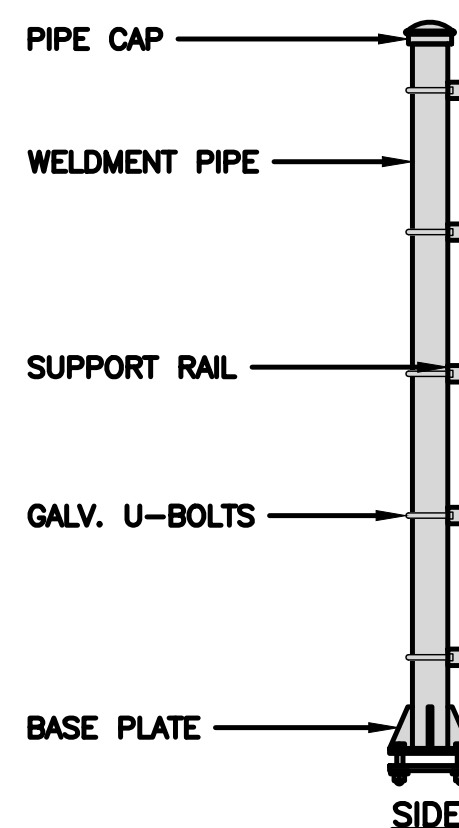
CABLES UNLIMITED HYBRID CABLE  
MINIMUM BEND RADIUSES

NO SCALE

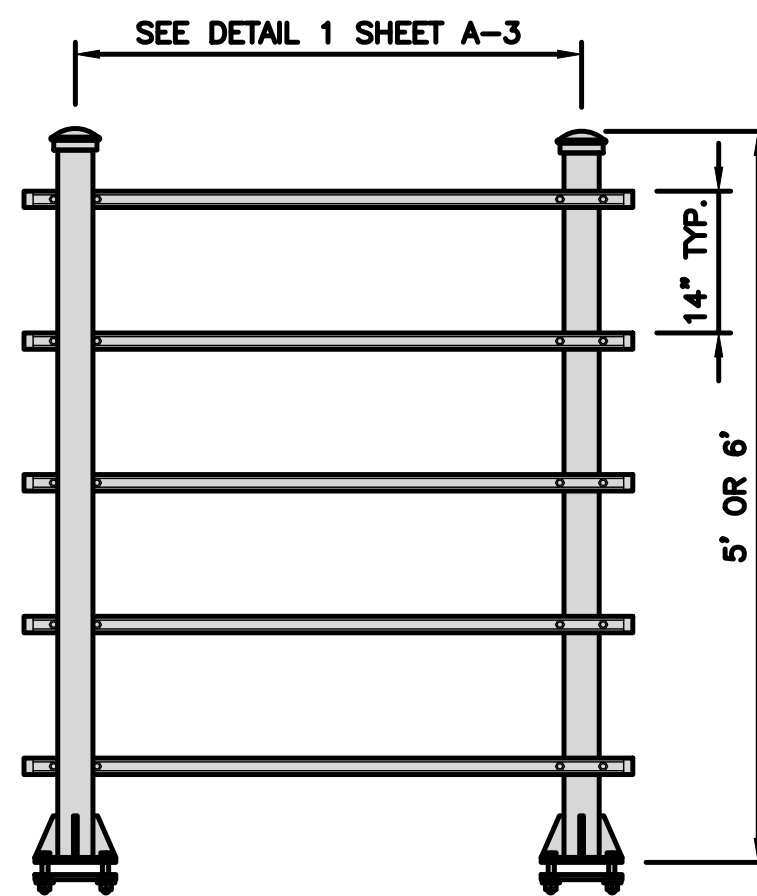
3

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

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



SIDE



FRONT

H-FRAME DETAIL

NO SCALE

5

NO SCALE

4

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

9

**dish**  
wireless.

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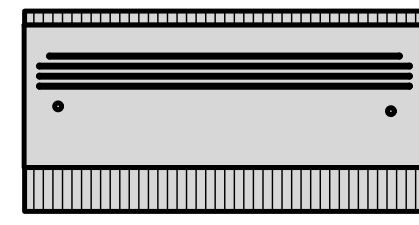
SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER

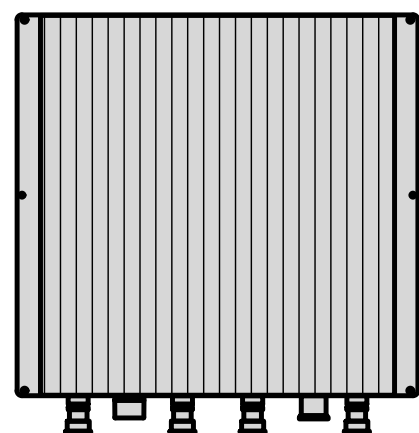
**A-5**



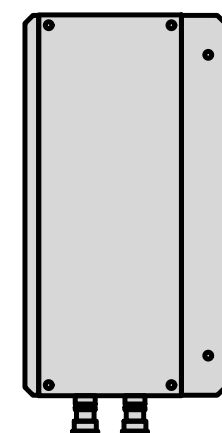
FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



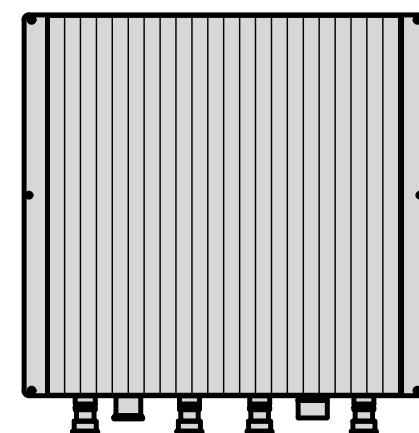
PLAN



BACK



SIDE



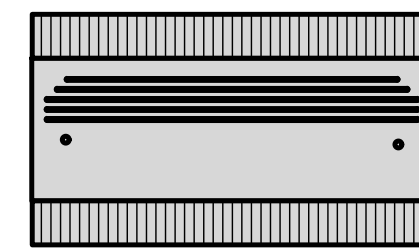
FRONT

RRH DETAIL

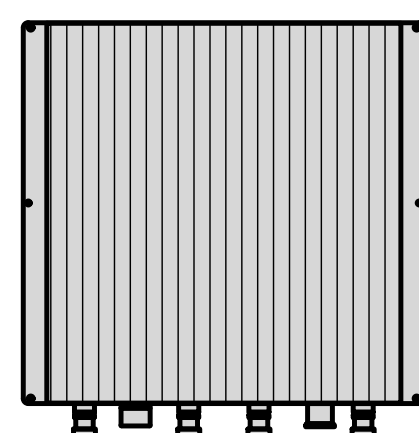
NO SCALE

1

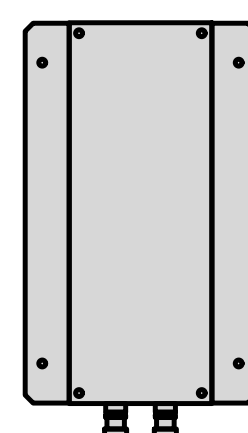
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



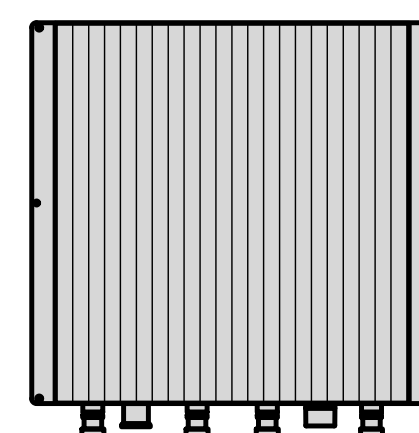
PLAN



BACK



SIDE



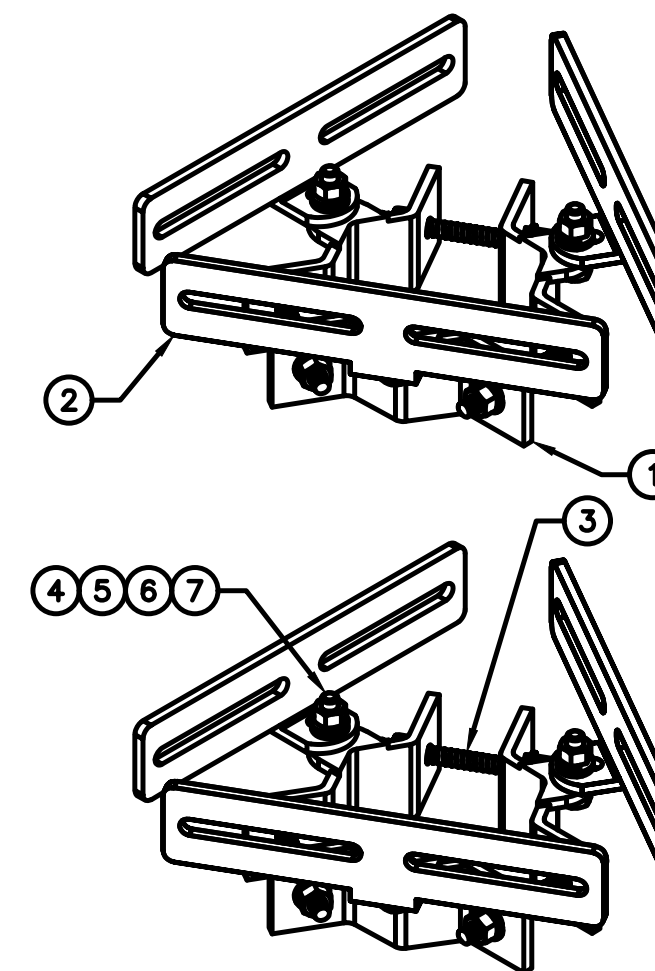
FRONT

RRH DETAIL

NO SCALE

2

EEI FPS-AB TRIAD FLUH MOUNT	
DESCRIPTION	PART # - QTY
TRIAD-FPS - 1/4" BRACKET ASSEMBLY	PART 1 - QTY: 6
TRIAD-AB - 1/4" HRPO GUSSET ASSEMBLY	PART 2 - QTY: 6
3/8"x5-1/2" A36 THREADED ROD	PART 3 - QTY: 6
3/8"x1-1/4" A307 BOLT	PART 4 - QTY: 6
3/8" HEX NUT	PART 5 - QTY: 6
3/8" FLAT WASHER	PART 6 - QTY: 6
3/8" LOCK WASHER	PART 7 - QTY: 6
TOTAL WEIGHT	±8 lbs



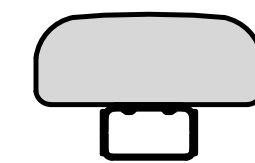
NOTE:  
OR DISH Wireless L.L.C.  
APPROVED EQUIVALENT

MAST MOUNT DETAIL

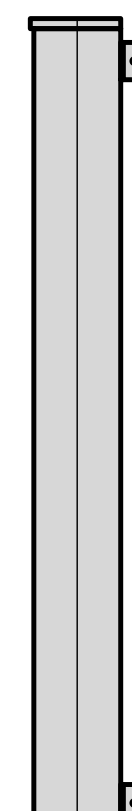
NO SCALE

3

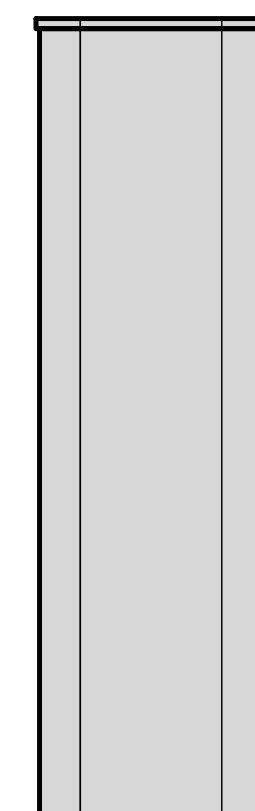
JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs



PLAN



SIDE



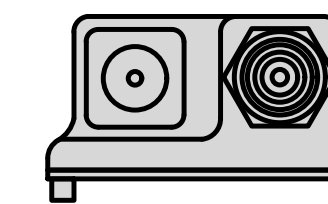
FRONT

ANTENNA DETAIL

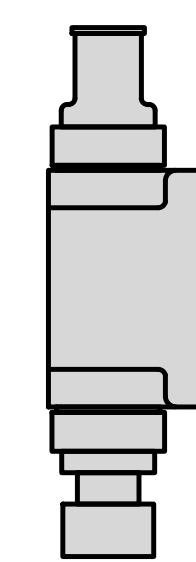
NO SCALE

5

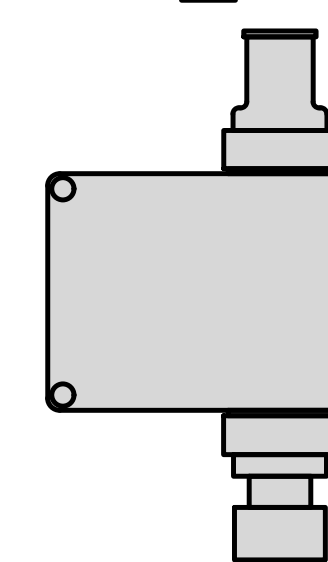
KAELUS SMART BIAS TEE SBT0003F1V2 (TOP OF TOWER)	
DIMENSIONS (HxWxD)	5.41"x3.27"x1.88"
WEIGHT	0.88 lbs
RF TO RF+AISG	
PASSBAND	555-3800 MHz
INSERTION LOSS	0.1dB MAX
RETURN LOSS	20dB MIN
MAX INPUT POWER	750W CW/5kW PEP
INTERMODULATION PRODUCTS	-160dBc(IM3)MAX 2x20W CW CARRIERS
RF IMPEDANCE	50 Ohms



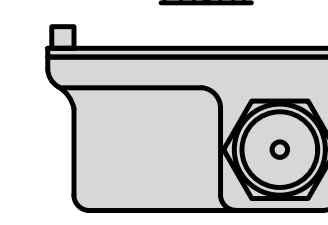
TOP



SIDE



FRONT



BOTTOM

SMART BIAS TEE DETAIL

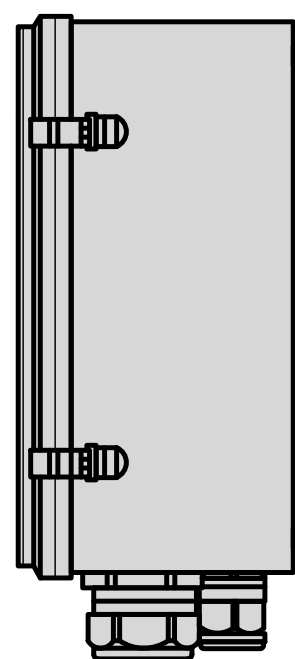
NO SCALE

6

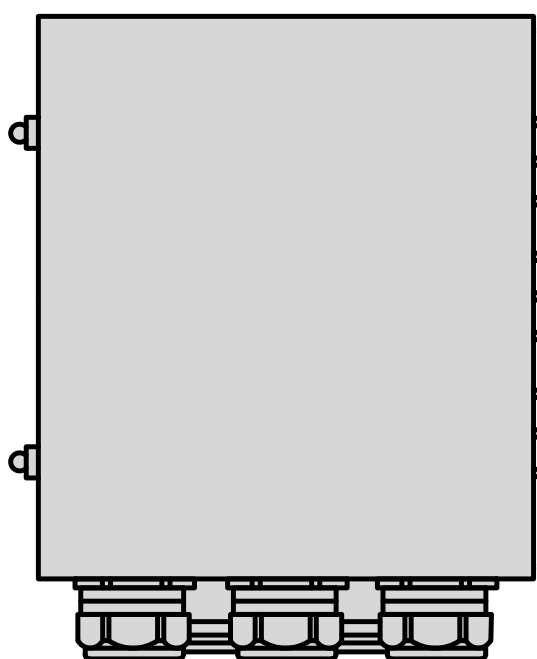
RAYCAP RDIC-6715-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	16"x14"x8"
WEIGHT	21.85 LBS



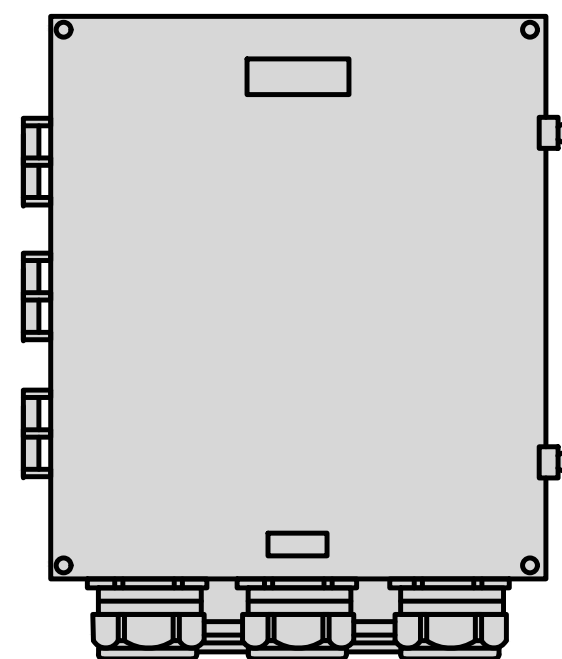
PLAN



SIDE



BACK



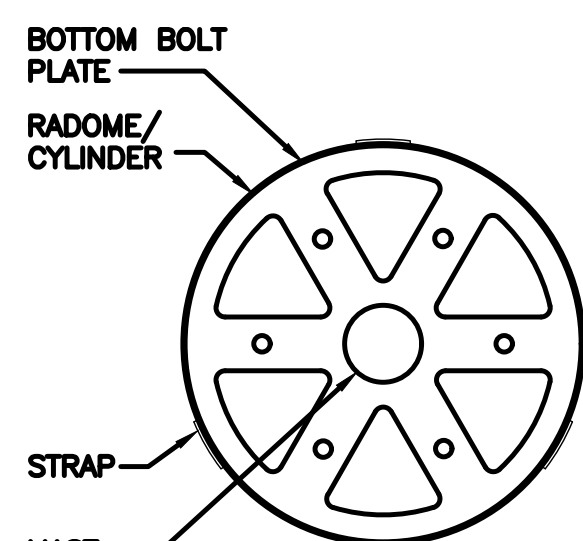
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SURGE SUPPRESSION DETAIL (OVP)

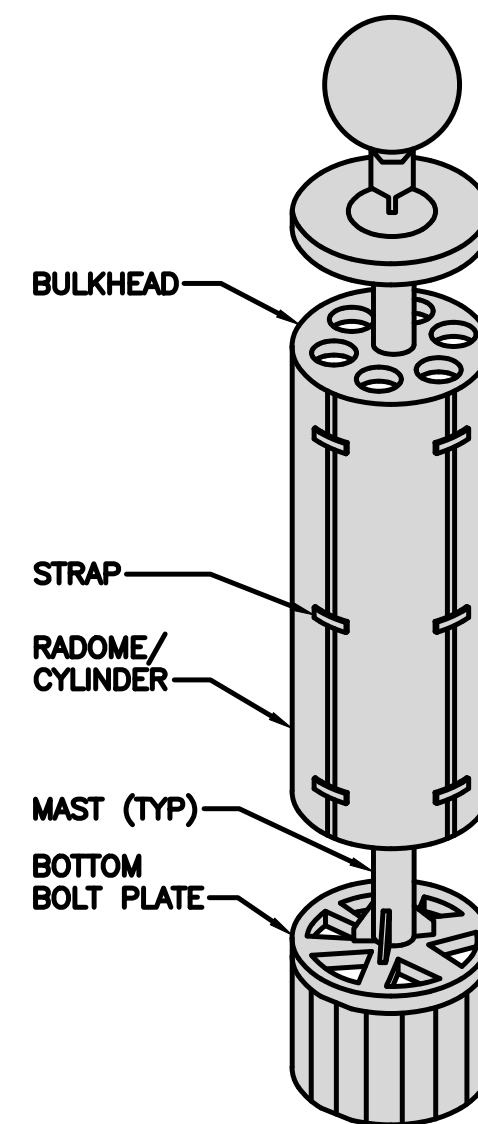
NO SCALE

7

RAYCAP STEALTH SMOOTH MULTI-PART	
RADOME OUTSIDE DIAMETERS	24"-60" DIA.
APPROX. MATERIAL THICKNESS	3/16"
MAX. HEIGHT	12'-0"
CONNECTION	BOLTS OR STRAPS



PLAN



ISOMETRIC

RADOME CANISTER DETAIL

NO SCALE

8

**dish**  
wireless.

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**FPA**  
FRENCH & PARRELLO  
ASSOCIATES

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or 732.312.9800 f: 732.312.9801



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DRAWN BY: CHECKED BY: APPROVED BY:

T.J.A. J.B. ---

RFDS REV #: ---

**CONSTRUCTION  
DOCUMENTS**

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A&E PROJECT NUMBER  
2438H.001.031

DISH Wireless L.L.C.  
PROJECT INFORMATION  
NJJER01106A  
1875 NOBLE AVENUE  
BRIDGEPORT, CT 06610

SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER

**A-6**

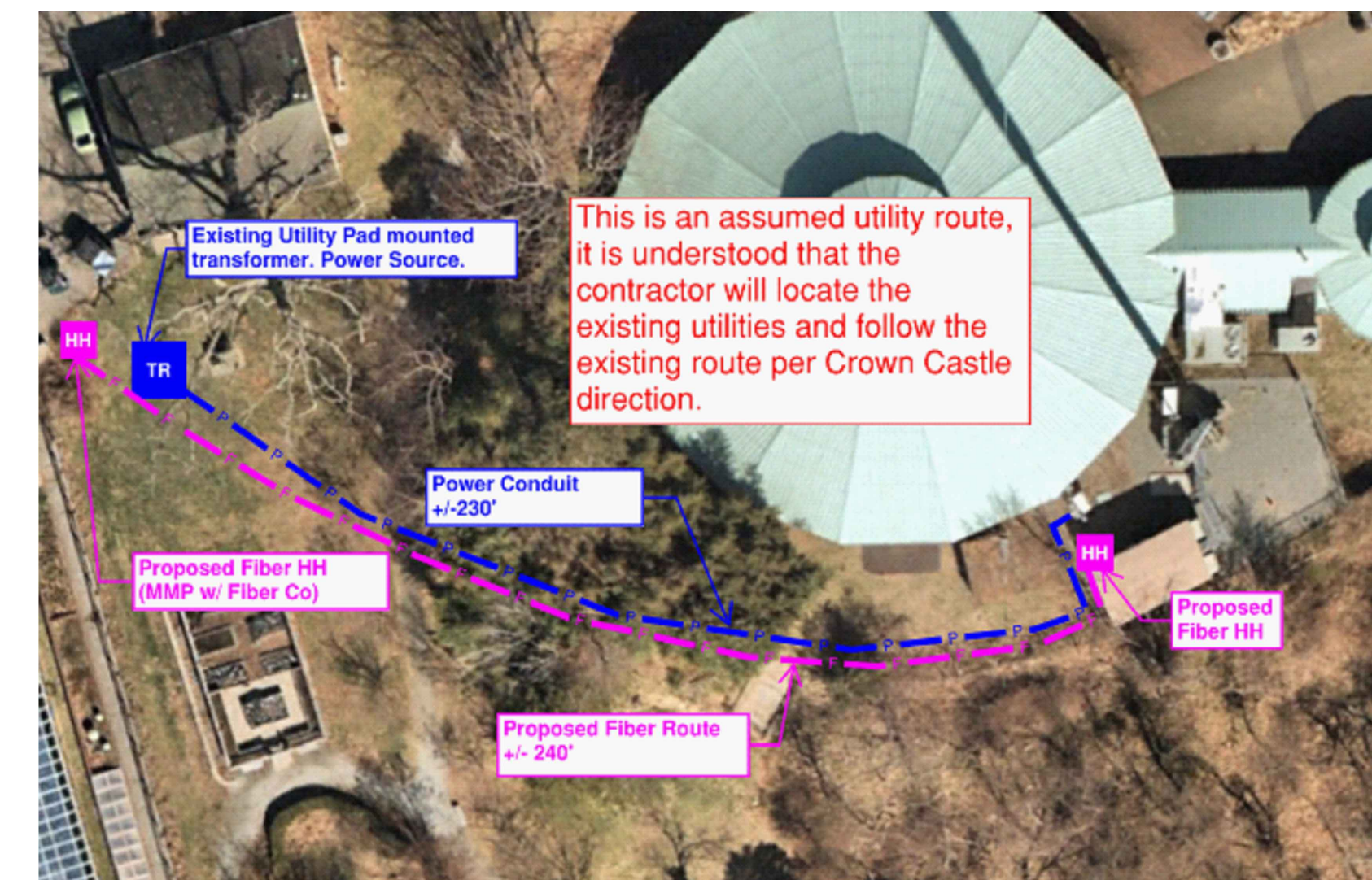
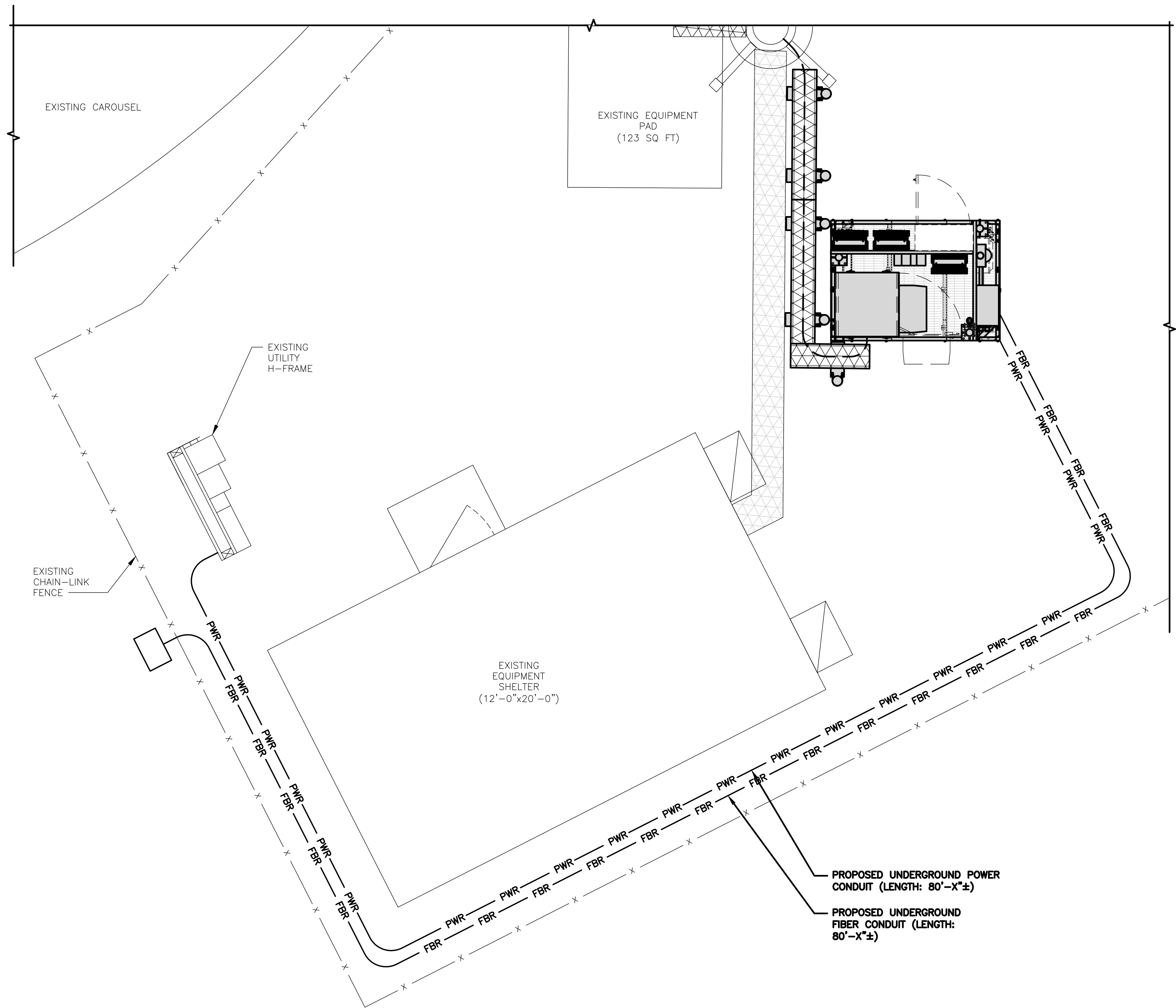


**NOTES**

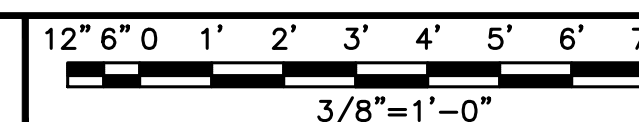
1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

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



**UTILITY ROUTE PLAN**



1

**ELECTRICAL NOTES**

NO SCALE

2



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BRIDGEPORT, CT 06610

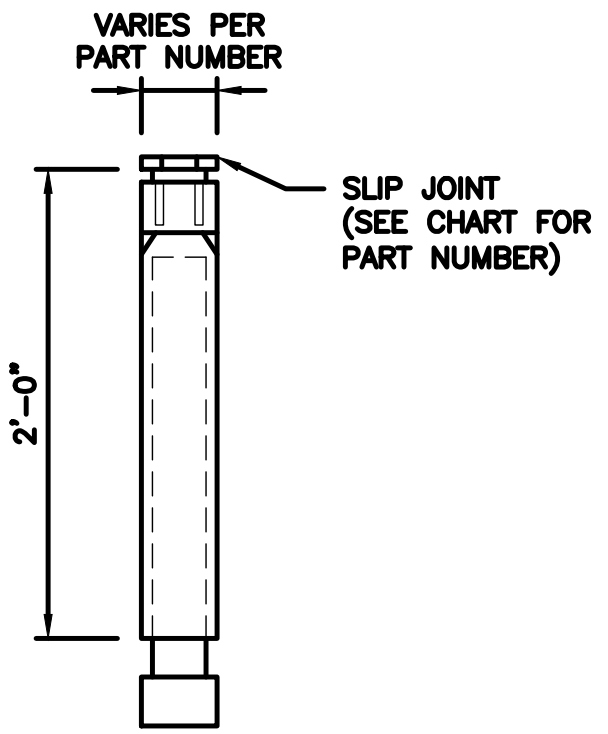
SHEET TITLE  
ELECTRICAL/FIBER ROUTE  
PLAN AND NOTES

SHEET NUMBER  
**E-1**



**CARLON EXPANSION FITTINGS**

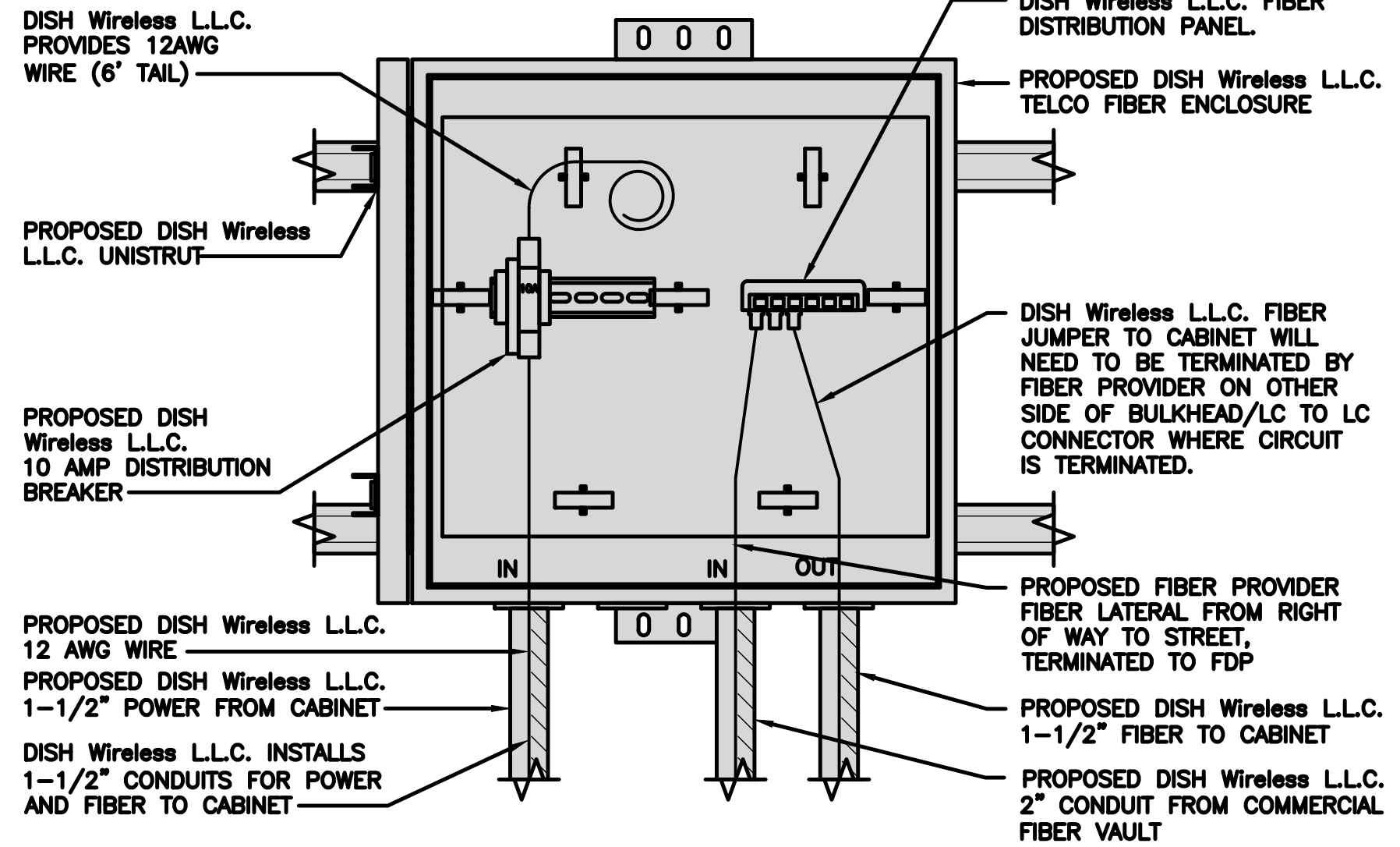
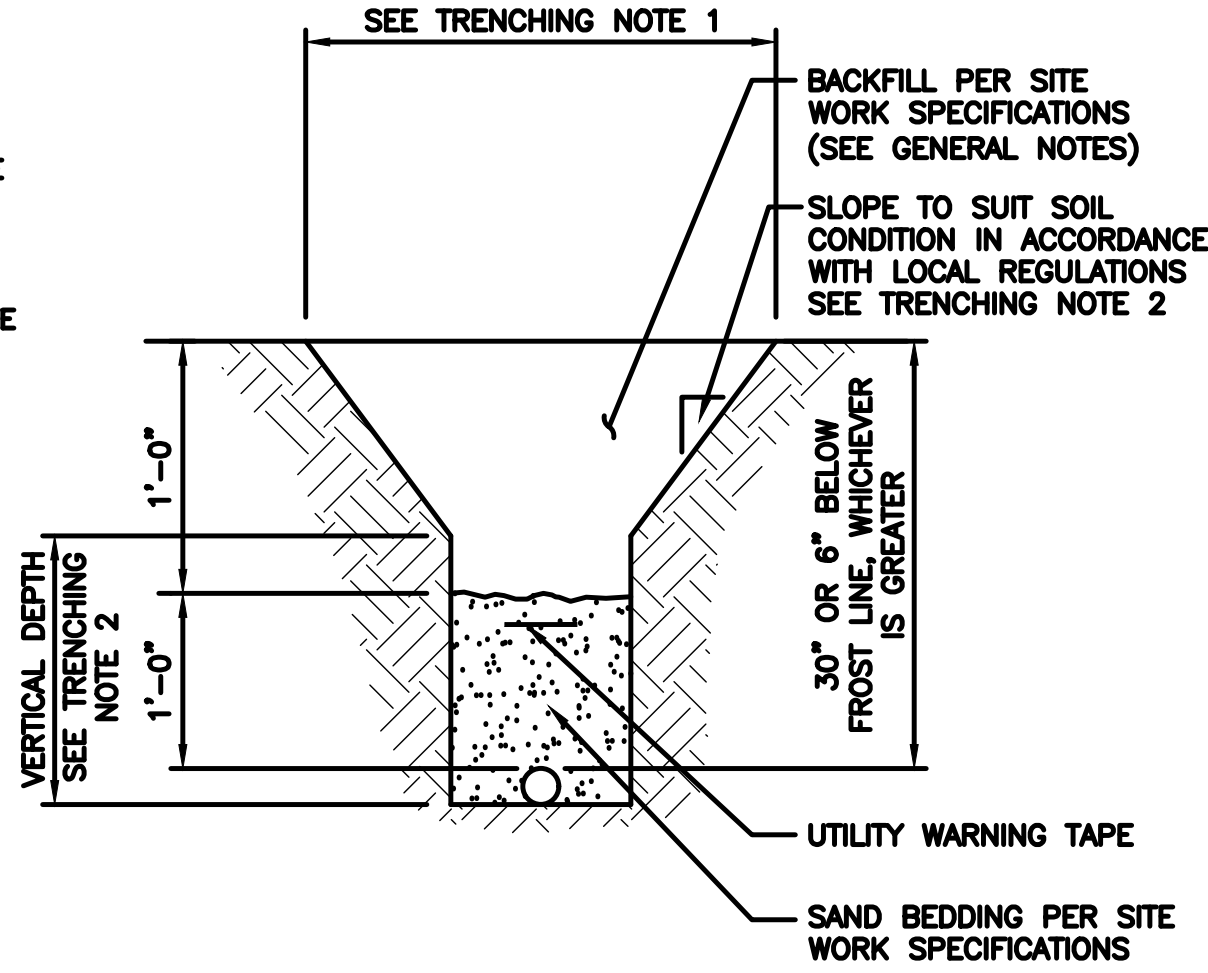
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N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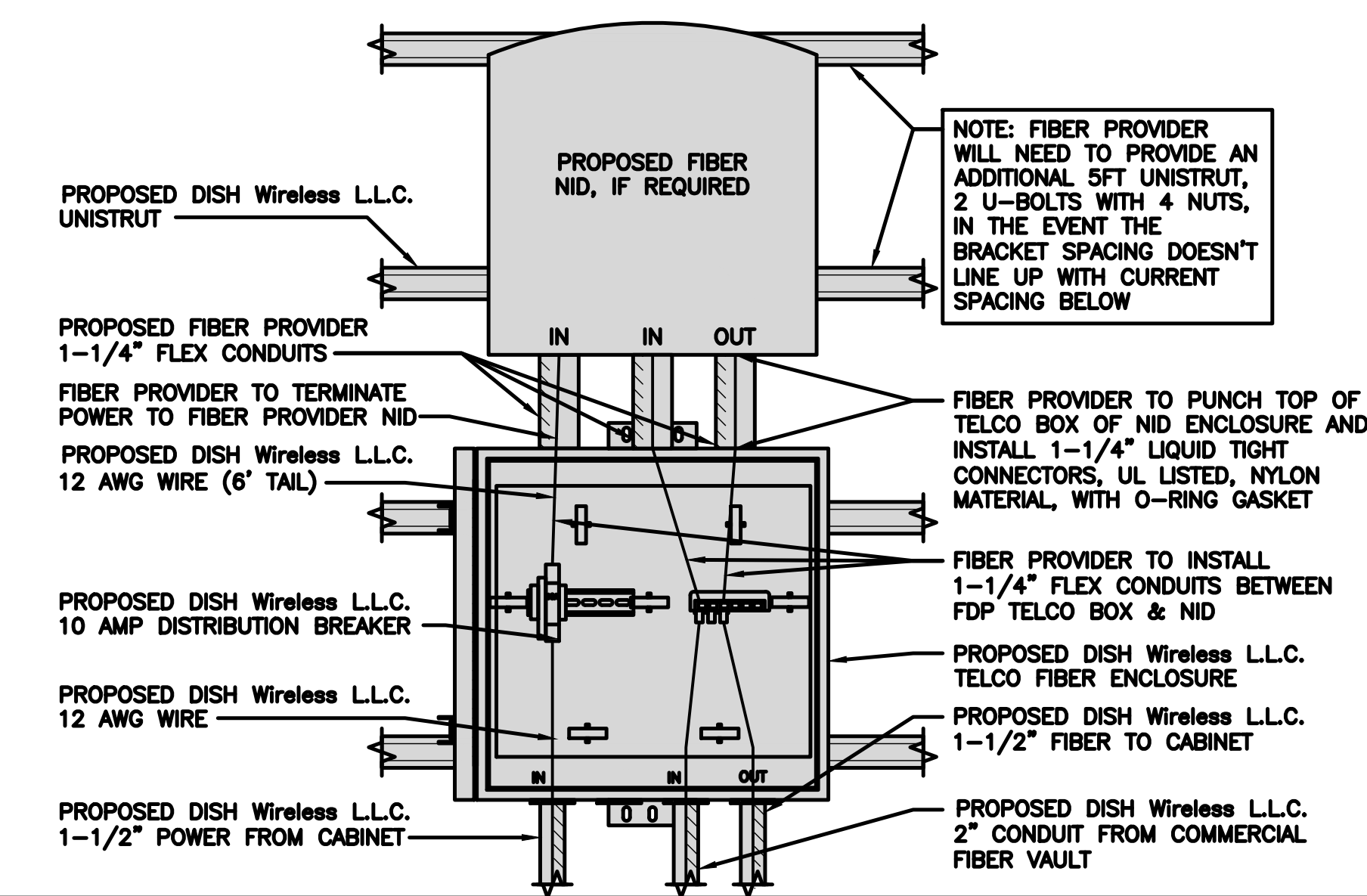


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**EXPANSION JOINT DETAIL** NO SCALE 1

**TYPICAL UNDERGROUND TRENCH DETAIL** NO SCALE 2

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



**LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL)** NO SCALE 4

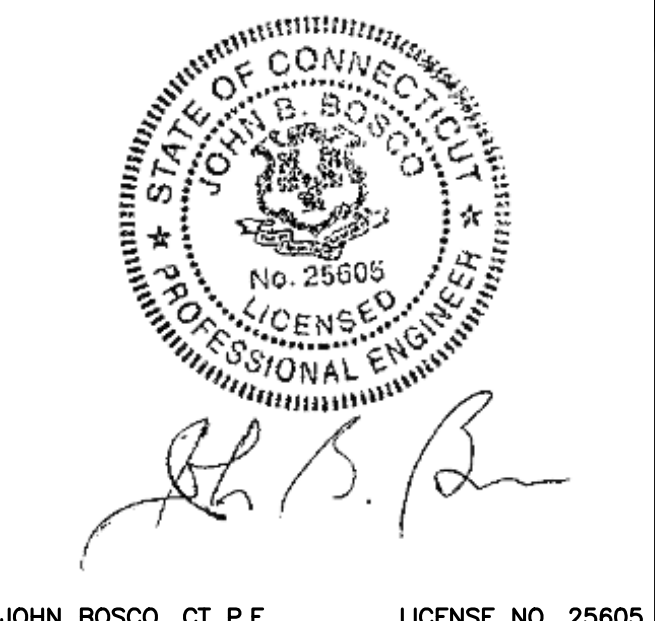
**NOT USED** NO SCALE 5

**NOT USED** NO SCALE 6

**NOT USED** NO SCALE 7

**NOT USED** NO SCALE 8

**NOT USED** NO SCALE 9



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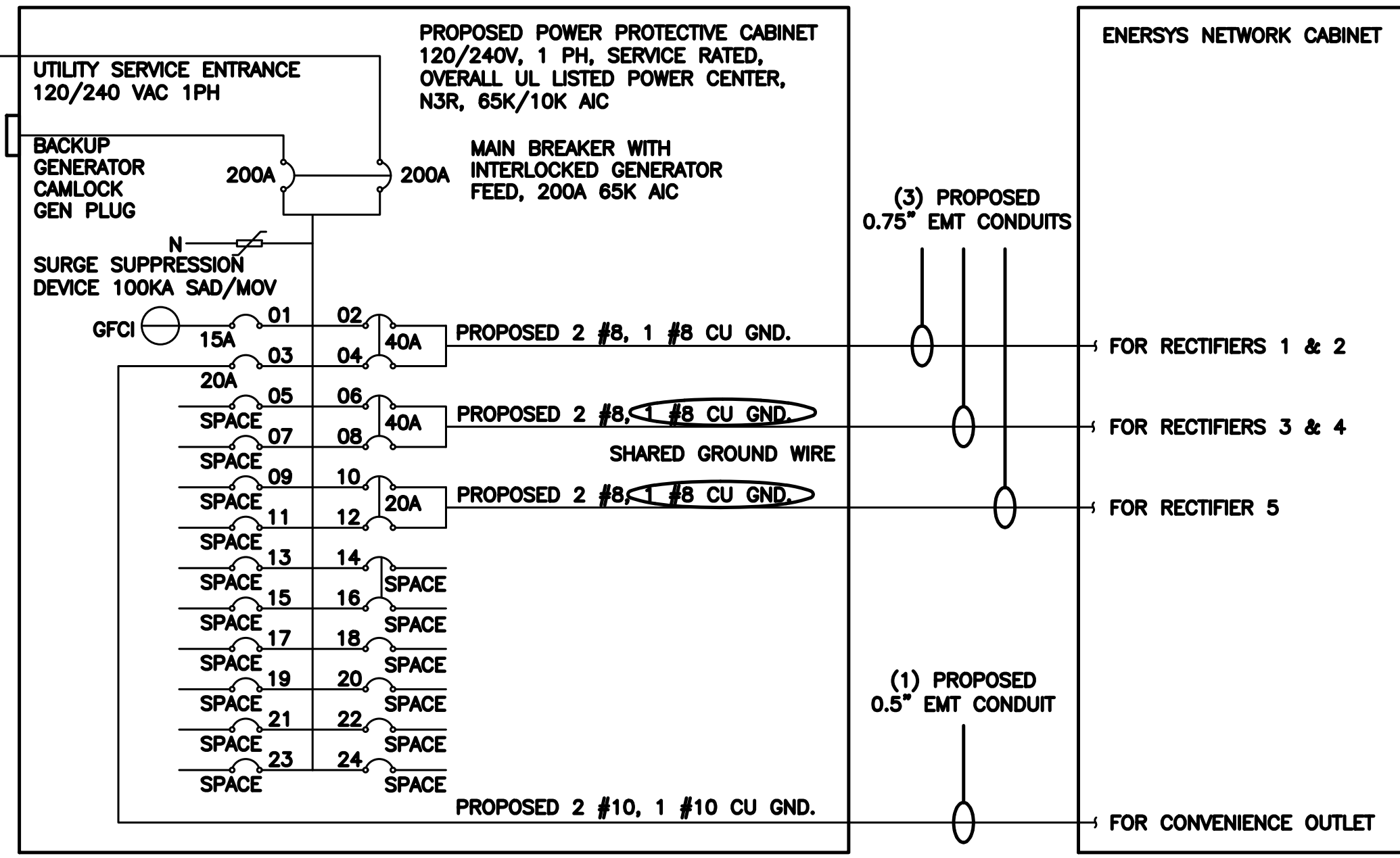
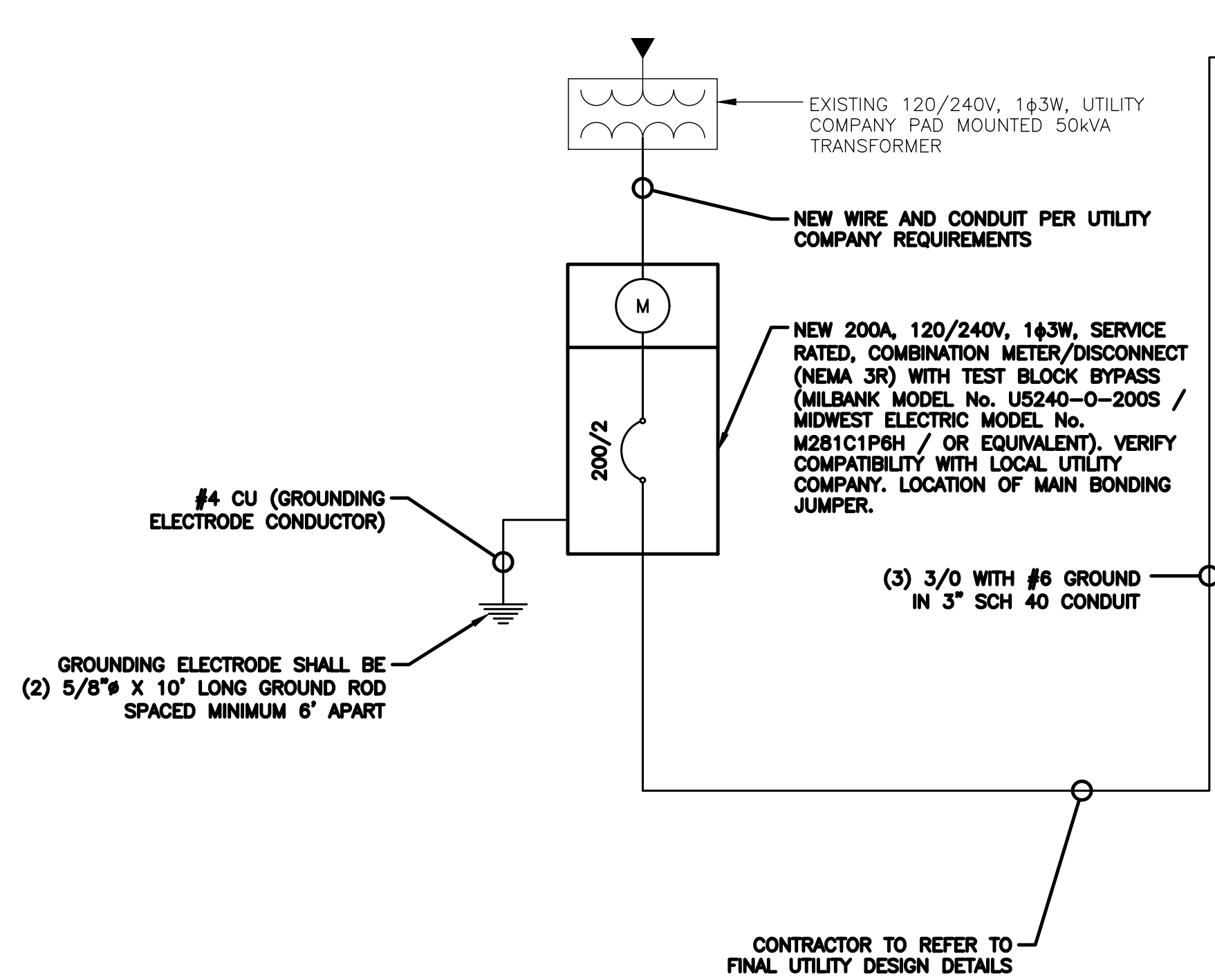
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DISH Wireless L.L.C.  
PROJECT INFORMATION  
NJJER01106A  
1875 NOBLE AVENUE  
BRIDGEPORT, CT 06610

SHEET TITLE  
ELECTRICAL  
DETAILS

SHEET NUMBER  
**E-2**





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

**BREAKERS REQUIRED:**

(2) 40A, 2P BREAKER - SQUARE D P/N:Q0240

(1) 20A, 2P BREAKER - SQUARE D P/N:Q0220

(1) 20A, 1P BREAKER - SQUARE D P/N:Q0120

**NOTES**

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 (3 CONDUITS): USING UL1015, CU.

#8 - 0.0552 SQ. IN X 2 = 0.1103 SQ. IN

#8 - 0.0131 SQ. IN X 1 = 0.0131 SQ. IN <BARE GROUND

TOTAL = 0.1234 SQ. IN

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

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

3/0 - 0.2679 SQ. IN X 3 = 0.8037 SQ. IN

#6 - 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND

TOTAL = 0.8544 SQ. IN

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

PPC ONE-LINE DIAGRAM

NO SCALE 1

**PROPOSED ENERSYS 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	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIERS 1 & 2
ENERSYS GFCI OUTLET			20A	3	B	4	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIER 3 & 4
-SPACE-				5	A	6	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIER 3 & 4
-SPACE-				7	B	8	20A	1920	1920	ENERSYS ALPHA CORDEX RECTIFIER 5
-SPACE-				9	A	10				
-SPACE-				11	B	12				
-SPACE-				13	A	14				
-SPACE-				15	B	16				
-SPACE-				17	A	18				
-SPACE-				19	B	20				
-SPACE-				21	A	22				
-SPACE-				23	B	24				
VOLTAGE AMPS								9500	9500	
200A MCB, 1ϕ, 24 SPACE, 120/240V										
MB RATING: 65,000 AIC										
				L1	L2					
				9680	9680					
				81	81					
										VOLTAGE AMPS
										AMPS
										MAX AMPS
										MAX 125%

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3



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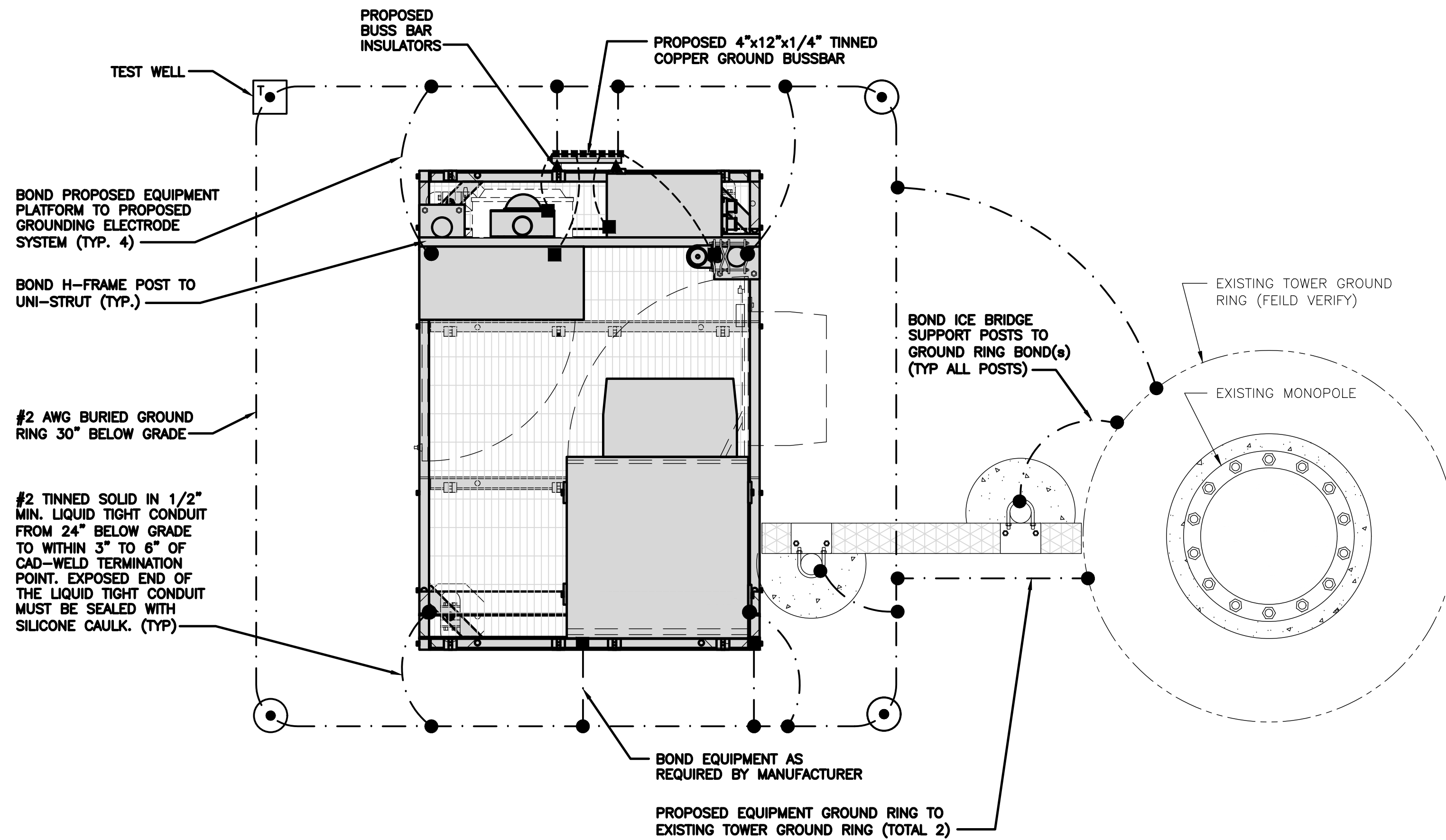
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DISH Wireless L.L.C.  
PROJECT INFORMATION  
NJJER01106A  
1875 NOBLE AVENUE  
BRIDGEPORT, CT 06610

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

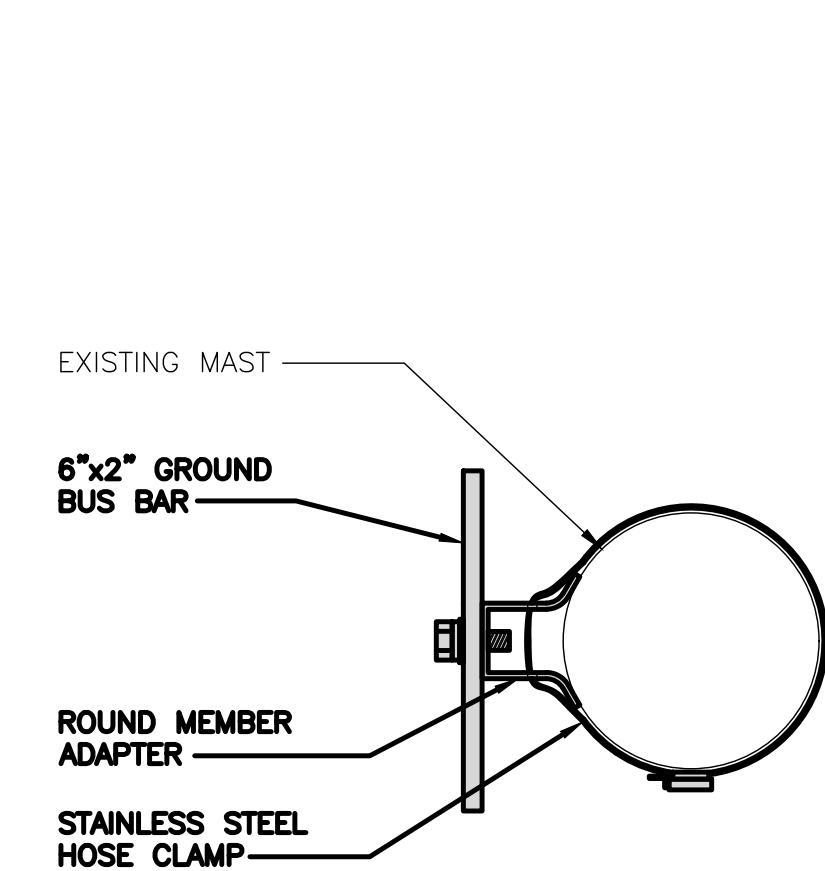
SHEET NUMBER  
**E-3**



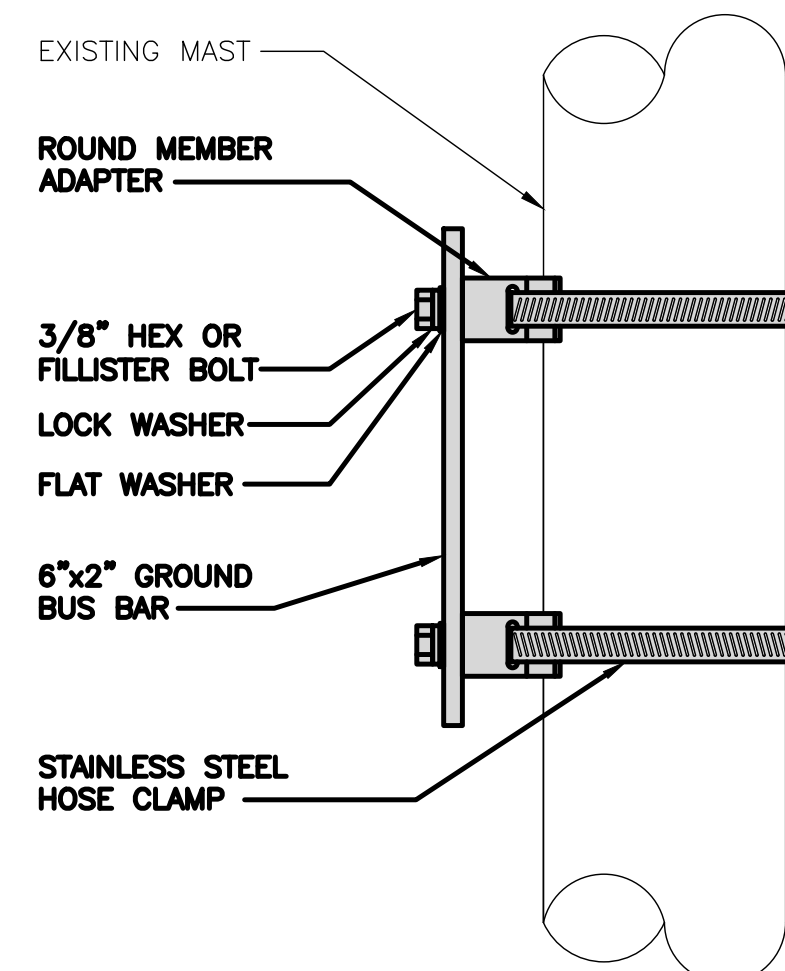


TYPICAL EQUIPMENT GROUNDING PLAN

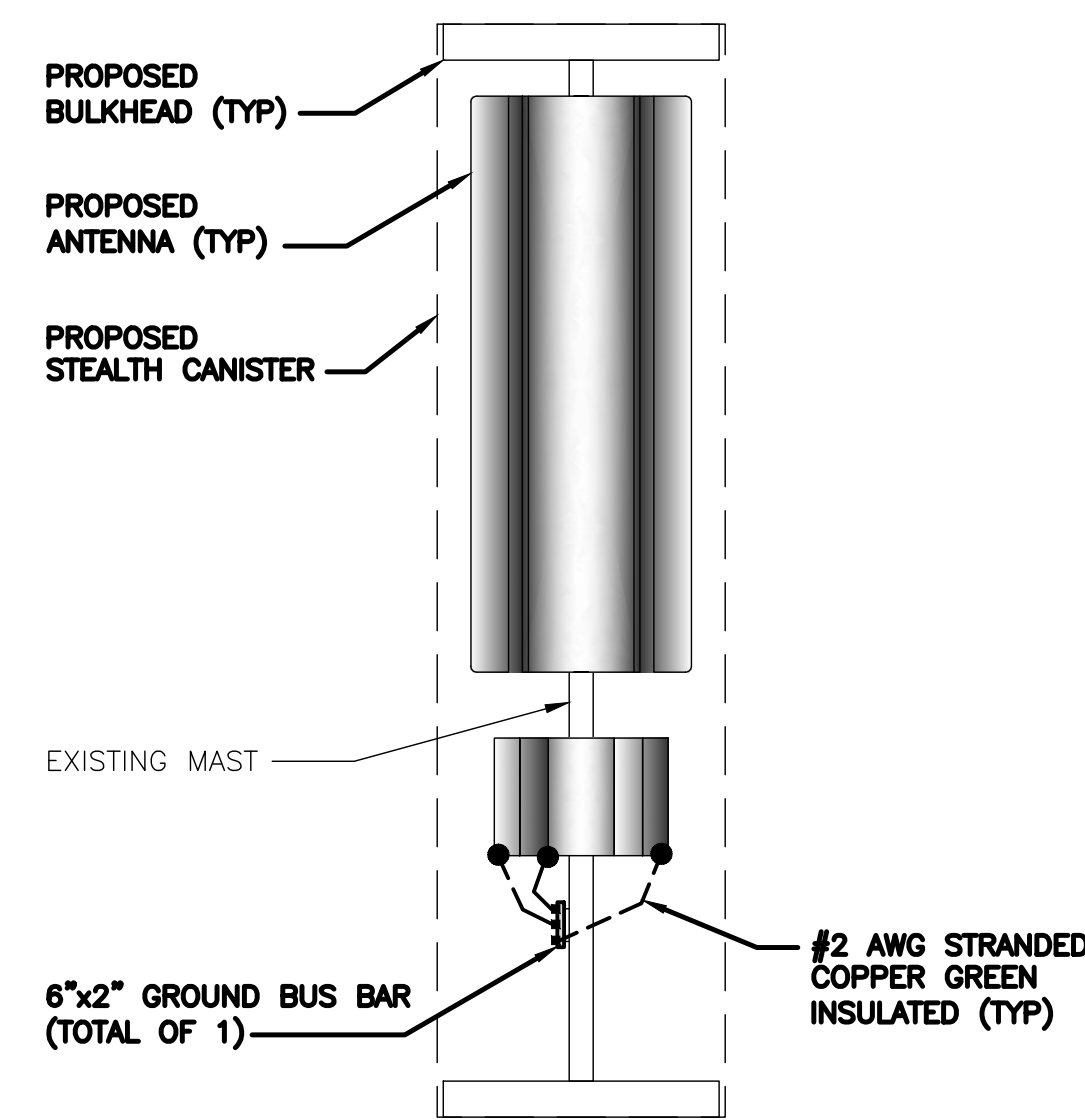
NO SCALE 1



BUSS BAR PLAN



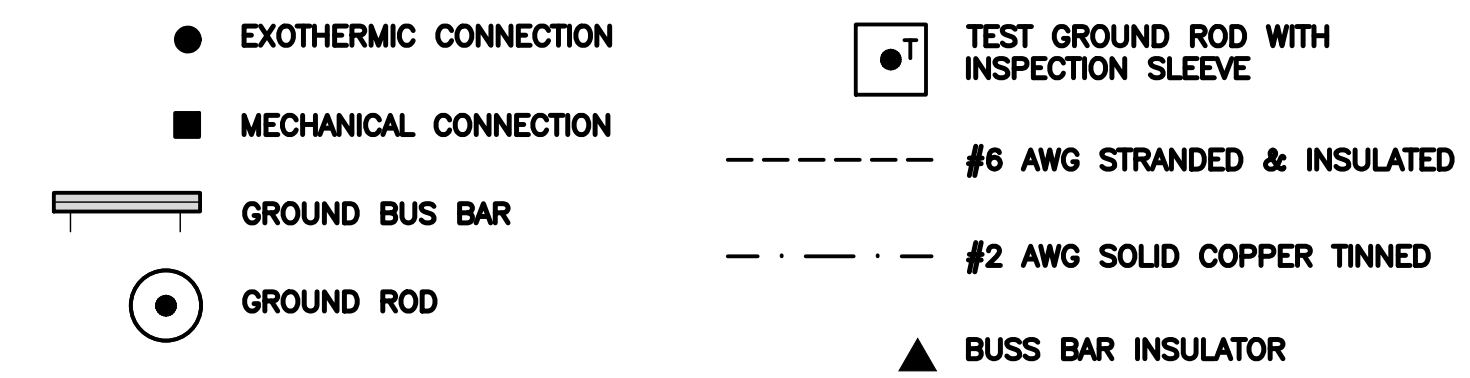
BUSS BAR ELEVATION



ANTENNA GROUNDING ELEVATION

TYPICAL ANTENNA GROUNDING DETAIL

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 AND 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.

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

GROUNDING KEY NOTES

NO SCALE 3



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SHEET TITLE  
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AND NOTES

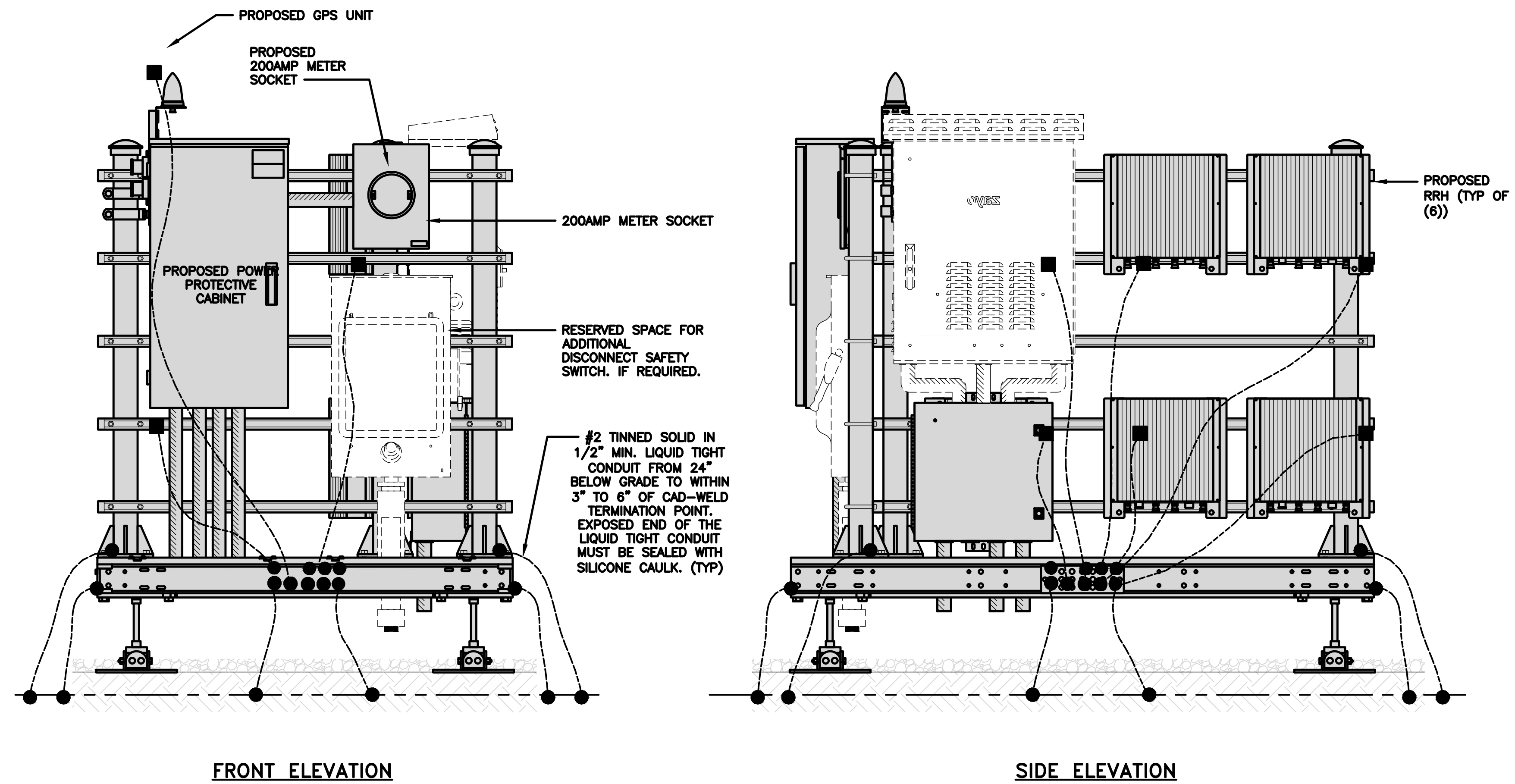
SHEET NUMBER

G-1



**NOTES**

EQUIPMENT CABINET OMITTED FOR CLARITY



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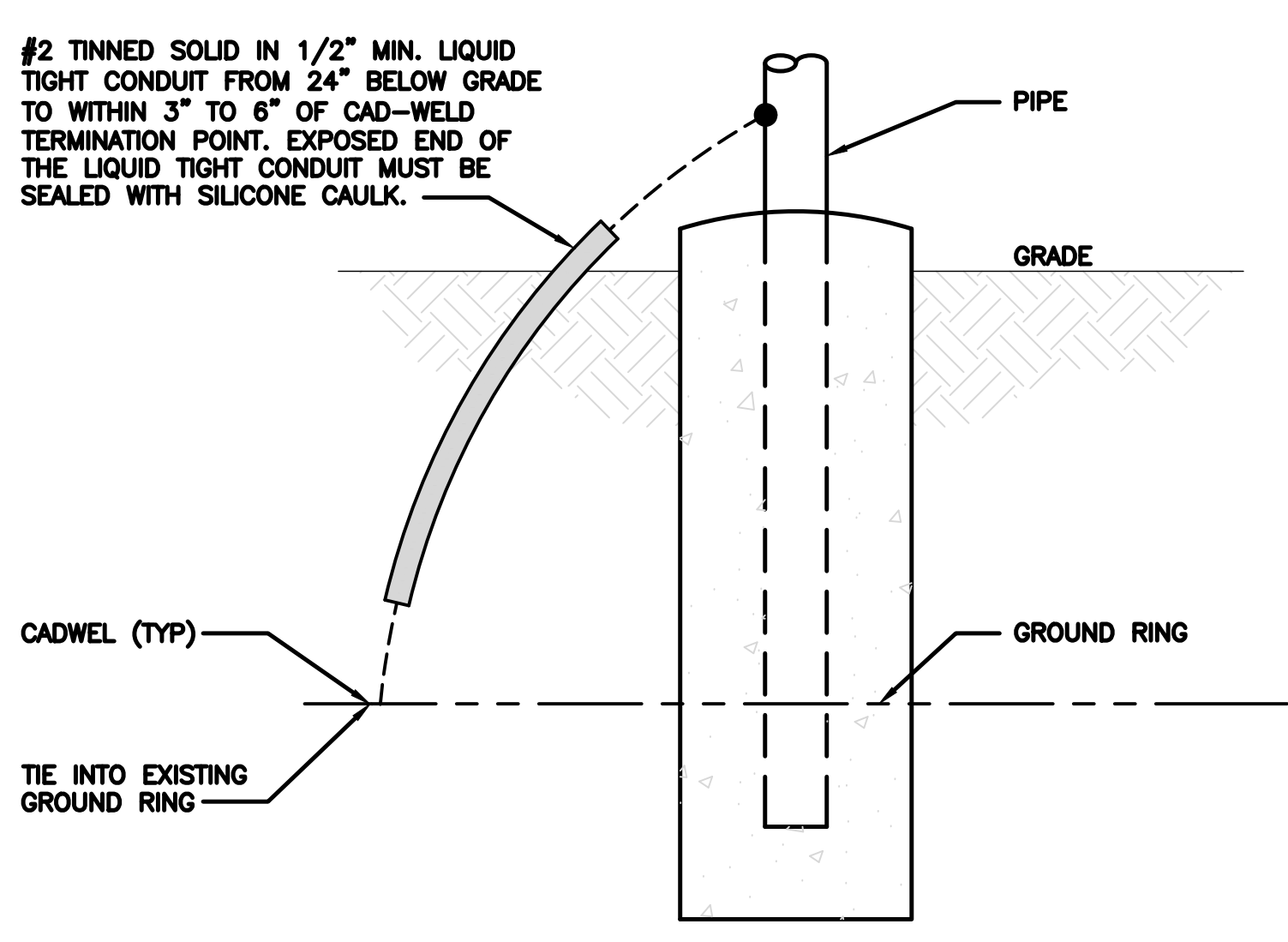
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SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER  
**G-2**

NOT USED

NO SCALE 1

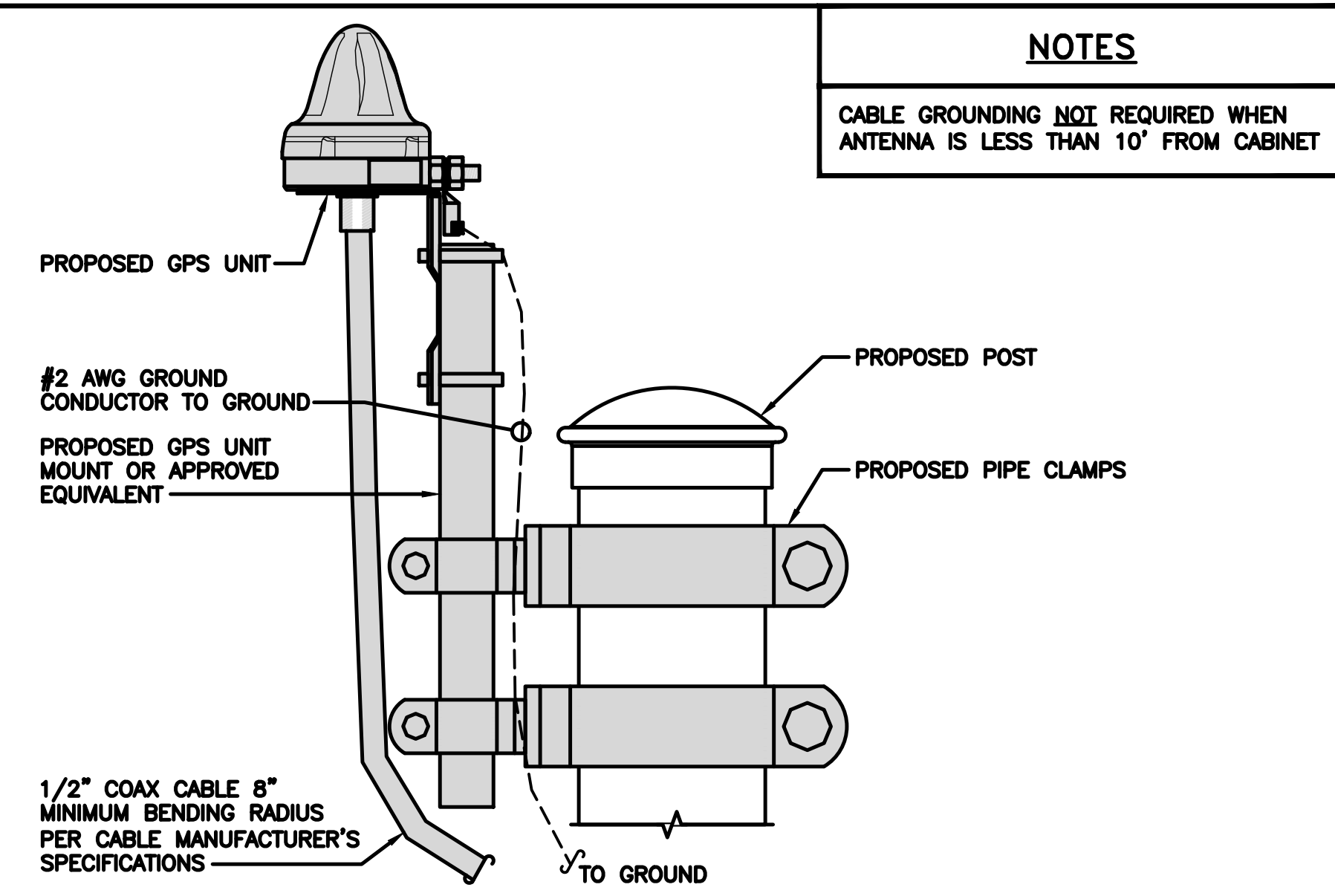


**TRANSITIONING GROUND DETAIL**

NO SCALE 5

**H-FRAME GROUNDING DETAIL**

NO SCALE 4

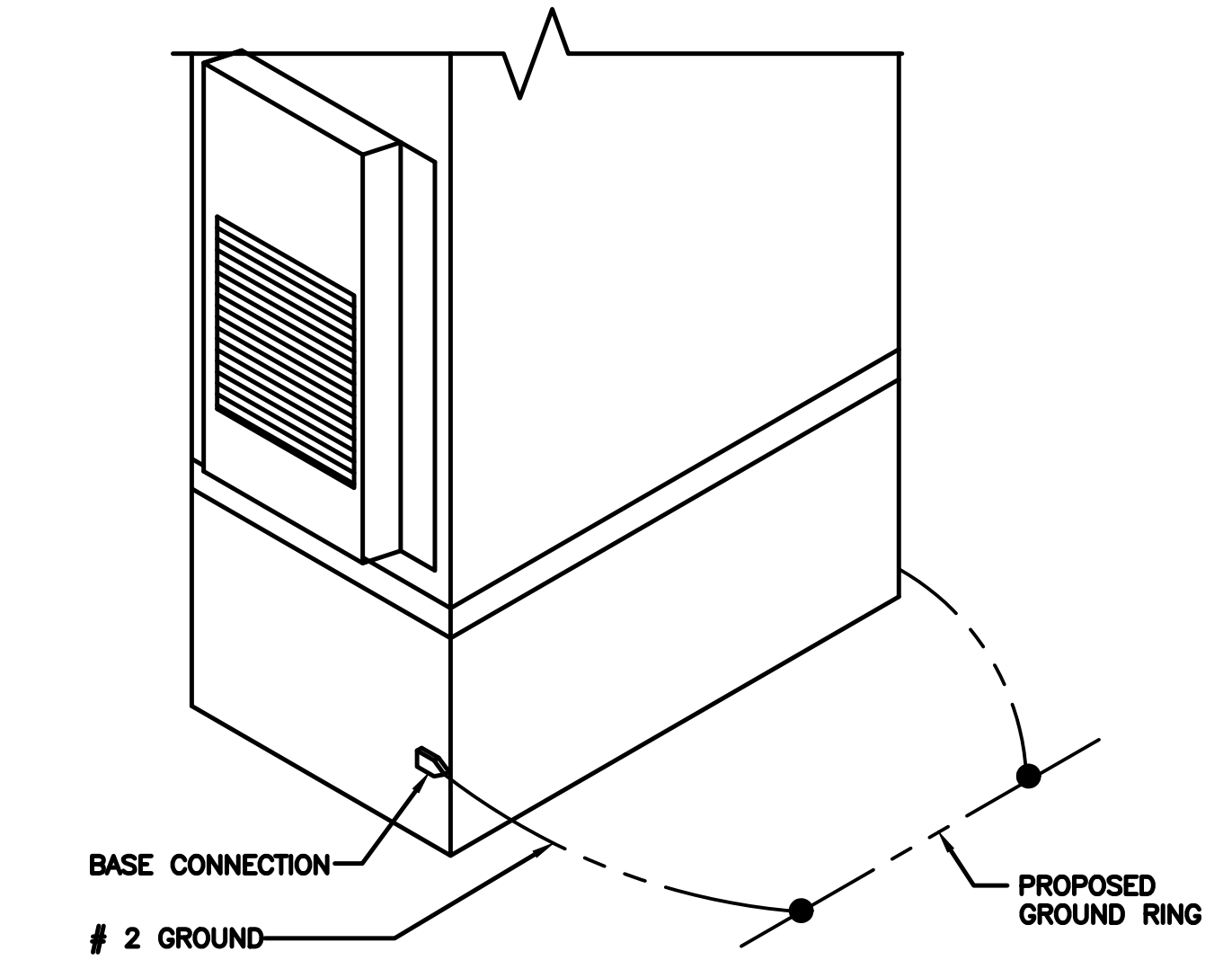


**TYPICAL GPS UNIT GROUNDING**

NO SCALE 6

**NOTES**

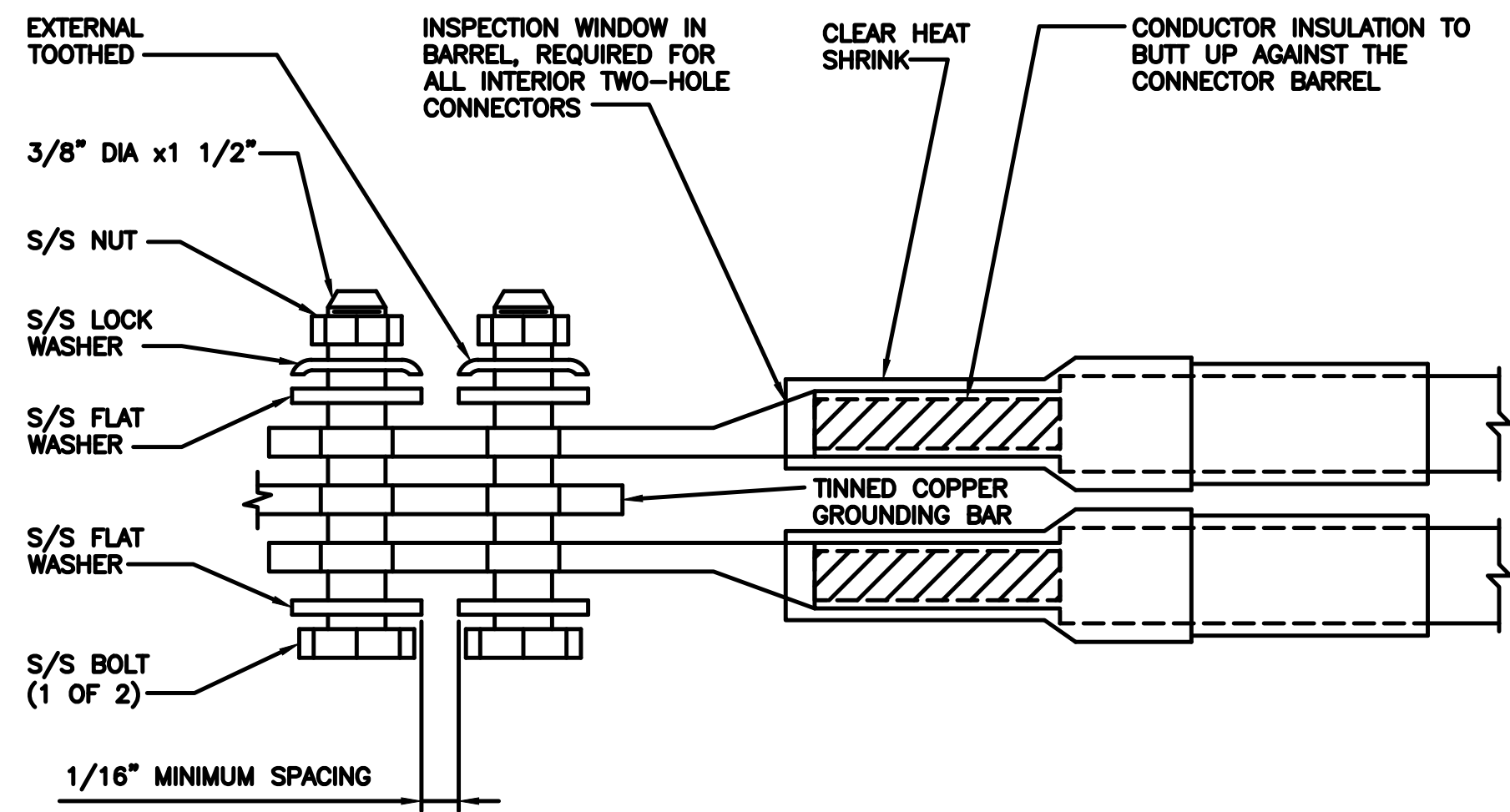
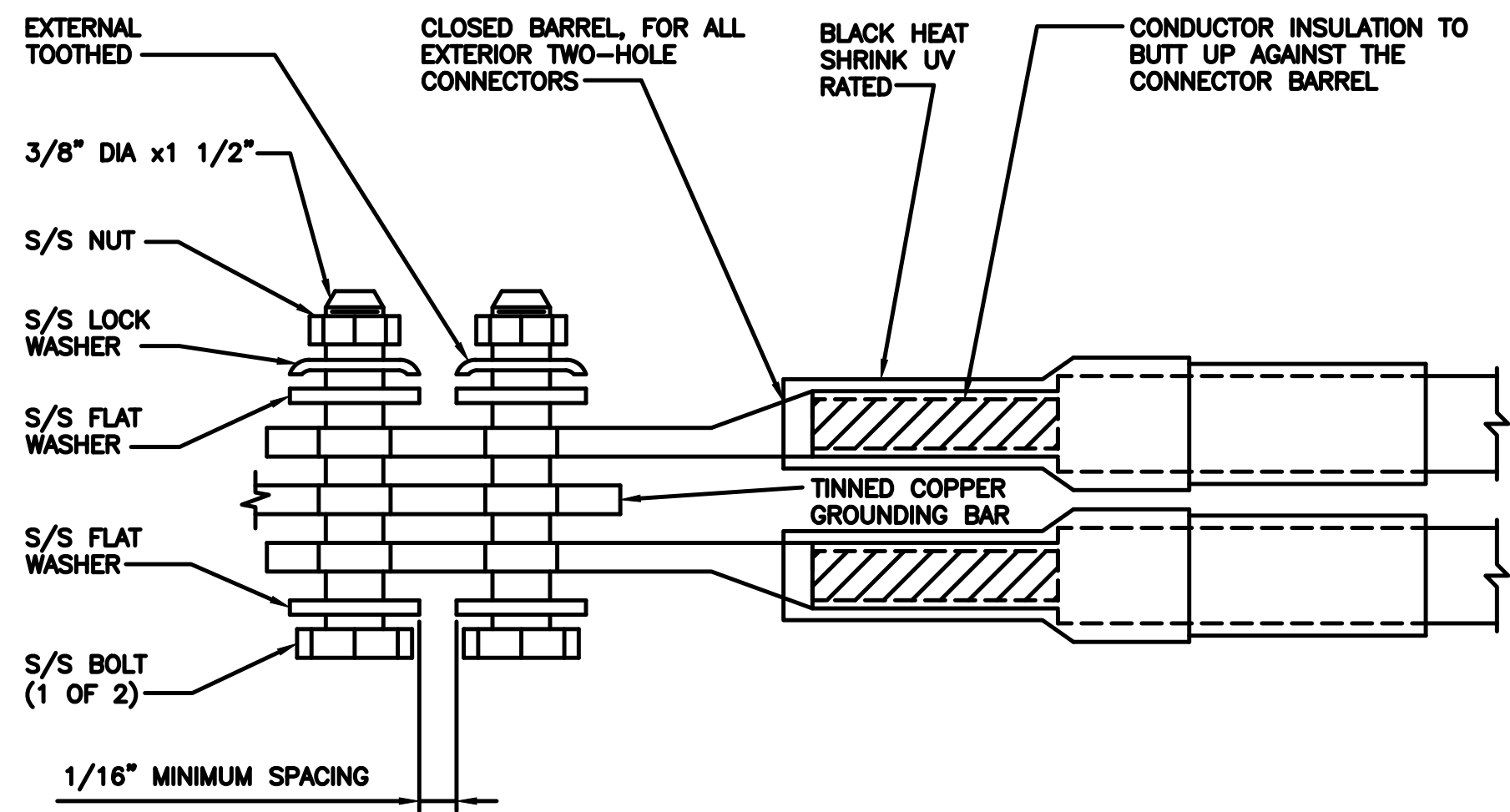
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



**OUTDOOR CABINET GROUNDING**

NO SCALE 7

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



TYPICAL GROUNDING NOTES

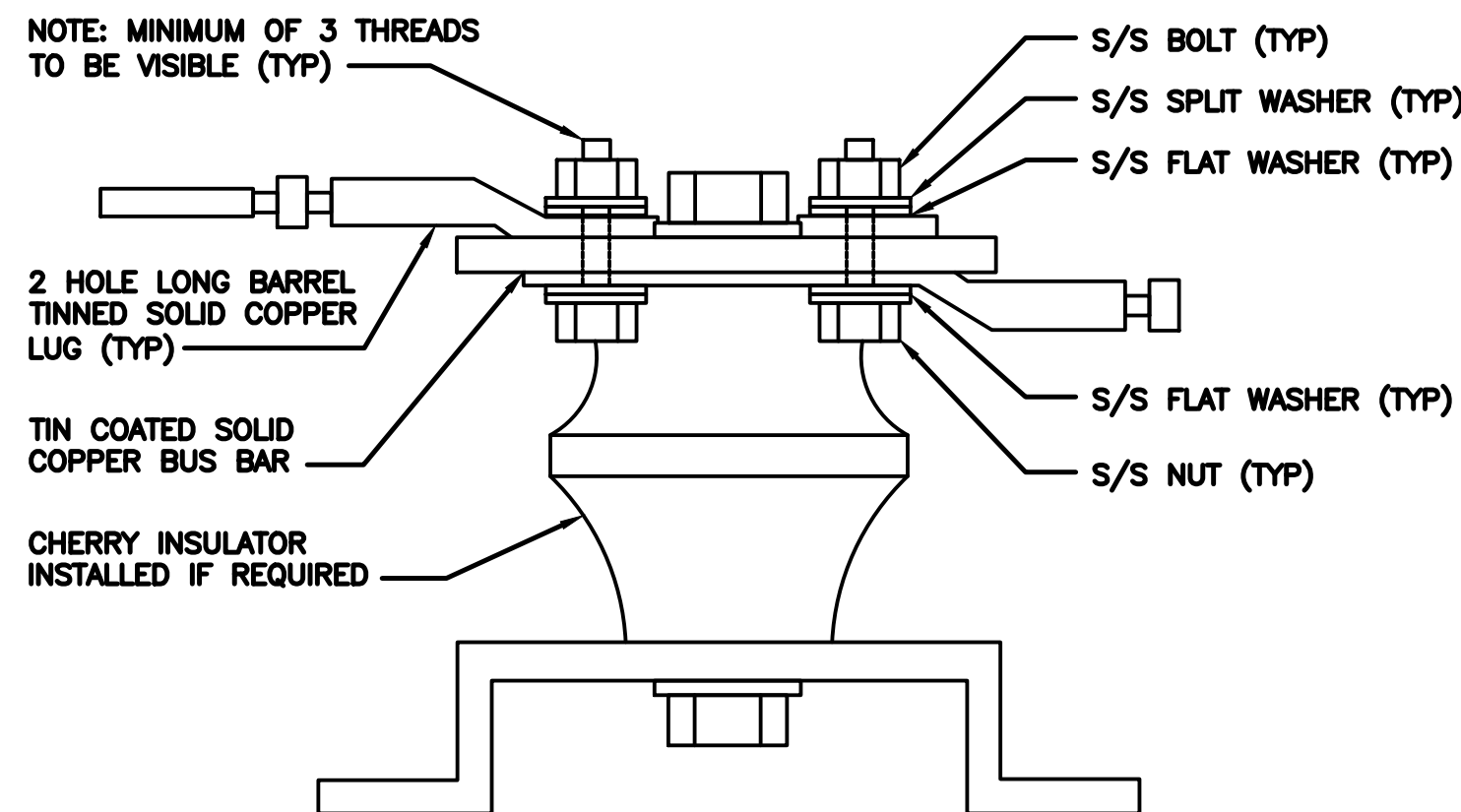
NO SCALE 1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

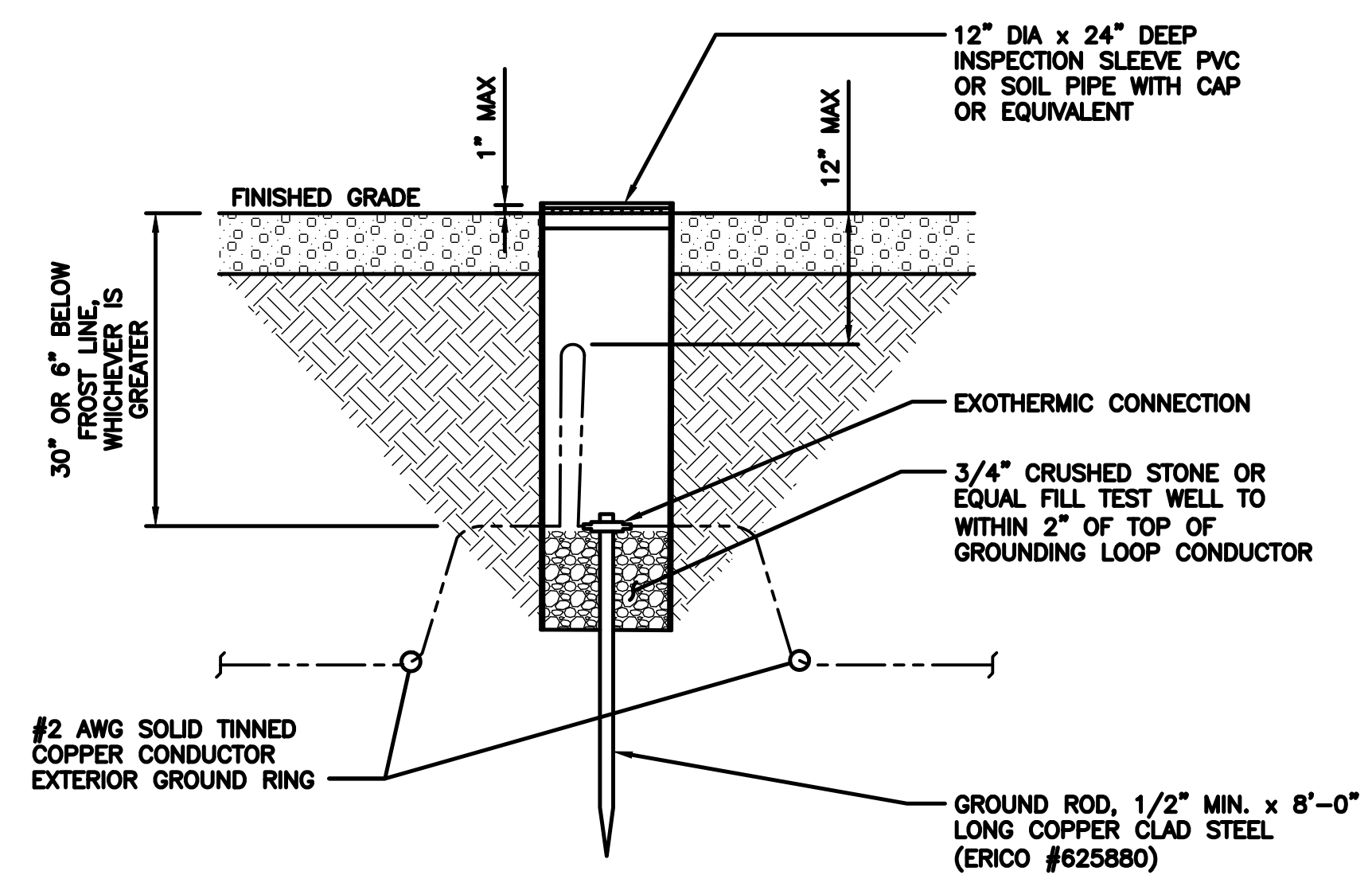
NO SCALE 4

NOT USED

NO SCALE 5

TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 6



NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

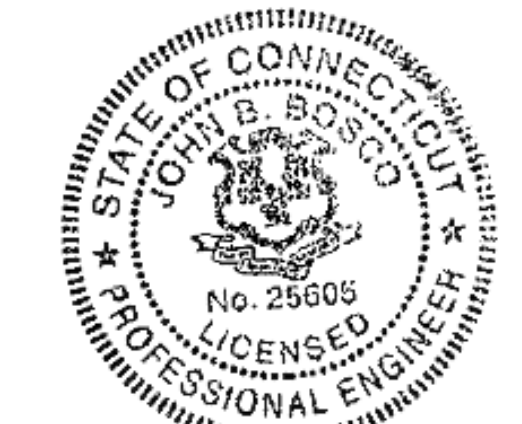
NO SCALE 9



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DRAWN BY: CHECKED BY: APPROVED BY:  
T.J.A. J.B. ---

RFDS REV #: ---

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A&E PROJECT NUMBER  
2438H.001.031

DISH Wireless L.L.C.  
PROJECT INFORMATION

NJER01106A  
1875 NOBLE AVENUE  
BRIDGEPORT, CT 06610

SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER  
**G-3**



**RF JUMPER COLOR CODING**

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

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

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

ALPHA RRH				BETA RRH				GAMMA RRH			
PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN
	WHITE (-) PORT	ORANGE	ORANGE		WHITE (-) PORT	ORANGE	ORANGE		WHITE (-) PORT	ORANGE	ORANGE
			WHITE (-) PORT				WHITE (-) PORT				WHITE (-) PORT

MID-BAND RRH -  
(AWS BANDS N66+N70)

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

RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN
	WHITE (-) PORT	PURPLE	PURPLE		WHITE (-) PORT	PURPLE	PURPLE		WHITE (-) PORT	PURPLE	PURPLE
			WHITE (-) PORT				WHITE (-) PORT				WHITE (-) PORT

**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 1	EXAMPLE 2	EXAMPLE 3
RED	RED	RED
BLUE	BLUE	
GREEN	GREEN	ORANGE
ORANGE	YELLOW	PURPLE
PURPLE		

**FIBER JUMPERS TO RRHs**

LOW-BAND RRH FIBER CABLES HAVE SECTOR  
STRIPE ONLY

LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

**POWER CABLES TO RRHs**

LOW-BAND RRH POWER CABLES HAVE SECTOR  
STRIPE ONLY

LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

**RET MOTORS AT ANTENNAS**

ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"	ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"	ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

**MICROWAVE RADIO LINKS**

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

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

FORWARD AZIMUTH OF 0-120 DEGREES		FORWARD AZIMUTH OF 120-240 DEGREES		FORWARD AZIMUTH OF 240-360 DEGREES	
PRIMARY	SECONDARY	PRIMARY	SECONDARY	PRIMARY	SECONDARY
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
RED	RED	BLUE	BLUE	GREEN	GREEN
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
	RED		BLUE		GREEN
	WHITE		WHITE		WHITE
	WHITE		WHITE		WHITE

**RF CABLE COLOR CODES**

NO SCALE

1

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



CBRS TECH  
(3 GHz)



AWS  
(N66+N70+H-BLOCK)



NEGATIVE SLANT PORT  
ON ANT/RRH



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

NOT USED

NO SCALE

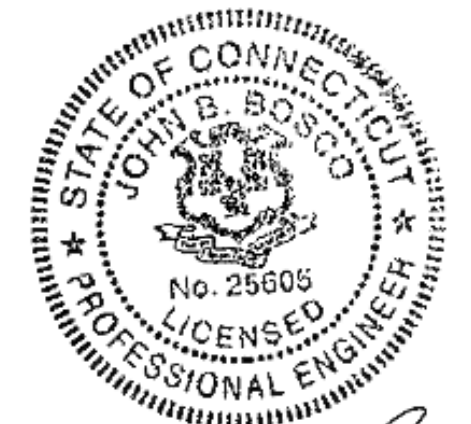
4



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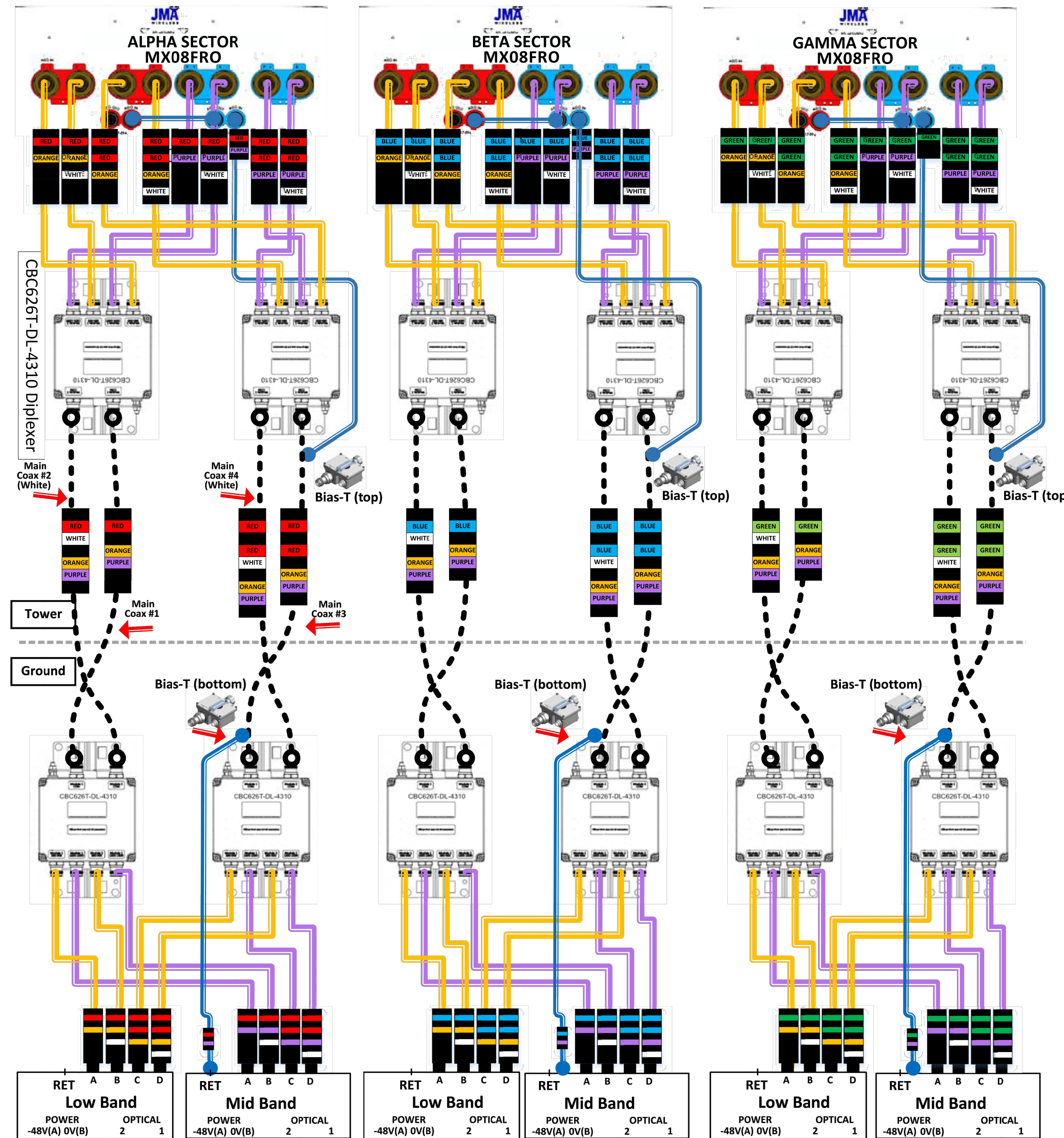
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DISH Wireless L.L.C.  
PROJECT INFORMATION  
NJJER01106A  
1875 NOBLE AVENUE  
BRIDGEPORT, CT 06610

SHEET TITLE  
RF  
CABLE COLOR CODE

SHEET NUMBER  
**RF-1**

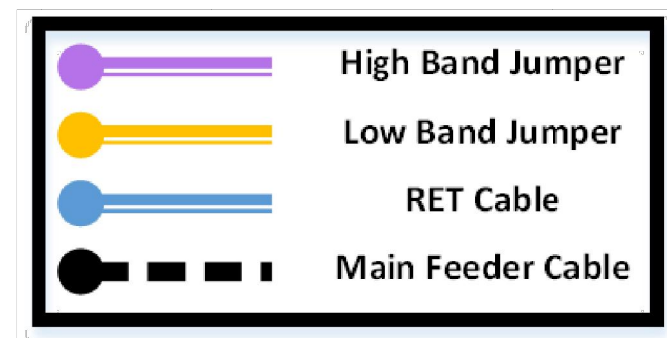




**5G Canister  
RF Connections Diagram**

JMA MX08FRO - 8 Port  
Fujitsu LOW/MID - Ground Mounted  
(2) CDX626T Sets per Sector - Commscope  
Bias-T for RET cables - Kaelus

Chuck Iversen	SIZE	FSCM NO	DWG NO	REV	1
18 - August - 2021	SCALE	None	SHEET	1 OF 1	



**RF PLUMBING DIAGRAM**

NO SCALE

1



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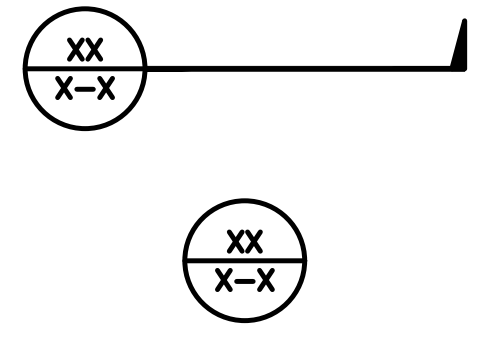
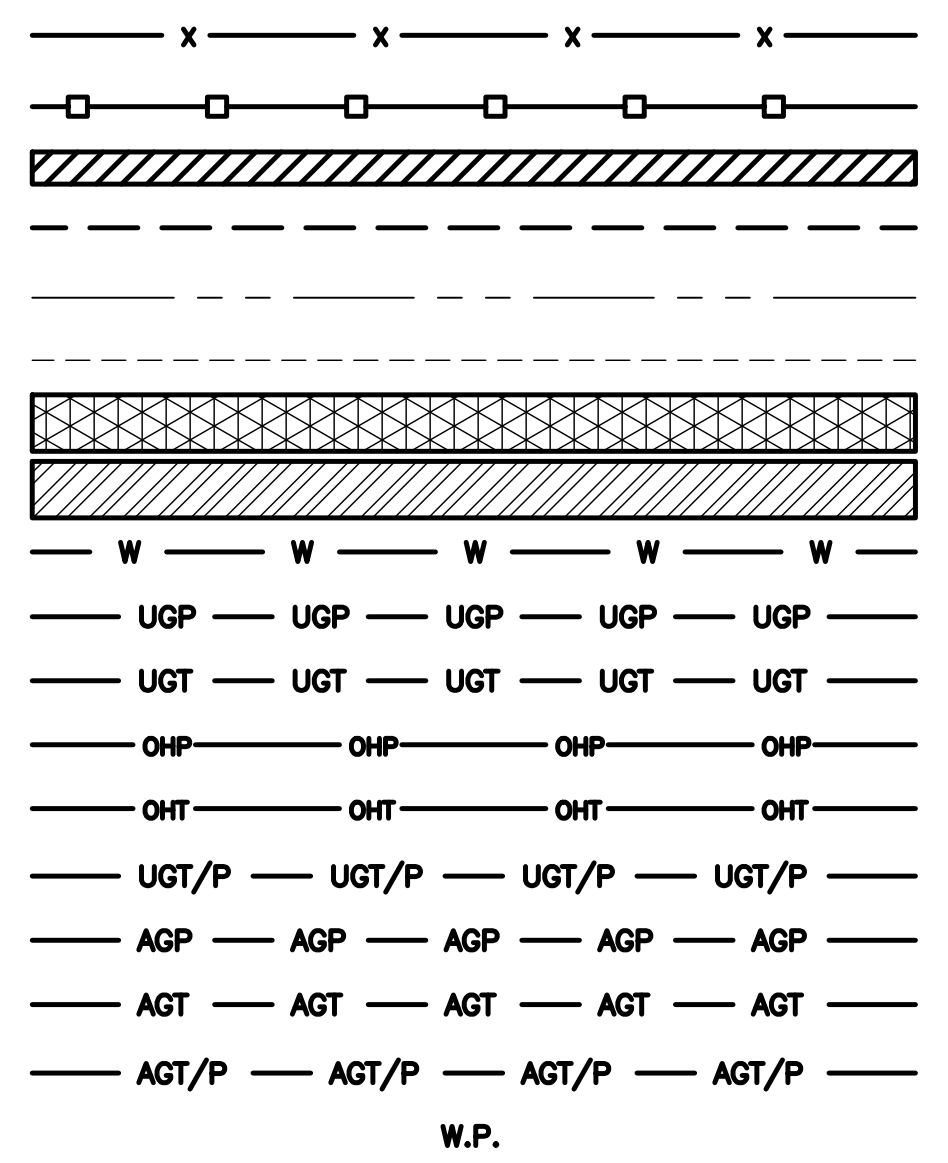
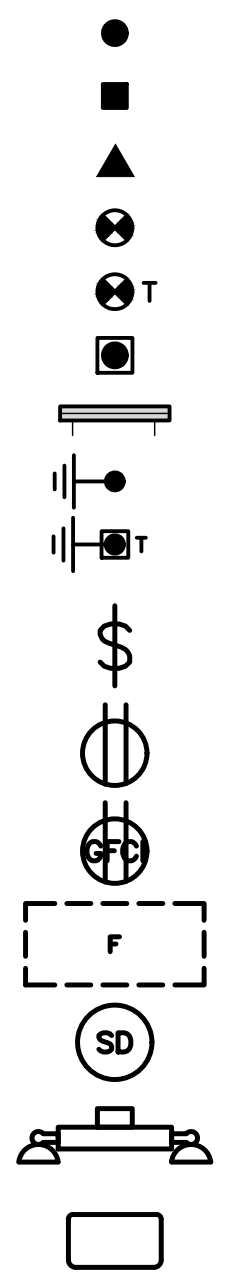
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SHEET TITLE  
RF  
PLUMBING DIAGRAM

SHEET NUMBER  
**RF-2**



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

**ABBREVIATIONS**



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 BRIDGEPORT, CT 06610

SHEET TITLE  
 LEGEND AND ABBREVIATIONS

SHEET NUMBER  
**GN-1**



**SITE ACTIVITY REQUIREMENTS:**

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

**GENERAL NOTES:**

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION  
CARRIER: DISH Wireless L.L.C.  
TOWER OWNER: TOWER OWNER
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF DISH Wireless L.L.C. AND TOWER OWNER
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
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REV	DATE	DESCRIPTION
A	07/21/21	ISSUED FOR REVIEW
B	04/29/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
2438H.001.031

DISH Wireless L.L.C.  
PROJECT INFORMATION  
NJER01106A  
1875 NOBLE AVENUE  
BRIDGEPORT, CT 06610

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER  
**GN-2**



**CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:**

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

**ELECTRICAL INSTALLATION NOTES:**

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
  - 4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
  - 4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. TIE WRAPS ARE NOT ALLOWED.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3 (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH Wireless L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH Wireless L.L.C.".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.



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A	07/21/21	ISSUED FOR REVIEW
B	04/29/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
2438H.001.031

DISH Wireless L.L.C.  
PROJECT INFORMATION

NJJER01106A  
1875 NOBLE AVENUE  
BRIDGEPORT, CT 06610

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER  
**GN-3**



**GROUNDING NOTES:**

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



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BRIDGEPORT, CT 06610

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER  
**GN-4**

# Exhibit D

## **Structural Analysis Report**

Date: **February 2, 2022**



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

**Subject: Structural Analysis Report**

**Carrier Designation:** *DISH Network Co-Locate*  
**Site Number:** NJJER01106A  
**Site Name:** CT-CCI-T-822779

**Crown Castle Designation:**  
**BU Number:** 822779  
**Site Name:** Bridgeport/ Rt 8  
**JDE Job Number:** 640179  
**Work Order Number:** 2069836  
**Order Number:** 548693 Rev. 4

**Engineering Firm Designation:** **TEP Project Number:** 61158.650523

**Site Data:** **1875 Noble Avenue, Bridgeport, Fairfield County, CT 06610**  
**Latitude 41° 12' 37.27", Longitude -73° 10' 52.26"**  
**120 Foot - Concealment Tower**

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

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

LC8.7: Feasibility SA

**Sufficient Capacity – 88.1%**

This analysis utilizes an ultimate 3-second gust wind speed of 119 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: Sarah E. Sarp / RAL

Respectfully submitted by:

Aaron T. Rucker, P.E.



Electronic Copy

02/02/2022

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## 1) INTRODUCTION

This is a 120-ft concealment tower designed by Pirod, Inc. and mapped by Tower Engineering Professionals in November of 2015. The base tower is 82-ft and the concealment spine extends from 82-ft to 120-ft. The tower has been modified per reinforcement drawings prepared by Paul J. Ford and Company in October of 2015. A proposed canister expansion and extension were considered in this analysis, enlarging the canister sections diameters from 36-in to 52-in at 84-ft, 46-in at 95-ft, and 40-in at 105-ft and extending the canister sections from 82-ft to 78-ft.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	119 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor:</b>	1.0
<b>Ice Thickness:</b>	1.5 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	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)
105.0	105.0	1	Generic	40" Dia. x 10' Long Concealment Canister	-	-
95.0	95.0	1	Generic	46" Dia. x 10' Long Concealment Canister	-	-
84.0	86.0	3	JMA Wireless	MX08FRO665-21	12	7/8
		6	Commscope	CDX623T-DS-T		
		3	Kaelus	SBT0001F1V1		
	84.0	1	Generic	52" Dia. x 12' Long Concealment Canister		
	80.0	1	Raycap	RDIDC-9181-PF-48		

**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)
115.0	115.0	3	Commscope	FVV-65C-R3	12	7/8
		1	Generic	36" Dia. x 10' Long Concealment Canister	-	-
105.0	107.0	3	RFS/Celwave	APX16DWV-16DWV-S-E-A20	12	7/8
95.0	96.0	3	Commscope	DHHTT65B-3XR	6	1-1/4
		3	RFS/Celwave	FD9R6004/1C-3L	2	3/8
		3	Nokia	FWHR	4	17/16
		1	Enclosures and Assembly	BEN-92P	1	1/8
					1	7/8

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Reference	Source
Geotechnical Report	3584592	CCISites
Tower Foundation Drawings	3914232	CCISites
Tower Manufacturer Drawings	3584593	CCISites
Tower Mapping Report		
Tower Reinforcement Drawings	6175820	CCISites
Post-Modification Inspection	6261360	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.

SolidWorks, a commercially available analysis software package, was used to create a finite element model of the canister spine flange connection at the 82.0-ft level. Selected output from the analysis is included in Appendix C - Additional Calculations.

#### 3.2) Assumptions

- 1) The tower and structures were maintained in accordance with the TIA-222 Standard.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and the referenced drawings.
- 3) Base and flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.

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

#### 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	$\phi P_{allow}$ (lb)	% Capacity	Pass / Fail
L1	120 - 110	Pole	P10.75x0.375	1	-3049	485121	8.5	Pass
L2	110 - 100	Pole	P10.75x0.375	2	-4237	485121	23.5	Pass
L3	100 - 90	Pole	P10.75x0.375	3	-5663	485121	45.0	Pass
L4	90 - 85	Pole	P10.75x0.375	4	-6582	485121	59.4	Pass
L5	85 - 82	Pole	P10.75x0.375	5	-7207	485121	68.0	Pass
L6	82 - 78	Pole	P24x0.375	6	-7743	1104673	16.6	Pass
L7	78 - 60	Pole	P24x0.375	7	-10647	1104673	29.9	Pass
L8	60 - 30	Pole	P24x0.375	8	-14678	1104673	56.3	Pass
L9	30 - 0	Pole	P24x0.375	9	-18849	1104673	85.8	Pass
							Summary	
						Pole (L9)	85.8	Pass
						<b>RATING =</b>	<b>85.8</b>	<b>Pass</b>

**Table 5 - Tower Component Stresses vs. Capacity – LC8.7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Flange Connection	110.0	6.8	Pass
1,2	Flange Connection	100.0	20.5	Pass
1,2	Flange Connection	90.0	40.2	Pass
1	Flange Connection (Stiffeners)	82.0	Sufficient	Pass
1,2	Flange Bolts	82.0	42.7	Pass
1,2	Bottom Flange	82.0	40.4	Pass
1,2,3	Flange Connection	60.0	46.1	Pass
1,2,3	Flange Connection	30.0	88.1	Pass
1,2	Anchor Rods	-	52.6	Pass
1,2,3	Base Plate	-	85.8	Pass
1,2	Base Foundation Structural	-	14.9	Pass
1,2	Base Foundation Soil Interaction	-	15.0	Pass

<b>Structure Rating (max from all components) =</b>	<b>88.1%</b>
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
- 2) Rating per TIA-222-H Section 15.5
- 3) Base/Flange plates are assumed to have the same capacity as their respective splice bolts or shaft.

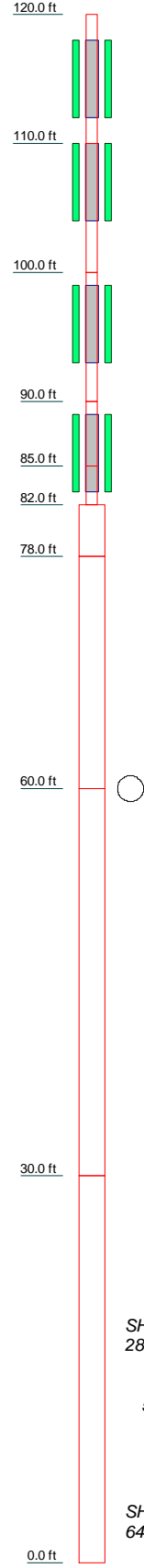
#### 4.1) Recommendations

- 1) The tower and its foundation have sufficient capacity to carry the proposed load configuration. In order for the results of this analysis to be considered valid, the following modification(s) must be completed
  - a) The existing concealment system is sufficient with proposed canister enlargement. New concealment sections and connections shall be designed by a competent, experienced, licensed professional engineer.



**APPENDIX A**  
**TNXTOWER OUTPUT**

Section	1								
Size	P10.75x0.375								
Length (ft)	10.0000								
Grade	A500-42								
Weight (lb)	415.9								
Section	2								
Size	P10.75x0.375								
Length (ft)	10.0000								
Grade	A500-42								
Weight (lb)	415.9								
Section	3								
Size	P10.75x0.375								
Length (ft)	10.0000								
Grade	A500-42								
Weight (lb)	415.9								
Section	4								
Size	P10.75x0.375								
Length (ft)	5.0000								
Grade	A500-42								
Weight (lb)	208.0								
Section	5								
Size	P24x0.375								
Length (ft)	3.0000								
Grade	A53-B-42								
Weight (lb)	378.8								
Section	6								
Size	P24x0.375								
Length (ft)	18.0000								
Grade	A53-B-42								
Weight (lb)	1704.8								
Section	7								
Size	P24x0.375								
Length (ft)	30.0000								
Grade	A53-B-42								
Weight (lb)	2841.3								
Section	8								
Size	P24x0.375								
Length (ft)	30.0000								
Grade	A53-B-42								
Weight (lb)	2841.3								
Section	9								
Size	P24x0.375								
Length (ft)	30.0000								
Grade	A53-B-42								
Weight (lb)	2841.3								

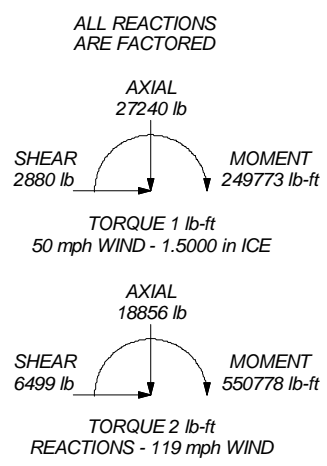


**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-42	42 ksi	58 ksi	A53-B-42	42 ksi	63 ksi

**TOWER DESIGN NOTES**

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 119 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 85.8%



 <p>Tower Engineering Professionals</p>	<b>Tower Engineering Professionals</b>		Job: <b>Bridgeport/ Rt B (BU 822779)</b>		
	326 Tryon Rd		Project: <b>TEP No. 61158.650523</b>		
	Raleigh, NC 27603		Client: <b>Crown Castle</b>	Drawn by: <b>Sarah E. Sarp</b>	App'd:
	Phone: (919) 661-6351		Code: <b>TIA-222-H</b>	Date: <b>02/02/22</b>	Scale: <b>NTS</b>
	FAX: (919) 661-6350		Path:		Dwg No. <b>E-1</b>

<p><b>tnxTower</b></p> <p><i>Tower Engineering Professionals</i> 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350</p>	<b>Job</b> Bridgeport/ Rt B (BU 822779)	<b>Page</b> 1 of 12
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	<b>Client</b> Crown Castle	<b>Designed by</b> Sarah E. Sarp

## Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

Tower base elevation above sea level: 123.0000 ft.

Basic wind speed of 119 mph.

Risk Category II.

Exposure Category C.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.0000 ft.

Nominal ice thickness of 1.5000 in.

Ice thickness is considered to increase with height.

Ice density of 56.00 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

<ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul>	<ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>√ Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> <li>Ignore KL/ry For 60 Deg. Angle Legs</li> </ul>	<ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-H Bracing Resist. Exemption</li> <li>Use TIA-222-H Tension Splice Exemption</li> <li style="text-align: center;">Poles</li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> <li>√ Pole Without Linear Attachments</li> <li>√ Pole With Shroud Or No Appurtenances</li> <li>Outside and Inside Corner Radii Are Known</li> </ul>
--	---	---

<b>tnxTower</b>  <b>Tower Engineering Professionals</b> 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b> Bridgeport/ Rt B (BU 822779)	<b>Page</b> 2 of 12
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	<b>Client</b> Crown Castle	<b>Designed by</b> Sarah E. Sarp

### Pole Section Geometry

Section	Elevation <i>ft</i>	Section Length <i>ft</i>	Pole Size	Pole Grade	Socket Length <i>ft</i>
L1	120.0000-110.0000	10.0000	P10.75x0.375	A500-42 (42 ksi)	
L2	110.0000-100.0000	10.0000	P10.75x0.375	A500-42 (42 ksi)	
L3	100.0000-90.0000	10.0000	P10.75x0.375	A500-42 (42 ksi)	
L4	90.0000-85.0000	5.0000	P10.75x0.375	A500-42 (42 ksi)	
L5	85.0000-82.0000	3.0000	P10.75x0.375	A500-42 (42 ksi)	
L6	82.0000-78.0000	4.0000	P24x0.375	A53-B-42 (42 ksi)	
L7	78.0000-60.0000	18.0000	P24x0.375	A53-B-42 (42 ksi)	
L8	60.0000-30.0000	30.0000	P24x0.375	A53-B-42 (42 ksi)	
L9	30.0000-0.0000	30.0000	P24x0.375	A53-B-42 (42 ksi)	

Tower Elevation <i>ft</i>	Gusset Area (per face) <i>ft<sup>2</sup></i>	Gusset Thickness <i>in</i>	Gusset Grade	Adjust. Factor <i>A<sub>f</sub></i>	Adjust. Factor <i>A<sub>r</sub></i>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals <i>in</i>	Double Angle Stitch Bolt Spacing Horizontals <i>in</i>	Double Angle Stitch Bolt Spacing Redundants <i>in</i>
L1 120.0000-110.0000				1	0	1			
L2 110.0000-100.0000				1	0	1			
L3 100.0000-90.0000				1	0	1			
L4 90.0000-85.0000				1	0	1			
L5 85.0000-82.0000				1	0	1			
L6 82.0000-78.0000				1	0	1			
L7 78.0000-60.0000				1	1	1			
L8 60.0000-30.0000				1	1	1			
L9 30.0000-0.0000				1	1	1			

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**Feed Line/Linear Appurtenances - Entered As Round Or Flat**

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
***											

**Feed Line/Linear Appurtenances - Entered As Area**

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
AVA5-50(7/8)	B	No	No	Inside Pole	115.0000 - 0.0000	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.30 0.30 0.30 0.30
***									
AVA5-50(7/8)	B	No	No	Inside Pole	105.0000 - 0.0000	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.30 0.30 0.30 0.30
***									
LDF6-50A(1-1/4)	A	No	No	Inside Pole	95.0000 - 0.0000	6	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.60 0.60 0.60 0.60
9833(3/8)	A	No	No	Inside Pole	95.0000 - 0.0000	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.07 0.07 0.07 0.07
7919A(17/64)	A	No	No	Inside Pole	95.0000 - 0.0000	4	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.03 0.03 0.03 0.03
004U8X-32125E2G(1/8)	A	No	No	Inside Pole	95.0000 - 0.0000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.01 0.01 0.01 0.01
TYPE SOOW 12/9(7/8)	A	No	No	Inside Pole	95.0000 - 0.0000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.51 0.51 0.51 0.51
***									
LDF5-50A(7/8)	B	No	No	Inside Pole	84.0000 - 0.0000	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.33 0.33 0.33 0.33
***									

**Feed Line/Linear Appurtenances Section Areas**



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Tower Section	Tower Elevation ft	Face	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight lb
L1	120.0000-110.0000 0	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	18
		C	0.000	0.000	0.000	0.000	0
L2	110.0000-100.0000 0	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	54
		C	0.000	0.000	0.000	0.000	0
L3	100.0000-90.0000	A	0.000	0.000	0.000	0.000	22
		B	0.000	0.000	0.000	0.000	72
		C	0.000	0.000	0.000	0.000	0
L4	90.0000-85.0000	A	0.000	0.000	0.000	0.000	22
		B	0.000	0.000	0.000	0.000	36
		C	0.000	0.000	0.000	0.000	0
L5	85.0000-82.0000	A	0.000	0.000	0.000	0.000	13
		B	0.000	0.000	0.000	0.000	30
		C	0.000	0.000	0.000	0.000	0
L6	82.0000-78.0000	A	0.000	0.000	0.000	0.000	18
		B	0.000	0.000	0.000	0.000	45
		C	0.000	0.000	0.000	0.000	0
L7	78.0000-60.0000	A	0.000	0.000	0.000	0.000	79
		B	0.000	0.000	0.000	0.000	201
		C	0.000	0.000	0.000	0.000	0
L8	60.0000-30.0000	A	0.000	0.000	0.000	0.000	131
		B	0.000	0.000	0.000	0.000	335
		C	0.000	0.000	0.000	0.000	0
L9	30.0000-0.0000	A	0.000	0.000	0.000	0.000	131
		B	0.000	0.000	0.000	0.000	335
		C	0.000	0.000	0.000	0.000	0

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight lb
L1	120.0000-110.0000 0	A	1.445	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	18
		C		0.000	0.000	0.000	0.000	0
L2	110.0000-100.0000 0	A	1.431	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	54
		C		0.000	0.000	0.000	0.000	0
L3	100.0000-90.0000	A	1.417	0.000	0.000	0.000	0.000	22
		B		0.000	0.000	0.000	0.000	72
		C		0.000	0.000	0.000	0.000	0
L4	90.0000-85.0000	A	1.406	0.000	0.000	0.000	0.000	22
		B		0.000	0.000	0.000	0.000	36
		C		0.000	0.000	0.000	0.000	0
L5	85.0000-82.0000	A	1.399	0.000	0.000	0.000	0.000	13
		B		0.000	0.000	0.000	0.000	30
		C		0.000	0.000	0.000	0.000	0
L6	82.0000-78.0000	A	1.393	0.000	0.000	0.000	0.000	18
		B		0.000	0.000	0.000	0.000	45
		C		0.000	0.000	0.000	0.000	0
L7	78.0000-60.0000	A	1.373	0.000	0.000	0.000	0.000	79
		B		0.000	0.000	0.000	0.000	201
		C		0.000	0.000	0.000	0.000	0
L8	60.0000-30.0000	A	1.315	0.000	0.000	0.000	0.000	131
		B		0.000	0.000	0.000	0.000	335
		C		0.000	0.000	0.000	0.000	0
L9	30.0000-0.0000	A	1.178	0.000	0.000	0.000	0.000	131

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight lb
		B		0.000	0.000	0.000	0.000	335
		C		0.000	0.000	0.000	0.000	0

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>x</sub> in	CP <sub>z</sub> in	CP <sub>x</sub> Ice in	CP <sub>z</sub> Ice in
L1	120.0000-110.0000	0.0000	0.0000	0.0000	0.0000
L2	110.0000-100.0000	0.0000	0.0000	0.0000	0.0000
L3	100.0000-90.0000	0.0000	0.0000	0.0000	0.0000
L4	90.0000-85.0000	0.0000	0.0000	0.0000	0.0000
L5	85.0000-82.0000	0.0000	0.0000	0.0000	0.0000
L6	82.0000-78.0000	0.0000	0.0000	0.0000	0.0000
L7	78.0000-60.0000	0.0000	0.0000	0.0000	0.0000
L8	60.0000-30.0000	0.0000	0.0000	0.0000	0.0000
L9	30.0000-0.0000	0.0000	0.0000	0.0000	0.0000

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

### User Defined Loads

Description	Elevation ft	Offset From Centroid ft	Azimuth Angle °	Weight lb	F <sub>x</sub> lb	F <sub>z</sub> lb	Wind Force lb	C <sub>AA</sub> C ft <sup>2</sup>
Flag	120.0000	0.00	0.00	No Ice	25	0	0	10.2434
				Ice	790	0	0	9.6353
				Service	25	0	0	10.3757

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight lb	
***									
***									
***									
FVV-65C-R3	A	From Leg	1.0000 0.00 0.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000	675 675 675 364

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Lateral					
FVV-65C-R3	B	From Leg	1.0000	0.00	115.0000	No Ice	0.0000	0.0000	675
			0.00			1/2" Ice	0.0000	0.0000	675
			0.00			1" Ice	0.0000	0.0000	675
						2" Ice	0.0000	0.0000	364
FVV-65C-R3	C	From Leg	1.0000	0.00	115.0000	No Ice	0.0000	0.0000	675
			0.00			1/2" Ice	0.0000	0.0000	675
			0.00			1" Ice	0.0000	0.0000	675
						2" Ice	0.0000	0.0000	364
***									
APX16DWV-16DWV-S-E-A 20	A	From Leg	1.0000	0.00	105.0000	No Ice	0.0000	0.0000	41
			0.00			1/2" Ice	0.0000	0.0000	41
			2.00			1" Ice	0.0000	0.0000	41
						2" Ice	0.0000	0.0000	205
APX16DWV-16DWV-S-E-A 20	B	From Leg	1.0000	0.00	105.0000	No Ice	0.0000	0.0000	41
			0.00			1/2" Ice	0.0000	0.0000	41
			2.00			1" Ice	0.0000	0.0000	41
						2" Ice	0.0000	0.0000	205
APX16DWV-16DWV-S-E-A 20	C	From Leg	1.0000	0.00	105.0000	No Ice	0.0000	0.0000	41
			0.00			1/2" Ice	0.0000	0.0000	41
			2.00			1" Ice	0.0000	0.0000	41
						2" Ice	0.0000	0.0000	205
***									
DHHTT65B-3XR	A	From Leg	1.0000	0.00	95.0000	No Ice	0.0000	0.0000	45
			0.00			1/2" Ice	0.0000	0.0000	45
			1.00			1" Ice	0.0000	0.0000	45
						2" Ice	0.0000	0.0000	283
DHHTT65B-3XR	B	From Leg	1.0000	0.00	95.0000	No Ice	0.0000	0.0000	45
			0.00			1/2" Ice	0.0000	0.0000	45
			1.00			1" Ice	0.0000	0.0000	45
						2" Ice	0.0000	0.0000	283
DHHTT65B-3XR	C	From Leg	1.0000	0.00	95.0000	No Ice	0.0000	0.0000	45
			0.00			1/2" Ice	0.0000	0.0000	45
			1.00			1" Ice	0.0000	0.0000	45
						2" Ice	0.0000	0.0000	283
FD9R6004/1C-3L	A	From Leg	1.0000	0.00	95.0000	No Ice	0.0000	0.0000	3
			0.00			1/2" Ice	0.0000	0.0000	3
			1.00			1" Ice	0.0000	0.0000	3
						2" Ice	0.0000	0.0000	19
FD9R6004/1C-3L	B	From Leg	1.0000	0.00	95.0000	No Ice	0.0000	0.0000	3
			0.00			1/2" Ice	0.0000	0.0000	3
			1.00			1" Ice	0.0000	0.0000	3
						2" Ice	0.0000	0.0000	19
FD9R6004/1C-3L	C	From Leg	1.0000	0.00	95.0000	No Ice	0.0000	0.0000	3
			0.00			1/2" Ice	0.0000	0.0000	3
			1.00			1" Ice	0.0000	0.0000	3
						2" Ice	0.0000	0.0000	19
FWHR	A	From Leg	1.0000	0.00	95.0000	No Ice	0.0000	0.0000	30
			0.00			1/2" Ice	0.0000	0.0000	30
			1.00			1" Ice	0.0000	0.0000	30
						2" Ice	0.0000	0.0000	78
FWHR	B	From Leg	1.0000	0.00	95.0000	No Ice	0.0000	0.0000	30
			0.00			1/2" Ice	0.0000	0.0000	30
			1.00			1" Ice	0.0000	0.0000	30
						2" Ice	0.0000	0.0000	78
FWHR	C	From Leg	1.0000	0.00	95.0000	No Ice	0.0000	0.0000	30
			0.00			1/2" Ice	0.0000	0.0000	30
			1.00			1" Ice	0.0000	0.0000	30

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
BEN-92P	C	From Leg	1.0000		0.00	95.0000	2" Ice 0.0000	0.0000	78
			0.00				No Ice 0.0000	0.0000	2
			1.00				1/2" Ice 0.0000	0.0000	2
							1" Ice 0.0000	0.0000	2
							2" Ice 0.0000	0.0000	38
***									
MX08FRO665-21	A	From Leg	1.0000		0.00	84.0000	No Ice 0.0000	0.0000	83
			0.00				1/2" Ice 0.0000	0.0000	83
			2.00				1" Ice 0.0000	0.0000	83
							2" Ice 0.0000	0.0000	83
MX08FRO665-21	B	From Leg	1.0000		0.00	84.0000	No Ice 0.0000	0.0000	83
			0.00				1/2" Ice 0.0000	0.0000	83
			2.00				1" Ice 0.0000	0.0000	83
							2" Ice 0.0000	0.0000	83
MX08FRO665-21	C	From Leg	1.0000		0.00	84.0000	No Ice 0.0000	0.0000	83
			0.00				1/2" Ice 0.0000	0.0000	83
			2.00				1" Ice 0.0000	0.0000	85
							2" Ice 0.0000	0.0000	83
(2) CDX623T-DS-T	A	From Leg	1.0000		0.00	84.0000	No Ice 0.0000	0.0000	10
			0.00				1/2" Ice 0.0000	0.0000	10
			2.00				1" Ice 0.0000	0.0000	10
							2" Ice 0.0000	0.0000	10
(2) CDX623T-DS-T	B	From Leg	1.0000		0.00	84.0000	No Ice 0.0000	0.0000	10
			0.00				1/2" Ice 0.0000	0.0000	10
			2.00				1" Ice 0.0000	0.0000	10
							2" Ice 0.0000	0.0000	10
(2) CDX623T-DS-T	C	From Leg	1.0000		0.00	84.0000	No Ice 0.0000	0.0000	10
			0.00				1/2" Ice 0.0000	0.0000	10
			2.00				1" Ice 0.0000	0.0000	10
							2" Ice 0.0000	0.0000	10
SBT0001F1V1	A	From Leg	1.0000		0.00	84.0000	No Ice 0.0000	0.0000	1
			0.00				1/2" Ice 0.0000	0.0000	1
			2.00				1" Ice 0.0000	0.0000	1
							2" Ice 0.0000	0.0000	1
SBT0001F1V1	B	From Leg	1.0000		0.00	84.0000	No Ice 0.0000	0.0000	1
			0.00				1/2" Ice 0.0000	0.0000	1
			2.00				1" Ice 0.0000	0.0000	1
							2" Ice 0.0000	0.0000	1
SBT0001F1V1	C	From Leg	1.0000		0.00	84.0000	No Ice 0.0000	0.0000	1
			0.00				1/2" Ice 0.0000	0.0000	1
			2.00				1" Ice 0.0000	0.0000	1
							2" Ice 0.0000	0.0000	1
RDIDC-9181-PF-48	A	From Leg	1.0000		0.00	84.0000	No Ice 0.0000	0.0000	20
			0.00				1/2" Ice 0.0000	0.0000	20
			-4.00				1" Ice 0.0000	0.0000	20
							2" Ice 0.0000	0.0000	20
***									
***									
52" Dia. x 12' Long Concealment Canister	C	None			0.00	84.0000	No Ice 0.0000	0.0000	0
							1/2" Ice 0.0000	0.0000	0
							1" Ice 0.0000	0.0000	0
							2" Ice 0.0000	0.0000	0
46" Dia. x 10' Long Concealment Canister	C	None			0.00	95.0000	No Ice 0.0000	0.0000	0
							1/2" Ice 0.0000	0.0000	0
							1" Ice 0.0000	0.0000	0
							2" Ice 0.0000	0.0000	0
40" Dia. x 10' Long	C	None			0.00	105.0000	No Ice 0.0000	0.0000	0

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz Lateral	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
Concealment Canister						1/2" Ice	0.0000	0.0000	0	
						1" Ice	0.0000	0.0000	0	
						2" Ice	0.0000	0.0000	0	
36" Dia. x 10' Long Concealment Canister	C	None			0.00	115.0000	No Ice	0.0000	0.0000	0
						1/2" Ice	0.0000	0.0000	0	
						1" Ice	0.0000	0.0000	0	
						2" Ice	0.0000	0.0000	0	
***										
Canister Load1	C	None			0.00	120.0000	No Ice	6.7500	6.7500	94
						1/2" Ice	16.9583	16.9583	206	
						1" Ice	17.4167	17.4167	320	
						2" Ice	18.3333	18.3333	559	
Canister Load2	C	None			0.00	110.0000	No Ice	14.2500	14.2500	452
						1/2" Ice	35.7500	35.7500	687	
						1" Ice	36.6667	36.6667	928	
						2" Ice	38.5000	38.5000	1429	
Canister Load3	C	None			0.00	100.0000	No Ice	16.1250	16.1250	478
						1/2" Ice	40.3333	40.3333	743	
						1" Ice	41.2500	41.2500	1015	
						2" Ice	43.0833	43.0833	1577	
Canister Load4	C	None			0.00	90.0000	No Ice	20.3250	20.3250	536
						1/2" Ice	50.6917	50.6917	871	
						1" Ice	51.7000	51.7000	1212	
						2" Ice	53.7167	53.7167	1915	
Canister Load5	C	None			0.00	78.0000	No Ice	11.7000	11.7000	477
						1/2" Ice	29.1500	29.1500	669	
						1" Ice	29.7000	29.7000	865	
						2" Ice	30.8000	30.8000	1268	
Truck Ball	C	None			0.00	120.7500	No Ice	0.8836	0.8836	50
						1/2" Ice	1.3783	1.3783	67	
						1" Ice	1.5272	1.5272	87	
						2" Ice	1.8479	1.8479	132	

## 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

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

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 110	18.03	39	1.30	0.00
L2	110 - 100	15.31	39	1.28	0.00
L3	100 - 90	12.69	39	1.21	0.00
L4	90 - 85	10.33	39	1.04	0.00
L5	85 - 82	9.31	39	0.91	0.00
L6	82 - 78	8.77	39	0.81	0.00
L7	78 - 60	8.09	39	0.80	0.00
L8	60 - 30	5.23	39	0.71	0.00
L9	30 - 0	1.50	39	0.45	0.00

### Critical Deflections and Radius of Curvature - Service Wind



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Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.7500	Truck Ball	39	18.03	1.30	0.00	29193
120.0000	Canister Load1	39	18.03	1.30	0.00	29193
115.0000	FVV-65C-R3	39	16.67	1.30	0.00	29193
110.0000	Canister Load2	39	15.31	1.28	0.00	13480
105.0000	APX16DWV-16DWV-S-E-A20	39	13.98	1.26	0.00	7309
100.0000	Canister Load3	39	12.69	1.21	0.00	4804
95.0000	DHHTT65B-3XR	39	11.47	1.13	0.00	3428
90.0000	Canister Load4	39	10.33	1.04	0.00	2514
84.0000	MX08FRO665-21	39	9.12	0.87	0.00	2347
78.0000	Canister Load5	39	8.09	0.80	0.00	10290

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 110	80.75	2	5.85	0.00
L2	110 - 100	68.57	2	5.77	0.00
L3	100 - 90	56.82	2	5.42	0.00
L4	90 - 85	46.21	2	4.65	0.00
L5	85 - 82	41.64	24	4.06	0.00
L6	82 - 78	39.23	24	3.63	0.00
L7	78 - 60	36.21	24	3.58	0.00
L8	60 - 30	23.39	24	3.19	0.00
L9	30 - 0	6.71	24	2.00	0.00

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.7500	Truck Ball	2	80.75	5.85	0.00	6676
120.0000	Canister Load1	2	80.75	5.85	0.00	6676
115.0000	FVV-65C-R3	2	74.63	5.83	0.00	6676
110.0000	Canister Load2	2	68.57	5.77	0.00	3072
105.0000	APX16DWV-16DWV-S-E-A20	2	62.60	5.64	0.00	1654
100.0000	Canister Load3	2	56.82	5.42	0.00	1083
95.0000	DHHTT65B-3XR	2	51.32	5.08	0.00	771
90.0000	Canister Load4	2	46.21	4.65	0.00	564
84.0000	MX08FRO665-21	24	40.81	3.90	0.00	526
78.0000	Canister Load5	24	36.21	3.58	0.00	2306

### Compression Checks

### Pole Design Data

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Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> lb	φP <sub>n</sub> lb	Ratio $\frac{P_u}{\phi P_n}$
L1	120 - 110 (1)	P10.75x0.375	10.0000	0.0000	0.0	12.2228	-3049	462020	0.007
L2	110 - 100 (2)	P10.75x0.375	10.0000	0.0000	0.0	12.2228	-4237	462020	0.009
L3	100 - 90 (3)	P10.75x0.375	10.0000	0.0000	0.0	12.2228	-5663	462020	0.012
L4	90 - 85 (4)	P10.75x0.375	5.0000	0.0000	0.0	12.2228	-6582	462020	0.014
L5	85 - 82 (5)	P10.75x0.375	3.0000	0.0000	0.0	12.2228	-7207	462020	0.016
L6	82 - 78 (6)	P24x0.375	4.0000	0.0000	0.0	27.8325	-7743	1052070	0.007
L7	78 - 60 (7)	P24x0.375	18.0000	0.0000	0.0	27.8325	-10647	1052070	0.010
L8	60 - 30 (8)	P24x0.375	30.0000	0.0000	0.0	27.8325	-14678	1052070	0.014
L9	30 - 0 (9)	P24x0.375	30.0000	0.0000	0.0	27.8325	-18849	1052070	0.018

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> lb-ft	φM <sub>ux</sub> lb-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M <sub>uy</sub> lb-ft	φM <sub>uy</sub> lb-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	120 - 110 (1)	P10.75x0.375	10555	127206	0.083	0	127206	0.000
L2	110 - 100 (2)	P10.75x0.375	30248	127206	0.238	0	127206	0.000
L3	100 - 90 (3)	P10.75x0.375	58449	127206	0.459	0	127206	0.000
L4	90 - 85 (4)	P10.75x0.375	77439	127206	0.609	0	127206	0.000
L5	85 - 82 (5)	P10.75x0.375	88793	127206	0.698	0	127206	0.000
L6	82 - 78 (6)	P24x0.375	103903	623717	0.167	0	623717	0.000
L7	78 - 60 (7)	P24x0.375	189499	623717	0.304	0	623717	0.000
L8	60 - 30 (8)	P24x0.375	359735	623717	0.577	0	623717	0.000
L9	30 - 0 (9)	P24x0.375	550778	623717	0.883	0	623717	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V <sub>u</sub> lb	φV <sub>n</sub> lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T <sub>u</sub> lb-ft	φT <sub>n</sub> lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	120 - 110 (1)	P10.75x0.375	1203	138606	0.009	0	126430	0.000
L2	110 - 100 (2)	P10.75x0.375	1994	138606	0.014	0	126430	0.000
L3	100 - 90 (3)	P10.75x0.375	2825	138606	0.020	0	126430	0.000
L4	90 - 85 (4)	P10.75x0.375	3784	138606	0.027	0	126430	0.000
L5	85 - 82 (5)	P10.75x0.375	3774	138606	0.027	1	126430	0.000
L6	82 - 78 (6)	P24x0.375	3799	315621	0.012	1	655568	0.000
L7	78 - 60 (7)	P24x0.375	5154	315621	0.016	1	655568	0.000
L8	60 - 30 (8)	P24x0.375	6160	315621	0.020	1	655568	0.000
L9	30 - 0 (9)	P24x0.375	6519	315621	0.021	1	655568	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 110 (1)	0.007	0.083	0.000	0.009	0.000	0.090	1.050	4.8.2
L2	110 - 100 (2)	0.009	0.238	0.000	0.014	0.000	0.247	1.050	4.8.2

<b>tnxTower</b>  <b>Tower Engineering Professionals</b> 326 Tryon Rd Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b> Bridgeport/ Rt B (BU 822779)	<b>Page</b> 12 of 12
	<b>Project</b> TEP No. 61158.650523	<b>Date</b> 12:01:07 02/02/22
	<b>Client</b> Crown Castle	<b>Designed by</b> Sarah E. Sarp

Section No.	Elevation ft	Ratio $P_u$	Ratio $M_{ux}$	Ratio $M_{uy}$	Ratio $V_u$	Ratio $T_u$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L3	100 - 90 (3)	0.012	0.459	0.000	0.020	0.000	0.472	1.050	4.8.2
L4	90 - 85 (4)	0.014	0.609	0.000	0.027	0.000	0.624	1.050	4.8.2
L5	85 - 82 (5)	0.016	0.698	0.000	0.027	0.000	0.714	1.050	4.8.2
L6	82 - 78 (6)	0.007	0.167	0.000	0.012	0.000	0.174	1.050	4.8.2
L7	78 - 60 (7)	0.010	0.304	0.000	0.016	0.000	0.314	1.050	4.8.2
L8	60 - 30 (8)	0.014	0.577	0.000	0.020	0.000	0.591	1.050	4.8.2
L9	30 - 0 (9)	0.018	0.883	0.000	0.021	0.000	0.901	1.050	4.8.2

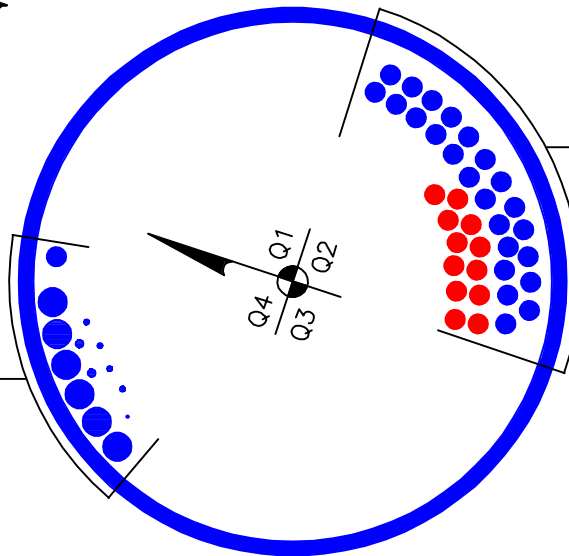
### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\phi P_{allow}$ lb	% Capacity	Pass Fail
L1	120 - 110	Pole	P10.75x0.375	1	-3049	485121	8.5	Pass
L2	110 - 100	Pole	P10.75x0.375	2	-4237	485121	23.5	Pass
L3	100 - 90	Pole	P10.75x0.375	3	-5663	485121	45.0	Pass
L4	90 - 85	Pole	P10.75x0.375	4	-6582	485121	59.4	Pass
L5	85 - 82	Pole	P10.75x0.375	5	-7207	485121	68.0	Pass
L6	82 - 78	Pole	P24x0.375	6	-7743	1104673	16.6	Pass
L7	78 - 60	Pole	P24x0.375	7	-10647	1104673	29.9	Pass
L8	60 - 30	Pole	P24x0.375	8	-14678	1104673	56.3	Pass
L9	30 - 0	Pole	P24x0.375	9	-18849	1104673	85.8	Pass
Summary								
Pole (L9)							85.8	Pass
<b>RATING =</b>							<b>85.8</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**



- (OTHER CONSIDERED EQUIPMENT)
- (1) 1/8" TO 95 FT LEVEL
  - (4) 17/64" TO 95 FT LEVEL
  - (2) 3/8" TO 95 FT LEVEL
  - (1) 7/8" TO 95 FT LEVEL
  - (6) 1-1/4" TO 95 FT LEVEL



- (PROPOSED EQUIPMENT CONFIGURATION)
- (12) 7/8" TO 84 FT LEVEL
- (OTHER CONSIDERED EQUIPMENT)
- (12) 7/8" TO 105 FT LEVEL
  - (12) 7/8" TO 115 FT LEVEL

**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

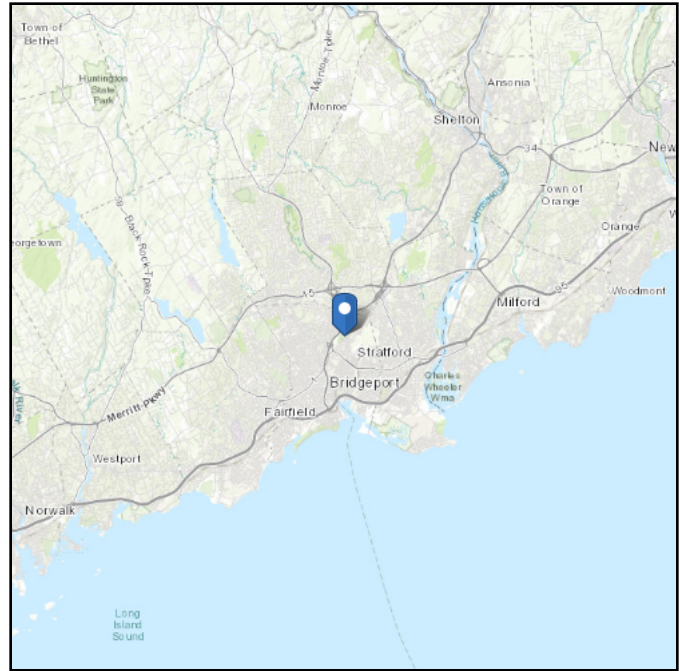
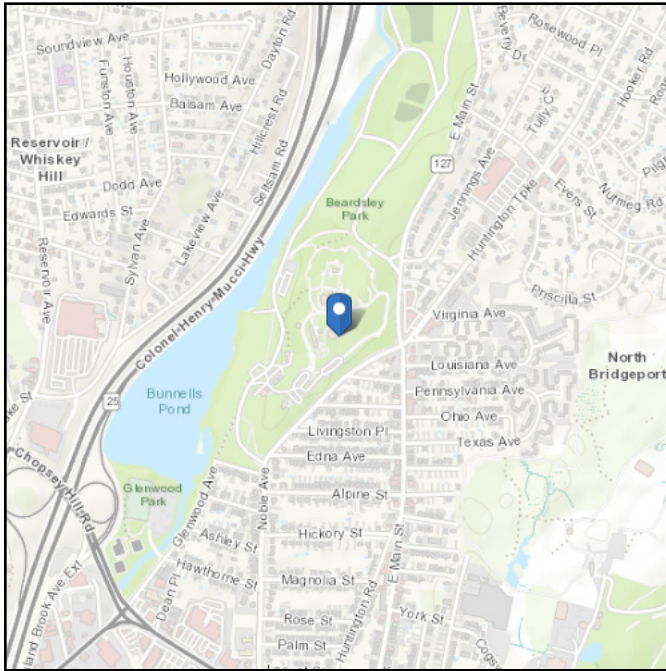


# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Elevation:** 123.27 ft (NAVD 88)  
**Latitude:** 41.210353  
**Longitude:** -73.181183



## Wind

### Results:

Wind Speed	123 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	93 Vmph
100-year MRI	99 Vmph

Wind speed updated per local jurisdiction requirements

**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).

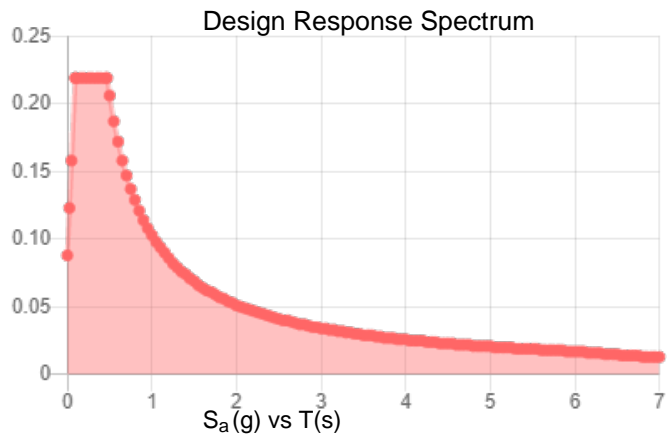
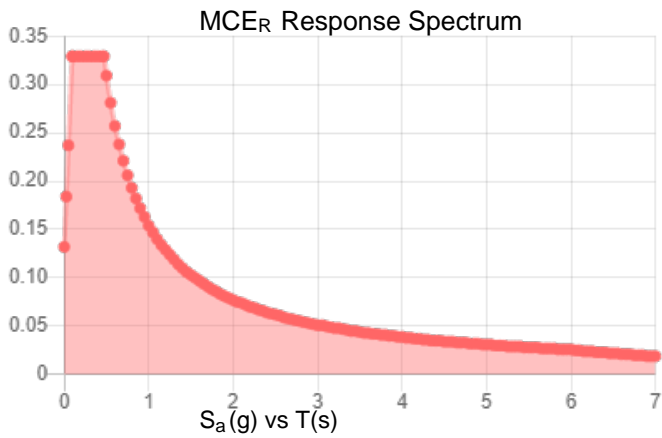
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_s$ :	0.206	$S_{DS}$ :	0.219
$S_1$ :	0.064	$S_{D1}$ :	0.103
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.111
$S_{MS}$ :	0.329	PGA <sub>M</sub> :	0.175
$S_{M1}$ :	0.154	F <sub>PGA</sub> :	1.578
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:** Wed Dec 29 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: 1.50 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 Dec 29 2021

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

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

---

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

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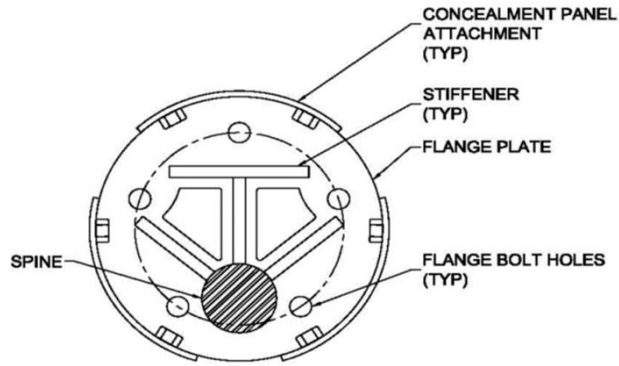
In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from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

# CCI Flagpole Tool



Site Data	
BU#:	822779
Site Name:	Bridgeport/ Rt 8
Order #:	548693 Rev. 4

Code	
Code:	TIA-222-H
Ice Thickness:	1.5 in
Windspeed (V):	119 mph
Ice Wind Speed (V):	50 mph
Exposure Category:	C
Topographic Feature:	N/A
Risk Category:	II



**FLANGE PLATE**  
(TYPE 5: SOLIDITY RATIO 0.9)

Tower Information	
Total Tower Height:	120 ft
Base Tower Height:	78 ft
Total Canister Length:	42 ft
Number of Canister Assembly Sections:	4

Canister Section Number *:	Canister Assembly Length (ft):	Canister Assembly Diameter (in):	Number of Sides Canister Section	Plate Type:	Mating Flange Plate Thickness (in)**:	Mating Flange Plate Diameter (in):	Solidity Ratio	Plate Weight (Kip):	Canister Weight (Kip)	Vent Length (ft):
1	10	36	Round	5	2.00	17.75	0.9	0.253	0.188	0-0
2	10	40	Round	5	2.00	17.75	0.9	0.253	0.209	0-0
3	10	46	Round	5	2.00	17.75	0.9	0.253	0.241	0-0
4	12	52	Round	1	2.50	25	0.45	0.313	0.327	0-0

\* Sections are numbered from the top of the tower down

\*\* Mating Flange Plate Thickness at the bottom of canister section

Flag on Tower:	Yes
Flag Width:	20 ft
Flag Height:	12 ft
Flag Elevation(z):	120 ft

Truck Ball on Tower:	Yes
Diameter of Ball:	18 in

Geometry : Base Tower + Spine			
-------------------------------	--	--	--

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Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
120	10		0	10.75	10.75	0.375	n/a	A500-42
110	10		0	10.75	10.75	0.375	n/a	A500-42
100	10		0	10.75	10.75	0.375	n/a	A500-42
90	5		0	10.75	10.75	0.375	n/a	A500-42

Delete  
[x]  
[x]  
[x]  
[x]

85	3		0	10.75	10.75	0.375	n/a	A500-42	[x]
82	4		0	24	24	0.375	n/a	A53-B-42	[x]
78	18		0	24	24	0.375	n/a	A53-B-42	[x]
60	30		0	24	24	0.375	n/a	A53-B-42	[x]
30	30		0	24	24	0.375	n/a	A53-B-42	[x]

Discrete Loads: Truck Ball	Apply $C_aA_A$ at Elevation(z) (ft)	$C_aA_A$ No Ice (ft <sup>2</sup> )	$C_aA_A$ 1/2" Ice (ft <sup>2</sup> )	$C_aA_A$ 1" Ice (ft <sup>2</sup> )	$C_aA_A$ 2" Ice (ft <sup>2</sup> )	$C_aA_A$ 4" Ice (ft <sup>2</sup> )	Weight No Ice (Kip)	Weight 1/2" Ice (Kip)
		120.75	0.884	1.378	1.527	1.848	2.581	0.05

Discrete Loads : $C_F A_F$ for Canister Assembly								
Canister Loading	Apply $C_F A_F$ at Elevation(z) (ft)	$C_F A_F$ No Ice (ft <sup>2</sup> )	$C_F A_F$ 1/2" Ice (ft <sup>2</sup> )	$C_F A_F$ 1" Ice (ft <sup>2</sup> )	$C_F A_F$ 2" Ice (ft <sup>2</sup> )	$C_F A_F$ 4" Ice (ft <sup>2</sup> )	Canister Assembly Weight No Ice (Kip)	Canister Assembly Weight 1/2" Ice (Kip)
Canister Load 1	120	6.750	16.958	17.417	18.333	20.167	0.094	0.206
Canister Load 2	110	14.250	35.750	36.667	38.500	42.167	0.452	0.687
Canister Load 3	100	16.125	40.333	41.250	43.083	46.750	0.478	0.743
Canister Load 4	90	20.325	50.692	51.700	53.717	57.750	0.536	0.871
Canister Load 5	78	11.700	29.150	29.700	30.800	33.000	0.477	0.669

User Forces: Flag Force Calculation Per ANSI/NAAMM FP 1001-07	
Wind <sub>FORCE</sub> =	0.460 Kip
Weight=	0.025 Kip
Wind <sub>FORCE, ICE</sub> =	0.084 Kip
Weight <sub>ICE</sub> =	0.790 Kip
W <sub>FORCE, SERVICE WIND</sub> =	0.117 Kip
Weight=	0.025 Kip

← Flag force should be included at the top of the flag attachment elevation. If the attachment of the flag to the halyard distributes forces equally to the pole, apply flag forces accordingly in tnx file.

Deflection Check Required:	Yes	<a href="#">Import Deflection Results</a>
3% Spine Deflection Check		
Allowable (3%) Horizontal Spine Deflection (Inches)	Actual Deflection *** (inches)	Sufficient/ Insufficient
15.120	9.943	Sufficient

\*\*\* Relative deflection under service level wind speed

# Monopole Flange Plate Connection

Elevation = 110 ft.



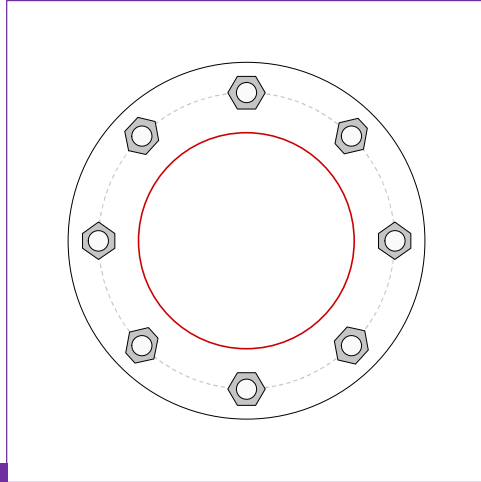
BU #	822779
Site Name	Bridgeport/ Rt 8
Order #	548693 Rev. 4

Applied Loads	
Moment (kip-ft)	10.55
Axial Force (kips)	3.05
Shear Force (kips)	1.20

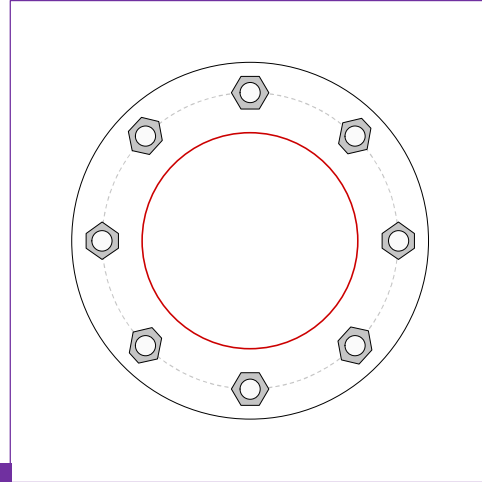
TIA-222 Revision	H
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\*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(8) 1"  $\varnothing$  bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 14.75" BC

Top Plate Data

17.75" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

17.75" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

10.75" x 0.375" round pole (A500-42; Fy=42 ksi, Fu=58 ksi)

Bottom Pole Data

10.75" x 0.375" round pole (A500-42; Fy=42 ksi, Fu=58 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	3.90
Allowable (kips)	54.54
Stress Rating:	6.8% Pass

Top Plate Capacity

Max Stress (ksi):	1.24	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	3.6%	Pass
Tension Side Stress Rating:	1.4%	Pass

Bottom Plate Capacity

Max Stress (ksi):	1.24	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	3.6%	Pass
Tension Side Stress Rating:	1.4%	Pass

# Monopole Flange Plate Connection

Elevation = 100 ft.

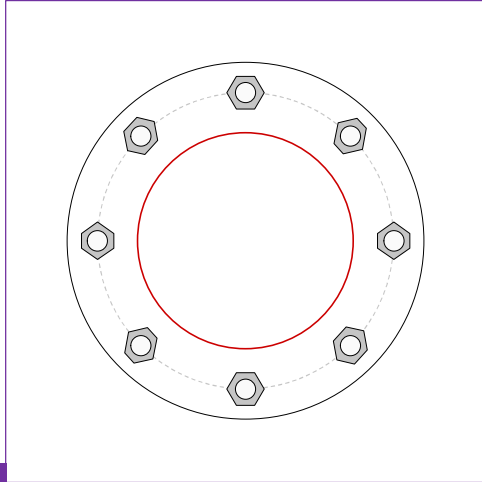


BU #	822779
Site Name	Bridgeport/ Rt 8
Order #	548693 Rev. 4
TIA-222 Revision	H

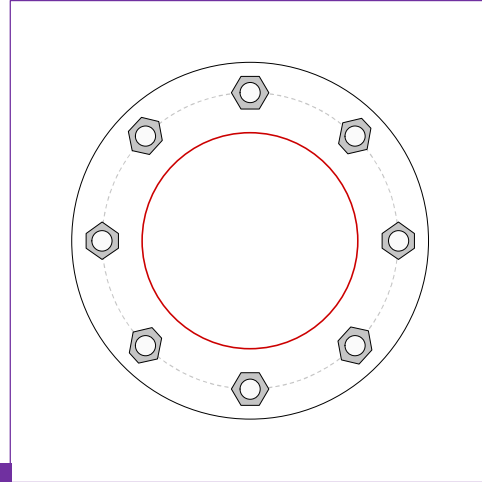
Applied Loads	
Moment (kip-ft)	30.25
Axial Force (kips)	4.24
Shear Force (kips)	1.99

\*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(8) 1"  $\varnothing$  bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 14.75" BC

Top Plate Data

17.75" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

17.75" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

10.75" x 0.375" round pole (A500-42; Fy=42 ksi, Fu=58 ksi)

Bottom Pole Data

10.75" x 0.375" round pole (A500-42; Fy=42 ksi, Fu=58 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	11.75
Allowable (kips)	54.54
Stress Rating:	20.5% <span style="color: green;">Pass</span>

Top Plate Capacity

Max Stress (ksi):	3.38	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	9.9%	<span style="color: green;">Pass</span>
Tension Side Stress Rating:	4.4%	<span style="color: green;">Pass</span>

Bottom Plate Capacity

Max Stress (ksi):	3.38	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	9.9%	<span style="color: green;">Pass</span>
Tension Side Stress Rating:	4.4%	<span style="color: green;">Pass</span>



# Monopole Flange Plate Connection

Elevation = 90 ft.

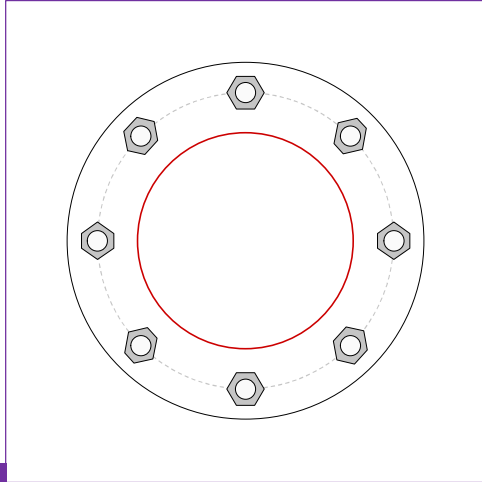


BU #	822779
Site Name	Bridgeport/ Rt 8
Order #	548693 Rev. 4
TIA-222 Revision	H

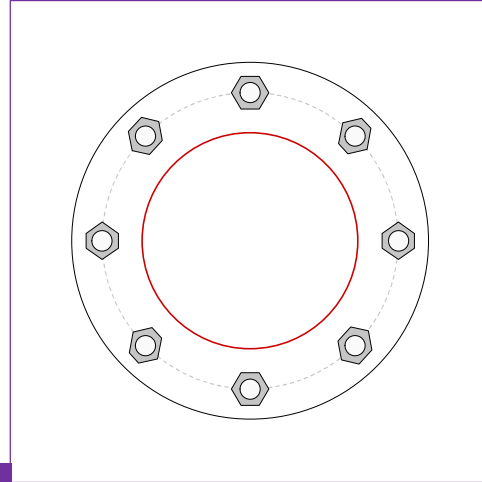
Applied Loads	
Moment (kip-ft)	58.45
Axial Force (kips)	5.66
Shear Force (kips)	2.83

\*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(8) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 14.75" BC

Top Plate Data

17.75" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

17.75" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

10.75" x 0.375" round pole (A500-42; Fy=42 ksi, Fu=58 ksi)

Bottom Pole Data

10.75" x 0.375" round pole (A500-42; Fy=42 ksi, Fu=58 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	23.03
Allowable (kips)	54.54
Stress Rating:	40.2% <span style="color: green;">Pass</span>

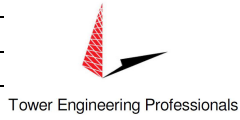
Top Plate Capacity

Max Stress (ksi):	6.45	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	19.0%	<span style="color: green;">Pass</span>
Tension Side Stress Rating:	8.5%	<span style="color: green;">Pass</span>

Bottom Plate Capacity

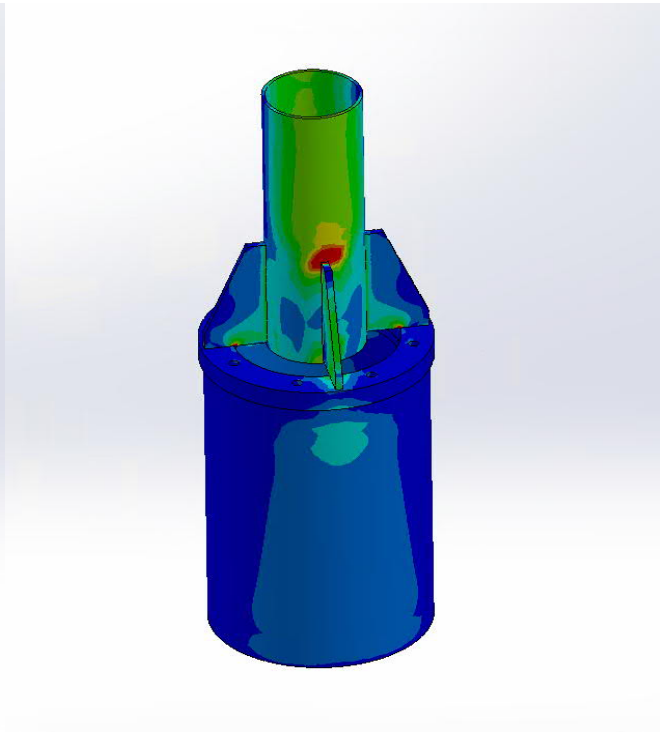
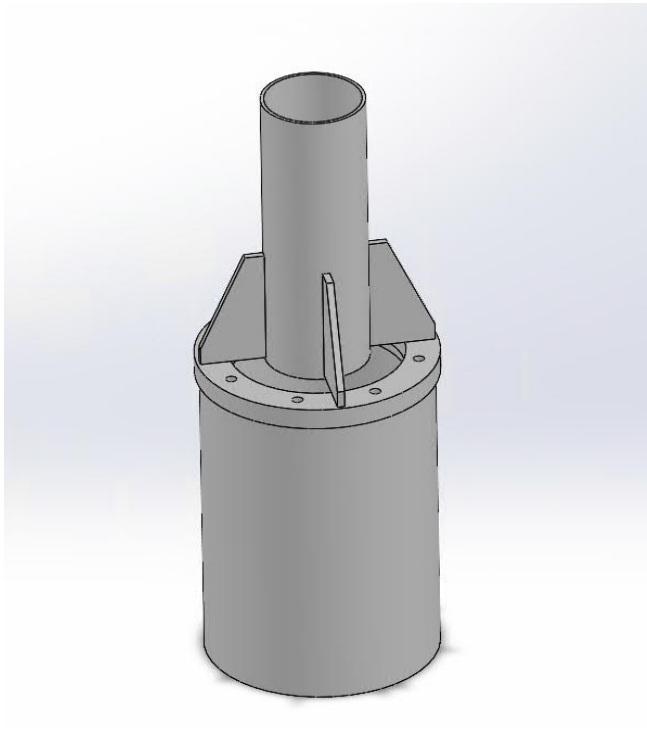
Max Stress (ksi):	6.45	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	19.0%	<span style="color: green;">Pass</span>
Tension Side Stress Rating:	8.5%	<span style="color: green;">Pass</span>

Client Site Name: Bridgeport/ Rt B  
 Client Site Number: BU 822779  
 Client Order Number: 548693 Rev. 4  
 TEP Project Number: 61158.650523



Engineer: SES  
 Check: RAL  
 Date: 2/2/2022  
 Page: 1

Simulation of Concealment Flange - 82-ft Elevation



Model Loads

Axial	7,210	lb
Shear	3,770	lb
Moment	88,790	lb-ft
Self-Weight Factor	1.2	

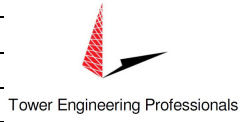
Overall Results

Sufficient

Model Part Information

Part	Part Grade
Spine Stub Section	A500-42
Stiffeners	A36
Top Flange	A36
Bottom Flange	A36
Tower Stub Section	A53-B-42

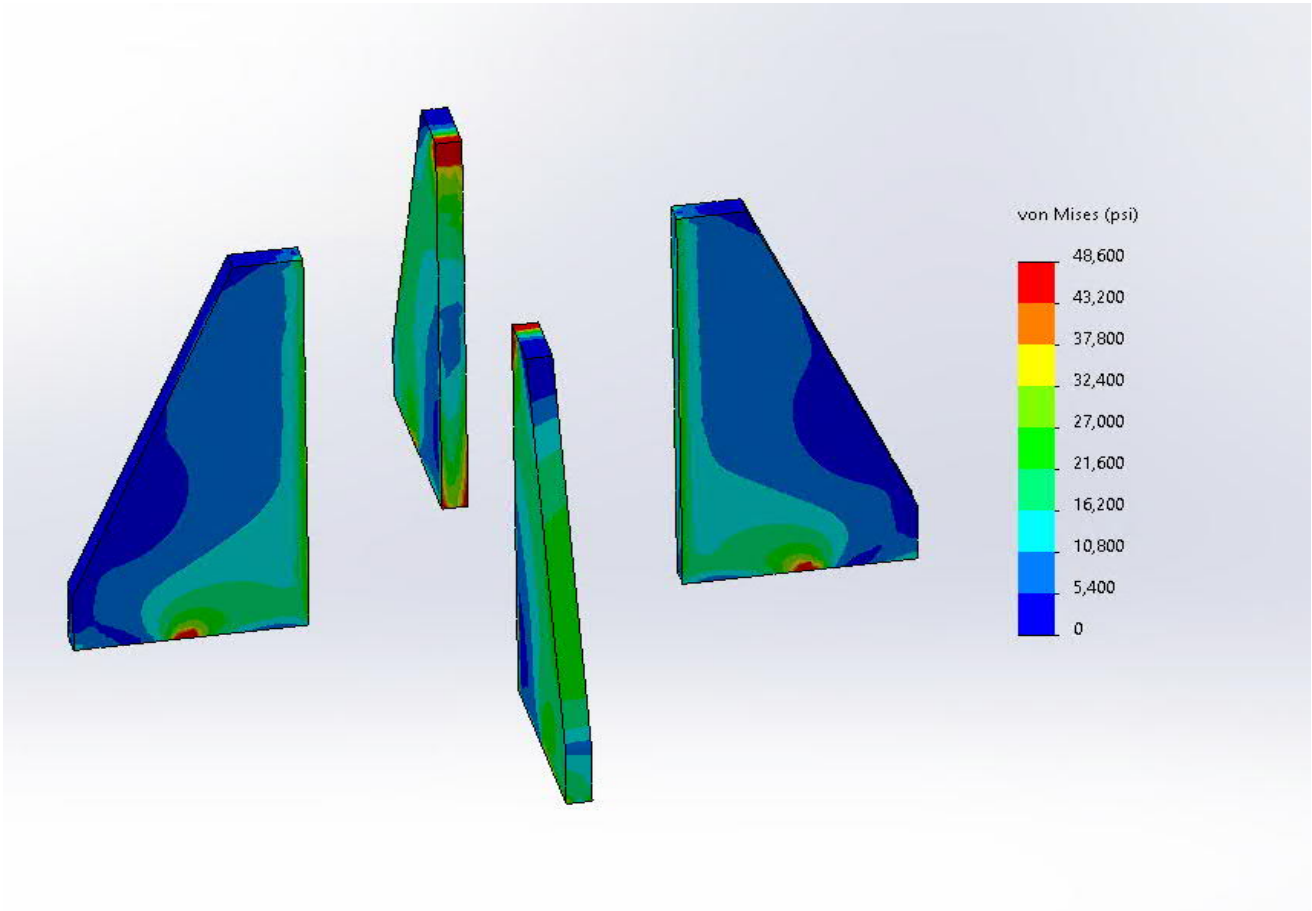
Client Site Name: Bridgeport/ Rt B  
Client Site Number: BU 822779  
Client Order Number: 548693 Rev. 4  
TEP Project Number: 61158.650523



Engineer: SES  
Check: RAL  
Date: 2/2/2022  
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Study: 0 Degree

Stiffeners



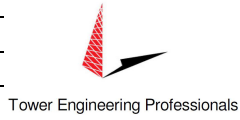
Assumptions

N/A

Results

Sufficient

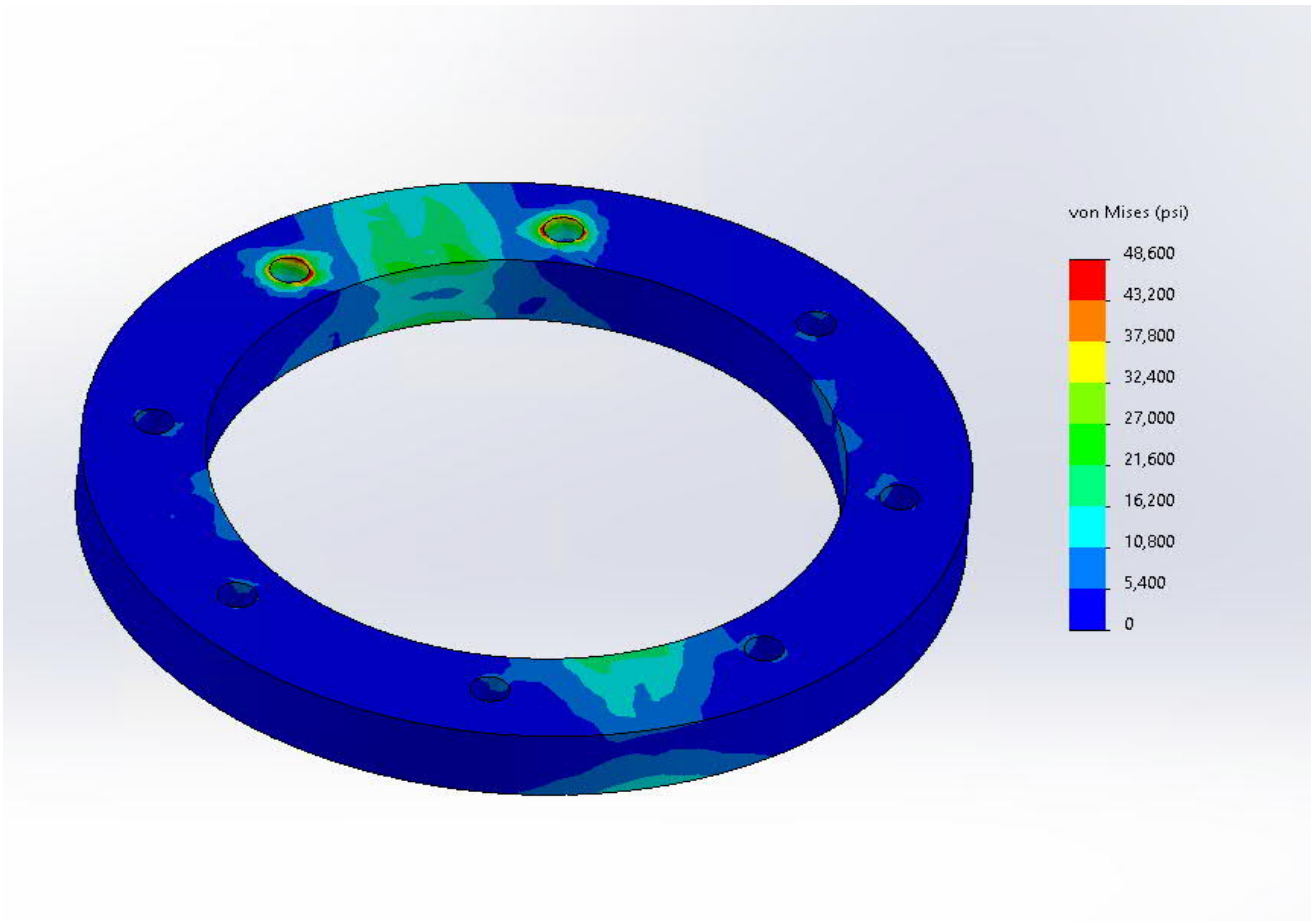
Client Site Name: Bridgeport/ Rt B  
Client Site Number: BU 822779  
Client Order Number: 548693 Rev. 4  
TEP Project Number: 61158.650523



Engineer: SES  
Check: RAL  
Date: 2/2/2022  
Page: 3

Study: 0 Degree

Top Flange



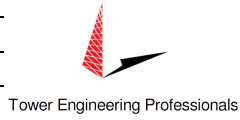
Assumptions

N/A

Results

Sufficient

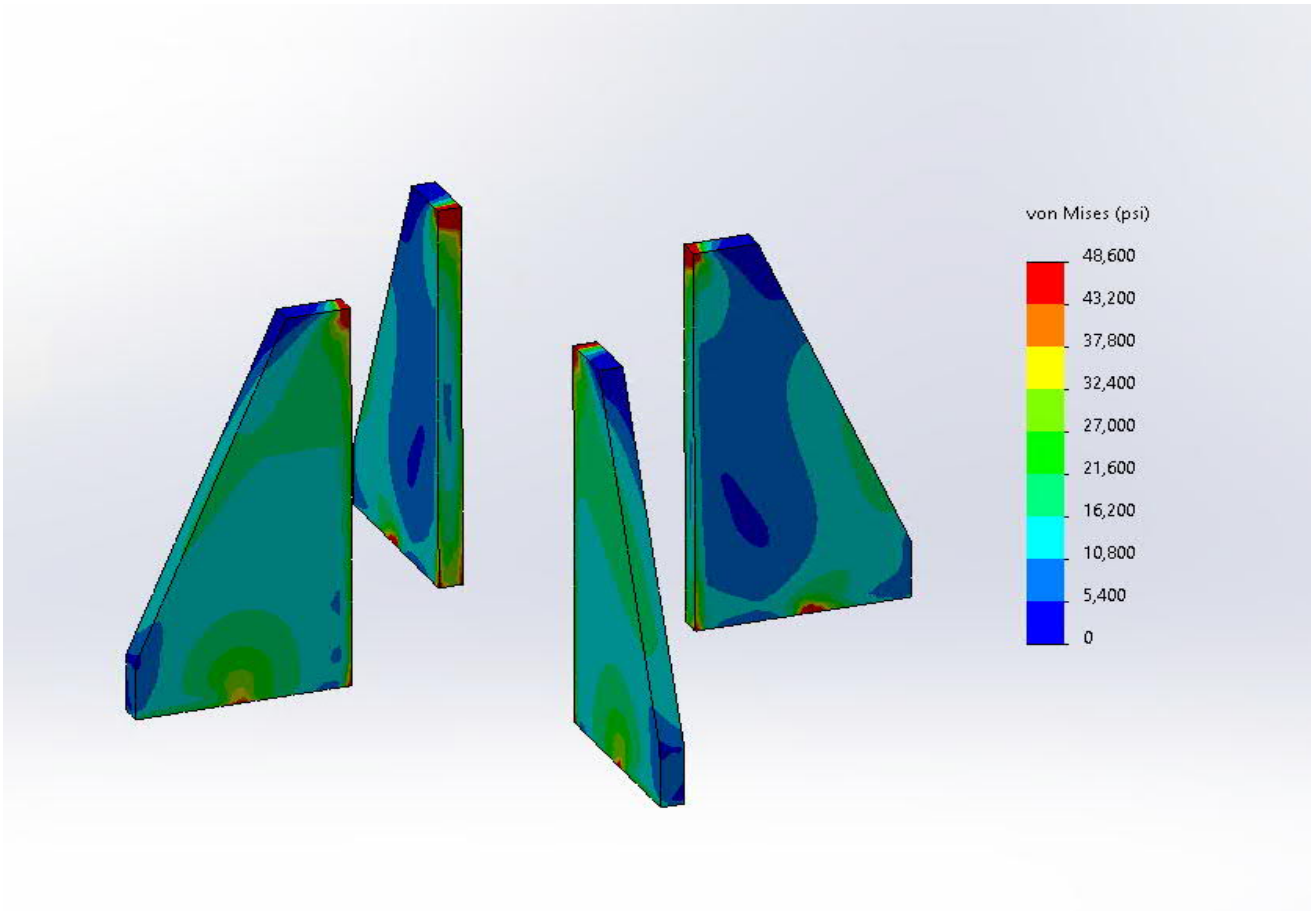
Client Site Name: Bridgeport/ Rt B  
Client Site Number: BU 822779  
Client Order Number: 548693 Rev. 4  
TEP Project Number: 61158.650523



Engineer: SES  
Check: RAL  
Date: 2/2/2022  
Page: 4

Study: 45 Degree

Stiffeners



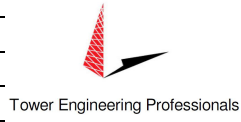
Assumptions

N/A

Results

Sufficient

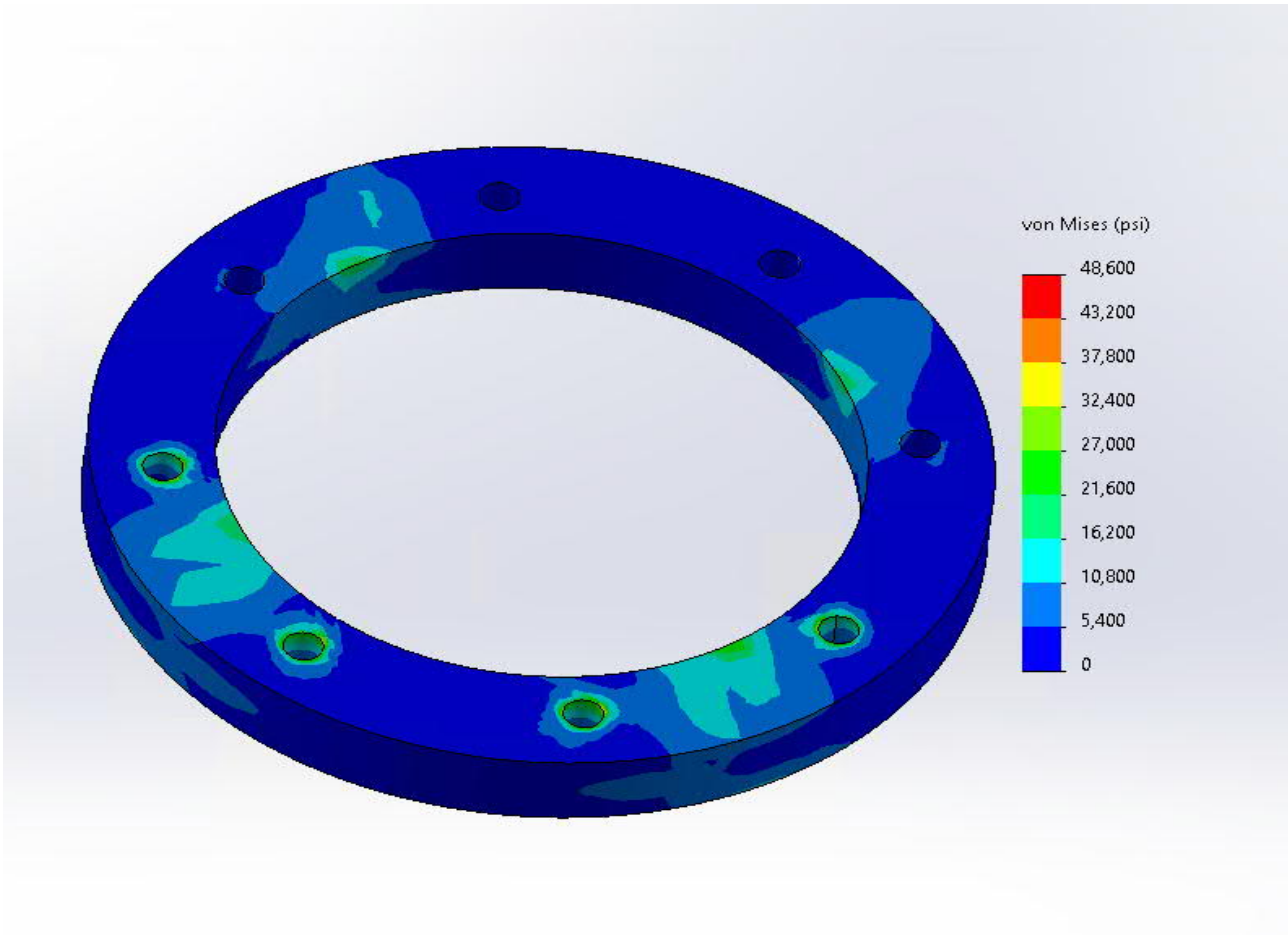
Client Site Name: Bridgeport/ Rt B  
Client Site Number: BU 822779  
Client Order Number: 548693 Rev. 4  
TEP Project Number: 61158.650523



Engineer: SES  
Check: RAL  
Date: 2/2/2022  
Page: 5

Study: 45 Degree

Top Flange



Assumptions

N/A

Results

Sufficient

# Monopole Flange Plate Connection

Elevation = 82 ft.

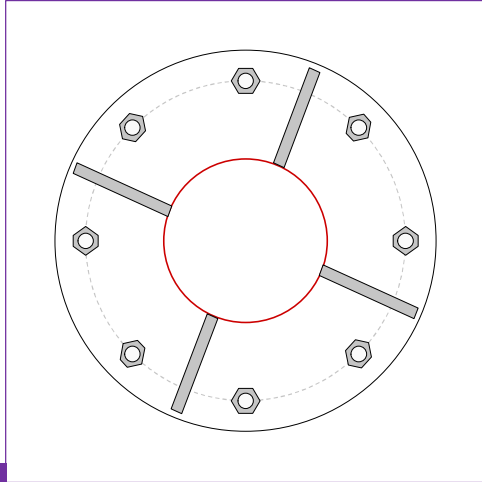


BU #	822779
Site Name	Bridgeport/ Rt 8
Order #	548693 Rev. 4
TIA-222 Revision	H

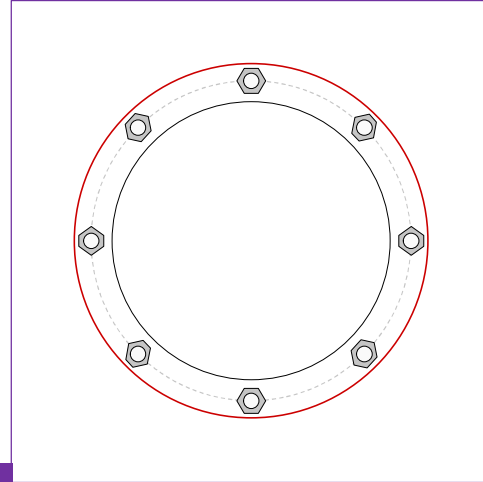
Applied Loads	
Moment (kip-ft)	88.79
Axial Force (kips)	7.21
Shear Force (kips)	3.77

\*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(8) 1"  $\varnothing$  bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 21" BC

Top Plate Data

25" OD x 2.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

(4) 13.5"H x 6.75"W x 0.75"T, Notch: 0"  
 plate: Fy= 36 ksi ; weld: Fy= 80 ksi  
 horiz. weld: 0.375" fillet  
 vert. weld: 0.375" fillet

Top Pole Data

10.75" x 0.375" round pole (A500-42; Fy=42 ksi, Fu=58 ksi)

Bottom Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	24.45
Allowable (kips)	54.54
Stress Rating:	42.7% Pass

Bottom Plate Capacity

Max Stress (ksi):	13.74	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	40.4%	Pass
Tension Side Stress Rating:	N/A	

Bottom Stiffener Capacity

Horizontal Weld:	N/A
Vertical Weld:	N/A
Plate Flexure+Shear:	N/A
Plate Tension+Shear:	N/A
Plate Compression:	N/A

Bottom Pole Capacity

Punching Shear:	N/A
-----------------	-----



# Monopole Flange Plate Connection

Elevation = 60 ft.

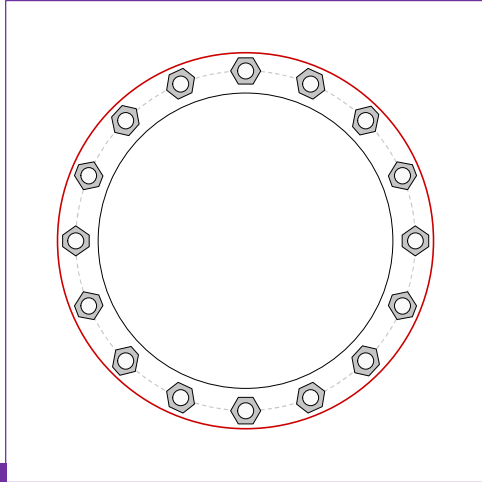


BU #	822779
Site Name	Bridgeport/ Rt 8
Order #	548693 Rev. 4
TIA-222 Revision	H

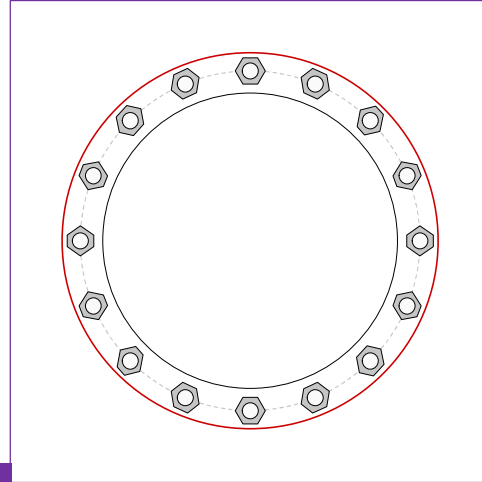
Applied Loads	
Moment (kip-ft)	189.50
Axial Force (kips)	10.65
Shear Force (kips)	5.15

\*TIA-222-H Section 15.5 Applied

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

(16) 1"  $\varnothing$  bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 21" BC

Top Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	26.38
Allowable (kips)	54.54
Stress Rating:	46.1% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

# Monopole Flange Plate Connection

Elevation = 30 ft.

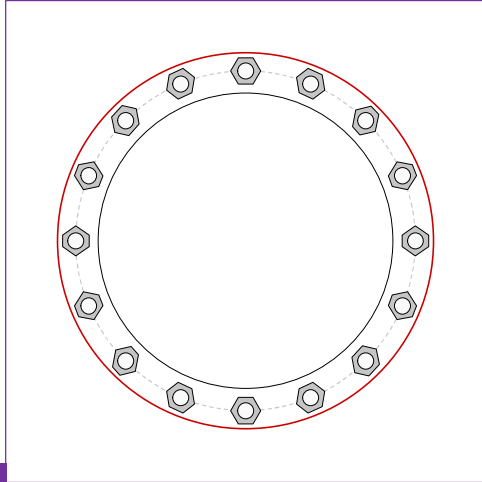


BU #	822779
Site Name	Bridgeport/ Rt 8
Order #	548693 Rev. 4
TIA-222 Revision	H

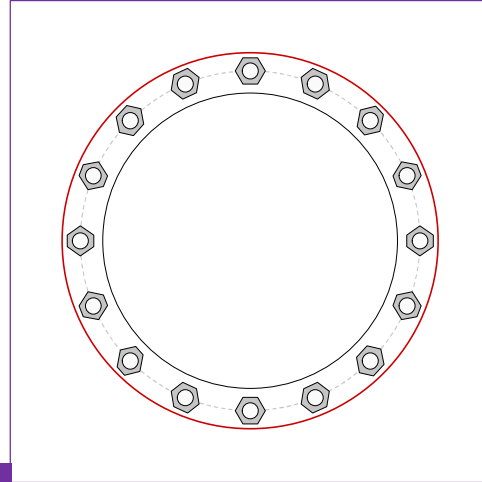
Applied Loads	
Moment (kip-ft)	359.74
Axial Force (kips)	14.68
Shear Force (kips)	6.16

\*TIA-222-H Section 15.5 Applied

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

(16) 1"  $\varnothing$  bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 21" BC

Top Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

18.25" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	50.43
Allowable (kips)	54.54
Stress Rating:	88.1% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Pirod OK
Tension Side Stress Rating:	Pirod OK

# Monopole Base Plate Connection

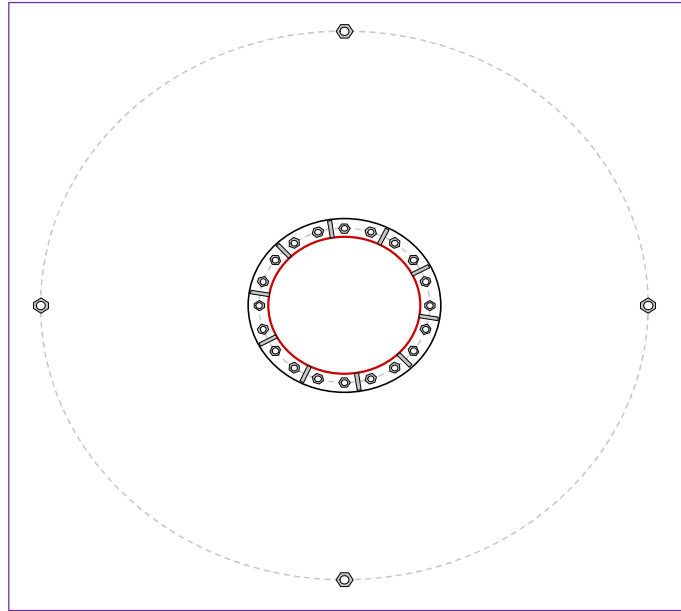


Site Info	
BU #	822779
Site Name	Bridgeport/ Rt 8
Order #	548693 Rev. 4

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
$I_{ar}$ (in)	See Custom Sheet

Applied Loads	
Moment (kip-ft)	550.78
Axial Force (kips)	18.85
Shear Force (kips)	6.52

\*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
GROUP 1: (20) 1" $\varnothing$ bolts (A687 N; $F_y=105$ ksi, $F_u=125$ ksi) on 27" BC
GROUP 2: (4) 1-1/2" $\varnothing$ bolts (Contech 40/16 N; $F_y=84.4$ ksi, $F_u=106$ ksi) on 96" BC

Base Plate Data
30.375" OD x 1.25" Plate (A36; $F_y=36$ ksi, $F_u=58$ ksi)

Stiffener Data
(10) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: $F_y= 36$ ksi ; weld: $F_y= 70$ ksi
horiz. weld: 0.3125" fillet
vert. weld: 0.3125" fillet

Pole Data
24" x 0.375" round pole (A53-B-42; $F_y=42$ ksi, $F_u=63$ ksi)

Anchor Rod Summary	(units of kips, kip-in)	
<b>GROUP 1:</b>		
$Pu\_c = 8.1$	$\phi Pn\_c = 74.22$	Stress Rating
$Vu = 0.33$	$\phi Vn = 33.4$	12.0%
$Mu = 0.26$	$\phi Mn = 15.75$	Pass
<b>GROUP 2:</b>		
$Pu\_c = 58.77$	$\phi Pn\_c = 106.34$	Stress Rating
$Vu = 0$	$\phi Vn = 47.85$	52.6%
$Mu = n/a$	$\phi Mn = n/a$	Pass
<b>Base Plate Summary</b>		
Max Stress (ksi):	-	
Allowable Stress (ksi):	-	
Stress Rating:	Pirod OK	
<b>Stiffener Summary</b>		
Horizontal Weld:	Pirod OK	
Vertical Weld:	Pirod OK	
Plate Flexure+Shear:	Pirod OK	
Plate Tension+Shear:	Pirod OK	
Plate Compression:	Pirod OK	
<b>Pole Summary</b>		
Punching Shear:	Pirod OK	

# CCIplate

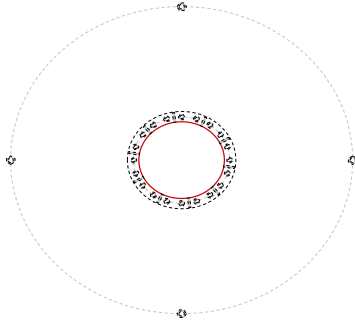
Elevation (ft)  (Base)

note: Bending interaction not considered when Grout Considered = "Yes"

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending	Grout Considered	Apply at BARB Elevation	BARB CL Elevation (ft)
1	Yes	Yes	Yes	No	No	
2	No	No	No	No	No	

Custom Bolt Connection										
Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, $\eta$	$l_{ar}$ (in):	Thread Type	Area Override, in <sup>2</sup>	Tension Only
1	1	0	1	A687	27	0.5	1.25	N-Included		No
2	1	18	1	A687	27	0.5	1.25	N-Included		No
3	1	36	1	A687	27	0.5	1.25	N-Included		No
4	1	54	1	A687	27	0.5	1.25	N-Included		No
5	1	72	1	A687	27	0.5	1.25	N-Included		No
6	1	90	1	A687	27	0.5	1.25	N-Included		No
7	1	108	1	A687	27	0.5	1.25	N-Included		No
8	1	126	1	A687	27	0.5	1.25	N-Included		No
9	1	144	1	A687	27	0.5	1.25	N-Included		No
10	1	162	1	A687	27	0.5	1.25	N-Included		No
11	1	180	1	A687	27	0.5	1.25	N-Included		No
12	1	198	1	A687	27	0.5	1.25	N-Included		No
13	1	216	1	A687	27	0.5	1.25	N-Included		No
14	1	234	1	A687	27	0.5	1.25	N-Included		No
15	1	252	1	A687	27	0.5	1.25	N-Included		No
16	1	270	1	A687	27	0.5	1.25	N-Included		No
17	1	288	1	A687	27	0.5	1.25	N-Included		No
18	1	306	1	A687	27	0.5	1.25	N-Included		No
19	1	324	1	A687	27	0.5	1.25	N-Included		No
20	1	342	1	A687	27	0.5	1.25	N-Included		No
21	2	0	1.5	Contech 40/16	96	0.5	0	N-Included	1.4	No
22	2	90	1.5	Contech 40/16	96	0.5	0	N-Included	1.4	No
23	2	180	1.5	Contech 40/16	96	0.5	0	N-Included	1.4	No
24	2	270	1.5	Contech 40/16	96	0.5	0	N-Included	1.4	No

## Plot Graphic



# Pier and Pad Foundation



BU #: 822779  
 Site Name: Bridgeport/ Rt 8  
 App. Number: 548693 Rev. 4

TIA-222 Revision: H  
 Tower Type: Monopole

Top & Bot. Pad Rein. Different?:   
 Block Foundation?:   
 Rectangular Pad?:

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	18.856	kips
Base Shear, $V_{u\_comp}$ :	6.499	kips
Moment, $M_u$ :	80.523	ft-kips
Tower Height, $H$ :	120	ft
BP Dist. Above Fdn, $bp_{dist}$ :	2.25	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	62.10	6.50	10.0%	Pass
<i>Bearing Pressure (ksf)</i>	22.50	1.18	5.0%	Pass
<i>Overturning (kip*ft)</i>	781.98	117.49	15.0%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	668.59	104.89	14.9%	Pass
<i>Pier Compression (kip)</i>	6123.66	25.35	0.4%	Pass
<i>Pad Flexure (kip*ft)</i>	374.32	51.45	13.1%	Pass
<i>Pad Shear - 1-way (kips)</i>	242.80	15.55	6.1%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.014	6.8%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	514.17	62.94	11.7%	Pass

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$ :	3.5	ft
Ext. Above Grade, $E$ :	0.5	ft
Pier Rebar Size, $Sc$ :	7	
Pier Rebar Quantity, $mc$ :	14	
Pier Tie/Spiral Size, $St$ :	4	
Pier Tie/Spiral Quantity, $mt$ :	9	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $cc_{pier}$ :	3	in

\*Rating per TIA-222-H Section 15.5

Structural Rating*:	14.9%
Soil Rating*:	15.0%

Pad Properties		
Depth, $D$ :	5	ft
Pad Width, $W_1$ :	12.5	ft
Pad Thickness, $T$ :	1.75	ft
Pad Rebar Size (Bottom dir. 2), $Sp_2$ :	5	
Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :	16	
Pad Clear Cover, $cc_{pad}$ :	3	in

Material Properties		
Rebar Grade, $F_y$ :	60	ksi
Concrete Compressive Strength, $F'_c$ :	4	ksi
Dry Concrete Density, $\delta_c$ :	150	pcf

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	125	pcf
Ultimate Gross Bearing, $Q_{ult}$ :	30.000	ksf
Cohesion, $C_u$ :	0.000	ksf
Friction Angle, $\phi$ :	34	degrees
SPT Blow Count, $N_{blows}$ :	21	
Base Friction, $\mu$ :	0.4	
Neglected Depth, $N$ :	3.30	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, $gw$ :	N/A	ft

<--Toggle between Gross and Net

# Exhibit E

## **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: 822779

NJJER01106A  
1875 Noble Avenue  
Bridgeport, Connecticut 06610

**May 26, 2022**

**EBI Project Number: 6222003434**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>16.90%</b>



May 26, 2022

Attn: Dish Wireless

Emissions Analysis for Site: 822779 - NJJER01106A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **1875 Noble Avenue in Bridgeport, 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 1875 Noble Avenue in Bridgeport, 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 n66 channels (AWS Band - 2190 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 / 2190 MHz channel(s) in Sector A, the JMA MX08FRO665-21 for the 600 MHz / 2190 MHz channel(s) in Sector B, the JMA MX08FRO665-21 for the 600 MHz / 2190 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 86 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 #:	I	Antenna #:	I	Antenna #:	I
Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21
Frequency Bands:	600 MHz / 2190 MHz	Frequency Bands:	600 MHz / 2190 MHz	Frequency Bands:	600 MHz / 2190 MHz
Gain:	11.35 dBd / 16.75 dBd	Gain:	11.35 dBd / 16.75 dBd	Gain:	11.35 dBd / 16.75 dBd
Height (AGL):	86 feet	Height (AGL):	86 feet	Height (AGL):	86 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):	1,543.86	ERP (W):	1,543.86	ERP (W):	1,543.86
Antenna AI MPE %:	<b>1.24%</b>	Antenna BI MPE %:	<b>1.24%</b>	Antenna CI MPE %:	<b>1.24%</b>

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	1.24%
T-Mobile	7.65%
Clearwire	0.24%
Nextel	1.23%
Sprint	6.54%
<b>Site Total MPE % :</b>	<b>16.90%</b>

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	1.24%
Dish Wireless Sector B Total:	1.24%
Dish Wireless Sector C Total:	1.24%
Site Total MPE % :	16.90%

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	86.0	2.49	600 MHz n71	400	0.62%
Dish Wireless 2190 MHz n66	4	275.14	86.0	6.18	2190 MHz n66	1000	0.62%
						<b>Total:</b>	<b>1.24%</b>

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

## Summary

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

The anticipated maximum composite contributions from the Dish Wireless facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Dish Wireless Sector	Power Density Value (%)
Sector A:	1.24%
Sector B:	1.24%
Sector C:	1.24%
Dish Wireless Maximum MPE % (Sector A):	1.24%
Site Total:	16.90%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **16.90%** 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 F

## **Letter of Authorization**





1200 MacArthur Blvd, Suite 200  
Mahwah, NJ 07430

Phone: (862) 226-6914  
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:**  
**1875 NOBLE AVENUE, BRIDGEPORT, CT 06610**

T-MOBILE USA TOWER LLC ("Crown Castle") hereby authorizes DISH NETWORK, 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:

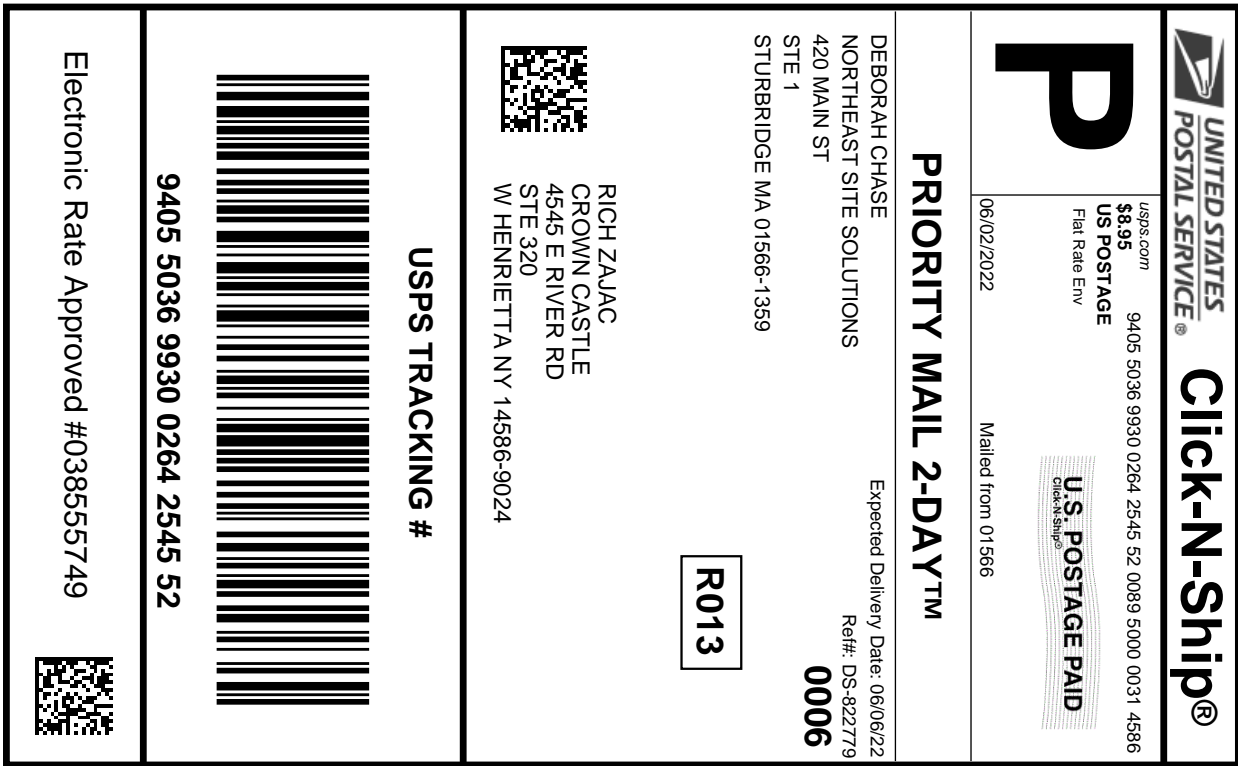
**Crown Site ID/Name: 822779/Bridgeport/ Rt 8**  
**Customer Site ID: NJJER01106A/CT-CCI-T-822779**  
**Site Address: 1875 Noble Avenue, Bridgeport, CT 06610**

Crown Castle

By:  \_\_\_\_\_ Date: 04/22/2022  
Robin Cannizzaro  
Real Estate Specialist

# Exhibit G

## Recipient Mailings



Cut on dotted line.

## Instructions

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

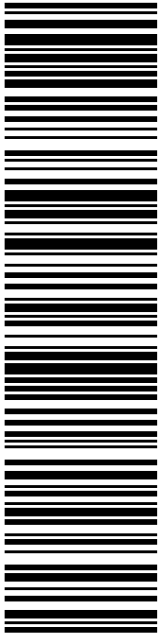
## Click-N-Ship® Label Record

<b>USPS TRACKING # :</b>	
<b>9405 5036 9930 0264 2545 52</b>	
Trans. #:	564817593
Print Date:	06/02/2022
Ship Date:	06/02/2022
Expected Delivery Date:	06/06/2022
Priority Mail® Postage:	<b>\$8.95</b>
Total:	<b>\$8.95</b>
<b>From:</b>	DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359
<b>To:</b>	RICH ZAJAC CROWN CASTLE 4545 E RIVER RD STE 320 W HENRIETTA NY 14586-9024
Ref#:	DS-822779

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




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**9405 5036 9930 0264 2545 69**

Electronic Rate Approved #038555749

**USPS TRACKING #**



JOSEPH GANIM  
MAYOR- BRIDGEPORT  
999 BROAD ST  
BRIDGEPORT CT 06604-4320

**P**

06/02/2022

**PRIORITY MAIL 2-DAY™**

usps.com  
**\$8.95**  
US POSTAGE  
Flat Rate Env

9405 5036 9930 0264 2545 69 0089 5000 0020 6604


U.S. POSTAGE PAID  
click-n-ship®

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

Expected Delivery Date: 06/06/22  
Ref#: DS-822779  
**0006**

Mailed from 01566

**C013**



**Click-N-Ship®**

UNITED STATES  
POSTAL SERVICE®



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## Click-N-Ship® Label Record

<b>USPS TRACKING # :</b>	
<b>9405 5036 9930 0264 2545 69</b>	
Trans. #:	564817593
Print Date:	06/02/2022
Ship Date:	06/02/2022
Expected Delivery Date:	06/06/2022
Priority Mail® Postage:	<b>\$8.95</b>
Total:	<b>\$8.95</b>
<b>From:</b>	DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359
<b>To:</b>	JOSEPH GANIM MAYOR- BRIDGEPORT 999 BROAD ST BRIDGEPORT CT 06604-4320
Ref#:	DS-822779
<p>* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.</p>	



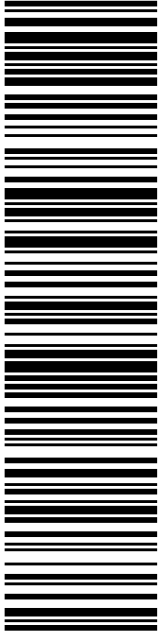
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DENNIS BUCKLEY  
ZONING ADMINISTRATOR  
45 LYON TER  
RM 210  
BRIDGEPORT CT 06604-4023

**USPS TRACKING #**



**9405 5036 9930 0264 2545 76**

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

**C031**

**P**

06/02/2022

USPS.com  
**US POSTAGE**  
Flat Rate Env

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**PRIORITY MAIL 2-DAY™**

Expected Delivery Date: 06/06/22  
Ref#: DS-822779  
**0006**

Electronic Rate Approved #038555749





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

## Click-N-Ship® Label Record

<b>USPS TRACKING # :</b>	
<b>9405 5036 9930 0264 2545 76</b>	
Trans. #: 564817593	Priority Mail® Postage: <b>\$8.95</b>
Print Date: 06/02/2022	Total: <b>\$8.95</b>
Ship Date: 06/02/2022	
Expected Delivery Date: 06/06/2022	
<b>From:</b> DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359	
Ref#: DS-822779	
<b>To:</b> DENNIS BUCKLEY ZONING ADMINISTRATOR 45 LYON TER RM 210 BRIDGEPORT CT 06604-4023	
* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.	

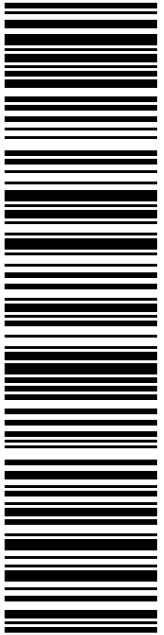


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CONNECTICUT ZOOLOGICAL SOCIETY  
1875 NOBLE AVE  
BRIDGEPORT CT 06610-1646

**USPS TRACKING #**



**9405 5036 9930 0264 2545 83**

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

**C020**

06/02/2022 Mailed from 01566


**P**

USPS.com  
US POSTAGE  
Flat Rate Env  
U.S. POSTAGE PAID  
click-n-ship®

9405 5036 9930 0264 2545 83 0089 5000 0020 6610  
\$8.95

Expected Delivery Date: 06/06/22 Ref#: DS-822779  
**0006**

**PRIORITY MAIL 2-DAY™**



**Click-N-Ship®**



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### Click-N-Ship® Label Record

**USPS TRACKING # :**  
**9405 5036 9930 0264 2545 83**

Trans. #: 564817593	Priority Mail® Postage: <b>\$8.95</b>
Print Date: 06/02/2022	Total: <b>\$8.95</b>
Ship Date: 06/02/2022	
Expected Delivery Date: 06/06/2022	

**From:** DEBORAH CHASE Ref#: DS-822779  
NORTHEAST SITE SOLUTIONS  
420 MAIN ST  
STE 1  
STURBRIDGE MA 01566-1359

**To:** CONNECTICUT ZOOLOGICAL SOCIETY  
1875 NOBLE AVE  
BRIDGEPORT CT 06610-1646

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



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822779  
Crown Dish



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

06/07/2022 08:51 AM

Product	Qty	Unit Price	Price
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Prepaid Mail	1		\$0.00
Bridgeport, CT 06610			
Weight: 0 lb 8.70 oz			
Acceptance Date:			
Tue 06/07/2022			
Tracking #:			
9405 5036 9930 0264 2545 83			

Prepaid Mail	1		\$0.00
West Henrietta, NY 14586			
Weight: 0 lb 2.00 oz			
Acceptance Date:			
Tue 06/07/2022			
Tracking #:			
9405 5036 9930 0264 2545 52			

Prepaid Mail	1		\$0.00
Bridgeport, CT 06604			
Weight: 0 lb 8.70 oz			
Acceptance Date:			
Tue 06/07/2022			
Tracking #:			
9405 5036 9930 0264 2545 69			

Prepaid Mail	1		\$0.00
Bridgeport, CT 06604			
Weight: 0 lb 8.60 oz			
Acceptance Date:			
Tue 06/07/2022			
Tracking #:			
9405 5036 9930 0264 2545 76			

Grand Total: \$0.00

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eligible to receive a third set  
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