



1 Cityplace Dr, Suite 490  
Creve Coeur, MO 63141

Phone: (314) 513-0147  
[www.crowncastle.com](http://www.crowncastle.com)

July 15<sup>th</sup>, 2022

Barbara Carboni, Town Planner  
Truro Town Hall  
24 Town Hall Road  
P.O. Box 2030  
Truro, MA 02666

RE:

**Notice of Application for Site Plan Review for DISH Wireless Telecommunication Co-  
location  
Crown Site ID#841273; DISH Site ID# BOSOS00592A  
344 Route 6, Truro, MA**

Dear Ms. Carboni

Attached is an application for Site Plan Review, for a new wireless collocation on an existing Crown Castle owned lattice tower located at 344 Route 6, Truro.

DISH officially entered the wireless retail space on July 1, 2020. Today, DISH Wireless is the fourth-largest wireless carrier in the United States with 8.9 million subscribers. DISH provides wireless voice and data services in the United States under the Boost Mobile brand and will provide services under its own brand after its network is built. This Application brought forth pertains to DISH's network build.

This collocation of new Transmission Equipment is for a Wireless Communications Facility ("Facility") located at the Site. The installation consists primarily of the following: adding three (3) antennas, six (6) remote radio units, and one (1) over voltage protection device at the 122' centerline height on the tower, three (3) DC power cables, three (3) fiber trunks and one (1) radio cabinet in the existing fenced compound, as depicted in the attached stamped plans.

Please feel free to contact me with any questions, and I look forward to working with you.

Sincerely,

*Katie Adams*

Katie Adams  
Crown Castle, Agent for DISH Wireless  
[kadams@nbcllc.com](mailto:kadams@nbcllc.com)  
(781) 392-7547



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

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

**Crown Castle Letter of Authorization**

**MA - TOWN OF TRURO  
Planning Department  
24 TOWN HALL ROAD  
TRURO, MA 02666**

**Re: Application for Zoning/Building Permit  
Crown Castle telecommunications site at:  
344 ROUTE 6, NORTH TRURO, MA 02652**

NCWPCS MPL 24 - YEAR SITES TOWER HOLDINGS LLC ("Crown Castle") hereby authorizes DISH Wireless LLC, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the TOWN OF TRURO for the existing wireless communications site described below:

**Crown Site ID/Name: 841273/TRURO  
Customer Site ID: BOBOS00592A/MA-CCI-T-841273  
Site Address: 344 ROUTE 6, NORTH TRURO, MA 02652**

Crown Castle

By:  \_\_\_\_\_ Date: 7/15/2022  
Richard Zajac  
Site Acquisition Specialist



# Town of Truro Planning Board

P.O. Box 2030, Truro, MA 02666

## APPLICATION FOR TELECOMMUNICATION STRUCTURES, BUILDINGS AND APPURTENANCES SITE PLAN REVIEW

To the Town Clerk and the Planning Board of the Town of Truro, MA Date 7/15/2022

The undersigned hereby files an application with the Truro Planning Board for the following:

**Site Plan Review** pursuant to §40.5 of the Truro Zoning Bylaw

### 1. General Information

Description of Property and Proposed Project DISH Wireless collocation on an existing Lattice Tower located at 344 Route 6. DISH to install 3 panel antennas and ancillary equipment on the existing tower, with a 5'x7' pad for equipment cabinet on the ground, within the existing compound, as per plans.

Property Address 344 Route 6, Truro Map(s) and Parcel(s) 39-172-A

Registry of Deeds title reference: Book \_\_\_\_\_, Page \_\_\_\_\_, or Certificate of Title Number \_\_\_\_\_ and Land Ct. Lot # \_\_\_\_\_ and Plan # \_\_\_\_\_

Applicant's Name Katie Adams on behalf of Crown Castle (Written Permission attached)

Applicant's Legal Mailing Address 100 Apollo Drive, Suite 303, Chelmsford MA 01824

Applicant's Phone(s), Fax and Email 781-392-7547 kadams@nbcllc.com

Applicant is one of the following: (please check appropriate box)

\*Written Permission of the owner is required for submittal of this application.

Owner  Prospective Buyer\*  Other\*

Owner's Name and Address Crown Castle 4545 E. River Rd. Suite 320, West Henrietta, NY 14586

Representative's Name and Address Richard Zajac 4545 E. River Rd. Suite 320, West Henrietta, NY 14586

Representative's Phone(s), Fax and Email 585-445-5896 Richard.Zajac@crowncastle.com

**2. Waiver(s) Request** – The Planning Board may, upon the request of the applicant, pursuant to §70.3.E, waive requirements of §40.5, provided that in the opinion of the Planning Board such a waiver would not be detrimental to the public interest, cause the Town any expense, or be inconsistent with the intent and purpose of this Bylaw. A request for a waiver by the applicant shall be accompanied by a reasonable explanation as to why the waiver is being requested. If multiple waivers are requested, the applicant shall explain why each waiver is requested.

- The applicant is **advised** to consult with the Building Commissioner, Planning Department, Conservation Department, and/or Health Department prior to submitting this application.

### Signature(s)

Katie Adams

Applicant(s)/Representative *Printed Name(s)*

**Katie Adams**

Applicant(s)/Representative *Signature(s)*

Owner(s) *Printed Name(s)* or written permission

Owner(s) *Signature(s)* or written permission

Your signature on this application authorizes the Members of the Planning Board and town staff to visit and enter upon the subject property.

## 40.5 - COMMUNICATION STRUCTURES, BUILDINGS AND APPURTENANCES - Applicant

Address: <u>344 Route 6</u> Applicant Name: <u>Katie Adams c/o Crown Castle</u> Date: <u>7/15/2022</u>				
No.	Requirement	Included	Not Included	Explanation, if needed
<b><u>B. Requirements</u></b>				
1	All building permits for a communications structure, building or appurtenance shall require a special permit from the Planning Board.			seeking SP
2	The minimum distance from the perimeter of the communications structure to any property line shall be the height of the structure including any antennas or appurtenances, plus ten (10) feet. The minimum distance from any guy wire, anchor or brace to any property line shall be the length of the guy wire or brace plus ten (10) feet. The setbacks for a communications building shall comply with the setback requirements of the zoning district.	X		
3	The communications structure, building or appurtenance shall be installed, maintained and operated in accordance with all applicable federal, state, county and local codes, standards and regulations and shall be designed to withstand sustained winds and gusts of a category 5 hurricane. If Federal Aviation Administration (FAA) or Federal Communications Commission (FCC) regulations are changed, then the owner or operator shall bring the structure, building and appurtenances into compliance with the new regulations within six (6) months of the effective date of such regulations or earlier if a more stringent compliance schedule is included in the regulation. Failure to comply with any new regulations shall be grounds for the removal of non-complying structures, buildings and appurtenances at the owner's expense.	X		
4	The height of the communications structure (tower) shall be no greater than one hundred and fifty (150 feet) above ground level.			n/a - tower existing
5	Communication antennas shall be located on pre-existing structures unless the applicant demonstrates that there are no feasible pre-existing structures. The installation shall preserve the character of such pre-existing structures.	X		
6	If the applicant has demonstrated that there are no feasible pre-existing structures to support antennas and appurtenances for the intended use, then any communications structure, building or appurtenance may be sited on public land.			n/a



**40.5 - COMMUNICATION STRUCTURES, BUILDINGS AND APPURTENANCES - Applicant**

Address: <u>344 Route 6</u> Applicant Name: <u>Katie Adams c/o Crown Castle</u> Date: <u>7/15/2022</u>				
No.	Requirement	Included	Not Included	Explanation, if needed
7	To the extent lawful and feasible, all service providers shall co-locate on a single tower. Towers shall be designed to structurally accommodate the maximum number of foreseeable users (within a ten-year period) technically practicable. The applicant is required to document all co-location tenants and provide a tower design indicating types and location of all facilities.	x		
8	New facilities or structures shall be considered only upon a finding by the Planning Board that existing or approved facilities or structures cannot accommodate the wireless communications equipment planned for the proposed tower.			n/a
9	The installation of a communications structure, building or appurtenance shall be designed to minimize visual impact; the maximum amount of natural vegetation shall be preserved; details of construction and finish shall blend with the surroundings; additional vegetative screening shall be employed where practical and particularly to screen abutting residential property whether developed or not. A detailed landscape plan will be required with the application.	x		
10	Location and siting of facilities and structures shall be consistent with any regional location and siting criteria established by the Cape Cod Commission.			n/a
11	Under normal operating conditions, noise emanating from the communications structure, building or appurtenance shall not be greater at the boundary of the lot on which it is sited than would otherwise exist in the absence of these facilities.	x		
12	No hazardous waste shall be discharged on the site. Any storage of fuel shall be in compliance with the Board of Health regulations. Documentation shall be provided for the contents of all communications buildings and/or cabinets.			n/a
13	All run-off of storm water from communications structures, buildings, and appurtenances, driveways and parking areas shall be contained on site; the amount of impervious surface on the site shall be minimized.	x		
14	Lighting, when required and permitted by the FAA or the Planning Board, shall be directed inward so as not to project onto surrounding properties.			n/a

**40.5 - COMMUNICATION STRUCTURES, BUILDINGS AND APPURTENANCES - Applicant**

<b>Address:</b> <u>344 Route 6</u> <b>Applicant Name:</b> <u>Katie Adams c/o Crown Castle</u> <b>Date:</b> <u>7/15/2022</u>				
No.	Requirement	Included	Not Included	Explanation, if needed
15	All structures, buildings or appurtenances must be secured to control access. Fencing materials shall be consistent with the character of abutting properties, with a locked gate and proper warning signals. A sign must be displayed indicating the name of the owner(s) and a 24 hour contact number. Only signs limited to safety will be allowed. Fencing is not required for antennas or other appurtenances mounted on a pre-existing structure.			n/a
16	As a condition of approval of the application the applicant shall agree, by execution of a covenant, to remove within six months any communications structure and building which has not operated for four consecutive months unless the cause is major damage which prohibits operation. In the event that major damage has rendered the facility inoperative, repair or removal of the facility shall begin within six months and be completed within an additional six months. Failure to comply with the conditions of the covenant shall be grounds for the removal of structures, buildings and appurtenances. Complete restoration of the site shall be at the owner(s) expense, secured by a bond from a recognized financial institution. The covenant shall include, also at the owner(s) expense, provision for liability insurance for any damage to any abutting property whether developed or not.	X		
17	At least forty-five (45) days before submitting an application for a special permit for the installation of a communications structure, building or appurtenance the applicant shall consult with the Planning Board. The purpose of the consultation is to facilitate the permitting process by the exchange of information between the applicant and the Planning Board, and for the applicant to obtain a detailed description of the information and documentation required, in writing, by the Planning Board, in order to clarify and resolve concerns of the Board and minimize potential problems with the application.	X		
18	The Planning Board shall hold a public hearing within sixty-five (65) days of the filing of an application and shall issue a decision within ninety (90) days following the date of the public hearing.			
19	The applicant shall submit the following written information to the Planning Board:			

**40.5 - COMMUNICATION STRUCTURES, BUILDINGS AND APPURTENANCES - Applicant**

**Address:** 344 Route 6      **Applicant Name:** Katie Adams c/o Crown Castle      **Date:** 7/15/2022

No.	Requirement	Included	Not Included	Explanation, if needed
19.a.	A survey of all sites for the installation of communications structures, buildings or appurtenances which are feasible for providing the intended services. The survey shall include a rationale for the selection of a prime and at least one alternative site. All sites in Truro shall be located on the appropriate sheet(s) of the Truro Assessor's Atlas;			n/a
19.b.	A survey of all pre-existing structures which are capable of supporting the equipment necessary to provide the intended service and a technical report which demonstrates why any such structure cannot be used by the applicant;			n/a
19.c.	The radiation pattern of all proposed antennas showing the frequency and intensity of radiation at ground level and at 30 feet above ground level. At the expense of the applicant, Electro Magnetic Field (EMF) readings shall be provided to the Board of Health yearly and immediately after any addition to the facility;	x		
19.d.	The sound level in decibels at ground level, at 30 feet above ground level and at the top of the facility and 10, 50, 100 and 500 feet from the communications structure, building or appurtenances for wind velocities between calm and 100 miles per hour with all equipment operating at normal levels, including before condition measured, after condition prediction and cumulative condition (with co-location) prediction;			n/a
19.e.	A delineation of the Assessor's Atlas of all areas in Truro which will not be served by the proposed installation for the prime and an alternative site;			n/a
19.f.	A statement of the services to be supported by the proposed communications structure, building or appurtenance;	x		
19.g.	Plans of special design features and materials, including landscaping, to minimize the visual impact of proposed communications structures, buildings and appurtenances. Site plans, elevations and fall zone should be included;			n/a
19.h.	A certification that the applicant has complied with all federal (including FAA), state and regional requirements to provide the proposed service and demonstration of compliance with the FCC guidelines for EMF's under National Environmental Policy Act (NEPA), including copies of the FCC Form 600, plus Environmental Assessment/Environmental Impact Statements as applicable;	x		

## 40.5 - COMMUNICATION STRUCTURES, BUILDINGS AND APPURTENANCES - Applicant

<b>Address:</b> <u>344 Route 6</u> <b>Applicant Name:</b> <u>Katie Adams c/o Crown Castle</u> <b>Date:</b> <u>7/15/2022</u>				
No.	Requirement	Included	Not Included	Explanation, if needed
19.i.	Within thirty (30) days after the application filing, the applicant shall arrange to fly a three-foot-diameter balloon at the primary and an alternate site at the maximum height of the proposed installation. The date and location of the flights shall be advertised at least 14 days, but not more than 21 days before the flights, in a newspaper with a general circulation in Truro. Photos shall be provided from all strategic viewing points, per agreement with the Planning Board prior to flight.			n/a
20	If a communications structure, building or appurtenance is to be installed on a pre-existing private structure or on land or a structure owned, prior to the effective date of the bylaw, by the Commonwealth of Massachusetts, or on land or a structure owned by the Town of Truro, the applicant shall submit the following written information to the Planning Board:			
20.a.	A draft contract, including requirements for removal of all structures and for complete site restoration in the case of discontinued use, between the applicant and the owner (if different from the applicant).			
20.b.	A description of the proposed facility at the proposed prime and alternate sites including:			n/a
	i) Height of the facility and its associated equipment and antennas;			
	ii) Access roads and power supplies;			
	iii) Type, size and number of transmitters;			
	iv) A list of all fuels to be used on the site and a detailed description of how each shall be contained.			
20.c.	A site plan (scale not less than 1 inch=40 feet), showing the proposed facility, fall zones, existing and proposed contour elevations, 100-year flood zones, water resources, Zones of Contribution, waterways, wetlands and all associated equipment and structures on the site, including elevations of all equipment and structures with sufficient detail to delineate the external finish of all structures and equipment; and			
20.d.	A landscape plan showing the proposed site before and after development, including topography and screening proposed to protect abutters.			
21	For all applications other than those set forth in § 40.5.B.20 above, the applicant shall submit the following written information to the Planning Board:			

**40.5 - COMMUNICATION STRUCTURES, BUILDINGS AND APPURTENANCES - Applicant**

Address: <u>344 Route 6</u> Applicant Name: <u>Katie Adams c/o Crown Castle</u> Date: <u>7/15/2022</u>				
No.	Requirement	Included	Not Included	Explanation, if needed
21.a.	A statement of the purpose for which the application is made.	X		
21.b.	The exact legal name of each person seeking a special permit and the address and telephone number or principal place of business of each such person.	X		
21.c.	The name, title, address and telephone number of the attorney or other person to whom correspondence or communications in regard to the application are to be addressed. Notice, orders, and other papers may be served upon the person so named, and such service shall be deemed to be service upon the applicant;	X		
21.d.	A statement of the need for the proposed facility with as much specific information as is practicable to demonstrate the need, including description of the proposed system and how the proposed facility would eliminate or alleviate any existing deficiency or limitation, including all co-location facilities;			n/a
21.e.	A statement of the benefits expected from the proposed facility with as much information as is practicable;			n/a
21.f.	A description of the proposed facility at the proposed prime and alternate sites including:			n/a
	i) Height of the facility and its associated equipment and antennas;			
	ii) Access roads and power supplies;			
	iii) Special design features and materials, including landscape plans;			
	iv) Type, size and number of transmitters and receivers, as well as the signal frequency, power output, and power density at the tower base, site boundary, and building where people might be exposed to the maximum power densities from the facility;			
	v) A map showing any fixed facilities with which the proposed facility would interact;			
	vi) The coverage signal strength, and integration of the proposed facility with any adjacent fixed facility, to be accompanied by a network plan showing interfaces with any adjacent service areas;			
	vii) A forecast of when maximum capability would be reached for the proposed facility and for facilities that would be integrated with the proposed facility;			
	viii) Documentation of contents of communications buildings and/or cabinets.			

**40.5 - COMMUNICATION STRUCTURES, BUILDINGS AND APPURTENANCES - Applicant**

Address: <u>344 Route 6</u> Applicant Name: <u>Katie Adams c/o Crown Castle</u> Date: <u>7/15/2022</u>				
No.	Requirement	Included	Not Included	Explanation, if needed
21.g.	A description of the proposed prime and alternative site, including:			N/a
	i) The most recent U.S.G.S. topographic quadrangle map (scale 1 inch = 2,000 feet) marked to show the site of the facility and any significant changes within a one-mile-radius of the site;			
	ii) A map (scale not less than 1 inch = 200 feet) of the lot or tract on which the facility is proposed to be located, showing the acreage and dimensions of such site, the name and location of adjacent public and private roads or the nearest public road, and the names of abutting owners and portions of their lands abutting the site;			
	iii) A site plan (scale not less than 1 inch = 40 feet), showing the proposed facility, fall zones, existing and proposed contour elevations, 100-year flood zones, water resources, Zones of Contribution, waterways, wetlands and all associated equipment and structures on the site, including elevations of all equipment and structures with sufficient detail to delineate the external finish of all structures and equipment;			
	iv) Where relevant, a terrain profile showing the proposed facility and access road and existing and proposed grades; and			
	v) The most recent aerial photograph (scale not less than 1 inch = 1,000 feet) showing the proposed site, access roads and all abutting properties.			
21.h.	A statement explaining mitigation measures for the proposed facility including:			N/a
	i) Construction techniques designed specifically to minimize adverse effects on natural areas and sensitive areas;			
	ii) Special design features made specifically to avoid or minimize adverse effects on natural areas and sensitive areas;			
	iii) Establishment of vegetation proposed near residential, recreation, and scenic areas;			
	iv) Special design features made specifically so that the proposed structures, buildings and appurtenances shall blend with pre-existing structures and buildings;			
	v) Methods for preservation of vegetation for wildlife habitat and screening;			

### 40.5 - COMMUNICATION STRUCTURES, BUILDINGS AND APPURTENANCES - Applicant

Address: <u>344 Route 6</u> Applicant Name: <u>Katie Adams c/o Crown Castle</u> Date: <u>7/15/2022</u>				
No.	Requirement	Included	Not Included	Explanation, if needed
	vi) A list of all fuels to be used on the site and a detailed description of how each shall be contained; and			
	vii) A statement describing any hazardous materials or wastes (including quantities) to be used or generated on the site.			
21.i.	A description of the existing and planned land uses of the proposed prime and alternative sites and surrounding areas;			
21.j.	A description of the scenic, natural, historic, and recreational characteristics of the proposed prime and alternative sites and surrounding areas;			
21.k.	Sight-line graphs to the proposed prime and alternative sites from visually impacted areas (a site from which the facility can be seen) such as residential developments, recreational areas, and historic sites;			
21.l.	A list describing the type and height of all existing and proposed communication structures, buildings and appurtenances within a ten-mile radius within the search area, or within any other area from which use of the proposed prime or alternative structure might be feasible from a location standpoint for purposes of the application;			
21.m.	A description of efforts to share existing and proposed structures, or consolidate telecommunications antennas of public and private services onto the proposed facility;			
21.n.	A description of the technical alternatives and a statement containing justification for the proposed facility;			
21.o.	A description of rejected sites with a U.S.G.S. topographic quadrangle map (scale 1 inch = 2,000 feet) marked to show the location of rejected sites;			
21.p.	A detailed description and justification for the site selected, including a description of siting criteria and the process by which other possible sites were considered and eliminated including but not limited to, environmental effects, cost differential, coverages lost or gained, potential interference with other facilities, and signal loss due to topographical features compared to the proposed prime and alternate sites;			
21.q.	A statement describing hazards to human health, if any, with supporting data and references to regulatory standards;			
21.r.	A statement of the estimated costs for site acquisition and construction of a facility at the prime and alternative sites;			

**40.5 - COMMUNICATION STRUCTURES, BUILDINGS AND APPURTENANCES - Applicant**

Address: <u>344 Route 6</u> Applicant Name: <u>Katie Adams c/o Crown Castle</u> Date: <u>7/15/2022</u>				
No.	Requirement	Included	Not Included	Explanation, if needed
21.s.	A schedule showing the proposed program of site acquisition, construction, completion, operation and relocation or removal of the existing facilities for the prime and alternative sits;			
21.t.	A copy of any filing or application that the applicant has been required to make together with any decision with regard to such filing or application;			
21.u.	A landscape plan showing the proposed site and location before and after development, including topography screening proposed to protect abutters;			
21.v.	Plans which show location and siting at a prime and at an alternate site; and			
21.w.	A technical report which demonstrates that the maximum height of the installation is the minimum feasible to provide the intended service.			
22	All written information submitted in accordance with the requirements listed in any previous section of this bylaw shall be certified by an appropriate licensed professional.			
23	The Planning Board may also refer applications to the Board of Health, the Zoning Board of Appeals, and the Conservation Commission for review.			
24	The Planning Board shall not approve any application that does not comply with all the requirements of this bylaw. The Board does, however, have the right to waive any part of this bylaw, when in its opinion, such a waiver would not be detrimental to the public interest, cause the Town any expense, or be inconsistent with the intent and purpose of this bylaw.			
25	Any permit issued by the Planning Board for a communications facility shall be valid for the applicant only; it may not be reassigned, leased or sold.			
26	Municipal and private, non-commercial uses are exempted from this bylaw.			
27	The Planning Board shall act in accordance with the standards and requirements set forth herein and in accordance with the Massachusetts General Laws.			
28	The invalidity of any section of this bylaw shall not invalidate any other section.			



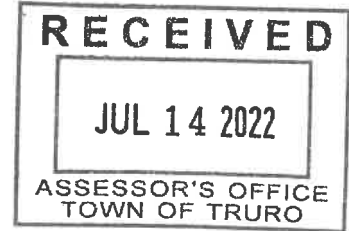


# TOWN OF TRURO

## Assessors Office

### Certified Abutters List

### Request Form



DATE: 7/14/2022

NAME OF APPLICANT: DISH Wireless

NAME OF AGENT (if any): Katie Adams, on behalf of Crown Castle

MAILING ADDRESS: 100 Apollo Drive Suite 303 Chelmsford MA 01824

CONTACT: HOME/CELL 781-392-7547 EMAIL kadams@nbcllc.com

PROPERTY LOCATION: 344 Route 6  
(street address)

PROPERTY IDENTIFICATION NUMBER: MAP 39 PARCEL 172 EXT. A  
(if condominium)

ABUTTERS LIST NEEDED FOR: **FEE: \$15.00 per checked item**  
(please check all applicable) (Fee must accompany the application unless other arrangements are made)

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Board of Health <sup>5</sup>         | <input type="checkbox"/> Planning Board (PB)                        | <input type="checkbox"/> Zoning Board of Appeals (ZBA) |
| <input type="checkbox"/> Cape Cod Commission                  | <input checked="" type="checkbox"/> Special Permit <sup>1</sup>     | <input type="checkbox"/> Special Permit <sup>1</sup>   |
| <input type="checkbox"/> Conservation Commission <sup>4</sup> | <input type="checkbox"/> Site Plan <sup>2</sup>                     | <input type="checkbox"/> Variance <sup>1</sup>         |
| <input type="checkbox"/> Licensing                            | <input type="checkbox"/> Preliminary Subdivision <sup>3</sup>       |  |
| Type: _____   | <input type="checkbox"/> Definitive Subdivision <sup>3</sup>        |  |
|   | <input type="checkbox"/> Accessory Dwelling Unit (ADU) <sup>2</sup> |  |
| <input type="checkbox"/> Other _____                          | (Fee: Inquire with Assessors)                                       |  |
- (Please Specify)

**Note: Per M.G.L., processing may take up to 10 calendar days. Please plan accordingly.**

#### THIS SECTION FOR ASSESSORS OFFICE USE ONLY

Date request received by Assessors: 7/14/2022 Date completed: 7/14/2022  
 List completed by: [Signature] Date paid: 7/14/2022 Cash/Check online CC

<sup>1</sup>Abutters, owners of land directly opposite on any public or private street or way, and abutters to the abutters within 300 feet of the property line.  
<sup>2</sup>Abutters to the subject property, abutters to the abutters, and owners of properties across the street from the subject property.  
<sup>3</sup>Landowners immediately bordering the proposed subdivision, landowners immediately bordering the immediate abutters, and landowners located across the streets and ways bordering the proposed subdivision. **Note:** For Definitive Subdivision only, responsibility of applicant to notify abutters and produce evidence as required.  
<sup>4</sup>All abutters within 300 feet of parcel, except Beach Point between Knowles Heights Road and Provincetown border, in which case it is all abutters within 100 feet. **Note:** Responsibility of applicant to notify abutters and produce evidence as required.  
<sup>5</sup>Abutters sharing any boundary or corner in any direction – including land across a street, river or stream. **Note:** Responsibility of applicant to notify abutters and produce evidence as required.



**TRURO ASSESSORS OFFICE**  
PO Box 2012 Truro, MA 02666  
Telephone: (508) 214-0921  
Fax: (508) 349-5506

**Date:** July 14, 2022

**To:** Katie Adams on behalf of Crown Castle, Agent for DISH Wireless

**From:** Assessors Department

**Certified Abutters List:** 344 Route 6 (Map 39, Parcel 172)

**Planning Board/Special Permit**

Attached is a combined list of abutters for the property located at 344Route 6.

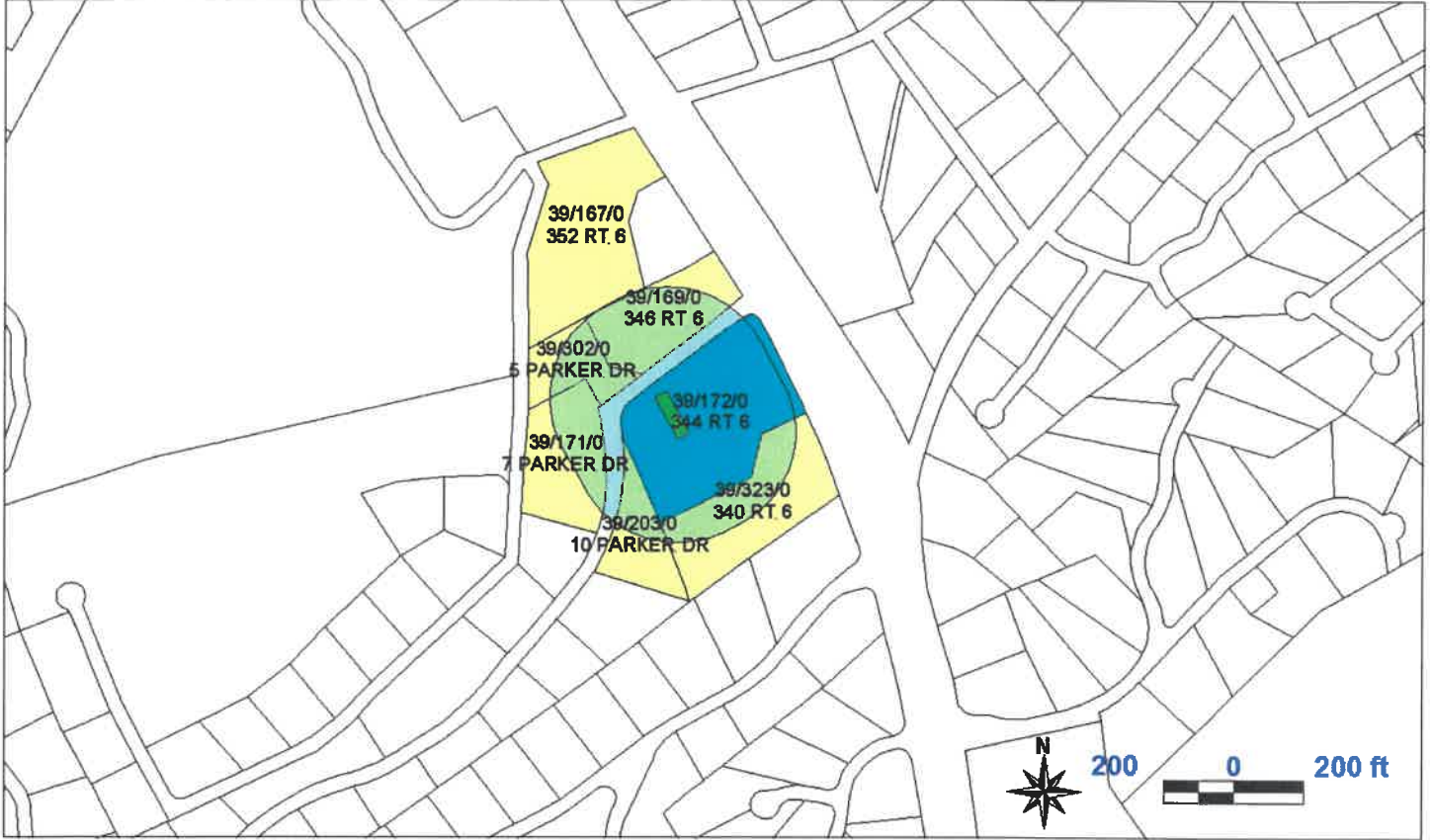
The current owner is Town of Truro.

The names and addresses of the abutters are as of July 8, 2022 according to the most recent documents received from the Barnstable County Registry of Deeds.

Certified by: \_\_\_\_\_

Olga Farrell  
Assessing Clerk

Abutters List Within 300 feet of Parcel 39/172/A



Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
1291	39-167-0-R	TRI-S PROPERTIES LLC	352 RT 6	PO BOX 1081	TRURO	MA	02666-1081
1293	39-169-0-R	SEAMENS BANK	346 RT 6	PO BOX 74	NO TRURO	MA	02652
1294	39-171-0-R	WESTVIEW COURT REALTY TRUST C/O TRIBUNA JR MICHAEL A	7 PARKER DR	192 MILTON ST	QUINCY	MA	02170
1295	39-172-0-E	TOWN OF TRURO	344 RT 6	PO BOX 2030	TRURO	MA	02666-2030
1296	39-172-A-R	SOUTHWESTERN BELL MOBILE SYSTE D/B/A CINGULAR WRLS-AT&T SVCS	344 RT 6	ATTN: TOWER PROPERTY TAX TEAM 754 PEACHTREE ST, 16TH FLR	ATLANTA	GA	30308
1324	39-203-0-R	COHEN JENNIFER S	10 PARKER DR	110 W 96TH ST #11A	NEW YORK	NY	10025
1421	39-302-0-R	PRIDEAUX-BRUNE DIANA & MAHONEY ANNE	5 PARKER DR	10 MUSEUM WAY, UNIT 1929	CAMBRIDGE	MA	02141
6429	39-323-0-E	TOWN OF TRURO	340 RT 6	PO BOX 2030	TRURO	MA	02666-2030

*WJH/KP/2022*

39-167-0-R

TRI-S PROPERTIES LLC  
PO BOX 1081  
TRURO, MA 02666-1081

39-169-0-R

SEAMENS BANK  
PO BOX 74  
NO TRURO, MA 02652

39-171-0-R

WESTVIEW COURT REALTY TRUST  
C/O TRIBUNA JR MICHAEL A  
192 MILTON ST  
QUINCY, MA 02170

39-172-0-E

TOWN OF TRURO  
PO BOX 2030  
TRURO, MA 02666-2030

39-172-A-R

SOUTHWESTERN BELL MOBILE SYSTE  
D/B/A CINGULAR WRLS-AT&T SVCS  
ATTN: TOWER PROPERTY TAX TEAM  
754 PEACHTREE ST, 16TH FLR  
ATLANTA, GA 30308

39-203-0-R

COHEN JENNIFER S  
110 W 96TH ST #11A  
NEW YORK, NY 10025

39-302-0-R

PRIDEAUX-BRUNE DIANA &  
MAHONEY ANNE  
10 MUSEUM WAY, UNIT 1929  
CAMBRIDGE, MA 02141

39-323-0-E

TOWN OF TRURO  
PO BOX 2030  
TRURO, MA 02666-2030

Date: 7/17/2021



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

**Subject:** Structural Evaluation

**Carrier Designation:** DISH Network Co-Locate  
**Site Number:** BOBOS00592A  
**Site Name:** MA-CCI-T-841273

**Crown Castle Designation:** **BU Number:** 841273  
**Site Name:** TRURO  
**JDE Job Number:** 644620  
**WO Number:** 1968406  
**Order Number:** 552716 Rev. 0

**Site Data:** 344 Route 6, North Truro, Barnstable County, MA  
**Latitude:** 42° 1' 18" **Longitude:** -70° 4' 30"  
**170 Foot – Self Support Tower**

Crown Castle is pleased to submit this “**Structural Evaluation**” to determine the structural integrity of the above-mentioned tower. The purpose of this evaluation is to determine the suitability of the tower structure to support the proposed equipment configuration listed in Table 1.

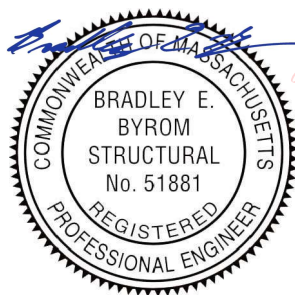
Based on a comparison of loading listed in the previous analysis dated 3/27/2019, the proposed loading change will not have a significant impact on the overall tower stress rating. Therefore, the final proposed equipment configuration listed in Table 1 is structurally **ACCEPTABLE**.

**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)
122	122	1	RAYCAP	RDIDC-9181-PF-48	1	1-1/2
		3	FUJITSU	TA08025-B604		
		3	FUJITSU	TA08025-B605		
		3	JMA WIRELESS	MX08FRO665-21		
		3	MOUNTS	Commscope MTC3975083		

Respectfully submitted by:

Bradley E. Byrom, P.E., S.E.  
Senior Project Engineer



Digitally signed by Bradley E Byrom  
Date: 2021.07.17 10:29:52 -04'00'



## Nationwide Programmatic Agreement Co-location Criteria Verification Form

Site Name: TRURO  
Business Unit Number: 841273 App ID: 552716  
Site Address: 344 ROUTE 6 NORTH TRURO, MA 02652  
Carrier Name: DISH Wireless L.L.C.  
Customer Site ID: BOBOS00592A

Tower was built on or before 3/16/01? YES  NO

### Criteria for Programmatic Agreement Eligibility for Towers Built on or before March 16, 2001

- YES  NO  The mounting of the antenna will result in a substantial increase in the size of the tower<sup>1</sup>.
- YES  NO  The tower has been found by the FCC to have an adverse or potentially adverse effect that has not been resolved through an MOA or other mechanism.
- YES  NO  The tower is the subject of a pending environmental review or proceeding before the FCC involving compliance with Section 106 of the NHPA.
- YES  NO  The tower owner has received written or electronic notice from the FCC that the FCC is in receipt of a complaint from a member of the public, a SHPO or the Council that the co-location has an adverse effect on one or more historic properties.

### Criteria for Programmatic Agreement Eligibility for Towers Built after March 16, 2001

- YES  NO  No Section 106 review (SHPO review) or any associated environmental (NEPA) review required by the FCC has been completed for this tower.
- YES  NO  The mounting of the antenna will result in a substantial increase in the size of the tower.<sup>1</sup>
- YES  NO  The tower is the subject of a pending environmental review or proceeding before the FCC involving compliance with Section 106 of the NHPA.
- YES  NO  The tower owner has received written or electronic notice from the FCC that the FCC is in receipt of a complaint from a member of the public, a SHPO or the Council that the co-location has an adverse effect on one or more historic properties.

If any of the above answers are "YES," consultation with the SHPO is required prior to placement of the antenna on the tower.

Approved By: *Christopher Page*

11/11/2021

A COPY OF THIS COMPLETED FORM MUST BE PROVIDED TO THE CARRIER AND TO THE CROWN CASTLE REGULATORY DEPARTMENT.

<sup>1</sup> Substantial increase in size of the tower" means: 1) an increase in the tower height of more than 10% or by the height of one antenna array with a separation distance from the nearest existing array not to exceed 20 feet, whichever is greater; 2) the installation of more than 4 new equipment cabinets or more than 1 new equipment building; 3) the addition of an appurtenance that would protrude from the edge of the tower more than 20 feet or more than the width of the tower at the level of the appurtenance, whichever is greater; or 4) the mounting of the antenna would involve excavation more than 30' in any direction outside the current boundaries of the site and any access or utility easements currently related to the site.





DISH Wireless L.L.C. SITE ID:  
**BOBOS00592A**

DISH Wireless L.L.C. SITE ADDRESS:  
**344 ROUTE 6  
NORTH TRURO, MA 02652**

### SCOPE OF WORK

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

- TOWER SCOPE OF WORK:**
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
  - INSTALL (3) PROPOSED SECTOR FRAMES
  - INSTALL PROPOSED JUMPERS
  - INSTALL (6) PROPOSED RRUs (2 PER SECTOR)
  - INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
  - INSTALL (1) PROPOSED HYBRID CABLE

- 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 NEW 200A METER IN EXISTING SOCKET

### SITE INFORMATION

PROPERTY OWNER: TOWN OF TRURO, MA  
 PROPERTY OWNER ADDRESS: 24 TOWN HALL ROAD TRURO, MA 02666  
 TOWER TYPE: SELF SUPPORT  
 TOWER CO SITE ID: 841273  
 TOWER APP NUMBER: 552716  
 COUNTY: BARNSTABLE  
 LATITUDE (NAD 83): 42° 1' 18.00" N 42.02166667  
 LONGITUDE (NAD 83): 70° 4' 30.00 W -70.07500000  
 ZONING JURISDICTION: TOWN OF TRURO, MA  
 ZONING DISTRICT: R (RESIDENTIAL)  
 PARCEL NUMBER: 039-000-172-00  
 OCCUPANCY GROUP: U  
 CONSTRUCTION TYPE: II-B  
 POWER COMPANY: EVERSOURCE  
 TELEPHONE COMPANY: CROWN CASTLE

### PROJECT DIRECTORY

APPLICANT: DISH Wireless L.L.C.  
 5701 SOUTH SANTA FE DRIVE  
 LITTLETON, CO 80120  
 TOWER OWNER: CROWN CASTLE  
 2000 CORPORATE DRIVE  
 CANONSBURG, PA 15317  
 (877) 486-9377  
 SITE DESIGNER: HUDSON DESIGN GROUP, LLC.  
 45 BEECHWOOD DRIVE  
 NORTH ANDOVER, MA 01845  
 (978) 557-5553  
 SITE ACQUISITION: COURTNEY PRESTON  
 courtney.preston.contractor  
 @crownncastle.com  
 CONSTRUCTION MANAGER: TIMOTHY HARDY  
 timothy.hardy@dish.com  
 RF ENGINEER: NAGESH NAYAK  
 nagesh.nayak@dish.com



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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



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DRAWN BY: PS CHECKED BY: SMA APPROVED BY: DPH

RFDS REV #: 0

### PRELIMINARY DOCUMENTS

SUBMITTALS		
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DISH Wireless L.L.C.  
PROJECT INFORMATION  
**BOBOS00592A**  
CROWN CASTLE BU#841273  
344 ROUTE 6  
NORTH TRURO, MA 02652

SHEET TITLE  
**TITLE SHEET**

SHEET NUMBER  
**T-1**

### MASSACHUSETTS CODE OF COMPLIANCE

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

CODE TYPE	CODE
BUILDING	MA STATE BUILDING CODE, 9TH EDITION (780 CMR)/2015 IBC W/ AMENDMENTS
MECHANICAL	MA STATE BUILDING CODE, 9TH EDITION (780 CMR)/2015 IMC W/ AMENDMENTS
ELECTRICAL	MA ELECTRICAL CODE/2020 NEC W/ AMENDMENTS

### SHEET INDEX

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

### SITE PHOTO



UNDERGROUND SERVICE ALERT - 811 DIG SAFE  
UTILITY NOTIFICATION CENTER OF MASSACHUSETTS  
(888) 344-7233  
WWW.DIGSAFE.COM



CALL 3 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

### GENERAL NOTES

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

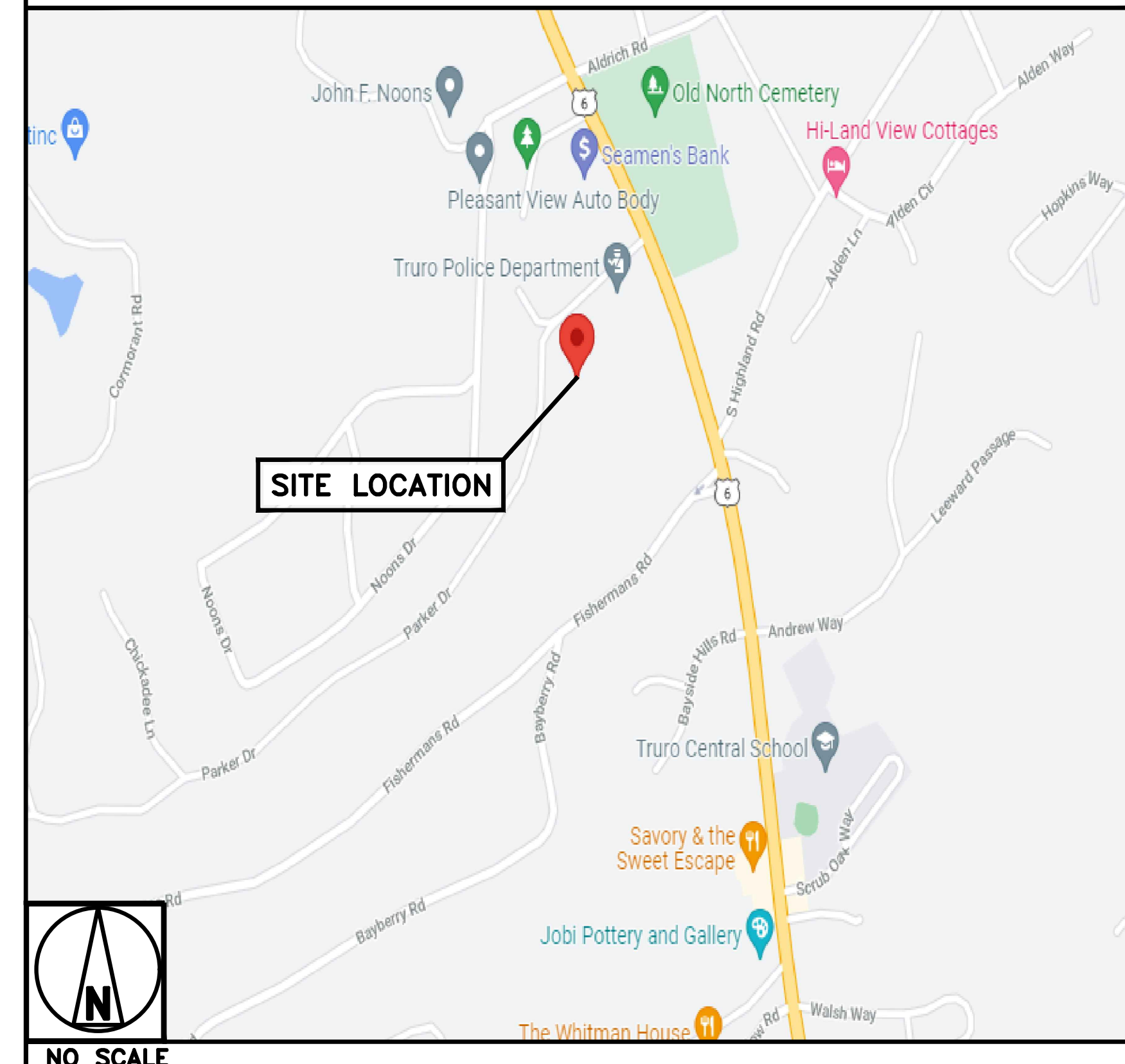
11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

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

### DIRECTIONS

**DIRECTIONS FROM BOSTON LOGAN INTERNATIONAL AIRPORT:**  
START OUT GOING EAST ON RACE POINT RD. TURN RIGHT TO STAY ON RACE POINT RD. TURN LEFT ONTO ROUTE 6/US-6 W. CONTINUE TO FOLLOW US-6 W. 344 ROUTE 6, NORTH TRURO, MA 02652, 344 ROUTE 6 IS ON THE RIGHT.

### VICINITY MAP





**NOTES**

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

**NOTES**

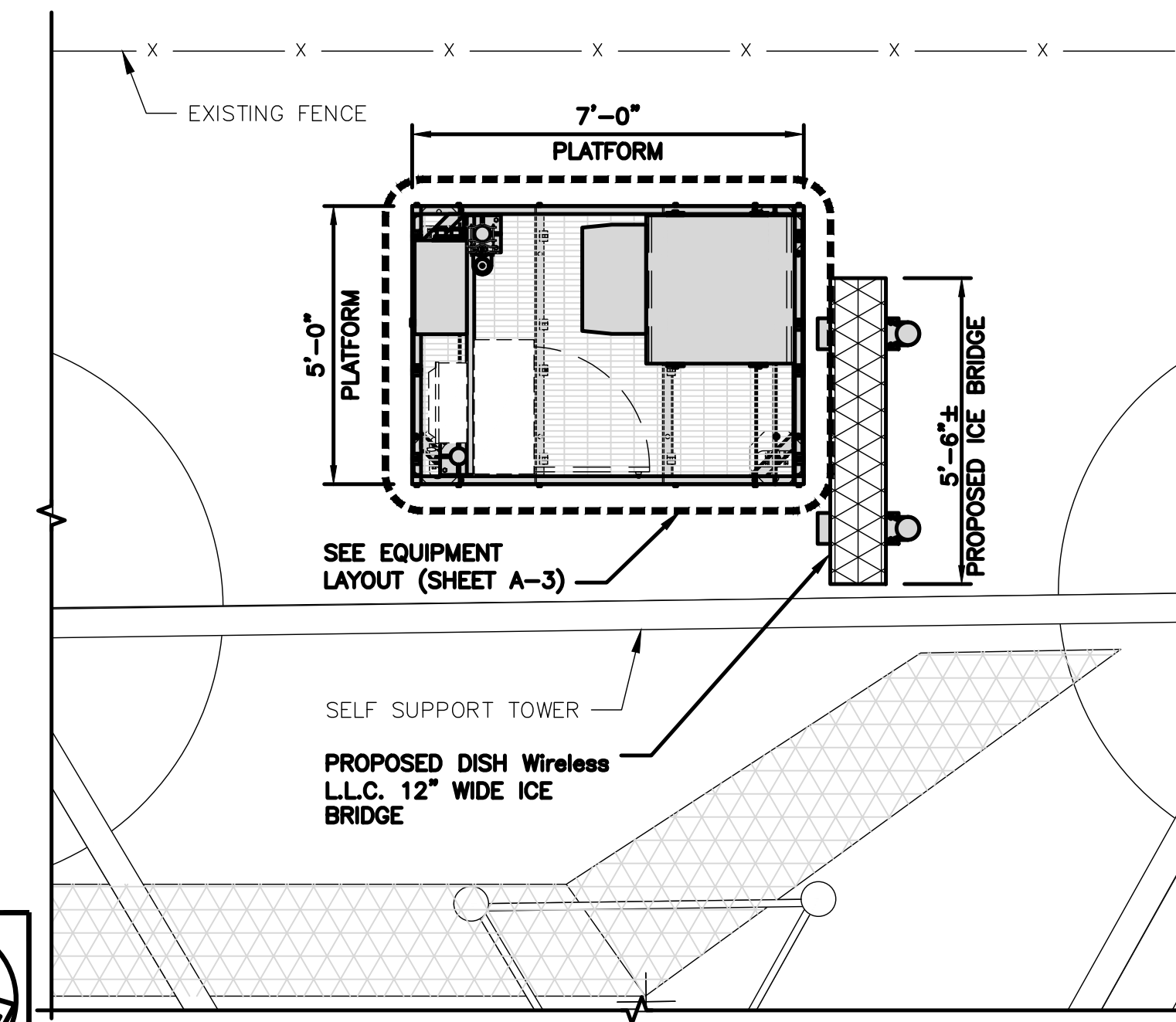
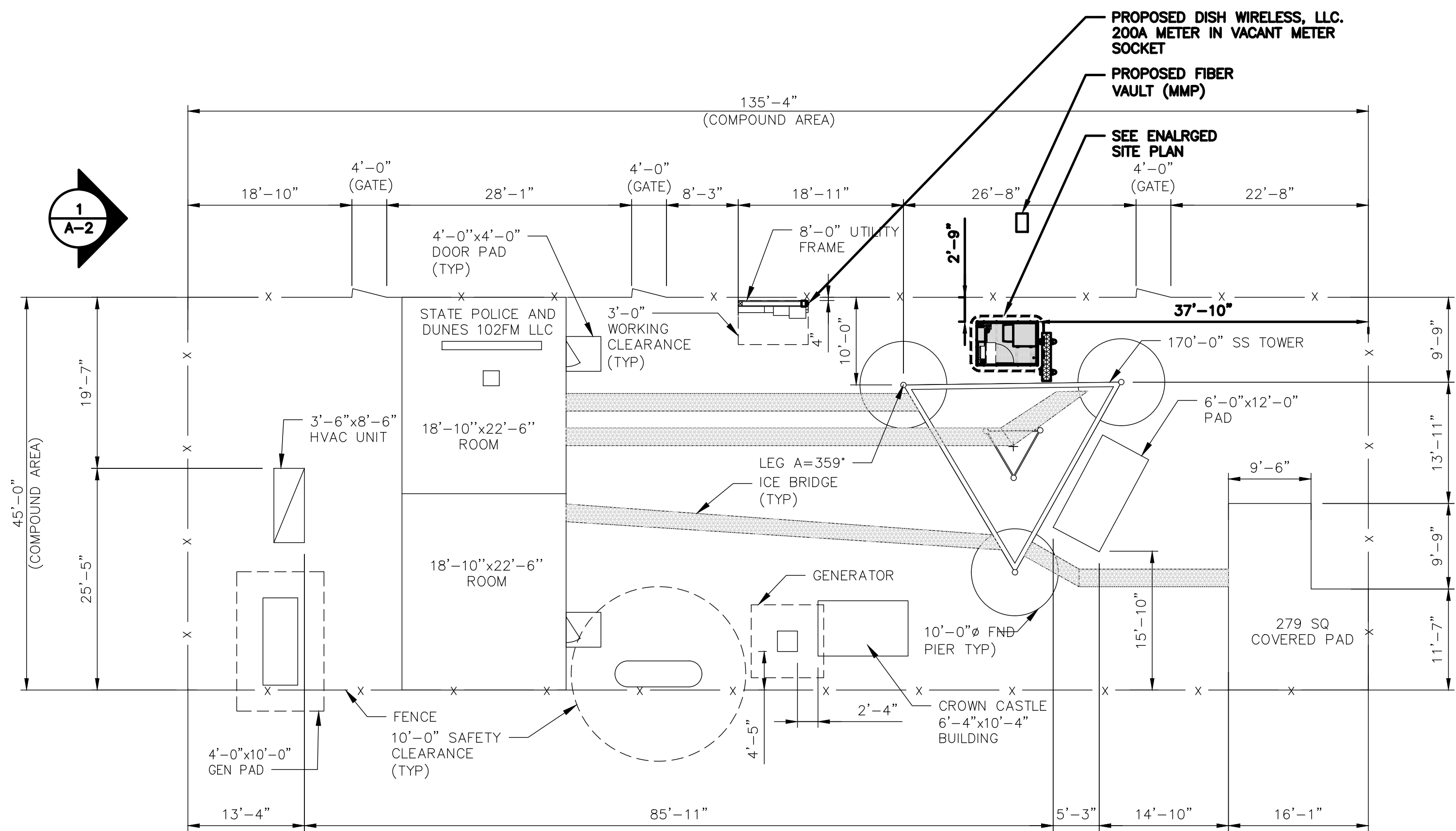
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



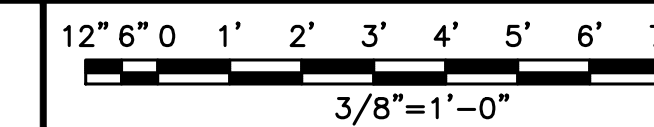
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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



**ENLARGED SITE PLAN**



2

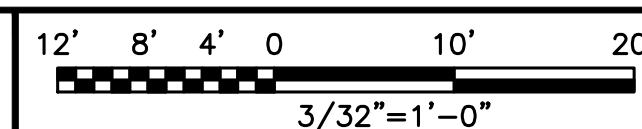


**OVERALL UTILITY ROUTE PLAN**

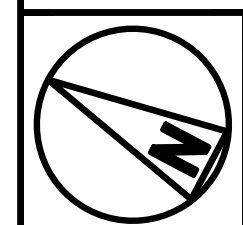
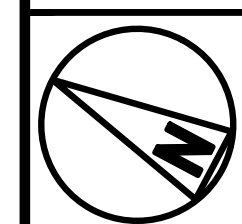
NO SCALE

3

**OVERALL SITE PLAN**



1



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DRAWN BY: PS CHECKED BY: SMA APPROVED BY: DPH

RFDS REV #: 0

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SUBMITTALS		
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A	11/15/2021	ISSUED FOR REVIEW
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BOBOS00592A

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBOS00592A  
CROWN CASTLE BU#841273  
344 ROUTE 6  
NORTH TRURO, MA 02652

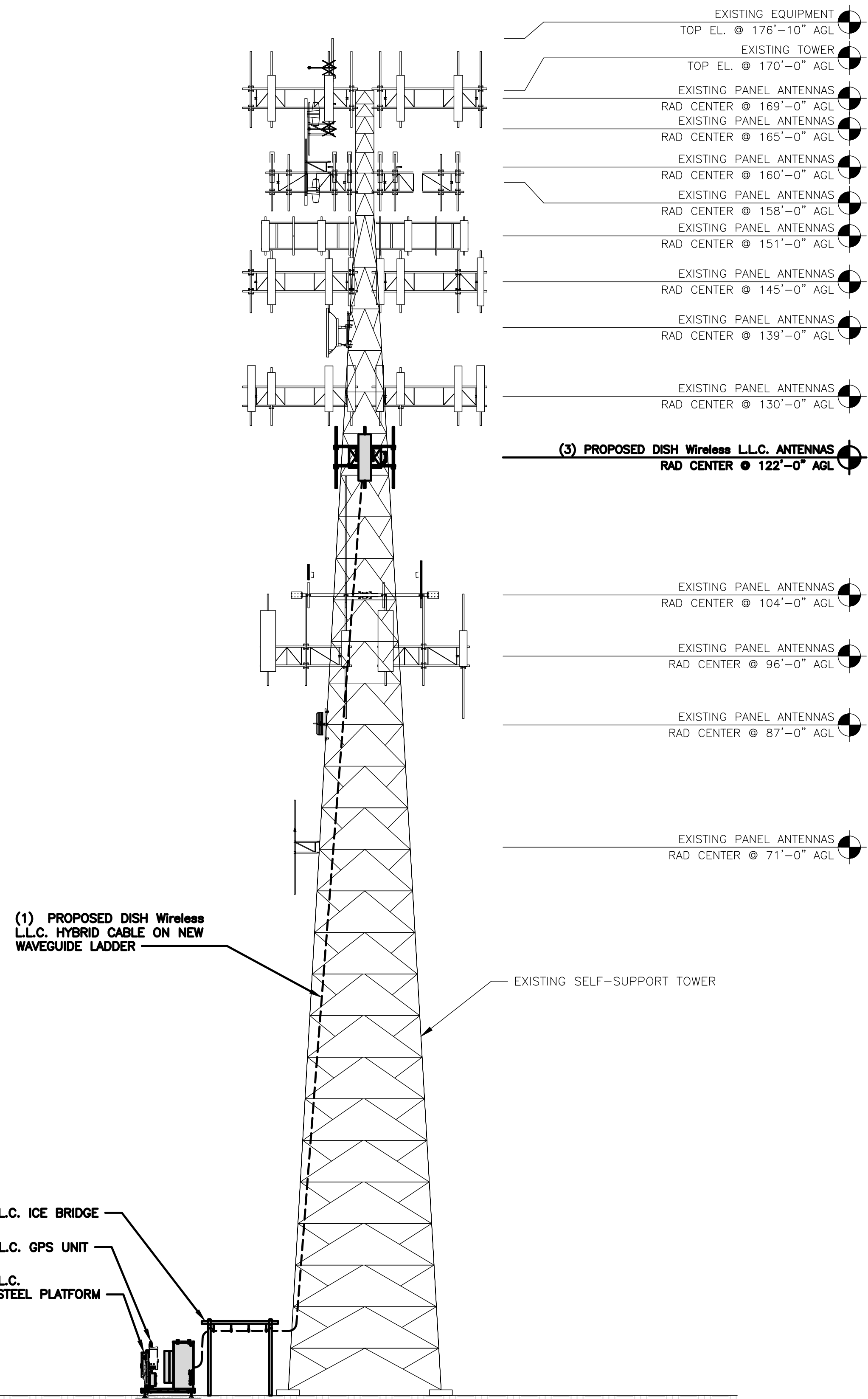
SHEET TITLE  
OVERALL AND ENLARGED SITE PLANS

SHEET NUMBER  
**A-1**

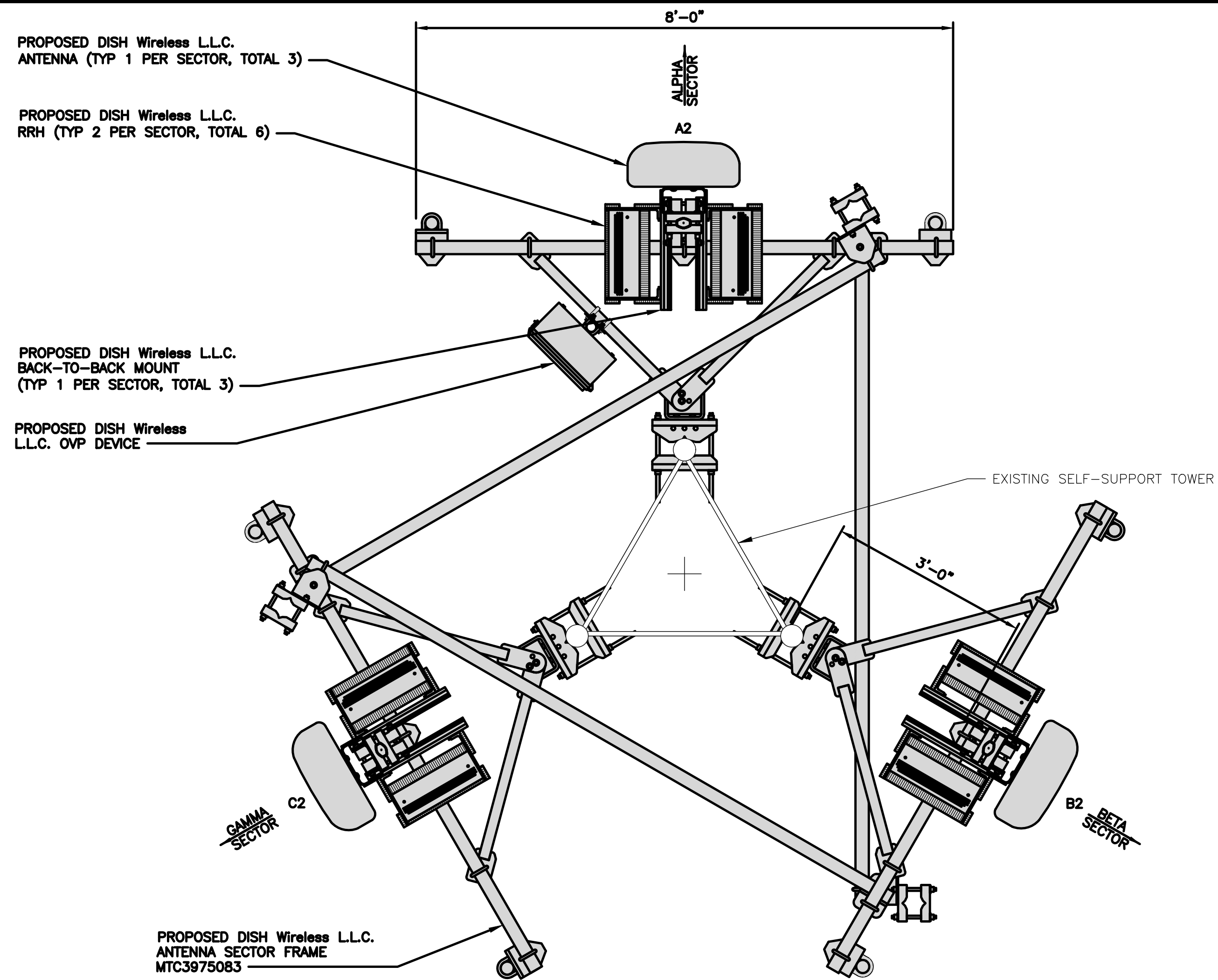
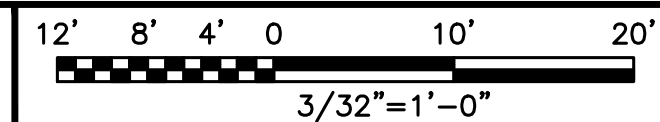


**NOTES**

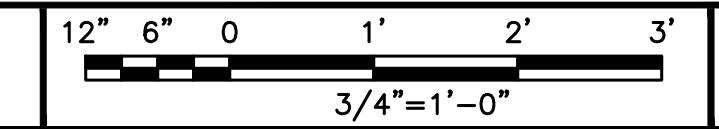
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



**PROPOSED ELEVATION**



**ANTENNA LAYOUT**



SECTOR POS.	ANTENNA					TRANSMISSION CABLE	RRH			OVP
	EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECH	AZIMUTH	RAD CENTER		FEED LINE TYPE AND LENGTH	MANUFACTURER - MODEL NUMBER	TECH	
A1	---	---	---	---	---	(1) HIGH-CAPACITY HYBRID CABLE (155' LONG)	FUJITSU / TA08025-B604	5G	A2	RAYCAP / RDIC-9181-PF-48
A2	PROPOSED	COMMSCOPE-FFW-65B-R2	5G	330°	122'-0"		FUJITSU / TA08025-B605	5G	A2	
A3	---	---	---	---	---		---	---	---	
B1	---	---	---	---	---	SHARED W/ALPHA	FUJITSU / TA08025-B604	5G	B2	SHARED W/ALPHA
B2	PROPOSED	COMMSCOPE-FFW-65B-R2	5G	80°	122'-0"		FUJITSU / TA08025-B605	5G	B2	
B3	---	---	---	---	---		---	---	---	
C1	---	---	---	---	---	SHARED W/ALPHA	FUJITSU / TA08025-B604	5G	C2	SHARED W/ALPHA
C2	PROPOSED	COMMSCOPE-FFW-65B-R2	5G	180°	122'-0"		FUJITSU / TA08025-B605	5G	C2	
C3	---	---	---	---	---		---	---	---	

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

**ANTENNA SCHEDULE**

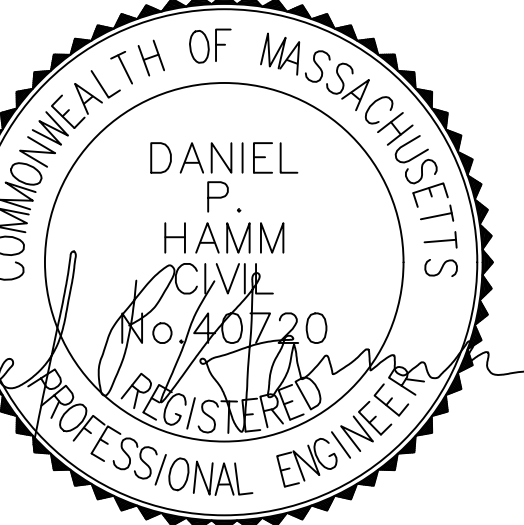
NO SCALE 3



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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



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DISH Wireless L.L.C. PROJECT INFORMATION  
BOBOS00592A  
CROWN CASTLE BU#841273  
344 ROUTE 6  
NORTH TRURO, MA 02652

SHEET TITLE  
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER  
**A-2**



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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



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A&E PROJECT NUMBER  
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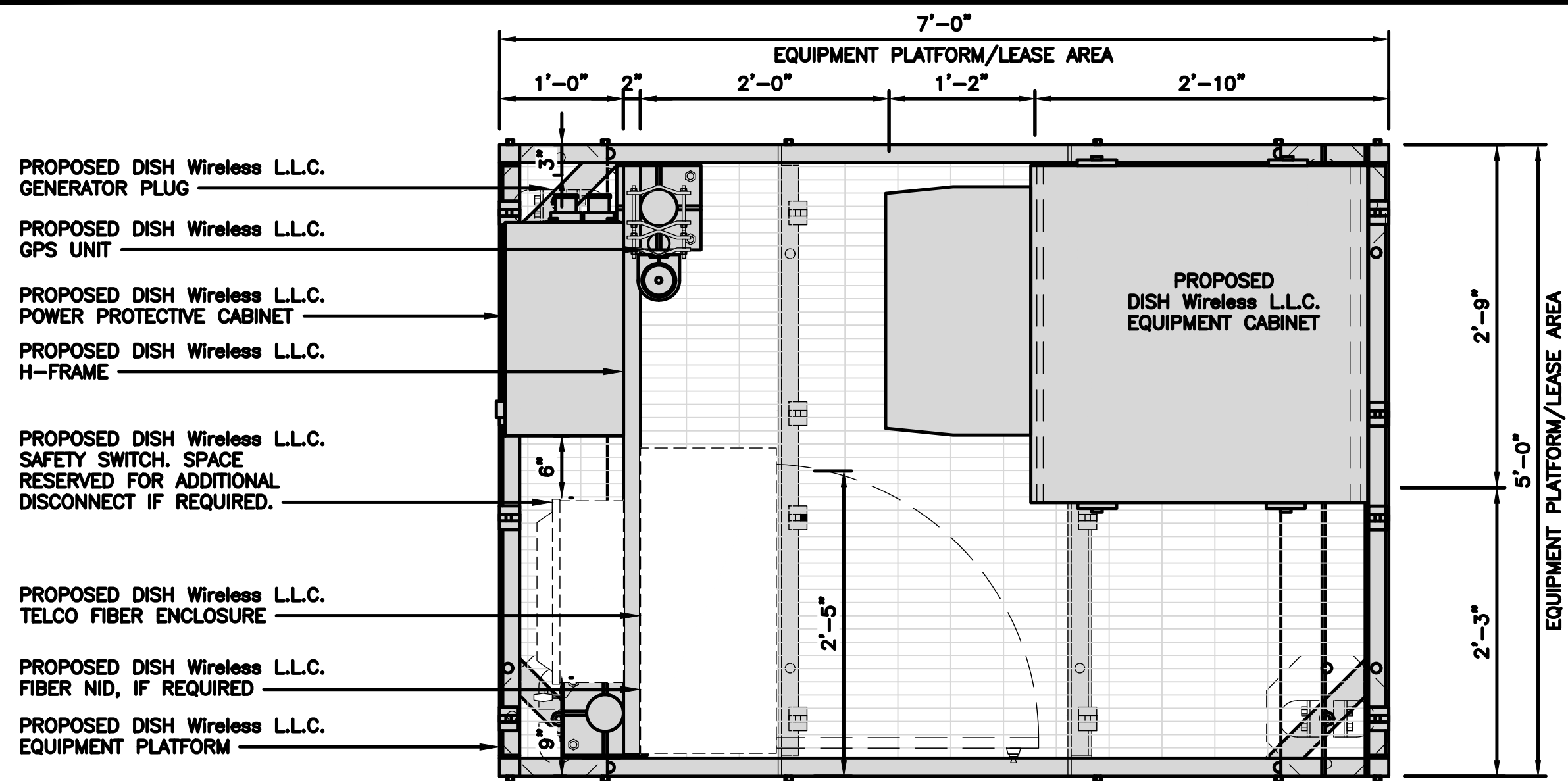
DISH Wireless L.L.C. PROJECT INFORMATION  
BOBOS00592A  
CROWN CASTLE BU#841273  
344 ROUTE 6  
NORTH TRURO, MA 02652

SHEET TITLE  
EQUIPMENT PLATFORM AND H-FRAME DETAILS

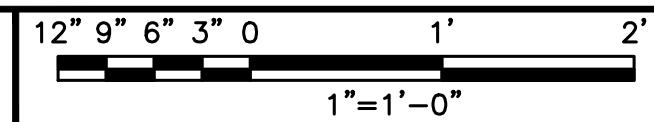
SHEET NUMBER  
**A-3**

**NOTES**

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



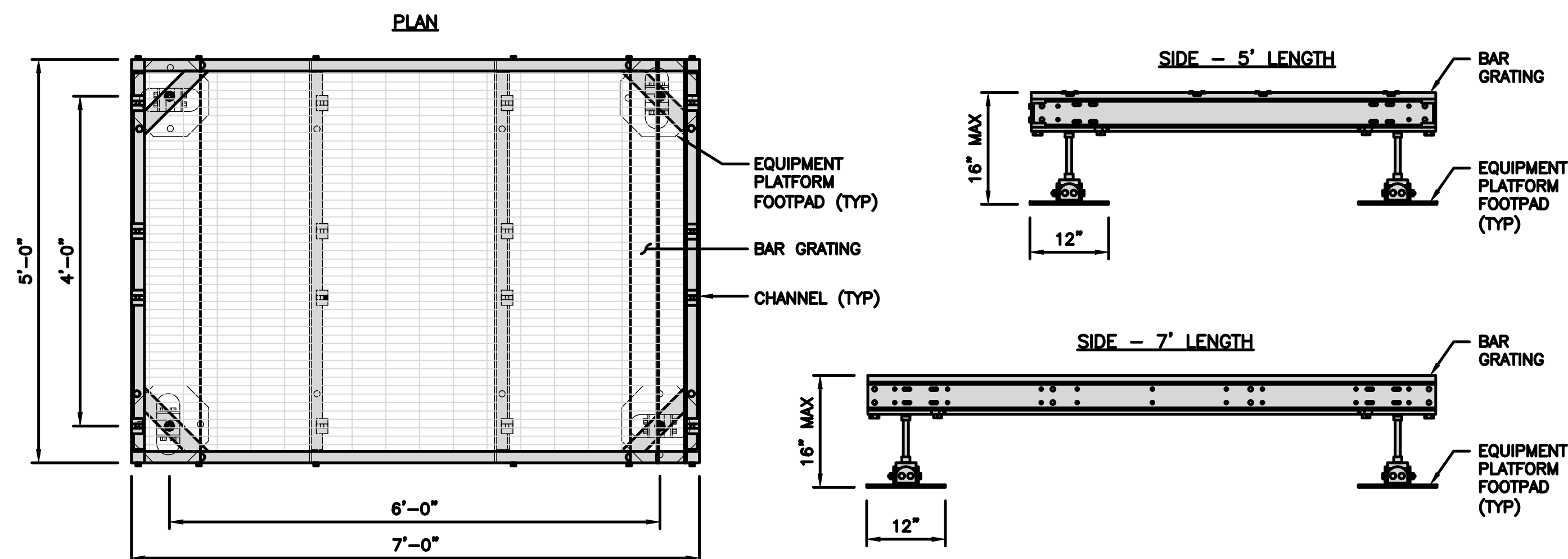
PLATFORM EQUIPMENT PLAN



1

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

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

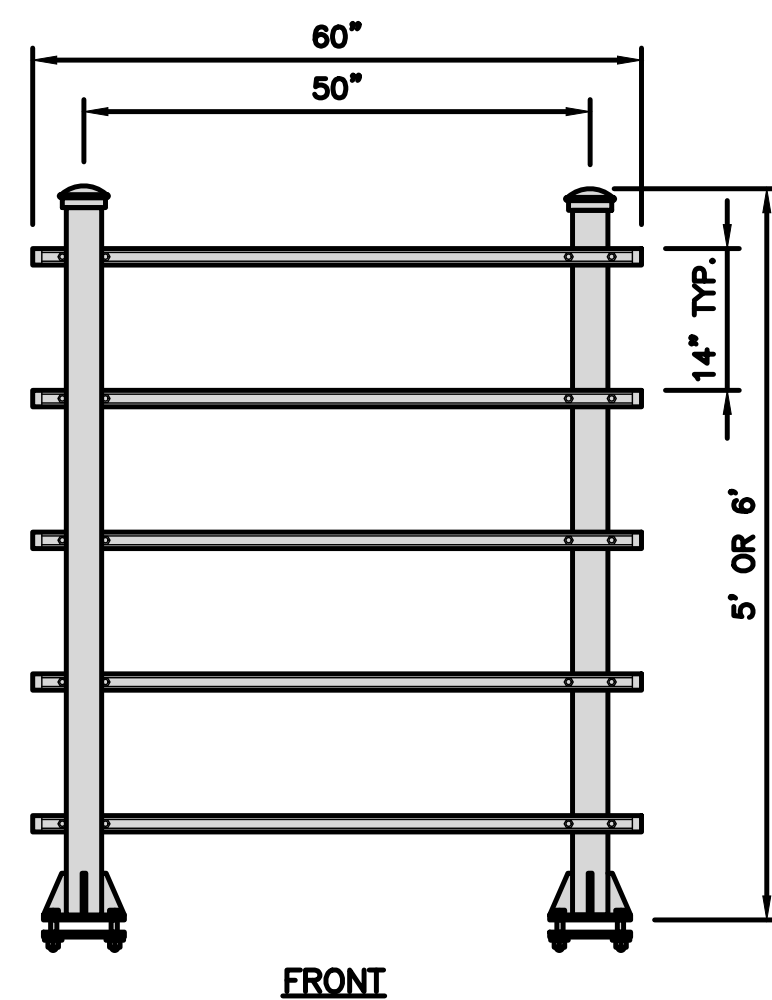
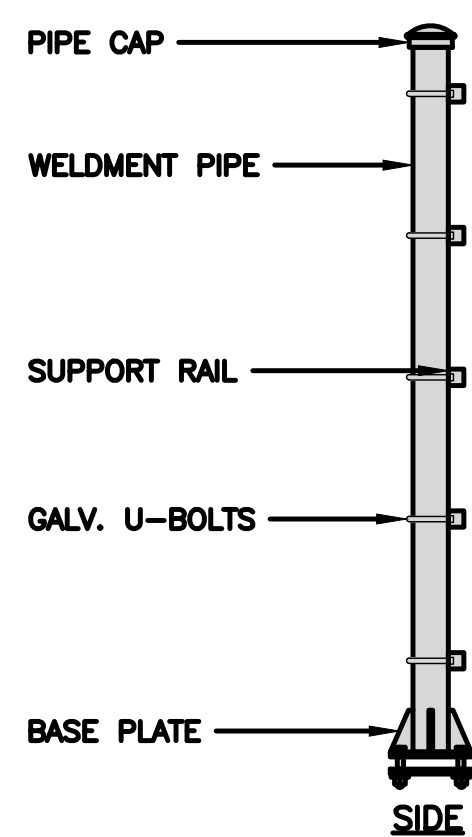


PLATFORM DETAIL

NO SCALE 2

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

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

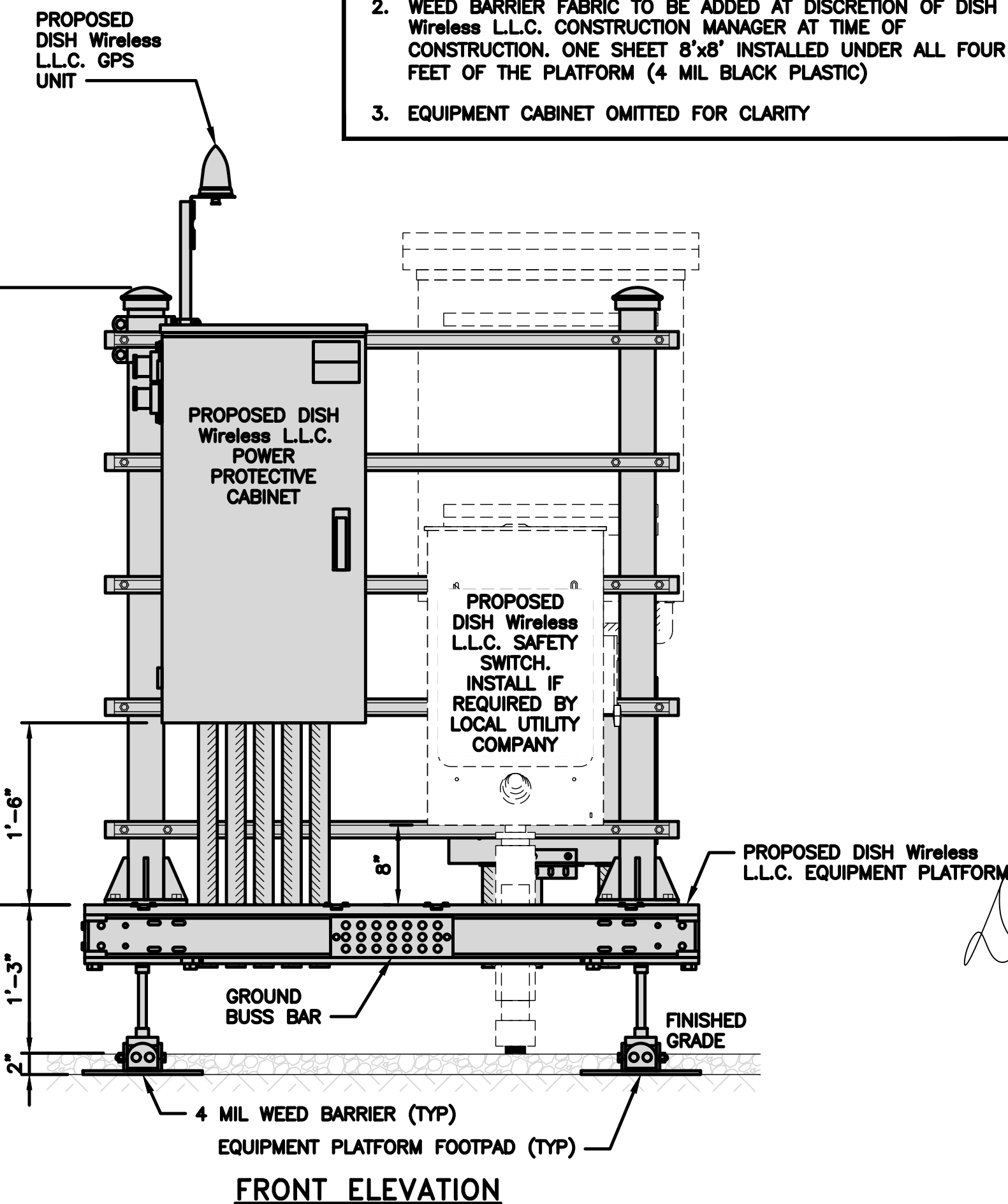


H-FRAME DETAIL

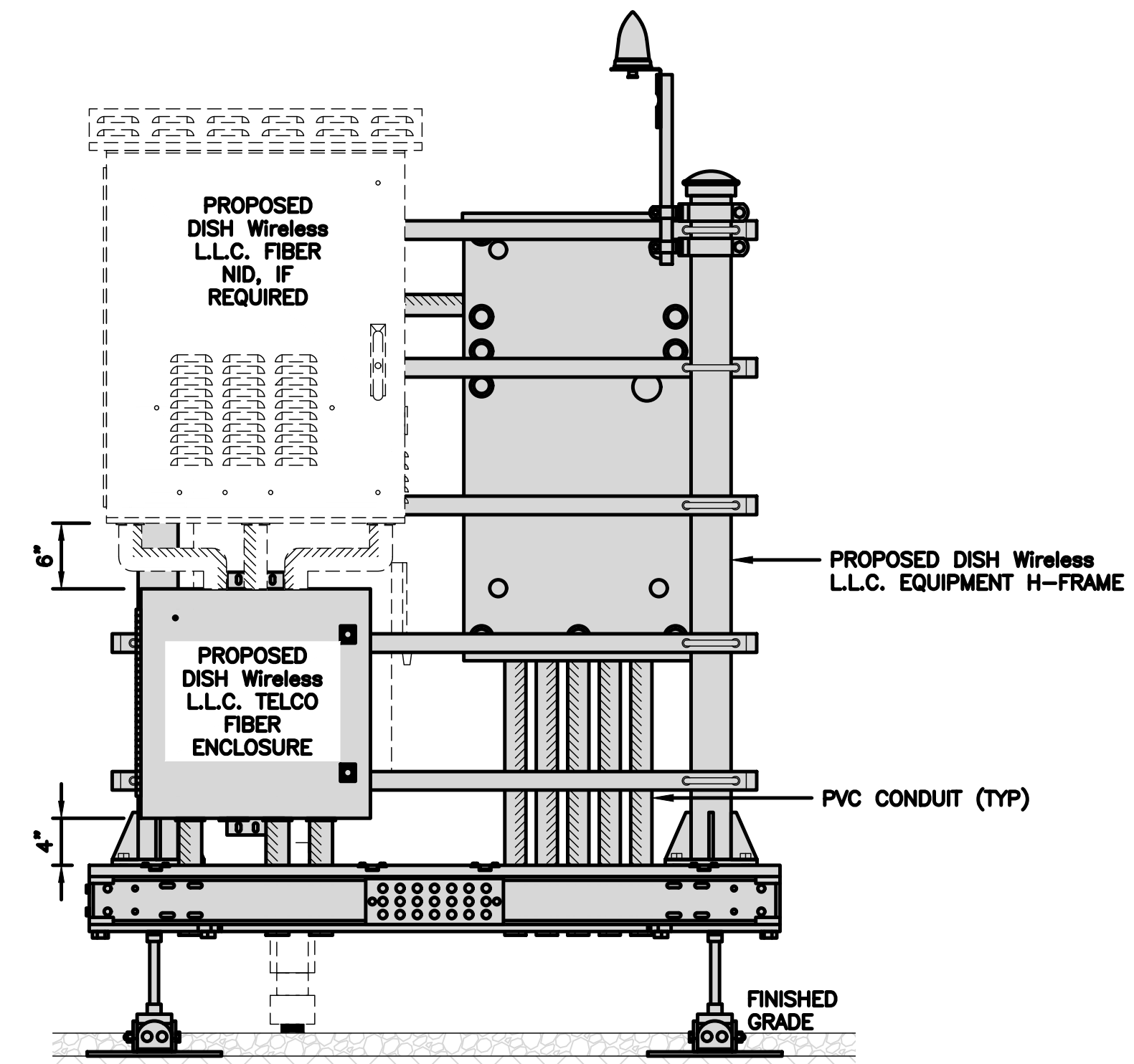
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NOT USED

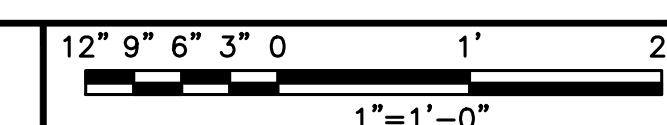
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FRONT ELEVATION

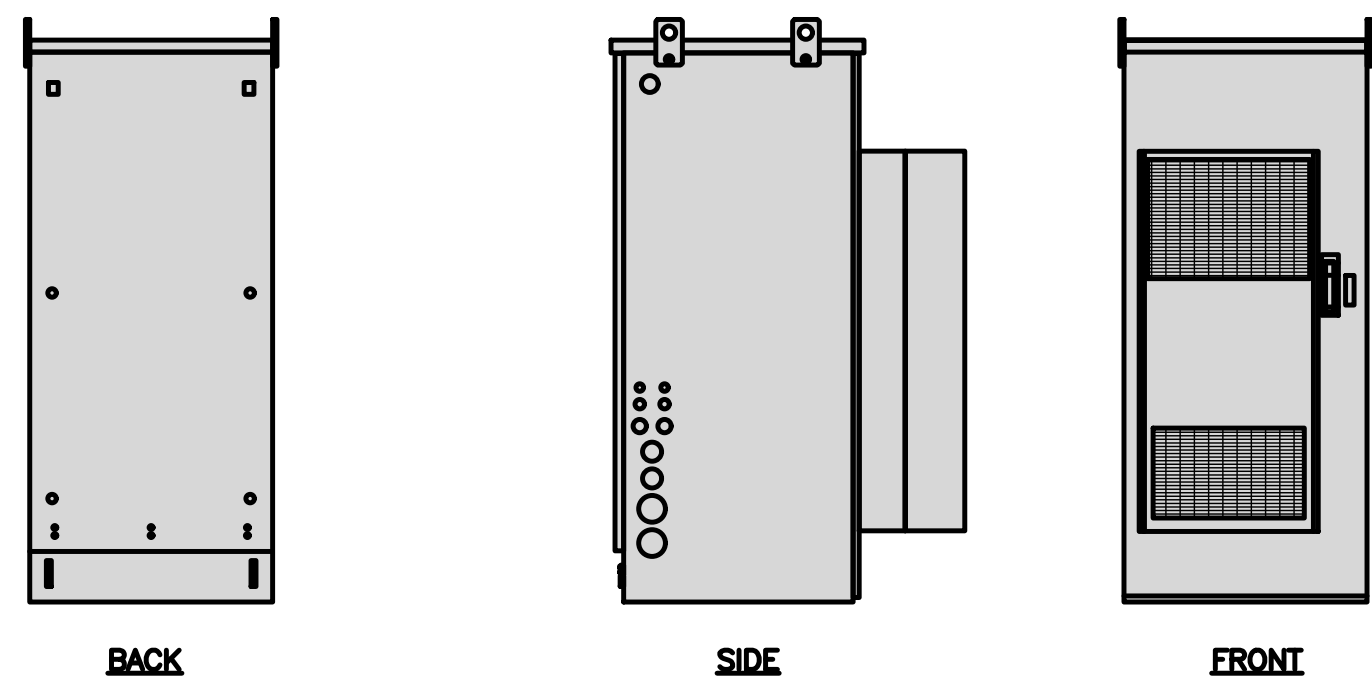
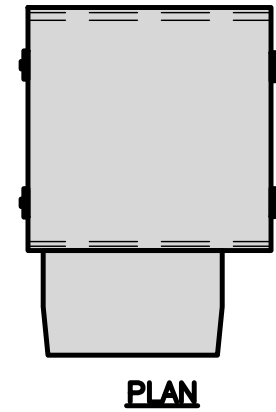


BACK ELEVATION



5

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

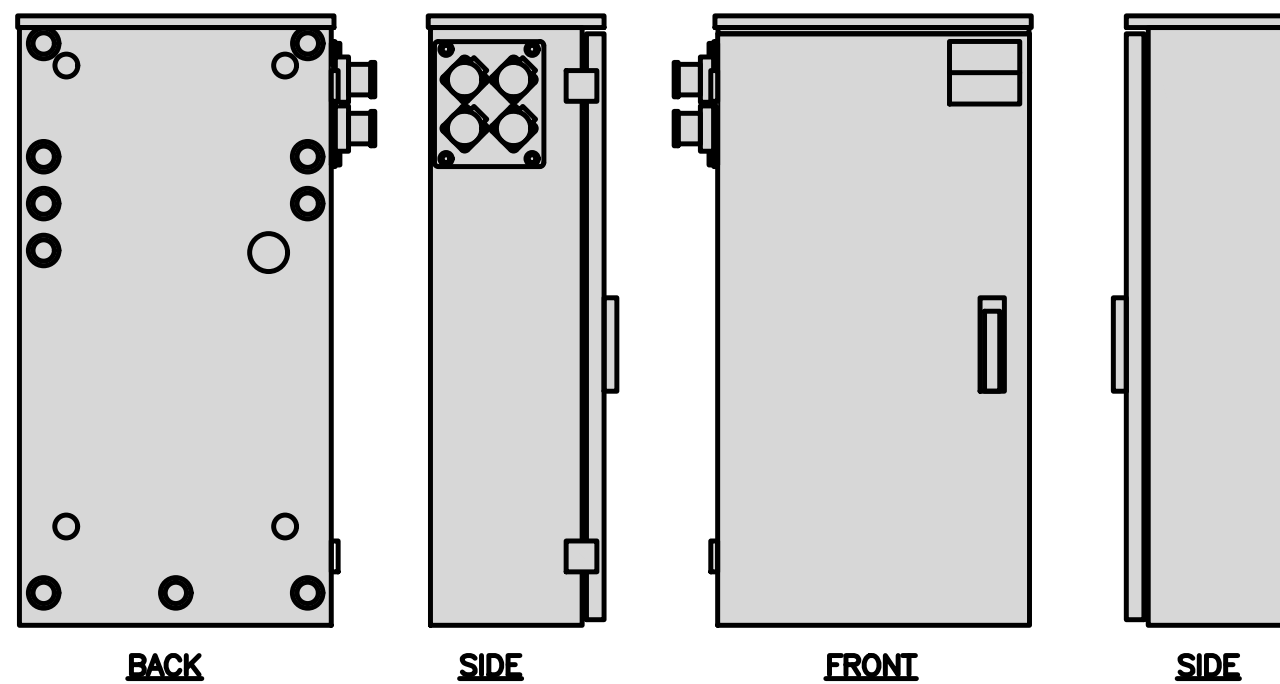
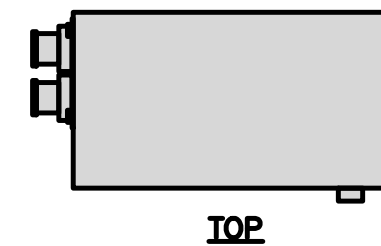


CABINET DETAIL

NO SCALE

1

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

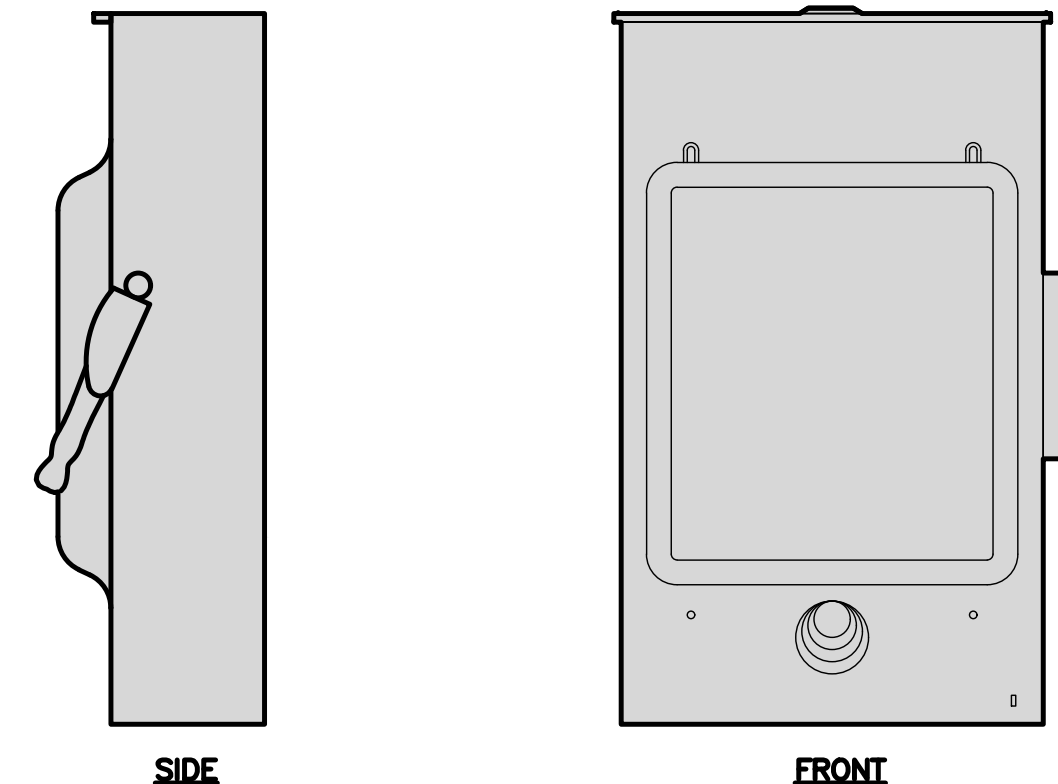
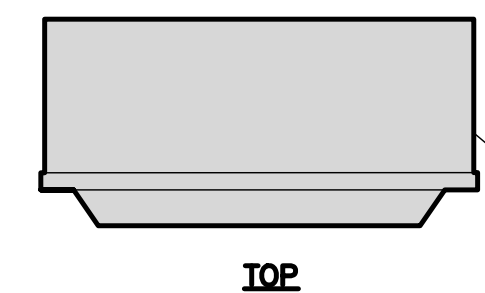


POWER PROTECTION CABINET (PPC) DETAIL

NO SCALE

2

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

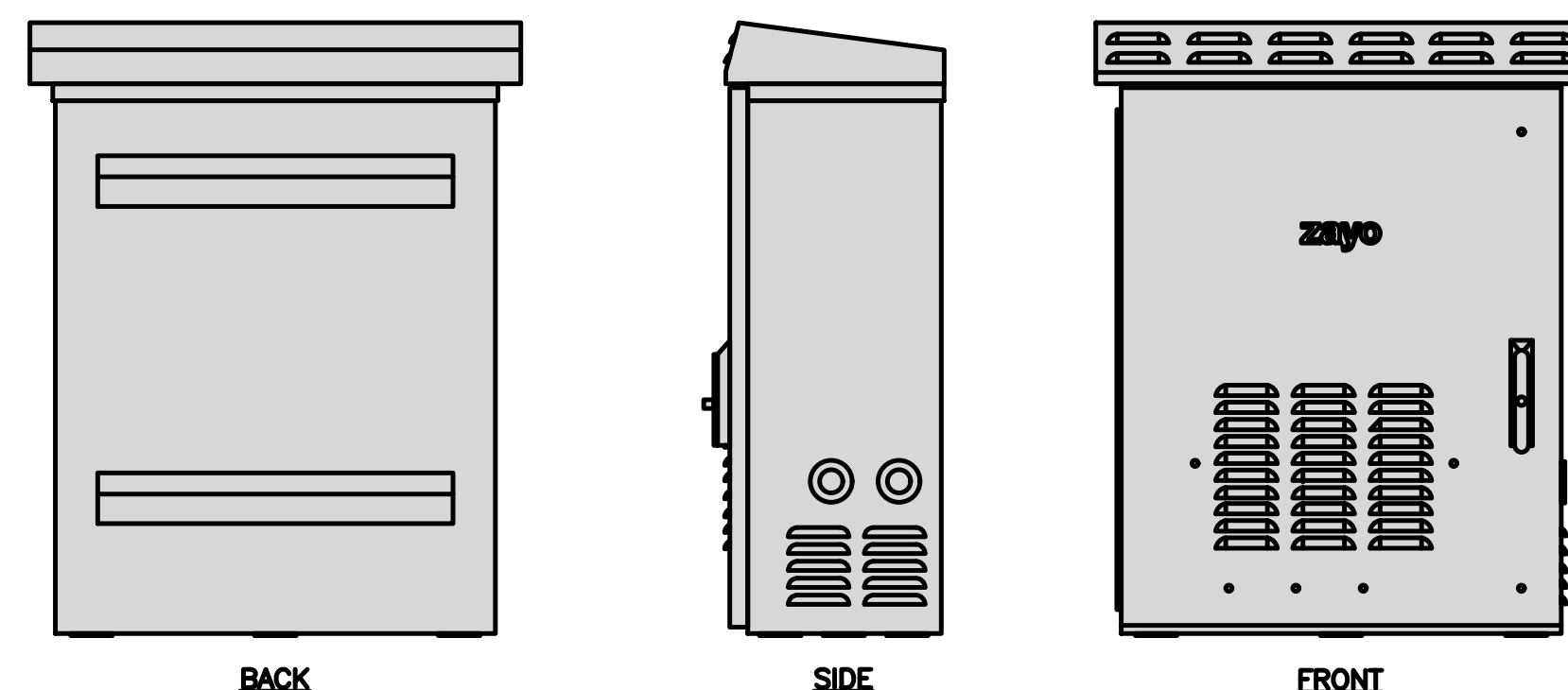
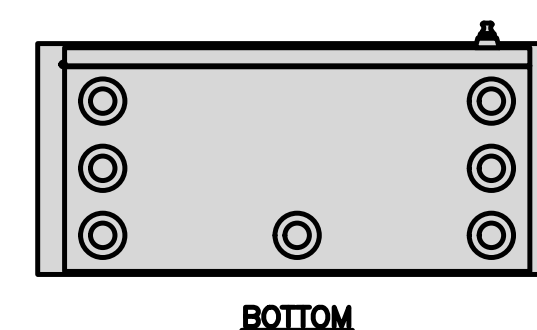


SAFETY SWITCH DETAIL

NO SCALE

3

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

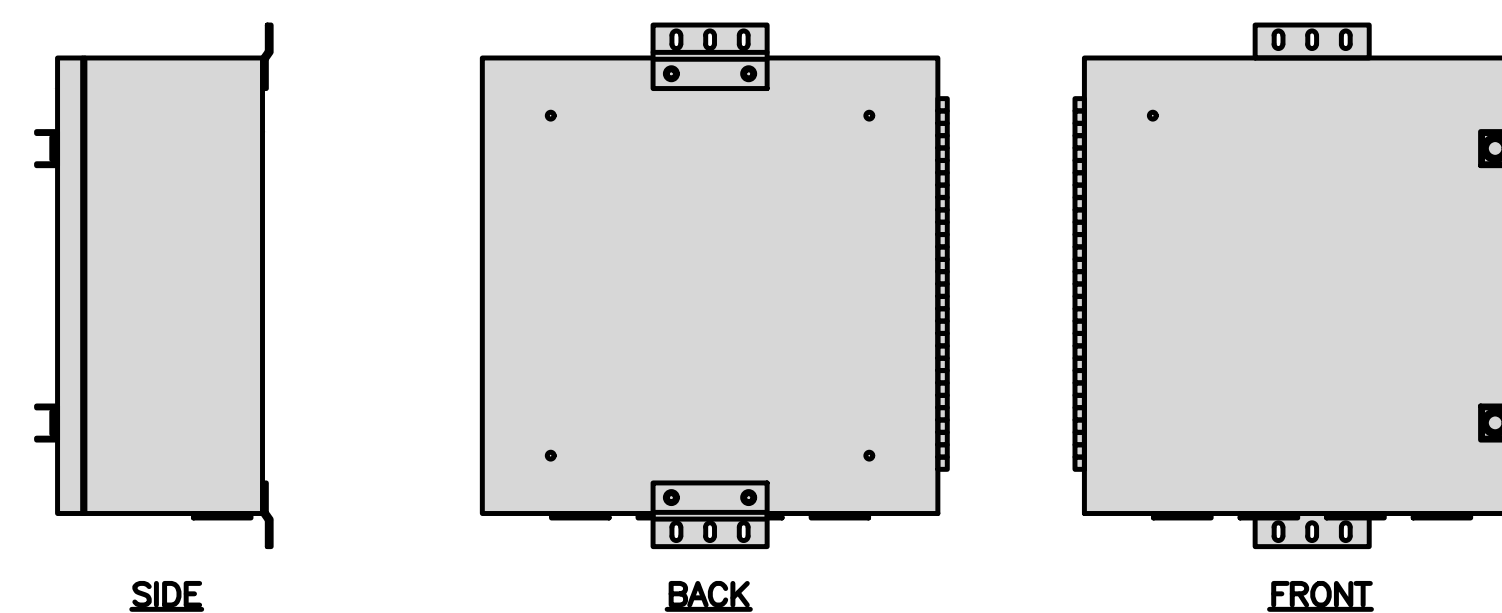
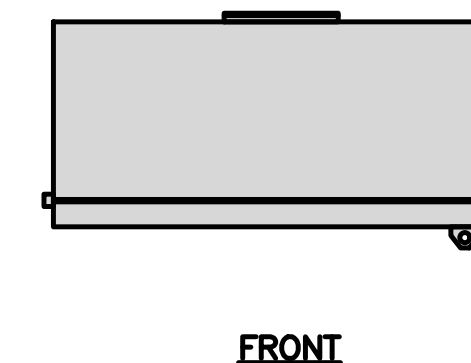


FIBER NID ENCLOSURE DETAIL

NO SCALE

5

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

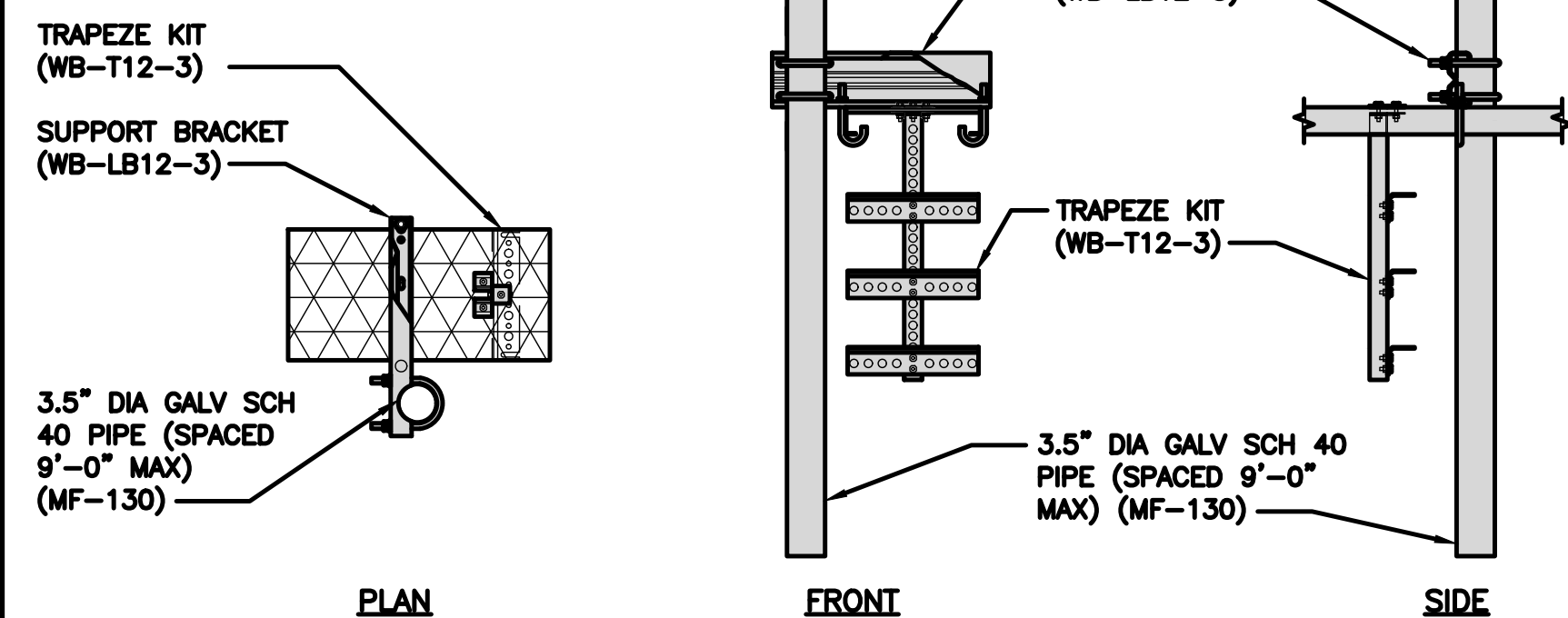


FIBER TELCO ENCLOSURE DETAIL

NO SCALE

6

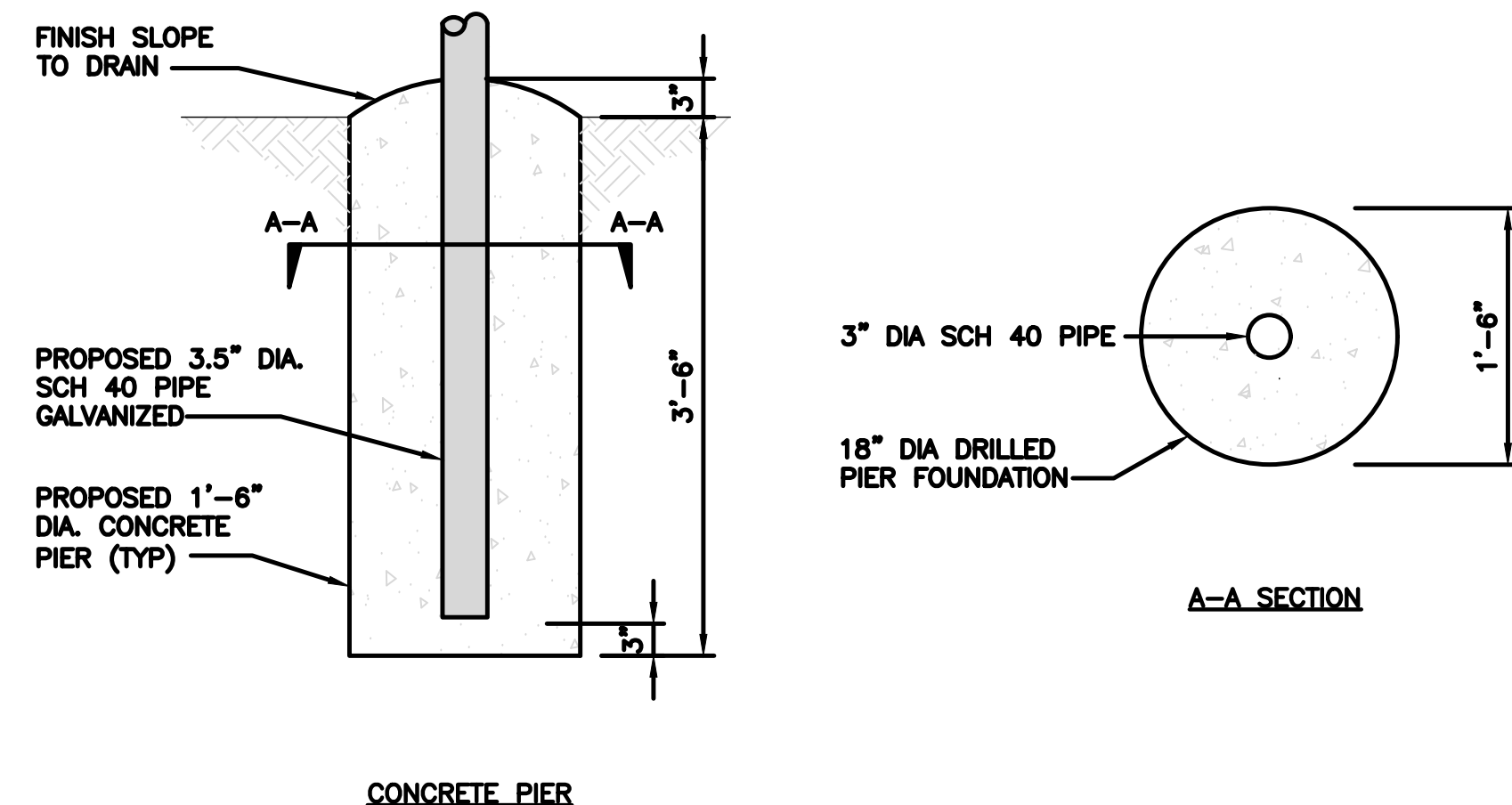
<b>COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT</b>		INCLUDED PRODUCTS:	WB-T12-3 TRAPEZE KIT, 3 RUNGS
DIMENSIONS (HxL)	160"x10'		WB-LB12-3 SUPPORT BRACKET
WEIGHT/ VOLUME	325.0 LBS		MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"
CABLE RUN (QTY)	12		



ICE BRIDGE DETAIL

NO SCALE

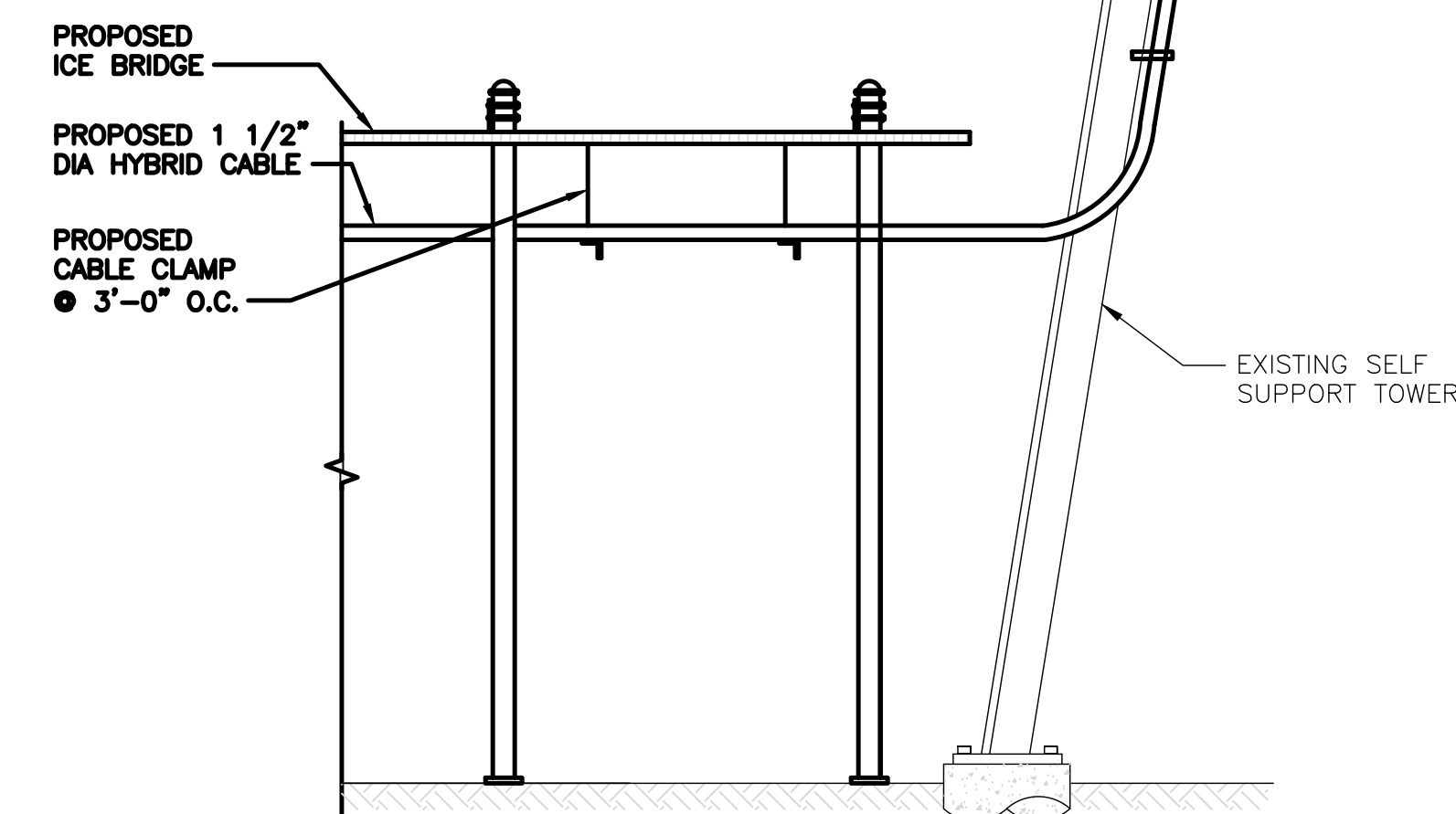
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TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

8



HYBRID CABLE RUN

NO SCALE

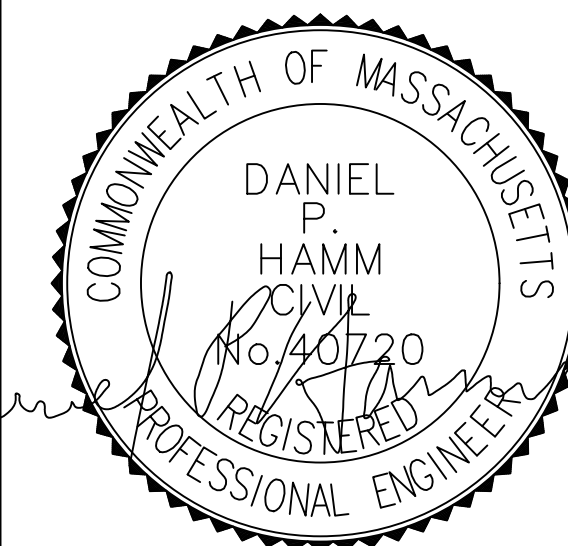
9

**dish wireless.**

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**HG HUDSON Design Group LLC**

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



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RFDS REV #: 0

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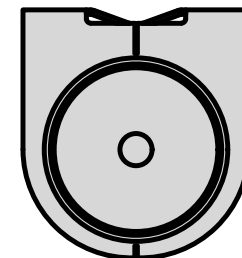
A&E PROJECT NUMBER  
BOBOS00592A

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBOS00592A  
CROWN CASTLE BU#841273  
344 ROUTE 6  
NORTH TRURO, MA 02652

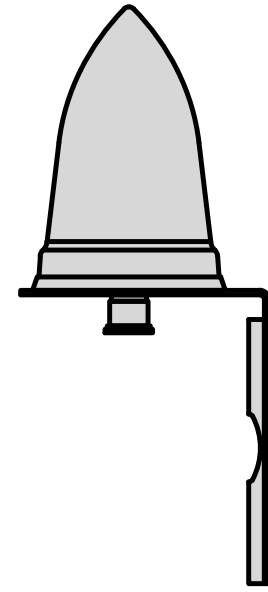
SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER  
**A-4**

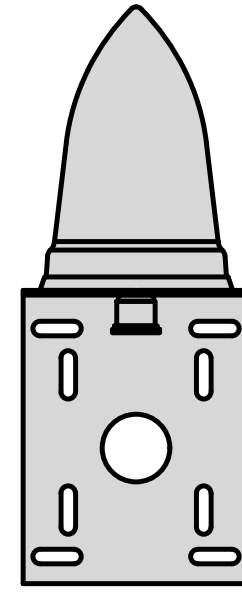
<b>PCTEL GPSGL-TMG-SPI-40NCB</b>	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



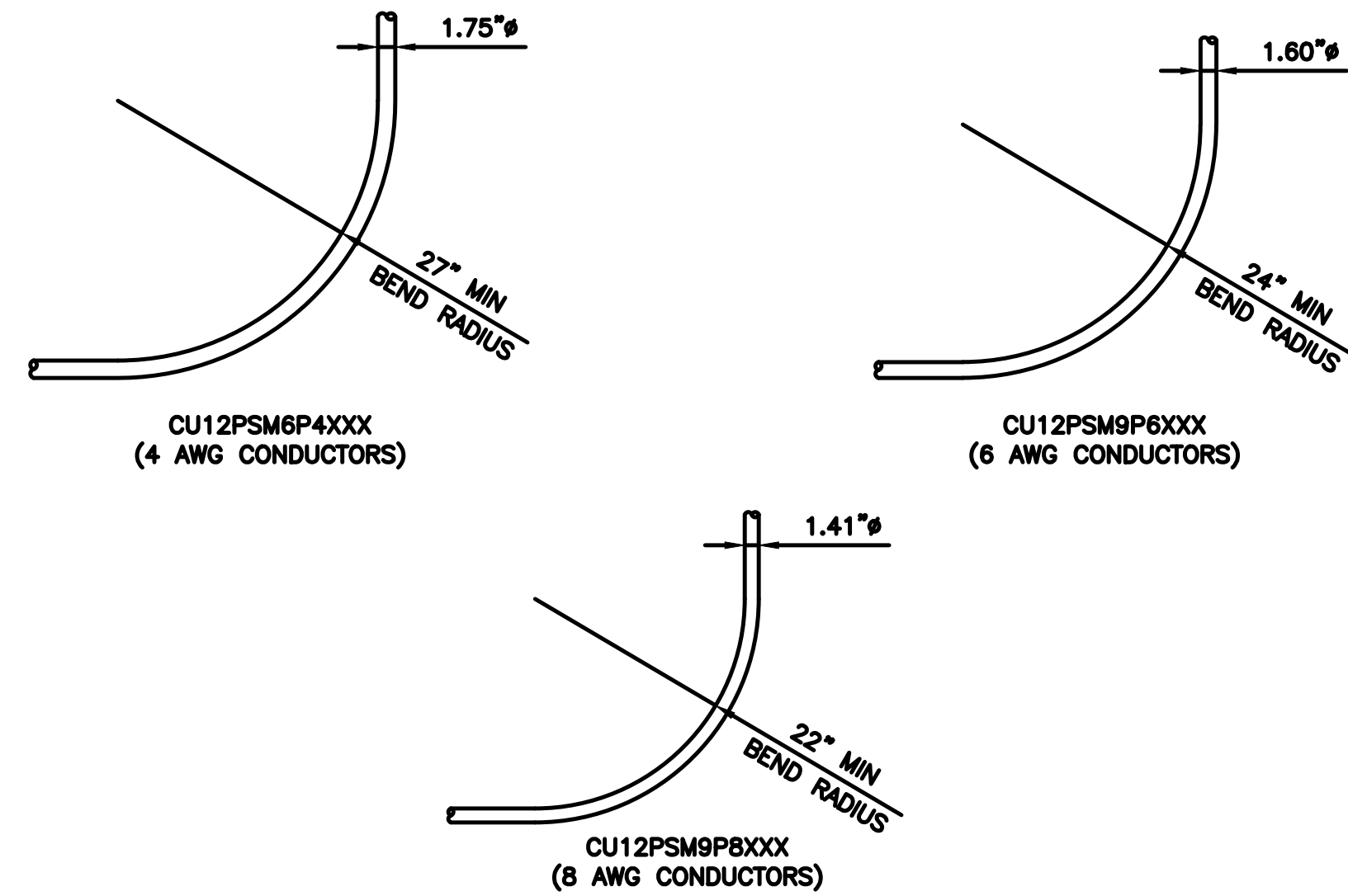
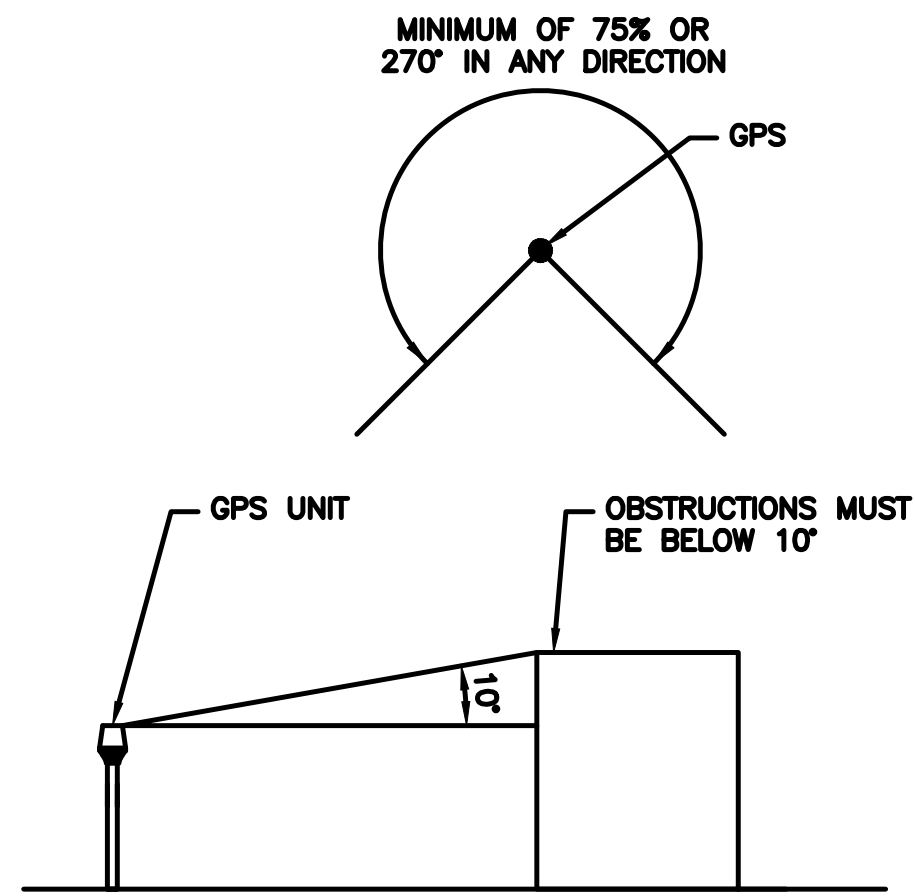
TOP



BACK



SIDE



GPS DETAIL

NO SCALE

1

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

2

CABLES UNLIMITED HYBRID CABLE  
MINIMUM BEND RADIUSES

NO SCALE

3

NOT USED

NO SCALE

4

NOT USED

NO SCALE

5

NOT USED

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

9

**dish**  
wireless.

5701 SOUTH SANTA FE DRIVE  
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**HG**  
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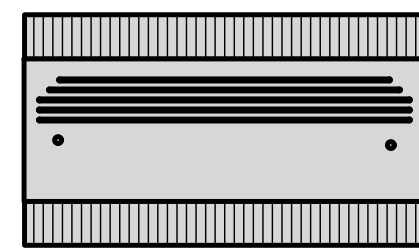
SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER

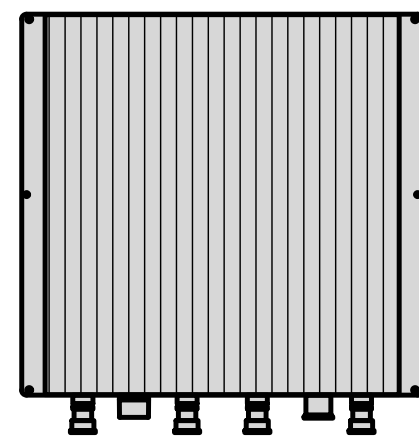
**A-5**



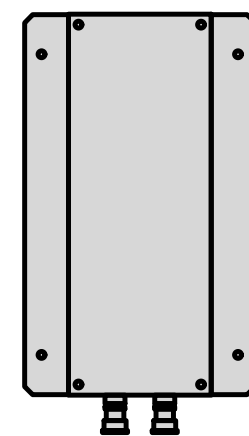
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



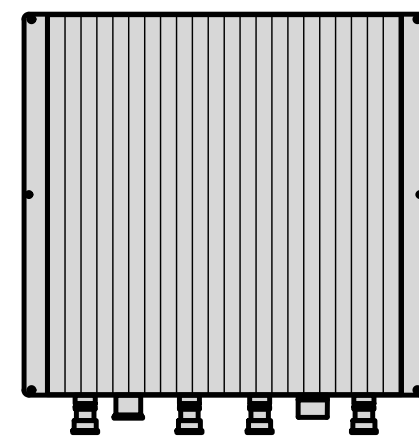
PLAN



BACK



SIDE



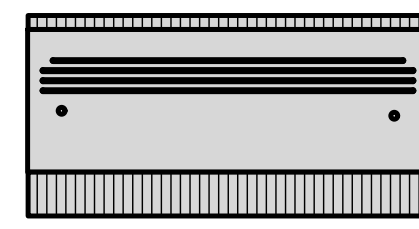
FRONT

RRH DETAIL

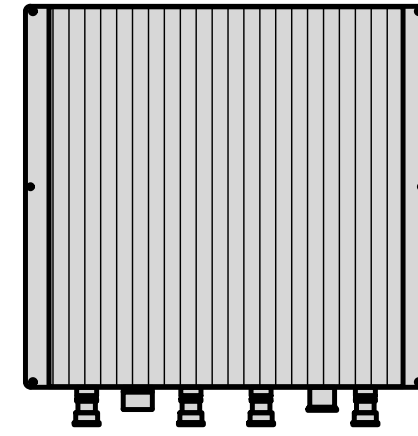
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1

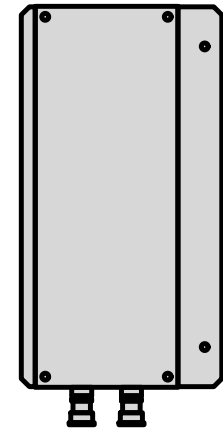
FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



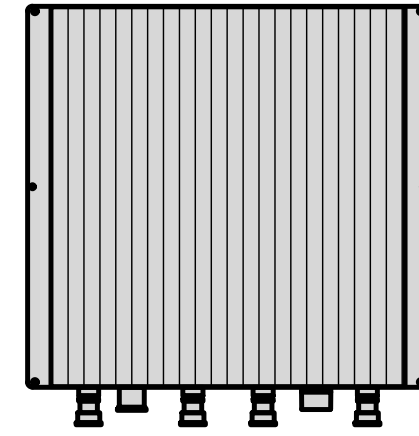
PLAN



BACK



SIDE



FRONT

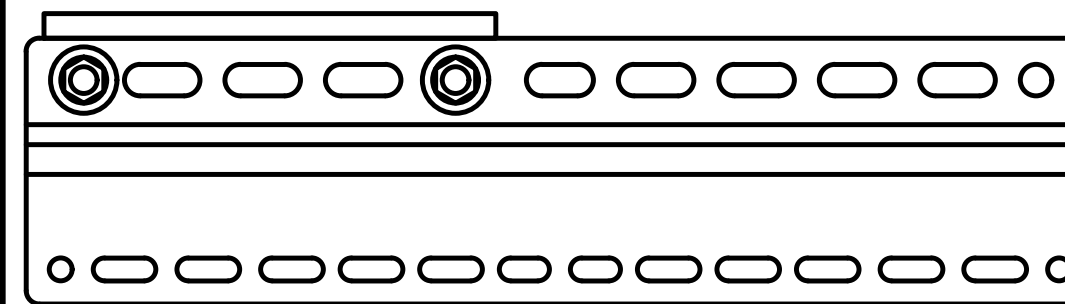
RRH DETAIL

NO SCALE

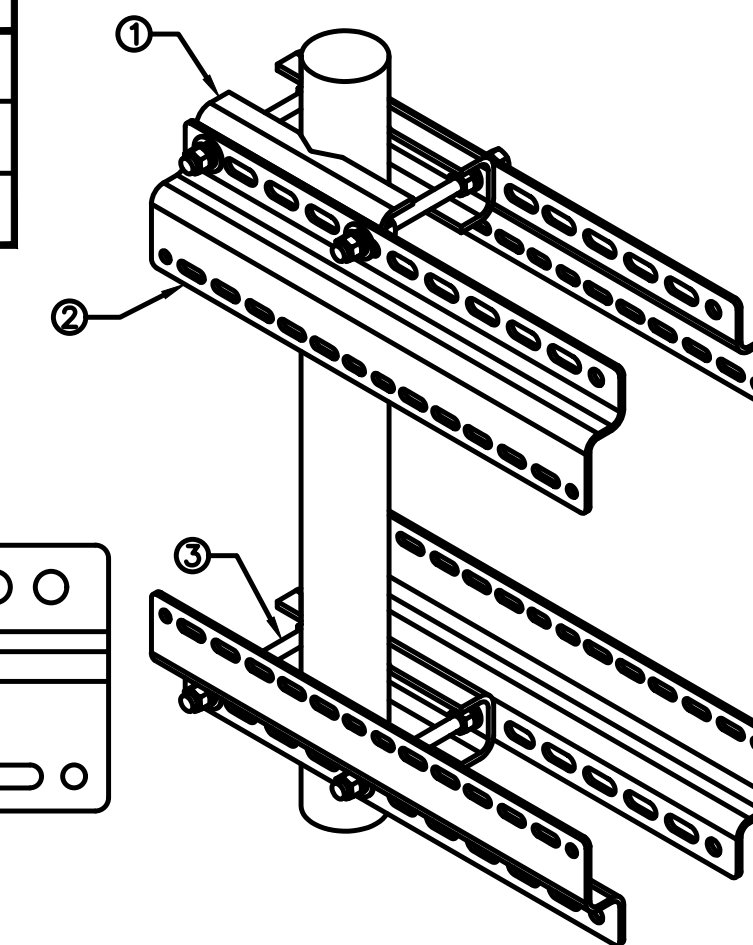
2

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

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



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

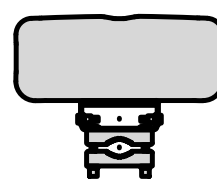


RRH MOUNT DETAIL

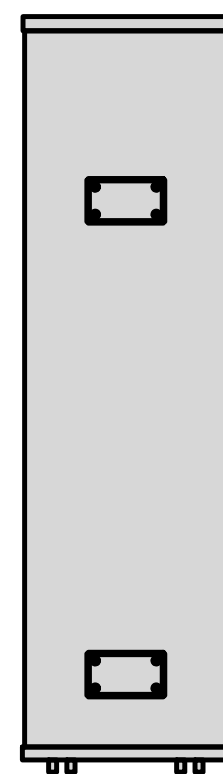
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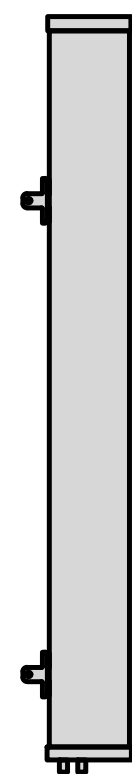
COMMSCOPE FFVV-65B-R2	
DIMENSIONS (HxWxD)(MM/IN)	1826x498x197 72"x19.6"x7.8"
RF CONNECTOR INTERFACE	4.3-10 FEMALE
WEIGHT	70.8 lbs
WEIGHT WITH BRACKETS	98.1 lbs



PLAN



BACK



SIDE



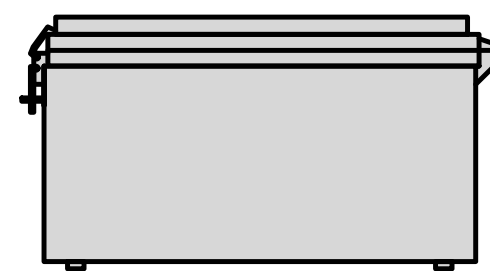
FRONT

ANTENNA DETAIL

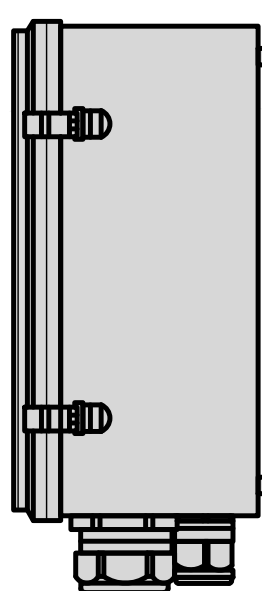
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4

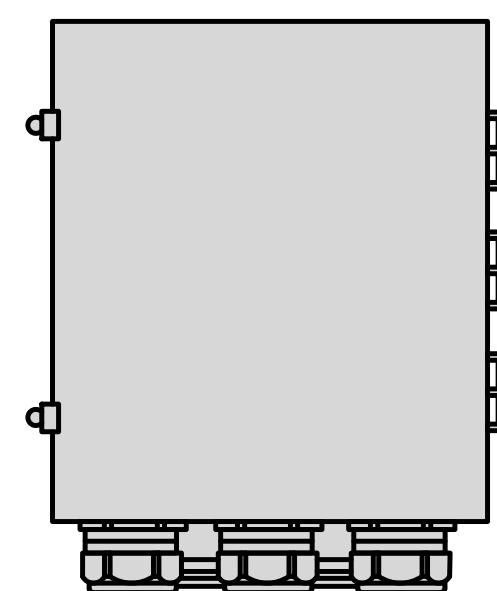
RAYCAP RDIC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



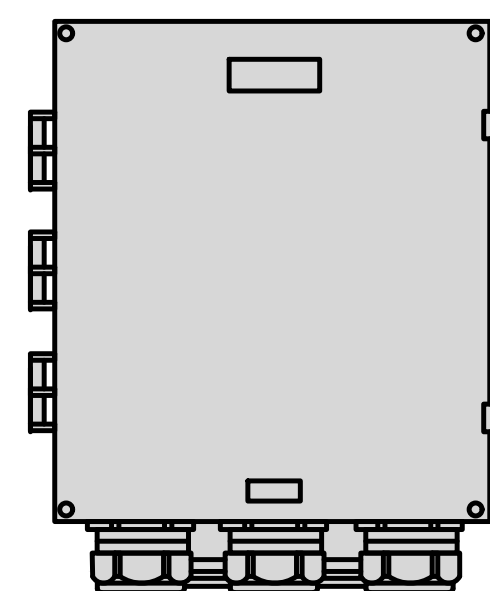
PLAN



SIDE



BACK



FRONT

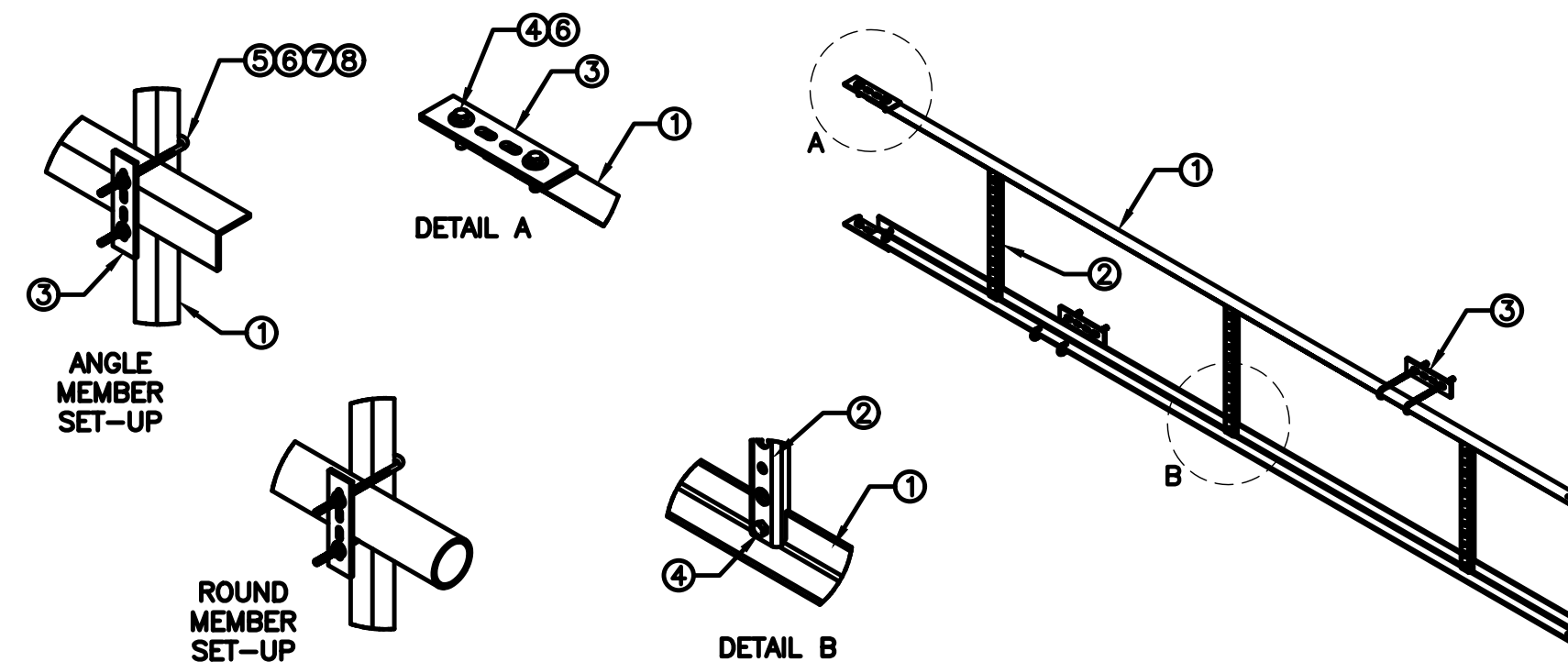
SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

7

COMMSCOPE 10' CABLE LADDER 6 HOLE RUNGS	
DIMENSIONS (WxL)	20.5"x120"
WEIGHT	43.65 lbs

ITEM#	DESCRIPTION
1	10' ANGLE SIDE RAIL
2	20" LADDER RUNG
3	BACKING PLATE
4	3/8"x1-1/2" GALV BOLT KIT
5	8" GALV J-BOLT KIT
6	3/8" GALV FLAT WASHER
7	3/8" GALV LOCK WASHER
8	3/8" GALV HEX NUT



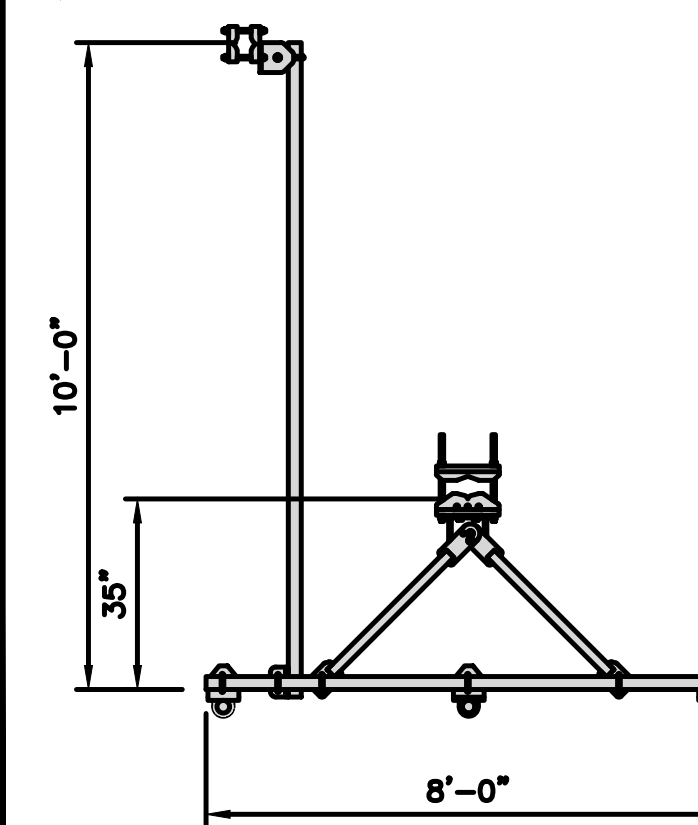
CABLE LADDER DETAIL

NO SCALE

8

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

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



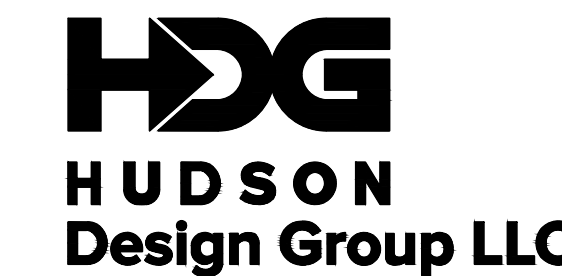
ANTENNA FRAME DETAIL

NO SCALE

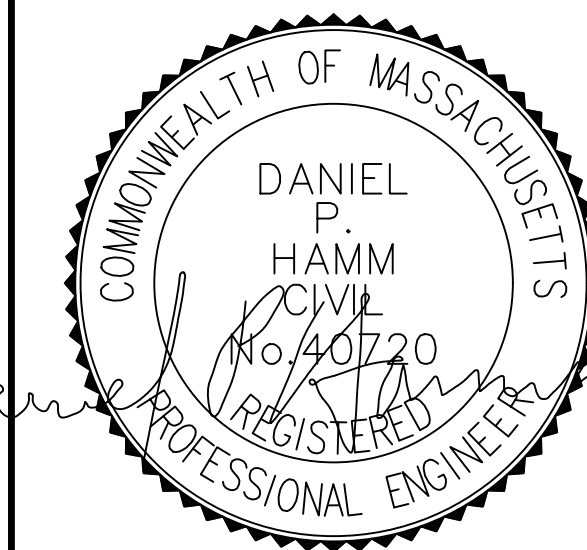
9



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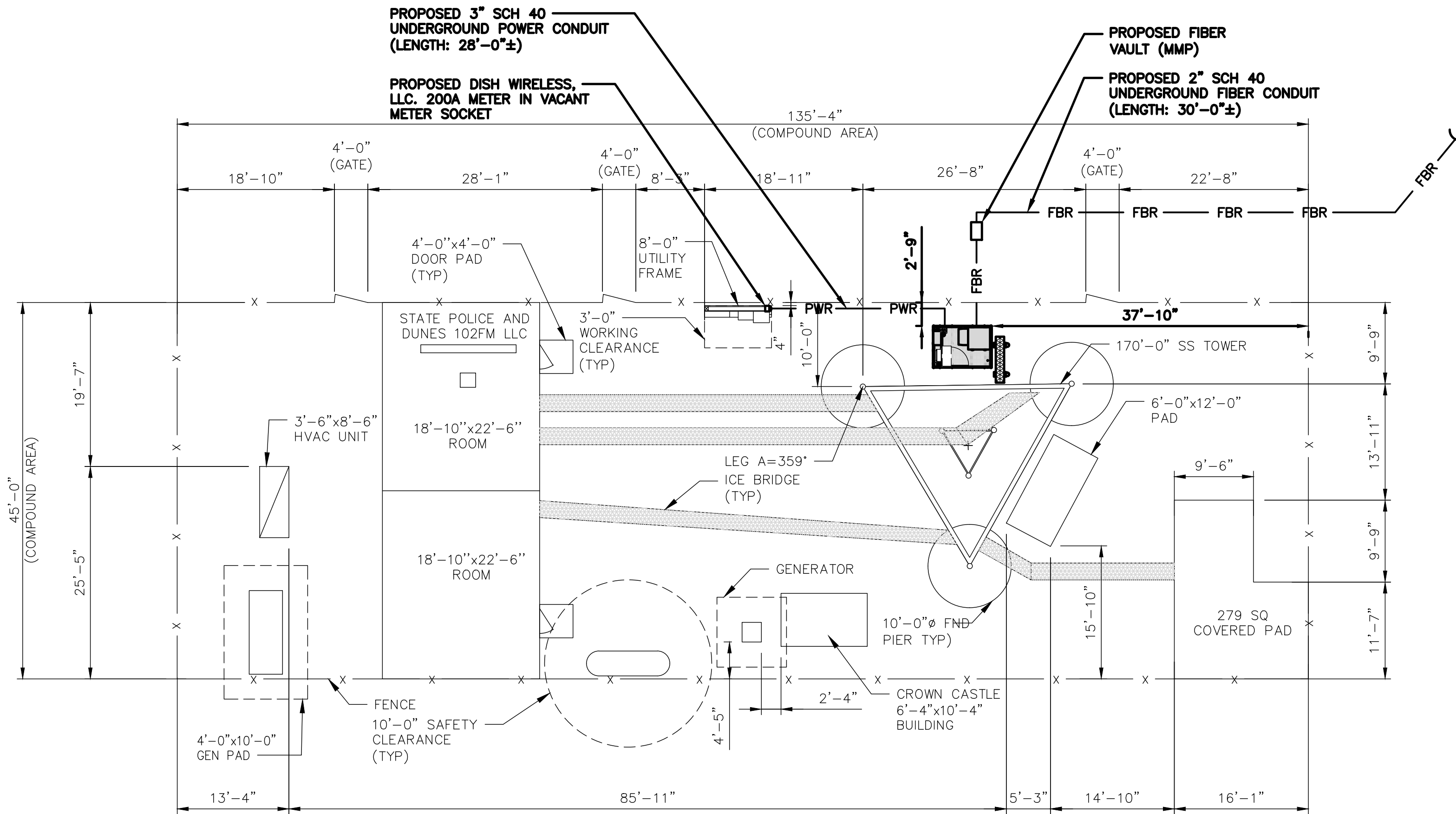
DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBOS00592A  
CROWN CASTLE BU#841273  
344 ROUTE 6  
NORTH TRURO, MA 02652

SHEET TITLE  
EQUIPMENT DETAILS

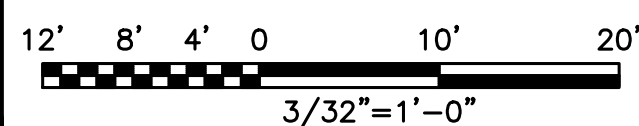
SHEET NUMBER  
**A-6**

**NOTES**

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



**UTILITY ROUTE PLAN**



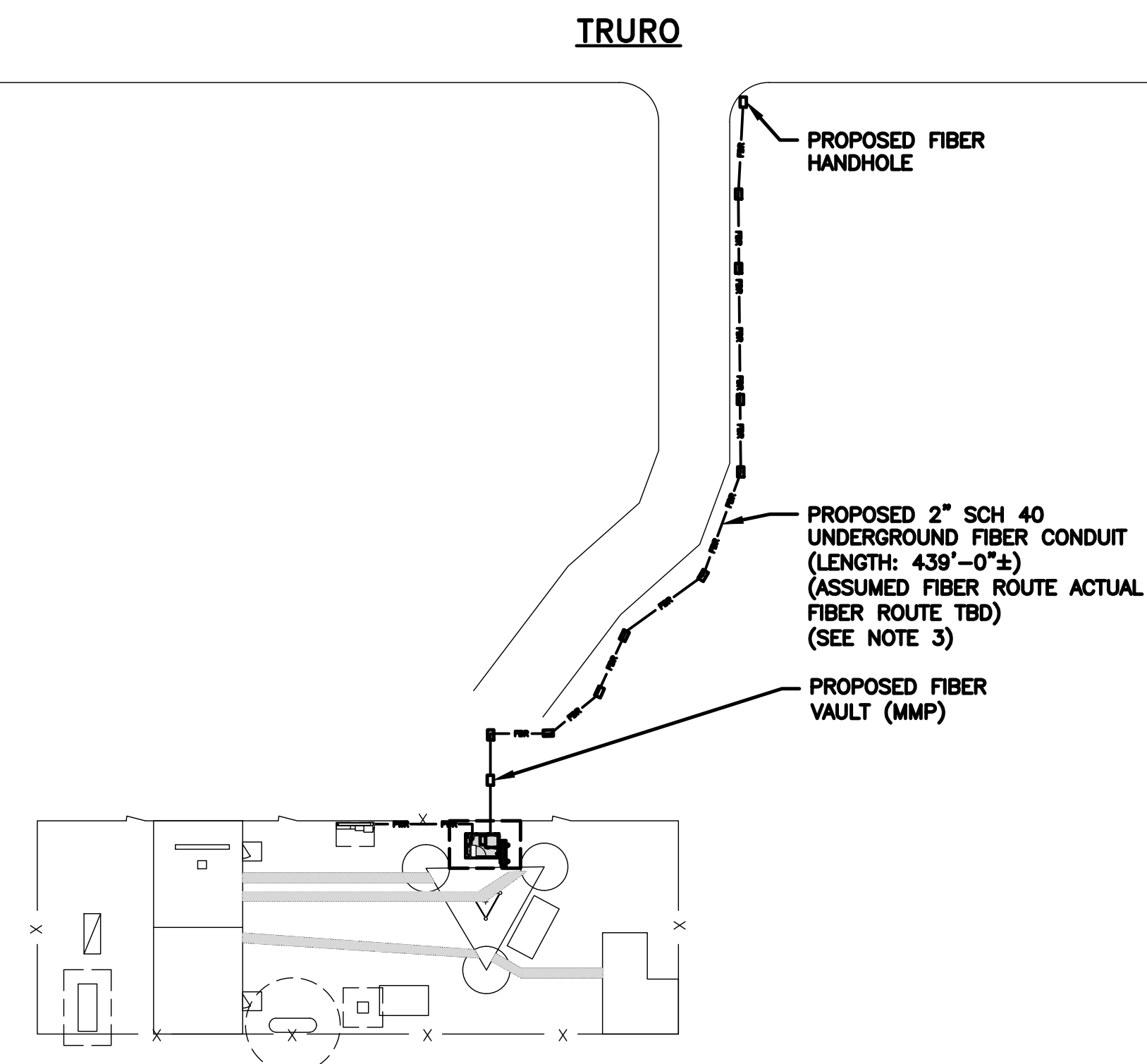
1

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

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

**ELECTRICAL NOTES**

2



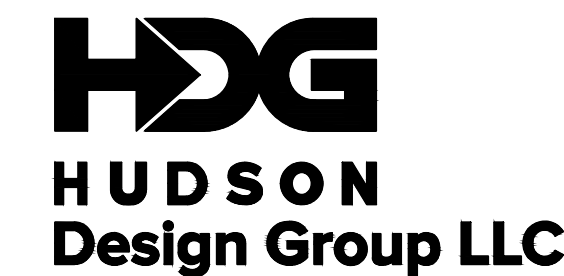
**OVERALL UTILITY ROUTE PLAN**

NO SCALE

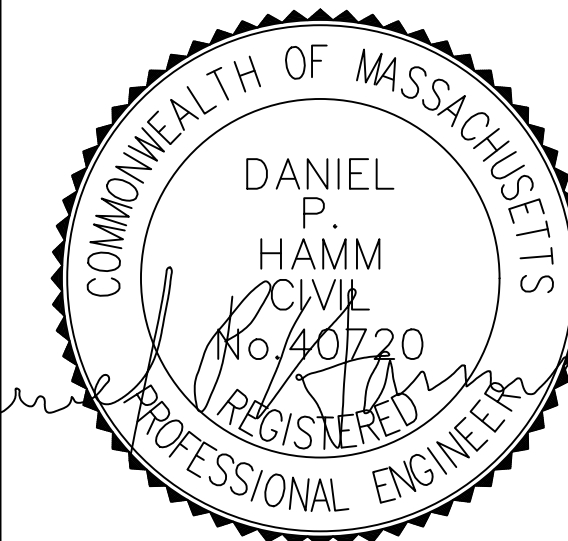
3



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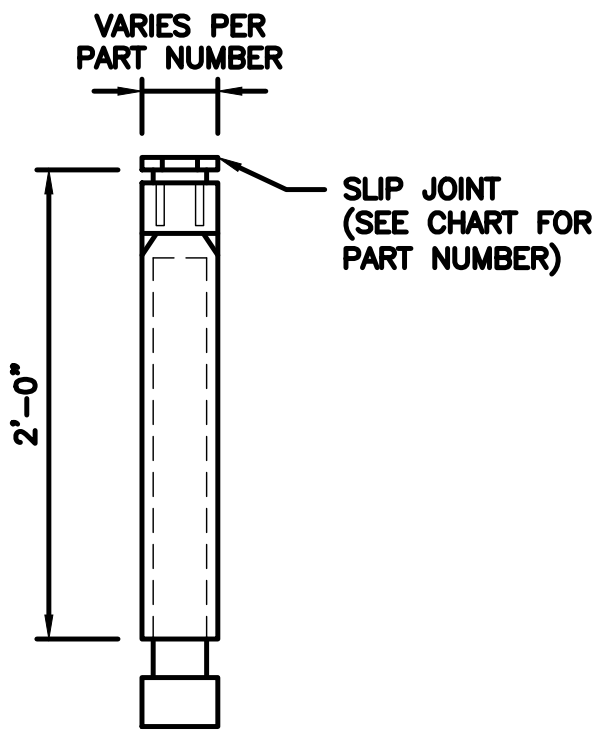
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NORTH TRURO, MA 02652

SHEET TITLE  
ELECTRICAL/FIBER ROUTE  
PLAN AND NOTES

SHEET NUMBER  
**E-1**

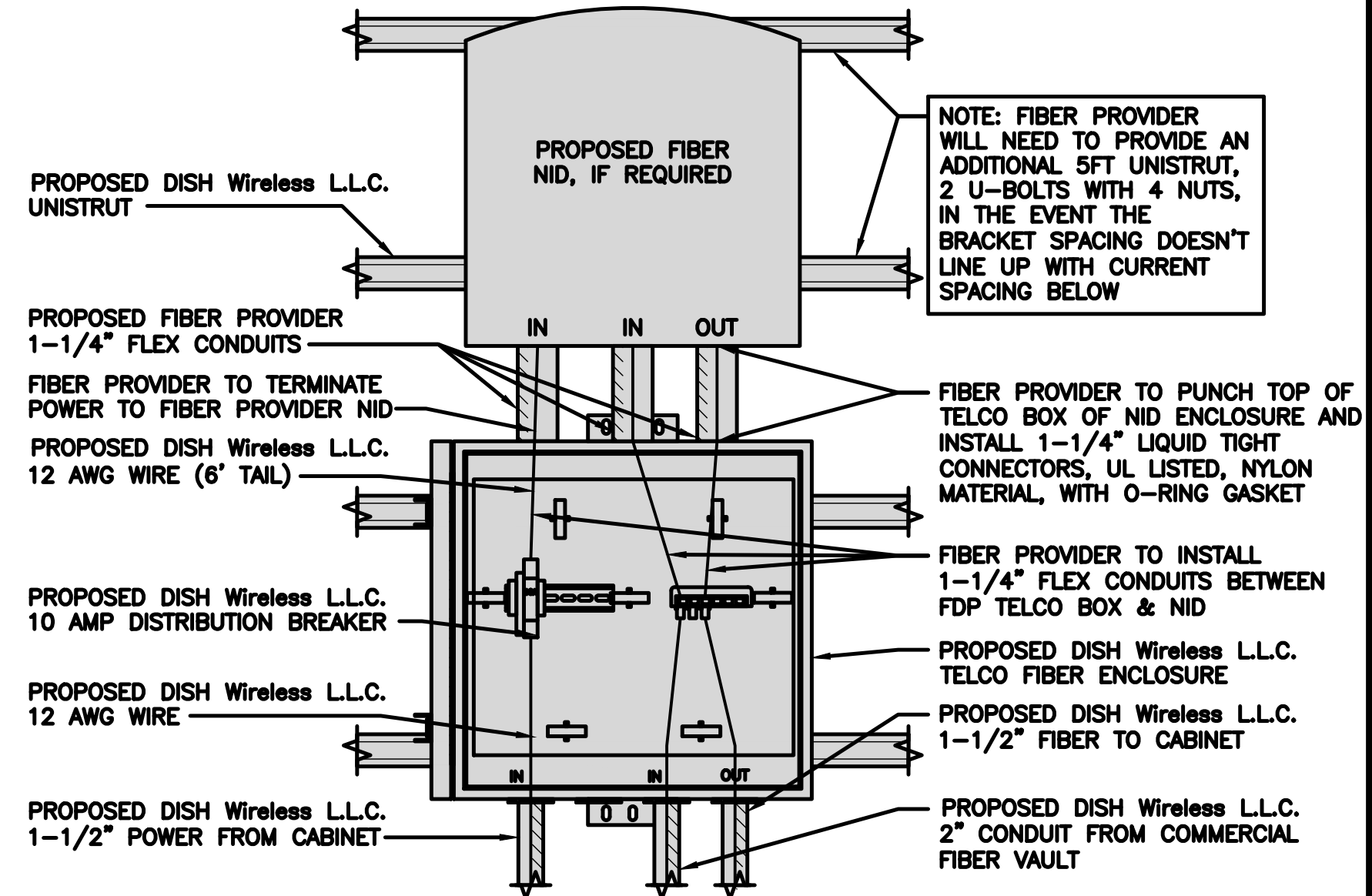
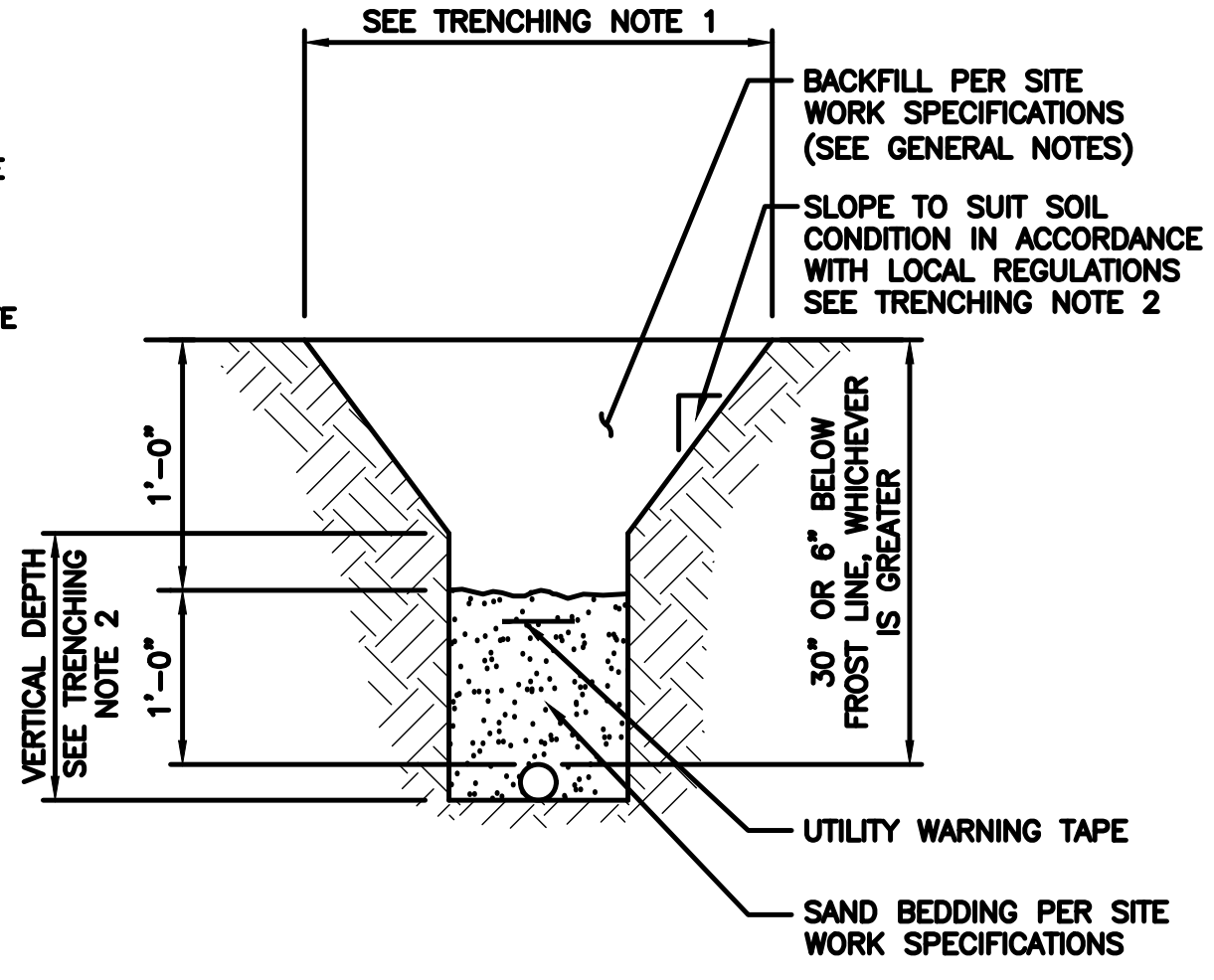
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"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



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

**TRENCHING NOTES**

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



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DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBOS00592A  
CROWN CASTLE BU#841273  
344 ROUTE 6  
NORTH TRURO, MA 02652

SHEET TITLE  
ELECTRICAL  
DETAILS

SHEET NUMBER  
**E-2**

EXPANSION JOINT DETAIL NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL NO SCALE 2

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

NOT USED NO SCALE 4

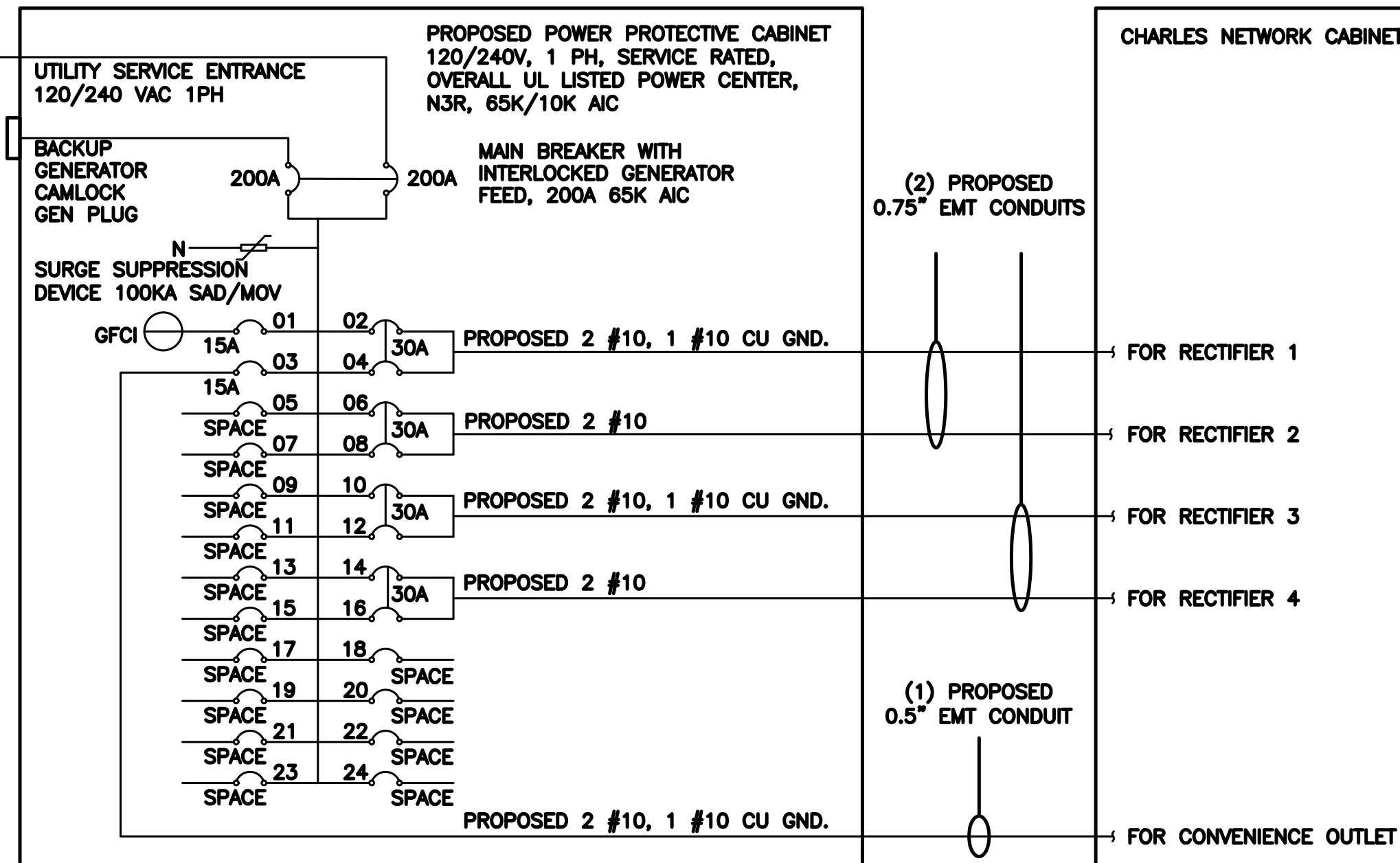
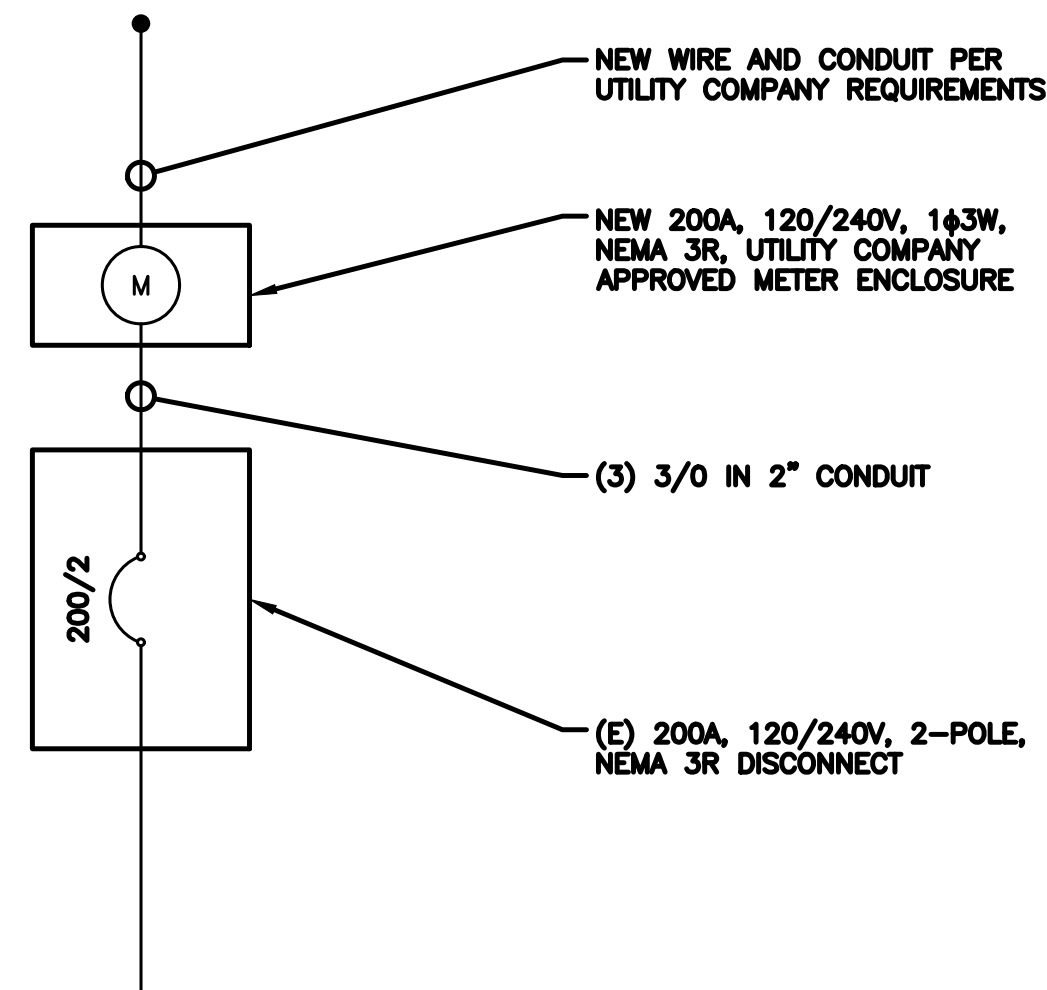
NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



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

**BREAKERS REQUIRED:**  
 (4) 30A, 2P BREAKER - SQUARE D P/N:Q0230  
 (1) 15A, 1P BREAKER - SQUARE D P/N:Q0115

**NOTES**

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

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

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

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

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

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.  
 #10 - 0.0211 SQ. IN X 2 = 0.0422 SQ. IN  
 #10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND  
**TOTAL = 0.0633 SQ. IN**

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

RECTIFIER CONDUCTORS (2 CONDUITS): USING UL1015, CU.  
 #10 - 0.0266 SQ. IN X 4 = 0.1064 SQ. IN  
 #10 - 0.0082 SQ. IN X 1 = 0.0082 SQ. IN <BARE GROUND  
**TOTAL = 0.1146 SQ. IN**

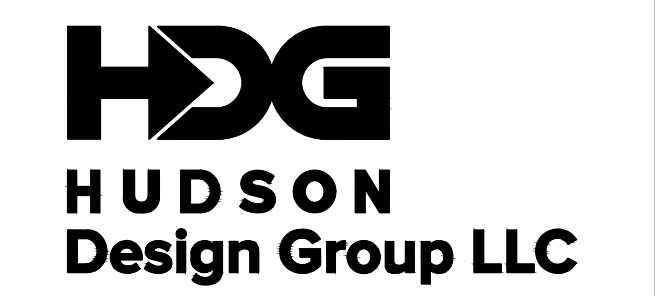
0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (5) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.  
 3/0 - 0.2679 SQ. IN X 3 = 0.8037 SQ. IN  
 #6 - 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND  
**TOTAL = 0.8544 SQ. IN**

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



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

SHEET NUMBER  
**E-3**

PPC ONE-LINE DIAGRAM

NO SCALE 11

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

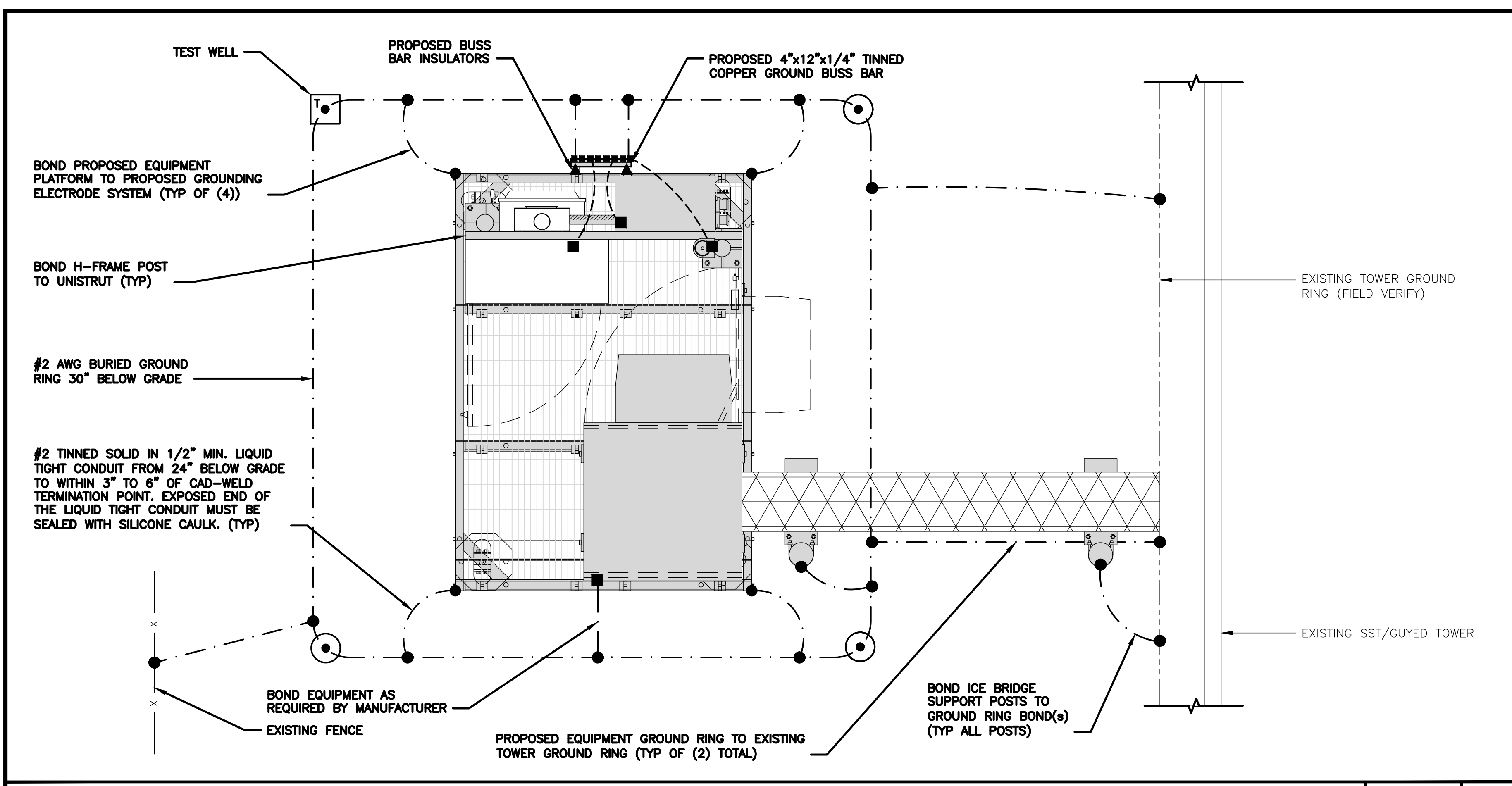
PANEL SCHEDULE

NO SCALE 2

NOT USED

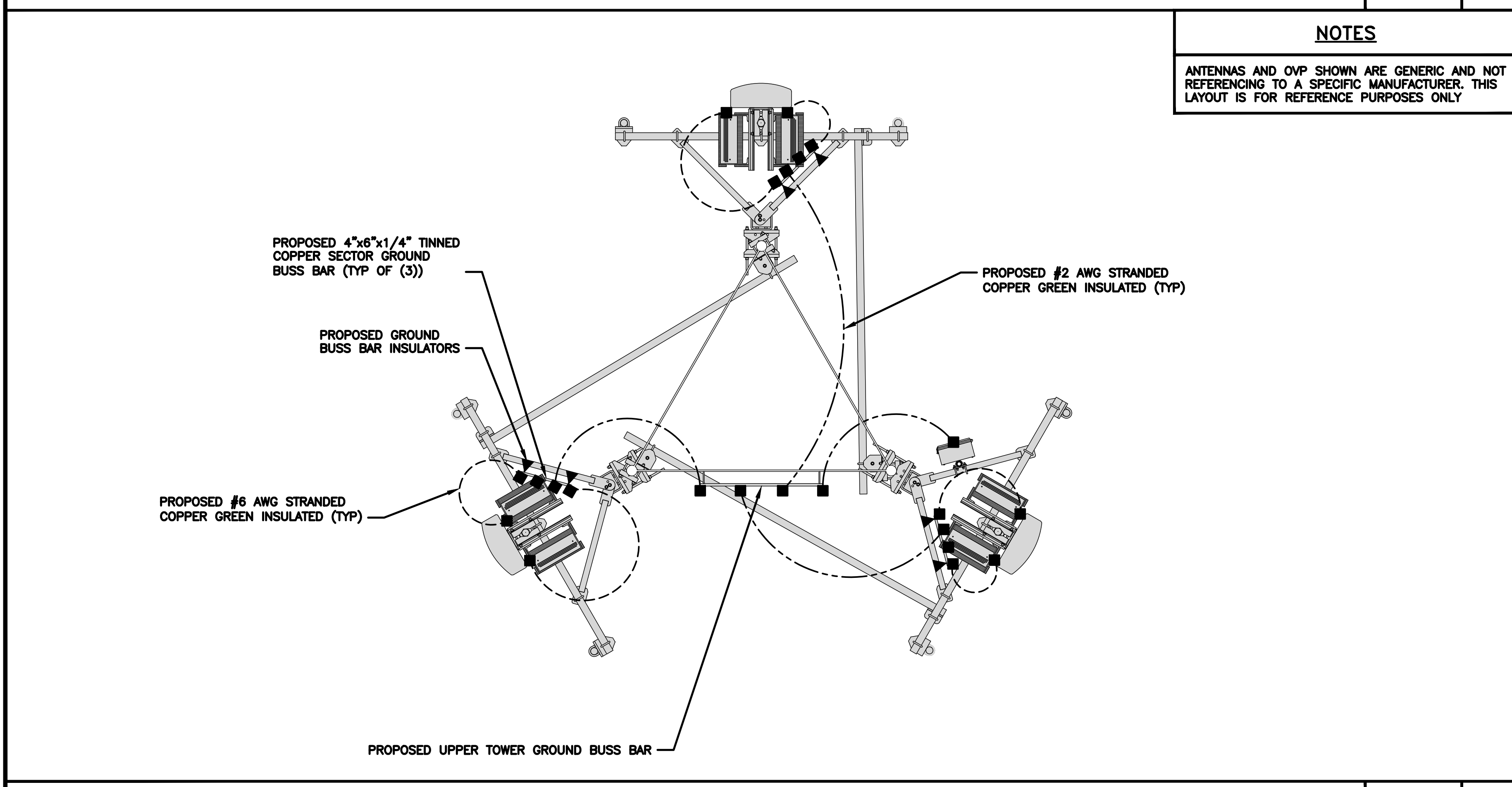
NO SCALE 3





**TYPICAL EQUIPMENT GROUNDING PLAN**

NO SCALE 1



**TYPICAL ANTENNA GROUNDING PLAN**

NO SCALE 2

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

**GROUNDING LEGEND**

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

**GROUNDING KEY NOTES**

- (A) **EXTERIOR GROUND RING:** #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
  - (B) **TOWER GROUND RING:** THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
  - (C) **INTERIOR GROUND RING:** #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.
  - (D) **BOND TO INTERIOR GROUND RING:** #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.
  - (E) **GROUND ROD:** UL LISTED COPPER CLAD STEEL. MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.
  - (F) **CELL REFERENCE GROUND BAR:** POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.
  - (G) **HATCH PLATE GROUND BAR:** BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.
  - (H) **EXTERIOR CABLE ENTRY PORT GROUND BARS:** LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.
  - (I) **TELCO GROUND BAR:** BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
  - (J) **FRAME BONDING:** THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
  - (K) **INTERIOR UNIT BONDS:** METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.
  - (L) **FENCE AND GATE GROUNDING:** METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.
  - (M) **EXTERIOR UNIT BONDS:** METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE
  - (N) **ICE BRIDGE SUPPORTS:** EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.
  - (O) **DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR**
  - (P) **TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO TOWER STEEL.**
- REFER TO DISH Wireless L.L.C. GROUNDING NOTES.

**GROUNDING KEY NOTES**

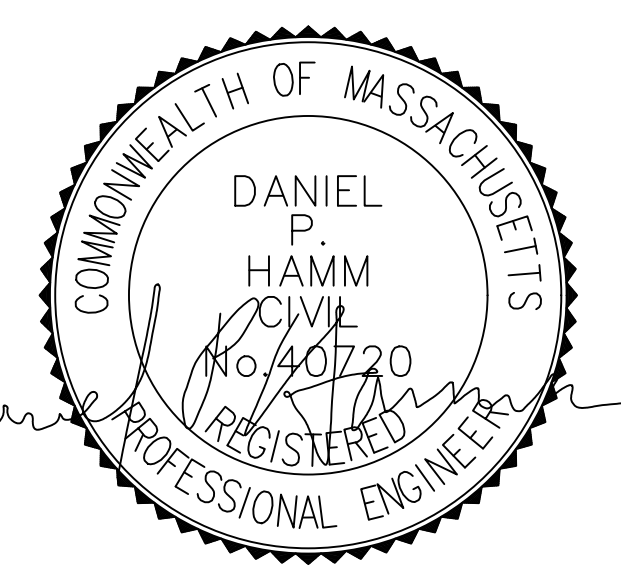
NO SCALE 3



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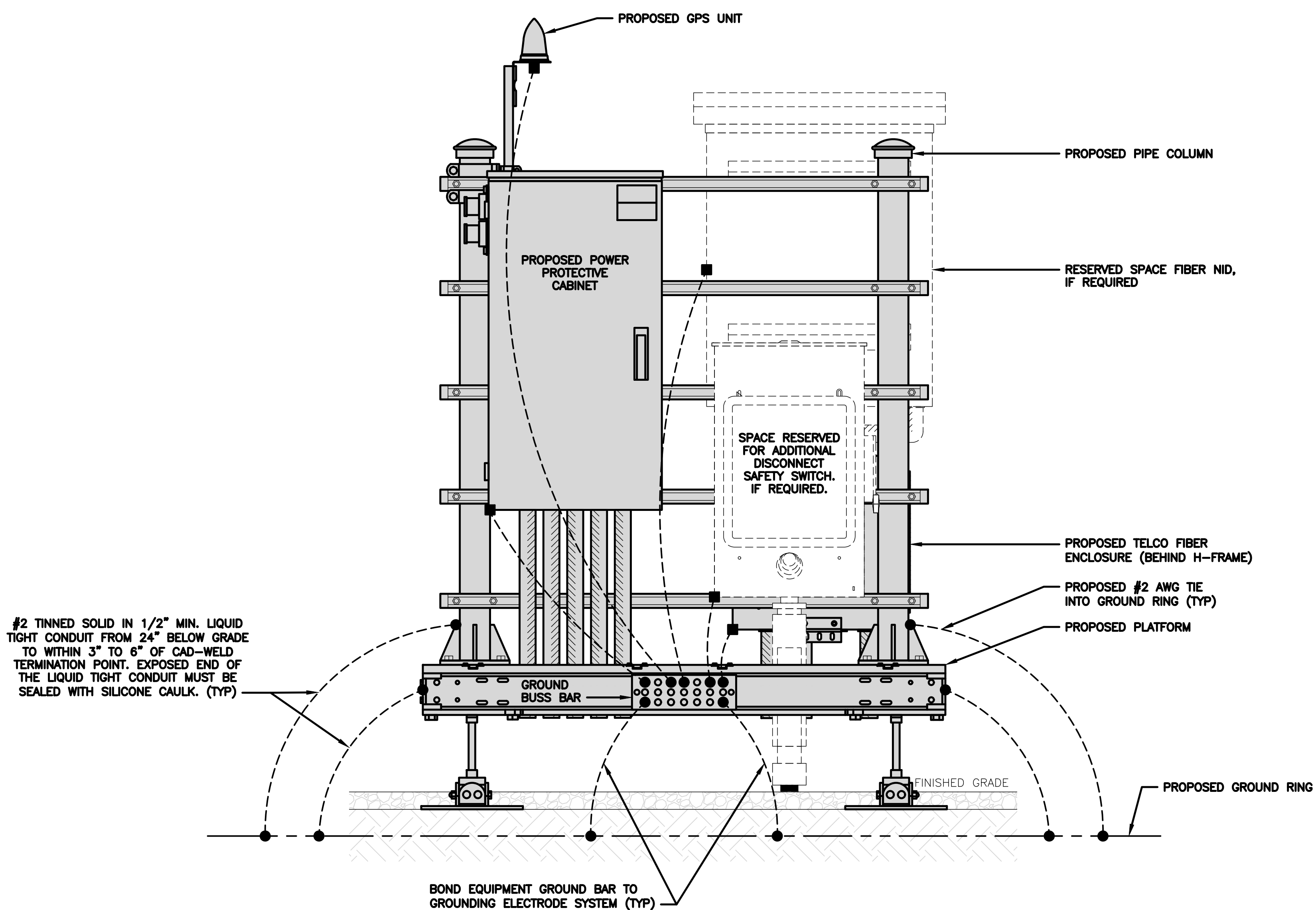
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SHEET TITLE  
GROUNDING PLANS AND NOTES

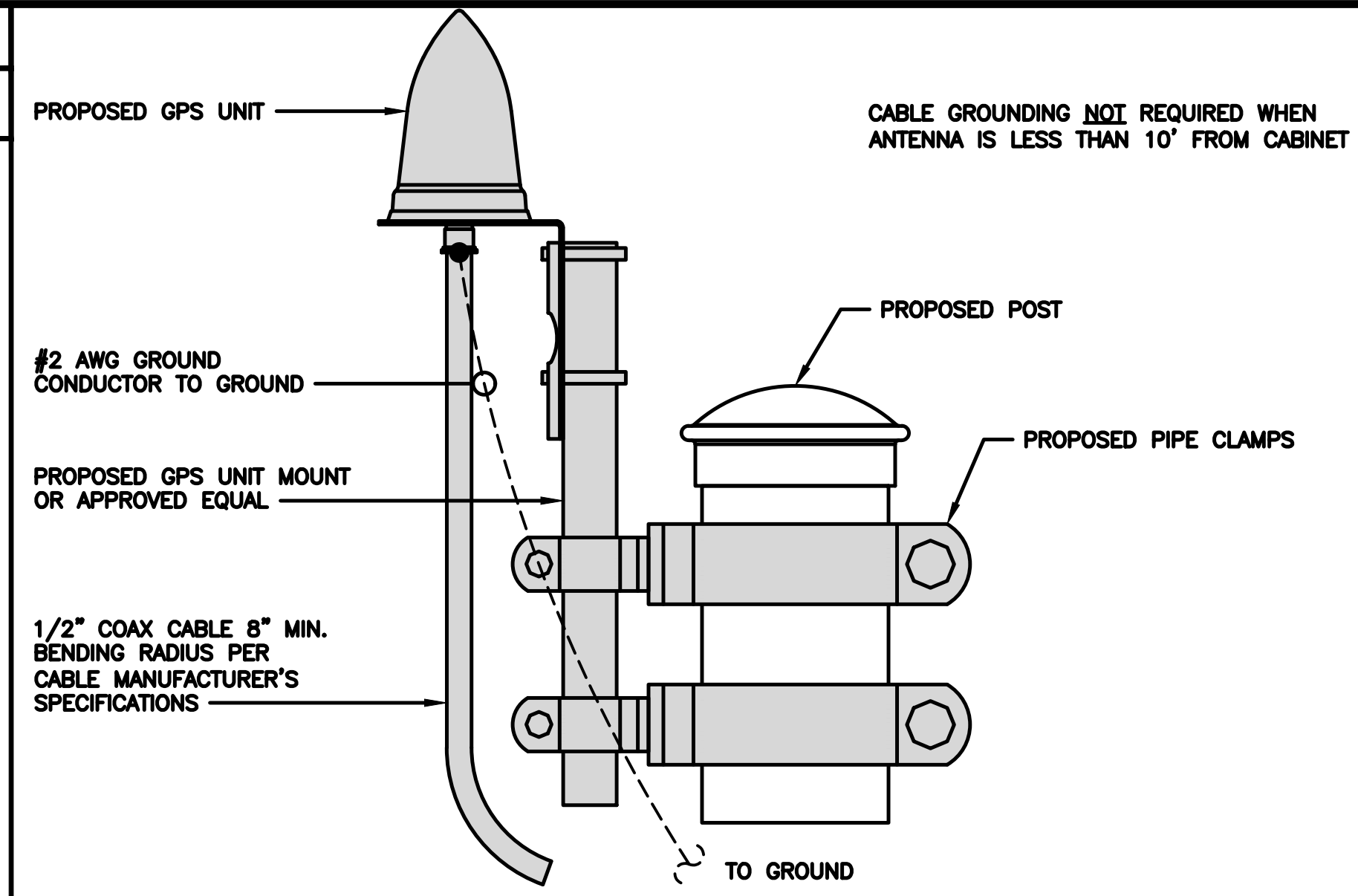
SHEET NUMBER  
**G-1**

**NOTES**  
EQUIPMENT CABINET OMITTED FOR CLARITY



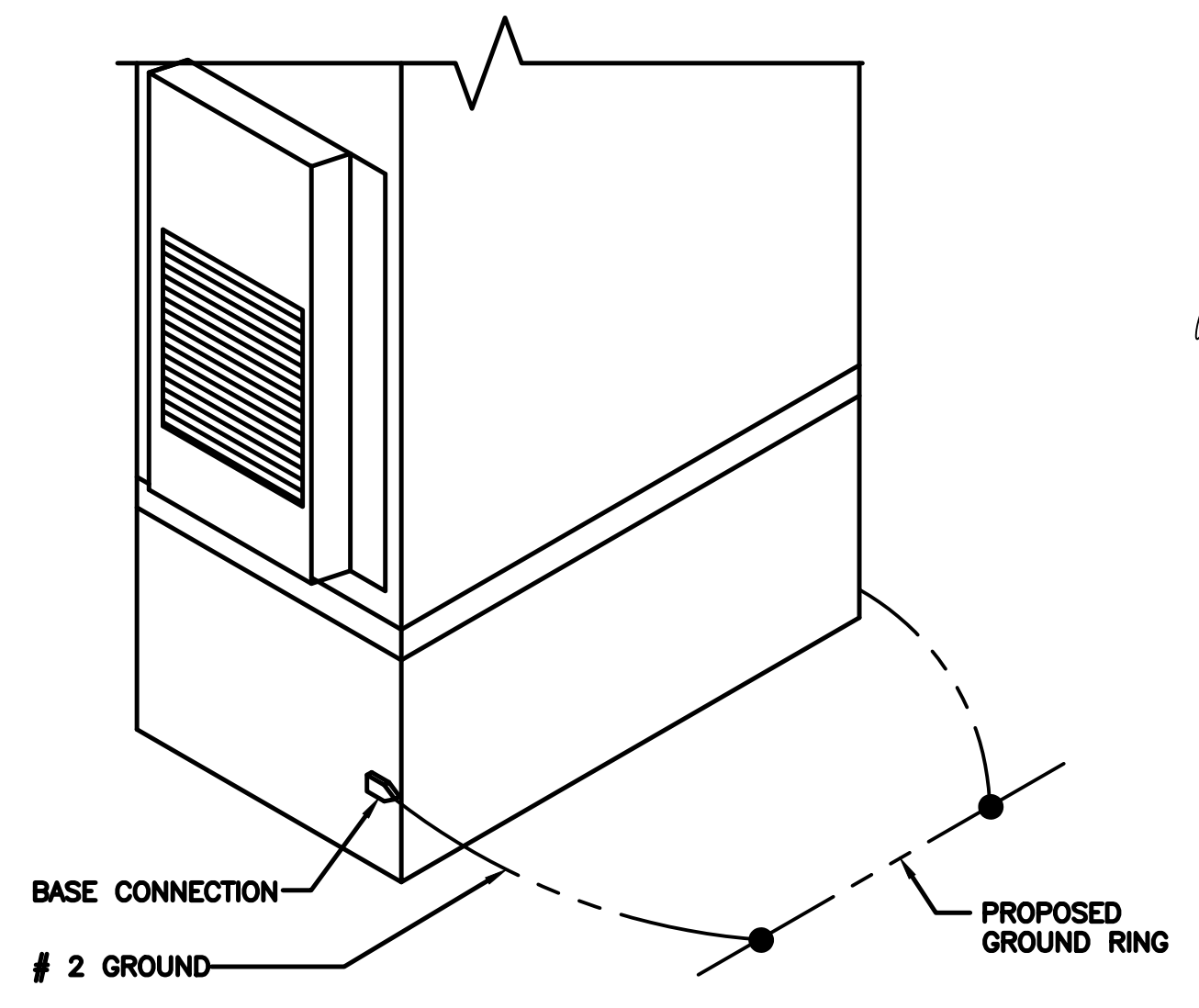
**H-FRAME GROUNDING DETAIL**

NO SCALE 1



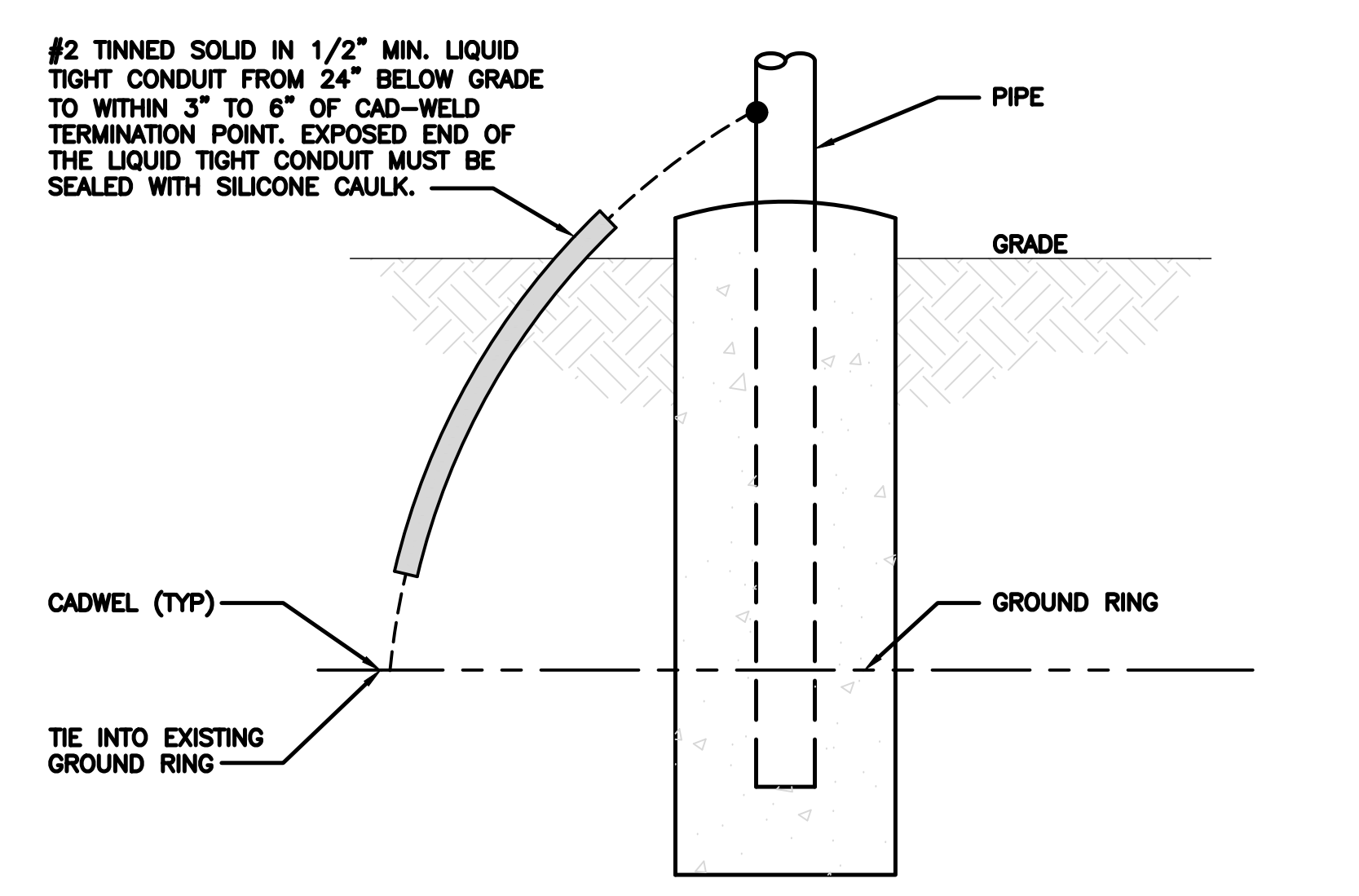
**TYPICAL GPS UNIT GROUNDING**

NO SCALE 2



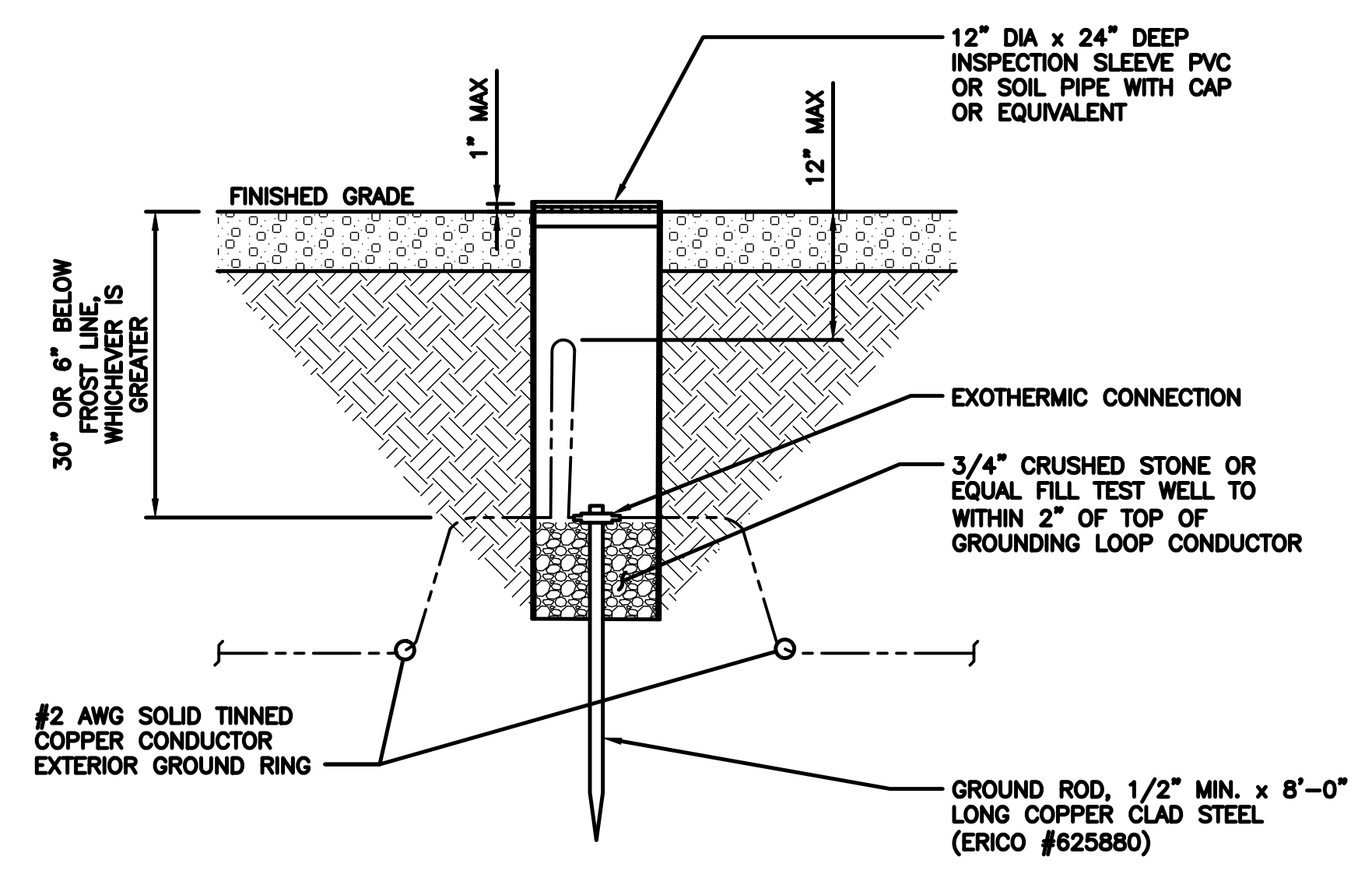
**OUTDOOR CABINET GROUNDING**

NO SCALE 3



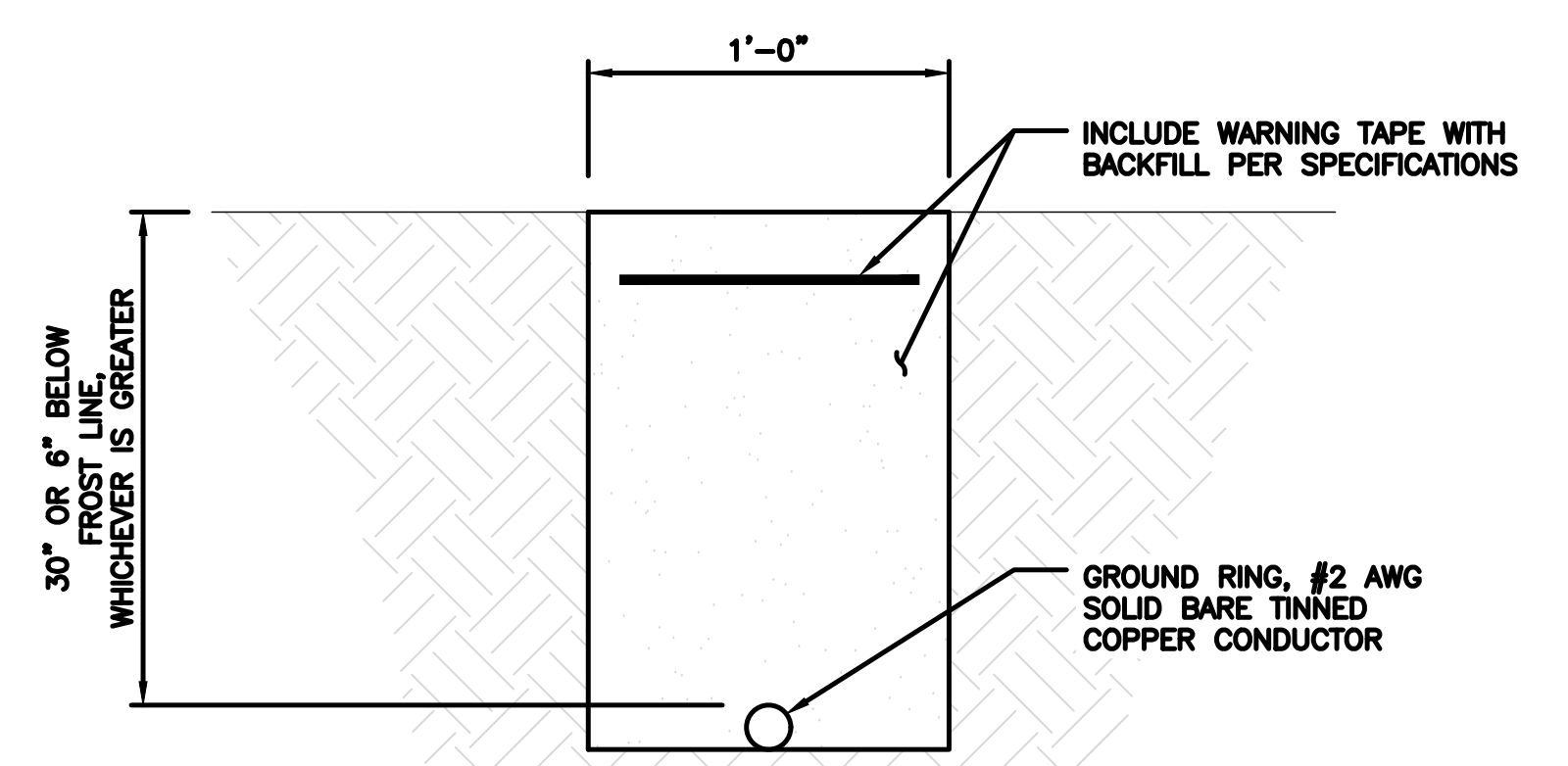
**TRANSITIONING GROUND DETAIL**

NO SCALE 4



**TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE**

NO SCALE 5



**TYPICAL GROUND RING TRENCH**

NO SCALE 6



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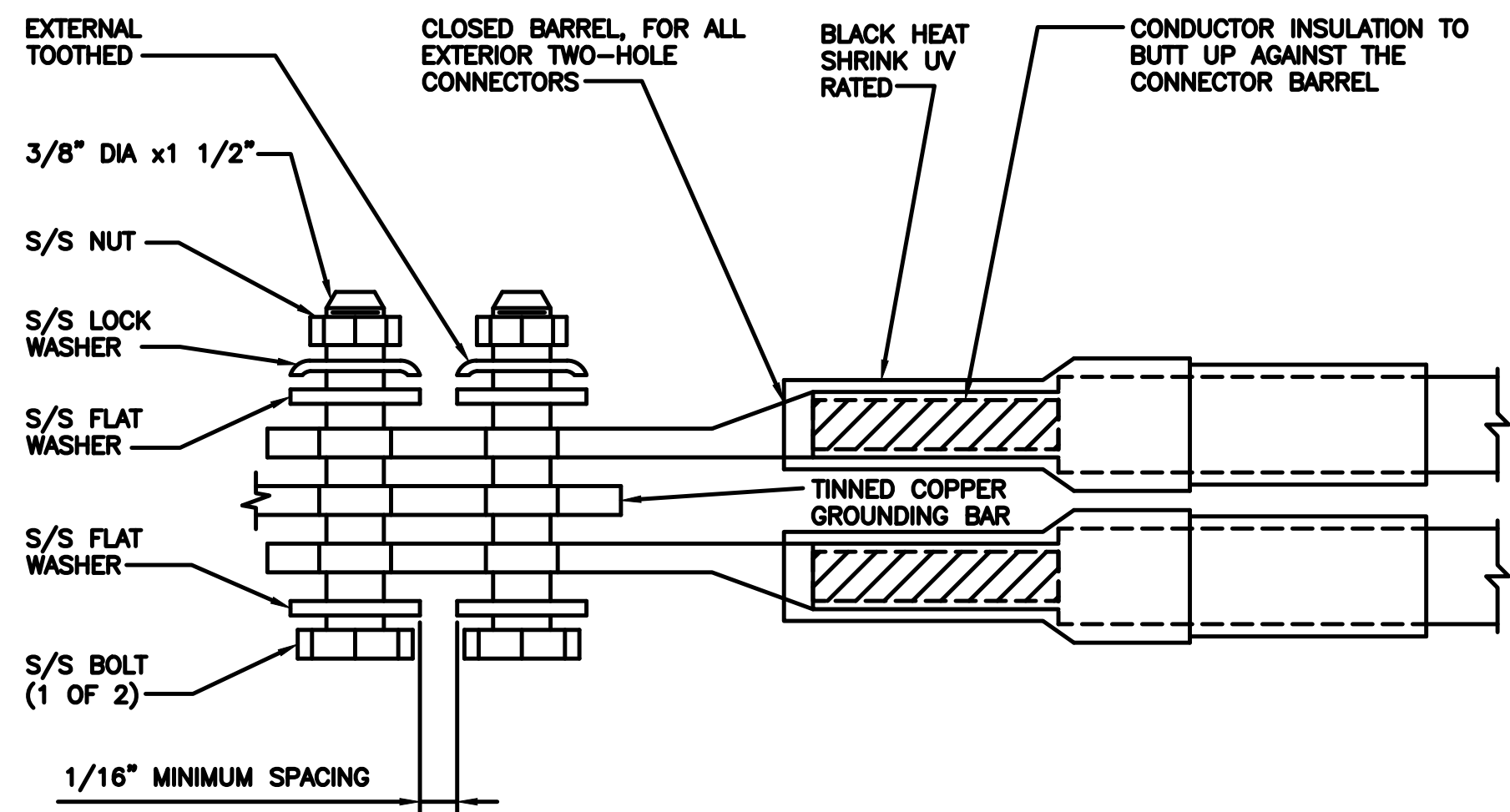
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SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER

**G-2**

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



TYPICAL GROUNDING NOTES

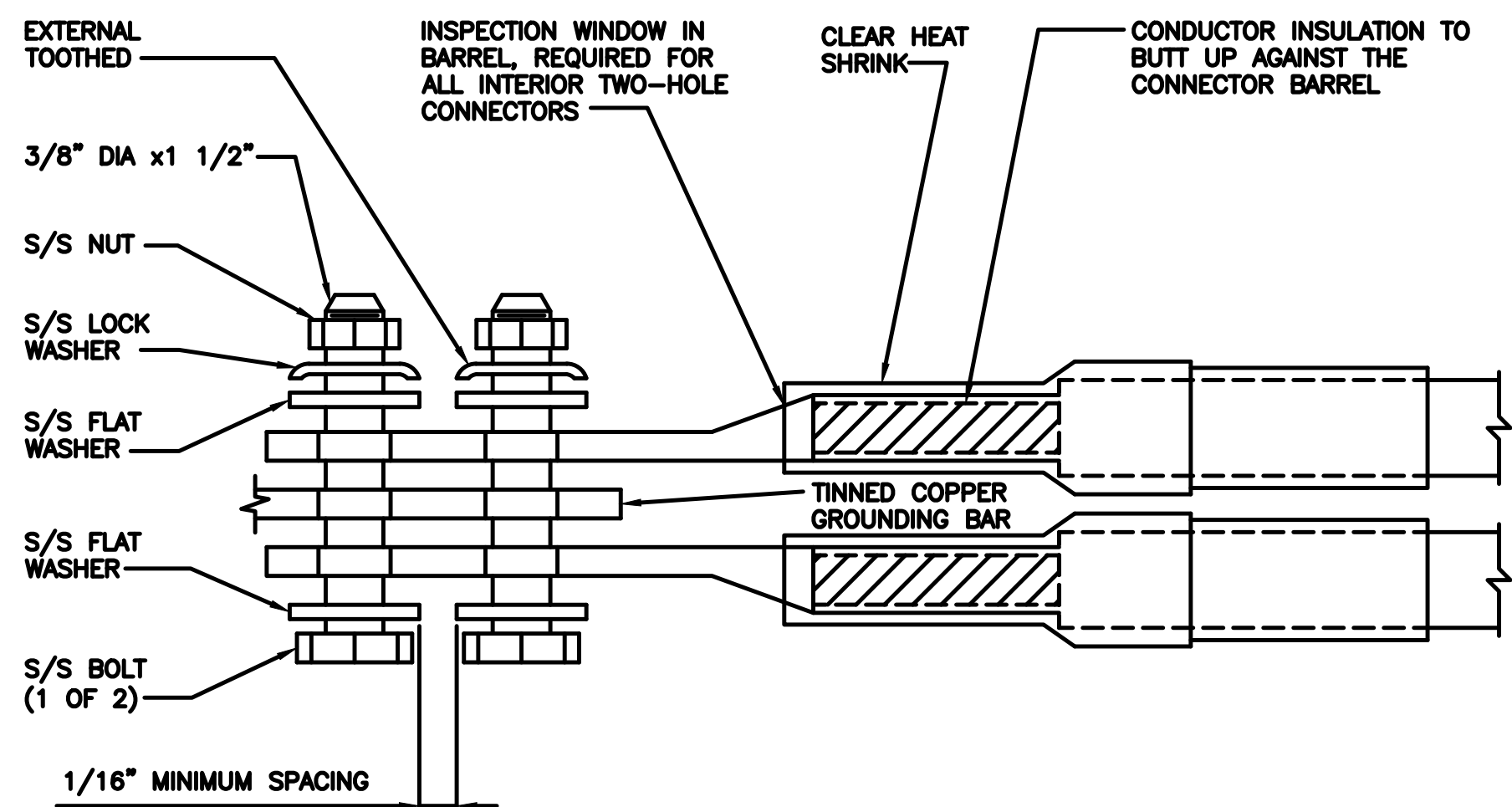
NO SCALE

1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE

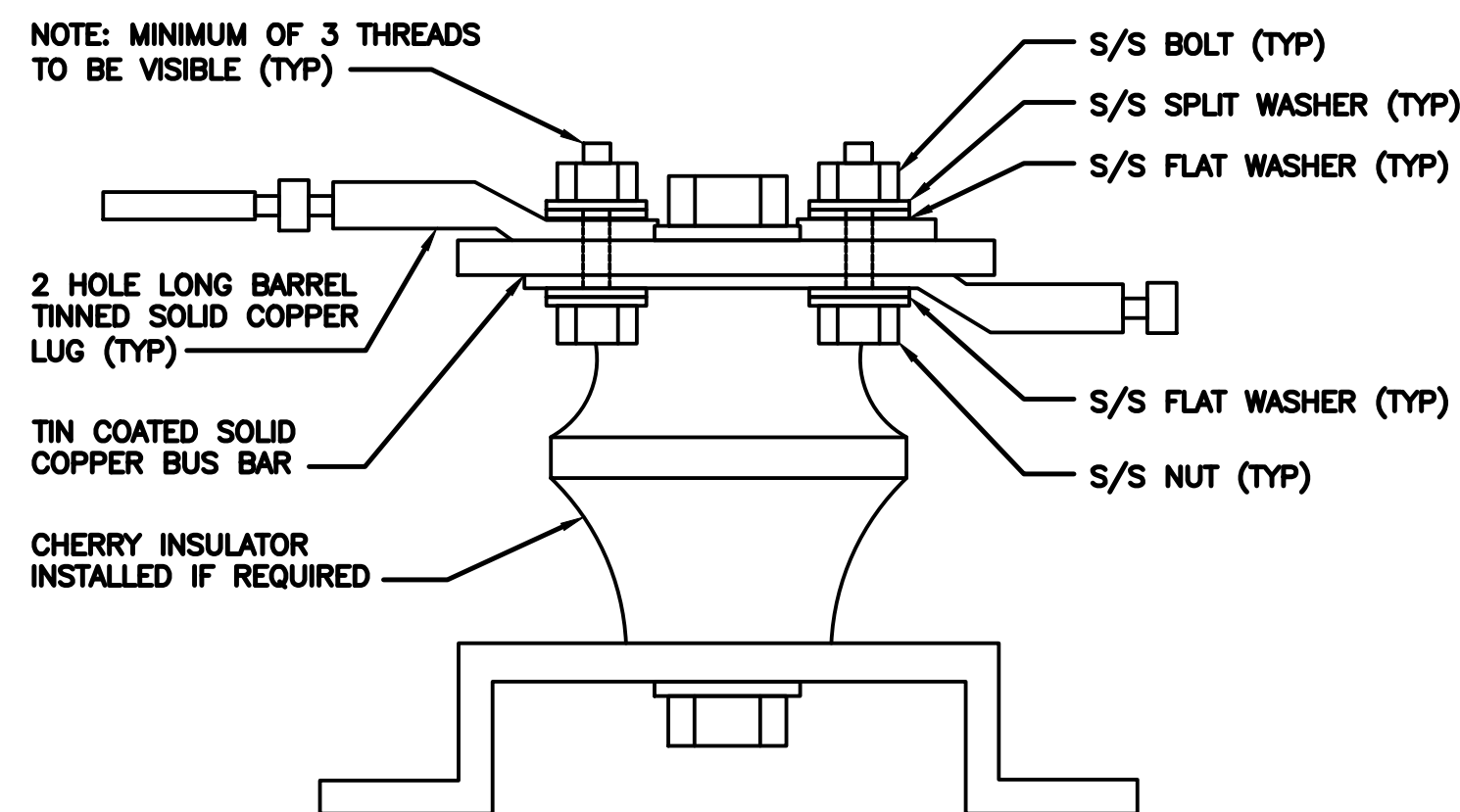
2



TYPICAL INTERIOR TWO HOLE LUG

NO SCALE

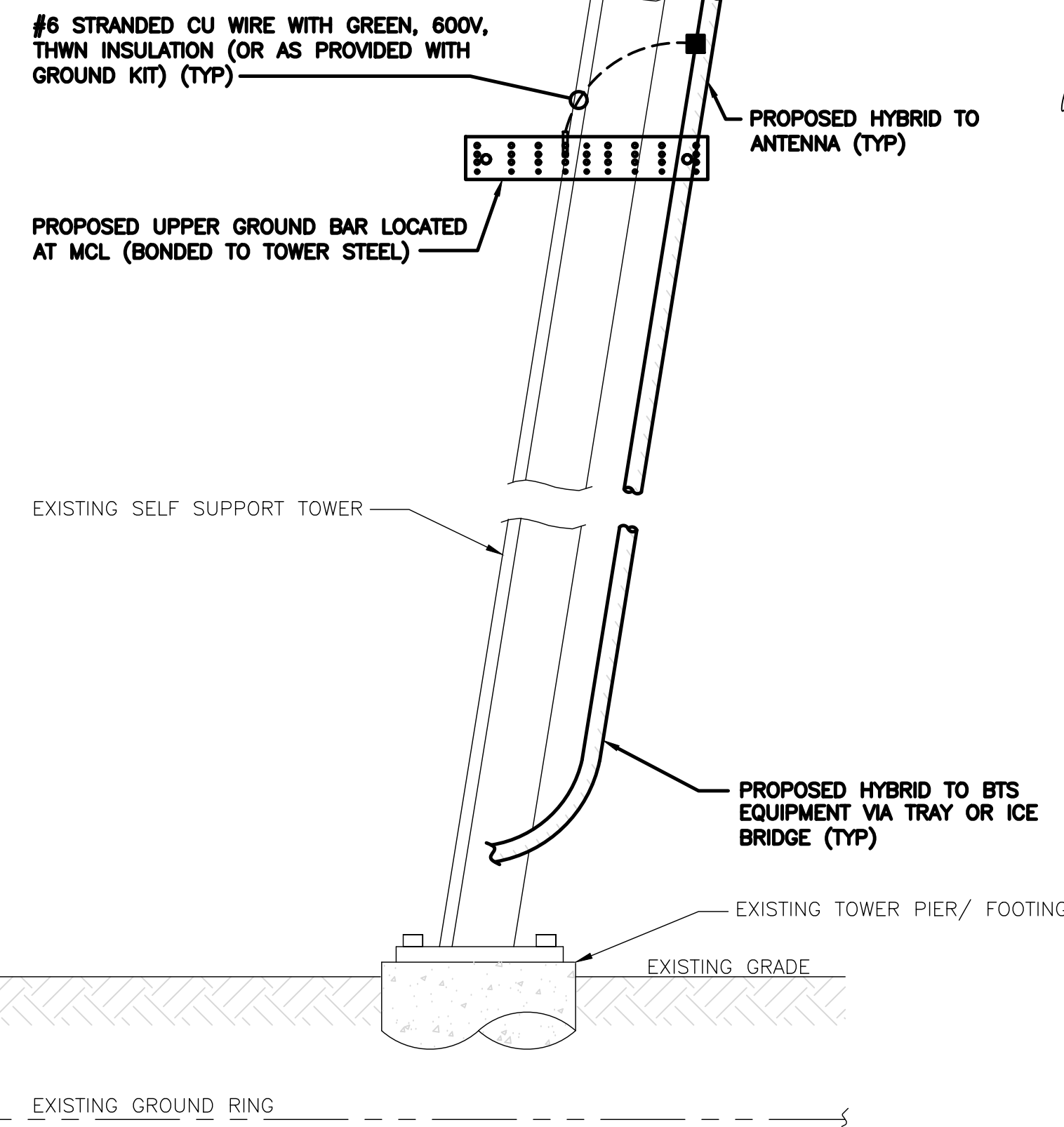
3



LUG DETAIL

NO SCALE

4



NOTES:

1. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
2. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

TYPICAL ANTENNA CABLE GROUNDING

NO SCALE

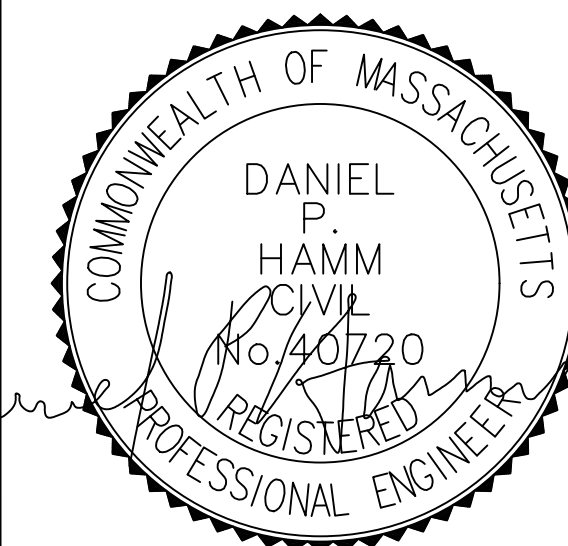
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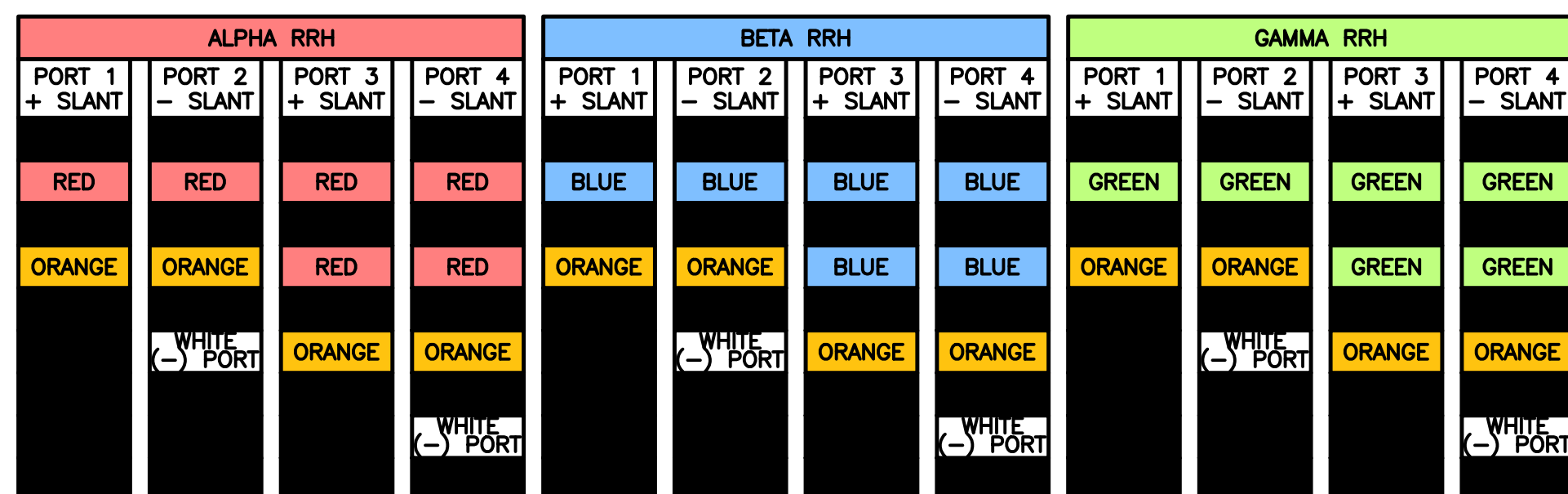
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G-3



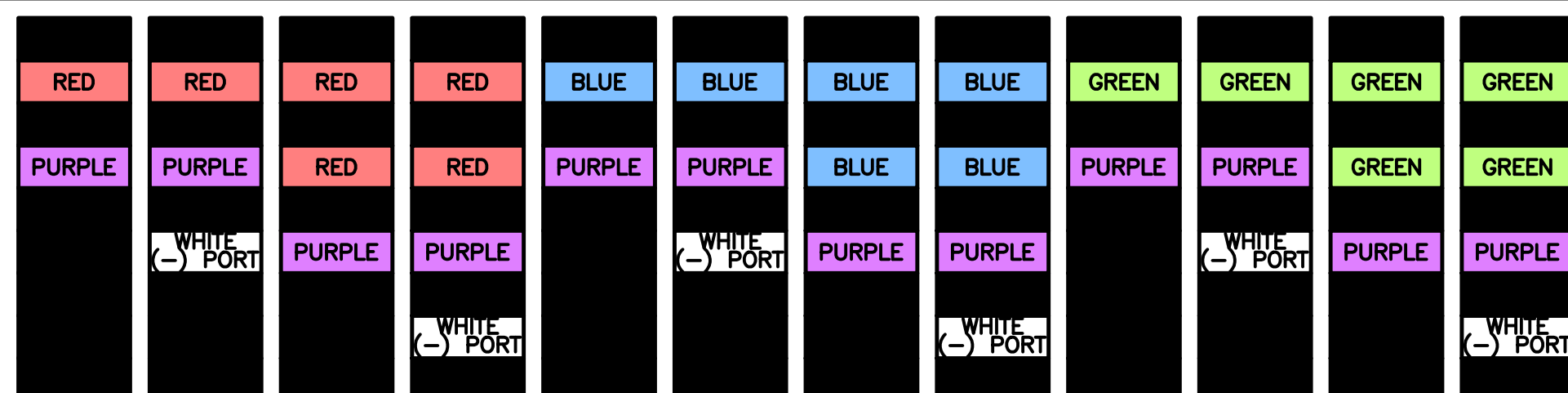
**HYBRID/DISCREET CABLES**

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

LOW-BAND RRH  
(600 MHz N71 BASEBAND) +  
(850 MHz N26 BAND) +  
(700 MHz N29 BAND) - OPTIONAL PER MARKET  
ADD FREQUENCY COLOR TO SECTOR BAND  
(CBRS WILL USE YELLOW BAND)

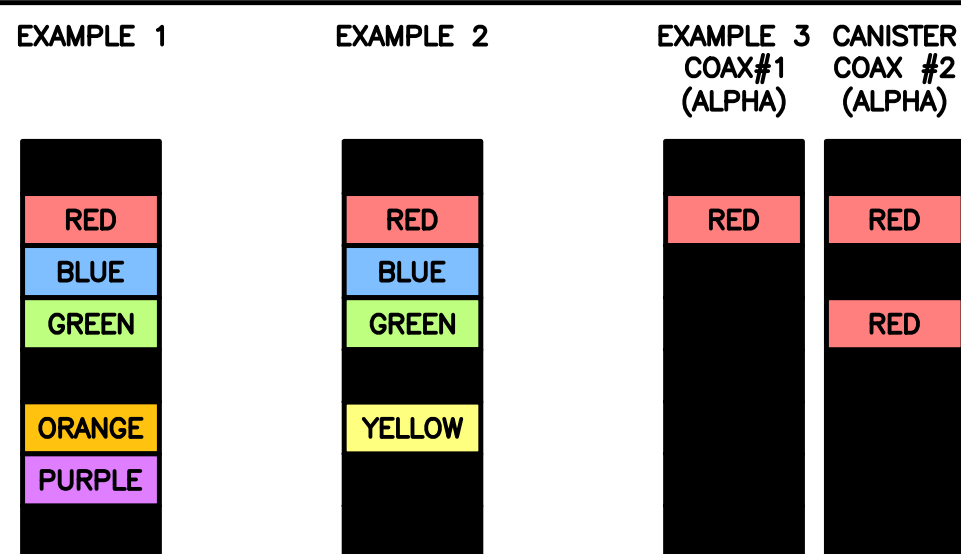


MID-BAND RRH  
(AWS BANDS N66+N70)  
ADD FREQUENCY COLOR TO SECTOR BAND  
(CBRS WILL USE YELLOW BANDS)



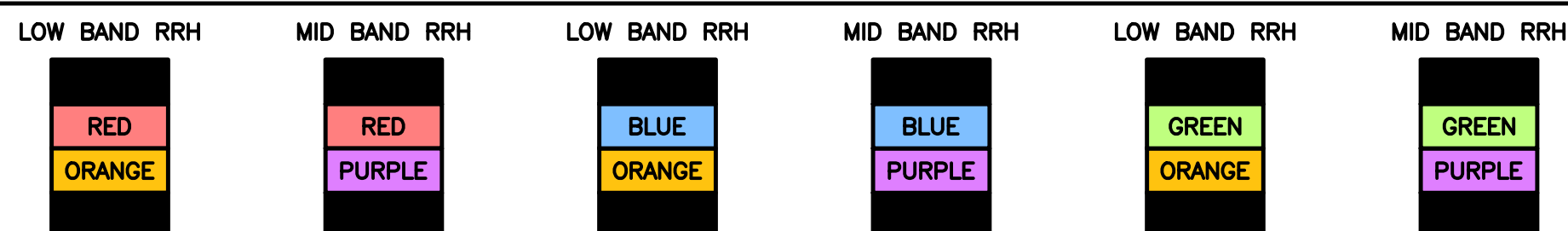
**HYBRID/DISCREET CABLES**

INCLUDE SECTOR BANDS BEING SUPPORTED  
ALONG WITH FREQUENCY BANDS.  
EXAMPLE 1 - HYBRID, OR DISCREET, SUPPORTS  
ALL SECTORS, BOTH LOW-BANDS AND  
MID-BANDS.  
EXAMPLE 2 - HYBRID, OR DISCREET, SUPPORTS  
CBRS ONLY, ALL SECTORS.  
EXAMPLE 3 - MAIN COAX WITH GROUND  
MOUNTED RRHS.



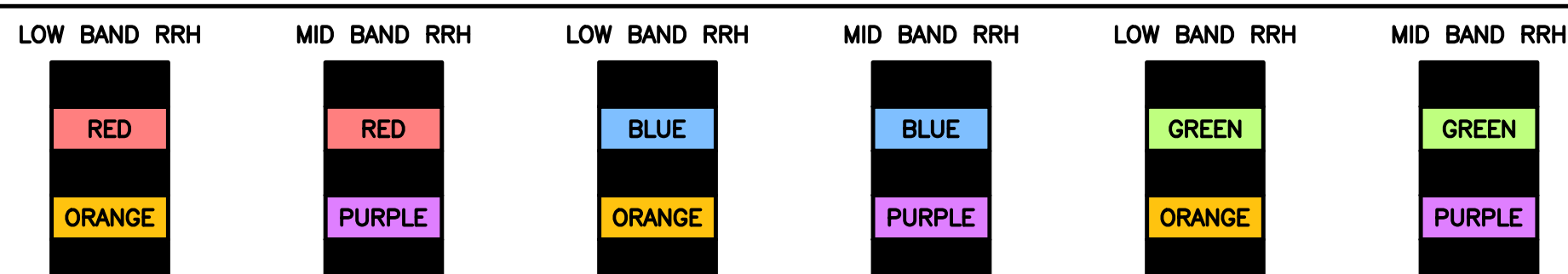
**FIBER JUMPERS TO RRHS**

LOW-BAND HHR FIBER CABLES HAVE SECTOR  
STRIPE ONLY.



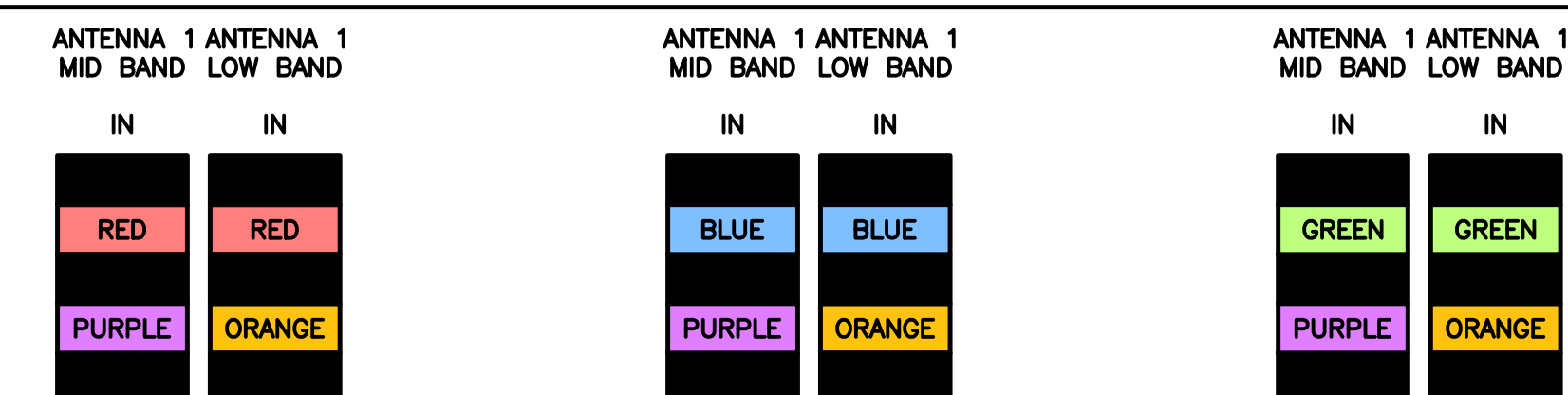
**POWER CABLES TO RRHS**

LOW-BAND RRH POWER CABLES HAVE SECTOR  
STRIPE ONLY.



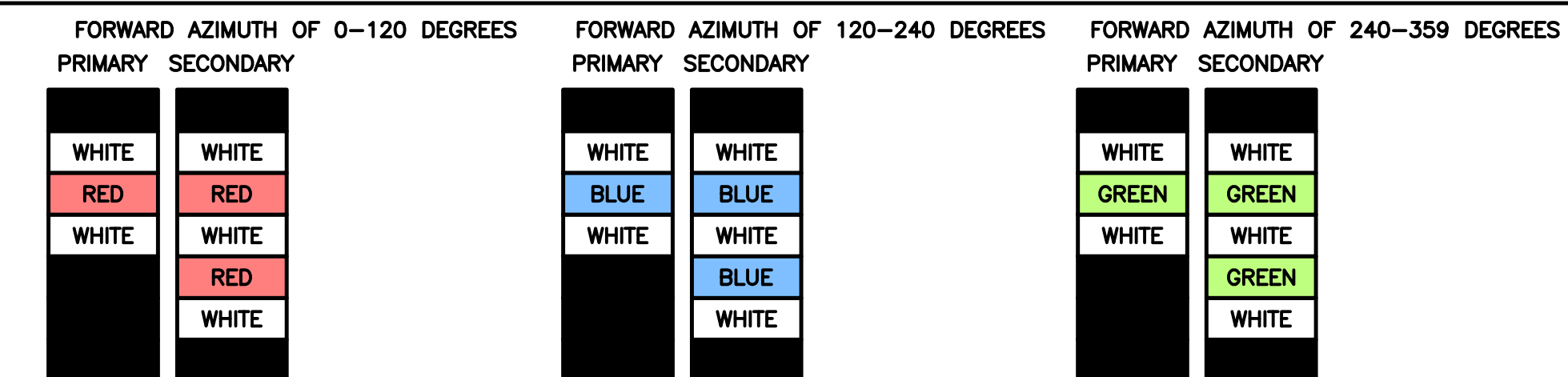
**RET MOTORS AT ANTENNAS**

RET CONTROL IS HANDLED BY THE MID-BAND  
RRH WHEN ONE SET OF RET PORTS EXIST ON  
ANTENNA.  
SEPARATE RET CABLES ARE USED WHEN  
ANTENNA PORTS PROVIDE INPUTS FOR BOTH  
LOW AND MID BANDS.



**MICROWAVE RADIO LINKS**

LINKS WILL HAVE A 1.5-2 INCH WHITE WRAP  
WITH THE AZIMUTH COLOR OVERLAPPING IN THE  
MIDDLE.  
ADD ADDITIONAL SECTOR COLOR BANDS FOR  
EACH ADDITIONAL MW RADIO.  
MICROWAVE CABLES WILL REQUIRE P-TOUCH  
LABELS INSIDE THE CABINET TO IDENTIFY THE  
LOCAL AND REMOTE SITE ID'S.



**RF CABLE COLOR CODES**

NO SCALE

1

**NOT USED**

NO SCALE

4

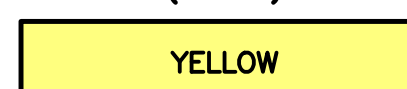
LOW BANDS (N71+N26)  
OPTIONAL - (N29)



AWS  
(N66+N70+H-BLOCK)



CBRS TECH  
(3 GHz)



NEGATIVE SLANT PORT  
ON ANT/RRH



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

NO SCALE

2

**NOT USED**

NO SCALE

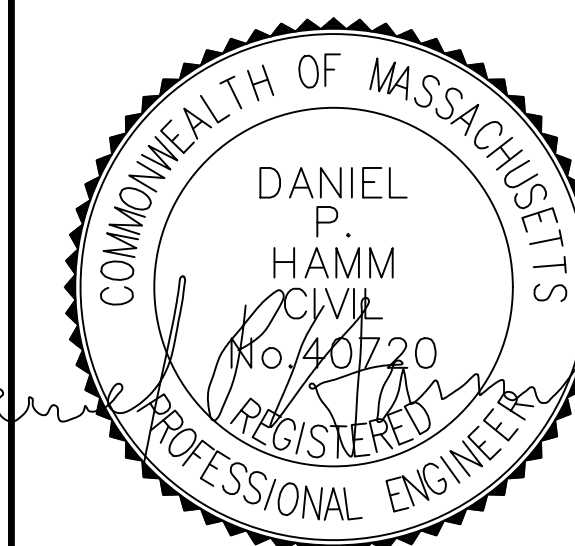
3

**dish**  
wireless.

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**HG**  
**HUDSON**  
Design Group LLC

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PS SMA DPH

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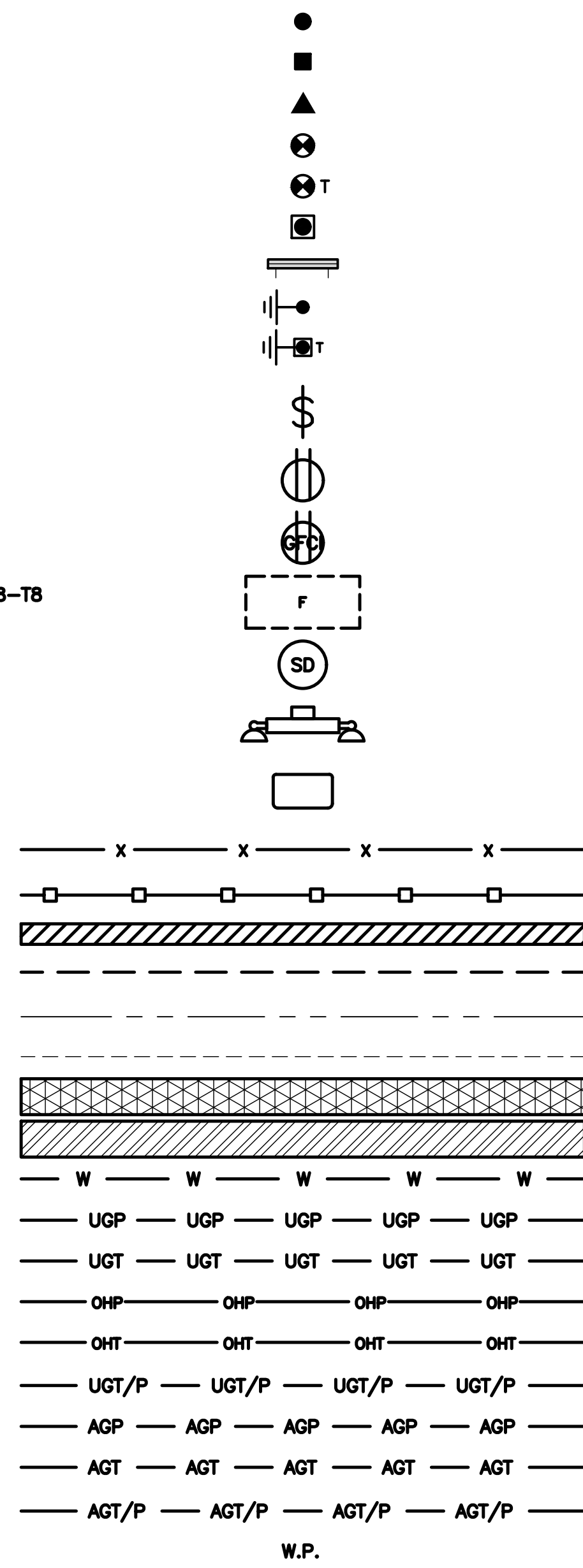
A&E PROJECT NUMBER  
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DISH Wireless L.L.C.  
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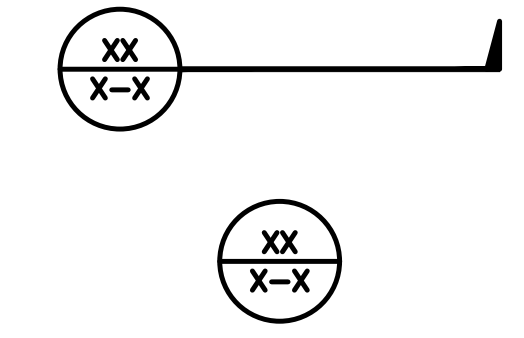
SHEET TITLE  
RF  
CABLE COLOR CODE

SHEET NUMBER  
**RF-1**

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



SECTION REFERENCE  
 DETAIL REFERENCE



**LEGEND**

AB ANCHOR BOLT  
 ABV ABOVE  
 AC ALTERNATING CURRENT  
 ADDL ADDITIONAL  
 AFF ABOVE FINISHED FLOOR  
 AFG ABOVE FINISHED GRADE  
 AGL ABOVE GROUND LEVEL  
 AIC AMPERAGE INTERRUPTION CAPACITY  
 ALUM ALUMINUM  
 ALT ALTERNATE  
 ANT ANTENNA  
 APPROX APPROXIMATE  
 ARCH ARCHITECTURAL  
 ATS AUTOMATIC TRANSFER SWITCH  
 AWG AMERICAN WIRE GAUGE  
 BATT BATTERY  
 BLDG BUILDING  
 BLK BLOCK  
 BLKG BLOCKING  
 BM BEAM  
 BTC BARE TINNED COPPER CONDUCTOR  
 BOF BOTTOM OF FOOTING  
 CAB CABINET  
 CANT CANTILEVERED  
 CHG CHARGING  
 CLG CEILING  
 CLR CLEAR  
 COL COLUMN  
 COMM COMMON  
 CONC CONCRETE  
 CONSTR CONSTRUCTION  
 DBL DOUBLE  
 DC DIRECT CURRENT  
 DEPT DEPARTMENT  
 DF DOUGLAS FIR  
 DIA DIAMETER  
 DIAG DIAGONAL  
 DIM DIMENSION  
 DWG DRAWING  
 DWL DOWEL  
 EA EACH  
 EC ELECTRICAL CONDUCTOR  
 EL ELEVATION  
 ELEC ELECTRICAL  
 EMT ELECTRICAL METALLIC TUBING  
 ENG ENGINEER  
 EQ EQUAL  
 EXP EXPANSION  
 EXT EXTERIOR  
 EW EACH WAY  
 FAB FABRICATION  
 FF FINISH FLOOR  
 FG FINISH GRADE  
 FIF FACILITY INTERFACE FRAME  
 FIN FINISH(ED)  
 FLR FLOOR  
 FDN FOUNDATION  
 FOC FACE OF CONCRETE  
 FOM FACE OF MASONRY  
 FOS FACE OF STUD  
 FOW FACE OF WALL  
 FS FINISH SURFACE  
 FT FOOT  
 FTG FOOTING  
 GA GAUGE  
 GEN GENERATOR  
 GFCI GROUND FAULT CIRCUIT INTERRUPTER  
 GLB GLUE LAMINATED BEAM  
 GLV GALVANIZED  
 GPS GLOBAL POSITIONING SYSTEM  
 GND GROUND  
 GSM GLOBAL SYSTEM FOR MOBILE  
 HDG HOT DIPPED GALVANIZED  
 HDR HEADER  
 HGR HANGER  
 HVAC HEAT/VENTILATION/AIR CONDITIONING  
 HT HEIGHT  
 IGR INTERIOR GROUND RING

IN INCH  
 INT INTERIOR  
 LB(S) POUND(S)  
 LF LINEAR FEET  
 LTE LONG TERM EVOLUTION  
 MAS MASONRY  
 MAX MAXIMUM  
 MB MACHINE BOLT  
 MECH MECHANICAL  
 MFR MANUFACTURER  
 MGB MASTER GROUND BAR  
 MIN MINIMUM  
 MISC MISCELLANEOUS  
 MTL METAL  
 MTS MANUAL TRANSFER SWITCH  
 MW MICROWAVE  
 NEC NATIONAL ELECTRIC CODE  
 NM NEWTON METERS  
 NO. NUMBER  
 # NUMBER  
 NTS NOT TO SCALE  
 OC ON-CENTER  
 OSHA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION  
 OPNG OPENING  
 P/C PRECAST CONCRETE  
 PCS PERSONAL COMMUNICATION SERVICES  
 PCU PRIMARY CONTROL UNIT  
 PRC PRIMARY RADIO CABINET  
 PP POLARIZING PRESERVING  
 PSF POUNDS PER SQUARE FOOT  
 PSI POUNDS PER SQUARE INCH  
 PT PRESSURE TREATED  
 PWR POWER CABINET  
 QTY QUANTITY  
 RAD RADIUS  
 RECT RECTIFIER  
 REF REFERENCE  
 REINF REINFORCEMENT  
 REQ'D REQUIRED  
 RET REMOTE ELECTRIC TILT  
 RF RADIO FREQUENCY  
 RMC RIGID METALLIC CONDUIT  
 RRH REMOTE RADIO HEAD  
 RRU REMOTE RADIO UNIT  
 RWY RACEWAY  
 SCH SCHEDULE  
 SHT SHEET  
 SIAD SMART INTEGRATED ACCESS DEVICE  
 SIM SIMILAR  
 SPEC SPECIFICATION  
 SQ SQUARE  
 SS STAINLESS STEEL  
 STD STANDARD  
 STL STEEL  
 TEMP TEMPORARY  
 THK THICKNESS  
 TMA TOWER MOUNTED AMPLIFIER  
 TN TOE NAIL  
 TOA TOP OF ANTENNA  
 TOC TOP OF CURB  
 TOF TOP OF FOUNDATION  
 TOP TOP OF PLATE (PARAPET)  
 TOS TOP OF STEEL  
 TOW TOP OF WALL  
 TVSS TRANSIENT VOLTAGE SURGE SUPPRESSION  
 TYP TYPICAL  
 UG UNDERGROUND  
 UL UNDERWRITERS LABORATORY  
 UNO UNLESS NOTED OTHERWISE  
 UMTS UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM  
 UPS UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)  
 VIF VERIFIED IN FIELD  
 W WIDE  
 W/ WITH  
 WD WOOD  
 WP WEATHERPROOF  
 WT WEIGHT

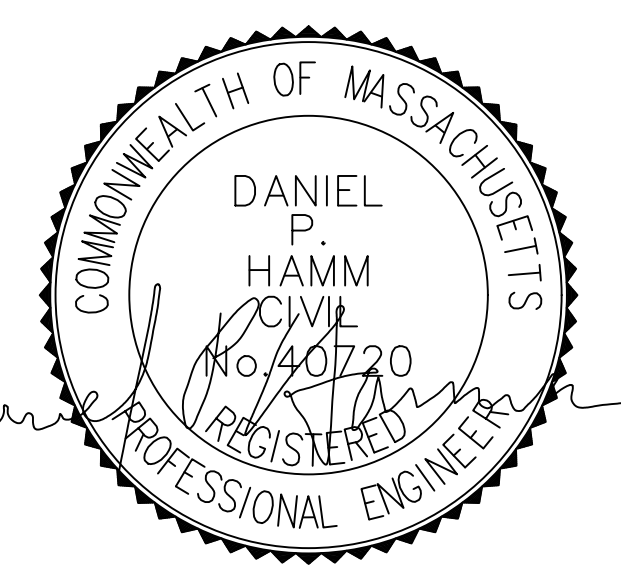
**ABBREVIATIONS**



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 344 ROUTE 6  
 NORTH TRURO, MA 02652

SHEET TITLE  
 LEGEND AND ABBREVIATIONS

SHEET NUMBER  
**GN-1**



**SITE ACTIVITY REQUIREMENTS:**

- 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.
- "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.
- 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.
- 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).
- 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."
- 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.
- 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.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.
- 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.
- ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
- 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.
- 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.
- 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.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- 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.
- 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.
- 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.
- 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
- 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:**

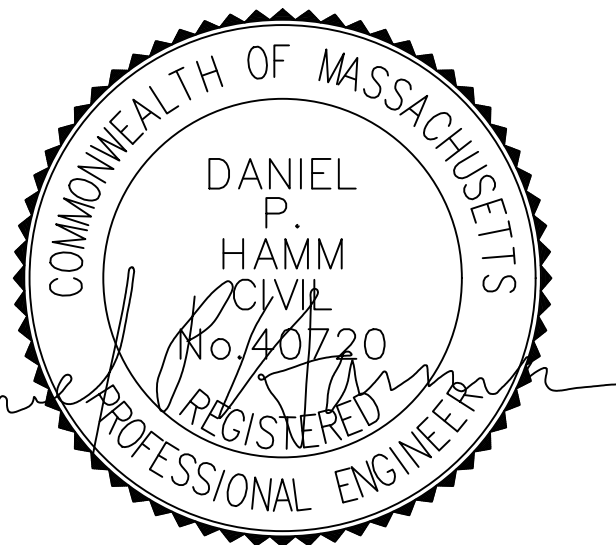
- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION  
CARRIER:DISH Wireless L.L.C.  
TOWER OWNER:TOWER OWNER
- THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- 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.
- 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.
- 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
- 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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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.

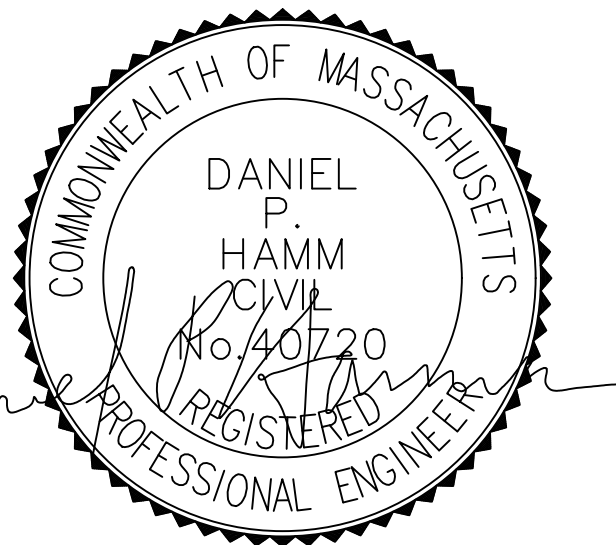
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL 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&E PROJECT NUMBER  
BOBOS00592A

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBOS00592A  
CROWN CASTLE BU#841273  
344 ROUTE 6  
NORTH TRURO, MA 02652

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER  
**GN-3**

**GROUNDING NOTES:**

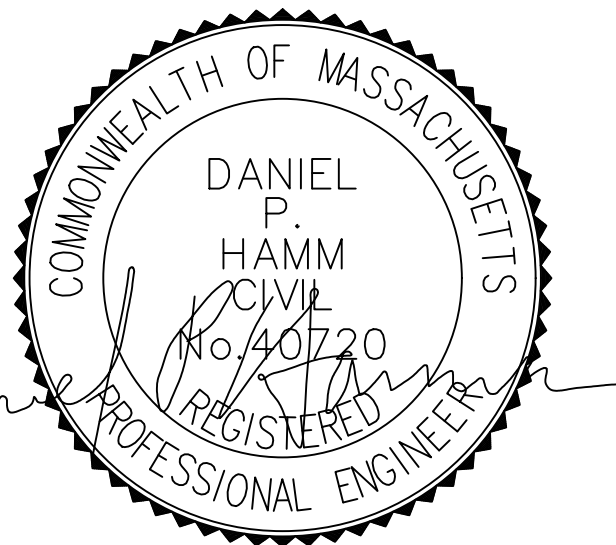
1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING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