



June 21, 2021

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

**RE: Request of DISH Wireless LLC for an Order to Approve the Shared Use of an Existing Tower
74 Goodrich Lane, Portland, CT 06480
Latitude: 41° 36' 29.90" / Longitude: -72° 35' 29.56"**

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, DISH Wireless LLC ("DISH") hereby requests an order from the Connecticut Siting Council ("Council") to approve the shared use by DISH of an existing telecommunication tower at 74 Goodrich Lane in Portland (the "Property"). The existing 160-foot monopole tower is owned by Crown Castle International Corp. ("Crown Castle"). The underlying property is also owned by Crown Castle. DISH requests that the Council find that the proposed shared use of the Crown Castle tower satisfies the criteria of C.G.S. §16-50aa and issue an order approving the proposed shared use. This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times. A copy of this filing is being sent to The Honorable Susan Bransfield, First Selectwoman for the Town of Portland, and John Herring, Zoning Enforcement Officer for the Town of Portland.

Background

The existing Crown Castle facility consists of a 160 - foot monopole tower within a 3600 square foot leased area. Verizon currently maintains antennas at the 158-foot level, Sprint/T-Mobile currently maintains antennas at both the 150 and 136-foot levels, Clearwire Corp currently maintains antennas at the 142-foot level, and AT&T currently maintains antennas at the 118-foot level. Verizon's equipment is located southeast of the tower, Sprint/T-Mobile's equipment is in two locations (east and west of the tower), Clearwire Corp's equipment is located south of the tower, and AT&T's equipment is located southeast of the tower.

DISH is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. DISH and Crown Castle have agreed to the proposed shared use of the 74 Goodrich Lane tower pursuant to mutually acceptable terms and conditions. Likewise, DISH and Crown Castle have agreed to the proposed installation of equipment cabinets on the ground on the northeast side of the tower within the existing compound. Crown Castle has authorized DISH to apply for all necessary permits and approvals that may be required to share the existing tower.

DISH proposes to install three (3) antennas, six (6) RRUs, one (1) antenna platform, and one (1) hybrid cable. In addition, DISH will install a ground equipment cabinet on a 5'x7' equipment platform. Included in the Construction Drawings are DISH's project specifications for locations of all proposed site improvements. The Construction Drawings also contain specifications for DISH's proposed antennas and ground work.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, "if the Council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such a shared use." DISH respectfully submits that the shared use of the tower satisfies these criteria.

A. Technical Feasibility. The existing Crown Castle tower is structurally capable of supporting DISH's proposed improvements. The proposed shared use of this tower is, therefore, technically feasible. A Feasibility Structural Analysis Report ("Structural Report") prepared for this project confirms that this tower can support DISH's proposed loading. A copy of the Structural Report has been included in this application.

B. Legal Feasibility. Under C.G.S. § 16-50aa, the Council has been authorized to issue order approving the shared use of an existing tower such as the Crown Castle tower. This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. In addition, § 16-50x(a) directs the Council to "give such consideration to the other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing tower facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use of the Crown Castle tower would have a minimal environmental effect for the following reasons:

1. The proposed installation will have no visual impact on the area of the tower. DISH's equipment cabinet would be installed within the existing facility compound. DISH's shared use of this tower therefore will not cause any significant change or alteration in the physical or environmental characteristics of the existing site.
2. Operation of DISH's antennas at this site would not exceed the RF emissions standard adopted by the Federal Communications Commission ("FCC"). Included in the EME report of this filing are the approximation tables that demonstrate that DISH's proposed facility will operate well within the FCC RF emissions safety standards.
3. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the

Melanie A. Bachman

June 21, 2021

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proposed installations would not generate any increased traffic to the Crown Castle facility other than periodic maintenance. The proposed shared use of the Crown Castle tower, would, therefore, have a minimal environmental effect, and is environmentally feasible.

D. Economic Feasibility. As previously mentioned, DISH has entered into an agreement with Crown Castle for the shared use of the existing facility subject to mutually agreeable terms. The proposed tower sharing is, therefore, economically feasible.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting DISH's full array of three (3) antennas, six (6) RRUs, one (1) antenna platform, one (1) hybrid cable and all related equipment. DISH is not aware of any public safety concerns relative to the proposed sharing of the existing Crown Castle tower

Conclusion

For the reasons discussed above, the proposed shared use of the existing Crown Castle tower at 74 Goodrich Lane satisfies the criteria stated in C.G.S. §16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use.

Sincerely,



Richard Zajac
Site Acquisition Specialist
4545 East River Road, Suite 320
West Henrietta, NY 14586
(585) 445-5896
richard.zajac@crowncastle.com

Melanie A. Bachman

June 21, 2021

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CC:

The Honorable Susan Bransfield, First Selectwoman (*via email only to sbransfield@portlandct.org*)

First Selectwoman's Office

33 East Main Street, 2nd Floor

Portland, CT 06480

860-342-6715

John Herring, Zoning Enforcement Officer (*via email only to zeo@portlandct.org*)

Land Use Office

33 East Main Street, 1st Floor

Portland, CT 06480

860-342-6719

Zajac, Richard

From: Zajac, Richard
Sent: Monday, June 21, 2021 12:33 PM
To: sbransfield@portlandct.org
Subject: Connecticut Siting Council Shared Use application notification
Attachments: CSC Shared Use Application - 74 Goodrich Lane.pdf

Good afternoon,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 74 Goodrich Lane in Portland.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

RICH ZAJAC

Site Acquisition Specialist

T: (585) 445-5896 M: (607) 346-7212

F: (724) 416-4461

CROWN CASTLE

4545 East River Road, Suite 320

West Henrietta, NY 14586

Zajac, Richard

From: Zajac, Richard
Sent: Monday, June 21, 2021 12:34 PM
To: zeo@portlandct.org
Subject: Connecticut Siting Council Shared Use application notification
Attachments: CSC Shared Use Application - 74 Goodrich Lane.pdf

Good afternoon,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 74 Goodrich Lane in Portland.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

RICH ZAJAC

Site Acquisition Specialist

T: (585) 445-5896 M: (607) 346-7212

F: (724) 416-4461

CROWN CASTLE

4545 East River Road, Suite 320

West Henrietta, NY 14586



3 Corporate Dr, Suite 101
Clifton Park, NY 12065

Phone: (201) 236-9224
Fax: (724) 416-6112
www.crowncastle.com

Crown Castle Letter of Authorization

CT - CONNECTICUT SITING COUNCIL

Re: Tower Share Application

Crown Castle telecommunications site at: 74 GOODRICH LANE, PORTLAND, CT 06480

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

Crown Site ID/Name: 806382/HRT 082 943274

Customer Site ID: BOBDL00050A/CT-CCI-T-806382

Site Address: 74 GOODRICH LANE, PORTLAND, CT 06480

Crown Castle USA Inc.

By:  Date: 5/13/21

Anne Marie Zsamba

Project Manager – Site Acquisition

Exhibit A

Original Facility Approval

DOCKET NO. 58

AN APPLICATION OF HARTFORD CELLULAR
COMPANY FOR A CERTIFICATE OF
ENVIRONMENTAL COMPATIBILITY AND PUBLIC
NEED FOR THE CONSTRUCTION, MAINTENANCE,
AND OPERATION OF FACILITIES TO PROVIDE
CELLULAR SERVICE IN HARTFORD, TOLLAND AND
MIDDLESEX COUNTIES.

CONNECTICUT SITING
COUNCIL

July 11, 1986.

D E C I S I O N A N D O R D E R

Pursuant to the foregoing opinion, the Connecticut Siting Council (Council) hereby directs that a Certificate of Environmental Compatibility and Public Need as provided by Section 16-50k of the General Statutes of Connecticut (CGS) be issued to the Hartford Cellular Company for the construction, maintenance, and operation of cellular mobile phone telecommunication towers and associated equipment in the towns of Glastonbury, Haddam, Hartford, Portland, Rocky Hill, Somers, Vernon, Windsor, and Willington subject to the conditions below.

- 1) The proposed Bloomfield and Middlefield sites are rejected without prejudice.
- 2) The antennas on the Glastonbury tower shall be mounted no higher than the 180' level of this existing tower.
- 3) The Portland and Rocky Hill towers shall be monopoles.
- 4) The towers shall be no taller than necessary to provide the proposed service, and in no event shall exceed total heights, including antennas, of
 - a) 193' at the Haddam site;
 - b) 173' at the Portland site;

- c) 153' at the Rocky Hill site;
- d) 173' at the Somers site;
- e) 173' at the Vernon site;
- f) 153' at the Willington site;
- g) 173' at the Windsor site.

5) The Hartford site receive antennas shall be mounted below the top of the high point of the building to preclude visibility.

6) Any future actions requiring the removal of the existing Glastonbury tower to be shared by the certificate holder shall also apply to the equipment mounted on that tower by the certificate holder, regardless of that equipment's status under Chapter 277a of the CGS.

7) The certificate holder shall submit a development and management (D&M) plan for the Haddam, Portland, Rocky Hill, Somers, Vernon and Windsor sites pursuant to Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies (RSA), except that irrelevant items in Section 16-50j-76 need only be identified as such. In addition to the requirements of Section 16-50j-76, the D&M plan shall provide plans for evergreen screening around the fenced perimeter at the Haddam, Somers, Vernon, and Windsor sites. The D&M plan shall include a proposal for painting the approved monopole structures to blend with the sky. The D&M plan must be approved prior to facility construction. Any changes to specifications in the D&M plan must be approved by the Council prior to facility operation.

8) All certified facilities shall be constructed, operated, and maintained as specified in the Council's record and in the

site plan required by order number 7.

9) The certificate holder shall comply with any future radiofrequency (RF) standards promulgated by state or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facilities granted in this decision shall continue to be in compliance with such standards.

10) The certificate holder shall permit public or private entities to share space on the towers approved herein, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. In addition to complying with Section 16-50j-73 of the RSA, the certificate holder shall notify the Council of the addition of any equipment to any approved tower.

11) A fence not lower than 8' shall surround each tower and associated equipment.

12) Unless necessary to comply with order 13, no lights shall be installed on any of these towers.

13) The facilities' construction and any future tower sharing shall be in accordance with all applicable federal, state, and municipal laws and regulations. Shared uses by entities not subject to jurisdiction pursuant to Section 16-50k of the CGS shall be subject to all applicable federal, state, and municipal laws and regulations.

14) Construction activities shall take place during daylight working hours.

15) This decision and order shall be void and the towers and associate equipment shall be dismantled and removed, or reapplication for any new use shall be made to the Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction.

16) This decision and order shall be void if all construction authorized herein is not completed within three years of the issuance of this decision, or within three years of the completion of any appeal if appeal of this decision is taken, unless otherwise approved by the Council.

Pursuant to CGS Section 16-50p, we hereby direct that a copy of the decision and order shall be served on each person listed below. A notice of the issuance shall be published in the Hartford Courant, Middletown Press, Manchester Journal Inquirer, and the Willimantic Chronicle.

The parties to the proceeding are:

Metro Mobile (applicant)
5 Eversley Avenue
Norwalk, Connecticut 06855
ATTN: Armand Mascioli
General Manager

Howard L. Slater, Esq. (its attorneys)
Scott A. Gursky, Esq.
Byrne, Slater, Sandler,
Shulman & Rouse, P.C.
111 Pearl Street
Hartford, Connecticut 06103

Richard Rubin, Esq.
Fleischman and Walsh, P.C.
1725 N Street, N.W.
Washington, D. C. 20036

Exhibit B

Property Card

Summary

Parcel Number 084-0009
 Alternate ID/Map Block Lot 00354100
 Location Address 74 GOODRICH LANE
 Legal Description
 (Note: Not to be used on legal documents.)
 Zoning R25
 Land Use (431) Communication Towers
 Acres 0.083
 Property Class 400
 Neighborhood 600
 Tax District 0
 Vol/Page 284/47

Map Not Available



Owner

Owner
 HALE JOAN J
 CROWN ATLANTIC LLC
 PMB 353
 4017 WASHINGTON RD
 MCMURRAY PA 15317

Valuation

	Appraised Values	Assessed Values
Current Land	\$74,900	\$52,430
Current Building	\$139,200	\$97,440
Current Total	\$214,100	\$149,870

Recent Sales In Area

Sale date range:

From:

06/16/2018

To:

06/16/2021

Sales by Neighborhood

Land

Descr	P	LN	CD	Acres	Frontage	Depth	Base Size	Base Rate	Sq ft.	Incr / Decr	Land-Val
PRIMARY	A	1	1	0.083	0	0	0.75	174,000	3,615	104000 / 83300	74,940

Total Acres:

0.0830

Total Land-Value:

74,940

Accessory Information

Card 1

Descr	Full Description	Type	Quantity	Year	Size	Area	Grade	Mods	Cond	F	MD%	Value
FENCE CHAI	FENCE CHAIN	FN1	1	1996	8 x 260	2,080	C-AVERAGE		3	3	0	2,570
TOWER CELL	TOWER CELLULAR	TT4	1	1978	1 x 160	160	C-AVERAGE		4	4	0	115,200
MACH SHED	FRAME MACHINERY SHED	SH1	1	1978	1 x 200	200	A-VERY GOOD +		4	4	0	12,000
MACH SHED	FRAME MACHINERY SHED	SH1	1	2000	1 x 96	96	B-GOOD		4	4	0	4,030
PAVING CON	PAVING CONCRETE MAT/SLAB	PC3	1	1996	1 x 2640	2,640	B-GOOD		3	3	0	5,350

Permits

Date	Number	Amount	Purpose
3/4/2021	21-91	20,000	OTHER
5/1/2019	19-149	10,000	OTHER
3/7/2019	19-68	20,000	73 CREP
12/12/2018	18-594	20,000	OTHER
8/2/2017	17-350	15,000	OTHER
2/14/2017	17-56	20,000	OTHER
1/31/2017	17-41	8,000	51 BLDG
8/26/2016	16-363	8,000	51 BLDG
11/12/2015	15-615	15,000	BLDG
11/19/2014	14-499	15,000	BLDG
10/15/2013	13-575	8,000	BLDG
12/21/2012	12-703	3,800	BLDG
7/5/2012	12-339	25,000	BLDG
4/4/2011	10051	10,000	BLDG
6/11/2010	9855	7,000	BLDG
1/14/2010	9715	15,000	BLDG
6/10/2008	9241	15,000	BLDG
11/9/1999	6148	38,600	BLDG

Photos



No data available for the following modules: Sales, Residential, Other Dwelling Features, Commercial, Interior/Exterior, Other Features, Tax History, Additions, Sketches.

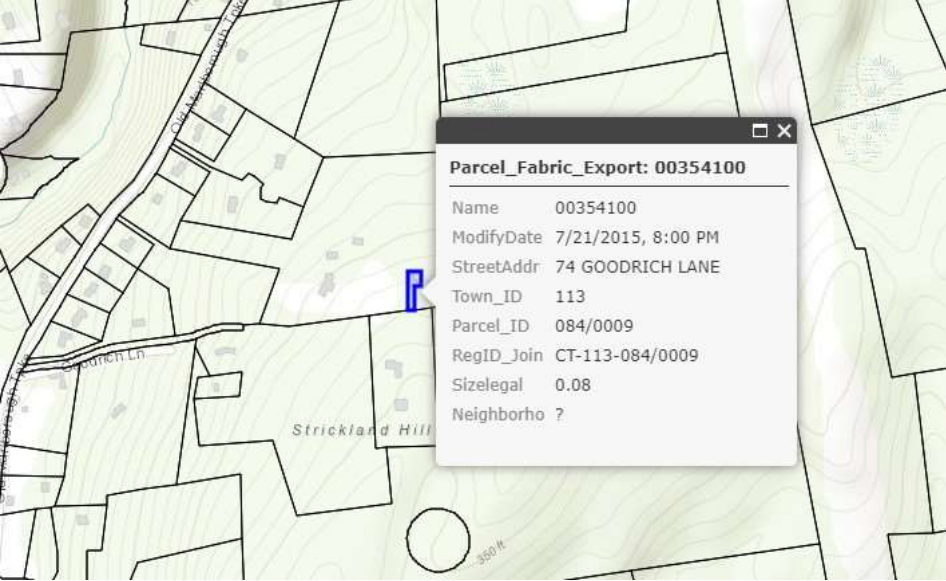
The Town of Portland Assessor makes every effort to produce the most accurate information possible. No warranties, expressed or implied are provided for the data herein, its use or interpretation. The assessment information is from the last certified tax roll. All other data is subject to change.

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

[Last Data Upload: 6/16/2021, 1:13:01 AM](#)

Developed by
 Schneider
GEOSPATIAL

Version 2.3.125



Parcel_Fabric_Export: 00354100

Name	00354100
ModifyDate	7/21/2015, 8:00 PM
StreetAddr	74 GOODRICH LANE
Town_ID	113
Parcel_ID	084/0009
RegID_Join	CT-113-084/0009
Sizelegal	0.08
Neighborho	?

Exhibit C

Construction Drawings



DISH WIRELESS, LLC. SITE ID:

BOBDL00050A

DISH WIRELESS, LLC. SITE ADDRESS:

**74 GOODRICH LANE
PORTLAND, CT 06480**

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:	
<ul style="list-style-type: none"> • INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR) • INSTALL (1) PROPOSED PLATFORM • 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:	
<ul style="list-style-type: none"> • 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 CIENA BOX (IF REQUIRED) • EXISTING METER SOCKET ON EXISTING H-FRAME TO BE UTILIZED 	

SITE INFORMATION	PROJECT DIRECTORY
PROPERTY OWNER: RIVERA, WAYNE	APPLICANT: DISH WIRELESS, LLC. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
ADDRESS: 58 GOODRICH LN PORTLAND, CT 06480	TOWER OWNER: CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (877) 486-9377
TOWER TYPE: MONOPOLE	SITE DESIGNER: INFINIGY 2500 W. HIGGINS RD. STE. 500 HOFFMAN ESTATES, IL 60169 (847) 648-4088
TOWER CO SITE ID: 806382	SITE ACQUISITION: NICHOLAS CURRY TBD
TOWER APP NUMBER: 553285	CONSTRUCTION MANAGER: JAVIER SOTO TBD
COUNTY: MIDDLESEX	RF ENGINEER: BOSSENER CHARLES
LATITUDE (NAD 83): 41° 36' 29.90" N 41.608306 N	
LONGITUDE (NAD 83): -72° 35' 29.56" W -72.591556 W	
ZONING JURISDICTION: CT-CONNECTICUT SITING COUNCIL	
ZONING DISTRICT: R-15	
PARCEL NUMBER: PORT-000084-000000-000009	
OCCUPANCY GROUP: U	
CONSTRUCTION TYPE: V-B	
POWER COMPANY: CONNECTICUT LIGHT & POWER	
TELEPHONE COMPANY: CROWN CASTLE	



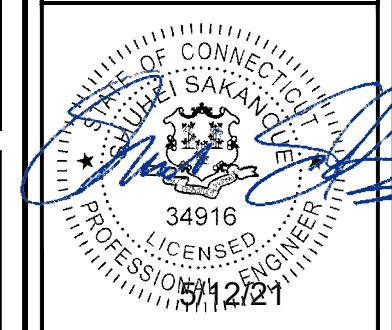
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 |
HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4088 | FAX: 518-690-0793
WWW.INFINIGY.COM



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

DRAWN BY: RCD	CHECKED BY: SS	APPROVED BY: CJW
---------------	----------------	------------------

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



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

GENERAL NOTES

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

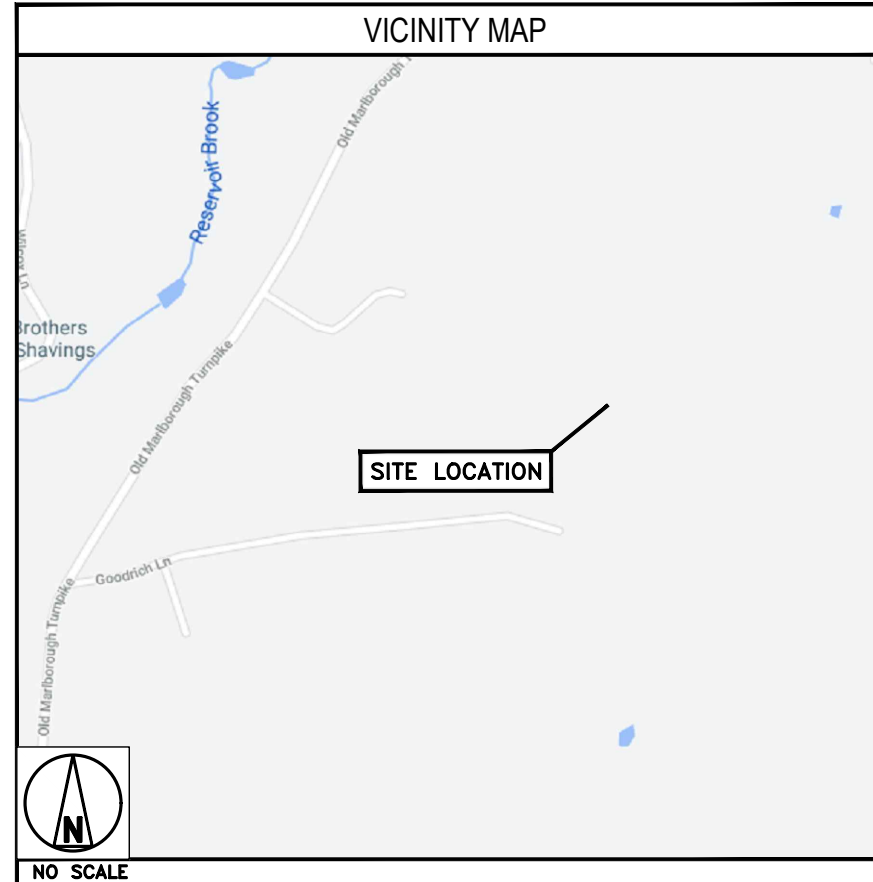
11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

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

DIRECTIONS

DIRECTIONS FROM HARTFORD-BRAINARD AIRPORT:

DEPART AND HEAD TOWARD MAXIM RD, TURN LEFT ONTO MAXIM RD, BEAR RIGHT ONTO BRAINARD RD, TAKE THE RAMP ON THE RIGHT FOR US-5 N / CT-15 N / WILBUR CROSS HWY N, AT EXIT 90, HEAD RIGHT ON THE RAMP FOR CT-2 EAST TOWARD NORWICH, AT EXIT 7, HEAD LEFT ON THE RAMP FOR CT-17 SOUTH TOWARD PORTLAND, TURN LEFT ONTO SAGE HOLLOW RD, BEAR LEFT ONTO CORNWALL ST, TURN LEFT ONTO OLD MARLBOROUGH TPKE, TURN RIGHT ONTO GOODRICH LN, ARRIVE AT 74 GOODRICH LANE, PORTLAND, CT 06480



CONNECTICUT CODE COMPLIANCE

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

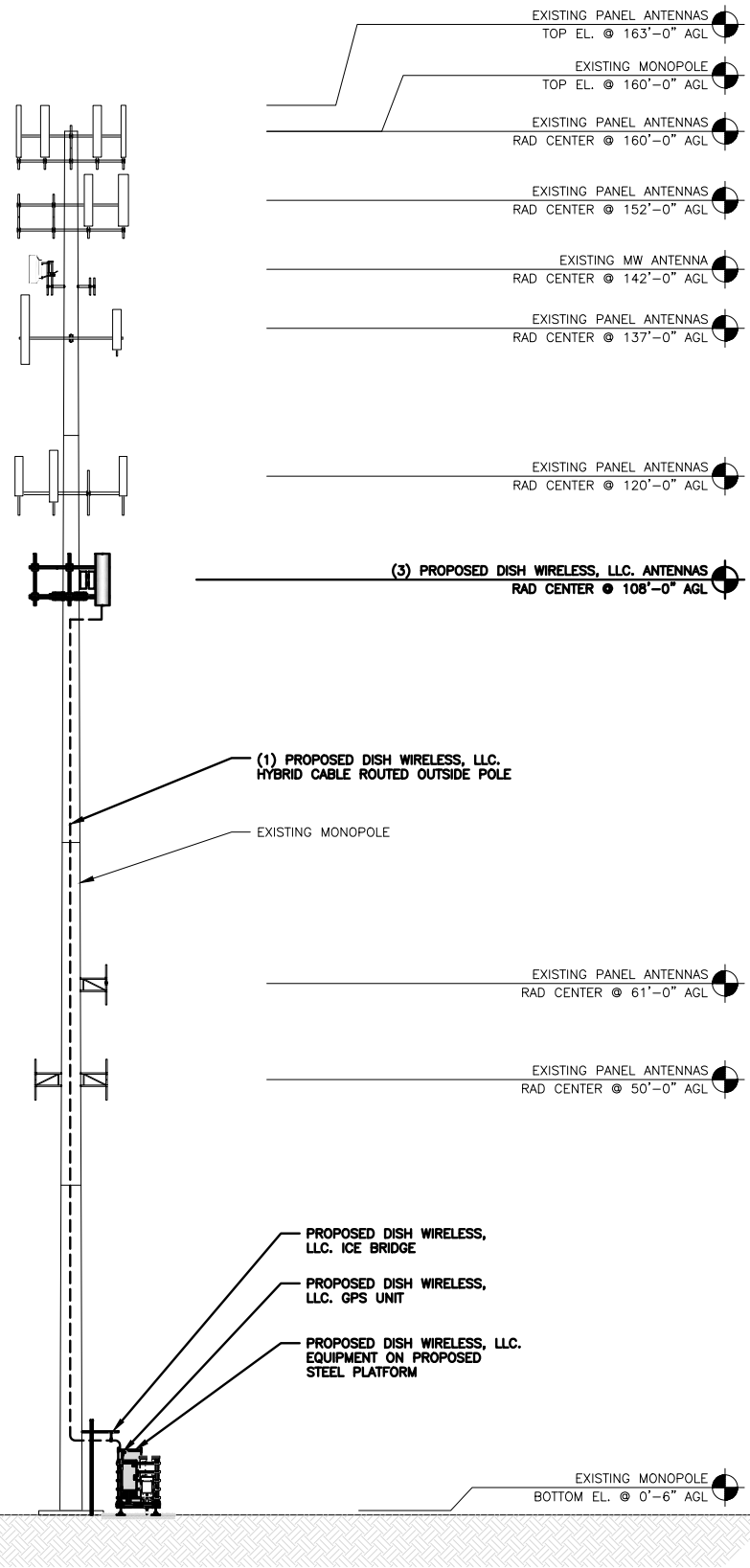
CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

SHEET INDEX

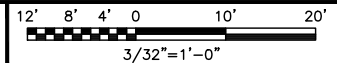
SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
A-1	OVERALL AND ENLARGED SITE PLAN
A-2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A-3	EQUIPMENT PLATFORM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
E-1	ELECTRICAL ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE,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

NOTES

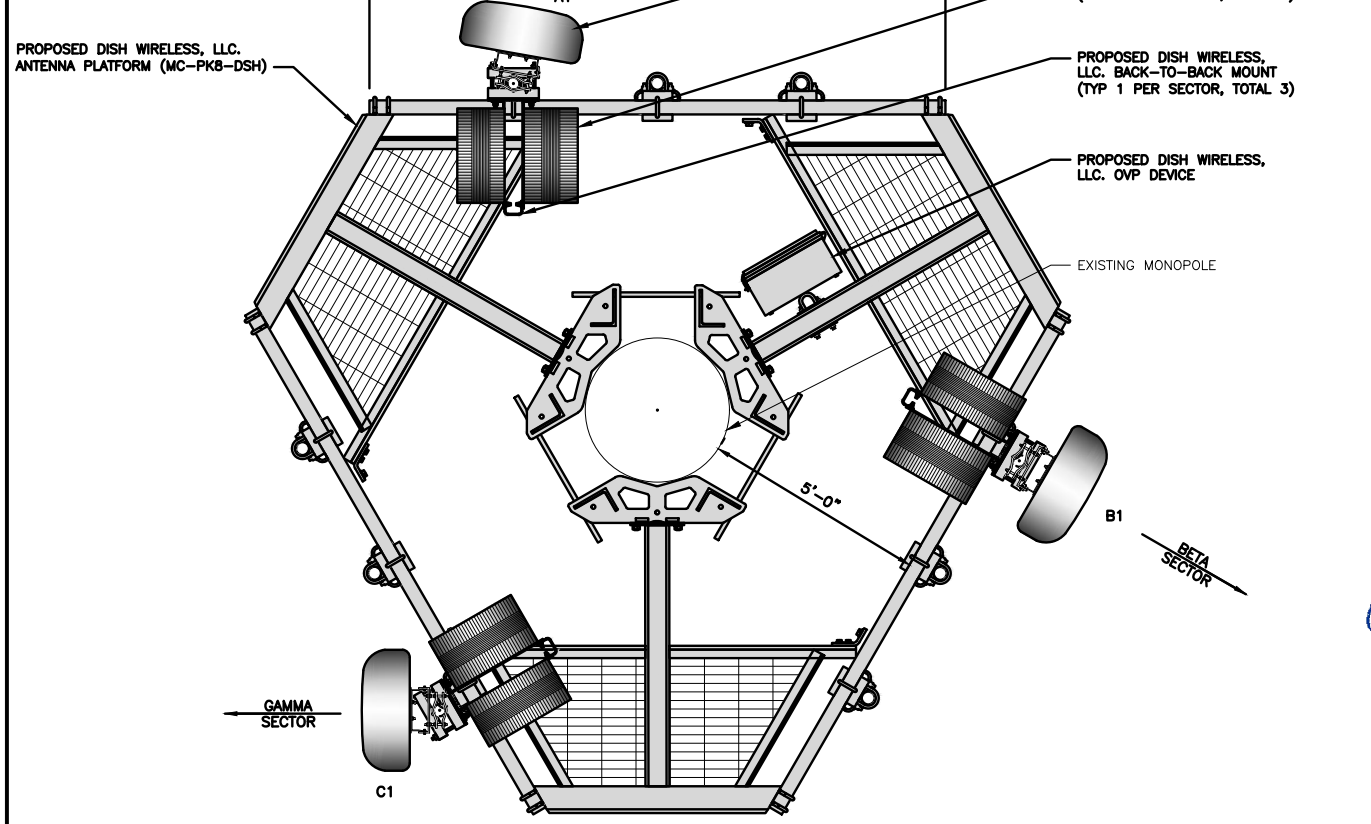
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.



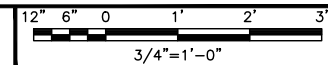
PROPOSED SOUTH ELEVATION



1



ANTENNA LAYOUT



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZMUTH	RAD CENTER	
ALPHA	A1	PROPOSED	JMA WIRELESS - MX08FRO665-20	5G	72.0" x 20.0"	10°	108'-0"	(1) HIGH-CAPACITY HYBRID CABLE (158' LONG)
BETA	B1	PROPOSED	JMA WIRELESS - MX08FRO665-20	5G	72.0" x 20.0"	120°	108'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS - MX08FRO665-20	5G	72.0" x 20.0"	270°	108'-0"	

- NOTES**
1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
 2. ANTENNA OR 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.

SECTOR	POSITION	RRH		NOTES
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY	
ALPHA	A1	FUJITSU - TA08025-B604	5G	1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS. 2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.
	A1	FUJITSU - TA08025-B605	5G	
BETA	B1	FUJITSU - TA08025-B604	5G	
	B1	FUJITSU - TA08025-B605	5G	
GAMMA	C1	FUJITSU - TA08025-B604	5G	
	C1	FUJITSU - TA08025-B605	5G	

ANTENNA SCHEDULE

NO SCALE

3



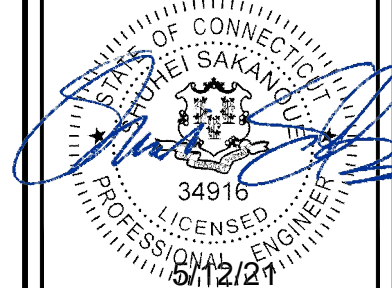
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DRAWN BY: RCD
CHECKED BY: SS
APPROVED BY: CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
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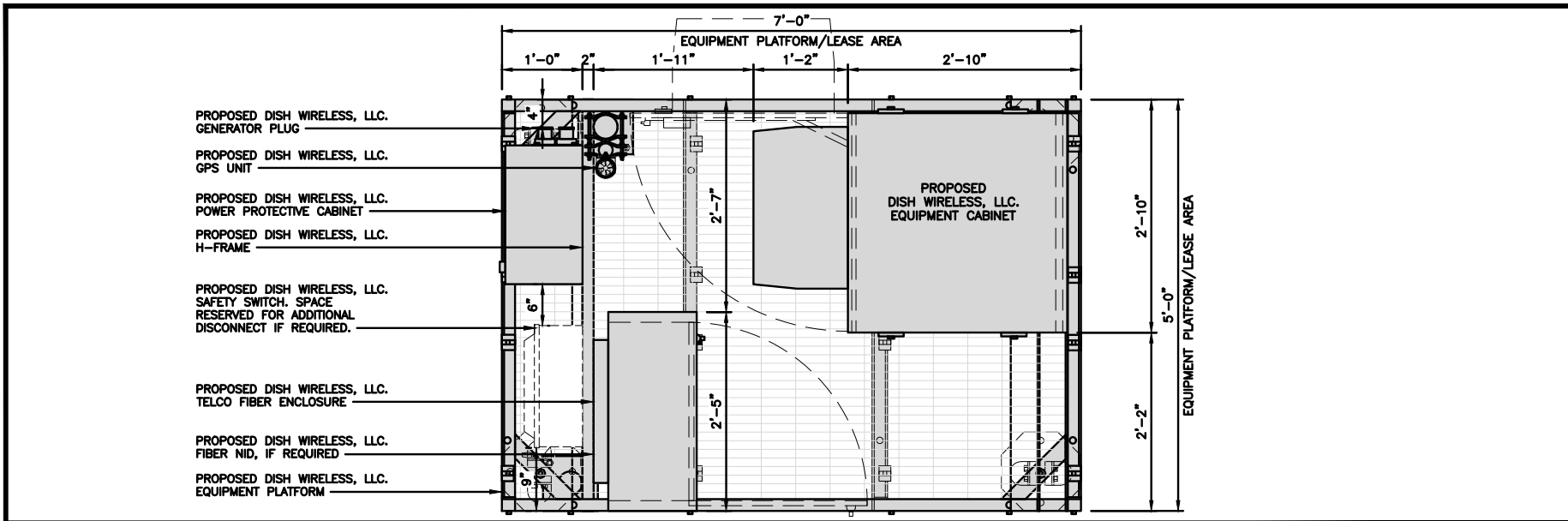
A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

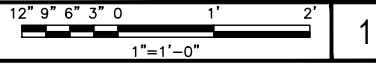
SHEET TITLE
ELEVATION, ANTENNA
LAYOUT AND SCHEDULE

SHEET NUMBER

A-2

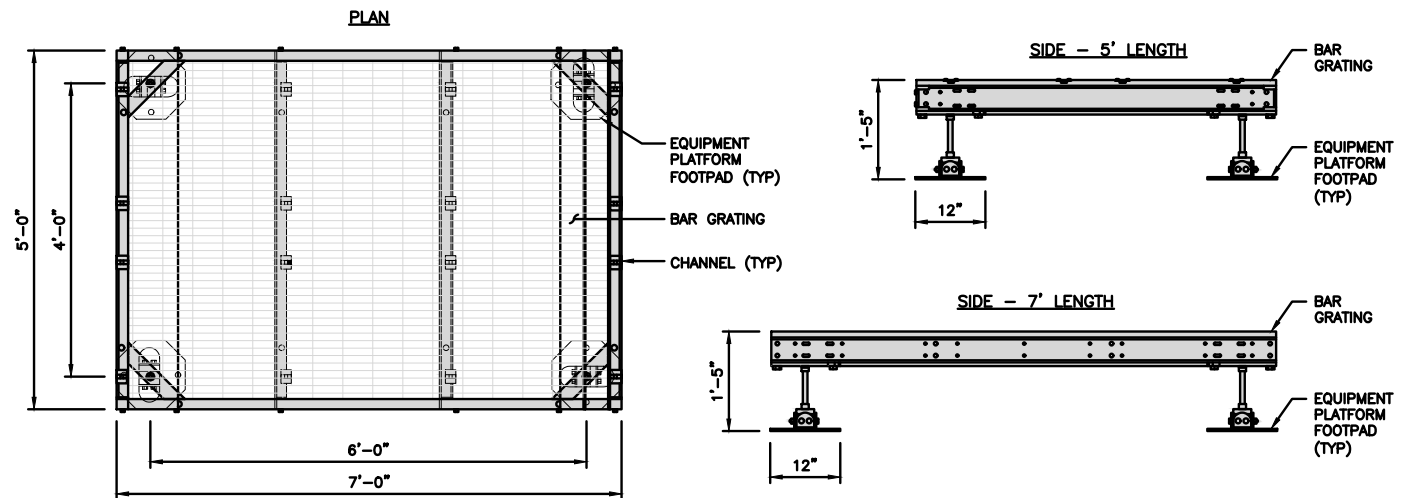


PLATFORM EQUIPMENT PLAN



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

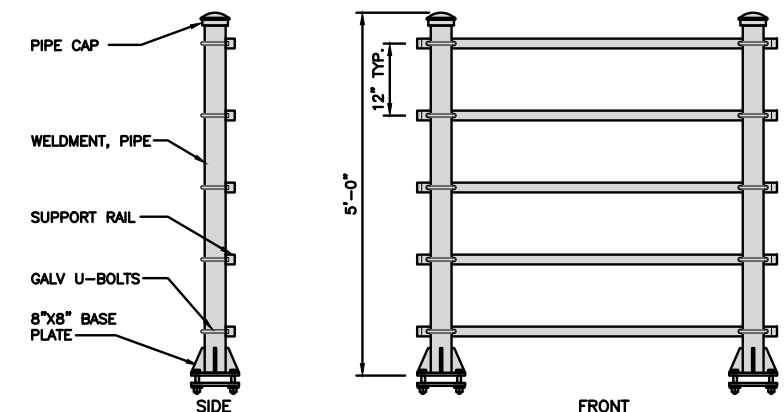
NOTE:
GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"



PLATFORM DETAIL

NO SCALE 2

KENWOOD T1701KT5-5S H-FRAME	
UNISTRUT/SUPPORT RAIL	5
WEIGHT/ VOLUME	173.6 LBS



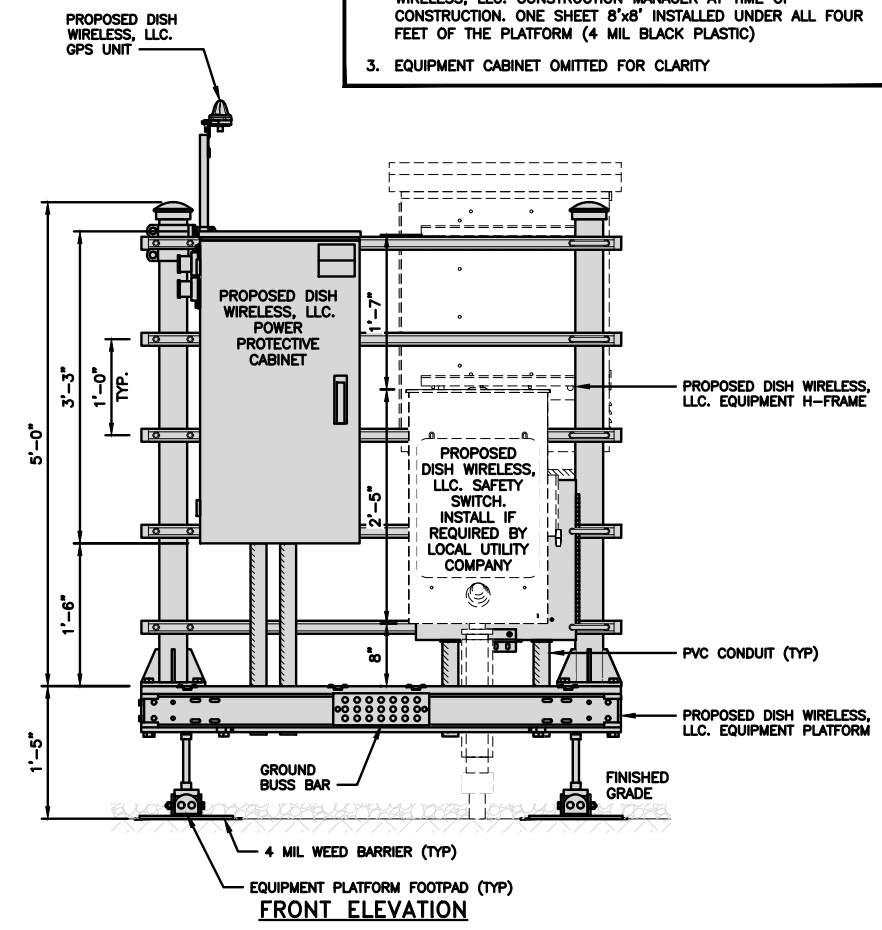
H-FRAME DETAIL

NO SCALE 3

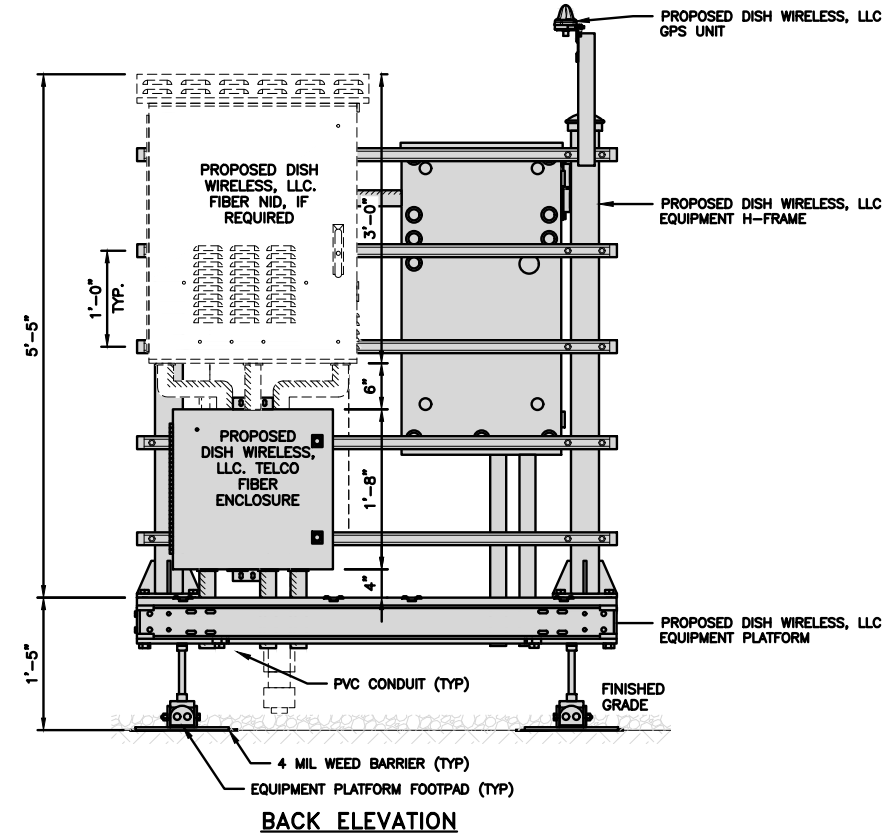
NOT USED

NO SCALE 4

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

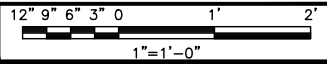


FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION



5



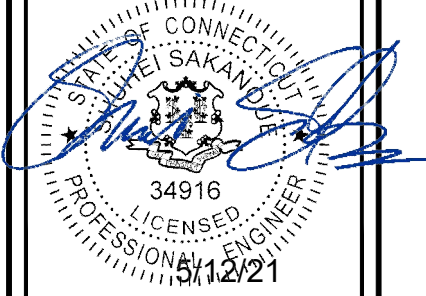
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RCD	SS	CJW

RFDS REV #: N/A

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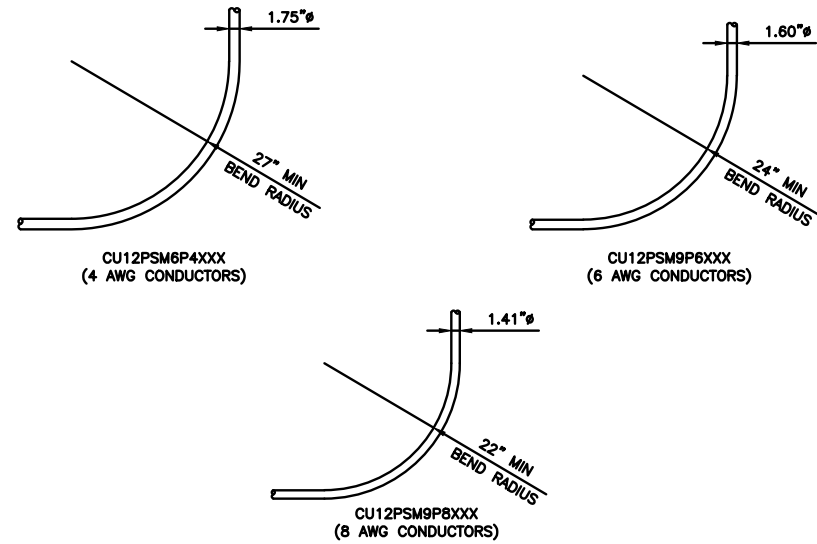
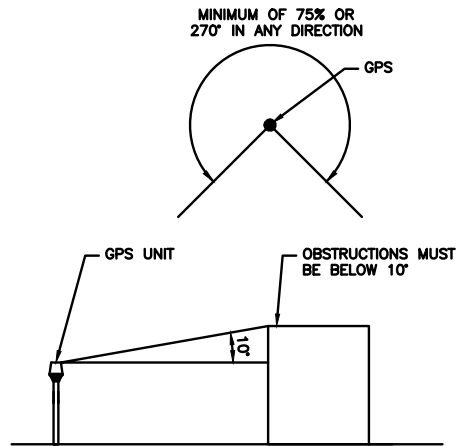
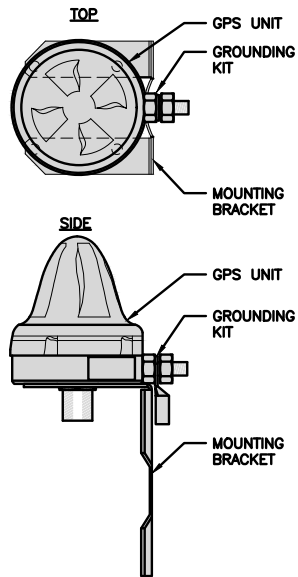
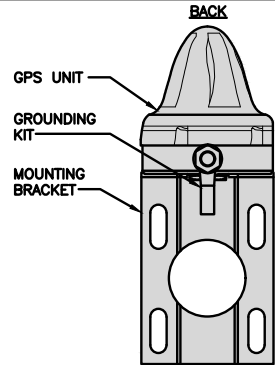
A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

ROSENBERGER GPSGLONASS-36-N-S	
DIMENSION (DIA x H)	69mm x 98.5mm
WEIGHT (WITH ACCESSORIES)	515.74g
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1559 MHz ~ 1610.5MHz



GPS ANTENNA 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.

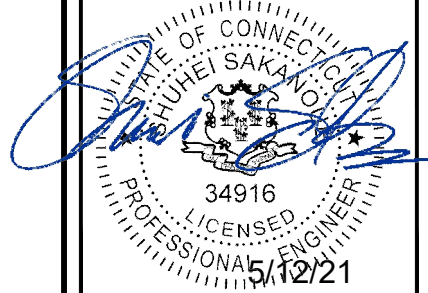
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**CROWN
CASTLE**

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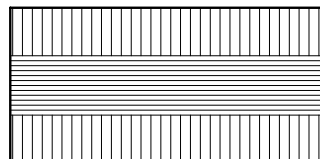
DISH WIRELESS, LLC.
PROJECT INFORMATION
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74 GOODRICH LANE
PORTLAND, CT 06480

SHEET TITLE
EQUIPMENT DETAILS

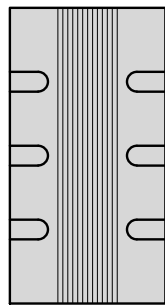
SHEET NUMBER

A-5

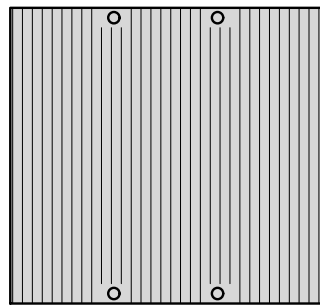
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

NOTES

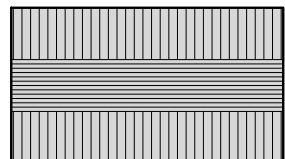
FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

REMOTE RADIO HEAD DETAIL

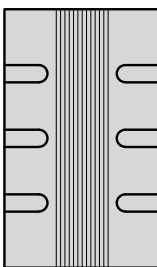
NO SCALE

1

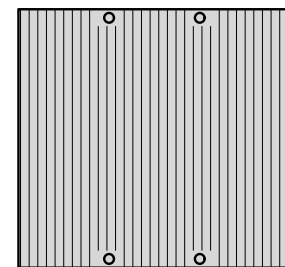
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

NOTES

FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

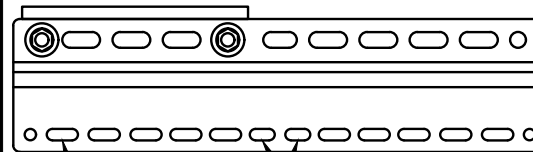
REMOTE RADIO HEAD DETAIL

NO SCALE

2

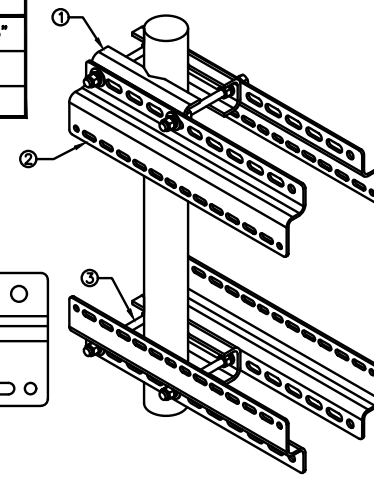
SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

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



11MM x 30MM SLOTS
40MM ON CENTER

11MM x 24MM SLOTS



REMOTE RADIO MOUNT DETAIL

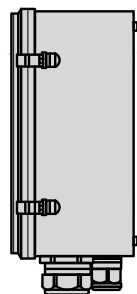
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3

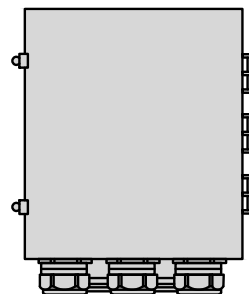
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



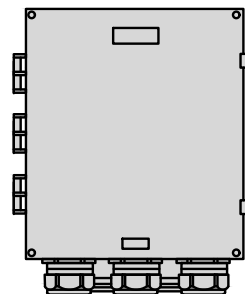
PLAN



SIDE



BACK



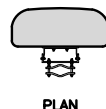
FRONT

SURGE SUPPRESSION DETAIL

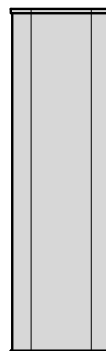
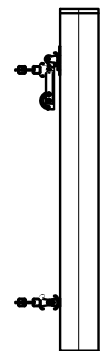
NO SCALE

4

JMA WIRELESS MX08FR0665-20 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	54 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



PLAN



NOTES

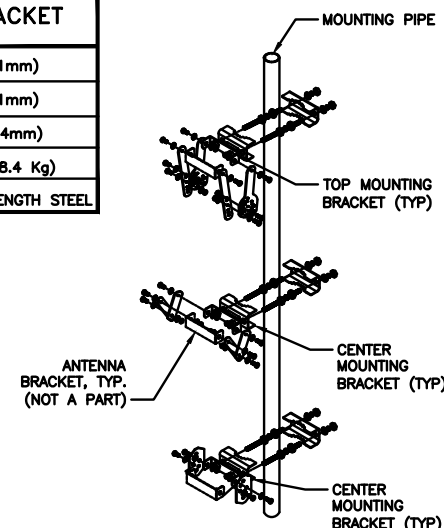
FINAL ANTENNA SPECIFICATIONS TO BE CONFIRMED BY GC

ANTENNA DETAIL

NO SCALE

5

JMA 91900318 MOUNTING BRACKET	
WIDTH	8.3" (211mm)
DEPTH	7.5" (191mm)
HEIGHT	11.2" (284mm)
TOTAL WEIGHT (WITH BRACKETS)	18.5 LBS (8.4 Kg)
HOUSING MATERIAL	GALV. HIGH STRENGTH STEEL

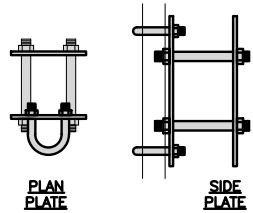


ANTENNA MOUNTING DETAIL

NO SCALE

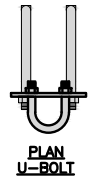
6

COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11.023 LBS



PLAN PLATE

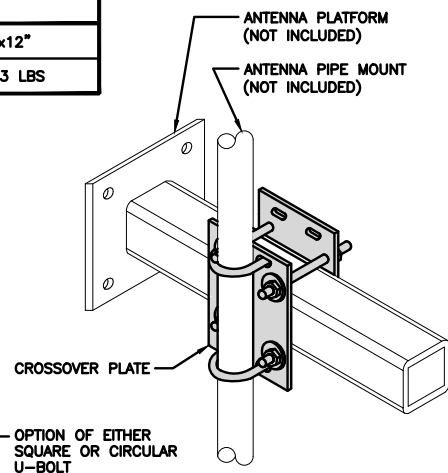
SIDE PLATE



PLAN U-BOLT



SIDE U-BOLT



CROSSOVER PLATE

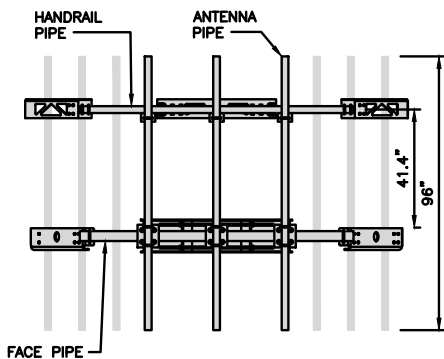
OPTION OF EITHER SQUARE OR CIRCULAR U-BOLT

RRH/OVP MOUNT DETAIL

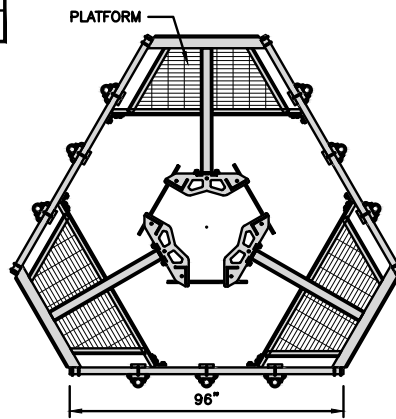
NO SCALE

7

COMMSCOPE MC-PK8-DSH	
FACE WIDTH	96"
WEIGHT	1373.08 lbs
NOTE: 15" TO 38" O.D.	



FACE PIPE



PLATFORM

ANTENNA PLATFORM DETAIL

NO SCALE

8

NOT USED

NO SCALE

9



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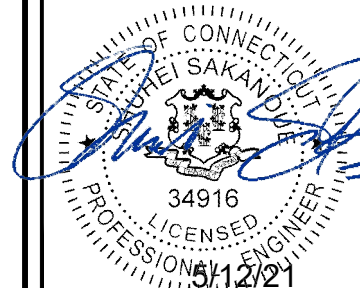


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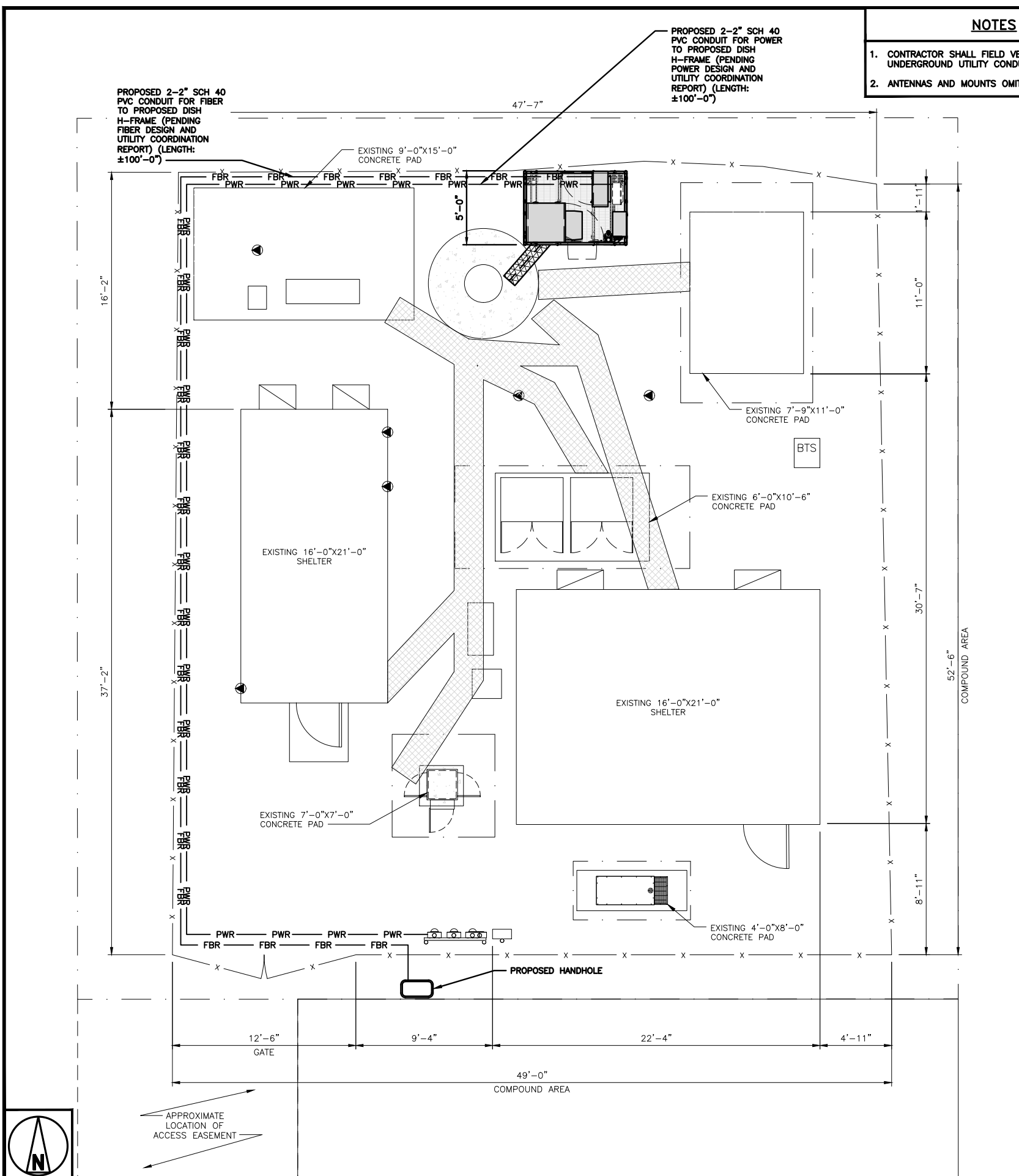
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DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER

A-6



NOTES

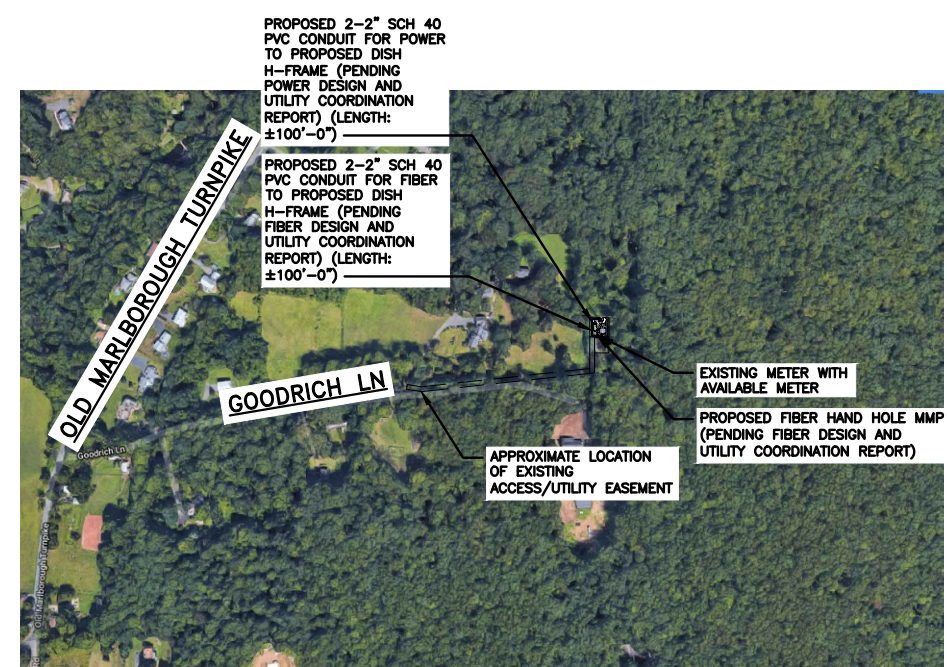
1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

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

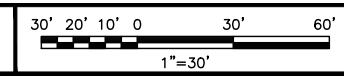
1. CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION,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

ELECTRICAL NOTES

2

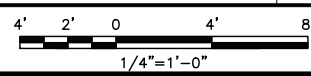


OVERALL UTILITY ROUTE PLAN



3

UTILITY ROUTE PLAN



1



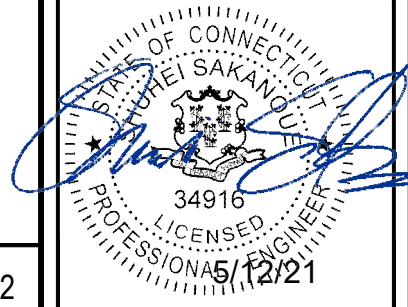
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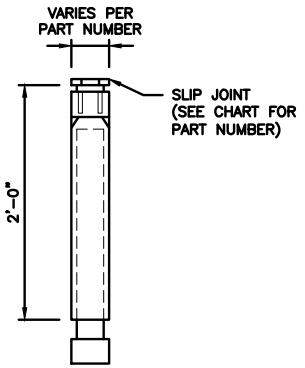
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PROJECT INFORMATION
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74 GOODRICH LANE
PORTLAND, CT 06480

SHEET TITLE
ELECTRICAL/FIBER ROUTE
PLAN AND NOTES

SHEET NUMBER
E-1

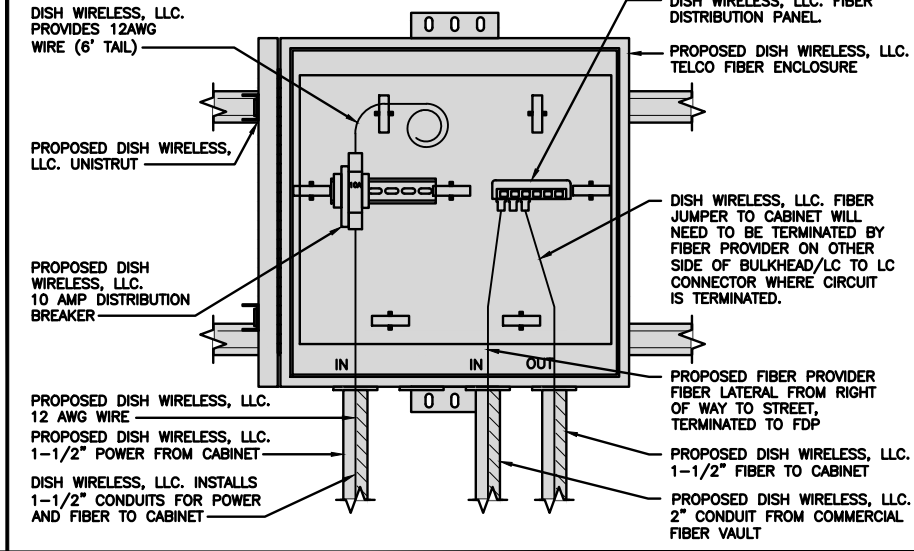
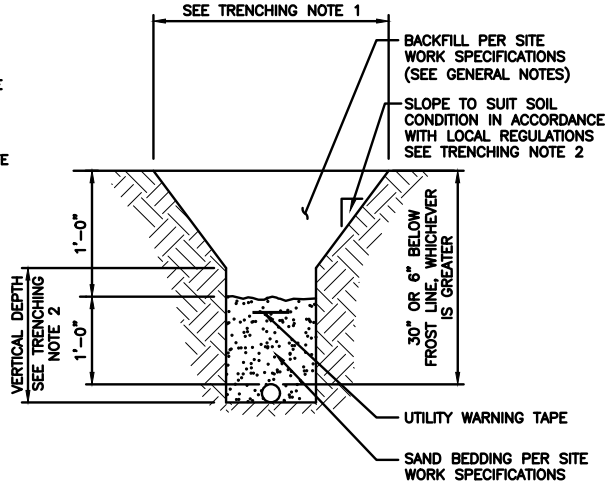
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"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



EXPANSION JOINT DETAIL

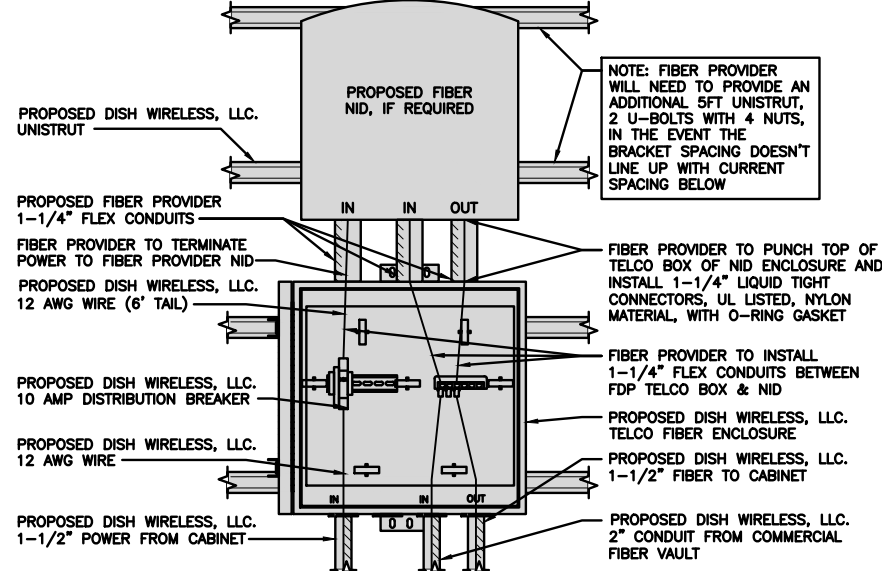
NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL

NO SCALE 2

DARK TELCO BOX – INTERIOR WIRING LAYOUT

NO SCALE 3



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL)

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



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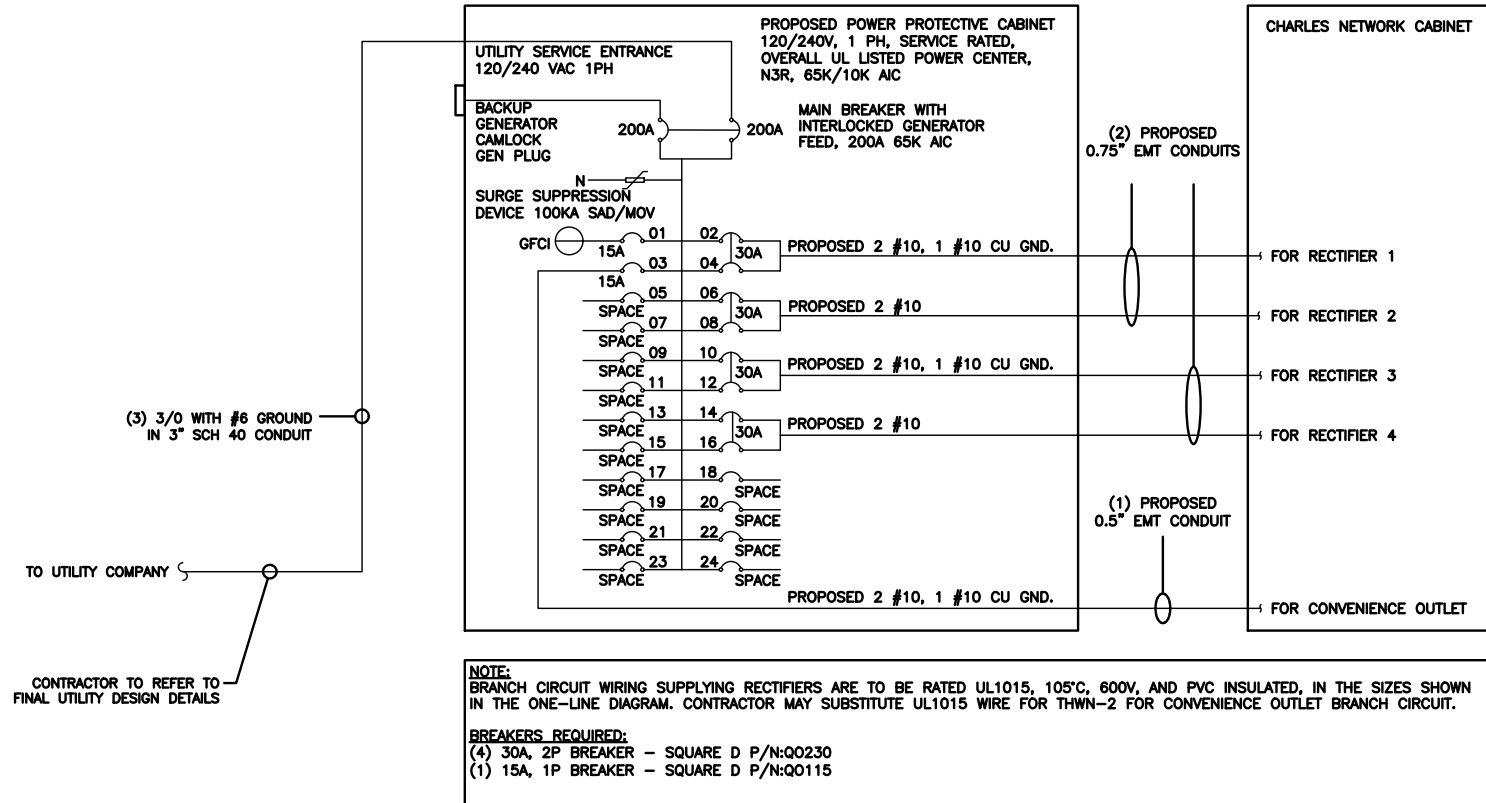
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A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER
E-2



NOTES

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

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

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

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

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

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

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

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

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

PPC ONE-LINE DIAGRAM

NO SCALE 1

PROPOSED CHARLES PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS)		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	30A	2880	2880	ABB/GE INFINITY RECTIFIER 2
-SPACE-				5	A	6	30A	2880	2880	ABB/GE INFINITY RECTIFIER 3
-SPACE-				7	B	8	30A	2880	2880	ABB/GE INFINITY RECTIFIER 4
-SPACE-				9	A	10				-SPACE-
-SPACE-				11	B	12				-SPACE-
-SPACE-				13	A	14				-SPACE-
-SPACE-				15	B	16				-SPACE-
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS								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



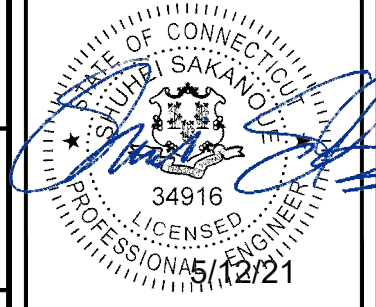
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 APPROVED BY: CJW

RFDS REV #: N/A

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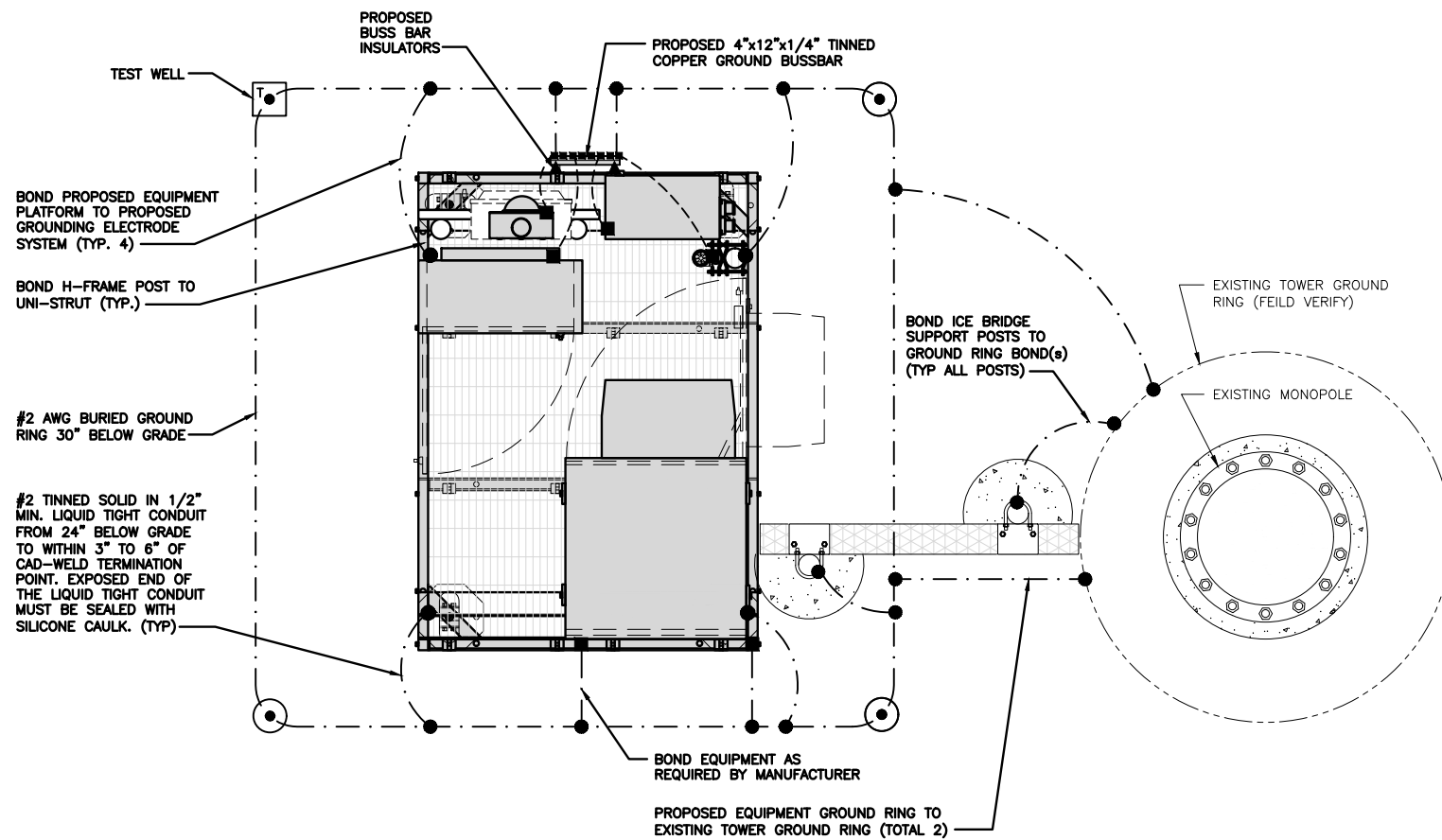
REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

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

SHEET NUMBER
E-3

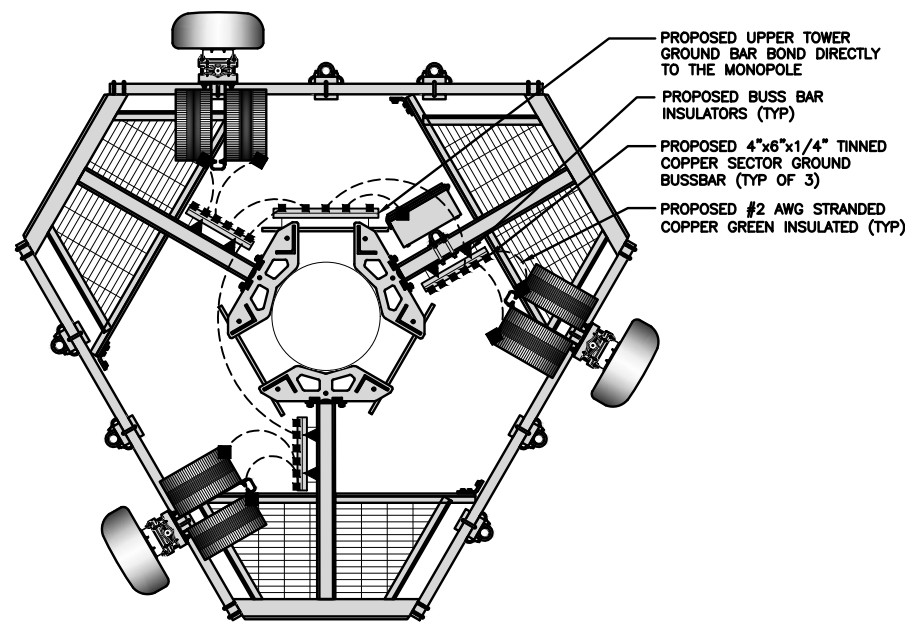


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1

NOTES

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



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2

- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- ▬ GROUND BUS BAR
- GROUND ROD
- ⊠ TEST GROUND ROD WITH INSPECTION SLEEVE
- #2 AWG STRANDED & INSULATED
- - - #2 AWG SOLID COPPER TINNED

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, LLC. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- TELCO GROUND BAR:** BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
- FRAME BONDING:** THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
- 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.
- 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.
- 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
- 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.
- 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**
- TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR. REFER TO DISH WIRELESS, LLC. GROUNDING NOTES.**

GROUNDING KEY NOTES

NO SCALE 3



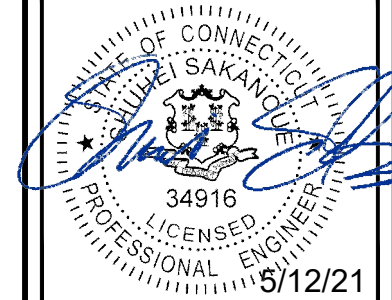
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CONSTRUCTION DOCUMENTS

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REV	DATE	DESCRIPTION
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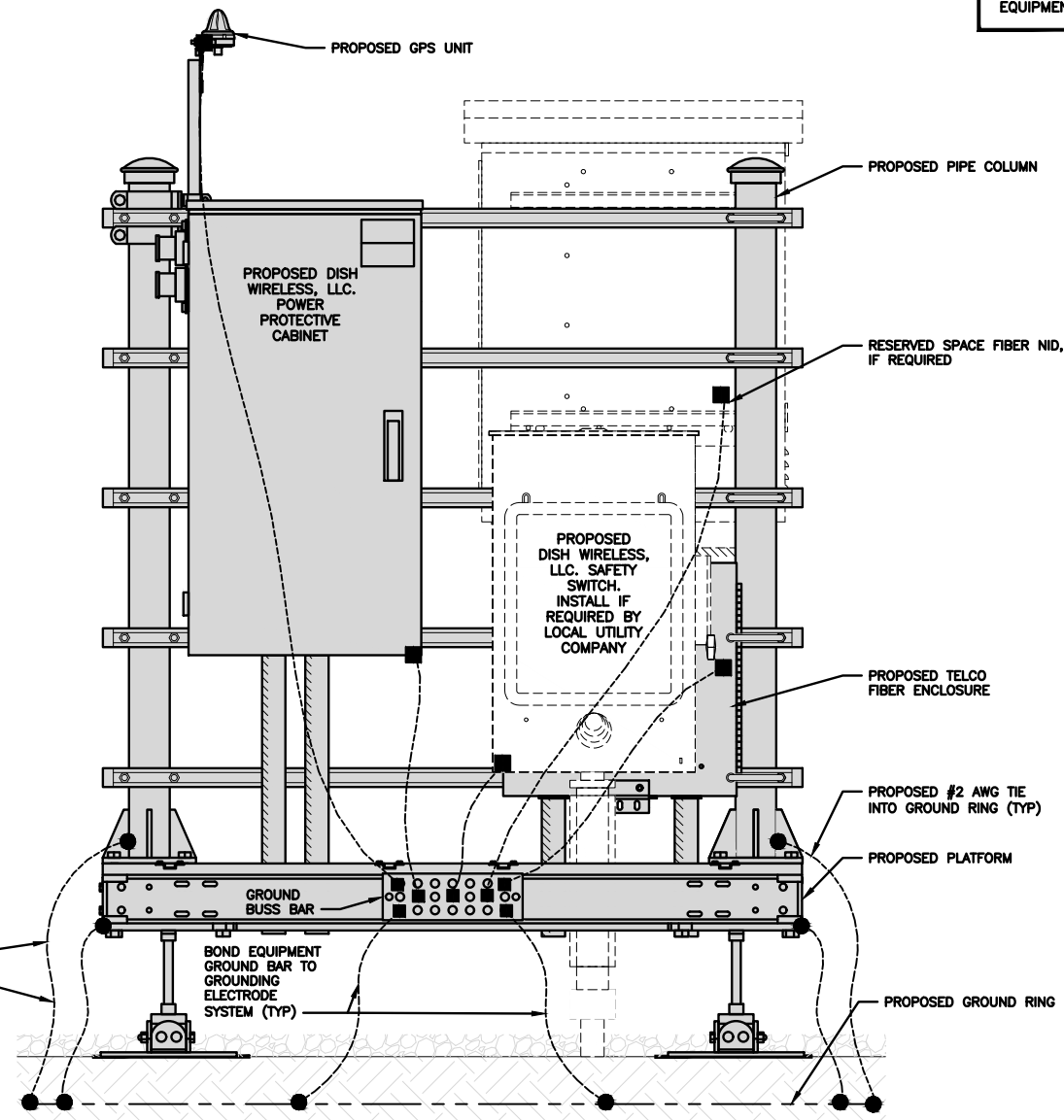
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER

G-1

NOTES
EQUIPMENT CABINET OMITTED FOR CLARITY

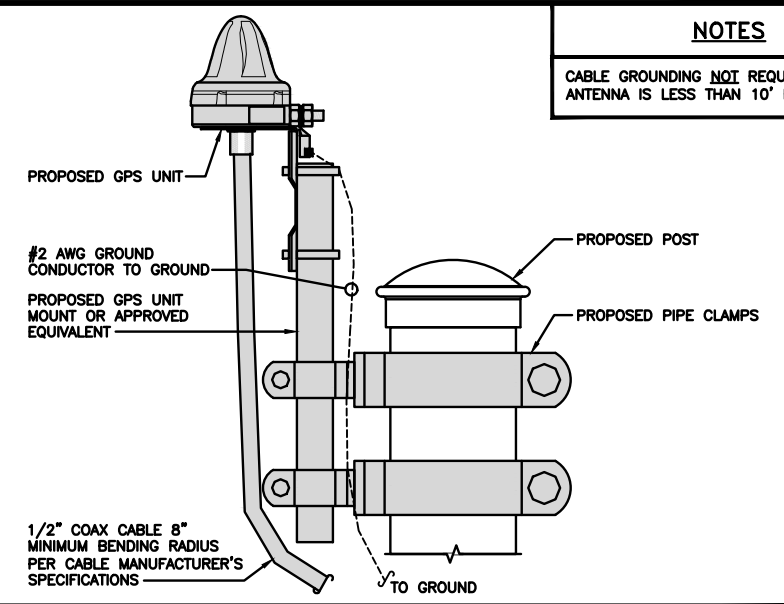


#2 TINNED SOLID IN 1/2" MIN. LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (TYP)

H-FRAME GROUNDING DETAIL

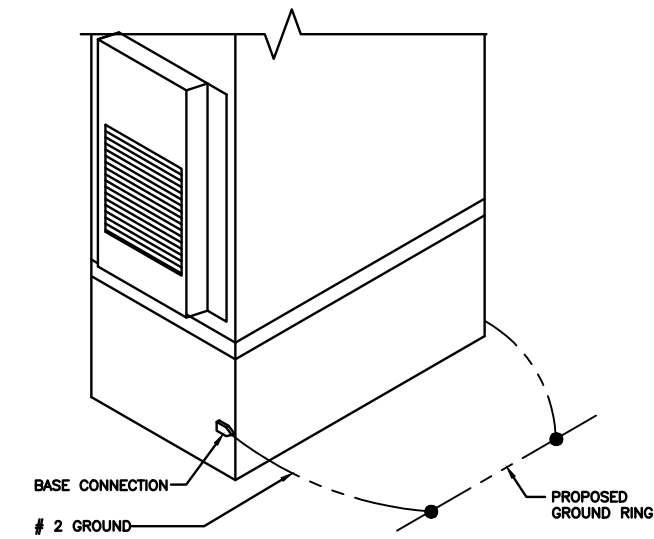
NO SCALE 1

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



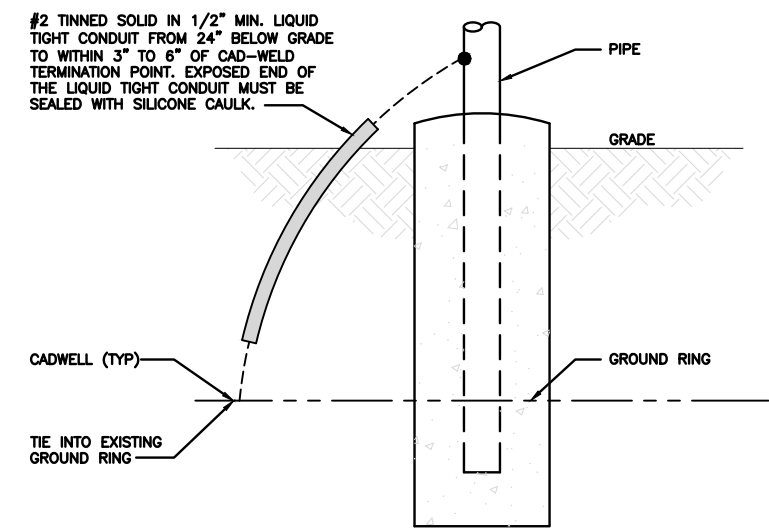
TYPICAL GPS UNIT GROUNDING

NO SCALE 2



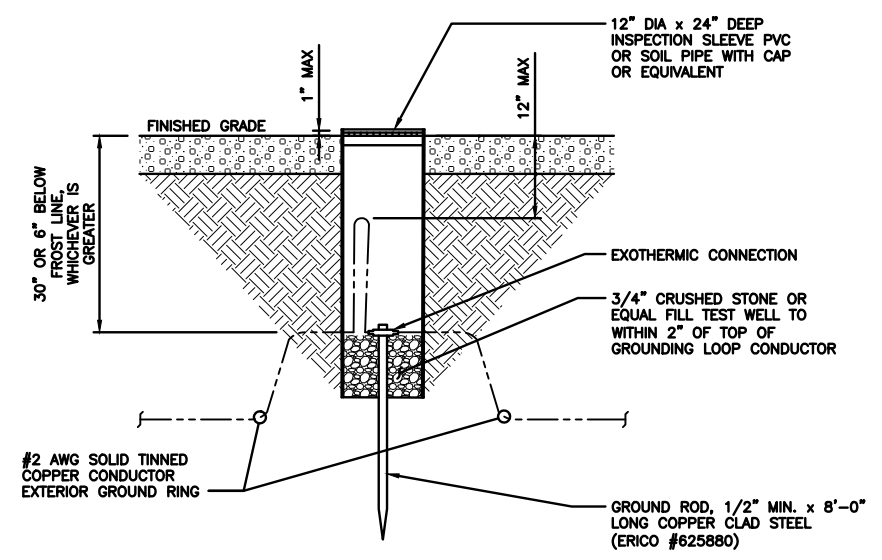
OUTDOOR CABINET GROUNDING

NO SCALE 3



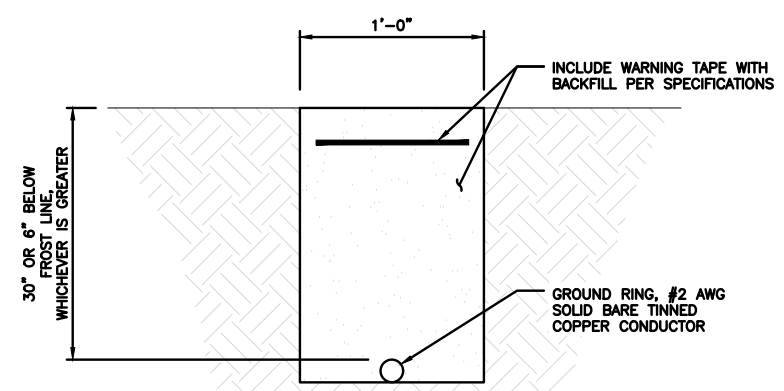
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5



TYPICAL GROUND RING TRENCH

NO SCALE 6

dish wireless.

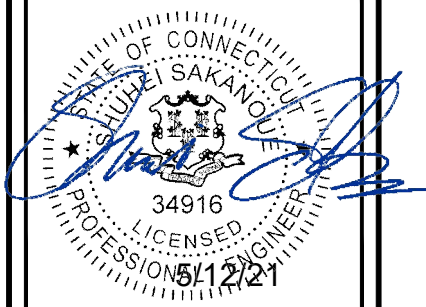
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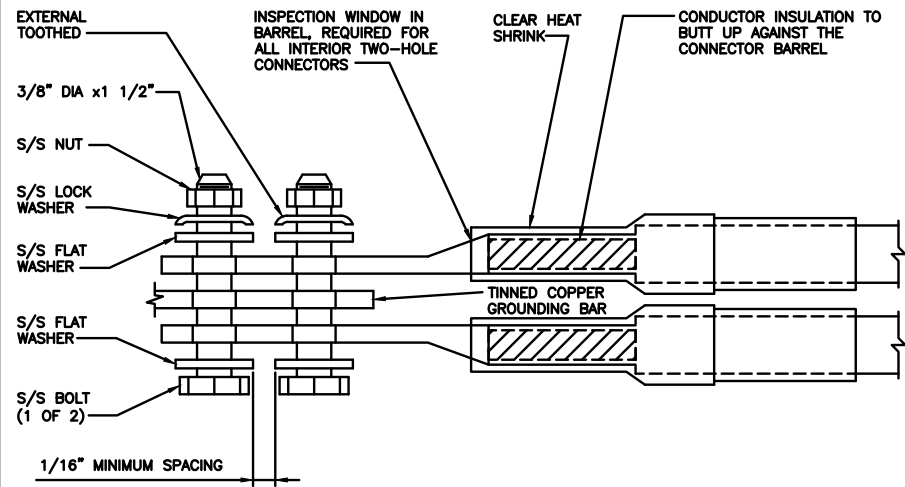
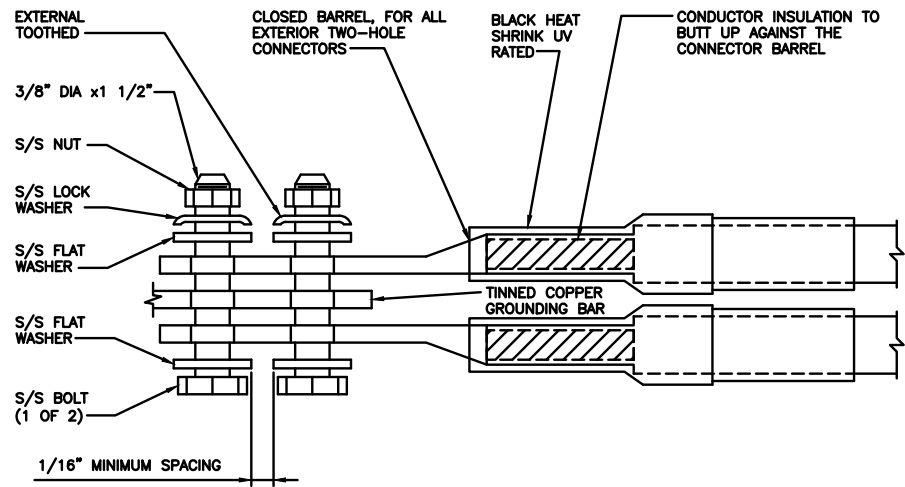
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2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

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.
9. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).



TYPICAL GROUNDING NOTES

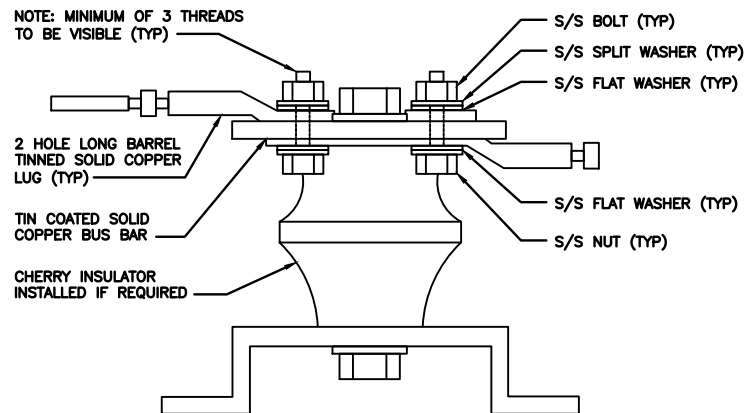
NO SCALE 1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

NO SCALE 4

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



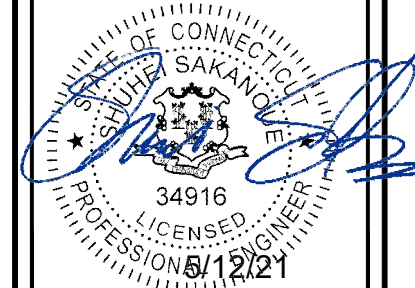
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BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

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GROUNDING DETAILS

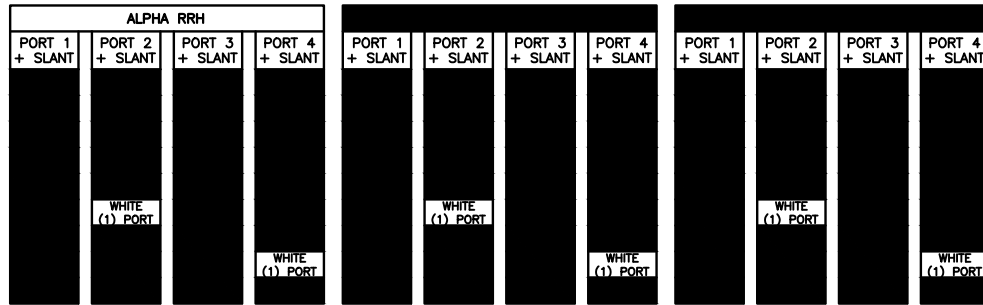
SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

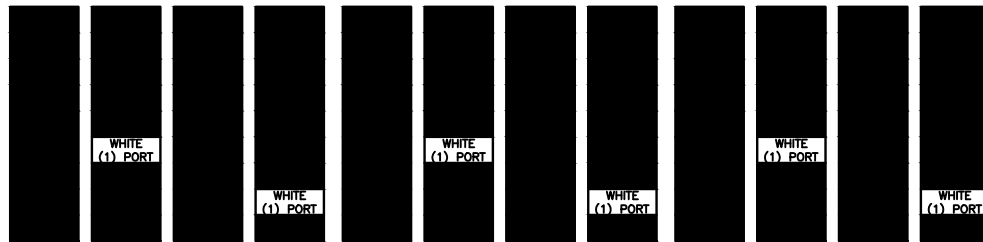
LOW-BAND RRH -
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) - OPTIONAL PER MARKET

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



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

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

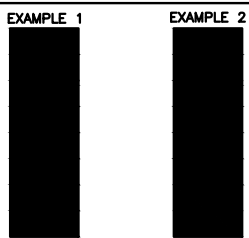


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED AM
LONG WITH FREQUENCY BANDS

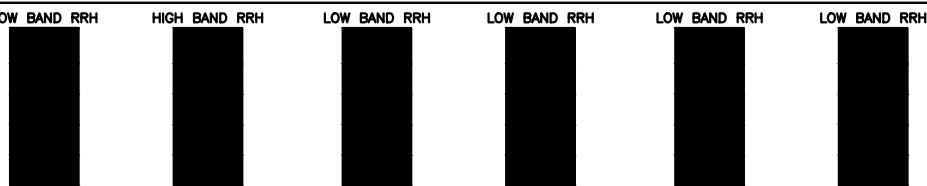
EXAMPLE 1 - HYBRID, OR DISCREET, SUPPORTS
ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



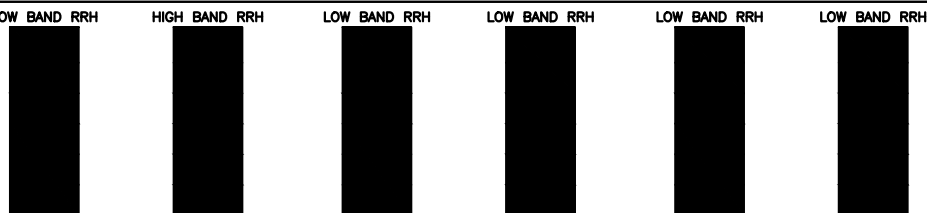
HYBRID/DISCREET CABLES

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

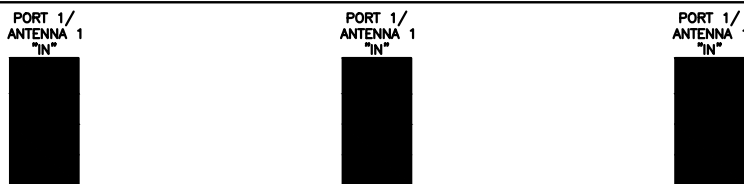


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY



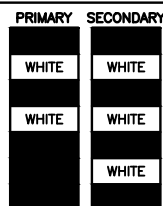
RET MOTORS AT ANTENNAS



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



RF CABLE COLOR CODES

NO SCALE

1

LOW BANDS (N71-N28)
OPTIONAL - (N29)



AWS
(N65+N70+H-BLOCK)



CBRS TECH
(3 GHz)



NEGATIVE SLANT PORT
ON ANTRRH



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

NOT USED

NO SCALE

4



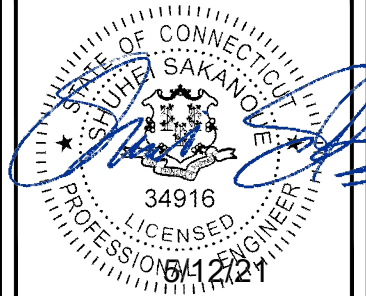
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TO ALTER THIS DOCUMENT.

DRAWN BY: CHECKED BY: APPROVED BY:
RCD SS CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL

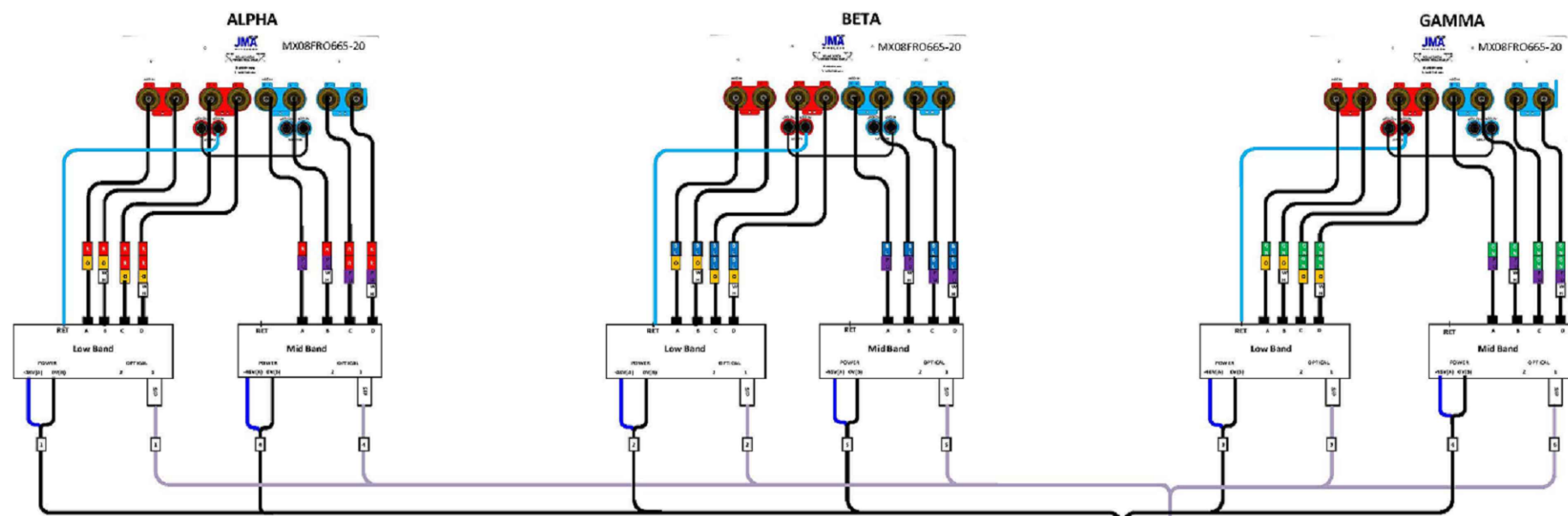
A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

SHEET TITLE
RF
CABLE COLOR CODES

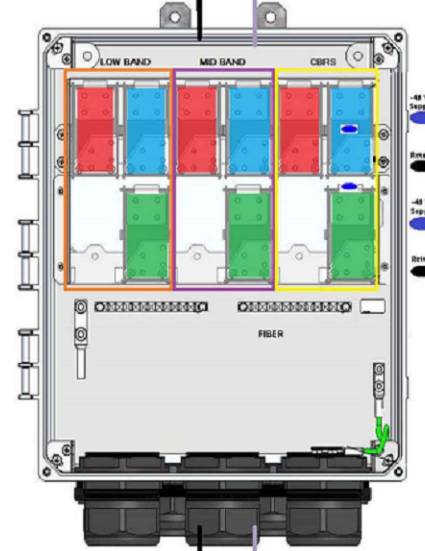
SHEET NUMBER

RF-1



Fiber Patch Panel

Bottom Row	Pair 1	Pair 2	Pair 3	Pair 10	Open	Open
Middle Row	Pair 4	Pair 5	Pair 6	Pair 11	Open	Open
Top Row	Pair 7	Pair 8	Pair 9	Pair 12	Open	Open



CSR NCS540

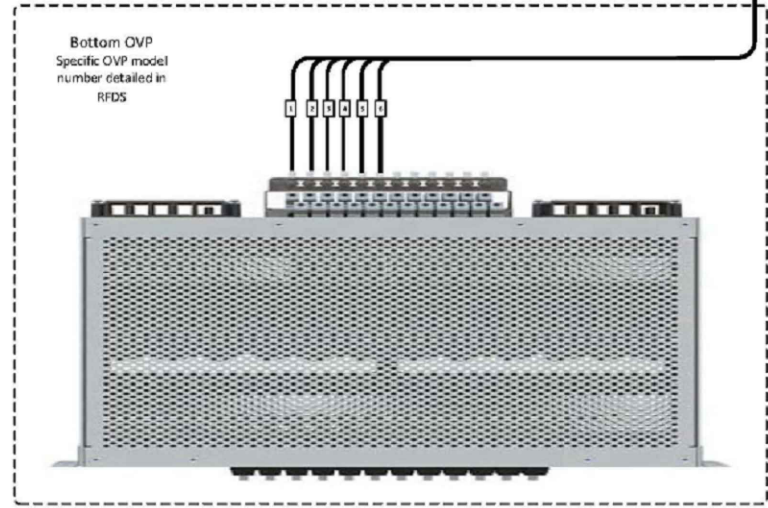
Port	Interface	Description
0	G0/0/0	Spine00
1	G0/0/1	CBRS - Alpha
2	G0/0/2	CBRS - Beta
3	G0/0/3	CBRS - Gamma
4	Te0/0/4	Fujitsu Low-Band RU - Alpha
5	Te0/0/5	Fujitsu Mid-Band RU - Alpha
6	Te0/0/6	Fujitsu Low-Band RU - Beta
7	Te0/0/7	Fujitsu Mid-Band RU - Beta
8	Te0/0/8	Fujitsu Low-Band RU - Gamma
9	Te0/0/9	Fujitsu Mid-Band RU - Gamma
10	Te0/0/10	Fixed Wls
11	Te0/0/11	Fixed Wls
12	Te0/0/12	Fixed Wls
13	Te0/0/13	Fixed Wls
14	Te0/0/14	CBRS1
15	Te0/0/15	CBRS2
16	Te0/0/16	CBRS3
17	G0/0/17	SM1 - BMC
18	G0/0/18	SM2 - BMC
19	Te0/0/19	SM1 - Data 1
20	Te0/0/20	SM1 - Data 2
21	Te0/0/21	SM2 - Data 1
22	Te0/0/22	SM2 - Data 2
23	Te0/0/23	Reserved Uplink (EDC, LDC)
24	Te0/0/24	Blank/Future
25	Te0/0/25	Blank/Future
26	Te0/0/26	Fiber NIU
27	Te0/0/27	Fiber NIU
28	Te0/0/28	Blank/Future
29	Te0/0/29	Blank/Future

top

bottom

Bottom OVP Layout

Circuit 1	Alpha Low Band
Circuit 2	Beta Low Band
Circuit 3	Gamma Low Band
Circuit 4	Alpha Mid Band
Circuit 5	Beta Mid Band
Circuit 6	Gamma Mid Band
Circuit 7	Alpha CBR8
Circuit 8	Beta CBR8
Circuit 9	Gamma CBR8
Circuit 10	Open
Circuit 11	Open
Circuit 12	Open



	5G plumbing diagram JMA MX08FRO665-20			
	2-2-2(LB+MB)			
Drawn By:	Rev:	Rev No:	Orig No:	Rev:
5-Jan-2021				3

dish wireless.

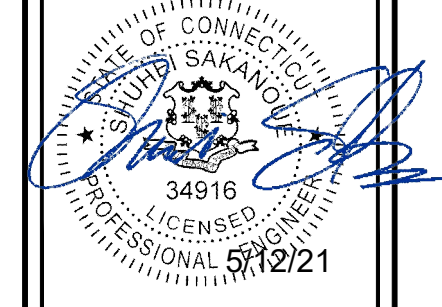
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CROWN CASTLE

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RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

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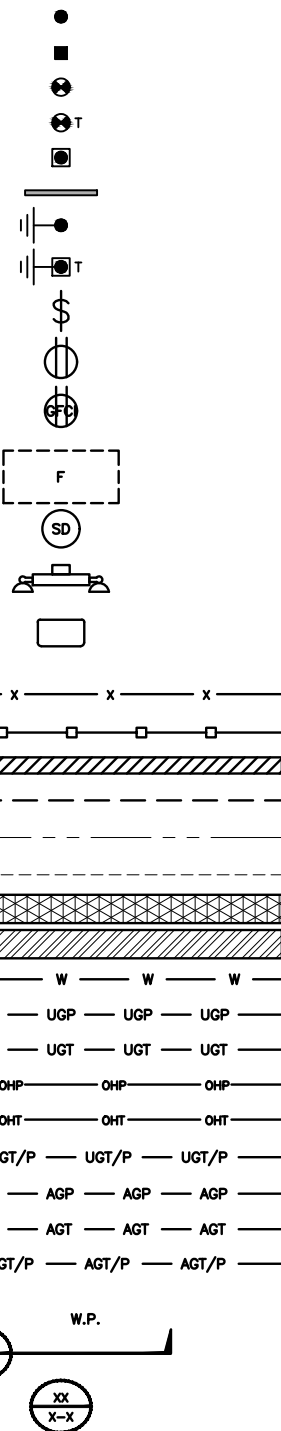
A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

SHEET TITLE
RF
PLUMBING DIAGRAM

SHEET NUMBER
RF-2

EXOTHERMIC CONNECTION
 MECHANICAL CONNECTION
 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-DEBTD
 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

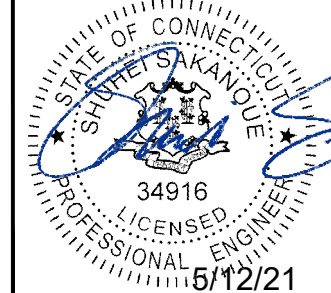


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DRAWN BY: RCD
 CHECKED BY: SS
 APPROVED BY: CJW
 RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL

A&E PROJECT NUMBER
 2039-Z5555C

DISH WIRELESS, LLC.
 PROJECT INFORMATION
 BOBDL00050A
 74 GOODRICH LANE
 PORTLAND, CT 06480

SHEET TITLE
 LEGEND AND ABBREVIATIONS

SHEET NUMBER
GN-1

SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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



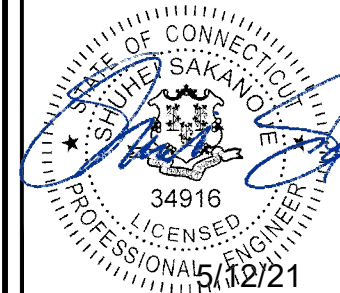
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DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	05/11/2021	FINAL

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

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, LLC. 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, LLC."
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.



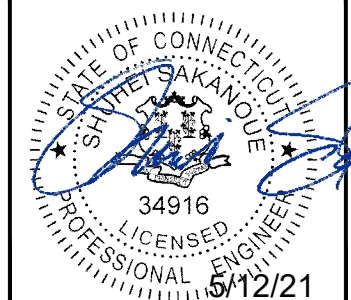
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REV	DATE	DESCRIPTION
0	05/11/2021	FINAL

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

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.



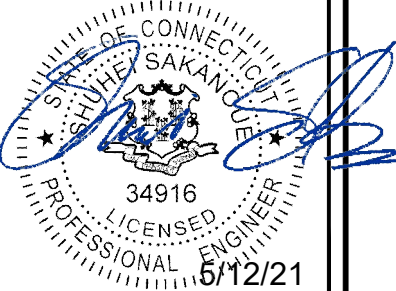
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DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

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0	05/11/2021	FINAL

A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00050A
74 GOODRICH LANE
PORTLAND, CT 06480

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

Exhibit D

Structural Analysis Report

Date: **April 01, 2021**



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

Subject: **Structural Analysis Report**

Carrier Designation: **DISH Network Co-Locate**
Site Number: BOBDL00050A
Site Name: CT-CCI-T-806382

Crown Castle Designation: **BU Number:** 806382
Site Name: HRT 082 943274
JDE Job Number: 645111
Work Order Number: 1945837
Order Number: 553285 Rev. 0

Engineering Firm Designation: **Crown Castle Project Number:** 1945837

Site Data: **74 GOODRICH LANE, PORTLAND, Middlesex County, CT**
Latitude 41° 36' 29.9", Longitude -72° 35' 29.56"
160 Foot - Monopole Tower

Crown Castle is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above-mentioned tower.

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

LC7: Proposed Equipment Configuration

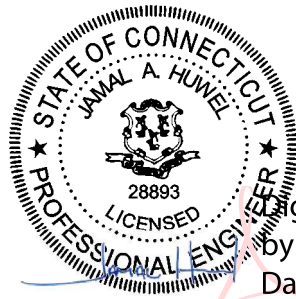
Sufficient Capacity - 81.5%

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2018 Connecticut Building Code. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Patrick Himes

Respectfully submitted by:

Jamal A. Huwel, P.E.
Director Engineering



Digitally signed
by Jamal A Huwel
Date: 2021.04.13
19:43:50 -04'00'

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1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by VALMONT.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
108.0	108.0	3	fujitsu	TA08025-B604	1	1-1/2
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-20 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
158.0	160.0	6	andrew	SBNHH-1D65B w/ Mount Pipe	8	1-5/8
		2	decibel	DB846F65ZAXY w/ Mount Pipe		
		4	decibel	DB846H80E-SX w/ Mount Pipe		
		2	raycap	RRFDC-3315-PF-48		
		3	samsung telecommunications	RFV01U-D1A		
		3	samsung telecommunications	RFV01U-D2A		
	1	tower mounts	Platform Mount [LP 713-1]			
150.0	152.0	3	alcatel lucent	1900MHZ RRH	4	1-1/4
		3	alcatel lucent	800MHZ RRH		
		3	alcatel lucent	RRH2X50-800		
		3	alcatel lucent	TD-RRH8X20-25		
		3	commscope	DT465B-2XR w/ Mount Pipe		
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
	1	tower mounts	Platform Mount [LP 713-1]			
142.0	144.0	2	radiowaves	HP3-11	2	1/2
	142.0	1	tower mounts	Side Arm Mount [SO 101-3]	2	Conduit

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
136.0	137.0	3	commscope	SBNH-1D65C-SR w/ Mount Pipe	7	1-5/8
		3	commscope	TMAT1921B78-21A		
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe		
		3	ericsson	RRUS 11 B12		
		3	ericsson	RRUS 11 B2		
	136.0	1	tower mounts	T-Arm Mount [TA 602-3]		
118.0	120.0	3	cci antennas	DMP65R-BU6D w/ Mount Pipe	6 4 2 6 1	1-1/4 3/4 3/8 5/16 Conduit
		3	cci antennas	OPA65R-BU6D w/ Mount Pipe		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14_CCIV2		
		3	ericsson	RRUS 8843 B2/B66A_CCIV2		
		3	powerwave technologies	1001940		
		3	powerwave technologies	1001983		
		6	powerwave technologies	7020.00		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP13519		
		4	powerwave technologies	LGP21401		
	2	raycap	DC6-48-60-18-8F			
	118.0	1	tower mounts	Platform Mount [LP 304-1_HR-1]		
61.0	61.0	2	lucent	KS24019-L112A	1	1/2
		1	tower mounts	Side Arm Mount [SO 701-1]		
50.0	50.0	2	tower mounts	Side Arm Mount [SO 701-1]	-	-

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1041653	CCISITES
4-POST-MODIFICATION INSPECTION	3996803	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	301226	CCISITES
4-TOWER MANUFACTURER DRAWINGS	255193	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	3865159	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.7.5), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	160 - 123.667	Pole	TP29.05x18.87x0.188	1	-10.995	990.374	65.7	Pass
L2	123.667 - 76.25	Pole	TP41.95x27.461x0.313	2	-26.621	2474.062	71.7	Pass
L3	76.25 - 37	Pole	TP52.32x39.715x0.344	3	-38.096	3314.493	81.5	Pass
L4	37 - 0	Pole	TP62x49.672x0.406	4	-55.745	4687.798	74.9	Pass
							Summary	
						Pole (L3)	81.5	Pass
						Rating =	81.5	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	66.6	Pass
1	Base Plate	0	38.2	Pass
1	Base Foundation Structural	0	78.0	Pass
1	Base Foundation Soil Interaction	0	62.4	Pass

Structure Rating (max from all components) =	81.5%
---	--------------

Notes:

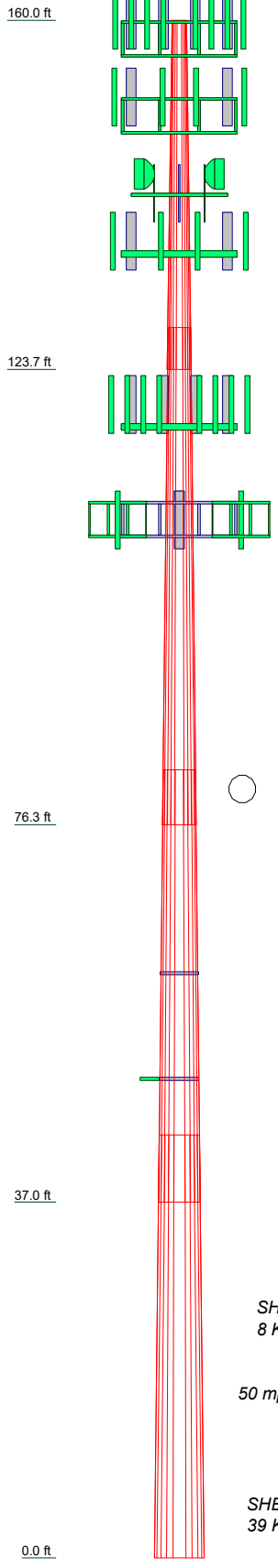
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3	4	
Length (ft)	36.333	51.750	45.000	44.000	
Number of Sides	12	12	12	12	
Thickness (in)	0.188	0.313	0.344	0.406	
Socket Length (ft)	4.333	5.750	7.000	49.672	
Top Dia (in)	18.870	27.461	39.715	62.000	
Bot Dia (in)	29.050	41.950	52.320		
Grade		A572-65			
Weight (K)	1.8	6.1	7.7	10.9	26.5



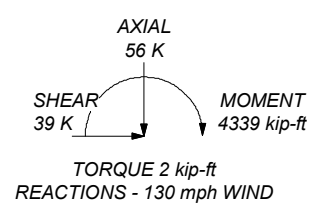
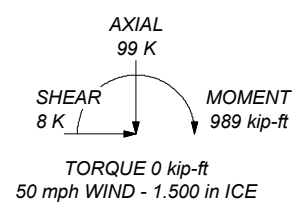
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 81.5%

ALL REACTIONS
ARE FACTORED



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

Job:	806382			
Project:				
Client:	Crown Castle	Drawn by:	phimes	
Code:	TIA-222-H	Date:	04/01/21	
Path:	C:\Users\phimes\Desktop\Work Area\806382\WO 1945837 - SA\Prod\806382.dwg		Scale:	NTS
			Dwg No.	E-1

Tower Input Data

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

- 3) Tower is located in Middlesex County, Connecticut.
- 4) Tower base elevation above sea level: 317.000 ft.
- 5) Basic wind speed of 130 mph.
- 6) Risk Category II.
- 7) Exposure Category B.
- 8) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- 9) Topographic Category: 1.
- 10) Crest Height: 0.000 ft.
- 11) Nominal ice thickness of 1.500 in.
- 12) Ice thickness is considered to increase with height.
- 13) Ice density of 56.000 pcf.
- 14) A wind speed of 50 mph is used in combination with ice.
- 15) Temperature drop of 50.000 °F.
- 16) Deflections calculated using a wind speed of 60 mph.
- 17) TIA-222-H Annex S.
- 18) A non-linear (P-delta) analysis was used.
- 19) Pressures are calculated at each section.
- 20) Stress ratio used in pole design is 1.05.
- 21) Tower analysis based on target reliabilities in accordance with Annex S.
- 22) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- 23) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

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

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	160.000-123.667	36.333	4.333	12	18.870	29.050	0.188	0.750	A572-65 (65 ksi)
L2	123.667-76.250	51.750	5.750	12	27.461	41.950	0.313	1.250	A572-65 (65 ksi)
L3	76.250-37.000	45.000	7.000	12	39.715	52.320	0.344	1.375	A572-65 (65 ksi)
L4	37.000-0.000	44.000		12	49.672	62.000	0.406	1.625	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	19.470	11.280	502.514	6.688	9.775	51.410	1018.229	5.551	4.555	24.292
	30.009	17.426	1852.870	10.333	15.048	123.131	3754.417	8.576	7.283	38.842
L2	29.575	27.318	2569.965	9.719	14.225	180.668	5207.445	13.445	6.522	20.871
	43.320	41.898	9271.410	14.906	21.730	426.662	18786.390	20.621	10.405	33.296
L3	42.662	43.579	8622.350	14.095	20.572	419.122	17471.219	21.448	9.722	28.283
	54.044	57.531	19838.067	18.607	27.102	731.984	40197.302	28.315	13.101	38.111
L4	53.311	64.445	19964.737	17.637	25.730	775.933	40453.969	31.718	12.223	30.088
	64.044	80.572	39016.215	22.051	32.116	1214.853	79057.429	39.655	15.527	38.221

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor Ar	Adjust. Factor Ar	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 160.000-123.667				1	1	1			
L2 123.667-76.250				1	1	1			
L3 76.250-37.000				1	1	1			
L4 37.000-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter r in	Weight klf

HB114-1-0813U4-M5F(1-1/4)	B	No	Surface Ar (CaAa)	150.000 - 0.000	4	4	0.300 0.500	1.540		0.001

2" Rigid Conduit	C	No	Surface Ar (CaAa)	142.000 - 0.000	2	2	0.100 0.200	2.000		0.003
HJ4-50(1/2")	C	No	Surface Ar (CaAa)	142.000 - 0.000	2	2	0.200 0.250	0.580		0.000

LDF6-50A(1-1/4")	A	No	Surface Ar (CaAa)	118.000 - 0.000	6	6	-0.490 -0.350	1.550		0.001
WR-VG86ST-BRD(3/4")	A	No	Surface Ar (CaAa)	118.000 - 0.000	2	1	-0.490 -0.350	0.795		0.001
FB-L98B-002-75000(3/8")	A	No	Surface Ar (CaAa)	118.000 - 0.000	7	7	-0.490 -0.350	0.394		0.000

Safety Line 3/8	C	No	Surface Ar (CaAa)	160.000 - 0.000	1	1	-0.490 -0.480	0.375		0.000

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf

CCI-65FP-045100	A	No	Surface Af (CaAa)	52.500 - 42.500	1	1	0.450 0.500	4.500	11.000	0.000
CCI-65FP-045100	B	No	Surface Af (CaAa)	52.500 - 42.500	1	1	0.450 0.500	4.500	11.000	0.000
CCI-65FP-045100	C	No	Surface Af (CaAa)	52.500 - 42.500	1	1	0.450 0.500	4.500	11.000	0.000
*										
CU12PSM9P6XXX(1-1/2)	A	No	Surface Ar (CaAa)	108.000 - 0.000	1	1	0.200 0.250	1.600		0.002

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	CAAA	Weight	
							ft ² /ft	klf	
HB158-1-08U8-S8J18(1-5/8)	B	No	No	Inside Pole	158.000 - 0.000	8	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001

MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	C	No	No	Inside Pole	136.000 - 0.000	7	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001
FB-L98B-002-75000(3/8")	A	No	No	Inside Pole	118.000 - 0.000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000
WR-VG86ST-BRD(3/4")	A	No	No	Inside Pole	118.000 - 0.000	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001
*									
2" Rigid Conduit	A	No	No	Inside Pole	118.000 - 0.000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.003 0.003 0.003 0.003

LDF4-50A(1/2")	B	No	No	Inside Pole	61.000 - 0.000	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	CAAA In Face ft ²	CAAA Out Face ft ²	Weight K
L1	160.000-123.667	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	16.221	0.000	0.483
		C	0.000	0.000	10.822	0.000	0.212
L2	123.667-76.250	A	0.000	0.000	58.733	0.000	0.474
		B	0.000	0.000	29.209	0.000	0.721
		C	0.000	0.000	26.245	0.000	0.655
L3	76.250-37.000	A	0.000	0.000	64.220	0.000	0.468

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L4	37.000-0.000	B	0.000	0.000	31.678	0.000	0.600
		C	0.000	0.000	29.225	0.000	0.542
		A	0.000	0.000	53.468	0.000	0.441
		B	0.000	0.000	22.792	0.000	0.568
		C	0.000	0.000	20.480	0.000	0.511

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	160.000-123.667	A	1.474	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	29.980	0.000	0.781
		C		0.000	0.000	37.409	0.000	0.577
L2	123.667-76.250	A	1.423	0.000	0.000	123.753	0.000	1.888
		B		0.000	0.000	53.984	0.000	1.257
		C		0.000	0.000	81.286	0.000	1.442
L3	76.250-37.000	A	1.345	0.000	0.000	127.979	0.000	1.876
		B		0.000	0.000	53.351	0.000	1.117
		C		0.000	0.000	75.048	0.000	1.252
L4	37.000-0.000	A	1.200	0.000	0.000	109.411	0.000	1.593
		B		0.000	0.000	40.932	0.000	0.944
		C		0.000	0.000	60.090	0.000	1.049

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	160.000-123.667	1.795	2.048	1.882	2.627
L2	123.667-76.250	-2.430	3.482	-2.340	3.641
L3	76.250-37.000	-2.914	3.469	-3.071	3.913
L4	37.000-0.000	-3.401	4.046	-3.606	4.592

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	3	HB114-1-0813U4-M5F(1-1/4)	123.67 - 150.00	1.0000	1.0000
L1	5	2" Rigid Conduit	123.67 - 142.00	1.0000	1.0000
L1	6	HJ4-50(1/2")	123.67 - 142.00	1.0000	1.0000
L1	22	Safety Line 3/8	123.67 - 160.00	1.0000	1.0000
L2	3	HB114-1-0813U4-M5F(1-1/4)	76.25 - 123.67	1.0000	1.0000
L2	5	2" Rigid Conduit	76.25 - 123.67	1.0000	1.0000
L2	6	HJ4-50(1/2")	76.25 - 123.67	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L2	10	LDF6-50A(1-1/4")	76.25 - 118.00	1.0000	1.0000
L2	14	WR-VG86ST-BRD(3/4")	76.25 - 118.00	1.0000	1.0000
L2	15	FB-L98B-002-75000(3/8")	76.25 - 118.00	1.0000	1.0000
L2	22	Safety Line 3/8	76.25 - 123.67	1.0000	1.0000
L2	32	CU12PSM9P6XXX(1-1/2)	76.25 - 108.00	1.0000	1.0000
L3	3	HB114-1-0813U4-M5F(1-1/4)	37.00 - 76.25	1.0000	1.0000
L3	5	2" Rigid Conduit	37.00 - 76.25	1.0000	1.0000
L3	6	HJ4-50(1/2")	37.00 - 76.25	1.0000	1.0000
L3	10	LDF6-50A(1-1/4")	37.00 - 76.25	1.0000	1.0000
L3	14	WR-VG86ST-BRD(3/4")	37.00 - 76.25	1.0000	1.0000
L3	15	FB-L98B-002-75000(3/8")	37.00 - 76.25	1.0000	1.0000
L3	22	Safety Line 3/8	37.00 - 76.25	1.0000	1.0000
L3	28	CCI-65FP-045100	42.50 - 52.50	1.0000	1.0000
L3	29	CCI-65FP-045100	42.50 - 52.50	1.0000	1.0000
L3	30	CCI-65FP-045100	42.50 - 52.50	1.0000	1.0000
L3	32	CU12PSM9P6XXX(1-1/2)	37.00 - 76.25	1.0000	1.0000
L4	3	HB114-1-0813U4-M5F(1-1/4)	0.00 - 37.00	1.0000	1.0000
L4	5	2" Rigid Conduit	0.00 - 37.00	1.0000	1.0000
L4	6	HJ4-50(1/2")	0.00 - 37.00	1.0000	1.0000
L4	10	LDF6-50A(1-1/4")	0.00 - 37.00	1.0000	1.0000
L4	14	WR-VG86ST-BRD(3/4")	0.00 - 37.00	1.0000	1.0000
L4	15	FB-L98B-002-75000(3/8")	0.00 - 37.00	1.0000	1.0000
L4	22	Safety Line 3/8	0.00 - 37.00	1.0000	1.0000
L4	32	CU12PSM9P6XXX(1-1/2)	0.00 - 37.00	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L3	28	CCI-65FP-045100	42.50 - 52.50	Auto	0.0000
L3	29	CCI-65FP-045100	42.50 - 52.50	Auto	0.0000
L3	30	CCI-65FP-045100	42.50 - 52.50	Auto	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		CAAA Front ft ²	CAAA Side ft ²	Weight K
(2) DB846H80E-SX w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	4.120	6.380	0.052
						1/2" Ice	4.760	7.050	0.104
						Ice	5.420	7.740	0.166
						1" Ice	6.780	9.170	0.325
						2" Ice			
(2) DB846H80E-SX w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	4.120	6.380	0.052
						1/2" Ice	4.760	7.050	0.104
						Ice	5.420	7.740	0.166
						1" Ice	6.780	9.170	0.325
						2" Ice			
(2) DB846F65ZAXY w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	6.100	6.810	0.058
						1/2" Ice	6.800	7.520	0.119
						Ice	7.510	8.240	0.191
						1" Ice	8.980	9.730	0.369
						2" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	4.090	3.300	0.066
						1/2" Ice	4.490	3.680	0.130
						Ice	4.890	4.070	0.204
						1" Ice	5.720	4.870	0.386
						2" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	4.090	3.300	0.066
						1/2" Ice	4.490	3.680	0.130
						Ice	4.890	4.070	0.204
						1" Ice	5.720	4.870	0.386
						2" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	4.090	3.300	0.066
						1/2" Ice	4.490	3.680	0.130
						Ice	4.890	4.070	0.204
						1" Ice	5.720	4.870	0.386
						2" Ice			
RRFDC-3315-PF-48	A	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	3.364	2.192	0.032
						1/2" Ice	3.597	2.395	0.061
						Ice	3.838	2.606	0.093
						1" Ice	4.343	3.049	0.168
						2" Ice			
RRFDC-3315-PF-48	C	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	3.364	2.192	0.032
						1/2" Ice	3.597	2.395	0.061
						Ice	3.838	2.606	0.093
						1" Ice	4.343	3.049	0.168
						2" Ice			
(2) RFV01U-D1A	A	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	1.875	1.250	0.084
						1/2" Ice	2.045	1.393	0.103
						Ice	2.223	1.543	0.124
						1" Ice	2.601	1.865	0.175
						2" Ice			
RFV01U-D1A	B	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	1.875	1.250	0.084
						1/2" Ice	2.045	1.393	0.103
						Ice	2.223	1.543	0.124
						1" Ice	2.601	1.865	0.175
						2" Ice			
RFV01U-D2A	B	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	1.875	1.013	0.070
						1/2" Ice	2.045	1.145	0.087
						Ice	2.223	1.284	0.106
						1" Ice	2.601	1.585	0.153
						2" Ice			
(2) RFV01U-D2A	C	From Leg	4.000 0.000 2.000	0.000	158.000	No Ice	1.875	1.013	0.070
						1/2" Ice	2.045	1.145	0.087
						Ice	2.223	1.284	0.106
						1" Ice	2.601	1.585	0.153
						2" Ice			
6' x 2" Mount Pipe	C	From Leg	4.000 0.000	0.000	158.000	No Ice	1.425	1.425	0.022
						1/2" Ice	1.925	1.925	0.033

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			0.000			Ice 2.294	2.294	0.048
						1" Ice 3.060	3.060	0.090
						2" Ice		
Platform Mount [LP 713-1]	C	None		0.000	158.000	No Ice 32.890	32.890	1.510
						1/2" 35.760	35.760	2.228
						Ice 38.760	38.760	3.026
						1" Ice 45.260	45.260	4.865
						2" Ice		

DT465B-2XR w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 5.500	4.380	0.091
						1/2" 5.970	4.840	0.164
						Ice 6.450	5.300	0.248
						1" Ice 7.440	6.260	0.451
						2" Ice		
DT465B-2XR w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 5.500	4.380	0.091
						1/2" 5.970	4.840	0.164
						Ice 6.450	5.300	0.248
						1" Ice 7.440	6.260	0.451
						2" Ice		
DT465B-2XR w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 5.500	4.380	0.091
						1/2" 5.970	4.840	0.164
						Ice 6.450	5.300	0.248
						1" Ice 7.440	6.260	0.451
						2" Ice		
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 4.600	4.010	0.095
						1/2" 5.050	4.450	0.160
						Ice 5.500	4.890	0.235
						1" Ice 6.440	5.820	0.419
						2" Ice		
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 4.600	4.010	0.095
						1/2" 5.050	4.450	0.160
						Ice 5.500	4.890	0.235
						1" Ice 6.440	5.820	0.419
						2" Ice		
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 4.600	4.010	0.095
						1/2" 5.050	4.450	0.160
						Ice 5.500	4.890	0.235
						1" Ice 6.440	5.820	0.419
						2" Ice		
TD-RRH8X20-25	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 4.045	1.535	0.070
						1/2" 4.298	1.714	0.097
						Ice 4.557	1.901	0.128
						1" Ice 5.098	2.295	0.201
						2" Ice		
TD-RRH8X20-25	B	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 4.045	1.535	0.070
						1/2" 4.298	1.714	0.097
						Ice 4.557	1.901	0.128
						1" Ice 5.098	2.295	0.201
						2" Ice		
TD-RRH8X20-25	C	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 4.045	1.535	0.070
						1/2" 4.298	1.714	0.097
						Ice 4.557	1.901	0.128
						1" Ice 5.098	2.295	0.201
						2" Ice		
RRH2X50-800	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1.701	1.282	0.053
						1/2" 1.864	1.428	0.070
						Ice 2.035	1.580	0.090
						1" Ice 2.398	1.908	0.138
						2" Ice		
RRH2X50-800	B	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1.701	1.282	0.053
						1/2" 1.864	1.428	0.070
						Ice 2.035	1.580	0.090
						1" Ice 2.398	1.908	0.138
						2" Ice		
RRH2X50-800	C	From Leg	4.000	0.000	150.000	No Ice 1.701	1.282	0.053

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			0.000			1/2"	1.864	1.428	0.070
			2.000			Ice	2.035	1.580	0.090
						1" Ice	2.398	1.908	0.138
						2" Ice			
800MHZ RRH	A	From Leg	4.000	0.000	150.000	No Ice	2.134	1.773	0.053
			0.000			1/2"	2.320	1.946	0.074
			2.000			Ice	2.512	2.127	0.098
						1" Ice	2.920	2.510	0.157
						2" Ice			
800MHZ RRH	B	From Leg	4.000	0.000	150.000	No Ice	2.134	1.773	0.053
			0.000			1/2"	2.320	1.946	0.074
			2.000			Ice	2.512	2.127	0.098
						1" Ice	2.920	2.510	0.157
						2" Ice			
800MHZ RRH	C	From Leg	4.000	0.000	150.000	No Ice	2.134	1.773	0.053
			0.000			1/2"	2.320	1.946	0.074
			2.000			Ice	2.512	2.127	0.098
						1" Ice	2.920	2.510	0.157
						2" Ice			
1900MHZ RRH	A	From Leg	4.000	0.000	150.000	No Ice	2.492	3.258	0.044
			0.000			1/2"	2.695	3.484	0.075
			2.000			Ice	2.906	3.718	0.110
						1" Ice	3.351	4.206	0.192
						2" Ice			
1900MHZ RRH	B	From Leg	4.000	0.000	150.000	No Ice	2.492	3.258	0.044
			0.000			1/2"	2.695	3.484	0.075
			2.000			Ice	2.906	3.718	0.110
						1" Ice	3.351	4.206	0.192
						2" Ice			
1900MHZ RRH	C	From Leg	4.000	0.000	150.000	No Ice	2.492	3.258	0.044
			0.000			1/2"	2.695	3.484	0.075
			2.000			Ice	2.906	3.718	0.110
						1" Ice	3.351	4.206	0.192
						2" Ice			
(2) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	150.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			0.000			Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
						2" Ice			
(2) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	150.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			0.000			Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
						2" Ice			
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	150.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			0.000			Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
						2" Ice			
L 2.5x2.5x1/4x12'	A	From Leg	4.000	0.000	153.000	No Ice	5.000	0.500	0.062
			0.000			1/2"	6.363	1.842	0.079
			0.000			Ice	7.738	3.196	0.106
						1" Ice	10.525	5.941	0.191
						2" Ice			
L 2.5x2.5x1/4x12'	B	From Leg	4.000	0.000	153.000	No Ice	5.000	0.500	0.062
			0.000			1/2"	6.363	1.842	0.079
			0.000			Ice	7.738	3.196	0.106
						1" Ice	10.525	5.941	0.191
						2" Ice			
L 2.5x2.5x1/4x12'	C	From Leg	4.000	0.000	153.000	No Ice	5.000	0.500	0.062
			0.000			1/2"	6.363	1.842	0.079
			0.000			Ice	7.738	3.196	0.106
						1" Ice	10.525	5.941	0.191
						2" Ice			
8' x 2.875" Mount Pipe	A	From Leg	4.000	0.000	150.000	No Ice	2.300	2.300	0.046

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			0.000			1/2"	3.132	3.132	0.063
			0.000			Ice	3.620	3.620	0.085
						1" Ice	4.620	4.620	0.146
						2" Ice			
8' x 2.875" Mount Pipe	B	From Leg	4.000	0.000	150.000	No Ice	2.300	2.300	0.046
			0.000			1/2"	3.132	3.132	0.063
			0.000			Ice	3.620	3.620	0.085
						1" Ice	4.620	4.620	0.146
						2" Ice			
8' x 2.875" Mount Pipe	C	From Leg	4.000	0.000	150.000	No Ice	2.300	2.300	0.046
			0.000			1/2"	3.132	3.132	0.063
			0.000			Ice	3.620	3.620	0.085
						1" Ice	4.620	4.620	0.146
						2" Ice			
Platform Mount [LP 713-1]	C	None		0.000	150.000	No Ice	32.890	32.890	1.510
						1/2"	35.760	35.760	2.228
						Ice	38.760	38.760	3.026
						1" Ice	45.260	45.260	4.865
						2" Ice			

(2) 6' x 3" Mount Pipe	A	From Leg	2.000	0.000	142.000	No Ice	1.767	1.767	0.030
			0.000			1/2"	2.129	2.129	0.044
			0.000			Ice	2.501	2.501	0.061
						1" Ice	3.272	3.272	0.109
						2" Ice			
(2) 6' x 3" Mount Pipe	B	From Leg	2.000	0.000	142.000	No Ice	1.767	1.767	0.030
			0.000			1/2"	2.129	2.129	0.044
			0.000			Ice	2.501	2.501	0.061
						1" Ice	3.272	3.272	0.109
						2" Ice			
(2) 6' x 3" Mount Pipe	C	From Leg	2.000	0.000	142.000	No Ice	1.767	1.767	0.030
			0.000			1/2"	2.129	2.129	0.044
			0.000			Ice	2.501	2.501	0.061
						1" Ice	3.272	3.272	0.109
						2" Ice			
4' x 2" Horizontal Face Mount Pipe	B	From Face	0.500	0.000	145.000	No Ice	0.870	0.010	0.015
			0.000			1/2"	1.110	0.050	0.022
			0.000			Ice	1.370	0.100	0.032
						1" Ice	1.900	0.240	0.061
						2" Ice			
4' x 2" Horizontal Face Mount Pipe	C	From Face	0.500	0.000	145.000	No Ice	0.870	0.010	0.015
			0.000			1/2"	1.110	0.050	0.022
			0.000			Ice	1.370	0.100	0.032
						1" Ice	1.900	0.240	0.061
						2" Ice			
J-Box - 1' x 1' x 4"	C	From Leg	0.500	0.000	145.000	No Ice	2.133	1.200	0.020
			0.000			1/2"	2.315	1.343	0.039
			0.000			Ice	2.504	1.493	0.061
						1" Ice	2.904	1.815	0.114
						2" Ice			
Side Arm Mount [SO 101-3]	C	None		0.000	142.000	No Ice	5.810	5.810	0.252
						1/2"	6.950	6.950	0.341
						Ice	8.280	8.280	0.457
						1" Ice	11.540	11.540	0.780
						2" Ice			

ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.000	0.000	136.000	No Ice	3.140	2.590	0.111
			0.000			1/2"	3.450	2.880	0.163
			1.000			Ice	3.770	3.190	0.224
						1" Ice	4.430	3.840	0.374
						2" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.000	0.000	136.000	No Ice	3.140	2.590	0.111
			0.000			1/2"	3.450	2.880	0.163
			1.000			Ice	3.770	3.190	0.224
						1" Ice	4.430	3.840	0.374

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	2" Ice			
							No Ice	3.140	2.590	0.111
							1/2"	3.450	2.880	0.163
							Ice	3.770	3.190	0.224
SBNH-1D65C-SR w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	1" Ice	4.430	3.840	0.374
							2" Ice			
							No Ice	5.560	4.470	0.083
							1/2"	6.070	4.970	0.165
SBNH-1D65C-SR w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	Ice	6.590	5.480	0.260
							1" Ice	7.660	6.520	0.493
							2" Ice			
							No Ice	5.560	4.470	0.083
SBNH-1D65C-SR w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	1/2"	6.070	4.970	0.165
							Ice	6.590	5.480	0.260
							1" Ice	7.660	6.520	0.493
							2" Ice			
TMAT1921B78-21A	A	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	No Ice	0.652	0.300	0.018
							1/2"	0.755	0.376	0.023
							Ice	0.864	0.459	0.030
							1" Ice	1.105	0.648	0.050
TMAT1921B78-21A	B	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	2" Ice			
							No Ice	0.652	0.300	0.018
							1/2"	0.755	0.376	0.023
							Ice	0.864	0.459	0.030
TMAT1921B78-21A	C	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	1" Ice	1.105	0.648	0.050
							2" Ice			
							No Ice	0.652	0.300	0.018
							1/2"	0.755	0.376	0.023
RRUS 11 B12	A	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	Ice	3.259	1.485	0.095
							1" Ice	3.715	1.826	0.153
							2" Ice			
							No Ice	2.833	1.182	0.051
RRUS 11 B12	B	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	1/2"	3.043	1.330	0.072
							Ice	3.259	1.485	0.095
							1" Ice	3.715	1.826	0.153
							2" Ice			
RRUS 11 B12	C	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	No Ice	2.833	1.182	0.051
							1/2"	3.043	1.330	0.072
							Ice	3.259	1.485	0.095
							1" Ice	3.715	1.826	0.153
RRUS 11 B2	A	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	2" Ice			
							No Ice	2.833	1.182	0.051
							1/2"	3.043	1.330	0.072
							Ice	3.259	1.485	0.095
RRUS 11 B2	B	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	1" Ice	3.715	1.826	0.153
							2" Ice			
							No Ice	2.833	1.182	0.051
							1/2"	3.043	1.330	0.072
RRUS 11 B2	C	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	Ice	3.259	1.485	0.095
							1" Ice	3.715	1.826	0.153
							2" Ice			
							No Ice	2.833	1.182	0.051
RRUS 11 B2	C	From Leg	4.000 0.000 1.000	0.000	0.000	136.000	1/2"	3.043	1.330	0.072
							Ice	3.259	1.485	0.095
							1" Ice	3.715	1.826	0.153
							2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
T-Arm Mount [TA 602-3]	C	None		0.000	136.000	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	13.400 13.400 16.440 19.700 25.860 25.860	0.774 1.004 1.292 2.053

7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.746 6.179 6.607 7.488 7.155	4.254 5.014 5.711 7.155 0.287
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.746 6.179 6.607 7.488 7.155	4.254 5.014 5.711 7.155 0.287
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.746 6.179 6.607 7.488 7.155	4.254 5.014 5.711 7.155 0.287
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice 2" Ice	11.960 12.700 13.460 15.020 8.690	5.970 6.630 7.300 8.690 0.529
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice 2" Ice	11.960 12.700 13.460 15.020 8.690	5.970 6.630 7.300 8.690 0.529
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice 2" Ice	11.960 12.700 13.460 15.020 8.690	5.970 6.630 7.300 8.690 0.529
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice 2" Ice	12.250 13.000 13.760 15.340 8.790	6.050 6.710 7.390 8.790 0.508
OPA65R-BU6D w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice 2" Ice	12.250 13.000 13.760 15.340 8.790	6.050 6.710 7.390 8.790 0.508
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice 2" Ice	12.250 13.000 13.760 15.340 8.790	6.050 6.710 7.390 8.790 0.508
RRUS 4449 B5/B12	A	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.968 2.144 2.328 2.718 2.075	1.408 1.564 1.727 2.075 0.163
RRUS 4449 B5/B12	B	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.968 2.144 2.328 2.718 2.075	1.408 1.564 1.727 2.075 0.163
RRUS 4449 B5/B12	C	From Leg	4.000 0.000 2.000	0.000	118.000	No Ice 1/2" Ice	1.968 2.144 2.328	1.408 1.564 1.727

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
							ft ²	ft ²	K
RRUS 4478 B14_CCIV2	A	From Leg	4.000	0.000	118.000	1" Ice	2.718	2.075	0.163
						2" Ice			
						No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						Ice	2.386	1.554	0.097
RRUS 4478 B14_CCIV2	B	From Leg	4.000	0.000	118.000	1" Ice	2.780	1.891	0.147
						2" Ice			
						No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						Ice	2.386	1.554	0.097
RRUS 4478 B14_CCIV2	C	From Leg	4.000	0.000	118.000	1" Ice	2.780	1.891	0.147
						2" Ice			
						No Ice	2.021	1.246	0.059
						1/2" Ice	2.200	1.396	0.077
						Ice	2.386	1.554	0.097
RRUS 8843 B2/B66A_CCIV2	A	From Leg	4.000	0.000	118.000	1" Ice	2.780	1.891	0.147
						2" Ice			
						No Ice	1.980	1.695	0.075
						1/2" Ice	2.157	1.861	0.096
						Ice	2.341	2.035	0.119
RRUS 8843 B2/B66A_CCIV2	B	From Leg	4.000	0.000	118.000	1" Ice	2.733	2.405	0.176
						2" Ice			
						No Ice	1.980	1.695	0.075
						1/2" Ice	2.157	1.861	0.096
						Ice	2.341	2.035	0.119
RRUS 8843 B2/B66A_CCIV2	C	From Leg	4.000	0.000	118.000	1" Ice	2.733	2.405	0.176
						2" Ice			
						No Ice	1.980	1.695	0.075
						1/2" Ice	2.157	1.861	0.096
						Ice	2.341	2.035	0.119
1001940	A	From Leg	4.000	0.000	118.000	1" Ice	0.444	0.304	0.015
						2" Ice			
						No Ice	0.176	0.083	0.002
						1/2" Ice	0.232	0.126	0.004
						Ice	0.295	0.178	0.006
1001940	B	From Leg	4.000	0.000	118.000	1" Ice	0.444	0.304	0.015
						2" Ice			
						No Ice	0.176	0.083	0.002
						1/2" Ice	0.232	0.126	0.004
						Ice	0.295	0.178	0.006
1001940	C	From Leg	4.000	0.000	118.000	1" Ice	0.444	0.304	0.015
						2" Ice			
						No Ice	0.176	0.083	0.002
						1/2" Ice	0.232	0.126	0.004
						Ice	0.295	0.178	0.006
1001983	A	From Leg	4.000	0.000	118.000	1" Ice	0.444	0.304	0.015
						2" Ice			
						No Ice	0.176	0.083	0.002
						1/2" Ice	0.232	0.126	0.004
						Ice	0.295	0.178	0.006
1001983	B	From Leg	4.000	0.000	118.000	1" Ice	0.444	0.304	0.015
						2" Ice			
						No Ice	0.176	0.083	0.002
						1/2" Ice	0.232	0.126	0.004
						Ice	0.295	0.178	0.006
1001983	C	From Leg	4.000	0.000	118.000	1" Ice	0.444	0.304	0.015
						2" Ice			
						No Ice	0.176	0.083	0.002
						1/2" Ice	0.232	0.126	0.004
						Ice	0.295	0.178	0.006
(2) 7020.00	A	From Leg	4.000	0.000	118.000	1" Ice	0.199	0.311	0.009
						2" Ice			
						No Ice	0.102	0.175	0.002

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						ft
(2) 7020.00	B	From Leg	4.000	0.000	0.000	118.000	1" Ice	0.326	0.476	0.022
							2" Ice			
							No Ice	0.102	0.175	0.002
							1/2" Ice	0.147	0.239	0.005
(2) 7020.00	C	From Leg	4.000	0.000	0.000	118.000	1" Ice	0.199	0.311	0.009
							2" Ice	0.326	0.476	0.022
							No Ice	0.102	0.175	0.002
							1/2" Ice	0.147	0.239	0.005
(2) LGP13519	A	From Leg	4.000	0.000	0.000	118.000	Ice	0.199	0.311	0.009
							1" Ice	0.326	0.476	0.022
							2" Ice			
							No Ice	0.290	0.181	0.005
(2) LGP13519	B	From Leg	4.000	0.000	0.000	118.000	1/2" Ice	0.362	0.241	0.008
							Ice	0.441	0.310	0.012
							1" Ice	0.622	0.473	0.024
							2" Ice			
(2) LGP13519	C	From Leg	4.000	0.000	0.000	118.000	No Ice	0.290	0.181	0.005
							1/2" Ice	0.362	0.241	0.008
							Ice	0.441	0.310	0.012
							1" Ice	0.622	0.473	0.024
LGP21401	A	From Leg	4.000	0.000	0.000	118.000	2" Ice			
							No Ice	1.104	0.207	0.014
							1/2" Ice	1.239	0.274	0.021
							Ice	1.381	0.348	0.030
LGP21401	A	From Leg	4.000	0.000	0.000	118.000	1" Ice	1.688	0.521	0.055
							2" Ice			
							No Ice	1.104	0.207	0.014
							1/2" Ice	1.239	0.274	0.021
LGP21401	B	From Leg	4.000	0.000	0.000	118.000	Ice	1.381	0.348	0.030
							1" Ice	1.688	0.521	0.055
							2" Ice			
							No Ice	1.104	0.207	0.014
LGP21401	C	From Leg	4.000	0.000	0.000	118.000	1/2" Ice	1.239	0.274	0.021
							Ice	1.381	0.348	0.030
							1" Ice	1.688	0.521	0.055
							2" Ice			
DC6-48-60-18-8F	A	From Leg	4.000	0.000	0.000	118.000	No Ice	1.212	1.212	0.020
							1/2" Ice	1.892	1.892	0.042
							Ice	2.105	2.105	0.067
							1" Ice	2.570	2.570	0.126
DC6-48-60-18-8F	C	From Leg	4.000	0.000	0.000	118.000	2" Ice			
							No Ice	1.212	1.212	0.020
							1/2" Ice	1.892	1.892	0.042
							Ice	2.105	2.105	0.067
3' x 2" Pipe Mount	A	From Leg	4.000	0.000	0.000	118.000	1" Ice	2.570	2.570	0.126
							2" Ice			
							No Ice	0.583	0.583	0.011
							1/2" Ice	0.770	0.770	0.017
3' x 2" Pipe Mount	B	From Leg	4.000	0.000	0.000	118.000	Ice	0.967	0.967	0.024
							1" Ice	1.388	1.388	0.047
							2" Ice			
							No Ice	0.583	0.583	0.011
3' x 2" Pipe Mount	B	From Leg	4.000	0.000	0.000	118.000	1/2" Ice	0.770	0.770	0.017
							Ice	0.967	0.967	0.024
							Ice	0.967	0.967	0.024

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
						1" Ice	1.388	1.388	0.047
(2) 3' x 2" Pipe Mount	C	From Leg	4.000 0.000 2.000	0.000	118.000	2" Ice No Ice	0.583 0.583	0.583 0.583	0.011 0.011
						1/2" Ice	0.770	0.770	0.017
						1" Ice	0.967	0.967	0.024
						2" Ice	1.388	1.388	0.047
Platform Mount [LP 304-1_HR-1]	C	None		0.000	118.000	No Ice	21.410	21.410	1.605
						1/2" Ice	26.620	26.620	2.056
						1" Ice	31.660	31.660	2.598
						2" Ice	41.380	41.380	3.958

KS24019-L112A	A	From Leg	3.000 0.000 0.000	0.000	61.000	No Ice	0.100	0.100	0.005
						1/2" Ice	0.180	0.180	0.006
						1" Ice	0.260	0.260	0.008
						2" Ice	0.420	0.420	0.011
2' x 2" Pipe Mount	A	From Leg	3.000 0.000 0.000	0.000	61.000	No Ice	0.023	0.023	0.007
						1/2" Ice	0.049	0.049	0.008
						1" Ice	0.085	0.085	0.009
						2" Ice	0.186	0.186	0.013
Side Arm Mount [SO 701-1]	A	From Leg	1.500 0.000 0.000	0.000	61.000	No Ice	0.850	1.670	0.065
						1/2" Ice	1.140	2.340	0.079
						1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121

2' x 2" Pipe Mount	A	From Leg	3.000 0.000 0.000	0.000	50.000	No Ice	0.023	0.023	0.007
						1/2" Ice	0.049	0.049	0.008
						1" Ice	0.085	0.085	0.009
						2" Ice	0.186	0.186	0.013
2' x 2" Pipe Mount	C	From Leg	3.000 0.000 0.000	0.000	50.000	No Ice	0.023	0.023	0.007
						1/2" Ice	0.049	0.049	0.008
						1" Ice	0.085	0.085	0.009
						2" Ice	0.186	0.186	0.013
Side Arm Mount [SO 701-1]	A	From Leg	1.500 0.000 0.000	0.000	50.000	No Ice	0.850	1.670	0.065
						1/2" Ice	1.140	2.340	0.079
						1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121

MX08FRO665-20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice	8.010	4.230	0.098
						1/2" Ice	8.520	4.690	0.184
						1" Ice	9.040	5.160	0.281
						2" Ice	10.110	6.120	0.512
MX08FRO665-20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice	8.010	4.230	0.098
						1/2" Ice	8.520	4.690	0.184
						1" Ice	9.040	5.160	0.281
						2" Ice	10.110	6.120	0.512
MX08FRO665-20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice	8.010	4.230	0.098
						1/2" Ice	8.520	4.690	0.184
						1" Ice	9.040	5.160	0.281
						2" Ice	10.110	6.120	0.512

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
TA08025-B604	A	From Leg	4.000	0.000	0.000	108.000	No Ice	1.964	0.981	0.064
			0.000	0.000			1/2"	2.138	1.112	0.081
			0.000	0.000			Ice	2.320	1.250	0.100
							1" Ice	2.705	1.548	0.148
							2" Ice			
TA08025-B604	B	From Leg	4.000	0.000	0.000	108.000	No Ice	1.964	0.981	0.064
			0.000	0.000			1/2"	2.138	1.112	0.081
			0.000	0.000			Ice	2.320	1.250	0.100
							1" Ice	2.705	1.548	0.148
							2" Ice			
TA08025-B605	A	From Leg	4.000	0.000	0.000	108.000	No Ice	1.964	1.129	0.075
			0.000	0.000			1/2"	2.138	1.267	0.093
			0.000	0.000			Ice	2.320	1.411	0.114
							1" Ice	2.705	1.723	0.164
							2" Ice			
TA08025-B604	C	From Leg	4.000	0.000	0.000	108.000	No Ice	1.964	0.981	0.064
			0.000	0.000			1/2"	2.138	1.112	0.081
			0.000	0.000			Ice	2.320	1.250	0.100
							1" Ice	2.705	1.548	0.148
							2" Ice			
TA08025-B605	B	From Leg	4.000	0.000	0.000	108.000	No Ice	1.964	1.129	0.075
			0.000	0.000			1/2"	2.138	1.267	0.093
			0.000	0.000			Ice	2.320	1.411	0.114
							1" Ice	2.705	1.723	0.164
							2" Ice			
TA08025-B605	C	From Leg	4.000	0.000	0.000	108.000	No Ice	1.964	1.129	0.075
			0.000	0.000			1/2"	2.138	1.267	0.093
			0.000	0.000			Ice	2.320	1.411	0.114
							1" Ice	2.705	1.723	0.164
							2" Ice			
RDIDC-9181-PF-48	A	From Leg	4.000	0.000	0.000	108.000	No Ice	2.312	1.293	0.022
			0.000	0.000			1/2"	2.502	1.448	0.041
			0.000	0.000			Ice	2.700	1.610	0.063
							1" Ice	3.118	1.957	0.117
							2" Ice			
Commscope MC-PK8-DSH	A	None			0.000	108.000	No Ice	34.240	34.240	1.749
							1/2"	62.950	62.950	2.099
							Ice	91.660	91.660	2.450
							1" Ice	149.080	149.080	3.151
							2" Ice			
(2) 8'x2" Antenna Mount Pipe	A	From Leg	4.000	0.000	0.000	108.000	No Ice	1.900	1.900	0.030
			0.000	0.000			1/2"	2.728	2.728	0.044
			0.000	0.000			Ice	3.401	3.401	0.064
							1" Ice	4.396	4.396	0.120
							2" Ice			
(2) 8'x2" Antenna Mount Pipe	B	From Leg	4.000	0.000	0.000	108.000	No Ice	1.900	1.900	0.030
			0.000	0.000			1/2"	2.728	2.728	0.044
			0.000	0.000			Ice	3.401	3.401	0.064
							1" Ice	4.396	4.396	0.120
							2" Ice			
(2) 8'x2" Antenna Mount Pipe	C	From Leg	4.000	0.000	0.000	108.000	No Ice	1.900	1.900	0.030
			0.000	0.000			1/2"	2.728	2.728	0.044
			0.000	0.000			Ice	3.401	3.401	0.064
							1" Ice	4.396	4.396	0.120
							2" Ice			

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
Radiowaves HP3-11	B	Paraboloid w/Shroud (HP)	From Leg	2.000	70.000		142.000	3.167	No Ice	0.050
				0.000					1/2" Ice	0.093
				2.000					1" Ice	0.135
									2" Ice	0.220
Radiowaves HP3-11	C	Paraboloid w/Shroud (HP)	From Leg	2.000	78.000		142.000	3.167	No Ice	0.050
				0.000					1/2" Ice	0.093
				2.000					1" Ice	0.135
									2" Ice	0.220

Load Combinations

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

Comb. No.	Description
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Sectio n No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	160 - 123.667	Pole	Max Tension	2	0.000	-0.001	-0.000
			Max. Compression	26	-29.609	0.879	-0.800
			Max. Mx	8	-11.025	-355.734	0.492
			Max. My	2	-11.003	-1.306	357.082
			Max. Vy	8	16.460	-355.734	0.492
			Max. Vx	2	-16.602	-1.306	357.082
			Max. Torque	9			-1.677
L2	123.667 - 76.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-58.605	2.896	0.324
			Max. Mx	8	-26.647	-1483.976	-1.823
			Max. My	2	-26.625	-1.055	1494.544
			Max. Vy	8	29.398	-1483.976	-1.823
			Max. Vx	2	-29.609	-1.055	1494.544
			Max. Torque	9			-1.674
L3	76.25 - 37	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-75.450	4.941	1.509
			Max. Mx	8	-38.108	-2691.080	-3.443
			Max. My	2	-38.098	-0.489	2710.027
			Max. Vy	8	34.165	-2691.080	-3.443
			Max. Vx	2	-34.329	-0.489	2710.027
			Max. Torque	15			-1.537
L4	37 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-99.198	7.178	2.149
			Max. Mx	8	-55.745	-4307.744	-6.270
			Max. My	2	-55.745	0.372	4334.129
			Max. Vy	8	39.313	-4307.744	-6.270
			Max. Vx	2	-39.471	0.372	4334.129
			Max. Torque	15			-1.536

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	36	99.198	8.438	-0.001
	Max. H _x	20	55.766	39.238	-0.021
	Max. H _z	2	55.766	0.012	39.441
	Max. M _x	2	4334.129	0.012	39.441
	Max. M _z	8	4307.744	-39.283	-0.063
	Max. Torsion	3	1.108	0.012	39.441
	Min. Vert	23	41.825	33.875	19.752
	Min. H _x	8	55.766	-39.283	-0.063
	Min. H _z	14	55.766	-0.073	-39.415
	Min. M _x	14	-4329.240	-0.073	-39.415
	Min. M _z	20	-4303.590	39.238	-0.021
	Min. Torsion	15	-1.536	-0.073	-39.415

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	46.472	0.000	0.000	-0.432	1.037	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	55.766	-0.012	-39.441	-4334.129	0.372	-1.106
0.9 Dead+1.0 Wind 0 deg - No Ice	41.825	-0.012	-39.441	-4289.719	0.072	-1.108
1.2 Dead+1.0 Wind 30 deg - No Ice	55.766	19.608	-34.248	-3768.670	-2150.561	-0.940
0.9 Dead+1.0 Wind 30 deg - No Ice	41.825	19.608	-34.248	-3729.994	-2128.901	-0.943
1.2 Dead+1.0 Wind 60 deg - No Ice	55.766	33.988	-19.836	-2187.077	-3726.892	0.120
0.9 Dead+1.0 Wind 60 deg - No Ice	41.825	33.988	-19.836	-2164.545	-3689.141	0.119
1.2 Dead+1.0 Wind 90 deg - No Ice	55.766	39.283	0.063	6.269	-4307.744	1.011
0.9 Dead+1.0 Wind 90 deg - No Ice	41.825	39.283	0.063	6.353	-4264.077	1.010
1.2 Dead+1.0 Wind 120 deg - No Ice	55.766	33.976	19.777	2172.453	-3722.524	1.144
0.9 Dead+1.0 Wind 120 deg - No Ice	41.825	33.976	19.777	2150.395	-3684.840	1.145
1.2 Dead+1.0 Wind 150 deg - No Ice	55.766	19.566	34.160	3751.616	-2139.550	1.293
0.9 Dead+1.0 Wind 150 deg - No Ice	41.825	19.566	34.160	3713.420	-2118.052	1.295
1.2 Dead+1.0 Wind 180 deg - No Ice	55.766	0.073	39.415	4329.240	-7.000	1.533
0.9 Dead+1.0 Wind 180 deg - No Ice	41.825	0.073	39.415	4285.149	-7.257	1.536
1.2 Dead+1.0 Wind 210 deg - No Ice	55.766	-19.545	34.163	3754.857	2143.662	1.124
0.9 Dead+1.0 Wind 210 deg - No Ice	41.825	-19.545	34.163	3716.600	2121.445	1.126
1.2 Dead+1.0 Wind 240 deg - No Ice	55.766	-33.991	19.752	2173.375	3729.945	-0.002
0.9 Dead+1.0 Wind 240 deg - No Ice	41.825	-33.991	19.752	2151.268	3691.517	0.000
1.2 Dead+1.0 Wind 270 deg - No Ice	55.766	-39.238	0.021	5.384	4303.590	-0.759
0.9 Dead+1.0 Wind 270 deg - No Ice	41.825	-39.238	0.021	5.434	4259.332	-0.758
1.2 Dead+1.0 Wind 300 deg - No Ice	55.766	-33.875	-19.752	-2169.788	3709.842	-0.509
0.9 Dead+1.0 Wind 300 deg - No Ice	41.825	-33.875	-19.752	-2147.494	3671.669	-0.510
1.2 Dead+1.0 Wind 330 deg - No Ice	55.766	-19.506	-34.169	-3754.100	2133.080	-0.727
0.9 Dead+1.0 Wind 330 deg - No Ice	41.825	-19.506	-34.169	-3715.611	2111.023	-0.728
1.2 Dead+1.0 Ice+1.0 Temp	99.198	-0.000	-0.000	-2.149	7.178	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	99.198	-0.004	-8.468	-988.665	7.439	-0.285
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	99.198	4.215	-7.348	-859.186	-482.945	-0.271
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	99.198	7.308	-4.252	-498.907	-842.276	-0.072
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	99.198	8.446	0.013	-0.855	-974.552	0.121
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	99.198	7.308	4.246	492.224	-841.615	0.198
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	99.198	4.212	7.335	851.951	-481.181	0.278
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	99.198	0.015	8.464	983.507	5.822	0.359
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	99.198	-4.205	7.334	852.402	496.151	0.302

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	99.198	-7.308	4.237	492.150	857.289	0.093
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	99.198	-8.438	0.001	-1.295	988.255	-0.078
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	99.198	-7.290	-4.241	-496.002	853.768	-0.088
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	99.198	-4.202	-7.337	-856.667	494.469	-0.180
Dead+Wind 0 deg - Service	46.472	-0.002	-7.913	-865.071	0.895	-0.225
Dead+Wind 30 deg - Service	46.472	3.934	-6.871	-752.251	-428.257	-0.191
Dead+Wind 60 deg - Service	46.472	6.819	-3.980	-436.687	-742.757	0.025
Dead+Wind 90 deg - Service	46.472	7.881	0.013	0.917	-858.640	0.206
Dead+Wind 120 deg - Service	46.472	6.817	3.968	433.098	-741.877	0.233
Dead+Wind 150 deg - Service	46.472	3.926	6.853	748.164	-426.056	0.263
Dead+Wind 180 deg - Service	46.472	0.015	7.908	863.419	-0.578	0.311
Dead+Wind 210 deg - Service	46.472	-3.921	6.854	748.812	428.513	0.228
Dead+Wind 240 deg - Service	46.472	-6.819	3.963	433.281	744.996	-0.001
Dead+Wind 270 deg - Service	46.472	-7.872	0.004	0.737	859.443	-0.155
Dead+Wind 300 deg - Service	46.472	-6.796	-3.963	-433.233	740.977	-0.104
Dead+Wind 330 deg - Service	46.472	-3.913	-6.855	-749.331	426.402	-0.148

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-46.472	0.000	0.000	46.472	0.000	0.000%
2	-0.012	-55.766	-39.441	0.012	55.766	39.441	0.000%
3	-0.012	-41.825	-39.441	0.012	41.825	39.441	0.000%
4	19.608	-55.766	-34.248	-19.608	55.766	34.248	0.000%
5	19.608	-41.825	-34.248	-19.608	41.825	34.248	0.000%
6	33.988	-55.766	-19.836	-33.988	55.766	19.836	0.000%
7	33.988	-41.825	-19.836	-33.988	41.825	19.836	0.000%
8	39.283	-55.766	0.063	-39.283	55.766	-0.063	0.000%
9	39.283	-41.825	0.063	-39.283	41.825	-0.063	0.000%
10	33.976	-55.766	19.777	-33.976	55.766	-19.777	0.000%
11	33.976	-41.825	19.777	-33.976	41.825	-19.777	0.000%
12	19.566	-55.766	34.160	-19.566	55.766	-34.160	0.000%
13	19.566	-41.825	34.160	-19.566	41.825	-34.160	0.000%
14	0.073	-55.766	39.415	-0.073	55.766	-39.415	0.000%
15	0.073	-41.825	39.415	-0.073	41.825	-39.415	0.000%
16	-19.545	-55.766	34.163	19.545	55.766	-34.163	0.000%
17	-19.545	-41.825	34.163	19.545	41.825	-34.163	0.000%
18	-33.991	-55.766	19.752	33.991	55.766	-19.752	0.000%
19	-33.991	-41.825	19.752	33.991	41.825	-19.752	0.000%
20	-39.238	-55.766	0.021	39.238	55.766	-0.021	0.000%
21	-39.238	-41.825	0.021	39.238	41.825	-0.021	0.000%
22	-33.875	-55.766	-19.752	33.875	55.766	19.752	0.000%
23	-33.875	-41.825	-19.752	33.875	41.825	19.752	0.000%
24	-19.506	-55.766	-34.169	19.506	55.766	34.169	0.000%
25	-19.506	-41.825	-34.169	19.506	41.825	34.169	0.000%
26	0.000	-99.198	0.000	0.000	99.198	0.000	0.000%
27	-0.004	-99.198	-8.468	0.004	99.198	8.468	0.000%
28	4.215	-99.198	-7.348	-4.215	99.198	7.348	0.000%
29	7.307	-99.198	-4.252	-7.308	99.198	4.252	0.000%
30	8.446	-99.198	0.013	-8.446	99.198	-0.013	0.000%
31	7.308	-99.198	4.245	-7.308	99.198	-4.246	0.000%
32	4.212	-99.198	7.335	-4.212	99.198	-7.335	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
33	0.015	-99.198	8.463	-0.015	99.198	-8.464	0.000%
34	-4.204	-99.198	7.333	4.205	99.198	-7.334	0.000%
35	-7.308	-99.198	4.237	7.308	99.198	-4.237	0.000%
36	-8.438	-99.198	0.001	8.438	99.198	-0.001	0.000%
37	-7.290	-99.198	-4.241	7.290	99.198	4.241	0.000%
38	-4.202	-99.198	-7.337	4.202	99.198	7.337	0.000%
39	-0.002	-46.472	-7.913	0.002	46.472	7.913	0.000%
40	3.934	-46.472	-6.871	-3.934	46.472	6.871	0.000%
41	6.819	-46.472	-3.980	-6.819	46.472	3.980	0.000%
42	7.881	-46.472	0.013	-7.881	46.472	-0.013	0.000%
43	6.817	-46.472	3.968	-6.817	46.472	-3.968	0.000%
44	3.925	-46.472	6.853	-3.926	46.472	-6.853	0.000%
45	0.015	-46.472	7.908	-0.015	46.472	-7.908	0.000%
46	-3.921	-46.472	6.854	3.921	46.472	-6.854	0.000%
47	-6.819	-46.472	3.963	6.819	46.472	-3.963	0.000%
48	-7.872	-46.472	0.004	7.872	46.472	-0.004	0.000%
49	-6.796	-46.472	-3.963	6.796	46.472	3.963	0.000%
50	-3.913	-46.472	-6.855	3.913	46.472	6.855	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001
2	Yes	4	0.0000001	0.00055989
3	Yes	4	0.0000001	0.00030988
4	Yes	5	0.0000001	0.00082221
5	Yes	5	0.0000001	0.00035603
6	Yes	5	0.0000001	0.00082634
7	Yes	5	0.0000001	0.00035792
8	Yes	4	0.0000001	0.00080422
9	Yes	4	0.0000001	0.00048291
10	Yes	5	0.0000001	0.00084278
11	Yes	5	0.0000001	0.00036714
12	Yes	5	0.0000001	0.00080116
13	Yes	5	0.0000001	0.00034735
14	Yes	4	0.0000001	0.00069833
15	Yes	4	0.0000001	0.00040879
16	Yes	5	0.0000001	0.00083537
17	Yes	5	0.0000001	0.00036317
18	Yes	5	0.0000001	0.00083425
19	Yes	5	0.0000001	0.00036220
20	Yes	4	0.0000001	0.00071741
21	Yes	4	0.0000001	0.00042303
22	Yes	5	0.0000001	0.00080935
23	Yes	5	0.0000001	0.00035143
24	Yes	5	0.0000001	0.00082797
25	Yes	5	0.0000001	0.00036047
26	Yes	4	0.0000001	0.00002598
27	Yes	5	0.0000001	0.00038222
28	Yes	5	0.0000001	0.00043757
29	Yes	5	0.0000001	0.00043704
30	Yes	5	0.0000001	0.00037649
31	Yes	5	0.0000001	0.00043573
32	Yes	5	0.0000001	0.00043349
33	Yes	5	0.0000001	0.00038130
34	Yes	5	0.0000001	0.00044340
35	Yes	5	0.0000001	0.00044304
36	Yes	5	0.0000001	0.00038252
37	Yes	5	0.0000001	0.00044030
38	Yes	5	0.0000001	0.00044254
39	Yes	4	0.0000001	0.00004984
40	Yes	4	0.0000001	0.00018781
41	Yes	4	0.0000001	0.00018972
42	Yes	4	0.0000001	0.00005528

43	Yes	4	0.00000001	0.00020718
44	Yes	4	0.00000001	0.00017847
45	Yes	4	0.00000001	0.00005485
46	Yes	4	0.00000001	0.00020156
47	Yes	4	0.00000001	0.00019798
48	Yes	4	0.00000001	0.00005209
49	Yes	4	0.00000001	0.00018415
50	Yes	4	0.00000001	0.00019911

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 123.667	20.958	40	1.253	0.003
L2	128 - 76.25	13.047	40	1.037	0.001
L3	82 - 37	4.965	40	0.609	0.000
L4	44 - 0	1.352	40	0.282	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
158.000	(2) DB846H80E-SX w/ Mount Pipe	40	20.440	1.241	0.003	34695
153.000	L 2.5x2.5x1/4x12'	40	19.149	1.210	0.003	24782
150.000	DT465B-2XR w/ Mount Pipe	40	18.379	1.191	0.003	17347
145.000	4' x 2" Horizontal Face Mount Pipe	40	17.112	1.158	0.002	11565
144.000	Radiowaves HP3-11	40	16.861	1.152	0.002	10842
142.000	(2) 6' x 3" Mount Pipe	40	16.363	1.138	0.002	9637
136.000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	40	14.901	1.097	0.002	7227
118.000	7770.00 w/ Mount Pipe	40	10.919	0.953	0.001	5636
108.000	MX08FRO665-20 w/ Mount Pipe	40	9.005	0.861	0.001	5862
61.000	KS24019-L112A	40	2.632	0.419	0.000	6357
50.000	2' x 2" Pipe Mount	40	1.741	0.329	0.000	6268

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 123.667	105.068	4	6.297	0.017
L2	128 - 76.25	65.434	4	5.208	0.007
L3	82 - 37	24.907	4	3.060	0.002
L4	44 - 0	6.780	4	1.417	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
158.000	(2) DB846H80E-SX w/ Mount Pipe	4	102.474	6.235	0.016	7081

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.000	L 2.5x2.5x1/4x12'	4	96.006	6.078	0.014	5057
150.000	DT465B-2XR w/ Mount Pipe	4	92.151	5.983	0.013	3539
145.000	4' x 2" Horizontal Face Mount Pipe	4	85.801	5.820	0.012	2358
144.000	Radiowaves HP3-11	4	84.545	5.787	0.011	2211
142.000	(2) 6' x 3" Mount Pipe	4	82.049	5.720	0.011	1964
136.000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	4	74.724	5.510	0.009	1472
118.000	7770.00 w/ Mount Pipe	4	54.770	4.785	0.005	1140
108.000	MX08FRO665-20 w/ Mount Pipe	4	45.171	4.324	0.004	1181
61.000	KS24019-L112A	4	13.202	2.102	0.001	1270
50.000	2' x 2" Pipe Mount	4	8.730	1.648	0.001	1251

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	160 - 123.667 (1)	TP29.05x18.87x0.188	36.333	0.000	0.0	16.693	-10.995	943.213	0.012
L2	123.667 - 76.25 (2)	TP41.95x27.461x0.313	51.750	0.000	0.0	40.278	-26.621	2356.250	0.011
L3	76.25 - 37 (3)	TP52.32x39.715x0.344	45.000	0.000	0.0	55.361	-38.096	3156.660	0.012
L4	37 - 0 (4)	TP62x49.672x0.406	44.000	0.000	0.0	80.572	-55.745	4464.570	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio M _{ux} / φM _{nx}	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio M _{uy} / φM _{ny}
L1	160 - 123.667 (1)	TP29.05x18.87x0.188	359.147	531.888	0.675	0.000	531.888	0.000
L2	123.667 - 76.25 (2)	TP41.95x27.461x0.313	1497.883	2023.500	0.740	0.000	2023.500	0.000
L3	76.25 - 37 (3)	TP52.32x39.715x0.344	2714.092	3219.825	0.843	0.000	3219.825	0.000
L4	37 - 0 (4)	TP62x49.672x0.406	4339.100	5609.658	0.774	0.000	5609.658	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u K	φV _n K	Ratio V _u / φV _n	Actual T _u kip-ft	φT _n kip-ft	Ratio T _u / φT _n
L1	160 - 123.667 (1)	TP29.05x18.87x0.188	16.646	292.958	0.057	0.223	712.485	0.000
L2	123.667 - 76.25 (2)	TP41.95x27.461x0.313	29.636	706.875	0.042	0.629	2488.867	0.000
L3	76.25 - 37 (3)	TP52.32x39.715x0.344	34.354	971.584	0.035	0.941	4274.492	0.000
L4	37 - 0 (4)	TP62x49.672x0.406	39.495	1414.040	0.028	0.940	7661.250	0.000

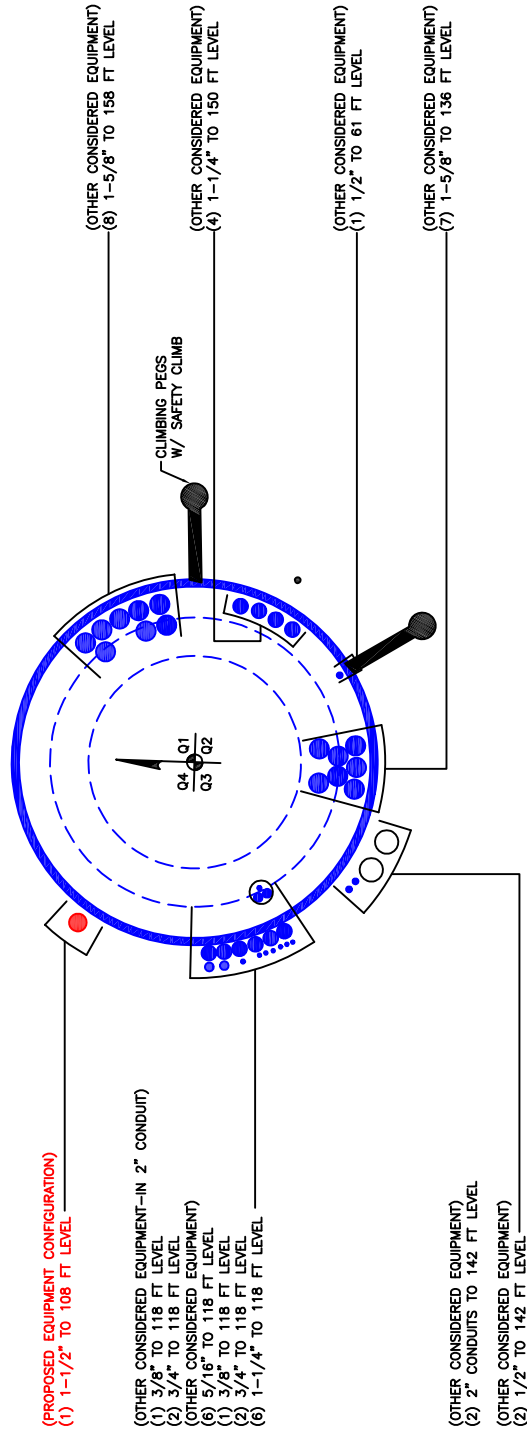
Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L1	160 - 123.667 (1)	0.012	0.675	0.000	0.057	0.000	0.690	1.050	4.8.2
L2	123.667 - 76.25 (2)	0.011	0.740	0.000	0.042	0.000	0.753	1.050	4.8.2
L3	76.25 - 37 (3)	0.012	0.843	0.000	0.035	0.000	0.856	1.050	4.8.2
L4	37 - 0 (4)	0.012	0.774	0.000	0.028	0.000	0.787	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	160 - 123.667	Pole	TP29.05x18.87x0.188	1	-10.995	990.374	65.7	Pass
L2	123.667 - 76.25	Pole	TP41.95x27.461x0.313	2	-26.621	2474.062	71.7	Pass
L3	76.25 - 37	Pole	TP52.32x39.715x0.344	3	-38.096	3314.493	81.5	Pass
L4	37 - 0	Pole	TP62x49.672x0.406	4	-55.745	4687.798	74.9	Pass
						Summary		
						Pole (L3)	81.5	Pass
						RATING =	81.5	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

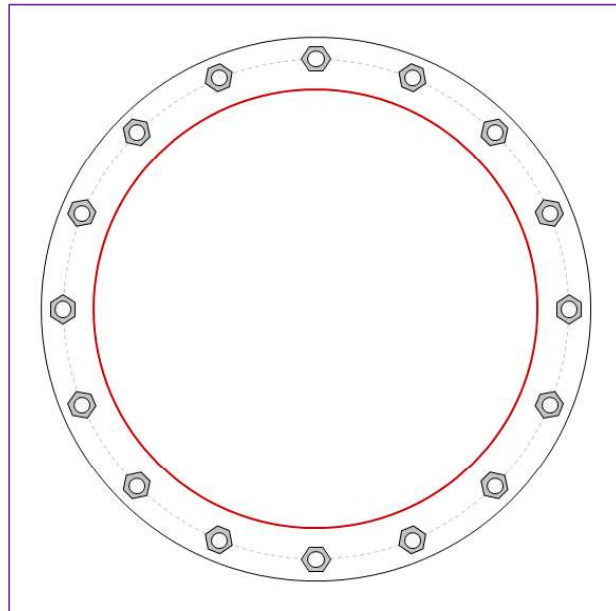


Site Info	
BU #	806382
Site Name	HRT 082 943274
Order #	553285, Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.75

Applied Loads	
Moment (kip-ft)	4339.10
Axial Force (kips)	55.75
Shear Force (kips)	39.49

*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
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Anchor Rod Data
(16) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 70.69" BC
Base Plate Data
76.69" OD x 2.75" Plate (S-128; $F_y=60$ ksi, $F_u=80$ ksi)
Stiffener Data
N/A
Pole Data
62" x 0.40625" 12-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary	<i>(units of kips, kip-in)</i>	
$Pu_c = 187.55$	$\phi Pn_c = 268.39$	Stress Rating
$Vu = 2.47$	$\phi Vn = 120.77$	66.6%
$Mu = n/a$	$\phi Mn = n/a$	Pass
Base Plate Summary		
Max Stress (ksi):	21.64	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	38.2%	Pass

Drilled Pier Foundation

BU #: 806382
 Site Name: HRT 082 943274
 Order Number: 553285, Rev. 0

TIA-222 Revision: H
 Tower Type: Monopole

Applied Loads		
Comp.	Uplift	
Moment (kip-ft)	4339.1	
Axial Force (kips)	55.77	
Shear Force (kips)	39.46	

Material Properties	
Concrete Strength, f _c :	4 ksi
Rebar Strength, F _y :	60 ksi
Tie Yield Strength, F _{yt} :	40 ksi

Pier Design Data	
Depth	20 ft
Ext. Above Grade	0.5 ft
Pier Section 1	
<i>From 0.5' above grade to 20' below grade</i>	
Pier Diameter	7.5 ft
Rebar Quantity	36
Rebar Size	11
Clear Cover to Ties	4 in
Tie Size	5
Tie Spacing	in

[Rebar & Pier Options](#)

[Embedded Pole Inputs](#)

[Bellied Pier Inputs](#)



Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
	N/A
Shear Design Options	
Check Shear along Depth of Pier:	<input checked="" type="checkbox"/>
Utilize Shear-Friction Methodology:	<input type="checkbox"/>
Override Critical Depth:	<input type="checkbox"/>

[Go to Soil Calculations](#)

Analysis Results			
Soil Lateral Check	Compression	Uplift	
D _{v=0} (ft. from TOC)	5.00	-	-
Soil Safety Factor	2.03	-	-
Max Moment (kip-ft)	4484.93	-	-
Rating*	62.4%	-	-
Soil Vertical Check	Compression	Uplift	
Skin Friction (kips)	390.26	-	-
End Bearing (kips)	1079.34	-	-
Weight of Concrete (kips)	163.02	-	-
Total Capacity (kips)	1469.60	-	-
Axial (kips)	218.79	-	-
Rating*	14.2%	-	-
Reinforced Concrete Flexure	Compression	Uplift	
Critical Depth (ft. from TOC)	4.66	-	-
Critical Moment (kip-ft)	4483.89	-	-
Critical Moment Capacity	9395.22	-	-
Rating*	45.5%	-	-
Reinforced Concrete Shear	Compression	Uplift	
Critical Depth (ft. from TOC)	15.29	-	-
Critical Shear (kip)	652.19	-	-
Critical Shear Capacity	795.88	-	-
Rating*	78.0%	-	-

Soil Interaction Rating*	62.4%
Structural Foundation Rating*	78.0%

*Rating per TIA-222-H Section 15.5

Soil Profile

# of Layers	4
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Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ _{soil} (pcf)	γ _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	1	1	100	150	0	0	0.000	0.000				Cohesionless
2	1	6	5	110	150	34	38	0.187	0.187			6	Cohesionless
3	6	9.5	3.5	115	150		38	0.702	0.702			11	Cohesionless
4	9.5	20	10.5	145	150		45	1.780	1.780		32.575	50	Cohesionless

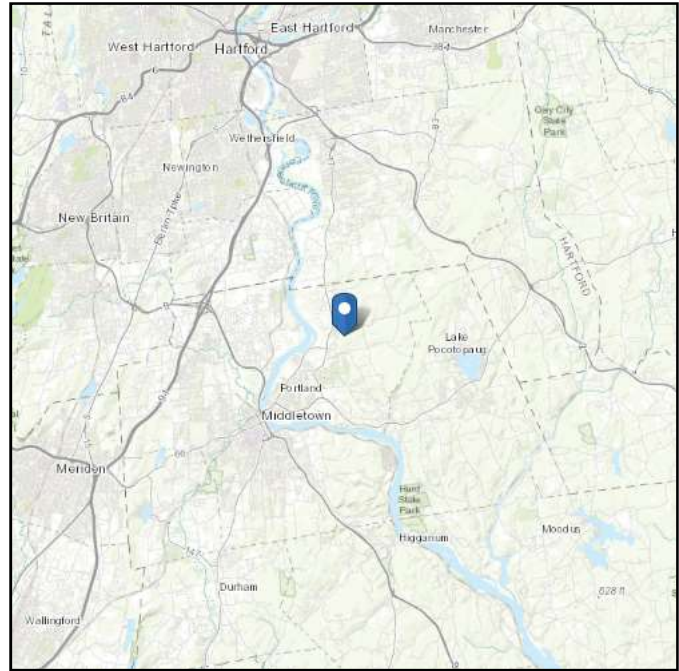
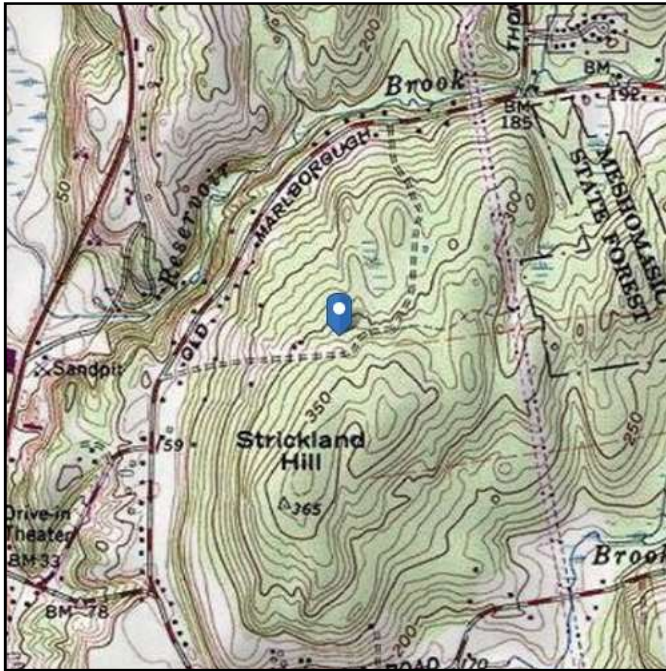
Groundwater Depth	N/A
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ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 316.81 ft (NAVD 88)
Latitude: 41.608306
Longitude: -72.591544



Wind

Results:

Wind Speed:	125 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	102 Vmph

*Ultimate 3-second gust wind speed of 130 mph is required for Risk Category II Structures by the Municipality of Portland.

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

Date Accessed: Thu Nov 12 2020

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

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

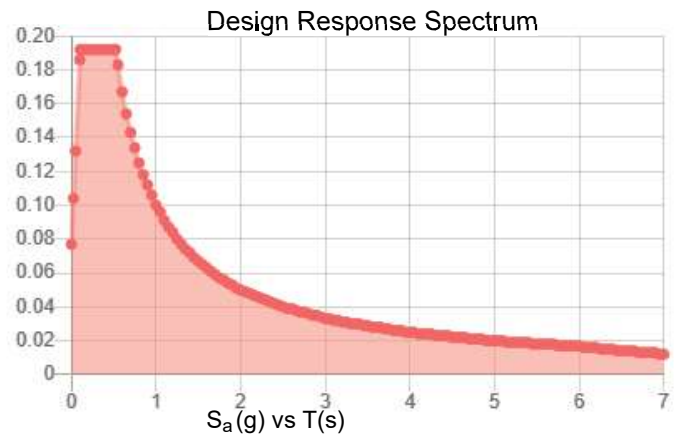
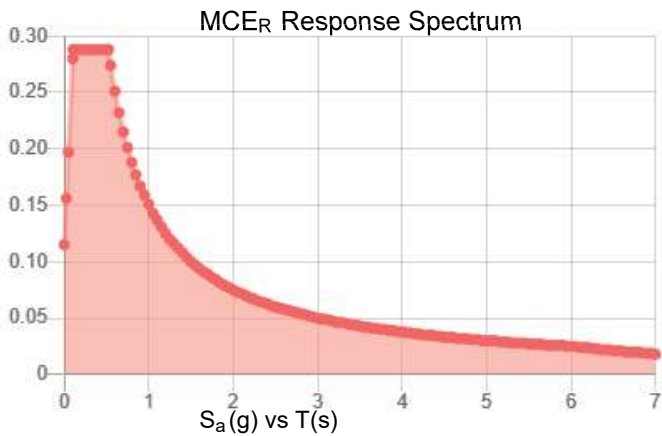
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.18	S_{DS} :	0.192
S_1 :	0.063	S_{D1} :	0.1
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.091
S_{MS} :	0.288	PGA _M :	0.146
S_{M1} :	0.151	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Thu Nov 12 2020

Date Source:

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

Ice

Results:

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

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

Date Accessed: Thu Nov 12 2020

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

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

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

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Exhibit E

Power Density/RF Emissions Report



RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of Dish Wireless

Crown Castle Site Name: HRT 082 943274
Crown Castle Site BU Number: 806382
Dish Wireless Site ID: BOBDL00050A
74 Goodrich Lane
Portland, CT
5/27/2021

Report Status:

Dish Wireless Is Compliant



Michael Fischer, P.E.
Registered Professional Engineer (Electrical)
Connecticut License Number 33928
Expires January 31, 2022

Signed 27 May 2021

Prepared By:

Site Safe, LLC

Engineering Statement in Re:
Electromagnetic Energy Analysis
Crown Castle
Portland, CT

My signature on the cover of this document indicates:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Site Safe, LLC in Vienna, Virginia; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by Crown Castle (see attached Site Summary and Carrier documents) and that Dish Wireless' installation involves communications equipment, antennas and associated technical equipment at a location referred to as "HRT 082 943274" ("the site"); and

That Dish Wireless proposes to operate at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by Dish Wireless and shown on the worksheet and that worst-case 100% duty cycle has been assumed; and

That in addition to the emitters specified in the worksheet, there are additional collocated point-to-point microwave facilities on this structure, and the antennas used are highly directional and oriented at angles at or just below the horizontal, and that the energy present at ground level is typically so low as to be considered insignificant and has not been included in this analysis (a list of microwave antennas is included); and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radio frequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio frequency energy must utilize the standards set by the FCC, which is the federal agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," which defines situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and 2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for licensees of Dish Wireless' operating frequencies as shown on the attached antenna worksheet; and

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed Dish Wireless operation is no more than 1.625% of the maximum permissible exposure limits in any accessible area on the ground; and

That it is understood per FCC Guidelines and OET 65 Appendix A, that regardless of the existent radio frequency environment, only those licensees whose contributions exceed 5% of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 7.967% of the maximum in any accessible area up to two meters above the ground per OET 65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET 65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier(s) and frequency range(s) indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding radio frequency safety; and

In summary, it is stated here that the proposed operation at the site will not result in exposure of the public to excessive levels of radio frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307(b), and that Dish Wireless' proposed operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals and approved contractor personnel trained in radio frequency safety and that this instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower or in the immediate proximity of the antennas.

**Crown Castle
HRT 082 943274
Site Summary**

Carrier	Area Maximum Percentage MPE
AT&T Mobility, LLC	0.220 %
AT&T Mobility, LLC	0.196 %
AT&T Mobility, LLC	0.139 %
AT&T Mobility, LLC (Not in service)	0.000 %
Dish Wireless (Proposed)	0.458 %
Dish Wireless (Proposed)	0.458 %
Dish Wireless (Proposed)	0.709 %
Sprint (T-Mobile)	0.311 %
Sprint (T-Mobile)	0.163 %
Sprint (T-Mobile)	0.160 %
Sprint (T-Mobile)	0.160 %
Sprint (T-Mobile)	0.121 %
T-Mobile	0.578 %
T-Mobile	0.441 %
T-Mobile	0.234 %
Verizon Wireless	0.398 %
Verizon Wireless	0.561 %
Verizon Wireless	0.551 %
Verizon Wireless	0.443 %
Verizon Wireless	1.666 %
 Composite Site MPE:	 7.967 %

AT&T Mobility, LLC
HRT 082 943274
Carrier Summary

Frequency: 1900 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 2.20126 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.22013 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
KMW	AM-X-CD-16-65-00T	120	10	3666	1.170263	0.117026	1.981516	0.198152
KMW	AM-X-CD-16-65-00T	120	140	3666	1.170263	0.117026	1.981516	0.198152
KMW	AM-X-CD-16-65-00T	120	260	3666	1.170263	0.117026	1.981516	0.198152

AT&T Mobility, LLC
HRT 082 943274
Carrier Summary

Frequency: 737 MHz
Maximum Permissible Exposure (MPE): 491.33 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 0.96306 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.19601 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
KMW	AM-X-CD-16-65-00T	120	10	1239	0.926649	0.188599	0.958498	0.195081
KMW	AM-X-CD-16-65-00T	120	140	1239	0.926649	0.188599	0.958498	0.195081
KMW	AM-X-CD-16-65-00T	120	260	1239	0.926649	0.188599	0.958498	0.195081

AT&T Mobility, LLC
HRT 082 943274
Carrier Summary

Frequency: 850 MHz
Maximum Permissible Exposure (MPE): 566.67 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 0.7902 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.13945 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
Powerwave	7770	120	10	547	0.374415	0.066073	0.577456	0.101904
Powerwave	7770	120	140	547	0.374415	0.066073	0.577456	0.101904
Powerwave	7770	120	260	547	0.374415	0.066073	0.577456	0.101904

AT&T Mobility, LLC (Not in service)
HRT 082 943274
Carrier Summary

Frequency: 850 MHz
Maximum Permissible Exposure (MPE): 566.67 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 0 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
Powerwave	7770	120	10	0	0	0	0	0
Powerwave	7770	120	140	0	0	0	0	0
Powerwave	7770	120	260	0	0	0	0	0

Dish Wireless (Proposed)
HRT 082 943274
Carrier Summary

Frequency: 2100 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 4.57613 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.45761 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
JMA Wireless	MX08FRO665-20	108	0	6904	2.064285	0.206428	4.534783	0.453478
JMA Wireless	MX08FRO665-20	108	120	6904	2.064285	0.206428	4.534783	0.453478
JMA Wireless	MX08FRO665-20	108	240	6904	2.064285	0.206428	4.534783	0.453478

Dish Wireless (Proposed)
HRT 082 943274
Carrier Summary

Frequency: 1900 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 4.57613 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.45761 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
JMA Wireless	MX08FRO665-20	108	0	6904	2.064285	0.206428	4.534783	0.453478
JMA Wireless	MX08FRO665-20	108	120	6904	2.064285	0.206428	4.534783	0.453478
JMA Wireless	MX08FRO665-20	108	240	6904	2.064285	0.206428	4.534783	0.453478

Dish Wireless (Proposed)
HRT 082 943274
Carrier Summary

Frequency: 600 MHz
Maximum Permissible Exposure (MPE): 400 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 2.83416 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.70854 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
JMA Wireless	MX08FRO665-20	108	0	3541	1.882459	0.470615	2.419745	0.604936
JMA Wireless	MX08FRO665-20	108	120	3541	1.882459	0.470615	2.419745	0.604936
JMA Wireless	MX08FRO665-20	108	240	3541	1.882459	0.470615	2.419745	0.604936

Sprint (T-Mobile)
HRT 082 943274
Carrier Summary

Frequency: 2500 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 3.11428 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.31143 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
Commscope	DT465B-2XR	152	330	5836	1.003217	0.100322	2.976074	0.297607
Commscope	DT465B-2XR	152	90	5836	1.003217	0.100322	2.976074	0.297607
Commscope	DT465B-2XR	152	210	5836	1.003217	0.100322	2.976074	0.297607

**Sprint (T-Mobile)
HRT 082 943274
Carrier Summary**

Frequency: 866 MHz
 Maximum Permissible Exposure (MPE): 577.33 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 0.94166 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.16311 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
Commscope	DT465B-2XR	152	330	2472	0.634721	0.10994	0.906505	0.157016
Commscope	DT465B-2XR	152	90	2472	0.634721	0.10994	0.906505	0.157016
Commscope	DT465B-2XR	152	210	2472	0.634721	0.10994	0.906505	0.157016

Sprint (T-Mobile)
HRT 082 943274
Carrier Summary

Frequency: 1990 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 1.59507 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.15951 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
RFS	APXVSP18-C-A20	152	330	3804	0.799767	0.079977	1.475539	0.147554
RFS	APXVSP18-C-A20	152	90	3804	0.799767	0.079977	1.475539	0.147554
RFS	APXVSP18-C-A20	152	210	3804	0.799767	0.079977	1.475539	0.147554

Sprint (T-Mobile)
HRT 082 943274
Carrier Summary

Frequency: 1900 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 1.59507 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.15951 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
RFS	APXVSPP18-C-A20	152	330	3804	0.799767	0.079977	1.475539	0.147554
RFS	APXVSPP18-C-A20	152	90	3804	0.799767	0.079977	1.475539	0.147554
RFS	APXVSPP18-C-A20	152	210	3804	0.799767	0.079977	1.475539	0.147554

Sprint (T-Mobile)
HRT 082 943274
Carrier Summary

Frequency: 862 MHz
Maximum Permissible Exposure (MPE): 574.67 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 0.69278 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.12055 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
RFS	APXVSP18-C-A20	152	330	2168	0.668228	0.116281	0.68337	0.118916
RFS	APXVSP18-C-A20	152	90	2168	0.668228	0.116281	0.68337	0.118916
RFS	APXVSP18-C-A20	152	210	2168	0.668228	0.116281	0.68337	0.118916

T-Mobile
HRT 082 943274
Carrier Summary

Frequency: 1900 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 5.77714 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.57771 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
ANDREW	SBNH-1D65C-SR	137	75	2938	3.311869	0.331187	3.889871	0.388987
ANDREW	SBNH-1D65C-SR	137	250	2938	3.311869	0.331187	3.889871	0.388987
ANDREW	SBNH-1D65C-SR	137	315	2938	3.311869	0.331187	3.889871	0.388987

**T-Mobile
HRT 082 943274
Carrier Summary**

Frequency: 700 MHz
 Maximum Permissible Exposure (MPE): 466.67 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 2.05726 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.44084 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
ANDREW	SBNH-1D65C-SR	137	75	1490	0.639627	0.137063	1.081889	0.231833
ANDREW	SBNH-1D65C-SR	137	250	1490	0.639627	0.137063	1.081889	0.231833
ANDREW	SBNH-1D65C-SR	137	315	1490	0.639627	0.137063	1.081889	0.231833

**T-Mobile
HRT 082 943274
Carrier Summary**

Frequency: 2100 MHz
 Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 2.34008 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.23401 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
Ericsson	AIR 21 B4A B2P	137	75	4123	1.068788	0.106879	1.2231	0.12231
Ericsson	AIR 21 B4A B2P	137	250	4123	1.068788	0.106879	1.2231	0.12231
Ericsson	AIR 21 B4A B2P	137	315	4123	1.068788	0.106879	1.2231	0.12231

**Verizon Wireless
HRT 082 943274
Carrier Summary**

Frequency: 2100 MHz
 Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 3.98215 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.39822 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
ANDREW	SBNHH-1D65B	160	340	6873	2.264455	0.226446	3.520516	0.352052
ANDREW	SBNHH-1D65B	160	100	6873	2.264455	0.226446	3.520516	0.352052
ANDREW	SBNHH-1D65B	160	200	6873	2.264455	0.226446	3.520516	0.352052

**Verizon Wireless
HRT 082 943274
Carrier Summary**

Frequency: 1900 MHz
 Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 5.60704 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.5607 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
ANDREW	SBNHH-1D65B	160	340	6111	4.062188	0.406219	5.262202	0.52622
ANDREW	SBNHH-1D65B	160	100	6111	4.062188	0.406219	5.262202	0.52622
ANDREW	SBNHH-1D65B	160	200	6111	4.062188	0.406219	5.262202	0.52622

**Verizon Wireless
HRT 082 943274
Carrier Summary**

Frequency: 850 MHz
 Maximum Permissible Exposure (MPE): 566.67 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 3.1201 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.55061 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
ANDREW	SBNHH-1D65B	160	340	2892	1.351142	0.238437	1.493131	0.263494
ANDREW	DB846H80ESX	160	340	2010	0.56123	0.099041	0.701925	0.123869
ANDREW	SBNHH-1D65B	160	100	2892	1.351142	0.238437	1.493131	0.263494
ANDREW	DB846H80ESX	160	100	2010	0.56123	0.099041	0.701925	0.123869
ANDREW	SBNHH-1D65B	160	200	2892	1.351142	0.238437	1.493131	0.263494
ANDREW	DB846F65ZAXY	160	200	1127	0.342924	0.060516	0.359398	0.063423
ANDREW	DB846F65ZAXY	160	200	1127	0.342924	0.060516	0.359398	0.063423

**Verizon Wireless
HRT 082 943274
Carrier Summary**

Frequency: 751 MHz
 Maximum Permissible Exposure (MPE): 500.67 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 2.218 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.44301 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
ANDREW	SBNHH-1D65B	160	340	2723	0.767539	0.153303	1.236803	0.247031
ANDREW	SBNHH-1D65B	160	100	2723	0.767539	0.153303	1.236803	0.247031
ANDREW	SBNHH-1D65B	160	200	2723	0.767539	0.153303	1.236803	0.247031

**Verizon Wireless
HRT 082 943274
Carrier Summary**

Frequency: 3700 MHz
 Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 16.65648 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 1.66565 %

Antenna Make	Model	Height (feet)	Orientation (degrees true)	ERP (Watts)	On Axis		Area	
					Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE	Max Power Density ($\mu\text{W}/\text{cm}^2$)	Percent of MPE
Samsung	MT6407-77A	160	340	43155	6.592024	0.659202	14.917192	1.491719
Samsung	MT6407-77A	160	100	43155	6.592024	0.659202	14.917192	1.491719
Samsung	MT6407-77A	160	200	43155	6.592024	0.659202	14.917192	1.491719

HRT 082 943274
Composite Microwave Antenna Summary

Carrier	Antenna Make/Model	Height (feet)
Sprint (T-Mobile)	Radiowaves HP3-11	144
Sprint (T-Mobile)	Radiowaves HP3-11	144