



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
430 Middlesex Turnpike, Old Saybrook, CT 06475
Latitude 41° 18' 44.50", Longitude -72° 22' 48.70"**

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 430 Middlesex Turnpike in Old Saybrook (the "Property"). The existing 175-foot monopole tower is owned by Crown Castle International Corp. ("Crown Castle"). The underlying property is owned by Robert Sorensen. 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 Carl P. Fortuna, Jr., First Selectman of the Town of Old Saybrook, and to Christina M. Costa, Town Planner for the Town of Old Saybrook. A copy is also being sent to the property owner.

Background

The existing Crown Castle facility consists of a 175-foot monopole tower within a 122,500 square foot leased area. The Town of Old Saybrook currently maintains antennas at the 172-foot level, and Sprint/T-Mobile currently maintains antennas at the 170-foot level. The Town of Old Saybrook's equipment is located northwest of the tower, and Sprint/T-Mobile's equipment is located west 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 430 Middlesex Turnpike 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 west side of the tower. This installation will require a 2'-9"x7'-7" compound expansion. 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, three (3) antenna t-arm mounts, and one (1) hybrid cable. In addition, DISH will install a ground equipment cabinet on a 5'x7' equipment platform that will require a 2'-9"x7'-7" compound expansion. 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 minimal visual impact on the area of the tower. DISH's equipment cabinet would require a compound expansion, but this expansion is minor in scope. 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

Page 3

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, three (3) antenna t-arm mounts, 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 430 Middlesex Turnpike 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

Page 4

CC:

The Honorable Carl P. Fortuna, Jr. - First Selectman
Town of Old Saybrook
302 Main Street
Town Hall
Old Saybrook, CT 06475
860-395-3123

Christina M. Costa - Town Planner
Town of Old Saybrook
302 Main Street
Town Hall
Old Saybrook, CT 06475
860-395-3131

Robert Sorensen
246 Bank Street
Seymour, CT 06483

ORIGIN ID: ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
629 KAYLEIGH DR

WEBSTER, NY 14580
UNITED STATES US

SHIP DATE: 21 JUN 21
ACTWGT: 1.00 LB
CAD: 112911364INET4340

BILL SENDER

TO CARL FORTUNA JR - FIRST SELECTMAN

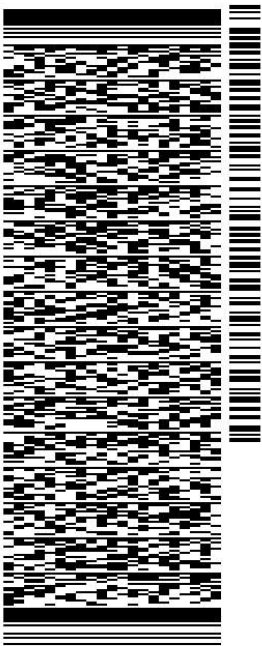
TOWN OF OLD SAYBROOK

302 MAIN STREET

TOWN HALL

OLD SAYBROOK CT 06475

(860) 395-3123 REF: 799001 7680
INV/ DEPT:
PO:

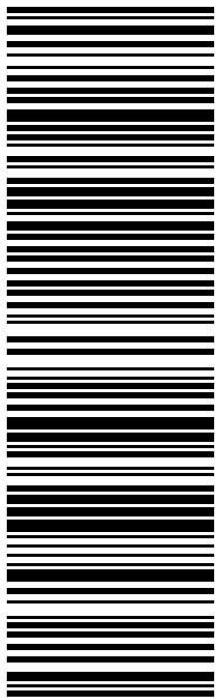


J211321033101uv

56DJ3/B387/FE4A

TRK# 7740 5386 8161 TUE - 22 JUN 4:30P
0201 STANDARD OVERNIGHT

XE SKKA 06475
CT-US BDL



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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

ORIGIN ID: ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
629 KAYLEIGH DR
WEBSTER, NY 14580
UNITED STATES US

SHIP DATE: 21 JUN21
ACTWGT: 1.00 LB
CAD: 112911364INET4340

BILL SENDER

TO CHRISTINA COSTA - TOWN PLANNER

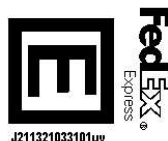
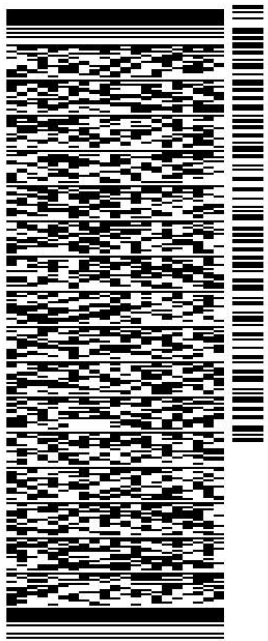
TOWN OF OLD SAYBROOK

302 MAIN STREET

TOWN HALL

OLD SAYBROOK CT 06475

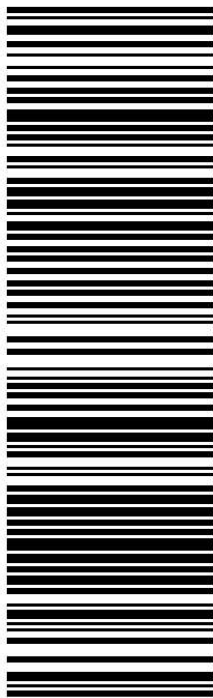
(860) 395-3131 REF: 799001 7680
INV/ DEPT:
PO:



J211321033101uv

56DJ3/B387/FE4A

TRK# 7740 5389 2350 TUE - 22 JUN 4:30P
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WEBSTER, NY 14580
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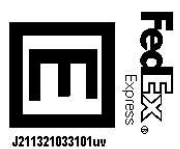
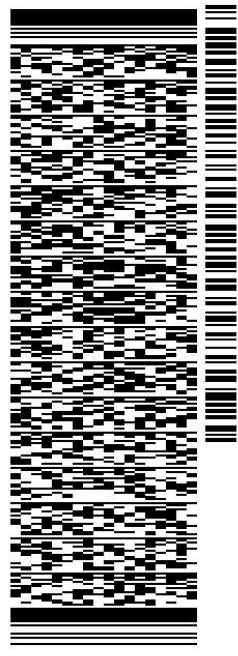
BILL SENDER

TO **ROBERT SORENSEN**

246 BANK STREET

SEYMOUR CT 06483

(585) 445-5896 REF: 799001 7680
INV/ DEPT:
PO:

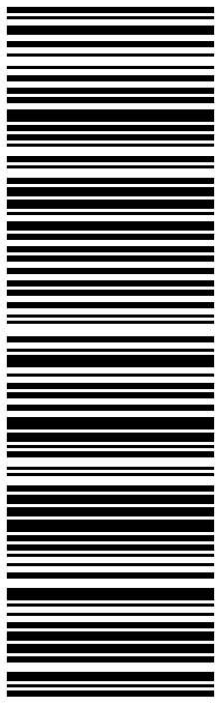


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3 Corporate Dr, Suite 101
Clifton Park, NY 12065

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: 430 Middlesex Turnpike, OLD SAYBROOK, CT 06475


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

Crown Site ID/Name: 876336/OLD SAYBROOK

Customer Site ID: BOBDL00088A/CT-CCI-T-876336

Site Address: 430 Middlesex Turnpike, OLD SAYBROOK, CT 06475

Crown Castle USA Inc.

By:  Date: 5/13/21

Anne Marie Zsamba

Project Manager – Site Acquisition

Exhibit A

Original Facility Approval

VOL. 0356 PAGE 0104

TOWN OF OLD SAYBROOK

ZONING DEPARTMENT
302 Main Street
Old Saybrook, Connecticut 06475
Tel. (860) 395-3131 • Fax (860) 395-3125

MAY 27 1998

TO: TOWN CLERK
TOWN OF OLD SAYBROOK
302 MAIN STREET
OLD SAYBROOK, CT 06475

SPECIAL EXCEPTION PERMIT

Notice is hereby given that the Zoning Commission, Town of Old Saybrook, has granted a SPECIAL EXCEPTION PERMIT to Sprint Spectrum L.P. (Sprint PCS) following a Public Hearing completed on April 6, 1998.

Said SPECIAL EXCEPTION applies to application for 175' monopole, 187 s.f. building and 999 lin. ft. chain link fence, 430 Middlesex Turnpike, Map 52 & 57, Lot 57 & 41.

This SPECIAL EXCEPTION is required under Section 52 of the Old Saybrook Zoning Regulations.

Pursuant to Chapter 124, Section 8-3d, Statutes Governing Municipal Planning and Zoning, revised to January 1, 1995, this SPECIAL EXCEPTION shall be recorded in the Office of the Town Clerk.

Certified: *Carol Suits*
Carol Suits, Administrative Assistant
Zoning Commission
Town of Old Saybrook

Dated: May 27, 1998

May 27, 1998
Rec'd for Record _____ at *3:20 P.M.*
Recorded by *Janet V. Becker*
Town Clerk

Exhibit B

Property Card

430 MIDDLESEX TPKE

Location 430 MIDDLESEX TPKE

MBLU 057/ 41T/ / /

Acct# 00596650

Owner SORENSEN ROBERT C

Assessment \$574,900

Appraisal \$821,200

PID 102712

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2018	\$716,000	\$105,200	\$821,200

Assessment			
Valuation Year	Improvements	Land	Total
2018	\$501,200	\$73,700	\$574,900

Owner of Record

Owner	SORENSEN ROBERT C	Sale Price	\$0
Co-Owner	C/O SPRINT SITES CT 03XC102	Certificate	
Address	BOX 12913 PROP TAX DEPT SHAWNEE MISSION, KS 66282-2913	Book & Page	0600/0597
		Sale Date	12/05/2014

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
SORENSEN ROBERT C	\$0		0554/0096	11/18/2010
SORENSEN ROBERT C & GEORGIANNA	\$0		0344/0075	05/12/1997

Building Information

Building 1 : Section 1

Year Built:

Living Area: 0

Building Attributes	
Field	Description
Style	Outbuildings

Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Cndtn	
Usrflid 103	
Usrflid 104	
Usrflid 105	
Usrflid 106	
Usrflid 107	
Num Park	
Fireplaces	
Usrflid 108	
Usrflid 101	
Usrflid 102	
Usrflid 100	
Usrflid 300	
Usrflid 301	

Building Photo



(<http://images.vgsi.com/photos/OldSaybrookCTPhotos/A00\01\37\47.jpg>)

Building Layout

Building Layout

(http://images.vgsi.com/photos/OldSaybrookCTPhotos/Sketches/102712_)

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
----------------	--------

No Data for Extra Features

Land

Land Use

Use Code 0431
Description TEL REL TW
Zone AA-1

Land Line Valuation

Size (Acres) 3
Depth
Assessed Value \$73,700
Appraised Value \$105,200

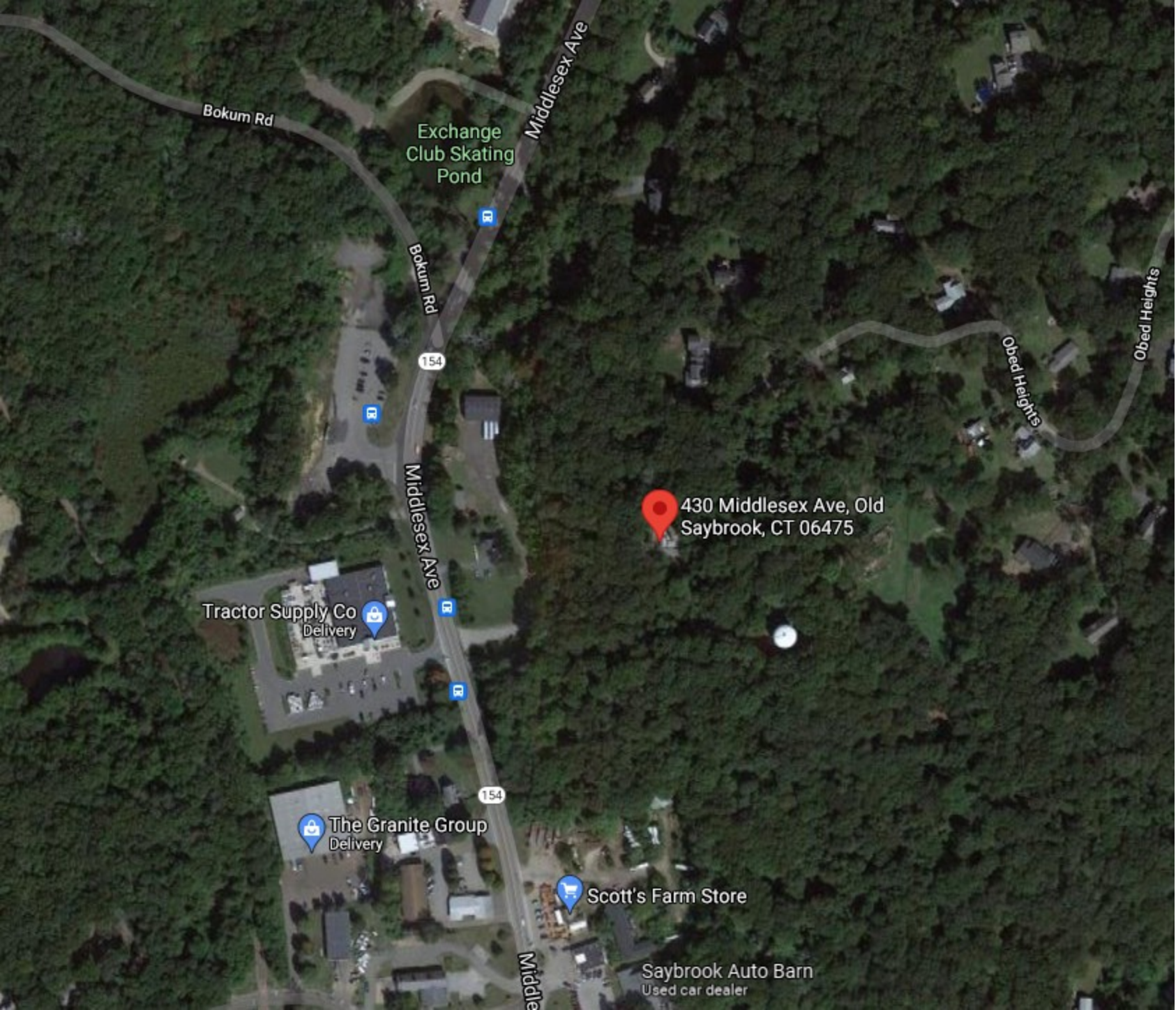
Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN3	FENCE-6' CHAIN			156.00 L.F.	\$1,100	1
PAV2	PAVING-CONC			600.00 S.F.	\$1,200	1
SHD6	COMM,MAS			216.00 S.F.	\$4,900	1
CELL	CELL TOWER			125.00 UNITS	\$101,300	1
MSC1	ARRAYS			3.00 UNIT	\$607,500	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2018	\$716,000	\$105,200	\$821,200
2016	\$7,600	\$239,800	\$247,400
2015	\$7,600	\$239,800	\$247,400

Assessment			
Valuation Year	Improvements	Land	Total
2018	\$501,200	\$73,600	\$574,800
2016	\$5,300	\$167,900	\$173,200
2015	\$5,300	\$167,900	\$173,200



Bokum Rd

Exchange Club Skating Pond

Middlesex Ave

Bokum Rd

154

Middlesex Ave

Obed Heights

Obed Heights

430 Middlesex Ave, Old Saybrook, CT 06475

Tractor Supply Co Delivery

The Granite Group Delivery

154

Middle

Scott's Farm Store

Saybrook Auto Barn Used car dealer

Exhibit C

Construction Drawings



DISH WIRELESS, LLC. SITE ID:

BOBDL00088A

DISH WIRELESS, LLC. SITE ADDRESS:

**430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475**

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 PROPOSED T-ARM MOUNT (1 PER SECTOR) • INSTALL PROPOSED JUMPERS • INSTALL (6) PROPOSED RRUs (2 PER SECTOR) • INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP) • INSTALL (1) PROPOSED HYBRID CABLE 	
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: SORENSEN ROBERT C	APPLICANT: DISH WIRELESS, LLC. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
ADDRESS: 430 MIDDLESEX TURNPIKE OLD SAYBROOK, CT 06475	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) 648-4068
TOWER CO SITE ID: 876336	SITE ACQUISITION: NICHOLAS CURRY NICHOLAS.CURRY@CROWNCASTLE.COM
TOWER APP NUMBER: 553289	CONSTRUCTION MANAGER: JAVIER SOTO
COUNTY: MIDDLESEX	RF ENGINEER: BOSSENER CHARLES
LATITUDE (NAD 83): 41° 18' 47.56" N 41.313211 N	
LONGITUDE (NAD 83): -72° 22' 51.99" W -72.381108 W	
ZONING JURISDICTION: CONNECTICUT SITING COUNCIL	
ZONING DISTRICT: AA-1	
PARCEL NUMBER: 102712	
OCCUPANCY GROUP: U	
CONSTRUCTION TYPE: V-B	
POWER COMPANY: NORTHEAST UTILITIES	
TELEPHONE COMPANY: AT&T	



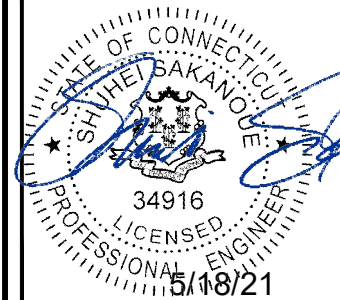
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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: 847-648-4068 | 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

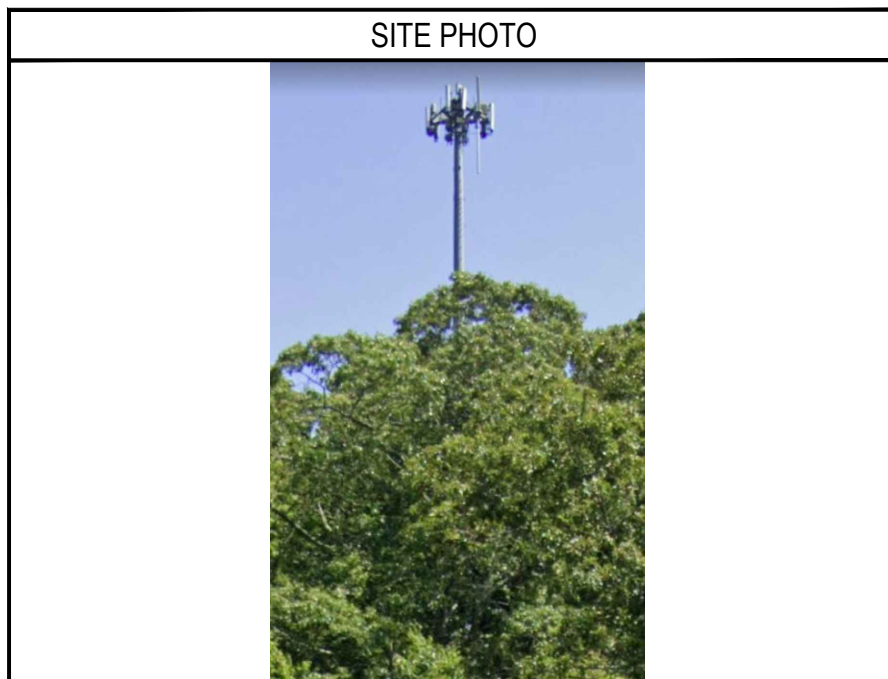
SUBMITTALS		
REV	DATE	DESCRIPTION
A	04/19/2021	PRELIM CDS
0	05/18/2021	FINAL CDS

A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

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

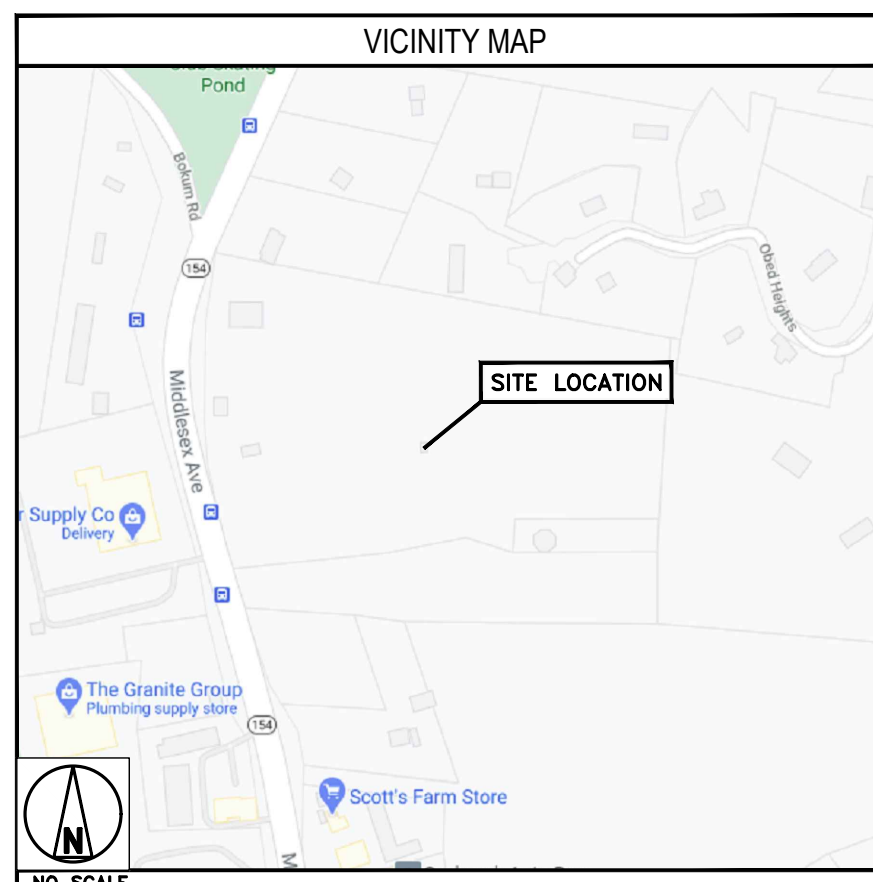
THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE. NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE 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 CHESTER AIRPORT:
HEAD NORTHWEST ON CHESTER AIRPORT TOWARDS CROSS RD, TURN RIGHT ONTO CT-145 / WINTHROP RD, TURN RIGHT ONTO CT-148 / W MAIN ST, TAKE THE RAMP ON THE RIGHT FOR CT-9 SOUTH AND HEAD TOWARDS OLD SAYBROOK, CONSTRUCTION ON CONSTRUCTION ON CT-9 SB NEAR I-84, EXPECT DELAYS, AT JUNCTION 2, HEAD RIGHT ON THE RAMP FOR CT-154 TOWARDS OLD SAYBROOK / R R STATION, TURN RIGHT ONTO CT-154 / MIDDLESEX TPKE TOWARDS OLD SAYBROOK / R R STATION, TURN LEFT ONTO OBED HEIGHTS, ARRIVE AT 430 MIDDLESEX TURNPIKE, OLD SAYBROOK, CT 06475



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:

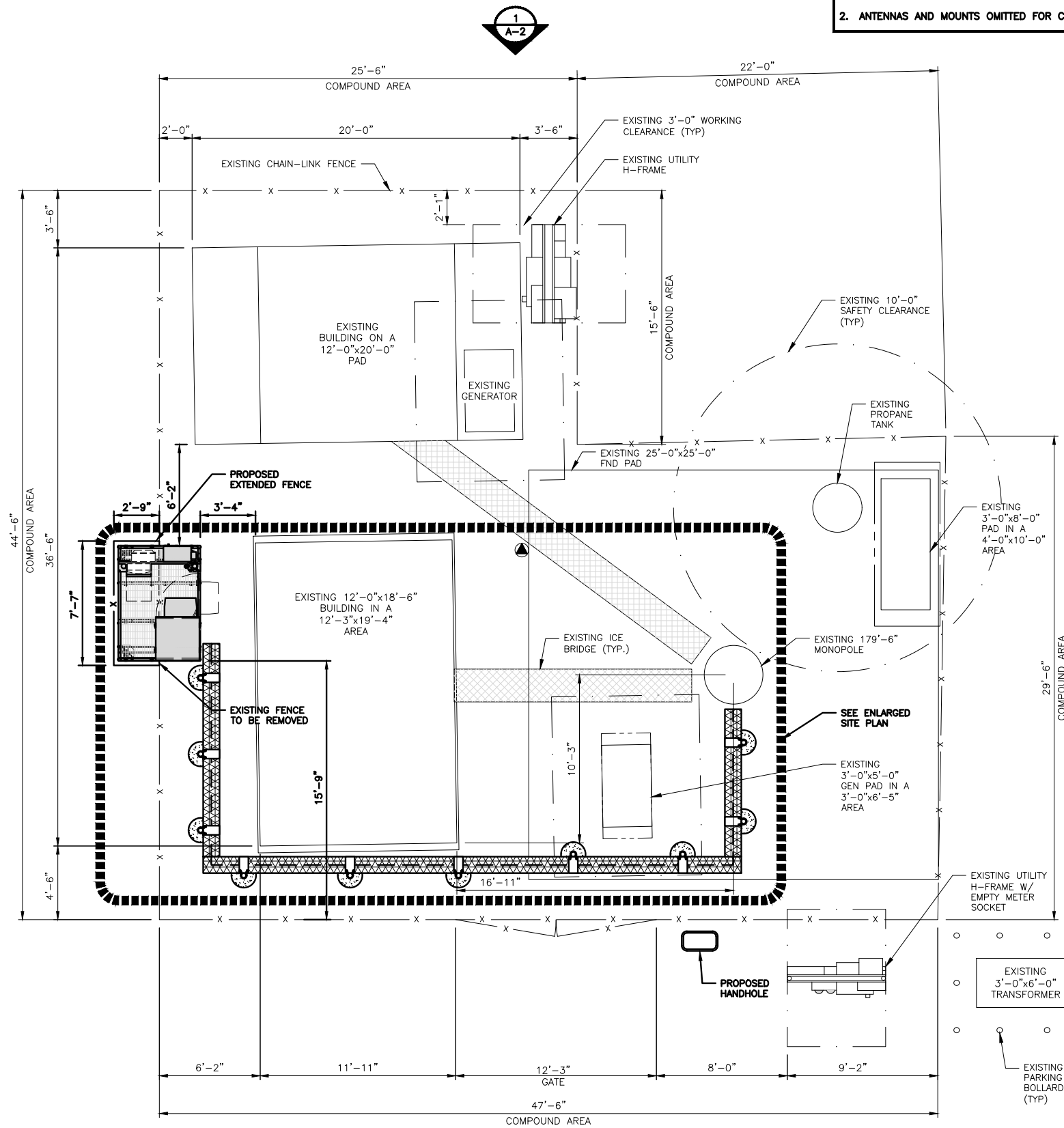
CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

SHEET INDEX

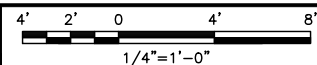
SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
A-1	OVERALL AND ENLARGED SITE PLAN
A-2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A-3	EQUIPMENT PLATEFROM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
A-7	FENCING DETAILS
E-1	ELECTRICAL ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
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. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



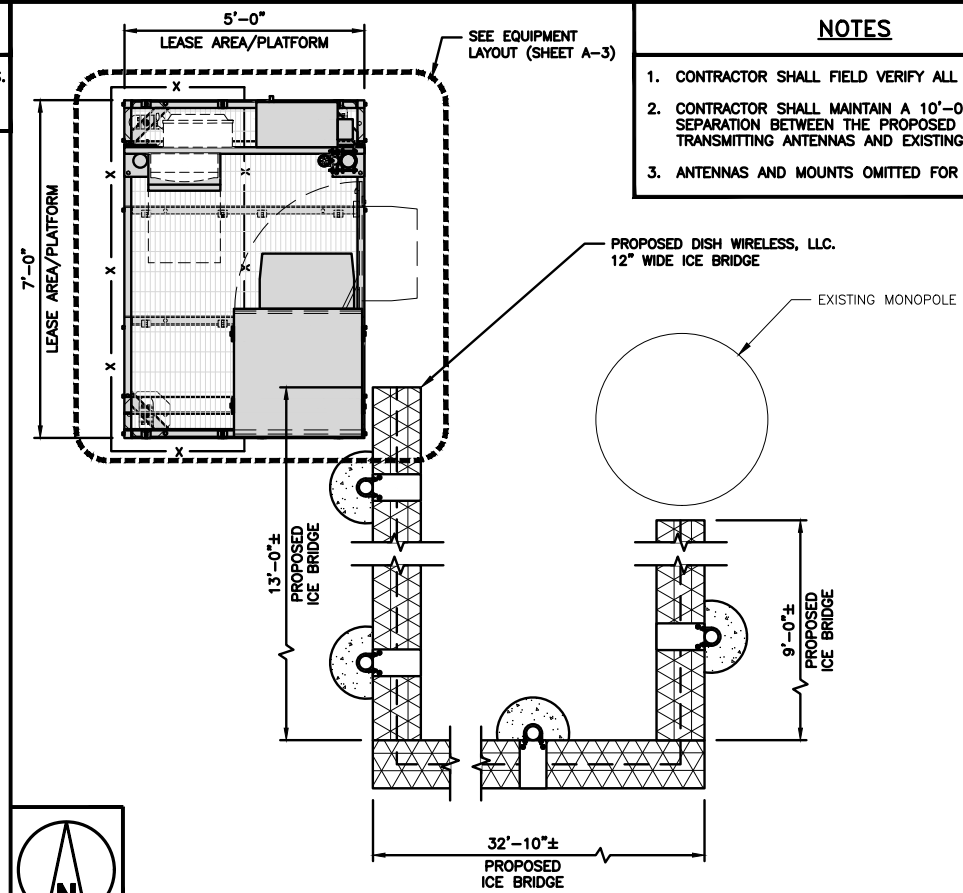
COMPOUND PLAN



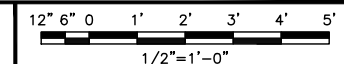
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NOTES

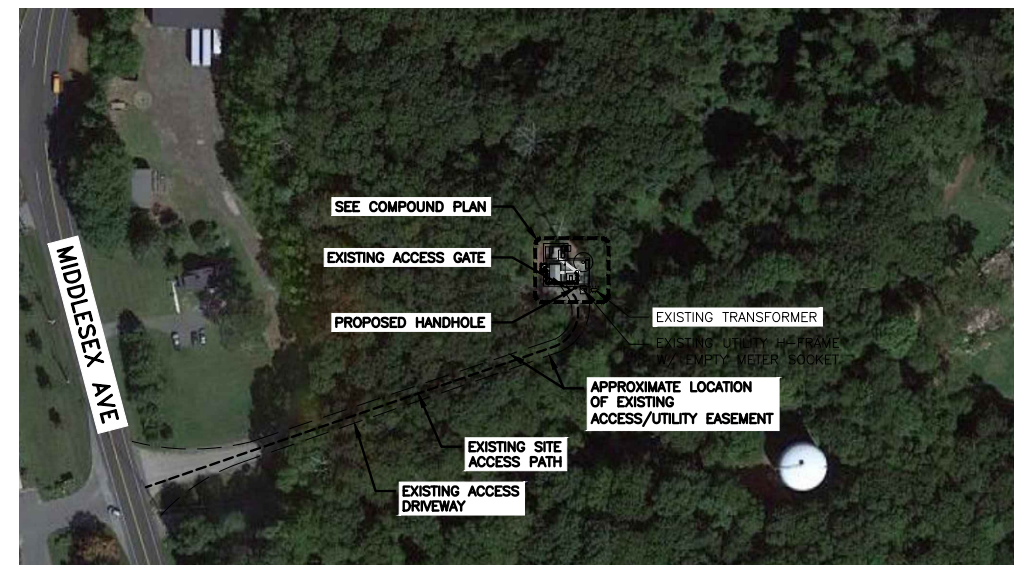
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



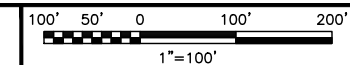
ENLARGED SITE PLAN



2



SITE PLAN



3

dish wireless.

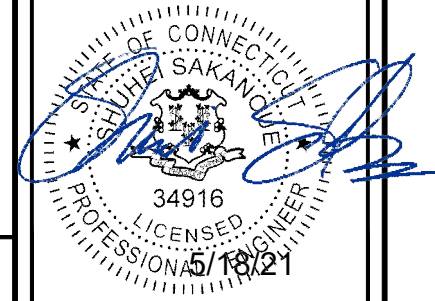
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

CROWN CASTLE

2000 CORPORATE DRIVE
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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
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

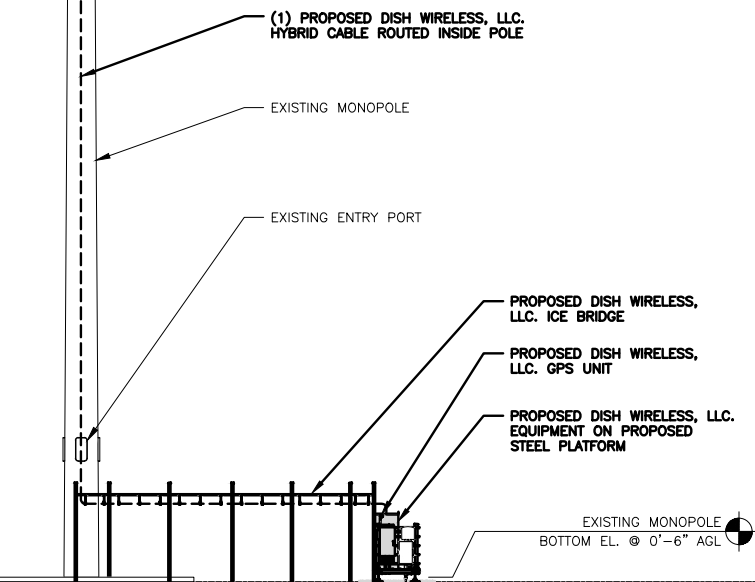
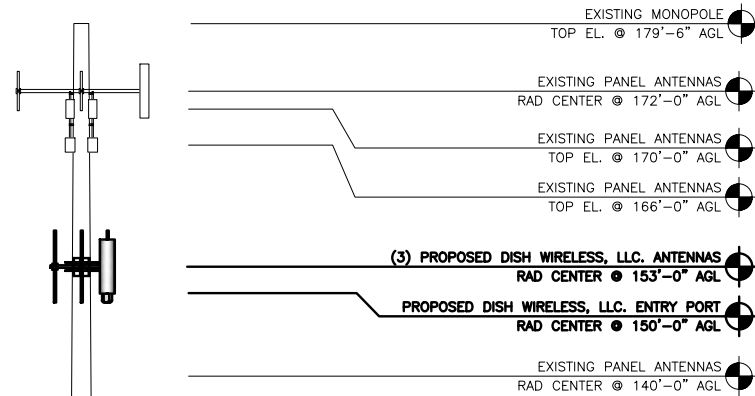
SHEET TITLE
OVERALL AND ENLARGED
SITE PLAN

SHEET NUMBER

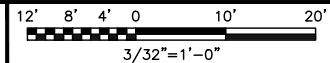
A-1

NOTES

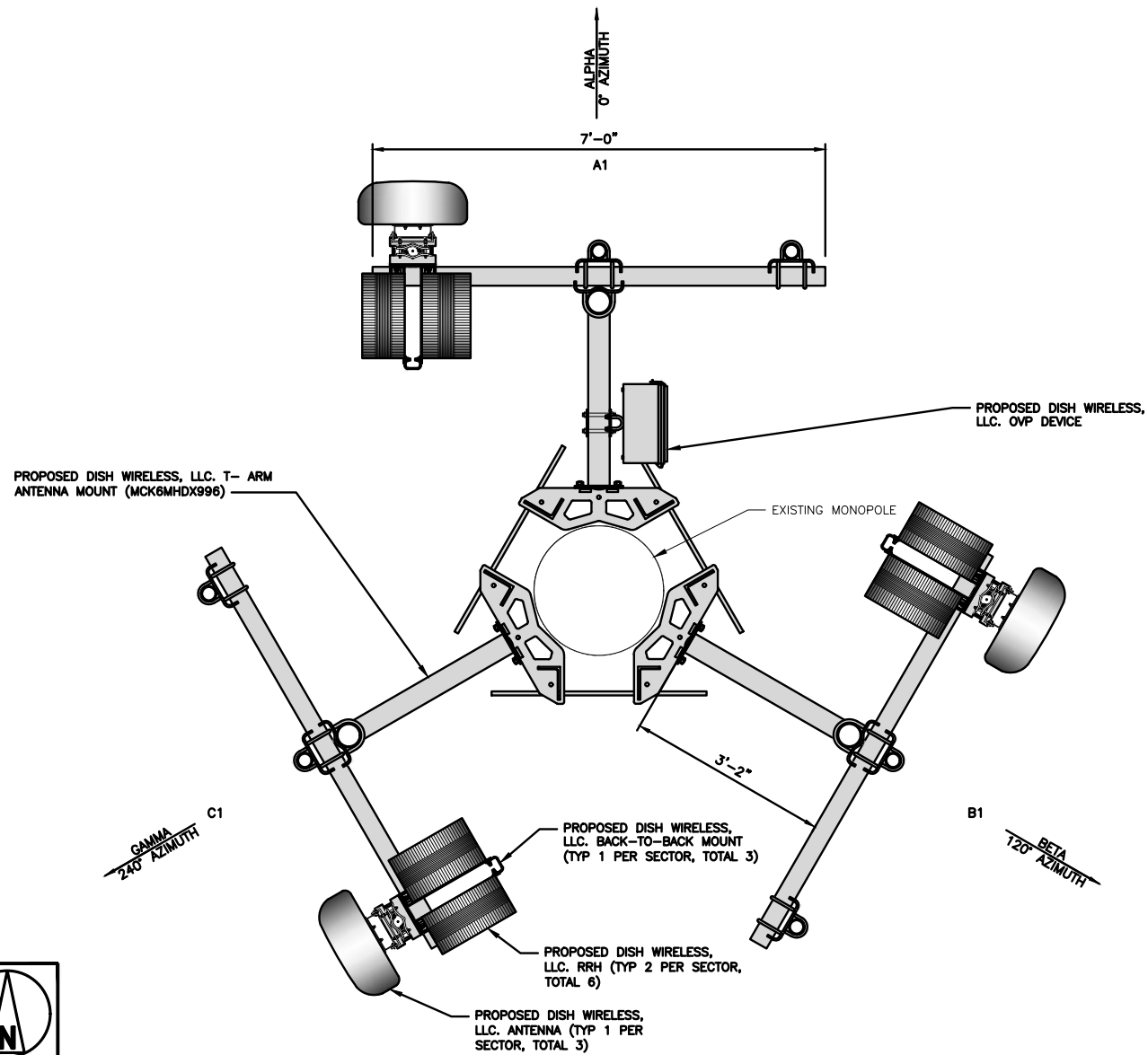
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY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



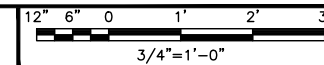
PROPOSED NORTH ELEVATION



1



ANTENNA LAYOUT



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS - MX08FRO665-20	5G	72.0" x 20.0"	0°	153'-0"	(1) HIGH-CAPACITY HYBRID CABLE (240' LONG)
BETA	B1	PROPOSED	JMA WIRELESS - MX08FRO665-20	5G	72.0" x 20.0"	120°	153'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS - MX08FRO665-20	5G	72.0" x 20.0"	240°	153'-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



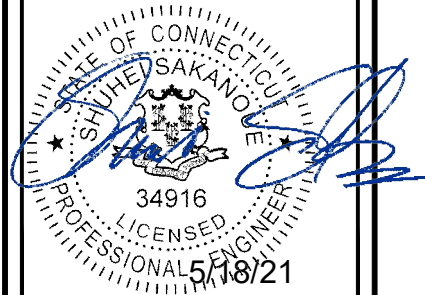
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APPROVED BY: CJW

RFDS REV #: N/A

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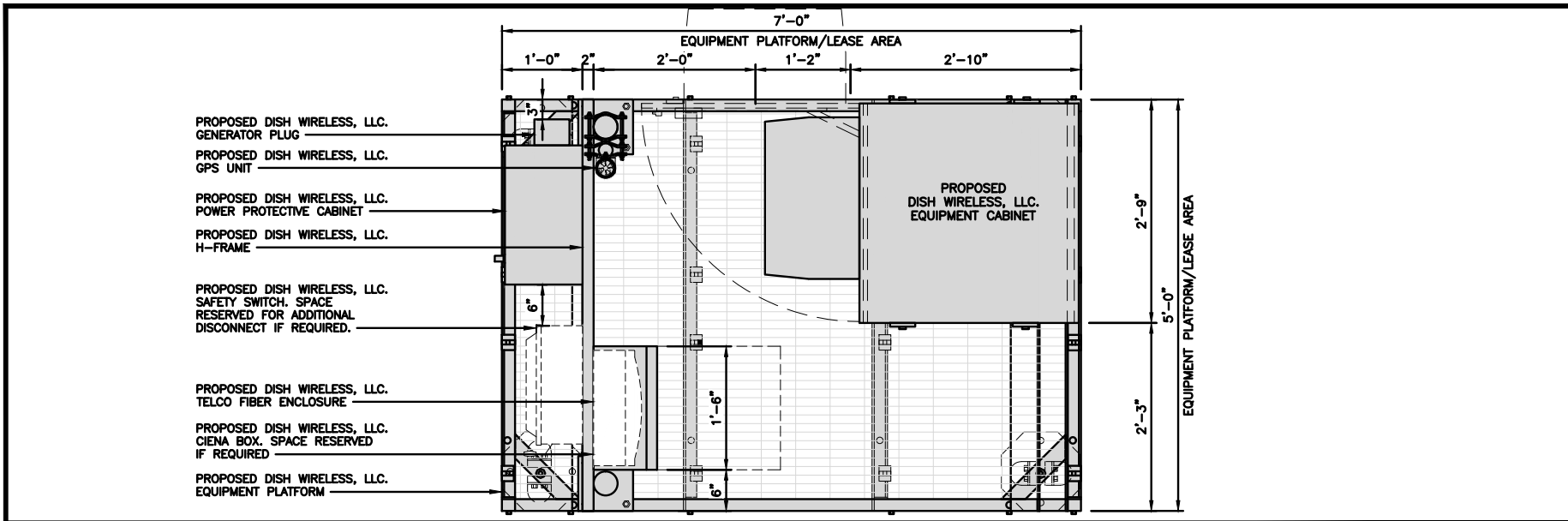
A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

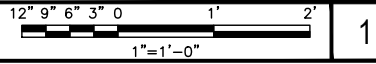
SHEET TITLE
ELEVATION, ANTENNA
LAYOUT AND SCHEDULE

SHEET NUMBER

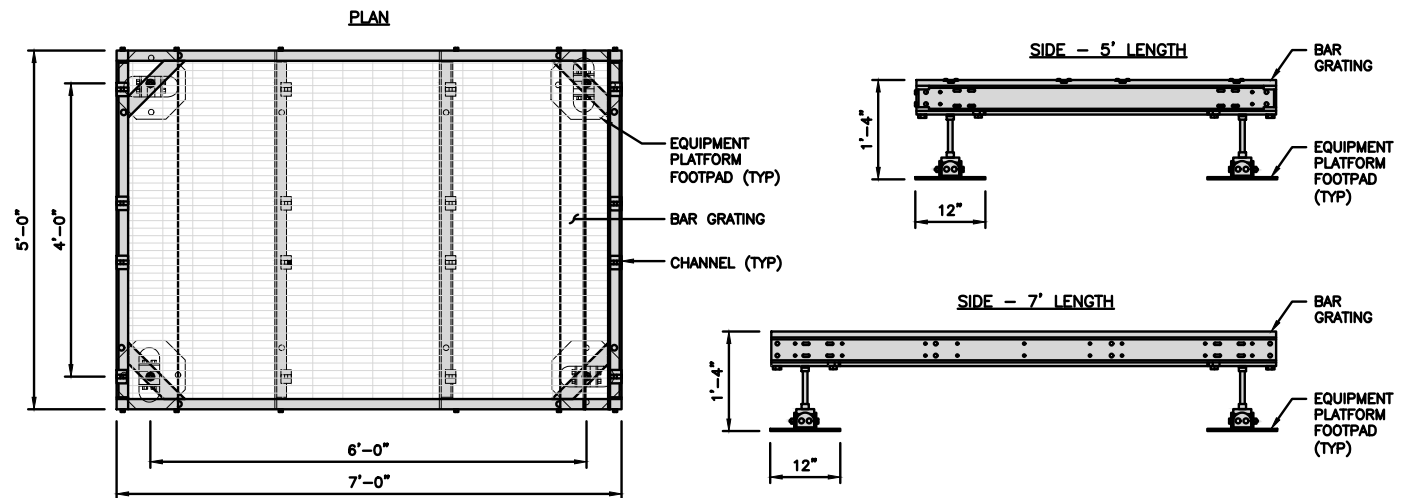
A-2



PLATFORM EQUIPMENT PLAN



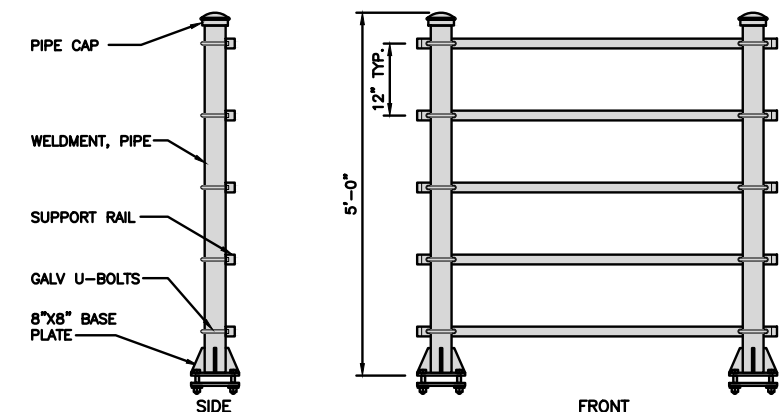
COMMSCOPE MTC4045LP 5X7 PLATFORM	
DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS



PLATFORM DETAIL

NO SCALE 2

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



H-FRAME DETAIL

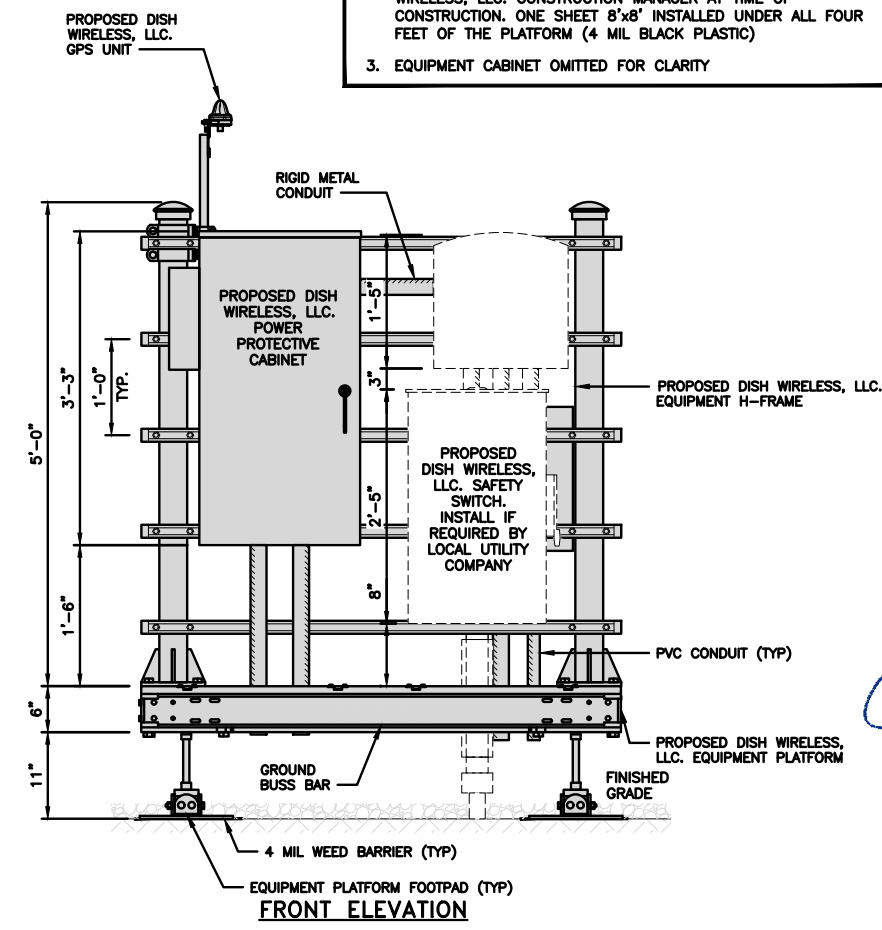
NO SCALE 3

NOT USED

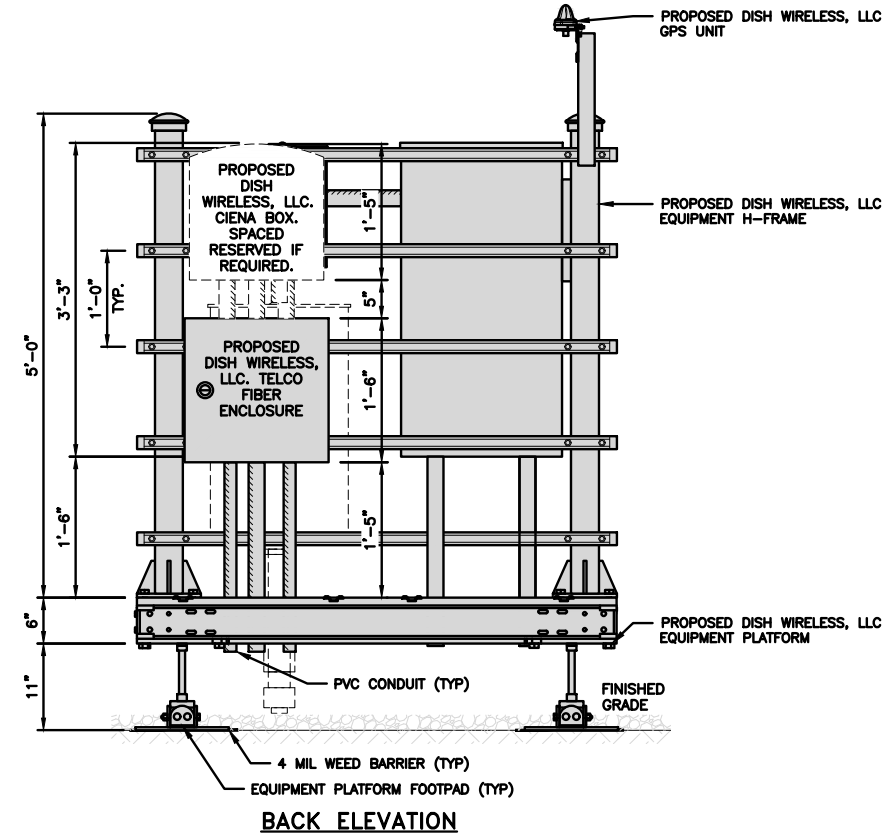
NO SCALE 4

NOTES

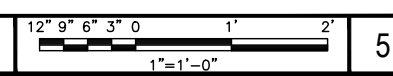
- CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
- WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH WIRELESS, LLC. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
- EQUIPMENT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



FRONT ELEVATION



BACK ELEVATION



H-FRAME EQUIPMENT ELEVATION

NO SCALE 5



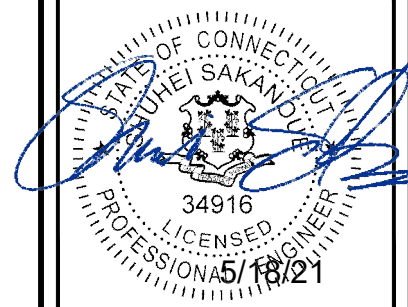
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RFDS REV #: N/A

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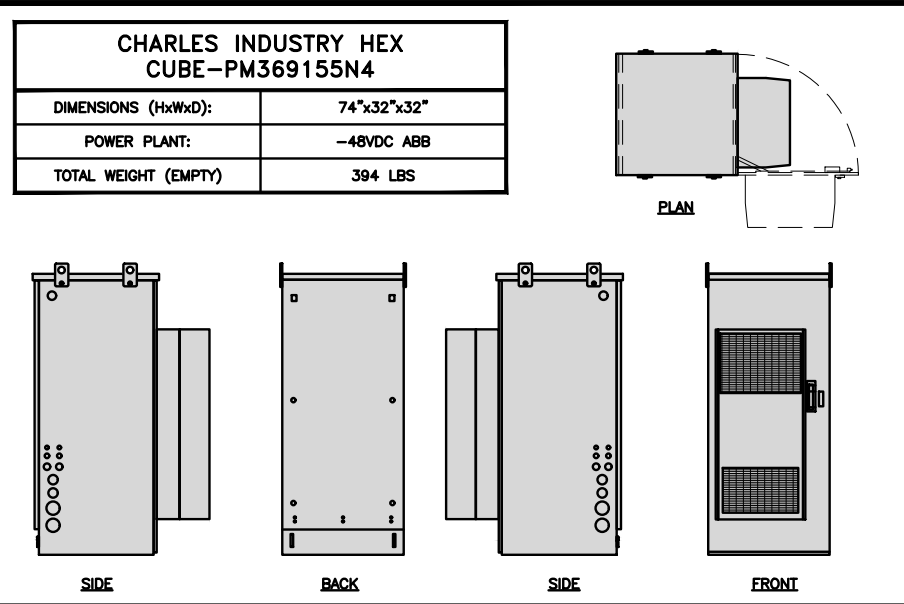
A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

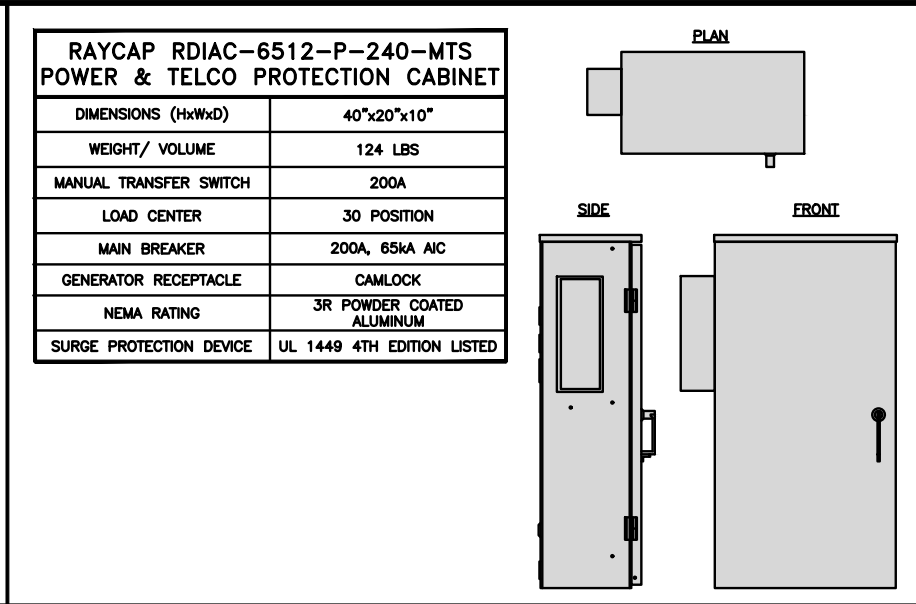
SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER

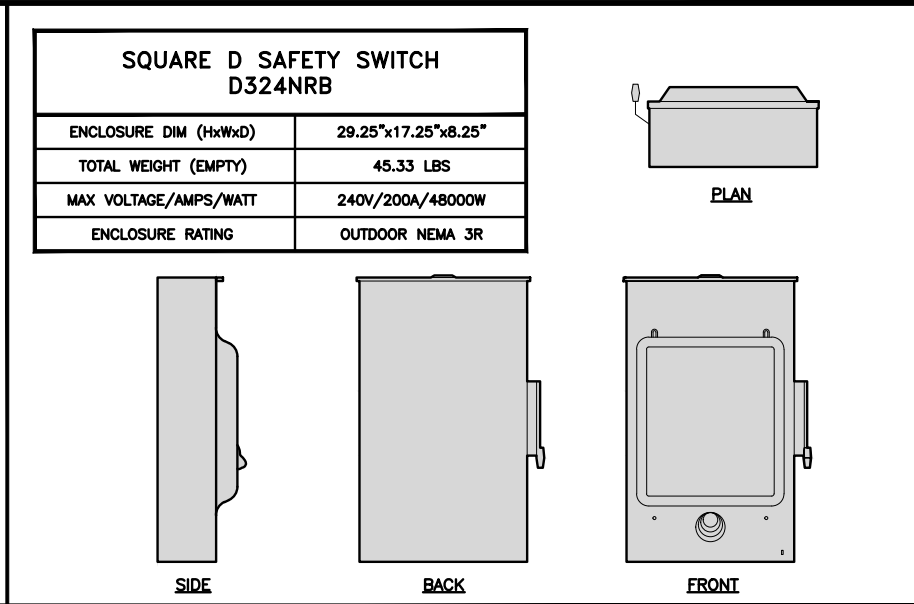
A-3



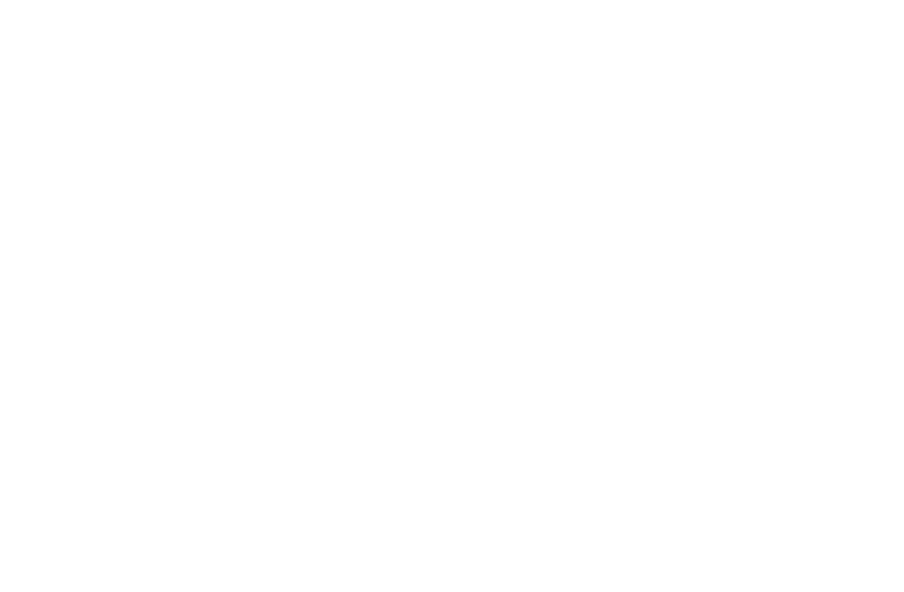
CABINET DETAIL NO SCALE 1



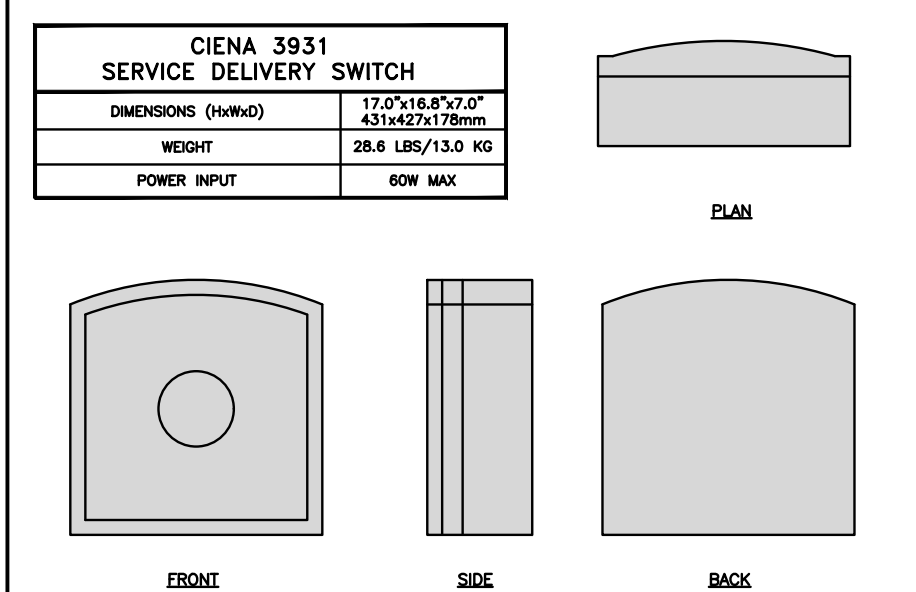
POWER PROTECTION CABINET (PPC) DETAIL NO SCALE 2



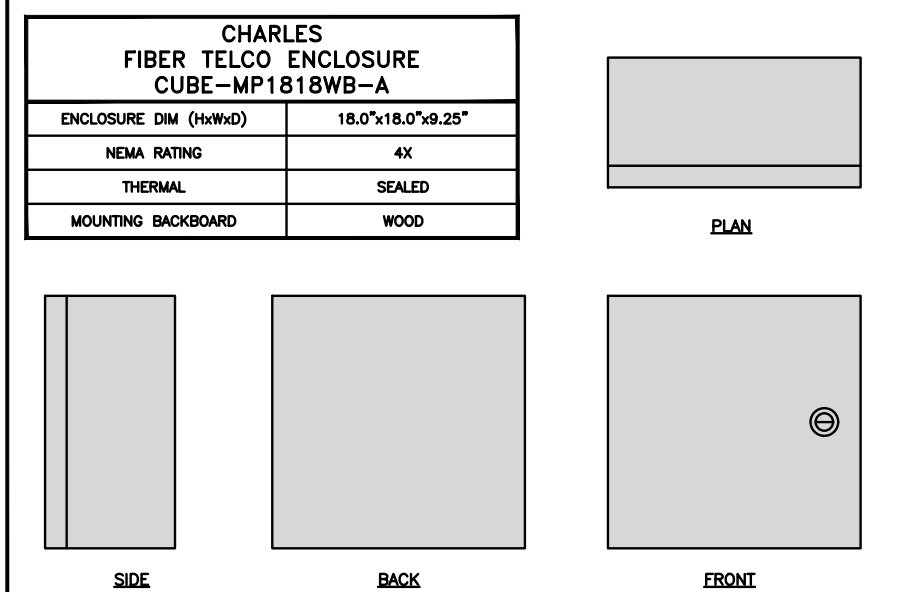
SAFETY SWITCH NO SCALE 3



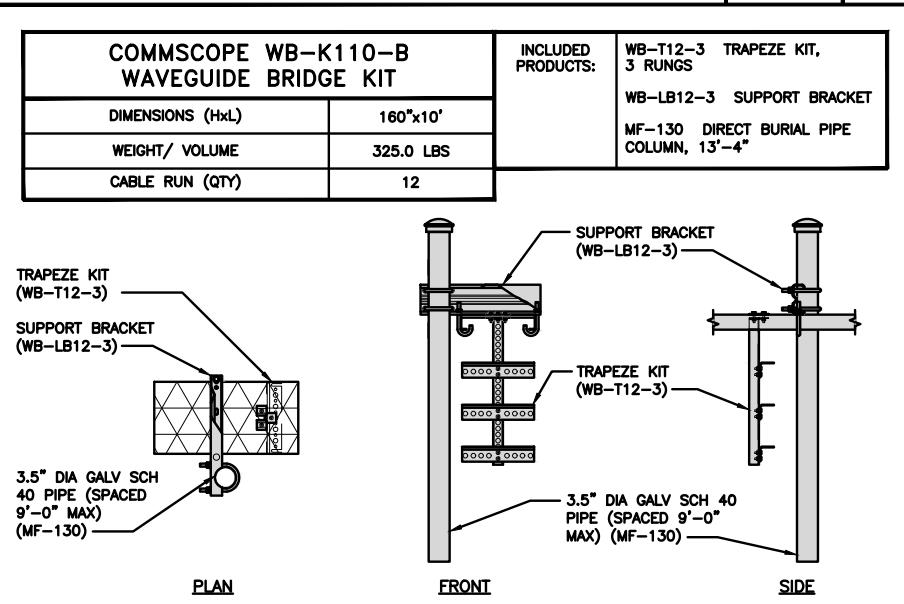
NOT USED NO SCALE 4



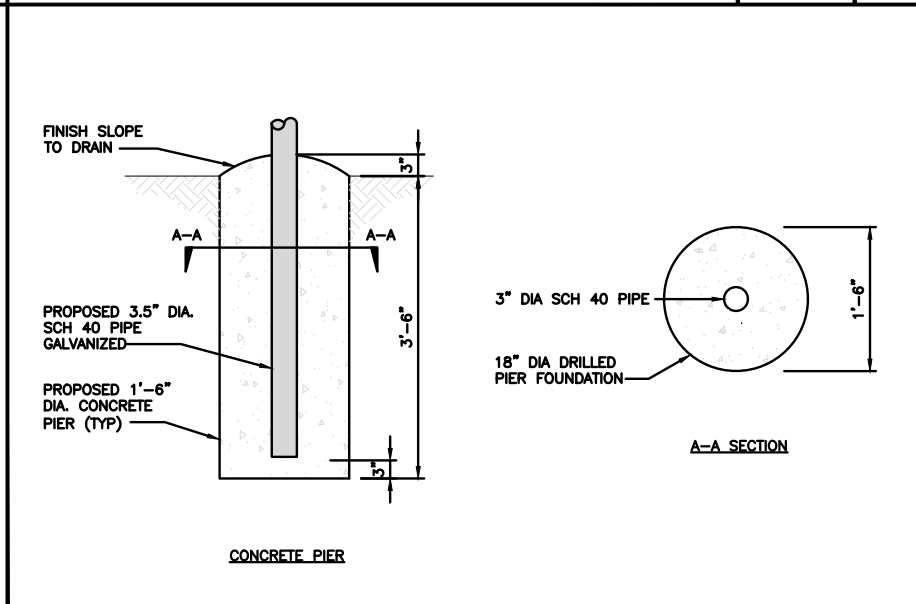
CIENA DETAIL NO SCALE 5



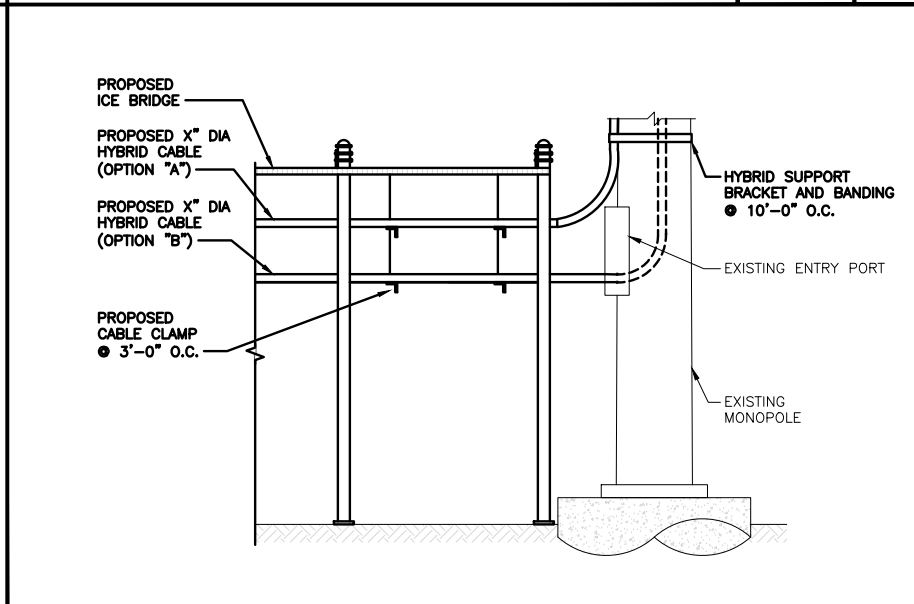
FIBER TELCO ENCLOSURE DETAIL NO SCALE 6



ICE BRIDGE DETAIL NO SCALE 7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL NO SCALE 8



HYBRID CABLE RUN NO SCALE 9

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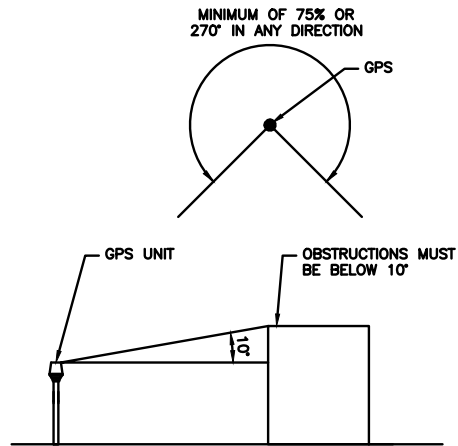
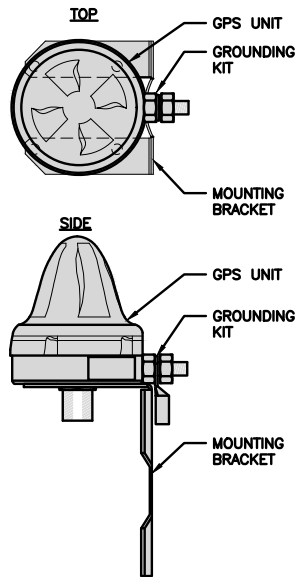
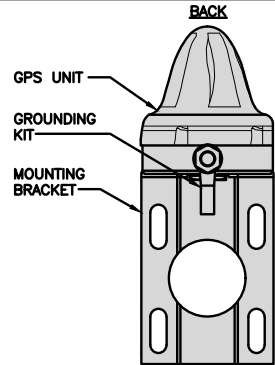
A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

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

NOT USED NO SCALE 3

NOT USED NO SCALE 4

NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



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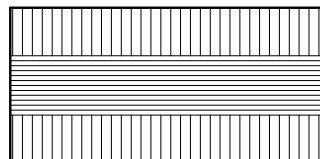
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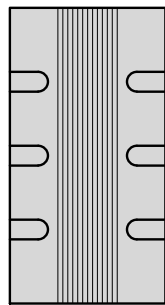
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

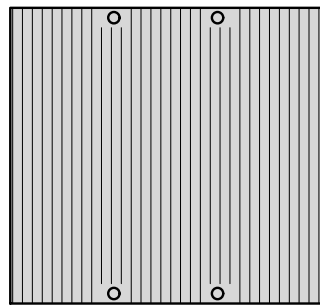
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

NOTES

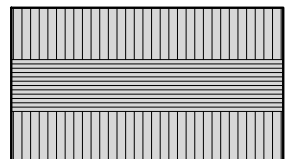
FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

REMOTE RADIO HEAD DETAIL

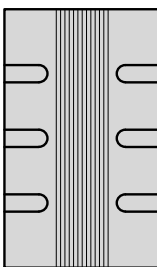
NO SCALE

1

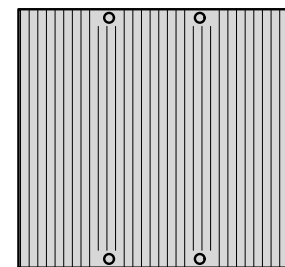
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

NOTES

FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

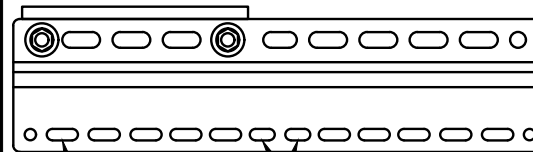
REMOTE RADIO HEAD DETAIL

NO SCALE

2

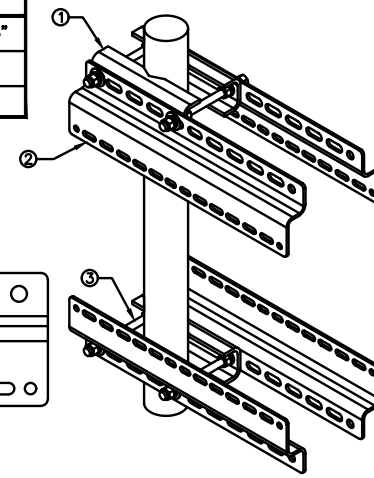
SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

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

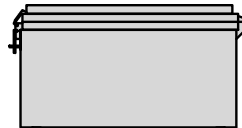


REMOTE RADIO MOUNT DETAIL

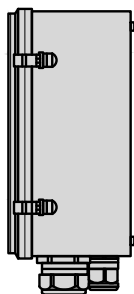
NO SCALE

3

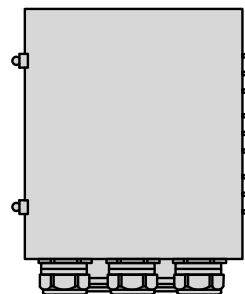
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



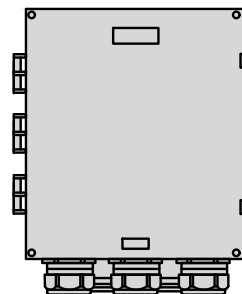
PLAN



SIDE



BACK



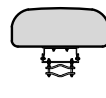
FRONT

SURGE SUPPRESSION DETAIL

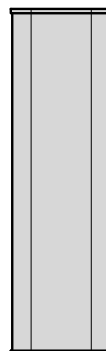
NO SCALE

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

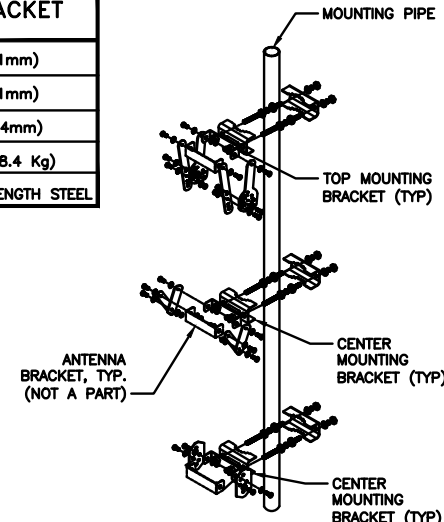
FINAL ANTENNA SPECIFICATIONS TO BE CONFIRMED BY GC

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

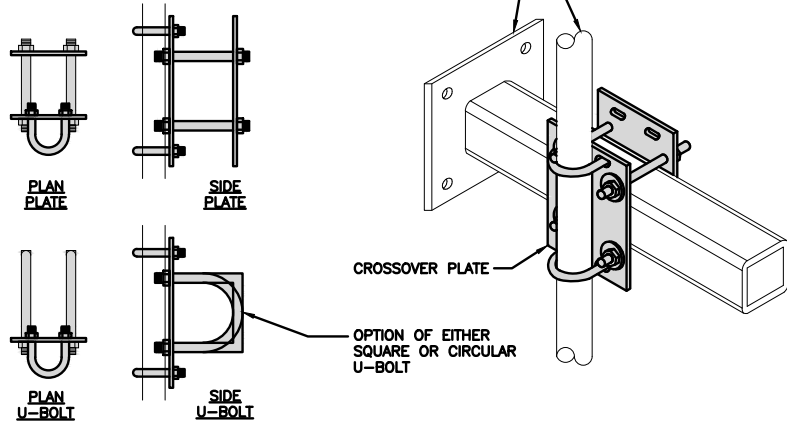


ANTENNA MOUNTING DETAIL

NO SCALE

6

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

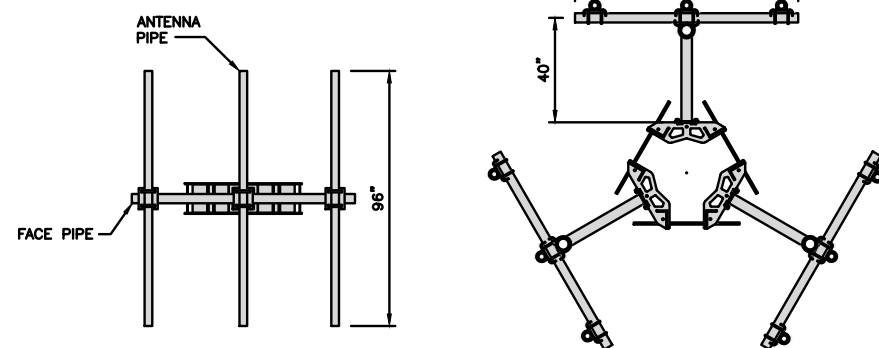


RRH/OVP MOUNT DETAIL

NO SCALE

7

COMMSCOPE MC-K6MHDx-9-96	
FACE WIDTH	7'-0"
WEIGHT	1203.31 lbs
NOTE: 15" TO 50" O.D.	



T-ARM MOUNT DETAIL

NO SCALE

8

NOT USED

NO SCALE

9

dish
wireless.

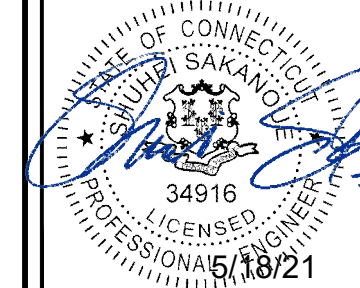
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RFDS REV #: N/A

CONSTRUCTION
DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	04/19/2021	PRELIM CDS
0	05/18/2021	FINAL CDS

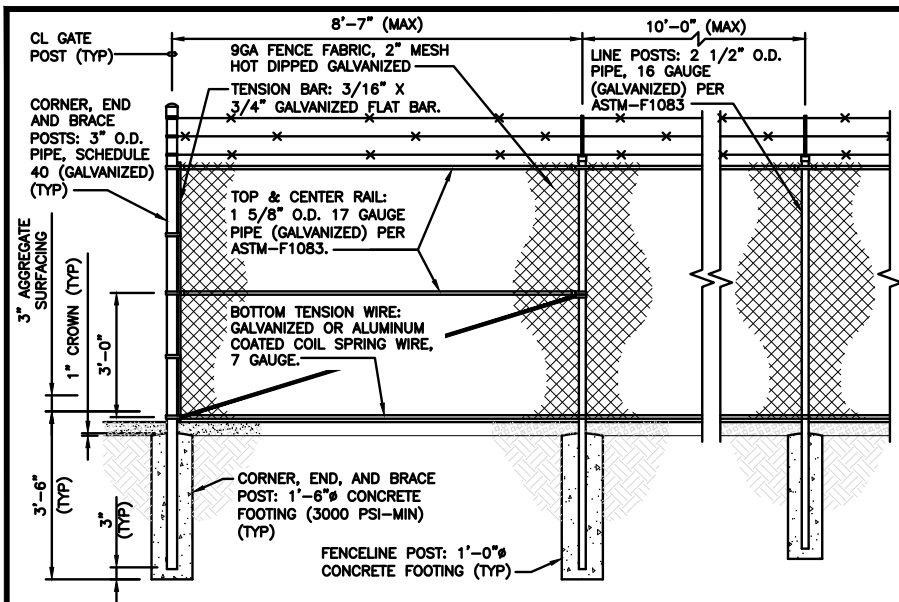
A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER

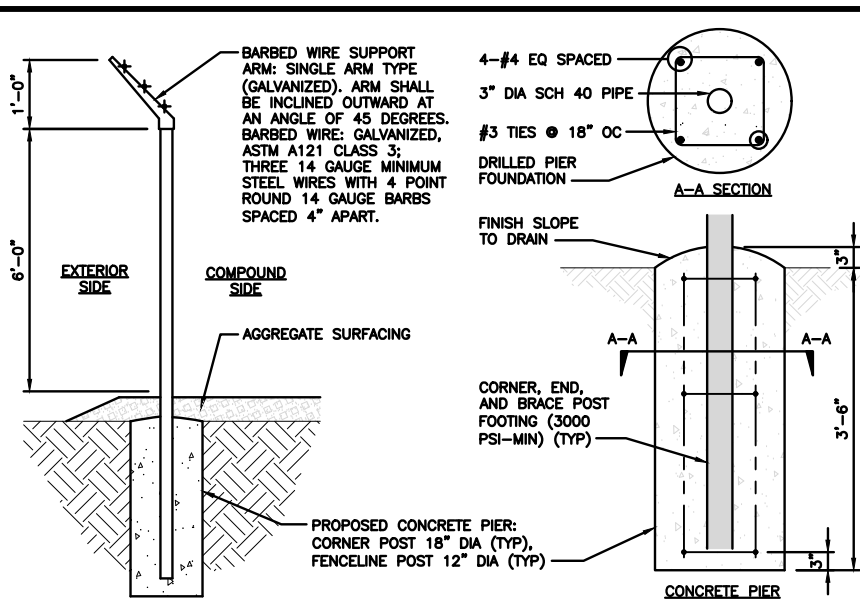
A-6



TYPICAL FENCE DETAIL

NO SCALE

1



TYPICAL FENCE & CONCRETE PIER SECTION

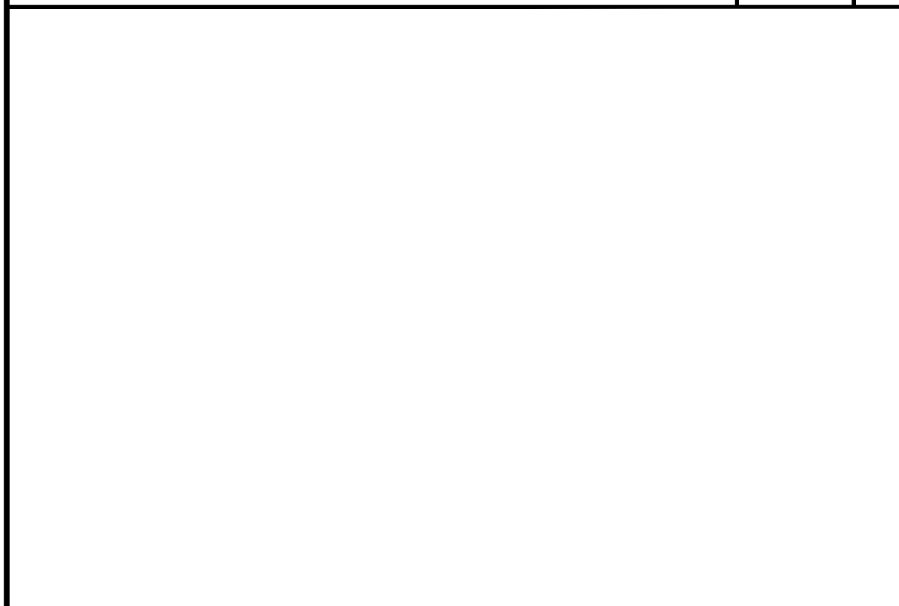
NO SCALE

2

NOT USED

NO SCALE

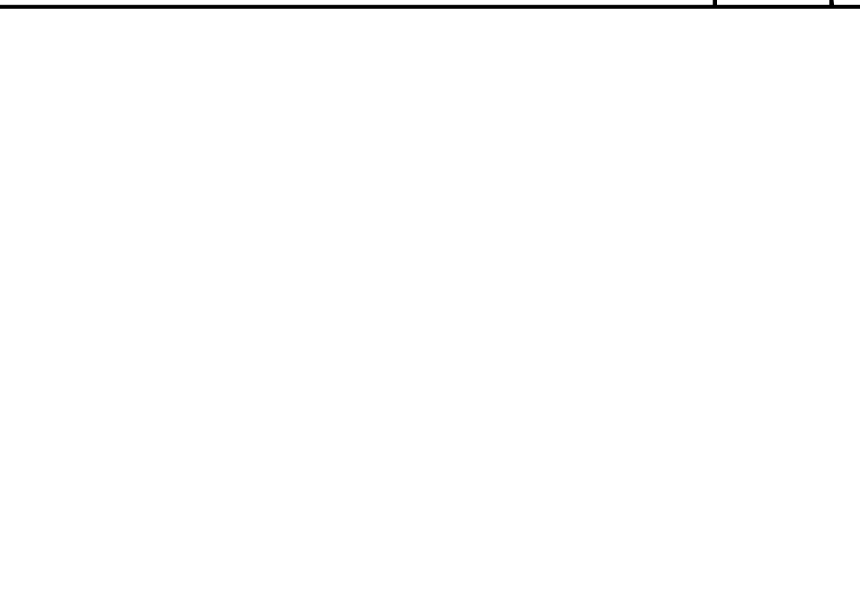
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NOT USED

NO SCALE

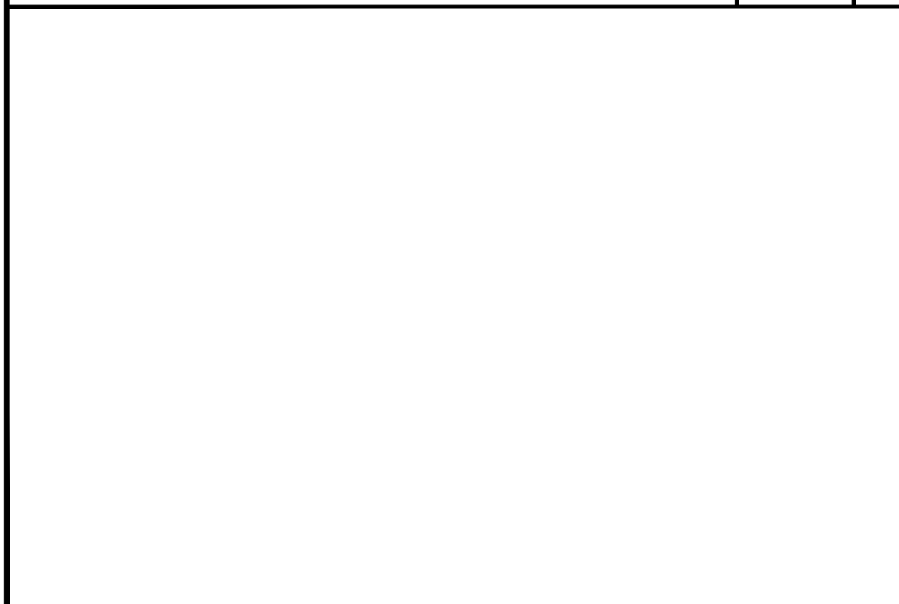
4



NOT USED

NO SCALE

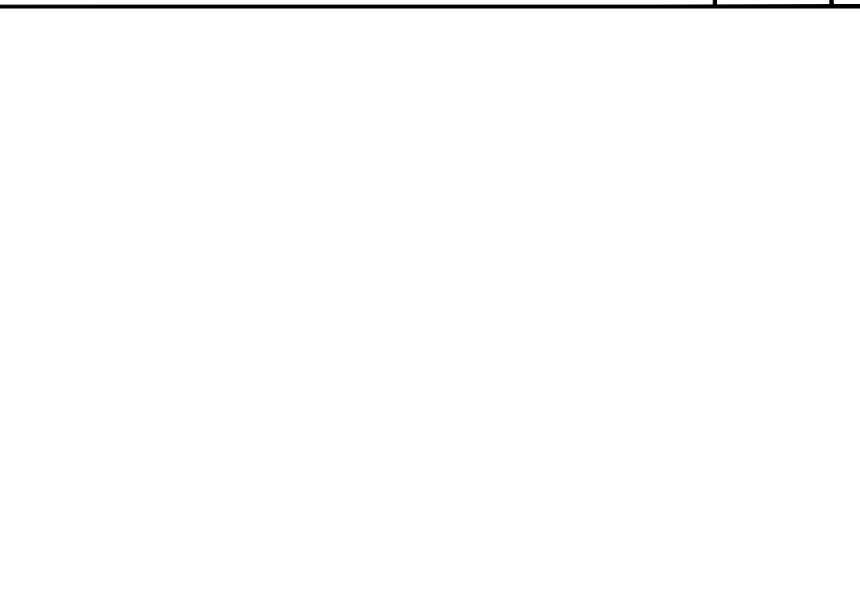
5



NOT USED

NO SCALE

6



NOT USED

NO SCALE

7

MATERIAL DESCRIPTION

NO SCALE

8

- ① LINE POSTS: 2 1/2" O.D. PIPE, 16 GAUGE (GALVANIZED) PER ASTM-F1083.
- ② CORNER, END AND BRACE POSTS: 3" O.D. PIPE, SCHEDULE 40 (GALVANIZED).
- ③ TOP RAIL: 1 5/8" O.D. 17 GAUGE PIPE (GALVANIZED) PER ASTM-F1083.
- ④ BRACE RAIL: 1 5/8" O.D. 17 GAUGE PIPE (GALVANIZED).
- ⑤ DIAGONAL TRUSS ROD: 3/8" GALVANIZED ROD WITH TURNBUCKLE.
- ⑥ TENSION BAR: 3/16" X 3/4" GALVANIZED FLAT BAR.
- ⑦ BOTTOM TENSION WIRE: GALVANIZED OR ALUMINUM COATED COIL SPRING WIRE, 7 GAUGE.
- ⑧ GATE POSTS: 2 7/8" O.D. SCHEDULE 40 PIPE (GALVANIZED).
- ⑨ COMBINATION PADLOCK ACCORDING TO DISH WIRELESS REQUIREMENTS.
- ⑩ GATE FRAMES: 1 7/8" O.D. SCHEDULE 40 PIPE (GALVANIZED).
- ⑪ BARBED WIRE SUPPORT ARM: SINGLE ARM TYPE (GALVANIZED). ARM SHALL BE INCLINED OUTWARD AT AN ANGLE OF 45 DEGREES.
- ⑫ BARBED WIRE: GALVANIZED, ASTM A121 CLASS 3; THREE 14 GAUGE MINIMUM STEEL WIRES WITH 4 POINT ROUND 14 GAUGE BARBS SPACED 4" APART.
- ⑬ 9GA FENCE FABRIC, 2" MESH HOT DIPPED GALVANIZED
- ⑭ MISCELLANEOUS:
 - A. RAIL COUPLINGS: SLEEVE TYPE, 6" LONG EXPANSION SPRING EVERY FIFTH COUPLING.
 - B. POST TOPS: PRESSED STEEL, MALLEABLE IRON WITH PRESSED STEEL EXTENSION ARM, OR ONE-PIECE ALUMINUM CASTING; WITH HOLE FOR TOP, ALL DESIGNED TO FIT OVER THE OUTSIDE OF THE POSTS AND TO PREVENT ENTRY OF MOISTURE INTO TUBULAR POSTS.
 - C. LATCHES SHALL BE FORKED TYPE AND SHALL BE ARRANGED FOR PADLOCKING WITH THE PADLOCK ACCESSIBLE FROM BOTH SIDES OF THE GATE.
 - D. KEEPERS SHALL CONSIST OF MECHANICAL DEVICES FOR SECURING AND SUPPORTING THE FREE END OF THE GATES WHEN IN THE FULL OPEN POSITION. KEEPERS SHALL BE MOUNTED ON 2 7/8" O.D. PIPE POSTS FILLED WITH CONCRETE AND SET IN CONCRETE FOUNDATIONS.
 - E. INSTALL FENCING PER ASTM-F567.
 - F. INSTALL SWING GATES PER ASTM-F900.
 - G. LOCAL ORDINANCE OF BARBED WIRE PERMIT REQUIREMENT SHALL BE COMPLETED IF REQUIRED.
 - H. USE GALVANIZED HOG RING WIRE TO MOUNT ALL SIGNS.
 - I. ALL SIGNS MUST BE MOUNTED ON INSIDE OF FENCE.

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RFDS REV #: N/A

CONSTRUCTION
DOCUMENTS

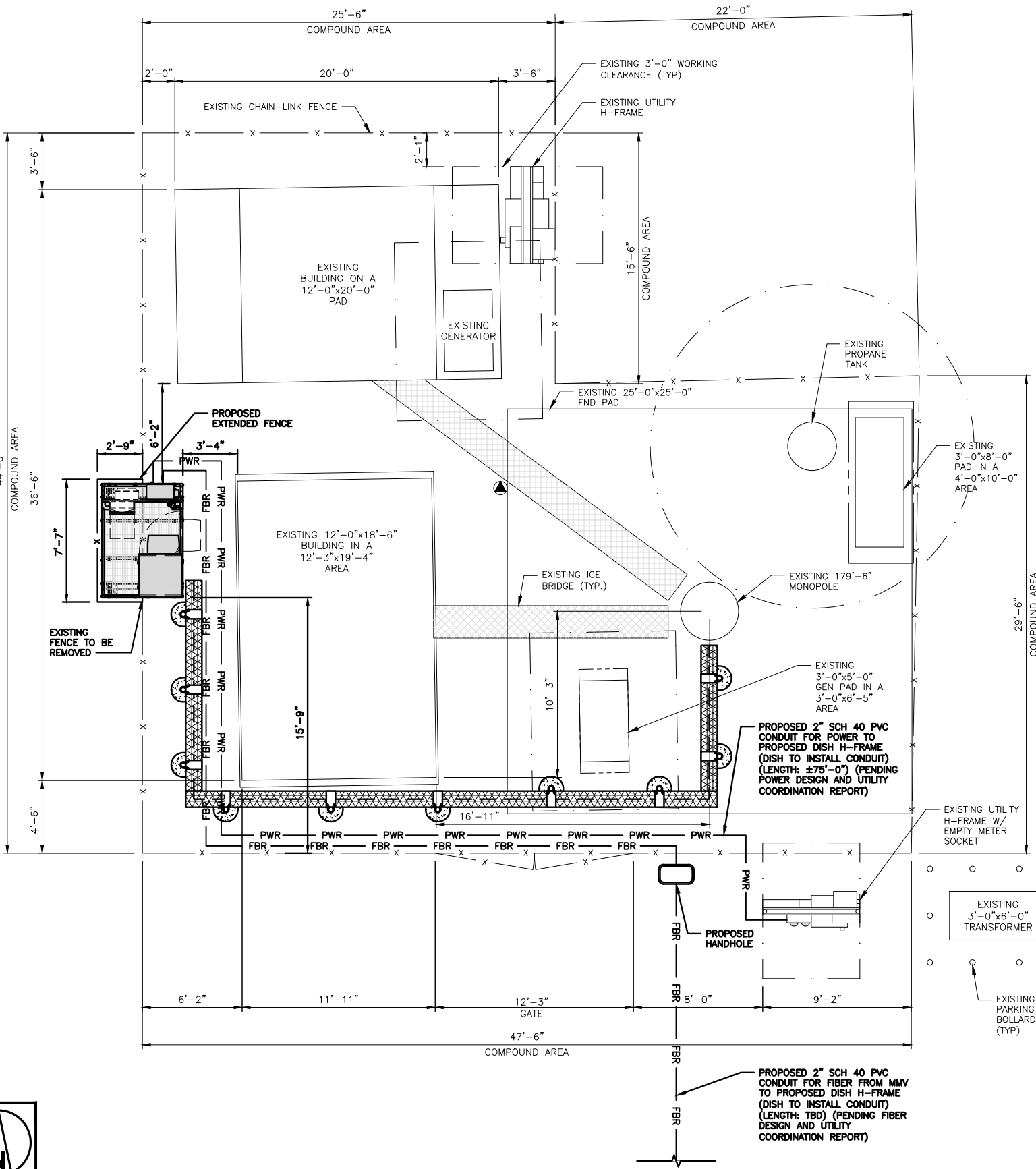
SUBMITTALS		
REV	DATE	DESCRIPTION
A	04/19/2021	PRELIM CDS
0	05/18/2021	FINAL CDS

A&E PROJECT NUMBER
1039-Z5555C

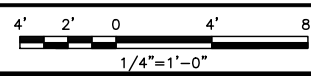
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

SHEET TITLE
FENCING DETAILS

SHEET NUMBER
A-7



UTILITY ROUTE PLAN



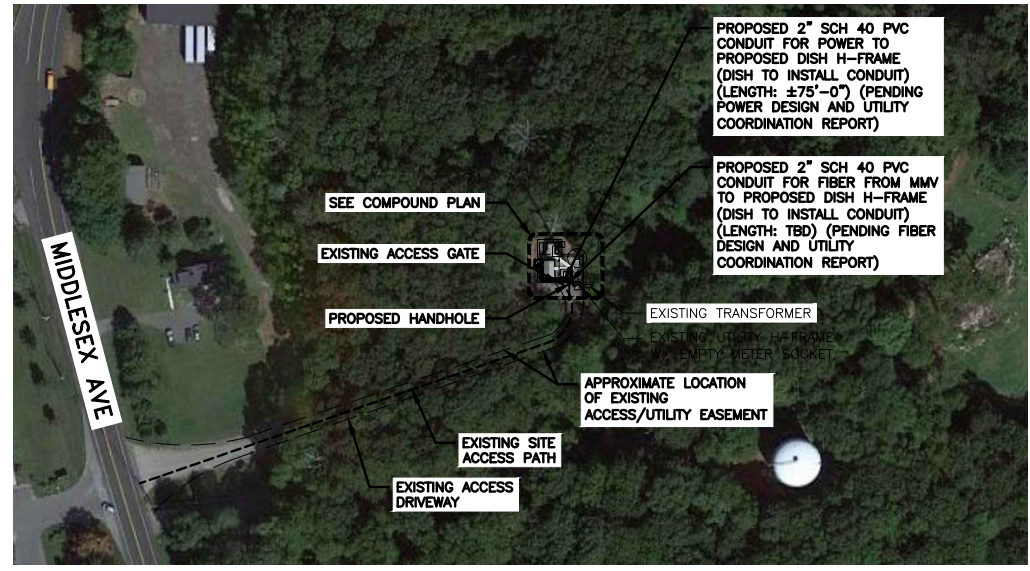
NOTES

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

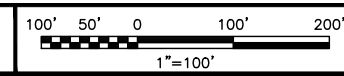
DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

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



OVERALL UTILITY ROUTE PLAN



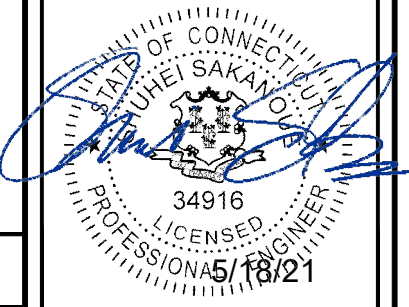
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APPROVED BY: CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	04/19/2021	PRELIM CDS
0	05/18/2021	FINAL CDS

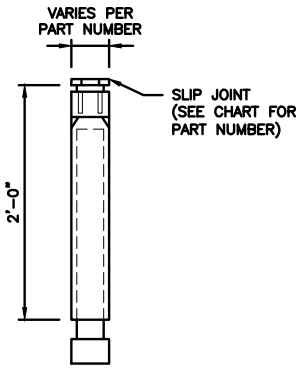
A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

SHEET TITLE
ELECTRICAL/FIBER ROUTE
PLAN AND NOTES

SHEET NUMBER
E-1

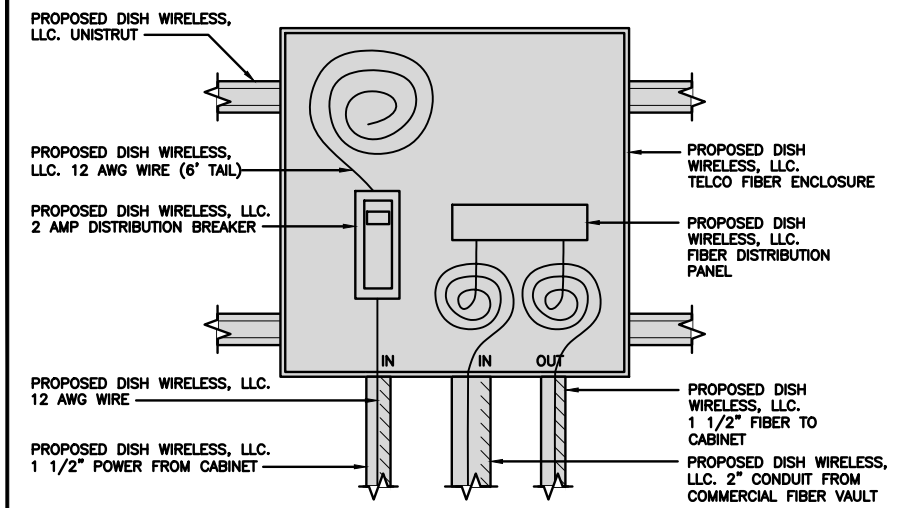
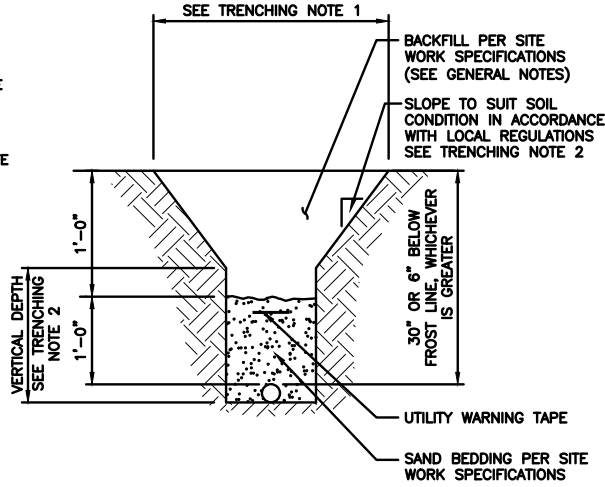
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"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



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

TRENCHING NOTES

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



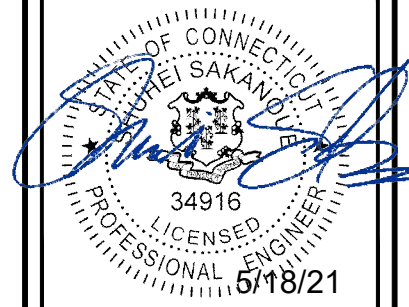
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RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

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0	05/18/2021	FINAL CDS

A&E PROJECT NUMBER
1039-25555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

SHEET TITLE
ELECTRICAL
DETAILS

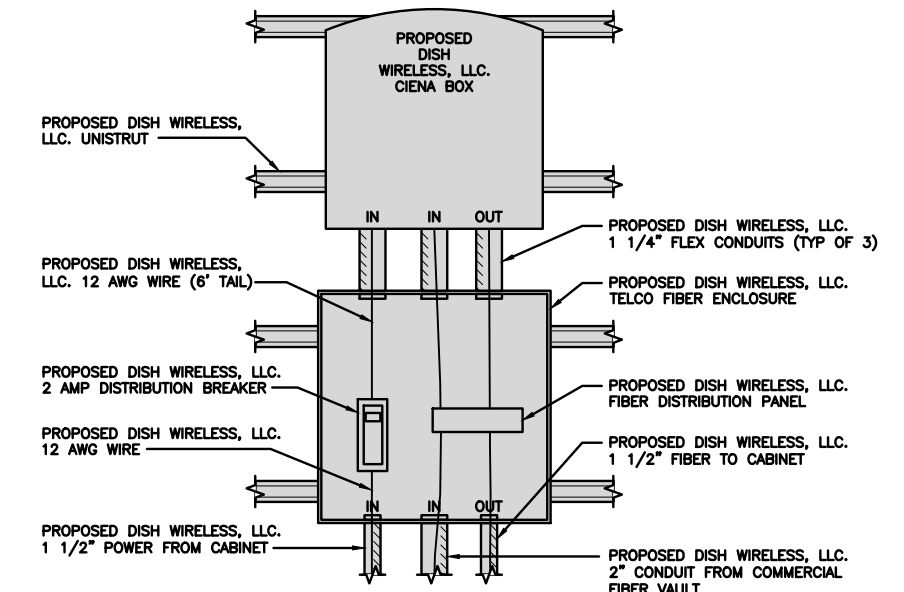
SHEET NUMBER

E-2

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 NO SCALE 4

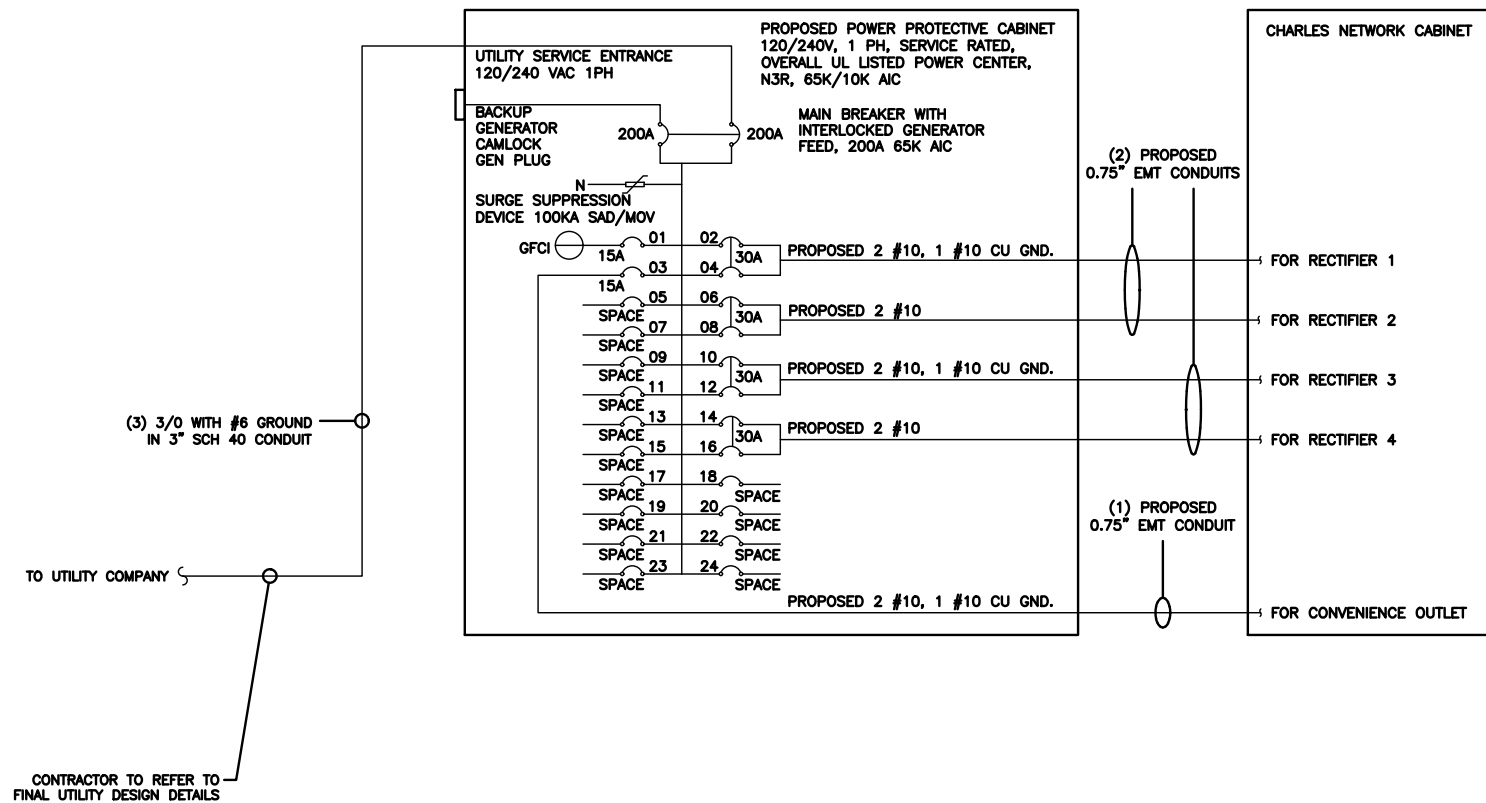
NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



NOTES

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

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

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

#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.
0.75" 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

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

RECTIFIER CONDUCTORS (2 CONDUITS): USING THWN-2, CU.

#10 - 0.0211 SQ. IN X 4 = 0.0844 SQ. IN
#10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND
TOTAL = 0.1055 SQ. IN

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

dish wireless.

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LUHEI SAKAMOTO, C.E.
34916
LICENSED PROFESSIONAL ENGINEER
5/18/21

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RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

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A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

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

SHEET NUMBER
E-3

PPC ONE-LINE DIAGRAM

NO SCALE 1

PROPOSED CHARLES PANEL SCHEDULE

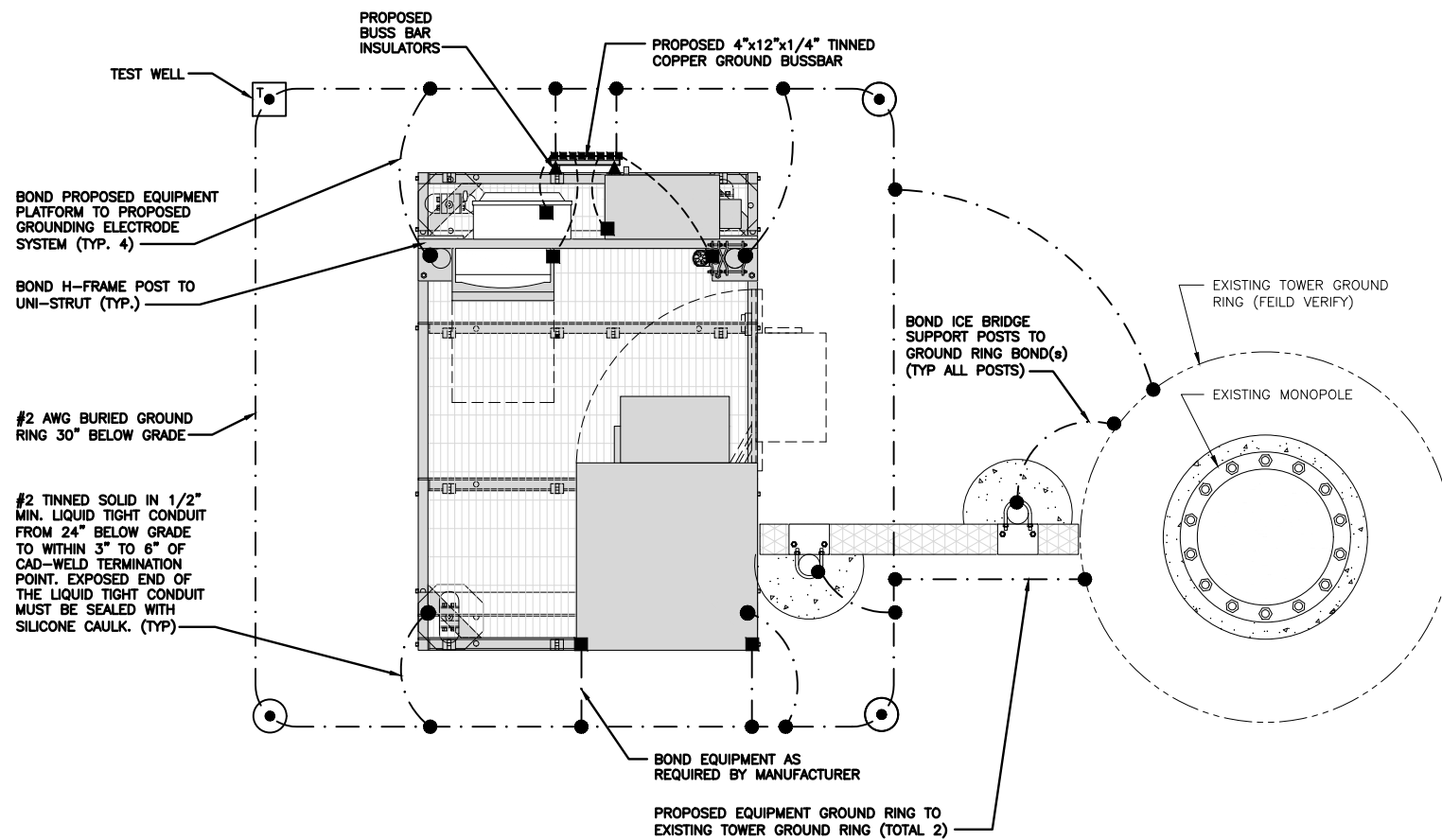
LOAD SERVED	VOLT AMPS (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS)		LOAD SERVED
	L1	L2						L1	L2	
PPC GFCI OUTLET	180	180	15A	1	A	2	30A	2880	2880	ABB/GE INFINITY RECTIFIER 1
CHARLES GFCI OUTLET			15A	3	B	4	30A	2880	2880	ABB/GE INFINITY RECTIFIER 2
-SPACE-				5	A	6	30A	2880	2880	ABB/GE INFINITY RECTIFIER 3
-SPACE-				7	B	8	30A	2880	2880	ABB/GE INFINITY RECTIFIER 4
-SPACE-				9	A	10	30A	2880	2880	-SPACE-
-SPACE-				11	B	12	30A	2880	2880	-SPACE-
-SPACE-				13	A	14	30A	2880	2880	-SPACE-
-SPACE-				15	B	16	30A	2880	2880	-SPACE-
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS	180	180						11520	11520	
200A MCB, 1φ, 24 SPACE, 120/240V				L1	L2					
MB RATING: 65,000 AIC				11700	11700			VOLTAGE AMPS		
				98	98			AMPS		
				98				MAX AMPS		
				123				MAX 125%		

PANEL SCHEDULE

NO SCALE 2

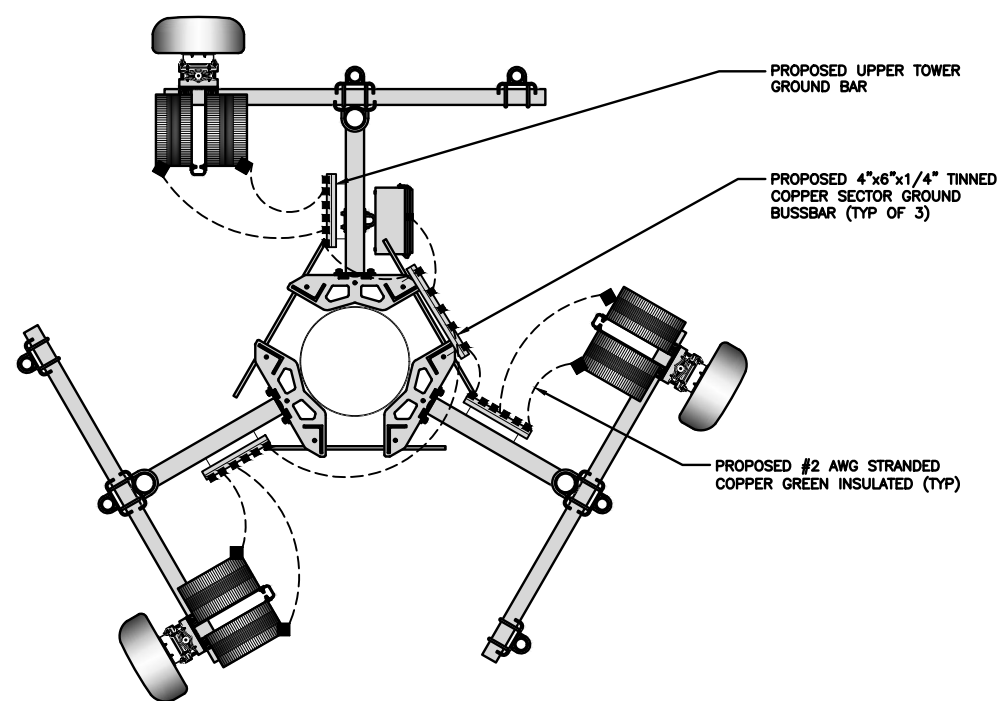
NOT USED

NO SCALE 3



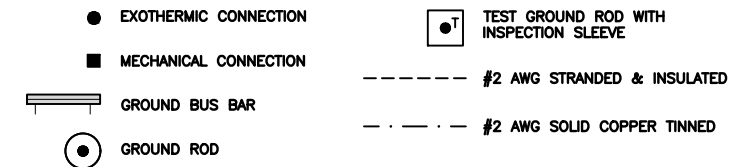
TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2



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

- (A) **EXTERIOR GROUND RING:** #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
- (B) **TOWER GROUND RING:** THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
- (C) **INTERIOR GROUND RING:** #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.
- (D) **BOND TO INTERIOR GROUND RING:** #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.
- (E) **GROUND ROD:** UL LISTED COPPER CLAD STEEL. MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.
- (F) **CELL REFERENCE GROUND BAR:** POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE. STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.
- (G) **HATCH PLATE GROUND BAR:** BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.
- (H) **EXTERIOR CABLE ENTRY PORT GROUND BARS:** LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.
- (J) **TELCO GROUND BAR:** BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
- (K) **FRAME BONDING:** THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
- (L) **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.
- (M) **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.
- (N) **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.
- (P) **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.
- (Q) **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.**
- (R) **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



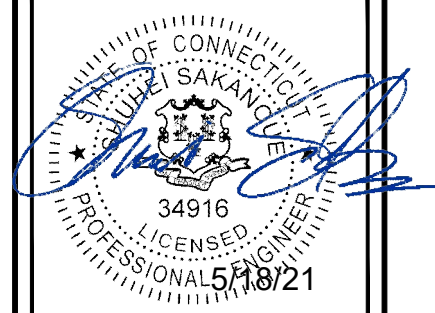
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DRAWN BY: RCD
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APPROVED BY: CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

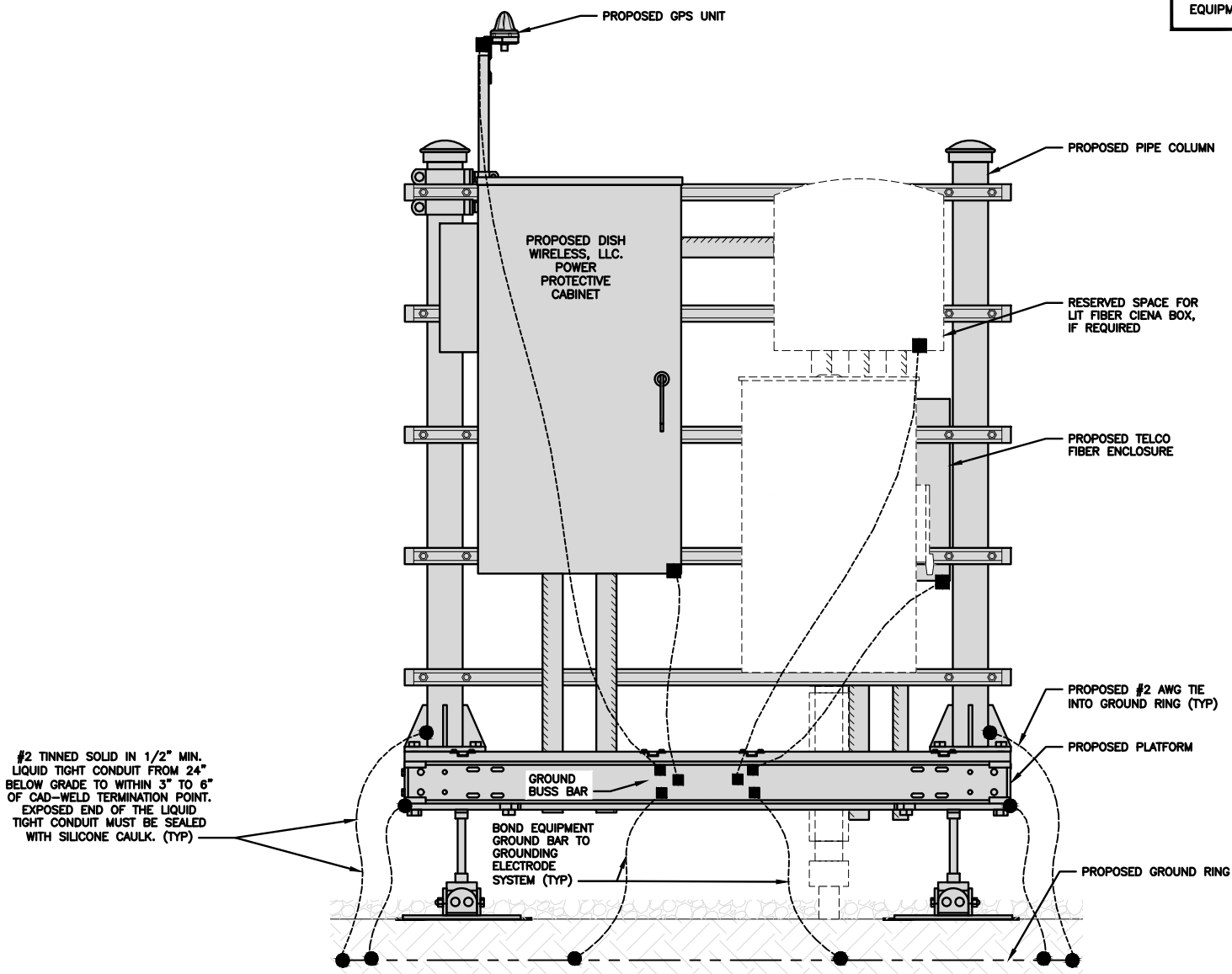
SUBMITTALS		
REV	DATE	DESCRIPTION
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0	05/18/2021	FINAL CDS

A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

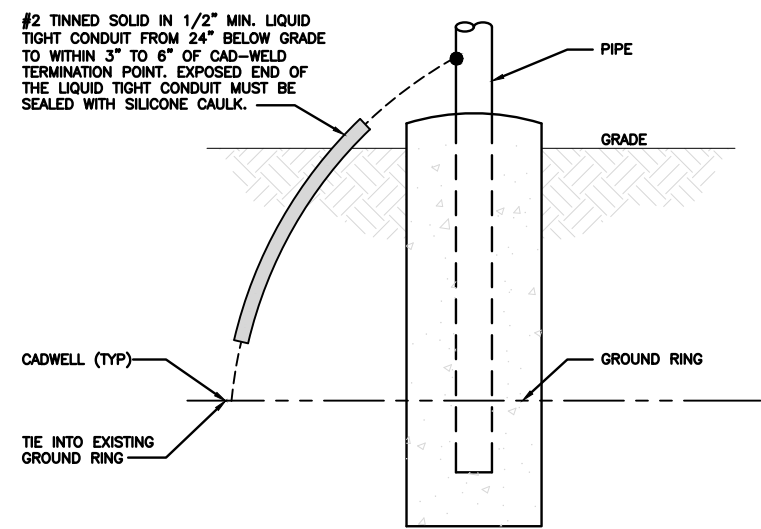
SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER
G-1



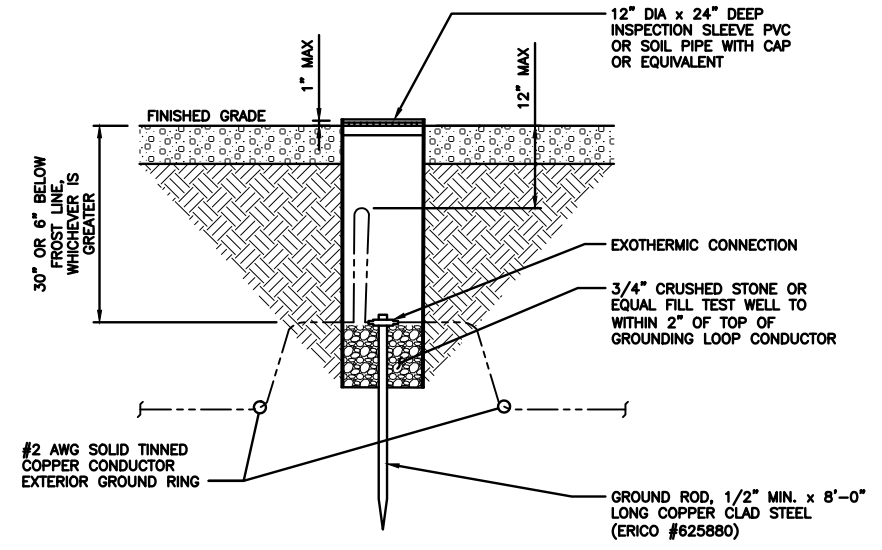
H-FRAME GROUNDING DETAIL

NO SCALE 1



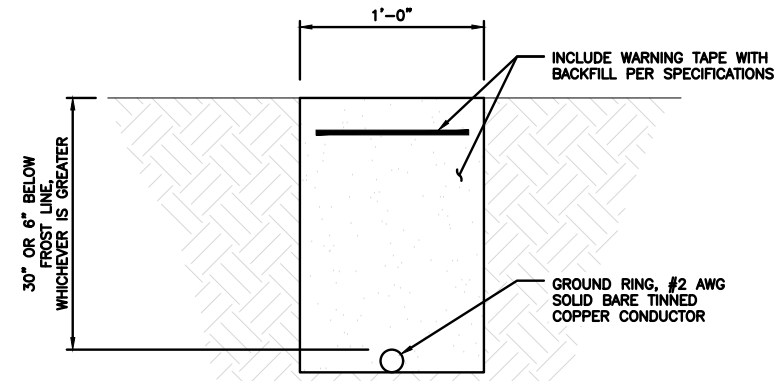
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5



TYPICAL GROUND RING TRENCH

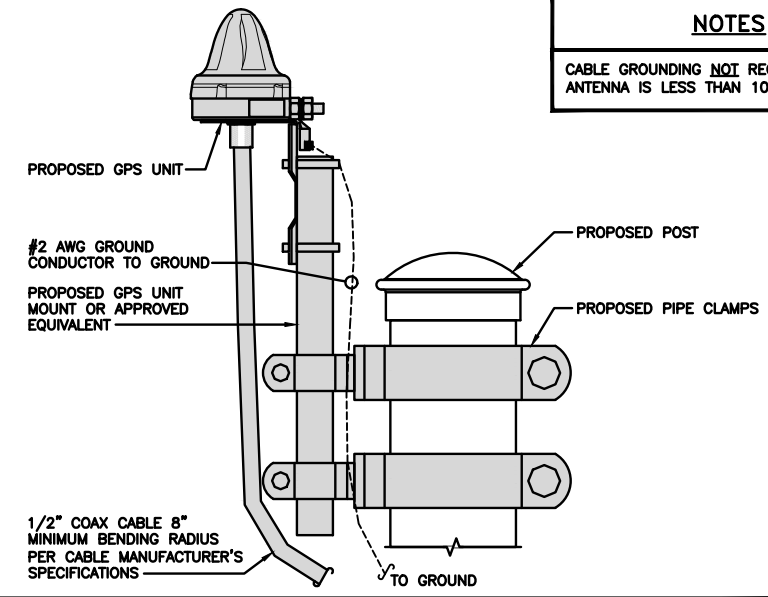
NO SCALE 6

NOTES

EQUIPMENT CABINET OMITTED FOR CLARITY

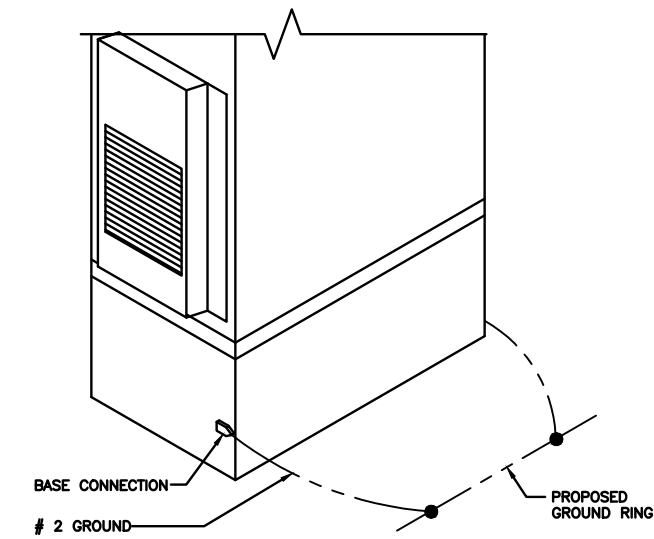
NOTES

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

dish
wireless.

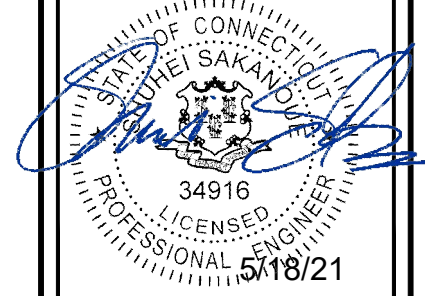
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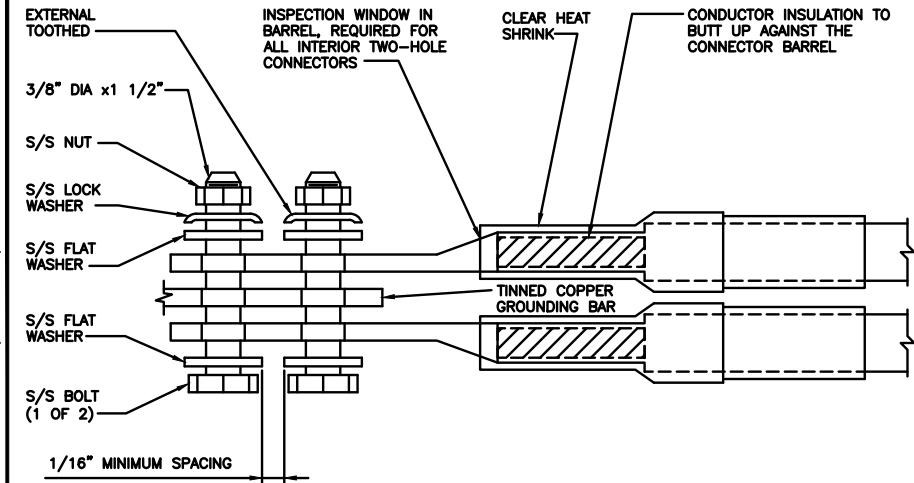
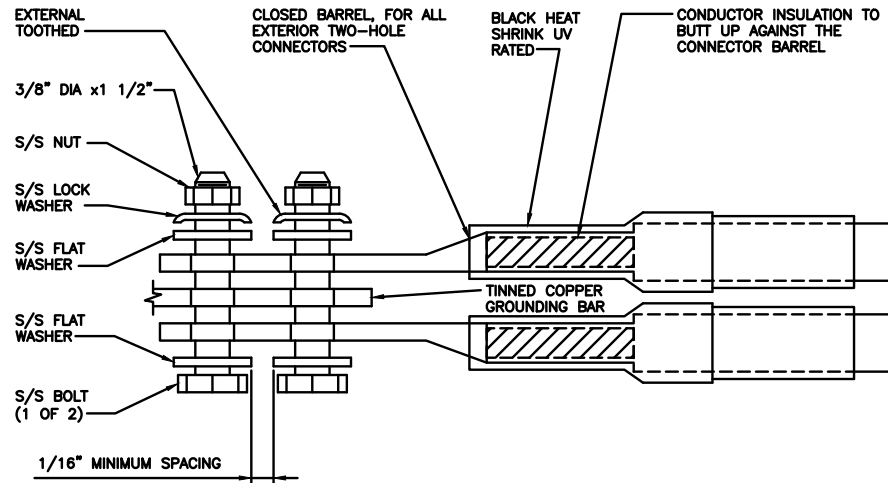
A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

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

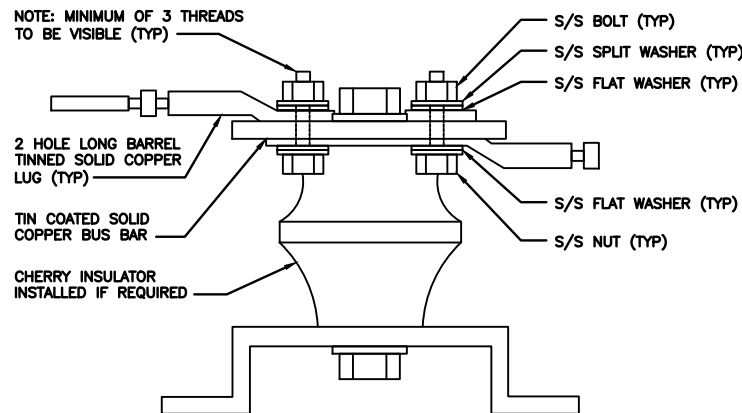
NO SCALE 1

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

dish
wireless.

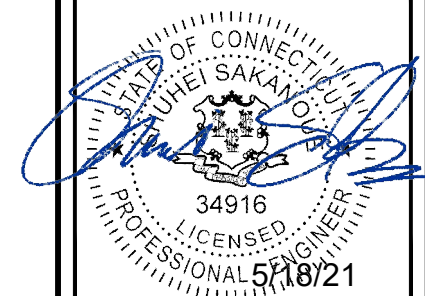
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DOCUMENTS

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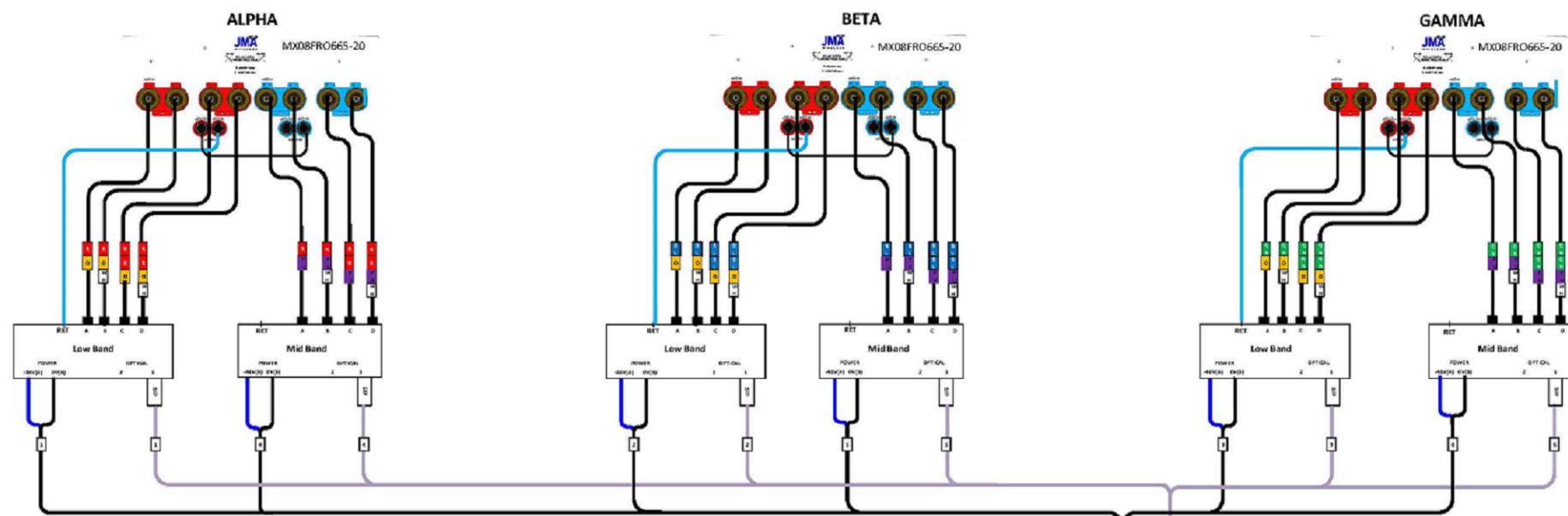
A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

SHEET TITLE
GROUNDING DETAILS

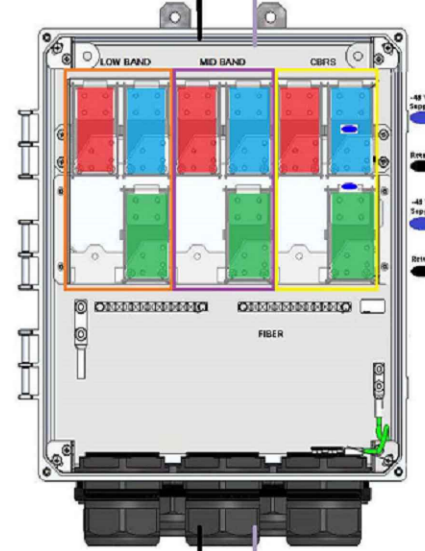
SHEET NUMBER

G-3



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

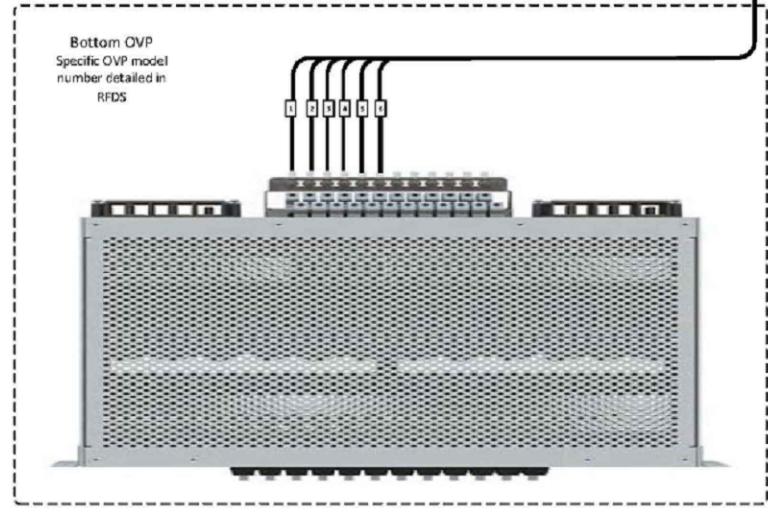
Port	Interface	Description
0	G0/0/0	Spine00
1	G0/0/1	CBRS - Alpha
2	G0/0/2	CBRS - Beta
3	G0/0/3	CBRS - Gamma
4	Te0/0/4	Fujitsu Low-Band RU - Alpha
5	Te0/0/5	Fujitsu Mid-Band RU - Alpha
6	Te0/0/6	Fujitsu Low-Band RU - Beta
7	Te0/0/7	Fujitsu Mid-Band RU - Beta
8	Te0/0/8	Fujitsu Low-Band RU - Gamma
9	Te0/0/9	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 CBRS
Circuit 8	Beta CBRS
Circuit 9	Gamma CBRS
Circuit 10	Open
Circuit 11	Open
Circuit 12	Open



	5G plumbing diagram JMA MX08FRO665-20			
	2-2-2(LB+MB)			
DATE	REV	BY	CHK	REV
5-Jan-2021				1

dish
wireless.

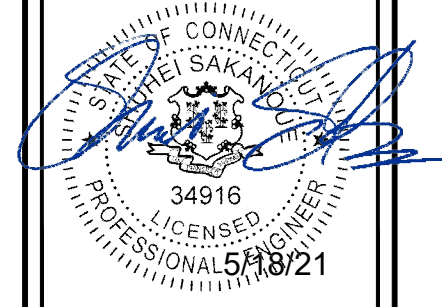
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A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

SHEET TITLE
RF
PLUMBING DIAGRAM

SHEET NUMBER
RF-2

RF JUMPER COLOR CODING

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

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

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

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

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

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

RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN
	WHITE (1) PORT	PURPLE	PURPLE		WHITE (1) PORT	PURPLE	PURPLE		WHITE (1) PORT	PURPLE	PURPLE
			WHITE (1) PORT				WHITE (1) PORT				WHITE (1) PORT

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

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

HYBRID/DISCREET CABLES

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

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

POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY

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

RET MOTORS AT ANTENNAS

PORT 1/ ANTENNA 1 "IN"	PORT 1/ ANTENNA 1 "IN"	PORT 1/ ANTENNA 1 "IN"
RED	BLUE	GREEN

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.

PRIMARY	SECONDARY
WHITE	WHITE
RED	RED
WHITE	WHITE
	RED
	WHITE

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



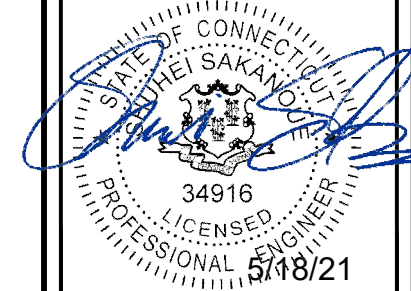
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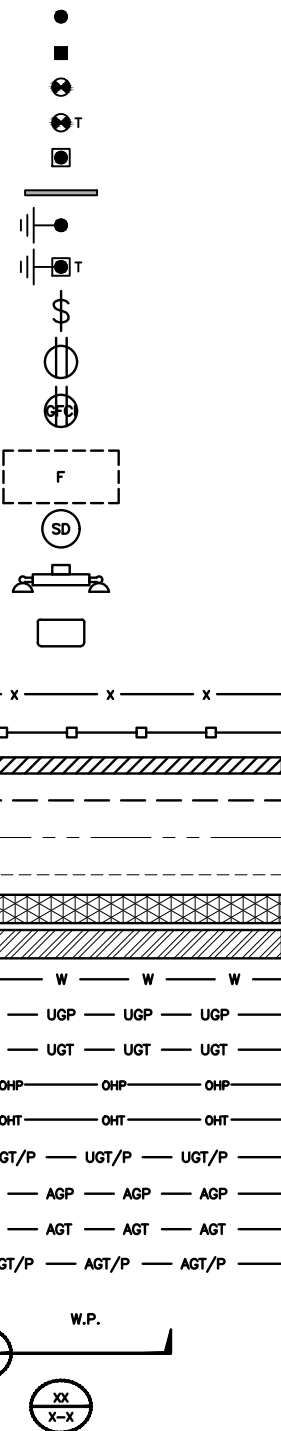
A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER
RF-1

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



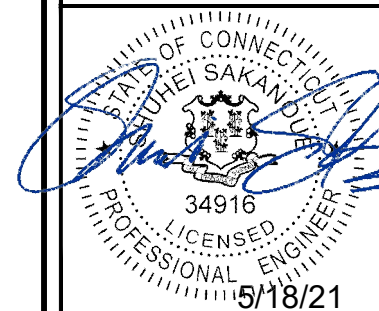
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 TO ALTER THIS DOCUMENT.

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

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	04/19/2021	PRELIM CDS
0	05/18/2021	FINAL CDS

A&E PROJECT NUMBER
 1039-25555C

DISH WIRELESS, LLC.
 PROJECT INFORMATION
 BOBDL00088A
 430 MIDDLESEX TURNPIKE
 OLD SAYBROOK, CT 06475

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.



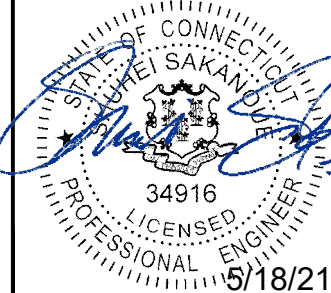
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DRAWN BY: CHECKED BY: APPROVED BY:

RCD SS CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	04/19/2021	PRELIM CDS
0	05/18/2021	FINAL CDS

A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

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.



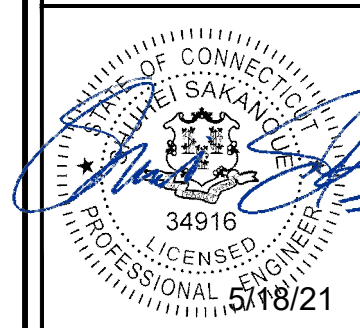
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DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW
RFDS REV #: N/A		

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	04/19/2021	PRELIM CDS
0	05/18/2021	FINAL CDS

A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

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.



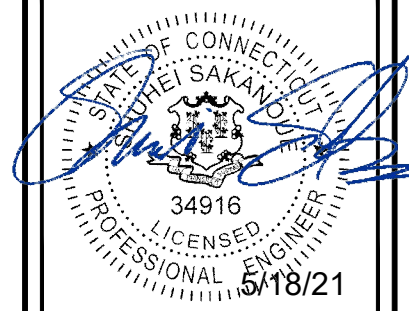
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DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

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SUBMITTALS		
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A&E PROJECT NUMBER
1039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00088A
430 MIDDLESEX TURNPIKE
OLD SAYBROOK, CT 06475

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

Exhibit D

Structural Analysis Report

Date: **May 21, 2021**



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

Subject: **Structural Analysis Report**

Carrier Designation: **DISH Network Co-Locate**
Site Number: BOBDL00088A
Site Name: CT-CCI-T-876336

Crown Castle Designation: **BU Number:** 876336
Site Name: OLD SAYBROOK
JDE Job Number: 645179
Work Order Number: 1973705
Order Number: 553289 Rev. 2

Engineering Firm Designation: **Crown Castle Project Number:** 1973705

Site Data: **430 Middlesex Turnpike, OLD SAYBROOK,**
MIDDLESEX County, CT
Latitude 41° 18' 47.56", Longitude -72° 22' 51.99"
175 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-86.9%

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 135 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Hayes Lei

Respectfully submitted by: 

Digitally signed by Maham Barimani
Date: 2021.05.23 08:59:40

Maham Barimani, P.E.
Senior Project Engineer

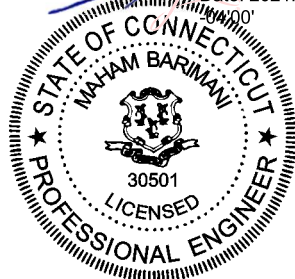


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1) INTRODUCTION

This tower is a 175 ft Monopole tower designed by SUMMIT.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	135 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)
153.0	153.0	3	fujitsu	TA08025-B604	1	1-3/4
		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)
172.0	178.0	1	rfs celwave	ALG6	3 2	1-1/4 7/8
	172.0	3	alcatel lucent	TD-RRH8x20-25		
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
		1	tower mounts	Platform Mount [LP 712-1]		
165.0	1	sinclair	SC381-HL			
170.0	170.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz w/ Mount Pipe	-	-
		1	tower mounts	Side Arm Mount [SO 102-3]		
	166.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER		
85.0	85.0	1		HE2-105	1	EW90
		1	tower mounts	Pipe Mount [PM 601-1]		
72.0	72.0	1	lucent	KS24019-L112A	1	1/2
		1	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1531893	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	1614591	CCISITES
4-TOWER MANUFACTURER DRAWINGS	2264466	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.9.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	175 - 125.667	Pole	TP27.49x17.63x0.188	1	-8.04	975.46	67.8	Pass
L2	125.667 - 84.75	Pole	TP35.3x26.249x0.281	2	-13.42	1889.61	65.3	Pass
L3	84.75 - 38.75	Pole	TP43.94x33.687x0.344	3	-23.07	2879.09	67.0	Pass
L4	38.75 - 0	Pole	TP51x42.002x0.406	4	-36.63	4065.28	64.1	Pass
							Summary	
						Pole (L1)	67.8	Pass
						Rating =	67.8	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	55.0	Pass
1	Base Plate	0	34.3	Pass
1	Anchor Rod Concrete Breakout	0	86.9	Pass
1	Base Foundation (Structure)	0	21.7	Pass
1	Base Foundation (Soil Interaction)	0	48.8	Pass

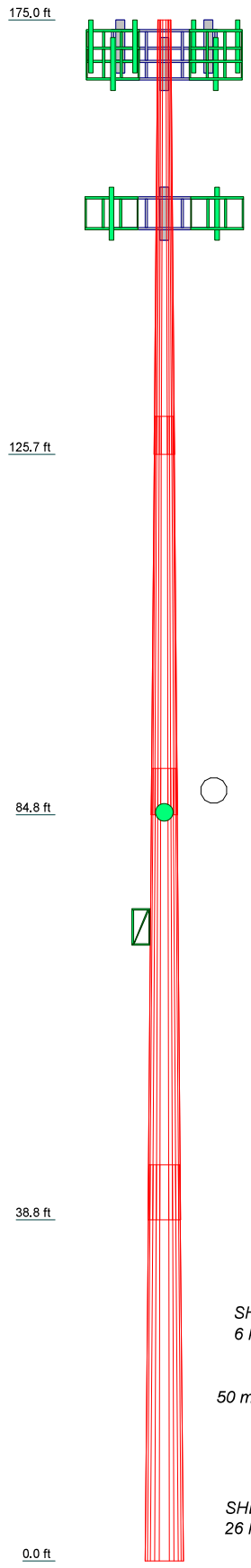
Structure Rating (max from all components) =	86.9%
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4.1) Recommendations

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

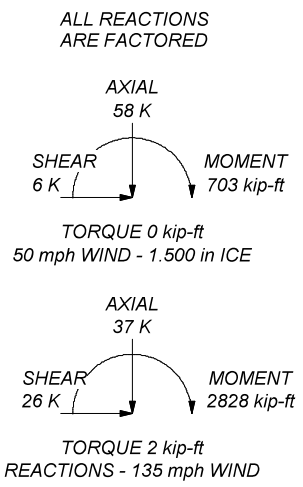
Section	1	2	3	4
Length (ft)	49.33	45.25	51.25	45.00
Number of Sides	12	12	12	12
Thickness (in)	0.188	0.281	0.344	0.406
Socket Length (ft)	4.33	5.25	6.25	42.002
Top Dia (in)	17.630	26.249	33.687	51.000
Bot Dia (in)	27.490	35.300	43.940	
Grade		A572-65		
Weight (K)	2.3	4.3	7.4	9.2
				23.2



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 135 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 67.8%



CROWN CASTLE
The Pathway To Possible

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

Job: BU 876336		
Project:	Client: Crown Castle	Drawn by: HLei
Code: TIA-222-H	Date: 05/21/21	App'd:
Path:	Scale: NTS	Dwg No. E-1

C:\Temporary Working Space - No One Drive\876336\WO 1973705 - SAI\Prof\876336_RPA.dwg

Tower Input Data

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

- Tower is located in Middlesex County, Connecticut.
- Tower base elevation above sea level: 143.32 ft.
- Basic wind speed of 135 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="background-color: #e0e0e0; text-align: center; 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 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	175.00-125.67	49.33	4.333	12	17.630	27.490	0.188	0.750	A572-65 (65 ksi)
L2	125.67-84.75	45.25	5.250	12	26.249	35.300	0.281	1.125	A572-65 (65 ksi)
L3	84.75-38.75	51.25	6.250	12	33.687	43.940	0.344	1.375	A572-65 (65 ksi)
L4	38.75-0.00	45.00		12	42.002	51.000	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	18.186	10.531	408.949	6.244	9.132	44.780	828.642	5.183	4.222	22.519
	28.394	16.484	1568.377	9.774	14.240	110.140	3177.956	8.113	6.865	36.612
L2	27.973	23.517	2024.106	9.296	13.597	148.865	4101.388	11.574	6.281	22.332
	36.446	31.714	4964.051	12.537	18.285	271.476	10058.514	15.609	8.707	30.957
L3	35.842	36.907	5237.487	11.937	17.450	300.141	10612.569	18.165	8.107	23.584
	45.369	48.256	11706.631	15.607	22.761	514.330	23720.808	23.750	10.855	31.577
L4	44.634	54.413	12016.769	14.891	21.757	552.314	24349.232	26.780	10.168	25.029
	52.656	66.183	21623.491	18.113	26.418	818.514	43815.055	32.573	12.579	30.964

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 175.00- 125.67				1	1	1			
L2 125.67- 84.75				1	1	1			
L3 84.75- 38.75				1	1	1			
L4 38.75-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety										
Step Pegs (5/8" SR) 7- in. w/30" step Safety Line 3/8	C	No	Surface Ar (CaAa)	175.00 - 0.00	1	1	0.000 0.000	0.350		0.487
	C	No	Surface Ar (CaAa)	175.00 - 0.00	1	1	0.000 0.000	0.375		0.220
Detuner										
AM Detuner	A	No	Surface Ar (CaAa)	113.00 - 4.00	1	1	0.500 0.500	0.280		1.000
AM Detuner	A	No	Surface Ar (CaAa)	113.00 - 4.00	1	1	-0.250 -0.250	0.280		1.000
AM Detuner	B	No	Surface Ar (CaAa)	113.00 - 4.00	1	1	0.250 0.250	0.280		1.000

**										
*										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
172									
LDF5-50A(7/8)	B	No	No	Inside Pole	172.00 - 0.00	2	No Ice	0.00	0.330
							1/2" Ice	0.00	0.330
							1" Ice	0.00	0.330
							2" Ice	0.00	0.330
HB114-1-08U4-M5J(1-1/4)	A	No	No	Inside Pole	172.00 - 0.00	3	No Ice	0.00	1.080
							1/2" Ice	0.00	1.080
							1" Ice	0.00	1.080
							2" Ice	0.00	1.080
HB114-21U3M12-XXXF(1-1/4)	A	No	No	Inside Pole	172.00 - 0.00	1	No Ice	0.00	1.220
							1/2" Ice	0.00	1.220
							1" Ice	0.00	1.220
							2" Ice	0.00	1.220
85									
EW90(ELLIPTICAL)	B	No	No	Inside Pole	85.00 - 0.00	1	No Ice	0.00	0.320
							1/2" Ice	0.00	0.320
							1" Ice	0.00	0.320
							2" Ice	0.00	0.320
72									
LDF4-50A(1/2)	A	No	No	Inside Pole	72.00 - 0.00	1	No Ice	0.00	0.150
							1/2" Ice	0.00	0.150
							1" Ice	0.00	0.150
							2" Ice	0.00	0.150

CU12PSM6P4XXX(1-3/4)	A	No	No	Inside Pole	153.00 - 0.00	1	No Ice	0.00	2.720
							1/2" Ice	0.00	2.720
							1" Ice	0.00	2.720
							2" Ice	0.00	2.720

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Feed Line/Linear Appurtenances Section Areas

Tower Section	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
L1	175.00-125.67	A	0.000	0.000	0.000	0.000	0.28
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	3.577	0.000	0.03
L2	125.67-84.75	A	0.000	0.000	1.582	0.000	0.35
		B	0.000	0.000	0.791	0.000	0.06
		C	0.000	0.000	2.966	0.000	0.03
L3	84.75-38.75	A	0.000	0.000	2.576	0.000	0.43
		B	0.000	0.000	1.288	0.000	0.09
		C	0.000	0.000	3.335	0.000	0.03
L4	38.75-0.00	A	0.000	0.000	1.946	0.000	0.35
		B	0.000	0.000	0.973	0.000	0.07
		C	0.000	0.000	2.809	0.000	0.03

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	175.00-125.67	A	1.482	0.000	0.000	0.000	0.000	0.28
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	32.827	0.000	0.36
L2	125.67-84.75	A	1.431	0.000	0.000	18.332	0.000	0.53
		B		0.000	0.000	9.166	0.000	0.15
		C		0.000	0.000	27.226	0.000	0.30
L3	84.75-38.75	A	1.357	0.000	0.000	28.905	0.000	0.70
		B		0.000	0.000	14.452	0.000	0.23
		C		0.000	0.000	29.664	0.000	0.32
L4	38.75-0.00	A	1.206	0.000	0.000	20.806	0.000	0.54
		B		0.000	0.000	10.403	0.000	0.17
		C		0.000	0.000	23.840	0.000	0.25

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	175.00-125.67	0.000	0.483	0.000	2.317
L2	125.67-84.75	0.000	0.343	0.000	1.411
L3	84.75-38.75	0.000	0.292	0.000	1.111
L4	38.75-0.00	0.000	0.315	0.000	1.272

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	2	Step Pegs (5/8" SR) 7-in. w/30" step	125.67 - 175.00	1.0000	1.0000
L1	3	Safety Line 3/8	125.67 - 175.00	1.0000	1.0000
L2	2	Step Pegs (5/8" SR) 7-in. w/30" step	84.75 - 125.67	1.0000	1.0000
L2	3	Safety Line 3/8	84.75 - 125.67	1.0000	1.0000
L2	13	AM Detuner	84.75 - 113.00	1.0000	1.0000
L2	14	AM Detuner	84.75 - 113.00	1.0000	1.0000
L2	15	AM Detuner	84.75 - 113.00	1.0000	1.0000
L3	2	Step Pegs (5/8" SR) 7-in. w/30" step	38.75 - 84.75	1.0000	1.0000
L3	3	Safety Line 3/8	38.75 - 84.75	1.0000	1.0000
L3	13	AM Detuner	38.75 - 84.75	1.0000	1.0000
L3	14	AM Detuner	38.75 - 84.75	1.0000	1.0000
L3	15	AM Detuner	38.75 - 84.75	1.0000	1.0000
L4	2	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 38.75	1.0000	1.0000
L4	3	Safety Line 3/8	0.00 - 38.75	1.0000	1.0000
L4	13	AM Detuner	4.00 - 38.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L4	14	AM Detuner	4.00 - 38.75	1.0000	1.0000
L4	15	AM Detuner	4.00 - 38.75	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
LR										
1/2" x 5' L Rod	C	From Leg	0.00	0.000	0.000	175.00	No Ice	0.25	0.25	0.00
							1/2" Ice	0.76	0.76	0.01
							1" Ice	1.29	1.29	0.01
							2" Ice	1.92	1.92	0.04
I72										
APXVSP18-C-A20 w/ Mount Pipe	A	From Centroid-Leg	4.00	0.000	0.000	172.00	No Ice	4.60	4.01	0.10
							1/2" Ice	5.05	4.45	0.16
							1" Ice	5.50	4.89	0.23
							2" Ice	6.44	5.82	0.42
APXVSP18-C-A20 w/ Mount Pipe	B	From Centroid-Leg	4.00	0.000	0.000	172.00	No Ice	4.60	4.01	0.10
							1/2" Ice	5.05	4.45	0.16
							1" Ice	5.50	4.89	0.23
							2" Ice	6.44	5.82	0.42
APXVSP18-C-A20 w/ Mount Pipe	C	From Centroid-Leg	4.00	0.000	0.000	172.00	No Ice	4.60	4.01	0.10
							1/2" Ice	5.05	4.45	0.16
							1" Ice	5.50	4.89	0.23
							2" Ice	6.44	5.82	0.42
APXVTM14-C-120 w/ Mount Pipe	A	From Centroid-Leg	4.00	0.000	0.000	172.00	No Ice	4.09	2.86	0.08
							1/2" Ice	4.48	3.23	0.13
							1" Ice	4.88	3.61	0.19
							2" Ice	5.71	4.40	0.33
APXVTM14-C-120 w/ Mount Pipe	B	From Centroid-Leg	4.00	0.000	0.000	172.00	No Ice	4.09	2.86	0.08
							1/2" Ice	4.48	3.23	0.13
							1" Ice	4.88	3.61	0.19
							2" Ice	5.71	4.40	0.33
APXVTM14-C-120 w/ Mount Pipe	C	From Centroid-Leg	4.00	0.000	0.000	172.00	No Ice	4.09	2.86	0.08
							1/2" Ice	4.48	3.23	0.13
							1" Ice	4.88	3.61	0.19
							2" Ice	5.71	4.40	0.33
ALG6	C	From Centroid-Leg	4.00	0.000	0.000	172.00	No Ice	2.65	2.65	0.04
							1/2" Ice	4.76	4.76	0.07
							1" Ice	5.26	5.26	0.11
							2" Ice	6.30	6.30	0.22
SC381-HL	C	From Centroid-Leg	4.00	0.000	0.000	172.00	No Ice	4.31	4.31	0.05
							1/2" Ice	7.38	7.38	0.09
							1" Ice	8.76	8.76	0.14
							2" Ice	10.39	10.39	0.27
TD-RRH8x20-25	A	From Centroid-Leg	4.00	0.000	0.000	172.00	No Ice	4.05	1.53	0.07
							1/2" Ice	4.30	1.71	0.10
							Ice	4.56	1.90	0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
						1" Ice	5.10	2.30	0.20
						2" Ice			
TD-RRH8x20-25	B	From Centroid-Leg	4.00 0.000 0.000	0.000	172.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						1" Ice	4.56	1.90	0.13
						2" Ice	5.10	2.30	0.20
TD-RRH8x20-25	C	From Centroid-Leg	4.00 0.000 0.000	0.000	172.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						1" Ice	4.56	1.90	0.13
						2" Ice	5.10	2.30	0.20
2.4" Dia. x 6' Mount Pipe	A	From Centroid-Leg	4.00 0.000 0.000	0.000	172.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.93	1.93	0.04
						1" Ice	2.32	2.32	0.06
						2" Ice	3.15	3.15	0.10
2.4" Dia. x 6' Mount Pipe	B	From Centroid-Leg	4.00 0.000 0.000	0.000	172.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.93	1.93	0.04
						1" Ice	2.32	2.32	0.06
						2" Ice	3.15	3.15	0.10
2.4" Dia. x 6' Mount Pipe	C	From Centroid-Leg	4.00 0.000 0.000	0.000	172.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.93	1.93	0.04
						1" Ice	2.32	2.32	0.06
						2" Ice	3.15	3.15	0.10
Platform Mount [LP 712-1]	C	None		0.000	172.00	No Ice	24.56	24.56	1.34
						1/2" Ice	27.92	27.92	1.91
						1" Ice	31.27	31.27	2.55
						2" Ice	37.98	37.98	3.97
170									
800MHz 2X50W RRH W/FILTER	A	From Leg	1.00 0.000 -4.000	0.000	170.00	No Ice	2.06	1.93	0.06
						1/2" Ice	2.24	2.11	0.09
						1" Ice	2.43	2.29	0.11
						2" Ice	2.83	2.68	0.17
800MHz 2X50W RRH W/FILTER	B	From Leg	1.00 0.000 -4.000	0.000	170.00	No Ice	2.06	1.93	0.06
						1/2" Ice	2.24	2.11	0.09
						1" Ice	2.43	2.29	0.11
						2" Ice	2.83	2.68	0.17
800MHz 2X50W RRH W/FILTER	C	From Leg	1.00 0.000 -4.000	0.000	170.00	No Ice	2.06	1.93	0.06
						1/2" Ice	2.24	2.11	0.09
						1" Ice	2.43	2.29	0.11
						2" Ice	2.83	2.68	0.17
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe	A	From Leg	1.00 0.000 0.000	0.000	170.00	No Ice	2.52	2.84	0.07
						1/2" Ice	2.79	3.24	0.10
						1" Ice	3.06	3.65	0.14
						2" Ice	3.65	4.53	0.23
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe	B	From Leg	1.00 0.000 0.000	0.000	170.00	No Ice	2.52	2.84	0.07
						1/2" Ice	2.79	3.24	0.10
						1" Ice	3.06	3.65	0.14
						2" Ice	3.65	4.53	0.23
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe	C	From Leg	1.00 0.000 0.000	0.000	170.00	No Ice	2.52	2.84	0.07
						1/2" Ice	2.79	3.24	0.10
						1" Ice	3.06	3.65	0.14
						2" Ice	3.65	4.53	0.23
Side Arm Mount [SO 102-3]	C	None		0.000	170.00	No Ice	3.60	3.60	0.07
						1/2" Ice	4.18	4.18	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
						Ice	4.75	4.75	0.14
						1" Ice	5.90	5.90	0.20
						2" Ice			
132 MX08FRO665-20 w/ Mount Pipe	A	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.10 0.18 0.28 0.51
MX08FRO665-20 w/ Mount Pipe	B	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.10 0.18 0.28 0.51
MX08FRO665-20 w/ Mount Pipe	C	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.10 0.18 0.28 0.51
TA08025-B604	A	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	B	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	C	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B605	A	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B605	B	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B605	C	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
RDIDC-9181-PF-48	A	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.31 2.50 2.70 3.12	1.29 1.45 1.61 1.96	0.02 0.04 0.06 0.12
(2) 8' x 2" Mount Pipe	A	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	0.03 0.04 0.06 0.12
(2) 8' x 2" Mount Pipe	B	From Leg	4.00 0.000 0.000	0.000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	0.03 0.04 0.06 0.12
(2) 8' x 2" Mount Pipe	C	From Leg	4.00	0.000	153.00	No Ice	1.90	1.90	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _A A _{Front} ft ²	C _A A _{Side} ft ²	Weight K	
			0.000			1/2"	2.73	2.73	0.04
			0.000			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice			
Commscope MC-PK8-DSH	C	None		0.000	153.00	No Ice	34.24	34.24	1.75
						1/2"	62.95	62.95	2.10
						Ice	91.66	91.66	2.45
						1" Ice	149.08	149.08	3.15
						2" Ice			
85 Pipe Mount [PM 601-1]	C	From Face	0.50 0.000 0.000	0.000	85.00	No Ice	1.32	1.32	0.07
						1/2"	1.58	1.58	0.08
						Ice	1.84	1.84	0.09
						1" Ice	2.40	2.40	0.13
						2" Ice			
72 KS24019-L112A	C	From Leg	3.00 0.000 0.000	0.000	72.00	No Ice	0.10	0.10	0.01
						1/2"	0.18	0.18	0.01
						Ice	0.26	0.26	0.01
						1" Ice	0.42	0.42	0.01
						2" Ice			
2.4" Dia x 18" Pipe	C	From Leg	3.00 0.000 0.000	0.000	72.00	No Ice	0.24	0.24	0.01
						1/2"	0.34	0.34	0.01
						Ice	0.46	0.46	0.01
						1" Ice	0.70	0.70	0.03
						2" Ice			
Side Arm Mount [SO 701-1]	C	From Leg	1.50 0.000 0.000	0.000	72.00	No Ice	0.85	1.67	0.07
						1/2"	1.14	2.34	0.08
						Ice	1.43	3.01	0.09
						1" Ice	2.01	4.35	0.12
						2" Ice			
**** Detuner Brace 28" (PL3"x3/16")	A	From Leg	1.00 0.000 0.000	0.000	113.00	No Ice	0.01	0.70	0.00
						1/2"	0.03	0.88	0.01
						Ice	0.06	1.06	0.01
						1" Ice	0.13	1.45	0.03
						2" Ice			
Detuner Brace 28" (PL3"x3/16")	B	From Leg	1.00 0.000 0.000	0.000	113.00	No Ice	0.01	0.70	0.00
						1/2"	0.03	0.88	0.01
						Ice	0.06	1.06	0.01
						1" Ice	0.13	1.45	0.03
						2" Ice			
Detuner Brace 28" (PL3"x3/16")	C	From Leg	1.00 0.000 0.000	0.000	113.00	No Ice	0.01	0.70	0.00
						1/2"	0.03	0.88	0.01
						Ice	0.06	1.06	0.01
						1" Ice	0.13	1.45	0.03
						2" Ice			
Detuner Brace 28" (PL3"x3/16")	A	From Leg	1.00 0.000 0.000	0.000	4.00	No Ice	0.01	0.70	0.00
						1/2"	0.03	0.88	0.01
						Ice	0.06	1.06	0.01
						1" Ice	0.13	1.45	0.03
						2" Ice			
Detuner Brace 28" (PL3"x3/16")	B	From Leg	1.00 0.000 0.000	0.000	4.00	No Ice	0.01	0.70	0.00
						1/2"	0.03	0.88	0.01
						Ice	0.06	1.06	0.01
						1" Ice	0.13	1.45	0.03
						2" Ice			
Detuner Brace 28" (PL3"x3/16")	C	From Leg	1.00 0.000 0.000	0.000	4.00	No Ice	0.01	0.70	0.00
						1/2"	0.03	0.88	0.01
						Ice	0.06	1.06	0.01
						1" Ice	0.13	1.45	0.03
						2" Ice			

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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	
85											
HE2-105	C	Paraboloid w/Shroud (HP)	From Face	1.00 0.000 0.000	-9.000		85.00	2.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.41 3.68 4.21	0.06 0.07 0.09 0.12

Load Combinations

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

Comb. No.	Description
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	175 - 125.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.86	1.54	-0.75
			Max. Mx	20	-8.05	350.16	-0.12
			Max. My	14	-8.04	0.32	-350.97
			Max. Vy	20	-11.98	350.16	-0.12
			Max. Vx	14	12.02	0.32	-350.97
L2	125.667 - 84.75	Pole	Max. Torque	13			-1.29
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.18	1.79	-1.00
			Max. Mx	20	-13.43	912.54	-0.12
			Max. My	14	-13.42	0.40	-915.09
			Max. Vy	20	-16.17	912.54	-0.12
L3	84.75 - 38.75	Pole	Max. Vx	2	-16.22	0.45	914.84
			Max. Torque	25			1.15
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.66	2.50	-1.87
			Max. Mx	20	-23.08	1759.00	0.68
			Max. My	2	-23.07	1.82	1766.60
L4	38.75 - 0	Pole	Max. Vy	8	21.23	-1757.60	-2.23
			Max. Vx	2	-21.37	1.82	1766.60
			Max. Torque	13			-1.60
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.95	2.77	-1.98
			Max. Mx	20	-36.63	2813.86	2.29
			Max. My	2	-36.63	3.27	2828.14
			Max. Vy	8	25.62	-2812.47	-4.21
			Max. Vx	2	-25.77	3.27	2828.14
			Max. Torque	13			-1.59

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	57.95	-0.01	-5.82
	Max. H _x	21	27.48	25.59	0.03
	Max. H _z	2	36.65	0.03	25.74
	Max. M _x	2	2828.14	0.03	25.74
	Max. M _z	8	2812.47	-25.60	-0.05
	Max. Torsion	25	1.59	12.82	22.32
	Min. Vert	19	27.48	22.14	-12.86
	Min. H _x	9	27.48	-25.60	-0.05
	Min. H _z	14	36.65	-0.02	-25.71
	Min. M _x	14	-2826.00	-0.02	-25.71
	Min. M _z	20	-2813.86	25.59	0.03
	Min. Torsion	13	-1.59	-12.81	-22.28

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	30.54	0.00	0.00	0.38	0.69	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	36.65	-0.03	-25.74	-2828.14	3.27	-1.38
0.9 Dead+1.0 Wind 0 deg - No Ice	27.48	-0.03	-25.74	-2794.22	3.02	-1.38
1.2 Dead+1.0 Wind 30 deg - No Ice	36.65	12.75	-22.30	-2449.83	-1402.08	-0.82
0.9 Dead+1.0 Wind 30 deg - No Ice	27.48	12.75	-22.30	-2420.46	-1385.39	-0.82
1.2 Dead+1.0 Wind 60 deg - No Ice	36.65	22.13	-12.88	-1414.50	-2432.50	0.01
0.9 Dead+1.0 Wind 60 deg - No Ice	27.48	22.13	-12.88	-1397.60	-2403.40	0.01
1.2 Dead+1.0 Wind 90 deg - No Ice	36.65	25.60	0.05	4.21	-2812.47	0.89
0.9 Dead+1.0 Wind 90 deg - No Ice	27.48	25.60	0.05	4.06	-2778.79	0.89
1.2 Dead+1.0 Wind 120 deg - No Ice	36.65	22.16	12.90	1417.57	-2434.82	1.40
0.9 Dead+1.0 Wind 120 deg - No Ice	27.48	22.16	12.90	1400.40	-2405.69	1.40
1.2 Dead+1.0 Wind 150 deg - No Ice	36.65	12.81	22.28	2448.83	-1406.47	1.59
0.9 Dead+1.0 Wind 150 deg - No Ice	27.48	12.81	22.28	2419.23	-1389.74	1.59
1.2 Dead+1.0 Wind 180 deg - No Ice	36.65	0.02	25.71	2826.00	-1.05	1.35
0.9 Dead+1.0 Wind 180 deg - No Ice	27.48	0.02	25.71	2791.85	-1.27	1.36
1.2 Dead+1.0 Wind 210 deg - No Ice	36.65	-12.75	22.27	2448.05	1403.63	0.79
0.9 Dead+1.0 Wind 210 deg - No Ice	27.48	-12.75	22.27	2418.45	1386.48	0.79
1.2 Dead+1.0 Wind 240 deg - No Ice	36.65	-22.14	12.86	1413.89	2435.18	-0.06
0.9 Dead+1.0 Wind 240 deg - No Ice	27.48	-22.14	12.86	1396.74	2405.61	-0.06
1.2 Dead+1.0 Wind 270 deg - No Ice	36.65	-25.59	-0.03	-2.29	2813.86	-0.87
0.9 Dead+1.0 Wind 270 deg - No Ice	27.48	-25.59	-0.03	-2.39	2779.72	-0.87
1.2 Dead+1.0 Wind 300 deg - No Ice	36.65	-22.16	-12.94	-1419.34	2436.81	-1.37
0.9 Dead+1.0 Wind 300 deg - No Ice	27.48	-22.16	-12.94	-1402.39	2407.23	-1.37
1.2 Dead+1.0 Wind 330 deg - No Ice	36.65	-12.82	-22.32	-2451.07	1409.06	-1.59
0.9 Dead+1.0 Wind 330 deg - No Ice	27.48	-12.82	-22.32	-2421.69	1391.88	-1.59
1.2 Dead+1.0 Ice+1.0 Temp	57.95	-0.00	0.00	1.98	2.77	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	57.95	-0.01	-5.83	-699.29	3.45	-0.42
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	57.95	2.89	-5.05	-605.36	-345.63	-0.24
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	57.95	5.02	-2.91	-348.60	-601.50	0.01
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	57.95	5.80	0.01	2.86	-695.71	0.26
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	57.95	5.03	2.92	353.35	-602.07	0.43
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	57.95	2.91	5.05	609.29	-346.67	0.49
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	57.95	0.01	5.82	702.86	2.38	0.41
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	57.95	-2.89	5.04	608.99	351.35	0.24

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	57.95	-5.02	2.91	352.43	607.42	-0.02
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	57.95	-5.80	-0.01	1.41	701.40	-0.26
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	57.95	-5.03	-2.93	-349.72	607.86	-0.42
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	57.95	-2.91	-5.05	-605.74	352.58	-0.49
Dead+Wind 0 deg - Service	30.54	-0.01	-4.82	-527.90	1.18	-0.36
Dead+Wind 30 deg - Service	30.54	2.39	-4.17	-457.24	-261.32	-0.21
Dead+Wind 60 deg - Service	30.54	4.14	-2.41	-263.87	-453.77	0.00
Dead+Wind 90 deg - Service	30.54	4.79	0.01	1.09	-524.73	0.23
Dead+Wind 120 deg - Service	30.54	4.15	2.42	265.06	-454.20	0.37
Dead+Wind 150 deg - Service	30.54	2.40	4.17	457.68	-262.13	0.42
Dead+Wind 180 deg - Service	30.54	0.00	4.81	528.13	0.37	0.36
Dead+Wind 210 deg - Service	30.54	-2.39	4.17	457.53	262.74	0.21
Dead+Wind 240 deg - Service	30.54	-4.15	2.41	264.38	455.40	-0.01
Dead+Wind 270 deg - Service	30.54	-4.79	-0.01	-0.11	526.13	-0.22
Dead+Wind 300 deg - Service	30.54	-4.15	-2.42	-264.76	455.71	-0.36
Dead+Wind 330 deg - Service	30.54	-2.40	-4.18	-457.47	263.75	-0.42

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-30.54	0.00	0.00	30.54	0.00	0.000%
2	-0.03	-36.65	-25.74	0.03	36.65	25.74	0.000%
3	-0.03	-27.48	-25.74	0.03	27.48	25.74	0.000%
4	12.75	-36.65	-22.30	-12.75	36.65	22.30	0.000%
5	12.75	-27.48	-22.30	-12.75	27.48	22.30	0.000%
6	22.13	-36.65	-12.88	-22.13	36.65	12.88	0.000%
7	22.13	-27.48	-12.88	-22.13	27.48	12.88	0.000%
8	25.60	-36.65	0.05	-25.60	36.65	-0.05	0.000%
9	25.60	-27.48	0.05	-25.60	27.48	-0.05	0.000%
10	22.16	-36.65	12.90	-22.16	36.65	-12.90	0.000%
11	22.16	-27.48	12.90	-22.16	27.48	-12.90	0.000%
12	12.81	-36.65	22.28	-12.81	36.65	-22.28	0.000%
13	12.81	-27.48	22.28	-12.81	27.48	-22.28	0.000%
14	0.02	-36.65	25.71	-0.02	36.65	-25.71	0.000%
15	0.02	-27.48	25.71	-0.02	27.48	-25.71	0.000%
16	-12.75	-36.65	22.27	12.75	36.65	-22.27	0.000%
17	-12.75	-27.48	22.27	12.75	27.48	-22.27	0.000%
18	-22.14	-36.65	12.86	22.14	36.65	-12.86	0.000%
19	-22.14	-27.48	12.86	22.14	27.48	-12.86	0.000%
20	-25.59	-36.65	-0.03	25.59	36.65	0.03	0.000%
21	-25.59	-27.48	-0.03	25.59	27.48	0.03	0.000%
22	-22.16	-36.65	-12.94	22.16	36.65	12.94	0.000%
23	-22.16	-27.48	-12.94	22.16	27.48	12.94	0.000%
24	-12.82	-36.65	-22.32	12.82	36.65	22.32	0.000%
25	-12.82	-27.48	-22.32	12.82	27.48	22.32	0.000%
26	0.00	-57.95	0.00	0.00	57.95	-0.00	0.000%
27	-0.01	-57.95	-5.83	0.01	57.95	5.83	0.000%
28	2.89	-57.95	-5.05	-2.89	57.95	5.05	0.000%
29	5.02	-57.95	-2.91	-5.02	57.95	2.91	0.000%
30	5.80	-57.95	0.01	-5.80	57.95	-0.01	0.000%
31	5.03	-57.95	2.92	-5.03	57.95	-2.92	0.000%
32	2.91	-57.95	5.05	-2.91	57.95	-5.05	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	0.01	-57.95	5.82	-0.01	57.95	-5.82	0.000%
34	-2.89	-57.95	5.04	2.89	57.95	-5.04	0.000%
35	-5.02	-57.95	2.91	5.02	57.95	-2.91	0.000%
36	-5.80	-57.95	-0.01	5.80	57.95	0.01	0.000%
37	-5.03	-57.95	-2.93	5.03	57.95	2.93	0.000%
38	-2.91	-57.95	-5.05	2.91	57.95	5.05	0.000%
39	-0.01	-30.54	-4.82	0.01	30.54	4.82	0.000%
40	2.39	-30.54	-4.17	-2.39	30.54	4.17	0.000%
41	4.14	-30.54	-2.41	-4.14	30.54	2.41	0.000%
42	4.79	-30.54	0.01	-4.79	30.54	-0.01	0.000%
43	4.15	-30.54	2.42	-4.15	30.54	-2.42	0.000%
44	2.40	-30.54	4.17	-2.40	30.54	-4.17	0.000%
45	0.00	-30.54	4.81	-0.00	30.54	-4.81	0.000%
46	-2.39	-30.54	4.17	2.39	30.54	-4.17	0.000%
47	-4.15	-30.54	2.41	4.15	30.54	-2.41	0.000%
48	-4.79	-30.54	-0.01	4.79	30.54	0.01	0.000%
49	-4.15	-30.54	-2.42	4.15	30.54	2.42	0.000%
50	-2.40	-30.54	-4.18	2.40	30.54	4.18	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00009889
3	Yes	5	0.00000001	0.00004501
4	Yes	6	0.00000001	0.00012223
5	Yes	5	0.00000001	0.00090067
6	Yes	6	0.00000001	0.00012480
7	Yes	5	0.00000001	0.00092029
8	Yes	5	0.00000001	0.00005483
9	Yes	4	0.00000001	0.00067001
10	Yes	6	0.00000001	0.00012787
11	Yes	5	0.00000001	0.00094301
12	Yes	6	0.00000001	0.00012100
13	Yes	5	0.00000001	0.00089135
14	Yes	5	0.00000001	0.00009285
15	Yes	5	0.00000001	0.00004231
16	Yes	6	0.00000001	0.00012669
17	Yes	5	0.00000001	0.00093389
18	Yes	6	0.00000001	0.00012447
19	Yes	5	0.00000001	0.00091740
20	Yes	5	0.00000001	0.00004610
21	Yes	4	0.00000001	0.00059651
22	Yes	6	0.00000001	0.00012191
23	Yes	5	0.00000001	0.00089828
24	Yes	6	0.00000001	0.00012854
25	Yes	5	0.00000001	0.00094762
26	Yes	4	0.00000001	0.00004298
27	Yes	5	0.00000001	0.00057762
28	Yes	5	0.00000001	0.00078137
29	Yes	5	0.00000001	0.00078621
30	Yes	5	0.00000001	0.00057240
31	Yes	5	0.00000001	0.00080589
32	Yes	5	0.00000001	0.00078728
33	Yes	5	0.00000001	0.00058326
34	Yes	5	0.00000001	0.00081626
35	Yes	5	0.00000001	0.00080958
36	Yes	5	0.00000001	0.00058176
37	Yes	5	0.00000001	0.00079372
38	Yes	5	0.00000001	0.00081418
39	Yes	4	0.00000001	0.00011111
40	Yes	4	0.00000001	0.00030996
41	Yes	4	0.00000001	0.00033601
42	Yes	4	0.00000001	0.00007263

43	Yes	4	0.00000001	0.00038614
44	Yes	4	0.00000001	0.00030050
45	Yes	4	0.00000001	0.00011023
46	Yes	4	0.00000001	0.00037004
47	Yes	4	0.00000001	0.00033662
48	Yes	4	0.00000001	0.00007197
49	Yes	4	0.00000001	0.00030633
50	Yes	4	0.00000001	0.00039985

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 125.667	26.229	45	1.410	0.009
L2	130 - 84.75	13.932	45	1.093	0.003
L3	90 - 38.75	6.335	45	0.696	0.001
L4	45 - 0	1.521	45	0.309	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	1/2" x 5' L Rod	45	26.229	1.410	0.009	42819
172.00	APXVSP18-C-A20 w/ Mount Pipe	45	25.353	1.392	0.009	42819
170.00	800MHz 2X50W RRH W/FILTER	45	24.770	1.379	0.008	42819
153.00	MX08FRO665-20 w/ Mount Pipe	45	19.901	1.270	0.006	9731
113.00	Detuner Brace 28" (PL3"x3/16")	45	10.277	0.931	0.002	5409
85.00	HE2-105	45	5.612	0.648	0.001	6561
72.00	KS24019-L112A	45	3.949	0.529	0.001	6382
4.00	Detuner Brace 28" (PL3"x3/16")	50	0.076	0.026	0.000	54355

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 125.667	139.801	14	7.494	0.033
L2	130 - 84.75	74.428	2	5.837	0.010
L3	90 - 38.75	33.885	2	3.723	0.004
L4	45 - 0	8.143	2	1.657	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	1/2" x 5' L Rod	14	139.801	7.494	0.033	8365
172.00	APXVSP18-C-A20 w/ Mount Pipe	14	135.146	7.398	0.031	8365
170.00	800MHz 2X50W RRH W/FILTER	14	132.046	7.334	0.030	8365
153.00	MX08FRO665-20 w/ Mount Pipe	2	106.175	6.765	0.020	1897
113.00	Detuner Brace 28" (PL3"x3/16")	2	54.944	4.973	0.006	1036
85.00	HE2-105	2	30.023	3.464	0.004	1235

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
72.00	KS24019-L112A	2	21.132	2.827	0.003	1199
4.00	Detuner Brace 28" (PL3"x3/16")	2	0.408	0.141	0.000	10169

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio P _u / φP _n
	ft		ft	ft		in ²	K	K	
L1	175 - 125.667 (1)	TP27.49x17.63x0.188	49.33	0.00	0.0	15.961	-8.04	929.01	0.009
L2	125.667 - 84.75 (2)	TP35.3x26.249x0.281	45.25	0.00	0.0	30.763	-13.42	1799.63	0.007
L3	84.75 - 38.75 (3)	TP43.94x33.687x0.344	51.25	0.00	0.0	46.872	-23.07	2741.99	0.008
L4	38.75 - 0 (4)	TP51x42.002x0.406	45.00	0.00	0.0	66.183	-36.63	3871.70	0.009

Pole Bending Design Data

Section No.	Elevation	Size	M _{ux}	φM _{nx}	Ratio M _{ux} / φM _{nx}	M _{uy}	φM _{ny}	Ratio M _{uy} / φM _{ny}
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	175 - 125.667 (1)	TP27.49x17.63x0.188	350.97	500.76	0.701	0.00	500.76	0.000
L2	125.667 - 84.75 (2)	TP35.3x26.249x0.281	915.09	1351.86	0.677	0.00	1351.86	0.000
L3	84.75 - 38.75 (3)	TP43.94x33.687x0.344	1766.60	2542.50	0.695	0.00	2542.50	0.000
L4	38.75 - 0 (4)	TP51x42.002x0.406	2828.14	4265.40	0.663	0.00	4265.40	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V _u	φV _n	Ratio V _u / φV _n	Actual T _u	φT _n	Ratio T _u / φT _n
	ft		K	K		kip-ft	kip-ft	
L1	175 - 125.667 (1)	TP27.49x17.63x0.188	12.02	280.12	0.043	1.11	651.39	0.002
L2	125.667 - 84.75 (2)	TP35.3x26.249x0.281	16.22	539.89	0.030	1.10	1613.18	0.001
L3	84.75 - 38.75 (3)	TP43.94x33.687x0.344	21.37	822.60	0.026	1.38	3064.07	0.000
L4	38.75 - 0 (4)	TP51x42.002x0.406	25.77	1161.51	0.022	1.38	5169.16	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
L1	175 - 125.667 (1)	0.009	0.701	0.000	0.043	0.002	0.712	1.050	4.8.2
L2	125.667 - 84.75 (2)	0.007	0.677	0.000	0.030	0.001	0.685	1.050	4.8.2
L3	84.75 - 38.75 (3)	0.008	0.695	0.000	0.026	0.000	0.704	1.050	4.8.2
L4	38.75 - 0 (4)	0.009	0.663	0.000	0.022	0.000	0.673	1.050	4.8.2

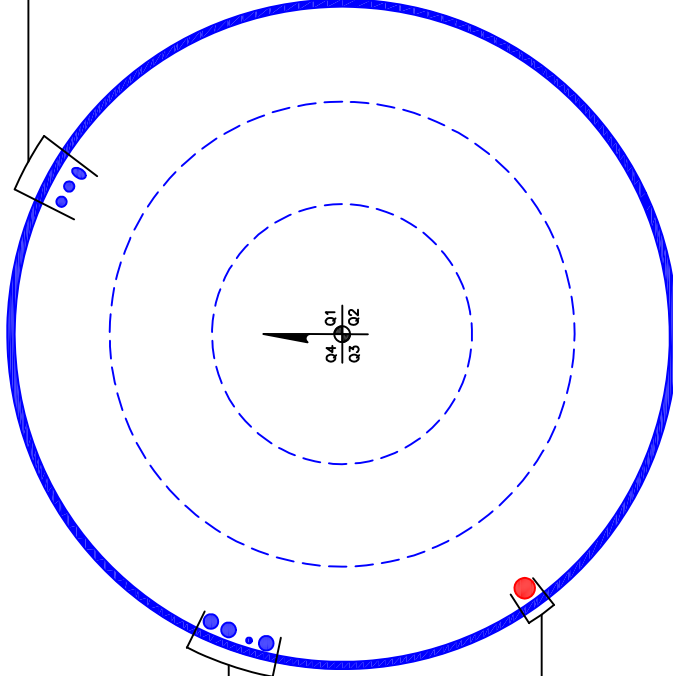
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	175 - 125.667	Pole	TP27.49x17.63x0.188	1	-8.04	975.46	67.8	Pass
L2	125.667 - 84.75	Pole	TP35.3x26.249x0.281	2	-13.42	1889.61	65.3	Pass
L3	84.75 - 38.75	Pole	TP43.94x33.687x0.344	3	-23.07	2879.09	67.0	Pass
L4	38.75 - 0	Pole	TP51x42.002x0.406	4	-36.63	4065.28	64.1	Pass
Summary								
Pole (L1)							67.8	Pass
RATING =							67.8	Pass

APPENDIX B
BASE LEVEL DRAWING



(OTHER CONSIDERED EQUIPMENT)
(1) EW90 TO 85 FT LEVEL
(2) 7/8" TO 172 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 72 FT LEVEL
(3) 1-1/4" TO 172 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-3/4" TO 153 FT LEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

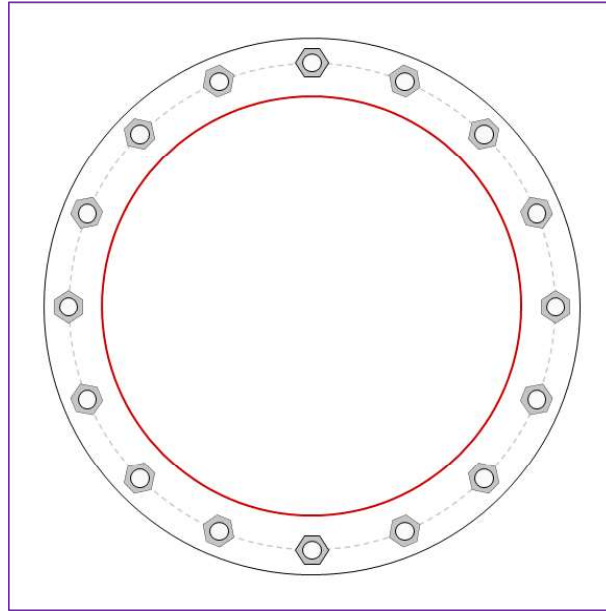


Site Info	
BU #	876336
Site Name	OLD SAYBROOK
Order #	

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

Applied Loads	
Moment (kip-ft)	2828.14
Axial Force (kips)	36.63
Shear Force (kips)	25.77

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(16) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 59.3" BC
Base Plate Data
65.3" OD x 2.75" Plate (S-128; $F_y=60$ ksi, $F_u=80$ ksi)
Stiffener Data
N/A
Pole Data
51" 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>	
$Pu_t = 140.7$	$\phi Pn_t = 243.75$	Stress Rating
$Vu = 1.61$	$\phi Vn = 149.1$	55.0%
$Mu = n/a$	$\phi Mn = n/a$	Pass
Base Plate Summary		
Max Stress (ksi):	19.43	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	34.3%	Pass

BU# 876336
WO# 1973705

Done By: HL
Checked By:
Date: 5/21/2021



Anchor Rod Concrete Breakout Strength

TIA-222-H



Description:

This sheet will determine a concrete breakout strength for a single anchor or for a group of anchors in the case that there is no existing rebar to transfer load into.

1. Inputs

- Undercut Anchors
- Torque-Controlled Anchors
- Displacement-Controlled Anchors
- Adhesive Anchor

- Cast-in
- Post-installed

- Cracked
- Uncracked

- Headed Rods
- Non-Headed Rods

- Single Anchor Concrete Breakout Strength
- Group of Anchors Concrete Breakout Strength

Concrete Compressive Strength: $f_c := 3000\text{psi}$

Concrete Weight Modification Factor: $\lambda := 1.0$ [ACI 318-14 25.4.2.4]

Anchor Effective Embedment Depth: $h_{ef} := 58.5\text{in}$ [ACI 318-14 17.4.2.3]

Total Tension from Anchor Rods: $T_n := 702.85\text{kip}$

Projected Concrete Failure Area:
(See Fig. R17.4.2.1(b)) $A_{Nc} := 306.78\text{ft}^2$ [ACI 318-14 17.4.2.1]

Eccentricity from Anchor Group Centroid to Tension Resultant:
(See Fig. R17.4.2.4) $e_N := 2.35\text{in}$ [ACI 318-14 17.5.2.4]

Minimum Distance from Anchor to Edge of Concrete:
(See Fig. R17.4.2.1) $c_{a_min} := 120.35\text{in}$ [ACI 318-14 17.4.2.5]

2. Maximum Projected Area of a Single Anchor

Projected Concrete Failure Area: $A_{Nco} := 9 \cdot h_{ef}^2 = 213.89 \text{ ft}^2$ [ACI 318-14 Eq. 17.4.2.1c]
(See Fig. R17.4.2.1(a))

3. Breakout Strength of a Single Anchor

Coefficient for Basic Concrete Breakout: $k_c = 24$ [ACI 318-14 17.4.2.2]

Breakout Strength: $N_b := k_c \cdot \lambda \cdot \sqrt{f_c} \cdot h_{ef}^{1.5} = 588.17 \cdot \text{kip}$ [ACI 318-14 Eq. 17.4.2.2a]

4. Breakout Strength of a Single Headed Anchor

Breakout Strength: $N_{bt} := 16 \cdot \lambda \cdot \sqrt{f_c} \cdot h_{ef}^{\frac{5}{3}} = 772.57 \cdot \text{kip}$ [ACI 318-14 Eq. 17.4.2.2b]

5. Modification Factors

Modification Factor for Anchor Rod Groups Loaded Eccentrically: $\psi_{ec_N} := \begin{cases} \frac{1}{\left(1 + \frac{2 \cdot e_N}{3 \cdot h_{ef}}\right)} & \text{if } \frac{1}{\left(1 + \frac{2 \cdot e_N}{3 \cdot h_{ef}}\right)} \leq 1 \\ 1 & \text{otherwise} \end{cases}$ [ACI 318-14 17.4.2.4]

$$\psi_{ec_N} = 0.97$$

Modification Factor for Edge Effects: $\psi_{ed_N} := \begin{cases} 0.7 + 0.3 \cdot \frac{c_{a_min}}{1.5 \cdot h_{ef}} & \text{if } c_{a_min} < 1.5 \cdot h_{ef} \\ 1 & \text{otherwise} \end{cases}$ [ACI 318-14 Eq. 17.4.2.5a
17.4.2.5b]

$$\psi_{ed_N} = 1$$

Non-Cracked Effects: $\psi_{c_N} = 1.25$ [ACI 318-14 17.4.2.6]

6. Post-Installed Anchors without Supplementary Reinforcement

Critical Edge Distance: $c_{ac} = 9.75 \text{ ft}$ [ACI 318-14 17.7.6]

Modification Factor:
$$\psi_{cp_N} := \begin{cases} \frac{c_{a_min}}{c_{ac}} & \text{if } c_{a_min} < c_{ac} \\ 1 & \text{otherwise} \end{cases}$$
 [ACI 318-14 Eq. 17.4.2.7a, 17.4.7.2b]

~~$$\psi_{cp_N} := \begin{cases} \psi_{cp_N} & \text{if } \psi_{cp_N} \geq 1.5 \cdot \frac{h_{ef}}{c_{ac}} \\ 1.5 \cdot \frac{h_{ef}}{c_{ac}} & \text{otherwise} \end{cases}$$~~ [ACI 318-14 17.4.2.7]

$$\psi_{cp_N} = 1$$

7. Concrete Breakout Strength

Tensile Strength Reduction Factor: $\phi := 0.75$

Case 1

[ACI 318-14 17.3.3]



Single Anchor Nominal Breakout Strength:

$$N_{cbs} := \frac{A_{Nc}}{A_{Nco}} \cdot \psi_{ed_N} \cdot \psi_{c_N} \cdot \psi_{cp_N} \cdot N_b$$
 [ACI 318-14 Eq. 17.4.2.1a]

$$N_{cbs} = 1054.51 \cdot \text{kip}$$

Case 2

Single Anchor in a Group Breakout Strength:

$$N_{cbg} := \frac{A_{Nc}}{A_{Nco}} \cdot \psi_{ec_N} \cdot \psi_{ed_N} \cdot \psi_{c_N} \cdot \psi_{cp_N} \cdot N_b$$
 [ACI 318-14 Eq. 17.4.2.1b]

$$N_{cbg} = 1027.01 \cdot \text{kip}$$

Controlling Case

Concrete Breakout Case: Case = "Case 2"

Breakout Strength: $\phi N_{cb} = 770.26 \cdot \text{kip}$

Breakout Rating:
$$\text{Rating} := \frac{T_n}{1.05 \cdot \phi N_{cb}} = 86.9\%$$

SUMMARY



1. Inputs

Concrete Compressive Strength:	$f_c = 3000 \text{ psi}$
Concrete Weight Modification Factor:	$\lambda = 1$
Anchor Effective Embedment Depth:	$h_{ef} = 58.5 \text{ in}$
Projected Concrete Failure Area:	$A_{Nc} = 306.78 \text{ ft}^2$
Eccentricity from Anchor Group Centroid to Tension Resultant:	$e_N = 2.35 \text{ in}$
Minimum Distance from Anchor to Edge of Concrete:	$c_{a_min} = 120.35 \text{ in}$

2. Maximum Projected Area of a Single Anchor

Projected Concrete Failure Area:	$A_{Nco} = 213.89 \text{ ft}^2$
----------------------------------	---------------------------------

3. Breakout Strength of a Single Anchor

Coefficient for Basic Concrete Breakout:	$k_c = 24$
Breakout Strength:	$N_{b1} = 588.17 \text{ kip}$

4. Breakout Strength of a Single Headed Anchor

Breakout Strength:	$N_{b2} = 772.57 \text{ kip}$
--------------------	-------------------------------

5. Modification Factors

Anchor Rod Groups Loaded Eccentrically:	$\psi_{ec_N} = 0.97$
Edge Effects:	$\psi_{ed_N} = 1$
Non-Cracked Effects:	$\psi_{c_N} = 1.25$

6. Post-Installed Anchors without Supplementary Reinforcement

Critical Edge Distance:	$c_{ac} = 9.75 \text{ ft}$
Modification Factor:	$\psi_{cp_N} = 1$

7. Concrete Breakout Strength

Concrete Breakout Case:	Case = "Group of Anchors Concrete Breakout Strength"
-------------------------	--

Breakout Strength:	$\phi N_{cb} = 770.26 \text{ kip}$	Breakout Rating:	$\text{Rating} := \frac{T_n}{1.05 \cdot \phi N_{cb}} = 86.9\%$
--------------------	------------------------------------	------------------	--

Pier and Pad Foundation



BU #: 876336
 Site Name: OLD SAYBROOK
 App. Number: 553289, Rev 2

TIA-222 Revision: H
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp} :	36.65	kips
Base Shear, V_u comp:	25.74	kips
Moment, M_u :	2828.14	ft-kips
Tower Height, H :	175	ft
BP Dist. Above Fdn, bp_{dist} :	4	in
Bolt Circle / Bearing Plate Width, BC :	59.3	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	221.97	25.74	11.0%	Pass
Bearing Pressure (ksf)	90.46	2.71	3.0%	Pass
Overtuning (kip*ft)	6105.97	2978.29	48.8%	Pass
Pad Flexure (kip*ft)	5183.74	1182.49	21.7%	Pass
Pad Shear - 1-way (kips)	1515.82	126.81	8.0%	Pass
Pad Shear - 2-way (Comp) (ksi)	0.164	0.001	0.7%	Pass
Flexural 2-way (Comp) (kip*ft)	6715.64	0.00	0.0%	Pass

*Rating per TIA-222-H Section 15.5

Soil Rating*:	48.8%
Structural Rating*:	21.7%

Pad Properties		
Depth, D :	5.1	ft
Pad Width, W_1 :	25	ft
Pad Thickness, T :	5.5	ft
Pad Rebar Size (Bottom dir. 2), Sp_2 :	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	24	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, F_y :	60	ksi
Concrete Compressive Strength, F'_c :	3	ksi
Dry Concrete Density, δ_c :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	120	pcf
Ultimate Net Bearing, Q_{net} :	120.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	30	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :		
Neglected Depth, N :		ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, gw :	N/A	ft

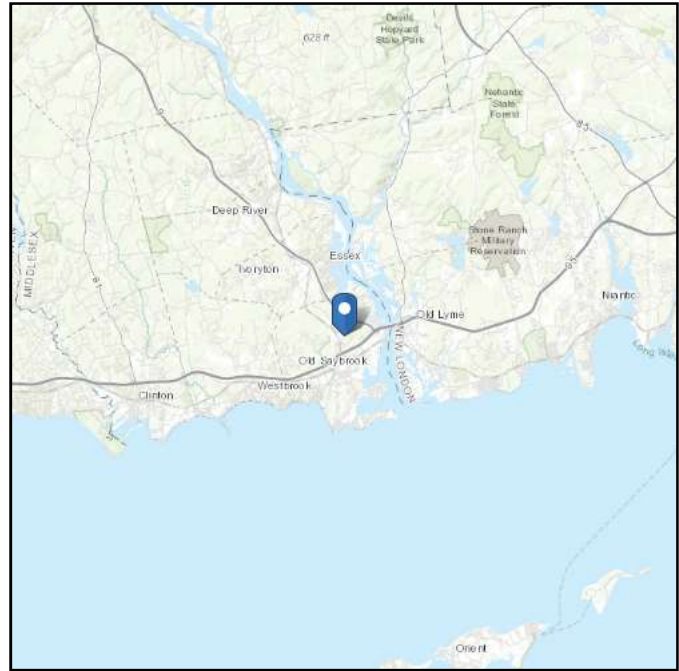
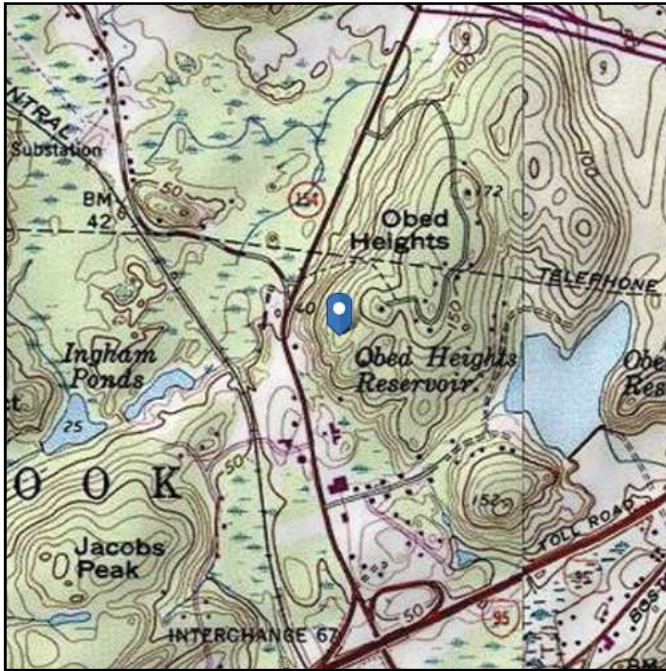
<--Toggle between Gross and Net

ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 143.32 ft (NAVD 88)
Latitude: 41.313211
Longitude: -72.381108



Wind

Results:

Wind Speed:	132 Vmph
10-year MRI	79 Vmph
25-year MRI	89 Vmph
50-year MRI	97 Vmph
100-year MRI	107 Vmph

Date Accessed: 7/20/2021
Accessed: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

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

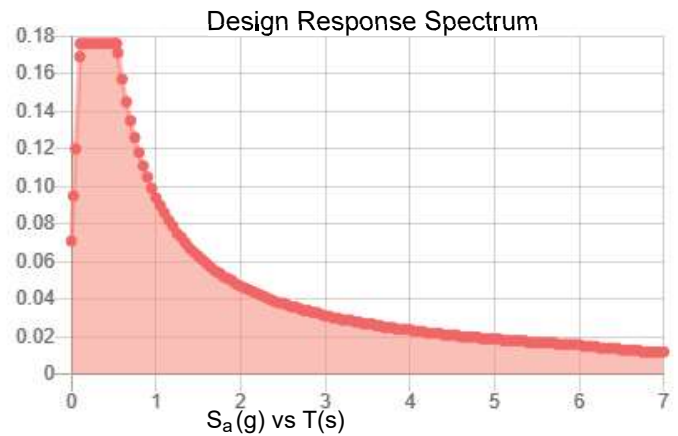
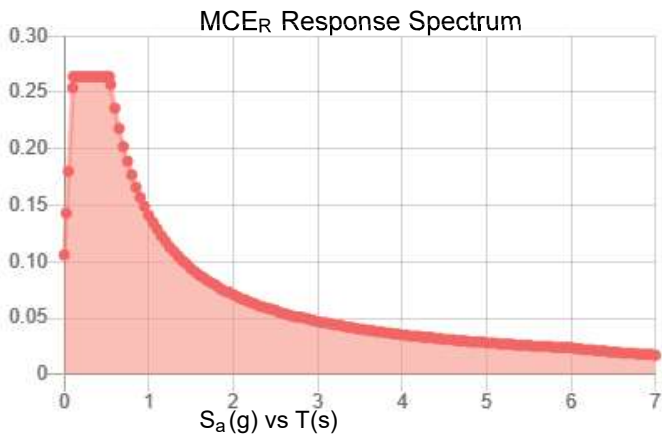
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.165	S_{DS} :	0.176
S_1 :	0.059	S_{D1} :	0.094
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.083
S_{MS} :	0.264	PGA_M :	0.133
S_{M1} :	0.141	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Tue Mar 30 2021

Date Source:

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

Ice

Results:

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

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

Date Accessed: Tue Mar 30 2021

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

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

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

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

Exhibit E

Power Density/RF Emissions Report



RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of Dish Wireless

Crown Castle Site Name: OLD SAYBROOK
Crown Castle Site BU Number: 876336
Dish Wireless Site Name: CT-CCI-T-876336
Dish Wireless Site ID: BOBDL00088A
Application ID: 553289
430 Middlesex Turnpike
Old Saybrook, 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
Old Saybrook, 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 on behalf of Dish Wireless (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 "OLD SAYBROOK" ("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 T-Mobile operation is no more than 0.825% 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 1.480% 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
OLD SAYBROOK
Site Summary**

Carrier	Area Maximum Percentage MPE
Dish Wireless (Proposed)	0.222 %
Dish Wireless (Proposed)	0.222 %
Dish Wireless (Proposed)	0.381 %
Sprint (T-Mobile)	0.182 %
Sprint (T-Mobile)	0.146 %
Sprint (T-Mobile)	0.146 %
Sprint (T-Mobile)	0.114 %
Town of Old Saybrook	0.067 %
Composite Site MPE:	1.480 %

**Dish Wireless (Proposed)
 OLD SAYBROOK
 Carrier Summary**

Frequency: 2100 MHz
 Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 2.22424 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.22242 %

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	153	0	6904	1.212438	0.121244	2.187241	0.218724
JMA Wireless	MX08FRO665-20	153	120	6904	1.212438	0.121244	2.187241	0.218724
JMA Wireless	MX08FRO665-20	153	240	6904	1.212438	0.121244	2.187241	0.218724

**Dish Wireless (Proposed)
 OLD SAYBROOK
 Carrier Summary**

Frequency: 1900 MHz
 Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 2.22424 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.22242 %

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	153	0	6904	1.212438	0.121244	2.187241	0.218724
JMA Wireless	MX08FRO665-20	153	120	6904	1.212438	0.121244	2.187241	0.218724
JMA Wireless	MX08FRO665-20	153	240	6904	1.212438	0.121244	2.187241	0.218724

**Dish Wireless (Proposed)
 OLD SAYBROOK
 Carrier Summary**

Frequency: 600 MHz
 Maximum Permissible Exposure (MPE): 400 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 1.52281 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.38070 %

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	153	0	3229	0.893843	0.223461	1.452612	0.363153
JMA Wireless	MX08FRO665-20	153	120	3229	0.893843	0.223461	1.452612	0.363153
JMA Wireless	MX08FRO665-20	153	240	3229	0.893843	0.223461	1.452612	0.363153

Sprint (T-Mobile) OLD SAYBROOK Carrier Summary

Frequency: 2500 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 1.82474 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.18247 %

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	APXVTM14-C-I20	172	330	6168	0.735257	0.073526	1.413920	0.141392
RFS	APXVTM14-C-I20	172	90	6168	0.735257	0.073526	1.413920	0.141392
RFS	APXVTM14-C-I20	172	210	6168	0.735257	0.073526	1.413920	0.141392

Sprint (T-Mobile) OLD SAYBROOK Carrier Summary

Frequency: 1990 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 1.46149 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.14615 %

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	172	350	3804	0.615435	0.061543	1.141838	0.114184
RFS	APXVSPP18-C-A20	172	90	3804	0.615435	0.061543	1.141838	0.114184
RFS	APXVSPP18-C-A20	172	190	3804	0.615435	0.061543	1.141838	0.114184

Sprint (T-Mobile) OLD SAYBROOK Carrier Summary

Frequency: 1900 MHz
Maximum Permissible Exposure (MPE): 1000 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 1.46149 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.14615 %

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	172	350	3804	0.615435	0.061543	1.141838	0.114184
RFS	APXVSPP18-C-A20	172	90	3804	0.615435	0.061543	1.141838	0.114184
RFS	APXVSPP18-C-A20	172	190	3804	0.615435	0.061543	1.141838	0.114184

Sprint (T-Mobile) OLD SAYBROOK Carrier Summary

Frequency: 862 MHz
Maximum Permissible Exposure (MPE): 574.67 $\mu\text{W}/\text{cm}^2$
Maximum power density at ground level: 0.65781 $\mu\text{W}/\text{cm}^2$
Highest percentage of Maximum Permissible Exposure: 0.11447 %

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	172	350	2168	0.516850	0.089939	0.530805	0.092368
RFS	APXVSPP18-C-A20	172	90	2168	0.516850	0.089939	0.530805	0.092368
RFS	APXVSPP18-C-A20	172	190	2168	0.516850	0.089939	0.530805	0.092368

**Town of Old Saybrook
OLD SAYBROOK
Carrier Summary**

Frequency: 450 MHz
 Maximum Permissible Exposure (MPE): 300 $\mu\text{W}/\text{cm}^2$
 Maximum power density at ground level: 0.20062 $\mu\text{W}/\text{cm}^2$
 Highest percentage of Maximum Permissible Exposure: 0.06687 %

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
SINCLAIR	SC381-HL	165	300	100	0.068111	0.022704	0.068111	0.022704
RFS	ALG6	178	359	100	0.186126	0.062042	0.186126	0.062042

OLD SAYBROOK
Composite Microwave Antenna Summary

Carrier	Antenna Make/Model	Height (feet)
Town of Old Saybrook	Gabriel HE2-105	85