



NSS **NORTHEAST**
SITE SOLUTIONS
Turnkey Wireless Development

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

August 18, 2022

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

RE: Exempt Modification Application
2189-2279 Black Rock Turnpike, Fairfield, CT 06432
Latitude: 41.181111
Longitude: -73.254722
Site #: 876398_Crown_Dish

Dear Ms. Bachman:

Based on the 2020 merger between T-Mobile and Sprint, and as part of the agreement, the DOJ required T-Mobile to divest some sites to Dish in order to create an additional wireless provider. This site is part of the agreement.

Dish Wireless LLC is requesting to file an exempt modification for an existing tower located at 2189-2279 Black Rock Turnpike, (a/k/a 2181 Black Rock Tpke) Fairfield, CT 06432. Dish Wireless LLC proposes to remove six (6) antennas and install three (3) antennas at the 79-foot level of the existing 90-foot concealment tower. The property is owned by R-K Black Rock I LLC and the tower is owned by Crown Castle. This modification includes hardware that is 5G capable.

Dish Wireless LLC Planned Modifications:

Remove:

(6) KATHREIN AP9-850/090 Antennas
(12) 7/8" Coax

Remove and Replace: None

Install New:

(3) JMA MX08FRO665-21 Antennas
(12) 7/8" Coax

Existing to Remain: None

Ground Work: (within existing compound)

New H-Frame
Equipment Cabinet
Power/Telco Cabinet
Ice Bridge
7'x5' Steel Platform



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The facility was approved by the Town of Fairfield on October 27, 2000. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Brenda L. Kupchick, First Selectwoman and Jim Wendt, Planning Director for the Town of Fairfield, as well as the property owner and the tower owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, Dish Wireless LLC respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Denise Sabo

Denise Sabo

Mobile: 203-435-3640

Fax: 413-521-0558

Office: 4 Angela's Way, Burlington CT 06013

Email: denise@northeastsitesolutions.com



NSS **NORTHEAST**
SITE SOLUTIONS
Turnkey Wireless Development

Attachments

Cc: Brenda L. Kupchick, First Selectwoman
Sullivan Independence Hall, Second Floor
725 Old Post Road
Fairfield, CT 06824

Jim Wendt, Planning Director
Sullivan Independence Hall
725 Old Post Road
Fairfield, CT 06824

R-K Black Rock I LLC – Property Owner
PO Box 790830
San Antonio, TX 78279-0830

Crown Castle – Tower Owner

Exhibit A

Original Facility Approval

BUILDING PERMIT
TOWN OF FAIRFIELD
BUILDING DEPARTMENT
(203) 256-3036

POST
INSPICUOUSLY

Permit No. 32065 BUI
Issued Date 27-OCT-00

Map: 076 Lot: 350

Location: 2215 BLACK ROCK TURNPIKE

Owner's Name & Address: SUN REALTY ASSOCIATES LLC
1877 BLACK ROCK TPK
FAIRFIELD CT 06430

Class of Work - Addition
Type of Occupancy - MISCELLANEOUS
Instruction Type -

Description: FLAGPOLE ONLY/ NO EXTERIOR ANTENNA

Contractor: SPRINT PCS
41 SEGUIN DRIVE

WORK TO BE DONE ACCORDING TO PLANS AND SPECIFICATIONS FILED WITH THE BUILDING DEPT. ALL TOWN ORDINANCES AND BUILDING REGULATIONS AND STATE LAWS SHALL BE IMPLIED WITH.

Estimated value of work by Building Official	\$110,000.00	Fee	\$929.60
		Pen	\$.00
		Total	\$929.60

RECORD OF PERMITS AND INSPECTIONS

Grading/Foundation Inspection..	Date.	Approved	Yes	No
Structural Framing Inspection.....	Date.....	Approved	Yes	No
Electrical Inspection.....	Date.....	Approved	Yes	No
Plumbing Inspection.....	Date.....	Approved	Yes	No
Roofing Inspection.....	Date.....	Approved	Yes	No
Insulation Inspection.....	Date.....	Approved	Yes	No
Approved for Covering.....	Date.....	Approved	Yes	No

FINAL INSPECTION MUST BE CALLED FOR AND A CERTIFICATE OF OCCUPANCY OBTAINED BEFORE THIS BUILDING IS OCCUPIED.

PER SEC. 29-265 STATE BUILDING CODE

JAMES GILLERAN
BUILDING OFFICIAL

RECORD OF APPROVALS

- HISTORICAL
- HEALTH
- SEPTIC TANK #
- SEWER
- ENGINEERING
- CONSERVATION

**FAIRFIELD FIRE DEPARTMENT
FIRE MARSHAL**

PLANS CHECKED 10/20/00

SIGNED _____

DO NOT BELIEVE THE
OF THEIR
WITH ALL

FOR OFFICE USE ONLY

RECORD OF FINAL INSPECTIONS

- Asbestos Date
- Footings Date
- Foundation Date
- Framing Date
- Plumbing Date
- Sprinkler Date
- Electrical Date
- Smoke Detector Date
- Insulation Date
- Mechanical Date
- Certificate of Occupancy Date

TAX COLLECTOR

**Town of Fairfield
Real Estate Taxes Paid**

Tax Office Date

C/M 10/20/00

PLANNING & ZONING

**APPROVED
FOR ZONING COMPLIANCE**

FOR Flag Pole only No other
antenna

10/20/00

[Signature]
Zoning Enforcement Officer

FAIRFIELD FIRE-RESCUE

140 REEF ROAD
FAIRFIELD, CONNECTICUT 06430

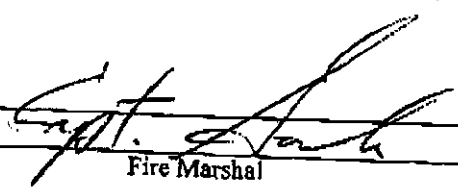
OFFICE OF THE FIRE MARSHAL

PHONE: (203) 254-4720

PLAN REVIEW REMARKS

Prop. Name:	Behind Old Navy	Address:	2189 Black Rock Tpke
Owner:	Sun Realty	Architect:	URS Corp.
Contact	Andrew Sabetta	Phone:	203-641-4005
PLAN #	00-10-20-01	DATE REVIEWED:	10/20/00
		BY:	George Gomola

Installing stealth flagpole cell antenna behind Einestien Bagel. Installation will not impied FD access to rear of building - 20' access corridor will be maintained. - Contractor will call 254-4700 when construction compromises FD access - will call again when access is restored.



 Fire Marshal 10/20/00

Created on 10/20/00 9:33 AM

Date

Exhibit B

Property Card

2181 BLACK ROCK TURNPIKE

Location 2181 BLACK ROCK TURNPIKE

Mblu 76/ 349/ / /

Acct# 09518

Owner R-K BLACK ROCK I LLC

Assessment \$18,491,760

Appraisal \$26,416,800

PID 6727

Building Count 3

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2021	\$15,701,500	\$10,715,300	\$26,416,800

Assessment			
Valuation Year	Improvements	Land	Total
2021	\$10,991,050	\$7,500,710	\$18,491,760

Owner of Record

Owner R-K BLACK ROCK I LLC
Co-Owner C/O PROPERTY TAX DEPT
Address P O BOX 790830
SAN ANTONIO, TX 78279-0830

Sale Price \$24,487,732
Certificate
Book & Page 5112/244-
Sale Date 03/14/2014
Instrument 25

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
R-K BLACK ROCK I LLC	\$24,487,732		5112/244-	25	03/14/2014
SUN REALTY ASSOCIATES LLC	\$0		1999/0117		06/11/1999
JERUSS J & S 1/3 KLEBAN A J &	\$0		0952/0222		12/29/1990

Building Information

Building 1 : Section 1

Year Built: 1964
Living Area: 59,089
Replacement Cost: \$11,329,103
Building Percent Good: 74

Replacement Cost \$8,383,500
Less Depreciation:

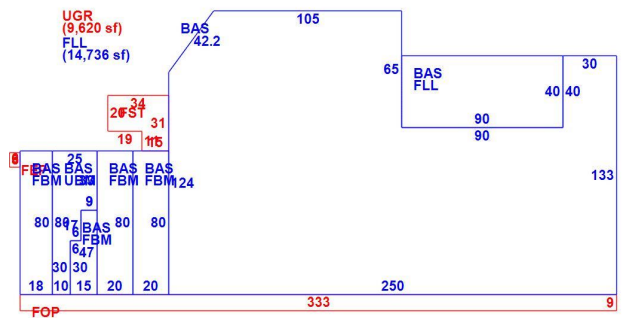
Building Attributes	
Field	Description
Style:	Strip Stores
Model	Comm/Ind
Grade	Very Good
Stories:	1
Occupancy	9.00
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	Acrylic Stucco
Roof Structure	Flat
Roof Cover	Rubber
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	Carpet
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	Central
Struct Class	
Bldg Use	Neighborhood Center C
Total Rooms	
Total Bedrms	00
Total Baths	0
Liv Area	
Effect Area	
1st Floor Use:	3235
Heat/AC	Heat/AC Pkgs
Frame Type	Masonry
Baths/Plumbing	Average
Ceiling/Wall	Sus-Ceil & WI
Rooms/Prtns	Average
Wall Height	14.00
% Comn Wall	0.00

Building Photo



(http://images.vgsi.com/photos2/FairfieldCTPhotos/\0081\IMG_8061_8136

Building Layout



(ParcelSketch.ashx?pid=6727&bid=6574)

Building Sub-Areas (sq ft)			
Code	Description	Gross Area	Living Area
BAS	First Floor	42,715	42,715
FLL	Finished Lower Level	18,336	13,752
FBM	Basement, Finished	5,243	2,622
FEP	Porch, Enclosed, Finished	48	0
FOP	Porch, Open, Finished	2,997	0
FST	Utility Storage, Finished	845	0
UBM	Basement, Unfinished	1,397	0
UGR	Garage, Under	9,620	0
		81,201	59,089

Building 2 : Section 1

Year Built: 2001
Living Area: 21,005
Replacement Cost: \$6,038,974
Building Percent Good: 88
Replacement Cost
Less Depreciation: \$5,314,300

Building Attributes : Bldg 2 of 3

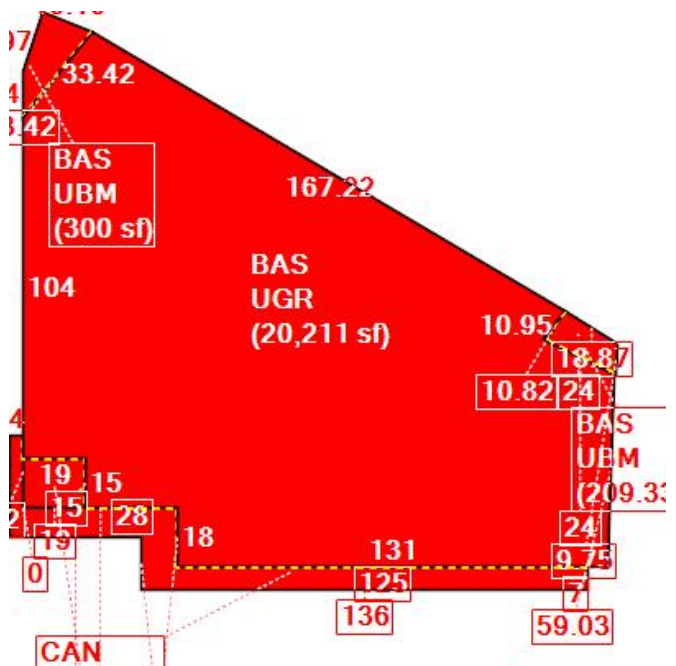
Field	Description
Style:	Strip Stores
Model	Comm/Ind
Grade	Very Good
Stories:	1
Occupancy	5.00
Exterior Wall 1	Acrylic Stucco
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rubber
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Hardwood
Interior Floor 2	Carpet
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	Central
Struct Class	
Bldg Use	Neighborhood Center C
Total Rooms	
Total Bedrms	00
Total Baths	0
Liv Area	
Effect Area	
1st Floor Use:	3235
Heat/AC	Heat/AC Pkgs
Frame Type	Fireprf Steel
Baths/Plumbing	Average
Ceiling/Wall	Sus-Ceil & WI
Rooms/Prtns	Average
Wall Height	15.00
% Comn Wall	0.00

Building Photo



(<http://images.vgsi.com/photos2/FairfieldCTPhotos/\02\02\98\62.jpg>)

Building Layout



(ParcelSketch.ashx?pid=6727&bid=22343)

Building Sub-Areas (sq ft)			
Code	Description	Gross Area	Living Area
BAS	First Floor	21,005	21,005
CAN	Canopy	1,598	0
UBM	Basement, Unfinished	794	0
UGR	Garage, Under	20,211	0
		43,608	21,005

Building 3 : Section 1

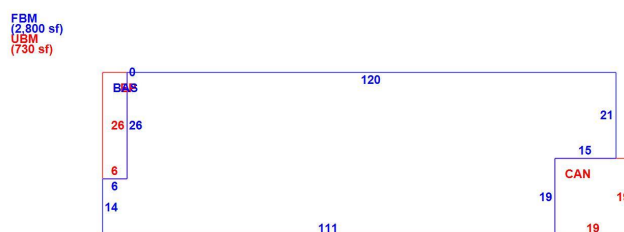
Year Built:	2004
Living Area:	5,999
Replacement Cost:	\$1,041,046
Building Percent Good:	90
Replacement Cost Less Depreciation:	\$936,900

Building Attributes : Bldg 3 of 3

Field	Description
Style:	Store
Model	Comm/Ind
Grade	Very Good
Stories:	1
Occupancy	2.00
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	Brick/Masonry
Roof Structure	Flat
Roof Cover	Rubber
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	Vinyl/Asphalt
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	Central
Struct Class	
Bldg Use	Neighborhood Center C
Total Rooms	
Total Bedrms	00
Total Baths	3
Liv Area	
Effect Area	
1st Floor Use:	323L
Heat/AC	Heat/AC Pkgs
Frame Type	Masonry
Baths/Plumbing	Average
Ceiling/Wall	Ceil & Walls
Rooms/Prtns	Average
Wall Height	15.00
% Comn Wall	

Building Photo


(<http://images.vgsi.com/photos2/FairfieldCTPhotos/\A02\02\98\63.jpg>)

Building Layout


(ParcelSketch.aspx?pid=6727&bid=22463)

Building Sub-Areas (sq ft)			
Code	Description	Gross Area	Living Area
BAS	First Floor	4,599	4,599
FBM	Basement, Finished	2,800	1,400
CAN	Canopy	361	0
FEP	Porch, Enclosed, Finished	156	0
UBM	Basement, Unfinished	730	0
		8,646	5,999

Extra Features

Extra Features				
Code	Description	Size	Value	Bldg #
ELV1	PASS ELEV	2.00 STOPS	\$66,600	3
SPR3	DRY	20974.00 S.F.	\$40,600	2
SPR1	SPRINKLERS-WET	20974.00 S.F.	\$44,300	2

SPR1	SPRINKLERS-WET	85430.00 S.F.	\$151,700	1
SPR2	WET/CONCEALED	7399.00 S.F.	\$18,000	3
ELV1	PASS ELEV	2.00 STOPS	\$65,100	2
ELV1	PASS ELEV	2.00 STOPS	\$54,800	1

Land

Land Use

Use Code 3235
Description Neighborhood Center C
Zone DCD
Neighborhood C3
Alt Land Appr No
Category

Land Line Valuation

Size (Sqr Feet) 254390
Depth 0
Assessed Value \$7,500,710
Appraised Value \$10,715,300

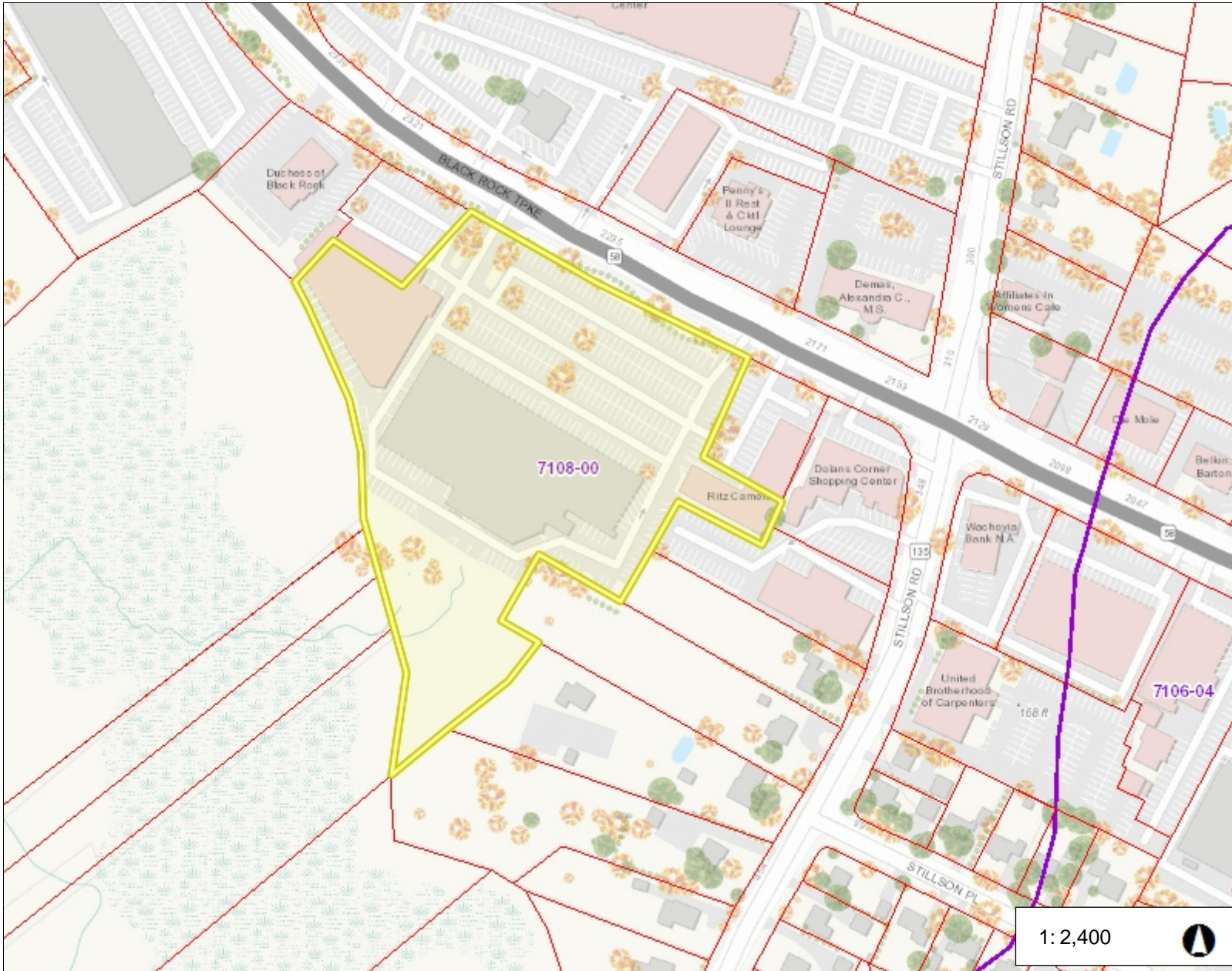
Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
LT4	W/FOUR LIGHTS			3.00 UNITS	\$6,300	1
LT1	LIGHTS-IN W/PL			2.00 UNITS	\$1,500	1
PAV1	PAVING-ASPHALT			150000.00 S.F.	\$499,500	1
SPL5	IGPOOL GUNITE			1500.00 S.F.	\$90,500	1
MSC42	UTIL BLDG - TELECOMM EQUIP			1.00 UNIT	\$27,900	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2021	\$15,701,500	\$10,715,300	\$26,416,800
2020	\$15,701,500	\$10,715,300	\$26,416,800
2019	\$13,894,100	\$5,138,000	\$19,032,100

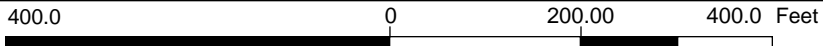
Assessment			
Valuation Year	Improvements	Land	Total
2021	\$10,991,050	\$7,500,710	\$18,491,760
2020	\$10,991,050	\$7,500,710	\$18,491,760
2019	\$9,725,870	\$3,596,600	\$13,322,470



Legend

- Parcels
- Local Basin Boundary
 - Major
 - Regional
 - Subregional
 - Local
- Local Basin Area

1:2,400



WGS_1984_Web_Mercator_Auxiliary_Sphere
Created by Greater Bridgeport Regional Council

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION



Exhibit C

Construction Drawings



DISH Wireless L.L.C. SITE ID:

NJJER01143A

DISH Wireless L.L.C. SITE ADDRESS:

**2189-2215 BLACK ROCK TURNPIKE
FAIRFIELD, CT 06825**

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 (3) PROPOSED ANTENNA MOUNTS (1 PER SECTOR) • INSTALL PROPOSED JUMPERS • INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP) • INSTALL (12) PROPOSED COAX CABLE • INSTALL (1) PROPOSED CABLE CLAMP 	
GROUND SCOPE OF WORK:	
<ul style="list-style-type: none"> • INSTALL (1) PROPOSED METAL PLATFORM • INSTALL (6) PROPOSED RRUs (2 PER SECTOR) • INSTALL (1) PROPOSED ICE BRIDGE • INSTALL (1) PROPOSED PPC CABINET • INSTALL (1) PROPOSED EQUIPMENT CABINET • INSTALL (1) PROPOSED POWER CONDUIT • INSTALL (1) PROPOSED TELCO CONDUIT • INSTALL (1) PROPOSED TELCO-FIBER BOX • INSTALL (1) PROPOSED GPS UNIT • INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED) • INSTALL (1) PROPOSED FIBER NID (IF REQUIRED) 	

SITE INFORMATION	PROJECT DIRECTORY
PROPERTY OWNER: ADDRESS: R-K BLACK ROCK I LLC C/O PROPERTY TAX DE P O BOX 790830 SAN ANTONIO, TX 78279	APPLICANT: DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER TYPE: MONOPOLE	TOWER OWNER: CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (877) 486-9377
TOWER CO SITE ID: 876398	SITE DESIGNER: B+T GROUP 1717 S. BOULDER AVE, SUITE 300 TULSA, OK 74119 (918) 587-4630
TOWER APP NUMBER: 548696	SITE ACQUISITION: GREGG BAILEY (914) 438-9326
COUNTY: FAIRFIELD	CONSTRUCTION MANAGER: JOSEPH DIPIAZZA JOSEPH.DIPIAZZA@DISH.COM
LATITUDE (NAD 83): 41° 10' 52.33" N 41.18120278° N	RF ENGINEER: MURUGABIRAN JAYAPAL MURUGABIRAN.JAYAPAL@ DISH.COM
LONGITUDE (NAD 83): 73° 15' 14.69" W 73.2540805600° W	
ZONING JURISDICTION: CONNECTICUT SITING COUNCIL	
ZONING DISTRICT: DCD	
PARCEL NUMBER: 0763490000	
OCCUPANCY GROUP: U	
CONSTRUCTION TYPE: V-B	
POWER COMPANY: CONNECTICUT L&P CO.	
TELEPHONE COMPANY: LIGHTOWER	



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com



B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
ANP	BEH	ANP

RFDS REV #: 3

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/14/21	ISSUED FOR REVIEW
0	2/28/22	ISSUED FOR CONSTRUCTION
1	6/9/22	ISSUED FOR CONSTRUCTION
2	7/30/22	ISSUED FOR CONSTRUCTION
3	8/15/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
151867.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

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

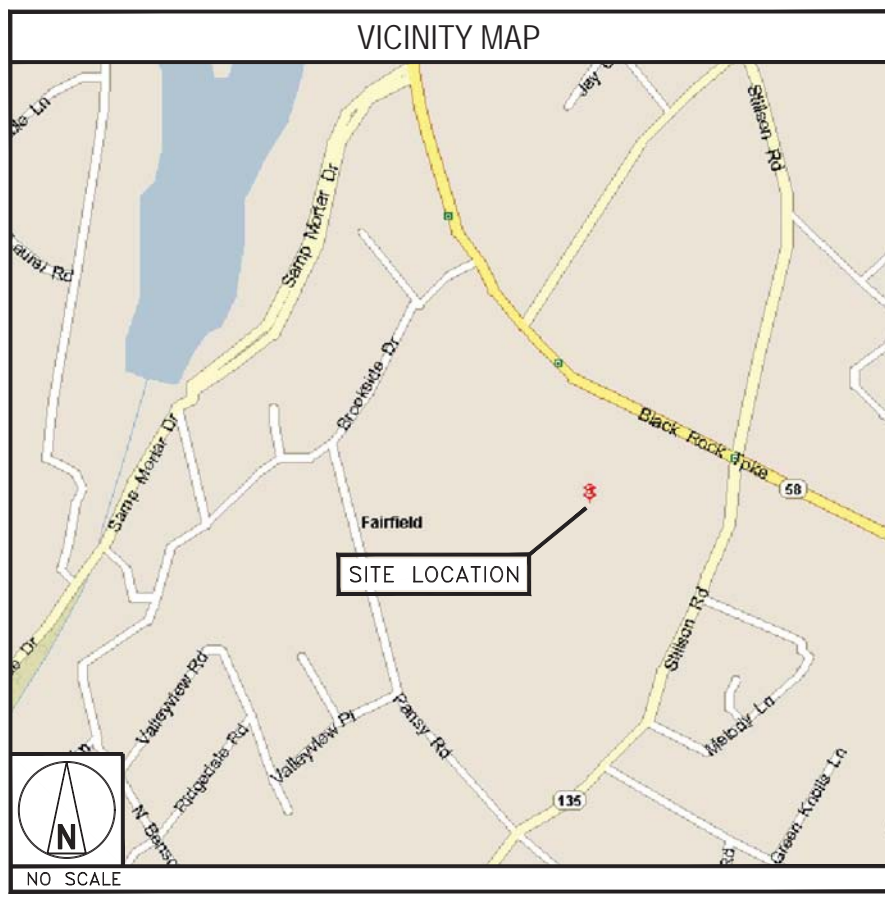
THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE. NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE 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 3 ADP BLVD:
GET ON I-280 E FROM LIVINGSTON AVE. CONTINUE ON I-280 E. TAKE I-95 N, I-87 N, HUTCHINSON RIVER PARKWAY N AND CT-15 N TO CONGRESS ST IN FAIRFIELD. TAKE EXIT 44 FROM CT-15 N. FOLLOW CT-58 TO DESTINATION ON RIGHT.



CONNECTICUT CODE COMPLIANCE

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

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

SHEET INDEX

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

NOTES

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

NOTES

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

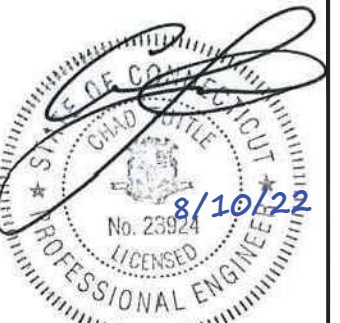
dish
wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

CROWN CASTLE

2000 CORPORATE DRIVE
CANONSBURG, PA 15317

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com



B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

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DRAWN BY: ANP
CHECKED BY: BEH
APPROVED BY: ANP

RFDS REV #: 3

CONSTRUCTION DOCUMENTS

SUBMITTALS		
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2	7/30/22	ISSUED FOR CONSTRUCTION
3	8/15/22	ISSUED FOR CONSTRUCTION

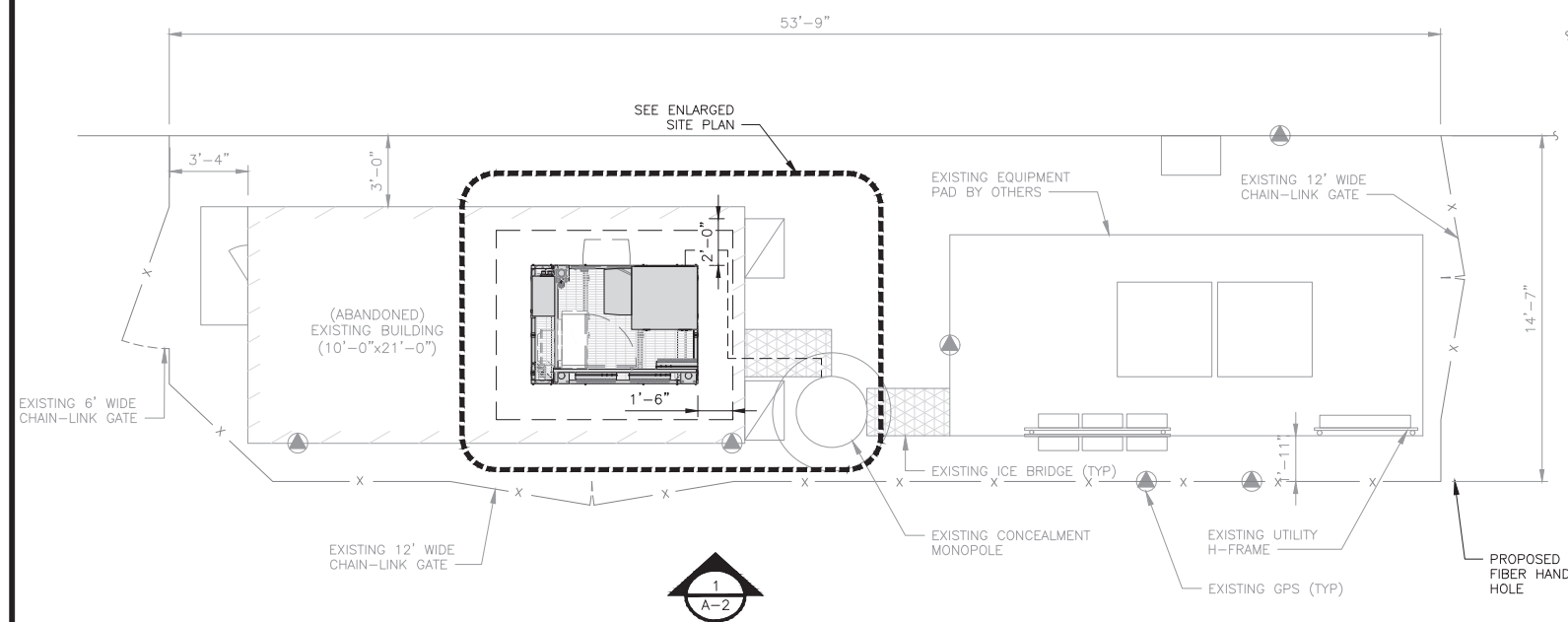
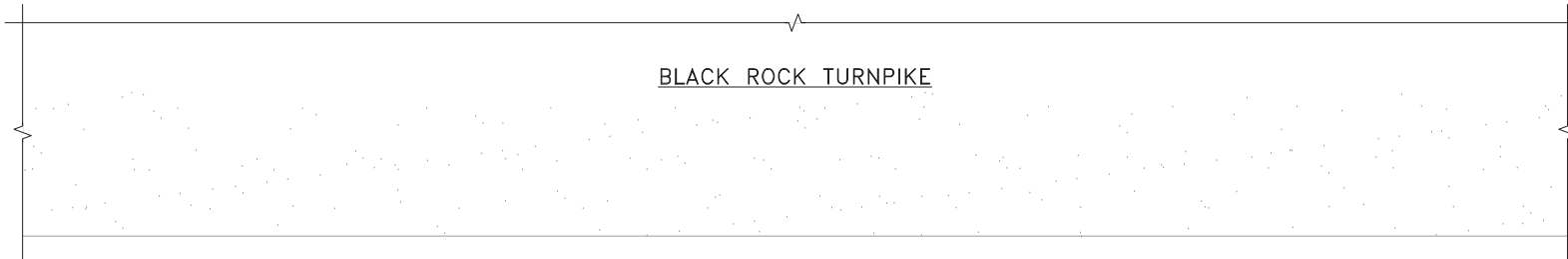
A&E PROJECT NUMBER
151867.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

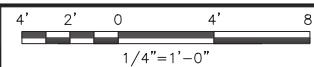
SHEET TITLE
OVERALL AND ENLARGED
SITE PLAN

SHEET NUMBER

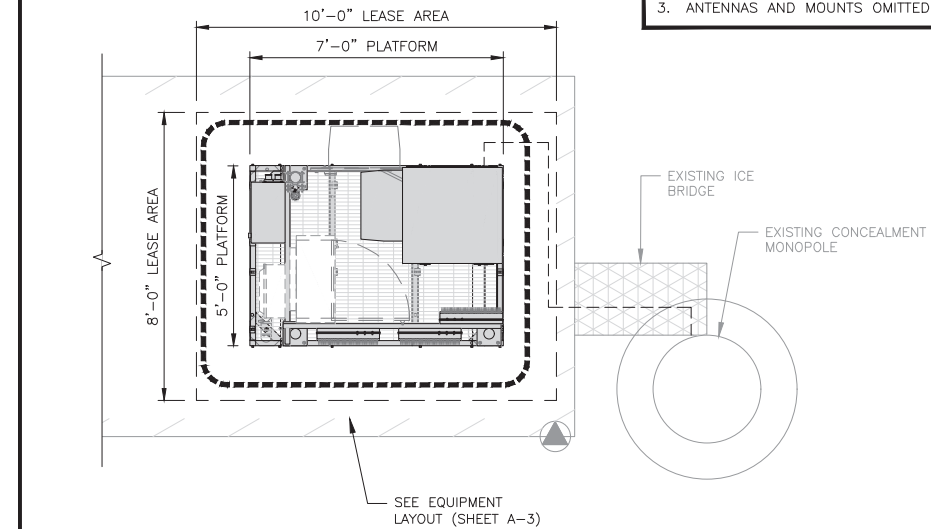
A-1



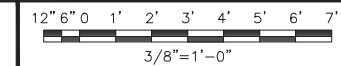
OVERALL SITE PLAN



1



ENLARGED SITE PLAN



2



UTILITY PLAN

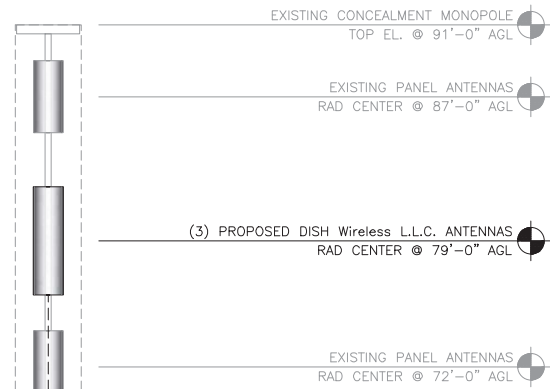
NO SCALE

3

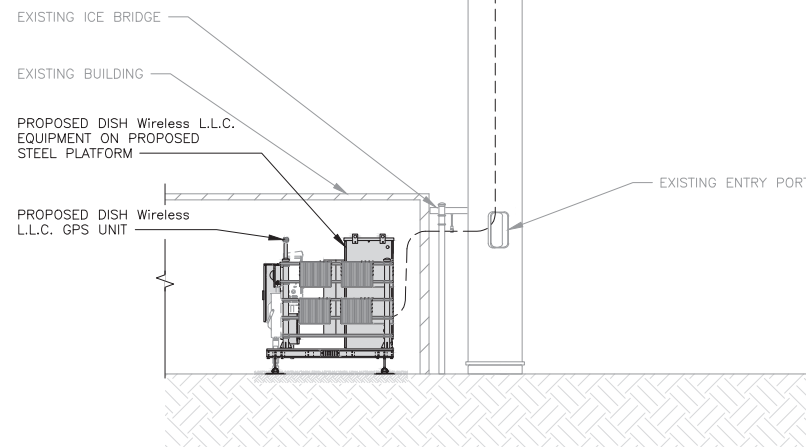
NOTES

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

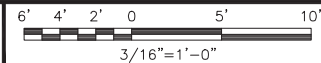
NOTES:
A MANLIFT WILL BE REQUIRED TO COMPLETE THE TOWER WORK ON THIS SITE.



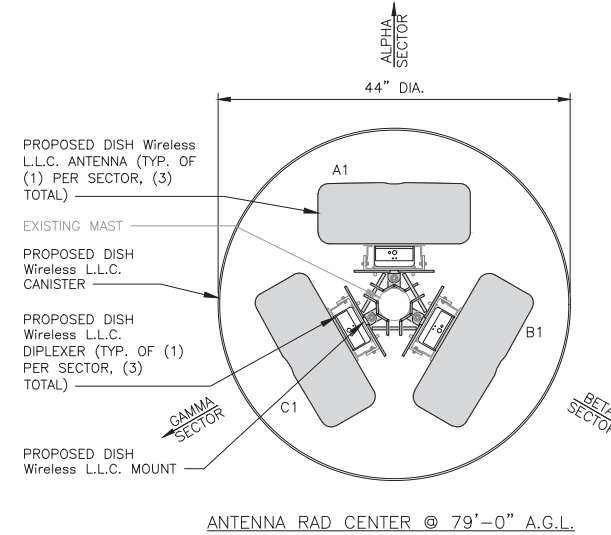
(12) PROPOSED DISH Wireless L.L.C. COAX CABLE INSIDE EXISTING MONOPOLE



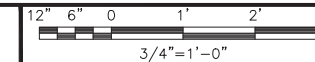
PROPOSED SOUTHWEST ELEVATION



1



ANTENNA LAYOUT



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE	
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH	
ALPHA	A1	PROPOSED	JMA WIRELESS-MX08FRO665-21	5G	72.0" x 20.0"	0°	79'-0"	(12) COAX CABLE (106' LONG) (1) CU12PSM9P8XXX (106'-0" LONG)	
BETA	B1	PROPOSED	JMA WIRELESS-MX08FRO665-21	5G	72.0" x 20.0"	120°	79'-0"		
GAMMA	C1	PROPOSED	JMA WIRELESS-MX08FRO665-21	5G	72.0" x 20.0"	240°	79'-0"		

SECTOR	POSITION	RRH		NOTES
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY	
ALPHA	A1	RAYCAP - RDIC-9181-PF-48	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-B604	5G	
	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



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



1717 S. BOULDER
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TULSA, OK 74119
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RFDS REV #: 3

CONSTRUCTION DOCUMENTS

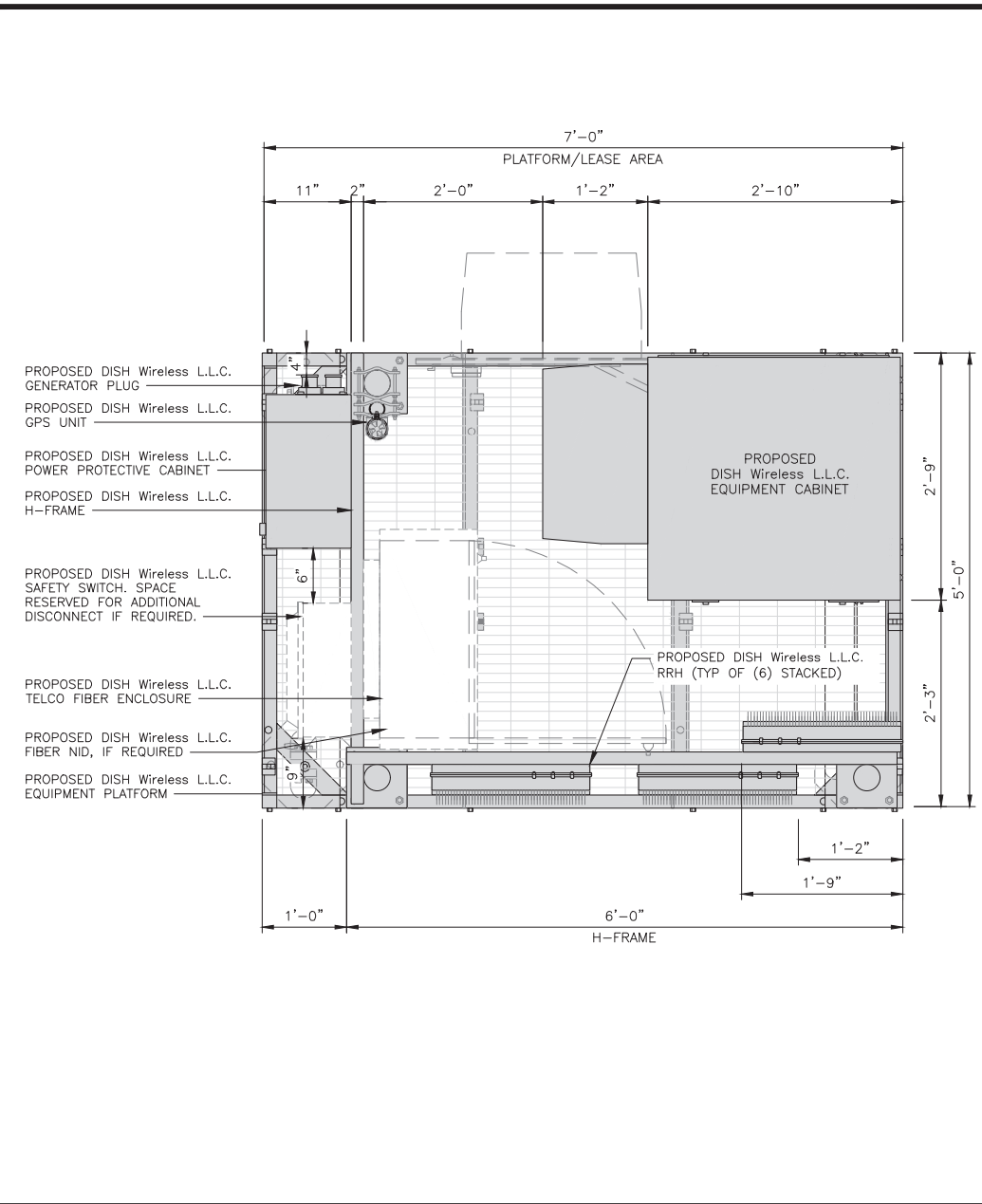
SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/14/21	ISSUED FOR REVIEW
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A&E PROJECT NUMBER
151867.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

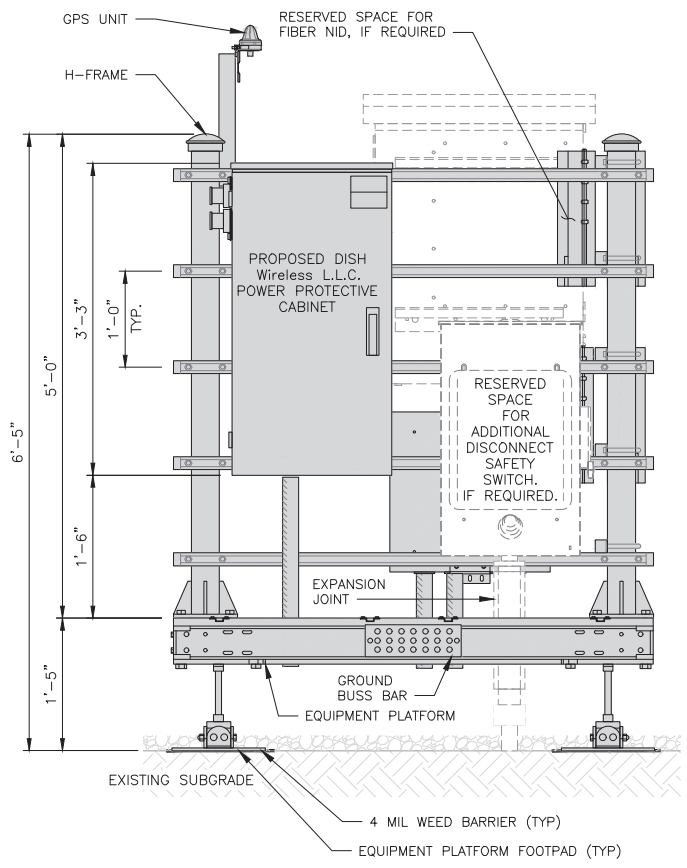
SHEET NUMBER
A-2



PLATFORM EQUIPMENT PLAN

NO SCALE

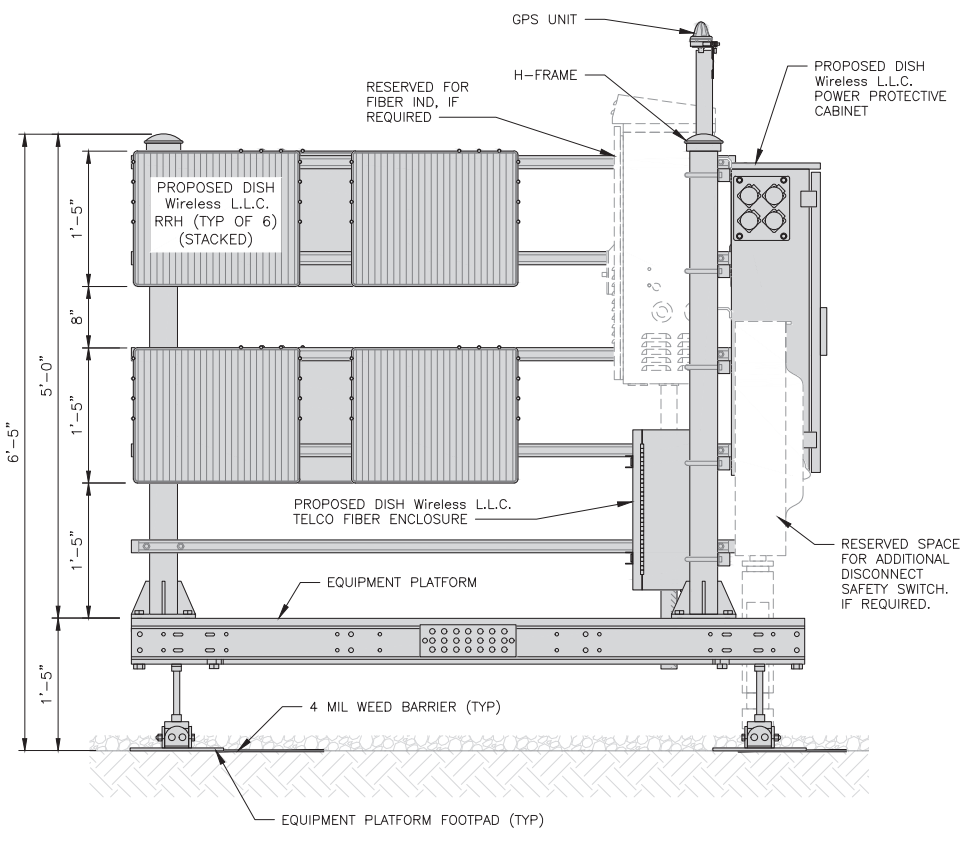
1



H-FRAME EQUIPMENT ELEVATION

NO SCALE

2



NOTES

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



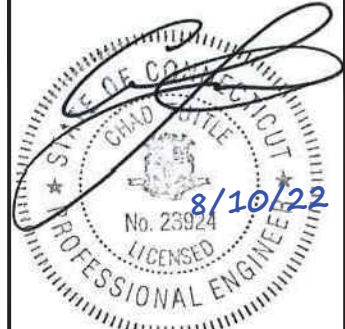
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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3	8/15/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
151867.001.01

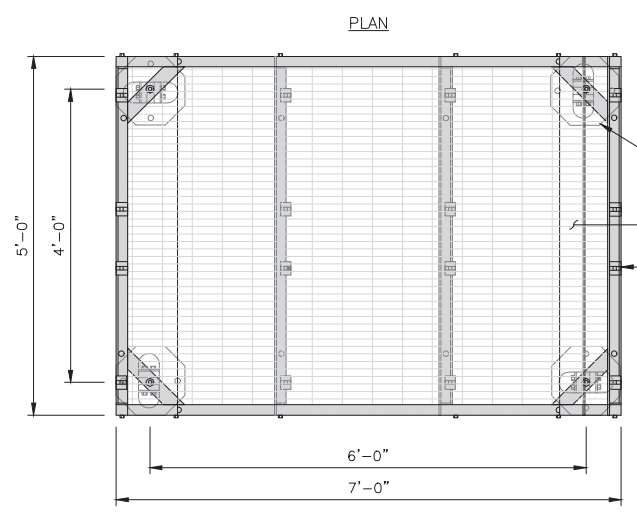
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER
A-3

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

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

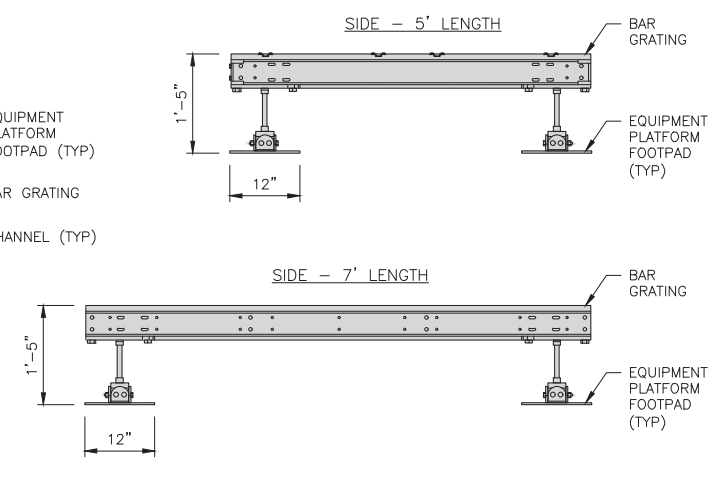


PLATFORM DETAIL

NO SCALE

3

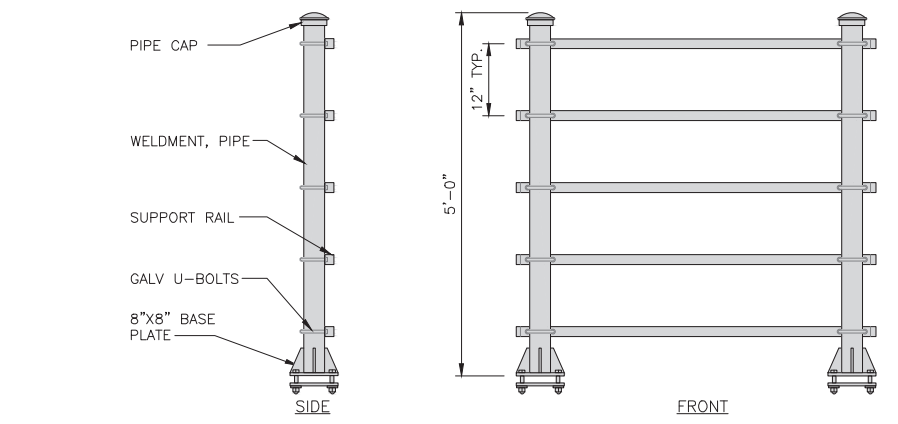
KENWOOD T1701KT5-5S H-FRAME	
UNISTRUT/SUPPORT RAIL	5
WEIGHT/ VOLUME	173.6 LBS



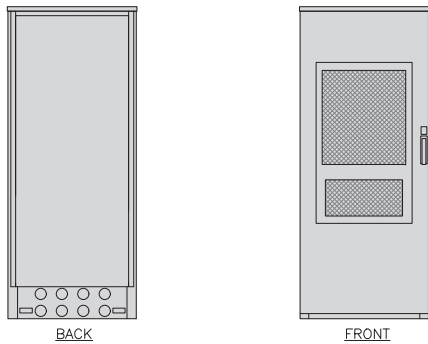
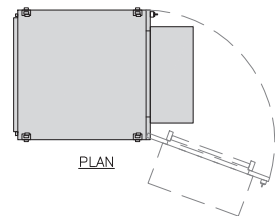
H-FRAME DETAIL

NO SCALE

4



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



CABINET DETAIL

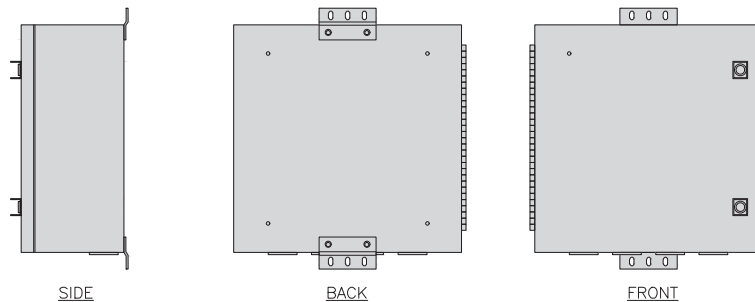
NO SCALE

1

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



FRONT



SIDE

BACK

FRONT

FIBER TELCO ENCLOSURE DETAIL

NO SCALE

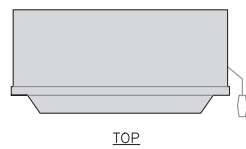
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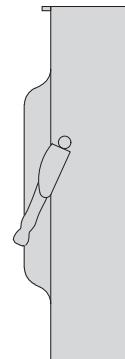
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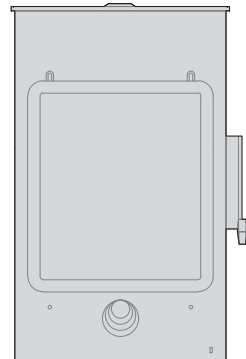
SQUARE D SAFETY SWITCHES D224NRB	
ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E-2875



TOP



SIDE



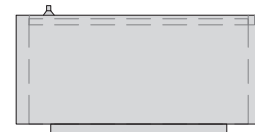
FRONT

SAFETY SWITCH DETAIL

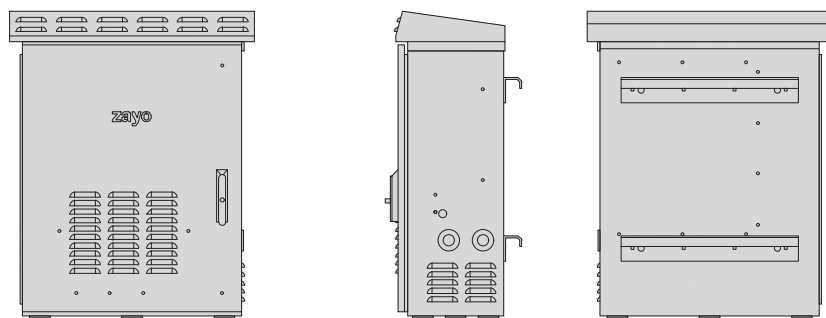
NO SCALE

4

ZAYO 5RU CABINET LEFT SWING DOOR ("LIT" SITES)	
DIMENSIONS (HxWxD)	36.115"x29"x12.9"
WEIGHT	85 LBS
POWER INPUT	20A, -48VDC



PLAN



FRONT

SIDE

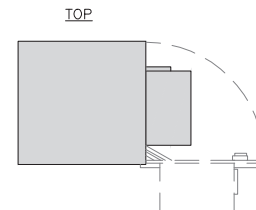
BACK

NETWORK INTERFACE UNIT DETAIL

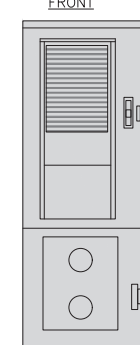
NO SCALE

5

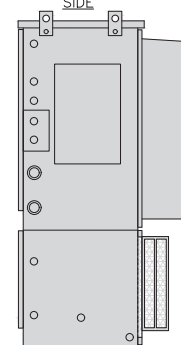
CHARLES INDUSTRY CUBE-SS4B228LX1	
HEIGHT	84.59"
WIDTH	32"
DEPTH	44.85"
TOTAL WEIGHT (EMPTY)	--



TOP



FRONT



SIDE

EQUIPMENT CABINET DETAIL

NO SCALE

6

NOT USED	
NO SCALE	7

NOT USED	
NO SCALE	8

NOT USED	
NO SCALE	9



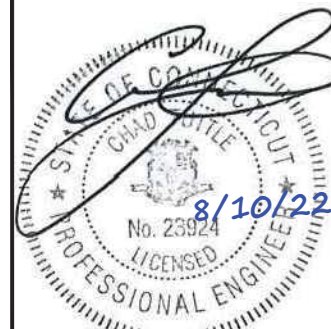
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



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DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4



NOT USED

NO SCALE

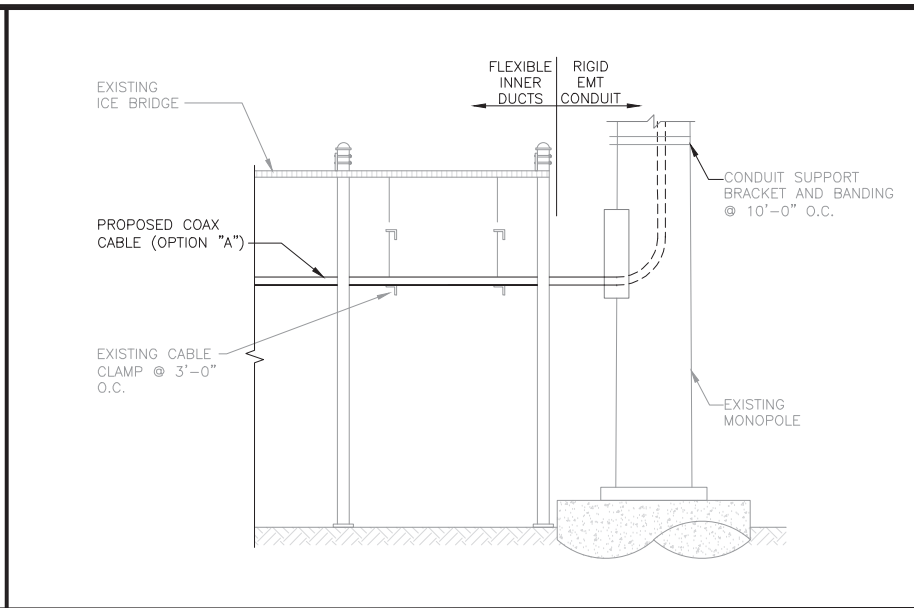
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NOT USED

NO SCALE

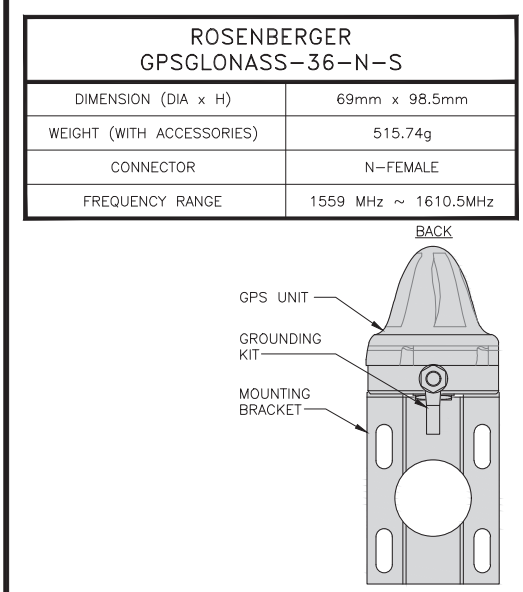
2



HYBRID CABLE RUN

NO SCALE

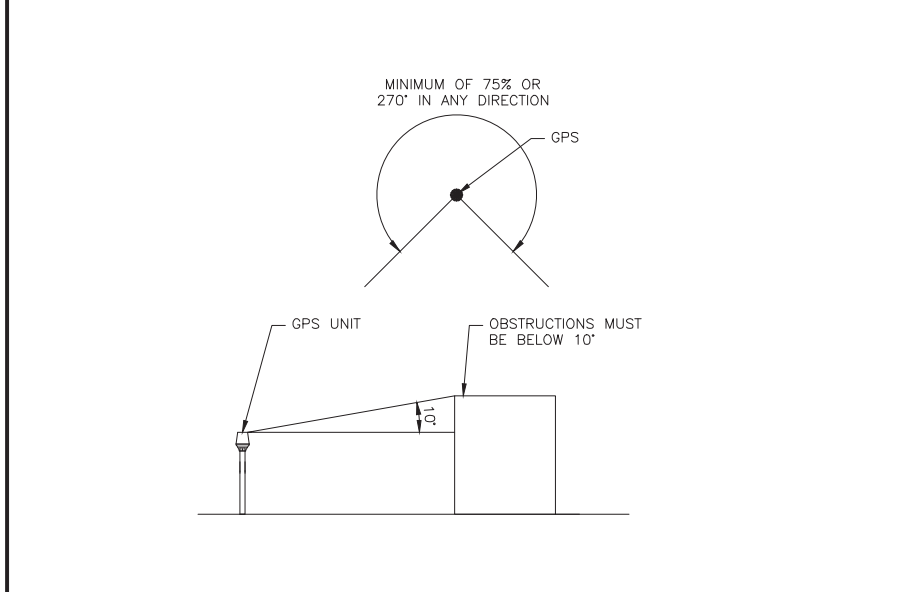
3



GPS ANTENNA DETAIL

NO SCALE

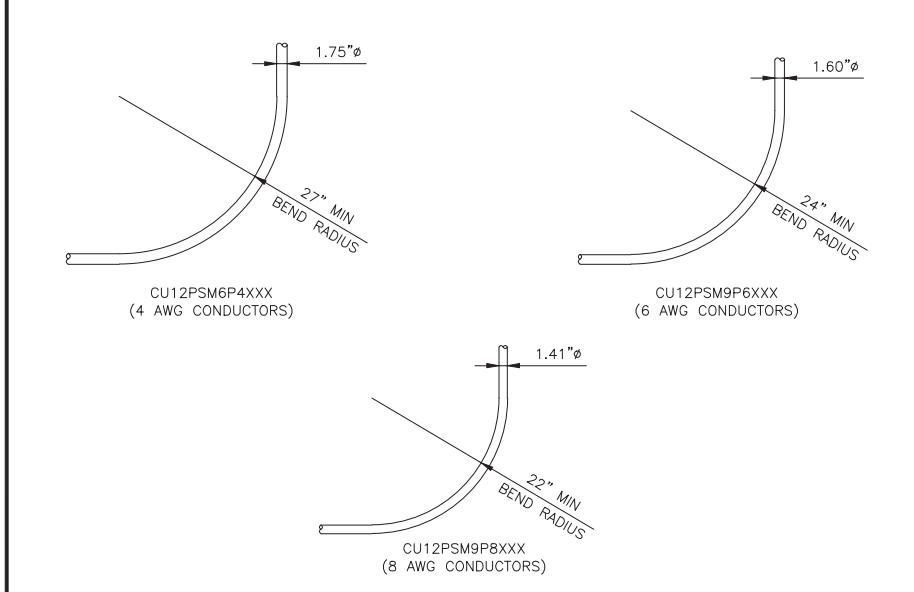
4



GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

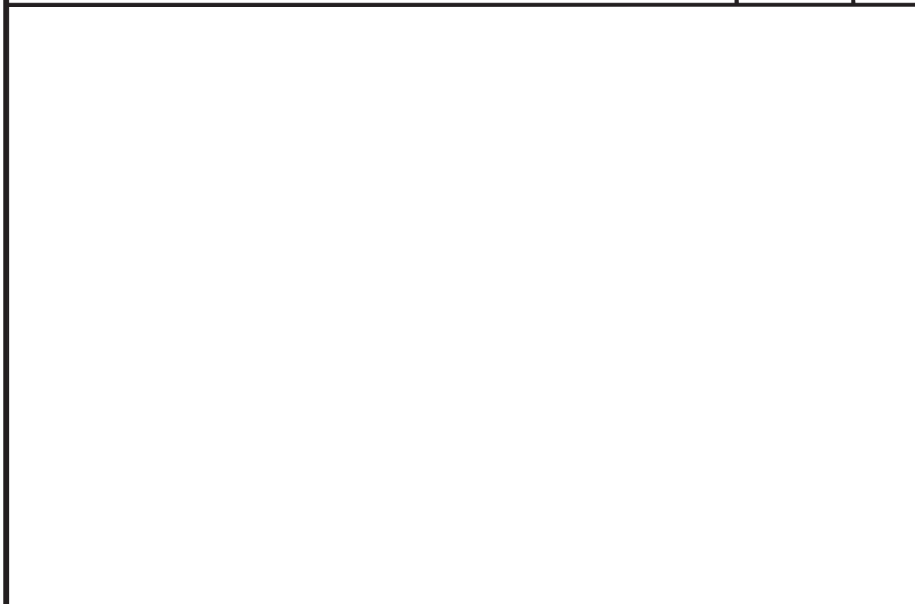
5



CABLES UNLIMITED HYBRID CABLE
MINIMUM BEND RADIUSES

NO SCALE

6



NOT USED

NO SCALE

7



NOT USED

NO SCALE

8



NOT USED

NO SCALE

9



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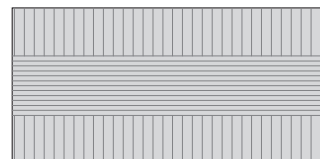
A&E PROJECT NUMBER
151867.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

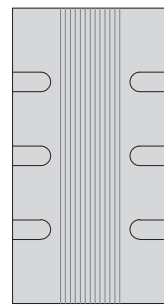
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

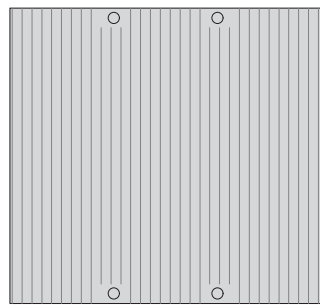
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



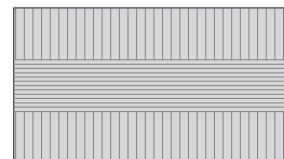
FRONT

REMOTE RADIO HEAD DETAIL

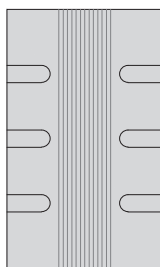
NO SCALE

1

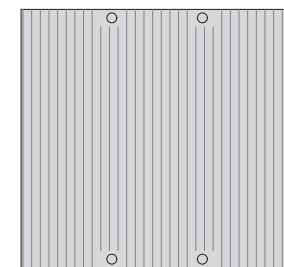
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



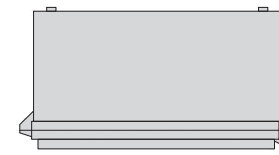
FRONT

REMOTE RADIO HEAD DETAIL

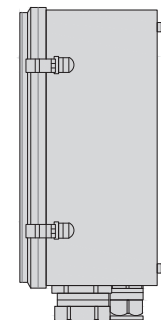
NO SCALE

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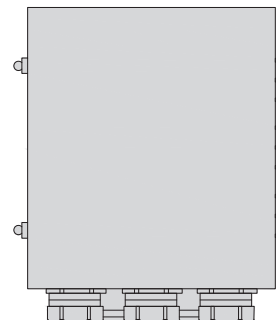
RAYCAP RDIDC-6715-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	16"x14"x8"
WEIGHT	21.85 LBS



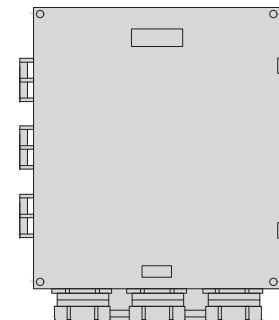
PLAN



SIDE



BACK



FRONT

SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

3

JMA WIRELESS MX08FRO665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	54 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



PLAN



BACK



SIDE

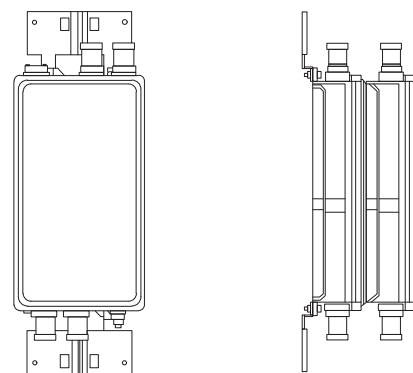


FRONT

ANTENNA DETAIL

NO SCALE

4



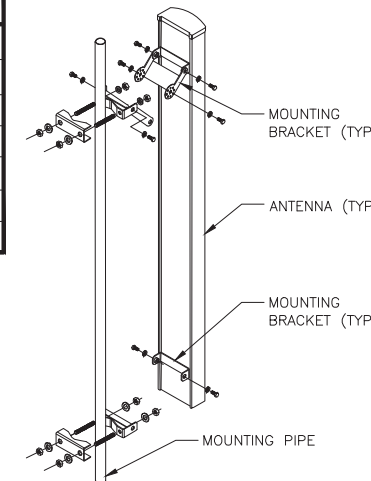
COMMSCOPE - E15V95P63
WEIGHT (WITHOUT MOUNTING HARDWARE): 10.14 LBS
SIZE (HxWxD): 8.8x4.9x4.5 IN.

DIPLEXER DETAIL

NO SCALE

5

M04 MOUNTING BRACKET HPA-33R-BUU-H4-K	
WIDTH	5" (135mm)
DEPTH	2" (51mm)
HEIGHT	8" (213mm)
TOTAL WEIGHT (WITH BRACKETS)	1.5 LBS (15.50 Kg)
HOUSING MATERIAL	ASA/ABS/ALUMINUM
RADOME COLOR	LIGHT GRAY
CONNECTOR	1X8-PIN DAISY CHAIN



MOUNTING BRACKET (TYP)

ANTENNA (TYP)

MOUNTING BRACKET (TYP)

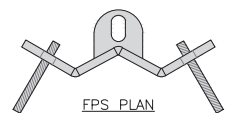
MOUNTING PIPE

ANTENNA MOUNTING DETAIL

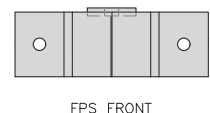
NO SCALE

6

EEI TRIAD-FPS MOUNT	
DIMENSIONS (HxWxD)	2"x5.72"x.25"
WEIGHT: 5.5 LBS	QTY: 6
SPECIFICATIONS: ROUND OR POLYGON POLES 3" TO 7" DIA., 1/4" BRACKET ASSEMBLY	

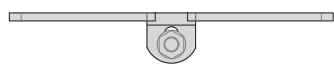


FPS PLAN

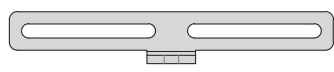


FPS FRONT

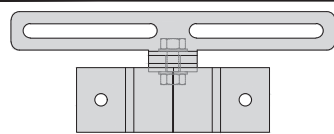
EEI TRIAD-AB MOUNT	
DIMENSIONS (HxWxD)	2"x10"x.25"
WEIGHT: 2 LBS	QTY: 6
SPECIFICATIONS: ANTENNA BRACKET, 1/4" HRPO GUSSET ASSEMBLY	



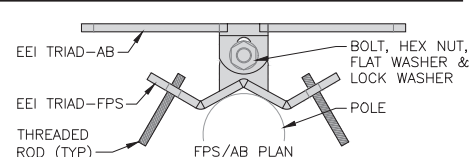
AB PLAN



AB FRONT



FPS/AB FRONT



E EI TRIAD-AB

E EI TRIAD-FPS

THREADED ROD (TYP)

FPS/AB PLAN

BOLT, HEX NUT, FLAT WASHER & LOCK WASHER

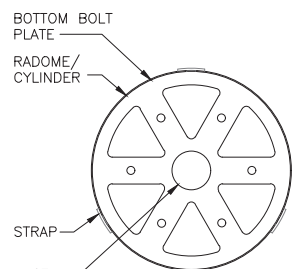
POLE

MAST MOUNT DETAIL

NO SCALE

7

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



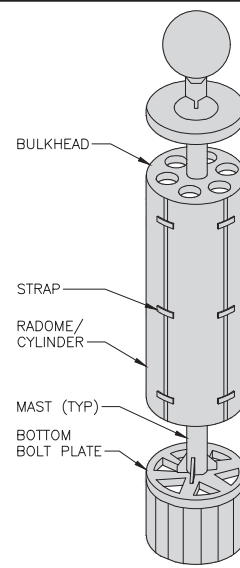
BOTTOM BOLT PLATE

RADOME/CYLINDER

STRAP

MAST

PLAN



BULKHEAD

STRAP

RADOME/CYLINDER

MAST (TYP)

BOTTOM BOLT PLATE

ISOMETRIC

RADOME CANISTER DETAIL

NO SCALE

8

NOT USED

NO SCALE

9

dish
wireless.

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A&E PROJECT NUMBER
151867.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

SHEET TITLE
EQUIPMENT DETAILS

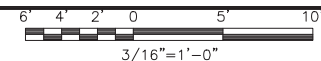
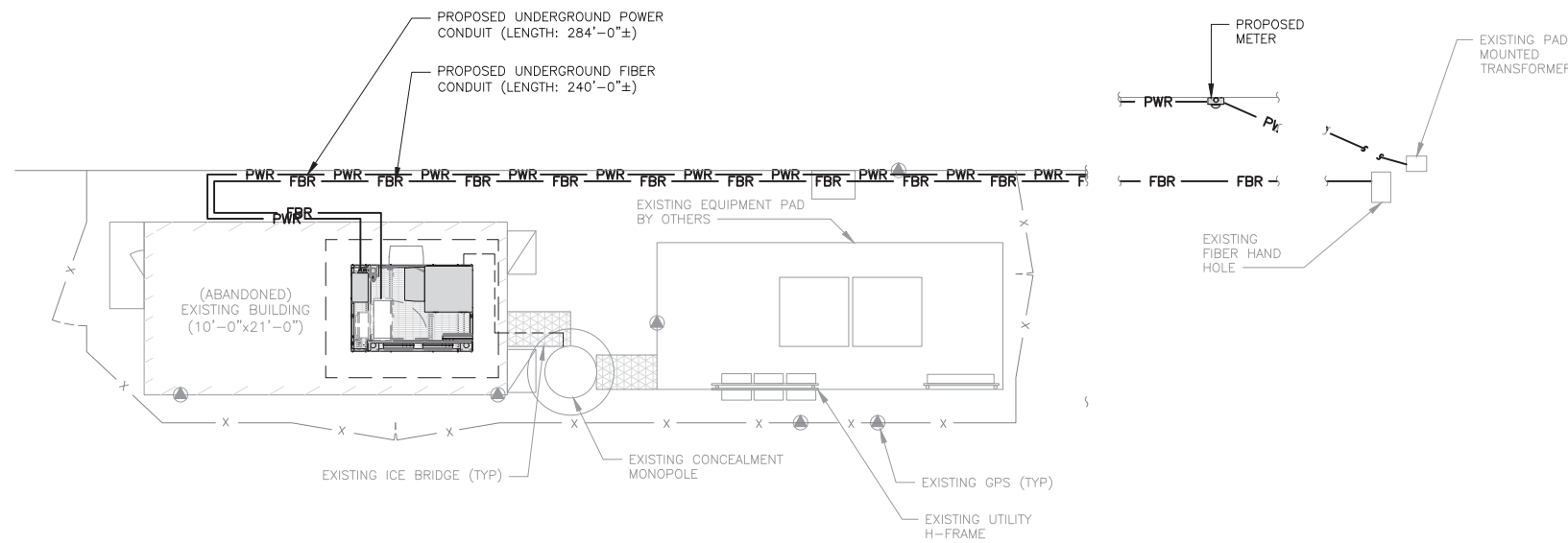
SHEET NUMBER
A-6

NOTES

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

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

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



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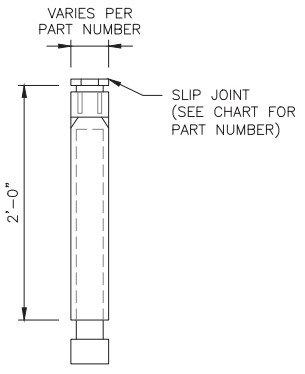
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FAIRFIELD, CT 06825

SHEET TITLE
ELECTRICAL/FIBER ROUTE
PLAN AND NOTES

SHEET NUMBER
E-1

CARLON EXPANSION FITTINGS

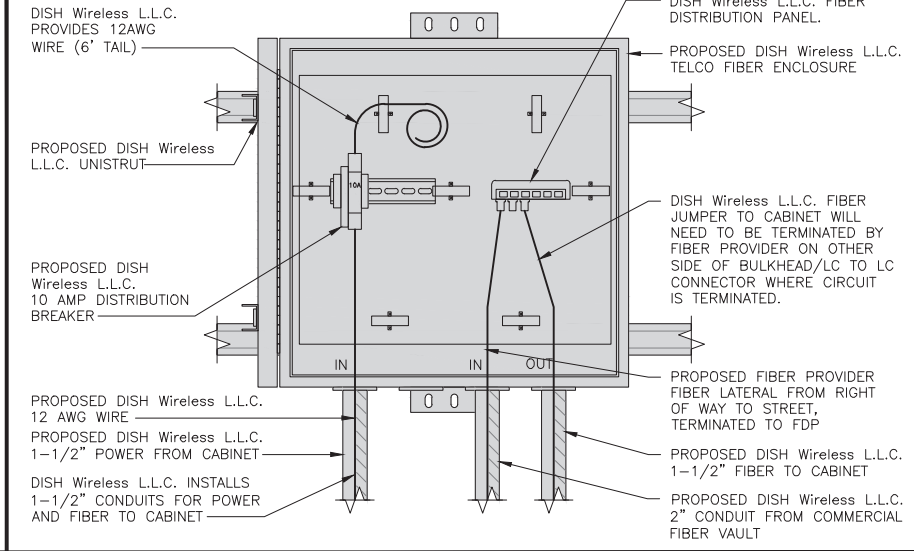
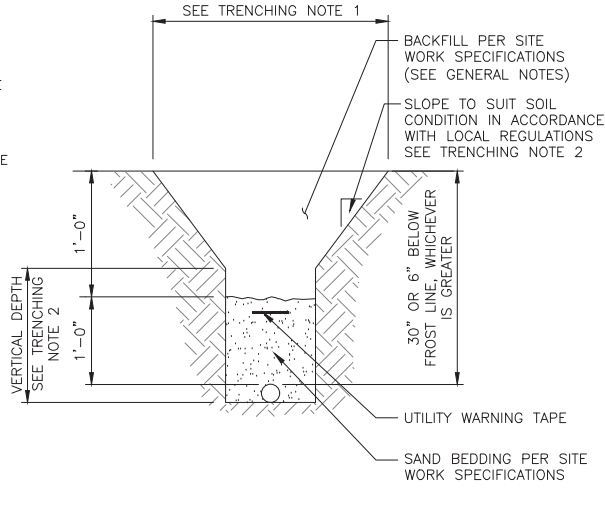
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N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



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

TRENCHING NOTES

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



EXPANSION JOINT DETAIL

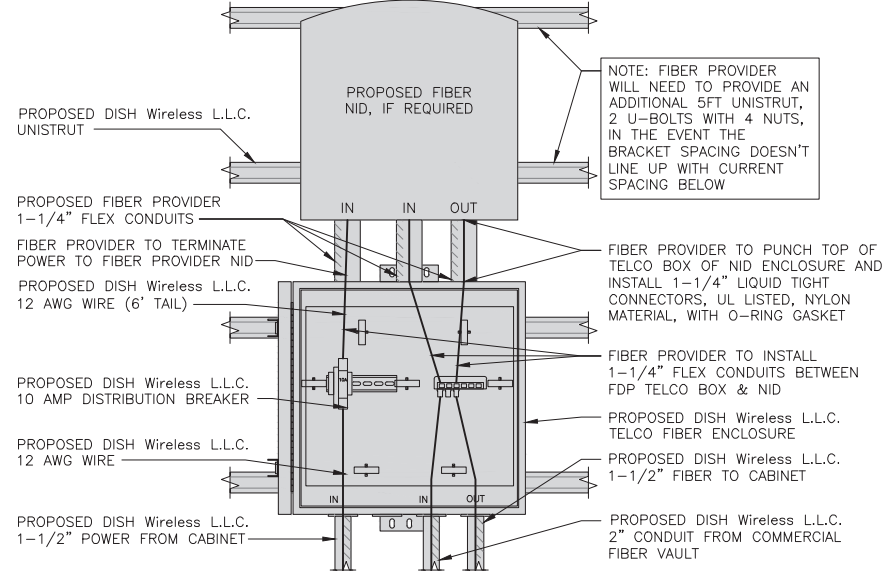
NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL

NO SCALE 2

DARK TELCO BOX – INTERIOR WIRING LAYOUT

NO SCALE 3



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL)

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



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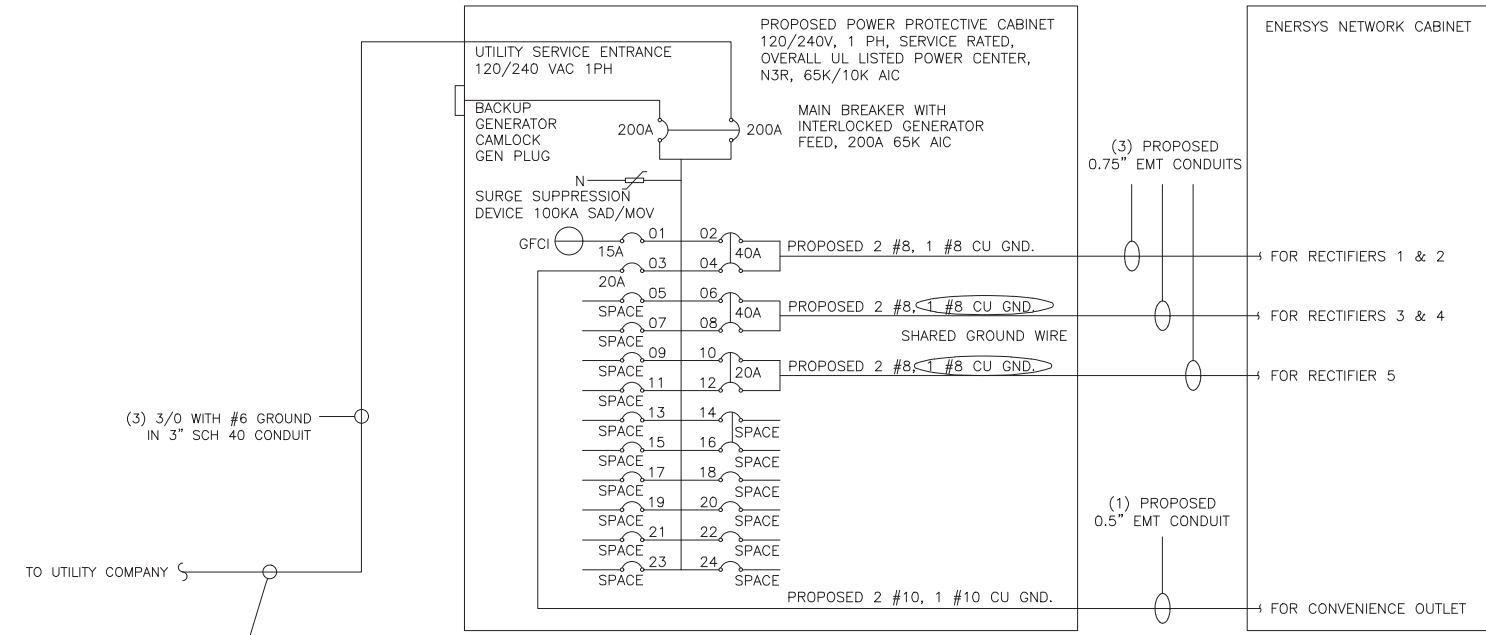
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DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER

E-2



(3) 3/0 WITH #6 GROUND
IN 3" SCH 40 CONDUIT

TO UTILITY COMPANY

CONTRACTOR TO REFER TO
FINAL UTILITY DESIGN DETAILS

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

BREAKERS REQUIRED:
(2) 40A, 2P BREAKER - SQUARE D P/N:Q0240
(1) 20A, 2P BREAKER - SQUARE D P/N:Q0220
(1) 20A, 1P BREAKER - SQUARE D P/N:Q0120

NOTES

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

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

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

RECTIFIER CONDUCTORS (3 CONDUITS): USING UL1015, CU.
 #8 - 0.0552 SQ. IN X 2 = 0.1103 SQ. IN
 #8 - 0.0131 SQ. IN X 1 = 0.0131 SQ. IN <BARE GROUND
 TOTAL = 0.1234 SQ. IN

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

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

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

PPC ONE-LINE DIAGRAM

NO SCALE 1

PROPOSED ENERSYS PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS)		LOAD SERVED
	L1	L2						L1	L2	
PPC GFCI OUTLET	180	180	15A	1	A	2	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIERS 1 & 2
ENERSYS GFCI OUTLET			20A	3	B	4	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIER 3 & 4
-SPACE-				5	A	6	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIER 3 & 4
-SPACE-				7	B	8	20A	1920	1920	ENERSYS ALPHA CORDEX RECTIFIER 5
-SPACE-				9	A	10				
-SPACE-				11	B	12				
-SPACE-				13	A	14				
-SPACE-				15	B	16				
-SPACE-				17	A	18				
-SPACE-				19	B	20				
-SPACE-				21	A	22				
-SPACE-				23	B	24				
VOLTAGE AMPS								9500	9500	
200A MCB, 1φ, 24 SPACE, 120/240V				L1	L2					
MB RATING: 65,000 AIC				9680	9680					
				81	81					
				81						
				102						

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3



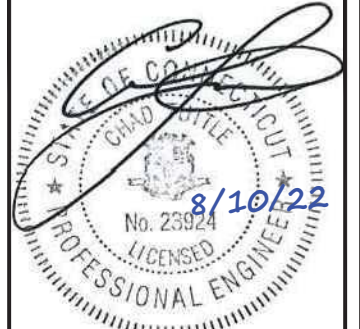
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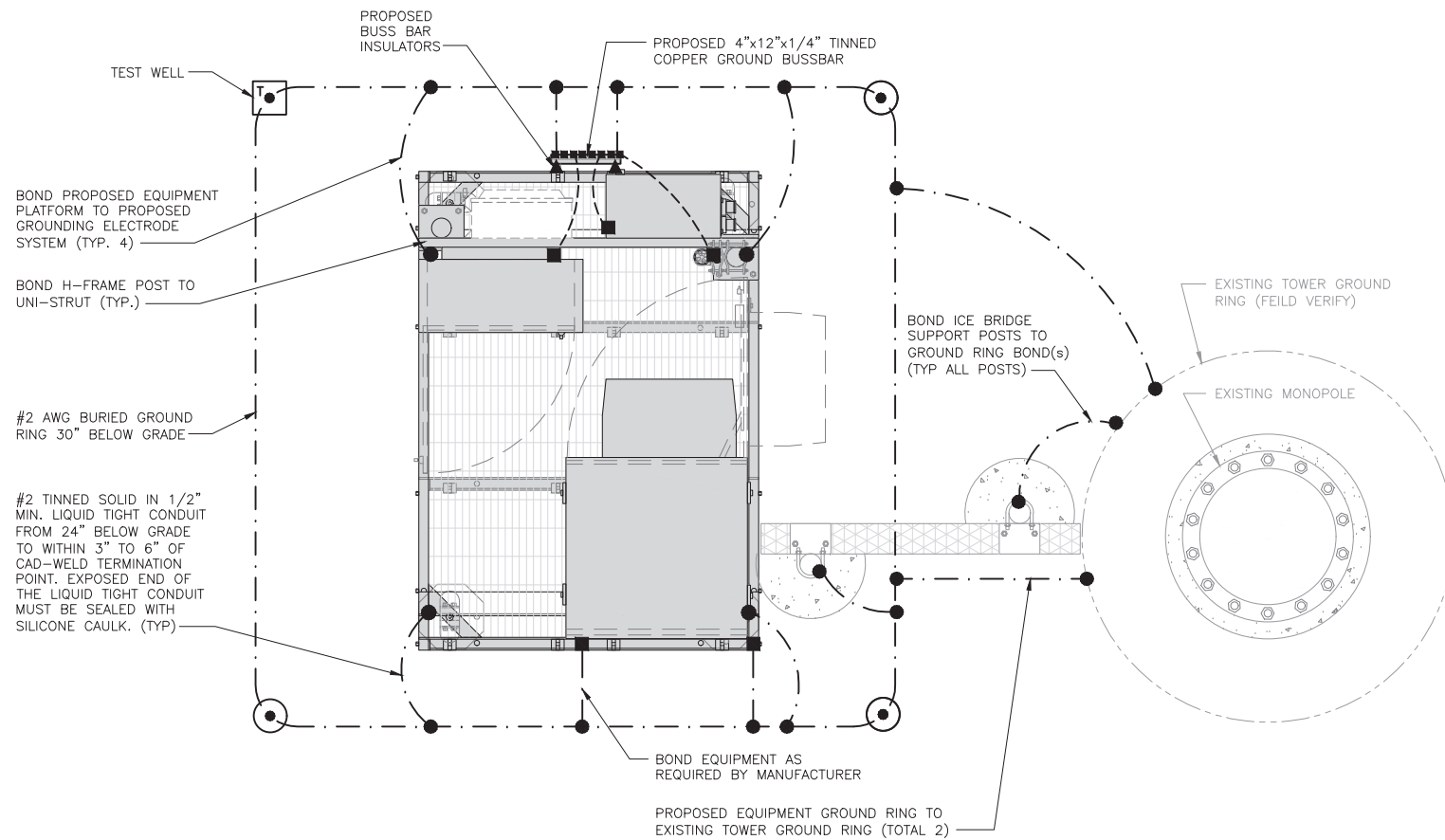
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DISH Wireless L.L.C.
PROJECT INFORMATION
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2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

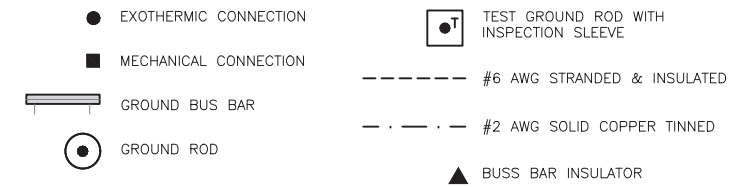
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT
CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1



GROUNDING LEGEND

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

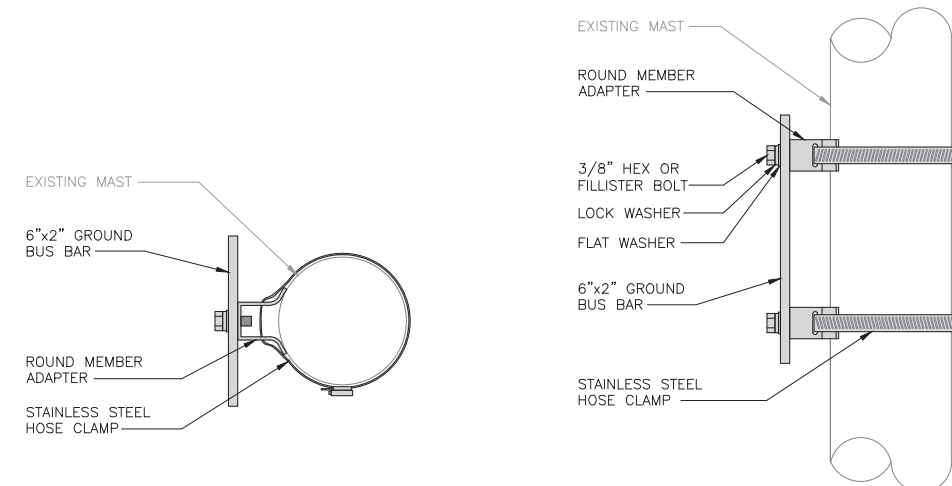
GROUNDING KEY NOTES

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

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

GROUNDING KEY NOTES

NO SCALE 3

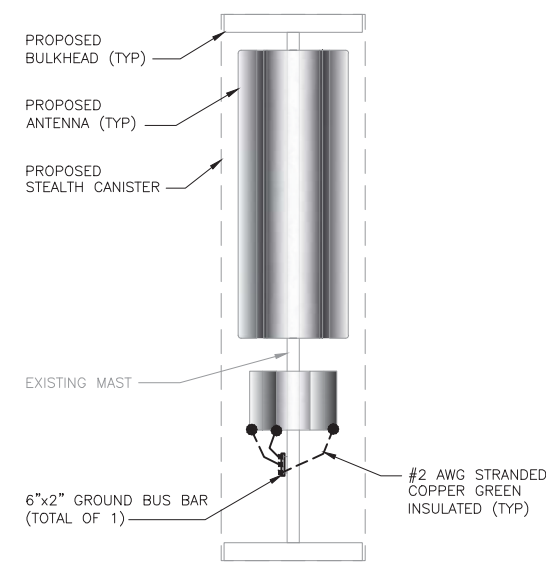


BUSS BAR PLAN

BUSS BAR ELEVATION

TYPICAL ANTENNA GROUNDING DETAIL

NO SCALE 2



ANTENNA GROUNDING ELEVATION



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151867.001.01

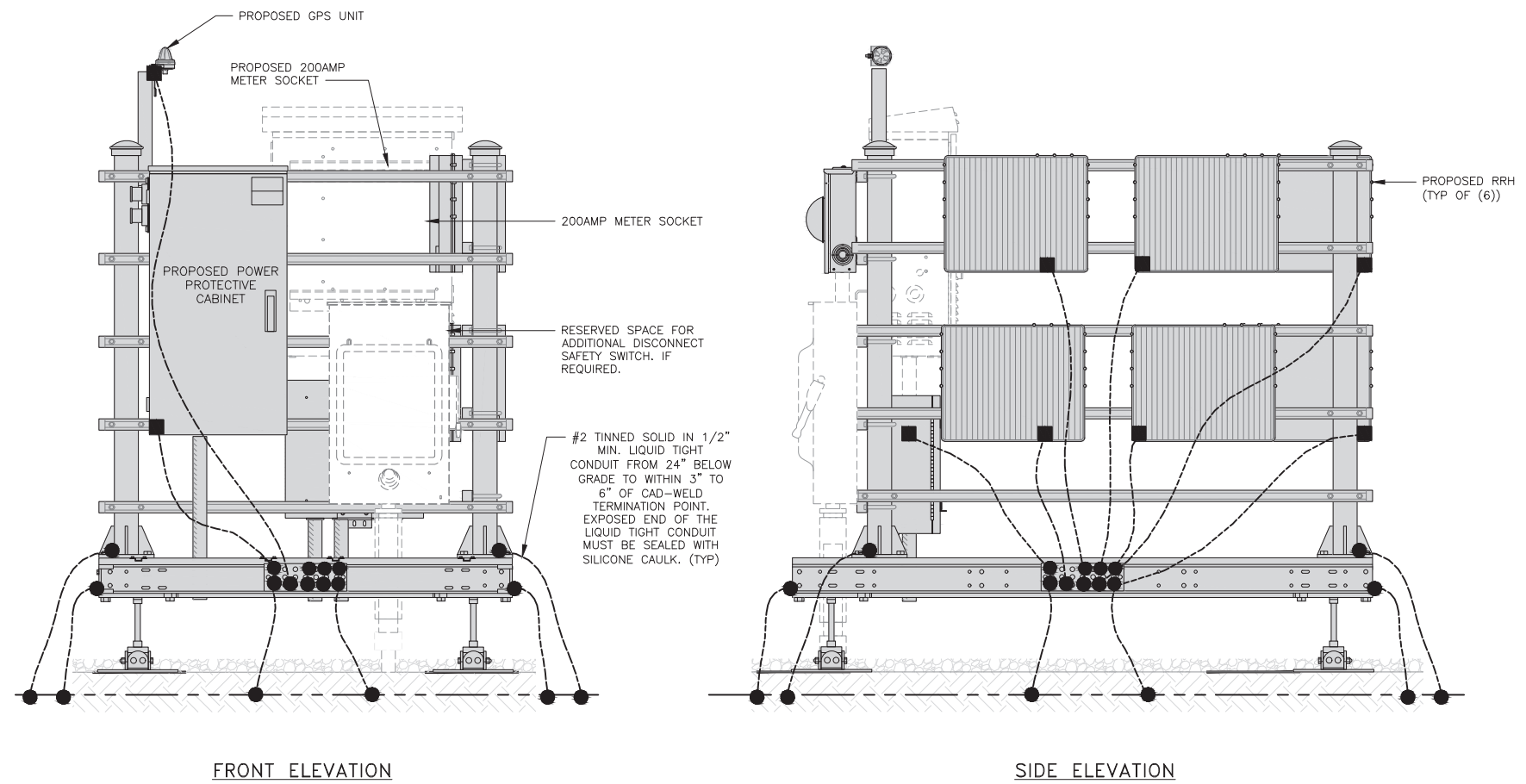
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PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER
G-1

NOTES

EQUIPMENT CABINET OMITTED FOR CLARITY



FRONT ELEVATION

SIDE ELEVATION



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SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2

NOT USED

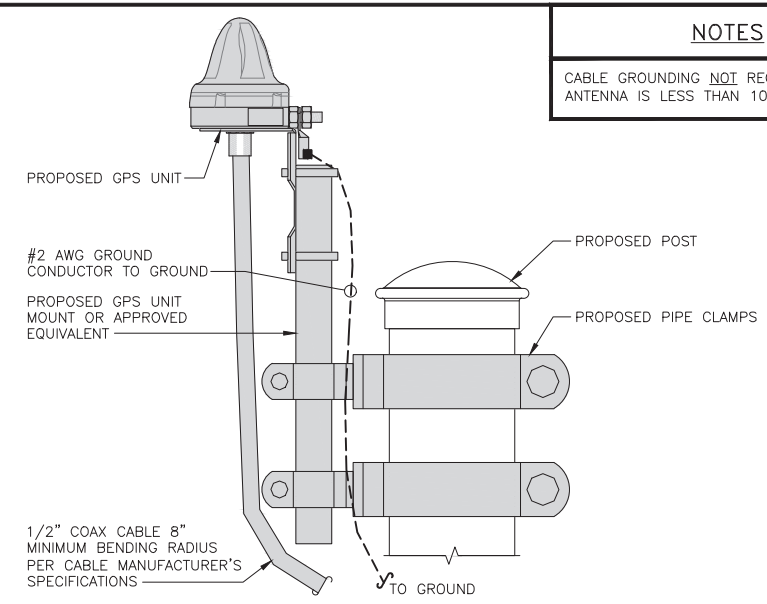
NO SCALE 1

H-FRAME GROUNDING DETAIL

NO SCALE 4

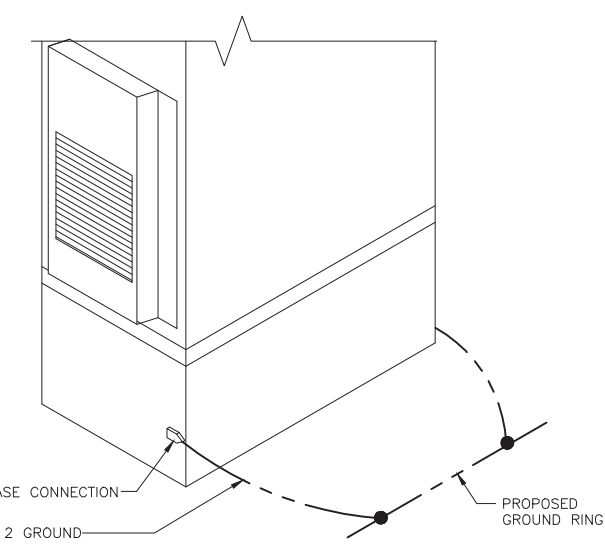
NOTES

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



TYPICAL GPS UNIT GROUNDING

NO SCALE 6



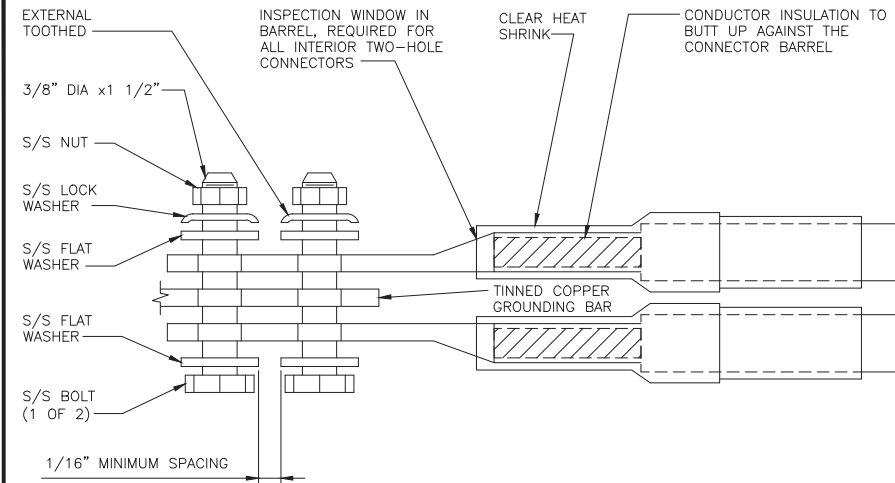
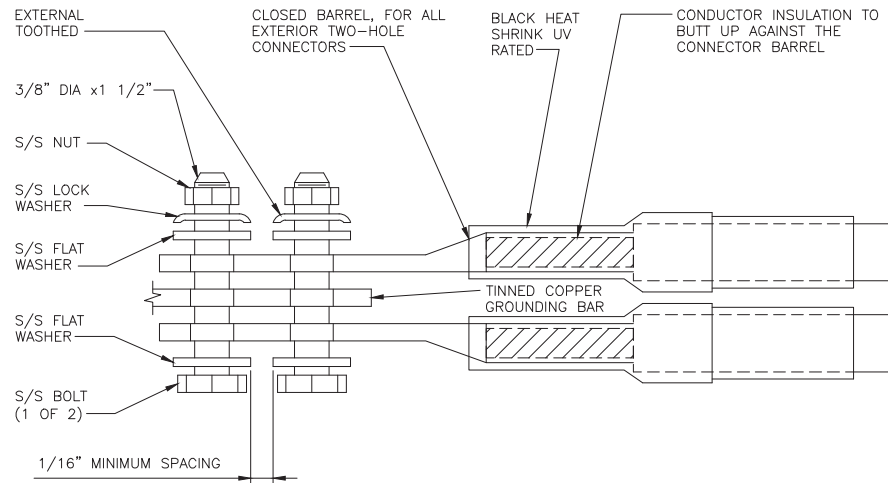
OUTDOOR CABINET GROUNDING

NO SCALE 7

NOT USED

NO SCALE 5

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



TYPICAL GROUNDING NOTES

NO SCALE

1

TYPICAL EXTERIOR TWO HOLE LUG

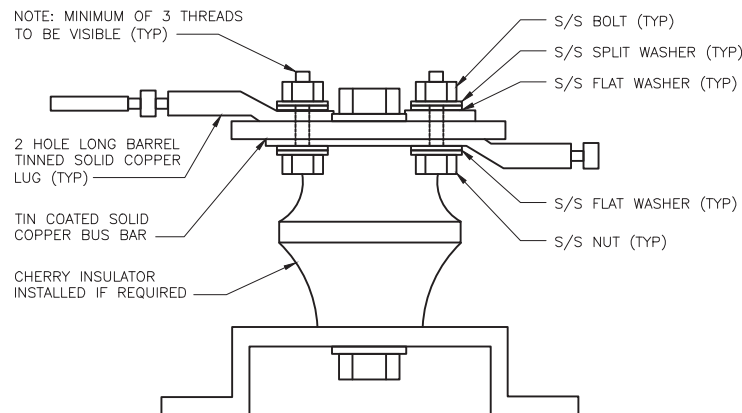
NO SCALE

2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE

3



LUG DETAIL

NO SCALE

4

NOT USED

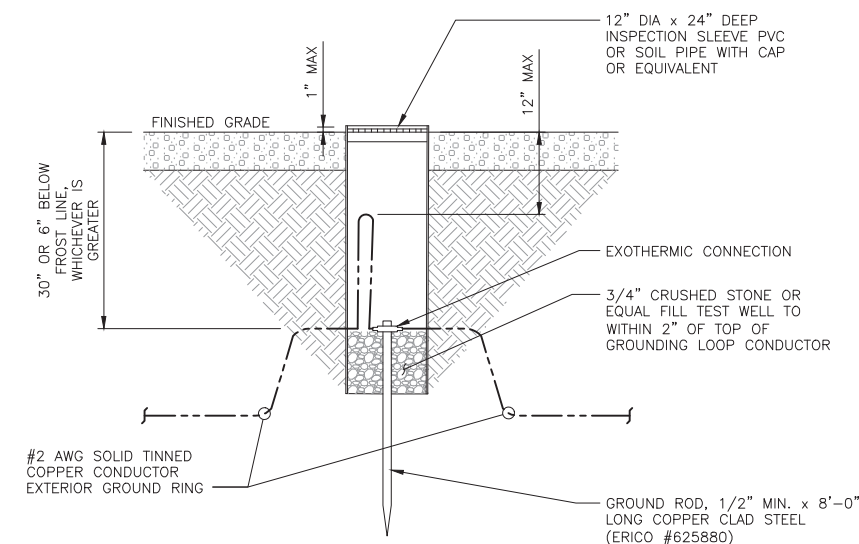
NO SCALE

5

TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE

6



NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

9

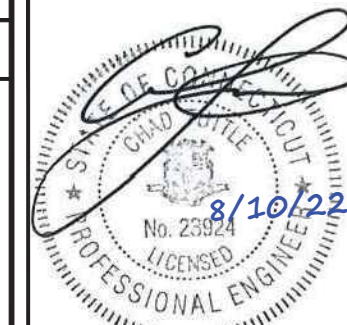
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SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER

G-3

RF JUMPER COLOR CODING

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

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

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

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

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

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

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

HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS

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

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

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

FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR STRIPE ONLY

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

POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY

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

RET MOTORS AT ANTENNAS

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

MICROWAVE RADIO LINKS

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

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

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

RF CABLE COLOR CODES

NO SCALE

1

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

AWS (N66+N70+H-BLOCK)
PURPLE

CBRS TECH (3 GHz)
YELLOW

NEGATIVE SLANT PORT ON ANT/RRH
WHITE

ALPHA SECTOR
RED

BETA SECTOR
BLUE

GAMMA SECTOR
GREEN

COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

NOT USED

NO SCALE

4



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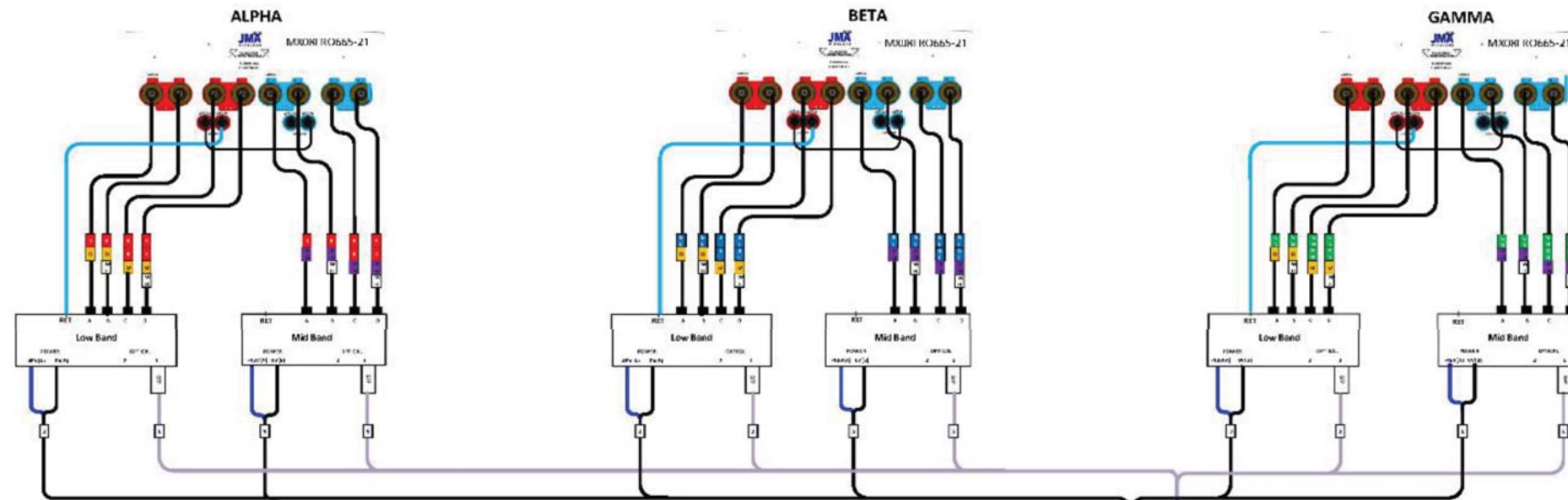
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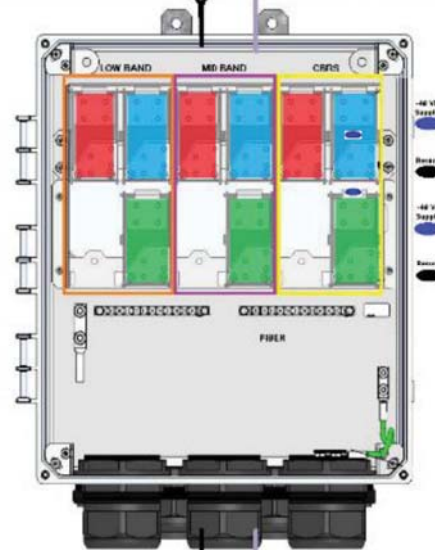
SHEET TITLE
RF
CABLE COLOR CODE

SHEET NUMBER
RF-1



Fiber Patch Panel

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



CSR NCS540

Port	Interface	Description
0	G00G00	Starbox
1	G00G01	CBRS - Alpha
2	G00G02	CBRS - Beta
3	G00G03	CBRS - Gamma
4	Te0G04	Fujitsu Low-Band RU - Alpha
5	Te0G05	Fujitsu Mid-Band RU - Alpha
6	Te0G06	Fujitsu Low-Band RU - Beta
7	Te0G07	Fujitsu Mid-Band RU - Beta
8	Te0G08	Fujitsu Low-Band RU - Gamma
9	Te0G09	Fujitsu Mid-Band RU - Gamma
10	Te0G10	Fixed VNB
11	Te0G11	Fixed VNB
12	Te0G12	Fixed VNB
13	Te0G13	Fixed VNB
14	Te0G14	CBRS1
15	Te0G15	CBRS2
16	Te0G16	CBRS3
17	G00G17	SM1 - BMC
18	G00G18	SM2 - BMC
19	Te0G19	SM1 - Data 1
20	Te0G20	SM1 - Data 2
21	Te0G21	SM2 - Data 1
22	Te0G22	SM2 - Data 2
23	Te0G23	Reserved Lpdm (FDC, LDC)
24	Te0G24	Blank/Future
25	Te0G25	Blank/Future
26	Te0G26	Fiber NUJ
27	Te0G27	Fiber NUJ
28	Te0G28	Blank/Future
29	Te0G29	Blank/Future

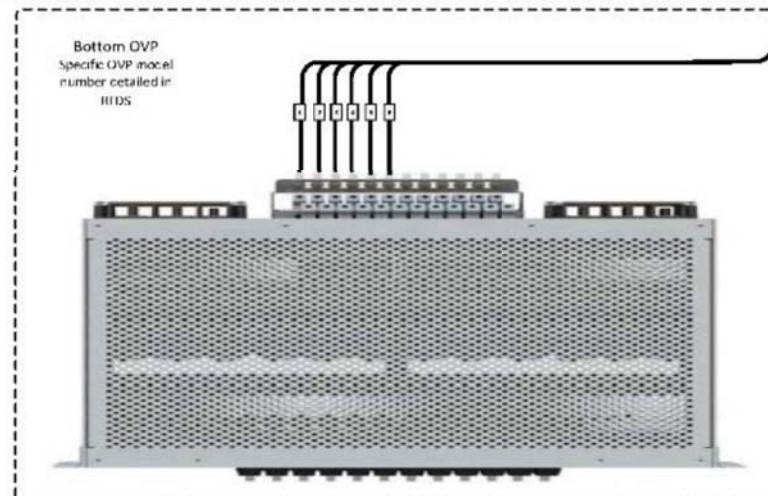
top

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

Bottom OVP
Specific OVP model
number detailed in
RUIS



	5G plumbing diagram (MA MXDR R0665-21 2-2-(LB+MB))			
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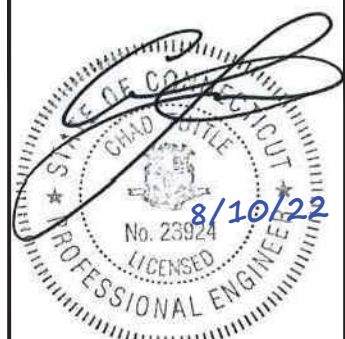
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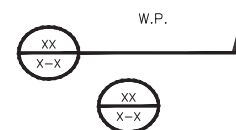
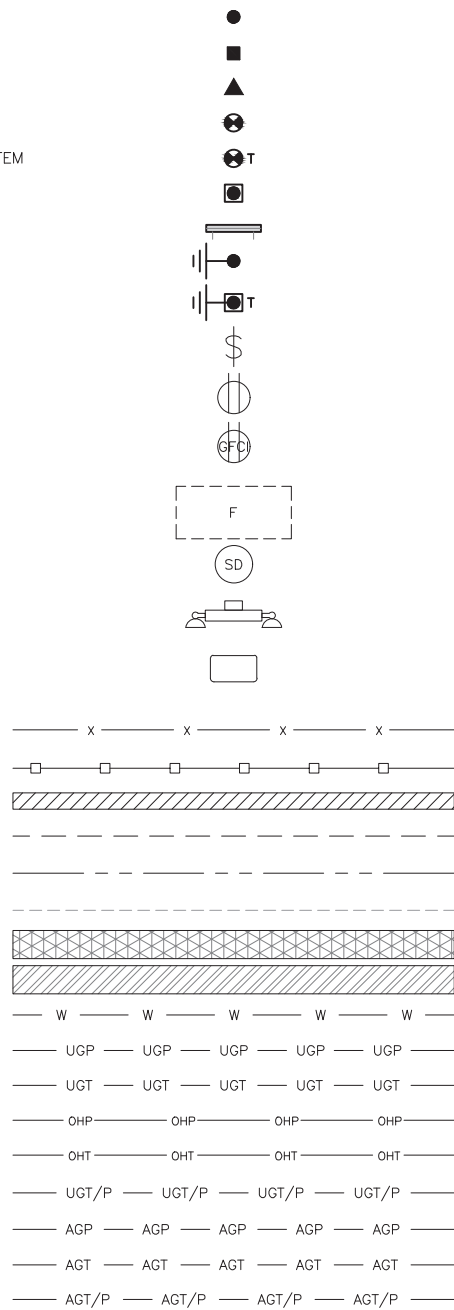
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SHEET TITLE
RF
PLUMBING DIAGRAM

SHEET NUMBER
RF-2

EXOTHERMIC CONNECTION
 MECHANICAL CONNECTION
 BUSS BAR INSULATOR
 CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 EXOTHERMIC WITH INSPECTION SLEEVE
 GROUNDING BAR
 GROUND ROD
 TEST GROUND ROD WITH INSPECTION SLEEVE
 SINGLE POLE SWITCH
 DUPLEX RECEPTACLE
 DUPLEX GFCI RECEPTACLE
 FLUORESCENT LIGHTING FIXTURE
 (2) TWO LAMPS 48-T8
 SMOKE DETECTION (DC)
 EMERGENCY LIGHTING (DC)
 SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW
 LED-1-25A400/51K-SR4-120-PE-DEBTDX



SECTION REFERENCE
 DETAIL REFERENCE

LEGEND

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

ABBREVIATIONS



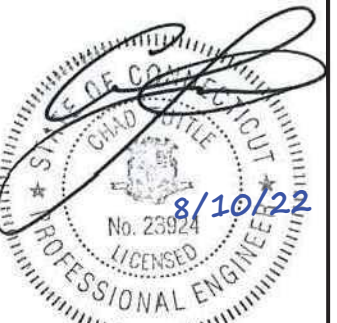
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SHEET TITLE
LEGEND AND ABBREVIATIONS

SHEET NUMBER
GN-1

SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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



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B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

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DRAWN BY:	CHECKED BY:	APPROVED BY:
ANP	BEH	ANP

RFDS REV #: 3

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/14/21	ISSUED FOR REVIEW
0	2/28/22	ISSUED FOR CONSTRUCTION
1	6/9/22	ISSUED FOR CONSTRUCTION
2	7/30/22	ISSUED FOR CONSTRUCTION
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A&E PROJECT NUMBER
151867.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

ELECTRICAL INSTALLATION NOTES:

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

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



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B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

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DRAWN BY:	CHECKED BY:	APPROVED BY:
ANP	BEH	ANP

RFDS REV #: 3

CONSTRUCTION DOCUMENTS

SUBMITTALS		
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A&E PROJECT NUMBER
151867.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

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.



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com



B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
ANP	BEH	ANP

RFDS REV #: 3

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/14/21	ISSUED FOR REVIEW
0	2/28/22	ISSUED FOR CONSTRUCTION
1	6/9/22	ISSUED FOR CONSTRUCTION
2	7/30/22	ISSUED FOR CONSTRUCTION
3	8/15/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
151867.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01143A
2189-2215 BLACK ROCK TPKE.
FAIRFIELD, CT 06825

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

Exhibit D

Structural Analysis Report

Date: **May 17, 2022**



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

Subject: **Structural Analysis Report**

Carrier Designation: **DISH Network Equipment swap**
Site Number: NJJER01143A
Site Name: CT-CCI-T-876398

Crown Castle Designation: **BU Number:** 876398
Site Name: FAIRFIELD 2 / SUN REALITY
JDE Job Number: 712663
Work Order Number: 2116116
Order Number: 612119 Rev. 4

Engineering Firm Designation: **Crown Castle Project Number:** 2116116

Site Data: **2189-2215 Black Rock Tpke., FAIRFIELD, FAIRFIELD County, CT**
Latitude 41° 10' 52.33", Longitude -73° 15' 14.69"
90 Foot - Concealment 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:

LC6.5: Existing Equipment + Maintenance Configuration Change (MCC) ***Sufficient Capacity-83.1%**

***The structure has sufficient capacity once the loading changes, described in the Recommendations section of this report, are completed.**

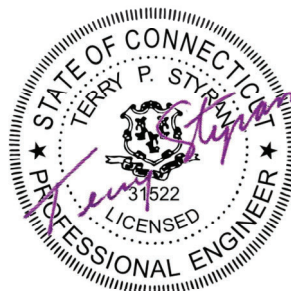
This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

The tower in this analysis is a concealment type structure; the antennas are installed behind concealment canisters and do not affect the tower’s wind profile. The proposed antenna installation is therefore considered in conformance to the existing building code.

Structural analysis prepared by: Kibreab Gebremariam

Respectfully submitted by:

Terry P. Styran, P.E.
Senior Project Engineer



Terry P Styran
2022.05.18
11:04:15 -04'00'

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1) INTRODUCTION

This tower is a 90 ft concealment tower designed by ENGINEERED ENDEAVORS, INC. The base tower is 74 ft and a concealment assembly extends from 74 ft to 90 ft.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	0.75 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)
79.0	79.0	3	jma wireless	MX08FRO665-21	12	7/8

Table 2 - Non-Carrier Equipment To Be Conditionally Removed

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
79.0	80.0	3	kathrein	AP9-850/090 w/ Mount Pipe	12	7/8
	76.0	3	kathrein	AP9-850/090 w/ Mount Pipe		

Table 3 - 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)
87.0	87.0	3	commscope	DHHTT65B-3XR	12	7/8
	86.0	4	rfs celwave	KIT-FD9R6004/1C-DL		
	85.0	2	rfs celwave	KIT-FD9R6004/1C-DL		
86.0	86.0	1	-	8' x 44" OD Concealment Canister	-	-
78.0	78.0	1	-	8' x 44" OD Concealment Canister	-	-
70.8	70.8	1	-	6.33' x 48.75" OD Concealment Canister	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1531968	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	2069482	CCISITES
4-TOWER MANUFACTURER DRAWINGS	2069490	CCISITES
4-POST-MODIFICATION INSPECTION	8187782	CCISITES

Document	Reference	Source
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	7633773	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	90 - 82	Pole	TP4.5x4.5x0.674	1	-0.640	255.191	30.7	Pass
L2	82 - 74	Pole	TP4.5x4.5x0.674	2	-1.723	255.191	83.1	Pass
L3	74 - 67.83	Pole	TP20.3223x19.5x0.1875	3	-2.525	873.907	10.2	Pass
L4	67.83 - 36.17	Pole	TP24.87x20.3223x0.1875	4	-4.754	990.982	25.7	Pass
L5	36.17 - 0	Pole	TP29.5x23.9668x0.25	5	-8.844	1651.140	31.1	Pass
							Summary	
						Pole (L2)	83.1	Pass
						Rating =	83.1	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolt	74	17.4	Pass
1	Anchor Rods	0	39.7	Pass
1	Base Plate	0	55.6	Pass
1	Base Foundation (Structure)	0	28.7	Pass
1	Base Foundation (Soil Interaction)	0	32.1	Pass

Structure Rating (max from all components) =	83.1%
---	--------------

Notes:

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

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. In order for the results of this analysis to be considered valid, the loading modification, as follows, must be completed.

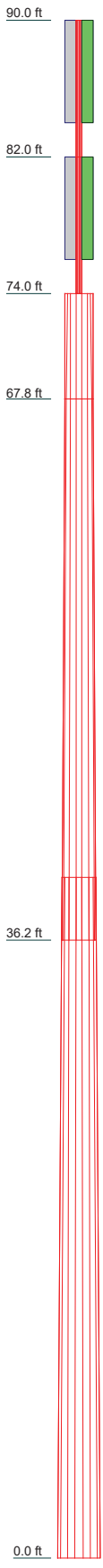
Loading Changes:

- a) Removal of the abandoned antennas, feed lines and mounts at the 79 ft level

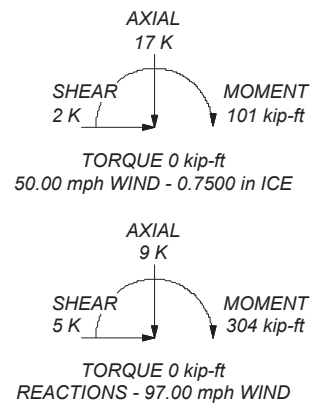
No structural modifications are required at this time provided that the above-listed changes are completed.

APPENDIX A
TNXTOWER OUTPUT

Section	5	4	3	2	1
Length (ft)	39.8400	31.6600	6.1700	8.0000	8.0000
Number of Sides	18	18	18	0	0
Thickness (in)	0.2500	0.1875	0.1875	0.6740	0.6740
Socket Length (ft)		3.6700			
Top Dia (in)	23.9668	20.3223	19.5000	4.5000	4.5000
Bot Dia (in)	29.5000	24.8700	20.3223	4.5000	4.5000
Grade		A572-65		A53-B-35	
Weight (K)	2.8	1.4	0.2	0.2	0.2



ALL REACTIONS ARE FACTORED



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A572-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97.00 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.00 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.00 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 83.1%

<p>CROWN CASTLE The pathway to Possible</p>	<p>Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2000 FAX:</p>		<p>Job: BU 876398</p>
	Project:	Client: Crown Castle	Drawn by: KGebremariam
	Code: TIA-222-G	Date: 05/17/22	App'd:
	Path:	Scale: NTS	Dwg No. E-1
	<p><small>C:\Users\KGebremariam\OneDrive - Crown Castle USA, Inc\Desktop\Work Area\BU876398\W02 2116116 - SA\Plot\BU876398.dwg</small></p>		

Tower Input Data

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

- Tower is located in Fairfield County, Connecticut.
- Basic wind speed of 97.00 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 1.
- Crest Height 0.0000 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50.00 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60.00 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- 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-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
--	---	---

Tapered Pole Section Geometry

Section	Elevation 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	90.0000- 82.0000	8.0000	0.000	Round	4.5000	4.5000	0.6740		A53-B-35 (35 ksi)
L2	82.0000- 74.0000	8.0000	0.000	Round	4.5000	4.5000	0.6740		A53-B-35 (35 ksi)
L3	74.0000- 67.8300	6.1700	0.000	18	19.5000	20.3223	0.1875	0.7500	A572-65 (65 ksi)

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
L4	67.8300-36.1700	31.6600	3.670	18	20.3223	24.8700	0.1875	0.7500	A572-65 (65 ksi)
L5	36.1700-0.0000	39.8400		18	23.9668	29.5000	0.2500	1.0000	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	4.5000	8.1013	15.2837	1.3735	2.2500	6.7927	30.5673	4.0482	0.0000	0
	4.5000	8.1013	15.2837	1.3735	2.2500	6.7927	30.5673	4.0482	0.0000	0
L2	4.5000	8.1013	15.2837	1.3735	2.2500	6.7927	30.5673	4.0482	0.0000	0
	4.5000	8.1013	15.2837	1.3735	2.2500	6.7927	30.5673	4.0482	0.0000	0
L3	19.7719	11.4934	541.5782	6.8559	9.9060	54.6717	1083.8689	5.7478	3.1020	16.544
	20.6069	11.9827	613.7445	7.1479	10.3237	59.4499	1228.2966	5.9925	3.2467	17.316
L4	20.6069	11.9827	613.7445	7.1479	10.3237	59.4499	1228.2966	5.9925	3.2467	17.316
	25.2247	14.6892	1130.6107	8.7623	12.6340	89.4898	2262.7090	7.3460	4.0471	21.585
L5	24.8156	18.8193	1337.3792	8.4195	12.1752	109.8450	2676.5182	9.4114	3.7782	15.113
	29.9165	23.2099	2508.7766	10.3837	14.9860	167.4080	5020.8543	11.6071	4.7520	19.008

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 Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 90.0000-82.0000				1	0	1			
L2 82.0000-74.0000				1	0	1			
L3 74.0000-67.8300				1	0	1			
L4 67.8300-36.1700				1	1	1			
L5 36.1700-0.0000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _{AA} ft ² /ft	Weight plf	
LDF5-50A(7/8)	C	No	No	Inside Pole	87.0000 - 0.0000	12	No Ice	0.0000	0.330
							1/2" Ice	0.0000	0.330
							1" Ice	0.0000	0.330
**									
LDF5-50A(7/8)	C	No	No	Inside Pole	79.0000 - 0.0000	12	No Ice	0.0000	0.330
							1/2" Ice	0.0000	0.330
							1" Ice	0.0000	0.330

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _{AA} ft ² /ft	Weight plf
**								

Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	90.0000-82.0000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.020
		D	0.000	0.000	0.000	0.000	0.000
L2	82.0000-74.0000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.051
		D	0.000	0.000	0.000	0.000	0.000
L3	74.0000-67.8300	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.049
		D	0.000	0.000	0.000	0.000	0.000
L4	67.8300-36.1700	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.251
		D	0.000	0.000	0.000	0.000	0.000
L5	36.1700-0.0000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.286
		D	0.000	0.000	0.000	0.000	0.000

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	90.0000-82.0000	A	1.651	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.020
		D		0.000	0.000	0.000	0.000	0.000
L2	82.0000-74.0000	A	1.635	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.051
		D		0.000	0.000	0.000	0.000	0.000
L3	74.0000-67.8300	A	1.619	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.049
		D		0.000	0.000	0.000	0.000	0.000
L4	67.8300-36.1700	A	1.569	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.251
		D		0.000	0.000	0.000	0.000	0.000
L5	36.1700-0.0000	A	1.408	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.286
		D		0.000	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	90.0000-82.0000	0.0000	0.0000	0.0000	0.0000
L2	82.0000-74.0000	0.0000	0.0000	0.0000	0.0000
L3	74.0000-67.8300	0.0000	0.0000	0.0000	0.0000
L4	67.8300-36.1700	0.0000	0.0000	0.0000	0.0000
L5	36.1700-0.0000	0.0000	0.0000	0.0000	0.0000

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

User Defined Loads

Description	Elevation	Offset From Centroid	Azimuth Angle	Weight	F _x	F _z	Wind Force	C _{AAc}	
	ft	ft	°	K	K	K	K	ft ²	
Flag	90.0000	0.000	0.000	No Ice	0.039	0.000	0.000	0.360	14.9134
				Ice	0.620	0.000	0.000	0.097	15.1331
				Service	0.039	0.000	0.000	0.138	16.6679

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement
			ft ft ft	°	ft

8' x 44" OD Concealment Canister	C	None		0.000	86.0000
8' x 44" OD Concealment Canister	C	None		0.000	78.0000
6.33' x 48.75" OD Concealment Canister	C	None		0.000	70.8000
** 72 **					

DHHTT65B-3XR	A	From Leg	0.5000 0.000 0.000	0.000	87.0000
DHHTT65B-3XR	B	From Leg	0.5000 0.000 0.000	0.000	87.0000
DHHTT65B-3XR	C	From Leg	0.5000 0.000 0.000	0.000	87.0000
(2) KIT-FD9R6004/1C-DL	A	From Leg	0.5000 0.000 -2.000	0.000	87.0000
(2) KIT-FD9R6004/1C-DL	B	From Leg	0.5000 0.000 -1.000	0.000	87.0000
(2) KIT-FD9R6004/1C-DL	C	From Leg	0.5000 0.000 -1.000	0.000	87.0000

MX08FRO665-21	A	From Leg	0.5000 0.000 0.000	0.000	79.0000
MX08FRO665-21	B	From Leg	0.5000 0.000 0.000	0.000	79.0000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
MX08FRO665-21	C	From Leg	0.000 0.5000 0.000 0.000	0.000	79.0000

Canister Load1	D	None		0.000	90.0000
Canister Load2	D	None		0.000	82.0000
Canister Load3	D	None		0.000	74.0000
Canister Load4	D	None		0.000	67.6700
Truck Ball	D	None		0.000	90.7500

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 45 deg - No Ice
5	0.9 Dead+1.6 Wind 45 deg - No Ice
6	1.2 Dead+1.6 Wind 90 deg - No Ice
7	0.9 Dead+1.6 Wind 90 deg - No Ice
8	1.2 Dead+1.6 Wind 135 deg - No Ice
9	0.9 Dead+1.6 Wind 135 deg - No Ice
10	1.2 Dead+1.6 Wind 180 deg - No Ice
11	0.9 Dead+1.6 Wind 180 deg - No Ice
12	1.2 Dead+1.6 Wind 225 deg - No Ice
13	0.9 Dead+1.6 Wind 225 deg - No Ice
14	1.2 Dead+1.6 Wind 270 deg - No Ice
15	0.9 Dead+1.6 Wind 270 deg - No Ice
16	1.2 Dead+1.6 Wind 315 deg - No Ice
17	0.9 Dead+1.6 Wind 315 deg - No Ice
18	1.2 Dead+1.0 Ice+1.0 Temp
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
20	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
21	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
22	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
23	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
24	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
25	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
26	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 45 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 135 deg - Service
31	Dead+Wind 180 deg - Service
32	Dead+Wind 225 deg - Service
33	Dead+Wind 270 deg - Service
34	Dead+Wind 315 deg - Service

Maximum Member Forces

Sectio n No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	90 - 82	Pole	Max Tension	2	0.000	0.000	-0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	82 - 74	Pole	Max. Compression	18	-2.517	-0.160	0.160
			Max. Mx	6	-0.640	-7.944	0.034
			Max. My	2	-0.640	-0.034	7.944
			Max. Vy	6	1.000	-7.944	0.034
			Max. Vx	2	-1.000	-0.034	7.944
			Max. Torque	26			-0.005
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	18	-5.233	-0.355	0.355
			Max. Mx	6	-1.723	-21.534	0.084
			Max. My	2	-1.723	-0.084	21.534
L3	74 - 67.83	Pole	Max. Vy	6	1.707	-14.773	0.083
			Max. Vx	2	-1.707	-0.083	14.773
			Max. Torque	26			-0.010
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	18	-6.995	-0.358	0.358
			Max. Mx	6	-2.525	-35.702	0.084
			Max. My	2	-2.525	-0.084	35.702
			Max. Vy	6	2.301	-35.702	0.084
			Max. Vx	2	-2.301	-0.084	35.702
			Max. Torque	26			-0.010
L4	67.83 - 36.17	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	18	-10.851	-0.348	0.348
			Max. Mx	6	-4.754	-124.029	0.086
			Max. My	2	-4.754	-0.086	124.029
			Max. Vy	6	3.727	-124.029	0.086
			Max. Vx	2	-3.727	-0.086	124.029
			Max. Torque	26			-0.010
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	18	-17.004	-0.323	0.323
			Max. Mx	6	-8.844	-303.586	0.087
L5	36.17 - 0	Pole	Max. My	2	-8.844	-0.087	303.586
			Max. Vy	6	5.296	-303.586	0.087
			Max. Vx	2	-5.296	-0.087	303.586
			Max. Torque	26			-0.010

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	18	17.004	0.001	-0.001
	Max. H _x	15	6.635	5.291	-0.000
	Max. H _z	3	6.635	0.000	5.291
	Max. M _x	2	303.586	0.000	5.291
	Max. M _z	6	303.586	-5.291	-0.000
	Max. Torsion	22	0.010	-1.229	-1.229
	Min. Vert	7	6.635	-5.291	-0.000
	Min. H _x	7	6.635	-5.291	-0.000
	Min. H _z	11	6.635	0.000	-5.291
	Min. M _x	10	-303.413	0.000	-5.291
	Min. M _z	14	-303.413	5.291	-0.000
	Min. Torsion	26	-0.010	1.229	1.229

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	7.373	-0.000	0.000	-0.067	-0.067	0.000

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
1.2 Dead+1.6 Wind 0 deg - No Ice	8.847	-0.000	-5.291	-303.586	-0.087	0.006
0.9 Dead+1.6 Wind 0 deg - No Ice	6.635	-0.000	-5.291	-301.717	-0.064	0.004
1.2 Dead+1.6 Wind 45 deg - No Ice	8.847	3.742	-3.742	-214.735	-214.735	0.000
0.9 Dead+1.6 Wind 45 deg - No Ice	6.635	3.742	-3.742	-213.394	-213.394	0.000
1.2 Dead+1.6 Wind 90 deg - No Ice	8.847	5.291	0.000	-0.087	-303.586	-0.006
0.9 Dead+1.6 Wind 90 deg - No Ice	6.635	5.291	0.000	-0.064	-301.717	-0.004
1.2 Dead+1.6 Wind 135 deg - No Ice	8.847	3.742	3.742	214.561	-214.735	-0.008
0.9 Dead+1.6 Wind 135 deg - No Ice	6.635	3.742	3.742	213.266	-213.394	-0.006
1.2 Dead+1.6 Wind 180 deg - No Ice	8.847	-0.000	5.291	303.413	-0.087	-0.006
0.9 Dead+1.6 Wind 180 deg - No Ice	6.635	-0.000	5.291	301.589	-0.064	-0.004
1.2 Dead+1.6 Wind 225 deg - No Ice	8.847	-3.742	3.742	214.561	214.561	0.000
0.9 Dead+1.6 Wind 225 deg - No Ice	6.635	-3.742	3.742	213.266	213.266	0.000
1.2 Dead+1.6 Wind 270 deg - No Ice	8.847	-5.291	0.000	-0.087	303.413	0.006
0.9 Dead+1.6 Wind 270 deg - No Ice	6.635	-5.291	0.000	-0.064	301.589	0.004
1.2 Dead+1.6 Wind 315 deg - No Ice	8.847	-3.742	-3.742	-214.735	214.561	0.008
0.9 Dead+1.6 Wind 315 deg - No Ice	6.635	-3.742	-3.742	-213.394	213.266	0.006
1.2 Dead+1.0 Ice+1.0 Temp	17.004	-0.001	0.001	-0.323	-0.323	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	17.004	-0.000	-1.738	-100.948	-0.391	0.007
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	17.004	1.229	-1.229	-71.496	-71.496	0.000
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	17.004	1.738	0.000	-0.391	-100.948	-0.007
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	17.004	1.229	1.229	70.697	-71.479	-0.010
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	17.004	-0.000	1.738	100.142	-0.391	-0.007
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	17.004	-1.229	1.229	70.697	70.697	-0.000
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	17.004	-1.738	0.000	-0.391	100.142	0.007
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	17.004	-1.229	-1.229	-71.479	70.697	0.010
Dead+Wind 0 deg - Service	7.373	-0.000	-1.146	-66.068	-0.072	0.001
Dead+Wind 45 deg - Service	7.373	0.810	-0.810	-46.738	-46.738	0.000
Dead+Wind 90 deg - Service	7.373	1.146	0.000	-0.072	-66.068	-0.001
Dead+Wind 135 deg - Service	7.373	0.810	0.810	46.595	-46.738	-0.002
Dead+Wind 180 deg - Service	7.373	-0.000	1.146	65.925	-0.072	-0.001
Dead+Wind 225 deg - Service	7.373	-0.810	0.810	46.595	46.595	0.000
Dead+Wind 270 deg - Service	7.373	-1.146	0.000	-0.072	65.925	0.001
Dead+Wind 315 deg - Service	7.373	-0.810	-0.810	-46.738	46.595	0.002

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-7.373	0.000	0.000	7.373	-0.000	0.001%
2	0.000	-8.847	-5.292	0.000	8.847	5.291	0.010%
3	0.000	-6.635	-5.292	0.000	6.635	5.291	0.009%
4	3.742	-8.847	-3.742	-3.742	8.847	3.742	0.003%
5	3.742	-6.635	-3.742	-3.742	6.635	3.742	0.002%
6	5.292	-8.847	0.000	-5.291	8.847	-0.000	0.010%
7	5.292	-6.635	0.000	-5.291	6.635	-0.000	0.009%
8	3.742	-8.847	3.742	-3.742	8.847	-3.742	0.003%
9	3.742	-6.635	3.742	-3.742	6.635	-3.742	0.002%
10	0.000	-8.847	5.292	0.000	8.847	-5.291	0.010%
11	0.000	-6.635	5.292	0.000	6.635	-5.291	0.009%
12	-3.742	-8.847	3.742	3.742	8.847	-3.742	0.003%
13	-3.742	-6.635	3.742	3.742	6.635	-3.742	0.002%
14	-5.292	-8.847	0.000	5.291	8.847	-0.000	0.010%
15	-5.292	-6.635	0.000	5.291	6.635	-0.000	0.009%
16	-3.742	-8.847	-3.742	3.742	8.847	3.742	0.003%
17	-3.742	-6.635	-3.742	3.742	6.635	3.742	0.002%
18	0.000	-17.004	0.000	0.001	17.004	-0.001	0.005%
19	0.000	-17.004	-1.738	0.000	17.004	1.738	0.002%
20	1.229	-17.004	-1.229	-1.229	17.004	1.229	0.002%
21	1.738	-17.004	0.000	-1.738	17.004	-0.000	0.002%
22	1.229	-17.004	1.229	-1.229	17.004	-1.229	0.003%
23	0.000	-17.004	1.738	0.000	17.004	-1.738	0.003%
24	-1.229	-17.004	1.229	1.229	17.004	-1.229	0.003%
25	-1.738	-17.004	0.000	1.738	17.004	-0.000	0.003%
26	-1.229	-17.004	-1.229	1.229	17.004	1.229	0.003%
27	0.000	-7.373	-1.147	0.000	7.373	1.146	0.009%
28	0.811	-7.373	-0.811	-0.810	7.373	0.810	0.009%
29	1.147	-7.373	0.000	-1.146	7.373	-0.000	0.009%
30	0.811	-7.373	0.811	-0.810	7.373	-0.810	0.009%
31	0.000	-7.373	1.147	0.000	7.373	-1.146	0.009%
32	-0.811	-7.373	0.811	0.810	7.373	-0.810	0.009%
33	-1.147	-7.373	0.000	1.146	7.373	-0.000	0.009%
34	-0.811	-7.373	-0.811	0.810	7.373	0.810	0.009%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	15	0.00013256	0.00013005
3	Yes	15	0.00009474	0.00011233
4	Yes	17	0.00000001	0.00010396
5	Yes	17	0.00000001	0.00008650
6	Yes	15	0.00013256	0.00013005
7	Yes	15	0.00009474	0.00011233
8	Yes	17	0.00000001	0.00010350
9	Yes	17	0.00000001	0.00008622
10	Yes	15	0.00013252	0.00012978
11	Yes	15	0.00009472	0.00011216
12	Yes	17	0.00000001	0.00010304
13	Yes	17	0.00000001	0.00008593
14	Yes	15	0.00013252	0.00012978
15	Yes	15	0.00009472	0.00011216
16	Yes	17	0.00000001	0.00010350
17	Yes	17	0.00000001	0.00008622
18	Yes	8	0.00000001	0.00003347
19	Yes	17	0.00000001	0.00003493
20	Yes	17	0.00000001	0.00004307
21	Yes	17	0.00000001	0.00003493
22	Yes	16	0.00000001	0.00007140
23	Yes	16	0.00000001	0.00005751
24	Yes	16	0.00000001	0.00006927
25	Yes	16	0.00000001	0.00005751
26	Yes	16	0.00000001	0.00007140
27	Yes	13	0.00000001	0.00011097
28	Yes	13	0.00000001	0.00010390
29	Yes	13	0.00000001	0.00011097
30	Yes	13	0.00000001	0.00010334
31	Yes	13	0.00000001	0.00011004
32	Yes	13	0.00000001	0.00010278
33	Yes	13	0.00000001	0.00011004
34	Yes	13	0.00000001	0.00010334

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	90 - 82	6.744	28	1.082	0.000
L2	82 - 74	5.007	28	0.945	0.000
L3	74 - 67.83	3.782	28	0.441	0.000
L4	67.83 - 36.17	3.224	28	0.422	0.000
L5	39.84 - 0	1.173	28	0.261	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.7500	Truck Ball	28	6.744	1.082	0.000	2080
90.0000	Canister Load1	28	6.744	1.082	0.000	2080
87.0000	DHHTT65B-3XR	28	6.060	1.075	0.000	2080
86.0000	8' x 44" OD Concealment Canister	28	5.838	1.065	0.000	2080
82.0000	Canister Load2	28	5.007	0.945	0.000	1414
79.0000	MX08FRO665-21	28	4.473	0.750	0.000	1227
78.0000	8' x 44" OD Concealment Canister	28	4.314	0.677	0.000	1202
74.0000	Canister Load3	28	3.782	0.441	0.000	1323

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
70.8000	6.33' x 48.75" OD Concealment Canister	28	3.468	0.396	0.000	2383
67.6700	Canister Load4	28	3.211	0.423	0.000	10465

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	90 - 82	30.485	4	4.803	0.002
L2	82 - 74	22.784	4	4.212	0.001
L3	74 - 67.83	17.294	4	2.010	0.000
L4	67.83 - 36.17	14.750	4	1.923	0.000
L5	39.84 - 0	5.379	4	1.197	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.7500	Truck Ball	4	30.485	4.803	0.002	487
90.0000	Canister Load1	4	30.485	4.803	0.002	487
87.0000	DHHTT65B-3XR	4	27.459	4.773	0.002	487
86.0000	8' x 44" OD Concealment Canister	4	26.474	4.731	0.002	487
82.0000	Canister Load2	4	22.784	4.212	0.001	330
79.0000	MX08FRO665-21	4	20.401	3.363	0.001	284
78.0000	8' x 44" OD Concealment Canister	4	19.691	3.043	0.001	278
74.0000	Canister Load3	4	17.294	2.010	0.000	303
70.8000	6.33' x 48.75" OD Concealment Canister	4	15.867	1.814	0.000	544
67.6700	Canister Load4	4	14.691	1.930	0.000	2367

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	90 - 82 (1)	TP4.5x4.5x0.674	8.0000	0.0000	0.0	8.1013	-0.640	255.191	0.003
L2	82 - 74 (2)	TP4.5x4.5x0.674	8.0000	0.0000	0.0	8.1013	-1.723	255.191	0.007
L3	74 - 67.83 (3)	TP20.3223x19.5x0.1875	6.1700	0.0000	0.0	11.982	-2.525	873.907	0.003
L4	67.83 - 36.17 (4)	TP24.87x20.3223x0.1875	31.660	0.0000	0.0	14.375	-4.754	990.982	0.005
L5	36.17 - 0 (5)	TP29.5x23.9668x0.25	39.840	0.0000	0.0	23.209	-8.844	1651.140	0.005

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux}	ϕM_{nx}	Ratio	M_{uy}	ϕM_{ny}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L1	90 - 82 (1)	TP4.5x4.5x0.674	7.960	26.167	0.304	0.000	26.167	0.000
L2	82 - 74 (2)	TP4.5x4.5x0.674	21.573	26.167	0.824	0.000	26.167	0.000
L3	74 - 67.83 (3)	TP20.3223x19.5x0.1875	35.745	361.310	0.099	0.000	361.310	0.000
L4	67.83 - 36.17 (4)	TP24.87x20.3223x0.1875	124.091	492.281	0.252	0.000	492.281	0.000
L5	36.17 - 0 (5)	TP29.5x23.9668x0.25	303.681	992.442	0.306	0.000	992.442	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u	ϕV_n	Ratio	Actual T_u	ϕT_n	Ratio
			K	K	$\frac{V_u}{\phi V_n}$	kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	90 - 82 (1)	TP4.5x4.5x0.674	1.001	127.595	0.008	0.000	35.662	0.000
L2	82 - 74 (2)	TP4.5x4.5x0.674	1.679	127.595	0.013	0.000	35.662	0.000
L3	74 - 67.83 (3)	TP20.3223x19.5x0.1875	2.303	436.954	0.005	0.000	724.518	0.000
L4	67.83 - 36.17 (4)	TP24.87x20.3223x0.1875	3.728	495.491	0.008	0.000	986.925	0.000
L5	36.17 - 0 (5)	TP29.5x23.9668x0.25	5.296	825.568	0.006	0.000	1989.875	0.000

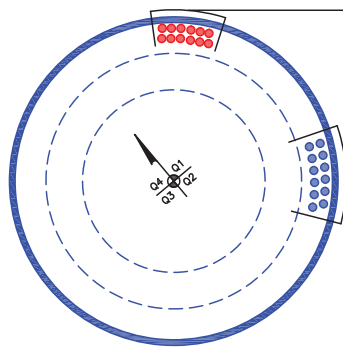
Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L1	90 - 82 (1)	0.003	0.304	0.000	0.008	0.000	0.307	1.000	4.8.2
L2	82 - 74 (2)	0.007	0.824	0.000	0.013	0.000	0.831	1.000	4.8.2
L3	74 - 67.83 (3)	0.003	0.099	0.000	0.005	0.000	0.102	1.000	4.8.2
L4	67.83 - 36.17 (4)	0.005	0.252	0.000	0.008	0.000	0.257	1.000	4.8.2
L5	36.17 - 0 (5)	0.005	0.306	0.000	0.006	0.000	0.311	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	90 - 82	Pole	TP4.5x4.5x0.674	1	-0.640	255.191	30.7	Pass
L2	82 - 74	Pole	TP4.5x4.5x0.674	2	-1.723	255.191	83.1	Pass
L3	74 - 67.83	Pole	TP20.3223x19.5x0.1875	3	-2.525	873.907	10.2	Pass
L4	67.83 - 36.17	Pole	TP24.87x20.3223x0.1875	4	-4.754	990.982	25.7	Pass
L5	36.17 - 0	Pole	TP29.5x23.9668x0.25	5	-8.844	1651.140	31.1	Pass
Summary								
Pole (L2)							83.1	Pass
RATING =							83.1	Pass

APPENDIX B
BASE LEVEL DRAWING



(PROPOSED EQUIPMENT CONFIGURATION)
(12) 7/8" TO 79 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(12) 7/8" TO 87 FT LEVEL

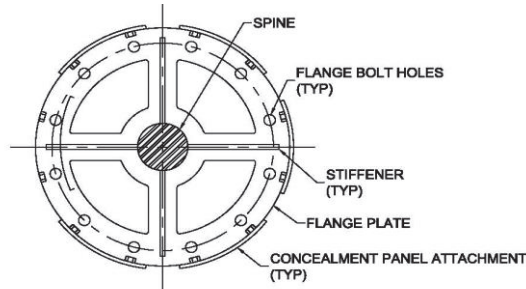
APPENDIX C
ADDITIONAL CALCULATIONS

CCI Flagpole Tool



Site Data	
BU#:	876398
Site Name:	Fairfield 2 /Sun Reality
Order #:	612119 Rev # 4

Code	
Code:	TIA-222-G
Ice Thickness:	0.75 in
Windspeed (V):	97 mph
Ice Wind Speed (V):	50 mph
Exposure Category:	B
Topographic Feature:	N/A
Structure Class:	II



FLANGE PLATE
(TYPE 2: SOLIDITY RATIO 0.75)

Tower Information	
Total Tower Height:	90 ft
Base Tower Height:	67.67 ft
Total Canister Length:	22.33 ft
Number of Canister Assembly Sections:	3

Canister Section Number ¹ :	Canister Assembly Length (ft):	Canister Assembly Diameter (in):	Ventilated Canister:	Manufacturer ² :	Number of Sides Canister Section	Plate Type:	Mating Flange Plate Thickness (in) ³ :	Mating Flange Plate Diameter (in):	Solidity Ratio	Plate Weight (Kip):	Canister Weight (Kip)	Vent Length (ft):
1	8	44	No		Round	2	1.50	19.5	0.75	0.191	0.184	0-0
2	8	44	No		Round	2	1.50	20.5	0.75	0.211	0.184	0-0
3	6.33	48.75	No		Round	2	0.38	48.75	0.75	0.302	0.162	0-0

¹ Sections are numbered from the top of the tower down

² Select manufacturer if available for vented canister. Leave blank to autocalculate Cf values.

³ Mating Flange Plate Thickness at the bottom of canister section

Flag on Tower:	Yes
Flag Width:	25 ft
Flag Height:	15 ft
Flag Elevation(z):	90 ft

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

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

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Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material	Delete
90	8	0	0	4.5	4.5	0.674	n/a	A53-B-35	[x]
82	8	0	0	4.5	4.5	0.674	n/a	A53-B-35	[x]
74	6.17	0	18	19.5	20.3223	0.1875	0.75	A572-65	[x]
67.83	31.66	3.67	18	20.3223	24.87	0.1875	0.75	A572-65	[x]
39.84	39.84	0	18	23.966835	29.5	0.25	1	A572-65	[x]

Discrete Loads: Truck Ball	Apply $C_a A_A$ at Elevation(z) (ft)	$C_a A_A$ No Ice (ft ²)	$C_a A_A$ 1/2" Ice (ft ²)	$C_a A_A$ 1" Ice (ft ²)	$C_a A_A$ 2" Ice (ft ²)	$C_a A_A$ 4" Ice (ft ²)	Weight No Ice (Kip)	Weight 1/2" Ice (Kip)
		90.75	0.884	1.378	1.527	1.848	2.581	0.05

Discrete Loads : $C_r A_F$ for Canister Assembly								
Canister Loading	Apply $C_r A_F$ at Elevation(z) (ft)	$C_r A_F$ No Ice (ft ²)	$C_r A_F$ 1/2" Ice (ft ²)	$C_r A_F$ 1" Ice (ft ²)	$C_r A_F$ 2" Ice (ft ²)	$C_r A_F$ 4" Ice (ft ²)	Canister Assembly Weight No Ice (Kip)	Canister Assembly Weight 1/2" Ice (Kip)
	Canister Load 1	90	8.800	18.000	18.400	19.200	20.800	0.092
Canister Load 2	82	17.600	36.000	36.800	38.400	41.600	0.375	0.592
Canister Load 3	74	16.515	33.746	34.462	35.895	38.761	0.384	0.587
Canister Load 4	67.67	7.715	15.746	16.062	16.695	17.961	0.382	0.478

User Forces: Flag Force Calculation Per ANSI/NAAMM FP 1001-07	
Wind _{FORCE} =	0.360 Kip
Weight=	0.039 Kip
Wind _{FORCE, ICE} =	0.097 Kip
Weight _{ICE} =	0.620 Kip
W _{FORCE, SERVICE WIND} =	0.138 Kip
Weight=	0.039 Kip

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

Monopole Flange Plate Connection

Elevation = 74 ft.

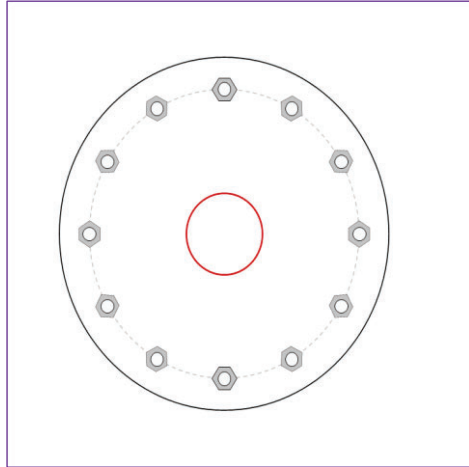


BU #	876398
Site Name	IRFIELD 2 / SUN REALT
Order #	

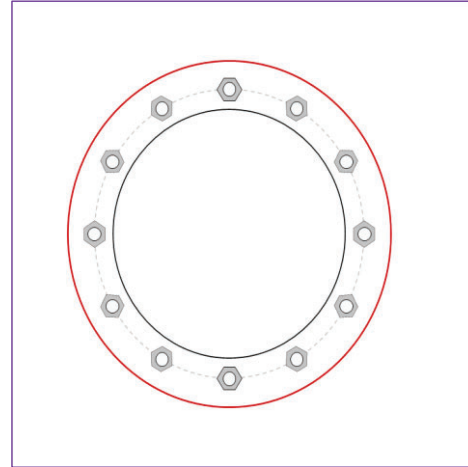
Applied Loads	
Moment (kip-ft)	21.57
Axial Force (kips)	1.72
Shear Force (kips)	1.68

TIA-222 Revision	G
------------------	---

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(12) 3/4" ϕ bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 16" BC

Top Plate Data

19.5" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

13.75" ID x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

4.5" x 0.674" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Bottom Pole Data

19.5" x 0.1875" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	5.25
Allowable (kips)	30.06
Stress Rating:	17.4% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	N/A
Tension Side Stress Rating:	N/A

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	N/A
Tension Side Stress Rating:	N/A

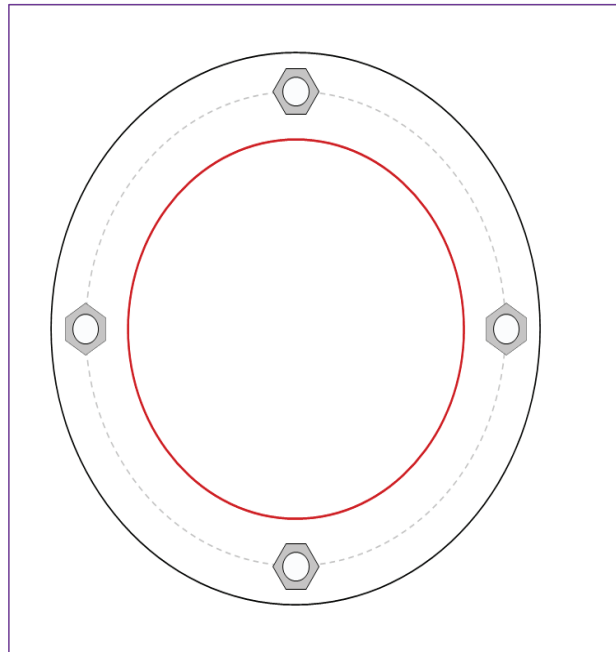
Monopole Base Plate Connection



Site Info	
BU #	876398
Site Name	IRFIELD 2 / SUN REALTY
Order #	

Analysis Considerations	
TIA-222 Revision	G
Grout Considered:	No
l_{ar} (in)	1.25
Eta Factor, η	0.5

Applied Loads	
Moment (kip-ft)	303.68
Axial Force (kips)	8.84
Shear Force (kips)	5.30



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

Anchor Rod Data
(4) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 37" BC
Base Plate Data
43" OD x 1.5" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)
Stiffener Data
N/A
Pole Data
29.5" x 0.25" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary		<i>(units of kips, kip-in)</i>	
$P_{u,c} = 100.55$	$\phi P_{n,t} = 260$		Stress Rating
$V_u = 1.32$	$\phi V_n = n/a$		39.7%
$M_u = n/a$	$\phi M_n = n/a$		Pass
Base Plate Summary			
Max Stress (ksi):	30.02		(Flexural)
Allowable Stress (ksi):	54		
Stress Rating:	55.6%		Pass

Drilled Pier Foundation

BU # :	876398
Site Name:	FAIRFIELD 2 / SUN REALTY
Order Number:	612119 Rev # 4
TIA-222 Revision:	G
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	304	
Axial Force (kips)	9	
Shear Force (kips)	5	

Material Properties	
Concrete Strength, f _c :	4 ksi
Rebar Strength, F _y :	60 ksi
Tie Yield Strength, F _y :	60 ksi

Pier Design Data	
Depth	14 ft
Ext. Above Grade	1 ft
Pier Section 1	
<i>From 1' above grade to 14' below grade</i>	
Pier Diameter	5 ft
Rebar Quantity	12
Rebar Size	8
Clear Cover to Ties	4 in
Tie Size	5
Tie Spacing	12 in

[Rebar & Pier Options](#)

[Embedded Pole Inputs](#)

[Rebar Pier Inputs](#)

Analysis Results		
Soil Lateral Check		
	Compression	Uplift
D _{reqd} (ft from TOC)	5.24	-
Soil Safety Factor	4.14	-
Max Moment (kip-ft)	329.84	-
Rating	32.1%	-
Soil Vertical Check		
	Compression	Uplift
Skin Friction (kips)	37.11	-
End Bearing (kips)	1178.10	-
Weight of Concrete (kips)	45.66	-
Total Capacity (kips)	1215.21	-
Axial (kips)	54.66	-
Rating	4.5%	-
Reinforced Concrete Flexure		
	Compression	Uplift
Critical Depth (ft from TOC)	5.06	-
Critical Moment (kip-ft)	329.73	-
Critical Moment Capacity	1147.53	-
Rating	28.7%	-
Reinforced Concrete Shear		
	Compression	Uplift
Critical Depth (ft from TOC)	11.08	-
Critical Shear (kip)	72.33	-
Critical Shear Capacity	399.50	-
Rating	18.1%	-
Structural Foundation Rating		28.7%
Soil Interaction Rating		32.1%

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

[Go to Soil Calculations](#)

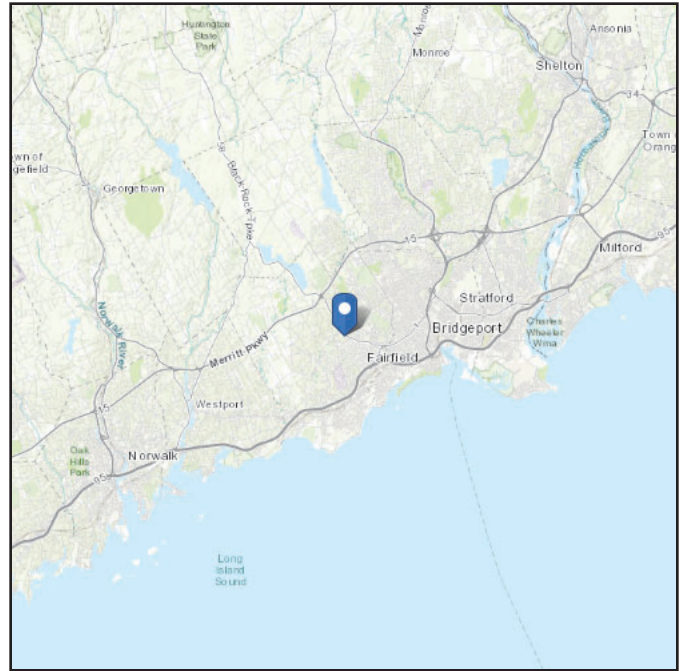
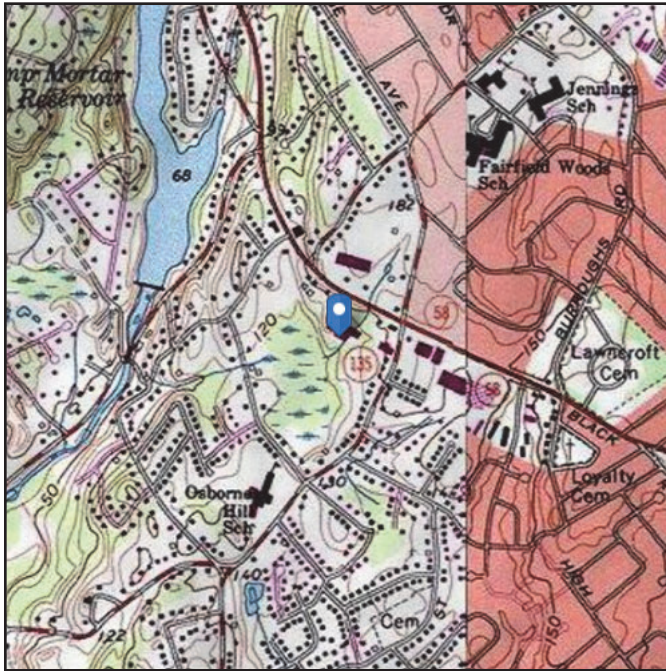
Soil Profile														
Groundwater Depth		9		# of Layers		3								
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ _{soil} (pcf)	γ _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.5	3.5	125	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.5	9	5.5	125	150	0	36	0.000	0.000	0.30	0.30			Cohesionless
3	9	14	5	65	87.6	0	36	0.000	0.000	0.30	0.30	80		Cohesionless

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 135.74 ft (NAVD 88)
Latitude: 41.181203
Longitude: -73.254081



Wind

Results:

Wind Speed:	122 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph

Data Source: ASCE/SEI 2010, 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.

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: Fri Apr 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.

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

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



BU: 876398
 WO: 2116116
 Order: 612119

Structure: A
 Rev: 4

Location					
	Decimal Degrees	Deg	Min	Sec	
Lat:	41.181203	+	41	10	52.33
Long:	-73.254081	-	73	15	14.69

Code and Site Parameters	
Seismic Design Code:	ASCE 7-10
Site Soil:	D Stiff Soil (Default)
Risk Category:	II
<u>USGS Seismic Reference</u>	
S_S :	0.2150 g
S_1 :	0.0650 g
T_L :	6 s

Seismic Design Category Determination	
Importance Factor, I_e :	1
Acceleration-based site coefficient, F_a :	1.6000
Velocity-based site coefficient, F_v :	2.4000
Design spectral response acceleration short period, S_{DS} :	0.2293 g
Design spectral response acceleration 1 s period, S_{D1} :	0.1040 g
Seismic Design Category Based on S_{DS} :	B
Seismic Design Category Based on S_{D1} :	B
Seismic Design Category Based on S_1 :	N/A
Controlling Seismic Design Category:	B

Exhibit E

Power Density/RF Emissions Report

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

Dish Wireless Existing Facility

Site ID: NJJER01143A

876398

**2189-2215 Black Rock Turnpike
Fairfield, Connecticut 06432**

September 9, 2021

EBI Project Number: 6221004864

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	14.17%

September 9, 2021

Dish Wireless

Emissions Analysis for Site: NJJER01143A - 876398

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **2189-2215 Black Rock Turnpike in Fairfield, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully

aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless Wireless antenna facility located at 2189-2215 Black Rock Turnpike in Fairfield, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 4 n71 channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 4 n70 channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 3) 4 n66 channels (AWS Band - 2190 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 5) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative

estimate as gain reductions for these particular antennas are typically much higher in this direction.

- 6) The antennas used in this modeling are the JMA MX08FRO665-20 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector A, the JMA MX08FRO665-20 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector B, the JMA MX08FRO665-20 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antenna mounting height centerline of the proposed antennas is 79 feet above ground level (AGL).
- 8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 9) All calculations were done with respect to uncontrolled / general population threshold limits.

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-20	Make / Model:	JMA MX08FRO665-20	Make / Model:	JMA MX08FRO665-20
Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz
Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd
Height (AGL):	79 feet	Height (AGL):	79 feet	Height (AGL):	79 feet
Channel Count:	12	Channel Count:	12	Channel Count:	12
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	5,236.31	ERP (W):	5,236.31	ERP (W):	5,236.31
Antenna AI MPE %:	4.44%	Antenna BI MPE %:	4.44%	Antenna CI MPE %:	4.44%

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	4.44%
Nextel	1.2%
Sprint	8.25%
Clearwire	0.28%
Site Total MPE % :	14.17%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	4.44%
Dish Wireless Sector B Total:	4.44%
Dish Wireless Sector C Total:	4.44%
Site Total MPE % :	14.17%

Dish Wireless Maximum MPE Power Values (Sector A)							
Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	79.0	6.04	600 MHz n71	400	1.51%
Dish Wireless 1900 MHz n70	4	542.70	79.0	14.65	1900 MHz n70	1000	1.46%
Dish Wireless 2190 MHz n66	4	542.70	79.0	14.65	2190 MHz n66	1000	1.46%
						Total:	4.44%

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

Summary

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

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


Dish Wireless Sector	Power Density Value (%)
Sector A:	4.44%
Sector B:	4.44%
Sector C:	4.44%
Dish Wireless Maximum MPE % (Sector A):	4.44%
Site Total:	14.17%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **14.17%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Exhibit F

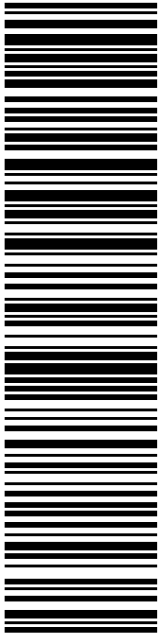
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CROWN CASTLE
STE 320
4545 E RIVER RD
W HENRIETTA NY 14586-9024


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420 MAIN ST
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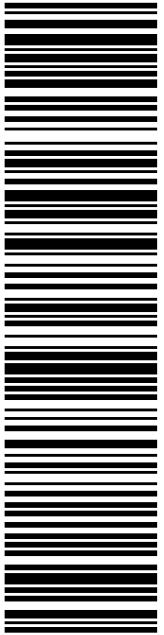


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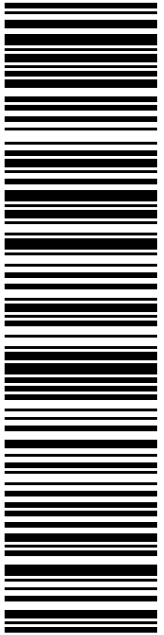
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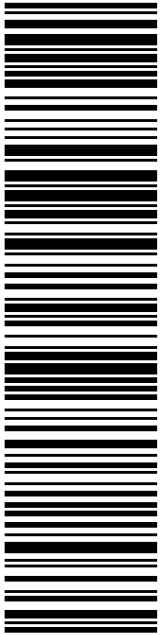


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SAN ANTONIO TX 78279-0830

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FARMINGTON, CT 06032-9998
(800)275-8777

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Product	Qty	Unit Price	Price
Prepaid Mail	1		\$0.00
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Weight: 0 lb 1.90 oz			
Acceptance Date: Mon 08/22/2022			
Tracking #: 9405 5036 9930 0326 0500 16			
Prepaid Mail	1		\$0.00
Fairfield, CT 06824			
Weight: 0 lb 7.80 oz			
Acceptance Date: Mon 08/22/2022			
Tracking #: 9405 5036 9930 0326 0500 54			
Prepaid Mail	1		\$0.00
Fairfield, CT 06824			
Weight: 0 lb 7.80 oz			
Acceptance Date: Mon 08/22/2022			
Tracking #: 9405 5036 9930 0326 0500 30			
Prepaid Mail	1		\$0.00
San Antonio, TX 78279			
Weight: 0 lb 7.80 oz			
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