



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

September 22, 2021

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

RE: Tower Share Application
319 Peter Green Road, Tolland CT 06084
Latitude: 41.896614
Longitude: 72.39373056
Site# 846293_Crown_Dish

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 319 Peter Green Road, Tolland, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 5G MHz antenna and six (6) RRUs, at the 100-foot level of the existing 119-foot monopole tower, one (1) Fiber cables will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7x5 lease area. Included are plans by B + T Group, dated August 15, 2021 Exhibit C. Also included is a structural analysis prepared by Crown Castle, dated May 30, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. This facility was approved by Connecticut Siting Council, Docket No. 276 on October 26, 2004. Please see attached Exhibit A.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to The Honorable Tammy Nuccio, Chairperson Town Council, for the Town of Tolland, David Corcoran, Director of Planning and Zoning, as well as the tower owner (Crown Castle) and property owner (ATT Mobility)

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the tower is 119-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 100-feet.
2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.



3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 9.38% as evidenced by Exhibit F.

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, Dish Wireless LLC respectfully indicates that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting Dish Wireless LLC proposed loading. The structural analysis is included as Exhibit D.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this support tower in Tolland. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish Wireless LLC to obtain a building permit for the proposed installation. Further, a Letter of Authorization is included as Exhibit G, authorizing Dish Wireless LLC to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 100-foot level of the existing 119-foot tower would have an insignificant visual impact on the area around the tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. Dish Wireless LLC will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist Dish Wireless LLC with this tower sharing application.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Dish Wireless LLC proposed loading. Dish Wireless LLC is not aware of any public safety concerns relative to the proposed sharing of the existing tower. Dish Wireless LLC intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Tolland.

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: The Honorable Tammy Nuccio, Chairperson Town Council
Town of Tolland
21 Tolland Green, Tolland CT 06084

David Corcoran – Director of Planning and Zoning
Town of Tolland
21 Tolland Green, Tolland CT 06084
Attn: Town Planning Office

Mark Krechko – Property Owner
ATTN: ATT Mobility
575 Morosgo Dr NE Suite 12 East T, Atlanta GA 30324

Crown Castle, Tower Owner

Exhibit A

Original Facility Approval

DOCKET NO. 276 – AT&T Wireless PCS, LLC d/b/a AT&T Wireless application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 319 Peter Green Road or 455 Crystal Lake Road, Tolland, Connecticut.	}	Connecticut
	}	Siting
	}	Council
		October 26, 2004

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to AT&T Wireless PCS, LLC d/b/a AT&T Wireless, hereinafter referred to as the Certificate Holder, for a telecommunications facility at Site A, located at 319 Peter Green Road, Tolland, Connecticut. The Council denies certification of Site B, located at 455 Crystal Lake Road, Tolland, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T Wireless and other entities, both public and private, but such tower shall not exceed a height of 120 feet above ground level. The height at the top of the antennas shall not exceed 123 feet above ground level.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Tolland for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
 - a. a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment building, access road, utility line, and landscaping; and
 - b. construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case

modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
6. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.
7. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.
8. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.
9. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved. Any request for extension of this period shall be filed with the Council not later than sixty days prior to expiration date of this Certificate and shall be served on all parties and intervenors and the Town of Tolland, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

Pursuant to General Statutes § 16-50p, the Council hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Hartford Courant and the Journal Inquirer.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

Exhibit B

Property Card

319 PETER GREEN ROAD

Location 319 PETER GREEN ROAD

Mblu 9/ 1/ 16/ 1

Acct# 7099

Owner KRECHKO MARK ETAL

Assessment \$435,200

Appraisal \$621,800

PID 184572

Building Count 2

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2019	\$73,200	\$548,600	\$621,800

Assessment			
Valuation Year	Improvements	Land	Total
2019	\$51,200	\$384,000	\$435,200

Owner of Record

Owner	KRECHKO MARK ETAL	Sale Price	\$0
Co-Owner	ATTN NREA TAX	Certificate	
Address	AT&T MOBILITY 575 MOROSGO DR NE SU 12 EAST T ATLANTA, GA 30324-3300	Book & Page	1042/0294
		Sale Date	09/26/2006

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
KRECHKO MARK ETAL	\$0		1042/0294	09/26/2006

Building Information

Building 1 : Section 1

Year Built: 2006
Living Area: 240
Replacement Cost: \$29,640
Building Percent Good: 92
**Replacement Cost
Less Depreciation:** \$27,300

Building Attributes

Field	Description
Style:	Communications Bld
Model	Ind/Comm
Grade	Average
Stories:	1
Occupancy	1.00
Ext Wall 1	Poly-Steel/Con
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar & Gravel
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Hot Air-no Duc
AC Type	Heat Pump
Struct Class	
Bldg Use	Industrial
Total Rooms	1
Total Bedrms	0
Total Baths	0
Solar	
1st Floor Use:	
Heat/AC	Heat/AC Pkg
Frame Type	Masonry
Baths/Plumbing	None
Ceiling/Wall	None
Rooms/Prtns	Light
Wall Height	8.00
% Comn Wall	0.00

Building Photo



(<http://images.vgsi.com/photos/TollandCTPhotos/\00\00\62\96.jpg>)

Building Layout



(http://images.vgsi.com/photos/TollandCTPhotos//Sketches/184572_6674.j)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	Main Floor	240	240
		240	240

Building 2 : Section 1

Year Built: 2008
Living Area: 360
Replacement Cost: \$44,460
Building Percent Good: 92
Replacement Cost Less Depreciation: \$40,900

Building Attributes : Bldg 2 of 2	
Field	Description
Style:	Communications Bld

Model	Ind/Comm
Grade	Average
Stories:	1
Occupancy	1.00
Ext Wall 1	Poly-Steel/Con
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar & Gravel
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Hot Air-no Duc
AC Type	Heat Pump
Struct Class	
Bldg Use	Industrial
Total Rooms	
Total Bedrms	
Total Baths	
Solar	
1st Floor Use:	
Heat/AC	Heat/AC Pkg
Frame Type	Masonry
Baths/Plumbing	None
Ceiling/Wall	None
Rooms/Prtns	Light
Wall Height	8.00
% Comn Wall	

Building Photo



(<http://images.vgsi.com/photos/TollandCTPhotos/default.jpg>)

Building Layout



(http://images.vgsi.com/photos/TollandCTPhotos/Sketches/184572_6831.j)

Building Sub-Areas (sq ft)			<u>Legend</u>
Code	Description	Gross Area	Living Area
BAS	Main Floor	360	360
		360	360

Extra Features

Extra Features		<u>Legend</u>
No Data for Extra Features		

Land

Land Use

Use Code	300
Description	Industrial
Zone	RDD

Land Line Valuation

Size (Acres)	0.50
Frontage	
Depth	

Neighborhood 350C
Alt Land Appr No
Category

Assessed Value \$384,000
Appraised Value \$548,600

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN	FENCE	CL8	8' Chain Link	250.00 L.F.	\$5,000	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
4000	\$73,200	\$548,600	\$621,800
2020	\$73,200	\$548,600	\$621,800
2019	\$73,200	\$548,600	\$621,800

Assessment			
Valuation Year	Improvements	Land	Total
4000	\$51,200	\$384,000	\$435,200
2020	\$51,200	\$384,000	\$435,200
2019	\$51,200	\$384,000	\$435,200

Exhibit C

Construction Drawings



DISH Wireless L.L.C. SITE ID:

BOBDL00072A

DISH Wireless L.L.C. SITE ADDRESS:

**319 PETER GREEN ROAD
TOLLAND, CT 06084**

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
GN-1	LEGEND AND ABBREVIATIONS
GN-2	GENERAL NOTES
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES

SCOPE OF WORK

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

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

- GROUND SCOPE OF WORK:**
- INSTALL (1) PROPOSED METAL PLATFORM
 - INSTALL (1) PROPOSED ICE BRIDGE
 - INSTALL (1) PROPOSED PPC CABINET
 - INSTALL (1) PROPOSED EQUIPMENT CABINET
 - INSTALL (1) PROPOSED POWER CONDUIT
 - INSTALL (1) PROPOSED TELCO CONDUIT
 - INSTALL (1) PROPOSED TELCO-FIBER BOX
 - INSTALL (1) PROPOSED GPS UNIT
 - INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)
 - INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)
 - INSTALL (1) PROPOSED METER SOCKET

SITE PHOTO



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.

SITE INFORMATION

PROPERTY OWNER: GEORGE KRECHKO
ADDRESS: 52 BASS DRIVE
ENFIELD, CT 06082

TOWER TYPE: MONOPOLE

TOWER CO SITE ID: 846293

TOWER APP NUMBER: 556620

COUNTY: TOLLAND

LATITUDE (NAD 83): 41° 53' 47.81" N
41.896614 N

LONGITUDE (NAD 83): 72° 23' 37.43" W
72.39373056 W

ZONING JURISDICTION: CITY OF TOLLAND

ZONING DISTRICT: RDD

PARCEL NUMBER: 09013142091016

OCCUPANCY GROUP: U

CONSTRUCTION TYPE: II-B

POWER COMPANY: EVERSOURCE

TELEPHONE COMPANY: N/A

PROJECT DIRECTORY

APPLICANT: DISH Wireless L.L.C.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

TOWER OWNER: CROWN CASTLE
2000 CORPORATE DRIVE
CANONSBURG, PA 15317
(877) 486-9377

SITE DESIGNER: B+T GROUP
1717 S. BOULDER AVE, SUITE 300
TULSA, OK 74119
(918) 587-4630

SITE ACQUISITION: NICHOLAS CURRY
NICHOLAS.CURRY@CROWNCastle.COM

CONSTRUCTION MANAGER: JAVIER SOTO
JAVIER.SOTO@DISH.COM

RF ENGINEER: BOSSENER CHARLES
BOSSENER.CHARLES@DISH.COM

DIRECTIONS

DIRECTIONS FROM SOUTHBRIDGE MUNICIPAL AIRPORT:

GET ON I-84 IN STURBRIDGE FROM PLEASANT ST, SOUTH ST, MASHAUG RD AND HAYNES ST/RTE 15 HEAD SOUTH ON CLEMENCE HILL RD TOWARD AIRPORT ACCESS RD TURN RIGHT ONTO AIRPORT ACCESS RD TURN LEFT ONTO PLEASANT ST TURN LEFT ONTO MAIN ST TURN RIGHT ONTO WEST ST TURN RIGHT ONTO SOUTH ST CONTINUE ONTO MASHAUG RD SLIGHT RIGHT TO STAY ON MASHAUG RD TURN LEFT ONTO HAYNES ST/RTE 15 TAKE THE RAMP ONTO I-84 FOLLOW I-84 TO CT-195 N IN TOLLAND. TAKE EXIT 68 FROM I-84 MERGE WITH I-84 ENTERING CONNECTICUT TAKE EXIT 68 FOR CT-195 TOWARD TOLLAND/MANSFIELD CONTINUE ON CT-195 N. TAKE CT-74 W AND PETER GREEN RD TO HUNTER RD TURN RIGHT ONTO CT-195 N CONTINUE ONTO CT-74 W TURN RIGHT ONTO BURBANK RD TURN RIGHT ONTO PETER GREEN RD TURN LEFT ONTO HUNTER RD 319 PETER GREEN RD

VICINITY MAP



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 2/10/22

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:
SJH MTJ MDW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
A	6/11/21	ISSUED FOR REVIEW
0	8/15/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
151920.001.01

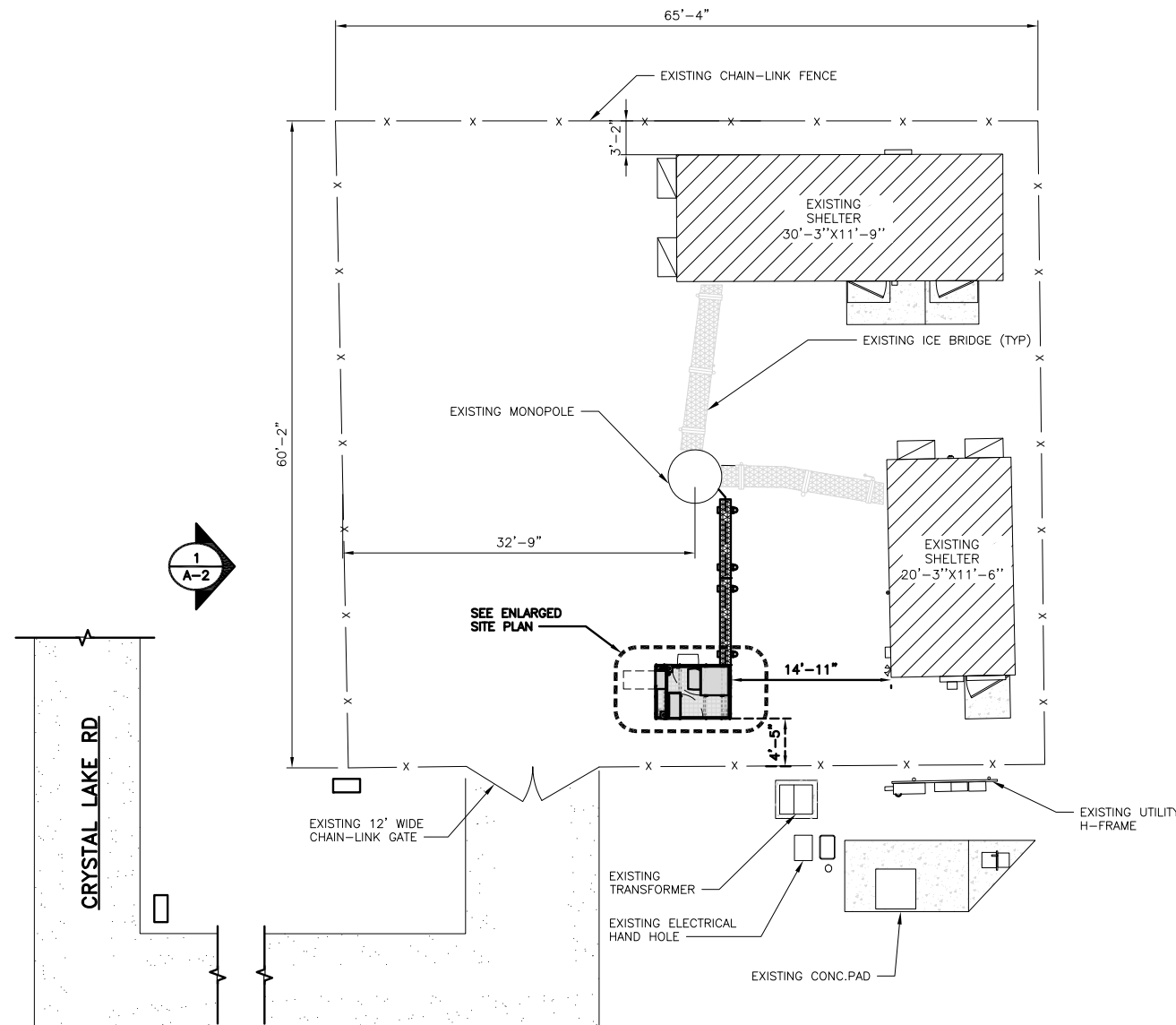
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00072A
319 PETER GREEN ROAD
TOLLAND, CT 06084

SHEET TITLE
TITLE SHEET

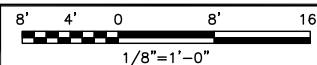
SHEET NUMBER
T-1

NOTES

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



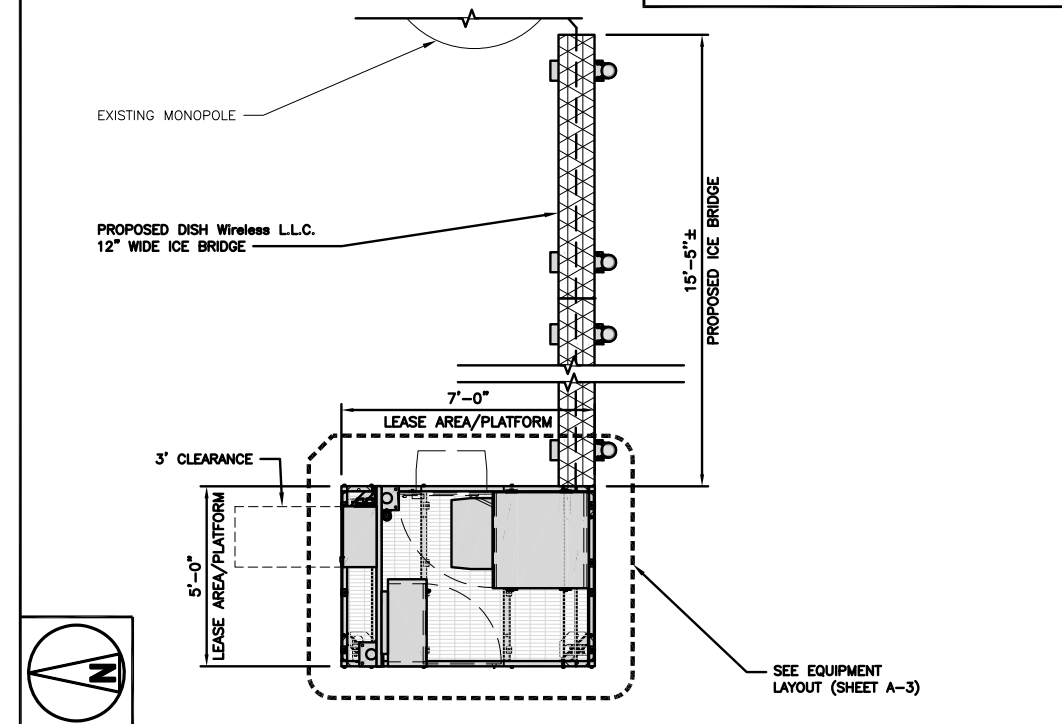
OVERALL SITE PLAN



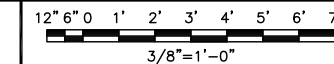
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NOTES

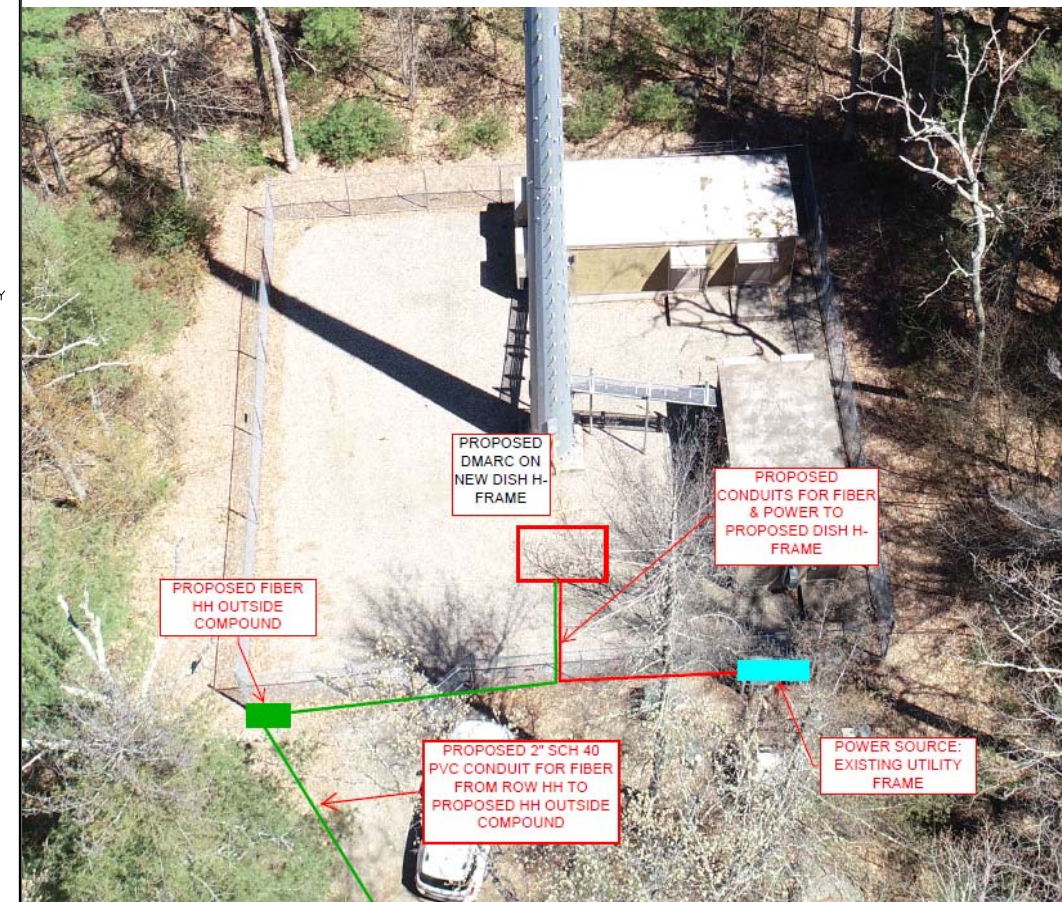
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN



2



UTILITY PLAN

NO SCALE

3



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
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DRAWN BY: SJH CHECKED BY: MTJ APPROVED BY: MDW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/11/21	ISSUED FOR REVIEW
0	8/15/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
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DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00072A
319 PETER GREEN ROAD
TOLLAND, CT 06084

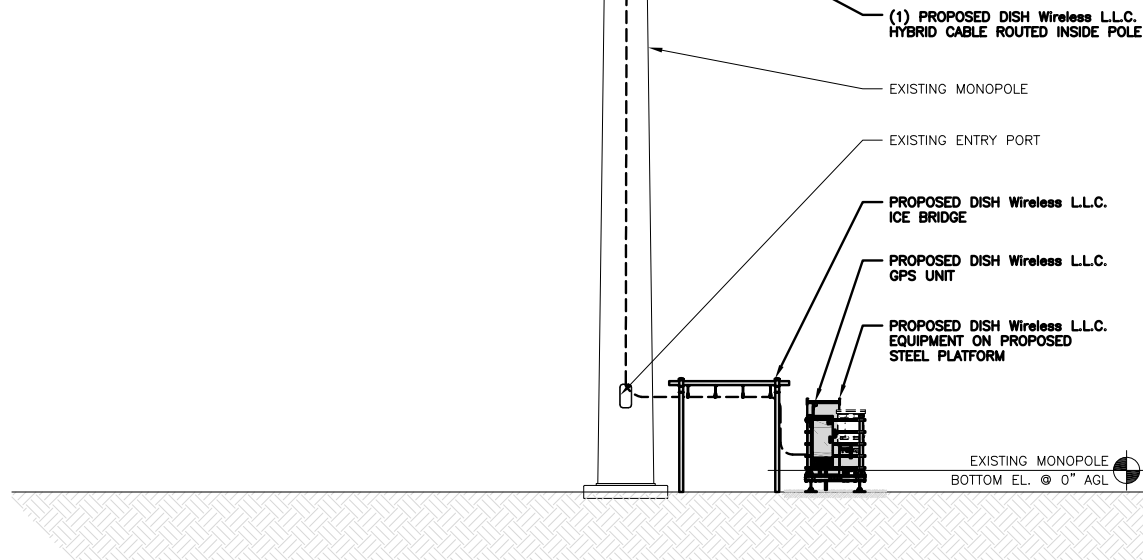
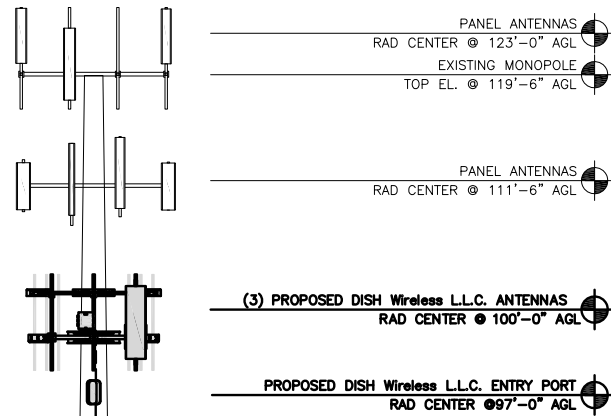
SHEET TITLE
OVERALL AND ENLARGED
SITE PLAN

SHEET NUMBER

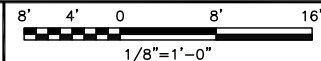
A-1

NOTES

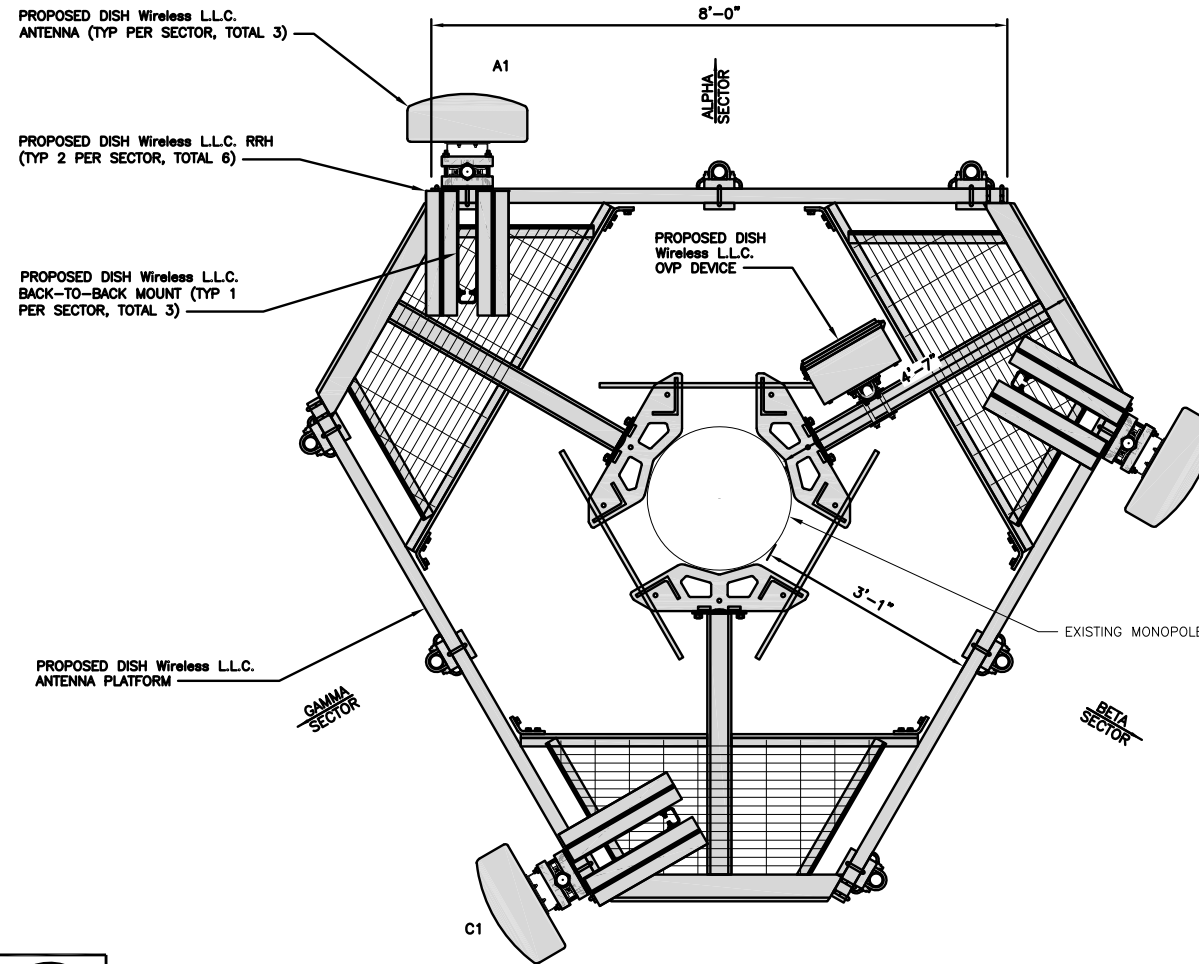
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



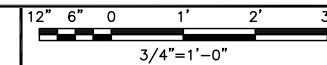
PROPOSED NORTH ELEVATION



1



ANTENNA LAYOUT



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA-MX08FRO665-21	5G	72.0" x 20.0"	0°	100'-0"	(1) HIGH-CAPACITY HYBRID CABLE (139' LONG)
BETA	B1	PROPOSED	JMA-MX08FRO665-21	5G	72.0" x 20.0"	120°	100'-0"	
GAMMA	C1	PROPOSED	JMA-MX08FRO665-21	5G	72.0" x 20.0"	240°	100'-0"	

SECTOR	POSITION	RRH		NOTES
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY	
ALPHA	A1	FUJITSU -TA08025B604	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 -TA08025B605	5G	
BETA	B1	FUJITSU -TA08025B604	5G	
	B1	FUJITSU -TA08025B605	5G	
GAMMA	C1	FUJITSU -TA08025B604	5G	
	C1	FUJITSU -TA08025B605	5G	

ANTENNA SCHEDULE

NO SCALE

3



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



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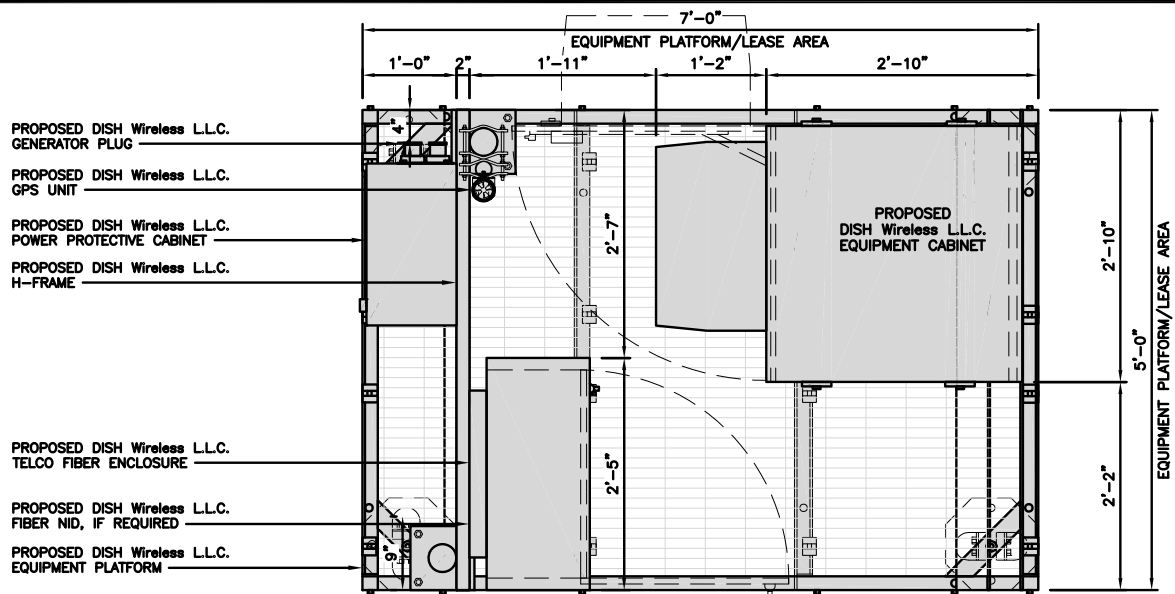
A&E PROJECT NUMBER
151920.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00072A
319 PETER GREEN ROAD
TOLLAND, CT 06084

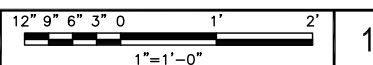
SHEET TITLE
ELEVATION, ANTENNA
LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



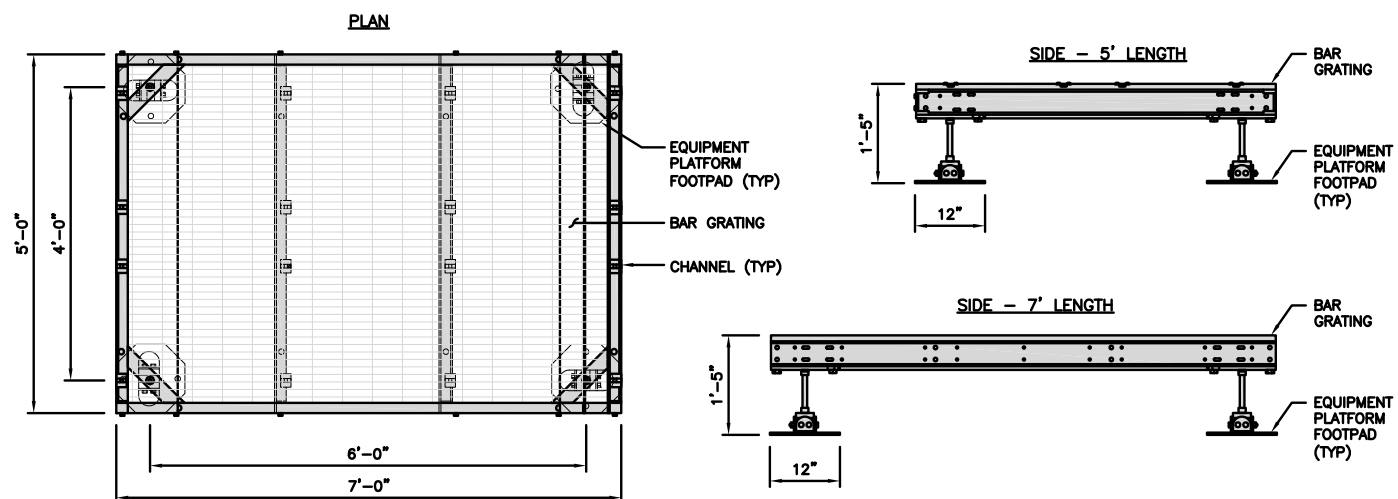
PLATFORM EQUIPMENT PLAN



1

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

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

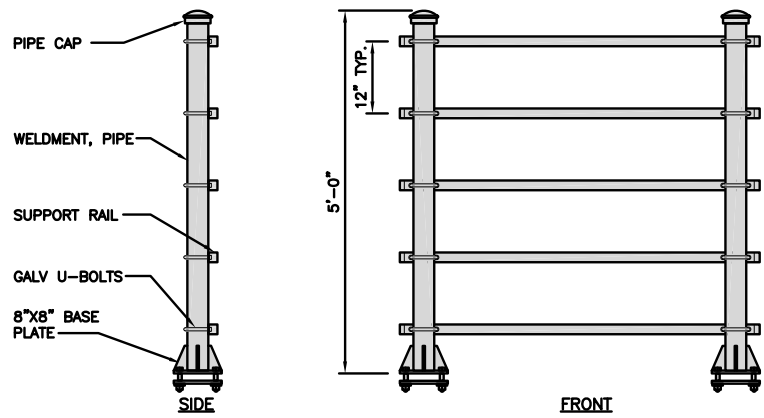


PLATFORM DETAIL

NO SCALE

2

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



H-FRAME DETAIL

NO SCALE

3

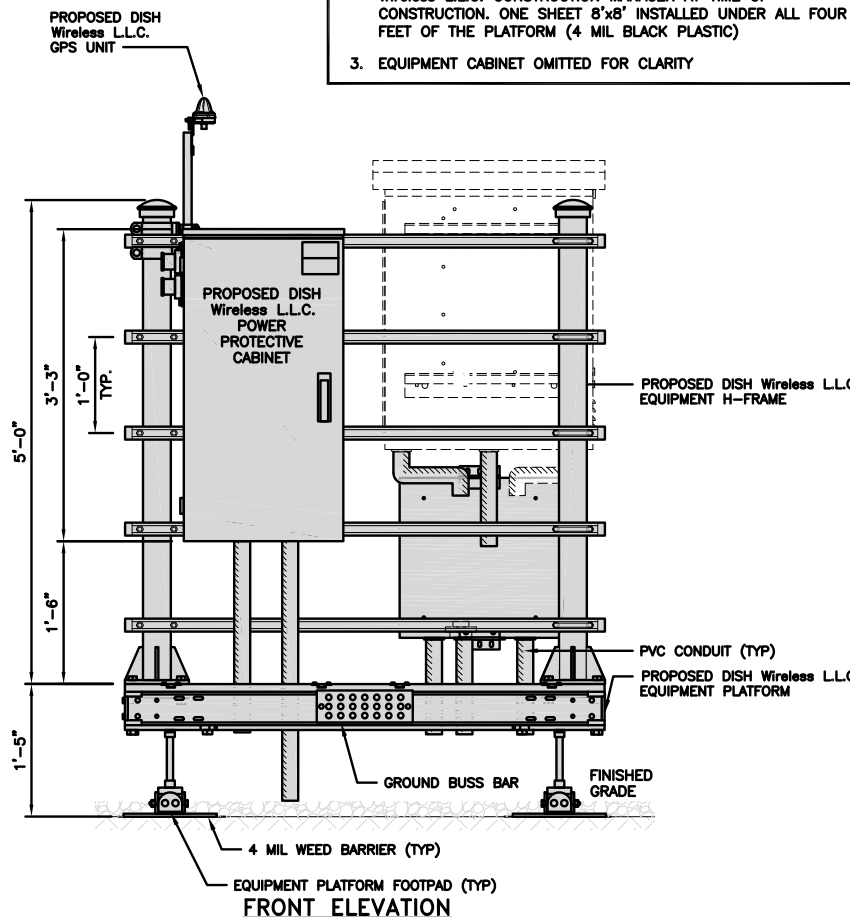
NOT USED

NO SCALE

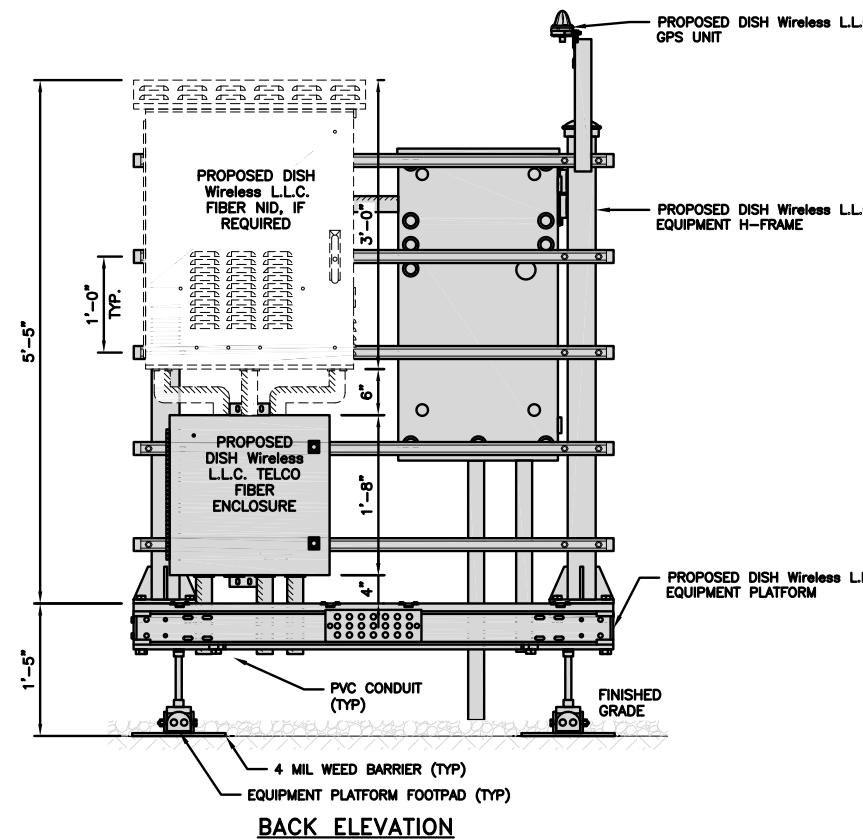
4

NOTES

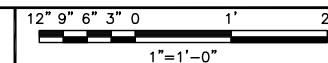
- CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
- WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH Wireless L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
- EQUIPMENT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



FRONT ELEVATION



BACK ELEVATION



5



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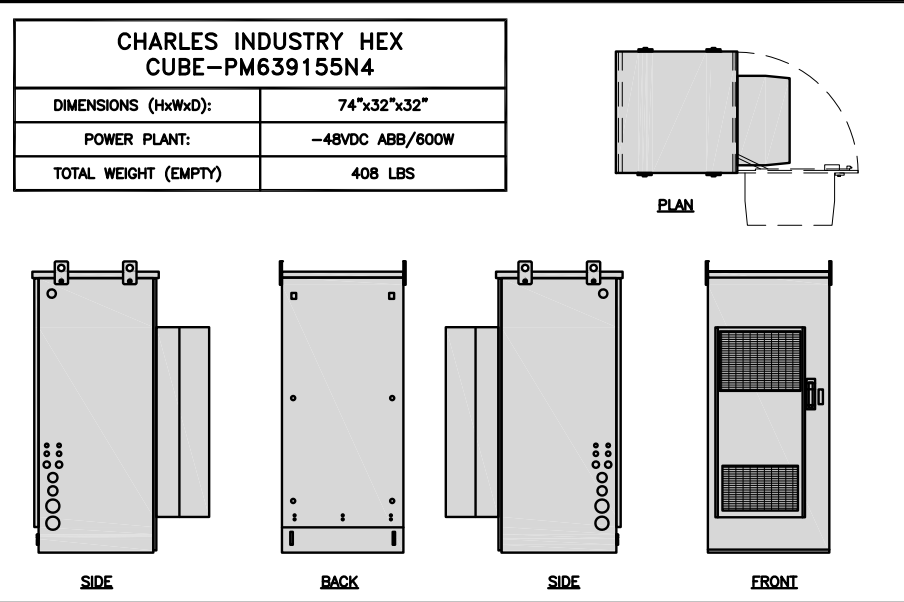
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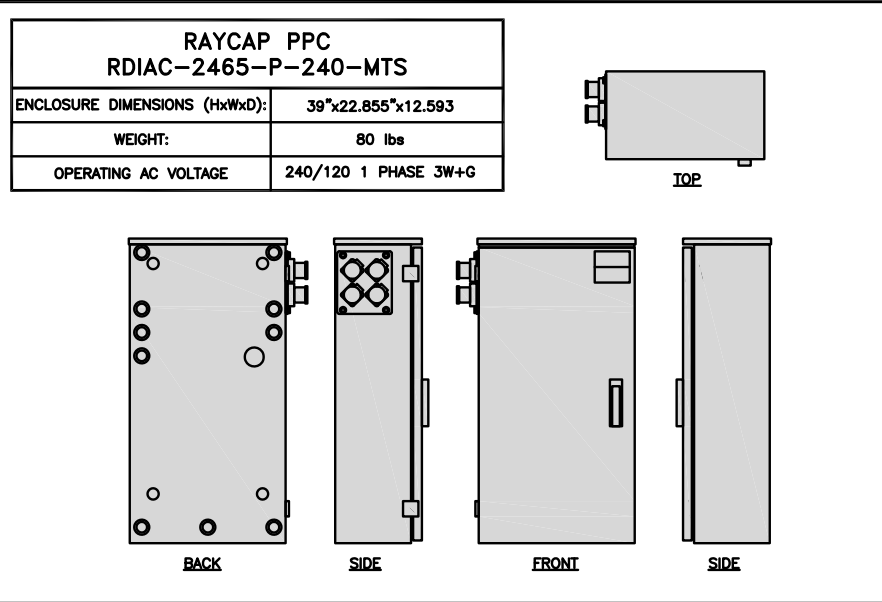
SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER

A-3



CABINET DETAIL NO SCALE 1



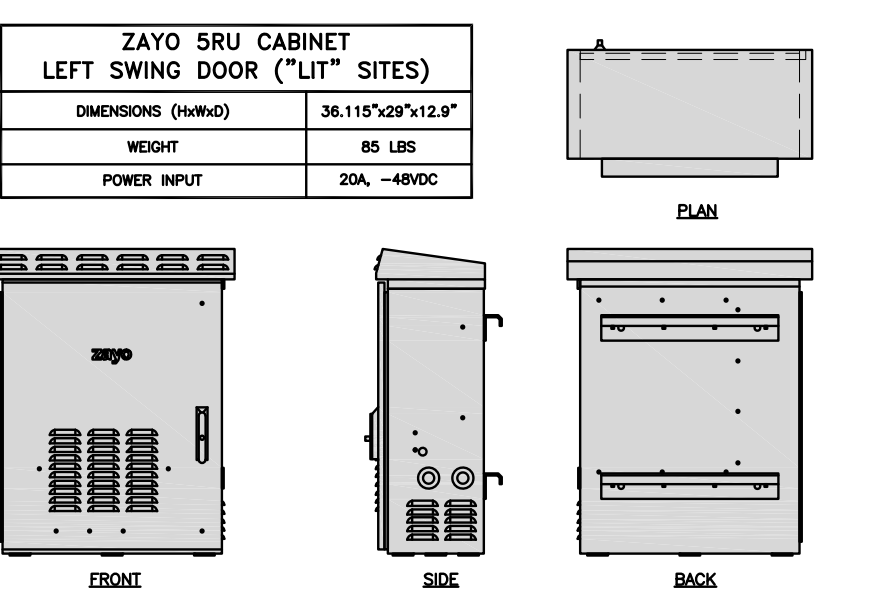
POWER PROTECTION CABINET (PPC) DETAIL NO SCALE 2



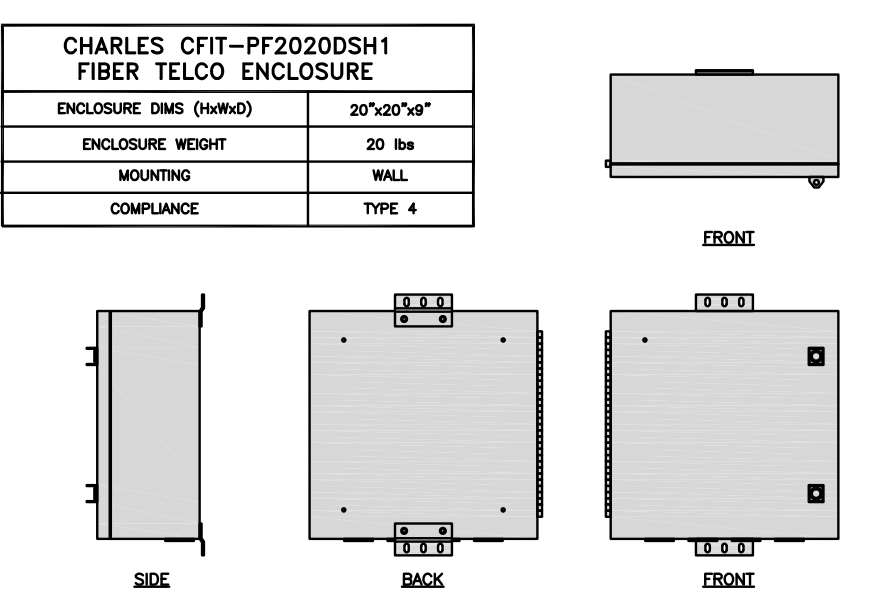
NO SCALE 3



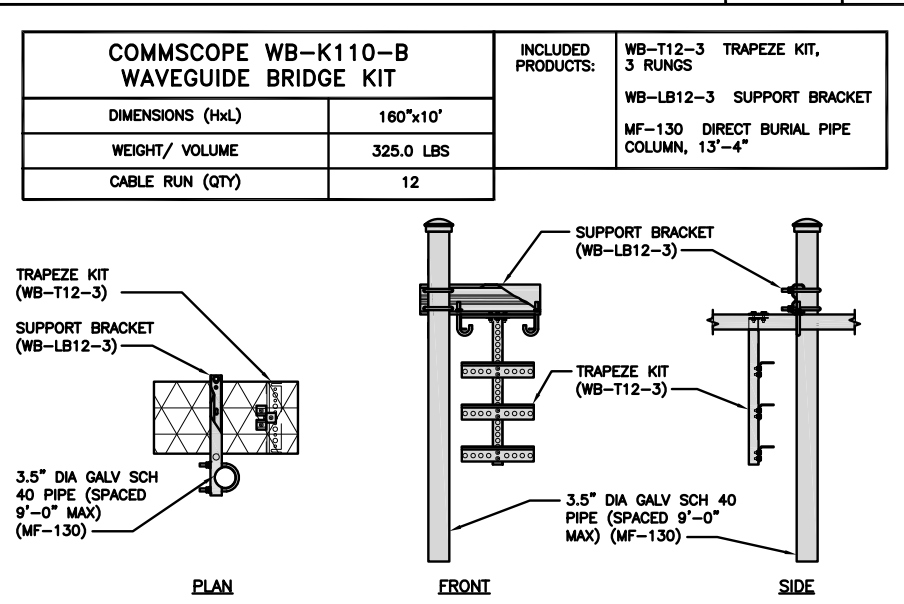
NO SCALE 4



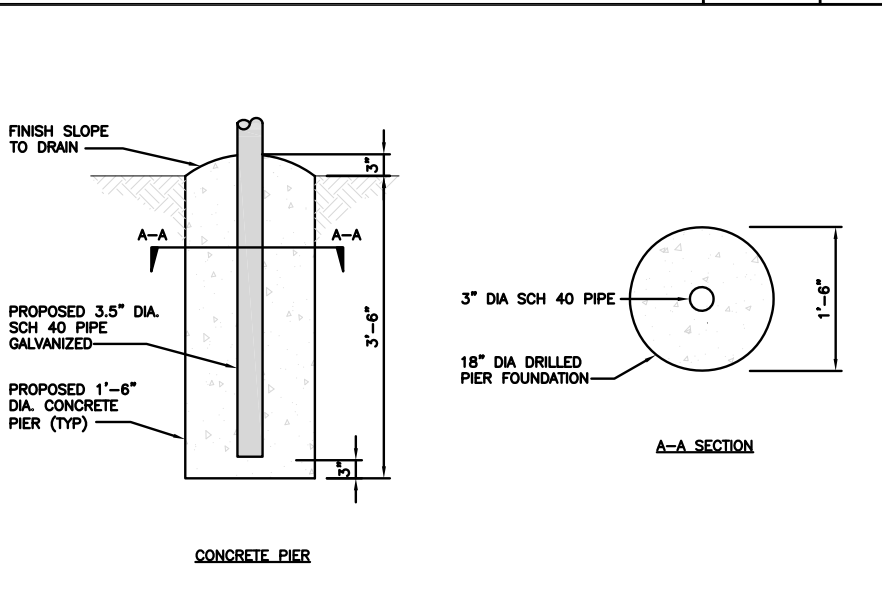
NETWORK INTERFACE UNIT DETAIL NO SCALE 5



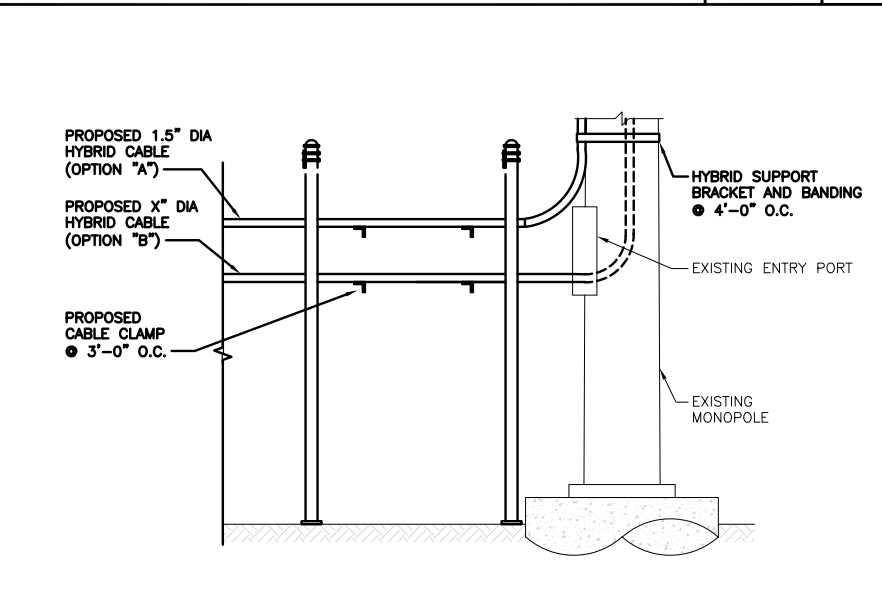
FIBER TELCO ENCLOSURE DETAIL NO SCALE 6



ICE BRIDGE DETAIL NO SCALE 7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL NO SCALE 8



HYBRID CABLE RUN NO SCALE 9



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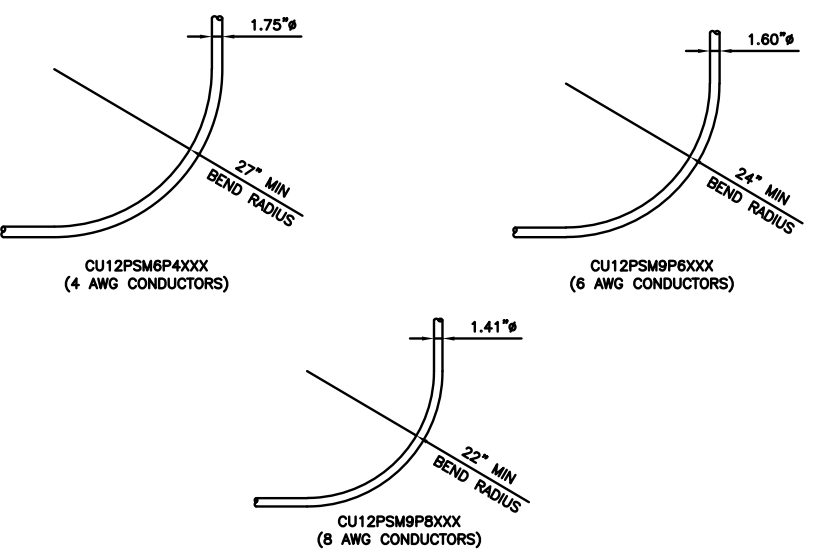
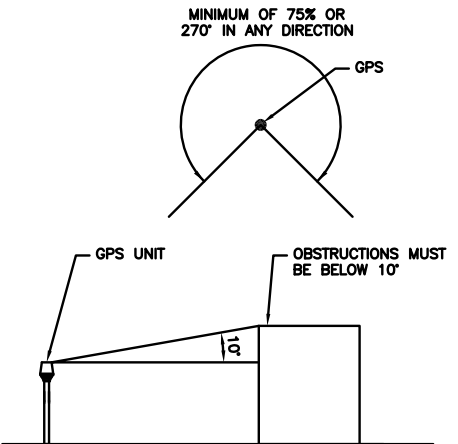
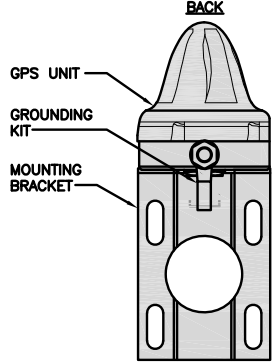
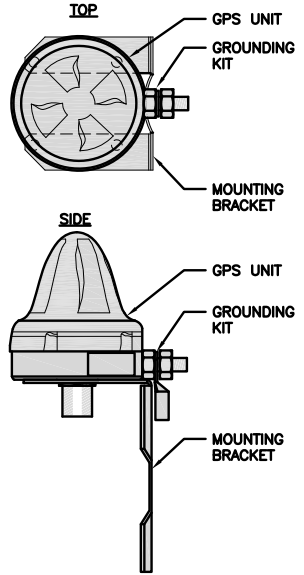
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BOBDL00072A
319 PETER GREEN ROAD
TOLLAND, CT 06084

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

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



GPS ANTENNA DETAIL NO SCALE 1

GPS MINIMUM SKY VIEW REQUIREMENTS NO SCALE 2

CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUS NO SCALE 3

NOT USED NO SCALE 4

NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



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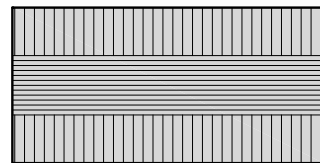
A&E PROJECT NUMBER
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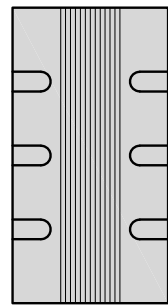
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

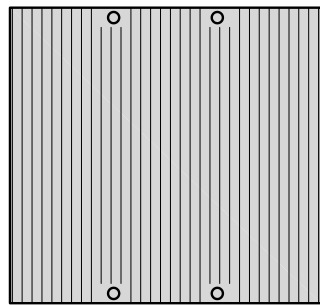
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



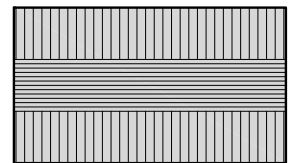
FRONT

REMOTE RADIO HEAD DETAIL

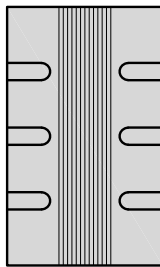
NO SCALE

1

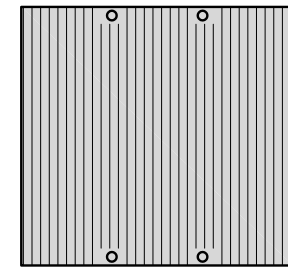
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

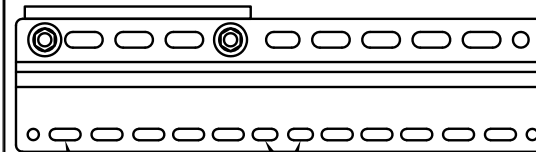
REMOTE RADIO HEAD DETAIL

NO SCALE

2

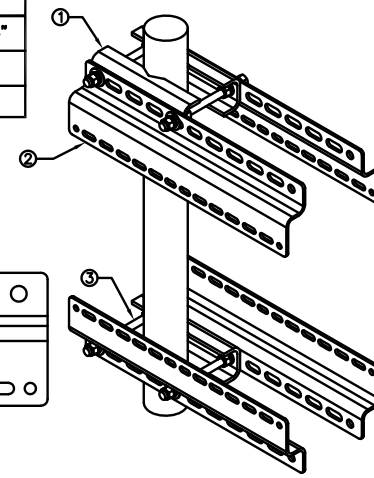
SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

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



11MM x 30MM SLOTS
40MM ON CENTER

11MM x 24MM SLOTS

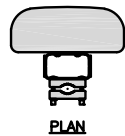


REMOTE RADIO MOUNT DETAIL

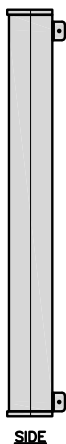
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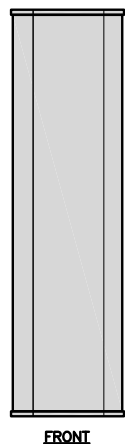
JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs



PLAN



SIDE



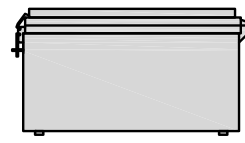
FRONT

ANTENNA DETAIL

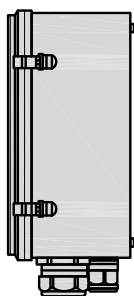
NO SCALE

4

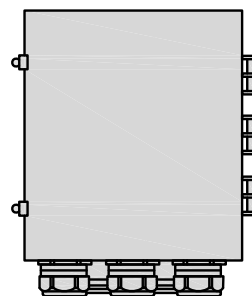
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



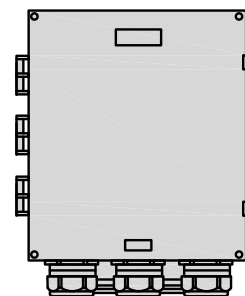
PLAN



SIDE



BACK



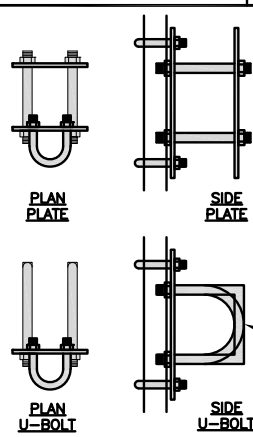
FRONT

SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

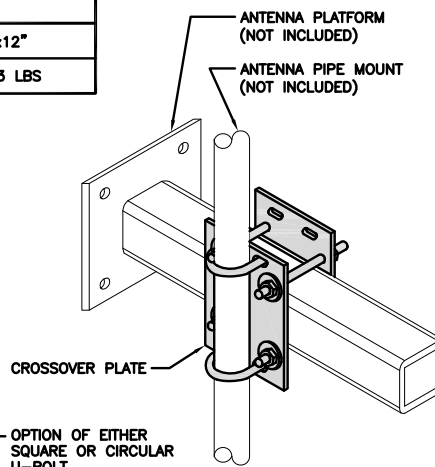
7

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



PLAN
U-BOLT

SIDE
U-BOLT



ANTENNA PLATFORM (NOT INCLUDED)

ANTENNA PIPE MOUNT (NOT INCLUDED)

CROSSOVER PLATE

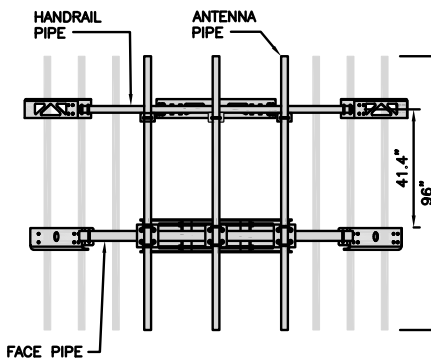
OPTION OF EITHER SQUARE OR CIRCULAR U-BOLT

RRH/OVP MOUNT DETAIL

NO SCALE

8

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



FACE PIPE

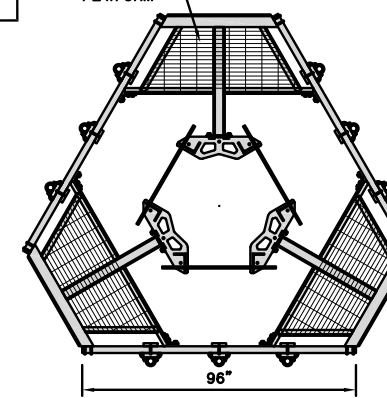
HANDRAIL PIPE

ANTENNA PIPE

41.4"

96"

PLATFORM



ANTENNA PLATFORM DETAIL

NO SCALE

9



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TOLLAND, CT 06084

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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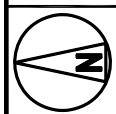
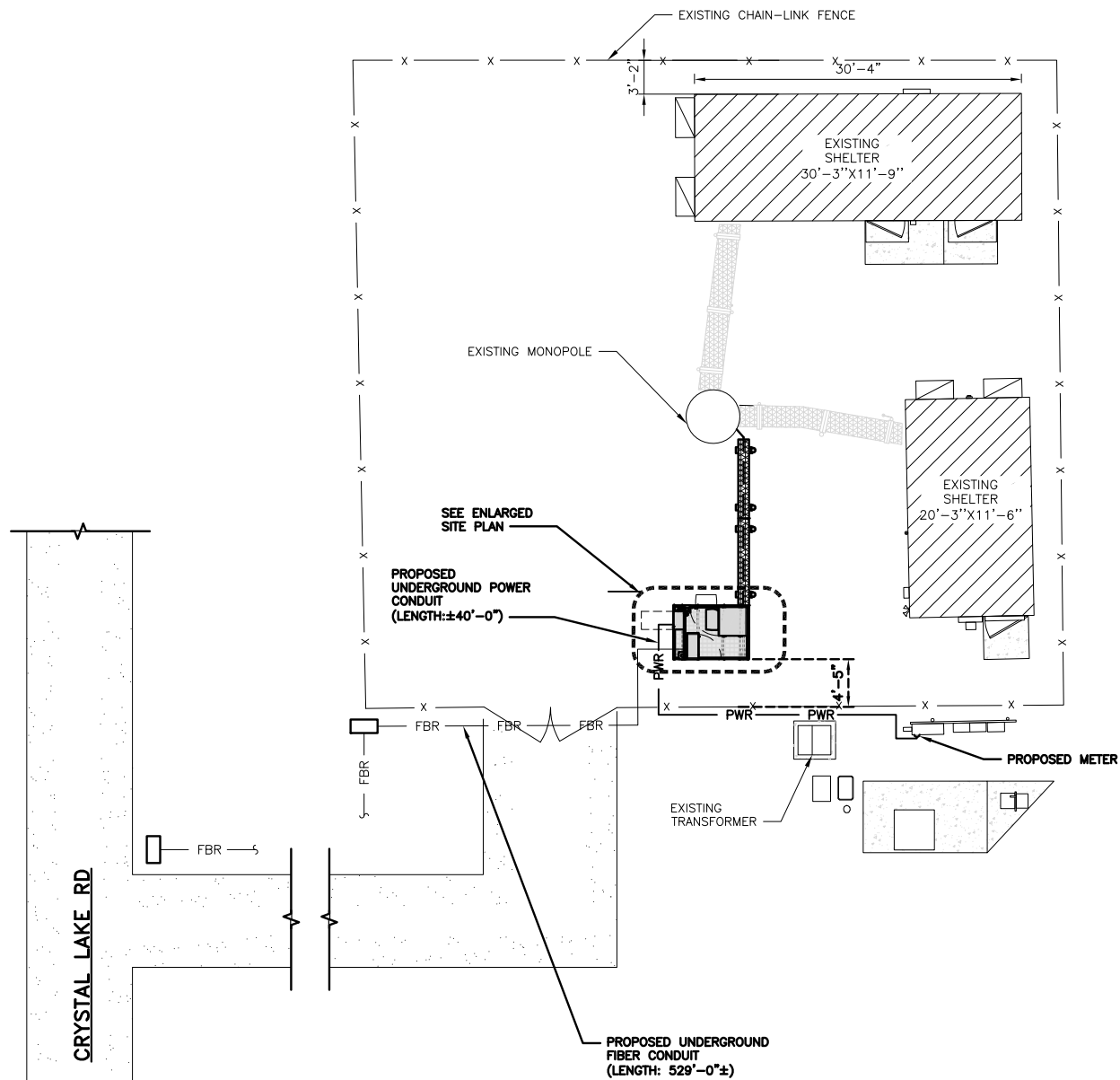
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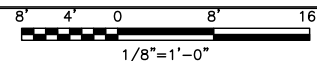
SHEET TITLE
ELECTRICAL/FIBER ROUTE
PLAN AND NOTES

SHEET NUMBER

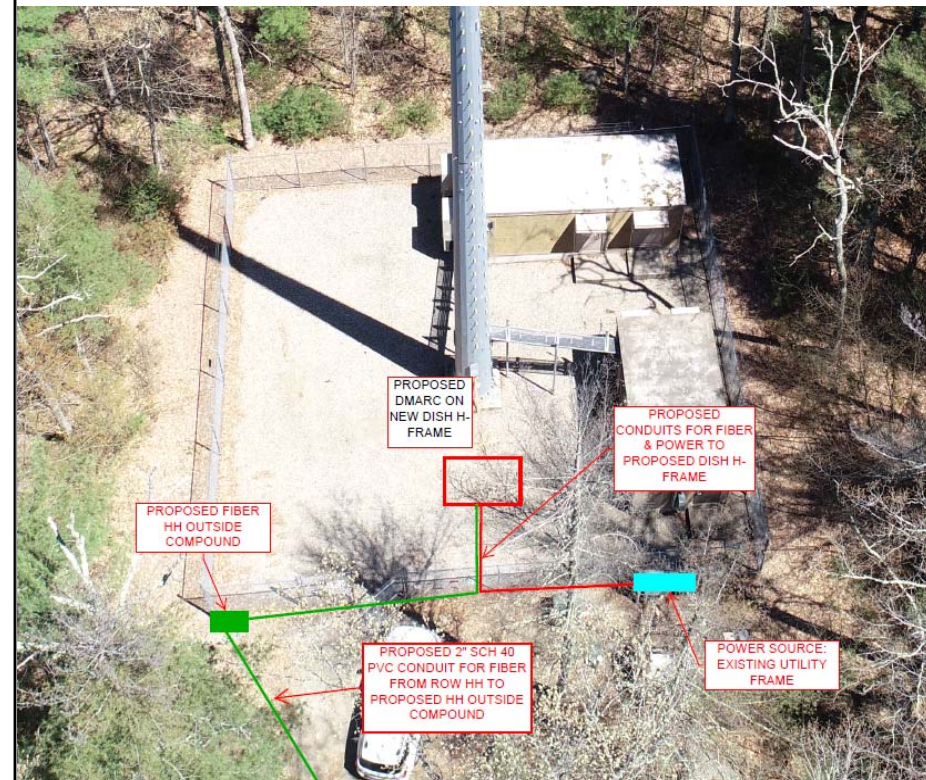
E-1



UTILITY ROUTE PLAN



1



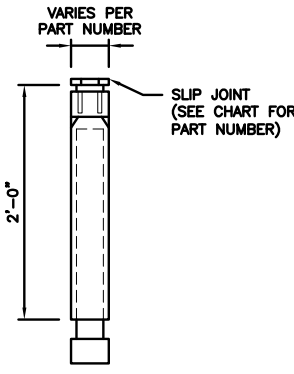
ELECTRICAL NOTES

NO SCALE

2

CARLON EXPANSION FITTINGS

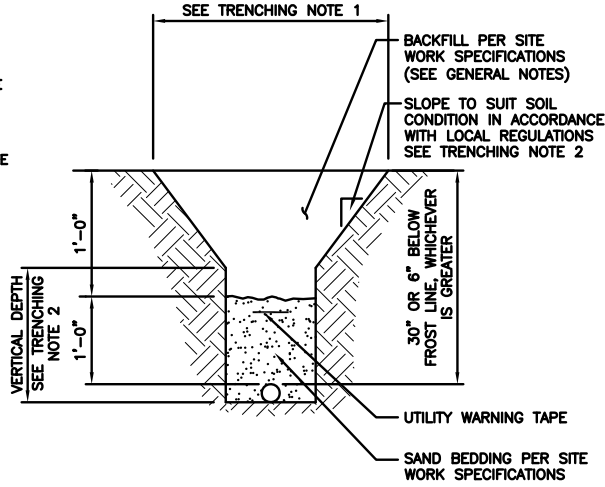
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N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

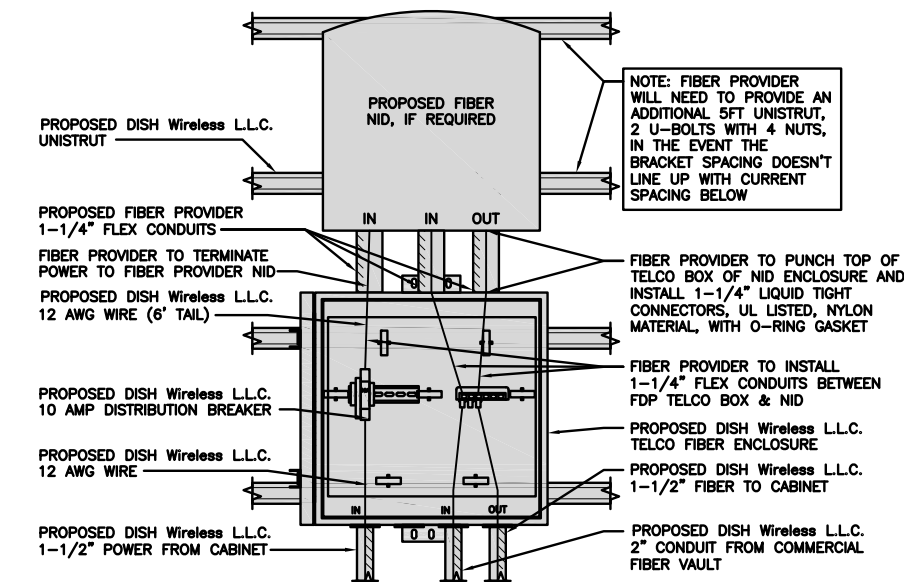
- CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
- TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT 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

NOT USED NO SCALE 3



NOT USED NO SCALE 5

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

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



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LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



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



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RFDS REV #: 0

CONSTRUCTION DOCUMENTS

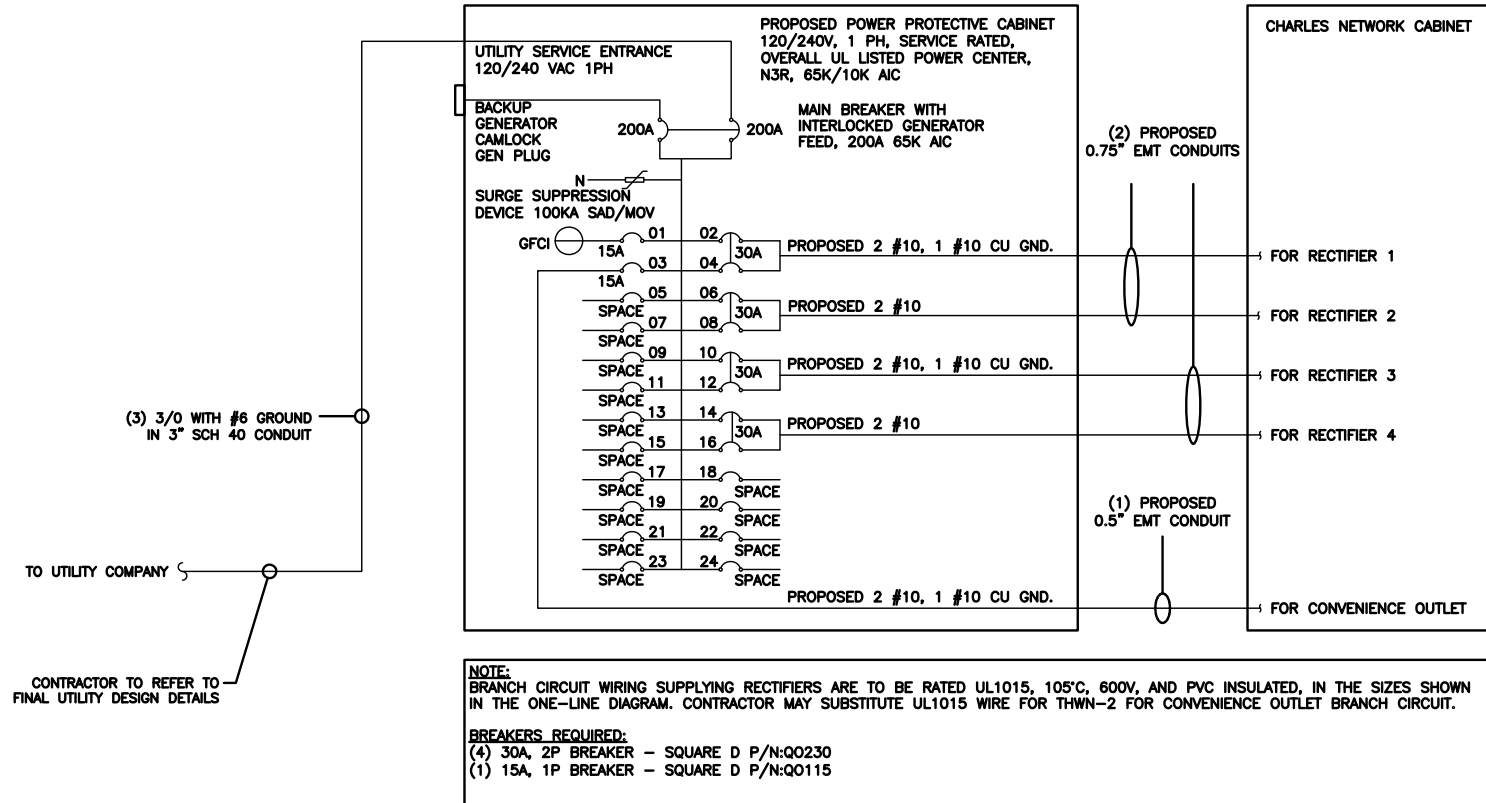
SUBMITTALS		
REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER
151920.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00072A
319 PETER GREEN ROAD
TOLLAND, CT 06084

SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER
E-2



NOTES

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

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

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

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

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

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

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

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

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

PPC ONE-LINE DIAGRAM

NO SCALE 1

PROPOSED CHARLES PANEL SCHEDULE

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

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3



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LITTLETON, CO 80120



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1717 S. BOULDER
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TULSA, OK 74119
PH: (918) 587-4630
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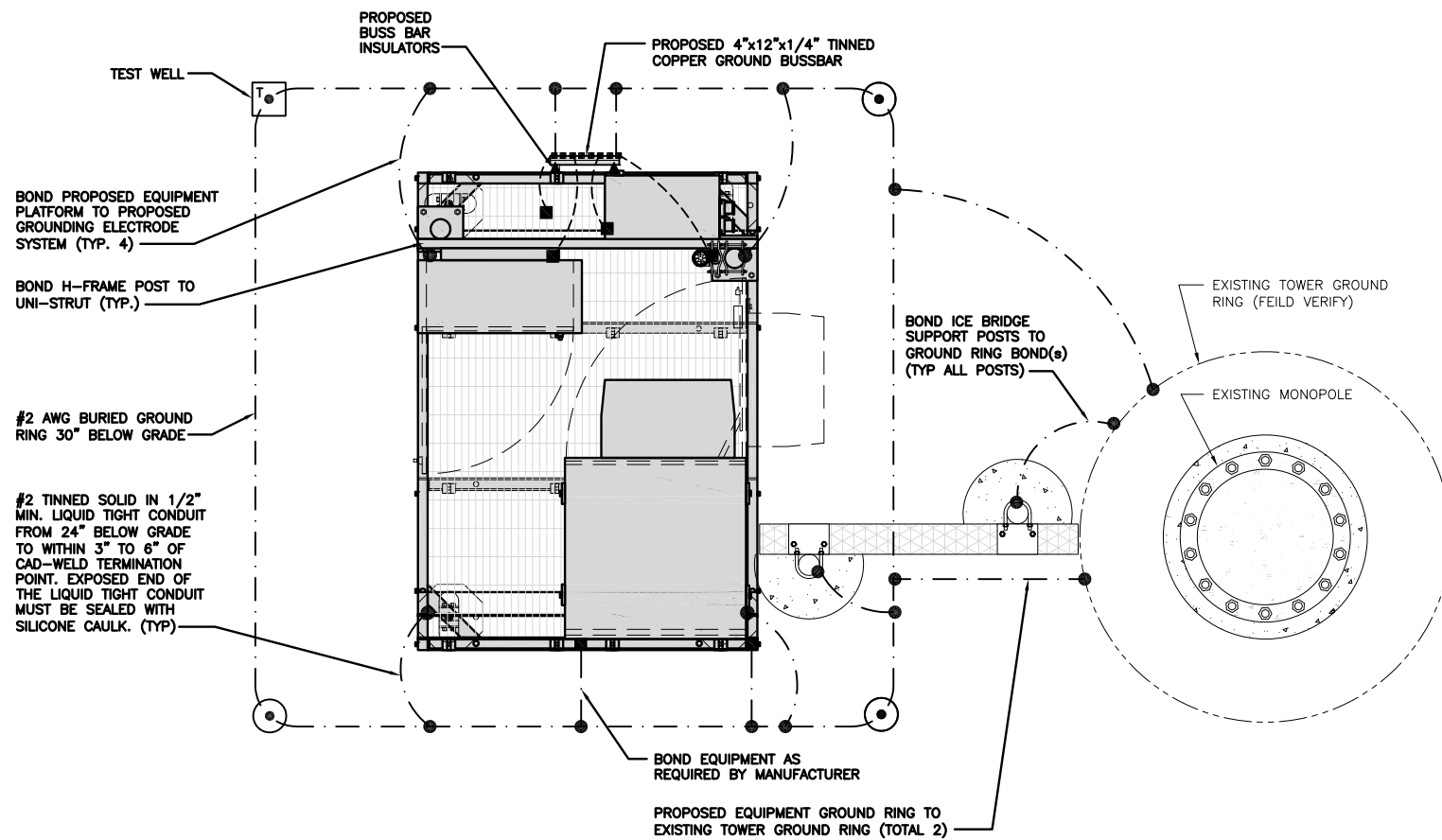
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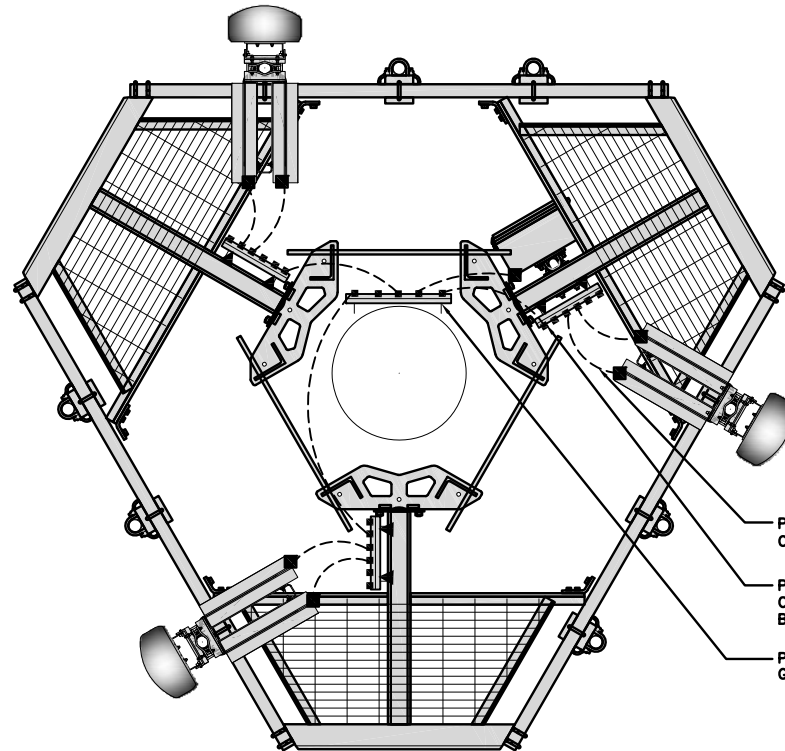
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT
CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3



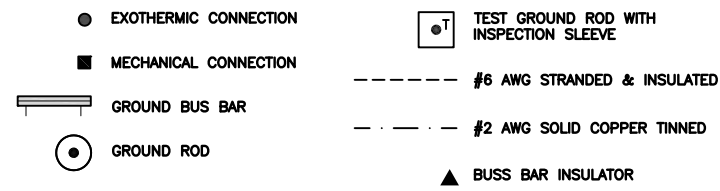
TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2



GROUNDING LEGEND

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

GROUNDING KEY NOTES

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

GROUNDING KEY NOTES

NO SCALE 3



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LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
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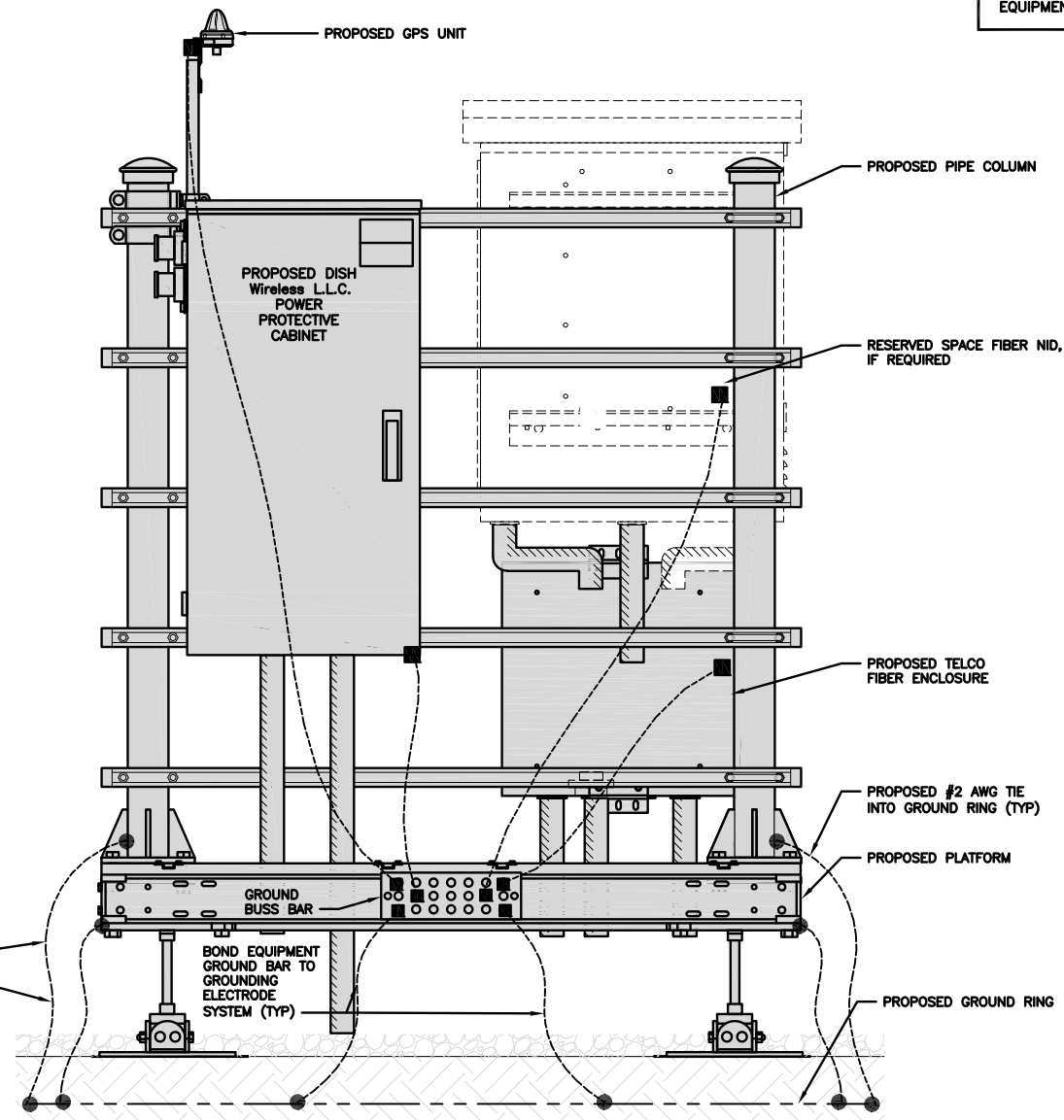
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00072A
319 PETER GREEN ROAD
TOLLAND, CT 06084

SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER

G-1

NOTES
EQUIPMENT CABINET OMITTED FOR CLARITY

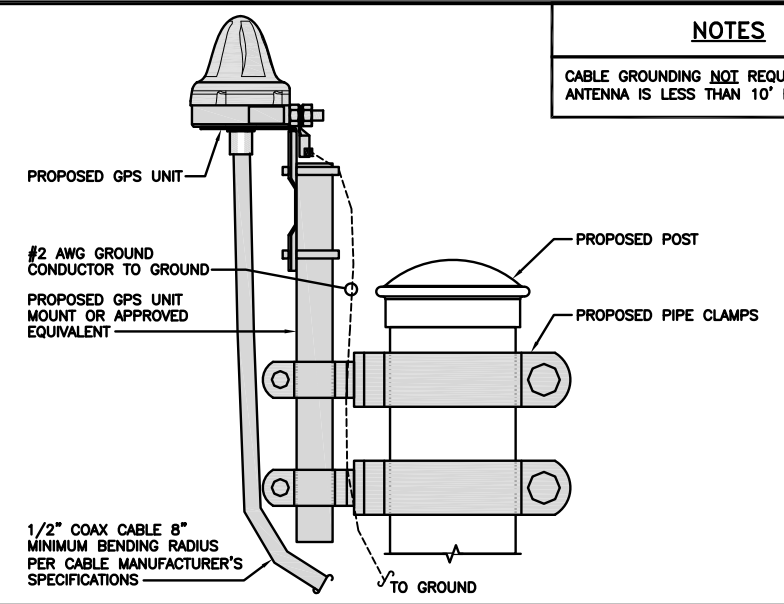


#2 TINNED SOLID IN 1/2" MIN. LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (TYP)

H-FRAME GROUNDING DETAIL

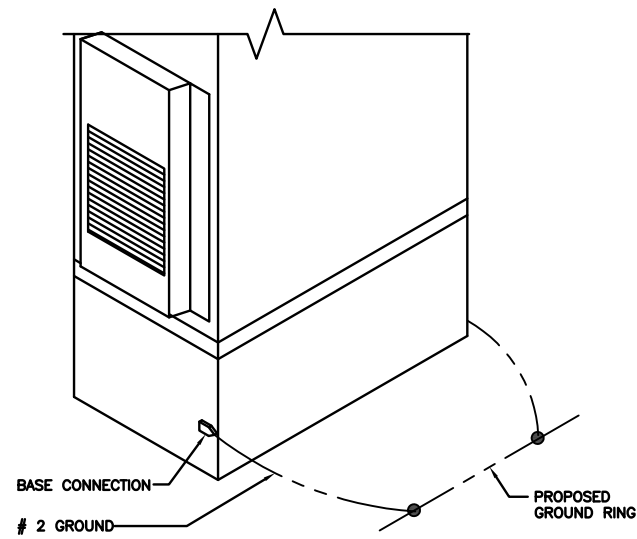
NO SCALE 1

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



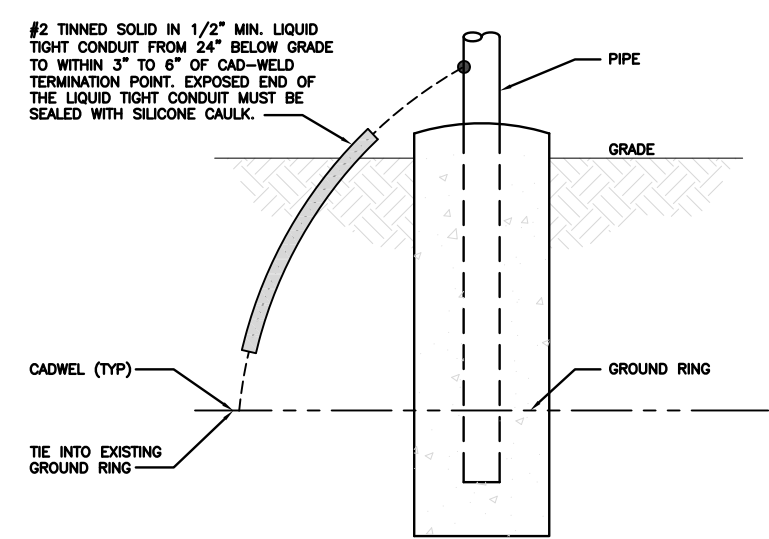
TYPICAL GPS UNIT GROUNDING

NO SCALE 2



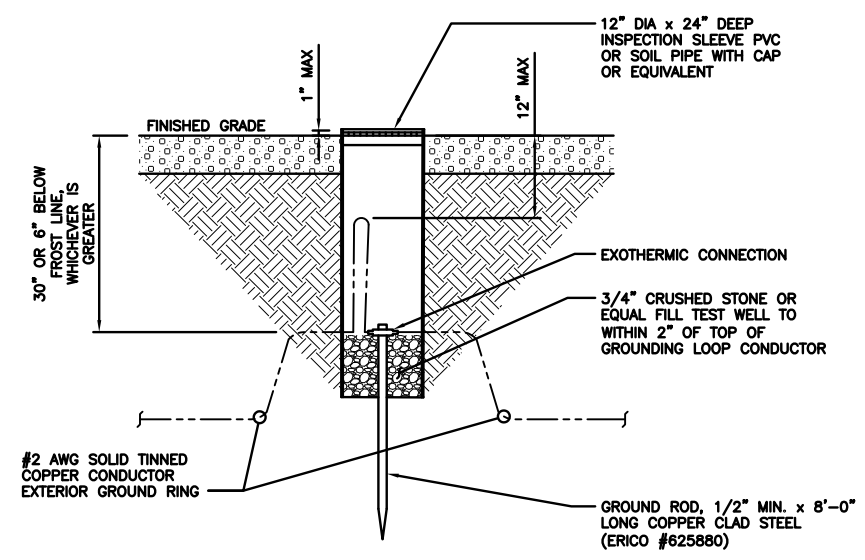
OUTDOOR CABINET GROUNDING

NO SCALE 3



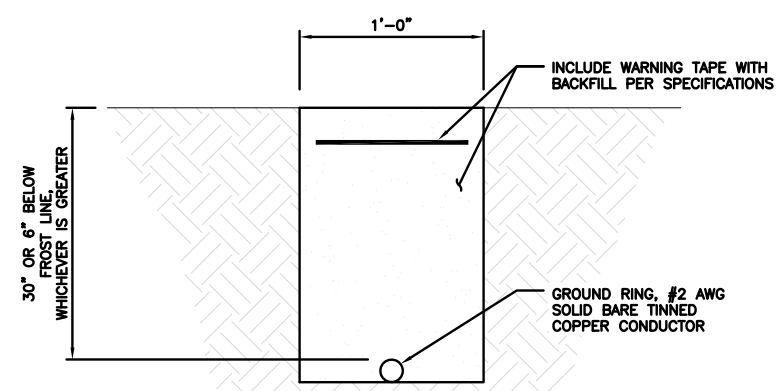
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5



TYPICAL GROUND RING TRENCH

NO SCALE 6



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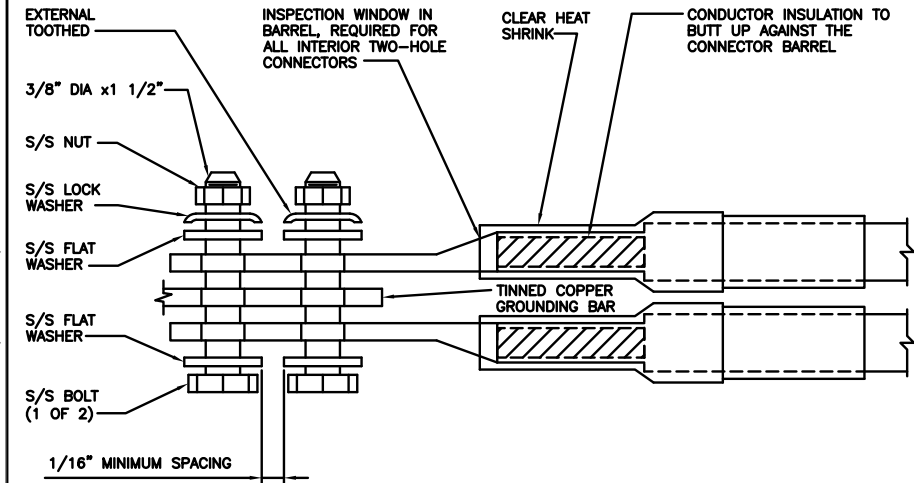
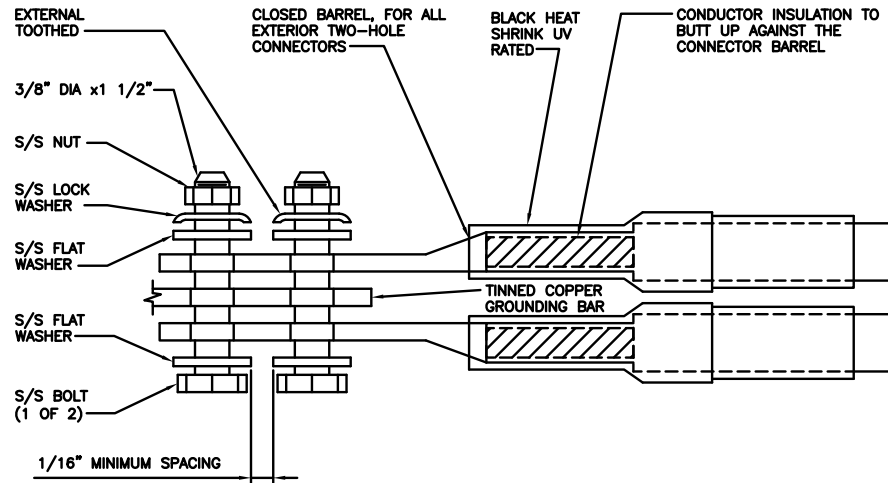
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SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2

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



TYPICAL GROUNDING NOTES

NO SCALE

1

TYPICAL EXTERIOR TWO HOLE LUG

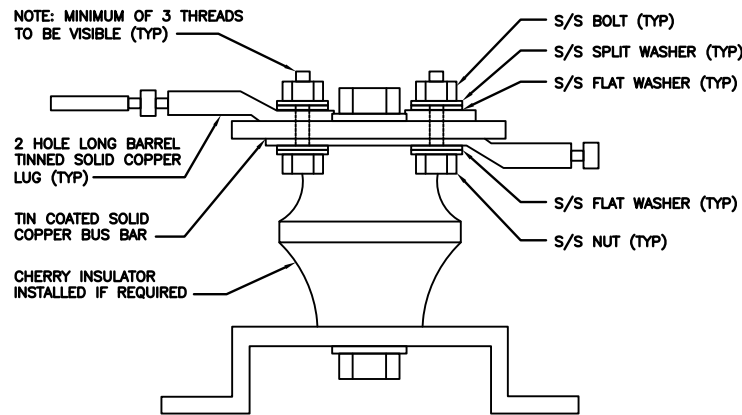
NO SCALE

2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE

3



LUG DETAIL

NO SCALE

4

NOT USED

NO SCALE

5

NOT USED

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

9

dish
wireless.

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CROWN
CASTLE

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B+T GRP

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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)

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

RF CABLE COLOR CODES

NO SCALE

1

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



AWS
(N66+N70+H-BLOCK)



CBRS TECH
(3 GHz)



NEGATIVE SLANT PORT
ON ANT/RRH



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

NOT USED

NO SCALE

4



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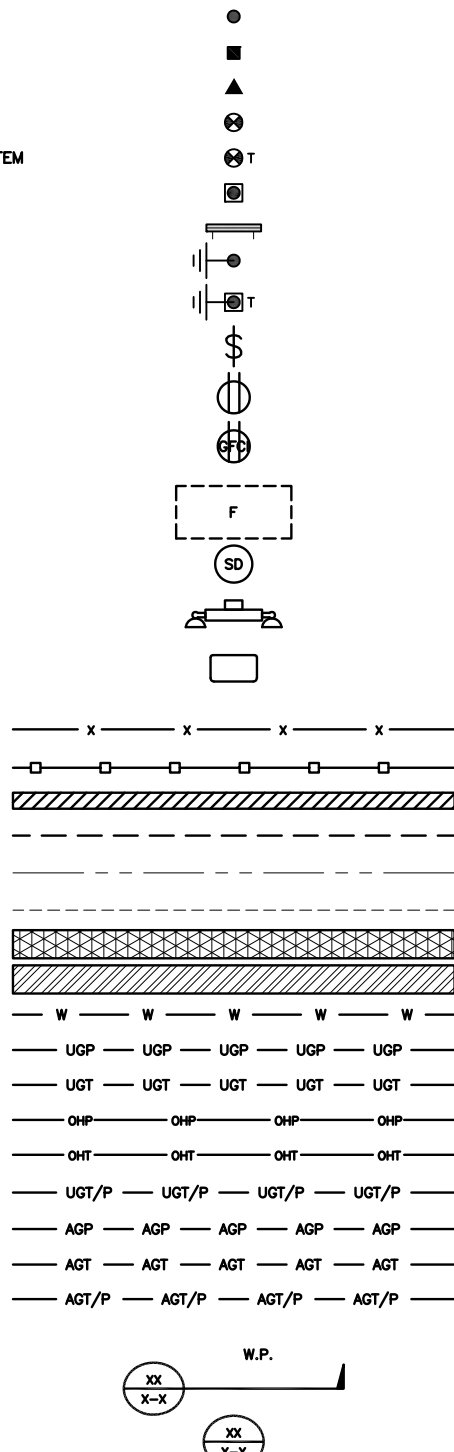
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00072A
319 PETER GREEN ROAD
TOLLAND, CT 06084

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER

RF-1

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



LEGEND

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

ABBREVIATIONS



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 TOLLAND, CT 06084

SHEET TITLE
 LEGEND AND ABBREVIATIONS

SHEET NUMBER
GN-1

SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
CARRIER:DISH Wireless L.L.C.
TOWER OWNER:TOWER OWNER
- THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
- THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
- NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
- SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF DISH Wireless L.L.C. AND TOWER OWNER
- CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
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BOBDL00072A
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SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

ELECTRICAL INSTALLATION NOTES:

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

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



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 2/10/22

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:
SJH	MTJ	MDW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/11/21	ISSUED FOR REVIEW
0	8/15/21	ISSUED FOR CONTRSTRUCTION

A&E PROJECT NUMBER
151920.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00072A
319 PETER GREEN ROAD
TOLLAND, CT 06084

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-3

GROUNDING NOTES:

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



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DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00072A
319 PETER GREEN ROAD
TOLLAND, CT 06084

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

Exhibit D

Structural Analysis Report

Date: **May 30, 2021**



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

Subject: **Structural Analysis Report**

Carrier Designation: **DISH Network Co-Locate**
Site Number: BOBDL00072A
Site Name: CT-CCI-T-846293

Crown Castle Designation: **BU Number:** 846293
Site Name: TOLLAND - PETER GREEN RD
JDE Job Number: 650063
Work Order Number: 1966261
Order Number: 556620 Rev. 1

Engineering Firm Designation: **Crown Castle Project Number:** 1966261

Site Data: **319 PETER GREEN ROAD, TOLLAND, TOLLAND County, CT**
Latitude 41° 53' 47.81", Longitude -72° 23' 37.43"
119 Foot - Monopole Tower

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

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

LC5: Proposed Equipment Configuration

Sufficient Capacity

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. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Patrick Himes

Respectfully submitted by:

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

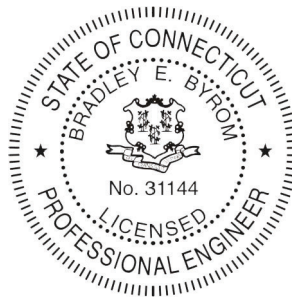


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1) INTRODUCTION

This tower is a 119 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC..

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	2 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)
100.0	100.0	3	fujitsu	TA08025-B604	1	1-1/2
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
119.0	122.0	3	ericsson	RRUS-11	12 2 1	1-5/8 7/8 1/2
		1	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe		
		6	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		2	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe		
		1	raycap	DC6-48-60-18-8F		
	121.0	1	commscope	CBC721A-03		
	120.0	3	powerwave technologies	LGP13519		
	119.0	2	commscope	CBC721A-03		
		1	tower mounts	Platform Mount [LP 712-1]		
110.0	110.0	3	antel	BXA-70063/6CF-2 w/ Mount Pipe	12	1-5/8
		6	antel	LPA-80063/6CF-2 w/ Mount Pipe		
		6	rfs celwave	FD9R6004/2C-3L		
		3	rymsa wireless	MG D3-800Tx w/ Mount Pipe		
		1	tower mounts	Platform Mount [LP 303-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	4705338	CCISITES
4-TOWER MANUFACTURER DRAWINGS	4705380	CCISITES
4-GEOTECHNICAL REPORTS	6176222	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	119 - 95.1927	Pole	TP26.25x18.5x0.1875	1	-9.08	907.73	26.5	Pass
L2	95.1927 - 47.25	Pole	TP41.3438x24.6441x0.25	2	-15.52	1913.76	43.9	Pass
L3	47.25 - 0	Pole	TP56x39.0142x0.3125	3	-27.94	3392.81	40.9	Pass
							Summary	
						Pole (L2)	43.9	Pass
						Rating =	43.9	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	27.6	Pass
1	Base Plate	0	25.8	Pass
1	Base Foundation (Structure)	0	33.0	Pass
1	Base Foundation (Soil Interaction)	0	31.8	Pass

Structure Rating (max from all components) =	43.9%
-----------------------------------------------------	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed. Rating per TIA-222-H Section 15.5.

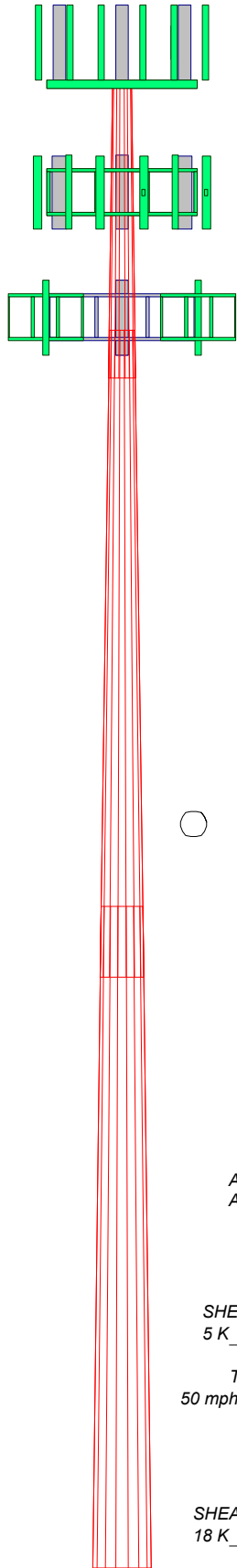
4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3	14.1
Length (ft)	23.81	51.72	52.92	
Number of Sides	18	18	18	
Thickness (in)	0.1875	0.2500	0.3125	
Socket Length (ft)	3.78	5.67	39.0142	
Top Dia (in)	18.5000	24.6441	56.0000	
Bot Dia (in)	26.2500	41.3438		
Grade		A572-65		
Weight (K)	1.1	4.6	8.4	

119.0 ft
95.2 ft
47.2 ft
0.0 ft



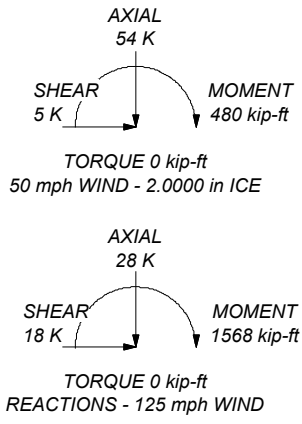
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 43.9%

ALL REACTIONS ARE FACTORED



<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# 846293</p>
	<p>Project:</p>		
	<p>Client: Crown Castle</p>	<p>Drawn by: phimes</p>	<p>App'd:</p>
	<p>Code: TIA-222-H</p>	<p>Date: 05/30/21</p>	<p>Scale: NTS</p>
	<p>Path: C:\Users\phimes\Desktop\Work Area\846293\WO 1966261 - SA\Prod\846293.dwg</p>	<p>Dwg No. E-1</p>	

Tower Input Data

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

- Tower is located in Tolland County, Connecticut.
- Tower base elevation above sea level: 697.00 ft.
- Basic wind speed of 125 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 2.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="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
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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	119.00-95.19	23.81	3.78	18	18.5000	26.2500	0.1875	0.7500	A572-65 (65 ksi)
L2	95.19-47.25	51.72	5.67	18	24.6441	41.3438	0.2500	1.0000	A572-65 (65 ksi)
L3	47.25-0.00	52.92		18	39.0142	56.0000	0.3125	1.2500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	18.7565	10.8982	461.7305	6.5009	9.3980	49.1307	924.0685	5.4501	2.9260	15.605
	26.6260	15.5104	1331.0484	9.2522	13.3350	99.8162	2663.8483	7.7567	4.2900	22.88
L2	26.2253	19.3567	1455.2517	8.6599	12.5192	116.2416	2912.4183	9.6802	3.8974	15.589
	41.9430	32.6079	6956.8350	14.5883	21.0026	331.2365	13922.824	16.3070	6.8365	27.346
L3	41.4149	38.3873	7264.1477	13.7391	19.8192	366.5204	14537.853	19.1973	6.3165	20.213
	56.8157	55.2350	21640.513	19.7691	28.4480	760.7042	43309.501	27.6228	9.3060	29.779

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 119.00-95.19				1	1	1			
L2 95.19-47.25				1	1	1			
L3 47.25-0.00				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 in	Perimeter in	Weight plf

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf
Lvl 119								
LDF4-50A(1/2")	C	No	No	Inside Pole	119.00 - 7.00	1	No Ice	0.15
							1/2" Ice	0.15
							1" Ice	0.15
							2" Ice	0.15
LDF5-50A(7/8")	C	No	No	Inside Pole	119.00 - 7.00	2	No Ice	0.33
							1/2" Ice	0.33
							1" Ice	0.33

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
LDF7-50A(1-5/8")	C	No	No	Inside Pole	119.00 - 7.00	12	2" Ice	0.00	0.33
							No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
Lvl 110									
LDF7-50A(1-5/8")	B	No	No	Inside Pole	110.00 - 7.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
							Lvl 100		
CU12PSM9P6XXX (1-1/2)	C	No	No	Inside Pole	100.00 - 0.00	1	No Ice	0.00	2.35
							1/2" Ice	0.00	2.35
							1" Ice	0.00	2.35
							2" Ice	0.00	2.35
							misc ***		

Feed Line/Linear Appurtenances Section Areas

Tower Section	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	119.00-95.19	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.15
		C	0.000	0.000	0.000	0.000	0.26
L2	95.19-47.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.47
		C	0.000	0.000	0.000	0.000	0.62
L3	47.25-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.40
		C	0.000	0.000	0.000	0.000	0.54

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	119.00-95.19	A	1.911	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.26
L2	95.19-47.25	A	1.833	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.47
		C		0.000	0.000	0.000	0.000	0.62
L3	47.25-0.00	A	1.637	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.40
		C		0.000	0.000	0.000	0.000	0.54

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	119.00-95.19	0.0000	0.0000	0.0000	0.0000
L2	95.19-47.25	0.0000	0.0000	0.0000	0.0000

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L3	47.25-0.00	0.0000	0.0000	0.0000	0.0000

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement ft
			Horz Lateral ft	Vert ft		
*						
Lightning Rod 5/8" x 8' *Lvl 119*	C	None			0.0000	123.00
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	119.00
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	119.00
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	119.00
P65-17-XLH-RR w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	119.00
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	119.00
P65-17-XLH-RR w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	119.00
(2) LGP21401	A	From Leg	4.00	0.00	0.0000	119.00
(2) LGP21401	B	From Leg	4.00	0.00	0.0000	119.00
(2) LGP21401	C	From Leg	4.00	0.00	0.0000	119.00
RRUS-11	A	From Leg	4.00	0.00	0.0000	119.00
RRUS-11	B	From Leg	4.00	0.00	0.0000	119.00
RRUS-11	C	From Leg	4.00	0.00	0.0000	119.00
CBC721A-03	A	From Leg	4.00	0.00	0.0000	119.00
CBC721A-03	B	From Leg	4.00	0.00	0.0000	119.00
CBC721A-03	C	From Leg	4.00	0.00	0.0000	119.00
LGP13519	A	From Leg	4.00	0.00	0.0000	119.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
LGP13519	B	From Leg	1.00 4.00 0.00	0.0000	119.00
LGP13519	C	From Leg	1.00 4.00 0.00	0.0000	119.00
DC6-48-60-18-8F	B	From Leg	1.00 4.00 0.00 3.00	0.0000	119.00
Platform Mount [LP 712-1] 6' x 2" Mount Pipe	C A	None From Leg	4.00 0.00 3.00	0.0000 0.0000	119.00 119.00
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	119.00
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	119.00
Lvl 110					
(2) LPA-80063/6CF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	110.00
(2) LPA-80063/6CF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	110.00
(2) LPA-80063/6CF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00
BXA-70063/6CF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	110.00
BXA-70063/6CF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	110.00
BXA-70063/6CF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00
MG D3-800Tx w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	110.00
MG D3-800Tx w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	110.00
MG D3-800Tx w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 0.00	0.0000	110.00
(2) FD9R6004/2C-3L	B	From Leg	4.00 0.00 0.00	0.0000	110.00
(2) FD9R6004/2C-3L	C	From Leg	4.00 0.00 0.00	0.0000	110.00
Platform Mount [LP 303-1] ***	C	None		0.0000	110.00
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	100.00
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	100.00

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement
			Horz Lateral	Vert		
			ft	ft	°	ft
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B604	A	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B604	B	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B604	C	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B605	A	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B605	B	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B605	C	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
RDIDC-9181-PF-48	B	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
Commscope MC-PK8-DSH	B	None			0.0000	100.00
(2) 8'x2" Antenna Mount Pipe	A	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
(2) 8'x2" Antenna Mount Pipe	B	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
(2) 8'x2" Antenna Mount Pipe	C	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation	z	K _z	q _z	A _G	F _{a c e}	A _F	A _R	A _{leg}	Leg %	C _{A A} _{In Face}	C _{A A} _{Out Face}
ft	ft		psf	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
L1 119.00-95.19	106.41	1.006	35	45.018	A	0.000	45.018	45.018	100.00	0.000	0.000
					B	0.000	45.018		100.00	0.000	0.000
					C	0.000	45.018		100.00	0.000	0.000
L2 95.19-47.25	69.95	0.892	31	136.174	A	0.000	136.174	136.174	100.00	0.000	0.000
					B	0.000	136.174		100.00	0.000	0.000
					C	0.000	136.174		100.00	0.000	0.000
L3 47.25-0.00	22.66	0.7	25	193.391	A	0.000	193.391	193.391	100.00	0.000	0.000
					B	0.000	193.391		100.00	0.000	0.000
					C	0.000	193.391		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	t_z in	A_G ft ²	F a c e	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²
L1 119.00-95.19	106.41	1.006	6	1.9112	52.601	A	0.000	52.601	52.601	100.00	0.000	0.000
						B	0.000	52.601	52.601	100.00	0.000	0.000
						C	0.000	52.601	52.601	100.00	0.000	0.000
L2 95.19-47.25	69.95	0.892	5	1.8326	151.445	A	0.000	151.445	151.445	100.00	0.000	0.000
						B	0.000	151.445	151.445	100.00	0.000	0.000
						C	0.000	151.445	151.445	100.00	0.000	0.000
L3 47.25-0.00	22.66	0.7	4	1.6373	207.823	A	0.000	207.823	207.823	100.00	0.000	0.000
						B	0.000	207.823	207.823	100.00	0.000	0.000
						C	0.000	207.823	207.823	100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	A_G ft ²	F a c e	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²
L1 119.00-95.19	106.41	1.006	8	45.018	A	0.000	45.018	45.018	100.00	0.000	0.000
					B	0.000	45.018	45.018	100.00	0.000	0.000
					C	0.000	45.018	45.018	100.00	0.000	0.000
L2 95.19-47.25	69.95	0.892	7	136.174	A	0.000	136.174	136.174	100.00	0.000	0.000
					B	0.000	136.174	136.174	100.00	0.000	0.000
					C	0.000	136.174	136.174	100.00	0.000	0.000
L3 47.25-0.00	22.66	0.7	5	193.391	A	0.000	193.391	193.391	100.00	0.000	0.000
					B	0.000	193.391	193.391	100.00	0.000	0.000
					C	0.000	193.391	193.391	100.00	0.000	0.000

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	119 - 95.1927	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.64	-0.55	-0.32
			Max. Mx	8	-9.08	-134.70	0.27
			Max. My	14	-9.08	0.23	-135.05
			Max. Vy	8	11.08	-134.70	0.27
			Max. Vx	14	11.08	0.23	-135.05
			Max. Torque	4			0.16
L2	95.1927 - 47.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.77	-0.55	-0.32
			Max. Mx	8	-15.52	-713.62	0.32
			Max. My	14	-15.52	0.28	-714.03
			Max. Vy	8	14.16	-713.62	0.32
			Max. Vx	14	14.17	0.28	-714.03
			Max. Torque	16			0.05
L3	47.25 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.70	-0.55	-0.32
			Max. Mx	8	-27.94	-1567.72	0.38
			Max. My	14	-27.94	0.34	-1568.20
			Max. Vy	8	18.20	-1567.72	0.38
			Max. Vx	14	18.21	0.34	-1568.20
			Max. Torque	16			0.05

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	53.70	-5.38	-0.00

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H _x	20	27.95	18.19	-0.00
	Max. H _z	2	27.95	-0.00	18.19
	Max. M _x	2	1568.08	-0.00	18.19
	Max. M _z	8	1567.72	-18.19	0.00
	Max. Torsion	16	0.05	9.10	-15.76
	Min. Vert	23	20.96	15.75	9.10
	Min. H _x	8	27.95	-18.19	0.00
	Min. H _z	14	27.95	0.00	-18.19
	Min. M _x	14	-1568.20	0.00	-18.19
	Min. M _z	20	-1567.51	18.19	-0.00
	Min. Torsion	4	-0.05	-9.10	15.76

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	23.29	0.00	0.00	0.05	-0.08	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	27.95	0.00	-18.19	-1568.08	-0.55	0.04
0.9 Dead+1.0 Wind 0 deg - No Ice	20.96	0.00	-18.19	-1558.96	-0.52	0.04
1.2 Dead+1.0 Wind 30 deg - No Ice	27.95	9.10	-15.76	-1358.21	-784.30	0.05
0.9 Dead+1.0 Wind 30 deg - No Ice	20.96	9.10	-15.76	-1350.31	-779.70	0.05
1.2 Dead+1.0 Wind 60 deg - No Ice	27.95	15.76	-9.10	-784.39	-1357.92	0.04
0.9 Dead+1.0 Wind 60 deg - No Ice	20.96	15.76	-9.10	-779.84	-1349.99	0.04
1.2 Dead+1.0 Wind 90 deg - No Ice	27.95	18.19	-0.00	-0.38	-1567.72	0.02
0.9 Dead+1.0 Wind 90 deg - No Ice	20.96	18.19	-0.00	-0.39	-1558.57	0.02
1.2 Dead+1.0 Wind 120 deg - No Ice	27.95	15.75	9.10	783.75	-1357.48	0.00
0.9 Dead+1.0 Wind 120 deg - No Ice	20.96	15.75	9.10	779.17	-1349.55	0.00
1.2 Dead+1.0 Wind 150 deg - No Ice	27.95	9.10	15.76	1357.89	-783.53	-0.02
0.9 Dead+1.0 Wind 150 deg - No Ice	20.96	9.10	15.76	1349.97	-778.94	-0.02
1.2 Dead+1.0 Wind 180 deg - No Ice	27.95	-0.00	18.19	1568.20	0.34	-0.04
0.9 Dead+1.0 Wind 180 deg - No Ice	20.96	-0.00	18.19	1559.05	0.36	-0.04
1.2 Dead+1.0 Wind 210 deg - No Ice	27.95	-9.10	15.76	1358.33	784.09	-0.05
0.9 Dead+1.0 Wind 210 deg - No Ice	20.96	-9.10	15.76	1350.40	779.55	-0.05
1.2 Dead+1.0 Wind 240 deg - No Ice	27.95	-15.76	9.10	784.51	1357.71	-0.04
0.9 Dead+1.0 Wind 240 deg - No Ice	20.96	-15.76	9.10	779.93	1349.83	-0.04
1.2 Dead+1.0 Wind 270 deg - No Ice	27.95	-18.19	0.00	0.50	1567.51	-0.03
0.9 Dead+1.0 Wind 270 deg - No Ice	20.96	-18.19	0.00	0.48	1558.41	-0.02
1.2 Dead+1.0 Wind 300 deg - No Ice	27.95	-15.75	-9.10	-783.62	1357.27	0.00
0.9 Dead+1.0 Wind 300 deg - No Ice	20.96	-15.75	-9.10	-779.08	1349.39	0.00
1.2 Dead+1.0 Wind 330 deg - No Ice	27.95	-9.10	-15.76	-1357.77	783.32	0.03
0.9 Dead+1.0 Wind 330 deg - No Ice	20.96	-9.10	-15.76	-1349.88	778.79	0.03

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
- No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	53.70	0.00	0.00	0.32	-0.55	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	53.70	-0.00	-5.38	-478.76	-0.68	0.04
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	53.70	2.69	-4.66	-414.60	-240.20	0.04
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	53.70	4.66	-2.69	-239.25	-415.53	0.04
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	53.70	5.38	0.00	0.31	-479.69	0.02
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	53.70	4.66	2.69	239.88	-415.48	-0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	53.70	2.69	4.66	415.27	-240.11	-0.02
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	53.70	0.00	5.38	479.48	-0.57	-0.04
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	53.70	-2.69	4.66	415.32	238.95	-0.04
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	53.70	-4.66	2.69	239.97	414.28	-0.04
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	53.70	-5.38	-0.00	0.41	478.44	-0.02
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	53.70	-4.66	-2.69	-239.16	414.23	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	53.70	-2.69	-4.66	-414.55	238.86	0.02
Dead+Wind 0 deg - Service	23.29	0.00	-3.95	-339.26	-0.18	0.02
Dead+Wind 30 deg - Service	23.29	1.97	-3.42	-293.85	-169.77	0.02
Dead+Wind 60 deg - Service	23.29	3.42	-1.98	-169.69	-293.89	0.02
Dead+Wind 90 deg - Service	23.29	3.95	-0.00	-0.05	-339.29	0.01
Dead+Wind 120 deg - Service	23.29	3.42	1.97	169.62	-293.79	-0.00
Dead+Wind 150 deg - Service	23.29	1.97	3.42	293.85	-169.60	-0.01
Dead+Wind 180 deg - Service	23.29	-0.00	3.95	339.36	0.01	-0.02
Dead+Wind 210 deg - Service	23.29	-1.97	3.42	293.95	169.60	-0.02
Dead+Wind 240 deg - Service	23.29	-3.42	1.98	169.79	293.72	-0.02
Dead+Wind 270 deg - Service	23.29	-3.95	0.00	0.15	339.11	-0.01
Dead+Wind 300 deg - Service	23.29	-3.42	-1.97	-169.52	293.62	0.00
Dead+Wind 330 deg - Service	23.29	-1.97	-3.42	-293.75	169.43	0.01

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-23.29	0.00	0.00	23.29	0.00	0.000%
2	0.00	-27.95	-18.19	-0.00	27.95	18.19	0.000%
3	0.00	-20.96	-18.19	-0.00	20.96	18.19	0.000%
4	9.10	-27.95	-15.76	-9.10	27.95	15.76	0.000%
5	9.10	-20.96	-15.76	-9.10	20.96	15.76	0.000%
6	15.76	-27.95	-9.10	-15.76	27.95	9.10	0.000%
7	15.76	-20.96	-9.10	-15.76	20.96	9.10	0.000%
8	18.19	-27.95	-0.00	-18.19	27.95	0.00	0.000%
9	18.19	-20.96	-0.00	-18.19	20.96	0.00	0.000%
10	15.75	-27.95	9.10	-15.75	27.95	-9.10	0.000%
11	15.75	-20.96	9.10	-15.75	20.96	-9.10	0.000%
12	9.10	-27.95	15.76	-9.10	27.95	-15.76	0.000%
13	9.10	-20.96	15.76	-9.10	20.96	-15.76	0.000%
14	-0.00	-27.95	18.19	0.00	27.95	-18.19	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
15	-0.00	-20.96	18.19	0.00	20.96	-18.19	0.000%
16	-9.10	-27.95	15.76	9.10	27.95	-15.76	0.000%
17	-9.10	-20.96	15.76	9.10	20.96	-15.76	0.000%
18	-15.76	-27.95	9.10	15.76	27.95	-9.10	0.000%
19	-15.76	-20.96	9.10	15.76	20.96	-9.10	0.000%
20	-18.19	-27.95	0.00	18.19	27.95	-0.00	0.000%
21	-18.19	-20.96	0.00	18.19	20.96	-0.00	0.000%
22	-15.75	-27.95	-9.10	15.75	27.95	9.10	0.000%
23	-15.75	-20.96	-9.10	15.75	20.96	9.10	0.000%
24	-9.10	-27.95	-15.76	9.10	27.95	15.76	0.000%
25	-9.10	-20.96	-15.76	9.10	20.96	15.76	0.000%
26	0.00	-53.70	0.00	0.00	53.70	0.00	0.000%
27	-0.00	-53.70	-5.38	0.00	53.70	5.38	0.000%
28	2.69	-53.70	-4.66	-2.69	53.70	4.66	0.000%
29	4.66	-53.70	-2.69	-4.66	53.70	2.69	0.000%
30	5.38	-53.70	0.00	-5.38	53.70	-0.00	0.000%
31	4.66	-53.70	2.69	-4.66	53.70	-2.69	0.000%
32	2.69	-53.70	4.66	-2.69	53.70	-4.66	0.000%
33	0.00	-53.70	5.38	-0.00	53.70	-5.38	0.000%
34	-2.69	-53.70	4.66	2.69	53.70	-4.66	0.000%
35	-4.66	-53.70	2.69	4.66	53.70	-2.69	0.000%
36	-5.38	-53.70	-0.00	5.38	53.70	0.00	0.000%
37	-4.66	-53.70	-2.69	4.66	53.70	2.69	0.000%
38	-2.69	-53.70	-4.66	2.69	53.70	4.66	0.000%
39	0.00	-23.29	-3.95	-0.00	23.29	3.95	0.000%
40	1.97	-23.29	-3.42	-1.97	23.29	3.42	0.000%
41	3.42	-23.29	-1.98	-3.42	23.29	1.98	0.000%
42	3.95	-23.29	-0.00	-3.95	23.29	0.00	0.000%
43	3.42	-23.29	1.97	-3.42	23.29	-1.97	0.000%
44	1.97	-23.29	3.42	-1.97	23.29	-3.42	0.000%
45	-0.00	-23.29	3.95	0.00	23.29	-3.95	0.000%
46	-1.97	-23.29	3.42	1.97	23.29	-3.42	0.000%
47	-3.42	-23.29	1.98	3.42	23.29	-1.98	0.000%
48	-3.95	-23.29	0.00	3.95	23.29	-0.00	0.000%
49	-3.42	-23.29	-1.97	3.42	23.29	1.97	0.000%
50	-1.97	-23.29	-3.42	1.97	23.29	3.42	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00003586
3	Yes	4	0.00000001	0.00001868
4	Yes	5	0.00000001	0.00008720
5	Yes	5	0.00000001	0.00004035
6	Yes	5	0.00000001	0.00008731
7	Yes	5	0.00000001	0.00004041
8	Yes	4	0.00000001	0.00003436
9	Yes	4	0.00000001	0.00001751
10	Yes	5	0.00000001	0.00008693
11	Yes	5	0.00000001	0.00004024
12	Yes	5	0.00000001	0.00008693
13	Yes	5	0.00000001	0.00004023
14	Yes	4	0.00000001	0.00003698
15	Yes	4	0.00000001	0.00001968
16	Yes	5	0.00000001	0.00008733
17	Yes	5	0.00000001	0.00004042
18	Yes	5	0.00000001	0.00008715
19	Yes	5	0.00000001	0.00004033
20	Yes	4	0.00000001	0.00003365
21	Yes	4	0.00000001	0.00001684
22	Yes	5	0.00000001	0.00008683
23	Yes	5	0.00000001	0.00004020
24	Yes	5	0.00000001	0.00008691

25	Yes	5	0.00000001	0.00004024
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00010252
28	Yes	5	0.00000001	0.00012533
29	Yes	5	0.00000001	0.00012507
30	Yes	5	0.00000001	0.00010297
31	Yes	5	0.00000001	0.00012554
32	Yes	5	0.00000001	0.00012562
33	Yes	5	0.00000001	0.00010288
34	Yes	5	0.00000001	0.00012473
35	Yes	5	0.00000001	0.00012494
36	Yes	5	0.00000001	0.00010234
37	Yes	5	0.00000001	0.00012424
38	Yes	5	0.00000001	0.00012420
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00003870
41	Yes	4	0.00000001	0.00003807
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00003824
44	Yes	4	0.00000001	0.00003843
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00003801
47	Yes	4	0.00000001	0.00003859
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00003808
50	Yes	4	0.00000001	0.00003793

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 95.1927	8.324	46	0.6754	0.0001
L2	98.974 - 47.25	5.628	45	0.5896	0.0001
L3	52.9166 - 0	1.445	46	0.2610	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.00	Lightning Rod 5/8" x 8'	46	8.324	0.6754	0.0001	33508
119.00	(2) 7770.00 w/ Mount Pipe	46	8.324	0.6754	0.0001	33508
110.00	(2) LPA-80063/6CF-2 w/ Mount Pipe	45	7.078	0.6408	0.0001	18615
100.00	MX08FRO665-21 w/ Mount Pipe	45	5.757	0.5951	0.0001	9007

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 95.1927	38.491	16	3.1248	0.0012
L2	98.974 - 47.25	26.026	16	2.7282	0.0003
L3	52.9166 - 0	6.681	16	1.2071	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.00	Lightning Rod 5/8" x 8'	16	38.491	3.1248	0.0012	7286
119.00	(2) 7770.00 w/ Mount Pipe	16	38.491	3.1248	0.0012	7286
110.00	(2) LPA-80063/6CF-2 w/ Mount Pipe	16	32.730	2.9650	0.0008	4047
100.00	MX08FRO665-21 w/ Mount Pipe	16	26.622	2.7534	0.0004	1957

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	119 - 95.1927 (1)	TP26.25x18.5x0.1875	23.81	0.00	0.0	14.777 9	-9.08	864.51	0.011
L2	95.1927 - 47.25 (2)	TP41.3438x24.6441x0.25	51.72	0.00	0.0	31.156 1	-15.52	1822.63	0.009
L3	47.25 - 0 (3)	TP56x39.0142x0.3125	52.92	0.00	0.0	55.235 0	-27.94	3231.25	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio M _{ux} / φM _{nx}	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio M _{uy} / φM _{ny}
L1	119 - 95.1927 (1)	TP26.25x18.5x0.1875	135.17	508.24	0.266	0.00	508.24	0.000
L2	95.1927 - 47.25 (2)	TP41.3438x24.6441x0.25	714.19	1580.72	0.452	0.00	1580.72	0.000
L3	47.25 - 0 (3)	TP56x39.0142x0.3125	1568.39	3727.85	0.421	0.00	3727.85	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u K	φV _n K	Ratio V _u / φV _n	Actual T _u kip-ft	φT _n kip-ft	Ratio T _u / φT _n
L1	119 - 95.1927 (1)	TP26.25x18.5x0.1875	11.08	259.35	0.043	0.16	563.99	0.000
L2	95.1927 - 47.25 (2)	TP41.3438x24.6441x0.25	14.17	546.79	0.026	0.05	1880.18	0.000
L3	47.25 - 0 (3)	TP56x39.0142x0.3125	18.21	969.38	0.019	0.05	4727.48	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	119 - 95.1927 (1)	0.011	0.266	0.000	0.043	0.000	0.278	1.050	4.8.2
L2	95.1927 - 47.25 (2)	0.009	0.452	0.000	0.026	0.000	0.461	1.050	4.8.2
L3	47.25 - 0 (3)	0.009	0.421	0.000	0.019	0.000	0.430	1.050	4.8.2

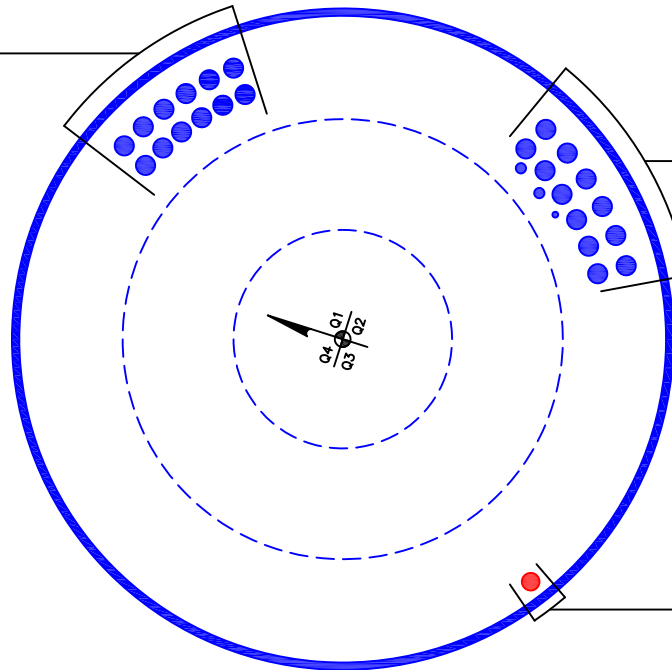
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L1	119 - 95.1927	Pole	TP26.25x18.5x0.1875	1	-9.08	907.73	26.5	Pass	
L2	95.1927 - 47.25	Pole	TP41.3438x24.6441x0.25	2	-15.52	1913.76	43.9	Pass	
L3	47.25 - 0	Pole	TP56x39.0142x0.3125	3	-27.94	3392.81	40.9	Pass	
							Summary		
							Pole (L2)	43.9	Pass
							RATING =	43.9	Pass

APPENDIX B
BASE LEVEL DRAWING



(OTHER CONSIDERED EQUIPMENT)
(12) 1-5/8" TO 110 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 119 FT LEVEL
(2) 7/8" TO 119 FT LEVEL
(12) 1-5/8" TO 119 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-1/2" TO 100 FT LEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

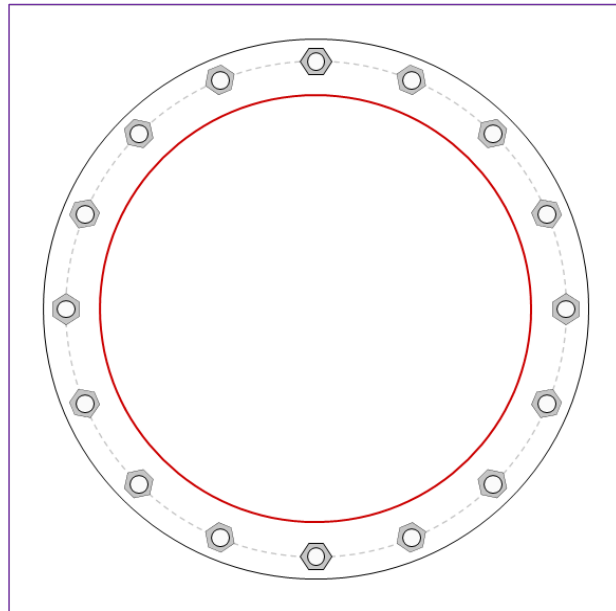


Site Info	
BU #	846293
Site Name	DLLAND - PTER GREEN F
Order #	556620, Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.625

Applied Loads	
Moment (kip-ft)	1568.39
Axial Force (kips)	27.94
Shear Force (kips)	18.21

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(16) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 65" BC
Base Plate Data
71" OD x 2.25" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)
Stiffener Data
N/A
Pole Data
56" x 0.3125" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary	<i>(units of kips, kip-in)</i>	
$Pu_t = 70.61$	$\phi Pn_t = 243.75$	Stress Rating
$Vu = 1.14$	$\phi Vn = 149.1$	27.6%
$Mu = n/a$	$\phi Mn = n/a$	Pass
Base Plate Summary		
Max Stress (ksi):	14.64	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	25.8%	Pass

Pier and Pad Foundation



BU # : 846293
Site Name: TOLLAND - PETE
App. Number: 556620, Rev. 1

TIA-222 Revision: H
Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp} :	27.95	kips
Base Shear, V_{u_comp} :	18.2	kips
Moment, M_u :	1568.39	ft-kips
Tower Height, H :	119	ft
BP Dist. Above Fdn, bp_{dist} :	3.125	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	203.96	18.20	8.5%	Pass
<i>Bearing Pressure (ksf)</i>	22.50	1.36	5.7%	Pass
<i>Overtuning (kip*ft)</i>	5293.32	1682.33	31.8%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	4677.77	1622.99	33.0%	Pass
<i>Pier Compression (kip)</i>	31187.52	54.41	0.2%	Pass
<i>Pad Flexure (kip*ft)</i>	3498.86	561.44	15.3%	Pass
<i>Pad Shear - 1-way (kips)</i>	896.51	86.83	9.2%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.017	8.5%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	4443.10	973.79	20.9%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	7	ft
Ext. Above Grade, E :	1	ft
Pier Rebar Size, Sc :	8	
Pier Rebar Quantity, mc :	36	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	7	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Structural Rating*:	33.0%
Soil Rating*:	31.8%

Pad Properties		
Depth, D :	5	ft
Pad Width, W_1 :	25	ft
Pad Thickness, T :	3	ft
Pad Rebar Size (Bottom dir. 2), Sp_2 :	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	32	
Pad Clear Cover, cc_{pad} :	3	in

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

Soil Properties		
Total Soil Unit Weight, γ :	125	pcf
Ultimate Gross Bearing, Q_{ult} :	30.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	35	degrees
SPT Blow Count, N_{blows} :	29	
Base Friction, μ :	0.45	
Neglected Depth, N :	3.30	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

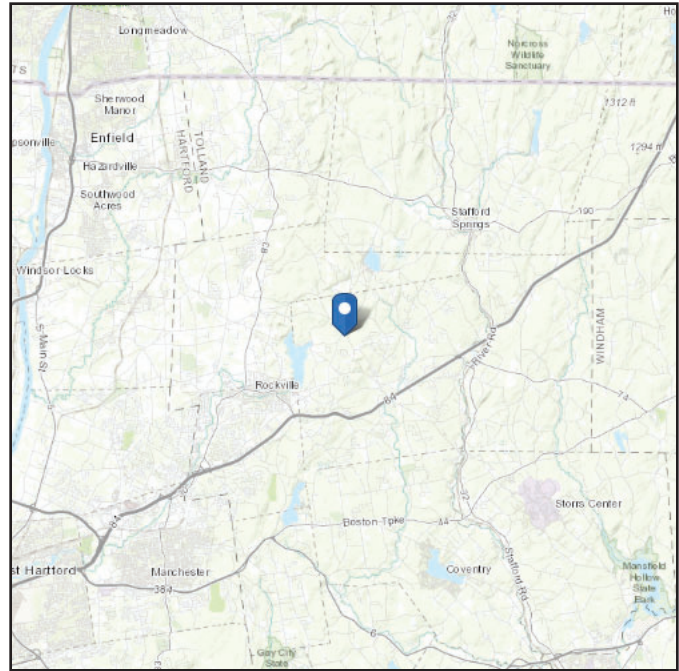
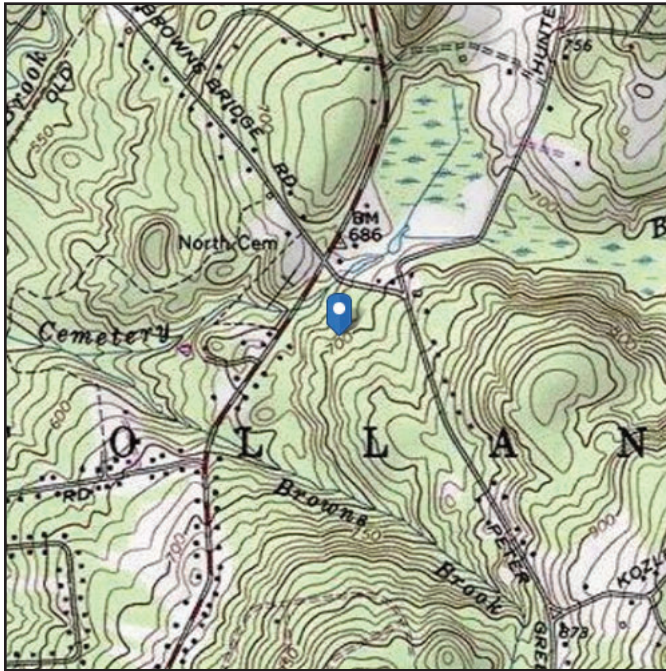
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ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 697.04 ft (NAVD 88)
Latitude: 41.896614
Longitude: -72.393731



Wind

Results:

Wind Speed:	124 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	101 Vmph

Ultimate 3-second gust wind speed of 125 mph required for Risk Category II.

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

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

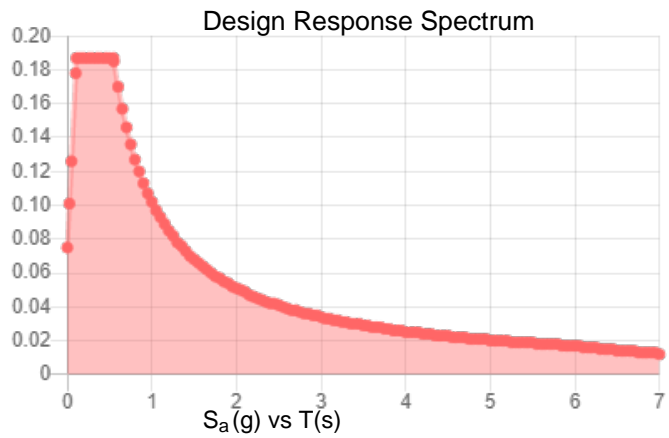
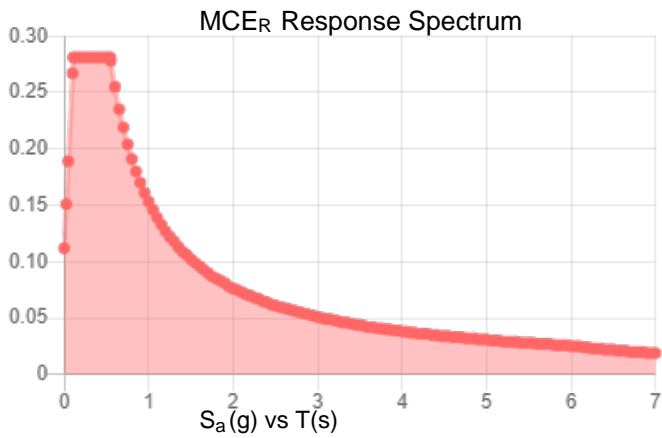
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.175	S_{DS} :	0.187
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.087
S_{MS} :	0.281	PGA _M :	0.139
S_{M1} :	0.153	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Sun May 30 2021

Date Source:

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

Ice

Results:

Ice Thickness: 1.00 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

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

Date Accessed: Sun May 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.

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Exhibit E

Mount Analysis

Date: **August 1, 2021**

Darcy Tarr
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
704-405-6589



Trylon
1825 W. Walnut Hill Lane,
Suite 302
Irving, TX 75038
214-930-1730

Subject: **Mount Replacement Analysis Report**

Carrier Designation: **DISH Network Equipment Change-Out**
Carrier Site Number: BOBDL00072A
Carrier Site Name: CT-CCI-T-846293

Crown Castle Designation: **Crown Castle BU Number:** 846293
Crown Castle Site Name: Tolland - Peter Green Rd
Crown Castle JDE Job Number: 650063
Crown Castle Order Number: 556620 Rev. 1

Engineering Firm Designation: **Trylon Report Designation:** 189198

Site Data: **319 Peter Green Road, Tolland, Tolland County, CT, 06084**
Latitude 41°53'47.81" Longitude -72°23'37.43"

Structure Information: **Tower Height & Type:** **119.0 ft Monopole**
Mount Elevation: **100.0 ft**
Mount Type: **8.0 ft Platform**

Dear Darcy Tarr,

Trylon is pleased to submit this "**Mount Replacement Analysis Report**" to determine the structural integrity of DISH Network's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Platform **Sufficient**
***Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Jordan Everson, E.I.T.

Respectfully Submitted by:
Cliff Abernathy, P.E.



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Supplemental Drawings

1) INTRODUCTION

This is a proposed 3 sector 8.0 ft Platform, designed by CommScope.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC / 2018 Connecticut State Building Code
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.175
Seismic S₁:	0.064
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
100.0	100.0	3	JMA WIRELESS	MX08FRO665-21	8.0 ft Platform [CommScope and MC-PK8-DSH]
		3	FUJITSU	TA08025-B604	
		3	FUJITSU	TA08025-B605	
		1	RAYCAP	RDIDC-9181-PF-48	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	DISH Network Application	556620 Rev. 1	CCI Sites
Mount Manufacturer Drawings	CommScope	MC-PK8-DSH	Trylon

3.1) Analysis Method

RISA-3D (Version 17.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A tool internally developed, using Microsoft Excel, by Trylon was used to calculate wind loading on all appurtenances, dishes, and mount members for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision B).

3.2) Assumptions

- 1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
- 3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- 4) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
- 5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
- 6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

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

4) ANALYSIS RESULTS

Table 3- Mount Component Stresses vs. Capacity (Platform, All Sectors)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2	Mount Pipe(s)	MP2	100.0	26.9	Pass
	Horizontal(s)	H1		11.3	Pass
	Standoff(s)	M7		58.8	Pass
	Bracing(s)	M11		48.0	Pass
	Handrail(s)	M19		10.9	Pass
	Mount Connection(s)	-		24.2	Pass

Structure Rating (max from all components) =	58.8%
-----------------------------------------------------	--------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) Rating per TIA-222-H, Section 15.5

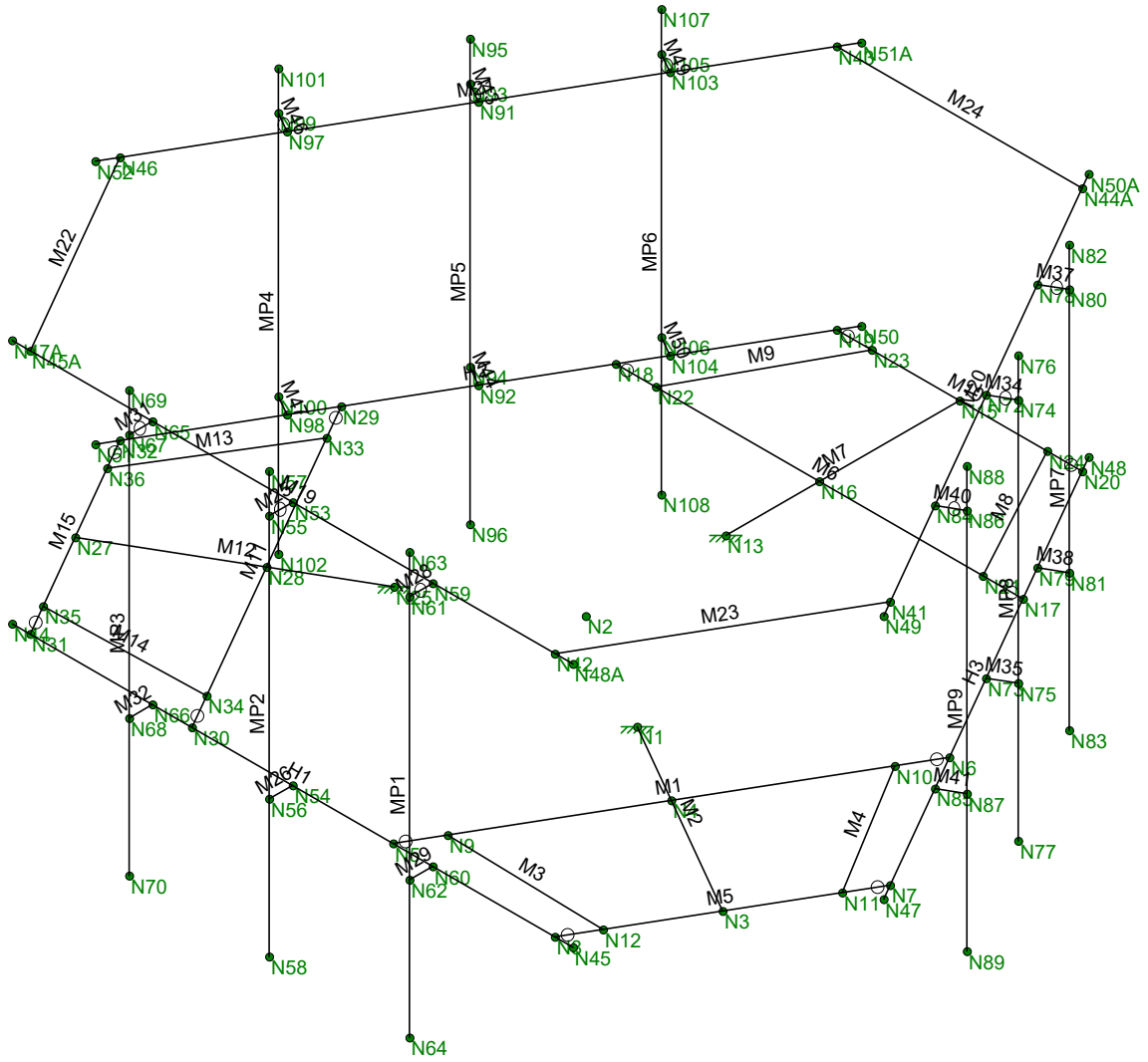
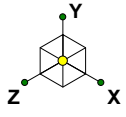
4.1) Recommendations

The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

1. Commscope MC-PK8-DSH

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

APPENDIX A
WIRE FRAME AND RENDERED MODELS



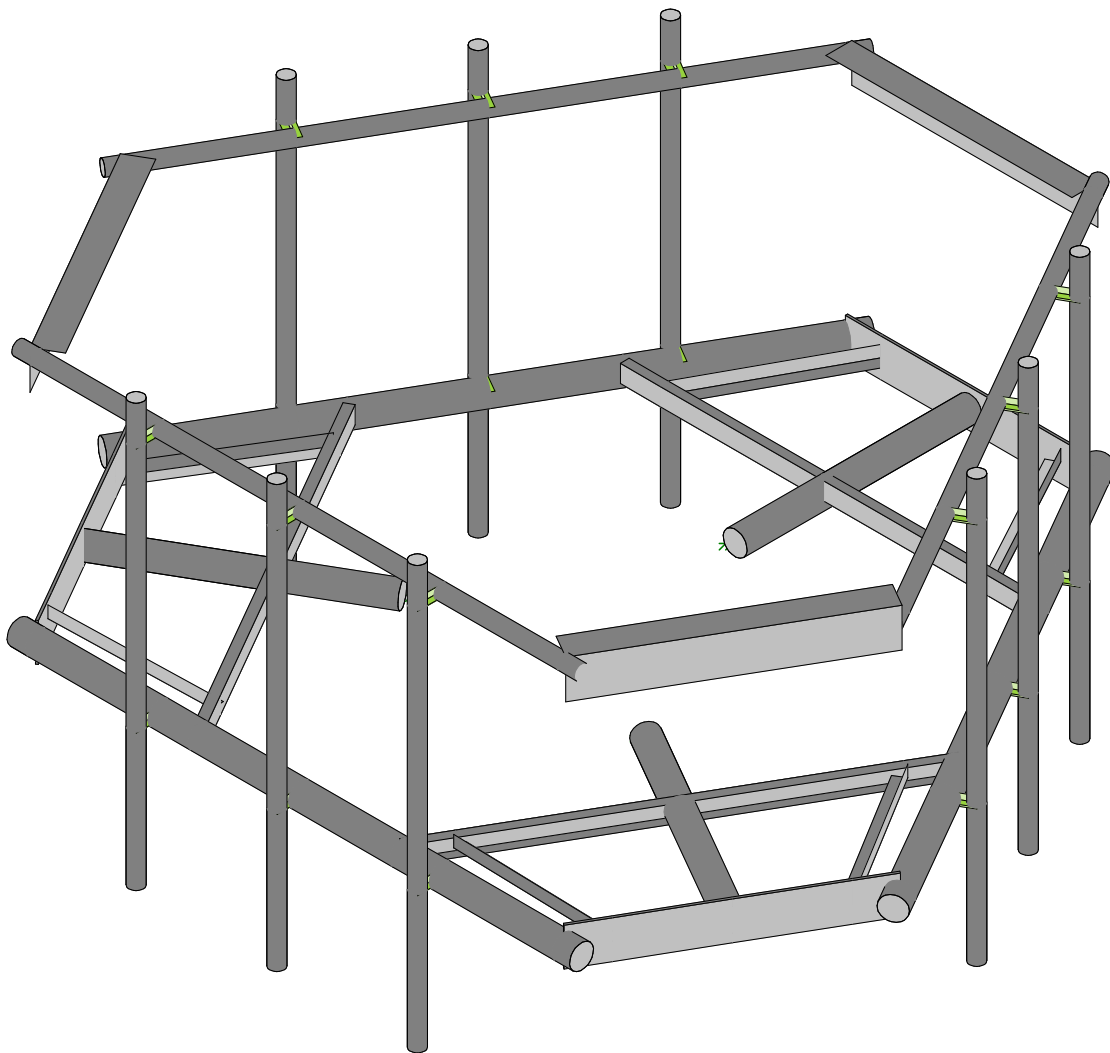
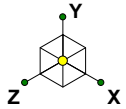
Envelope Only Solution

MC-PK8-C

Wireframe 1

July 31, 2021 at 7:40 PM

846293_loaded.r3d



Envelope Only Solution

MC-PK8-C

Rendered 2

July 31, 2021 at 7:41 PM

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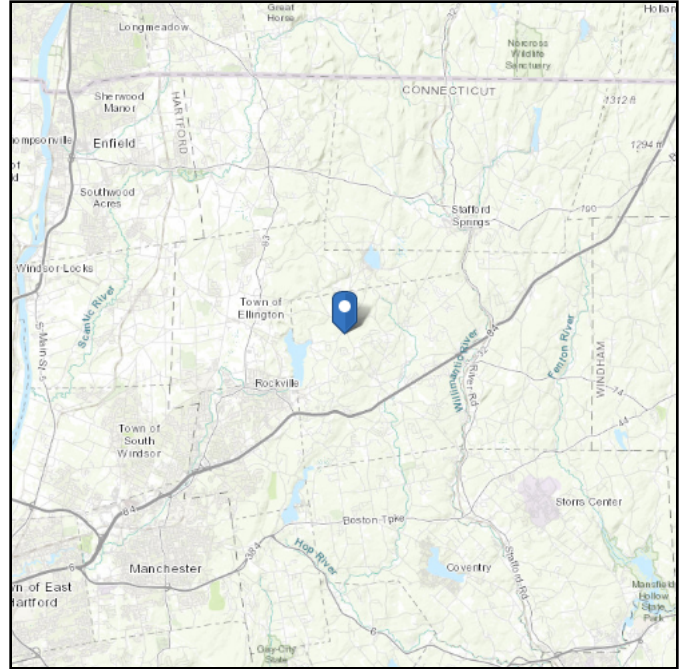
APPENDIX B
SOFTWARE INPUT CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 697.04 ft (NAVD 88)
Latitude: 41.896614
Longitude: -72.393731



Ice

Results:

Ice Thickness: 1.00 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

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

Date Accessed: Fri Jul 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.

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Trylon

1825 W. Walnut Hill Lane Suite 120
Irving, TX 75038

TIA LOAD CALCULATOR 2.0

PROJECT DATA	
Job Code:	189198
Carrier Site ID:	BOBDL00072A
Carrier Site Name:	CT-CCI-T-846293

CODES AND STANDARDS	
Building Code:	2015 IBC
Local Building Code:	2018 CTSCB
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	100.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	119.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	B	--
Site Class:	D - Default	--
Ground Elevation:	697.04	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor (K_{zt}):	1.00	--
Mount Topo Factor (K_{zt}):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	125	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	0.99	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (G_h):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	36.62	psf

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	2.00	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	36.62	psf
Mount Ice Thickness (t_z):	2.23	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	65.91	psf
Round Member Pressure:	39.55	psf
Ice Wind Pressure:	7.15	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel. (S_s):	0.18	g
1 Second Accel. (S_1):	0.06	g
Short Period Des. (S_{DS}):	0.19	g
1 Second Des. (S_{D1}):	0.10	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (C_s):	0.09	--
Amplification Factor (A_S):	1.20	--

LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1

#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site

APPENDIX C
SOFTWARE ANALYSIS OUTPUT

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISACONNECTION CODE	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-12: LRFD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: Strength
Aluminum Code	AA ADM1-10: LRFD - Building
Stainless Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parame Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR SET ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E...	Density[k/ft...	Yield[psi]	Ry	Fu[psi]	Rt
1	A992	29000	11154	.3	.65	.49	50000	1.1	65000	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36000	1.5	58000	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50000	1.1	65000	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42000	1.4	58000	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46000	1.4	58000	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35000	1.6	60000	1.2
7	A1085	29000	11154	.3	.65	.49	50000	1.4	65000	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Plates	6.5"x0.37" Plate	Beam	RECT	A53 Gr.B	Typical	2.405	.027	8.468	.106
2	Grating Bracing	L2x2x3	Beam	Single An...	A36 Gr.36	Typical	.722	.271	.271	.009
3	Standoffs	PIPE 3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
4	Standoff Bracing	C3X5	Beam	Channel	A36 Gr.36	Typical	1.47	.241	1.85	.043
5	Handrails	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	Handrail Corners	L6 5/8x4 7/16x3/16	Beam	Single An...	A36 Gr.36	Typical	2.039	3.593	9.575	.023
7	Horizontals	PIPE 3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
8	Mount Pipes	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N25	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N13	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction



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 Designer : JE
 Job Number :
 Model Name : 846293

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Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distributed	Area(Member)	Surface(Plate/Wall)
1	Self Weight	DL		-1			20		3	
2	Structure Wind Z	WLZ						51		
3	Structure Wind X	WLX						51		
4	Wind Load 0 AZI	WLZ					40			
5	Wind Load 30 AZI	None					40			
6	Wind Load 45 AZI	None					40			
7	Wind Load 60 AZI	None					40			
8	Wind Load 90 AZI	WLX					40			
9	Wind Load 120 AZI	None					40			
10	Wind Load 135 AZI	None					40			
11	Wind Load 150 AZI	None					40			
12	Ice Weight	OL1					20	51	3	
13	Ice Structure Wind Z	OL2						51		
14	Ice Structure Wind X	OL3						51		
15	Ice Wind Load 0 AZI	OL2					40			
16	Ice Wind Load 30 AZI	None					40			
17	Ice Wind Load 45 AZI	None					40			
18	Ice Wind Load 60 AZI	None					40			
19	Ice Wind Load 90 AZI	OL3					40			
20	Ice Wind Load 120 ...	None					40			
21	Ice Wind Load 135 ...	None					40			
22	Ice Wind Load 150 ...	None					40			
23	Seismic Load Z	ELZ			-112		20			
24	Seismic Load X	ELX	-112				20			
25	Live Load 1 (Lv)	None					1			
26	Live Load 2 (Lv)	None					1			
27	Live Load 3 (Lv)	None					1			
28	Live Load 4 (Lv)	None					1			
29	Live Load 5 (Lv)	None					1			
30	Live Load 6 (Lv)	None					1			
31	Live Load 7 (Lv)	None					1			
32	Live Load 8 (Lv)	None					1			
33	Live Load 9 (Lv)	None					1			
34	Maintenance Load 1...	None					1			
35	Maintenance Load 2...	None					1			
36	Maintenance Load 3...	None					1			
37	Maintenance Load 4...	None					1			
38	Maintenance Load 5...	None					1			
39	Maintenance Load 6...	None					1			
40	Maintenance Load 7...	None					1			
41	Maintenance Load 8...	None					1			
42	Maintenance Load 9...	None					1			
43	BLC 1 Transient Are...	None						9		
44	BLC 12 Transient Ar...	None						9		

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4DL	Yes	Y		DL	1.4														
2	1.2DL + 1WL 0 AZI	Yes	Y		DL	1.2	2	1	3	4	1									
3	1.2DL + 1WL 30 AZI	Yes	Y		DL	1.2	2	.866	3	.5	5	1								
4	1.2DL + 1WL 45 AZI	Yes	Y		DL	1.2	2	.707	3	.707	6	1								
5	1.2DL + 1WL 60 AZI	Yes	Y		DL	1.2	2	.5	3	.866	7	1								
6	1.2DL + 1WL 90 AZI	Yes	Y		DL	1.2	2		3	1	8	1								
7	1.2DL + 1WL 120 AZI	Yes	Y		DL	1.2	2	-.5	3	.866	9	1								



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Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
8	1.2DL + 1WL 135 AZI	Yes	Y		DL	1.2	2	-7...	3	.707	10	1										
9	1.2DL + 1WL 150 AZI	Yes	Y		DL	1.2	2	-8...	3	.5	11	1										
10	1.2DL + 1WL 180 AZI	Yes	Y		DL	1.2	2	-1	3		4	-1										
11	1.2DL + 1WL 210 AZI	Yes	Y		DL	1.2	2	-8...	3	-.5	5	-1										
12	1.2DL + 1WL 225 AZI	Yes	Y		DL	1.2	2	-7...	3	-.7...	6	-1										
13	1.2DL + 1WL 240 AZI	Yes	Y		DL	1.2	2	-.5	3	-.8...	7	-1										
14	1.2DL + 1WL 270 AZI	Yes	Y		DL	1.2	2		3	-1	8	-1										
15	1.2DL + 1WL 300 AZI	Yes	Y		DL	1.2	2	.5	3	-.8...	9	-1										
16	1.2DL + 1WL 315 AZI	Yes	Y		DL	1.2	2	.707	3	-.7...	10	-1										
17	1.2DL + 1WL 330 AZI	Yes	Y		DL	1.2	2	.866	3	-.5	11	-1										
18	0.9DL + 1WL 0 AZI	Yes	Y		DL	.9	2	1	3		4	1										
19	0.9DL + 1WL 30 AZI	Yes	Y		DL	.9	2	.866	3	.5	5	1										
20	0.9DL + 1WL 45 AZI	Yes	Y		DL	.9	2	.707	3	.707	6	1										
21	0.9DL + 1WL 60 AZI	Yes	Y		DL	.9	2	.5	3	.866	7	1										
22	0.9DL + 1WL 90 AZI	Yes	Y		DL	.9	2		3	1	8	1										
23	0.9DL + 1WL 120 AZI	Yes	Y		DL	.9	2	-.5	3	.866	9	1										
24	0.9DL + 1WL 135 AZI	Yes	Y		DL	.9	2	-.7...	3	.707	10	1										
25	0.9DL + 1WL 150 AZI	Yes	Y		DL	.9	2	-.8...	3	.5	11	1										
26	0.9DL + 1WL 180 AZI	Yes	Y		DL	.9	2	-1	3		4	-1										
27	0.9DL + 1WL 210 AZI	Yes	Y		DL	.9	2	-.8...	3	-.5	5	-1										
28	0.9DL + 1WL 225 AZI	Yes	Y		DL	.9	2	-.7...	3	-.7...	6	-1										
29	0.9DL + 1WL 240 AZI	Yes	Y		DL	.9	2	-.5	3	-.8...	7	-1										
30	0.9DL + 1WL 270 AZI	Yes	Y		DL	.9	2		3	-1	8	-1										
31	0.9DL + 1WL 300 AZI	Yes	Y		DL	.9	2	.5	3	-.8...	9	-1										
32	0.9DL + 1WL 315 AZI	Yes	Y		DL	.9	2	.707	3	-.7...	10	-1										
33	0.9DL + 1WL 330 AZI	Yes	Y		DL	.9	2	.866	3	-.5	11	-1										
34	1.2DL + 1DLi + 1WLi 0 AZI	Yes	Y		DL	1.2	0...	1	13	1	14		15	1								
35	1.2DL + 1DLi + 1WLi 30 AZI	Yes	Y		DL	1.2	0...	1	13	.866	14	.5	16	1								
36	1.2DL + 1DLi + 1WLi 45 AZI	Yes	Y		DL	1.2	0...	1	13	.707	14	.707	17	1								
37	1.2DL + 1DLi + 1WLi 60 AZI	Yes	Y		DL	1.2	0...	1	13	.5	14	.866	18	1								
38	1.2DL + 1DLi + 1WLi 90 AZI	Yes	Y		DL	1.2	0...	1	13		14	1	19	1								
39	1.2DL + 1DLi + 1WLi 120 AZI	Yes	Y		DL	1.2	0...	1	13	-.5	14	.866	20	1								
40	1.2DL + 1DLi + 1WLi 135 AZI	Yes	Y		DL	1.2	0...	1	13	-.7...	14	.707	21	1								
41	1.2DL + 1DLi + 1WLi 150 AZI	Yes	Y		DL	1.2	0...	1	13	-.8...	14	.5	22	1								
42	1.2DL + 1DLi + 1WLi 180 AZI	Yes	Y		DL	1.2	0...	1	13	-1	14		15	-1								
43	1.2DL + 1DLi + 1WLi 210 AZI	Yes	Y		DL	1.2	0...	1	13	-.8...	14	-.5	16	-1								
44	1.2DL + 1DLi + 1WLi 225 AZI	Yes	Y		DL	1.2	0...	1	13	-.7...	14	-.7...	17	-1								
45	1.2DL + 1DLi + 1WLi 240 AZI	Yes	Y		DL	1.2	0...	1	13	-.5	14	-.8...	18	-1								
46	1.2DL + 1DLi + 1WLi 270 AZI	Yes	Y		DL	1.2	0...	1	13		14	-1	19	-1								
47	1.2DL + 1DLi + 1WLi 300 AZI	Yes	Y		DL	1.2	0...	1	13	.5	14	-.8...	20	-1								
48	1.2DL + 1DLi + 1WLi 315 AZI	Yes	Y		DL	1.2	0...	1	13	.707	14	-.7...	21	-1								
49	1.2DL + 1DLi + 1WLi 330 AZI	Yes	Y		DL	1.2	0...	1	13	.866	14	-.5	22	-1								
50	(1.2+0.2Sds)DL + 1E 0 AZI	Yes	Y		DL	1.2...	23	1	24													
51	(1.2+0.2Sds)DL + 1E 30 AZI	Yes	Y		DL	1.2...	23	.866	24	.5												
52	(1.2+0.2Sds)DL + 1E 45 AZI	Yes	Y		DL	1.2...	23	.707	24	.707												
53	(1.2+0.2Sds)DL + 1E 60 AZI	Yes	Y		DL	1.2...	23	.5	24	.866												
54	(1.2+0.2Sds)DL + 1E 90 AZI	Yes	Y		DL	1.2...	23		24	1												
55	(1.2+0.2Sds)DL + 1E 120 AZI	Yes	Y		DL	1.2...	23	-.5	24	.866												
56	(1.2+0.2Sds)DL + 1E 135 AZI	Yes	Y		DL	1.2...	23	-.7...	24	.707												
57	(1.2+0.2Sds)DL + 1E 150 AZI	Yes	Y		DL	1.2...	23	-.8...	24	.5												
58	(1.2+0.2Sds)DL + 1E 180 AZI	Yes	Y		DL	1.2...	23	-1	24													
59	(1.2+0.2Sds)DL + 1E 210 AZI	Yes	Y		DL	1.2...	23	-.8...	24	-.5												
60	(1.2+0.2Sds)DL + 1E 225 AZI	Yes	Y		DL	1.2...	23	-.7...	24	-.7...												
61	(1.2+0.2Sds)DL + 1E 240 AZI	Yes	Y		DL	1.2...	23	-.5	24	-.8...												
62	(1.2+0.2Sds)DL + 1E 270 AZI	Yes	Y		DL	1.2...	23		24	-1												
63	(1.2+0.2Sds)DL + 1E 300 AZI	Yes	Y		DL	1.2...	23	.5	24	-.8...												
64	(1.2+0.2Sds)DL + 1E 315 AZI	Yes	Y		DL	1.2...	23	.707	24	-.7...												



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 Designer : JE
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Envelope Joint Reactions

Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC	
1	N25	max	891.582	20	2414.392	39	1472.924	3	162.004	33	1666.35	3	-1.54	30
2		min	-897.385	12	127.344	31	-1469.22	27	-2589.25	41	-1665.765	27	-4196.524	38
3	N1	max	897.386	8	2414.382	45	1472.926	17	162.002	19	1665.766	25	4196.502	46
4		min	-891.583	32	127.346	21	-1469.222	25	-2589.24	43	-1666.351	17	1.538	22
5	N13	max	1497.332	22	2321.832	34	353.585	18	4710.645	34	1420.899	30	684.319	167
6		min	-1497.332	30	96.66	26	-361.065	10	-66.197	26	-1420.899	22	-684.323	223
7	Totals:	max	2736.665	22	6841.774	42	2903.094	18						
8		min	-2736.665	30	1427.289	66	-2903.096	10						

Envelope AISC 15th(360-16): LRFD Steel Code Checks

Member	Shape	Code Check	Loc[in]	LC	Shear Che...	Loc[.Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn	
1	M12	PIPE 3.5	.617	40	.155	40	1	.75262	78750	7953.75	7953.75	2	H1-1b	
2	M2	PIPE 3.5	.617	40	.155	40	1	.75262	78750	7953.75	7953.75	2	H1-1b	
3	M7	PIPE 3.5	.593	40	.150	40	2	.75262	78750	7953.75	7953.75	2	H1-1b	
4	M11	C3X5	.504	34.856	.176	63.1	y	34	11202	47628	981.263	4104	1	H1-1b
5	M1	C3X5	.504	34.856	.176	6.536	y	34	11202	47628	981.263	4104	1	H1-1b
6	M6	C3X5	.480	34.856	.168	63.1	y	45	37027	47628	981.263	4020.2	1	H1-1b
7	MP1	PIPE 2.0	.286	48	.039	48	10	20866	32130	1871.6	1871.6	2	H1-1b	
8	MP3	PIPE 2.0	.286	48	.039	48	10	20866	32130	1871.6	1871.6	2	H1-1b	
9	MP2	PIPE 2.0	.282	48	.045	48	5	20866	32130	1871.6	1871.6	1	H1-1b	
10	MP4	PIPE 2.0	.282	48	.033	48	5	20866	32130	1871.6	1871.6	1	H1-1b	
11	MP9	PIPE 2.0	.282	48	.033	48	15	20866	32130	1871.6	1871.6	1	H1-1b	
12	MP5	PIPE 2.0	.274	48	.040	48	10	20866	32130	1871.6	1871.6	1	H1-1b	
13	MP8	PIPE 2.0	.274	48	.040	48	10	20866	32130	1871.6	1871.6	1	H1-1b	
14	MP6	PIPE 2.0	.261	48	.039	48	4	20866	32130	1871.6	1871.6	2	H1-1b	
15	MP7	PIPE 2.0	.261	48	.039	48	16	20866	32130	1871.6	1871.6	2	H1-1b	
16	M15	6.5"x0.37"	.214	21	.112	21	y	42	3513.8	75757.5	583.963	6400.8	1	H1-1b
17	M5	6.5"x0.37"	.214	21	.112	21	y	42	3513.8	75757.5	583.963	6400.8	1	H1-1b
18	M10	6.5"x0.37"	.212	21	.107	21	y	47	3513.8	75757.5	583.963	6184.7	1	H1-1b
19	M4	L2x2x3	.139	0	.037	0	y	41	18051	23392.8	557.717	1239.29	2	H2-1
20	M13	L2x2x3	.139	0	.037	0	z	43	18051	23392.8	557.717	1239.29	2	H2-1
21	M8	L2x2x3	.126	0	.036	0	z	38	18051	23392.8	557.717	1239.29	2	H2-1
22	M9	L2x2x3	.126	0	.036	0	y	46	18051	23392.8	557.717	1239.29	2	H2-1
23	M14	L2x2x3	.125	0	.038	0	y	35	18051	23392.8	557.717	1239.29	2	H2-1
24	M3	L2x2x3	.125	0	.038	0	z	49	18051	23392.8	557.717	1239.29	2	H2-1
25	H1	PIPE 3.5	.119	48	.075	24	10	60666	78750	7953.75	7953.75	1	H1-1b	
26	H2	PIPE 3.5	.116	48	.072	72	5	60666	78750	7953.75	7953.75	1	H1-1b	
27	H3	PIPE 3.5	.116	48	.072	24	15	60666	78750	7953.75	7953.75	1	H1-1b	
28	M19	PIPE 2.0	.114	72	.106	24	2	14916	32130	1871.6	1871.6	1	H1-1b	
29	M20	PIPE 2.0	.114	24	.103	72	8	14916	32130	1871.6	1871.6	1	H1-1b	
30	M21	PIPE 2.0	.114	72	.103	24	12	14916	32130	1871.6	1871.6	1	H1-1b	
31	M24	L6 5/8x4 7...	.091	21	.027	0	y	14	15453	66065	1040.5	3031.0	1	H2-1
32	M22	L6 5/8x4 7...	.089	0	.029	0	y	3	15453	66065	1040.5	3031.0	2	H2-1
33	M23	L6 5/8x4 7...	.089	42	.029	42	y	17	15453	66065	1040.5	3031.0	2	H2-1

APPENDIX D
ADDITIONAL CALCUATIONS

BOLT TOOL 1.5.2

Project Data	
Job Code:	189198
Carrier Site ID:	BOBDL00072A
Carrier Site Name:	CT-CCI-T-846293

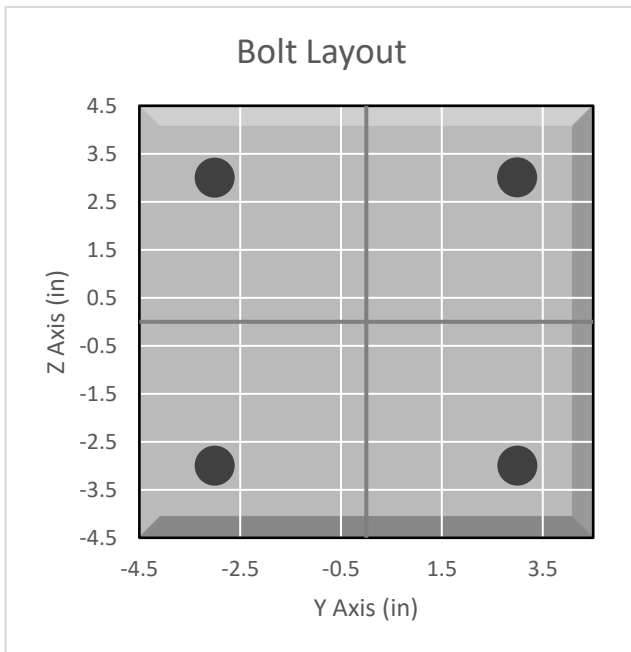
Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	TIA-222-H

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in

Connection Description
Mount to Tower

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	13805.8	lbs
Tension Force (T_u):	5158.0	lbs
Shear Force (V_u):	735.9	lbs
Tension Usage:	24.2%	--
Shear Usage:	5.1%	--
Interaction:	24.2%	Pass
Controlling Member:	M12	--
Controlling LC:	42	--

*Rating per TIA-222-H Section 15.5



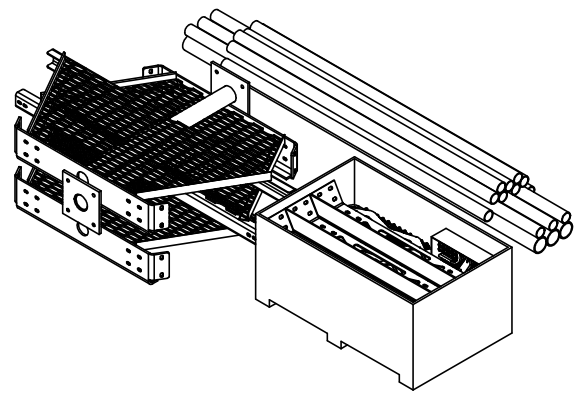
APPENDIX E
SUPPLEMENTAL DRAWINGS

ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT	NOTE NO.
1	MTC3006SB	STEEL BUNDLE FOR SNUB NOSE PLATFORM	1	402.64 LBS	
2	MCPK8CSB	PIPE STEEL BUNDLE FOR MC-PK8-C	1	464.27 LBS	
3	MCPK8CHWK	HARDWARE KIT FOR MC-PK8-C	1	543.22 LBS	




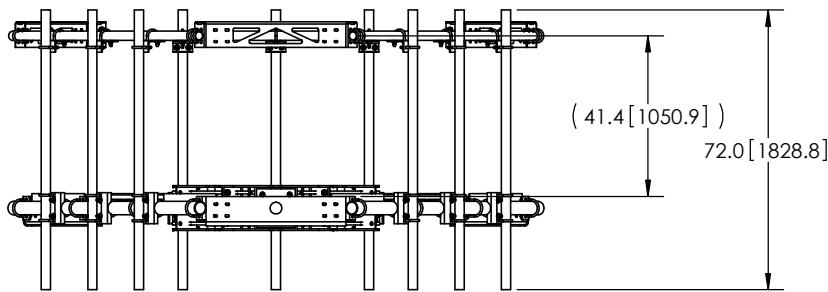
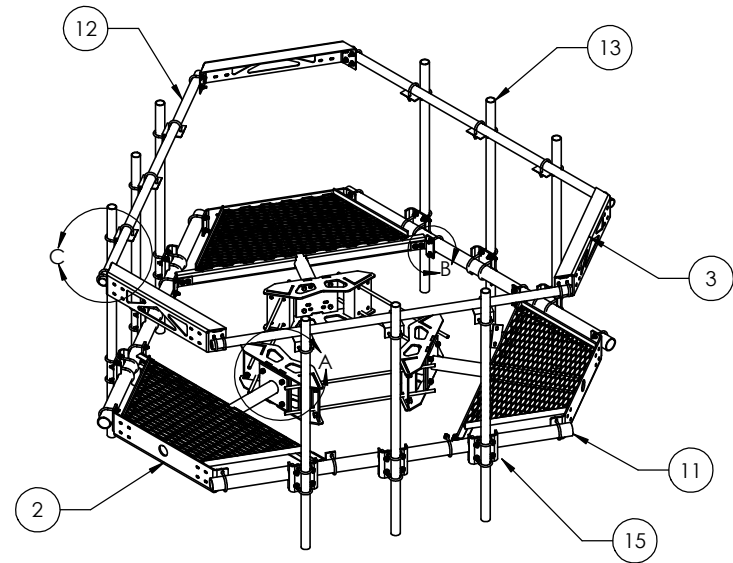
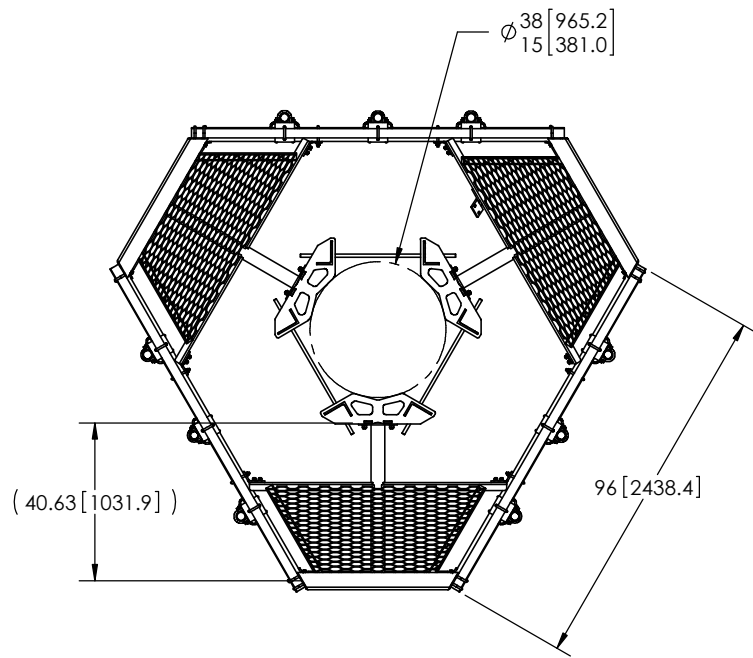
REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
A		INITIAL RELEASE	DRR	12/27/11
B	8000005979	CHANGE NOSE CORNER BRKT, ADD GUB-4240	MSM	11/25/14
C	8000007579	NEW RINGMOUNT WELDMENT DESIGN	RJC	04/07/15

FOR BOM ENTRY ONLY



NOTES:
1. CUSTOMER ASSEMBLY SHEETS 2-3.

<small>These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.</small>			<small>DRAWN BY:</small> MSM	<small>SHEET:</small> 1 of 3	<small>PART NUMBER:</small> MC-PK8-C
<small>ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED:</small>			<small>CHECKED BY:</small> TP	<small>SCALE:</small> NTS	<small>DESCRIPTION:</small> LOW PROFILE PLATFORM KIT 8' FACE
<small>.X = ± .12 ANGLES ±2° .XX = ± .06 FRACTIONS ±1/32 .XXX = ± .03</small>			<small>DATE:</small> 10/18/11	<small>MATERIAL:</small> A36, A500	<small>DRAWING TYPE:</small> ASSEMBLY DRAWING
<small>REMOVE BURRS AND BREAK EDGES .005</small>			<small>REVISION:</small> C	<small>FINISH:</small> GALV A123	 WESTCHESTER, IL. 60154 U.S.A.
<small>DO NOT SCALE THIS PRINT</small>				<small>WEIGHT:</small> 1410.14 LBS	



ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1	230.42 LBS
2	MTC300601	Low Profile Co-Location Platform Snub Nose	3	134.21 LBS
3	MT195801	Corner Weldment Snub Nose Handrail	3	27.10 LBS
4	XA2020.01	CROSS OVER ANGLE	9	2.65 LBS
5	GUB-4356	1/2" X 3-5/8" X 6" GALV U-BOLT	18	0.82 LBS
6	GUB-4355	1/2" X 3-5/8" X 5" GALV U-BOLT	12	0.71 LBS
7	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	48	0.56 LBS
8	GB-04145	1/2" X 1-1/2" GALV BOLT KIT	12	0.13 LBS
9	GWF-04	1/2" GALV FLAT WASHER	24	0.03 LBS
10	GB-0520A	5/8" X 2" GALV BOLT KIT (A325)	12	0.27 LBS
11	MT54796	3.50" OD X 96" GALV PIPE	3	60.28 LBS
12	MT-651-96	Ø2.375" OD X 96" PIPE	3	29.07 LBS
13	MT-651	2.375" OD x 72" PIPE	9	21.80 LBS
14	MT19617	MT196 Pipe Mount Plate	6	2.49 LBS
15	MT21701	PIPE MOUNT PLATE	9	7.93 LBS

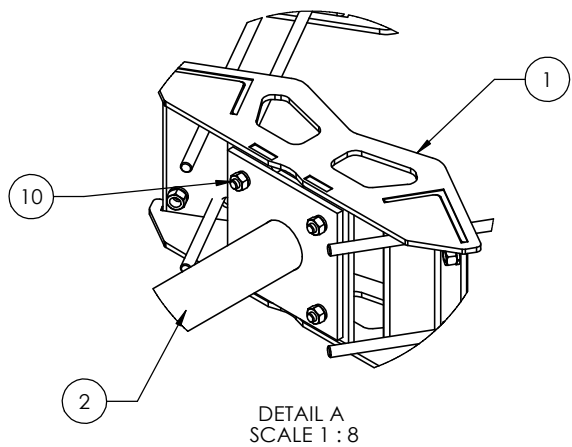
<small>These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.</small>			
DESIGNED BY: MSM	DATE: 10/18/11	SHEET: 2 of 3	PART NUMBER: MC-PK8-C
CHECKED BY: TP	DATE: 10/18/11	SCALE: NTS	DESCRIPTION: 25" OD Snub Nose MT-196
REVISION: C	DATE: 10/18/11	MATERIAL: A36, A53	DRAWING TYPE: ASSEMBLY DRAWING
REVISION: C	DATE: 10/18/11	FINISH: GALV A123	WEIGHT: 1361.27 LBS

NOTES:

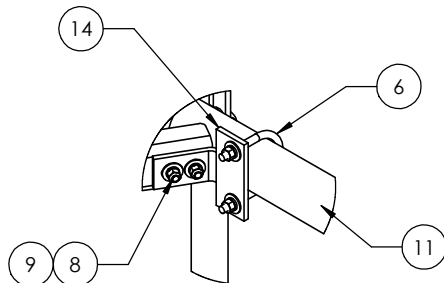
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.
2. WILL FIT MONOPOLES 15"-38" OD.



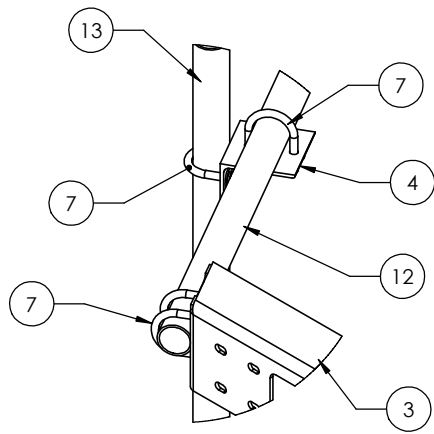
8 7 6 5 4 3 2 1



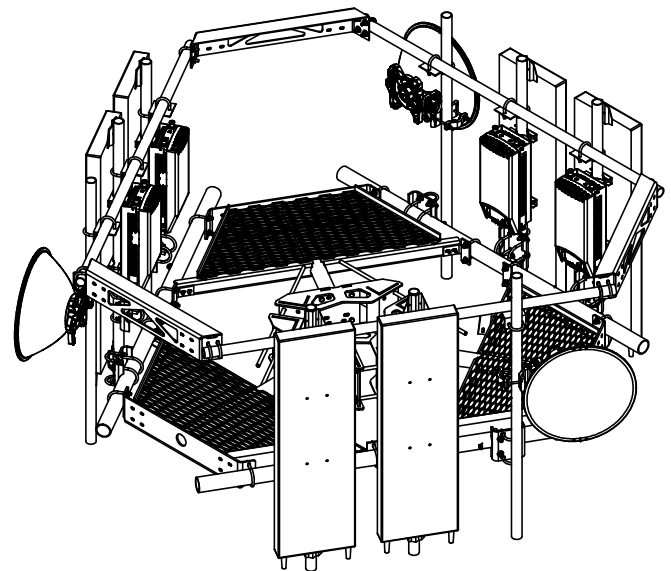
DETAIL A
SCALE 1 : 8



DETAIL B
SCALE 1 : 8




DETAIL C
SCALE 1 : 8



WITH ANTENNAS

NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.

<small>These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.</small>			<small>DRAWN BY:</small> MSM	<small>SHEET:</small> 3 of 3	<small>PART NUMBER:</small> MC-PK8-C
<small>ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED:</small> .X = ± .12 ANGLES ±2° .XX = ± .06 FRACTIONS ±1/32 .XXX = ± .03 REMOVE BURRS AND BREAK EDGES .005 DO NOT SCALE THIS PRINT			<small>CHECKED BY:</small> TP	<small>SCALE:</small> NTS	<small>DESCRIPTION:</small> 25" OD Snub Nose MT-196
			<small>DATE:</small> 10/18/11	<small>MATERIAL:</small> A36, A53	<small>DRAWING TYPE:</small> ASSEMBLY DRAWING
			<small>REVISION:</small> C	<small>FINISH:</small> GALV A123	 WESTCHESTER, IL. 60154 U.S.A.
				<small>WEIGHT:</small> 1361.27 LBS	

8 7 6 5 4 3 2 1

Exhibit F

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: BOBDL00072A

846293

319 Peter Green Road
Tolland, Connecticut 06084

August 31, 2021

EBI Project Number: 6221004799

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	9.38%

August 31, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00072A - 846293

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **319 Peter Green Road in Tolland, 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 319 Peter Green Road in Tolland, 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) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 4) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

- 5) The antennas used in this modeling are the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector A, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector B, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 6) The antenna mounting height centerline of the proposed antennas is 100 feet above ground level (AGL).
- 7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 8) All calculations were done with respect to uncontrolled / general population threshold limits.

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21
Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz
Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd
Height (AGL):	100 feet	Height (AGL):	100 feet	Height (AGL):	100 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts
ERP (W):	3,065.51	ERP (W):	3,065.51	ERP (W):	3,065.51
Antenna AI MPE %:	1.79%	Antenna BI MPE %:	1.79%	Antenna CI MPE %:	1.79%

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	1.79%
AT&T	2.55%
Verizon	5.04%
Site Total MPE % :	9.38%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	1.79%
Dish Wireless Sector B Total:	1.79%
Dish Wireless Sector C Total:	1.79%
Site Total MPE % :	9.38%

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	100.0	3.64	600 MHz n71	400	0.91%
Dish Wireless 1900 MHz n70	4	542.70	100.0	8.83	1900 MHz n70	1000	0.88%
						Total:	1.79%

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

Summary

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

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

Dish Wireless Sector	Power Density Value (%)
Sector A:	1.79%
Sector B:	1.79%
Sector C:	1.79%
Dish Wireless Maximum MPE % (Sector A):	1.79%
Site Total:	9.38%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **9.38%** 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 G

Letter of Authorization



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

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

Crown Castle Letter of Authorization

CT - CONNECTICUT SITING COUNCIL

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

**Re: Tower Share Application
Crown Castle telecommunications site at:
319 PETER GREEN ROAD, TOLLAND, CT 06084**

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

**Crown Site ID/Name: 846293/TOLLAND - PETER GREEN RD
Customer Site ID: BOBDL00072A/CT-CCI-T-846293
Site Address: 319 PETER GREEN ROAD, TOLLAND, CT 06084**

Crown Castle

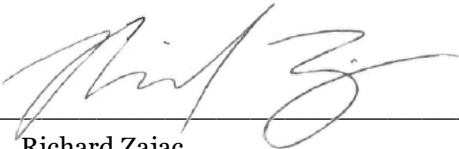

By:  _____ Date: 9/7/2021
Richard Zajac
Site Acquisition Specialist

Exhibit H

Recipient Mailings



**UNITED STATES
POSTAL SERVICE®**

Click-N-Ship®

P

usps.com 9405 5036 9930 0013 1338 31 0079 5000 0031 4586
US POSTAGE
 Flat Rate Env
 09/23/2021

U.S. POSTAGE PAID
Click-N-Ship®

Mailed from 01566


PRIORITY MAIL 2-DAY™

Expected Delivery Date: 09/27/21
 Re#: DS-846293
0006

R013

SHIP TO: RICH ZAJAC
 CROWN CASTLE
 4545 E RIVER RD
 STE 320
 W HENRIETTA NY 14586-9024

USPS TRACKING #



9405 5036 9930 0013 1338 31

Electronic Rate Approved #038555749



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0013 1338 31

Trans. #: 544356443	Priority Mail® Postage: \$7.95
Print Date: 09/23/2021	Total: \$7.95
Ship Date: 09/23/2021	
Expected Delivery Date: 09/27/2021	

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


Re#: DS-846293

To: RICH ZAJAC
 CROWN CASTLE
 4545 E RIVER RD
 STE 320
 W HENRIETTA NY 14586-9024

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



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P

usps.com 9405 5036 9930 0013 1338 48 0079 5000 0053 0324
\$7.95
US POSTAGE
 Flat Rate Env
U.S. POSTAGE PAID
Click-N-Ship®

09/23/2021 Mailed from 01566

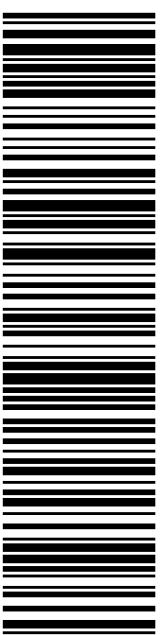
PRIORITY MAIL 2-DAY™

Expected Delivery Date: 09/27/21
 Re#: DS-846293
0006

C027

SHIP MARK KRECHKO
 TO: ATTN: ATT MOBILITY
 575 MOROSGO DR NE
 STE 12
 ATLANTA GA 30324-3300

USPS TRACKING #



9405 5036 9930 0013 1338 48

Electronic Rate Approved #038555749



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Instructions

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4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
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Click-N-Ship® Label Record

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Print Date: 09/23/2021	Total: \$7.95
Ship Date: 09/23/2021	
Expected Delivery Date: 09/27/2021	

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

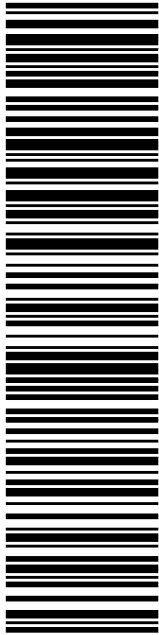
Re#: DS-846293

To: MARK KRECHKO
 ATTN: ATT MOBILITY
 575 MOROSGO DR NE
 STE 12
 ATLANTA GA 30324-3300

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



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9405 5036 9930 0013 1338 55

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SHIP

TO: DAVID CORCORAN
DIRECTOR OF PLANNING & ZONING
21 TOLLAND GRN
TOLLAND CT 06084-3028

P

PRIORITY MAIL 2-DAY™

Expected Delivery Date: 09/27/21
Ref#: DS-846293
0006

R010

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usps.com 9405 5036 9930 0013 1338 55 0079 5000 0010 6084
US POSTAGE \$7.95
Flat Rate Envoy

U.S. POSTAGE PAID
click-n-ship®

Mailed from 01566



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Instructions

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0013 1338 55

Trans. #: 544356443	Priority Mail® Postage: \$7.95
Print Date: 09/23/2021	Total: \$7.95
Ship Date: 09/23/2021	
Expected Delivery Date: 09/27/2021	

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


Ref#: DS-846293

To: DAVID CORCORAN
DIRECTOR OF PLANNING & ZONING
21 TOLLAND GRN
TOLLAND CT 06084-3028

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P

usps.com 9405 5036 9930 0013 1338 62 0079 5000 0010 6084
US POSTAGE
 Flat Rate Env
 09/23/2021

U.S. POSTAGE PAID
click-n-ship®

Mailed from 01566

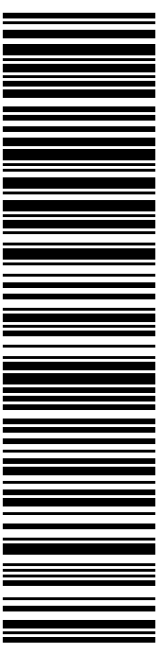
PRIORITY MAIL 2-DAY™

Expected Delivery Date: 09/27/21
 Re#: DS-846293
0006

R010

SHIP TO: TAMMY NUCCIO
 CHAIRPERSON, TOWN COUNCIL
 21 TOLLAND GRN
 TOLLAND CT 06084-3028

USPS TRACKING #



9405 5036 9930 0013 1338 62

Electronic Rate Approved #038555749



Cut on dotted line.

Instructions

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Trans. #: 544356443	Priority Mail® Postage: \$7.95
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From: DEBORAH CHASE
 NORTHEAST SITE SOLUTIONS
 420 MAIN ST
 STE 1
 STURBRIDGE MA 01566-1359

Re#: DS-846293

To: TAMMY NUCCIO
 CHAIRPERSON, TOWN COUNCIL
 21 TOLLAND GRN
 TOLLAND CT 06084-3028

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



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846293 - Tolland



FISKDALE
458 MAIN ST
FISKDALE, MA 01518-9998
(800)275-8777

09/24/2021 11:15 AM

Product	Qty	Unit Price	Price
Prepaid Mail	1		\$0.00
Atlanta, GA 30324			
Weight: 1 lb 3.30 oz			
Acceptance Date:			
Fri 09/24/2021			
Tracking #:			
9405 5036 9930 0013 1338 48			
Prepaid Mail	1		\$0.00
West Henrietta, NY 14586			
Weight: 0 lb 2.00 oz			
Acceptance Date:			
Fri 09/24/2021			
Tracking #:			
9405 5036 9930 0013 1338 31			
Prepaid Mail	1		\$0.00
Tolland, CT 06084			
Weight: 1 lb 3.20 oz			
Acceptance Date:			
Fri 09/24/2021			
Tracking #:			
9405 5036 9930 0013 1338 62			
Prepaid Mail	1		\$0.00
Tolland, CT 06084			
Weight: 1 lb 3.30 oz			
Acceptance Date:			
Fri 09/24/2021			
Tracking #:			
9405 5036 9930 0013 1338 55			
Grand Total:			\$0.00

Date: **May 30, 2021**



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

Subject: **Structural Analysis Report**

Carrier Designation: **DISH Network Co-Locate**
Site Number: BOBDL00072A
Site Name: CT-CCI-T-846293

Crown Castle Designation: **BU Number:** 846293
Site Name: TOLLAND - PETER GREEN RD
JDE Job Number: 650063
Work Order Number: 1966261
Order Number: 556620 Rev. 1

Engineering Firm Designation: **Crown Castle Project Number:** 1966261

Site Data: **319 PETER GREEN ROAD, TOLLAND, TOLLAND County, CT**
Latitude 41° 53' 47.81", Longitude -72° 23' 37.43"
119 Foot - Monopole Tower

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

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

LC5: Proposed Equipment Configuration

Sufficient Capacity

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. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Patrick Himes

Respectfully submitted by:

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

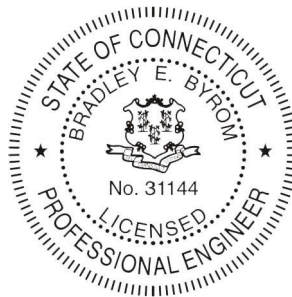


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1) INTRODUCTION

This tower is a 119 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC..

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	2 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)
100.0	100.0	3	fujitsu	TA08025-B604	1	1-1/2
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
119.0	122.0	3	ericsson	RRUS-11	12 2 1	1-5/8 7/8 1/2
		1	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe		
		6	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		2	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe		
		1	raycap	DC6-48-60-18-8F		
	121.0	1	commscope	CBC721A-03		
	120.0	3	powerwave technologies	LGP13519		
	119.0	2	commscope	CBC721A-03		
		1	tower mounts	Platform Mount [LP 712-1]		
110.0	110.0	3	antel	BXA-70063/6CF-2 w/ Mount Pipe	12	1-5/8
		6	antel	LPA-80063/6CF-2 w/ Mount Pipe		
		6	rfs celwave	FD9R6004/2C-3L		
		3	rymsa wireless	MG D3-800Tx w/ Mount Pipe		
		1	tower mounts	Platform Mount [LP 303-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	4705338	CCISITES
4-TOWER MANUFACTURER DRAWINGS	4705380	CCISITES
4-GEOTECHNICAL REPORTS	6176222	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	119 - 95.1927	Pole	TP26.25x18.5x0.1875	1	-9.08	907.73	26.5	Pass
L2	95.1927 - 47.25	Pole	TP41.3438x24.6441x0.25	2	-15.52	1913.76	43.9	Pass
L3	47.25 - 0	Pole	TP56x39.0142x0.3125	3	-27.94	3392.81	40.9	Pass
							Summary	
						Pole (L2)	43.9	Pass
						Rating =	43.9	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	27.6	Pass
1	Base Plate	0	25.8	Pass
1	Base Foundation (Structure)	0	33.0	Pass
1	Base Foundation (Soil Interaction)	0	31.8	Pass

Structure Rating (max from all components) =	43.9%
-----------------------------------------------------	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed. Rating per TIA-222-H Section 15.5.

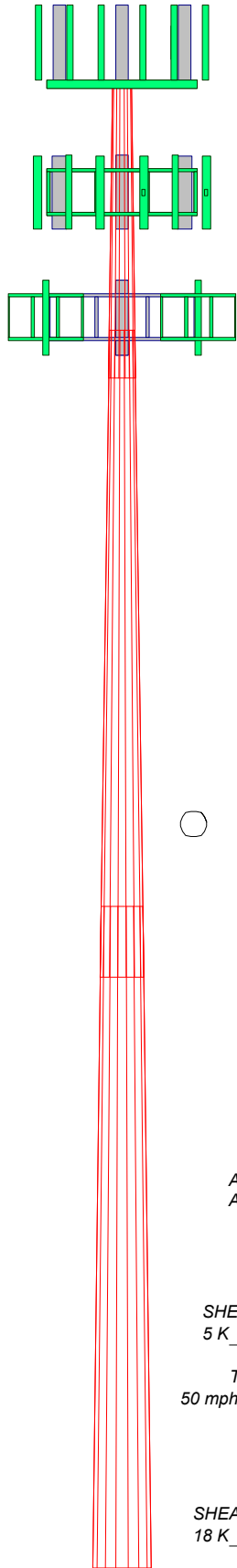
4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3	
Length (ft)	23.81	51.72	52.92	
Number of Sides	18	18	18	
Thickness (in)	0.1875	0.2500	0.3125	
Socket Length (ft)	3.78	5.67	39.0142	
Top Dia (in)	18.5000	24.6441	56.0000	
Bot Dia (in)	26.2500	41.3438		
Grade		A572-65		
Weight (K)	1.1	4.6	8.4	14.1

119.0 ft
95.2 ft
47.2 ft
0.0 ft



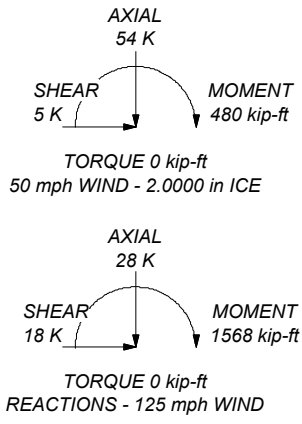
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 43.9%

ALL REACTIONS ARE FACTORED



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

Job: BU# 846293	Project:	
Client: Crown Castle	Drawn by: phimes	App'd:
Code: TIA-222-H	Date: 05/30/21	Scale: NTS
Path: C:\Users\phimes\Desktop\Work Area\846293\WO 1966261 - SA\Prod\846293.dwg	Dwg No. E-1	

Tower Input Data

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

- Tower is located in Tolland County, Connecticut.
- Tower base elevation above sea level: 697.00 ft.
- Basic wind speed of 125 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 2.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="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	119.00-95.19	23.81	3.78	18	18.5000	26.2500	0.1875	0.7500	A572-65 (65 ksi)
L2	95.19-47.25	51.72	5.67	18	24.6441	41.3438	0.2500	1.0000	A572-65 (65 ksi)
L3	47.25-0.00	52.92		18	39.0142	56.0000	0.3125	1.2500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	18.7565	10.8982	461.7305	6.5009	9.3980	49.1307	924.0685	5.4501	2.9260	15.605
	26.6260	15.5104	1331.0484	9.2522	13.3350	99.8162	2663.8483	7.7567	4.2900	22.88
L2	26.2253	19.3567	1455.2517	8.6599	12.5192	116.2416	2912.4183	9.6802	3.8974	15.589
	41.9430	32.6079	6956.8350	14.5883	21.0026	331.2365	13922.824	16.3070	6.8365	27.346
L3	41.4149	38.3873	7264.1477	13.7391	19.8192	366.5204	14537.853	19.1973	6.3165	20.213
	56.8157	55.2350	21640.513	19.7691	28.4480	760.7042	43309.501	27.6228	9.3060	29.779

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 119.00-95.19				1	1	1			
L2 95.19-47.25				1	1	1			
L3 47.25-0.00				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 in	Perimeter in	Weight plf

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf
Lvl 119								
LDF4-50A(1/2")	C	No	No	Inside Pole	119.00 - 7.00	1	No Ice	0.15
							1/2" Ice	0.15
							1" Ice	0.15
							2" Ice	0.15
LDF5-50A(7/8")	C	No	No	Inside Pole	119.00 - 7.00	2	No Ice	0.33
							1/2" Ice	0.33
							1" Ice	0.33

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
LDF7-50A(1-5/8")	C	No	No	Inside Pole	119.00 - 7.00	12	2" Ice	0.00	0.33
							No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
Lvl 110									
LDF7-50A(1-5/8")	B	No	No	Inside Pole	110.00 - 7.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
							Lvl 100		
CU12PSM9P6XXX (1-1/2)	C	No	No	Inside Pole	100.00 - 0.00	1	No Ice	0.00	2.35
							1/2" Ice	0.00	2.35
							1" Ice	0.00	2.35
							2" Ice	0.00	2.35
							misc ***		

Feed Line/Linear Appurtenances Section Areas

Tower Section	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	119.00-95.19	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.15
		C	0.000	0.000	0.000	0.000	0.26
L2	95.19-47.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.47
		C	0.000	0.000	0.000	0.000	0.62
L3	47.25-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.40
		C	0.000	0.000	0.000	0.000	0.54

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	119.00-95.19	A	1.911	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.26
L2	95.19-47.25	A	1.833	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.47
		C		0.000	0.000	0.000	0.000	0.62
L3	47.25-0.00	A	1.637	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.40
		C		0.000	0.000	0.000	0.000	0.54

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	119.00-95.19	0.0000	0.0000	0.0000	0.0000
L2	95.19-47.25	0.0000	0.0000	0.0000	0.0000

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L3	47.25-0.00	0.0000	0.0000	0.0000	0.0000

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement ft
			Horz Lateral ft	Vert ft		
*						
Lightning Rod 5/8" x 8' *Lvl 119*	C	None			0.0000	123.00
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	119.00
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	3.00	0.0000	119.00
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	119.00
P65-17-XLH-RR w/ Mount Pipe	A	From Leg	4.00	3.00	0.0000	119.00
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	119.00
P65-17-XLH-RR w/ Mount Pipe	C	From Leg	4.00	3.00	0.0000	119.00
(2) LGP21401	A	From Leg	4.00	0.00	0.0000	119.00
(2) LGP21401	B	From Leg	4.00	3.00	0.0000	119.00
(2) LGP21401	C	From Leg	4.00	0.00	0.0000	119.00
RRUS-11	A	From Leg	4.00	3.00	0.0000	119.00
RRUS-11	B	From Leg	4.00	0.00	0.0000	119.00
RRUS-11	C	From Leg	4.00	3.00	0.0000	119.00
CBC721A-03	A	From Leg	4.00	0.00	0.0000	119.00
CBC721A-03	B	From Leg	4.00	2.00	0.0000	119.00
CBC721A-03	C	From Leg	4.00	0.00	0.0000	119.00
LGP13519	A	From Leg	4.00	0.00	0.0000	119.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
LGP13519	B	From Leg	1.00 4.00 0.00	0.0000	119.00
LGP13519	C	From Leg	1.00 4.00 0.00	0.0000	119.00
DC6-48-60-18-8F	B	From Leg	1.00 4.00 0.00 3.00	0.0000	119.00
Platform Mount [LP 712-1] 6' x 2" Mount Pipe	C A	None From Leg	4.00 0.00 3.00	0.0000 0.0000	119.00 119.00
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	119.00
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	119.00
Lvl 110					
(2) LPA-80063/6CF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	110.00
(2) LPA-80063/6CF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	110.00
(2) LPA-80063/6CF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00
BXA-70063/6CF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	110.00
BXA-70063/6CF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	110.00
BXA-70063/6CF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00
MG D3-800Tx w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	110.00
MG D3-800Tx w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	110.00
MG D3-800Tx w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	110.00
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 0.00	0.0000	110.00
(2) FD9R6004/2C-3L	B	From Leg	4.00 0.00 0.00	0.0000	110.00
(2) FD9R6004/2C-3L	C	From Leg	4.00 0.00 0.00	0.0000	110.00
Platform Mount [LP 303-1] ***	C	None		0.0000	110.00
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	100.00
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	100.00

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement
			Horz Lateral	Vert		
			ft	ft	°	ft
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B604	A	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B604	B	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B604	C	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B605	A	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B605	B	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
TA08025-B605	C	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
RDIDC-9181-PF-48	B	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
Commscope MC-PK8-DSH	B	None			0.0000	100.00
(2) 8'x2" Antenna Mount Pipe	A	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
(2) 8'x2" Antenna Mount Pipe	B	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		
(2) 8'x2" Antenna Mount Pipe	C	From Leg	4.00	0.00	0.0000	100.00
			0.00	0.00		

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation	z	K _z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
ft	ft		psf	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
L1 119.00-95.19	106.41	1.006	35	45.018	A	0.000	45.018	45.018	100.00	0.000	0.000
					B	0.000	45.018		100.00	0.000	0.000
					C	0.000	45.018		100.00	0.000	0.000
L2 95.19-47.25	69.95	0.892	31	136.174	A	0.000	136.174	136.174	100.00	0.000	0.000
					B	0.000	136.174		100.00	0.000	0.000
					C	0.000	136.174		100.00	0.000	0.000
L3 47.25-0.00	22.66	0.7	25	193.391	A	0.000	193.391	193.391	100.00	0.000	0.000
					B	0.000	193.391		100.00	0.000	0.000
					C	0.000	193.391		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	t_z in	A_G ft ²	F a c e	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	C_{AA} In Face ft ²	C_{AA} Out Face ft ²
L1 119.00-95.19	106.41	1.006	6	1.9112	52.601	A	0.000	52.601	52.601	100.00	0.000	0.000
						B	0.000	52.601	100.00	0.000	0.000	
						C	0.000	52.601	100.00	0.000	0.000	
L2 95.19-47.25	69.95	0.892	5	1.8326	151.445	A	0.000	151.445	151.445	100.00	0.000	0.000
						B	0.000	151.445	100.00	0.000	0.000	
						C	0.000	151.445	100.00	0.000	0.000	
L3 47.25-0.00	22.66	0.7	4	1.6373	207.823	A	0.000	207.823	207.823	100.00	0.000	0.000
						B	0.000	207.823	100.00	0.000	0.000	
						C	0.000	207.823	100.00	0.000	0.000	

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	A_G ft ²	F a c e	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	C_{AA} In Face ft ²	C_{AA} Out Face ft ²
L1 119.00-95.19	106.41	1.006	8	45.018	A	0.000	45.018	45.018	100.00	0.000	0.000
					B	0.000	45.018	100.00	0.000	0.000	
					C	0.000	45.018	100.00	0.000	0.000	
L2 95.19-47.25	69.95	0.892	7	136.174	A	0.000	136.174	136.174	100.00	0.000	0.000
					B	0.000	136.174	100.00	0.000	0.000	
					C	0.000	136.174	100.00	0.000	0.000	
L3 47.25-0.00	22.66	0.7	5	193.391	A	0.000	193.391	193.391	100.00	0.000	0.000
					B	0.000	193.391	100.00	0.000	0.000	
					C	0.000	193.391	100.00	0.000	0.000	

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	119 - 95.1927	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.64	-0.55	-0.32
			Max. Mx	8	-9.08	-134.70	0.27
			Max. My	14	-9.08	0.23	-135.05
			Max. Vy	8	11.08	-134.70	0.27
			Max. Vx	14	11.08	0.23	-135.05
			Max. Torque	4			0.16
L2	95.1927 - 47.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.77	-0.55	-0.32
			Max. Mx	8	-15.52	-713.62	0.32
			Max. My	14	-15.52	0.28	-714.03
			Max. Vy	8	14.16	-713.62	0.32
			Max. Vx	14	14.17	0.28	-714.03
			Max. Torque	16			0.05
L3	47.25 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.70	-0.55	-0.32
			Max. Mx	8	-27.94	-1567.72	0.38
			Max. My	14	-27.94	0.34	-1568.20
			Max. Vy	8	18.20	-1567.72	0.38
			Max. Vx	14	18.21	0.34	-1568.20
			Max. Torque	16			0.05

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	53.70	-5.38	-0.00

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H _x	20	27.95	18.19	-0.00
	Max. H _z	2	27.95	-0.00	18.19
	Max. M _x	2	1568.08	-0.00	18.19
	Max. M _z	8	1567.72	-18.19	0.00
	Max. Torsion	16	0.05	9.10	-15.76
	Min. Vert	23	20.96	15.75	9.10
	Min. H _x	8	27.95	-18.19	0.00
	Min. H _z	14	27.95	0.00	-18.19
	Min. M _x	14	-1568.20	0.00	-18.19
	Min. M _z	20	-1567.51	18.19	-0.00
	Min. Torsion	4	-0.05	-9.10	15.76

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	23.29	0.00	0.00	0.05	-0.08	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	27.95	0.00	-18.19	-1568.08	-0.55	0.04
0.9 Dead+1.0 Wind 0 deg - No Ice	20.96	0.00	-18.19	-1558.96	-0.52	0.04
1.2 Dead+1.0 Wind 30 deg - No Ice	27.95	9.10	-15.76	-1358.21	-784.30	0.05
0.9 Dead+1.0 Wind 30 deg - No Ice	20.96	9.10	-15.76	-1350.31	-779.70	0.05
1.2 Dead+1.0 Wind 60 deg - No Ice	27.95	15.76	-9.10	-784.39	-1357.92	0.04
0.9 Dead+1.0 Wind 60 deg - No Ice	20.96	15.76	-9.10	-779.84	-1349.99	0.04
1.2 Dead+1.0 Wind 90 deg - No Ice	27.95	18.19	-0.00	-0.38	-1567.72	0.02
0.9 Dead+1.0 Wind 90 deg - No Ice	20.96	18.19	-0.00	-0.39	-1558.57	0.02
1.2 Dead+1.0 Wind 120 deg - No Ice	27.95	15.75	9.10	783.75	-1357.48	0.00
0.9 Dead+1.0 Wind 120 deg - No Ice	20.96	15.75	9.10	779.17	-1349.55	0.00
1.2 Dead+1.0 Wind 150 deg - No Ice	27.95	9.10	15.76	1357.89	-783.53	-0.02
0.9 Dead+1.0 Wind 150 deg - No Ice	20.96	9.10	15.76	1349.97	-778.94	-0.02
1.2 Dead+1.0 Wind 180 deg - No Ice	27.95	-0.00	18.19	1568.20	0.34	-0.04
0.9 Dead+1.0 Wind 180 deg - No Ice	20.96	-0.00	18.19	1559.05	0.36	-0.04
1.2 Dead+1.0 Wind 210 deg - No Ice	27.95	-9.10	15.76	1358.33	784.09	-0.05
0.9 Dead+1.0 Wind 210 deg - No Ice	20.96	-9.10	15.76	1350.40	779.55	-0.05
1.2 Dead+1.0 Wind 240 deg - No Ice	27.95	-15.76	9.10	784.51	1357.71	-0.04
0.9 Dead+1.0 Wind 240 deg - No Ice	20.96	-15.76	9.10	779.93	1349.83	-0.04
1.2 Dead+1.0 Wind 270 deg - No Ice	27.95	-18.19	0.00	0.50	1567.51	-0.03
0.9 Dead+1.0 Wind 270 deg - No Ice	20.96	-18.19	0.00	0.48	1558.41	-0.02
1.2 Dead+1.0 Wind 300 deg - No Ice	27.95	-15.75	-9.10	-783.62	1357.27	0.00
0.9 Dead+1.0 Wind 300 deg - No Ice	20.96	-15.75	-9.10	-779.08	1349.39	0.00
1.2 Dead+1.0 Wind 330 deg - No Ice	27.95	-9.10	-15.76	-1357.77	783.32	0.03
0.9 Dead+1.0 Wind 330 deg - No Ice	20.96	-9.10	-15.76	-1349.88	778.79	0.03

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
- No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	53.70	0.00	0.00	0.32	-0.55	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	53.70	-0.00	-5.38	-478.76	-0.68	0.04
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	53.70	2.69	-4.66	-414.60	-240.20	0.04
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	53.70	4.66	-2.69	-239.25	-415.53	0.04
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	53.70	5.38	0.00	0.31	-479.69	0.02
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	53.70	4.66	2.69	239.88	-415.48	-0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	53.70	2.69	4.66	415.27	-240.11	-0.02
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	53.70	0.00	5.38	479.48	-0.57	-0.04
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	53.70	-2.69	4.66	415.32	238.95	-0.04
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	53.70	-4.66	2.69	239.97	414.28	-0.04
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	53.70	-5.38	-0.00	0.41	478.44	-0.02
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	53.70	-4.66	-2.69	-239.16	414.23	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	53.70	-2.69	-4.66	-414.55	238.86	0.02
Dead+Wind 0 deg - Service	23.29	0.00	-3.95	-339.26	-0.18	0.02
Dead+Wind 30 deg - Service	23.29	1.97	-3.42	-293.85	-169.77	0.02
Dead+Wind 60 deg - Service	23.29	3.42	-1.98	-169.69	-293.89	0.02
Dead+Wind 90 deg - Service	23.29	3.95	-0.00	-0.05	-339.29	0.01
Dead+Wind 120 deg - Service	23.29	3.42	1.97	169.62	-293.79	-0.00
Dead+Wind 150 deg - Service	23.29	1.97	3.42	293.85	-169.60	-0.01
Dead+Wind 180 deg - Service	23.29	-0.00	3.95	339.36	0.01	-0.02
Dead+Wind 210 deg - Service	23.29	-1.97	3.42	293.95	169.60	-0.02
Dead+Wind 240 deg - Service	23.29	-3.42	1.98	169.79	293.72	-0.02
Dead+Wind 270 deg - Service	23.29	-3.95	0.00	0.15	339.11	-0.01
Dead+Wind 300 deg - Service	23.29	-3.42	-1.97	-169.52	293.62	0.00
Dead+Wind 330 deg - Service	23.29	-1.97	-3.42	-293.75	169.43	0.01

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-23.29	0.00	0.00	23.29	0.00	0.000%
2	0.00	-27.95	-18.19	-0.00	27.95	18.19	0.000%
3	0.00	-20.96	-18.19	-0.00	20.96	18.19	0.000%
4	9.10	-27.95	-15.76	-9.10	27.95	15.76	0.000%
5	9.10	-20.96	-15.76	-9.10	20.96	15.76	0.000%
6	15.76	-27.95	-9.10	-15.76	27.95	9.10	0.000%
7	15.76	-20.96	-9.10	-15.76	20.96	9.10	0.000%
8	18.19	-27.95	-0.00	-18.19	27.95	0.00	0.000%
9	18.19	-20.96	-0.00	-18.19	20.96	0.00	0.000%
10	15.75	-27.95	9.10	-15.75	27.95	-9.10	0.000%
11	15.75	-20.96	9.10	-15.75	20.96	-9.10	0.000%
12	9.10	-27.95	15.76	-9.10	27.95	-15.76	0.000%
13	9.10	-20.96	15.76	-9.10	20.96	-15.76	0.000%
14	-0.00	-27.95	18.19	0.00	27.95	-18.19	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
15	-0.00	-20.96	18.19	0.00	20.96	-18.19	0.000%
16	-9.10	-27.95	15.76	9.10	27.95	-15.76	0.000%
17	-9.10	-20.96	15.76	9.10	20.96	-15.76	0.000%
18	-15.76	-27.95	9.10	15.76	27.95	-9.10	0.000%
19	-15.76	-20.96	9.10	15.76	20.96	-9.10	0.000%
20	-18.19	-27.95	0.00	18.19	27.95	-0.00	0.000%
21	-18.19	-20.96	0.00	18.19	20.96	-0.00	0.000%
22	-15.75	-27.95	-9.10	15.75	27.95	9.10	0.000%
23	-15.75	-20.96	-9.10	15.75	20.96	9.10	0.000%
24	-9.10	-27.95	-15.76	9.10	27.95	15.76	0.000%
25	-9.10	-20.96	-15.76	9.10	20.96	15.76	0.000%
26	0.00	-53.70	0.00	0.00	53.70	0.00	0.000%
27	-0.00	-53.70	-5.38	0.00	53.70	5.38	0.000%
28	2.69	-53.70	-4.66	-2.69	53.70	4.66	0.000%
29	4.66	-53.70	-2.69	-4.66	53.70	2.69	0.000%
30	5.38	-53.70	0.00	-5.38	53.70	-0.00	0.000%
31	4.66	-53.70	2.69	-4.66	53.70	-2.69	0.000%
32	2.69	-53.70	4.66	-2.69	53.70	-4.66	0.000%
33	0.00	-53.70	5.38	-0.00	53.70	-5.38	0.000%
34	-2.69	-53.70	4.66	2.69	53.70	-4.66	0.000%
35	-4.66	-53.70	2.69	4.66	53.70	-2.69	0.000%
36	-5.38	-53.70	-0.00	5.38	53.70	0.00	0.000%
37	-4.66	-53.70	-2.69	4.66	53.70	2.69	0.000%
38	-2.69	-53.70	-4.66	2.69	53.70	4.66	0.000%
39	0.00	-23.29	-3.95	-0.00	23.29	3.95	0.000%
40	1.97	-23.29	-3.42	-1.97	23.29	3.42	0.000%
41	3.42	-23.29	-1.98	-3.42	23.29	1.98	0.000%
42	3.95	-23.29	-0.00	-3.95	23.29	0.00	0.000%
43	3.42	-23.29	1.97	-3.42	23.29	-1.97	0.000%
44	1.97	-23.29	3.42	-1.97	23.29	-3.42	0.000%
45	-0.00	-23.29	3.95	0.00	23.29	-3.95	0.000%
46	-1.97	-23.29	3.42	1.97	23.29	-3.42	0.000%
47	-3.42	-23.29	1.98	3.42	23.29	-1.98	0.000%
48	-3.95	-23.29	0.00	3.95	23.29	-0.00	0.000%
49	-3.42	-23.29	-1.97	3.42	23.29	1.97	0.000%
50	-1.97	-23.29	-3.42	1.97	23.29	3.42	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00003586
3	Yes	4	0.00000001	0.00001868
4	Yes	5	0.00000001	0.00008720
5	Yes	5	0.00000001	0.00004035
6	Yes	5	0.00000001	0.00008731
7	Yes	5	0.00000001	0.00004041
8	Yes	4	0.00000001	0.00003436
9	Yes	4	0.00000001	0.00001751
10	Yes	5	0.00000001	0.00008693
11	Yes	5	0.00000001	0.00004024
12	Yes	5	0.00000001	0.00008693
13	Yes	5	0.00000001	0.00004023
14	Yes	4	0.00000001	0.00003698
15	Yes	4	0.00000001	0.00001968
16	Yes	5	0.00000001	0.00008733
17	Yes	5	0.00000001	0.00004042
18	Yes	5	0.00000001	0.00008715
19	Yes	5	0.00000001	0.00004033
20	Yes	4	0.00000001	0.00003365
21	Yes	4	0.00000001	0.00001684
22	Yes	5	0.00000001	0.00008683
23	Yes	5	0.00000001	0.00004020
24	Yes	5	0.00000001	0.00008691

25	Yes	5	0.00000001	0.00004024
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00010252
28	Yes	5	0.00000001	0.00012533
29	Yes	5	0.00000001	0.00012507
30	Yes	5	0.00000001	0.00010297
31	Yes	5	0.00000001	0.00012554
32	Yes	5	0.00000001	0.00012562
33	Yes	5	0.00000001	0.00010288
34	Yes	5	0.00000001	0.00012473
35	Yes	5	0.00000001	0.00012494
36	Yes	5	0.00000001	0.00010234
37	Yes	5	0.00000001	0.00012424
38	Yes	5	0.00000001	0.00012420
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00003870
41	Yes	4	0.00000001	0.00003807
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00003824
44	Yes	4	0.00000001	0.00003843
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00003801
47	Yes	4	0.00000001	0.00003859
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00003808
50	Yes	4	0.00000001	0.00003793

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 95.1927	8.324	46	0.6754	0.0001
L2	98.974 - 47.25	5.628	45	0.5896	0.0001
L3	52.9166 - 0	1.445	46	0.2610	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.00	Lightning Rod 5/8" x 8'	46	8.324	0.6754	0.0001	33508
119.00	(2) 7770.00 w/ Mount Pipe	46	8.324	0.6754	0.0001	33508
110.00	(2) LPA-80063/6CF-2 w/ Mount Pipe	45	7.078	0.6408	0.0001	18615
100.00	MX08FRO665-21 w/ Mount Pipe	45	5.757	0.5951	0.0001	9007

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 95.1927	38.491	16	3.1248	0.0012
L2	98.974 - 47.25	26.026	16	2.7282	0.0003
L3	52.9166 - 0	6.681	16	1.2071	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.00	Lightning Rod 5/8" x 8'	16	38.491	3.1248	0.0012	7286
119.00	(2) 7770.00 w/ Mount Pipe	16	38.491	3.1248	0.0012	7286
110.00	(2) LPA-80063/6CF-2 w/ Mount Pipe	16	32.730	2.9650	0.0008	4047
100.00	MX08FRO665-21 w/ Mount Pipe	16	26.622	2.7534	0.0004	1957

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	119 - 95.1927 (1)	TP26.25x18.5x0.1875	23.81	0.00	0.0	14.777 9	-9.08	864.51	0.011
L2	95.1927 - 47.25 (2)	TP41.3438x24.6441x0.25	51.72	0.00	0.0	31.156 1	-15.52	1822.63	0.009
L3	47.25 - 0 (3)	TP56x39.0142x0.3125	52.92	0.00	0.0	55.235 0	-27.94	3231.25	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio M _{ux} / φM _{nx}	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio M _{uy} / φM _{ny}
L1	119 - 95.1927 (1)	TP26.25x18.5x0.1875	135.17	508.24	0.266	0.00	508.24	0.000
L2	95.1927 - 47.25 (2)	TP41.3438x24.6441x0.25	714.19	1580.72	0.452	0.00	1580.72	0.000
L3	47.25 - 0 (3)	TP56x39.0142x0.3125	1568.39	3727.85	0.421	0.00	3727.85	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u K	φV _n K	Ratio V _u / φV _n	Actual T _u kip-ft	φT _n kip-ft	Ratio T _u / φT _n
L1	119 - 95.1927 (1)	TP26.25x18.5x0.1875	11.08	259.35	0.043	0.16	563.99	0.000
L2	95.1927 - 47.25 (2)	TP41.3438x24.6441x0.25	14.17	546.79	0.026	0.05	1880.18	0.000
L3	47.25 - 0 (3)	TP56x39.0142x0.3125	18.21	969.38	0.019	0.05	4727.48	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	119 - 95.1927 (1)	0.011	0.266	0.000	0.043	0.000	0.278	1.050	4.8.2
L2	95.1927 - 47.25 (2)	0.009	0.452	0.000	0.026	0.000	0.461	1.050	4.8.2
L3	47.25 - 0 (3)	0.009	0.421	0.000	0.019	0.000	0.430	1.050	4.8.2

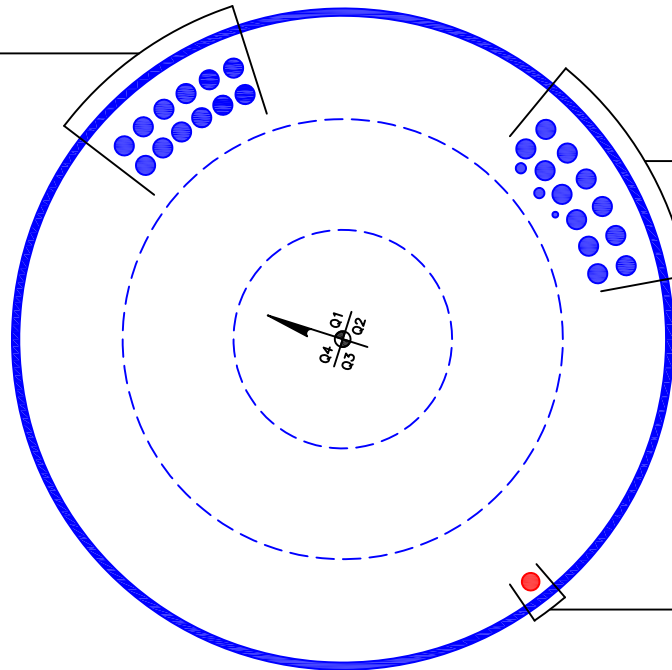
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L1	119 - 95.1927	Pole	TP26.25x18.5x0.1875	1	-9.08	907.73	26.5	Pass	
L2	95.1927 - 47.25	Pole	TP41.3438x24.6441x0.25	2	-15.52	1913.76	43.9	Pass	
L3	47.25 - 0	Pole	TP56x39.0142x0.3125	3	-27.94	3392.81	40.9	Pass	
							Summary		
							Pole (L2)	43.9	Pass
							RATING =	43.9	Pass

APPENDIX B
BASE LEVEL DRAWING



(OTHER CONSIDERED EQUIPMENT)
(12) 1-5/8" TO 110 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 119 FT LEVEL
(2) 7/8" TO 119 FT LEVEL
(12) 1-5/8" TO 119 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-1/2" TO 100 FT LEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

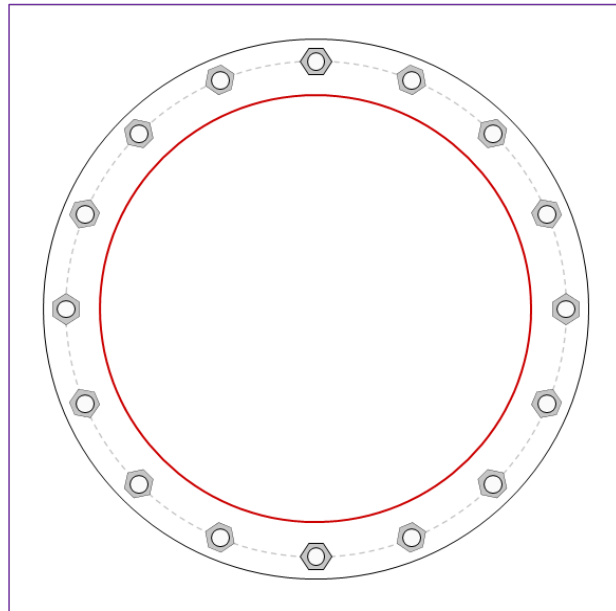


Site Info	
BU #	846293
Site Name	DLLAND - PTER GREEN F
Order #	556620, Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.625

Applied Loads	
Moment (kip-ft)	1568.39
Axial Force (kips)	27.94
Shear Force (kips)	18.21

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(16) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 65" BC
Base Plate Data
71" OD x 2.25" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)
Stiffener Data
N/A
Pole Data
56" x 0.3125" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary	<i>(units of kips, kip-in)</i>	
$Pu_t = 70.61$	$\phi Pn_t = 243.75$	Stress Rating
$Vu = 1.14$	$\phi Vn = 149.1$	27.6%
$Mu = n/a$	$\phi Mn = n/a$	Pass
Base Plate Summary		
Max Stress (ksi):	14.64	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	25.8%	Pass

Pier and Pad Foundation



BU # : 846293
Site Name: TOLLAND - PETE
App. Number: 556620, Rev. 1

TIA-222 Revision: H
Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp} :	27.95	kips
Base Shear, V_{u_comp} :	18.2	kips
Moment, M_u :	1568.39	ft-kips
Tower Height, H :	119	ft
BP Dist. Above Fdn, bp_{dist} :	3.125	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	203.96	18.20	8.5%	Pass
<i>Bearing Pressure (ksf)</i>	22.50	1.36	5.7%	Pass
<i>Overtuning (kip*ft)</i>	5293.32	1682.33	31.8%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	4677.77	1622.99	33.0%	Pass
<i>Pier Compression (kip)</i>	31187.52	54.41	0.2%	Pass
<i>Pad Flexure (kip*ft)</i>	3498.86	561.44	15.3%	Pass
<i>Pad Shear - 1-way (kips)</i>	896.51	86.83	9.2%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.017	8.5%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	4443.10	973.79	20.9%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	7	ft
Ext. Above Grade, E :	1	ft
Pier Rebar Size, Sc :	8	
Pier Rebar Quantity, mc :	36	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	7	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Structural Rating*:	33.0%
Soil Rating*:	31.8%

Pad Properties		
Depth, D :	5	ft
Pad Width, W_1 :	25	ft
Pad Thickness, T :	3	ft
Pad Rebar Size (Bottom dir. 2), Sp_2 :	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	32	
Pad Clear Cover, cc_{pad} :	3	in

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

Soil Properties		
Total Soil Unit Weight, γ :	125	pcf
Ultimate Gross Bearing, Q_{ult} :	30.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	35	degrees
SPT Blow Count, N_{blows} :	29	
Base Friction, μ :	0.45	
Neglected Depth, N :	3.30	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

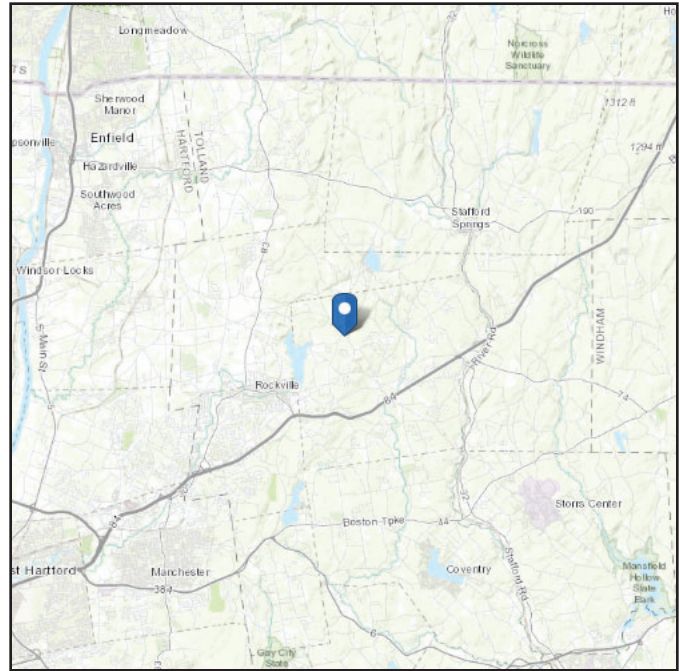
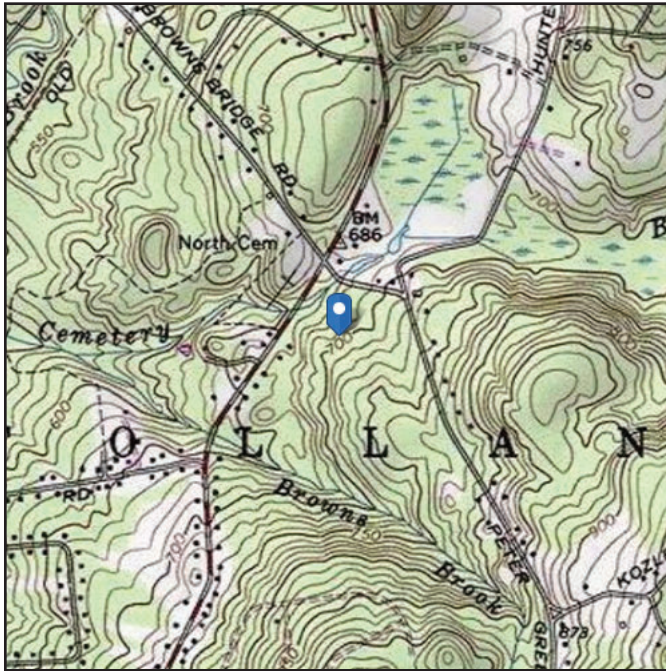
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ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 697.04 ft (NAVD 88)
Latitude: 41.896614
Longitude: -72.393731



Wind

Results:

Wind Speed:	124 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	101 Vmph

Ultimate 3-second gust wind speed of 125 mph required for Risk Category II.

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

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

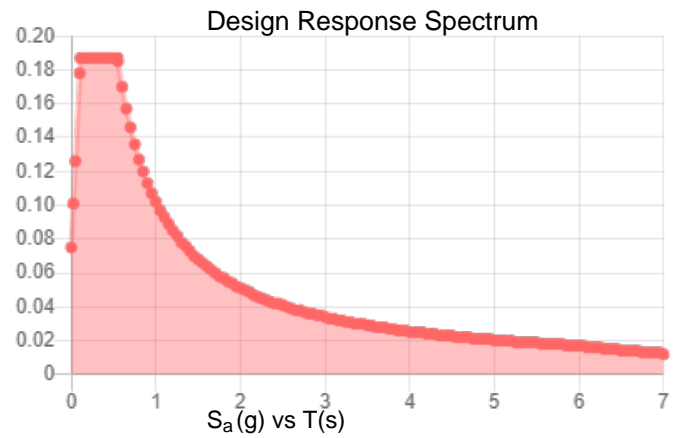
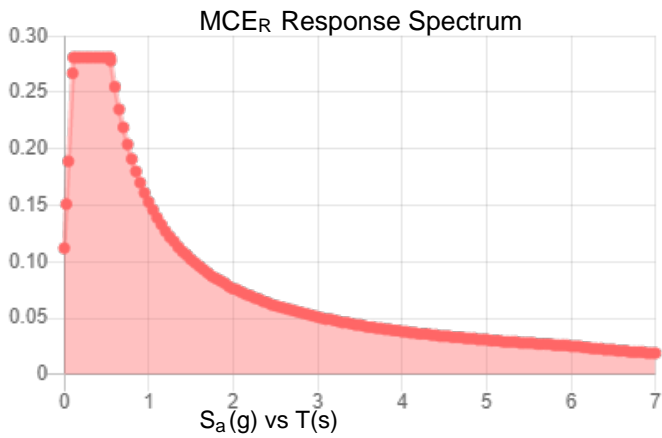
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_S :	0.175	S_{DS} :	0.187
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.087
S_{MS} :	0.281	PGA _M :	0.139
S_{M1} :	0.153	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Sun May 30 2021

Date Source:

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

Ice

Results:

Ice Thickness: 1.00 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

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

Date Accessed: Sun May 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.

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