



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

August 15, 2021

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

RE: Exempt Modification Application
439-455 Homestead Ave, Hartford CT 06105
Latitude: 41.78378056
Longitude: -72.70379444
Site#: 806369_Crown_Dish

Dear Ms. Bachman:

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

Dish Wireless LLC is requesting to file an exempt modification for an existing tower located at 439-455 Homestead Ave, Hartford CT 06105. Dish Wireless LLC proposes to install three (3) antennas at the 93-foot level of the existing 140-foot tower. The property is owned by Talar Properties LLC and the tower is owned by Crown Castle. This modification includes hardware that is 5G capable.

Dish Wireless LLC Planned Modifications:

Remove:
Antenna mount
(12) DB844H90 Antenna

Remove and Replace: NONE

Install New:
Commscope MC-PK8-DSH Mount
(3) LMA MX08FRO665-20 Antenna
(3) TA08025-B604 RRU
(3) TA08025-B605 RRU
(1) Raycap
(1) 1-1/2" Hybrid

Existing to Remain:
NONE



Ground Work: (within existing compound)

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

The facility was approved by the CT Siting Council Docket No. 126 on April 9, 1990. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-SOj-73, a copy of this letter is being sent to Luke Bronin, Mayor, Elected Official and Aimee Chambers, Director of Planning for the City of Hartford, as well as the property owner and the tower owner.

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

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

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

Sincerely,

Denise Sabo

Denise Sabo
Mobile: 203-435-3640
Fax: 413-521-0558
Office: 4 Angela's Way, Burlington CT 06013
Email: denise@northeastitesolutions.com



NSS **NORTHEAST**
SITE SOLUTIONS
Turnkey Wireless Development

Attachments cc:

Luke Bronin, Mayor (luke.bronin@hartford.gov)
City of Hartford
550 Main Street, Room 200 Hartford, CT 06103

Aimee Chambers, Director of Planning (aimee.chambers@hartford.gov)
City of Hartford
250 Constitution Plaza, 4th Floor Hartford, CT 06103

Talar Properties LLC
705 N Mountain Road Newington, CT 06111

Crown Castle, Tower Owner

Exhibit A

Original Facility Approval

DOCKET NO. 126 - AN APPLICATION OF METRO MOBILE CTS OF HARTFORD, INC., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, OPERATION, AND MAINTENANCE OF A CELLULAR TELEPHONE TOWER AND ASSOCIATED EQUIPMENT IN THE CITY OF HARTFORD, CONNECTICUT. : Connecticut Siting Council April 9, 1990

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

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council finds that the effects associated with the construction, operation, and maintenance of a cellular telephone facility at the proposed Hartford site, including effects on the natural environment; ecological integrity and balance; forests and parks; air and water purity; and fish and wildlife are not significant either alone or cumulatively with other effects, 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 Section 16-50k of the General Statutes of Connecticut (CGS), be issued to Metro Mobile CTS of Hartford, Inc., for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building at the proposed site in Hartford, 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 monopole tower including antennas and associated equipment shall not exceed a height of 153 feet above ground level, 215 feet AMSL.
2. The facility shall be constructed in accordance with the State of Connecticut Basic Building Code.
3. The tower shall be designed and constructed to withstand 125 mph winds with two-inch radial ice accumulation.
4. 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 State Agencies. The D&M plan shall include detailed plans of the site preparation with a soil boring report; plans, design details, and specifications for the tower foundation; and a site plan with placement of the tower as far removed from abutting properties and structures as possible.

5. The Certificate Holder shall prepare the D&M plan in consultation with the City of Hartford, which may provide its comments to the Council within 20 days of submission to the City.
6. The Certificate Holder shall comply with existing and any future radio frequency (RF) standard promulgated by State or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted in this Decision and Order shall be brought into compliance with such standards.
7. The Certificate Holder shall provide the Council a recalculated report of power density if and when additional channels over the proposed 90 channels, higher wattage over the proposed 100 watts per channel, or if other circumstances in operation cause a change in power density above the levels originally calculated in the application.
8. The Certificate Holder shall permit public or private entities to share space on the tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
9. If this facility does not initially provide, or permanently ceases to provide, cellular service following the completion of construction, this Decision and Order shall be void, and the tower and all associated equipment in this application shall be dismantled and removed or reapplication of any new use shall be made to the Council before any such new use is made.
10. Unless otherwise approved by the Council, this Decision and Order shall be void if construction authorized herein is not completed within three years of the effective date of this Decision and Order.

Pursuant to Section 16-50p of the CGS, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below. A notice of issuance shall be published in the Hartford Courant.

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 State Agencies.

The parties or intervenors to this proceeding are:

(Applicant)

Metro Mobile CTS of
Hartford, Inc.
100 Corporate Drive
Windsor, CT 06095
Attn: Gary N. Schulman
Vice President and
General Manager

(Its Representative)

Robinson & Cole
One Commercial Plaza
Hartford, CT 06103-3597
Attn: Earl W. Phillips
Jr., Esq.

(Intervenor)

SNET Cellular, Inc.
227 Church Street
New Haven, CT 06506

(Its Representative)

Peter J. Tyrrell
Senior Attorney
SNET Cellular, Inc.
227 Church Street
Room 1021
New Haven, CT 06506

JAW

4248E

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case in Docket No. 126 - An application of Metro Mobile CTS of Hartford, Inc., for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telephone tower and associated equipment in the City of Hartford, Connecticut, or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut the 9th day of April, 1990.

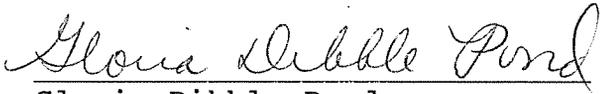
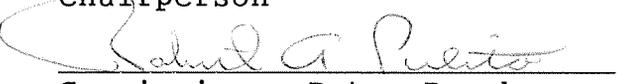
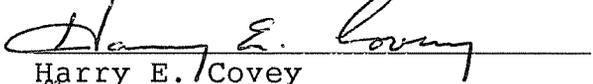
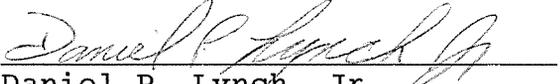
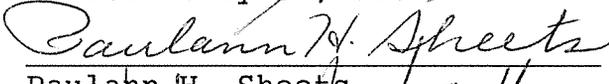
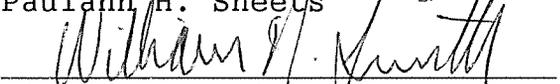
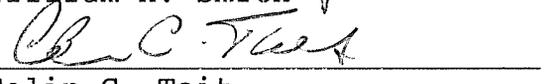
<u>Council Members</u>	<u>Vote Cast</u>
 Gloria Dibble Pond Chairperson	Yes
 Commissioner Peter Boucher Designee: Robert A. Pulito	Yes
 Commissioner Leslie Carothers Designee: Brian Emerick	Yes
 Harry E. Covey	Yes
 Mortimer A. Gelston	Yes
 Daniel P. Lynch, Jr.	Yes
 Paulann H. Sheets	Abstain
 William H. Smith	Yes
 Colin C. Tait	Yes

Exhibit B

Property Card

Unofficial Property Record Card - Hartford, CT

General Property Data

Parcel ID 152-181-002	Account Number
Prior Parcel ID	Property Location 441-455 HOMESTEAD AVE
Property Owner TALAR PROPERTIES LLC	Property Use VAC LAND IND
Mailing Address 705 N MOUNTAIN RD	Most Recent Sale Date 3/7/2001
City NEWINGTON	Legal Reference 04350-0044
Mailing State CT Zip 06111-1412	Grantor HUDSON ASSOCIATES
ParcelZoning CX-1	Sale Price 0
	Land Area 79,715.000 acres

Current Property Assessment

Card 1 Value	Building Value 0	Xtra Features Value 0	Land Value 224,630	Total Value 224,630
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Building Description

Building Style N/A	Foundation Type N/A	Flooring Type N/A
# of Living Units 0	Frame Type N/A	Basement Floor N/A
Year Built N/A	Roof Structure N/A	Heating Type N/A
Building Grade N/A	Roof Cover N/A	Heating Fuel N/A
Building Condition N/A	Siding N/A	Air Conditioning 0%
Finished Area (SF) 0	Interior Walls N/A	# of Bsmt Garages 0
Number Rooms 0	# of Bedrooms 0	# of Full Baths 0
# of 3/4 Baths 0	# of 1/2 Baths 0	# of Other Fixtures 0

Legal Description

Narrative Description of Property

This property contains 79,715.000 acres of land mainly classified as VAC LAND IND with a(n) N/A style building, built about N/A , having N/A exterior and N/A roof cover, with 0 commercial unit(s) and 0 residential unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 0 half bath(s).

Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranted.

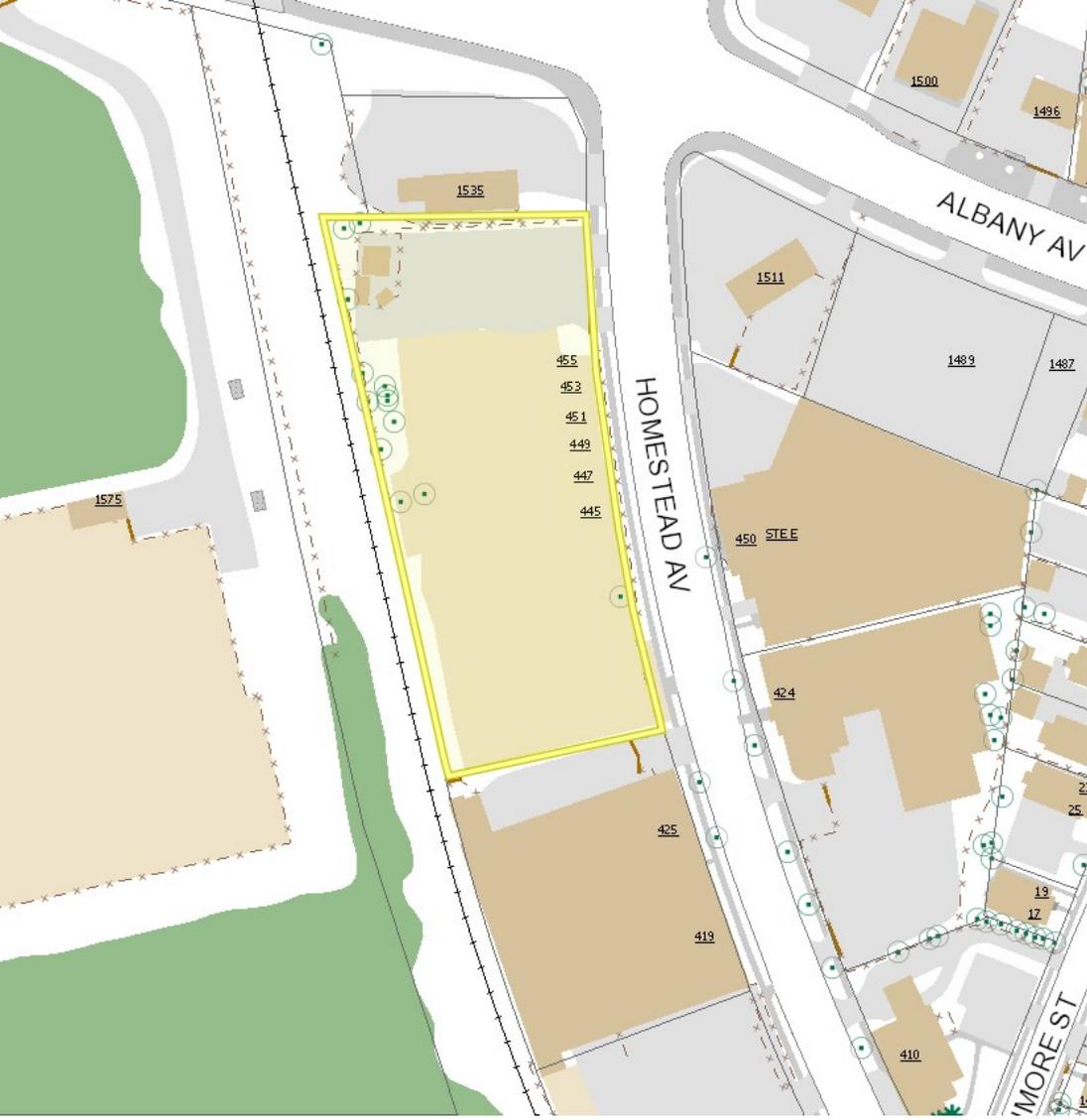


Exhibit C

Construction Drawings



DISH Wireless L.L.C. SITE ID:

BOBDL00044A

DISH Wireless L.L.C. SITE ADDRESS:

**439-455 HOMESTEAD AVE
HARTFORD, CT 06105**

SCOPE OF WORK	
THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:	
TOWER SCOPE OF WORK:	
<ul style="list-style-type: none"> • REMOVE ALL EXISTING ABANDONED EQUIPMENT AT 93'-0" MCL • REMOVE EXISTING ANTENNA @ 91'-6" LEVEL • INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR) • INSTALL (1) PROPOSED TOWER PLATFORM MOUNT • INSTALL PROPOSED JUMPERS • INSTALL (6) PROPOSED RRU's (2 PER SECTOR) • INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP) • INSTALL (1) PROPOSED HYBRID CABLE 	
GROUND SCOPE OF WORK:	
<ul style="list-style-type: none"> • REMOVE EXISTING 4'-11"X3'-3" STEEL PLATFORM • 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 FIBER NID (IF REQUIRED) • INSTALL FENCE EXPANSION 6'-3" X 9'-4" X 6'-2" 	

SITE INFORMATION		PROJECT DIRECTORY	
PROPERTY OWNER:	GLOBAL SIGNAL ACQUISITIONS	APPLICANT:	DISH Wireless L.L.C.
ADDRESS:	P.O. BOX 277455 ATLANTA, GA. 30384-7455		5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER TYPE:	MONOPOLE	TOWER OWNER:	CROWN CASTLE
TOWER CO SITE ID:	806369		2000 CORPORATE DRIVE CANONSBURG, PA 15317 (877) 486-9377
TOWER APP NUMBER:	556641	SITE DESIGNER:	B+T GROUP
COUNTY:	HARTFORD		1717 S. BOULDER AVE, SUITE 300 TULSA, OK 74119 (918) 587-4630
LATITUDE (NAD 83):	41° 47' 01.6" N 41.78378056 N	SITE ACQUISITION:	SARAH PARSONS
LONGITUDE (NAD 83):	72° 42' 13.7" W 72.70379444 W	CONSTRUCTION MANAGER:	JAVIER SOTO
ZONING JURISDICTION:	CT - CITY OF HARTFORD		JAVIER.SOTO@DISH.COM
ZONING DISTRICT:	CX-1	RF ENGINEER:	BOSSENER CHARLES
PARCEL NUMBER:	HTFD-000152-000181-000002		BOSSENER.CHARLES@DISH.COM
OCCUPANCY GROUP:	U		
CONSTRUCTION TYPE:	II-B		
POWER COMPANY:	CONNECTICUT LIGHT & POWER		
TELEPHONE COMPANY:	LIGHTOWER		



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



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



B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

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:
JJR MTJ MDW

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/2/21	ISSUED FOR REVIEW
B	7/2/21	ISSUED FOR REVIEW
D	7/28/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
89233.006.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00044A
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

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
A-7	FENCE DETAILS
E-1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE
G-1	GROUNDING PLANS AND NOTES
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
RF-1	RF CABLE COLOR CODE
GN-1	LEGEND AND ABBREVIATIONS
GN-2	GENERAL NOTES
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES

SITE PHOTO



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



GENERAL NOTES

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

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

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

DIRECTIONS

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:
GET ON I-91 N IN WINDSOR FROM CT-187 N/BLUE HILLS AVE AND CT-218 E 12 MIN (4.5 MI) HEAD NORTH TOWARD WESTBOURNE PKWY 266 FT TURN LEFT ONTO WESTBOURNE PKWY 0.4 MI TURN LEFT ONTO CT-187 N/BLUE HILLS AVE 2.0 MI TURN RIGHT ONTO CT-218 E/COTTAGE GROVE RD CONTINUE TO FOLLOW CT-218 E 1.6 MI TURN LEFT TO MERGE WITH I-91 N TOWARD SPRINGFIELD 0.3 MI CONTINUE ON I-91 N. TAKE CT-20 W TO SCHOEPHOESTER RD IN WINDSOR LOCKS 10 MIN (10.0 MI) MERGE WITH I-91 N 5.3 MI USE THE RIGHT 2 LANES TO TAKE EXIT 40 FOR CT-20 TOWARD BRADLEY INTERNATIONAL AIRPORT 0.6 MI CONTINUE ONTO CT-20 W 2.8 MI CONTINUE ONTO BRADLEY INTERNATIONAL AIRPORT CON 1.3 MI DRIVE TO YOUR DESTINATION 1 MIN (0.4 MI) USE ANY LANE TO TURN SLIGHTLY RIGHT ONTO SCHOEPHOESTER RD 0.2 MI USE THE RIGHT 2 LANES TO TURN SLIGHTLY RIGHT.

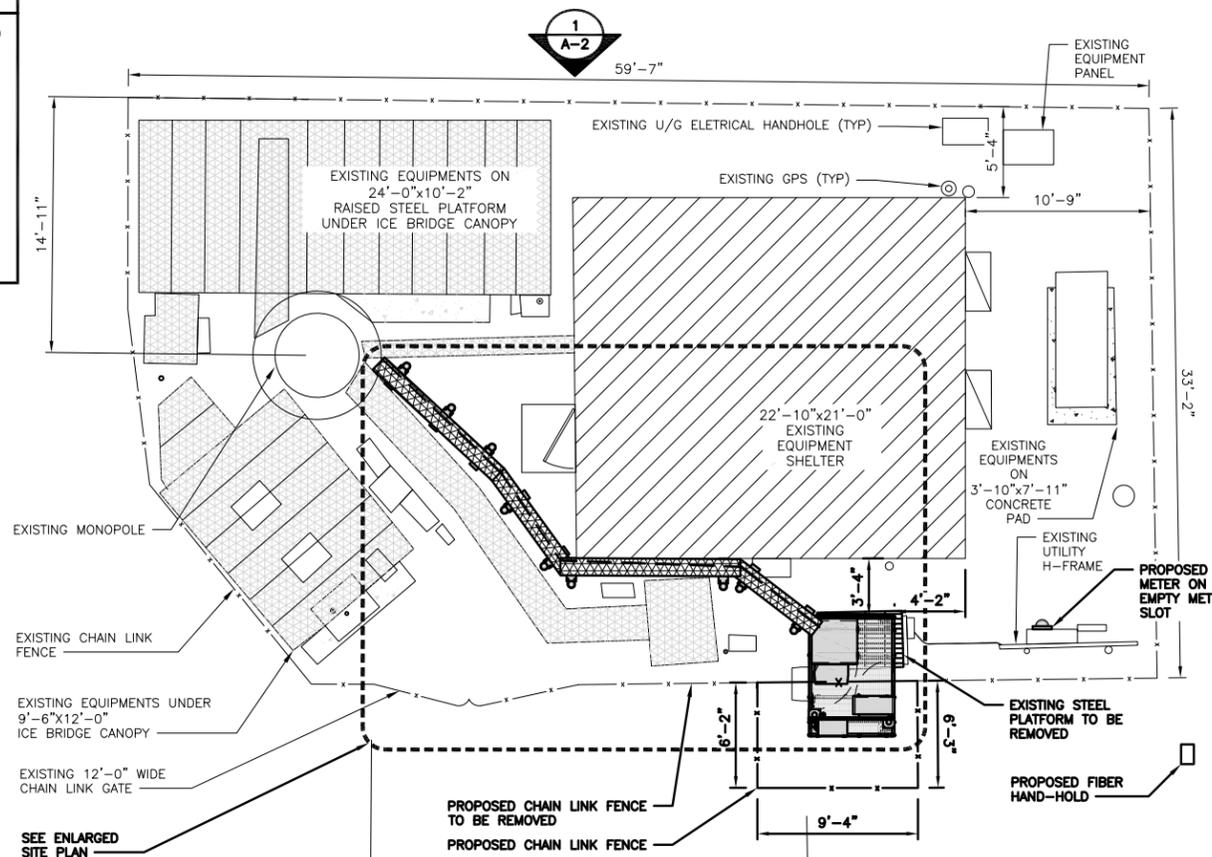
VICINITY MAP



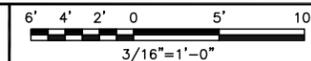
NO SCALE

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. THE GROUND LEASE PROVIDES BROAD/BLANKET UTILITY RIGHTS. PWR AND FBR PATH DEPICTED ON A-1 AND E-1 ARE BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO FIELD VERIFICATION, PRIOR PROJECT DOCUMENTATION AND OTHER REAL PROPERTY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS NOT AN OPTION, PLEASE NOTIFY CROWN CASTLE REAL ESTATE AS FURTHER COORDINATION MAY BE NEEDED.



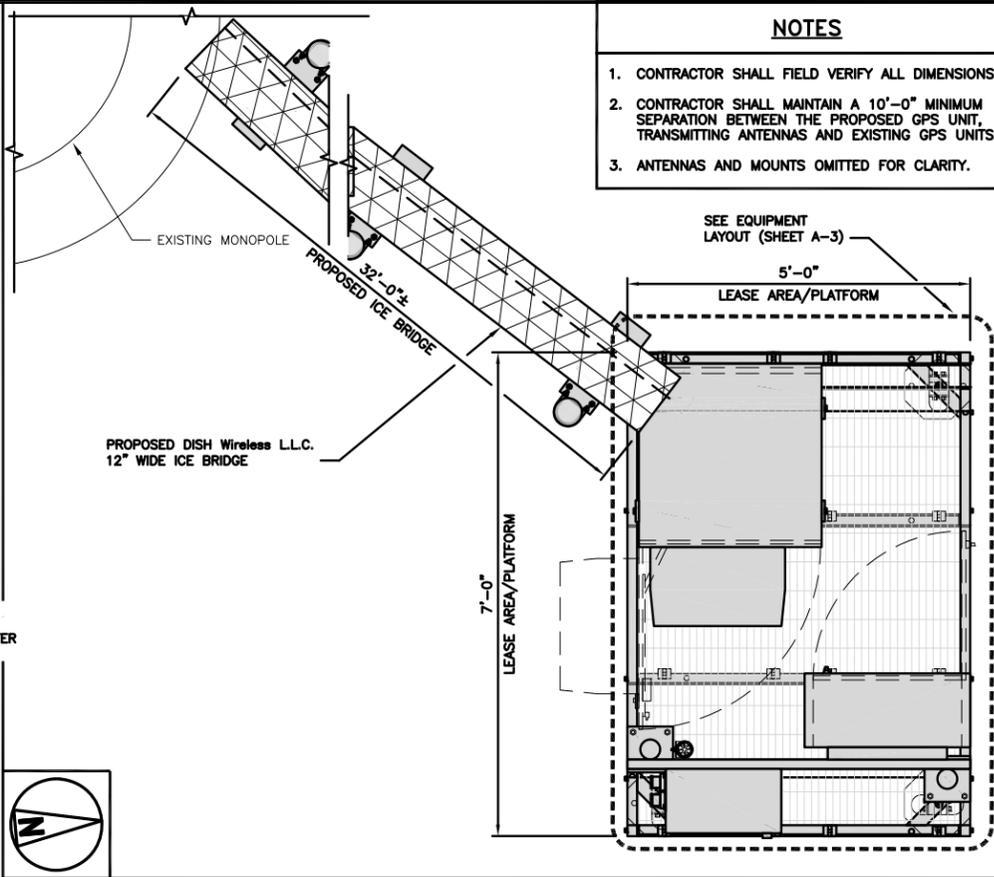
OVERALL SITE PLAN



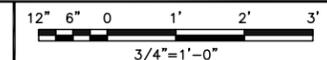
1

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

3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



1717 S. BOULDER
SUITE 300
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DRAWN BY:	CHECKED BY:	APPROVED BY:
JJR	MTJ	MDW

RFDS REV #: ---

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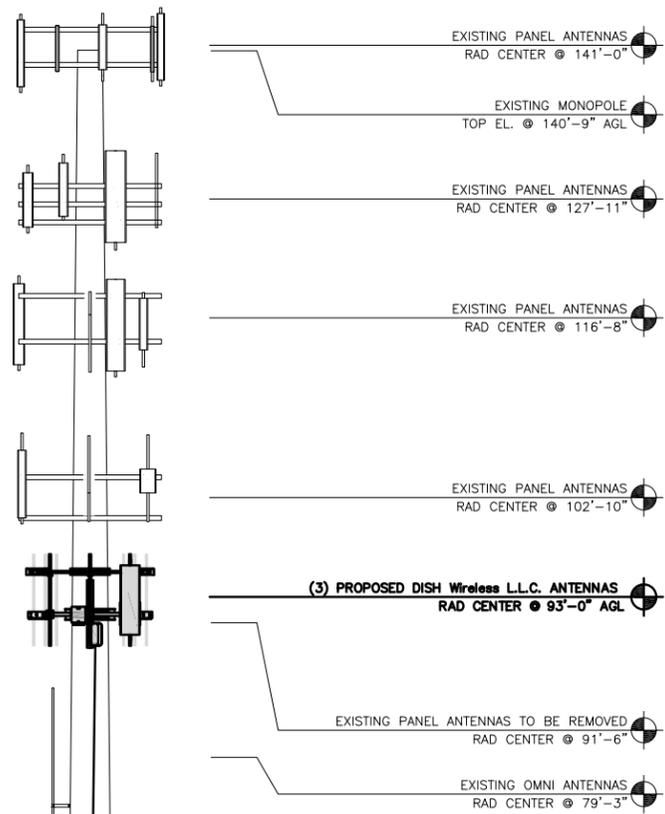
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDLOO44A
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

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.



(1) PROPOSED DISH Wireless L.L.C. HYBRID CABLE ROUTED EXTERIOR POLE

EXISTING MONOPOLE

PROPOSED DISH Wireless L.L.C. ICE BRIDGE

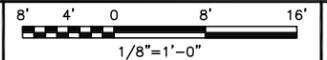
PROPOSED DISH Wireless L.L.C. GPS UNIT

PROPOSED DISH Wireless L.L.C. EQUIPMENT ON PROPOSED STEEL PLATFORM

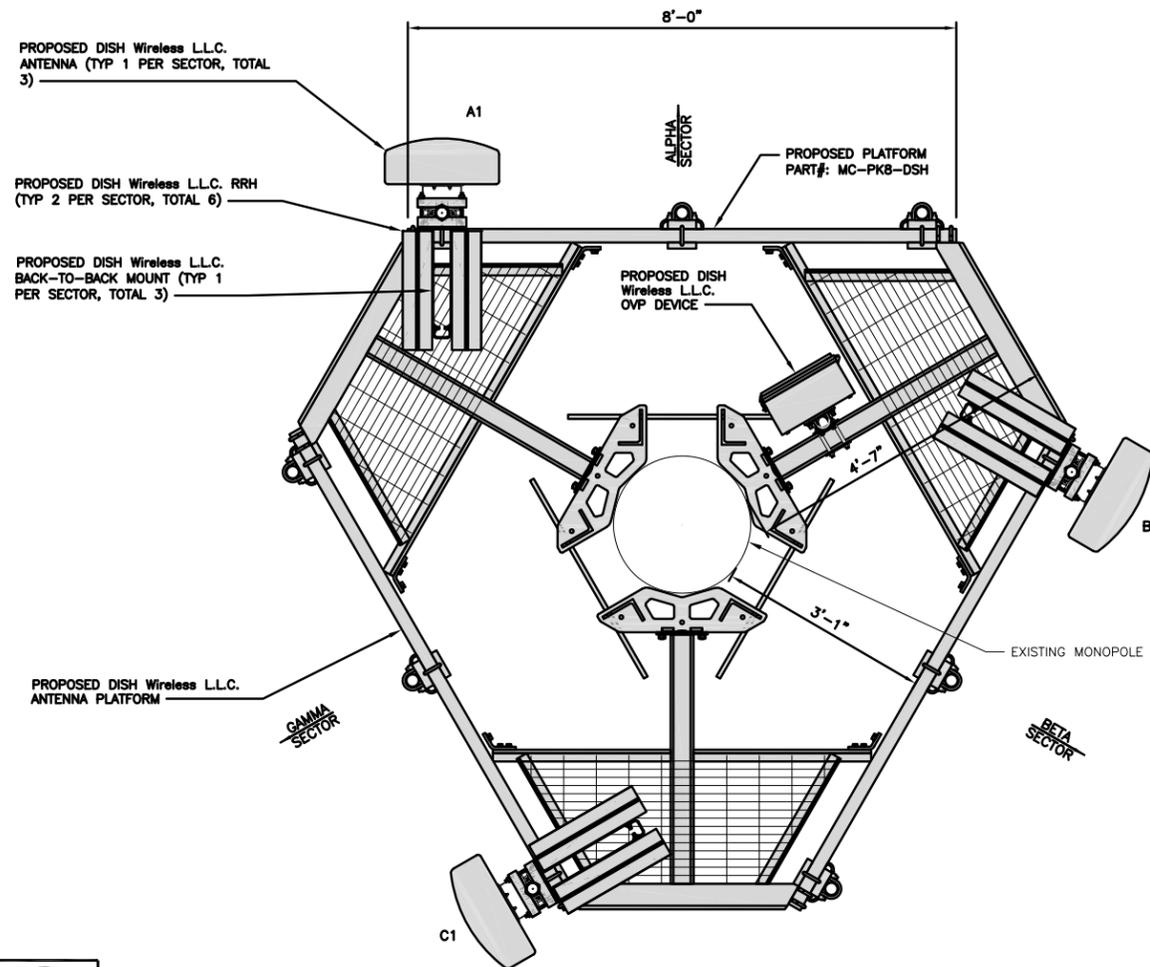
EXISTING ENTRY PORT

EXISTING MONOPOLE
BOTTOM EL. @ 3° AGL

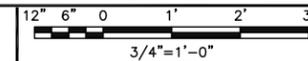
PROPOSED WEST ELEVATION



1



ANTENNA LAYOUT



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS-MX08FRO665-21	5G	72.0" x 20.0"	0°	93°-0"	(1) HIGH-CAPACITY HYBRID CABLE (150' LONG)
BETA	B1	PROPOSED	JMA WIRELESS-MX08FRO665-21	5G	72.0" x 20.0"	120°	93°-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS-MX08FRO665-21	5G	72.0" x 20.0"	240°	93°-0"	

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

ANTENNA SCHEDULE

NO SCALE

3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

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DRAWN BY: CHECKED BY: APPROVED BY:
JJR MTJ MDW

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/2/21	ISSUED FOR REVIEW
B	7/2/21	ISSUED FOR REVIEW
0	7/28/21	ISSUED FOR CONSTRUCTION

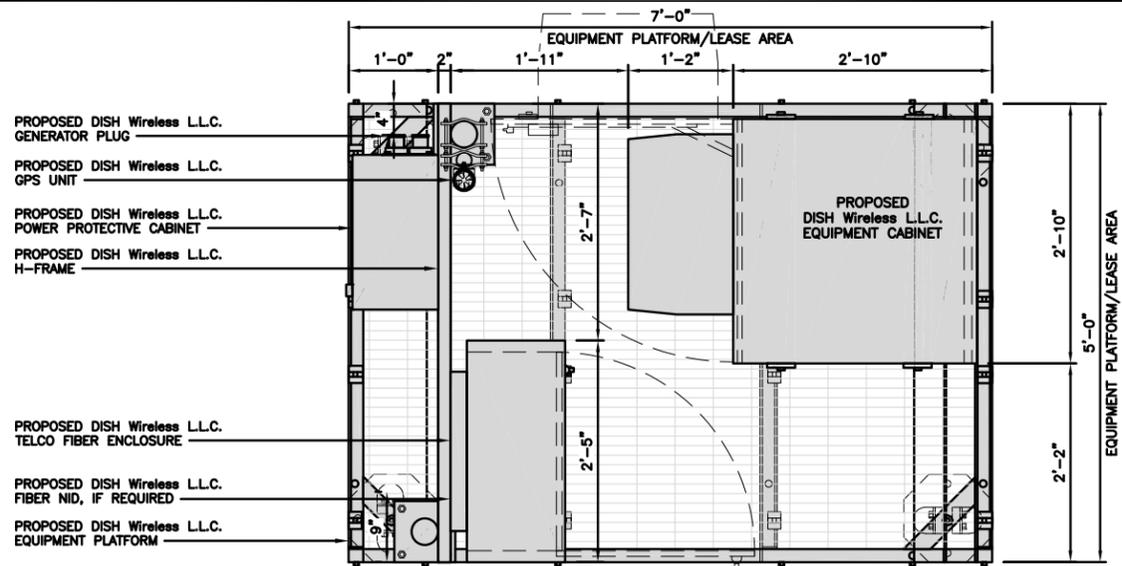
A&E PROJECT NUMBER
89233.006.01

DISH Wireless L.L.C. PROJECT INFORMATION
BOBDLOO044A
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

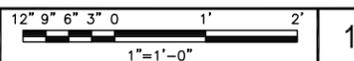
SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



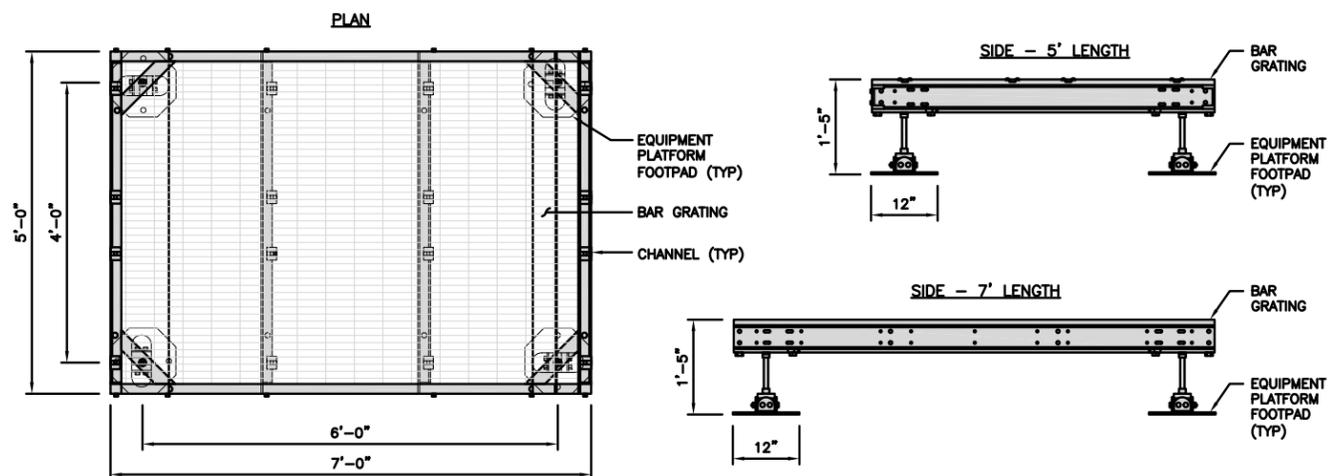
PLATFORM EQUIPMENT PLAN



1

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

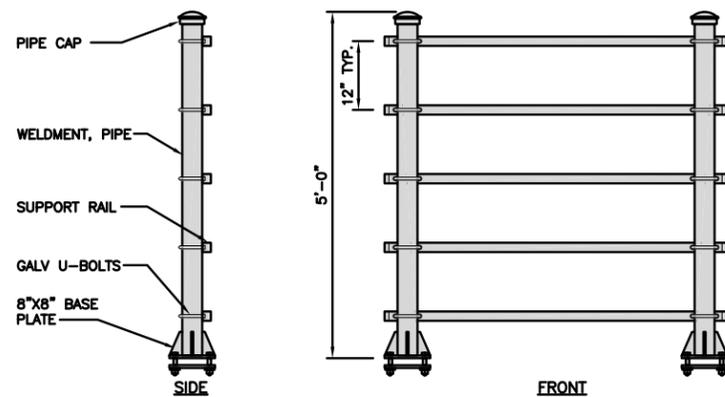
NOTE:
GC TO PROVIDE EXTENDED
THREAD FOR PLATFORM IF
REQUIRED HEIGHT EXCEEDS 17"



PLATFORM DETAIL

NO SCALE 2

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



H-FRAME DETAIL

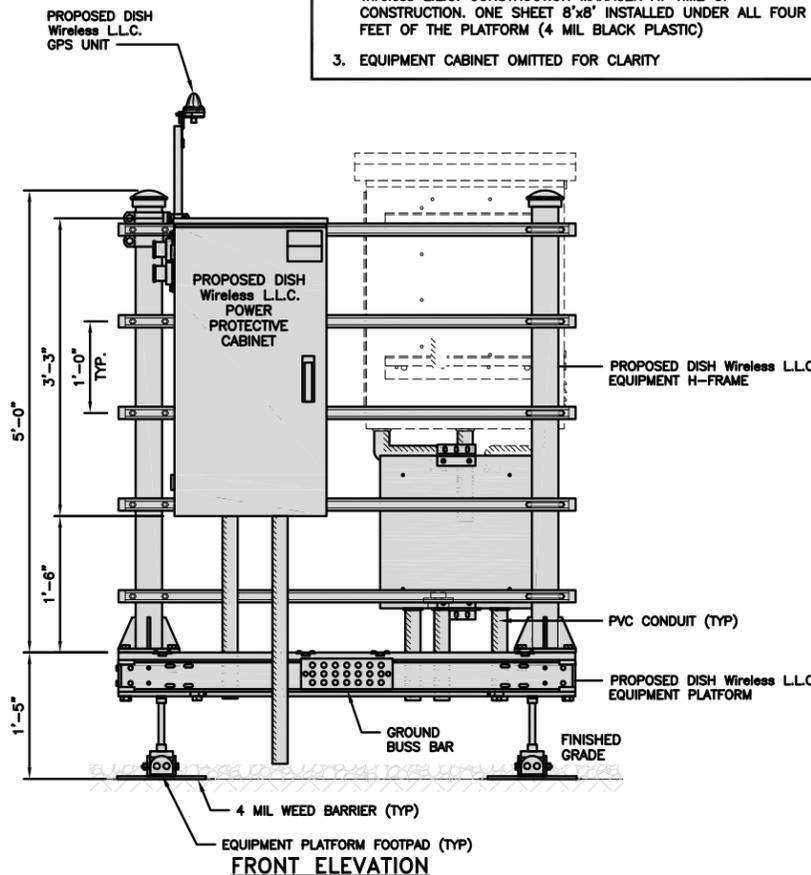
NO SCALE 3

NOT USED

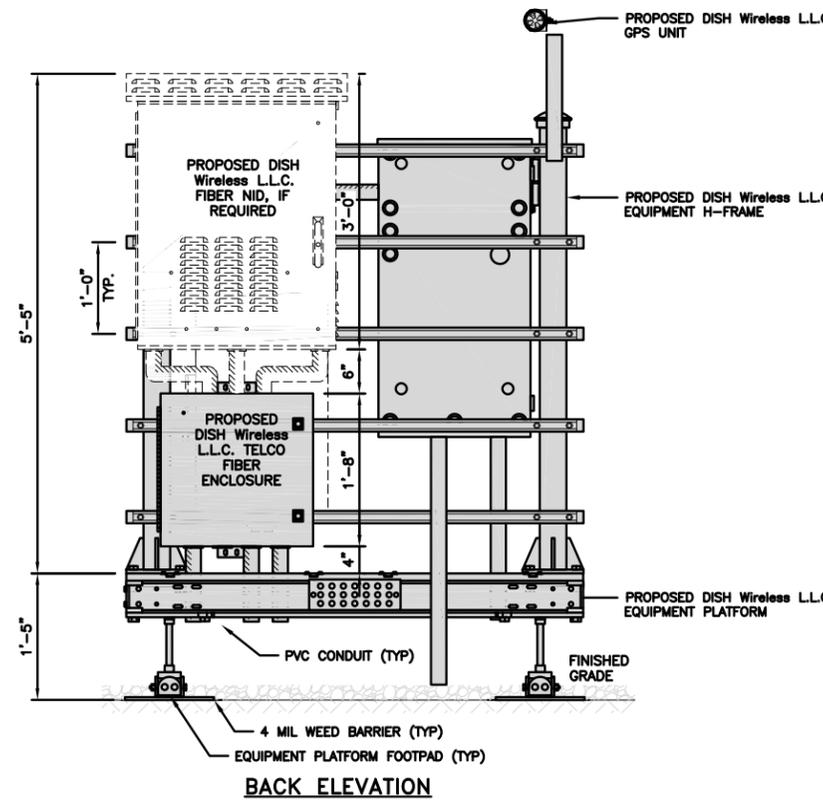
NO SCALE 4

NOTES

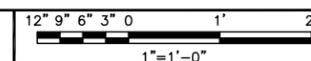
1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
2. WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH Wireless L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. EQUIPMENT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



FRONT ELEVATION



BACK ELEVATION



5



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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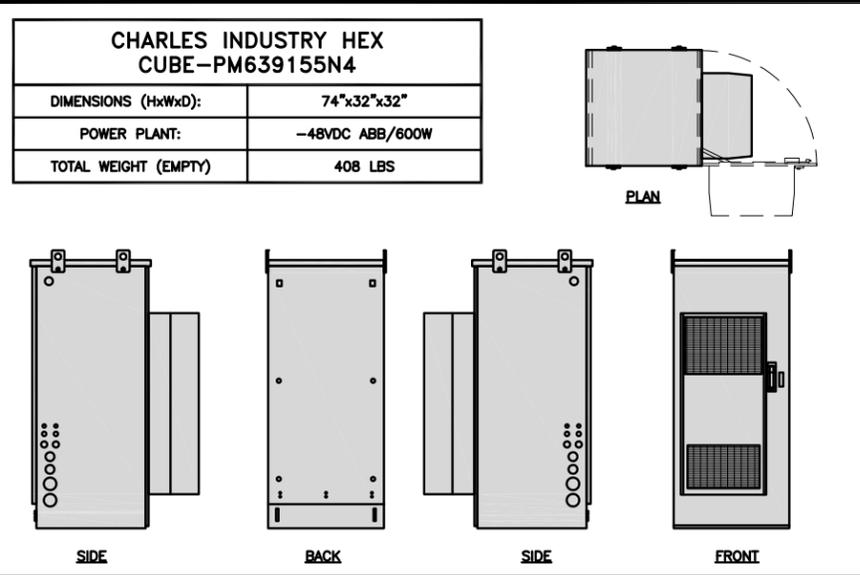
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HARTFORD, CT 06105

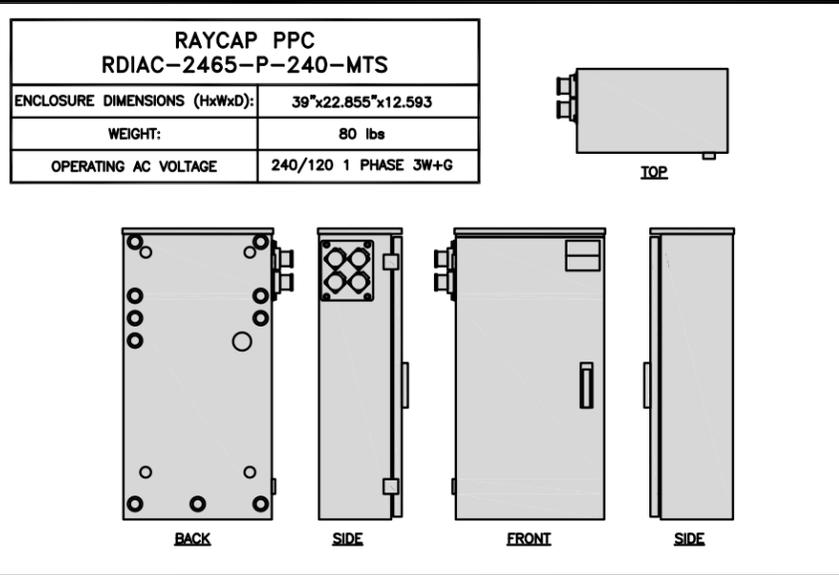
SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER

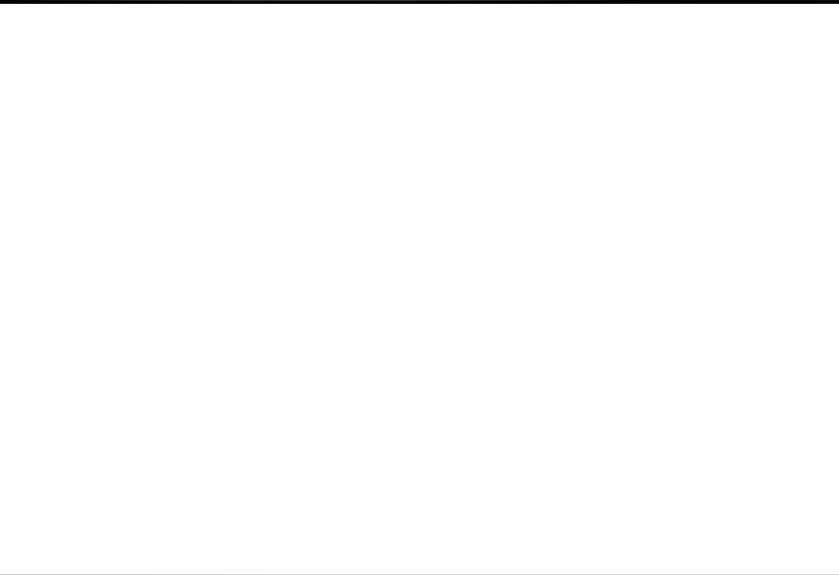
A-3



CABINET DETAIL NO SCALE 1



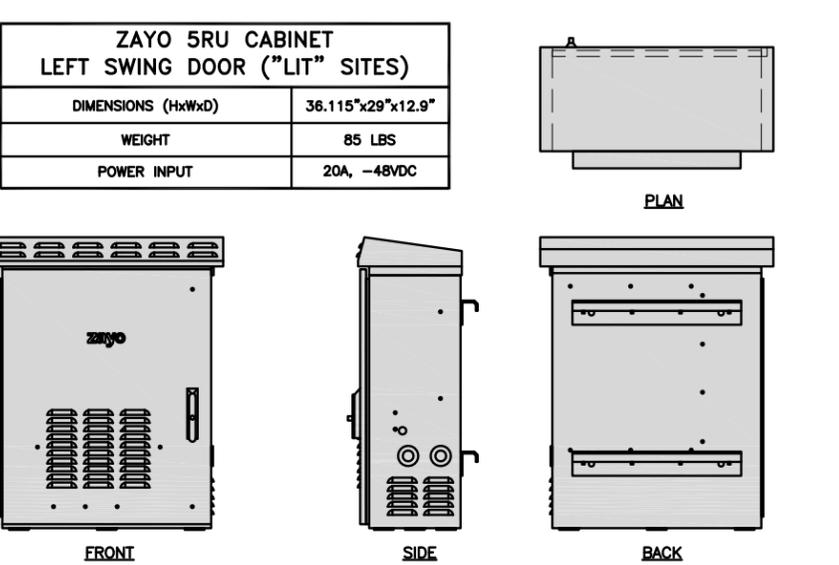
POWER PROTECTION CABINET (PPC) DETAIL NO SCALE 2



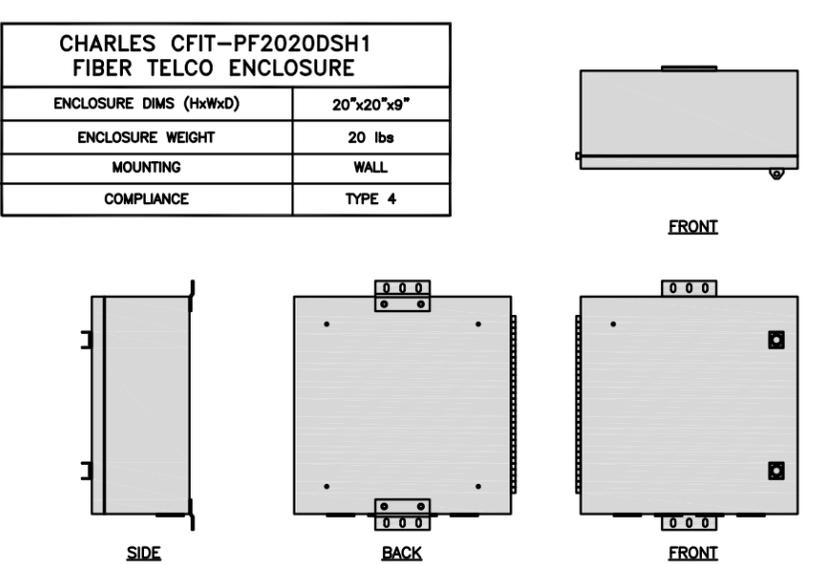
NOT USED NO SCALE 3



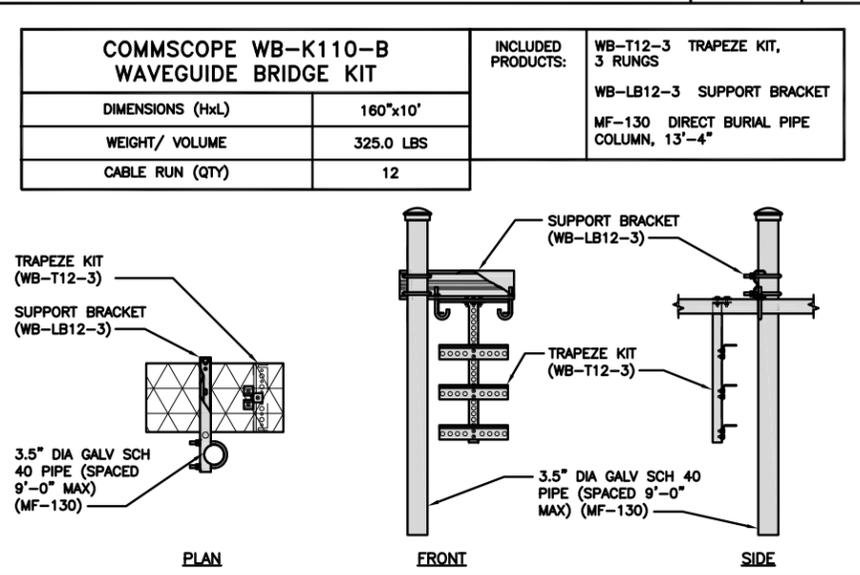
NOT USED NO SCALE 4



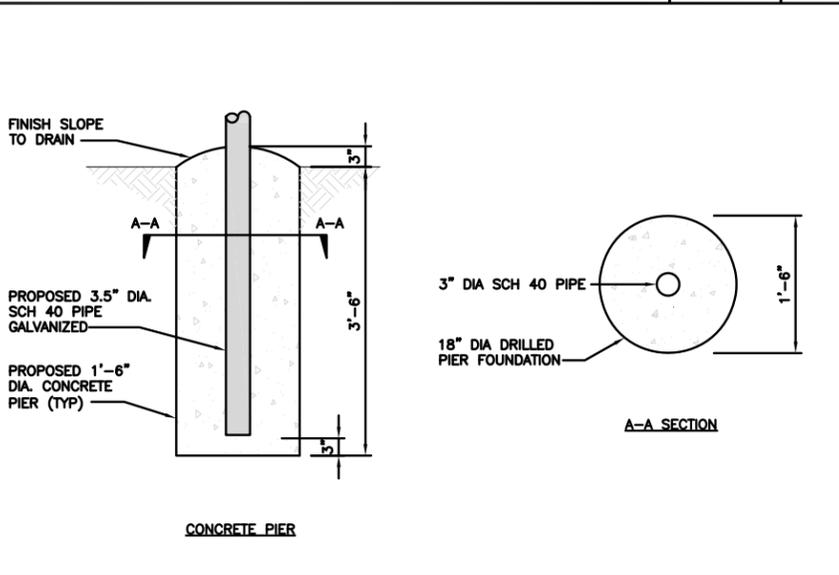
NETWORK INTERFACE UNIT DETAIL NO SCALE 5



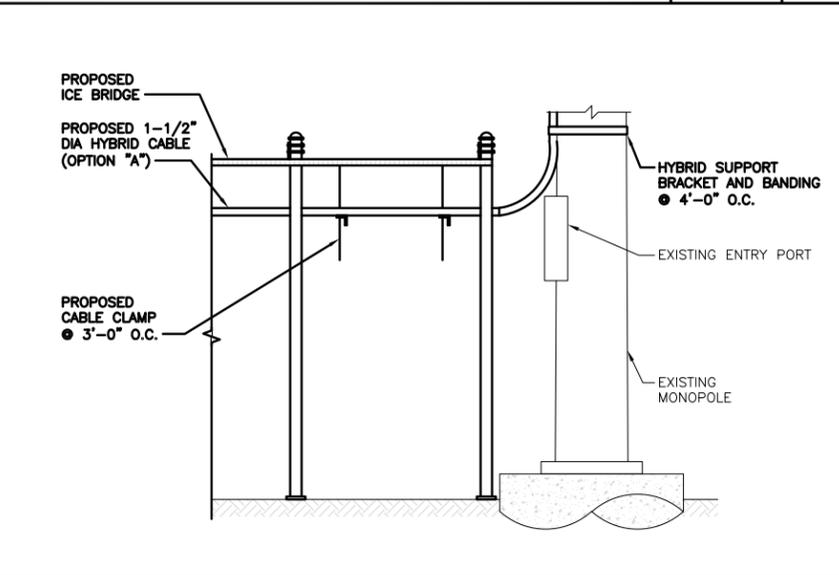
FIBER TELCO ENCLOSURE DETAIL NO SCALE 6



ICE BRIDGE DETAIL NO SCALE 7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL NO SCALE 8



HYBRID CABLE RUN NO SCALE 9

dish wireless.

5701 SOUTH SANTA FE DRIVE
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CROWN CASTLE
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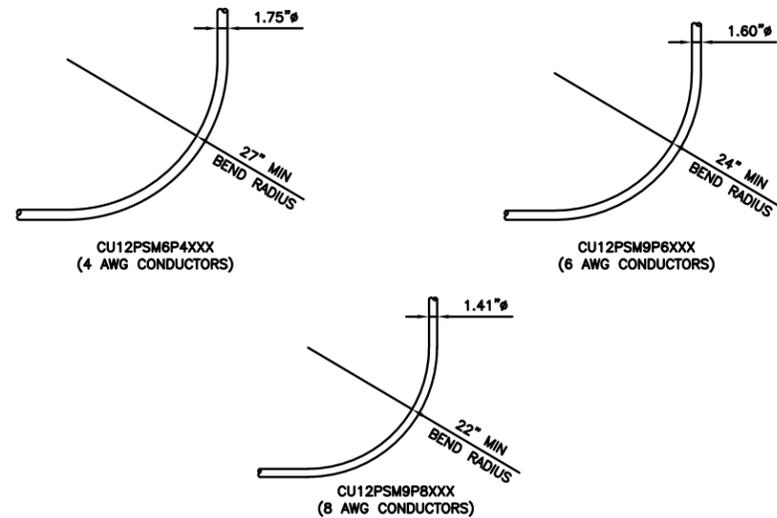
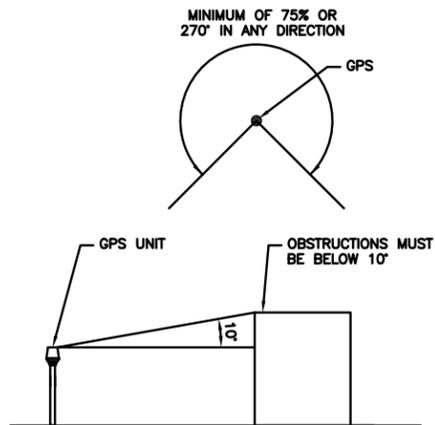
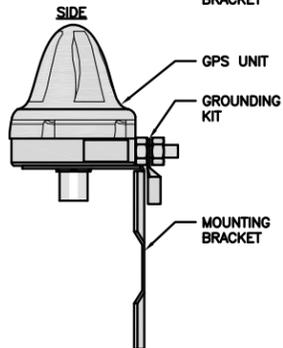
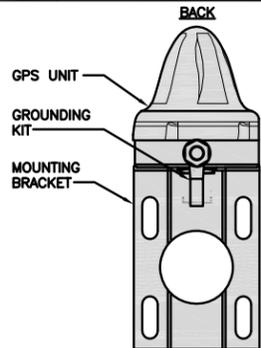
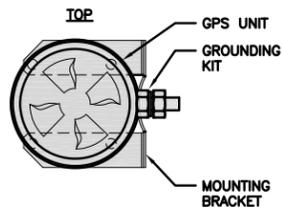
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PROJECT INFORMATION
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HARTFORD, CT 06105

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 RADIUSES NO SCALE 3

NOT USED NO SCALE 4

NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



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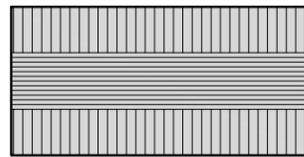
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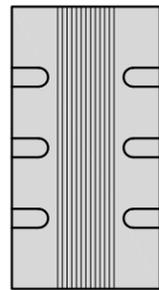
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

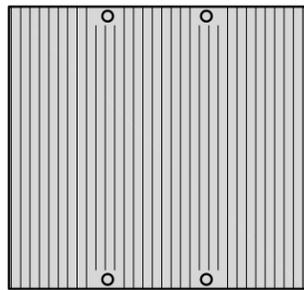
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



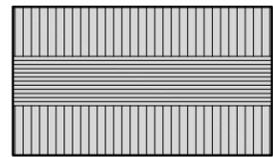
FRONT

REMOTE RADIO HEAD DETAIL

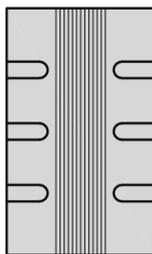
NO SCALE

1

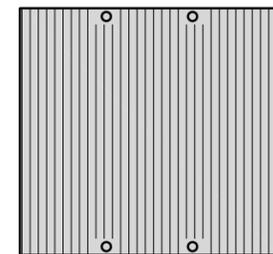
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

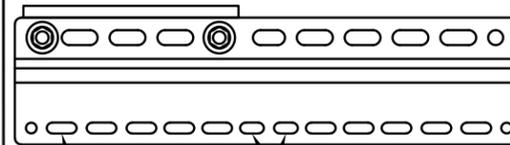
REMOTE RADIO HEAD DETAIL

NO SCALE

2

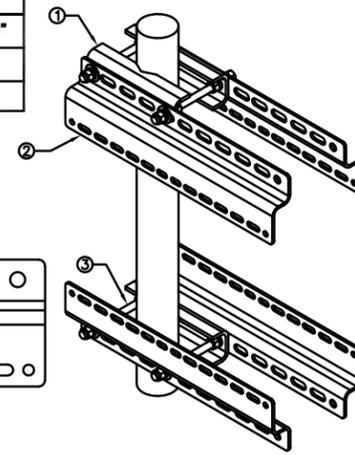
SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

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

NO SCALE

3

JMA WIRELESS MX08FRO665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	64.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



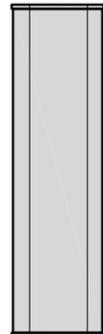
PLAN



BACK



SIDE

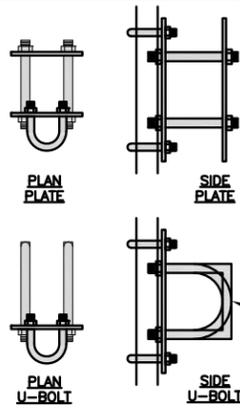


FRONT

NO SCALE

4

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

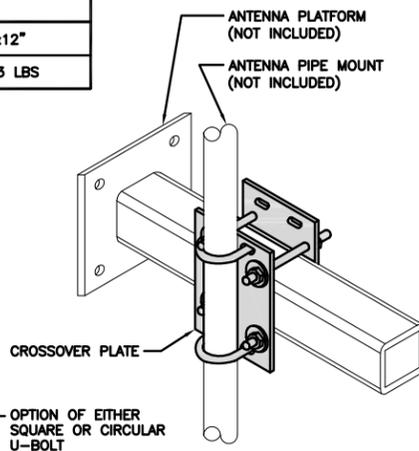


PLAN PLATE

SIDE PLATE

PLAN U-BOLT

SIDE U-BOLT



ANTENNA PLATFORM (NOT INCLUDED)

ANTENNA PIPE MOUNT (NOT INCLUDED)

CROSSOVER PLATE

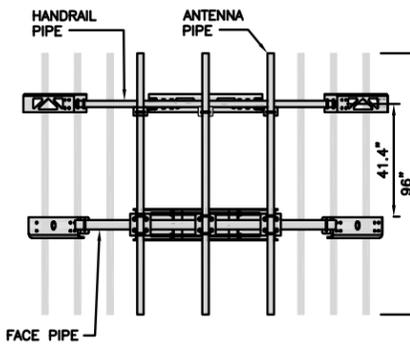
OPTION OF EITHER SQUARE OR CIRCULAR U-BOLT

NOT USED

NO SCALE

5

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



FACE PIPE

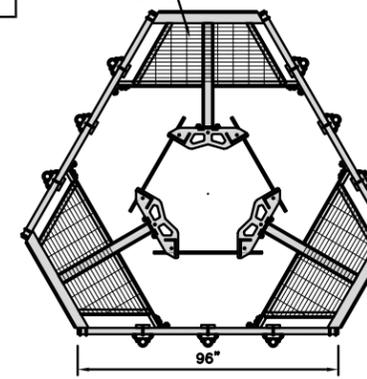
HANDRAIL PIPE

ANTENNA PIPE

41.4"

96"

PLATFORM



ANTENNA PLATFORM DETAIL

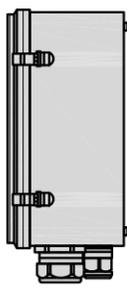
NO SCALE

9

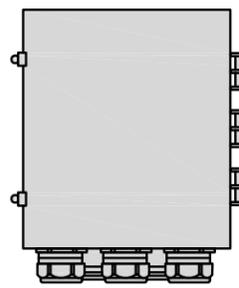
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



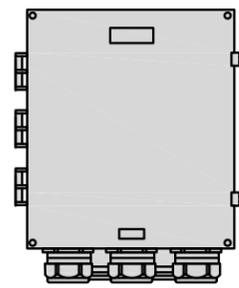
PLAN



SIDE



BACK



FRONT

SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

7



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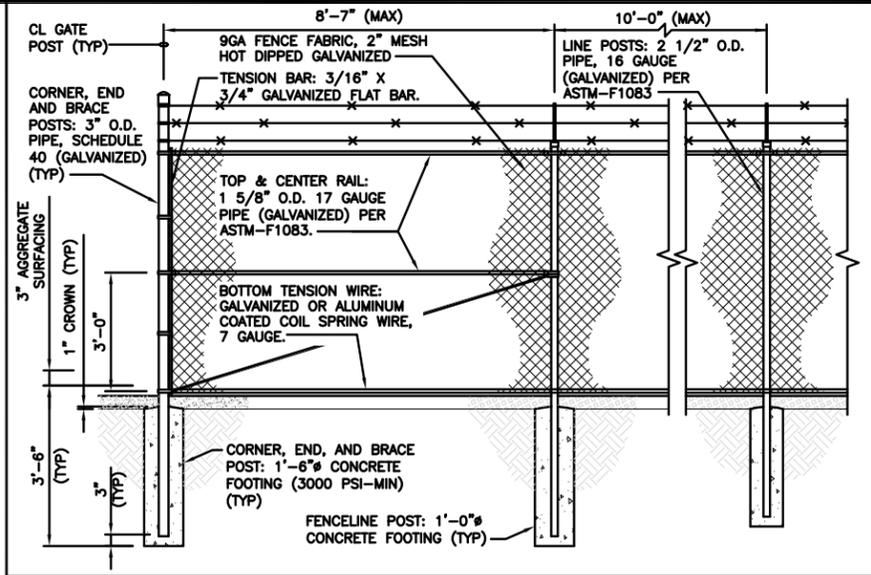
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SHEET TITLE
EQUIPMENT DETAILS

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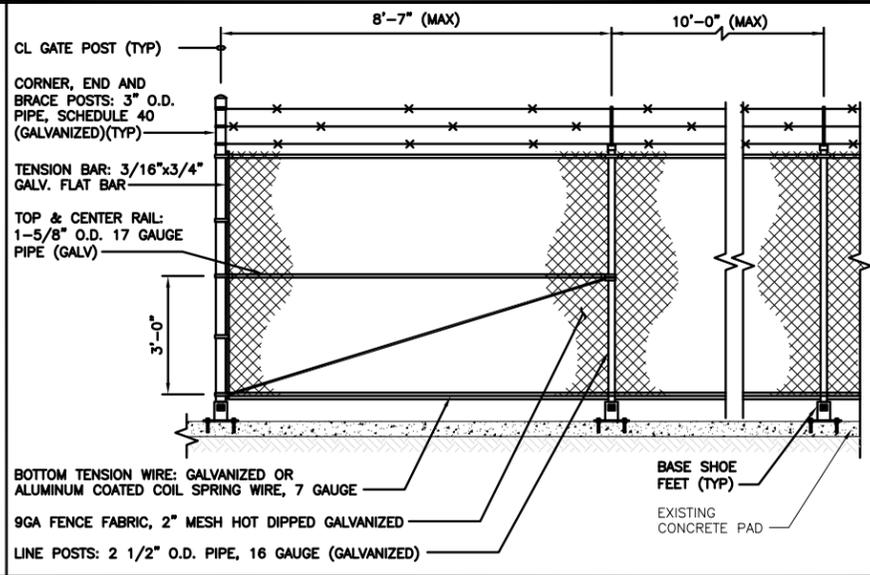
A-6

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



TYPICAL FENCE DETAIL

NO SCALE 2



TYPICAL FENCE ELEVATION DETAIL

NO SCALE 3

MATERIAL DESCRIPTION

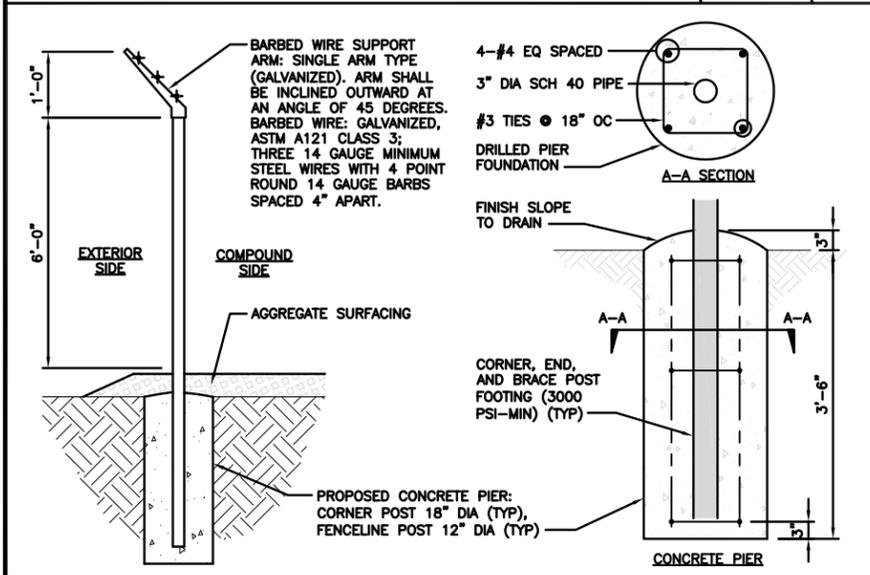
NO SCALE 1

NOT USED

NO SCALE 4

NOT USED

NO SCALE 5



TYPICAL FENCE & CONCRETE PIER SECTION

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8



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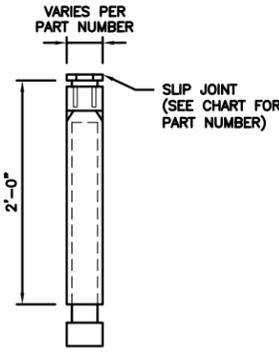
DISH Wireless L.L.C.
PROJECT INFORMATION
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HARTFORD, CT 06105

SHEET TITLE
ELECTRICAL/FIBER ROUTE
PLAN AND NOTES

SHEET NUMBER
E-1

CARLON EXPANSION FITTINGS

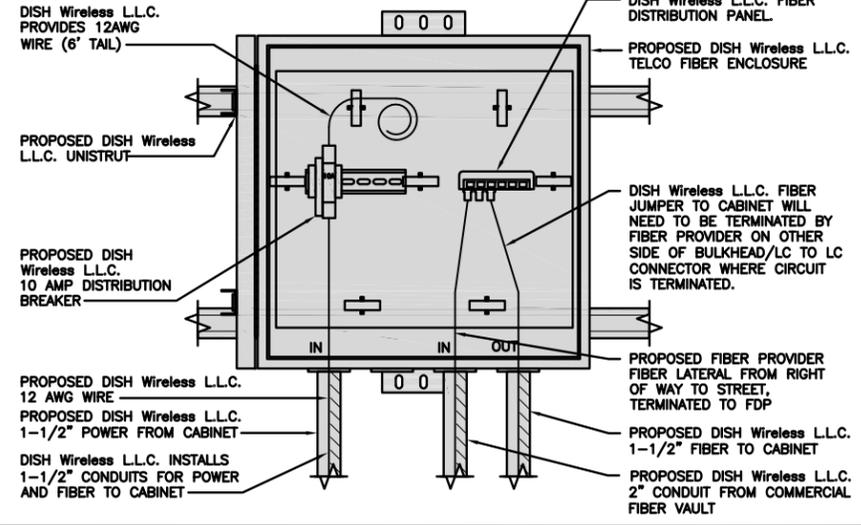
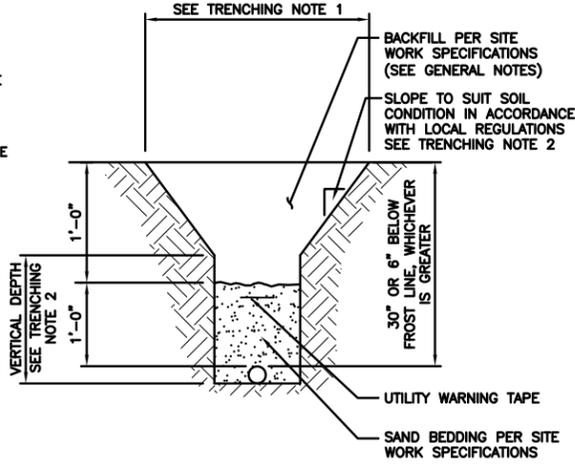
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N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



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

TRENCHING NOTES

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



EXPANSION JOINT DETAIL

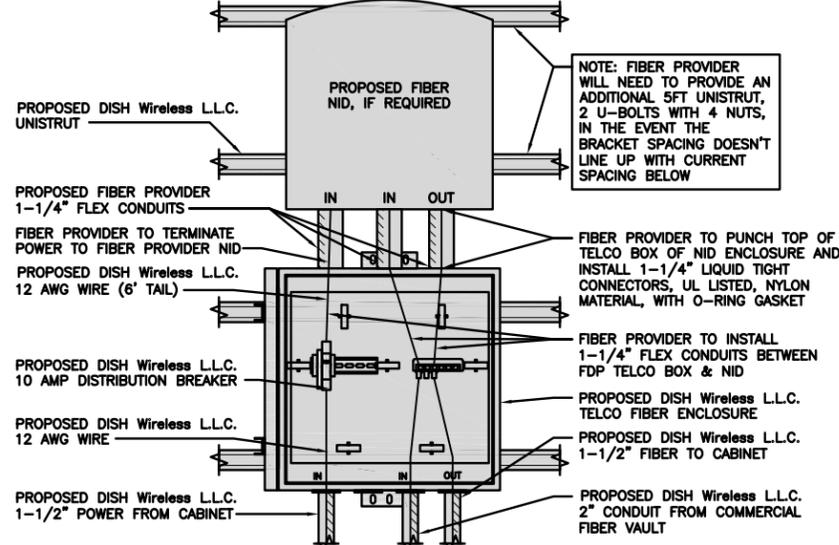
NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL

NO SCALE 2

DARK TELCO BOX – INTERIOR WIRING LAYOUT

NO SCALE 3



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL)

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



5701 SOUTH SANTA FE DRIVE
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RFDS REV #: ---

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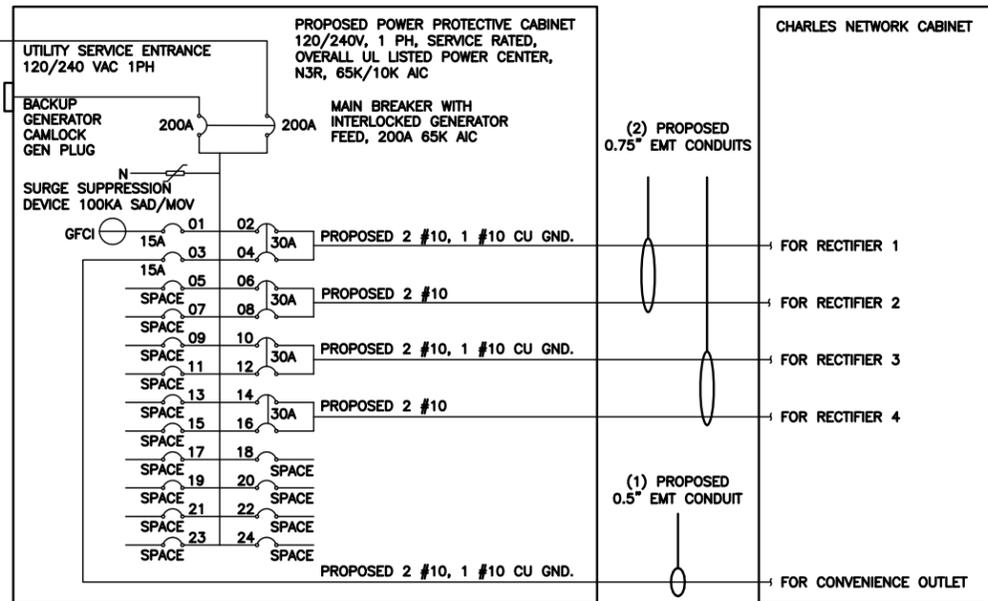
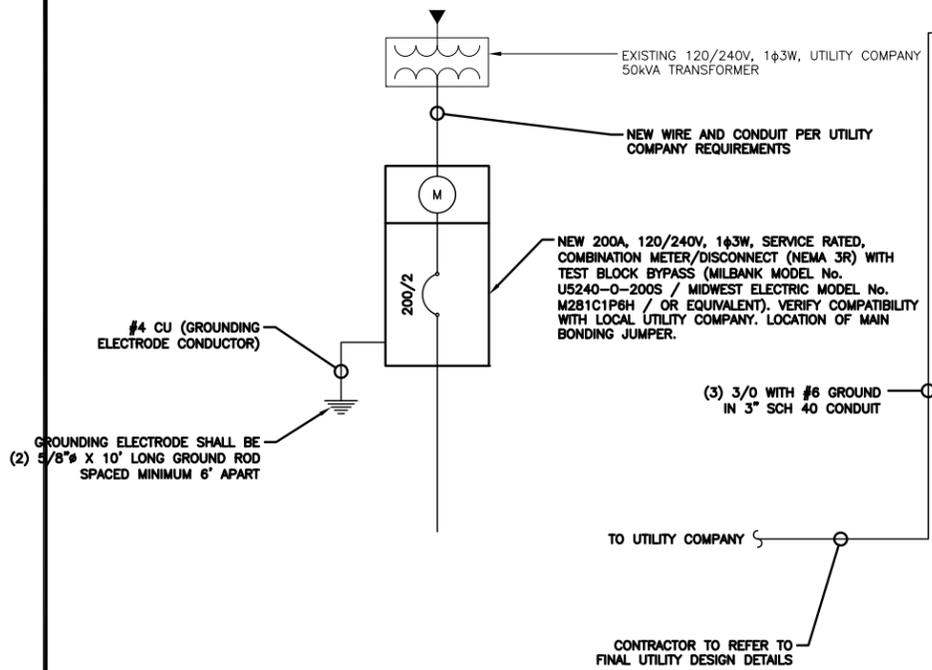
A&E PROJECT NUMBER
89233.006.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDLOO044A
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER

E-2



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

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

NOTES

THE (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						
				98	98						
				98							
				123							

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3



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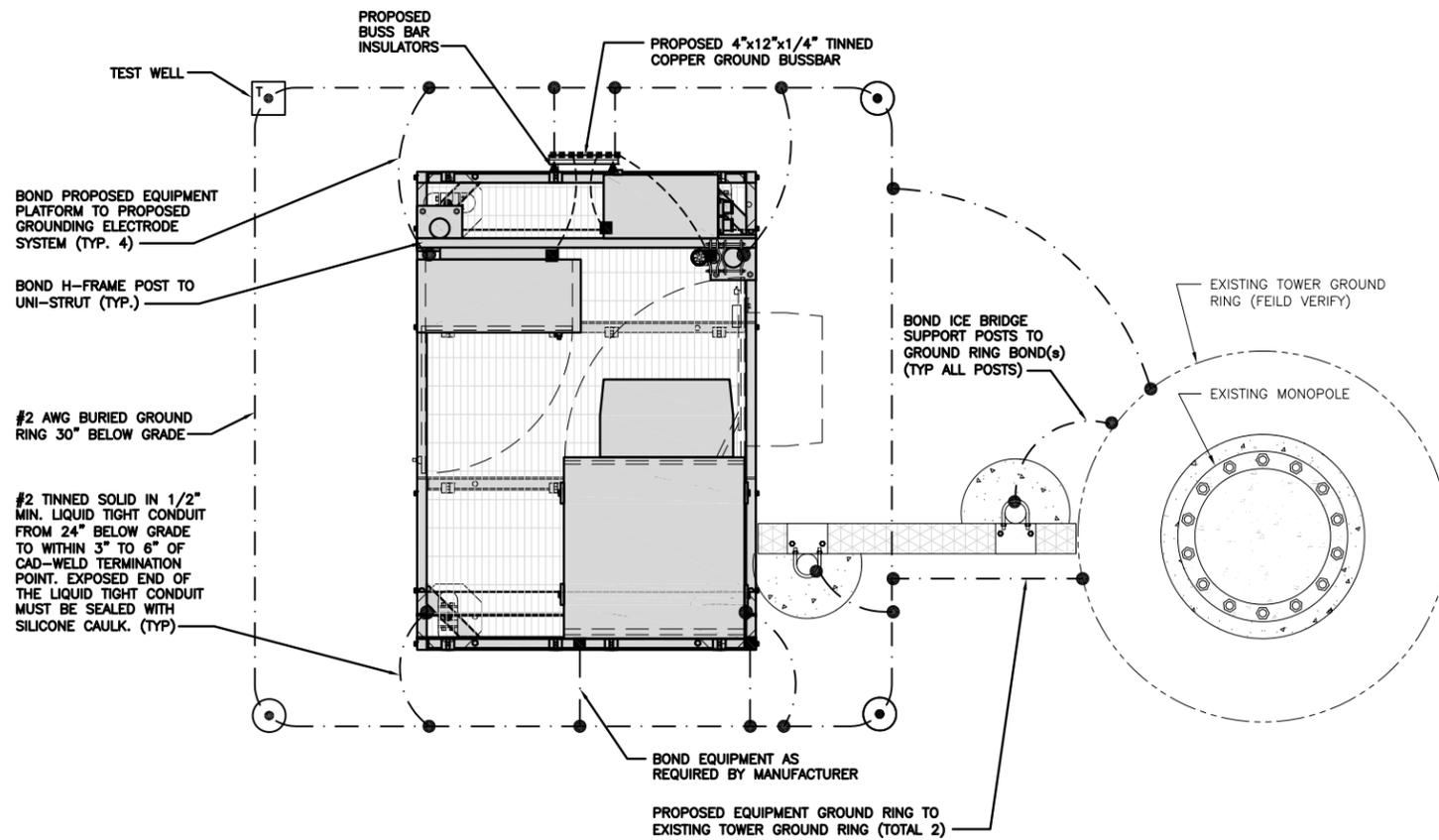
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DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDLOO044A
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

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

SHEET NUMBER
E-3

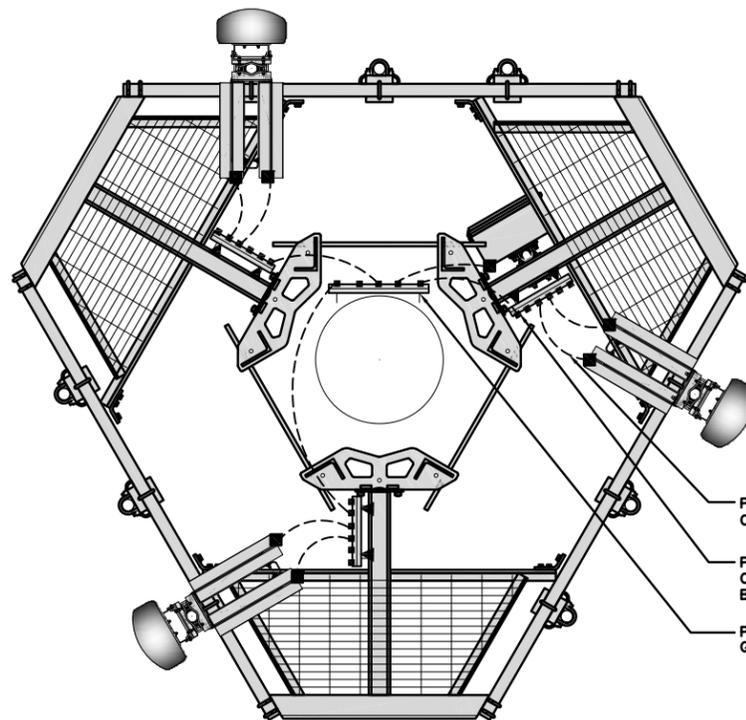


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1

NOTES

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



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2

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

GROUNDING LEGEND

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

GROUNDING KEY NOTES

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

GROUNDING KEY NOTES

NO SCALE 3



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RFDS REV #: ---

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PROJECT INFORMATION
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439-455 HOMESTEAD AVE
HARTFORD, CT 06105

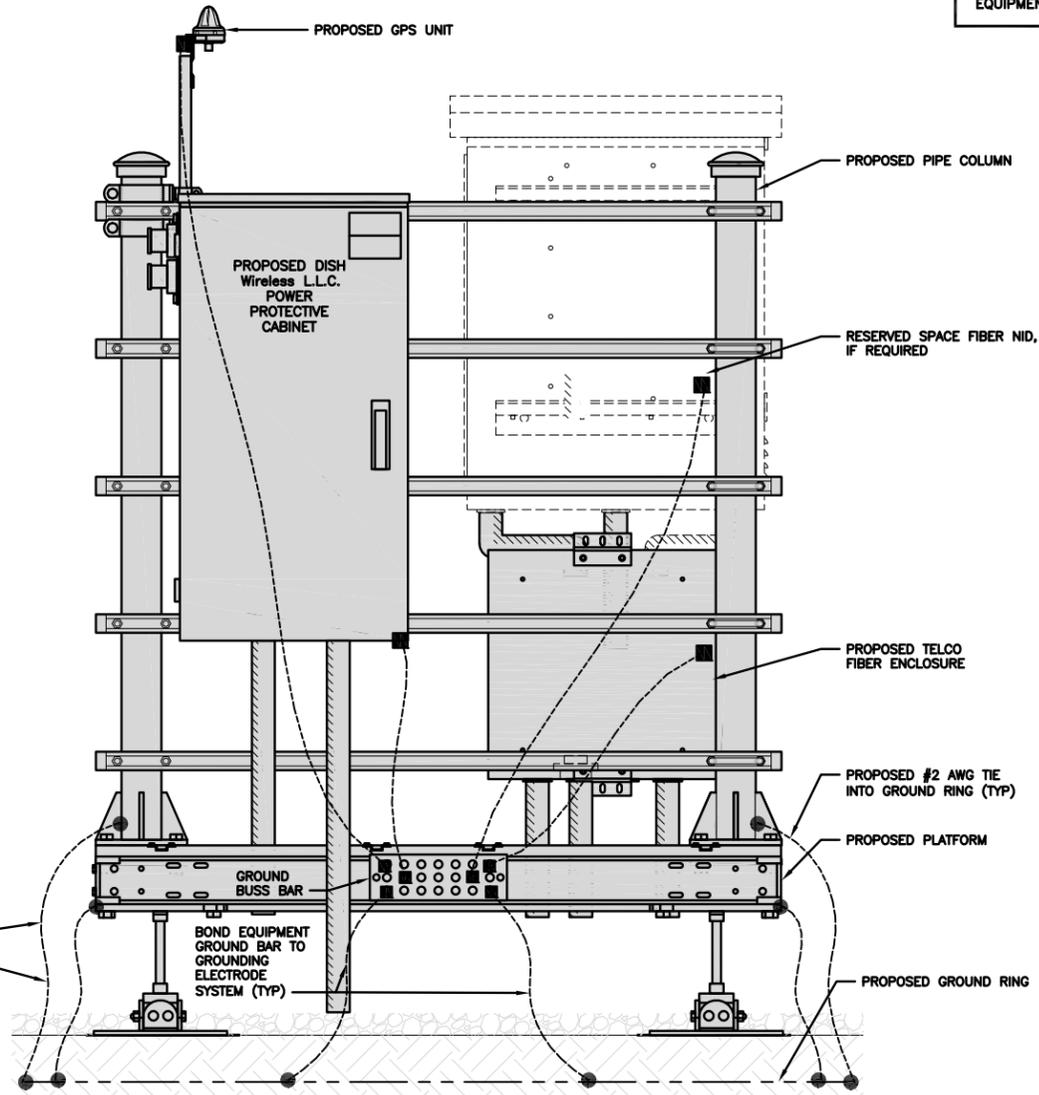
SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER

G-1

NOTES

EQUIPMENT CABINET OMITTED FOR CLARITY

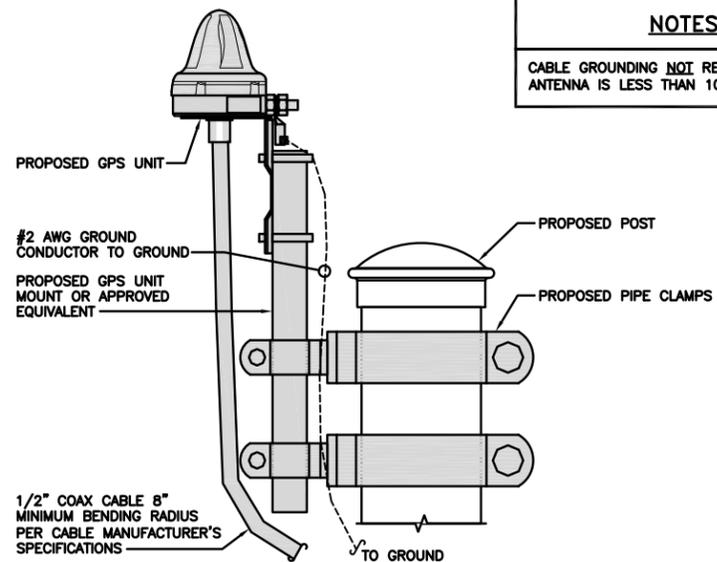


H-FRAME GROUNDING DETAIL

NO SCALE 1

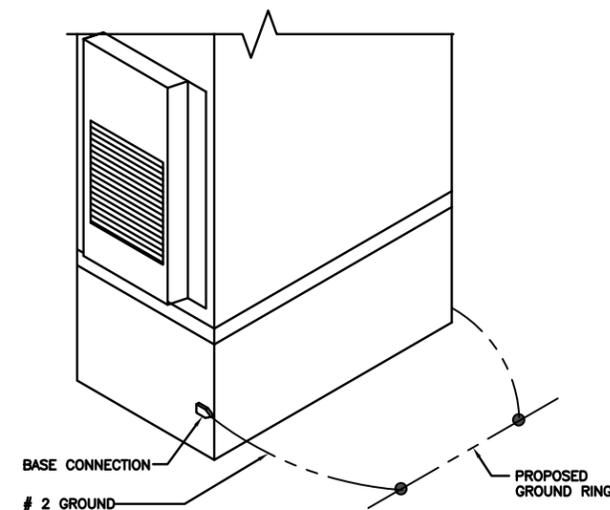
NOTES

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



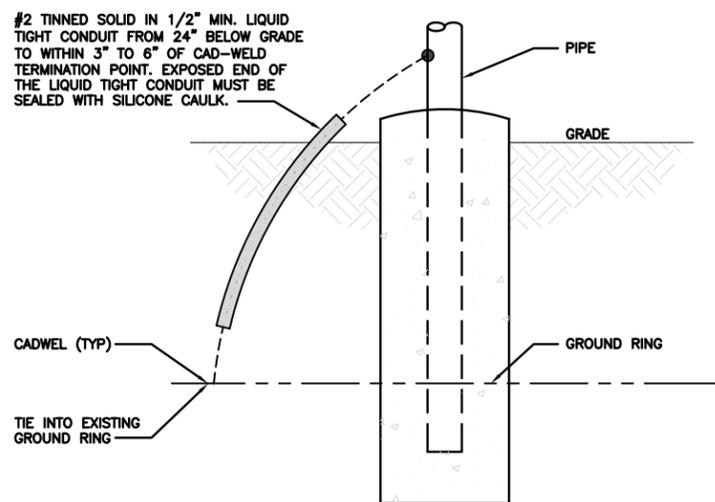
TYPICAL GPS UNIT GROUNDING

NO SCALE 2



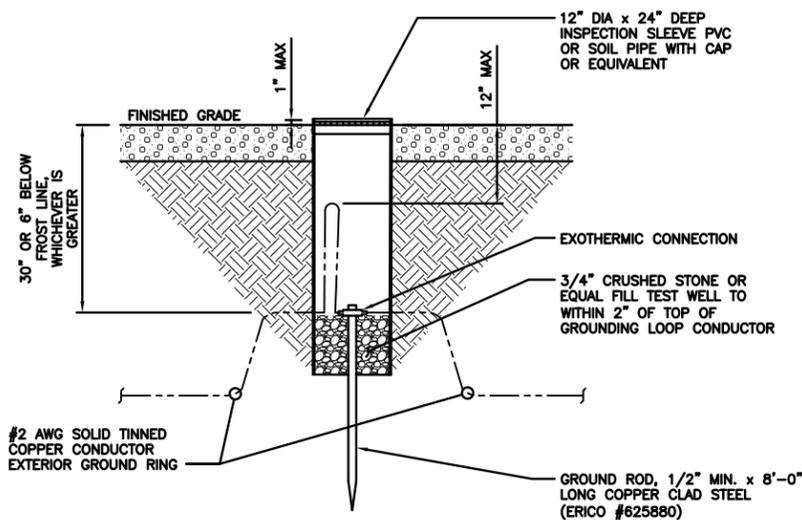
OUTDOOR CABINET GROUNDING

NO SCALE 3



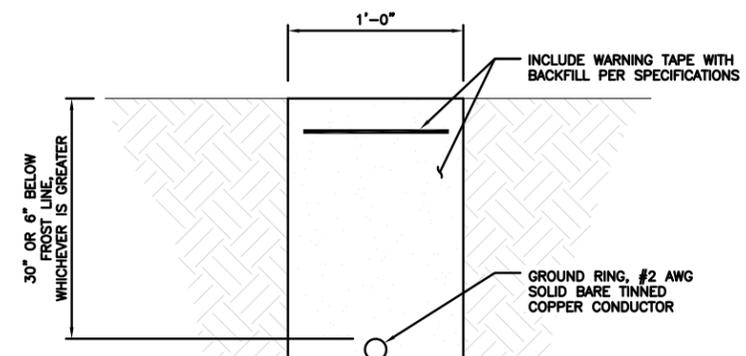
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5



TYPICAL GROUND RING TRENCH

NO SCALE 6

dish wireless.

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CROWN CASTLE

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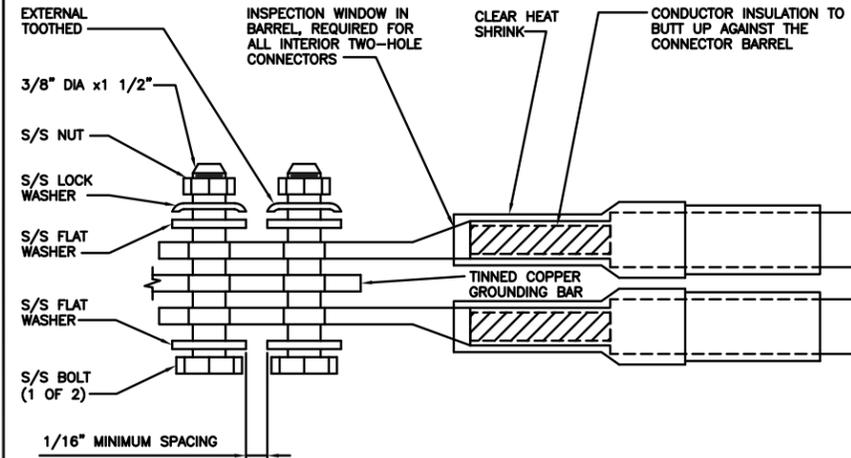
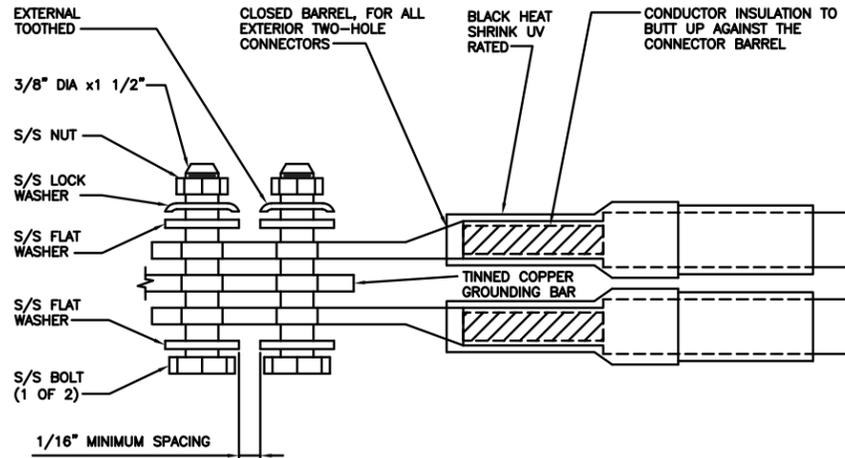
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PROJECT INFORMATION
BOBDL0044A
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

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

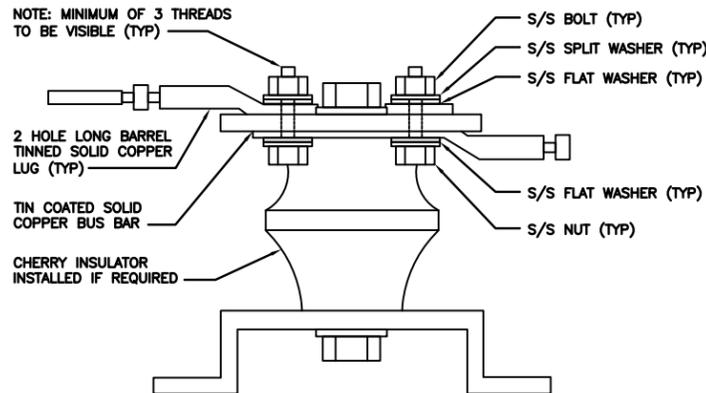
NO SCALE

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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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)



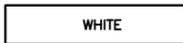
CBRS TECH
(3 GHz)



AWS
(N66+N70+H-BLOCK)



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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JJR MTJ MDW

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D	7/28/21	ISSUED FOR CONSTRUCTION

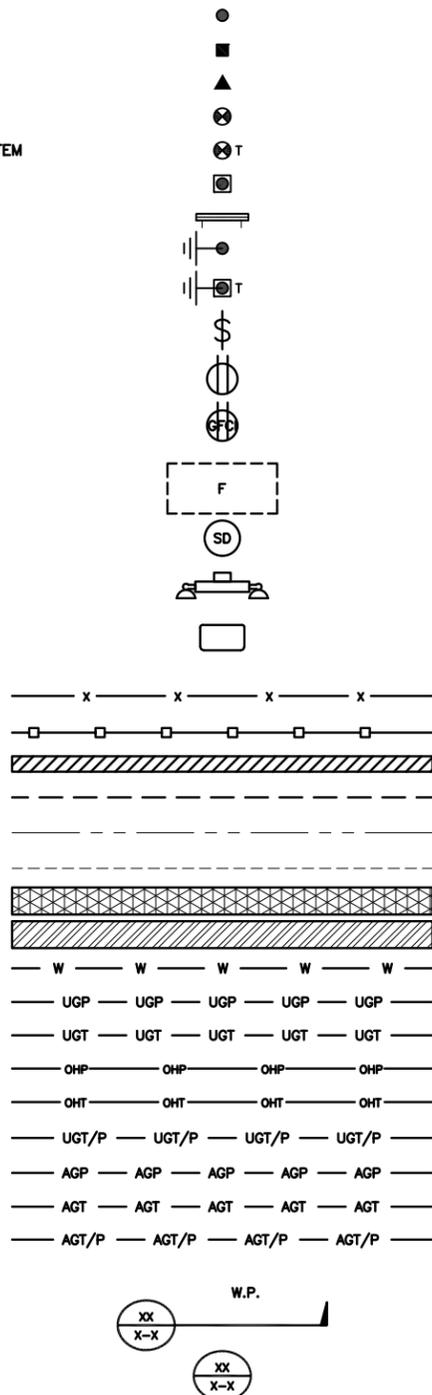
A&E PROJECT NUMBER
89233.006.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00044A
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

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



LEGEND

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

ABBREVIATIONS



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PROJECT INFORMATION
BOBDLOO044A
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE
LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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



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A&E PROJECT NUMBER
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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDLOO44A
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

ELECTRICAL INSTALLATION NOTES:

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

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



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LITTLETON, CO 80120



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B&T ENGINEERING, INC.
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DRAWN BY:	CHECKED BY:	APPROVED BY:
JJR	MTJ	MDW

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/2/21	ISSUED FOR REVIEW
B	7/2/21	ISSUED FOR REVIEW
D	7/28/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
89233.006.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDLOO044A
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

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

BOBDLOO044A
439-455 HOMESTEAD AVE
HARTFORD, CT 06105

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

Exhibit D

Structural Analysis Report

Date: **May 28, 2021**



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

Subject: **Structural Analysis Report**

Carrier Designation: **DISH Network Co-Locate**
Site Number: BOBDL00044A
Site Name: CT-CCI-T-806369

Crown Castle Designation: **BU Number:** 806369
Site Name: HRT 094 943225
JDE Job Number: 650039
Work Order Number: 1968786
Order Number: 556641 Rev. 0

Engineering Firm Designation: **Crown Castle Project Number:** 1968786

Site Data: **439-455 HOMESTEAD AVE, HARTFORD, HARTFORD County, CT**
Latitude 41° 47' 1.61", Longitude -72° 42' 13.66"
140 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 – 52.6%

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

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

Structural analysis prepared by: Hayes Lei

Respectfully submitted by:

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



Digitally signed by Bradley E Byrom
Date: 2021.05.29 17:10:09 -04'00'

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1) INTRODUCTION

This tower is a 140 ft Monopole tower designed by VALMONT.

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)
93.0	93.0	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 - Non-Carrier Equipment To Be Conditionally Removed

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
93.0	93.0	3	kathrein	742 213 w/ Mount Pipe	-	-
		1	tower mounts	Pipe Mount [PM 602-3]		
		2	tower mounts	Side Arm Mount [SO 104-3]		

Table 3 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
140.0	140.0	3	alcatel lucent	RRH2X40-AWS	13	1-5/8
		3	amphenol	BXA-80063-4BF-EDIN-X w/ Mount Pipe		
		3	antel	BXA-171063-8BF-EDIN-2 w/ Mount Pipe		
		3	antel	BXA-171063/8CF-EDIN-2 w/ Mount Pipe		
		3	css	X7C-FRO-660-V w/ Mount Pipe		
		1	raycap	RRFDC-3315-PF-48		
		6	rfs celwave	FD9R6004/2C-3L		
		1	tower mounts	Platform Mount [LP 713-1]		
		3	tower mounts	Side Arm Mount [SO 203-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
126.0	128.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	9 3 1	1-5/8 1-3/8 1-1/4
		3	ericsson	AIR 3246 B66 w/ Mount Pipe		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
	126.0	3	rfs celwave	ATMAA1412D-1A20		
		1	tower mounts	Platform Mount [LP 713-1]		
117.0	120.0	2	cci antennas	DMP65R-BU6D w/ Mount Pipe	2 4 2 12 3	3/8 3/4 7/8 1-5/8 conduit
		1	cci antennas	DMP65R-BU8D w/ Mount Pipe		
		1	cci antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe		
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 8843 B2/B66A_CCIV2		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		2	quintel technology	QS66512-3 w/ Mount Pipe		
		1	raycap	DC6-48-60-0-8C-EV		
	2	raycap	DC6-48-60-18-8F			
	117.0	1	tower mounts	Platform Mount [LP 713-1]		
104.0	104.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz		
		1	tower mounts	Pipe Mount [PM 601-3]		
103.0	107.0	1	andrew	VHLP2-180	1 3 3 3 3 2	1-1/2 1-1/4 1/4 5/16 1/2 conduit
		1	andrew	VHLP2.5-11		
		2	dragonwave	HORIZON COMPACT		
	105.0	3	argus technologies	LLPX310R-V1 w/ Mount Pipe		
		3	nokia	AAHC w/ Mount Pipe		
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	IBC1900BB-1		
		3	rfs celwave	IBC1900HG-2A		
		3	samsung telecommunications	WIMAX DAP HEAD		
	103.0	1	tower mounts	Platform Mount [LP 713-1]		
93.0	93.0	-	-	-	6	1-5/8
74.0	80.0	1	antel	BCD-87010	1	7/8
	74.0	1	tower mounts	Side Arm Mount [SO 701-1]		
50.0	52.0	1	lucent	KS24019-L112A	1	7/8

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
	50.0	1	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	2294838	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	2294380	CCISITES
4-TOWER MANUFACTURER DRAWINGS	2294379	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 3 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	140 - 86.83	Pole	TP39.223x26.216x0.3125	1	-25.24	2319.28	36.0	Pass
L2	86.83 - 38	Pole	TP50.56x37.2109x0.4063	2	-40.53	3892.16	50.1	Pass
L3	38 - 0	Pole	TP59.05x48.0329x0.5	3	-61.63	5790.26	49.0	Pass
							Summary	
						Pole (L2)	50.1	Pass
						Rating =	50.1	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	52.6	Pass
1	Base Plate	0	17.1	Pass
1	Base Foundation (Structure)	0	36.6	Pass
1	Base Foundation (Soil Interaction)	0	42.3	Pass

Structure Rating (max from all components) =	52.6%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity. 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. In order for the results of this analysis to be considered valid, the loading modification, as follows, must be completed.

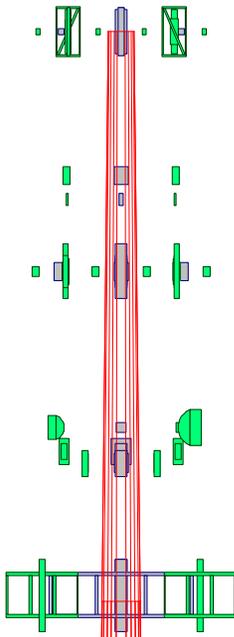
Loading Changes:

- a) Removal of the abandoned antennas and mounts at the 93 ft level

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

APPENDIX A
TNXTOWER OUTPUT

140.0 ft



MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford 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: 50.1%

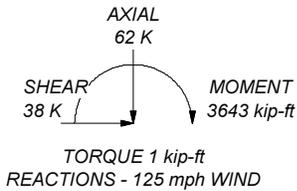
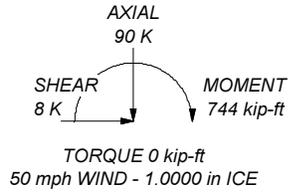
86.8 ft

38.0 ft

0.0 ft

Section	1	2	3
Length (ft)	53.17	54.50	45.00
Number of Sides	12	12	12
Thickness (in)	0.3125	0.4063	0.5000
Socket Length (ft)	5.67	7.00	
Top Dia (in)	26.2160	37.2109	48.0329
Bot Dia (in)	39.2230	50.5600	59.0500
Grade		A572-65	
Weight (K)	5.9	10.5	13.1

ALL REACTIONS ARE FACTORED



CROWN CASTLE
The Pathway To Possible

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Job: BU# 806369		
Project:	Client: CCI	App'd:
Code: TIA-222-H	Drawn by: HLei	Scale: NTS
Path:	Date: 05/28/21	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 Hartford County, Connecticut.
- Tower base elevation above sea level: 60.06 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	140.00-86.83	53.17	5.67	12	26.2160	39.2230	0.3125	1.2500	A572-65 (65 ksi)
L2	86.83-38.00	54.50	7.00	12	37.2109	50.5600	0.4063	1.6250	A572-65 (65 ksi)
L3	38.00-0.00	45.00		12	48.0329	59.0500	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	27.0306	26.0654	2232.3752	9.2735	13.5799	164.3883	4523.3974	12.8286	6.1884	19.803
	40.4964	39.1537	7566.4519	13.9300	20.3175	372.4103	15331.683	19.2703	9.6743	30.958
L2	39.8181	48.1451	8324.2452	13.1761	19.2753	431.8614	16867.177	23.6956	8.8838	21.868
	52.2003	65.6074	21064.222	17.9550	26.1901	804.2825	42681.825	32.2900	12.4613	30.674
L3	51.3252	76.5280	22069.675	17.0168	24.8811	887.0069	44719.145	37.6648	11.5328	23.066
	60.9567	94.2655	41247.015	20.9609	30.5879	1348.4749	83577.635	46.3946	14.4854	28.971

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 140.00- 86.83				1	1	1			
L2 86.83- 38.00				1	1	1			
L3 38.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A(1-5/8)	B	No	Surface Ar (CaAa)	140.00 - 0.00	6	6	-0.500 -0.325	1.9800		0.82
HCS 6X12 6AWG(1- 3/8)	C	No	Surface Ar (CaAa)	126.00 - 0.00	1	1	0.275 0.275	1.3800		1.70
LCF158-50JA(1-5/8)	C	No	Surface Ar (CaAa)	126.00 - 0.00	5	5	0.292 0.433	2.0100		0.92
2-1/4" (Nominal) Conduit	C	No	Surface Ar (CaAa)	117.00 - 0.00	1	1	0.408 0.408	2.5000		0.72
MLC6C-06C-008R- 008R(1-1/2)	A	No	Surface Ar (CaAa)	103.00 - 0.00	1	1	-0.217 -0.217	1.4800		1.52
HB114-1-08U4-M5J(1- 1/4)	A	No	Surface Ar (CaAa)	103.00 - 0.00	3	2	-0.458 -0.408	1.5400		1.08
2-1/4" (Nominal) Conduit	A	No	Surface Ar (CaAa)	103.00 - 0.00	2	2	-0.300 -0.233	2.5000		0.72

LDF5-50A(7/8)	B	No	Surface Ar (CaAa)	74.00 - 0.00	1	1	-0.258 -0.258	1.0900		0.33

LDF5-50A(7/8)	B	No	Surface Ar (CaAa)	50.00 - 0.00	1	1	-0.283 -0.283	1.0900		0.33

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***** CU12PSM9P6XXX(1-1/2) *** ** *	B	No	Surface Ar (CaAa)	93.00 - 0.00	1	1	0.000 0.000	1.6000		2.35

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		CAAA ft ² /ft	Weight plf
LDF7-50A(1-5/8)	C	No	No	Inside Pole	140.00 - 0.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
HB158-1-08U8-S8J18(1-5/8)	C	No	No	Inside Pole	140.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.30 1.30 1.30
***** ***** HCS 6X12 6AWG(1-3/8)	C	No	No	Inside Pole	126.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.70 1.70 1.70
LCF158-50JA(1-5/8)	C	No	No	Inside Pole	126.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.92 0.92 0.92
LCF158-50JA(1-5/8)	C	No	No	Inside Pole	126.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.92 0.92 0.92
HB114-21U3M12-XXXF(1-1/4)	C	No	No	Inside Pole	126.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.22 1.22 1.22
***** ***** WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	117.00 - 0.00	4	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.58 0.58 0.58
LDF7-50A(1-5/8)	C	No	No	Inside Pole	117.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	117.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.06 0.06 0.06
FB-L98B-034-XXXXXX(3/8)	C	No	No	Inside Pole	117.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.05 0.05 0.05
WR-VG66ST-BRD_CCIV2(7/8)	C	No	No	Inside Pole	117.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.88 0.88 0.88
***** ***** LDF1-50A(1/4)	C	No	No	Inside Pole	103.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.06 0.06 0.06
ATCB-B01-005(5/16)	C	No	No	Inside Pole	103.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.07 0.07 0.07
FSJ4-50B(1/2)	C	No	No	Inside Pole	103.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.14 0.14 0.14
***** ***** AVA7-50(1-5/8)	C	No	No	Inside Pole	93.00 - 0.00	6	No Ice 1/2" Ice	0.00 0.00	0.70 0.70

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _{AA} A _A ft ² /ft	Weight plf
						1" Ice	0.00	0.70

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Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} A _A In Face ft ²	C _{AA} A _A Out Face ft ²	Weight K
L1	140.00-86.83	A	0.000	0.000	15.459	0.000	0.10
		B	0.000	0.000	64.153	0.000	0.28
		C	0.000	0.000	52.314	0.000	1.39
L2	86.83-38.00	A	0.000	0.000	46.681	0.000	0.30
		B	0.000	0.000	71.055	0.000	0.37
		C	0.000	0.000	68.020	0.000	1.98
L3	38.00-0.00	A	0.000	0.000	36.328	0.000	0.24
		B	0.000	0.000	59.508	0.000	0.30
		C	0.000	0.000	52.934	0.000	1.54

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} A _A In Face ft ²	C _{AA} A _A Out Face ft ²	Weight K
L1	140.00-86.83	A	0.961	0.000	0.000	29.597	0.000	0.34
		B		0.000	0.000	93.898	0.000	0.96
		C		0.000	0.000	84.883	0.000	2.04
L2	86.83-38.00	A	0.905	0.000	0.000	89.378	0.000	1.02
		B		0.000	0.000	115.886	0.000	1.24
		C		0.000	0.000	110.776	0.000	2.84
L3	38.00-0.00	A	0.802	0.000	0.000	68.086	0.000	0.76
		B		0.000	0.000	100.037	0.000	1.02
		C		0.000	0.000	84.844	0.000	2.17

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	140.00-86.83	-2.6921	-1.2840	-2.8266	-0.8114
L2	86.83-38.00	-4.5365	-0.6362	-4.5575	-0.4228
L3	38.00-0.00	-4.8745	-1.0231	-4.7460	-0.9661

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	LDF7-50A(1-5/8)	86.83 - 140.00	1.0000	1.0000
L1	6	HCS 6X12 6AWG(1-3/8)	86.83 - 126.00	1.0000	1.0000
L1	7	LCF158-50JA(1-5/8)	86.83 - 126.00	1.0000	1.0000
L1	19	2-1/4" (Nominal) Conduit	86.83 - 117.00	1.0000	1.0000
L1	23	MLC6C-06C-008R-008R(1-1/2)	86.83 - 103.00	1.0000	1.0000
L1	24	HB114-1-08U4-M5J(1-1/4)	86.83 - 103.00	1.0000	1.0000
L1	26	2-1/4" (Nominal) Conduit	86.83 - 103.00	1.0000	1.0000
L1	34	CU12PSM9P6XXX(1-1/2)	86.83 - 93.00	1.0000	1.0000
L2	1	LDF7-50A(1-5/8)	38.00 - 86.83	1.0000	1.0000
L2	6	HCS 6X12 6AWG(1-3/8)	38.00 - 86.83	1.0000	1.0000
L2	7	LCF158-50JA(1-5/8)	38.00 - 86.83	1.0000	1.0000
L2	19	2-1/4" (Nominal) Conduit	38.00 - 86.83	1.0000	1.0000
L2	23	MLC6C-06C-008R-008R(1-1/2)	38.00 - 86.83	1.0000	1.0000
L2	24	HB114-1-08U4-M5J(1-1/4)	38.00 - 86.83	1.0000	1.0000
L2	26	2-1/4" (Nominal) Conduit	38.00 - 86.83	1.0000	1.0000
L2	30	LDF5-50A(7/8)	38.00 - 74.00	1.0000	1.0000
L2	32	LDF5-50A(7/8)	38.00 - 50.00	1.0000	1.0000
L2	34	CU12PSM9P6XXX(1-1/2)	38.00 - 86.83	1.0000	1.0000
L3	1	LDF7-50A(1-5/8)	0.00 - 38.00	1.0000	1.0000
L3	6	HCS 6X12 6AWG(1-3/8)	0.00 - 38.00	1.0000	1.0000
L3	7	LCF158-50JA(1-5/8)	0.00 - 38.00	1.0000	1.0000
L3	19	2-1/4" (Nominal) Conduit	0.00 - 38.00	1.0000	1.0000
L3	23	MLC6C-06C-008R-008R(1-1/2)	0.00 - 38.00	1.0000	1.0000
L3	24	HB114-1-08U4-M5J(1-1/4)	0.00 - 38.00	1.0000	1.0000
L3	26	2-1/4" (Nominal) Conduit	0.00 - 38.00	1.0000	1.0000
L3	30	LDF5-50A(7/8)	0.00 - 38.00	1.0000	1.0000
L3	32	LDF5-50A(7/8)	0.00 - 38.00	1.0000	1.0000
L3	34	CU12PSM9P6XXX(1-1/2)	0.00 - 38.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C_{AA} Front ft ²	C_{AA} Side ft ²	Weight K	
BXA-80063-4BF-EDIN-X w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	No Ice	4.62	3.47	0.03
			0.00			1/2"	4.99	4.04	0.07
			0.00			Ice	5.36	4.63	0.12
						1" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
BXA-80063-4BF-EDIN-X w/ Mount Pipe	B	From Leg	4.00	0.0000	140.00	No Ice	4.62	3.47	0.03
			0.00			1/2"	4.99	4.04	0.07
			0.00			Ice	5.36	4.63	0.12
BXA-80063-4BF-EDIN-X w/ Mount Pipe	C	From Leg	4.00	0.0000	140.00	1" Ice			
			0.00			No Ice	4.62	3.47	0.03
			0.00			1/2"	4.99	4.04	0.07
BXA-171063/8CF-EDIN-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	Ice	5.36	4.63	0.12
			0.00			1" Ice			
			0.00			No Ice	3.14	3.51	0.03
BXA-171063/8CF-EDIN-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	140.00	1/2"	3.52	4.13	0.06
			0.00			Ice	3.89	4.76	0.10
			0.00			1" Ice			
BXA-171063/8CF-EDIN-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	140.00	No Ice	3.14	3.51	0.03
			0.00			1/2"	3.52	4.13	0.06
			0.00			Ice	3.89	4.76	0.10
X7C-FRO-660-V w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	1" Ice			
			0.00			No Ice	8.88	6.44	0.07
			0.00			1/2"	9.60	7.13	0.15
X7C-FRO-660-V w/ Mount Pipe	B	From Leg	4.00	0.0000	140.00	Ice	10.34	7.83	0.23
			0.00			1" Ice			
			0.00			No Ice	8.88	6.44	0.07
X7C-FRO-660-V w/ Mount Pipe	C	From Leg	4.00	0.0000	140.00	1/2"	9.60	7.13	0.15
			0.00			Ice	10.34	7.83	0.23
			0.00			1" Ice			
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	No Ice	3.18	3.35	0.03
			0.00			1/2"	3.56	3.97	0.06
			0.00			Ice	3.93	4.60	0.10
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	140.00	1" Ice			
			0.00			No Ice	3.18	3.35	0.03
			0.00			1/2"	3.56	3.97	0.06
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	140.00	Ice	3.93	4.60	0.10
			0.00			1" Ice			
			0.00			No Ice	3.18	3.35	0.03
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.0000	140.00	1/2"	3.56	3.97	0.06
			0.00			Ice	3.93	4.60	0.10
			0.00			1" Ice			
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	140.00	No Ice	0.31	0.08	0.00
			0.00			1/2"	0.39	0.12	0.01
			0.00			Ice	0.47	0.17	0.01
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.0000	140.00	1" Ice			
			0.00			No Ice	0.31	0.08	0.00
			0.00			1/2"	0.39	0.12	0.01
RRH2X40-AWS	A	From Leg	4.00	0.0000	140.00	Ice	0.47	0.17	0.01
			0.00			1" Ice			
			0.00			No Ice	2.16	1.42	0.04
RRH2X40-AWS	B	From Leg	4.00	0.0000	140.00	1/2"	2.36	1.59	0.06
			0.00			Ice	2.57	1.77	0.08
			0.00			1" Ice			
RRH2X40-AWS	C	From Leg	4.00	0.0000	140.00	No Ice	2.16	1.42	0.04
			0.00			1/2"	2.36	1.59	0.06
			0.00			Ice	2.57	1.77	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			0.00			1/2"	2.36	1.59	0.06
			0.00			Ice	2.57	1.77	0.08
						1" Ice			
RRFDC-3315-PF-48	B	From Leg	4.00	0.0000	140.00	No Ice	3.36	2.19	0.03
			0.00			1/2"	3.60	2.39	0.06
			0.00			Ice	3.84	2.61	0.09
						1" Ice			
Platform Mount [LP 713-1]	C	None		0.0000	140.00	No Ice	32.89	32.89	1.51
						1/2"	35.76	35.76	2.23
						Ice	38.76	38.76	3.03
						1" Ice			
Side Arm Mount [SO 203-1]	A	From Leg	4.00	0.0000	140.00	No Ice	2.96	3.36	0.13
			0.00			1/2"	4.10	4.68	0.15
			0.00			Ice	5.24	6.00	0.18
						1" Ice			
Side Arm Mount [SO 203-1]	B	From Leg	4.00	0.0000	140.00	No Ice	2.96	3.36	0.13
			0.00			1/2"	4.10	4.68	0.15
			0.00			Ice	5.24	6.00	0.18
						1" Ice			
Side Arm Mount [SO 203-1]	C	From Leg	4.00	0.0000	140.00	No Ice	2.96	3.36	0.13
			0.00			1/2"	4.10	4.68	0.15
			0.00			Ice	5.24	6.00	0.18
						1" Ice			

APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00	0.0000	126.00	No Ice	14.69	6.87	0.19
			0.00			1/2"	15.46	7.55	0.31
			2.00			Ice	16.23	8.25	0.46
						1" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00	0.0000	126.00	No Ice	14.69	6.87	0.19
			0.00			1/2"	15.46	7.55	0.31
			2.00			Ice	16.23	8.25	0.46
						1" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00	0.0000	126.00	No Ice	14.69	6.87	0.19
			0.00			1/2"	15.46	7.55	0.31
			2.00			Ice	16.23	8.25	0.46
						1" Ice			
AIR 3246 B66 w/ Mount Pipe	A	From Leg	4.00	0.0000	126.00	No Ice	8.18	6.56	0.20
			0.00			1/2"	8.66	7.39	0.27
			2.00			Ice	9.12	8.13	0.35
						1" Ice			
AIR 3246 B66 w/ Mount Pipe	B	From Leg	4.00	0.0000	126.00	No Ice	8.18	6.56	0.20
			0.00			1/2"	8.66	7.39	0.27
			2.00			Ice	9.12	8.13	0.35
						1" Ice			
AIR 3246 B66 w/ Mount Pipe	C	From Leg	4.00	0.0000	126.00	No Ice	8.18	6.56	0.20
			0.00			1/2"	8.66	7.39	0.27
			2.00			Ice	9.12	8.13	0.35
						1" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00	0.0000	126.00	No Ice	3.76	3.15	0.19
			0.00			1/2"	4.12	3.49	0.25
			2.00			Ice	4.48	3.84	0.32
						1" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00	0.0000	126.00	No Ice	3.76	3.15	0.19
			0.00			1/2"	4.12	3.49	0.25
			2.00			Ice	4.48	3.84	0.32
						1" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00	0.0000	126.00	No Ice	3.76	3.15	0.19
			0.00			1/2"	4.12	3.49	0.25
			2.00			Ice	4.48	3.84	0.32
						1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00	0.0000	126.00	No Ice	1.97	1.59	0.07
			0.00			1/2"	2.15	1.75	0.09
			2.00			Ice	2.33	1.92	0.12
						1" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _A A _A			Weight K
			Horz ft	Lateral ft			Front ft ²	Side ft ²		
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00	0.0000	126.00	No Ice	1.97	1.59	0.07	
			0.00			1/2"	2.15	1.75	0.09	
			2.00			Ice	2.33	1.92	0.12	
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00	0.0000	126.00	1" Ice				
			0.00			No Ice	1.97	1.59	0.07	
			2.00			1/2"	2.15	1.75	0.09	
ATMAA1412D-1A20	A	From Leg	4.00	0.0000	126.00	Ice	2.33	1.92	0.12	
			0.00			1" Ice				
			0.00			No Ice	0.41	1.00	0.01	
ATMAA1412D-1A20	B	From Leg	4.00	0.0000	126.00	1/2"	0.50	1.13	0.02	
			0.00			Ice	0.59	1.26	0.03	
			0.00			1" Ice				
ATMAA1412D-1A20	C	From Leg	4.00	0.0000	126.00	No Ice	0.41	1.00	0.01	
			0.00			1/2"	0.50	1.13	0.02	
			0.00			Ice	0.59	1.26	0.03	
Platform Mount [LP 713-1]	C	None		0.0000	126.00	1" Ice				
						No Ice	32.89	32.89	1.51	
						1/2"	35.76	35.76	2.23	
L 2.5" x 2.5" x 3/16" x 144"	A	From Leg	4.00	0.0000	126.00	Ice	38.76	38.76	3.03	
			0.00			1" Ice				
			2.00			No Ice	0.05	3.00	0.03	
L 2.5" x 2.5" x 3/16" x 144"	B	From Leg	4.00	0.0000	126.00	1/2"	0.08	3.82	0.06	
			0.00			Ice	0.12	4.64	0.10	
			2.00			1" Ice				
L 2.5" x 2.5" x 3/16" x 144"	C	From Leg	4.00	0.0000	126.00	No Ice	0.05	3.00	0.03	
			0.00			1/2"	0.08	3.82	0.06	
			2.00			Ice	0.12	4.64	0.10	
*****	A	From Leg	4.00	0.0000	117.00	1" Ice				
			0.00			No Ice	5.75	4.25	0.06	
			3.00			1/2"	6.18	5.01	0.10	
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	117.00	Ice	6.61	5.71	0.16	
			0.00			1" Ice				
			3.00			No Ice	5.75	4.25	0.06	
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	117.00	1/2"	6.18	5.01	0.10	
			0.00			Ice	6.61	5.71	0.16	
			3.00			1" Ice				
TPA-65R-LCUUUU-H8 w/ Mount Pipe	A	From Leg	4.00	0.0000	117.00	No Ice	5.75	4.25	0.06	
			0.00			1/2"	6.18	5.01	0.10	
			3.00			Ice	6.61	5.71	0.16	
QS66512-3 w/ Mount Pipe	B	From Leg	4.00	0.0000	117.00	1" Ice				
			0.00			No Ice	4.04	4.18	0.13	
			3.00			1/2"	4.42	4.57	0.20	
QS66512-3 w/ Mount Pipe	C	From Leg	4.00	0.0000	117.00	Ice	4.82	4.97	0.28	
			0.00			1" Ice				
			3.00			No Ice	4.04	4.18	0.13	
DMP65R-BU8D w/ Mount Pipe	A	From Leg	4.00	0.0000	117.00	1/2"	4.42	4.57	0.20	
			0.00			Ice	4.82	4.97	0.28	
			3.00			1" Ice				
DMP65R-BU8D w/ Mount Pipe	A	From Leg	4.00	0.0000	117.00	No Ice	15.89	7.89	0.14	
			0.00			1/2"	16.81	8.74	0.25	
			3.00			Ice	17.76	9.60	0.38	
						1" Ice				

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.00	0.0000	117.00	No Ice	11.96	5.97	0.11
			0.00			1/2"	12.70	6.63	0.20
			3.00			Ice	13.46	7.30	0.30
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.00	0.0000	117.00	1" Ice	11.96	5.97	0.11
			0.00			No Ice	12.70	6.63	0.20
			3.00			1/2"	13.46	7.30	0.30
(2) LGP21401	A	From Leg	4.00	0.0000	117.00	Ice	1.10	0.21	0.01
			0.00			1/2"	1.24	0.27	0.02
			3.00			Ice	1.38	0.35	0.03
(2) LGP21401	B	From Leg	4.00	0.0000	117.00	1" Ice	1.10	0.21	0.01
			0.00			No Ice	1.24	0.27	0.02
			3.00			1/2"	1.38	0.35	0.03
(2) LGP21401	C	From Leg	4.00	0.0000	117.00	Ice	1.10	0.21	0.01
			0.00			No Ice	1.24	0.27	0.02
			3.00			1/2"	1.38	0.35	0.03
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	117.00	1" Ice	1.21	1.21	0.02
			0.00			No Ice	1.89	1.89	0.04
			3.00			1/2"	2.11	2.11	0.07
DC6-48-60-18-8F	B	From Leg	4.00	0.0000	117.00	Ice	1.21	1.21	0.02
			0.00			No Ice	1.89	1.89	0.04
			3.00			1/2"	2.11	2.11	0.07
RRUS 32 B30	A	From Leg	4.00	0.0000	117.00	1" Ice	2.69	1.57	0.06
			0.00			No Ice	2.91	1.76	0.08
			3.00			1/2"	3.14	1.95	0.10
RRUS 32 B30	B	From Leg	4.00	0.0000	117.00	Ice	2.69	1.57	0.06
			0.00			No Ice	2.91	1.76	0.08
			3.00			1/2"	3.14	1.95	0.10
RRUS 32 B30	C	From Leg	4.00	0.0000	117.00	1" Ice	2.69	1.57	0.06
			0.00			No Ice	2.91	1.76	0.08
			3.00			1/2"	3.14	1.95	0.10
(2) RRUS 8843 B2/B66A_CCIV2	A	From Leg	4.00	0.0000	117.00	Ice	1.98	1.70	0.08
			0.00			No Ice	2.16	1.86	0.10
			3.00			1/2"	2.34	2.04	0.12
RRUS 8843 B2/B66A_CCIV2	B	From Leg	4.00	0.0000	117.00	1" Ice	1.98	1.70	0.08
			0.00			No Ice	2.16	1.86	0.10
			3.00			1/2"	2.34	2.04	0.12
RRUS 4449 B5/B12	A	From Leg	4.00	0.0000	117.00	Ice	1.97	1.41	0.07
			0.00			No Ice	2.14	1.56	0.09
			3.00			1/2"	2.33	1.73	0.11
RRUS 4449 B5/B12	B	From Leg	4.00	0.0000	117.00	1" Ice	1.97	1.41	0.07
			0.00			No Ice	2.14	1.56	0.09
			3.00			1/2"	2.33	1.73	0.11
RRUS 4449 B5/B12	C	From Leg	4.00	0.0000	117.00	Ice	1.97	1.41	0.07
			0.00			No Ice	2.14	1.56	0.09
			3.00			1/2"	2.33	1.73	0.11
DC6-48-60-0-8C-EV	C	From Leg	4.00	0.0000	117.00	1" Ice	1.14	1.14	0.03
			0.00			No Ice	1.79	1.79	0.05
			3.00			1/2"	2.00	2.00	0.07
Platform Mount [LP 713-1]	C	None		0.0000	117.00	No Ice	32.89	32.89	1.51

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
						1/2" Ice 38.76	35.76 38.76	2.23 3.03	

800MHz 2X50W RRH W/FILTER	A	From Leg	2.00 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 2.43	2.06 2.24 2.29	1.93 2.11 2.29	0.06 0.09 0.11
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 2.43	2.06 2.24 2.29	1.93 2.11 2.29	0.06 0.09 0.11
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 2.43	2.06 2.24 2.29	1.93 2.11 2.29	0.06 0.09 0.11
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 2.74	2.32 2.53 2.65	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 2.74	2.32 2.53 2.65	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 2.74	2.32 2.53 2.65	2.24 2.44 2.65	0.06 0.08 0.11
Pipe Mount [PM 601-3]	C	None		0.0000	104.00	No Ice 1/2" Ice 6.57	4.39 5.48 6.57	4.39 5.48 6.57	0.20 0.24 0.28
**** sprint ****									
AAHC w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 5.06	4.41 4.73 5.06	2.69 3.08 3.49	0.12 0.16 0.20
AAHC w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 5.06	4.41 4.73 5.06	2.69 3.08 3.49	0.12 0.16 0.20
AAHC w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 5.06	4.41 4.73 5.06	2.69 3.08 3.49	0.12 0.16 0.20
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 5.50	4.60 5.05 5.50	4.01 4.45 4.89	0.10 0.16 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 5.50	4.60 5.05 5.50	4.01 4.45 4.89	0.10 0.16 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 5.50	4.60 5.05 5.50	4.01 4.45 4.89	0.10 0.16 0.23
IBC1900BB-1	A	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 1.22	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900BB-1	B	From Leg	4.00 0.00 2.00	0.0000	103.00	No Ice 1/2" Ice 1.22	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
IBC1900BB-1	C	From Leg	4.00	0.0000	103.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			2.00			Ice	1.22	0.66	0.04
IBC1900HG-2A	A	From Leg	4.00	0.0000	103.00	1" Ice	0.97	0.46	0.02
			0.00			No Ice	1.09	0.56	0.03
			2.00			1/2"	1.22	0.66	0.04
IBC1900HG-2A	B	From Leg	4.00	0.0000	103.00	Ice	0.97	0.46	0.02
			0.00			No Ice	1.09	0.56	0.03
			2.00			1/2"	1.22	0.66	0.04
IBC1900HG-2A	C	From Leg	4.00	0.0000	103.00	1" Ice	0.97	0.46	0.02
			0.00			No Ice	1.09	0.56	0.03
			2.00			1/2"	1.22	0.66	0.04
*****clearwireless *****						1" Ice			
LLPX310R-V1 w/ Mount Pipe	A	From Leg	4.00	0.0000	103.00	No Ice	3.88	2.36	0.06
			0.00			1/2"	4.29	2.73	0.09
			2.00			Ice	4.72	3.12	0.13
LLPX310R-V1 w/ Mount Pipe	B	From Leg	4.00	0.0000	103.00	1" Ice	3.88	2.36	0.06
			0.00			No Ice	4.29	2.73	0.09
			2.00			1/2"	4.72	3.12	0.13
LLPX310R-V1 w/ Mount Pipe	C	From Leg	4.00	0.0000	103.00	Ice	3.88	2.36	0.06
			0.00			No Ice	4.29	2.73	0.09
			2.00			1/2"	4.72	3.12	0.13
WIMAX DAP HEAD	A	From Leg	4.00	0.0000	103.00	1" Ice	1.55	0.68	0.03
			0.00			No Ice	1.70	0.80	0.04
			2.00			Ice	1.87	0.92	0.06
WIMAX DAP HEAD	B	From Leg	4.00	0.0000	103.00	1" Ice	1.55	0.68	0.03
			0.00			No Ice	1.70	0.80	0.04
			2.00			Ice	1.87	0.92	0.06
WIMAX DAP HEAD	C	From Leg	4.00	0.0000	103.00	1" Ice	1.55	0.68	0.03
			0.00			No Ice	1.70	0.80	0.04
			2.00			Ice	1.87	0.92	0.06
HORIZON COMPACT	A	From Leg	4.00	0.0000	103.00	1" Ice	0.72	0.37	0.01
			0.00			No Ice	0.83	0.45	0.02
			4.00			Ice	0.94	0.54	0.03
HORIZON COMPACT	B	From Leg	4.00	0.0000	103.00	1" Ice	0.72	0.37	0.01
			0.00			No Ice	0.83	0.45	0.02
			4.00			Ice	0.94	0.54	0.03
Platform Mount [LP 713-1]	C	None		0.0000	103.00	1" Ice	32.89	32.89	1.51
						No Ice	35.76	35.76	2.23
						Ice	38.76	38.76	3.03
*****						1" Ice			
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00	0.0000	93.00	No Ice	8.01	4.23	0.11
			0.00			1/2"	8.52	4.69	0.19
			0.00			Ice	9.04	5.16	0.29
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00	0.0000	93.00	1" Ice	8.01	4.23	0.11
			0.00			No Ice	8.52	4.69	0.19
			0.00			Ice	9.04	5.16	0.29
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00	0.0000	93.00	1" Ice	8.01	4.23	0.11
			0.00			No Ice	8.52	4.69	0.19

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			0.00			1/2" Ice	9.04	5.16	0.29
TA08025-B604	A	From Leg	4.00 0.00 0.00	0.0000	93.00	1" Ice No Ice	1.96	0.98	0.06
						1/2" Ice	2.14	1.11	0.08
						Ice	2.32	1.25	0.10
TA08025-B604	B	From Leg	4.00 0.00 0.00	0.0000	93.00	1" Ice No Ice	1.96	0.98	0.06
						1/2" Ice	2.14	1.11	0.08
						Ice	2.32	1.25	0.10
TA08025-B604	C	From Leg	4.00 0.00 0.00	0.0000	93.00	1" Ice No Ice	1.96	0.98	0.06
						1/2" Ice	2.14	1.11	0.08
						Ice	2.32	1.25	0.10
TA08025-B605	A	From Leg	4.00 0.00 0.00	0.0000	93.00	1" Ice No Ice	1.96	1.13	0.08
						1/2" Ice	2.14	1.27	0.09
						Ice	2.32	1.41	0.11
TA08025-B605	B	From Leg	4.00 0.00 0.00	0.0000	93.00	1" Ice No Ice	1.96	1.13	0.08
						1/2" Ice	2.14	1.27	0.09
						Ice	2.32	1.41	0.11
TA08025-B605	C	From Leg	4.00 0.00 0.00	0.0000	93.00	1" Ice No Ice	1.96	1.13	0.08
						1/2" Ice	2.14	1.27	0.09
						Ice	2.32	1.41	0.11
RDIDC-9181-PF-48	A	From Leg	4.00 0.00 0.00	0.0000	93.00	1" Ice No Ice	2.31	1.29	0.02
						1/2" Ice	2.50	1.45	0.04
						Ice	2.70	1.61	0.06
(2) 8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	93.00	1" Ice No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.04
						Ice	3.40	3.40	0.06
(2) 8' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	93.00	1" Ice No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.04
						Ice	3.40	3.40	0.06
(2) 8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	93.00	1" Ice No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.04
						Ice	3.40	3.40	0.06
Commscope MC-PK8-DSH	C	None		0.0000	93.00	1" Ice No Ice	34.24	34.24	1.75
						1/2" Ice	62.95	62.95	2.10
						Ice	91.66	91.66	2.45
						1" Ice			

BCD-87010	B	From Leg	2.00 0.00 6.00	60.0000	74.00	No Ice 1/2" Ice	2.90	2.90	0.03
						Ice	4.05	4.05	0.05
						1" Ice	5.21	5.21	0.08
Side Arm Mount [SO 701-1]	B	From Leg	0.00 0.00 0.00	60.0000	74.00	No Ice 1/2" Ice	0.85	1.67	0.07
						Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09

KS24019-L112A	C	From Leg	4.00 0.00 2.00	0.0000	50.00	No Ice 1/2" Ice	0.10	0.10	0.01
						Ice	0.18	0.18	0.01
						1" Ice	0.26	0.26	0.01
Side Arm Mount [SO 701-1]	C	None		0.0000	50.00	No Ice 1/2" Ice	0.85	1.67	0.07
						Ice	1.14	2.34	0.08
						Ice	1.43	3.01	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} _{Front} ft ²	C _{AA} _{Side} ft ²	Weight K
						1" Ice		

**								
*								

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K	
VHLP2.5-11	B	Paraboloid w/Shroud (HP)	From Leg	4.00	3.0000		103.00	2.92	No Ice	6.68	0.03
				0.00					1/2" Ice	7.07	0.04
				4.00					1" Ice	7.46	0.05
VHLP2-180	C	Paraboloid w/Shroud (HP)	From Leg	4.00	86.0000		103.00	2.00	No Ice	3.14	0.03
				0.00					1/2" Ice	3.41	0.04
				4.00					1" Ice	3.68	0.06

Load Combinations

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

Comb. No.	Description
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	140 - 86.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.04	-1.82	1.15
			Max. Mx	8	-25.31	-653.71	-3.42
			Max. My	2	-25.30	3.73	657.28
			Max. Vy	20	-24.99	652.81	4.39
			Max. Vx	14	25.13	-4.67	-656.30
			Max. Torque	22			-1.55
L2	86.83 - 38	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.94	-2.59	0.72
			Max. Mx	20	-40.59	1978.58	14.14
			Max. My	2	-40.58	15.47	1995.32
			Max. Vy	20	-30.76	1978.58	14.14
			Max. Vx	14	31.19	-14.79	-1995.01
			Max. Torque	24			-1.36
L3	38 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.51	-3.19	0.70
			Max. Mx	20	-61.63	3472.87	23.37
			Max. My	2	-61.63	26.58	3510.91
			Max. Vy	20	-35.60	3472.87	23.37
			Max. Vx	14	36.08	-24.05	-3510.90
			Max. Torque	24			-1.34

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	89.51	0.00	0.00
	Max. H _x	20	61.65	35.58	0.20
	Max. H _z	2	61.65	0.25	36.05
	Max. M _x	2	3510.91	0.25	36.05
	Max. M _z	8	3470.00	-35.53	-0.21
	Max. Torsion	12	1.16	-19.13	-33.07
	Min. Vert	13	46.24	-19.13	-33.07
	Min. H _x	8	61.65	-35.53	-0.21
	Min. H _z	14	61.65	-0.20	-36.05
	Min. M _x	14	-3510.90	-0.20	-36.05
	Min. M _z	20	-3472.87	35.58	0.20
	Min. Torsion	24	-1.34	19.16	33.09

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	51.37	0.00	0.00	-0.30	-1.11	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	61.65	-0.25	-36.05	-3510.91	26.58	1.02
0.9 Dead+1.0 Wind 0 deg - No Ice	46.24	-0.25	-36.05	-3486.06	26.74	1.01
1.2 Dead+1.0 Wind 30 deg - No Ice	61.65	17.66	-30.83	-3012.60	-1723.15	0.75
0.9 Dead+1.0 Wind 30 deg - No Ice	46.24	17.66	-30.83	-2991.21	-1710.62	0.74
1.2 Dead+1.0 Wind 60 deg - No Ice	61.65	30.73	-17.69	-1727.08	-3001.18	0.04
0.9 Dead+1.0 Wind 60 deg - No Ice	46.24	30.73	-17.69	-1714.77	-2979.61	0.04
1.2 Dead+1.0 Wind 90 deg - No Ice	61.65	35.53	0.21	23.07	-3470.00	-0.46
0.9 Dead+1.0 Wind 90 deg - No Ice	46.24	35.53	0.21	23.00	-3445.13	-0.46
1.2 Dead+1.0 Wind 120 deg - No Ice	61.65	32.84	19.12	1833.59	-3145.50	-0.95
0.9 Dead+1.0 Wind 120 deg - No Ice	46.24	32.84	19.12	1820.82	-3123.10	-0.95
1.2 Dead+1.0 Wind 150 deg - No Ice	61.65	19.13	33.07	3135.46	-1814.85	-1.16
0.9 Dead+1.0 Wind 150 deg - No Ice	46.24	19.13	33.07	3113.68	-1801.84	-1.16
1.2 Dead+1.0 Wind 180 deg - No Ice	61.65	0.20	36.05	3510.90	-24.05	-1.02
0.9 Dead+1.0 Wind 180 deg - No Ice	46.24	0.20	36.05	3486.24	-23.53	-1.02
1.2 Dead+1.0 Wind 210 deg - No Ice	61.65	-17.60	30.87	3016.48	1713.95	-0.67
0.9 Dead+1.0 Wind 210 deg - No Ice	46.24	-17.60	30.87	2995.25	1702.19	-0.67
1.2 Dead+1.0 Wind 240 deg - No Ice	61.65	-30.78	17.63	1719.69	3003.68	0.04
0.9 Dead+1.0 Wind 240 deg - No Ice	46.24	-30.78	17.63	1707.62	2982.80	0.04
1.2 Dead+1.0 Wind 270 deg - No Ice	61.65	-35.58	-0.20	-23.37	3472.87	0.67
0.9 Dead+1.0 Wind 270 deg - No Ice	46.24	-35.58	-0.20	-23.10	3448.67	0.67
1.2 Dead+1.0 Wind 300 deg - No Ice	61.65	-32.88	-19.13	-1835.72	3146.36	1.18
0.9 Dead+1.0 Wind 300 deg - No Ice	46.24	-32.88	-19.13	-1822.75	3124.65	1.18
1.2 Dead+1.0 Wind 330 deg - No Ice	61.65	-19.16	-33.09	-3138.70	1815.75	1.34
0.9 Dead+1.0 Wind 330 deg - No Ice	46.24	-19.16	-33.09	-3116.70	1803.43	1.34
1.2 Dead+1.0 Ice+1.0 Temp	89.51	0.00	0.00	-0.70	-3.19	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	89.51	-0.04	-7.52	-742.55	1.69	0.22
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	89.51	3.73	-6.50	-641.78	-370.60	0.17
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	89.51	6.49	-3.73	-368.61	-642.63	0.03
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	89.51	7.50	0.04	3.54	-742.40	-0.07
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	89.51	6.51	3.78	372.53	-644.53	-0.19
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	89.51	3.77	6.52	642.49	-375.59	-0.24
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	89.51	0.04	7.52	741.19	-7.51	-0.23

Load Combination	Vertical	Shear _x	Shear _z	Overturing Moment, M _x	Overturing Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	89.51	-3.72	6.51	641.12	362.65	-0.16
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	89.51	-6.50	3.72	365.87	636.83	-0.02
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	89.51	-7.51	-0.04	-4.94	736.64	0.11
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	89.51	-6.51	-3.78	-374.28	638.40	0.23
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	89.51	-3.78	-6.52	-644.43	369.47	0.27
Dead+Wind 0 deg - Service	51.37	-0.05	-7.83	-759.37	4.89	0.22
Dead+Wind 30 deg - Service	51.37	3.83	-6.69	-651.62	-373.43	0.16
Dead+Wind 60 deg - Service	51.37	6.67	-3.84	-373.67	-649.77	0.01
Dead+Wind 90 deg - Service	51.37	7.71	0.04	4.75	-751.14	-0.10
Dead+Wind 120 deg - Service	51.37	7.13	4.15	396.23	-680.99	-0.21
Dead+Wind 150 deg - Service	51.37	4.15	7.18	677.75	-393.28	-0.25
Dead+Wind 180 deg - Service	51.37	0.04	7.83	758.90	-6.05	-0.22
Dead+Wind 210 deg - Service	51.37	-3.82	6.70	651.99	369.74	-0.15
Dead+Wind 240 deg - Service	51.37	-6.68	3.83	371.60	648.61	0.01
Dead+Wind 270 deg - Service	51.37	-7.73	-0.04	-5.28	750.06	0.15
Dead+Wind 300 deg - Service	51.37	-7.14	-4.15	-397.16	679.48	0.26
Dead+Wind 330 deg - Service	51.37	-4.16	-7.19	-678.91	391.77	0.29

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	-51.37	0.00	0.00	51.37	0.00	0.000%
2	-0.25	-61.65	-36.05	0.25	61.65	36.05	0.000%
3	-0.25	-46.24	-36.05	0.25	46.24	36.05	0.000%
4	17.66	-61.65	-30.83	-17.66	61.65	30.83	0.000%
5	17.66	-46.24	-30.83	-17.66	46.24	30.83	0.000%
6	30.73	-61.65	-17.69	-30.73	61.65	17.69	0.000%
7	30.73	-46.24	-17.69	-30.73	46.24	17.69	0.000%
8	35.53	-61.65	0.21	-35.53	61.65	-0.21	0.000%
9	35.53	-46.24	0.21	-35.53	46.24	-0.21	0.000%
10	32.84	-61.65	19.12	-32.84	61.65	-19.12	0.000%
11	32.84	-46.24	19.12	-32.84	46.24	-19.12	0.000%
12	19.13	-61.65	33.07	-19.13	61.65	-33.07	0.000%
13	19.13	-46.24	33.07	-19.13	46.24	-33.07	0.000%
14	0.20	-61.65	36.05	-0.20	61.65	-36.05	0.000%
15	0.20	-46.24	36.05	-0.20	46.24	-36.05	0.000%
16	-17.60	-61.65	30.87	17.60	61.65	-30.87	0.000%
17	-17.60	-46.24	30.87	17.60	46.24	-30.87	0.000%
18	-30.78	-61.65	17.63	30.78	61.65	-17.63	0.000%
19	-30.78	-46.24	17.63	30.78	46.24	-17.63	0.000%
20	-35.58	-61.65	-0.20	35.58	61.65	0.20	0.000%
21	-35.58	-46.24	-0.20	35.58	46.24	0.20	0.000%
22	-32.88	-61.65	-19.13	32.88	61.65	19.13	0.000%
23	-32.88	-46.24	-19.13	32.88	46.24	19.13	0.000%
24	-19.16	-61.65	-33.09	19.16	61.65	33.09	0.000%
25	-19.16	-46.24	-33.09	19.16	46.24	33.09	0.000%
26	0.00	-89.51	0.00	0.00	89.51	0.00	0.000%
27	-0.04	-89.51	-7.52	0.04	89.51	7.52	0.000%
28	3.73	-89.51	-6.50	-3.73	89.51	6.50	0.000%
29	6.49	-89.51	-3.73	-6.49	89.51	3.73	0.000%
30	7.50	-89.51	0.04	-7.50	89.51	-0.04	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
31	6.51	-89.51	3.78	-6.51	89.51	-3.78	0.000%
32	3.77	-89.51	6.52	-3.77	89.51	-6.52	0.000%
33	0.04	-89.51	7.52	-0.04	89.51	-7.52	0.000%
34	-3.72	-89.51	6.51	3.72	89.51	-6.51	0.000%
35	-6.50	-89.51	3.72	6.50	89.51	-3.72	0.000%
36	-7.51	-89.51	-0.04	7.51	89.51	0.04	0.000%
37	-6.51	-89.51	-3.78	6.51	89.51	3.78	0.000%
38	-3.78	-89.51	-6.52	3.78	89.51	6.52	0.000%
39	-0.05	-51.37	-7.83	0.05	51.37	7.83	0.000%
40	3.83	-51.37	-6.69	-3.83	51.37	6.69	0.000%
41	6.67	-51.37	-3.84	-6.67	51.37	3.84	0.000%
42	7.71	-51.37	0.04	-7.71	51.37	-0.04	0.000%
43	7.13	-51.37	4.15	-7.13	51.37	-4.15	0.000%
44	4.15	-51.37	7.18	-4.15	51.37	-7.18	0.000%
45	0.04	-51.37	7.83	-0.04	51.37	-7.83	0.000%
46	-3.82	-51.37	6.70	3.82	51.37	-6.70	0.000%
47	-6.68	-51.37	3.83	6.68	51.37	-3.83	0.000%
48	-7.73	-51.37	-0.04	7.73	51.37	0.04	0.000%
49	-7.14	-51.37	-4.15	7.14	51.37	4.15	0.000%
50	-4.16	-51.37	-7.19	4.16	51.37	7.19	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	0.00006783
3	Yes	4	0.00000001	0.00003851
4	Yes	5	0.00000001	0.00005251
5	Yes	4	0.00000001	0.00098157
6	Yes	5	0.00000001	0.00005165
7	Yes	4	0.00000001	0.00096563
8	Yes	4	0.00000001	0.00005651
9	Yes	4	0.00000001	0.00002964
10	Yes	5	0.00000001	0.00005543
11	Yes	5	0.00000001	0.00002616
12	Yes	5	0.00000001	0.00005651
13	Yes	5	0.00000001	0.00002678
14	Yes	4	0.00000001	0.00010884
15	Yes	4	0.00000001	0.00006793
16	Yes	5	0.00000001	0.00005065
17	Yes	4	0.00000001	0.00094728
18	Yes	5	0.00000001	0.00005100
19	Yes	4	0.00000001	0.00095405
20	Yes	4	0.00000001	0.00009736
21	Yes	4	0.00000001	0.00006028
22	Yes	5	0.00000001	0.00005845
23	Yes	5	0.00000001	0.00002767
24	Yes	5	0.00000001	0.00005333
25	Yes	4	0.00000001	0.00099193
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00052674
28	Yes	4	0.00000001	0.00054739
29	Yes	4	0.00000001	0.00054699
30	Yes	4	0.00000001	0.00052707
31	Yes	4	0.00000001	0.00054893
32	Yes	4	0.00000001	0.00054886
33	Yes	4	0.00000001	0.00052420
34	Yes	4	0.00000001	0.00053969
35	Yes	4	0.00000001	0.00053807
36	Yes	4	0.00000001	0.00051995
37	Yes	4	0.00000001	0.00054435
38	Yes	4	0.00000001	0.00054645
39	Yes	4	0.00000001	0.00001020
40	Yes	4	0.00000001	0.00002322
41	Yes	4	0.00000001	0.00002239
42	Yes	4	0.00000001	0.00000981
43	Yes	4	0.00000001	0.00002335
44	Yes	4	0.00000001	0.00002561
45	Yes	4	0.00000001	0.00001039
46	Yes	4	0.00000001	0.00002136
47	Yes	4	0.00000001	0.00002173
48	Yes	4	0.00000001	0.00001009
49	Yes	4	0.00000001	0.00002638
50	Yes	4	0.00000001	0.00002239

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 86.83	11.086	43	0.6582	0.0011
L2	92.5 - 38	5.009	43	0.5129	0.0005
L3	45 - 0	1.169	43	0.2347	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	BXA-80063-4BF-EDIN-X w/ Mount Pipe	43	11.086	0.6582	0.0011	102356
126.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	43	9.182	0.6255	0.0009	36556
117.00	7770.00 w/ Mount Pipe	43	7.988	0.6018	0.0008	22251
107.00	VHLP2.5-11	43	6.713	0.5708	0.0006	15508
104.00	800MHz 2X50W RRH W/FILTER	43	6.345	0.5602	0.0006	14216
103.00	AAHC w/ Mount Pipe	43	6.224	0.5566	0.0006	13831
93.00	MX08FRO665-21 w/ Mount Pipe	43	5.064	0.5152	0.0005	10982
74.00	BCD-87010	43	3.168	0.4132	0.0003	9513
50.00	KS24019-L112A	43	1.430	0.2648	0.0002	8259

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 86.83	51.240	22	3.0427	0.0049
L2	92.5 - 38	23.165	22	2.3727	0.0023
L3	45 - 0	5.408	22	1.0857	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	BXA-80063-4BF-EDIN-X w/ Mount Pipe	22	51.240	3.0427	0.0049	22273
126.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	22	42.446	2.8920	0.0040	7954
117.00	7770.00 w/ Mount Pipe	22	36.930	2.7827	0.0035	4840
107.00	VHLP2.5-11	22	31.042	2.6396	0.0030	3372
104.00	800MHz 2X50W RRH W/FILTER	22	29.340	2.5909	0.0028	3091
103.00	AAHC w/ Mount Pipe	22	28.780	2.5740	0.0028	3007
93.00	MX08FRO665-21 w/ Mount Pipe	22	23.421	2.3833	0.0023	2386
74.00	BCD-87010	22	14.652	1.9116	0.0015	2063
50.00	KS24019-L112A	22	6.613	1.2249	0.0008	1787

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	140 - 86.83 (1)	TP39.223x26.216x0.3125	53.17	0.00	0.0	37.758 0	-25.24	2208.84	0.011
L2	86.83 - 38 (2)	TP50.56x37.2109x0.4063	54.50	0.00	0.0	63.364 5	-40.53	3706.82	0.011
L3	38 - 0 (3)	TP59.05x48.0329x0.5	45.00	0.00	0.0	94.265 5	-61.63	5514.53	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	140 - 86.83 (1)	TP39.223x26.216x0.3125	671.16	1838.14	0.365	0.00	1838.14	0.000
L2	86.83 - 38 (2)	TP50.56x37.2109x0.4063	2054.50	3995.66	0.514	0.00	3995.66	0.000
L3	38 - 0 (3)	TP59.05x48.0329x0.5	3642.72	7247.00	0.503	0.00	7247.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	140 - 86.83 (1)	TP39.223x26.216x0.3125	25.73	662.65	0.039	0.99	2187.20	0.000
L2	86.83 - 38 (2)	TP50.56x37.2109x0.4063	32.46	1112.05	0.029	1.18	4738.27	0.000
L3	38 - 0 (3)	TP59.05x48.0329x0.5	38.06	1654.36	0.023	1.18	8520.33	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	140 - 86.83 (1)	0.011	0.365	0.000	0.039	0.000	0.378	1.050	4.8.2
L2	86.83 - 38 (2)	0.011	0.514	0.000	0.029	0.000	0.526	1.050	4.8.2
L3	38 - 0 (3)	0.011	0.503	0.000	0.023	0.000	0.514	1.050	4.8.2

Section Capacity Table

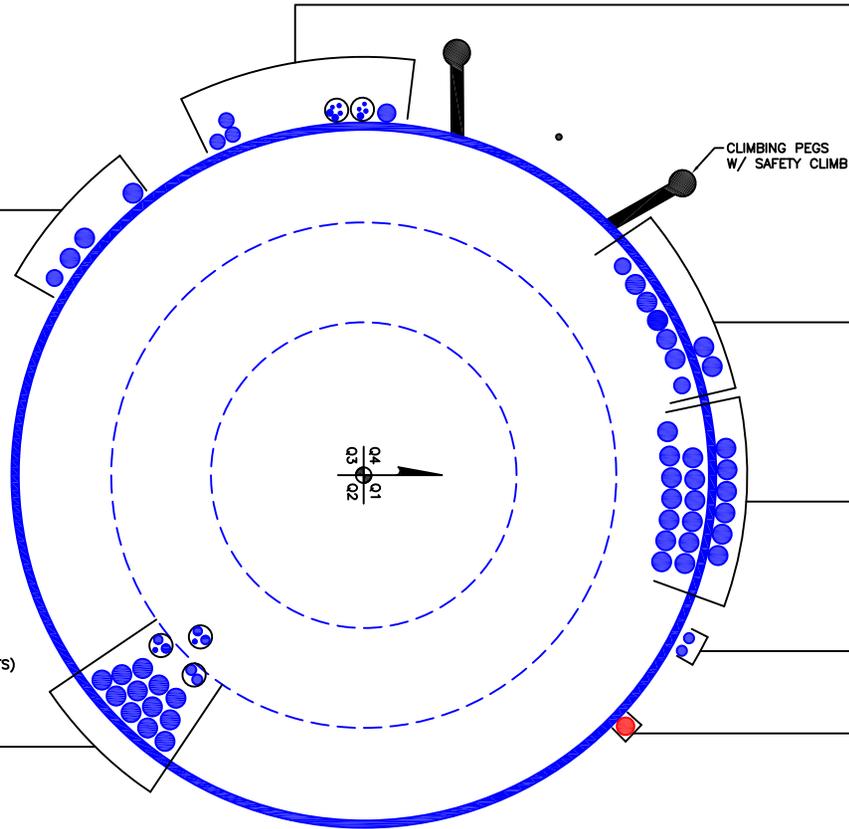
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	140 - 86.83	Pole	TP39.223x26.216x0.3125	1	-25.24	2319.28	36.0	Pass
L2	86.83 - 38	Pole	TP50.56x37.2109x0.4063	2	-40.53	3892.16	50.1	Pass
L3	38 - 0	Pole	TP59.05x48.0329x0.5	3	-61.63	5790.26	49.0	Pass
Summary								
Pole (L2)							50.1	Pass
RATING =							50.1	Pass

APPENDIX B
BASE LEVEL DRAWING



(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/4" TO 126 FT LEVEL
(1) 1-3/8" TO 126 FT LEVEL
(2) 1-5/8" TO 126 FT LEVEL

(OTHER CONSIDERED EQUIPMENT—IN (3) 2" CONDUITS)
(2) 3/8" TO 117 FT LEVEL
(4) 3/4" TO 117 FT LEVEL
(2) 7/8" TO 117 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(12) 1-5/8" TO 117 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/2" TO 103 FT LEVEL
(3) 1-1/4" TO 103 FT LEVEL

(OTHER CONSIDERED EQUIPMENT—IN CONDUIT)
(3) 1/4" TO 103 FT LEVEL
(3) 5/16" TO 103 FT LEVEL
(3) 1/2" TO 103 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(2) 1-3/8" TO 126 FT LEVEL
(7) 1-5/8" TO 126 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(6) 1-5/8" TO 93 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(13) 1-5/8" TO 140 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(1) 7/8" TO 50 FT LEVEL
(1) 7/8" TO 74 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-1/2" TO 93 FT LEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

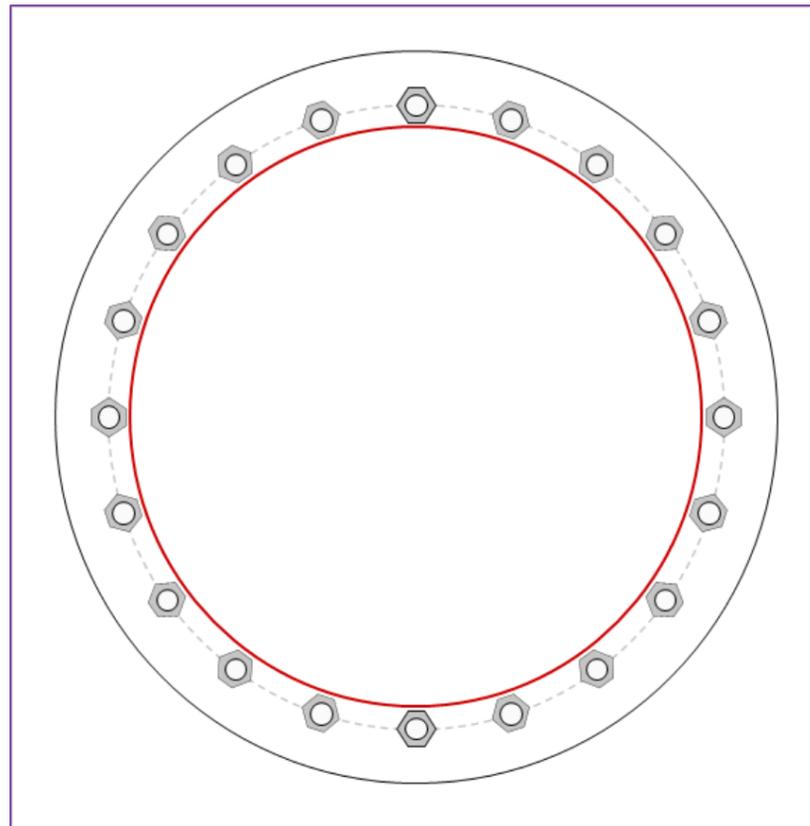


Site Info	
BU #	806369
Site Name	HRT 094 943225
Order #	556641, Rev 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.25

Applied Loads	
Moment (kip-ft)	3642.72
Axial Force (kips)	61.63
Shear Force (kips)	38.06

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(20) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 63.5" BC
Base Plate Data
74.641" OD x 3" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)
Stiffener Data
N/A
Pole Data
59.05" x 0.5" 12-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary (units of kips, kip-in)		
$P_{u,t} = 134.53$	$\phi P_{n,t} = 243.75$	Stress Rating
$V_u = 1.9$	$\phi V_n = 149.1$	52.6%
$M_u = n/a$	$\phi M_n = n/a$	Pass
Base Plate Summary		
Max Stress (ksi):	9.7	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	17.1%	Pass

Drilled Pier Foundation

BU # :	806369
Site Name:	HRT 094 943225
Order Number:	556641, Rev 0
TIA-222 Revision:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	3642.73	
Axial Force (kips)	61.65	
Shear Force (kips)	38.04	

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	40	ksi

Pier Design Data		
Depth	47	ft
Ext. Above Grade	0	ft
Pier Section 1		
<i>From 0' below grade to 47' below grade</i>		
Pier Diameter	7.5	ft
Rebar Quantity	52	
Rebar Size	10	
Rebar Cage Diameter	82	in
Tie Size	4	
Tie Spacing		in

[Rebar & Pier Options](#)

[Embedded Pole Inputs](#)

[Belled Pier Inputs](#)

Analysis Results

Soil Lateral Check	Compression	Uplift
D _{v=0} (ft from TOC)	7.59	-
Soil Safety Factor	6.97	-
Max Moment (kip-ft)	3862.90	-
Rating*	18.2%	-

Soil Vertical Check	Compression	Uplift
Skin Friction (kips)	406.44	-
End Bearing (kips)	298.21	-
Weight of Concrete (kips)	251.31	-
Total Capacity (kips)	704.65	-
Axial (kips)	312.96	-
Rating*	42.3%	-

Reinforced Concrete Flexure	Compression	Uplift
Critical Depth (ft from TOC)	7.52	-
Critical Moment (kip-ft)	3862.87	-
Critical Moment Capacity	10727.68	-
Rating*	34.3%	-

Reinforced Concrete Shear	Compression	Uplift
Critical Depth (ft from TOC)	25.54	-
Critical Shear (kip)	216.45	-
Critical Shear Capacity	563.37	-
Rating*	36.6%	-

Structural Foundation Rating*	36.6%
Soil Interaction Rating*	42.3%

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
N/A	<input type="checkbox"/>
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	<input type="checkbox"/>
Shear Design Options	
Check Shear along Depth of Pier:	<input checked="" type="checkbox"/>
Utilize Shear-Friction Methodology:	<input type="checkbox"/>
Override Critical Depth:	<input type="checkbox"/>

[Go to Soil Calculations](#)

Soil Profile			
Groundwater Depth	10	# of Layers	8

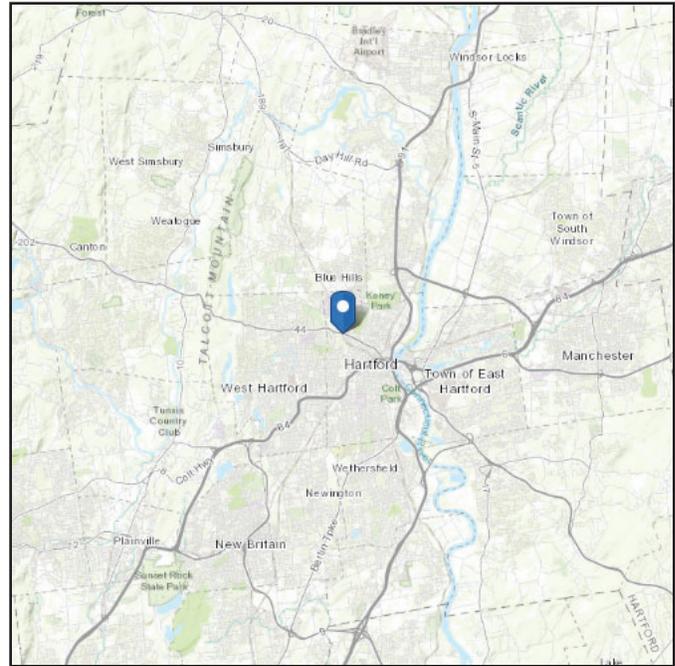
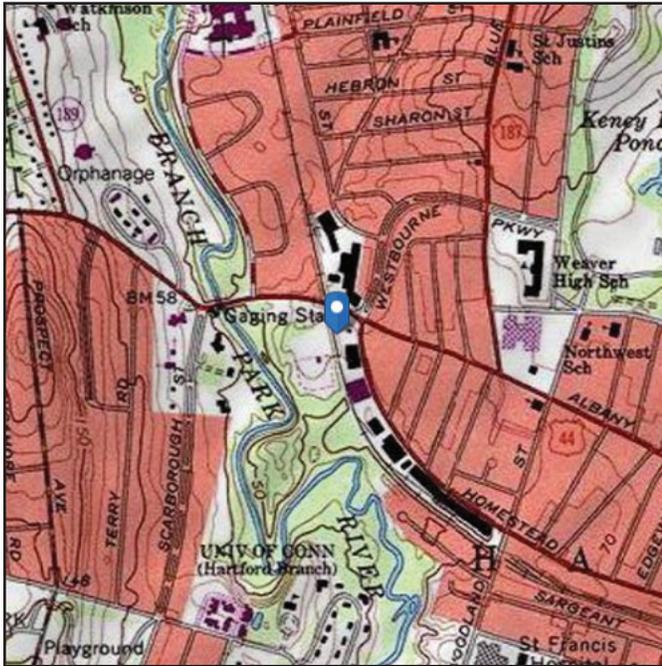
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ _{soil} (pcf)	γ _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	105	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2	3.75	1.75	100	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
3	3.75	5	1.25	100	150	0.5	30	0.000	0.000	0.00	0.00			Cohesionless
4	5	10	5	100	150	0.5	30	0.000	0.000	0.60	0.60			Cohesionless
5	10	25	15	36	87.6	0.1	27	0.000	0.000	0.40	0.40			Cohesionless
6	25	35	10	36	87.6	0.1	27	0.000	0.000	0.60	0.60			Cohesionless
7	35	45	10	41	87.6	0.2	0	0.11	0.11	0.60	0.60			Cohesive
8	45	47	2	41	87.6	0	32	0.00	0.00	1.00	1.00	9		Cohesionless

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 60.06 ft (NAVD 88)
Latitude: 41.783781
Longitude: -72.703794



Wind

Results:

Wind Speed:	122 Vmph	125 Vmph required by Jurisdiction
10-year MRI	76 Vmph	
25-year MRI	86 Vmph	
50-year MRI	92 Vmph	
100-year MRI	99 Vmph	

Date Accessed: ~~ASCE/SEI 7-10~~ **ASCE/SEI 7-2021**, 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).

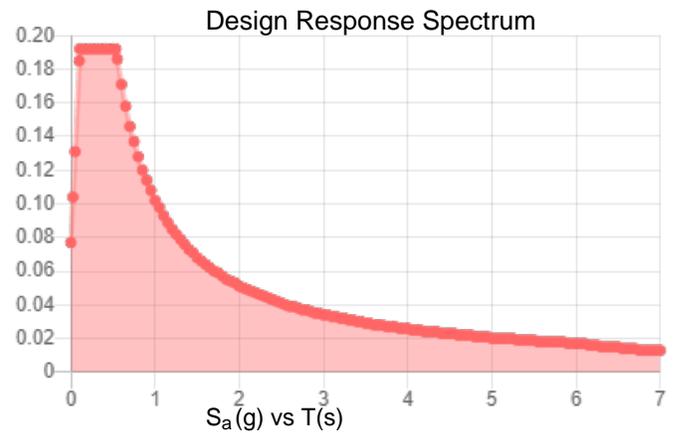
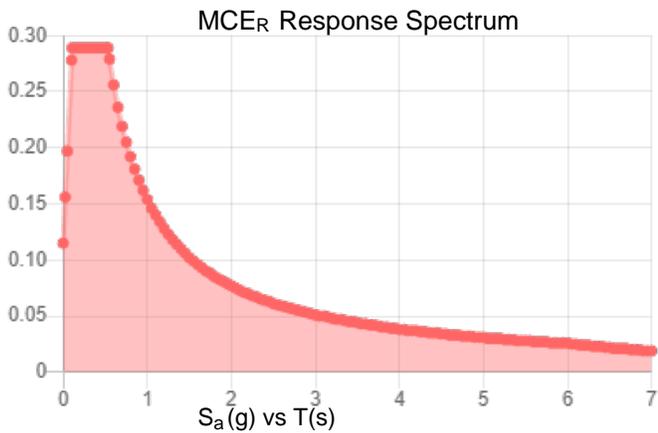
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.18	S_{DS} :	0.192
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.091
S_{MS} :	0.289	PGA _M :	0.145
S_{M1} :	0.154	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Wed May 12 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: Wed May 12 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: **July 30, 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: BOBDL00044A
Carrier Site Name: CT-CCI-T-806369

Crown Castle Designation: **Crown Castle BU Number:** 806369
Crown Castle Site Name: HRT 094 943225
Crown Castle JDE Job Number: 650039
Crown Castle Order Number: 556641 Rev. 0

Engineering Firm Designation: **Trylon Report Designation:** 189050

Site Data: **439-455 Homestead Ave, Hartford, Hartford County, CT, 06105**
Latitude 41°47'1.61" Longitude -72°42'13.66"

Structure Information: **Tower Height & Type:** **140.0 ft Monopole**
Mount Elevation: **93.0 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.

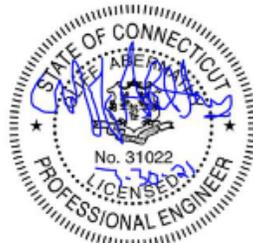
The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

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

This analysis has been performed in accordance with the 2015 International 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.

Mount analysis prepared by: Mostafa Faghihnia, P.E.

Respectfully Submitted by:
Cliff Abernathy, P.E.



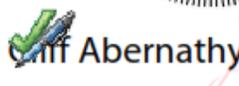
 Digitally signed by Cliff Abernathy
Date: 2021.07.30 16:41:39 -04'00'

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7) APPENDIX C

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8) APPENDIX D

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9) APPENDIX E

Supplemental Drawings

1) INTRODUCTION

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

2) ANALYSIS CRITERIA

Building Code: 2015 IBC
TIA-222 Revision: TIA-222-H
Risk Category: II
Ultimate Wind Speed: 125 mph
Exposure Category: B
Topographic Factor at Base: 1.0
Topographic Factor at Mount: 1.0
Ice Thickness: 2.0 in
Wind Speed with Ice: 50 mph
Seismic S_s: 0.181
Seismic S₁: 0.064
Live Loading Wind Speed: 60 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
93.0	93.0	3	JMA WIRELESS	MX08FRO665-21	8.0 ft Platform [Commscope 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	556641 Rev. 0	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 Tylon 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)	MP1	93.0	23.7	Pass
	Horizontal(s)	H1		11.1	Pass
	Standoff(s)	M2		58.5	Pass
	Bracing(s)	M1		47.0	Pass
	Handrail(s)	M19		8.9	Pass
	Mount Connection(s)	---		24.0	Pass

Structure Rating (max from all components) =	58.5%
---	--------------

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

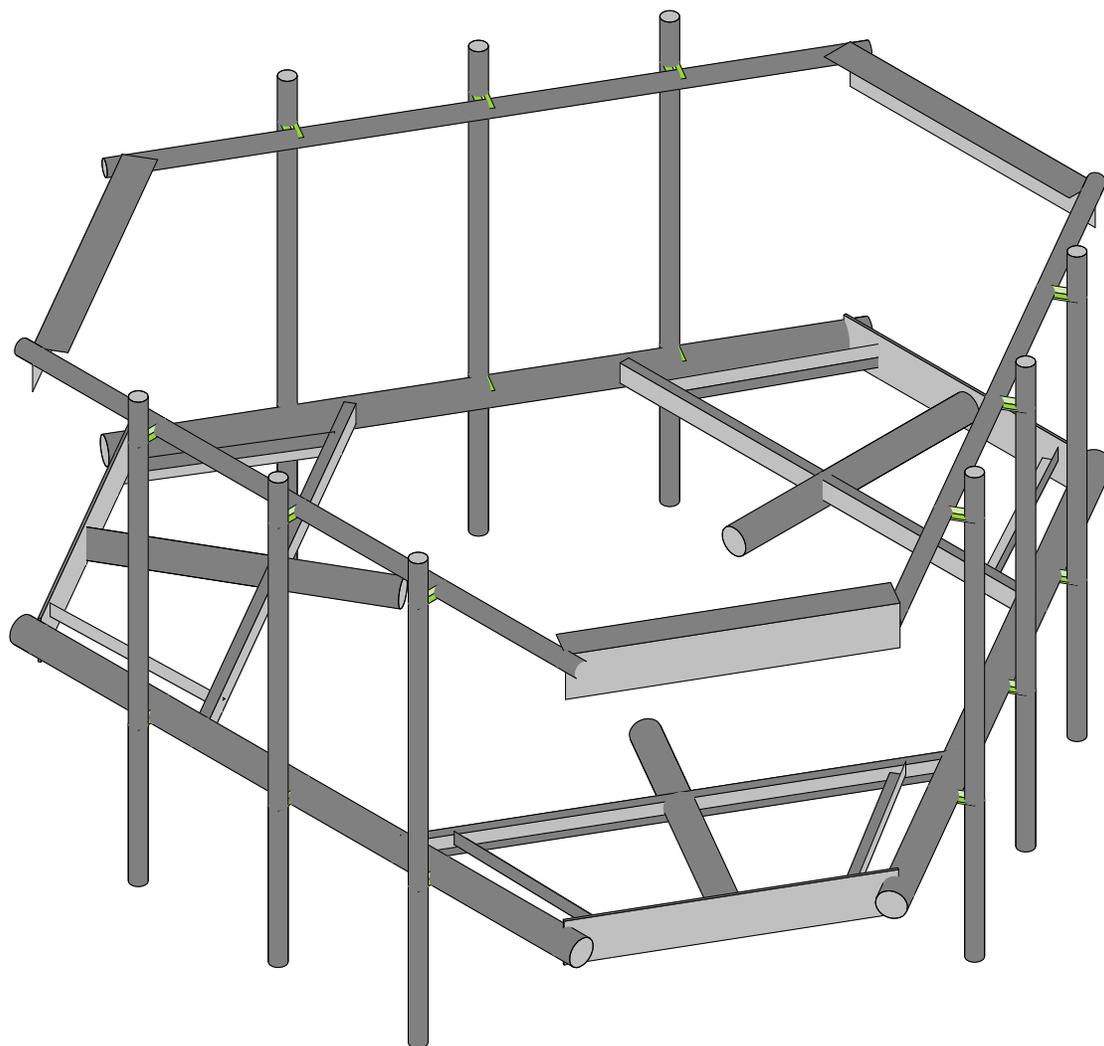
4.1) Recommendations

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



Trylon

MFT

189050

806369

Render

July 30, 2021 at 12:44 PM

HRT094_loaded.r3d

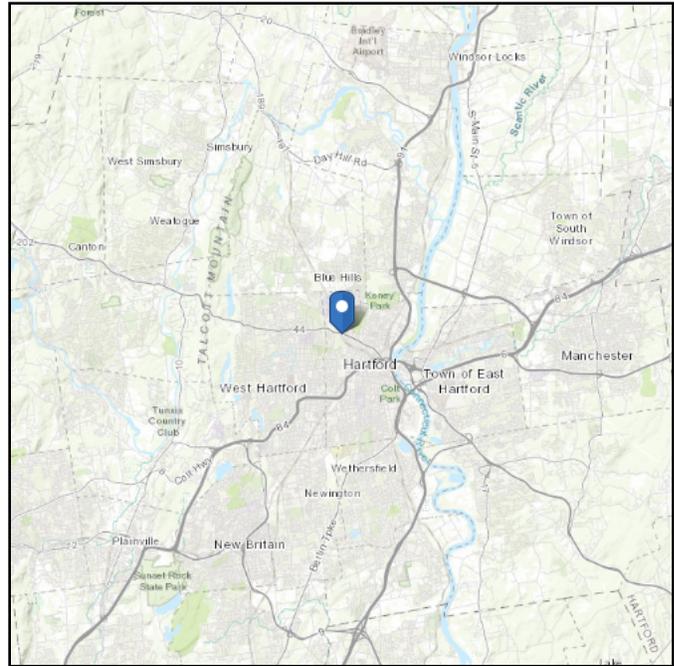
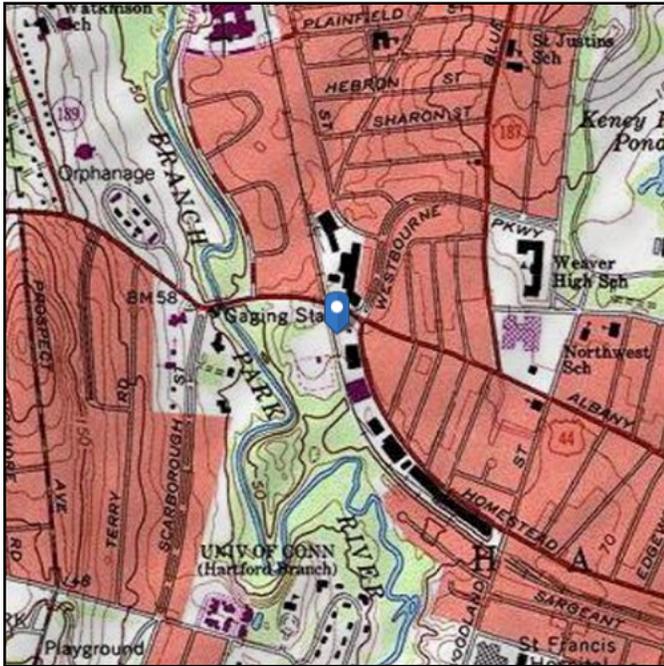
APPENDIX B
SOFTWARE INPUT CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 60.06 ft (NAVD 88)
Latitude: 41.783781
Longitude: -72.703794



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: Thu Jul 29 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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TIA LOAD CALCULATOR 2.0

PROJECT DATA	
Job Code:	189050
Carrier Site ID:	806369
Carrier Site Name:	HRT 094 943225

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

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	93.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	140.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	B	--
Site Class:	D - Stiff Soil	--
Ground Elevation:	57.7	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):	0.97	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (G_h):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	36.71	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}):	36.71	psf
Mount Ice Thickness (t_{iz}):	2.22	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	66.07	psf
Round Member Pressure:	39.64	psf
Ice Wind Pressure:	7.27	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):	0.10	--
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

A Ya Vy' Df]a Ufm8 UU'f7 cb]bi YXL

Sæ^	Q]ac	R]ac	S]ac	Ü[æ^Q^*D Ü^&ç] D]æ^	V] ^	Ô•ã}^! Åac	Tæ]æ	Ô•ã}^! Á] ^	
IÍ	TÚÍ	ÞJÍ	ÞJÍ		T[]}ÁÚá^	Óæ	Úá^	ÓÉ HÓ:ÉÓ	V] }æ
IÎ	TÎÎ	ÞJJ	ÞJÎ		ÜØØ	Þ]}^	Þ]}^	ÜØØ	V] }æ
IÏ	TÏÏ	ÞFÉE	ÞJÏ		ÜØØ	Þ]}^	Þ]}^	ÜØØ	V] }æ
IÌ	TÚÍ	ÞFÈF	ÞFÈG		T[]}ÁÚá^	Óæ	Úá^	ÓÉ HÓ:ÉÓ	V] }æ
IJ	TÍJ	ÞFÉÍ	ÞFÈH		ÜØØ	Þ]}^	Þ]}^	ÜØØ	V] }æ
Í€	TÍ€	ÞFÉÍ	ÞFÈI		ÜØØ	Þ]}^	Þ]}^	ÜØØ	V] }æ
ÍF	TÚÍ	ÞFÉÍ	ÞFÈÍ		T[]}ÁÚá^	Óæ	Úá^	ÓÉ HÓ:ÉÓ	V] }æ

A Ya Vy' 5Xj UbWX'8 UHU

Sæ^	Q]æ^	RÁ]æ^	Q]æ^c]á	RÁ]æ^c]á	VEÓÁ] ^	Ü@•æ	Ô•ÁÚæ	Qæç^	Úã}æ
F	TF	Ó}ÚØ	Ó}ÚØ			ÿ^.			Þ]}^
G	TG					ÿ^.			Þ]}^
H	TH					ÿ^.			Þ]}^
I	TI					ÿ^.			Þ]}^
Í	TÍ	UUUÚYU	UUUÚYU			ÿ^.	Ô^æ c		Þ]}^
Î	TÎ	Ó}ÚØ	Ó}ÚØ			ÿ^.			Þ]}^
Ï	TÏ					ÿ^.			Þ]}^
Ì	TÌ					ÿ^.			Þ]}^
J	TJ					ÿ^.			Þ]}^
F€	TF€	UUUÚYU	UUUÚYU			ÿ^.	Ô^æ c		Þ]}^
FF	TF	Ó}ÚØ	Ó}ÚØ			ÿ^.			Þ]}^
FG	TFG					ÿ^.			Þ]}^
FH	TFH					ÿ^.			Þ]}^
FI	TFI					ÿ^.			Þ]}^
FÍ	TFÍ	UUUÚYU	UUUÚYU			ÿ^.	Ô^æ c		Þ]}^
FÎ	PF					ÿ^.	Ô^æ c		Þ]}^
FÏ	PH					ÿ^.			Þ]}^
FÌ	PG					ÿ^.			Þ]}^
FJ	TFJ					ÿ^.			Þ]}^
G€	TG€					ÿ^.			Þ]}^
GF	TGF					ÿ^.			Þ]}^
GG	TGG					ÿ^.			Þ]}^
GH	TGH					ÿ^.			Þ]}^
G	TG					ÿ^.			Þ]}^
G	TG	UUUÚYU				ÿ^.	ÉÁÓÆ		Þ]}^
G	TG					ÿ^.	ÉÁÓÆ		Þ]}^
G	TUG					ÿ^.			Þ]}^
G	TG	UUUÚYU				ÿ^.	ÉÁÓÆ		Þ]}^
GJ	TGJ					ÿ^.	ÉÁÓÆ		Þ]}^
H€	TUF					ÿ^.			Þ]}^
HF	THF	UUUÚYU				ÿ^.	ÉÁÓÆ		Þ]}^
HG	THG					ÿ^.	ÉÁÓÆ		Þ]}^
HH	TUH					ÿ^.			Þ]}^
HI	THI	UUUÚYU				ÿ^.	ÉÁÓÆ		Þ]}^
HÍ	THÍ					ÿ^.	ÉÁÓÆ		Þ]}^
HÏ	TÚÍ					ÿ^.			Þ]}^
HÏ	THÏ	UUUÚYU				ÿ^.	ÉÁÓÆ		Þ]}^
HÌ	THÌ					ÿ^.	ÉÁÓÆ		Þ]}^
HJ	TÚÍ					ÿ^.			Þ]}^
I€	TÍ€	UUUÚYU				ÿ^.	ÉÁÓÆ		Þ]}^

A Ya Vyf'5 Xj Ub WX'8 UuVf'7 cbh'bi YxL

Sää^	Q^A^æ^	RÄ^A^æ^	Q^~^çá	RÄ^~^çá	VEDÄU]'	Ú@~æ	Ö^~Äæ	Qæç^	Ú^ä {æ
IF	TIF					ÿ^.	EE^OZEE		p[]^
IG	TUJ					ÿ^.			p[]^
IH	TIH	UUUÝUU				ÿ^.	EE^OZEE		p[]^
II	TII					ÿ^.	EE^OZEE		p[]^
IÍ	TÚÍ					ÿ^.			p[]^
IÎ	TÎÎ	UUUÝUU				ÿ^.	EE^OZEE		p[]^
IÏ	TÏÏ					ÿ^.	EE^OZEE		p[]^
IÌ	TÚÌ					ÿ^.			p[]^
IJ	TIJ	UUUÝUU				ÿ^.	EE^OZEE		p[]^
Í€	TÍ€					ÿ^.	EE^OZEE		p[]^
ÍF	TÚÍ					ÿ^.			p[]^

<chFc`YX'GhYY'8 Yg[] b'DU'Ua Yhfg

Sää^	Úç^	S^)*çá	Sä^çá	Sä::çá	Sš[{}A[]çá	Sš[{}A[]çá	S::	Öa	Ø^&ç[]
F	TF	Úçá[~Á]EEÍJÉFH			Sä^				Sää^æ
G	TG	Úçá[~Á]EEÍ€			Sä^				Sää^æ
H	TH	Ö:æ *Á:æ EE GÉJÍ			Sä^				Sää^æ
I	TI	Ö:æ *Á:æ EE GÉJÍ			Sä^				Sää^æ
Í	TÍ	Úæ.	IG		Sä^				Sää^æ
Î	TÎ	Úçá[~Á]EEÍJÉFH	G	G	G	G	G		Sää^æ
Ï	TÏ	Úçá[~Á]EEÍ€			Sä^				Sää^æ
Ì	TÌ	Ö:æ *Á:æ EE GÉJÍ			Sä^				Sää^æ
J	TJ	Ö:æ *Á:æ EE GÉJÍ			Sä^				Sää^æ
F€	TF€	Úæ.	IG		Sä^				Sää^æ
FF	TFE	Úçá[~Á]EEÍJÉFH			Sä^				Sää^æ
FG	TFG	Úçá[~Á]EEÍ€			Sä^				Sää^æ
FH	TFH	Ö:æ *Á:æ EE GÉJÍ			Sä^				Sää^æ
FI	TFI	Ö:æ *Á:æ EE GÉJÍ			Sä^				Sää^æ
FÍ	TFÍ	Úæ.	IG		Sä^				Sää^æ
FÏ	PF	P[íã[]æ	JÍ		Sä^				Sää^æ
FÌ	PH	P[íã[]æ	JÍ		Sä^				Sää^æ
FÌ	PG	P[íã[]æ	JÍ		Sä^				Sää^æ
FJ	TFJ	Pæá:æ	JÍ		Sä^				Sää^æ
G€	TG€	Pæá:æ	JÍ		Sä^				Sää^æ
GF	TGF	Pæá:æ	JÍ		Sä^				Sää^æ
GG	TGG	Pæá:æ Ö EE	IG		Sä^				Sää^æ
GH	TGH	Pæá:æ Ö EE	IG		Sä^				Sää^æ
G	TG	Pæá:æ Ö EE	IG		Sä^				Sää^æ
G	TUG	T[~]Úã^.	IG		Sä^				Sää^æ
G	TUF	T[~]Úã^.	IG		Sä^				Sää^æ
G	TUH	T[~]Úã^.	IG		Sä^				Sää^æ
G	TU	T[~]Úã^.	IG		Sä^				Sää^æ
GJ	TUJ	T[~]Úã^.	IG		Sä^				Sää^æ
H€	TU€	T[~]Úã^.	IG		Sä^				Sää^æ
HF	TUÍ	T[~]Úã^.	IG		Sä^				Sää^æ
HG	TUÌ	T[~]Úã^.	IG		Sä^				Sää^æ
HH	TUÏ	T[~]Úã^.	IG		Sä^				Sää^æ

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HF	T HF	ÜY	Ë Ì Ï	€	Ä FEE
HG	T HG	ÜY	Ë Ì Ï	€	Ä FEE
HH	T Ú H	ÜY	Ë Ü Æ I G	€	Ä FEE
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II	T II	ÜY	Ë Ì Ï	€	Ä FEE
IÍ	T Ú Í	ÜY	Ë Ü Æ I G	€	Ä FEE
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Iİ	T Ú Ī	ÜY	Ë Ü Æ I G	€	Ä FEE
IJ	T I J	ÜY	Ë Ì Ï	€	Ä FEE
I€	T I€	ÜY	Ë Ì Ï	€	Ä FEE
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F	TF	UZ	Éí Èì G	Éí Èì G	€	À FEE
G	TG	UZ	Éí Èh	Éí Èh	€	À FEE
H	TH	UZ	Éí Èí J	Éí Èí J	€	À FEE
I	TI	UZ	Éí Èí J	Éí Èí J	€	À FEE
Í	TÍ	UZ	Éí ÖÖG F	Éí ÖÖG F	€	À FEE
Î	TÎ	UZ	Éí Èì G	Éí Èì G	€	À FEE
Ï	TÏ	UZ	Éí Èh	Éí Èh	€	À FEE
Ì	TÌ	UZ	Éí Èí J	Éí Èí J	€	À FEE
J	TJ	UZ	Éí Èí J	Éí Èí J	€	À FEE
F€	T F€	UZ	Éí ÖÖG F	Éí ÖÖG F	€	À FEE
FF	T FF	UZ	Éí Èì G	Éí Èì G	€	À FEE
FG	T FG	UZ	Éí Èh	Éí Èh	€	À FEE
FH	T FH	UZ	Éí Èí J	Éí Èí J	€	À FEE
FI	T FI	UZ	Éí Èí J	Éí Èí J	€	À FEE
FÍ	T FÍ	UZ	Éí ÖÖG F	Éí ÖÖG F	€	À FEE
FÎ	PF	UZ	Éí Èh	Éí Èh	€	À FEE
FÏ	PH	UZ	Éí Èh	Éí Èh	€	À FEE
FÌ	PG	UZ	Éí Èh	Éí Èh	€	À FEE
FJ	T FJ	UZ	Éö Èí í	Éö Èí í	€	À FEE
F€	T F€	UZ	Éö Èí í	Éö Èí í	€	À FEE
GF	T GF	UZ	Éö Èí í	Éö Èí í	€	À FEE
GG	T GG	UZ	Éí FÈ FG	Éí FÈ FG	€	À FEE
GH	T GH	UZ	Éí FÈ FG	Éí FÈ FG	€	À FEE
G	T G	UZ	Éí FÈ FG	Éí FÈ FG	€	À FEE
Ğ	T Ğ	UZ	€	€	€	À FEE
Ĝ	T Ĝ	UZ	€	€	€	À FEE
Ġ	T ÚG	UZ	Éö Èí í	Éö Èí í	€	À FEE
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GJ	T GJ	UZ	€	€	€	À FEE
H€	T ÚF	UZ	Éö Èí í	Éö Èí í	€	À FEE
HF	T HF	UZ	€	€	€	À FEE
HG	T HG	UZ	€	€	€	À FEE
HH	T ÚH	UZ	Éö Èí í	Éö Èí í	€	À FEE
H	T H	UZ	€	€	€	À FEE
HÍ	T HÍ	UZ	€	€	€	À FEE
HÎ	T ÚI	UZ	Éö Èí í	Éö Èí í	€	À FEE
HÏ	T HÏ	UZ	€	€	€	À FEE
HÌ	T HÌ	UZ	€	€	€	À FEE
HJ	T ÚI	UZ	Éö Èí í	Éö Èí í	€	À FEE
I€	T I€	UZ	€	€	€	À FEE
IF	T IF	UZ	€	€	€	À FEE
IG	T ÚJ	UZ	Éö Èí í	Éö Èí í	€	À FEE
IH	T IH	UZ	€	€	€	À FEE
II	T II	UZ	€	€	€	À FEE
IÍ	T ÚI	UZ	Éö Èí í	Éö Èí í	€	À FEE
IÎ	T IÎ	UZ	€	€	€	À FEE
IÏ	T IÏ	UZ	€	€	€	À FEE
IÌ	T ÚI	UZ	Éö Èí í	Éö Èí í	€	À FEE
IJ	T IJ	UZ	€	€	€	À FEE
I€	T I€	UZ	€	€	€	À FEE
ÍF	T ÚI	UZ	Éö Èí í	Éö Èí í	€	À FEE

9bj YcdY5=G7 %h fl * \$!% L' @: 8 GhY7 cXY7\ YWg f7 cbh7bi YXL

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G	TÌ	ŠQGH	Æé	€	G	Æí	: H fí é fí ÆGHUÇÉ ííí Æí FGHUÇJ GÆPÇF
G	TFI	ŠQGH	Æé	€	ì	Æí	^ H fí é fí ÆGHUÇÉ ííí Æí FGHUÇJ GÆPÇF
G	TFJ	ÚQÓ' GÆ	ÆJH	G	F€	Æí F	G fí Jfí ÆÆHGfHÉ fí fí Æí G fí fí Æí G fí fí Æí à
GJ	TÇE	ÚQÓ' GÆ	ÆJH	G	ì	Æí Ì	ì fí Jfí ÆÆHGfHÉ fí fí Æí G fí fí Æí G fí fí Æí à
H€	TGF	ÚQÓ' GÆ	ÆJF	ÌG	ì	Æí Ì	fGfí Jfí ÆÆHGfHÉ fí fí Æí G fí fí Æí G fí fí Æí à
HF	TG	Š ÁÐ d ÁÆŠ	Æí €	ÇÆŠ ÆŠ	Fí	ÆGf	^ Í fí íí HÆŠ í é í ÆŠ é í ÆJF HÆfÆí Ì GÆPÇF
HG	TGH	Š ÁÐ d ÁÆŠ	Æí J	ÌG	HG	ÆGG	^ J fí íí HÆŠ í é í ÆŠ é í ÆJF HÆfÆí Ì GÆPÇF
HH	TGG	Š ÁÐ d ÁÆŠ	Æí í	€	Gf	ÆGG	^ FF fí íí HÆŠ í é í ÆŠ é í ÆJF HÆfÆí Ì GÆPÇF

APPENDIX D
ADDITIONAL CALCUATIONS

BOLT TOOL 1.5.2

Project Data	
Job Code:	189050
Carrier Site ID:	806369
Carrier Site Name:	HRT 094 943225

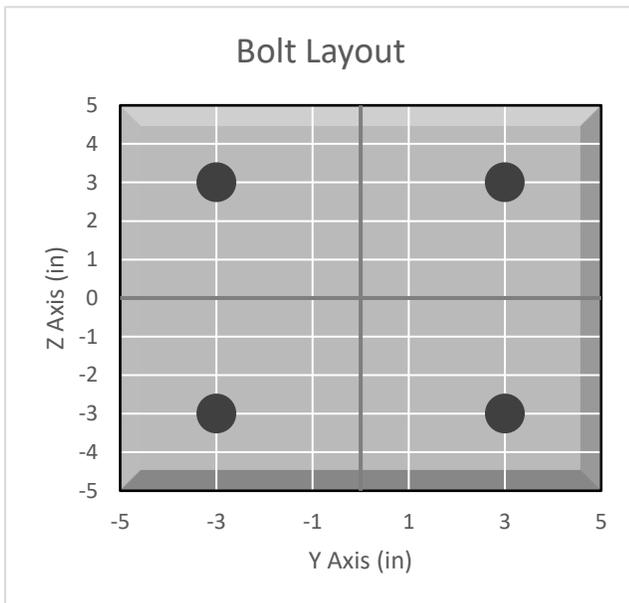
Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	TIA-222-H

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 Collar Connection

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	13805.8	lbs
Tension Force (T_u):	5126.9	lbs
Shear Force (V_u):	727.6	lbs
Tension Usage:	24.0%	--
Shear Usage:	5.0%	--
Interaction:	24.0%	Pass
Controlling Member:	M2	--
Controlling LC:	42	--

*Rating per TIA-222-H Section 15.5



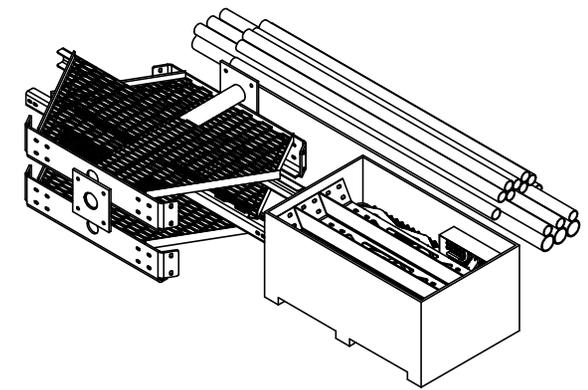
APPENDIX E
SUPPLEMENTAL DRAWINGS

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	



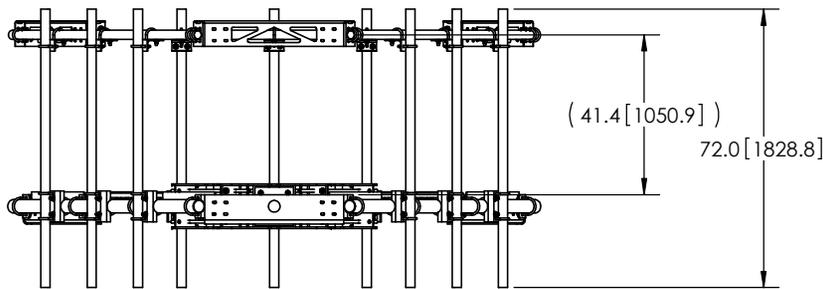
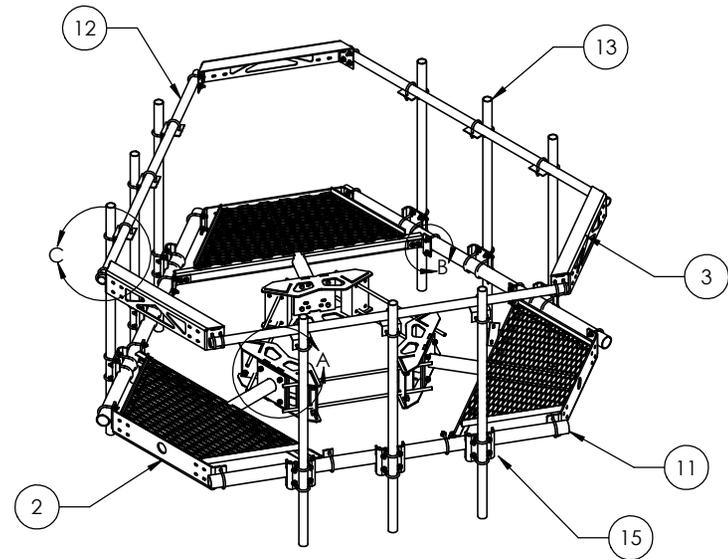
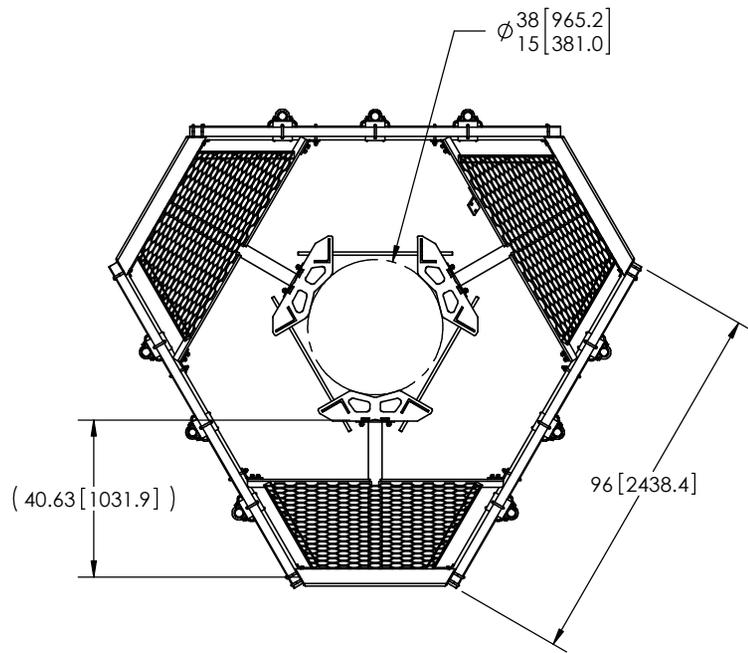
REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
A		INITIAL RELEASE	DRR	12/27/11
B	8000005979	CHANGE NOSE CORNER BRKT, ADD GUB-4240	MSM	11/25/14
C	8000007579	NEW RINGMOUNT WELDMENT DESIGN	RJC	04/07/15

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> .X = ± .12 ANGLES ±2° .XX = ± .06 FRACTIONS ±1/32 .XXX = ± .03 REMOVE BURRS AND BREAK EDGES .005			<small>CHECKED BY:</small> TP	<small>SCALE:</small> NTS	<small>DESCRIPTION:</small> LOW PROFILE PLATFORM KIT 8' FACE
<small>DO NOT SCALE THIS PRINT</small>			<small>DATE:</small> 10/18/11	<small>MATERIAL:</small> A36, A500	<small>DRAWING TYPE:</small> ASSEMBLY DRAWING
			<small>REVISION:</small> C	<small>FINISH:</small> GALV A123	 WESTCHESTER, IL. 60154 U.S.A.
				<small>WEIGHT:</small> 1410.14 LBS	

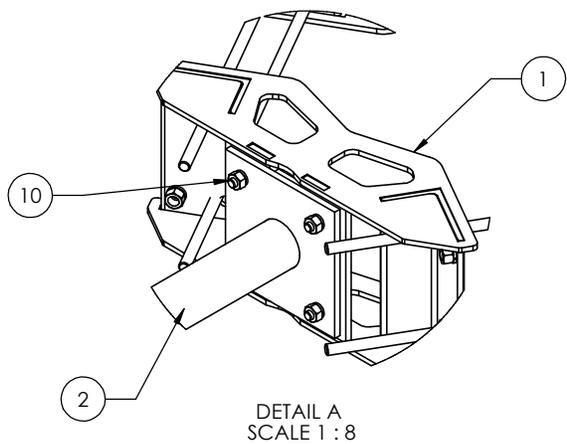


ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1	230.42 LBS
2	MTC300601	Low Profile Co-Location Platform Snub Nose	3	134.21 LBS
3	MT195801	Corner Weldment Snub Nose Handrail	3	27.10 LBS
4	XA2020.01	CROSS OVER ANGLE	9	2.65 LBS
5	GUB-4356	1/2" X 3-5/8" X 6" GALV U-BOLT	18	0.82 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

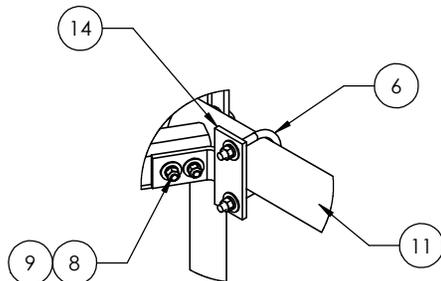
<small>These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.</small>			
DESIGNED BY: MSM	DRAWN BY: TP	DATE: 10/18/11	REV: C
<small>ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS 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		SHEET: 2 of 3 TITLE: 25" OD Snub Nose MT-196 MATERIAL: A36, A53 FINISH: GALV A123 WEIGHT: 1361.27 LBS	PART NUMBER: MC-PK8-C DRAWING TYPE: ASSEMBLY DRAWING  WESTCHESTER, IL. 60154 U.S.A.

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

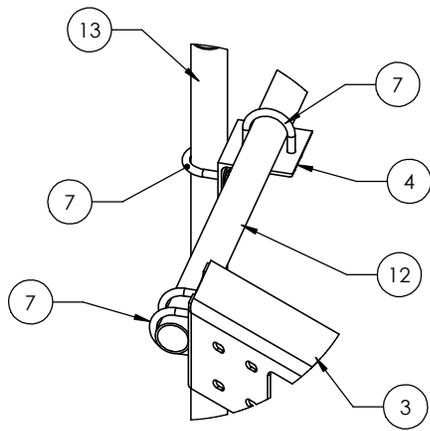
8 7 6 5 4 3 2 1



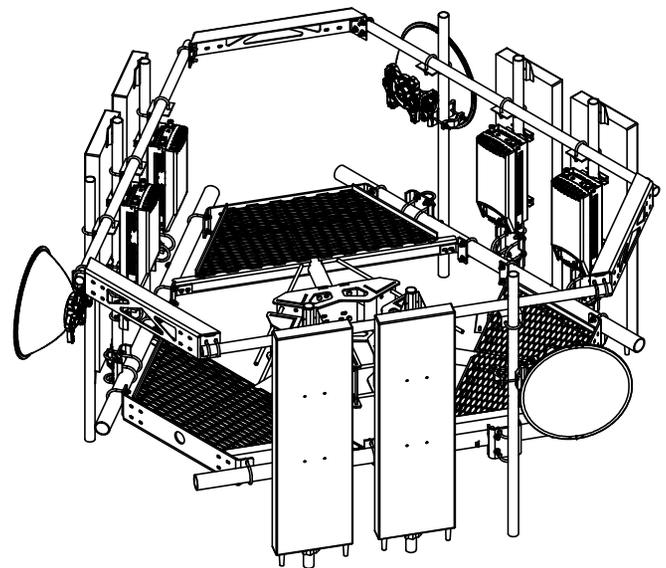
DETAIL A
SCALE 1 : 8



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: 806369

BOBDL00044A
439-455 Homestead Avenue
Hartford, Connecticut 06105

June 24, 2021

EBI Project Number: 6221003213

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	48.94%

June 24, 2021

Dish Wireless

Emissions Analysis for Site: 806369 - BOBDL00044A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **439-455 Homestead Avenue in Hartford, 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 439-455 Homestead Avenue in Hartford, 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 10 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 5G 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 5G 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 10 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 10 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 93 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 #:	I	Antenna #:	I	Antenna #:	I
Make / Model:	JMA MX08FRO665-2I	Make / Model:	JMA MX08FRO665-2I	Make / Model:	JMA MX08FRO665-2I
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):	93 feet	Height (AGL):	93 feet	Height (AGL):	93 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):	36,123.20	ERP (W):	36,123.20	ERP (W):	36,123.20
Antenna AI MPE %:	21.91%	Antenna BI MPE %:	21.91%	Antenna CI MPE %:	21.91%

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	21.91%
Sprint	1.23%
Clearwire	0.19%
Sensus (CL&P)	0.25%
Metro PCS	1.57%
T-Mobile	13.2%
Verizon	2.87%
AT&T	7.72%
Site Total MPE % :	48.94%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	21.91%
Dish Wireless Sector B Total:	21.91%
Dish Wireless Sector C Total:	21.91%
Site Total MPE % :	
	48.94%

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 5G	4	1667.71	93.0	31.69	600 MHz 5G	400	7.92%
Dish Wireless 1900 MHz 5G	4	7363.09	93.0	139.89	1900 MHz 5G	1000	13.99%
						Total:	21.91%

• 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:

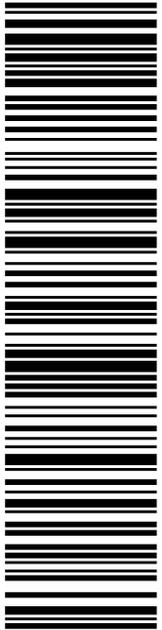
Dish Wireless Sector	Power Density Value (%)
Sector A:	21.91%
Sector B:	21.91%
Sector C:	21.91%
Dish Wireless Maximum MPE % (Sector A):	21.91%
Site Total:	48.94%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **48.94%** 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

Recipient Mailings



USPS TRACKING #

9405 5036 9930 0482 0855 32

Electronic Rate Approved #038555749

SHIP

TO: LUKE BRONIN
MAYOR OF HARTFORD
550 MAIN ST RM 200
HARTFORD CT 06103-2913

P

08/24/2021

U.S. POSTAGE PAID
click-n-ship®

USPS.com 9405 5036 9930 0482 0855 32 0000 0000 0010 6103
US POSTAGE Flat Rate Env
Mailed from 01566

PRIORITY MAIL 2-DAY™

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

Expected Delivery Date: 08/27/21
Ref#: DS-806369
0006

C006



Click-N-Ship®



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 0482 0855 32

Trans. #: 541503321	Priority Mail® Postage: \$7.95
Print Date: 08/23/2021	Total: \$7.95
Ship Date: 08/24/2021	
Expected Delivery Date: 08/27/2021	

From: DEBORAH CHASE Ref#: DS-806369
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

To: LUKE BRONIN
MAYOR OF HARTFORD
550 MAIN ST RM 200
HARTFORD CT 06103-2913

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Mailed from 01566

PRIORITY MAIL 2-DAY™

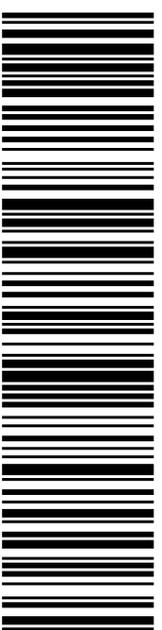
Expected Delivery Date: 08/27/21
 Re#: DS-806369
0006

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

C003

SHIP TO: AIMEE CHAMBERS
 DIRECTOR OF PLANNING
 250 CONSTITUTION PLZ
 FL 4
 HARTFORD CT 06103-1800

USPS TRACKING #



9405 5036 9930 0482 0855 56

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 0482 0855 56

Trans. #: 541503321	Priority Mail® Postage: \$7.95
Print Date: 08/23/2021	Total: \$7.95
Ship Date: 08/24/2021	
Expected Delivery Date: 08/27/2021	

From: DEBORAH CHASE Re#: DS-806369
 NORTHEAST SITE SOLUTIONS
 420 MAIN ST
 STE 1
 STURBRIDGE MA 01566-1359

To: AIMEE CHAMBERS
 DIRECTOR OF PLANNING
 250 CONSTITUTION PLZ
 FL 4
 HARTFORD CT 06103-1800

* 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.



Thank you for shipping with the United States Postal Service!
 Check the status of your shipment on the USPS Tracking® page at usps.com



UNITED STATES POSTAL SERVICE®

Click-N-Ship®

P

usps.com 9405 5036 9930 0482 0855 70 0000 0000 0010 6111
\$7.95
US POSTAGE
Flat Rate Env
U.S. POSTAGE PAID
Click-N-Ship®

08/24/2021 Mailed from 01566

PRIORITY MAIL 2-DAY™

Expected Delivery Date: 08/27/21
Re#: DS-806369
0006

C015

SHIP TO:
TALAR PROPERTIES LLC
705 N MOUNTAIN RD
NEWINGTON CT 06111-1412

USPS TRACKING #



9405 5036 9930 0482 0855 70

Electronic Rate Approved #038555749



Cut on dotted line.

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0482 0855 70

Trans. #: 541503321	Priority Mail® Postage: \$7.95
Print Date: 08/23/2021	Total: \$7.95
Ship Date: 08/24/2021	
Expected Delivery Date: 08/27/2021	

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

Re#: DS-806369

To: TALAR PROPERTIES LLC
705 N MOUNTAIN RD
NEWINGTON CT 06111-1412

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**UNITED STATES
POSTAL SERVICE®**

Click-N-Ship®

P

usps.com 9405 5036 9930 0482 0855 87 0000 0000 0031 4586
US POSTAGE
 Flat Rate Envoy

U.S. POSTAGE PAID
Click-N-Ship®

08/24/2021 Mailed from 01566

PRIORITY MAIL 2-DAY™

Expected Delivery Date: 08/27/21
 Re#: DS-806369
0006

R013

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

USPS TRACKING #



9405 5036 9930 0482 0855 87

Electronic Rate Approved #038555749



Cut on dotted line.

Instructions

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0482 0855 87

Trans. #: 541503321	Priority Mail® Postage: \$7.95
Print Date: 08/23/2021	Total: \$7.95
Ship Date: 08/24/2021	
Expected Delivery Date: 08/27/2021	

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

Re#: DS-806369

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

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CR 8000369



**UNITED STATES
POSTAL SERVICE.**

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

08/24/2021

12:20 PM

Product Qty Unit Price

Prepaid Mail 1 \$0.00
West Henrietta, NY 14586
Weight: 0 lb 2.00 oz
Acceptance Date:
Tue 08/24/2021
Tracking #:
9405 5036 9930 0482 0855 87

Prepaid Mail 1 \$0.00
Newington, CT 06111
Weight: 1 lb 7.60 oz
Acceptance Date:
Tue 08/24/2021
Tracking #:
9405 5036 9930 0482 0855 70

Prepaid Mail 1 \$0.00
Hartford, CT 06103
Weight: 1 lb 7.60 oz
Acceptance Date:
Tue 08/24/2021
Tracking #:
9405 5036 9930 0482 0855 32

Prepaid Mail 1 \$0.00
Hartford, CT 06103
Weight: 1 lb 7.50 oz
Acceptance Date:
Tue 08/24/2021
Tracking #:
9405 5036 9930 0482 0855 56

Grand Total:

\$0.00
