



**NORTHEAST**  
SITE SOLUTIONS

*Turnkey Wireless Development*

Northeast Site Solutions  
Denise Sabo  
4 Angela's Way, Burlington CT 06013  
203-435-3640  
[denise@northeastsitesolutions.com](mailto:denise@northeastsitesolutions.com)

June 2, 2022

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

RE: Tower Share Application  
116 Grant Hill Road, Brooklyn, CT 06234  
Latitude: 41.791388  
Longitude: -72.015277  
Site #: 876390\_Crown\_Dish

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 116 Grant Hill Road, Brooklyn, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 MHz 5G antennas and six (6) RRUs, at the 70-foot level of the existing 150-foot monopole tower, one (1) Fiber cable will also be installed. Dish Wireless LLC equipment cabinets will be placed within a 7' x 5' lease area within the base of the stealth structure. Included are plans by Hudson Design Group, dated April 4, 2022, Exhibit C. Also included is a structural analysis prepared by Morrison Hershfield, dated November 18, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the Town of Brooklyn on April 17, 2000. Please see attached Exhibit A.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Austin Tanner, First Selectman and Jana Butts Roberson, Director of Community Development for the Town of Brooklyn, as well as the tower owner and property owner (Crown/Global Signal).

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

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the existing tower is 150-feet and the Dish Wireless LLC antennas will be located at a centerline height of 70-feet.
2. The proposed modifications will not result in an increase of the site boundary as depicted on the attached site plan.



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

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. The combined site operations will result in a total power density of 24.20% as evidenced by Exhibit F.

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

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

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

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 70-foot level of the existing 150-foot tower would have an insignificant visual impact on the area around the tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

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

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

Sincerely,

*Denise Sabo*

Denise Sabo

Mobile: 203-435-3640

Fax: 413-521-0558

Office: 4 Angela's Way, Burlington CT 06013

Email: [denise@northeastsitesolutions.com](mailto:denise@northeastsitesolutions.com)



**NSS**

**NORTHEAST**  
SITE SOLUTIONS

*Turnkey Wireless Development*

Attachments

Cc: Austin Tanner, First Selectman  
Town of Brooklyn  
4 Wolf Den Road  
PO Box 356  
Brooklyn 06234

Jana Butts Roberson, Director of Community Development  
Town of Brooklyn  
69 South Main Street  
Suite 22  
Brooklyn, CT 06234

Crown Castle, Tower & Property Owner  
Sprint Spectrum  
C/O Global Signal AC1 II LLC  
PMB353  
4017 Washington Rd  
McMurray, PA 15317

# Exhibit A

## **Original Facility Approval**



PERMIT NO. **No. 005802**

## APPLICATION FOR BUILDING PERMIT

TOWN OF BROOKLYN  
CONNECTICUT

(Application must be typed or printed)

LOCATION OF JOB (NO. & STREET) <b>116 Short Hill</b>		CARD NO.	MAP <b>4</b>	BLOCK	LOT <b>5</b>
OWNER <b>Robert Bernier</b>	TEL.	ADDRESS (NO., STREET, TOWN, STATE, ZIP) <b>None</b>			
APPLICANT <b>Sprint Spectrum</b>	TEL.	ADDRESS (NO., STREET, TOWN, STATE, ZIP) <b>9 Barnes Ind. Rd Wallingford Ct 06492</b>			
BUILDER	TEL.	ADDRESS (NO., STREET, TOWN, STATE, ZIP)			
LICENSE #	NAME & TEL. # OF PERSON RESPONSIBLE				

## All Permits Must Be Posted And Visible From The Street

<b>SIZE OF BUILDING</b> STORIES _____ NO. OF FAMILIES _____ HEIGHT _____ DEPTH _____ FRONT _____ TOTAL FLOOR AREA (NEW) _____ SQ.FT.		<b>DISTANCES FROM LOT LINE</b> (Circle Front Lot Line) EAST _____ WEST _____ NORTH _____ SOUTH _____ <b>PROPOSED USE</b> <input type="checkbox"/> NEW HOME (Single Family) <input type="checkbox"/> MULTI FAMILY # OF BEDROOMS _____ WATER SUPPLY _____ <input type="checkbox"/> ADDITION <input type="checkbox"/> GARAGE <input type="checkbox"/> DECK/PORCH <input type="checkbox"/> SHED <input type="checkbox"/> POOL <input type="checkbox"/> COMMERCIAL/PUBLIC <input type="checkbox"/> OTHER _____		<b>OTHER REQUIREMENTS</b> ZONING PERMIT _____ REQ'D. _____ ATTACHED _____ PLOT PLAN _____ REQ'D. _____ ATTACHED _____ SEPTIC PERMIT _____ REQ'D. _____ ATTACHED _____																												
<b>TYPE OF WORK BEING DONE</b> <input type="checkbox"/> ORIG. CONSTRUCTION <input type="checkbox"/> REPAIR <input type="checkbox"/> ALTERATION <input type="checkbox"/> DEMOLITION <input type="checkbox"/> ADDITION		<b>CONSTRUCTION VALUE</b> ESTIMATED _____ ACTUAL _____		<b>APPROVALS</b> ZONING _____ FIRE MARSHAL _____ WETLAND _____ ENGINEER _____ SANITATION _____ STREET SUPT. _____																												
<b>TYPE OF HEAT</b> <input type="checkbox"/> ELECTRIC <input type="checkbox"/> SOLAR <input type="checkbox"/> GAS <input type="checkbox"/> OTHER <input type="checkbox"/> OIL		<b>BUILDING PLANS</b> _____ REQUIRED _____ ATTACHED _____ <b>MATERIALS LIST</b> _____ ON PLANS _____ ATTACHED _____		<b>FEE COVERS</b> <table border="1"> <thead> <tr> <th></th> <th>VALUE</th> <th>FEE</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> CONSTRUCTION</td> <td><b>118,000</b></td> <td><b>826</b></td> </tr> <tr> <td><input type="checkbox"/> PLUMBING</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> HEATING</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> ELECTRICAL</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> SEPTIC</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> ZONING</td> <td></td> <td><b>35</b></td> </tr> <tr> <td><input type="checkbox"/> OTHER</td> <td></td> <td></td> </tr> <tr> <td><b>TOTAL</b></td> <td></td> <td><b>861</b></td> </tr> </tbody> </table> CHECK # <b>0588</b> DATE PAID <b>4-6-00</b>			VALUE	FEE	<input checked="" type="checkbox"/> CONSTRUCTION	<b>118,000</b>	<b>826</b>	<input type="checkbox"/> PLUMBING			<input type="checkbox"/> HEATING			<input type="checkbox"/> ELECTRICAL			<input type="checkbox"/> SEPTIC			<input checked="" type="checkbox"/> ZONING		<b>35</b>	<input type="checkbox"/> OTHER			<b>TOTAL</b>		<b>861</b>
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<input type="checkbox"/> OTHER																																
<b>TOTAL</b>		<b>861</b>																														

DESCRIPTION OF WORK / REMARKS:

**150' ~~tower~~ telecommunication tower**

All work covered by this application has been authorized by the (owner) or (agent) of this property and will be done according to state regulations. This permit shall lapse if work does not commence within 6 months.

**4/17/00**  
Date

**Archie J. Roberts**  
Owner/Agent Signature

☒ APPROVED  
**4/17/00**  
Date

☐ DISAPPROVED  
**John R. [Signature]**  
Building Official

Office Copy - White

Owner Copy - Yellow

Assessor's Copy - Pink

Building Official - Green

Building Official - Goldenrod

# Exhibit B

## **Property Card**

116 GRANT HILL RD

Location	116 GRANT HILL RD	Mblu	4/ / 5/ CELL/
Acct#	00024910	Owner	SPRINT SPECTRUM
Assessment	\$845,500	Appraisal	\$1,207,800
PID	3735	Building Count	1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2020	\$1,207,800	\$0	\$1,207,800
Assessment			
Valuation Year	Improvements	Land	Total
2020	\$845,500	\$0	\$845,500

Owner of Record

Owner	SPRINT SPECTRUM	Sale Price	\$0
Co-Owner	C/O GLOBAL SIGNAL AC1 II LLC	Certificate	
Care Of		Book	0000
Address	PMB353	Page	0000
	4017 WASHINGTON RD	Sale Date	10/01/2009
	MCMURRAY, PA 15317	Instrument	
		Qualified	U

Ownership History

Ownership History						
Owner	Sale Price	Certificate	Instrument	Sale Date	Book	Page
SPRINT SPECTRUM	\$0			10/01/2009	0000	0000

Building Information

Building 1 : Section 1

Year Built:	
Living Area:	0
Replacement Cost:	\$0
Building Percent Good:	

Replacement Cost  
Less Depreciation: \$0

Building Attributes	
Field	Description
Style:	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Cndtn	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

Building Photo



(https://images.vgsi.com/photos/BrooklynCTPhotos/default.jpg)

Building Layout

Building Layout (ParcelSketch.ashx?pid=3735&bid=3668)

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

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Use Code

Description

Zone

Neighborhood

Alt Land Appr

Category

4300

TEL TWR MDL00

No

Size (Acres)

Frontage

Depth

Assessed Value

Appraised Value

0

\$0

\$0

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
SHD5	Cell Shed			360.00 SF	\$54,000	1
FN3	FENCE-6' CHAIN			280.00 L.F.	\$1,300	1
TWR	CELL TOWER			1.00 UNITS	\$90,000	1
ARY	CELL ARRAY			5.00 UNIT	\$1,062,500	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2020	\$1,207,800	\$0	\$1,207,800
2019	\$1,055,300	\$0	\$1,055,300
2018	\$1,055,300	\$0	\$1,055,300

Assessment			
Valuation Year	Improvements	Land	Total
2020	\$845,500	\$0	\$845,500
2019	\$738,700	\$0	\$738,700
2018	\$738,700	\$0	\$738,700





neccog

Neccog GIS Site



1: 9,028



0.3 0 0.14 0.3 Miles

WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
© Latitude Geographics Group Ltd.

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

THIS MAP IS NOT TO BE USED FOR NAVIGATION

### Legend

- Town
- Buildings 2012
- Parcels

### Notes

116 Grant Hill Road, Brooklyn, CT

# Exhibit C

## **Construction Drawings**



DISH Wireless L.L.C. SITE ID:

**BOBOS00895A**

DISH Wireless L.L.C. SITE ADDRESS:

**116 GRANT HILL RD.  
BROOKLYN, CT 06234**

#### CONNECTICUT CODE OF 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	2016 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

#### SHEET INDEX

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

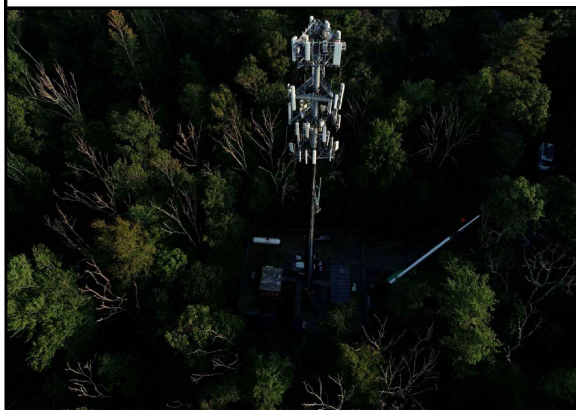
#### SCOPE OF WORK

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

- TOWER SCOPE OF WORK:
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
  - INSTALL (1) PROPOSED ANTENNA 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
  - INSTALL (1) PROPOSED CABLE ENTRY PORT

- GROUND SCOPE OF WORK:
- INSTALL (1) PROPOSED METAL PLATFORM
  - INSTALL (1) PROPOSED ICE BRIDGE
  - INSTALL (1) PROPOSED PPC CABINET
  - INSTALL (1) PROPOSED EQUIPMENT CABINET
  - INSTALL (1) PROPOSED POWER CONDUIT
  - INSTALL (1) PROPOSED TELCO CONDUIT
  - INSTALL (1) PROPOSED TELCO-FIBER BOX
  - INSTALL (1) PROPOSED GPS UNIT
  - INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)
  - INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)
  - INSTALL (1) PROPOSED NEW 200A METER IN EXISTING SOCKET

#### SITE PHOTO



UNDERGROUND SERVICE ALERT CBYD 811  
UTILITY NOTIFICATION CENTER OF CONNECTICUT  
(800) 922-4455  
WWW.CBYD.COM

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION



#### GENERAL NOTES

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

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

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

#### SITE INFORMATION

PROPERTY OWNER: BERNER, DAWNA G & JEAN-PAUL  
PROPERTY OWNER: 116 GRANT HILL RD.  
ADDRESS: BROOKLYN, CT 06234  
TOWER TYPE: MONOPOLE  
  
TOWER CO SITE ID: 876390  
  
TOWER APP NUMBER: 572911  
  
COUNTY: WINDHAM  
  
LATITUDE (NAD 83): 41° 47' 29.64" N  
41.79156667  
LONGITUDE (NAD 83): 72° 0' 54.04" W  
-72.01501111  
ZONING JURISDICTION: CONNECTICUT SITING COUNCIL, CT  
ZONING DISTRICT: RA-RESIDENTIAL-AGRICULTURAL  
  
PARCEL NUMBER: BROO-024900-000000  
  
OCCUPANCY GROUP: U  
  
CONSTRUCTION TYPE: II-B  
  
POWER COMPANY: NORTHEAST UTILITIES  
  
TELEPHONE COMPANY: TBD

#### PROJECT DIRECTORY

APPLICANT: DISH Wireless L.L.C.  
5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120  
  
TOWER OWNER: CROWN CASTLE  
2000 CORPORATE DRIVE  
CANONSBURG, PA 15317  
(877) 486-9377  
  
SITE DESIGNER: HUDSON DESIGN GROUP, LLC.  
45 BEECHWOOD DRIVE  
NORTH ANDOVER, MA 01845  
(978) 557-5553  
  
SITE ACQUISITION: COURTNEY PRESTON  
COURTNEY.PRESTON@CROWNCASTLE.COM  
@CROWNCASTLE.COM  
  
CONSTRUCTION MANAGER: JAVIER SOTO  
JAVIER.SOTO@DISH.COM  
  
RF ENGINEER: DIPESH PARIKH  
DIPESH.PARIKH@DISH.COM

#### DIRECTIONS

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT (BDL):  
START OUT GOING WEST ON SCHOEHOESTER RD. MAKE A U-TURN ONTO SCHOEHOESTER RD. MAKE A U-TURN ONTO SCHOEHOESTER RD. MERGE ONTO CT-20 E TOWARD HARTFORD/SPRINGFIELD/1-81. MERGE ONTO I-81 S TOWARD HARTFORD. MERGE ONTO I-291 E VIA EXIT 35A TOWARD MANCHESTER. TAKE THE EXIT TOWARD I-384/1-54 W/HARTFORD. MERGE ONTO I-384 E VIA THE RAMP ON THE LEFT. I-384 E BECOMES BOSTON TURNPIKE/US-6 E/US-44 E. TAKE US-6 E TOWARD WILLIAMANTIC/PROVIDENCE. TURN SLIGHT LEFT ONTO ROUTE 6/US-6 E. CONTINUE TO FOLLOW US-6 E. MERGE ONTO US-6 E TOWARD WINDHAM AIRPORT/DANIELSON/PROVIDENCE. TURN LEFT ONTO CHERRY HILL RD. TAKE THE 1ST LEFT ONTO GRANT HILL RD. 116 GRANT HILL RD, BROOKLYN, CT 06234-1450, 116 GRANT HILL RD IS ON THE RIGHT.

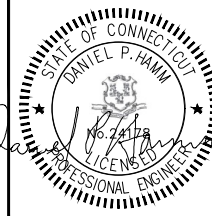
#### VICINITY MAP



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



45 BEECHWOOD DRIVE N. ANDOVER, MA 01845  
TEL: (978) 557-5553 FAX: (978) 336-5556



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: PS CHECKED BY: SMA APPROVED BY: DPH

RFDS REV #: 2

#### PRELIMINARY REVIEW

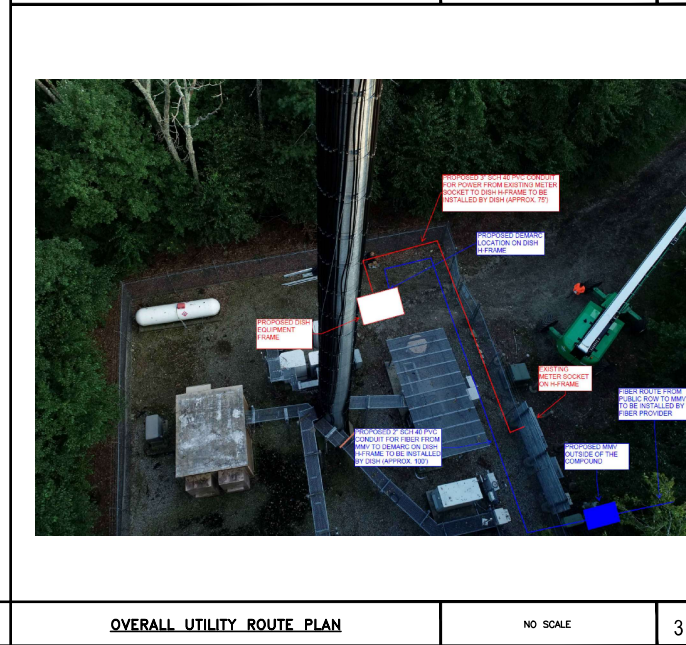
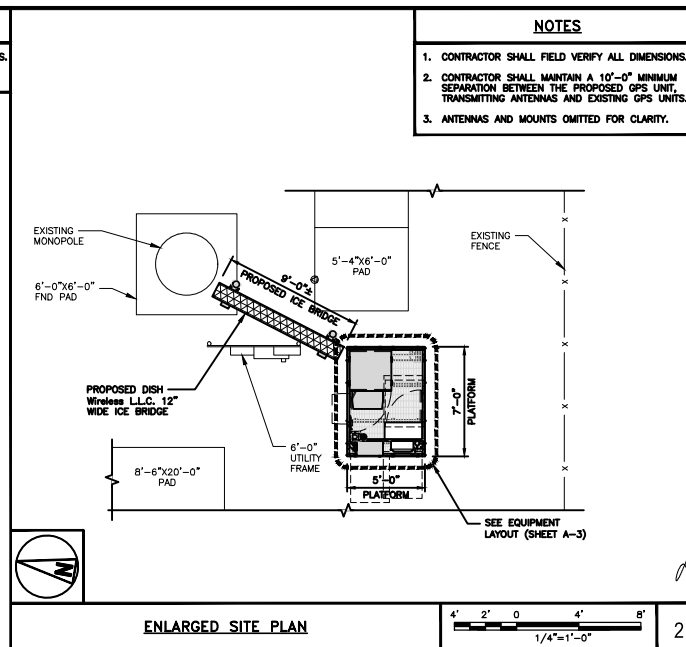
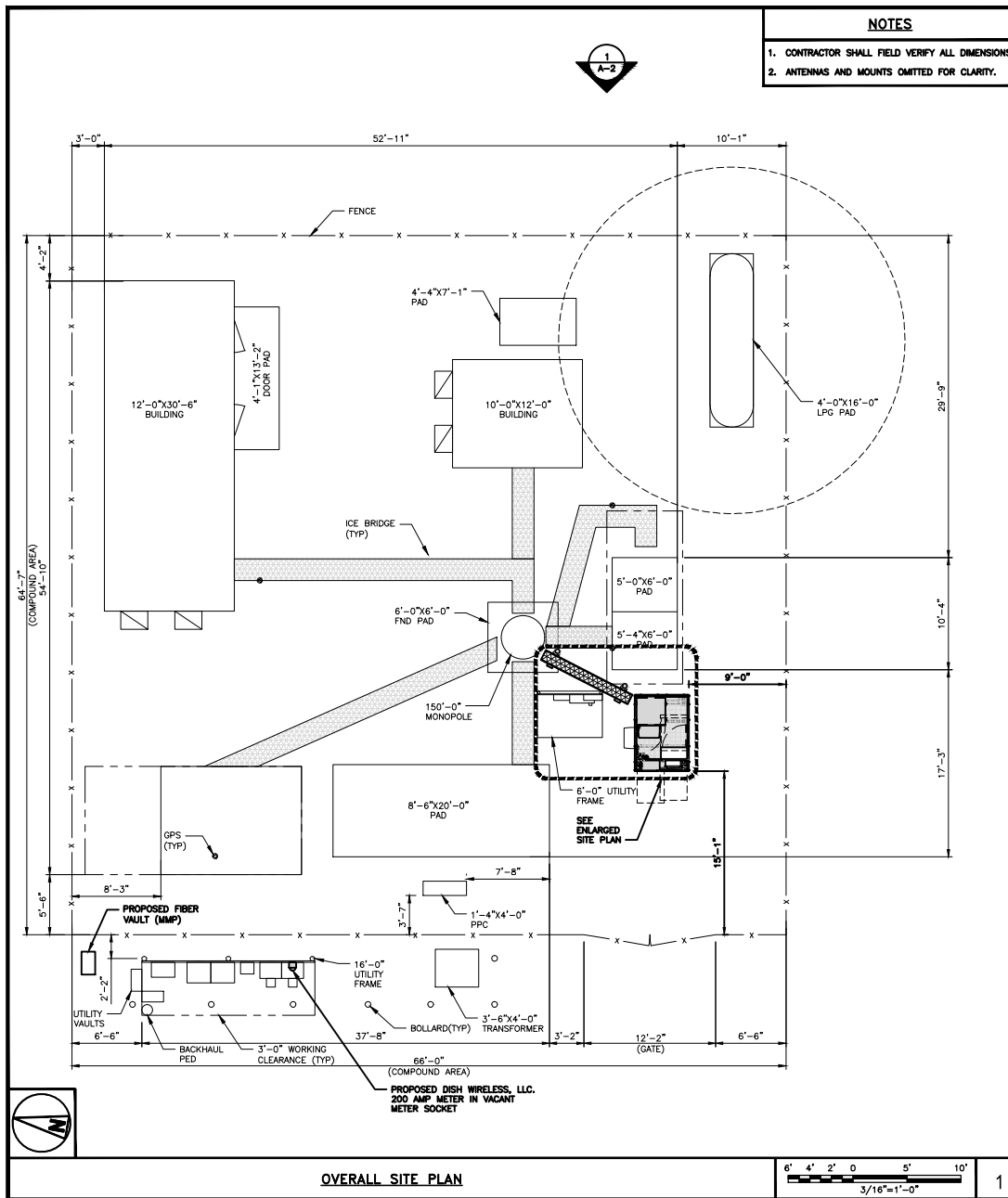
REV	DATE	DESCRIPTION
A	01/04/2022	ISSUED FOR REVIEW
B	04/04/2022	ISSUED FOR REVIEW

A&E PROJECT NUMBER  
**BOBOS00895A**  
  
DISH Wireless L.L.C.  
PROJECT INFORMATION  
**BOBOS00895A**  
CROWN CASTLE BU# 876390  
116 GRANT HILL RD.  
BROOKLYN, CT 06234

SHEET TITLE  
**TITLE SHEET**

SHEET NUMBER  
**T-1**





5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

45 BEECHWOOD DRIVE  
N. ANDOVER, MA 01945  
TEL: (978) 557-5553  
FAX: (978) 336-5556

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:
PS	SMA	DPH

RFDS REV #: 2

**PRELIMINARY REVIEW**

SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/04/2022	ISSUED FOR REVIEW
B	04/04/2022	ISSUED FOR REVIEW

A&E PROJECT NUMBER  
**BOBOS00895A**

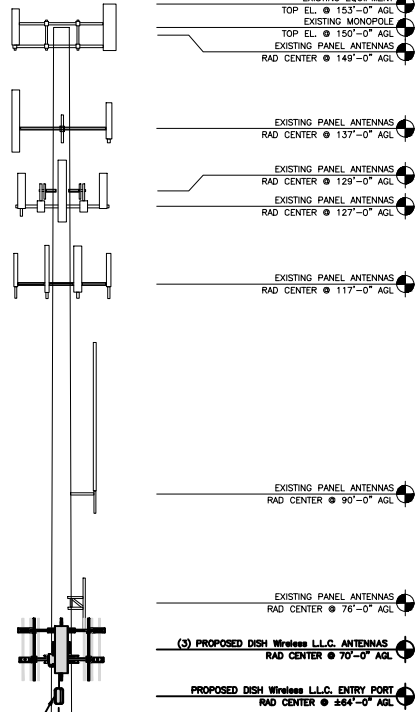
DISH Wireless L.L.C. PROJECT INFORMATION  
**BOBOS00895A**  
CROWN CASTLE BU# 876390  
116 GRANT HILL RD.  
BROOKLYN, CT 06234

SHEET TITLE  
**OVERALL AND ENLARGED SITE PLAN**

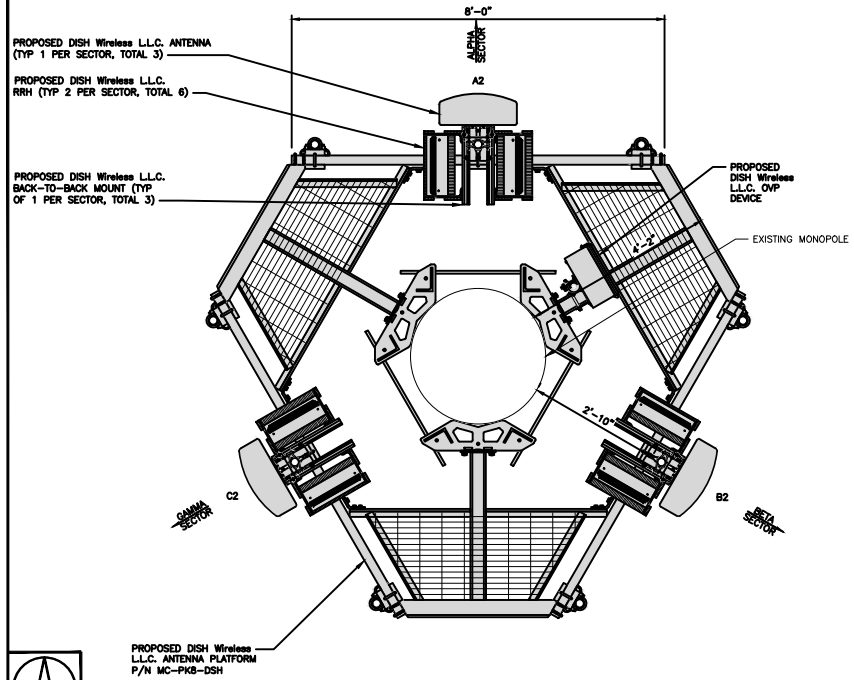
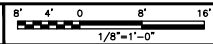
SHEET NUMBER  
**A-1**

# NOTES

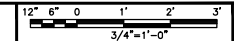
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED ELEVATION



ANTENNA LAYOUT



SECTOR POS.	EXISTING OR PROPOSED	ANTENNA				TRANSMISSION CABLE	RRH			OVP
		MANUFACTURER -- MODEL NUMBER	TECH	AZIMUTH	RAD CENTER		MANUFACTURER -- MODEL NUMBER	TECH	POS.	
A1	---	---	---	---	---	(1) HIGH-CAPACITY HYBRID CABLE (105' LONG)	FLUTSU-TA08025-B604	5G	A2	RAYCAP/RRDIO 9181-PF-48
A2	PROPOSED	COMMScope FFVW-65B-R2	5G	0°	70'-0"		FLUTSU-TA08025-B605	5G	A2	
A3	---	---	---	---	---		---	---	---	
B1	---	---	---	---	---	SHARED W/ALPHA	FLUTSU-TA08025-B604	5G	B2	SHARED W/ALPHA
B2	PROPOSED	COMMScope FFVW-65B-R2	5G	120°	70'-0"		FLUTSU-TA08025-B605	5G	B2	
B3	---	---	---	---	---		---	---	---	
C1	---	---	---	---	---	SHARED W/ALPHA	FLUTSU-TA08025-B604	5G	C2	SHARED W/ALPHA
C2	PROPOSED	COMMScope FFVW-65B-R2	5G	240°	70'-0"		FLUTSU-TA08025-B605	5G	C2	
C3	---	---	---	---	---		---	---	---	

## NOTES

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.

ANTENNA SCHEDULE

NO SCALE 3

**dish**  
wireless.

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

**HDG**  
HUDSON  
Design Group LLC

45 BEECHWOOD DRIVE TEL: (978) 557-5553  
N. ANDOVER, MA 01945 FAX: (978) 336-5556



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DRAWN BY: PS CHECKED BY: SMA APPROVED BY: DPH

RFDS REV #: 2

## PRELIMINARY REVIEW

SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/04/2022	ISSUED FOR REVIEW
B	04/04/2022	ISSUED FOR REVIEW

A&E PROJECT NUMBER

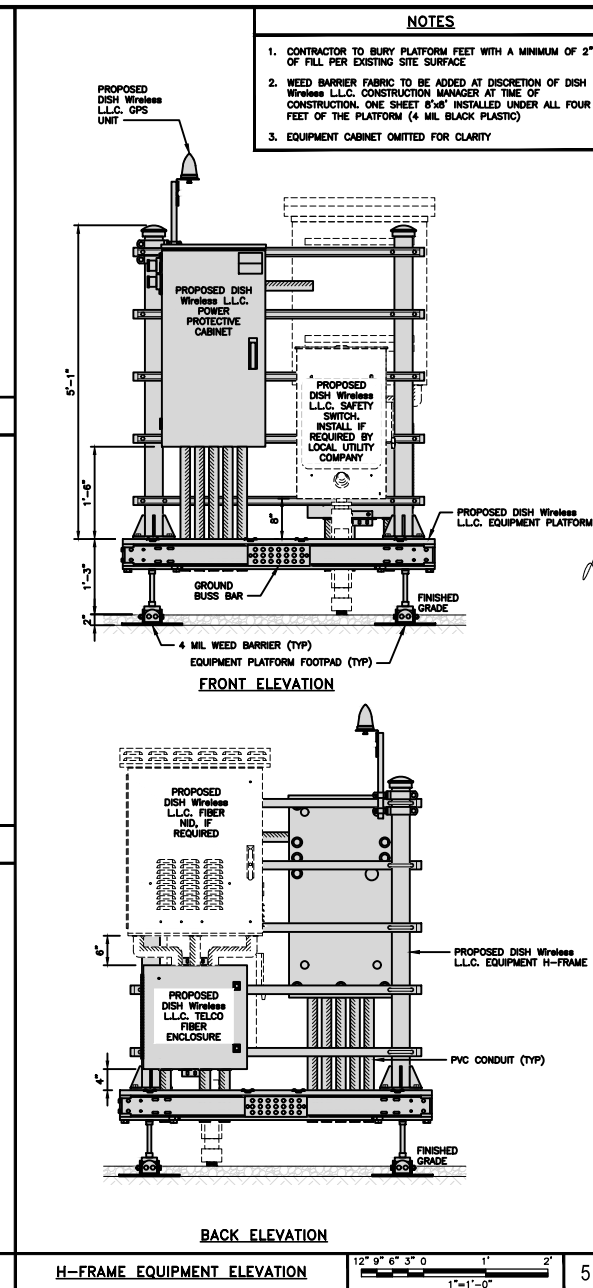
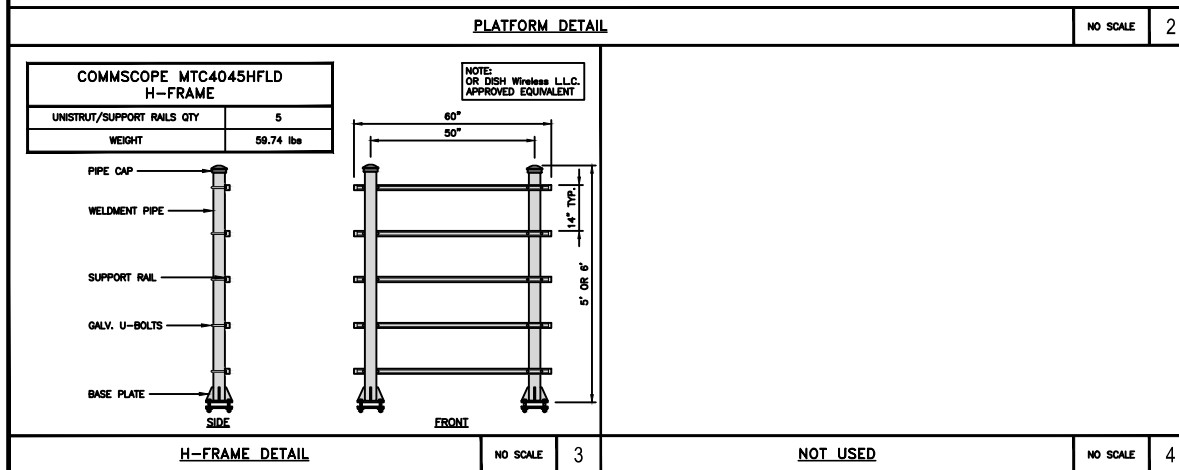
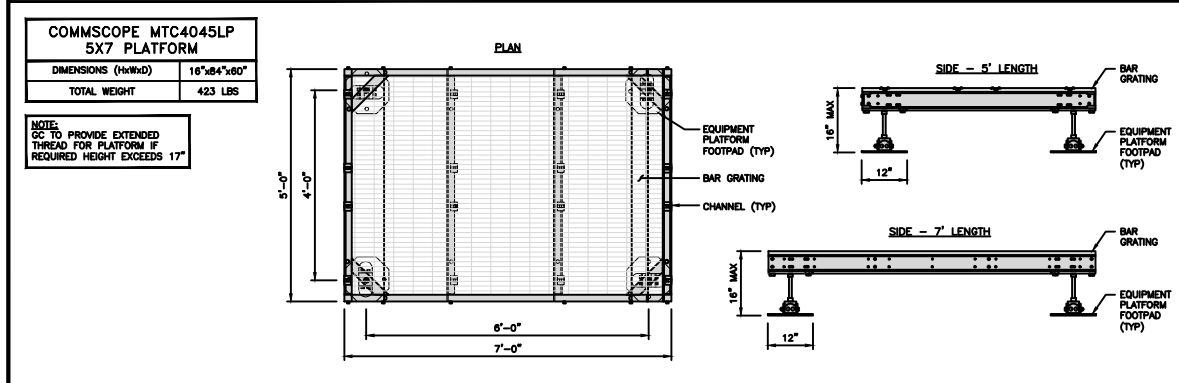
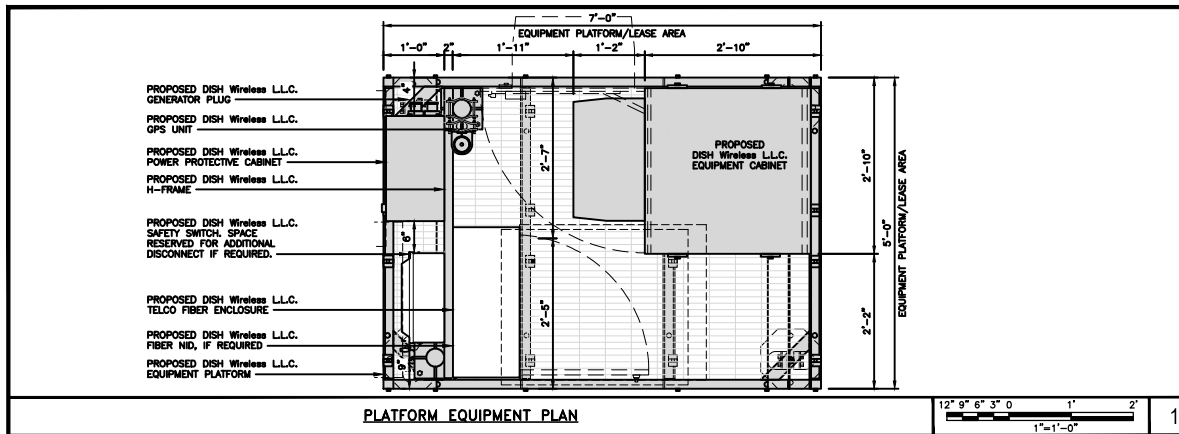
BOBOS00895A

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBOS00895A  
CROWN CASTLE BU# 876390  
116 GRANT HILL RD.  
BROOKLYN, CT 06234

SHEET TITLE  
ELEVATION, ANTENNA  
LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



- 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 LLC. 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

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

45 BEECHWOOD DRIVE  
N. ANDOVER, MA 01945  
TEL: (978) 557-5553  
FAX: (978) 557-5556

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DISH Wireless LLC. PROJECT INFORMATION  
BOBOS00895A  
CROWN CASTLE BU# 876390  
116 GRANT HILL RD.  
BROOKLYN, CT 06234

SHEET TITLE  
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER  
A-3

CHARLES INDUSTRY HEX CUBE-PM639155N4

DIMENSIONS (HxWxD)

74"x32"x32"

POWER PLANT

-48VDC ABB/600W

TOTAL WEIGHT (EMPTY)

408 lbs

PLAN

BACK

SIDE

FRONT

RAYCAP PPC RDIAC-2465-P-240-MTS

ENCLOSURE DIMENSIONS (HxWxD)

39"x22.855"x12.593

WEIGHT

80 lbs

OPERATING AC VOLTAGE

240/120 1 PHASE 3W+G

TOP

BACK

SIDE

FRONT

SIDE

SQUARE D SAFETY SWITCHES D224NRB

ENCLOSURE DIM (HxWxD)

29.25"x19.00"x8.50"

ENCLOSURE TYPE

NEMA 3R RAINPROOF

UL LISTED

FILE E-2875

TOP

SIDE

FRONT

CABINET DETAIL

NO SCALE

1

POWER PROTECTION CABINET (PPC) DETAIL

NO SCALE

2

SAFETY SWITCH DETAIL

NO SCALE

3

ZAYO 5RU (LEFT SWING DOOR) FIBER NID ENCLOSURE

DIMENSIONS (HxWxD)

36.1"x29"x12.9"

WEIGHT

85 lbs

BOTTOM

BACK

SIDE

FRONT

CHARLES CFIT-PF2020DSH1 FIBER TELCO ENCLOSURE

ENCLOSURE DIMS (HxWxD)

20"x20"x9"

ENCLOSURE WEIGHT

20 lbs

MOUNTING

WALL

COMPLIANCE

TYPE 4

FRONT

SIDE

BACK

FRONT

NOT USED

NO SCALE

4

FIBER NID ENCLOSURE DETAIL

NO SCALE

5

FIBER TELCO ENCLOSURE DETAIL

NO SCALE

6

COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT

DIMENSIONS (HxL)

160"x10"

WEIGHT/ VOLUME

325.0 LBS

CABLE RUN (QTY)

12

INCLUDED PRODUCTS:

WB-T12-3 TRAPEZE KIT, 3 RUNGS

WB-LB12-3 SUPPORT BRACKET

MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"

TRAPEZE KIT (WB-T12-3)

SUPPORT BRACKET (WB-LB12-3)

TRAPEZE KIT (WB-T12-3)

TRAPEZE KIT (WB-T12-3)

3.5" DIA GALV SCH 40 PIPE (SPACED 9'-0" MAX) (MF-130)

3.5" DIA GALV SCH 40 PIPE (SPACED 9'-0" MAX) (MF-130)

PLAN

FRONT

SIDE

FINISH SLOPE TO DRAIN

PROPOSED 3.5" DIA SCH 40 PIPE GALVANIZED

PROPOSED 1'-6" DIA. CONCRETE PIER (TYP)

CONCRETE PIER

3" DIA SCH 40 PIPE

18" DIA DRILLED PIER FOUNDATION

A-A SECTION

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

8

PROPOSED ICE BRIDGE

PROPOSED 1-3/8" DIA HYBRID CABLE

PROPOSED CABLE CLAMP @ 3'-0" O.C.

EXISTING ENTRY PORT

EXISTING MONOPOLE

HYBRID CABLE RUN

NO SCALE

9

STATE OF CONNECTICUT

DANIEL P. HAMM

NO. 24178

PROFESSIONAL ENGINEER

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DRAWN BY:

PS

CHECKED BY:

SMA

APPROVED BY:

DPH

RFDS REV #:

2

PRELIMINARY REVIEW

SUBMITTALS

REV

DATE

DESCRIPTION

A

01/04/2022

ISSUED FOR REVIEW

B

04/04/2022

ISSUED FOR REVIEW

A&E PROJECT NUMBER

BOBOS00895A

DISH Wireless L.L.C. PROJECT INFORMATION

BOBOS00895A

CROWN CASTLE BU# 876390

116 GRANT HILL RD.

BROOKLYN, CT 06234

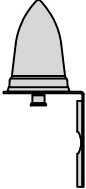
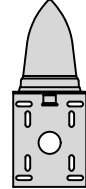

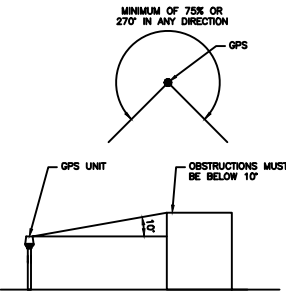
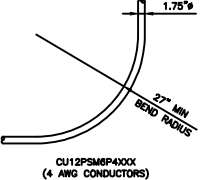
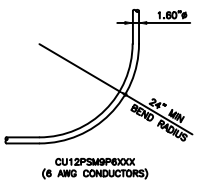
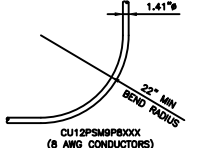
SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

A-4

DISH Wireless L.L.C. TEMPLATE VERSION 47 - 12/17/2021

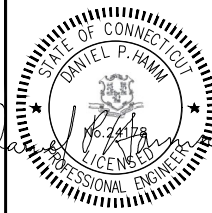
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;"><b>PCTEL</b> <b>GPSGL-TMG-SPI-40NCB</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">DIMENSIONS (DIAxH) MM/INCH</td> <td>81x184mm 3.2"x7.25"</td> </tr> <tr> <td>WEIGHT W/ACCESSORIES</td> <td>075 lbs</td> </tr> <tr> <td>CONNECTOR</td> <td>N-FEMALE</td> </tr> <tr> <td>FREQUENCY RANGE</td> <td>1590 ± 30MHz</td> </tr> </table> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>BACK</p> </div> <div style="text-align: center;">  <p>SIDE</p> </div> </div>			DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"	WEIGHT W/ACCESSORIES	075 lbs	CONNECTOR	N-FEMALE	FREQUENCY RANGE	1590 ± 30MHz	<div style="text-align: center;">  <p>TOP</p> </div> <div style="text-align: center; margin-top: 20px;">  <p>MINIMUM OF 75% OR 270° IN ANY DIRECTION</p> <p>GPS UNIT</p> <p>OBSTRUCTIONS MUST BE BELOW 10°</p> </div>			<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>CU12PSM8P400X (4 AWG CONDUCTORS)</p> </div> <div style="text-align: center;">  <p>CU12PSM8P600X (6 AWG CONDUCTORS)</p> </div> </div> <div style="text-align: center; margin-top: 20px;">  <p>CU12PSM8P600X (8 AWG CONDUCTORS)</p> </div>		
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"															
WEIGHT W/ACCESSORIES	075 lbs															
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FREQUENCY RANGE	1590 ± 30MHz															
GPS DETAIL			NO SCALE	1	GPS MINIMUM SKY VIEW REQUIREMENTS			NO SCALE	2	CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUS			NO SCALE	3		
NOT USED			NO SCALE	4	NOT USED			NO SCALE	5	NOT USED			NO SCALE	6		
NOT USED			NO SCALE	7	NOT USED			NO SCALE	8	NOT USED			NO SCALE	9		



5701 SOUTH SANTA FE DRIVE  
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DRAWN BY:	CHECKED BY:	APPROVED BY:
PS	SMA	DPH

RFDS REV #: 2

PRELIMINARY  
REVIEW

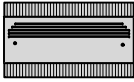
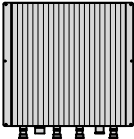
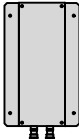
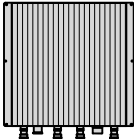

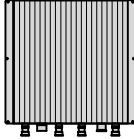
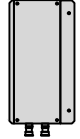
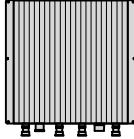
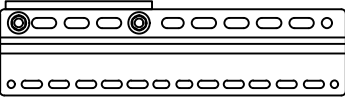




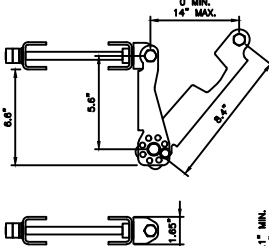
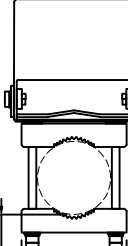
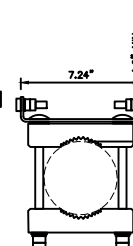


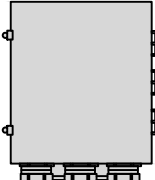
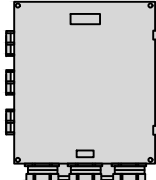
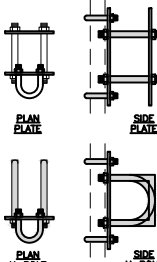
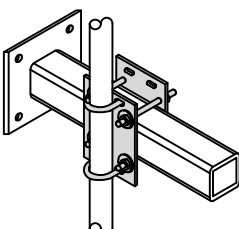
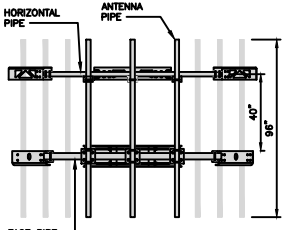
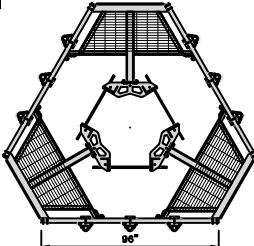
SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/04/2022	ISSUED FOR REVIEW
B	04/04/2022	ISSUED FOR REVIEW

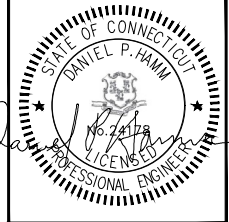
A&E PROJECT NUMBER  
BOBOS00895A

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBOS00895A  
CROWN CASTLE BU# 876390  
116 GRANT HILL RD.  
BROOKLYN, CT 06234

SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER  
**A-5**

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">FUJITSU TRIPLE BAND TA08025-B605</th> </tr> <tr> <td>DIMENSIONS (h x w x d)</td> <td>14.9"x15.7"x9"</td> </tr> <tr> <td>WEIGHT</td> <td>74.95 lbs</td> </tr> <tr> <td>CONNECTOR TYPE</td> <td>4.3-10 RF CONNECTOR</td> </tr> <tr> <td>POWER SUPPLY</td> <td>DC -55V--36V</td> </tr> </table> <div style="text-align: center;">  <p>PLAN</p> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;">    </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p>BACK</p> <p>SIDE</p> <p>FRONT</p> </div>	FUJITSU TRIPLE BAND TA08025-B605		DIMENSIONS (h x w x d)	14.9"x15.7"x9"	WEIGHT	74.95 lbs	CONNECTOR TYPE	4.3-10 RF CONNECTOR	POWER SUPPLY	DC -55V--36V	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">FUJITSU DUAL BAND TA08025-B604</th> </tr> <tr> <td>DIMENSIONS (h x w x d)</td> <td>14.9"x15.7"x7.8"</td> </tr> <tr> <td>WEIGHT</td> <td>63.9 lbs</td> </tr> <tr> <td>CONNECTOR TYPE</td> <td>4.3-10 RF CONNECTOR</td> </tr> <tr> <td>POWER SUPPLY</td> <td>DC -55V--36V</td> </tr> </table> <div style="text-align: center;">  <p>PLAN</p> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;">    </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p>BACK</p> <p>SIDE</p> <p>FRONT</p> </div>	FUJITSU DUAL BAND TA08025-B604		DIMENSIONS (h x w x d)	14.9"x15.7"x7.8"	WEIGHT	63.9 lbs	CONNECTOR TYPE	4.3-10 RF CONNECTOR	POWER SUPPLY	DC -55V--36V	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">SABRE DOUBLE Z-BRACKET C10123155</th> </tr> <tr> <td>DIMENSIONS (h x w x d) (1 BRACKET)</td> <td>5"x20"x1-13/16"</td> </tr> <tr> <td>WEIGHT (FULL ASSEMBLY)</td> <td>35.79 lbs</td> </tr> <tr> <td>PACKAGE QUANTITY</td> <td>4</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <th>#</th> <th>DESCRIPTION</th> </tr> <tr> <td>1</td> <td>PLATE, CHANNEL BRACKET</td> </tr> <tr> <td>2</td> <td>RRH Z BRACKET, 3/16"</td> </tr> <tr> <td>3</td> <td>THREADED ROD ASSEMBLY 1/2"x12"</td> </tr> </table> <div style="text-align: center;">  </div> <div style="margin-top: 10px;"> <p>NOTE: OR DISH Wireless L.L.C. APPROVED EQUIVALENT</p> </div>	SABRE DOUBLE Z-BRACKET C10123155		DIMENSIONS (h x w x d) (1 BRACKET)	5"x20"x1-13/16"	WEIGHT (FULL ASSEMBLY)	35.79 lbs	PACKAGE QUANTITY	4	#	DESCRIPTION	1	PLATE, CHANNEL BRACKET	2	RRH Z BRACKET, 3/16"	3	THREADED ROD ASSEMBLY 1/2"x12"
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NO SCALE	NO SCALE	NO SCALE																																				
1	2	3																																				
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PS	SMA	DPH

RFDS REV #: 2

PRELIMINARY REVIEW		
SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/04/2022	ISSUED FOR REVIEW
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A&E PROJECT NUMBER BOBOS00895A		
DISH Wireless L.L.C. PROJECT INFORMATION BOBOS00895A CROWN CASTLE BU# 876390 116 GRANT HILL RD. BROOKLYN, CT 06234		
SHEET TITLE EQUIPMENT DETAILS		
SHEET NUMBER <b>A-6</b>		



NOTES	
1.	CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2.	ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3.	DUE TO UTILITY EASEMENT RIGHTS SPECIFIED IN THE GROUND LEASE, CUSTOMER MAY INSTALL EQUIPMENT WITHIN SPECIFIED UTILITY EASEMENT AREA, "PWR" AND "TBR" PATH DEPICTED ON A-1 AND E-1 REPRESENT PLANNED ROUTING ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO A SURVEY, EXHIBITS, METES AND BOUNDS OF THE UTILITY EASEMENT, FIELD VERIFICATION, PRIOR PROJECT DOCUMENTS AND OTHER REAL PROPERTY RIGHTS DOCUMENTS, WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS MATERIALLY INCONSISTENT WITH "PWR" AND "TBR" PATH DEPICTED ON A-1 AND E-1 AND SAID VARIANCE IS NOT NOTED ON CD, PLEASE NOTIFY TOWER OWNER AS FURTHER COORDINATION MAY BE NEEDED.



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

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

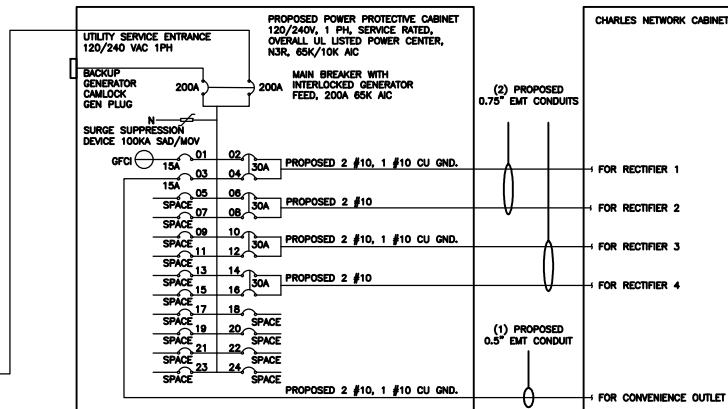
1



**E-1**







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

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

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

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

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9 TABLE 4 ARTICLE 350

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9  
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
<hr/>	
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 CONDUCTS): 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
<u>TOTAL</u>	<u>= 0.1146 SQ. IN</u>

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
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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		15A	1	A	2	30A	2880		ABB/OE INFINITY RECIPITER 1	
CHARLES GFCI OUTLET		180	180	15A	2	B	3	30A	2880	2880	ABB/OE INFINITY RECIPITER 1	
-SPACE-					3	B	4	30A			ABB/OE INFINITY RECIPITER 2	
-SPACE-					4	A	5	30A	2880	2880	ABB/OE INFINITY RECIPITER 2	
-SPACE-					5	A	6	30A	2880	2880	ABB/OE INFINITY RECIPITER 3	
-SPACE-					6	B	7	30A	2880	2880	ABB/OE INFINITY RECIPITER 3	
-SPACE-					7	B	8	30A	2880	2880	ABB/OE INFINITY RECIPITER 4	
-SPACE-					8	A	9	30A	2880	2880	ABB/OE INFINITY RECIPITER 4	
-SPACE-					9	A	10	30A	2880	2880	ABB/OE INFINITY RECIPITER 5	
-SPACE-					10	B	11	30A	2880	2880	ABB/OE INFINITY RECIPITER 5	
-SPACE-					11	B	12	30A	2880	2880	ABB/OE INFINITY RECIPITER 6	
-SPACE-					12	A	13	30A	2880	2880	ABB/OE INFINITY RECIPITER 6	
-SPACE-					13	B	14	30A	2880	2880	ABB/OE INFINITY RECIPITER 7	
-SPACE-					14	A	15	30A	2880	2880	ABB/OE INFINITY RECIPITER 7	
-SPACE-					15	B	16	30A	2880	2880	ABB/OE INFINITY RECIPITER 8	
-SPACE-					16	A	17	30A	2880	2880	ABB/OE INFINITY RECIPITER 8	
-SPACE-					17	B	18	30A	2880	2880	ABB/OE INFINITY RECIPITER 9	
-SPACE-					18	A	19	30A	2880	2880	ABB/OE INFINITY RECIPITER 9	
-SPACE-					19	B	20	30A	2880	2880	ABB/OE INFINITY RECIPITER 10	
-SPACE-					20	A	21	30A	2880	2880	ABB/OE INFINITY RECIPITER 10	
-SPACE-					21	B	22	30A	2880	2880	ABB/OE INFINITY RECIPITER 11	
-SPACE-					22	A	23	30A	2880	2880	ABB/OE INFINITY RECIPITER 11	
-SPACE-					23	B	24	30A	2880	2880	ABB/OE INFINITY RECIPITER 12	
-SPACE-					24	A	25	30A	2880	2880	ABB/OE INFINITY RECIPITER 12	
VOLTAGE AMPS		180	180						11520	11520		
30A MCC 120, 24 SPACE, 120/240V					L1	L2						
MB RATING: 65,000 AAC					11700	11700		VOLTAGE AMPS				
					98	98		AMPS				
					98	98		MAX AMPS				
					123	123		125%				

**PANEL SCHEDULE**

NO SCALE | 2

NOT USED

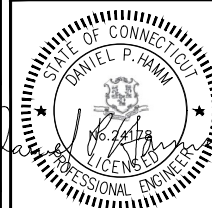
NO SCALE	3
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PS	SMA	DPH

RFDS REV #: 2

PRELIMINARY  
REVIEW[illegible]

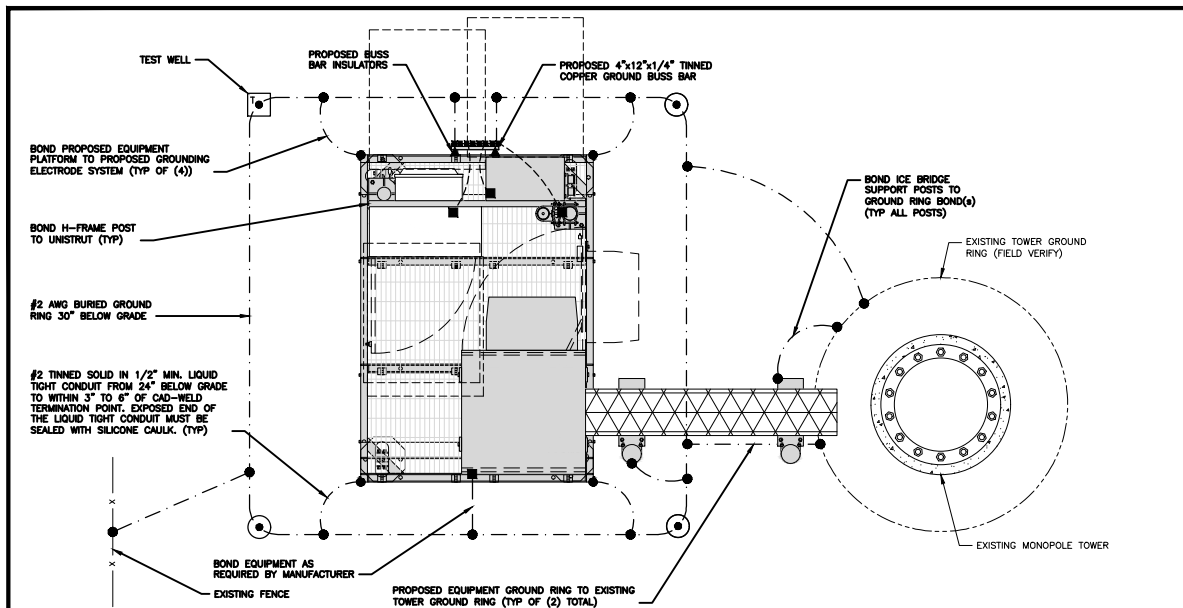
A&E PROJECT NUMBER  
BOBOS00895A

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBOS00895A  
CROWN CASTLE BU# 876390  
116 GRANT HILL RD.  
BROOKLYN, CT 06234

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

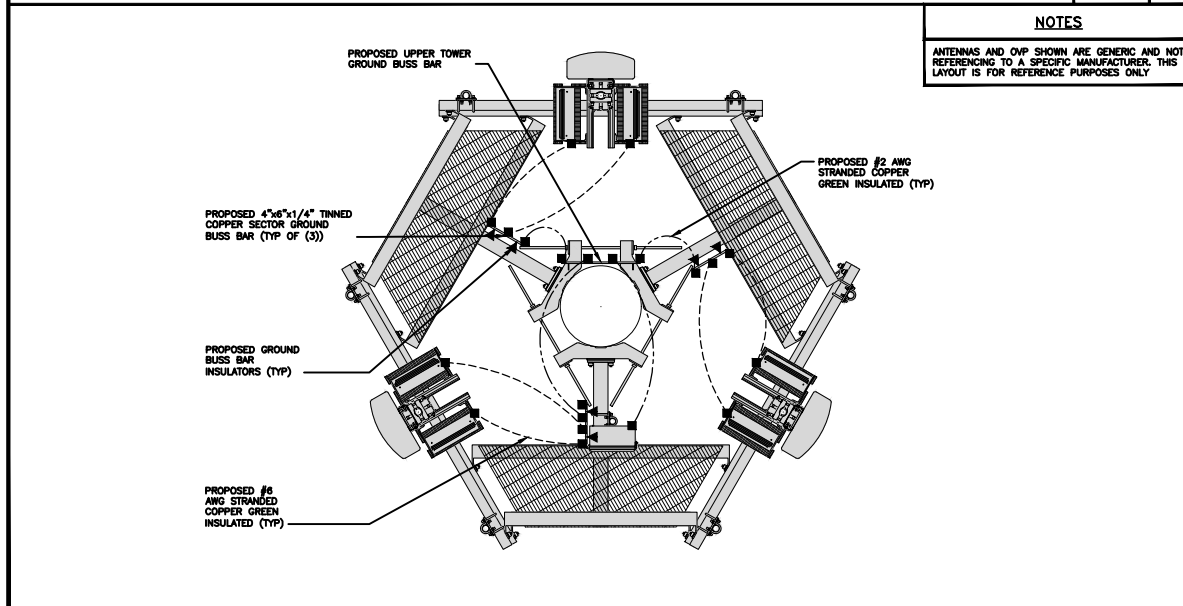
SHEET NUMBER

E-3



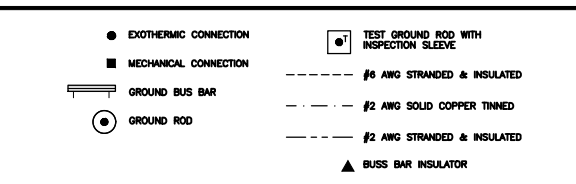
TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2



GROUNDING LEGEND

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

GROUNDING KEY NOTES

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

GROUNDING KEY NOTES

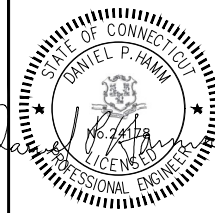
NO SCALE 3



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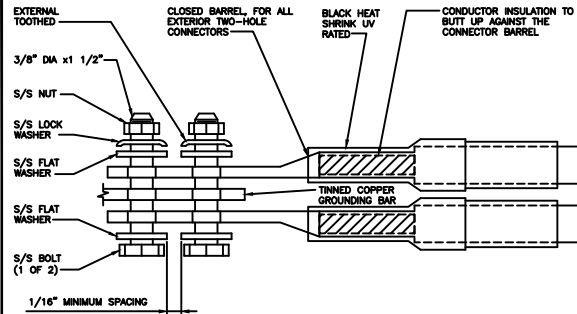
SHEET TITLE  
GROUNDING PLANS AND NOTES

SHEET NUMBER

G-1



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).

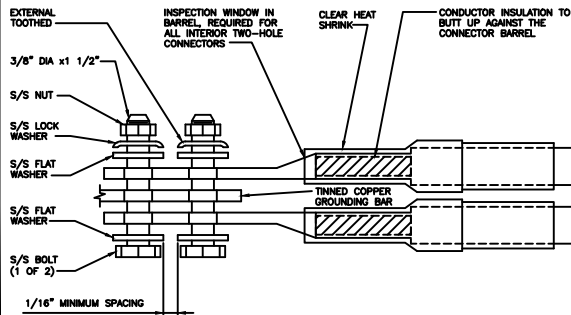


TYPICAL GROUNDING NOTES

NO SCALE 1

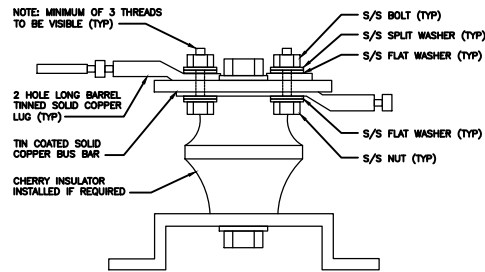
TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2



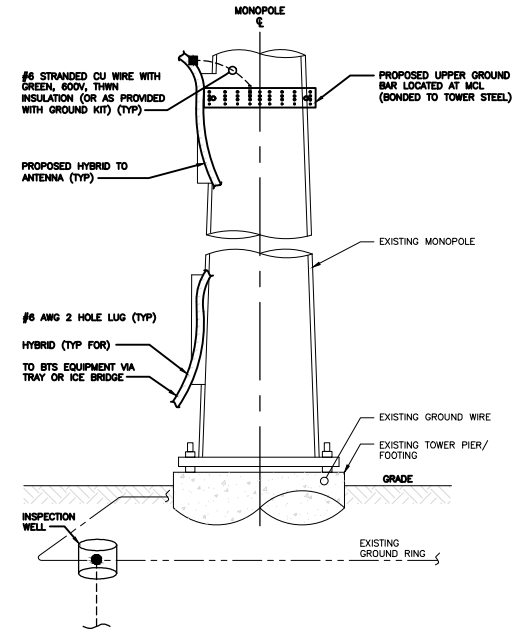
TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

NO SCALE 4



NOTES:

1. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
2. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

TYPICAL ANTENNA CABLE GROUNDING

NO SCALE 5



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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DRAWN BY: PS CHECKED BY: SMA APPROVED BY: DPH

RFDS REV #: 2

PRELIMINARY REVIEW

SUBMITTALS		
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A&E PROJECT NUMBER  
BOBOS00895A

DISH Wireless LLC.  
PROJECT INFORMATION  
BOBOS00895A  
CROWN CASTLE BU# 876390  
116 GRANT HILL RD.  
BROOKLYN, CT 06234

SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER

G-3

HYBRID/DISCREET CABLES											
3/4" TAPE WIDTHS WITH 3/4" SPACING											
LOW-BAND RRH (600 MHz N71 BASEBAND) + (850 MHz N26 BAND) + (700 MHz N29 BAND) - OPTIONAL PER MARKET ADD FREQUENCY COLOR TO SECTOR BAND (CBRS WILL USE YELLOW BAND)											
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
<b>HYBRID/DISCREET CABLES</b> 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 3 - MAIN COAX WITH GROUND MOUNTED RRHs.											
EXAMPLE 1			EXAMPLE 2			EXAMPLE 3			CANISTER COAX #1 (ALPHA)		
RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED
BLUE	BLUE	BLUE	BLUE	BLUE	BLUE	BLUE	BLUE	BLUE	BLUE	BLUE	BLUE
GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
ORANGE	ORANGE	ORANGE	ORANGE	ORANGE	ORANGE	ORANGE	ORANGE	ORANGE	ORANGE	ORANGE	ORANGE
PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE
<b>FIBER JUMPERS TO RRHs</b> LOW-BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.											
LOW BAND RRH			MID BAND RRH			LOW BAND RRH			MID BAND RRH		
RED	RED	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	BLUE	BLUE
ORANGE	ORANGE	ORANGE	PURPLE	PURPLE	PURPLE	ORANGE	ORANGE	ORANGE	PURPLE	PURPLE	PURPLE
<b>POWER CABLES TO RRHs</b> LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY.											
LOW BAND RRH			MID BAND RRH			LOW BAND RRH			MID BAND RRH		
RED	RED	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	BLUE	BLUE
ORANGE	ORANGE	ORANGE	PURPLE	PURPLE	PURPLE	ORANGE	ORANGE	ORANGE	PURPLE	PURPLE	PURPLE
<b>RET MOTORS AT ANTENNAS</b> RET CONTROL IS HANDLED BY THE MID-BAND RRH WHEN ONE SET OF RET PORTS EXIST ON ANTENNA. SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.											
ANTENNA 1 ANTENNA 1 MID BAND LOW BAND			ANTENNA 1 ANTENNA 1 MID BAND LOW BAND			ANTENNA 1 ANTENNA 1 MID BAND LOW BAND			ANTENNA 1 ANTENNA 1 MID BAND LOW BAND		
IN	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN
RED	RED	RED	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE	PURPLE
<b>MICROWAVE RADIO LINKS</b> 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 240-359 DEGREES			
PRIMARY		SECONDARY		PRIMARY		SECONDARY		PRIMARY		SECONDARY	
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE

RF CABLE COLOR CODES

NO SCALE

1

NOT USED

NO SCALE

4

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

ORANGE

AWS  
(N66+N70+H-BLOCK)

PURPLE

CBRS TECH  
(3 GHz)

YELLOW

NEGATIVE SLANT PORT  
ON ANT/RRH

WHITE

ALPHA SECTOR

RED

BETA SECTOR

BLUE

GAMMA SECTOR

GREEN

COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

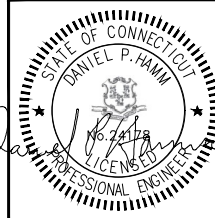
3

**dish**  
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BROOKLYN, CT 06234

SHEET TITLE  
RF  
CABLE COLOR CODES

SHEET NUMBER

**RF-1**





SIGN TYPES		
TYPE	COLOR	COLOR CODE PURPOSE
INFORMATION	GREEN	"INFORMATIONAL SIGN" TO NOTIFY OTHERS OF SITE OWNERSHIP & CONTACT NUMBER AND POTENTIAL RF EXPOSURE.
NOTICE	BLUE	"NOTICE BEYOND THIS POINT" RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)
CAUTION	YELLOW	"CAUTION BEYOND THIS POINT" RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)
WARNING	ORANGE/RED	"WARNING BEYOND THIS POINT" RF FIELDS AT THIS SITE EXCEED FCC RULES FOR HUMAN EXPOSURE. FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS COULD RESULT IN SERIOUS INJURY. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)

#### SIGN PLACEMENT:

- RF SIGNAGE PLACEMENT SHALL FOLLOW THE RECOMMENDATIONS OF AN EXISTING EME REPORT, CREATED BY A THIRD PARTY PREVIOUSLY AUTHORIZED BY DISH Wireless L.L.C.
- INFORMATION SIGN (GREEN) SHALL BE LOCATED ON EXISTING DISH Wireless L.L.C. EQUIPMENT.  
A) IF THE INFORMATION SIGN IS A STICKER, IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C. EQUIPMENT CABINET.  
B) IF THE INFORMATION SIGN IS A METAL SIGN IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C. H-FRAME WITH A SECURE ATTACH METHOD.
- IF EME REPORT IS NOT AVAILABLE AT THE TIME OF CREATION OF CONSTRUCTION DOCUMENTS; PLEASE CONTACT DISH Wireless L.L.C. CONSTRUCTION MANAGER FOR FURTHER INSTRUCTION ON HOW TO PROCEED.

#### NOTES:

1. FOR DISH Wireless L.L.C. LOGO, SEE DISH Wireless L.L.C. DESIGN SPECIFICATIONS (PROVIDED BY DISH Wireless L.L.C.)
2. SITE ID SHALL BE APPLIED TO SIGNS USING "LASER ENGRAVING" OR ANY OTHER WEATHER RESISTANT METHOD (DISH Wireless L.L.C. APPROVAL REQUIRED)
3. TEXT FOR SIGNAGE SHALL INDICATE CORRECT SITE NAME AND NUMBER AS PER DISH Wireless L.L.C. CONSTRUCTION MANAGER RECOMMENDATIONS.
4. CABINET/SHELTER MOUNTING APPLICATION REQUIRES ANOTHER PLATE APPLIED TO THE FACE OF THE CABINET WITH WATER PROOF POLYURETHANE ADHESIVE
5. ALL SIGNS WILL BE SECURED WITH EITHER STAINLESS STEEL ZIP TIES OR STAINLESS STEEL TECH SCREWS
6. ALL SIGNS TO BE 8.5"x11" AND MADE WITH 0.04" OF ALUMINUM MATERIAL

# INFORMATION

This is an access point to an area with transmitting antennas.

Obey all signs and barriers beyond this point.  
Call the DISH Wireless L.L.C. NOC at 1-866-624-6874

Site ID: \_\_\_\_\_



THIS SIGN IS FOR REFERENCE PURPOSES ONLY

# NOTICE



Transmitting Antenna(s)

Radio frequency fields beyond this point MAY EXCEED the FCC Occupational exposure limit.

Obey all posted signs and site guidelines for working in radio frequency environments.

Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

Site ID: \_\_\_\_\_

**dish**

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

# CAUTION



Transmitting Antenna(s)

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Site ID: \_\_\_\_\_

**dish**

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# WARNING



Transmitting Antenna(s)

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**dish**

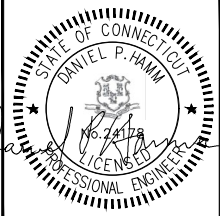
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wireless.

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PS SMA DPH

RFDS REV #: 2

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DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOBOS00895A  
CROWN CASTLE BU# 876390  
116 GRANT HILL RD.  
BROOKLYN, CT 06234

SHEET TITLE  
RF  
SIGNAGE

SHEET NUMBER  
GN-2

RF SIGNAGE

#### 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 DERIVED 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.

**dish**  
wireless.

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RFDS REV #: 2

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BROOKLYN, CT 06234

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

**GN-3**



**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 pcf.
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.

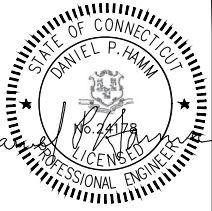
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL 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 SPECIMATE 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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PROJECT INFORMATION  
BOBOS00895A  
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116 GRANT HILL RD.  
BROOKLYN, CT 06234

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GENERAL NOTES

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**GN-4**

**GROUNDING NOTES:**

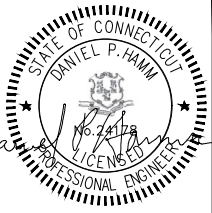
1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OFF-POTENTIAL RESISTANCE TO EARTH TESTING (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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116 GRANT HILL RD.  
BROOKLYN, CT 06234

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER

**GN-5**

# Exhibit D

## **Structural Analysis Report**

Date: November 18, 2021



MORRISON HERSHFIELD

Morrison Hershfield  
1455 Lincoln Parkway, Suite 500  
Atlanta, GA 30346  
(770) 379-8500

**Subject:** Structural Analysis Report

**Carrier Designation:** DISH Network Co-Locate  
**Site Number:** BOBOS00895A

**Crown Castle Designation:** BU Number: 876390  
Site Name: Hampton / Bernier  
JDE Job Number: 671533  
Work Order Number: 2044669  
Order Number: 572911 Rev. 0

**Engineering Firm Designation:** Morrison Hershfield Project Number: CN9-365R1 / 2200039

**Site Data:** 116 Grant Hill Rd., Brooklyn, Windham County, CT 06234  
Latitude 41° 47' 29.64", Longitude -72° 0' 54.04"  
150 Foot – EEI Monopole Tower

Morrison Hershfield is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above-mentioned tower.

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

LC7: Proposed Equipment Configuration

**Sufficient Capacity – 90.3%**

This analysis utilizes an ultimate 3-second gust wind speed of 121 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. PEN.0028133)  
Senior Engineer



Digitally signed by  
G. Lance Cooke  
Date: 2021.11.18  
08:47:31-08'00'

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## 1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by Engineered Endeavors, Inc.

The tower has been modified per reinforcement drawings prepared by Tower Engineering Professionals Inc., in May of 2008. Reinforcement consists of adding base plate stiffeners. Per the post modification inspection completed by Tower Engineering Professionals, Inc., in January of 2009, these modifications have been properly installed and were considered in this analysis.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	121 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor:</b>	5
<b>Ice Thickness:</b>	1 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	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)
70.0	70.0	3	jma wireless	MX08FRO665-21 w/ Mount Pipe	1	1-3/8
		3	fujitsu	TA08025-B604		
		3	fujitsu	TA08025-B605		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		

**Table 2 - Other Considered Equipment**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
149.0	150.0	3	commscope	NNVV-65B-R4 w/ Mount Pipe	4	1-1/4
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe		
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz		
		6	alcatel lucent	RRH2X50-800		
		3	alcatel lucent	TD-RRH8x20-25		
	149.0	1	-	Platform Mount [LP 303-1_HR-1]		
		1	-	Platform Mount [LP 712-1]		
137.0	138.0	3	rfs/celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	7	1-5/8
		3	rfs/celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	ericsson	KRY 112 489/2		
		3	ericsson	RADIO 4449 B12/B71		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
137.0	137.0	1	-	Handrail Kit [#HRK14]	-	-
		1	-	Kicker Kit [#PRK-SFS-L]		
		1	-	Platform Mount [LP 1201-1_HR-1]		
129.0	129.0	1	-	Side Arm Mount [SO 104-3]		
	127.0	3	ericsson	TME-RRUS-11		
127.0	129.0	3	kmw communications	AM-X-CD-17-65-00T-RET w/ Mount Pipe	12 3 1	1-1/4 3/8 2C
		6	powerwave technologies	7770.00 w/ Mount Pipe		
	127.0	6	powerwave technologies	LGP 17201		
		6	powerwave technologies	LGP13519		
		1	raycap	DC6-48-60-18-8F		
		1	-	Sector Mount [SM 901-3]		
117.0	119.0	6	antel	LPA-80080/4CF w/ Mount Pipe	17	1-5/8
		6	commscope	NHH-65B-R2B w/ Mount Pipe		
		1	raycap	RVZDC-6627-PF-48_CCIV2		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	samsung telecommunications	RF4439D-25A		
		3	samsung telecommunications	RF4440D-13A		
	117.0	1	-	Platform Mount [LP 303-1]		
90.0	100.0	1	db spectra	DS9A09F36D-N	2 1	1-1/4 1/2
	90.0	1	-	Side Arm Mount [SO 307-1]		
		1	bird technologies group	TTA-429-94C-08179		
76.0	77.0	1	lucent	KS24019-L112A	1	1/2
	76.0	1	-	Side Arm Mount [SO 701-1]		

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1615347	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	1615410	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1533003	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2255030	CCISITES
4-POST-MODIFICATION INSPECTION	2383064	CCISITES

### 3.1) Analysis Method

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

### 3.2) Assumptions

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

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

## 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 123.29	Pole	TP22.9x17x0.1875	1	-12.73	802.65	50.9	Pass
L2	123.29 - 88.88	Pole	TP30x21.7696x0.3125	2	-20.54	1752.41	71.1	Pass
L3	88.88 - 43.8	Pole	TP39.2x28.4504x0.375	3	-34.41	2752.19	81.7	Pass
L4	43.8 - 0	Pole	TP48x37.2689x0.4375	4	-51.06	4056.91	79.7	Pass
							Summary	
						Pole (L3)	81.7	Pass
						Rating =	81.7	Pass

**Table 5 - Tower Component Stresses vs. Capacity – LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	77.0	Pass
1	Base Plate		71.2	Pass
1	Base Foundation (Structure)	0	90.3	Pass
1	Base Foundation (Soil Interaction)		75.1	Pass

<b>Structure Rating (max from all components) =</b>	<b>90.3%*</b>
---	---------------

Notes:

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

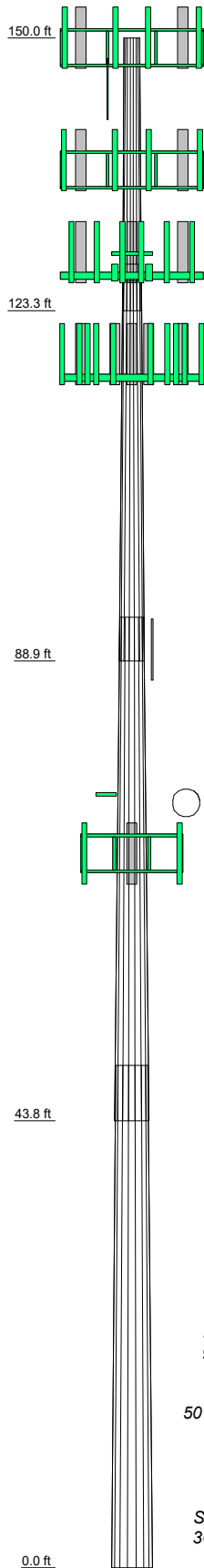
### 4.1) Recommendations

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

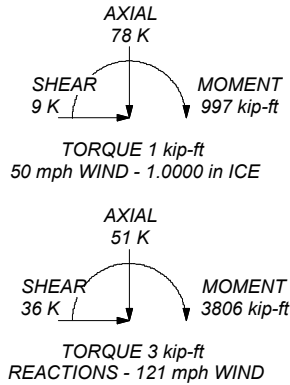


**APPENDIX A**  
**TNXTOWER OUTPUT**

Section	1	2	3	4	
Length (ft)	26.71	37.83	49.33	49.22	
Number of Sides	18	18	18	18	
Thickness (in)	0.1875	0.3125	0.3750	0.4375	
Socket Length (ft)	3.42	4.25	5.42	37.2689	
Top Dia (in)	17.0000	21.7696	28.4504	48.0000	
Bot Dia (in)	22.9000	30.0000	39.2000		
Grade	A572-65				
Weight (K)	1.1	3.3	6.7	9.8	20.8



ALL REACTIONS  
ARE FACTORED



## MATERIAL STRENGTH

GRADE	F <sub>y</sub>	F <sub>u</sub>	GRADE	F <sub>y</sub>	F <sub>u</sub>
A572-65	65 ksi	80 ksi			

## TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 121 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 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 5 with Crest Height of 110.00 ft
8. TOWER RATING: 81.7%



Consulting Engineers

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Job: **CN9-365R1 / 2200039**

Project: **876390 / Hampton / Bernier**

Client: **Crown Castle USA**

Drawn by: **KV**

App'd:

Code: **TIA-222-H**

Date: **11/18/21**

Scale: **NTS**

Path:

Dwg No. **E-1**

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## 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 Windham County, Connecticut.
- Tower base elevation above sea level: 715.00 ft.
- Basic wind speed of 121 mph.
- Risk Category II.
- Exposure Category B.
- Crest Height: 110.00 ft.
- Rigorous Topographic Factor Procedure for wind speed-up calculations is used.
  - Topographic Feature: Continuous Ridge.
  - Slope Distance L: 920.00 ft.
  - Distance from Crest x: 0.00 ft.
  - Horizontal Distance Downwind: No.
- Nominal ice thickness of 1.0000 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	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-H Bracing Resist.
		Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-H Tension Splice
		Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No
		Appurtenances
		Outside and Inside Corner Radii Are
		Known

### Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-123.29	26.71	3.42	18	17.0000	22.9000	0.1875	0.7500	A572-65 (65 ksi)
L2	123.29-88.88	37.83	4.25	18	21.7696	30.0000	0.3125	1.2500	A572-65 (65 ksi)
L3	88.88-43.80	49.33	5.42	18	28.4504	39.2000	0.3750	1.5000	A572-65 (65 ksi)
L4	43.80-0.00	49.22		18	37.2689	48.0000	0.4375	1.7500	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	17.2333	10.0055	357.3078	5.9684	8.6360	41.3742	715.0858	5.0037	2.6620	14.197
	23.2243	13.5168	880.9281	8.0629	11.6332	75.7253	1763.0154	6.7597	3.7004	19.735
L2	22.8127	21.2827	1237.9543	7.6173	11.0589	111.9416	2477.5376	10.6434	3.2814	10.501
	30.4146	29.4463	3278.8026	10.5391	15.2400	215.1445	6561.9196	14.7259	4.7300	15.136
L3	29.7718	33.4167	3327.7548	9.9668	14.4528	230.2502	6659.8883	16.7115	4.3473	11.593
	39.7469	46.2115	8800.5544	13.7829	19.9136	441.9369	17612.6889	23.1101	6.2392	16.638
L4	38.9763	51.1450	8765.5170	13.0752	18.9326	462.9852	17542.5679	25.5774	5.7893	13.233
	48.6730	66.0465	18876.2818	16.8847	24.3840	774.1257	37777.4015	33.0295	7.6780	17.55

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00- 123.29				1	1	1			
L2 123.29- 88.88				1	1	1			
L3 88.88- 43.80				1	1	1			
L4 43.80-0.00				1	1	1			

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
*****										
Safety Line 3/8"	C	No	Surface Ar (CaAa)	150.00 - 0.00	1	1	-0.050 -0.050	0.3750		0.22
Climbing Pegs	C	No	Surface Ar (CaAa)	150.00 - 0.00	1	1	-0.100 0.000	0.7050		1.80
*****										
LDF7-50A(1-5/8)	A	No	Surface Ar (CaAa)	137.00 - 0.00	3	3	0.000 0.160	1.9800		0.82
*****										
LDF7-50A(1-5/8)	B	No	Surface Ar (CaAa)	117.00 - 0.00	17	9	0.000 0.500	1.9800		0.82
***										
*****										
LDF4-50A(1/2)	A	No	Surface Ar (CaAa)	90.00 - 0.00	1	1	-0.290 -0.290	0.6250		0.15

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
LDF6-50A(1-1/4)	A	No	Surface Ar (CaAa)	90.00 - 0.00	2	2	-0.280 -0.200	1.5500		0.60
*****										
CU12PSM9P8XXX(1-3/8)	A	No	Surface Ar (CaAa)	70.00 - 0.00	1	1	-0.500 -0.500	1.4110		1.66
*****										

### 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 <sup>2</sup> /ft	Weight plf
*****									
***									
HB114-1-0813U4-M5J(1-1/4)	C	No	No	Inside Pole	149.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.20 1.20 1.20
HB114-13U3M12-XXXF(1-1/4)	C	No	No	Inside Pole	149.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.99 0.99 0.99
LDF7-50A(1-5/8)	A	No	No	Inside Pole	137.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
***									
HCS 6X12 4AWG(1-5/8")	A	No	No	Inside Pole	137.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.40 2.40 2.40
*****									
LDF6-50A(1-1/4)	B	No	No	Inside Pole	127.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.60 0.60 0.60
FB-L98B-002-75000(3/8)	B	No	No	Inside Pole	127.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.06 0.06 0.06
CONDUIT(2)	B	No	No	Inside Pole	127.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.34 0.34 0.34
*****									
LDF4-50A(1/2)	A	No	No	Inside Pole	76.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.15 0.15 0.15
*****									

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	CAAA In Face ft <sup>2</sup>	CAAA Out Face ft <sup>2</sup>	Weight K
L1	150.00-123.29	A	0.000	0.000	8.144	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	2.885	0.000	0.17
L2	123.29-88.88	A	0.000	0.000	20.857	0.000	0.25
		B	0.000	0.000	50.110	0.000	0.66
		C	0.000	0.000	3.716	0.000	0.23
L3	88.88-43.80	A	0.000	0.000	47.267	0.000	0.44
		B	0.000	0.000	80.333	0.000	0.98
		C	0.000	0.000	4.869	0.000	0.30
L4	43.80-0.00	A	0.000	0.000	48.513	0.000	0.46
		B	0.000	0.000	78.052	0.000	0.95
		C	0.000	0.000	4.730	0.000	0.29

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	150.00-123.29	A	1.065	0.000	0.000	13.832	0.000	0.21
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	14.268	0.000	0.28
L2	123.29-88.88	A	1.057	0.000	0.000	35.756	0.000	0.53
		B		0.000	0.000	70.128	0.000	1.32
		C		0.000	0.000	18.382	0.000	0.37
L3	88.88-43.80	A	1.036	0.000	0.000	96.341	0.000	1.19
		B		0.000	0.000	112.326	0.000	2.03
		C		0.000	0.000	23.925	0.000	0.48
L4	43.80-0.00	A	0.961	0.000	0.000	99.249	0.000	1.23
		B		0.000	0.000	108.908	0.000	1.96
		C		0.000	0.000	22.880	0.000	0.46

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>x</sub> in	CP <sub>z</sub> in	CP <sub>x</sub> Ice in	CP <sub>z</sub> Ice in
L1	150.00-123.29	-1.5995	-0.7103	-1.1513	0.4474
L2	123.29-88.88	4.0955	-0.9994	2.7972	-0.2629
L3	88.88-43.80	3.2567	-0.7681	1.4300	-0.0342
L4	43.80-0.00	3.5027	-0.7807	1.3541	0.0902

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 <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	2	Safety Line 3/8"	123.29 - 150.00	1.0000	1.0000
L1	3	Climbing Pegs	123.29 - 150.00	1.0000	1.0000
L1	13	LDF7-50A(1-5/8)	123.29 - 137.00	1.0000	1.0000
L2	2	Safety Line 3/8"	88.88 - 123.29	1.0000	1.0000
L2	3	Climbing Pegs	88.88 - 123.29	1.0000	1.0000
L2	13	LDF7-50A(1-5/8)	88.88 - 123.29	1.0000	1.0000
L2	21	LDF7-50A(1-5/8)	88.88 - 117.00	1.0000	1.0000
L2	26	LDF4-50A(1/2)	88.88 - 90.00	1.0000	1.0000
L2	27	LDF6-50A(1-1/4)	88.88 - 90.00	1.0000	1.0000
L3	2	Safety Line 3/8"	43.80 - 88.88	1.0000	1.0000
L3	3	Climbing Pegs	43.80 - 88.88	1.0000	1.0000
L3	13	LDF7-50A(1-5/8)	43.80 - 88.88	1.0000	1.0000
L3	21	LDF7-50A(1-5/8)	43.80 - 88.88	1.0000	1.0000
L3	26	LDF4-50A(1/2)	43.80 - 88.88	1.0000	1.0000
L3	27	LDF6-50A(1-1/4)	43.80 - 88.88	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L3	31	CU12PSM9P8XXX(1-3/8)	43.80 - 70.00	1.0000	1.0000
L4	2	Safety Line 3/8"	0.00 - 43.80	1.0000	1.0000
L4	3	Climbing Pegs	0.00 - 43.80	1.0000	1.0000
L4	13	LDF7-50A(1-5/8)	0.00 - 43.80	1.0000	1.0000
L4	21	LDF7-50A(1-5/8)	0.00 - 43.80	1.0000	1.0000
L4	26	LDF4-50A(1/2)	0.00 - 43.80	1.0000	1.0000
L4	27	LDF6-50A(1-1/4)	0.00 - 43.80	1.0000	1.0000
L4	31	CU12PSM9P8XXX(1-3/8)	0.00 - 43.80	1.0000	1.0000

## Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
*****									
(2) 6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	149.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			1.00			Ice	2.29	2.29	0.05
(2) 6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	149.00	1" Ice No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			1.00			Ice	2.29	2.29	0.05
(2) 6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	149.00	1" Ice No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			1.00			Ice	2.29	2.29	0.05
Transition Ladder	C	From Leg	2.00	0.0000	149.00	1" Ice No Ice	6.00	6.00	0.16
			0.00			1/2"	8.00	8.00	0.24
			-4.00			Ice	10.00	10.00	0.32
Platform Mount [LP 303-1_HR-1]	C	None		0.0000	149.00	1" Ice No Ice	17.09	17.09	1.50
						1/2"	21.47	21.47	1.88
						Ice	25.72	25.72	2.35
Platform Mount [LP 712-1]	C	None		0.0000	149.00	1" Ice No Ice	24.56	24.56	1.34
						1/2"	27.92	27.92	1.91
						Ice	31.27	31.27	2.55
***						1" Ice			
NNVV-65B-R4 w/ Mount Pipe	A	From Leg	4.00	0.0000	149.00	No Ice	7.55	4.23	0.11
			0.00			1/2"	8.04	4.67	0.20
			1.00			Ice	8.53	5.12	0.30
NNVV-65B-R4 w/ Mount Pipe	B	From Leg	4.00	0.0000	149.00	1" Ice No Ice	7.55	4.23	0.11
			0.00			1/2"	8.04	4.67	0.20
			1.00			Ice	8.53	5.12	0.30
NNVV-65B-R4 w/ Mount Pipe	C	From Leg	4.00	0.0000	149.00	1" Ice No Ice	7.55	4.23	0.11
			0.00			1/2"	8.04	4.67	0.20
			1.00			Ice	8.53	5.12	0.30
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00	0.0000	149.00	1" Ice No Ice	4.09	2.86	0.08
			0.00			1/2"	4.48	3.23	0.13
			1.00			Ice	4.88	3.61	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00	0.0000	149.00	1" Ice No Ice	4.09	2.86	0.08
			0.00			1/2"	4.48	3.23	0.13
			1.00			Ice	4.88	3.61	0.19
APXVTM14-ALU-I20 w/	C	From Leg	4.00	0.0000	149.00	1" Ice No Ice	4.09	2.86	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
Mount Pipe			0.00 1.00			1/2" Ice 1" Ice	4.48 4.88	3.23 3.61	0.13 0.19
(2) RRH2X50-800	A	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09
(2) RRH2X50-800	B	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09
(2) RRH2X50-800	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09
PCS 1900MHz 4x45W- 65MHz	A	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W- 65MHz	B	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W- 65MHz	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
TD-RRH8x20-25	A	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	B	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	C	From Leg	4.00 0.00 1.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
*****									
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Platform Mount [LP 1201- 1_HR-1]	C	None		0.0000	137.00	No Ice 1/2" Ice 1" Ice	26.39 31.40 36.20	26.39 31.40 36.20	2.36 3.06 3.86
*****									
APX16DWV-16DWV-S-E- A20 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	6.29 6.86 7.45	2.76 3.27 3.79	0.06 0.11 0.16
APX16DWV-16DWV-S-E- A20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	6.29 6.86 7.45	2.76 3.27 3.79	0.06 0.11 0.16



Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
APX16DWV-16DWV-S-E- A20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	6.29 6.86 7.45	2.76 3.27 3.79	0.06 0.11 0.16
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	14.69 15.46 16.23	6.87 7.55 8.25	0.19 0.31 0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	14.69 15.46 16.23	6.87 7.55 8.25	0.19 0.31 0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	14.69 15.46 16.23	6.87 7.55 8.25	0.19 0.31 0.46
KRY 112 489/2	A	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	0.56 0.66 0.76	0.37 0.45 0.54	0.02 0.02 0.03
KRY 112 489/2	B	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	0.56 0.66 0.76	0.37 0.45 0.54	0.02 0.02 0.03
KRY 112 489/2	C	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	0.56 0.66 0.76	0.37 0.45 0.54	0.02 0.02 0.03
RADIO 4449 B12/B71	A	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RADIO 4449 B12/B71	B	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RADIO 4449 B12/B71	C	From Leg	4.00 0.00 1.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
Kicker Kit [#PRK-SFS-L]	C	None		0.0000	137.00	No Ice 1/2" Ice 1" Ice	11.84 16.96 22.08	11.84 16.96 22.08	0.64 0.83 0.32
Handrail Kit [#HRK14]	C	None		0.0000	137.00	No Ice 1/2" Ice 1" Ice	6.36 8.52 10.62	6.36 8.52 10.62	0.30 0.39 0.46
*****									
TME-RRUS-11	A	From Leg	1.00 0.00 -2.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice	2.96 3.23 3.50	1.67 1.98 2.30	0.06 0.08 0.12
TME-RRUS-11	B	From Leg	1.00 0.00 -2.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice	2.96 3.23 3.50	1.67 1.98 2.30	0.06 0.08 0.12
TME-RRUS-11	C	From Leg	1.00 0.00 -2.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice	2.96 3.23 3.50	1.67 1.98 2.30	0.06 0.08 0.12
4' x 2" Horizontal Leg Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice	0.04 0.09 0.13	0.87 1.11 1.36	0.01 0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
4' x 2" Horizontal Leg Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice	0.04 0.09 0.13	0.87 1.11 1.36	0.01 0.02 0.03
4' x 2" Horizontal Leg Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice	0.04 0.09 0.13	0.87 1.11 1.36	0.01 0.02 0.03
Side Arm Mount [SO 104- 3]	C	None		0.0000	129.00	No Ice 1/2" Ice 1" Ice	2.62 3.30 3.98	2.62 3.30 3.98	0.29 0.41 0.53
*****									
(2) 7770.00 w/ Mount Pipe	A	From Leg	3.00 0.00 2.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	B	From Leg	3.00 0.00 2.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	C	From Leg	3.00 0.00 2.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
AM-X-CD-17-65-00T-RET w/ Mount Pipe	A	From Leg	3.00 0.00 2.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	6.09 6.66 7.24	4.31 4.86 5.42	0.09 0.17 0.26
AM-X-CD-17-65-00T-RET w/ Mount Pipe	B	From Leg	3.00 0.00 2.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	6.09 6.66 7.24	4.31 4.86 5.42	0.09 0.17 0.26
AM-X-CD-17-65-00T-RET w/ Mount Pipe	C	From Leg	3.00 0.00 2.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	6.09 6.66 7.24	4.31 4.86 5.42	0.09 0.17 0.26
(2) LGP 17201	A	From Leg	3.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	1.67 1.83 2.00	0.47 0.57 0.68	0.03 0.04 0.06
(2) LGP 17201	B	From Leg	3.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	1.67 1.83 2.00	0.47 0.57 0.68	0.03 0.04 0.06
(2) LGP 17201	C	From Leg	3.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	1.67 1.83 2.00	0.47 0.57 0.68	0.03 0.04 0.06
(2) LGP13519	A	From Leg	3.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	0.29 0.36 0.44	0.18 0.24 0.31	0.01 0.01 0.01
(2) LGP13519	B	From Leg	3.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	0.29 0.36 0.44	0.18 0.24 0.31	0.01 0.01 0.01
(2) LGP13519	C	From Leg	3.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	0.29 0.36 0.44	0.18 0.24 0.31	0.01 0.01 0.01
DC6-48-60-18-8F	B	From Leg	3.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
Sector Mount [SM 901-3]	C	None		0.0000	127.00	No Ice 1/2" Ice 1" Ice	12.78 15.53 18.18	12.78 15.53 18.18	1.26 1.45 1.69
*****									
(2) LPA-80080/4CF w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	2.86 3.22 3.59	6.57 7.19 7.84	0.03 0.08 0.13
(2) LPA-80080/4CF w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	2.86 3.22 3.59	6.57 7.19 7.84	0.03 0.08 0.13
(2) LPA-80080/4CF w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	2.86 3.22 3.59	6.57 7.19 7.84	0.03 0.08 0.13
Platform Mount [LP 303-1]	C	None		0.0000	117.00	No Ice 1/2" Ice 1" Ice	14.69 18.01 21.34	14.69 18.01 21.34	1.25 1.57 1.94
*****									
(2) NHH-65B-R2B w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	4.09 4.48 4.88	3.29 3.67 4.06	0.07 0.13 0.21
(2) NHH-65B-R2B w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	4.09 4.48 4.88	3.29 3.67 4.06	0.07 0.13 0.21
(2) NHH-65B-R2B w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	4.09 4.48 4.88	3.29 3.67 4.06	0.07 0.13 0.21
MT6407-77A w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	0.10 0.14 0.18
MT6407-77A w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	0.10 0.14 0.18
MT6407-77A w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	0.10 0.14 0.18
RF4440D-13A	A	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.13 1.27 1.41	0.07 0.09 0.11
RF4440D-13A	B	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.13 1.27 1.41	0.07 0.09 0.11
RF4440D-13A	C	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.13 1.27 1.41	0.07 0.09 0.11
RF4439D-25A	A	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.25 1.39 1.54	0.07 0.09 0.11
RF4439D-25A	B	From Leg	4.00 0.00 2.00	0.0000	117.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.25 1.39 1.54	0.07 0.09 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
RF4439D-25A	C	From Leg	4.00 0.00 2.00	0.0000	117.00	1" Ice No Ice 1/2" Ice	1.87 2.03 2.21	1.25 1.39 1.54	0.07 0.09 0.11
RVZDC-6627-PF- 48_CCIV2	A	From Leg	4.00 0.00 2.00	0.0000	117.00	1" Ice No Ice 1/2" Ice	4.06 4.32 4.58	3.10 3.34 3.58	0.03 0.07 0.11
*****						1" Ice			
DS9A09F36D-N	A	From Leg	4.00 0.00 10.00	0.0000	90.00	No Ice 1/2" Ice	5.76 7.71 9.68	5.76 7.71 9.68	0.05 0.09 0.14
TTA-429-94C-08179	A	From Leg	4.00 0.00 0.00	0.0000	90.00	1" Ice No Ice 1/2" Ice	1.03 1.17 1.32	1.03 1.17 1.32	0.01 0.02 0.04
6' x 2" Horizontal Mount Pipe	A	From Leg	2.50 0.00 0.00	0.0000	90.00	1" Ice No Ice 1/2" Ice	1.14 1.76 2.14	0.01 0.04 0.09	0.02 0.03 0.04
Pipe Mount [PM 601-1]	A	From Leg	0.50 0.00 0.00	0.0000	90.00	1" Ice No Ice 1/2" Ice	1.32 1.58 1.84	1.32 1.58 1.84	0.07 0.08 0.09
Side Arm Mount [SO 307- 1]	A	From Leg	2.50 0.00 0.00	0.0000	90.00	1" Ice No Ice 1/2" Ice	0.41 0.81 1.23	2.66 4.48 6.37	0.05 0.07 0.11
*****						1" Ice			
KS24019-L112A	C	From Leg	3.00 0.00 1.00	0.0000	76.00	No Ice 1/2" Ice	0.14 0.20 0.26	0.14 0.20 0.26	0.01 0.01 0.01
Side Arm Mount [SO 701- 1]	C	From Leg	1.50 0.00 0.00	0.0000	76.00	1" Ice No Ice 1/2" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
*****						1" Ice			
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.11 0.19 0.29
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	70.00	1" Ice No Ice 1/2" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.11 0.19 0.29
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	70.00	1" Ice No Ice 1/2" Ice	8.01 8.52 9.04	4.23 4.69 5.16	0.11 0.19 0.29
TA08025-B604	A	From Leg	4.00 0.00 0.00	0.0000	70.00	1" Ice No Ice 1/2" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
(2) TA08025-B604	C	From Leg	4.00 0.00 0.00	0.0000	70.00	1" Ice No Ice 1/2" Ice	1.96 2.14 2.32	0.98 1.11 1.25	0.06 0.08 0.10
TA08025-B605	A	From Leg	4.00 0.00 0.00	0.0000	70.00	1" Ice No Ice 1/2" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11
(2) TA08025-B605	B	From Leg	4.00	0.0000	70.00	1" Ice No Ice	1.96	1.13	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
			0.00			1/2"	2.14	1.27	0.09
			0.00			Ice	2.32	1.41	0.11
						1" Ice			
RDIDC-9181-PF-48	A	From Leg	4.00	0.0000	70.00	No Ice	2.01	1.17	0.02
			0.00			1/2"	2.19	1.31	0.04
			0.00			Ice	2.37	1.46	0.06
						1" Ice			
(2) 8' x 2" Mount Pipe	A	From Leg	4.00	0.0000	70.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice			
(2) 8' x 2" Mount Pipe	B	From Leg	4.00	0.0000	70.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice			
(2) 8' x 2" Mount Pipe	C	From Leg	4.00	0.0000	70.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice			
Commscope MC-PK8-DSH	C	None		0.0000	70.00	No Ice	34.24	34.24	1.75
						1/2"	62.95	62.95	2.10
						Ice	91.66	91.66	2.45
						1" Ice			
*****									

## 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	150 - 123.29	Pole	Max Tension	42	0.00	0.00	-0.00
			Max. Compression	26	-25.38	0.77	-0.61
			Max. Mx	20	-12.79	211.68	-0.23
			Max. My	14	-12.76	0.33	-211.89
			Max. Vy	8	16.28	-210.88	-0.23
			Max. Vx	2	-16.31	0.34	211.23
			Max. Torque	24			0.81
L2	123.29 - 88.88	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.52	-0.03	0.89
			Max. Mx	20	-20.70	901.50	0.27
			Max. My	2	-20.64	0.01	906.28
			Max. Vy	8	22.77	-901.45	0.24
			Max. Vx	2	-23.01	0.01	906.28
			Max. Torque	9			2.03
L3	88.88 - 43.8	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.66	-1.13	4.94
			Max. Mx	8	-34.55	-2072.40	1.18
			Max. My	2	-34.46	-0.33	2105.09
			Max. Vy	8	30.04	-2072.40	1.18
			Max. Vx	2	-31.16	-0.33	2105.09
			Max. Torque	19			-2.54
L4	43.8 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.75	-2.54	7.39
			Max. Mx	8	-51.07	-3641.97	1.49
			Max. My	2	-51.07	-0.62	3746.53
			Max. Vy	8	33.72	-3641.97	1.49
			Max. Vx	2	-35.49	-0.62	3746.53
			Max. Torque	19			-2.53

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	77.75	0.00	9.07
	Max. H <sub>x</sub>	20	51.11	33.66	0.01
	Max. H <sub>z</sub>	2	51.11	0.01	35.43
	Max. M <sub>x</sub>	2	3746.53	0.01	35.43
	Max. M <sub>z</sub>	8	3641.97	-33.66	-0.01

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. Torsion	7	2.52	-29.15	16.84
	Min. Vert	19	38.33	29.15	-16.84
	Min. H <sub>x</sub>	8	51.11	-33.66	-0.01
	Min. H <sub>z</sub>	14	51.11	-0.01	-35.43
	Min. M <sub>x</sub>	14	-3741.54	-0.01	-35.43
	Min. M <sub>z</sub>	20	-3638.83	33.66	0.01
	Min. Torsion	19	-2.52	29.15	-16.84

## Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturing Moment, M <sub>x</sub> kip-ft	Overturing Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	42.59	0.00	0.00	-1.95	-1.26	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	51.11	-0.01	-35.43	-3746.53	-0.62	-0.75
0.9 Dead+1.0 Wind 0 deg - No Ice	38.33	-0.01	-35.43	-3674.51	-0.22	-0.74
1.2 Dead+1.0 Wind 30 deg - No Ice	51.11	17.93	-31.10	-3297.31	-1901.54	-1.88
0.9 Dead+1.0 Wind 30 deg - No Ice	38.33	17.93	-31.10	-3233.94	-1864.95	-1.88
1.2 Dead+1.0 Wind 60 deg - No Ice	51.11	29.15	-16.84	-1823.60	-3153.79	-2.51
0.9 Dead+1.0 Wind 60 deg - No Ice	38.33	29.15	-16.84	-1787.83	-3092.60	-2.52
1.2 Dead+1.0 Wind 90 deg - No Ice	51.11	33.66	0.01	-1.49	-3641.97	-2.47
0.9 Dead+1.0 Wind 90 deg - No Ice	38.33	33.66	0.01	-0.85	-3571.39	-2.48
1.2 Dead+1.0 Wind 120 deg - No Ice	51.11	29.16	16.86	1820.34	-3154.73	-1.77
0.9 Dead+1.0 Wind 120 deg - No Ice	38.33	29.16	16.86	1785.86	-3093.54	-1.78
1.2 Dead+1.0 Wind 150 deg - No Ice	51.11	17.34	30.05	3205.67	-1852.60	-0.59
0.9 Dead+1.0 Wind 150 deg - No Ice	38.33	17.34	30.05	3144.87	-1816.74	-0.60
1.2 Dead+1.0 Wind 180 deg - No Ice	51.11	0.01	35.43	3741.54	-2.57	0.75
0.9 Dead+1.0 Wind 180 deg - No Ice	38.33	0.01	35.43	3670.83	-2.15	0.74
1.2 Dead+1.0 Wind 210 deg - No Ice	51.11	-17.93	31.10	3292.36	1898.33	1.88
0.9 Dead+1.0 Wind 210 deg - No Ice	38.33	-17.93	31.10	3230.29	1862.58	1.88
1.2 Dead+1.0 Wind 240 deg - No Ice	51.11	-29.15	16.84	1818.67	3150.61	2.52
0.9 Dead+1.0 Wind 240 deg - No Ice	38.33	-29.15	16.84	1784.21	3090.25	2.52
1.2 Dead+1.0 Wind 270 deg - No Ice	51.11	-33.66	-0.01	-3.44	3638.83	2.47
0.9 Dead+1.0 Wind 270 deg - No Ice	38.33	-33.66	-0.01	-2.78	3569.06	2.48
1.2 Dead+1.0 Wind 300 deg - No Ice	51.11	-29.16	-16.86	-1825.31	3151.61	1.77
0.9 Dead+1.0 Wind 300 deg - No Ice	38.33	-29.16	-16.86	-1789.52	3091.23	1.78
1.2 Dead+1.0 Wind 330 deg - No Ice	51.11	-17.34	-30.05	-3210.67	1849.46	0.59
0.9 Dead+1.0 Wind 330 deg - No Ice	38.33	-17.34	-30.05	-3148.55	1814.40	0.60
1.2 Dead+1.0 Ice+1.0 Temp	77.75	0.00	-0.00	-7.39	-2.54	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	77.75	-0.00	-9.07	-996.95	-2.19	-0.23
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	77.75	4.54	-7.86	-864.19	-497.31	-0.55
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	77.75	7.86	-4.53	-501.89	-859.87	-0.71
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	77.75	9.08	0.00	-7.12	-992.72	-0.69
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	77.75	7.87	4.54	487.54	-860.27	-0.48
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	77.75	4.54	7.86	849.55	-498.00	-0.14
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	77.75	0.00	9.07	981.92	-2.98	0.23
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	77.75	-4.54	7.86	849.16	492.15	0.55
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	77.75	-7.86	4.53	486.86	854.71	0.71
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	77.75	-9.08	-0.00	-7.91	987.56	0.69
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	77.75	-7.87	-4.54	-502.57	855.11	0.48
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	77.75	-4.54	-7.86	-864.59	492.83	0.14
Dead+Wind 0 deg - Service	42.59	-0.00	-8.21	-860.91	-1.08	-0.17
Dead+Wind 30 deg - Service	42.59	4.15	-7.20	-757.96	-437.18	-0.44

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead+Wind 60 deg - Service	42.59	6.75	-3.90	-419.75	-724.26	-0.59
Dead+Wind 90 deg - Service	42.59	7.80	0.00	-1.85	-836.21	-0.58
Dead+Wind 120 deg - Service	42.59	6.75	3.90	416.00	-724.49	-0.42
Dead+Wind 150 deg - Service	42.59	4.02	6.96	733.81	-425.88	-0.14
Dead+Wind 180 deg - Service	42.59	0.00	8.21	856.76	-1.53	0.17
Dead+Wind 210 deg - Service	42.59	-4.15	7.20	753.81	434.57	0.44
Dead+Wind 240 deg - Service	42.59	-6.75	3.90	415.61	721.66	0.59
Dead+Wind 270 deg - Service	42.59	-7.80	-0.00	-2.30	833.61	0.58
Dead+Wind 300 deg - Service	42.59	-6.75	-3.90	-420.14	721.89	0.42
Dead+Wind 330 deg - Service	42.59	-4.02	-6.96	-737.96	423.28	0.14

## 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	-42.59	0.00	0.00	42.59	0.00	0.000%
2	-0.01	-51.11	-35.43	0.01	51.11	35.43	0.000%
3	-0.01	-38.33	-35.43	0.01	38.33	35.43	0.000%
4	17.93	-51.11	-31.10	-17.93	51.11	31.10	0.000%
5	17.93	-38.33	-31.10	-17.93	38.33	31.10	0.000%
6	29.15	-51.11	-16.84	-29.15	51.11	16.84	0.000%
7	29.15	-38.33	-16.84	-29.15	38.33	16.84	0.000%
8	33.66	-51.11	0.01	-33.66	51.11	-0.01	0.000%
9	33.66	-38.33	0.01	-33.66	38.33	-0.01	0.000%
10	29.16	-51.11	16.86	-29.16	51.11	-16.86	0.000%
11	29.16	-38.33	16.86	-29.16	38.33	-16.86	0.000%
12	17.34	-51.11	30.05	-17.34	51.11	-30.05	0.000%
13	17.34	-38.33	30.05	-17.34	38.33	-30.05	0.000%
14	0.01	-51.11	35.43	-0.01	51.11	-35.43	0.000%
15	0.01	-38.33	35.43	-0.01	38.33	-35.43	0.000%
16	-17.93	-51.11	31.10	17.93	51.11	-31.10	0.000%
17	-17.93	-38.33	31.10	17.93	38.33	-31.10	0.000%
18	-29.15	-51.11	16.84	29.15	51.11	-16.84	0.000%
19	-29.15	-38.33	16.84	29.15	38.33	-16.84	0.000%
20	-33.66	-51.11	-0.01	33.66	51.11	0.01	0.000%
21	-33.66	-38.33	-0.01	33.66	38.33	0.01	0.000%
22	-29.16	-51.11	-16.86	29.16	51.11	16.86	0.000%
23	-29.16	-38.33	-16.86	29.16	38.33	16.86	0.000%
24	-17.34	-51.11	-30.05	17.34	51.11	30.05	0.000%
25	-17.34	-38.33	-30.05	17.34	38.33	30.05	0.000%
26	0.00	-77.75	0.00	-0.00	77.75	0.00	0.000%
27	-0.00	-77.75	-9.07	0.00	77.75	9.07	0.000%
28	4.54	-77.75	-7.86	-4.54	77.75	7.86	0.000%
29	7.86	-77.75	-4.53	-7.86	77.75	4.53	0.000%
30	9.08	-77.75	0.00	-9.08	77.75	-0.00	0.000%
31	7.87	-77.75	4.54	-7.87	77.75	-4.54	0.000%
32	4.54	-77.75	7.86	-4.54	77.75	-7.86	0.000%
33	0.00	-77.75	9.07	-0.00	77.75	-9.07	0.000%
34	-4.54	-77.75	7.86	4.54	77.75	-7.86	0.000%
35	-7.86	-77.75	4.53	7.86	77.75	-4.53	0.000%
36	-9.08	-77.75	-0.00	9.08	77.75	0.00	0.000%
37	-7.87	-77.75	-4.54	7.87	77.75	4.54	0.000%
38	-4.54	-77.75	-7.86	4.54	77.75	7.86	0.000%
39	-0.00	-42.59	-8.21	0.00	42.59	8.21	0.000%
40	4.15	-42.59	-7.20	-4.15	42.59	7.20	0.000%
41	6.75	-42.59	-3.90	-6.75	42.59	3.90	0.000%
42	7.80	-42.59	0.00	-7.80	42.59	-0.00	0.000%
43	6.75	-42.59	3.90	-6.75	42.59	-3.90	0.000%
44	4.02	-42.59	6.96	-4.02	42.59	-6.96	0.000%
45	0.00	-42.59	8.21	-0.00	42.59	-8.21	0.000%
46	-4.15	-42.59	7.20	4.15	42.59	-7.20	0.000%
47	-6.75	-42.59	3.90	6.75	42.59	-3.90	0.000%
48	-7.80	-42.59	-0.00	7.80	42.59	0.00	0.000%
49	-6.75	-42.59	-3.90	6.75	42.59	3.90	0.000%
50	-4.02	-42.59	-6.96	4.02	42.59	6.96	0.000%



### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00032307
3	Yes	5	0.00000001	0.00015027
4	Yes	7	0.00000001	0.00014711
5	Yes	6	0.00000001	0.00050561
6	Yes	7	0.00000001	0.00014877
7	Yes	6	0.00000001	0.00051692
8	Yes	5	0.00000001	0.00049229
9	Yes	5	0.00000001	0.00022771
10	Yes	7	0.00000001	0.00014439
11	Yes	6	0.00000001	0.00050043
12	Yes	7	0.00000001	0.00014657
13	Yes	6	0.00000001	0.00050693
14	Yes	5	0.00000001	0.00030648
15	Yes	5	0.00000001	0.00014287
16	Yes	7	0.00000001	0.00015220
17	Yes	6	0.00000001	0.00052520
18	Yes	7	0.00000001	0.00014265
19	Yes	6	0.00000001	0.00049395
20	Yes	5	0.00000001	0.00050881
21	Yes	5	0.00000001	0.00023511
22	Yes	7	0.00000001	0.00014704
23	Yes	6	0.00000001	0.00051034
24	Yes	7	0.00000001	0.00014717
25	Yes	6	0.00000001	0.00050906
26	Yes	4	0.00000001	0.00005322
27	Yes	6	0.00000001	0.00021312
28	Yes	6	0.00000001	0.00047441
29	Yes	6	0.00000001	0.00049219
30	Yes	6	0.00000001	0.00021303
31	Yes	6	0.00000001	0.00046813
32	Yes	6	0.00000001	0.00047159
33	Yes	6	0.00000001	0.00021000
34	Yes	6	0.00000001	0.00047964
35	Yes	6	0.00000001	0.00046228
36	Yes	6	0.00000001	0.00021267
37	Yes	6	0.00000001	0.00048627
38	Yes	6	0.00000001	0.00048270
39	Yes	4	0.00000001	0.00048190
40	Yes	5	0.00000001	0.00031022
41	Yes	5	0.00000001	0.00031733
42	Yes	4	0.00000001	0.00053873
43	Yes	5	0.00000001	0.00029208
44	Yes	5	0.00000001	0.00030439
45	Yes	4	0.00000001	0.00047712
46	Yes	5	0.00000001	0.00033620
47	Yes	5	0.00000001	0.00028370
48	Yes	4	0.00000001	0.00053943
49	Yes	5	0.00000001	0.00030762
50	Yes	5	0.00000001	0.00030908

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.29	35.797	40	2.1702	0.0038
L2	126.71 - 88.88	25.540	40	1.9723	0.0027
L3	93.13 - 43.8	13.363	40	1.4270	0.0024
L4	49.22 - 0	3.561	40	0.6769	0.0008

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	(2) 6' x 2" Mount Pipe	40	35.345	2.1630	0.0037	18026
137.00	6' x 2" Mount Pipe	40	29.966	2.0732	0.0029	6932
129.00	TME-RRUS-11	40	26.502	1.9979	0.0027	4315
127.00	(2) 7770.00 w/ Mount Pipe	40	25.661	1.9757	0.0027	4027
117.00	(2) LPA-80080/4CF w/ Mount Pipe	40	21.639	1.8411	0.0027	3704
90.00	DS9A09F36D-N	40	12.425	1.3700	0.0023	3308
76.00	KS24019-L112A	40	8.669	1.1199	0.0018	3192
70.00	MX08FRO665-21 w/ Mount Pipe	40	7.284	1.0160	0.0016	3145

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.29	155.613	4	9.4895	0.0163
L2	126.71 - 88.88	111.075	4	8.6175	0.0114
L3	93.13 - 43.8	58.163	4	6.2263	0.0101
L4	49.22 - 0	15.503	4	2.9497	0.0033

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	(2) 6' x 2" Mount Pipe	4	153.650	9.4587	0.0160	4354
137.00	6' x 2" Mount Pipe	4	130.296	9.0649	0.0125	1672
129.00	TME-RRUS-11	4	115.253	8.7308	0.0114	1038
127.00	(2) 7770.00 w/ Mount Pipe	4	111.600	8.6324	0.0114	968
117.00	(2) LPA-80080/4CF w/ Mount Pipe	4	94.129	8.0401	0.0114	884
90.00	DS9A09F36D-N	4	54.084	5.9770	0.0098	776
76.00	KS24019-L112A	4	37.744	4.8841	0.0077	744
70.00	MX08FRO665-21 w/ Mount Pipe	4	31.714	4.4300	0.0067	731

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KI/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
L1	150 - 123.29 (1)	TP22.9x17x0.1875	26.71	0.00	0.0	13.067 2	-12.73	764.43	0.017
L2	123.29 - 88.88 (2)	TP30x21.7696x0.3125	37.83	0.00	0.0	28.529 2	-20.54	1668.96	0.012
L3	88.88 - 43.8 (3)	TP39.2x28.4504x0.375	49.33	0.00	0.0	44.805 7	-34.41	2621.13	0.013
L4	43.8 - 0 (4)	TP48x37.2689x0.4375	49.22	0.00	0.0	66.046 5	-51.06	3863.72	0.013

### Pole Bending Design Data

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft	$\phi M_{nx}$ kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	$M_{uy}$ kip-ft	$\phi M_{ny}$ kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 123.29 (1)	TP22.9x17x0.1875	212.33	413.83	0.513	0.00	413.83	0.000
L2	123.29 - 88.88 (2)	TP30x21.7696x0.3125	914.54	1249.92	0.732	0.00	1249.92	0.000
L3	88.88 - 43.8 (3)	TP39.2x28.4504x0.375	2139.11	2537.12	0.843	0.00	2537.12	0.000
L4	43.8 - 0 (4)	TP48x37.2689x0.4375	3806.32	4628.73	0.822	0.00	4628.73	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 123.29 (1)	TP22.9x17x0.1875	16.33	229.33	0.071	0.41	440.97	0.001
L2	123.29 - 88.88 (2)	TP30x21.7696x0.3125	23.53	500.69	0.047	0.56	1261.18	0.000
L3	88.88 - 43.8 (3)	TP39.2x28.4504x0.375	31.71	786.34	0.040	1.89	2592.30	0.001
L4	43.8 - 0 (4)	TP48x37.2689x0.4375	35.96	1159.12	0.031	1.88	4828.05	0.000

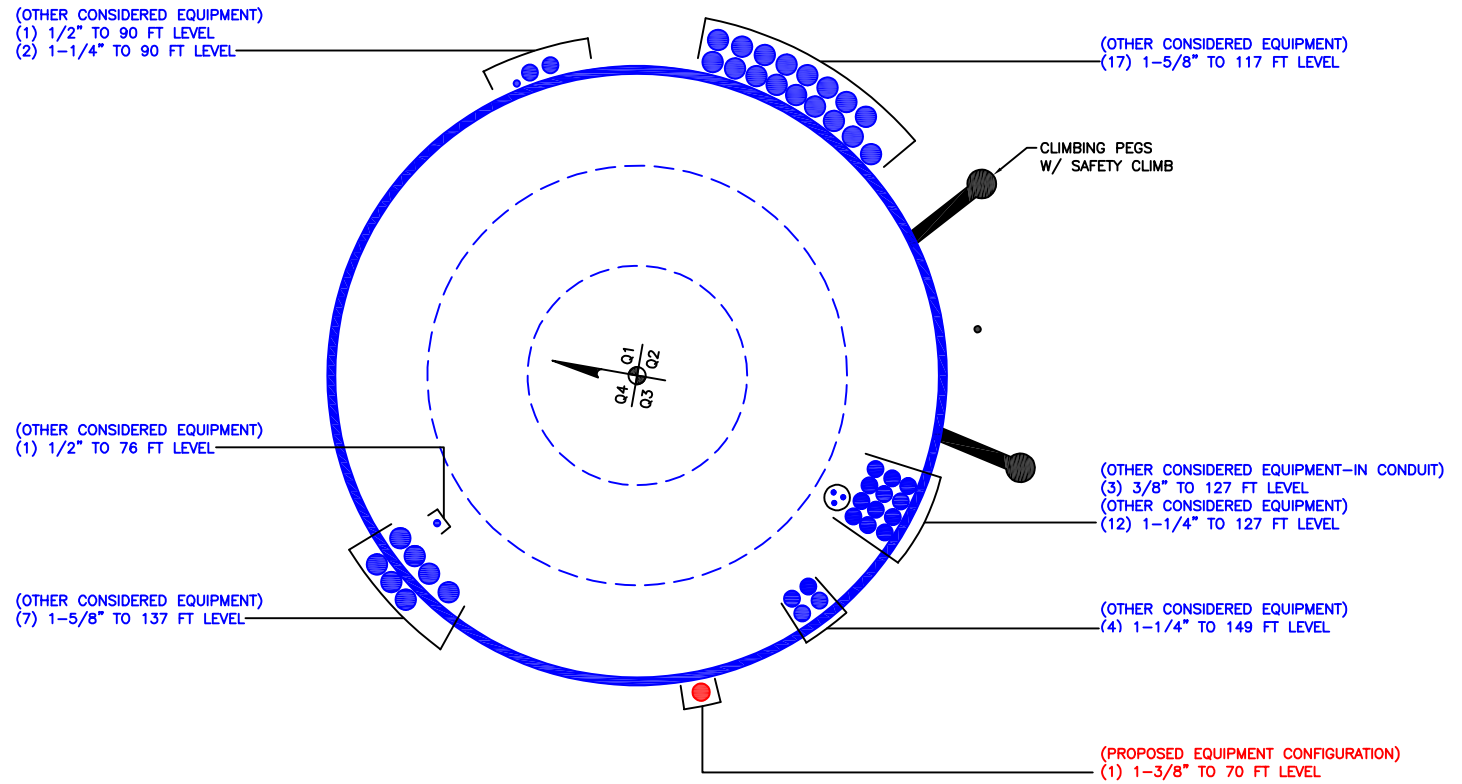
### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$	Ratio $M_{ux}$	Ratio $M_{uy}$	Ratio $V_u$	Ratio $T_u$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 123.29 (1)	0.017	0.513	0.000	0.071	0.001	0.535	1.050	4.8.2
L2	123.29 - 88.88 (2)	0.012	0.732	0.000	0.047	0.000	0.746	1.050	4.8.2
L3	88.88 - 43.8 (3)	0.013	0.843	0.000	0.040	0.001	0.858	1.050	4.8.2
L4	43.8 - 0 (4)	0.013	0.822	0.000	0.031	0.000	0.837	1.050	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 123.29	Pole	TP22.9x17x0.1875	1	-12.73	802.65	50.9	Pass
L2	123.29 - 88.88	Pole	TP30x21.7696x0.3125	2	-20.54	1752.41	71.1	Pass
L3	88.88 - 43.8	Pole	TP39.2x28.4504x0.375	3	-34.41	2752.19	81.7	Pass
L4	43.8 - 0	Pole	TP48x37.2689x0.4375	4	-51.06	4056.91	79.7	Pass
							Summary	
							Pole (L3)	Pass
							<b>RATING = 81.7</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**



**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

## Monopole Base Plate Connection

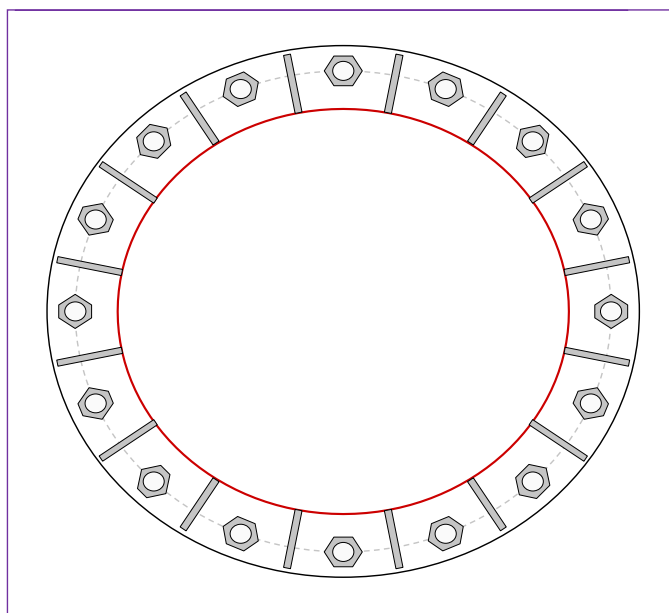


Site Info	
BU #	876390
Site Name	Hampton / Bernier
Order #	572911 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$I_{ar}$ (in)	1

Applied Loads	
Moment (kip-ft)	3806.32
Axial Force (kips)	51.06
Shear Force (kips)	35.96

\*TIA-222-H Section 15.5 Applied



### Connection Properties

#### Anchor Rod Data

(16) 2-1/4"  $\phi$  bolts (A615-75 N;  $F_y=75$  ksi,  $F_u=100$  ksi) on 57" BC

#### Base Plate Data

63" OD x 2" Plate (A871 Gr. 60;  $F_y=60$  ksi,  $F_u=75$  ksi)

#### Stiffener Data

(16) 18"H x 7"W x 0.75"T, Notch: 0.75"

plate:  $F_y=50$  ksi ; weld:  $F_y=70$  ksi

horiz. weld: 0.375" groove, 45° dbl bevel FALSE

vert. weld: 0.375" fillet

#### Pole Data

48" x 0.4375" 18-sided pole (A572-65;  $F_y=65$  ksi,  $F_u=80$  ksi)

### Analysis Results

#### Anchor Rod Summary

(units of kips, kip-in)

$Pu_t = 197.01$	$\phi Pn_t = 243.75$	<b>Stress Rating</b>
$Vu = 2.25$	$\phi Vn = 149.1$	<b>77.0%</b>
$Mu = n/a$	$\phi Mn = n/a$	<b>Pass</b>

#### Base Plate Summary

Max Stress (ksi):	35.14	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	<b>62.0%</b>	<b>Pass</b>

#### Stiffener Summary

Horizontal Weld:	<b>63.9%</b>	<b>Pass</b>
Vertical Weld:	<b>48.9%</b>	<b>Pass</b>
Plate Flexure+Shear:	<b>22.7%</b>	<b>Pass</b>
Plate Tension+Shear:	<b>64.7%</b>	<b>Pass</b>
Plate Compression:	<b>71.2%</b>	<b>Pass</b>

#### Pole Summary

Punching Shear:	<b>12.6%</b>	<b>Pass</b>
-----------------	--------------	-------------

# Pier and Pad Foundation



BU #: 876390  
 Site Name: Hampton / Bernier  
 App. Number: 572911 Rev. 0

TIA-222 Revision: H  
 Tower Type: Monopole

Top & Bot. Pad Rein. Different?:	<input checked="" type="checkbox"/>
Block Foundation?:	<input type="checkbox"/>
Rectangular Pad?:	<input type="checkbox"/>

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	51.11	kips
Base Shear, $V_{u\_comp}$ :	35.9	kips
Moment, $M_u$ :	3806.32	ft-kips
Tower Height, $H$ :	150	ft
BP Dist. Above Fdn, $bp_{dist}$ :	3.25	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$ :	6.5	ft
Ext. Above Grade, $E$ :	1	ft
Pier Rebar Size, $Sc$ :	9	
Pier Rebar Quantity, $mc$ :	27	
Pier Tie/Spiral Size, $St$ :	4	
Pier Tie/Spiral Quantity, $mt$ :	4	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $cc_{pier}$ :	3	in

Pad Properties		
Depth, $D$ :	5	ft
Pad Width, $W_1$ :	25.25	ft
Pad Thickness, $T$ :	3	ft
Pad Rebar Size (Top dir. 2), $Sp_{top2}$ :	9	
Pad Rebar Quantity (Top dir. 2), $mp_{top2}$ :	20	
Pad Rebar Size (Bottom dir. 2), $Sp_2$ :	9	
Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :	35	
Pad Clear Cover, $cc_{pad}$ :	3	in

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

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	125	pcf
Ultimate Net Bearing, $Q_{net}$ :	12.000	ksf
Cohesion, $C_u$ :	0.000	ksf
Friction Angle, $\phi$ :	30	degrees
SPT Blow Count, $N_{blows}$ :	6	
Base Friction, $\mu$ :	0.5	
Neglected Depth, $N$ :	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, $gw$ :	13	ft

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	217.25	35.90	15.7%	Pass
Bearing Pressure (ksf)	9.47	3.39	35.8%	Pass
Overturning (kip*ft)	5369.39	4031.44	75.1%	Pass
Pier Flexure (Comp.) (kip*ft)	4129.48	3914.02	90.3%	Pass
Pier Compression (kip)	26891.28	73.93	0.3%	Pass
Pad Flexure (kip*ft)	4770.48	1881.78	37.6%	Pass
Pad Shear - 1-way (kips)	899.95	276.46	29.3%	Pass
Pad Shear - 2-way (Comp) (ksi)	0.190	0.041	20.7%	Pass
Flexural 2-way (Comp) (kip*ft)	4566.12	2348.41	49.0%	Pass

\*Rating per TIA-222-H Section 15.5

Structural Rating*:	90.3%
Soil Rating*:	75.1%

--Toggle between Gross and Net

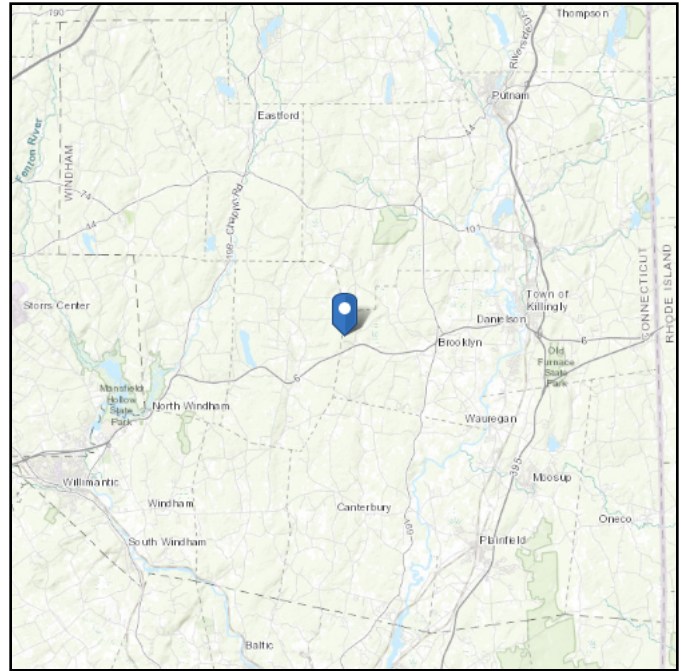
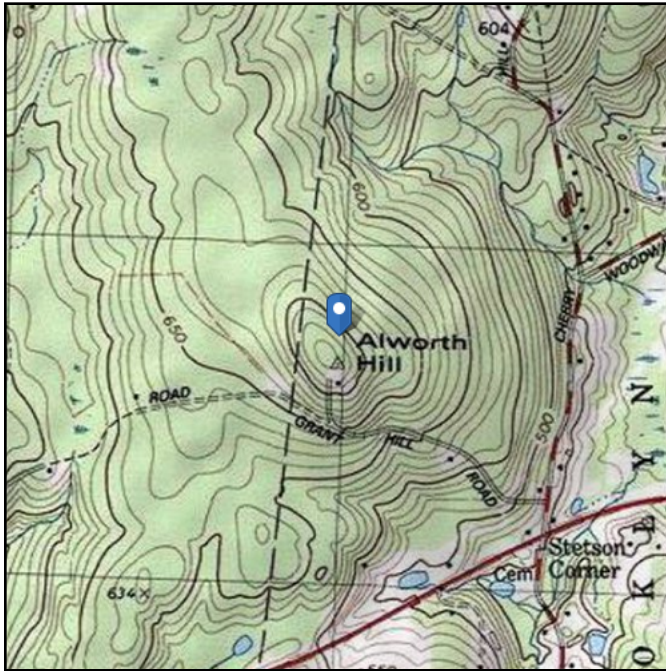


# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Elevation:** 715.2 ft (NAVD 88)  
**Latitude:** 41.791567  
**Longitude:** -72.015011



## Wind

### Results:

Wind Speed:	121 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	94 Vmph
100-year MRI	100 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Thu Nov 18 2021

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 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

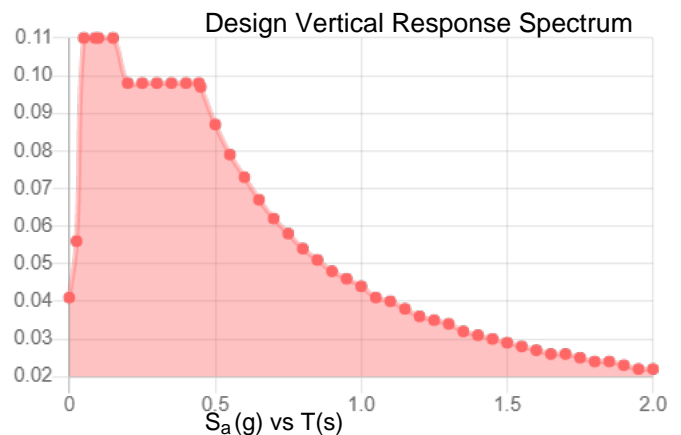
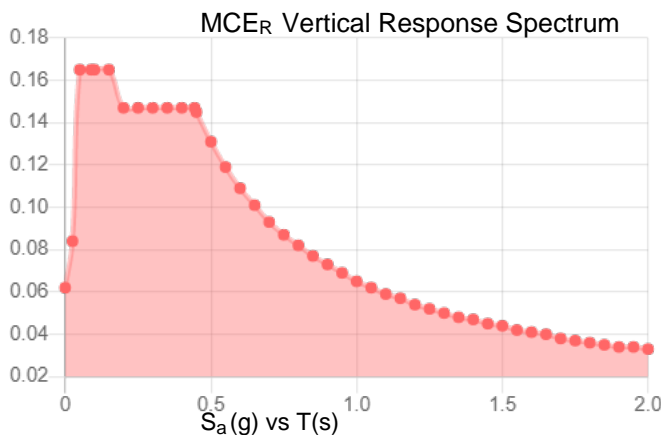
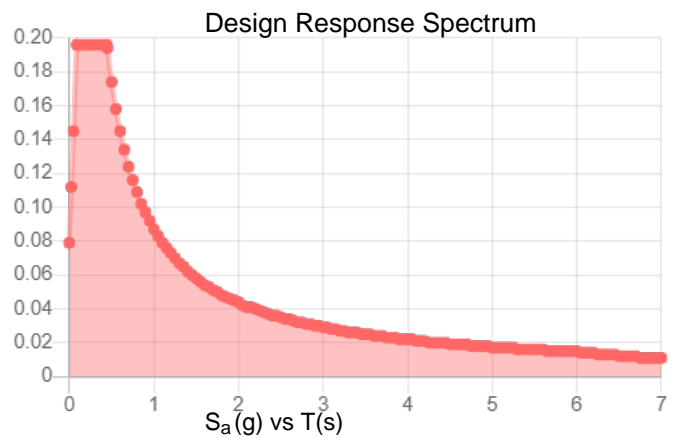
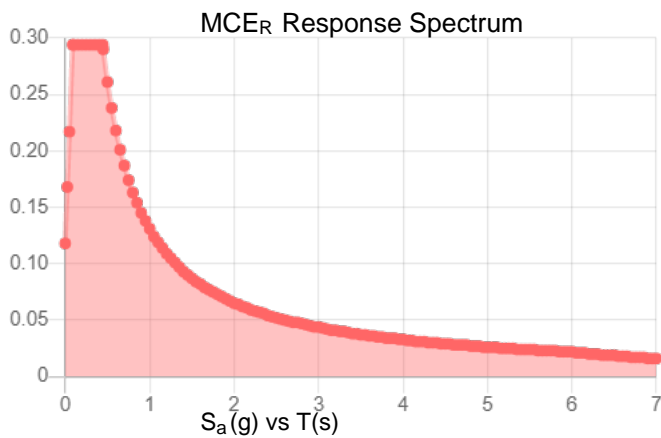
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_S$ :	0.184	$S_{D1}$ :	0.087
$S_1$ :	0.054	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.099
$F_v$ :	2.4	PGA <sub>M</sub> :	0.159
$S_{MS}$ :	0.294	$F_{PGA}$ :	1.6
$S_{M1}$ :	0.131	$I_e$ :	1
$S_{DS}$ :	0.196	$C_v$ :	0.7

**Seismic Design Category** B



**Data Accessed:**

Thu Nov 18 2021

**Date Source:**

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

**Results:**

Ice Thickness: 1.00 in.  
Concurrent Temperature: 15 F  
Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

**Date Accessed:** Thu Nov 18 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 500-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: **April 6, 2022**



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

<b>Subject:</b>	<b>Mount Analysis Report</b>		
<b>Carrier Designation:</b>	<b>DISH Network Equipment Change-Out</b>		
	<b>Carrier Site Number:</b>	BOBOS00895A	
	<b>Carrier Site Name:</b>	-	
<b>Crown Castle Designation:</b>	<b>BU Number:</b>	876390	
	<b>Site Name:</b>	HAMPTON / BERNIER	
	<b>JDE Job Number:</b>	671533	
	<b>Order Number:</b>	572911 Rev. 2	
<b>Engineering Firm Designation:</b>	<b>Trylon Report Designation:</b>	206818	
<b>Site Data:</b>	<b>116 Grant Hill Rd., Brooklyn, Windham County, CT, 06234</b> <b>Latitude 41°47'29.64" Longitude -72°0'54.04"</b>		
<b>Structure Information:</b>	<b>Tower Height &amp; Type:</b>	<b>150.0 ft Monopole</b>	
	<b>Mount Elevation:</b>	<b>70.0 ft</b>	
	<b>Mount Width &amp; Type:</b>	<b>8.0 ft Platform</b>	

Trylon is pleased to submit this “**Mount 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**

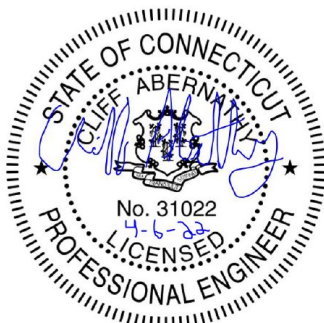
**Sufficient\***

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

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 121 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Gabriela Raboj

Respectfully Submitted by:  
Cliff Abernathy, P.E.



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### 3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

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3.2) Assumptions

### 4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity

4.1) Recommendations

### 5) APPENDIX A

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### 7) APPENDIX C

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### 8) APPENDIX D

Additional Calculations

### 9) APPENDIX E

Supplemental Drawings

## 1) INTRODUCTION

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

## 2) ANALYSIS CRITERIA

<b>Building Code:</b>	2018 IBC
<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Ultimate Wind Speed:</b>	121 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor at Base:</b>	1.512
<b>Topographic Factor at Mount:</b>	1.310
<b>Ice Thickness:</b>	1.00 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Seismic <math>S_s</math>:</b>	0.184
<b>Seismic <math>S_1</math>:</b>	0.054
<b>Live Loading Wind Speed:</b>	30 mph
<b>Man Live Load at Mid/End-Points:</b>	250 lb
<b>Man Live Load at Mount Pipes:</b>	500 lb

**Table 1 - Proposed Equipment Configuration**

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
70.0	70.0	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	572911, Rev. 2	CCI Sites
Structural Analysis Report	Morrison Hershfield	10237817	CCI Sites
Mount Modification Drawings	Commscope	MC-PK8-DSH	Trylon

### 3.1) Analysis Method

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

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

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

### 3.2) Assumptions

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

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

This analysis may be affected if any assumptions are not valid or have been made in error. Trylon 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, 3	Mount Pipe(s)	MP1	70.0	13.7	Pass
	Horizontal(s)	H1		13.0	Pass
	Standoff(s)	M2		25.5	Pass
	Bracing(s)	M1		32.2	Pass
	Handrail(s)	M51		10.1	Pass
	Plate(s)	M15		25.9	Pass
	Mount Connection(s)	-		20.6	Pass

<b>Structure Rating (max from all components) =</b>	<b>32.2%</b>
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) See additional documentation in "Appendix D – Additional Calculations" for detailed mount connection calculations.
- 3) Rating per TIA-222-H, Section 15.5

### 4.1) Recommendations

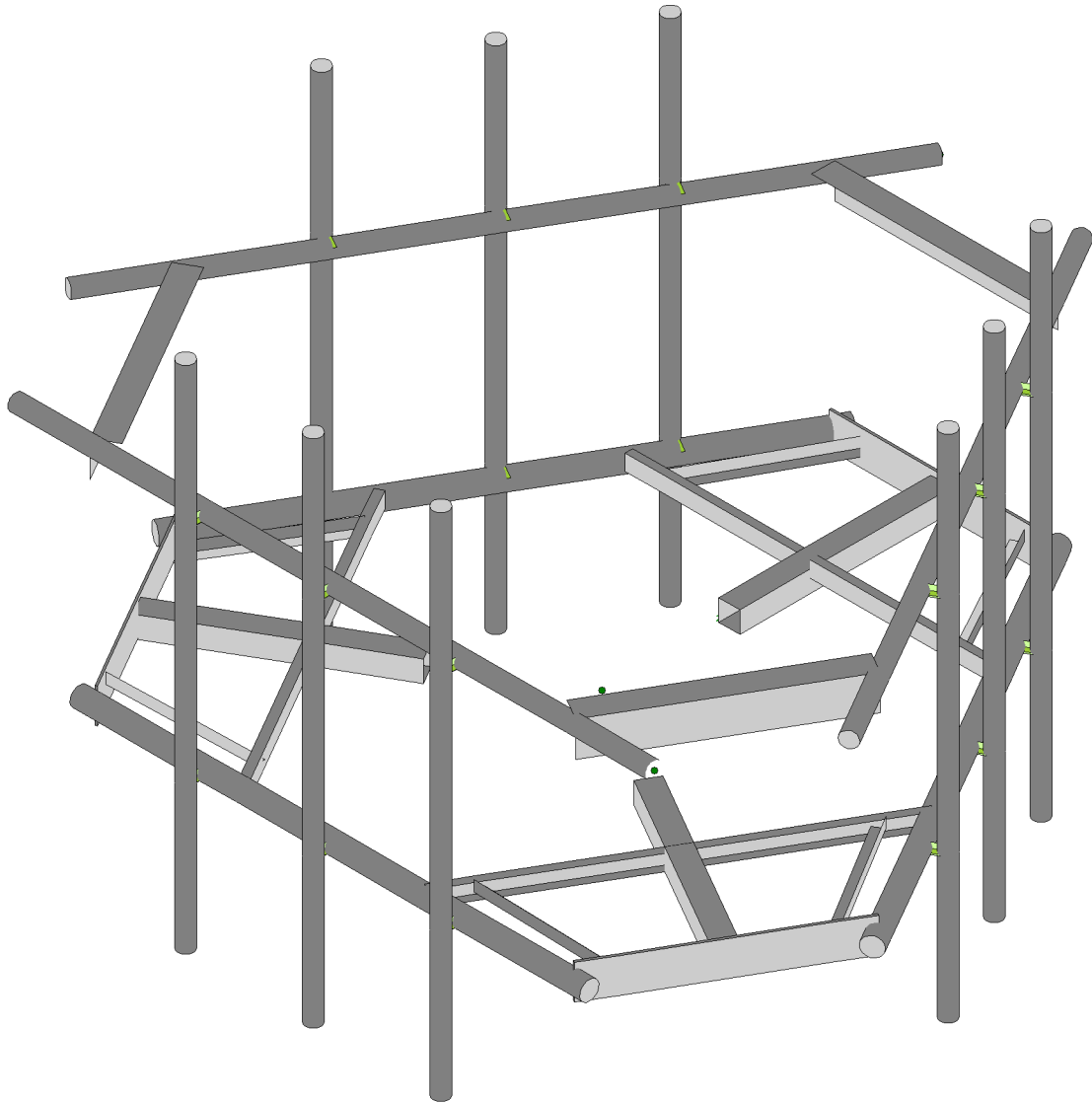
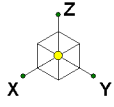
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

1. Commscope, MC-PK8-DSH.

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

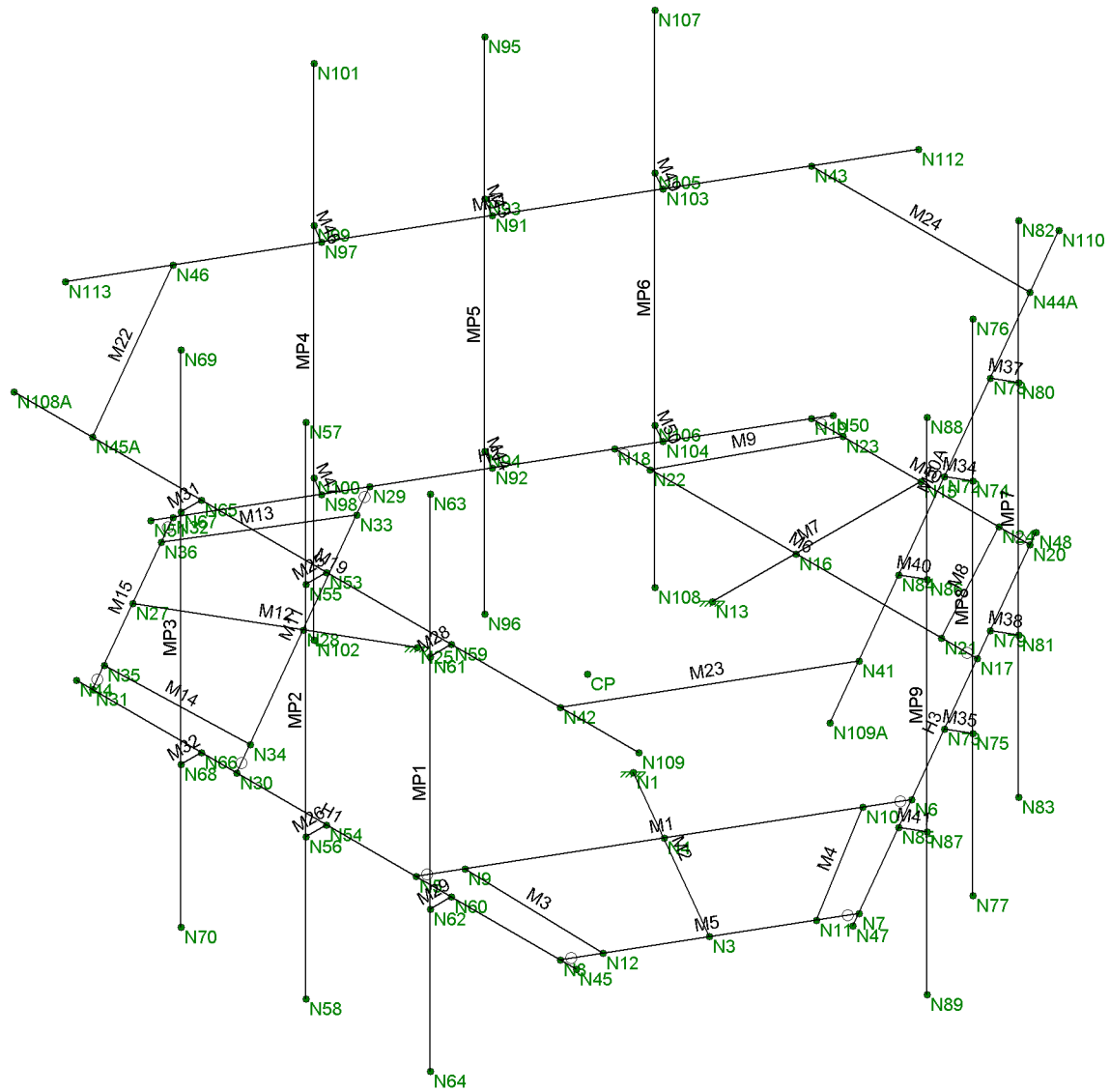


**APPENDIX A**  
**WIRE FRAME AND RENDERED MODELS**



Envelope Only Solution

Trylon	876390	SK - 1
GR		Apr 6, 2022 at 11:46 AM
206818		876390_loaded.r3d


$$\dot{U} \dot{a}^* \wedge \dot{A} G$$

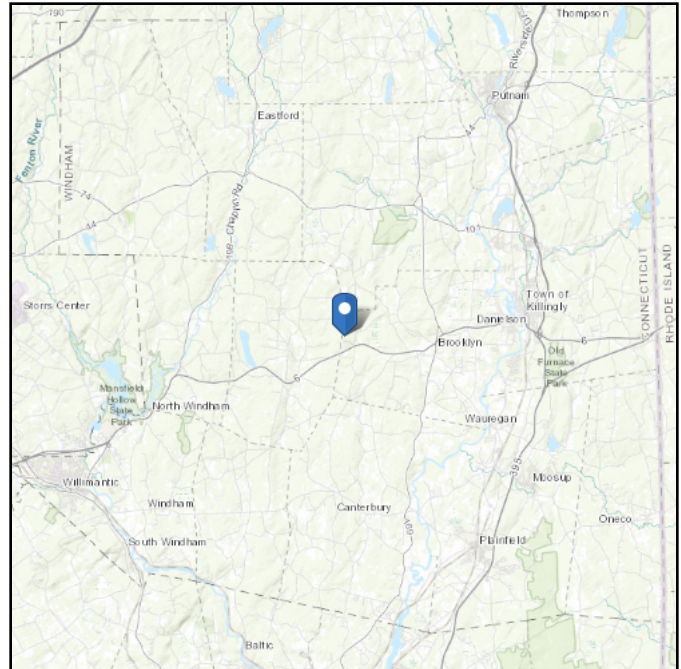
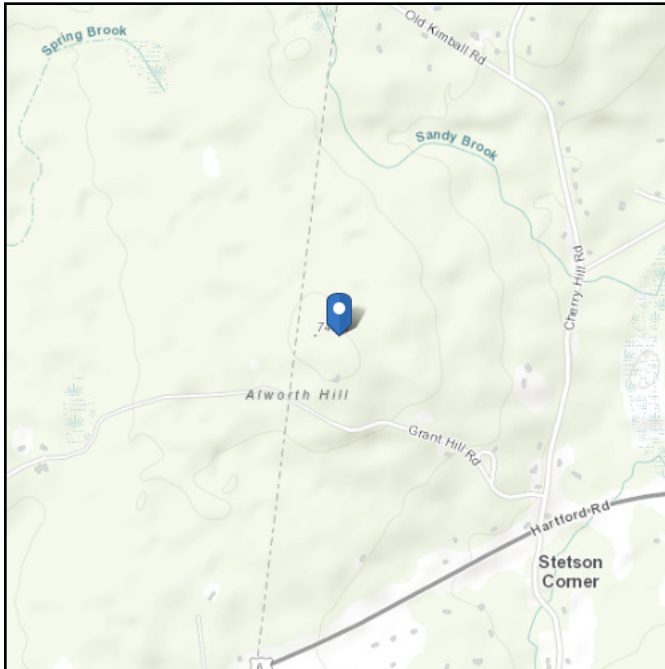
**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**

# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** D - Default (see  
Section 11.4.3)

**Elevation:** 715.2 ft (NAVD 88)  
**Latitude:** 41.791567  
**Longitude:** -72.015011



## Wind

### Results:

Wind Speed	121 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	94 Vmph
100-year MRI	100 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2  
Date Accessed: Tue Apr 05 2022

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 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

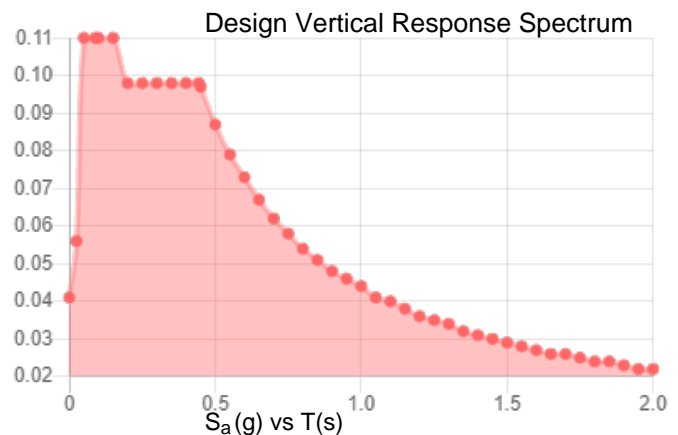
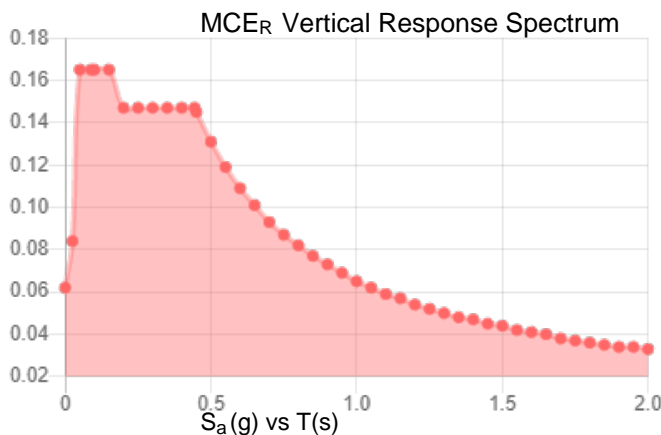
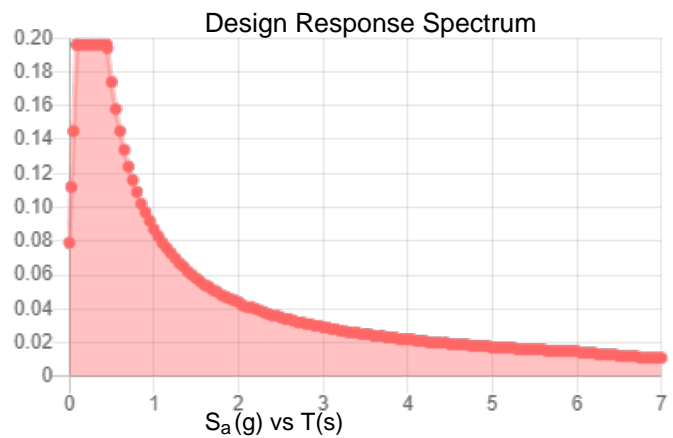
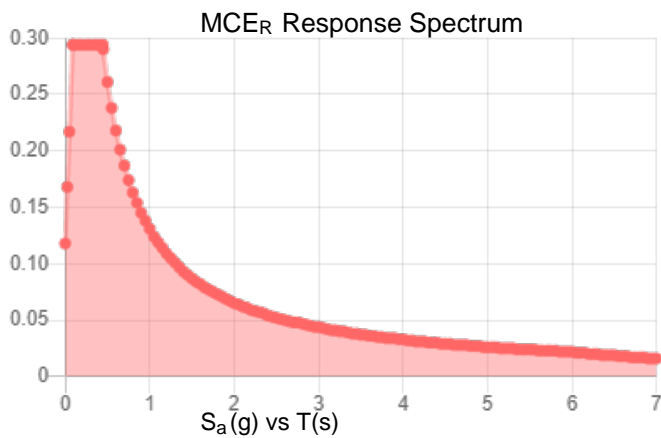
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:** D - Default (see Section 11.4.3)

**Results:**

$S_S$ :	0.184	$S_{D1}$ :	0.087
$S_1$ :	0.054	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.099
$F_v$ :	2.4	PGA <sub>M</sub> :	0.159
$S_{MS}$ :	0.294	$F_{PGA}$ :	1.6
$S_{M1}$ :	0.131	$I_e$ :	1
$S_{DS}$ :	0.196	$C_v$ :	0.7

**Seismic Design Category** B



**Data Accessed:** Tue Apr 05 2022

**Date Source:**

**USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.**

**Results:**

Ice Thickness: 1.00 in.  
Concurrent Temperature: 15 F  
Gust Speed 50 mph

**Data Source:** Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

**Date Accessed:** Tue Apr 05 2022

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

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## TIA LOAD CALCULATOR 2.2

PROJECT DATA		
Job Code:	206818	
Carrier Site ID:	BOBOS00895A	
Carrier Site Name:	-	

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

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	70.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	150.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	B	--
Site Class:	D - Default	--
Ground Elevation:	715.2	ft.

TOPOGRAPHIC DATA		
Topographic Category:	5.00	--
Topographic Feature:	Flat Topped Hill	--
Crest Point Elevation:	715.00	ft.
Base Point Elevation:	454.00	ft.
Crest to Mid-Height (L/2):	605.00	ft.
Distance from Crest (x):	346.00	ft.
Base Topo Factor ( $K_{zt}$ ):	1.512	--
Mount Topo Factor ( $K_{zt}$ ):	1.310	--

WIND PARAMETERS		
Design Wind Speed:	121	mph
Wind Escalation Factor ( $K_s$ ):	1.00	--
Velocity Coefficient ( $K_z$ ):	0.89	--
Directionality Factor ( $K_d$ ):	0.95	--
Gust Effect Factor ( $G_h$ ):	1.00	--
Shielding Factor ( $K_a$ ):	0.90	--
Velocity Pressure ( $q_z$ ):	40.56	psf
Ground Elevation Factor ( $K_e$ ):	0.97	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness ( $t_i$ ):	1.00	in
Importance Factor ( $I_i$ ):	1.00	--
Ice Velocity Pressure ( $q_{zi}$ ):	8.37	psf
Mount Ice Thickness ( $t_{iz}$ ):	1.18	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	73.01	psf
Round Member Pressure:	43.81	psf
Ice Wind Pressure:	9.04	psf

SEISMIC PARAMETERS		
Importance Factor ( $I_e$ ):	1.00	--
Short Period Accel. ( $S_s$ ):	0.184	g
1 Second Accel. ( $S_1$ ):	0.054	g
Short Period Des. ( $S_{DS}$ ):	0.20	g
1 Second Des. ( $S_{D1}$ ):	0.09	g
Short Period Coeff. ( $F_a$ ):	1.60	--
1 Second Coeff. ( $F_v$ ):	2.40	--
Response Coefficient ( $C_s$ ):	0.10	--
Amplification Factor ( $A_S$ ):	3.00	--



## 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

## EQUIPMENT LOADING

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## EQUIPMENT LOADING [CONT.]

[illegible]

## EQUIPMENT WIND CALCULATIONS

[illegible]

## EQUIPMENT LATERAL WIND FORCE CALCULATIONS

[illegible]

## EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

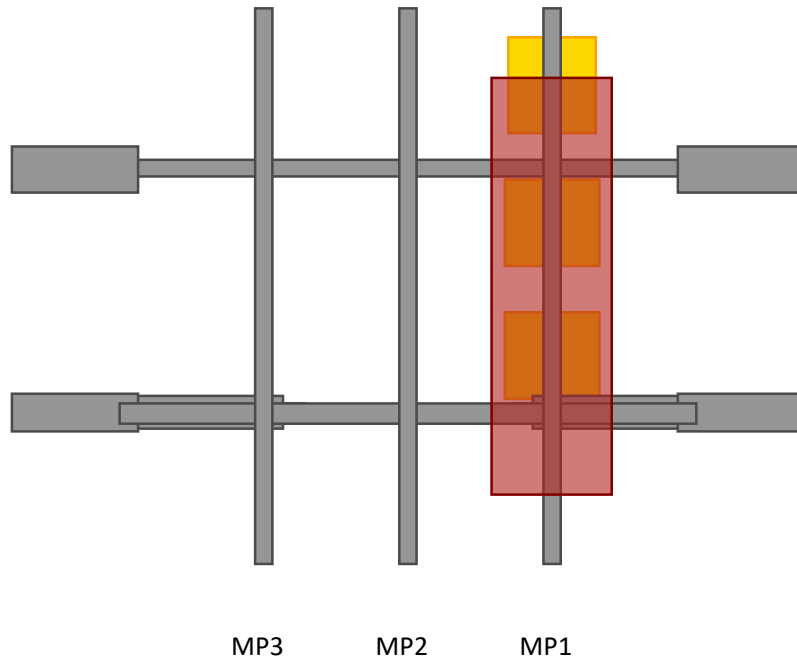
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## EQUIPMENT SEISMIC FORCE CALCULATIONS

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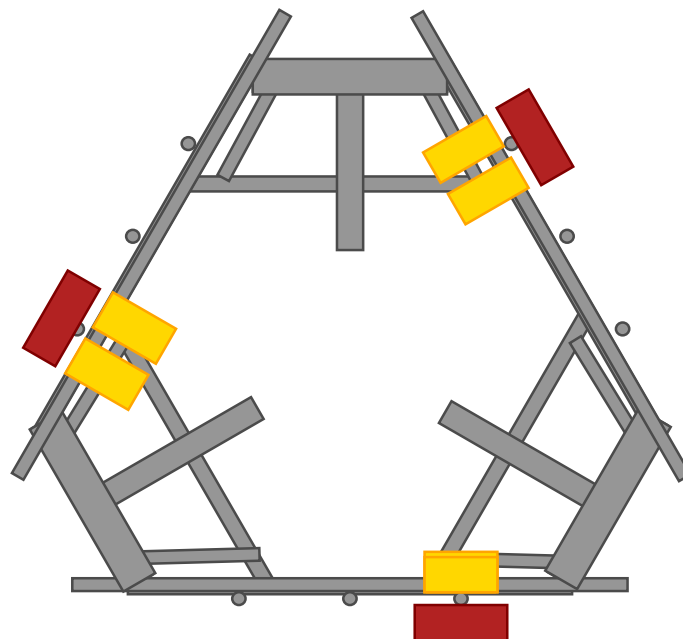


### ELEVATION VIEW



\*Elevation View Shows Only One Sector

### PLAN VIEW





**APPENDIX C**  
**SOFTWARE ANALYSIS OUTPUT**

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FÍ H	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	F	H		I	ÆH
FÍ I	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	H	ÆH	F	Í	ÆH
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FÍ J	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	F	H		I	ÆH
FÍ €	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	H	ÆH	F	Í	ÆH
FÍ F	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	H	ÆH	H	Î	ÆH
FÍ G	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	F	H	ÆH	H	Ï
FÍ H	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G		H	ÆH	F	i	ÆH
FÍ I	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	F	H	ÆH	J	ÆH
FÍ Í	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	H	ÆH	H	F€	ÆH
FÍ Î	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	H	ÆH	F	FF	ÆH
FÍ Ï	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	F	H		I	ÆH
FÍ Ì	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	H	ÆH	F	Í	ÆH
FÍ J	FEÖSÆAÆEY^	Y	ÖS	FEG	H	FE	G	ÆH	H	ÆH	H	Î	ÆH
FJ €	FEÖSÆAÆEY^	Y	ÖS	FEG	I €	FE	G	ÆH	F	H		I	ÆH
FJ I	FEÖSÆAÆEY^	Y	ÖS	FEG	I €	FE	G	ÆH	H	ÆH	F	Í	ÆH
FJ J	FEÖSÆAÆEY^	Y	ÖS	FEG	I €	FE	G	ÆH	H	ÆH	H	Î	ÆH
FJ €	FEÖSÆAÆEY^	Y	ÖS	FEG	I €	FE	G	ÆH	F	H	ÆH	H	Ï
FJ F	FEÖSÆAÆEY^	Y	ÖS	FEG	I €	FE	G		H	ÆH	F	i	ÆH

[illegible]

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[illegible][illegible][illegible]

**APPENDIX D**  
**ADDITIONAL CALCULATIONS**

**BOLT TOOL 1.5.2**

Project Data	
Job Code:	206818
Carrier Site ID:	BOBOS00895A
Carrier Site Name:	-

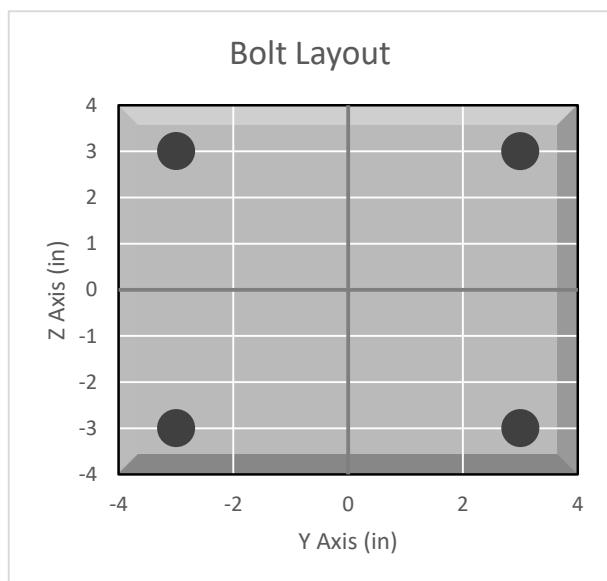
Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	AISC

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (F <sub>y</sub> ):	92	ksi
Ultimate Strength (F <sub>u</sub> ):	120	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in

Connection Description
Standoff to Collar

Bolt Check*		
Tensile Capacity ( $\phi T_n$ ):	20340.1	lbs
Shear Capacity ( $\phi V_n$ ):	13805.8	lbs
Tension Force (T <sub>u</sub> ):	4396.2	lbs
Shear Force (V <sub>u</sub> ):	881.4	lbs
Tension Usage:	20.6%	--
Shear Usage:	6.1%	--
Interaction:	20.6%	Pass
Controlling Member:	M2	--
Controlling LC:	10	--

\*Rating per TIA-222-H Section 15.5



**APPENDIX E**  
**SUPPLEMENTAL DRAWINGS**



4

3

2

1

NOTES:

- 1.0 GENERAL
- 1.1 ALL METRIC DIMENSIONS ARE IN BRACKETS

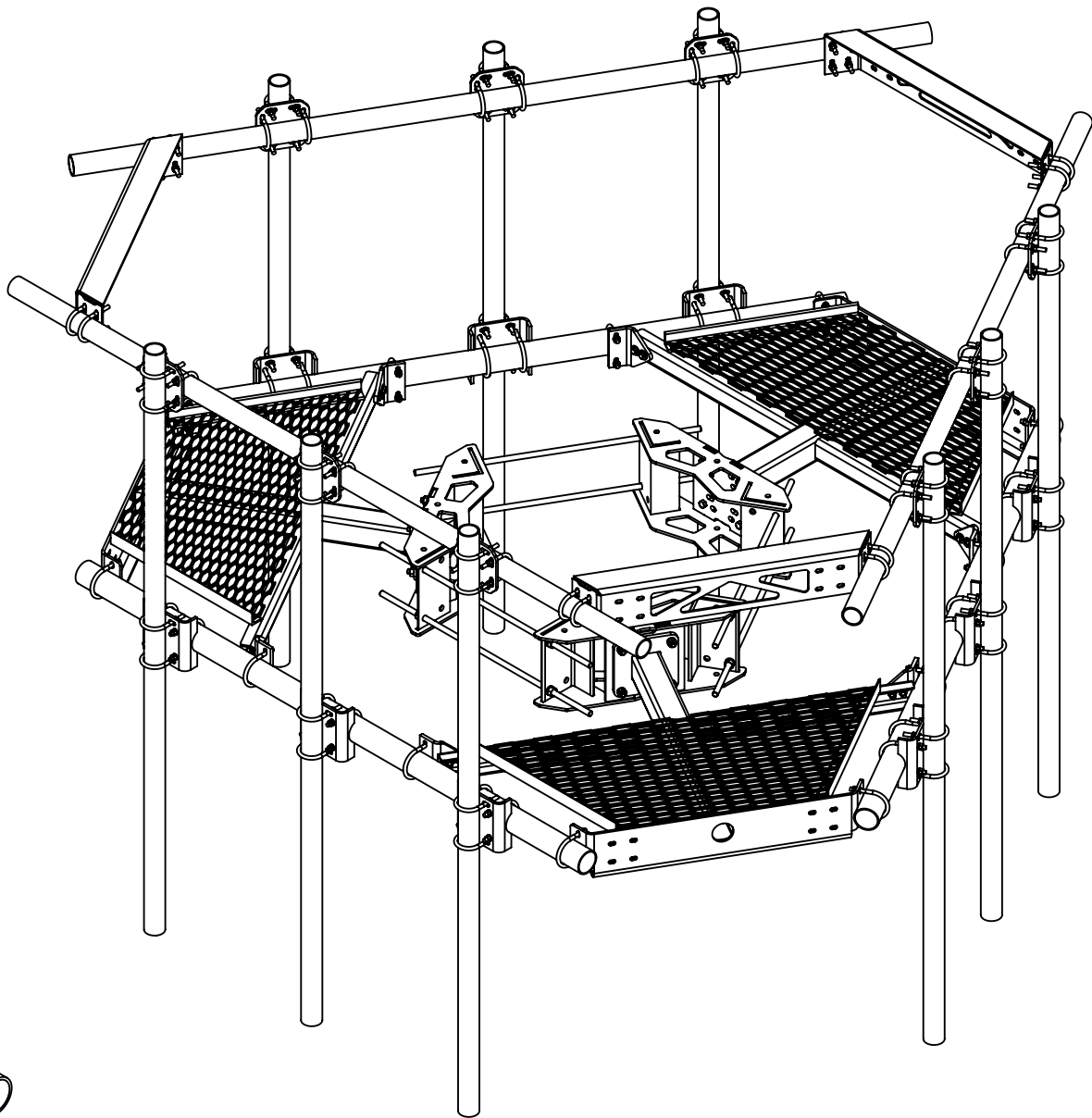
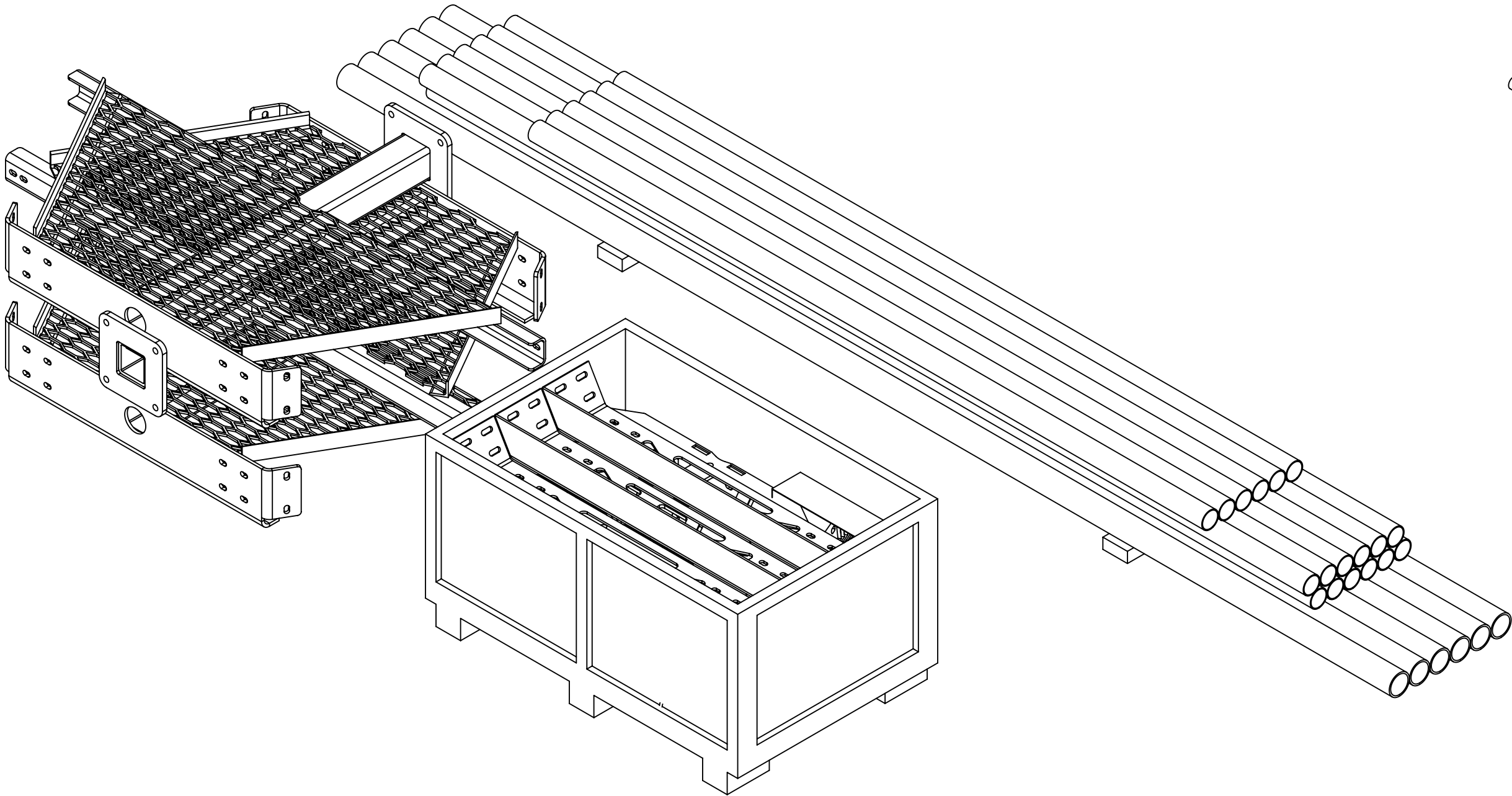
1.2 FOR PATENTS, SEE WWW.CS-PAT.COM
- 2.0 DESIGN NOTES
- 2.1 TIGHTEN ALL BOLTS SECURING FLAT PLATES BY THE TURN-OF-NUT METHOD.

TIGHTEN ALL U-BOLTS USING TURN-OF-NUT METHOD WITH ATTENTION TO LEAVE EQUAL DISTANCE AND EQUAL FORCE ON EACH LEG OF THE U-BOLT.
- 3.0 MANUFACTURING/SPECIAL REQUIREMENTS
- 4.0 TEST
- 5.0 PACKAGING
- 5.1 PACKAGING SHALL MEET COMMSCOPE REQUIREMENTS PER DOCUMENT IS-PL-3005.



5.2 PRINTED DOCUMENT TO BE PLACED INSIDE POLYBAG AND THEN IN SHIPPING CONTAINER.

5.3 EXTRA HARDWARE MAYBE SUPPLIED, BAGGED AND SHIPPED.

REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
A	10272PC	INITIAL RELEASE	HDAI	03/08/2021
B	14762	SHEET 1: UPDATED NOTE 2.1 & ADDED NOTE 5.1 TO 5.2 SHEET2: REPOSITION ANTENNA PIPES; CHANGED HAND RAIL DISTANCE FORM PLATFORM: 42" WAS 40" IN ZONE B3; DIM Ø 12 WAS Ø 15 IN ZONE D3; UPDATED ITEM 4: GB-0522A WAS GB-0520A	JL1183	09/10/2021
c	40139639CMO	ADDED WEIGHT AND MASS INFORMATION	LL1090	12/07/2021



PATENT PENDING

COMMSCOPE, INC. OF NORTH CAROLINA										
TOLERANCES							SAP MATERIAL MASTER			
1 PLACE .X ± .25                      3 PLACE .XXX ± 0.06							MC-PK8-DSH			
2 PLACE .XX ± 0.12                      ANGLES                      ± 2°										
FINISH GALV A123							MATERIAL SEE SEPARATE BILLS OF MATERIAL			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES INTERPRET PER ANSI Y 14.5M-1994		NAME	DATE	TITLE  <b>LOW PROFILE PLATFORM FACE</b>						
	CE	MRC	02/17/20							
	RW	LL1090	12/07/2021							
	AD	VCORTEZ1	12/09/2021	SCALE <b>1:32</b>		DOCUMENT NO.  <b>MC-PK8-DSH</b>				
	RE	VCORTEZ1	12/09/2021							
	ECN 40139639CMO									
SIZE	Auth Group	INSL	MODEL			DRAWING			SHEET 1 OF 3	
<b>C</b>			VERSION 03	STATUS RE	REVISION B	VERSION 02	STATUS RE	REVISION C		

DENSITY		lbs/in³
MASS	1801.56	lbs
VOLUME	6362.00	in³
SURFACE AREA	55884.77	in²
HEIGHT	96"	
LENGTH	46"	
WIDTH	29'	

4

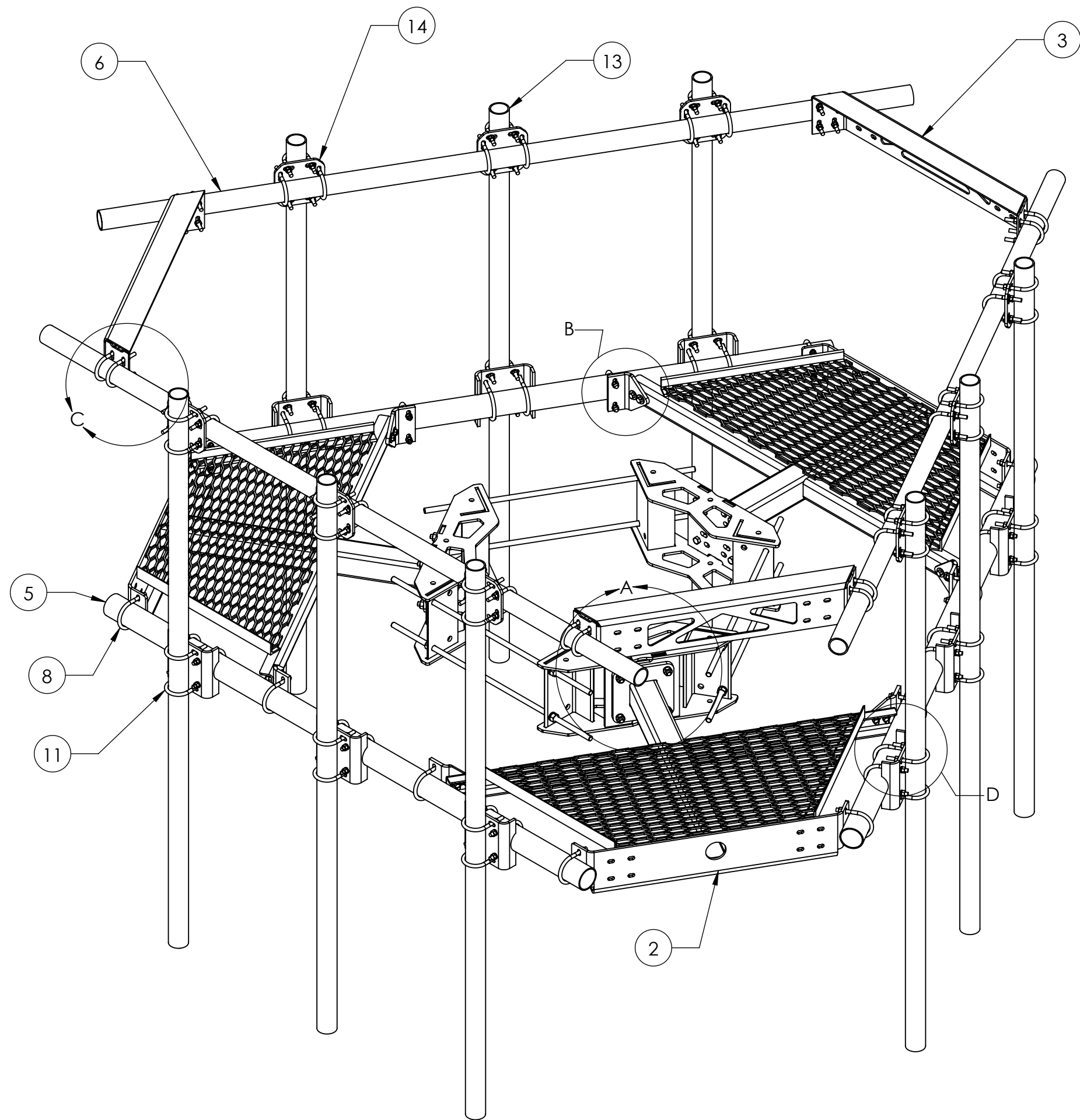
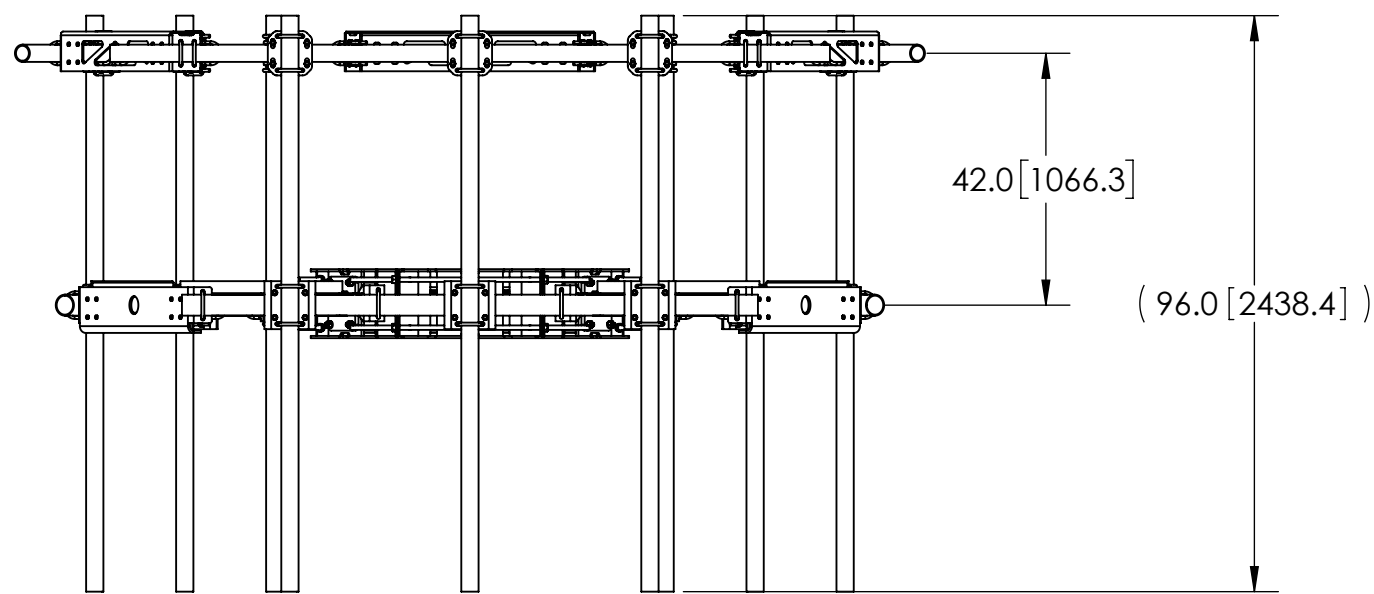
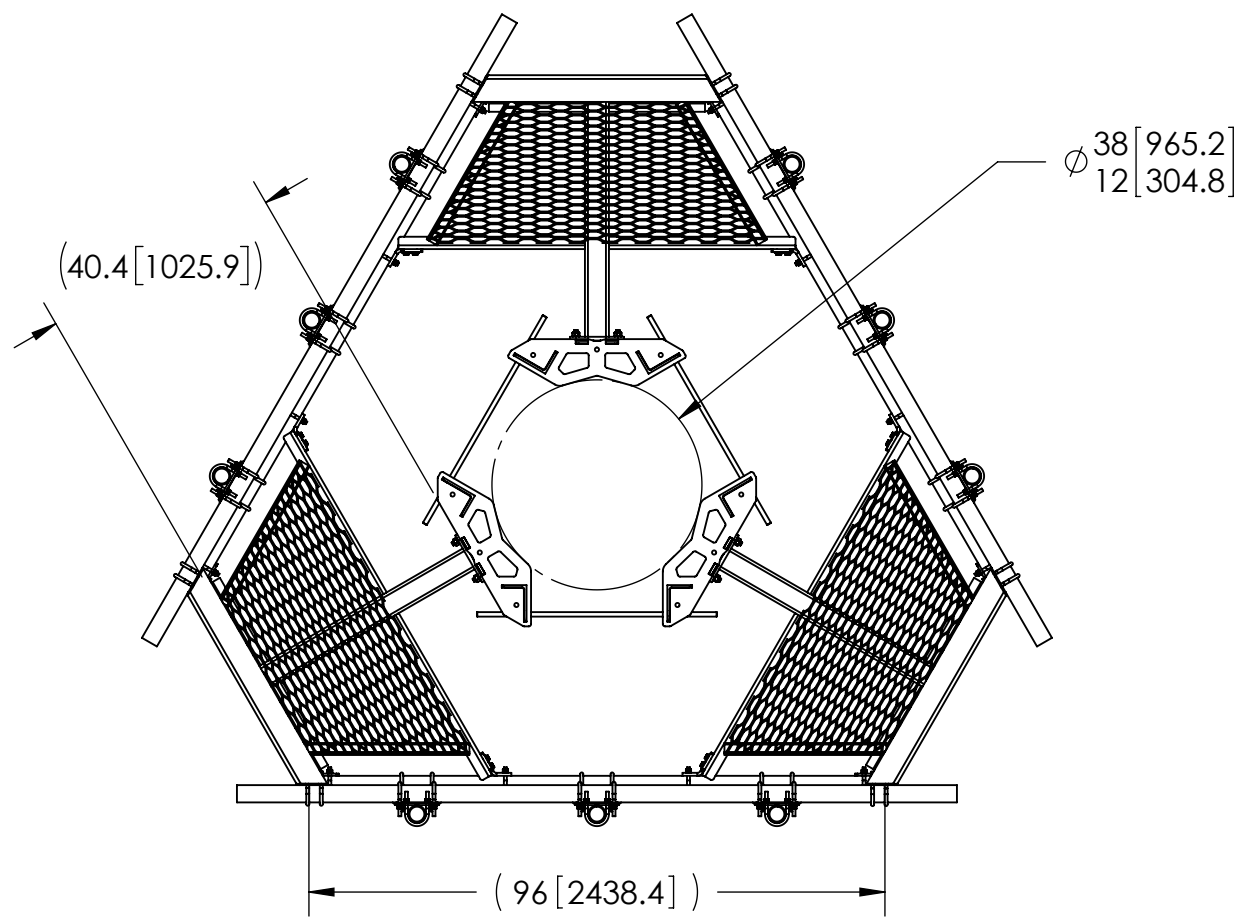
3

2

1



NOTES:



BOM IS FOR REFERENCE ONLY, PART NUMBER SUBSTITUTIONS MAY BE MADE

ITEM	PART NO.	DESCRIPTION	QTY.
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1
2	MTC300602	SECTOR WELDMENT FOR SNUB NOSE PLATFORM	3
3	MT195801	Corner Weldment Snub Nose Handrail	3
4	GB-0522A	5/8" X 2-1/4" GALV BOLT KIT (A325)	12
5	MT54796	3.50" OD X 96" GALV PIPE	3
6	MT546120	2.875" O.D. X 120" PIPE	3
7	GWF-04	1/2" GALV FLAT WASHER	12
8	GUB-4355	1/2" X 3-5/8" X 5" GALV U-BOLT	12
9	MTC300618	MOUNTING PLATE FOR MT-196	6
10	GB-04205	1/2" X 2" GALV BOLT KIT	12
11	MT-219M-H	3.5" OD X 2-7/8" OD CLAMP BRACKET ASSY	9
12	GUB-4352	1/2" X 3" X 5-1/4" GALV U-BOLT	12
13	MT54696	Ø 2.875" O.D. X 96" PIPE	9
14	XP-2525	CROSSOVER PLATE KIT, 2-7/8 OD X 2-7/8 OD	9

COMMScope, INC. OF NORTH CAROLINA				
TITLE				
LOW PROFILE PLATFORM FACE				
SIZE	SCALE	DOCUMENT NO.		
C	1:32	MC-PK8-DSH		
		DRAWING		
		VERSION	STATUS	REVISION
		02	RE	C
		SHEET		

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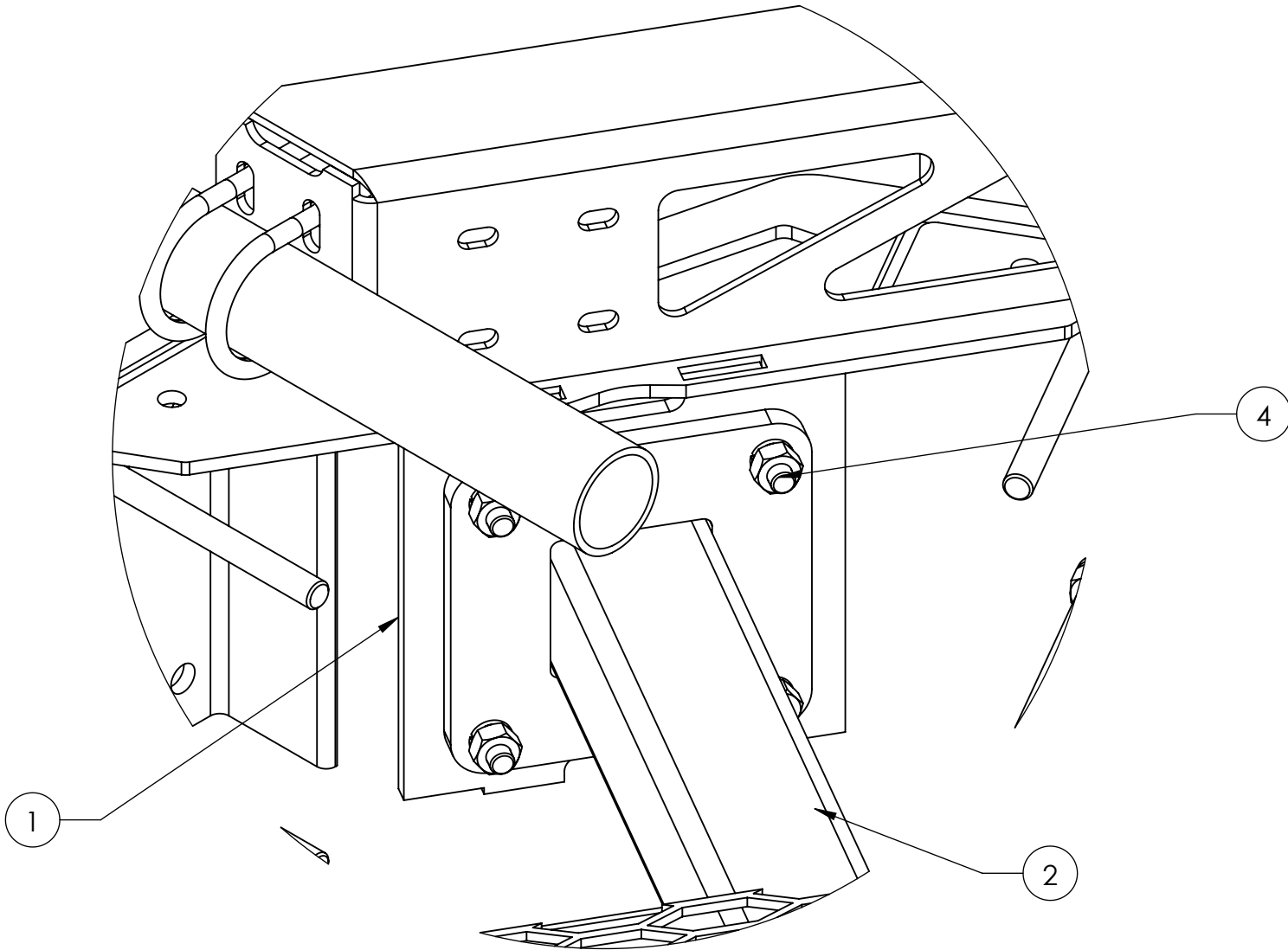
4

3

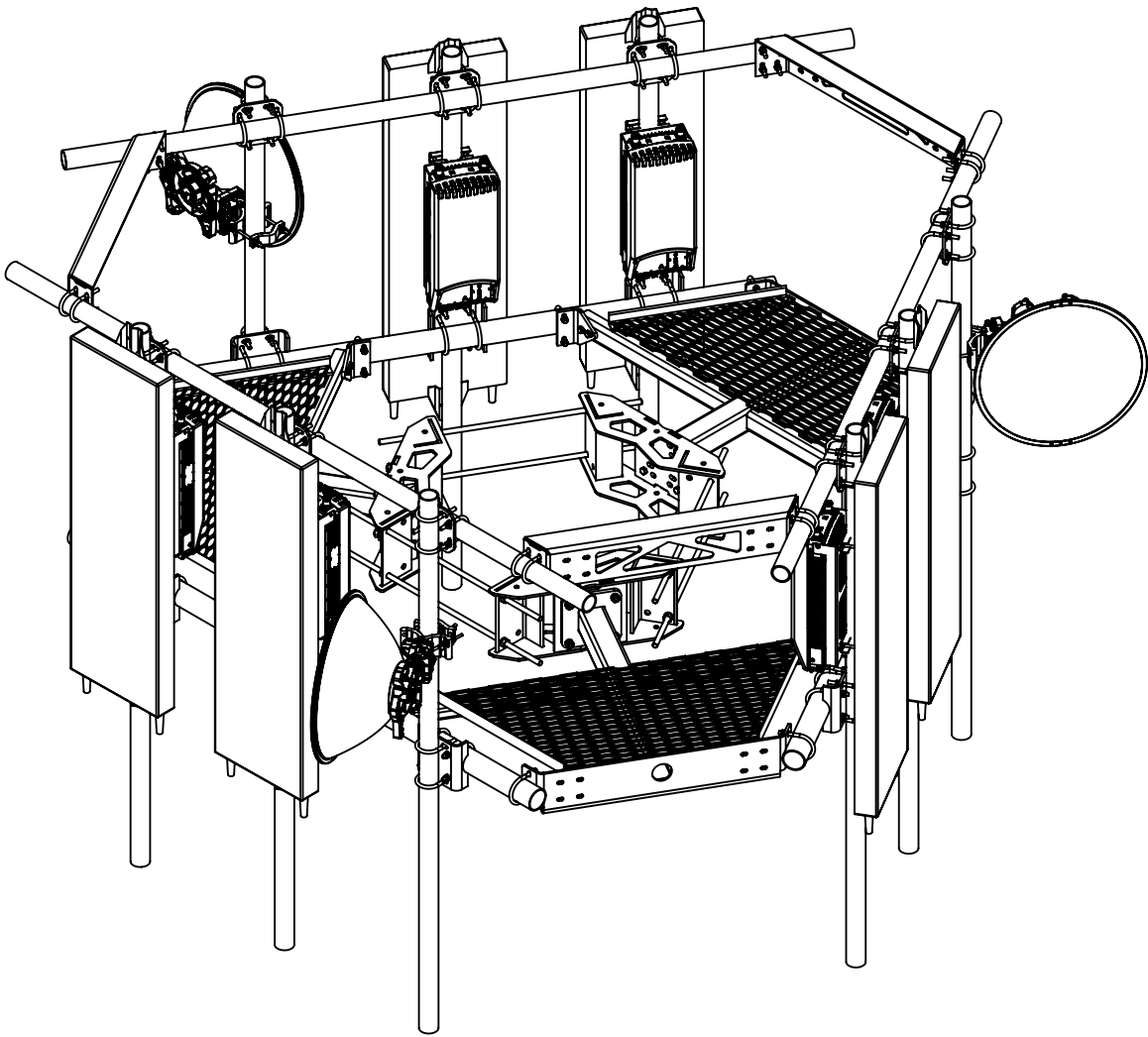
2

1

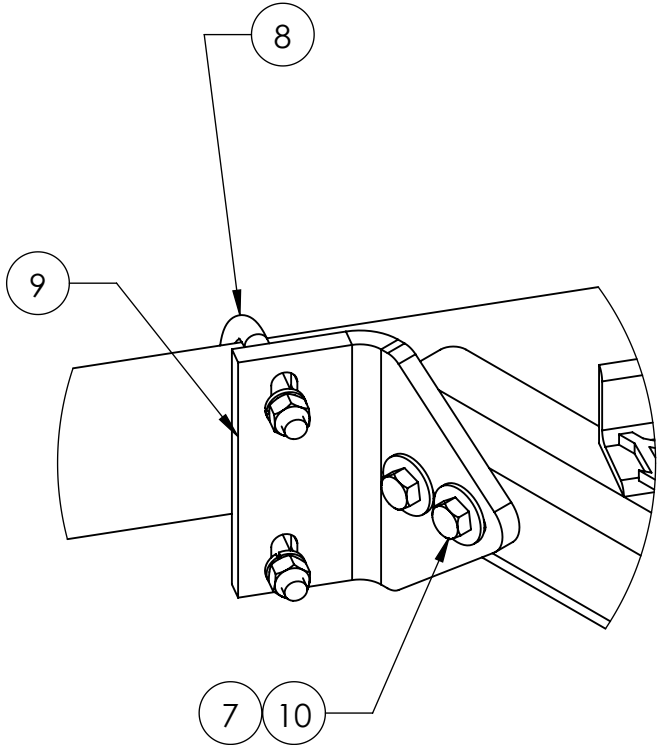
NOTES:



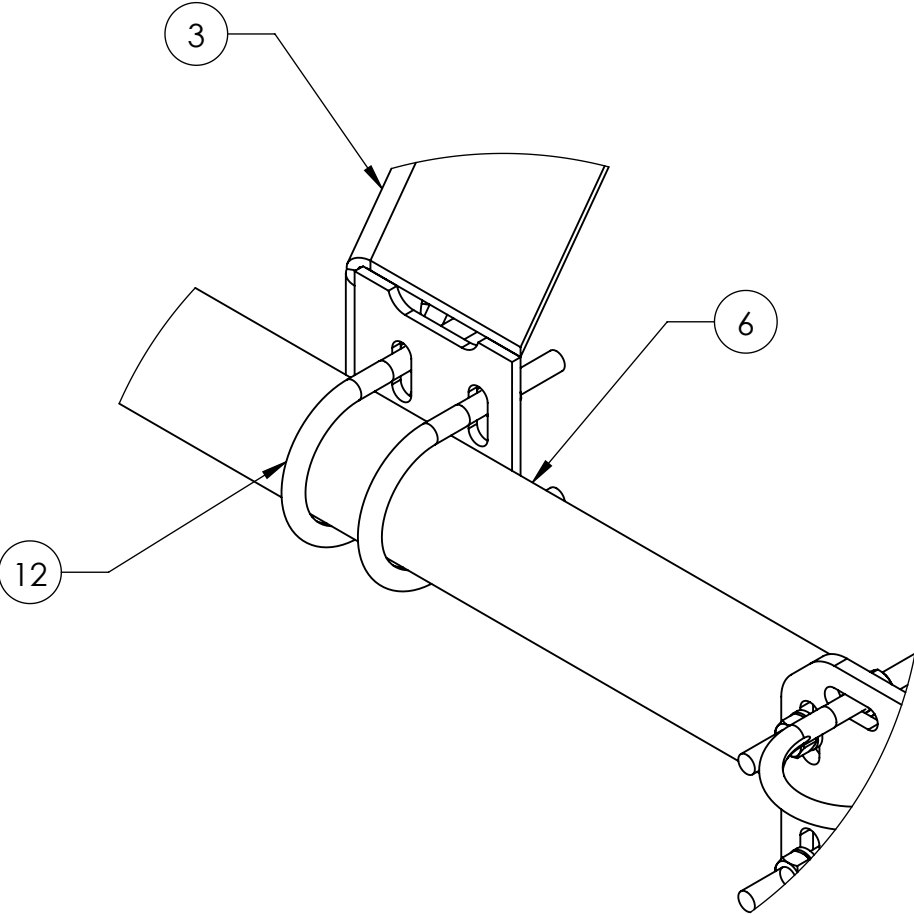
DETAIL A  
SCALE 1 : 4



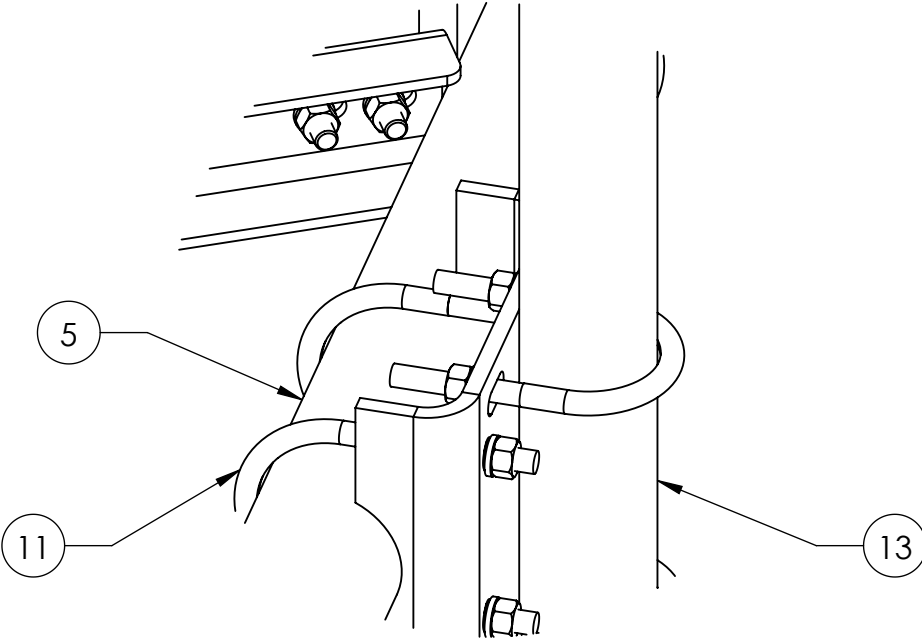
WITH ANTENNAS





DETAIL B  
SCALE 1 : 4



DETAIL C  
SCALE 1 : 4



DETAIL D  
SCALE 1 : 4

COMMSCOPE, INC. OF NORTH CAROLINA					
TITLE LOW PROFILE PLATFORM FACE					
SIZE C	SCALE 1:24	DOCUMENT NO. MC-PK8-DSH			
 		DRAWING			SHEET 3 OF 3
		VERSION 02	STATUS RE	REVISION C	

# Exhibit F

## **Power Density/RF Emissions Report**



# EBI Consulting

environmental | engineering | due diligence

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

Dish Wireless Existing Facility

Site ID: 876390

BOBOS00895A

116 Grant Hill Road  
Brooklyn, Connecticut 06234

**May 24, 2022**

**EBI Project Number: 6222003241**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>24.20%</b>

May 24, 2022

Attn: Dish Wireless

Emissions Analysis for Site: 876390 - BOBOS00895A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **116 Grant Hill Road in Brooklyn, 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 116 Grant Hill Road in Brooklyn, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

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



- 5) The antennas used in this modeling are the JMA MX08FRO665-2I for the 600 MHz / 1900 MHz channel(s) in Sector A, the JMA MX08FRO665-2I for the 600 MHz / 1900 MHz channel(s) in Sector B, the JMA MX08FRO665-2I for the 600 MHz / 1900 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 6) The antenna mounting height centerline of the proposed antennas is 70 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:	11.35 dBd / 15.75 dBd	Gain:	11.35 dBd / 15.75 dBd	Gain:	11.35 dBd / 15.75 dBd
Height (AGL):	70 feet	Height (AGL):	70 feet	Height (AGL):	70 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	280.00 Watts	Total TX Power (W):	280.00 Watts	Total TX Power (W):	280.00 Watts
ERP (W):	1,424.17	ERP (W):	1,424.17	ERP (W):	1,424.17
Antenna AI MPE %:	1.83%	Antenna BI MPE %:	1.83%	Antenna CI MPE %:	1.83%





Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	1.83%
Sprint	2.62%
AT&T	2.35%
T-Mobile	2.19%
Verizon	14.9%
CL&P	0.31%
Site Total MPE % :	24.20%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	1.83%
Dish Wireless Sector B Total:	1.83%
Dish Wireless Sector C Total:	1.83%
Site Total MPE % :	24.20%

Dish Wireless Maximum MPE Power Values (Sector A)							
Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
Dish Wireless 600 MHz n71	4	110.82	70.0	3.89	600 MHz n71	400	0.97%
Dish Wireless 1900 MHz n70	4	245.22	70.0	8.61	1900 MHz n70	1000	0.86%
						<b>Total:</b>	<b>1.83%</b>

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



## Summary

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

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

Dish Wireless Sector	Power Density Value (%)
Sector A:	1.83%
Sector B:	1.83%
Sector C:	1.83%
Dish Wireless Maximum MPE % (Sector A):	1.83%
Site Total:	24.20%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **24.20%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

# Exhibit G

## **Letter of Authorization**



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

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

### **Crown Castle Letter of Authorization**

#### **CT - CONNECTICUT SITING COUNCIL**

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

**Re: Tower Share Application**  
**Crown Castle telecommunications site at:**  
**116 GRANT HILL RD., BROOKLYN, CT 06234**

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




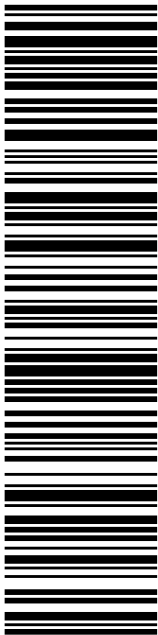

**Crown Site ID/Name: 876390/HAMPTON / BERNIER**  
**Customer Site ID: BOBOS00895A/**  
**Site Address: 116 Grant Hill Rd., BROOKLYN, CT 06234**

Crown Castle

By:  Date: 6/1/2022  
Richard Zajac  
Site Acquisition Specialist

# Exhibit H

## **Recipient Mailings**

 <b>UNITED STATES POSTAL SERVICE®</b>		<b>Click-N-Ship®</b>	
		<small>usps.com</small> <b>US POSTAGE</b> Flat Rate Env <b>U.S. POSTAGE PAID</b> <small>Click-N-Ship®</small>	
06/02/2022		Mailed from 01566	
<b>PRIORITY MAIL 2-DAY™</b>		Expected Delivery Date: 06/04/22 Ref#: DS-876390 <b>0006</b>	
DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359		 AUSTIN TANNER FIRST SELECTMAN PO BOX 356 BROOKLYN CT 06234-0356	
		<b>USPS TRACKING #</b>	
<b>9405 5036 9930 0263 9447 20</b>			
Electronic Rate Approved #038555749			

✂ ————— Cut on dotted line.

## Instructions



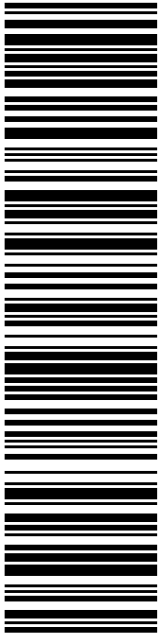
- Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
- Place your label so it does not wrap around the edge of the package.
- Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
- 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.
- Mail your package on the "Ship Date" you selected when creating this label.

## Click-N-Ship® Label Record

<b>USPS TRACKING # :</b> <b>9405 5036 9930 0263 9447 20</b>	
Trans. #: 564791197 Print Date: 06/02/2022 Ship Date: 06/02/2022 Expected Delivery Date: 06/04/2022	Priority Mail® Postage: <b>\$8.95</b> Total: <b>\$8.95</b>
<b>From:</b> DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359 Ref#: DS-876390	
<b>To:</b> AUSTIN TANNER FIRST SELECTMAN PO BOX 356 BROOKLYN CT 06234-0356	
<small>* 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.</small>	



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

 <b>UNITED STATES POSTAL SERVICE®</b>		<b>Click-N-Ship®</b>	
<b>P</b>		<small>usps.com</small> <b>US POSTAGE</b> Flat Rate Env <b>U.S. POSTAGE PAID</b> <small>Click-N-Ship®</small>	
06/02/2022		Mailed from 01566	
<b>PRIORITY MAIL 2-DAY™</b>			
DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359		Expected Delivery Date: 06/04/22 Ref#: DS-876390 <b>0006</b>	
		JANA BUTTS-ROBERTSON DIRECTOR OF COMMUNITY DEVELOPMENT 69 S MAIN ST STE 22 BROOKLYN CT 06234-3830	
<b>USPS TRACKING #</b>			
			
<b>9405 5036 9930 0263 9447 44</b>			
Electronic Rate Approved #038555749			

✂ ————— Cut on dotted line.

## Instructions

- 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.
- Place your label so it does not wrap around the edge of the package.
- 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.
- 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.
- Mail your package on the "Ship Date" you selected when creating this label.

## Click-N-Ship® Label Record

**USPS TRACKING # :**  
**9405 5036 9930 0263 9447 44**

Trans. #: 564791197  
 Print Date: 06/02/2022  
 Ship Date: 06/02/2022  
 Expected Delivery Date: 06/04/2022

Priority Mail® Postage: **\$8.95**  
 Total: **\$8.95**

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




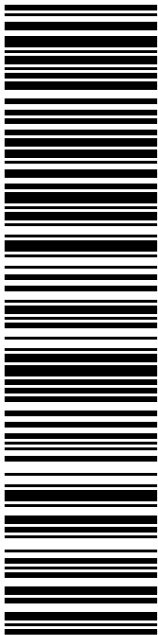

Ref#: DS-876390

**To:** JANA BUTTS-ROBERTSON  
 DIRECTOR OF COMMUNITY DEVELOPMENT  
 69 S MAIN ST  
 STE 22  
 BROOKLYN CT 06234-3830

\* 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

 <b>UNITED STATES POSTAL SERVICE®</b>		<b>Click-N-Ship®</b>	
		<small>usps.com</small> <b>US POSTAGE</b> <small>Flat Rate Env</small>	
06/02/2022		Mailed from 01566	
<b>PRIORITY MAIL 3-DAY™</b>			
DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359		Expected Delivery Date: 06/06/22 Ref#: DS-876390 <b>0006</b>	
		<b>C033</b>	
CROWN CASTLE 4017 WASHINGTON RD PMB 353 MCMURRAY PA 15317-2510			
<b>USPS TRACKING #</b>			
			
<b>9405 5036 9930 0263 9447 68</b>			
Electronic Rate Approved #038555749			
			



Cut on dotted line.

## Instructions

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## Click-N-Ship® Label Record

<b>USPS TRACKING # :</b> <b>9405 5036 9930 0263 9447 68</b>	
Trans. #: 564791197 Print Date: 06/02/2022 Ship Date: 06/02/2022 Expected Delivery Date: 06/06/2022	Priority Mail® Postage: <b>\$8.95</b> Total: <b>\$8.95</b>
<b>From:</b> DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359	
<b>To:</b> CROWN CASTLE 4017 WASHINGTON RD PMB 353 MCMURRAY PA 15317-2510	
Ref#: DS-876390	
<small>* 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.</small>	



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Check the status of your shipment on the USPS Tracking® page at usps.com



876390 Crown Disl



FARMINGTON  
210 MAIN ST  
FARMINGTON, CT 06032-9998  
(800) 275-8777

06/03/2022

04:24 PM

Product	Qty	Unit Price	Price
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Prepaid Mail	1		\$0.00
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Brooklyn, CT 06234

Weight: 0 lb 8.70 oz

Acceptance Date:

Fri 06/03/2022

Tracking #:

9405 5036 9930 0263 9447 20

Prepaid Mail	1		\$0.00
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Brooklyn, CT 06234

Weight: 0 lb 8.70 oz

Acceptance Date:

Fri 06/03/2022

Tracking #:

9405 5036 9930 0263 9447 44

Prepaid Mail	1		\$0.00
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Canonsburg, PA 15317

Weight: 0 lb 8.70 oz

Acceptance Date:

Fri 06/03/2022

Tracking #:

9405 5036 9930 0263 9447 68

Grand Total:	\$0.00
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Receipt #: 840-50600020-2-5550513-1  
Clark: 77