



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

September 3, 2021

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

RE: Tower Share Application
750 Rainbow Road, Windsor CT
Latitude: 41.91928611
Longitude: -72.71043611
Site# 842877_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 750 Rainbow Road in Windsor, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 5G MHz antenna and six (6) RRUs, at the 65-foot level of the existing 101-foot monopole tower, one (1) Fiber cables will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7x5 lease area. Included are plans by Infinigy, dated August 15, 2021 Exhibit C. Also included is a structural analysis prepared by Crown Castle, dated May 29, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. This facility was approved by the Town of Windsor Planning and Zoning on May 15, 2003. 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 Mayor Donald Trinks, Elected Official for the Town of Windsor, Eric Barz, Town Planner, as well as the tower owner (Crown Castle) and property owner (Town of Windsor)

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

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the tower is 101-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 65-feet.
2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligible.



4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 27.45% as evidenced by Exhibit F.

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

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

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this support tower in Windsor. 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 65-foot level of the existing 101-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 guyed 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 Windsor.

Sincerely,

Denise Sabo

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



NSS **NORTHEAST**
SITE SOLUTIONS
Turnkey Wireless Development

Attachments cc:

Mayor Donald Trinks - as Elected Official and Property Owner
275 Broad Street Windsor CT 06095

Eric Barz- Town Planner
275 Broad Street Windsor CT 06095

Crown Castle, Tower Owner

Exhibit A

Original Facility Approval


I, Anita M. Mips, Chairperson of the Windsor Town Planning and Zoning Commission, hereby certify that on December 10, 2002 the Planning and Zoning Commission of the Town of Windsor granted approval of a Special Use for a wireless telecommunications tower facility under Zoning Regulations Section 2.2.19E(1) and Section 12.2 as presented by the applicant including a waiver in the amount of 129.9 feet from the fall zone requirement as requested by the applicant subject to the following condition:

There shall be no lighting or paint striping of the tower as described in an FAA letter to the applicant which letter shall be presented to the Commission as part of the public record.

Said Special Use was granted for the property located at: 750 Rainbow Road

The owner of record of said parcel is: Town of Windsor

Dated at Windsor, Connecticut, this 15th day of May, 2003

 Chairperson

Public Act #75-317

Received for Record this _____ day of _____, 2002

Attest: Town Clerk

RECEIVED FOR RECORD
WINDSOR TOWN CLERK
03 OCT 13 AM 10:46
VOL 1417 PG 233
BY *Hatfield R. Quinn*
TOWN CLERK



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

October 24, 2007

Steven L. Levine
Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-047-052-131-142-164-071004** – New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 232 South Main Street, East Windsor; 319-321 New Britain Avenue, Farmington; 250 Meriden-Waterbury Turnpike, Southington; 5 Barbara Road, Tolland; and 750 Rainbow Road, Windsor, Connecticut.

Dear Mr. Levine:

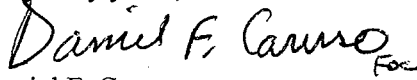
At a public meeting held on October 16, 2007, the Connecticut Siting Council (Council) acknowledged your notice to modify these existing telecommunications facilities, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the condition that the modifications specified for the Tolland tower in the structural analysis report dated September 27, 2007, and sealed by Jaime Reyes, P.E., be performed prior to the antenna installation and that a signed letter from a Professional Engineer be submitted to the Council to certify that the modifications have been properly completed.

The proposed modifications are to be implemented as specified here and in your notice[s] dated October 4, 2007, including the placement of all necessary equipment and shelters within the tower compounds. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to existing facility sites that would not increase tower heights, extend the boundaries of the tower sites, increase noise levels at the tower site boundaries by six decibels, and increase the total radio frequencies electromagnetic radiation power densities measured at the tower site boundaries to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. These facilities have also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on these towers.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to any of these facilities will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Handwritten signature of Daniel F. Caruso in cursive script.

Daniel F. Caruso
Chairman

DFC/MP/cm

- c: The Honorable Linda L. Roberts, First Selectman, Town of East Windsor
- Laurie Whitten, Town Planner, Town of East Windsor
- The Honorable Donald Trinks, Mayor, Town of Windsor
- Mario Zavarella, Town Planner, Town of Windsor
- The Honorable John Barry, Chairman Town Council, Town of Southington
- Mary Hughes, Town Planner, Town of Southington
- The Honorable Kathleen W. Bach, Chairman Town Council, Town of Tolland
- Linda Farmer, Town Planner, Town of Tolland
- The Honorable Mike Clark, Chairman Town Council, Town of Farmington
- Jeffrey Ollendorf, Town Planner, Town of Farmington
- Balch Communications
- John Rogus
- American Tower
- Christopher B. Fisher, Esq., Cuddy & Feder LLP



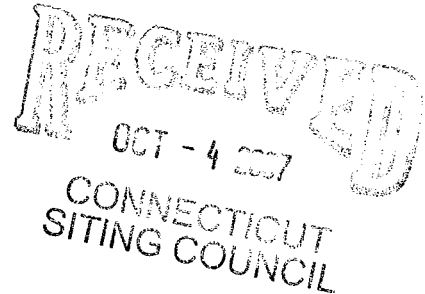
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7636
Fax: (860) 513-7190

EM-CING-047-052-131-142-164-071004

Steven L. Levine
Real Estate Consultant

HAND DELIVERED

October 4, 2007



Honorable Daniel F. Caruso, Chairman,
and Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: New Cingular Wireless PCS, LLC notice of intent to modify 5 existing tele-communications facilities located in East Windsor, Farmington, Southington, Tolland, and Windsor

Dear Chairman Caruso and Members of the Council:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") capability, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("Cingular") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of each of the municipalities in which an affected cell site is locate.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile (GSM) communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

Attached are summary sheets detailing the planned changes, including power density calculations reflecting the change in the effect of Cingular's operations at each affected site. Also included is documentation of the structural sufficiency of each tower to accommodate the revised antenna configuration.

The changes to the facilities do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facilities will not be significantly changed or altered. Rather, the planned changes to the facilities fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. In each instance, the height of the overall structure will be unaffected. Modifications to the existing sites include all or some of the following as necessary to bring each site into conformance with the plan:

- Replacement of existing panel antennas with new antennas of similar size, shape, and weight, or, installation of additional antennas of similar size, shape, and weight.
- Installation of small tower mount amplifiers ("TMA's") and/or diplexers to the platform on which the panel antennas are mounted to enhance signal reception.
- Installation of additional or larger coaxial cables as required.
- Installation of an additional equipment cabinet in existing shelters, or on existing or enlarged concrete pads.

None of these modifications will extend the height of the tower.

2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than some enlarged equipment pads as noted in the following attachments.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.

4. Radio frequency power density may increase due to use of one GSM channel for UMTS transmissions. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, Cingular Wireless respectfully submits that the proposed changes at the referenced sites constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 513-7636 with questions concerning this matter. Thank you for your consideration.

Sincerely,



Steven L. Levine
Real Estate Consultant

Attachments

Exhibit B

Property Card

Property Cards

Address Search : [Clear Search](#)

Your search returned multiple addresses

Additional addresses:
[750 RAINBOW RD](#)

750 Rainbow Rd

Property Owner:
Windsor Town Of

Property Co-Owner
C/O At&T Mobility

Mailing Address:
575 Morosgo Dr Suite 13-F
Atlanta, GA
30324

File Code
12534

Map:
8

Block:
140

Lot:
750

Census Tract:
12534.01

Property Type:
Cell Tower

Land Area (Acres):
0.05

Zone:
NZ



[Click to Enlarge](#)

Construction Details

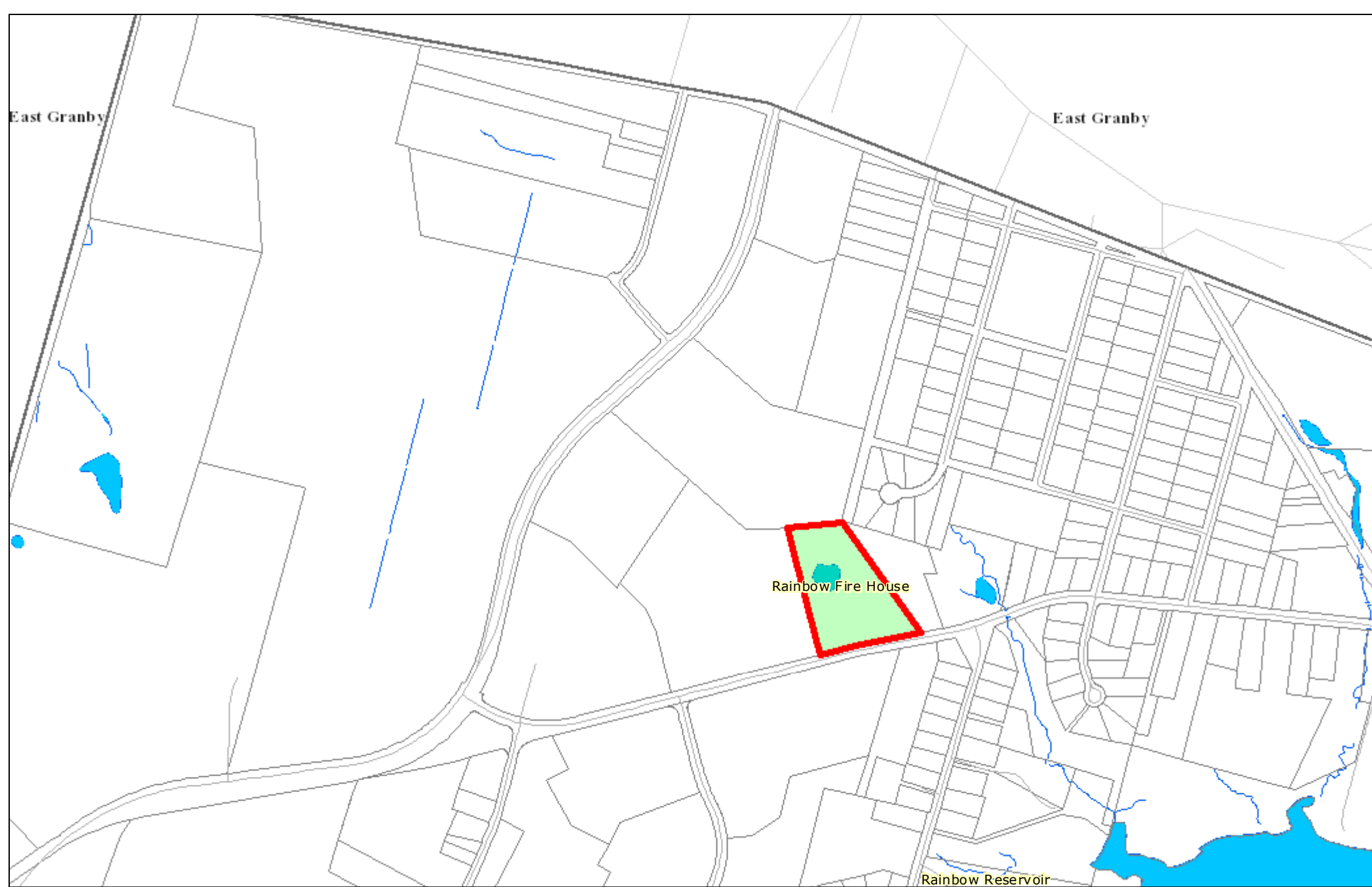
Year Built:	Total Rooms:
Building Style:	Bedrooms:
Stories:	Bathrooms:
Living Area: 0 Sq/Ft	Half Baths:
Building ID 102171	Heating Type
Grade	Heating Fuel
Exterior Wall	AC Type

Valuation
Assessed Land Value: \$97,580 Assessed Building Value: \$119,700 Total Assessed Value: \$217,280
<hr/> Appraised Land Value: \$139,400 Appraised Building Value: \$171,000 Total Appraised Value: \$310,400

Last Sale
Last Sale Date: Wednesday, September 23rd, 1998 Last Sale Price: \$0 Qualified Sale: U Book/Page: 1169/ 11

Prior Owners			
Sale Date	Owner Name	Sale Price	Book / Page
1997/6/30	RIVER BEND ASSOCIATES	0	1121/ 400
1976/9/29	CULBRO CORP	0	312/ 1

Parcel Sketch			
<input checked="" type="checkbox"/>		Sub Area Detail	
		Code	Gross Area (Sq Ft) : Living Area (Sq Ft)
Outbuildings & Extra Features			
Code	Description	Appraised Value	Assessed Value
CB3	PerCastConCel	\$131300.00	\$91910.00
AOF	Office Area	APT	Apartment
CAN	Canopy	BAS	First Floor
EAF	Attic (Expan)(Finished)	CDN	Canopy (Det)
FBM	Basement (Finished)	CLP	Loading Platform (Finished)
FDC	Carport (Det)(Framed)	FAT	Attic (Finished)
FEP	Porch (Encl)(Finished)	FCP	Carport (Framed)
FLL	Lower Level (Finished)	FDS	Porch (Scrn)(Det)(Finished)
FST	Utility (Finished)	FDU	Utility (Det)(Finished)
SDA	Store Display Area	FGR	Garage (Framed)
TQS	Three-Qtr Story	FHS	Half-Story (Finished)
UCB	Cabana (Encl)(Unfinished)	FOP	Porch (Open)(Finished)
UEP	Porch (Encl)(Unfinished)	FSP	Porch (Screen)(Finished)
UOP	Porch (Open)(Unfinished)	FUS	Upper-Story (Finished)
UUS	Upper-Story (Unfinished)	SFB	Base (Semi-Finished)
		SPA	Service Prod Area
		UAT	Attic (Unfinished)
		UBM	Basement (Unfinished)
		UDU	Utility (Det)(Unfinished)
		ULP	Loading Platform (Unfinished)
		UST	Utility (Strg)(Unfinished)
		WDK	Wood Deck



Hartford County, Connecticut

gis map

Property Boundaries not legally binding for title or zoning purposes.

Horizontal Datum is Connecticut State Plane Feet, NAD83

The Town of Windsor makes no warranty as to the accuracy, reliability, or completeness of the information and is not responsible for any error or omissions for results obtained from the use of the information.

1 inch = 940 feet

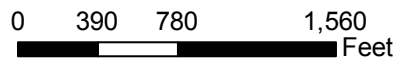


Exhibit C

Construction Drawings



DISH Wireless L.L.C. SITE ID:

BOBDL00070A

DISH Wireless L.L.C. SITE ADDRESS:

**750 RAINBOW ROAD
WINDSOR, CT 06095**

SCOPE OF WORK

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

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

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

SITE INFORMATION

PROPERTY OWNER: WINDSOR TOWN OF
ADDRESS: 275 BROAD ST
ATT: ACCOUNTS RECEIVABLE
WINDSOR, CT 06095

TOWER TYPE: MONOPOLE

TOWER CO SITE ID: 842877

TOWER APP NUMBER: 556622

COUNTY: HARTFORD

LATITUDE (NAD 83): 41° 55' 9.43" N
41.91928611 N

LONGITUDE (NAD 83): 72° 42' 37.57" W
72.71043611 W

ZONING JURISDICTION: CONNECTICUT SITING COUNCIL

ZONING DISTRICT: NZ

PARCEL NUMBER: 12534

OCCUPANCY GROUP: U

CONSTRUCTION TYPE: II-B

POWER COMPANY: EVERSOURCE

TELEPHONE COMPANY: T.B.D.

PROJECT DIRECTORY

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

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

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

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

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

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



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



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



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

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

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

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/17/21	ISSUED FOR REVIEW
0	8/15/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
101655.008.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00070A
750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

CONNECTICUT CODE COMPLIANCE

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

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

SITE PHOTO



DIRECTIONS

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:
WINDSOR SCHOOL DISTRICT WINDSOR, CT, USA CONTINUE TO RAINBOW RD HEAD SOUTHWEST TOWARD STONE RD TURN LEFT ONTO STONE RD TAKE INTERNATIONAL DR, CT-20 E AND BRADLEY INTERNATIONAL AIRPORT CON TO YOUR DESTINATION IN WINDSOR LOCKS TURN RIGHT AT THE 1ST CROSS STREET ONTO RAINBOW RD TURN RIGHT ONTO INTERNATIONAL DR USE THE RIGHT 2 LANES TO TURN RIGHT ONTO CT-20 E KEEP LEFT AT THE Y JUNCTION, FOLLOW SIGNS FOR BRADLEY INTERNATIONAL AIRPORT AND MERGE WITH BRADLEY INTERNATIONAL AIRPORT CON USE ANY LANE TO TURN SLIGHTLY RIGHT ONT SCHOEPHOESTER RD USE THE RIGHT 2 LANES TO TURN SLIGHTLY RIGHT

VICINITY MAP



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.

SHEET INDEX

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

NOTES

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

NOTES

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

dish
wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

CROWN CASTLE

2000 CORPORATE DRIVE
CANONSBURG, PA 15317

B+T GRP

1717 S. BOULDER
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TULSA, OK 74119
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8/15/21

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

RFDS REV #: 0

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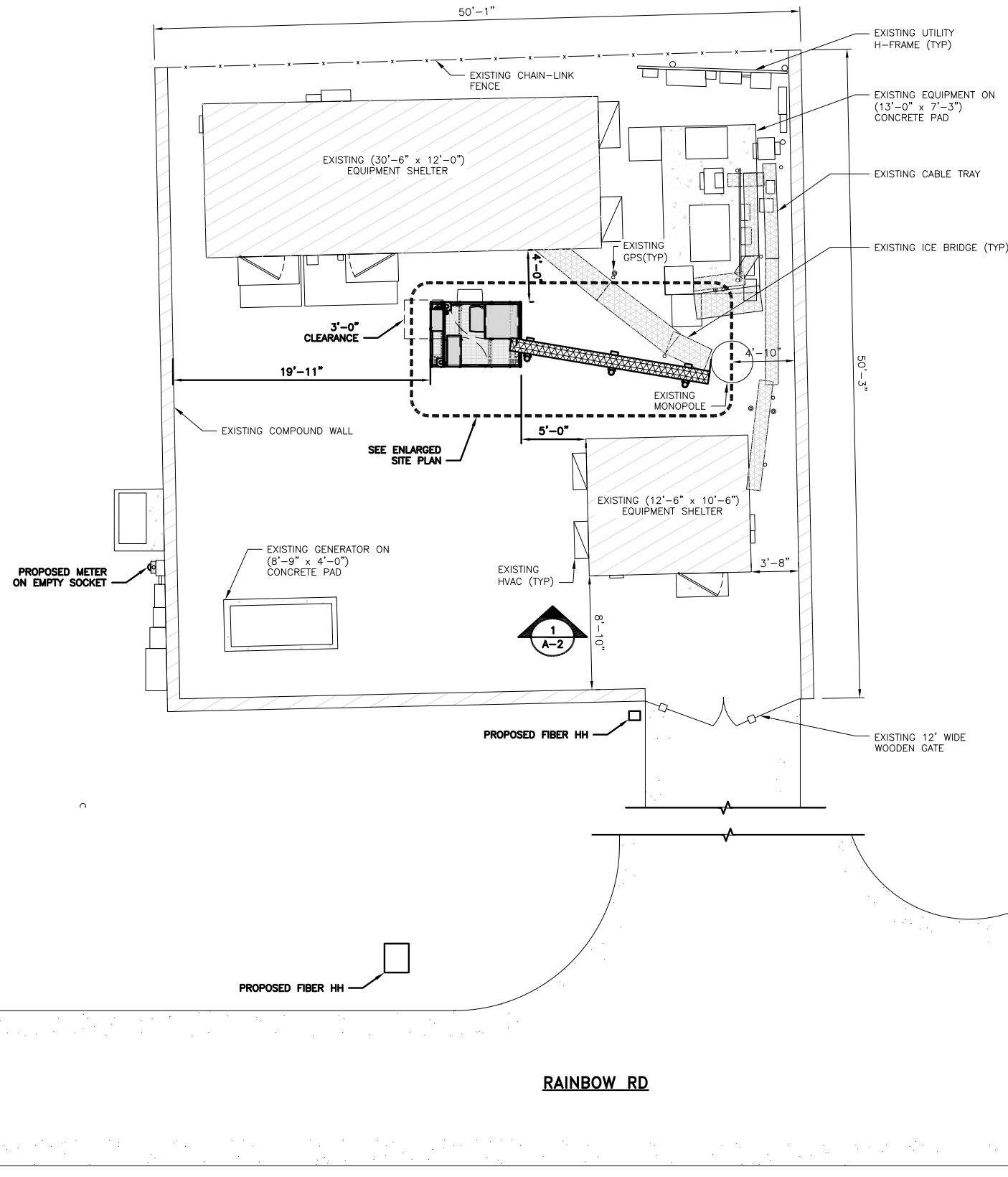
DISH Wireless L.L.C.
PROJECT INFORMATION

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WINDSOR, CT 06095

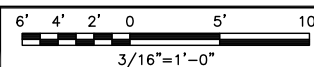
SHEET TITLE
OVERALL AND ENLARGED
SITE PLAN

SHEET NUMBER

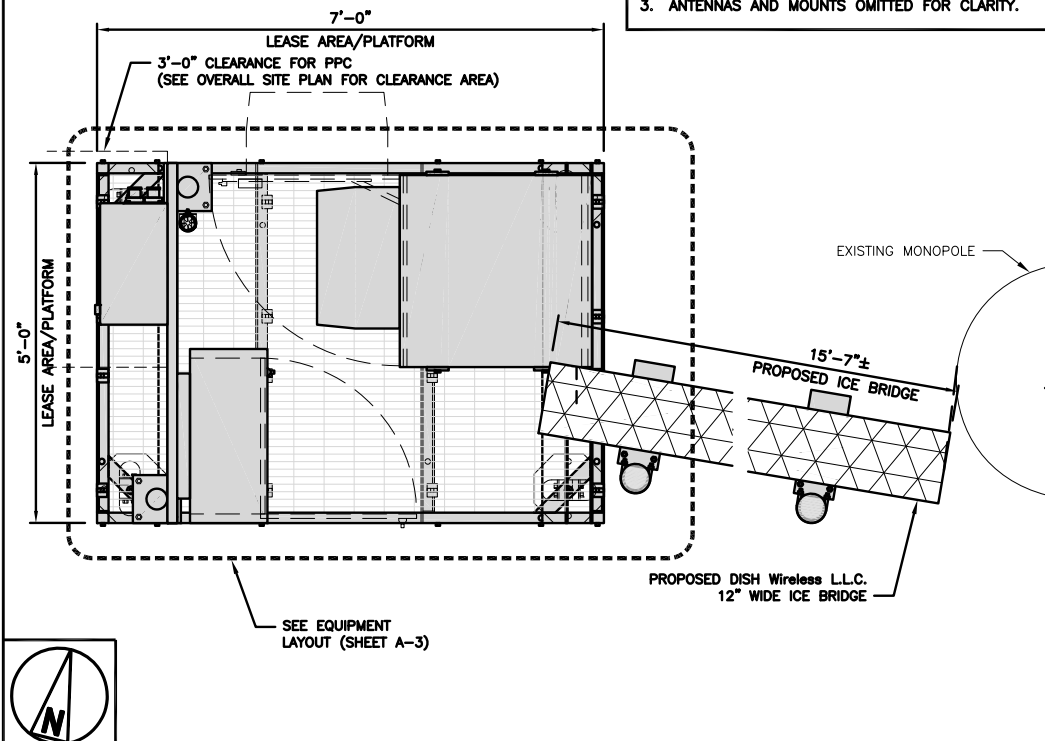
A-1



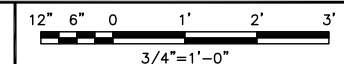
OVERALL SITE PLAN



1



ENLARGED SITE PLAN



2



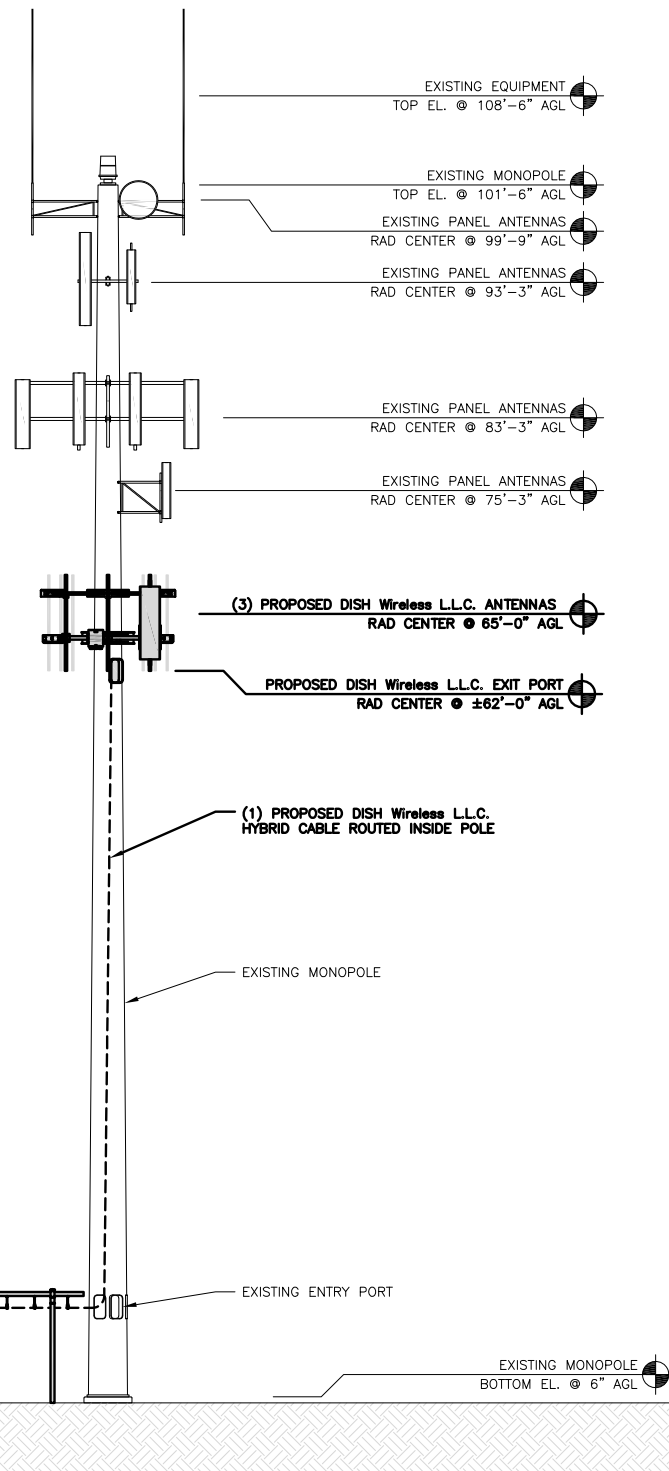
UTILITY PLAN

NO SCALE

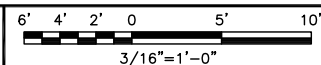
3

NOTES

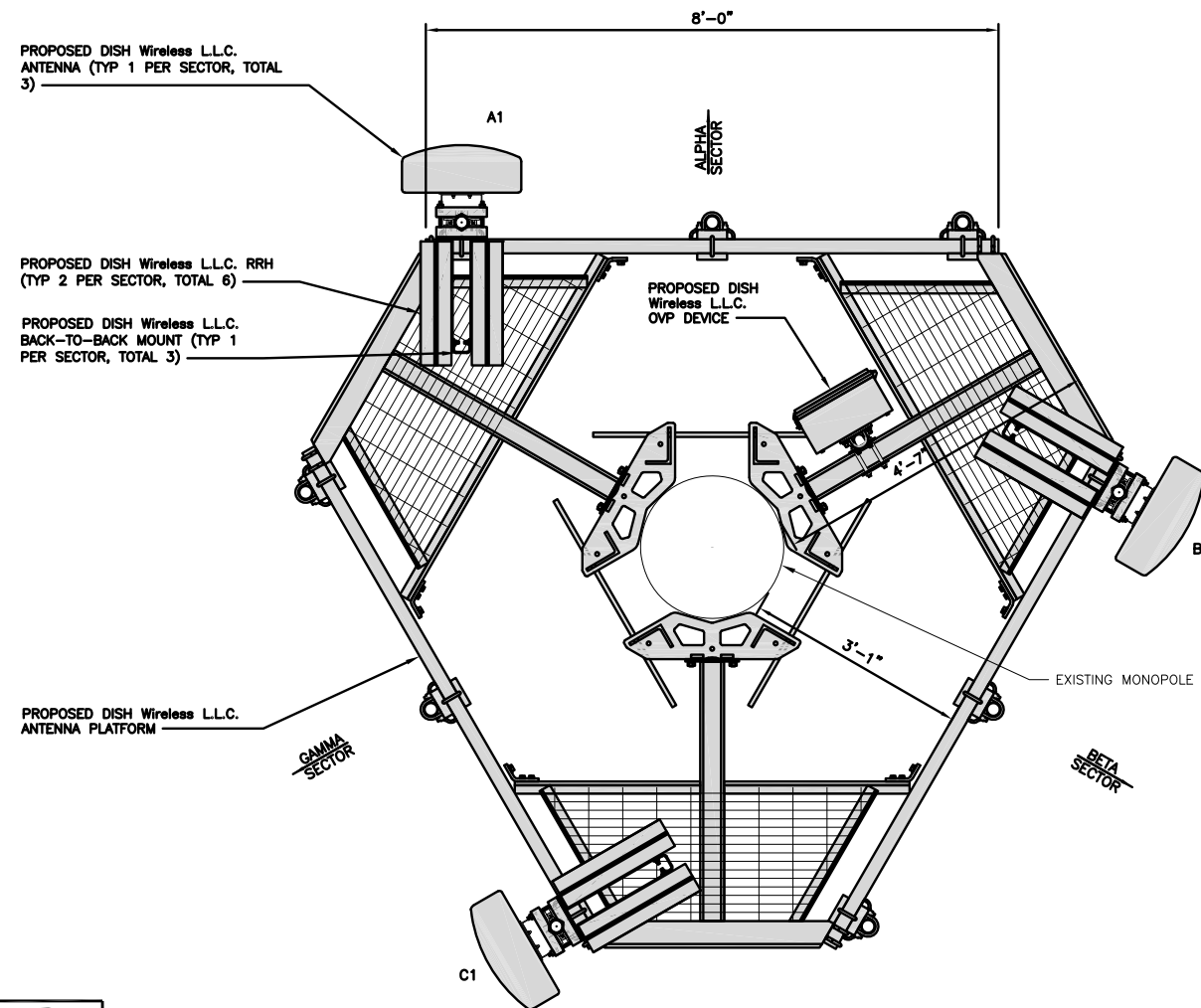
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



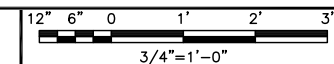
PROPOSED SOUTH ELEVATION



1



ANTENNA LAYOUT



2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	0°	65'-0"	(1) HIGH-CAPACITY HYBRID CABLE (104' LONG)
BETA	B1	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	120°	65'-0"	
GAMMA	C1	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	240°	65'-0"	

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

ANTENNA SCHEDULE

NO SCALE

3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



2000 CORPORATE DRIVE
CANONSBURG, PA 15317



1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
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DRAWN BY: SJH CHECKED BY: MTJ APPROVED BY: MDW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

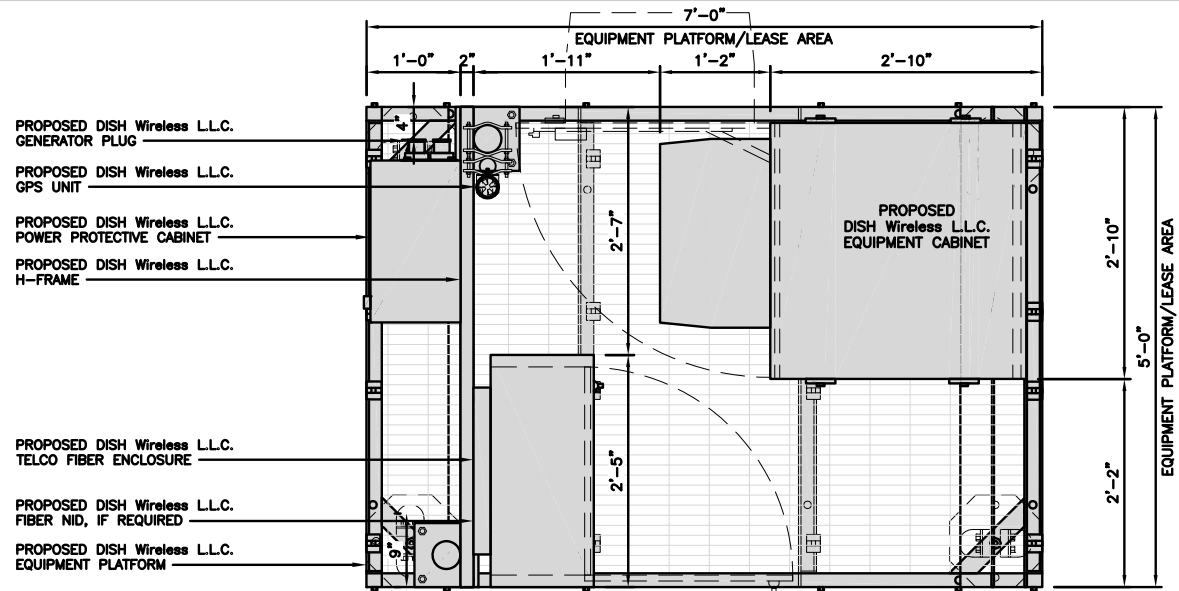
SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/17/21	ISSUED FOR REVIEW
0	8/15/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
101655.008.01

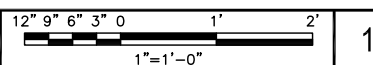
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00070A
750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



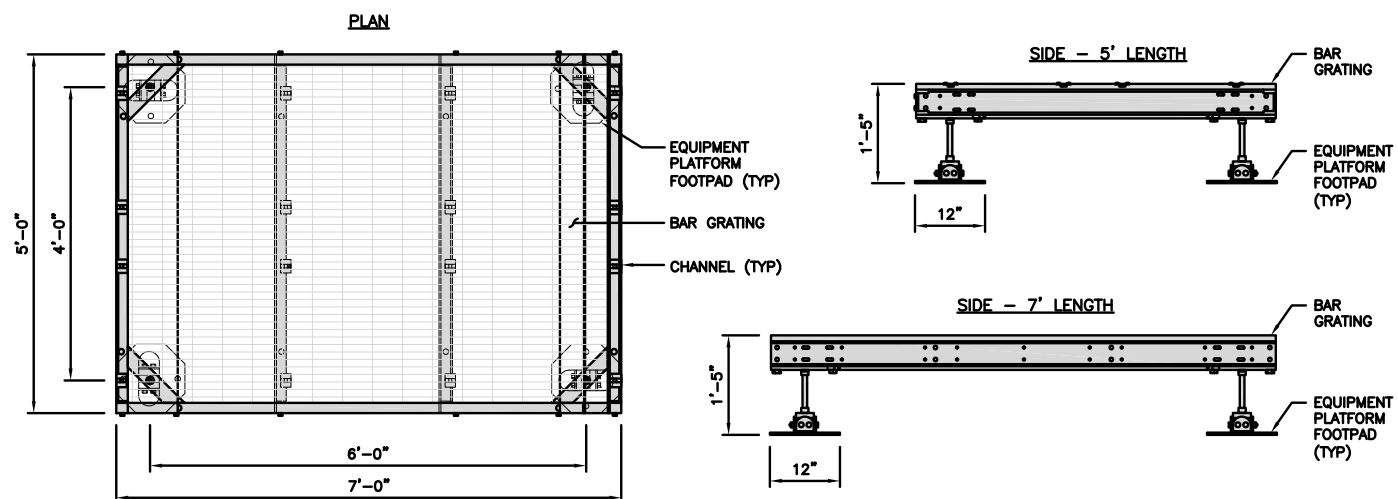
PLATFORM EQUIPMENT PLAN



1

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

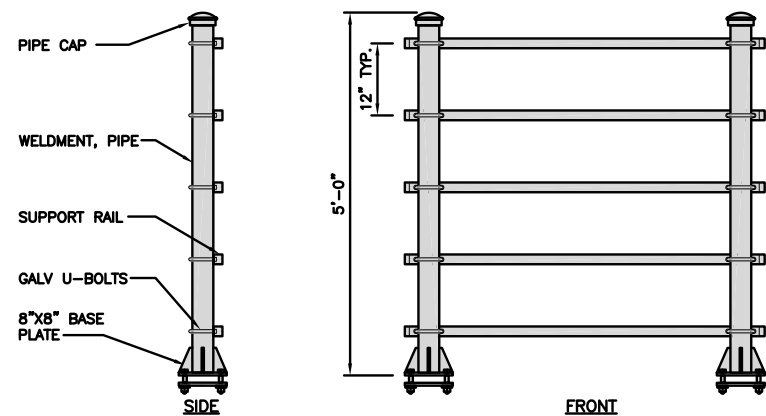
NOTE:
GC TO PROVIDE EXTENDED
THREAD FOR PLATFORM IF
REQUIRED HEIGHT EXCEEDS 17"



PLATFORM DETAIL

NO SCALE 2

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



H-FRAME DETAIL

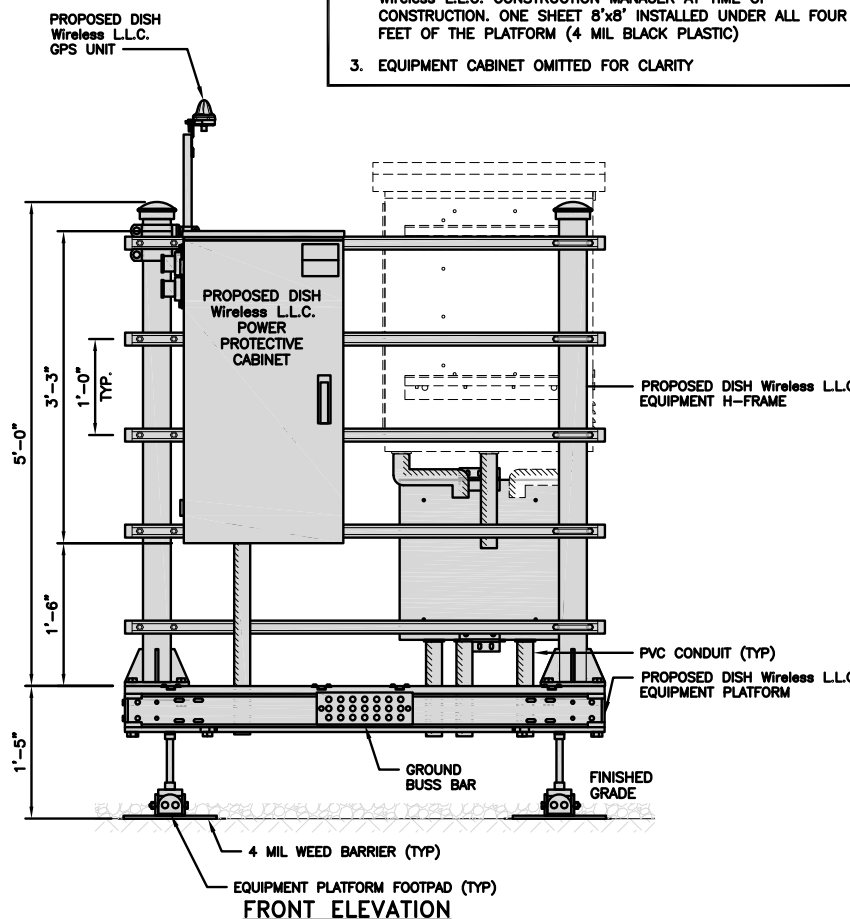
NO SCALE 3

NOT USED

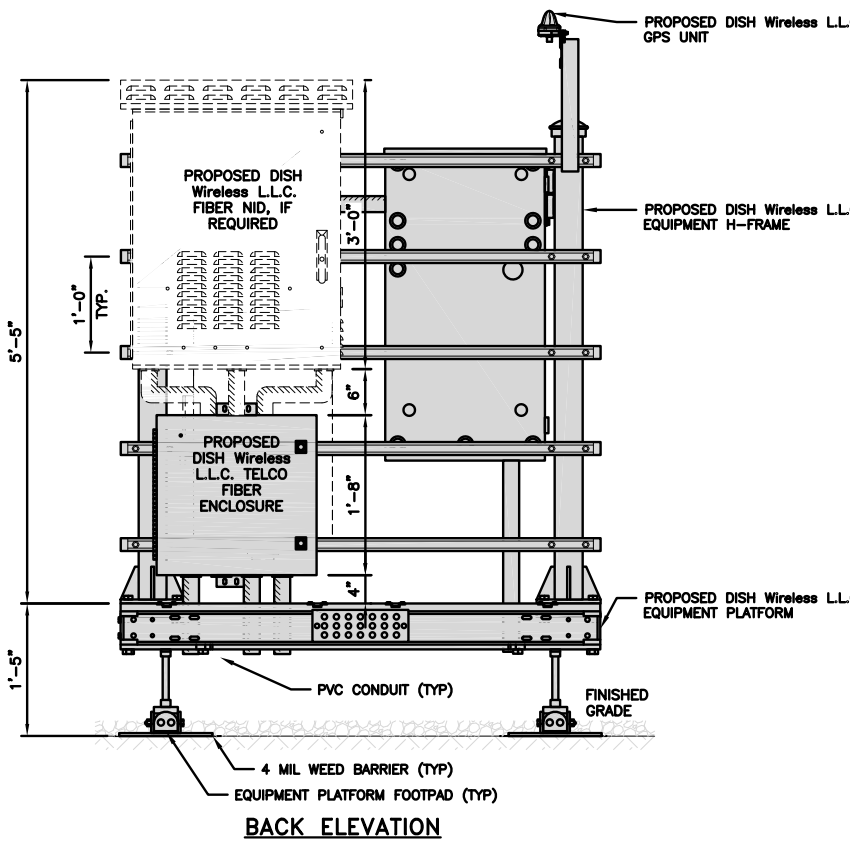
NO SCALE 4

NOTES

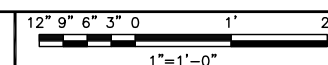
- CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
- WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH Wireless L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
- EQUIPMENT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



FRONT ELEVATION



BACK ELEVATION



5



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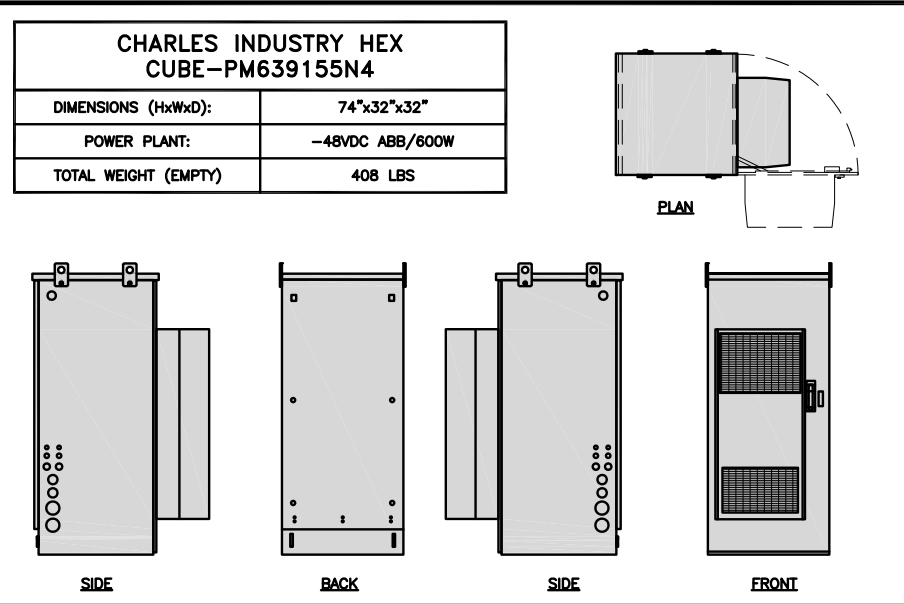
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00070A
750 RAINBOW ROAD
WINDSOR, CT 06095

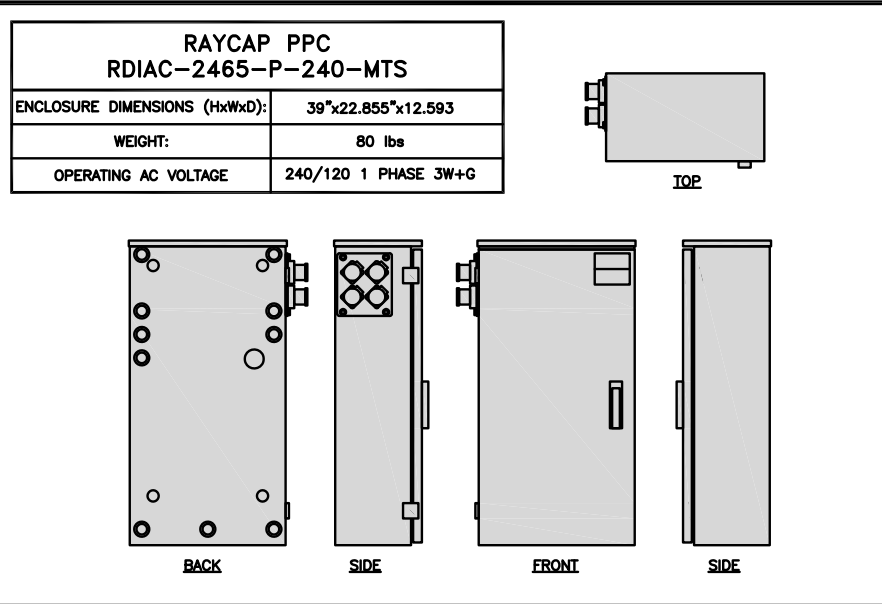
SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER

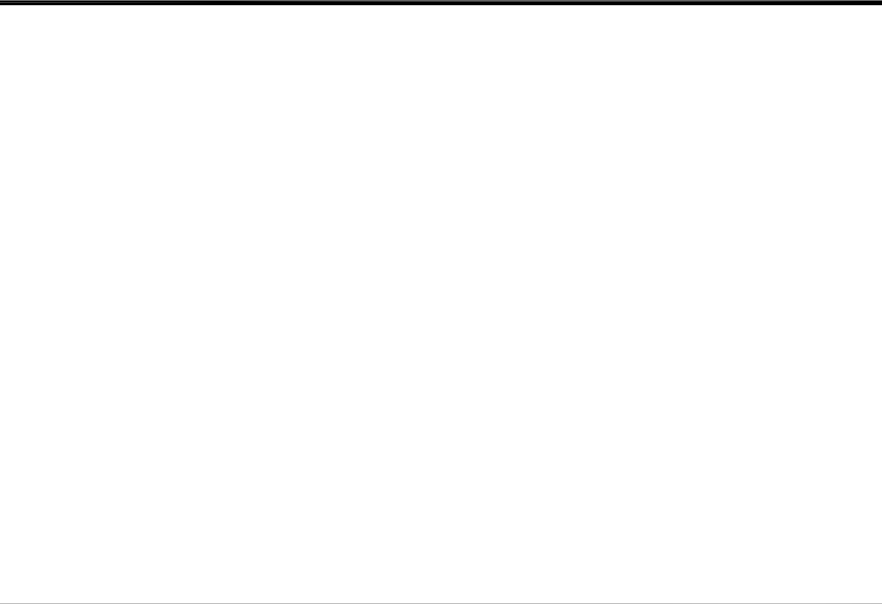
A-3



CABINET DETAIL NO SCALE 1



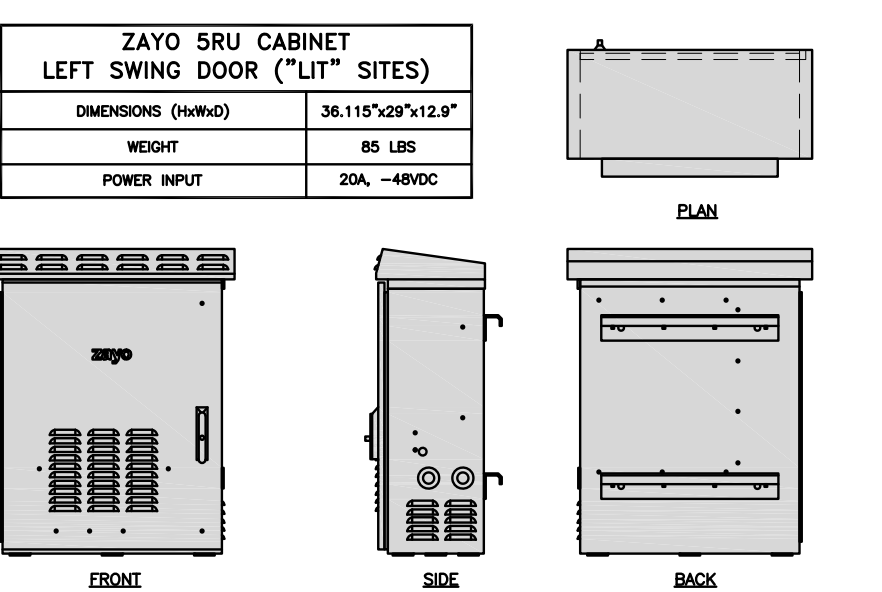
POWER PROTECTION CABINET (PPC) DETAIL NO SCALE 2



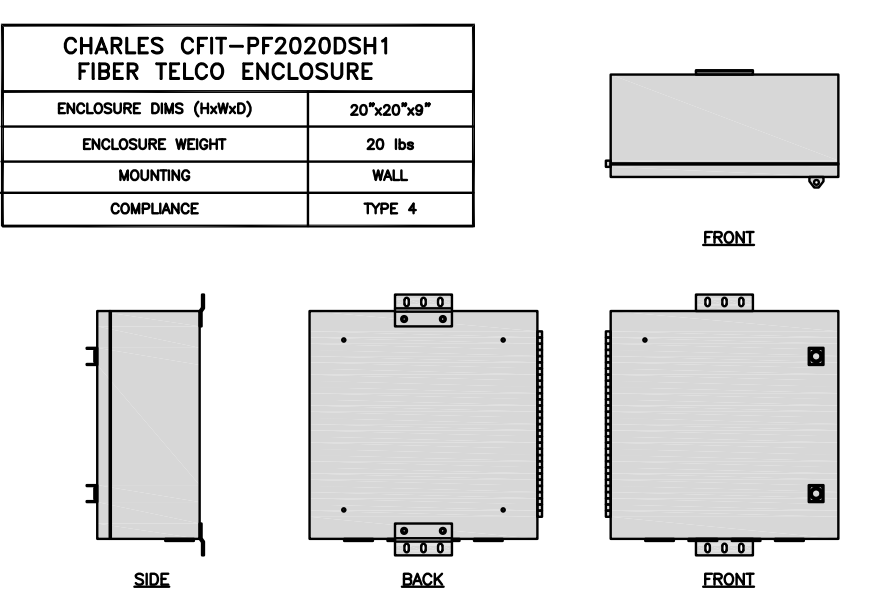
NOT USED NO SCALE 3



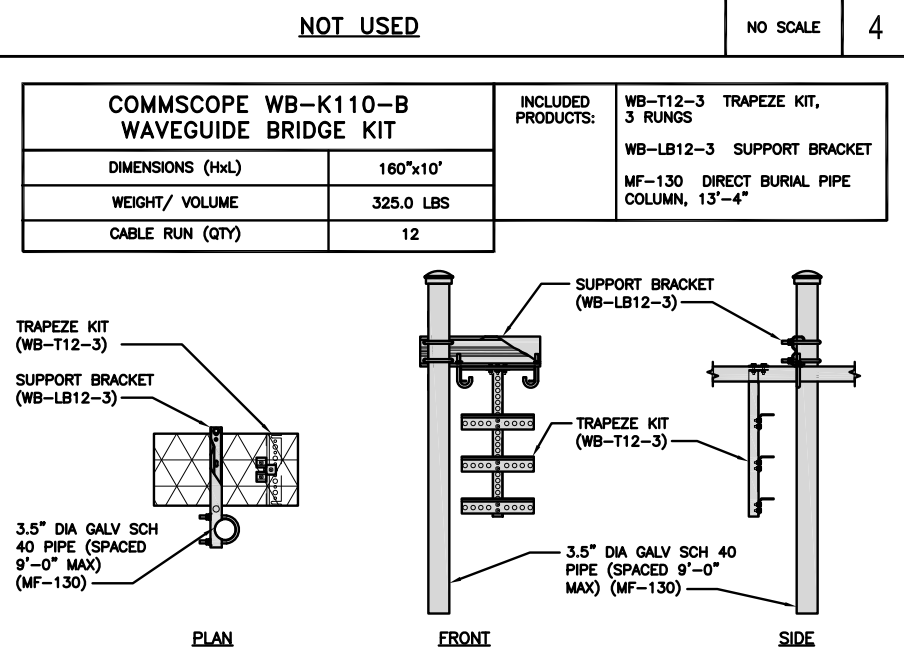
NOT USED NO SCALE 4



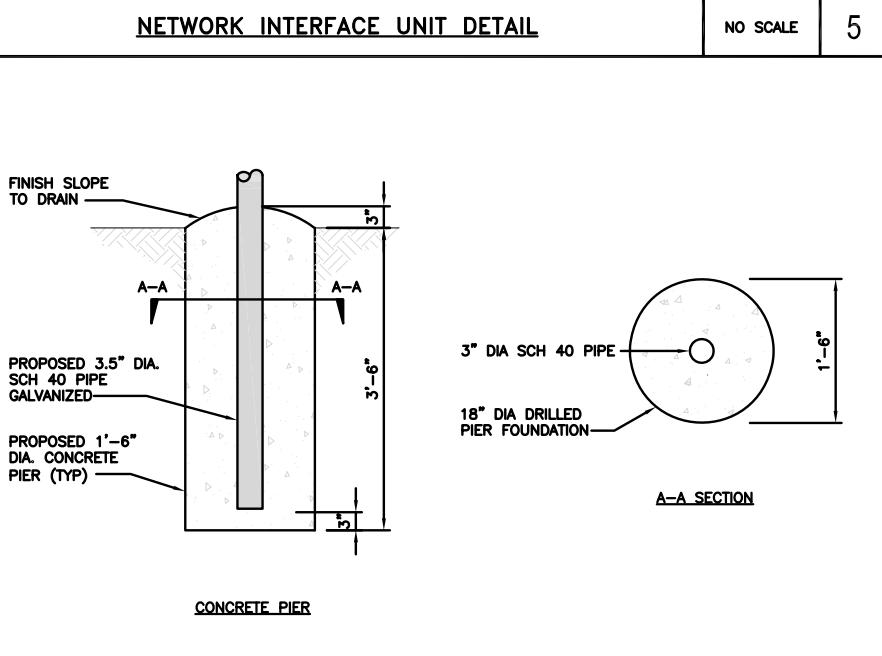
NETWORK INTERFACE UNIT DETAIL NO SCALE 5



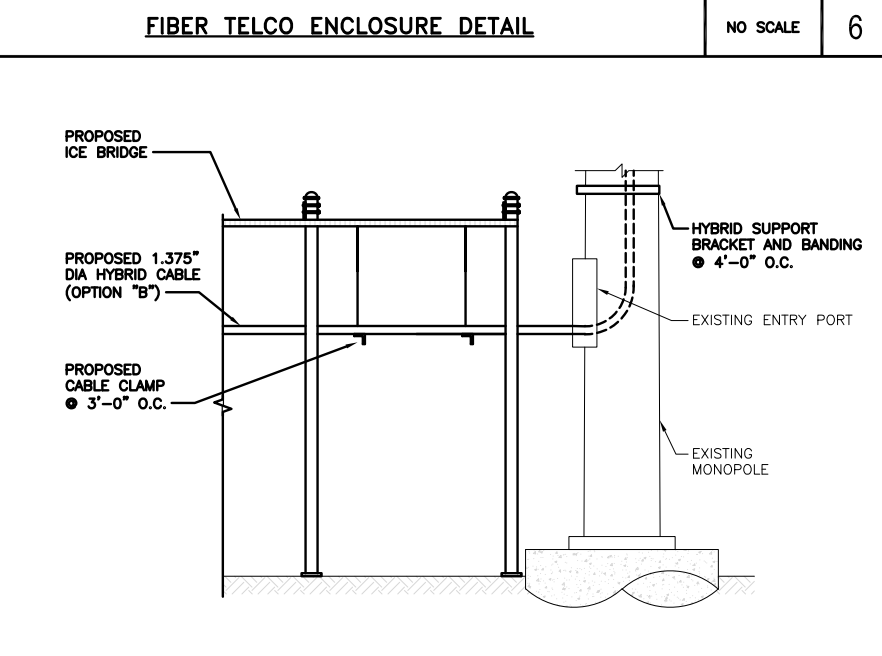
FIBER TELCO ENCLOSURE DETAIL NO SCALE 6



ICE BRIDGE DETAIL NO SCALE 7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL NO SCALE 8



HYBRID CABLE RUN NO SCALE 9

dish wireless.

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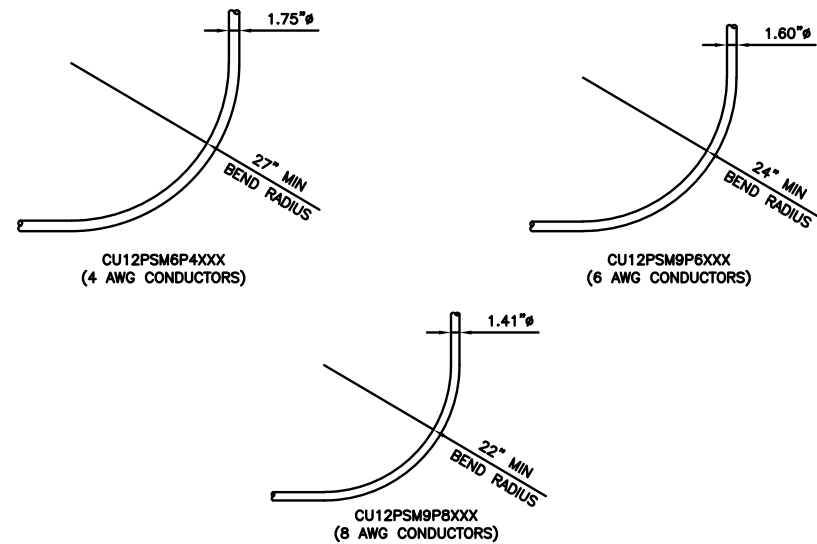
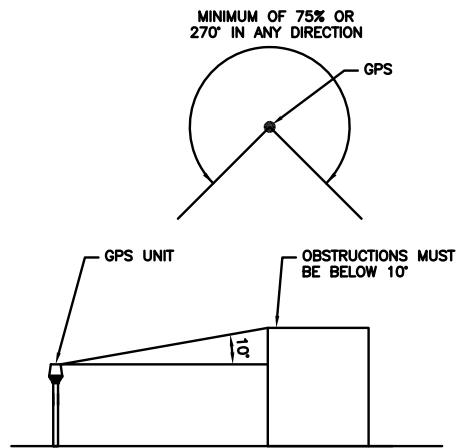
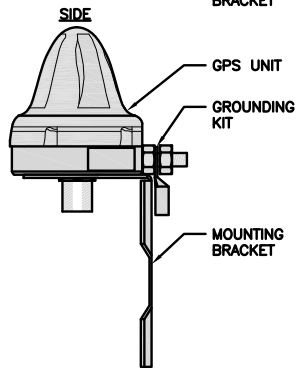
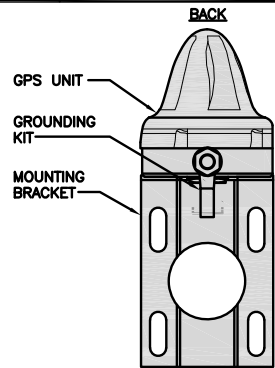
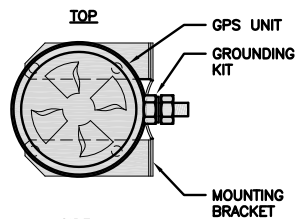
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00070A
750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

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



GPS ANTENNA DETAIL NO SCALE 1

GPS MINIMUM SKY VIEW REQUIREMENTS NO SCALE 2

CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUS NO SCALE 3

NOT USED NO SCALE 4

NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



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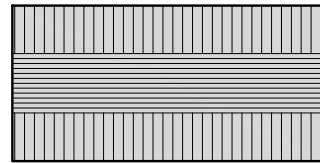
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PROJECT INFORMATION

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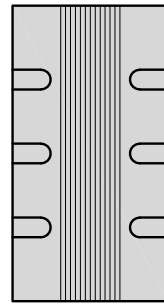
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

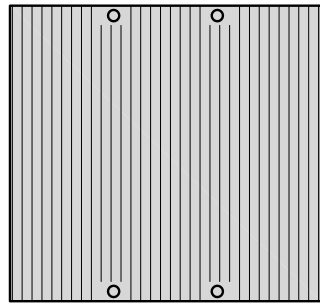
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



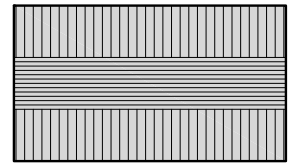
FRONT

REMOTE RADIO HEAD DETAIL

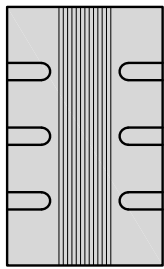
NO SCALE

1

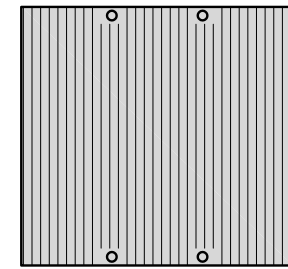
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

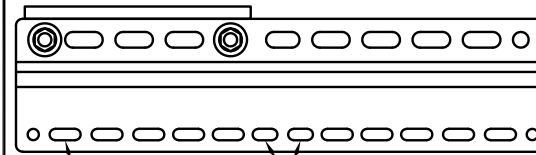
REMOTE RADIO HEAD DETAIL

NO SCALE

2

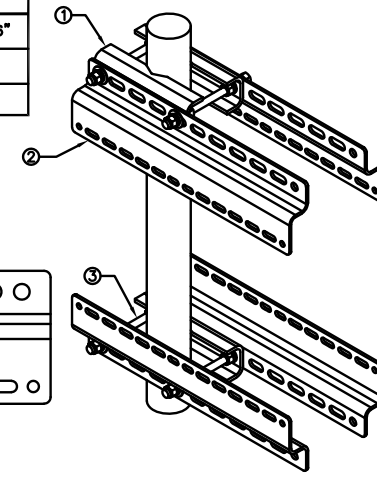
SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

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



11MM x 30MM SLOTS
40MM ON CENTER

11MM x 24MM SLOTS

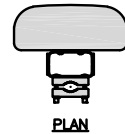


REMOTE RADIO MOUNT DETAIL

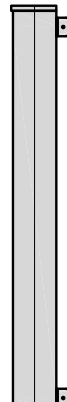
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3

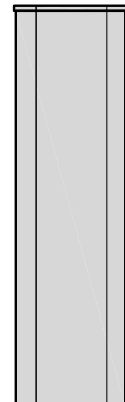
JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs



PLAN



SIDE



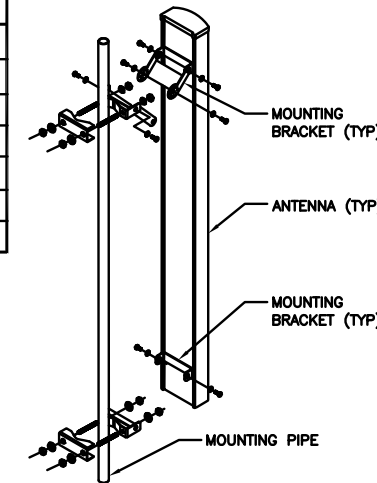
FRONT

ANTENNA DETAIL

NO SCALE

4

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



MOUNTING BRACKET (TYP)

ANTENNA (TYP)

MOUNTING BRACKET (TYP)

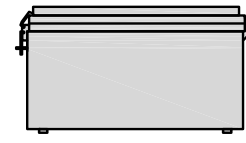
MOUNTING PIPE

ANTENNA MOUNTING DETAIL

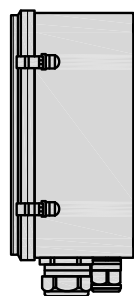
NO SCALE

6

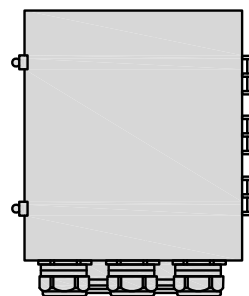
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



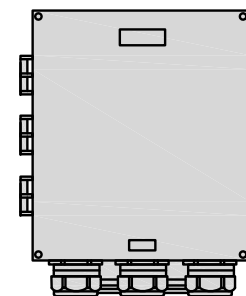
PLAN



SIDE



BACK



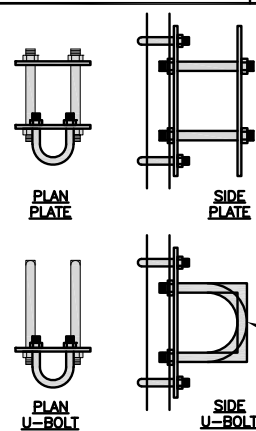
FRONT

SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

7

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

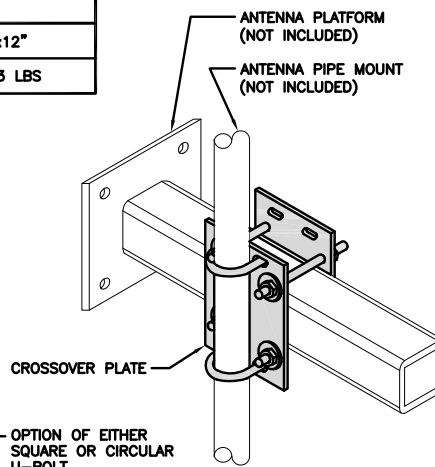


PLAN PLATE

SIDE PLATE

PLAN U-BOLT

SIDE U-BOLT



ANTENNA PLATFORM (NOT INCLUDED)

ANTENNA PIPE MOUNT (NOT INCLUDED)

CROSSOVER PLATE

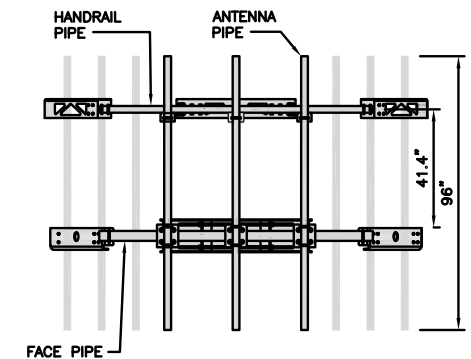
OPTION OF EITHER SQUARE OR CIRCULAR U-BOLT

RRH/OVP MOUNT DETAIL

NO SCALE

8

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



FACE PIPE

HANDRAIL PIPE

ANTENNA PIPE

41.4"

96"

PLATFORM

96"

ANTENNA PLATFORM DETAIL

NO SCALE

9

dish
wireless.

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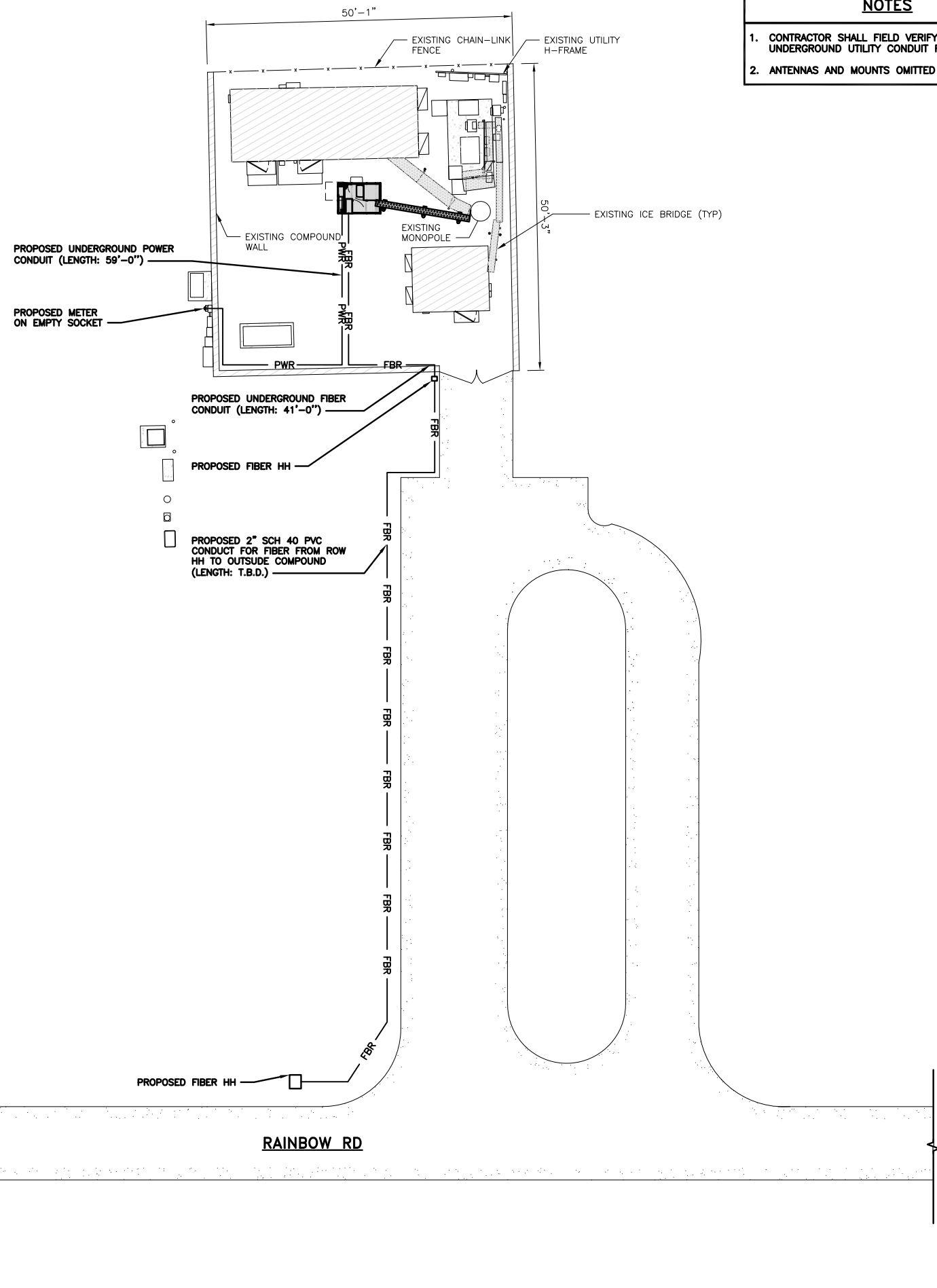
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00070A
750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER

A-6

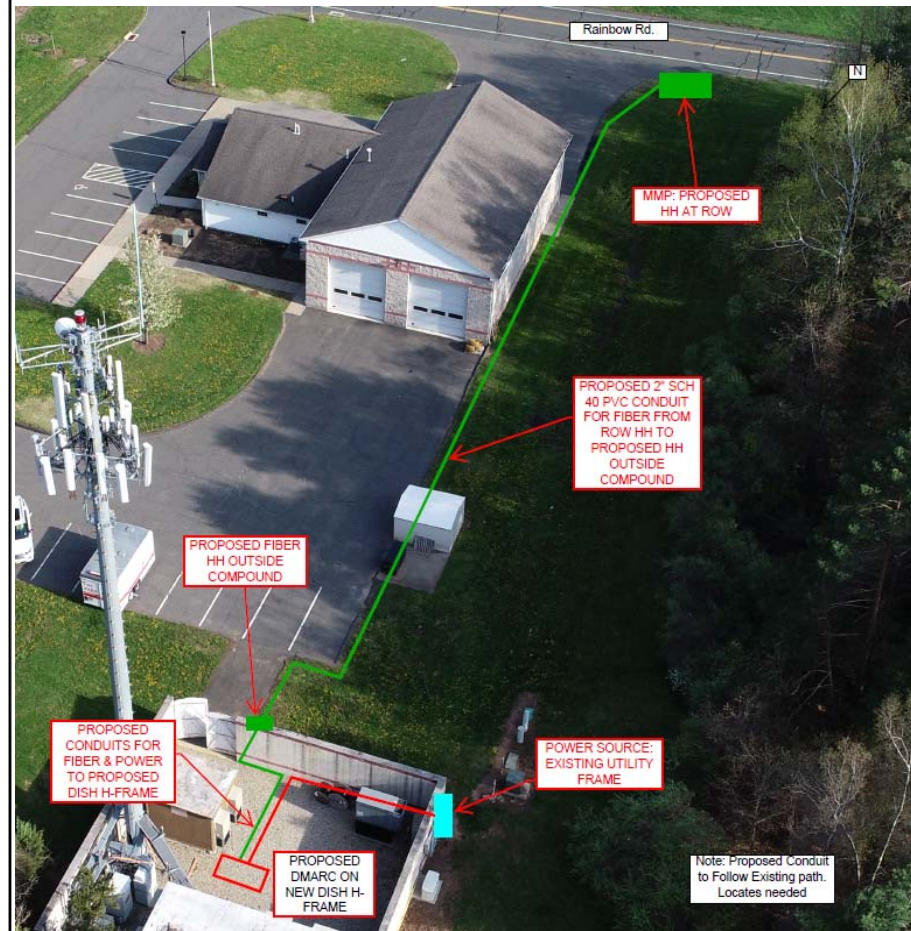


NOTES

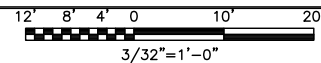
1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

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

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



UTILITY ROUTE PLAN



ELECTRICAL NOTES



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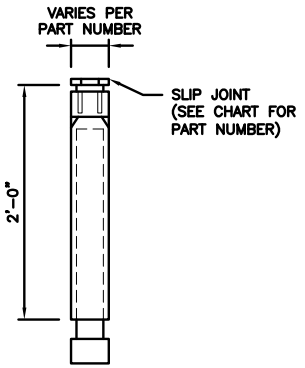
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00070A
750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
**ELECTRICAL/FIBER ROUTE
PLAN AND NOTES**

SHEET NUMBER

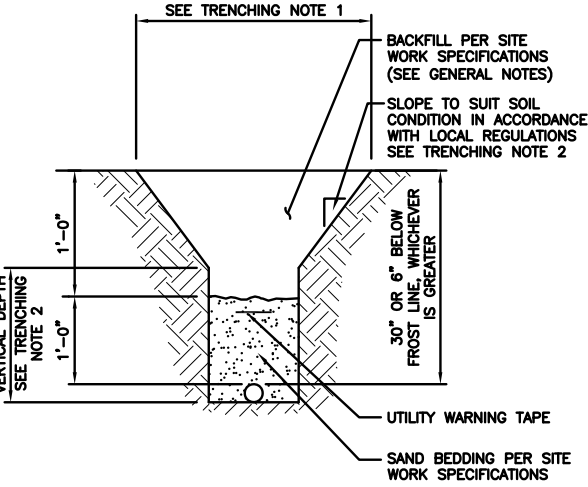
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"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



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

TRENCHING NOTES

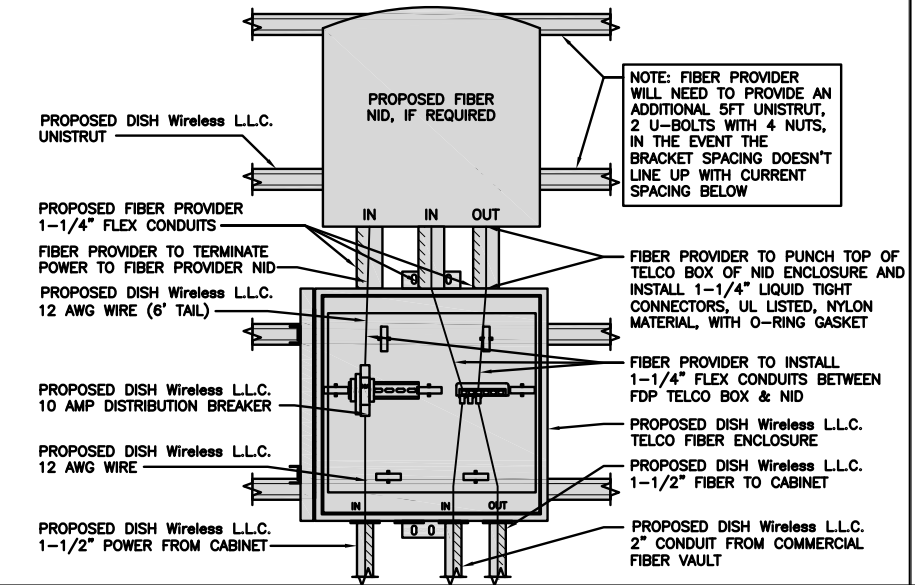
- CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
- TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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



EXPANSION JOINT DETAIL NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL NO SCALE 2

NOT USED NO SCALE 3



NOTE: FIBER PROVIDER WILL NEED TO PROVIDE AN ADDITIONAL 5FT UNISTRUT, 2 U-BOLTS WITH 4 NUTS, IN THE EVENT THE BRACKET SPACING DOESN'T LINE UP WITH CURRENT SPACING BELOW

FIBER PROVIDER TO PUNCH TOP OF TELCO BOX OF NID ENCLOSURE AND INSTALL 1-1/4" LIQUID TIGHT CONNECTORS, UL LISTED, NYLON MATERIAL, WITH O-RING GASKET

FIBER PROVIDER TO INSTALL 1-1/4" FLEX CONDUITS BETWEEN FDP TELCO BOX & NID

PROPOSED DISH Wireless L.L.C. TELCO FIBER ENCLOSURE

PROPOSED DISH Wireless L.L.C. 1-1/2" FIBER TO CABINET

PROPOSED DISH Wireless L.L.C. 2" CONDUIT FROM COMMERCIAL FIBER VAULT

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

NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



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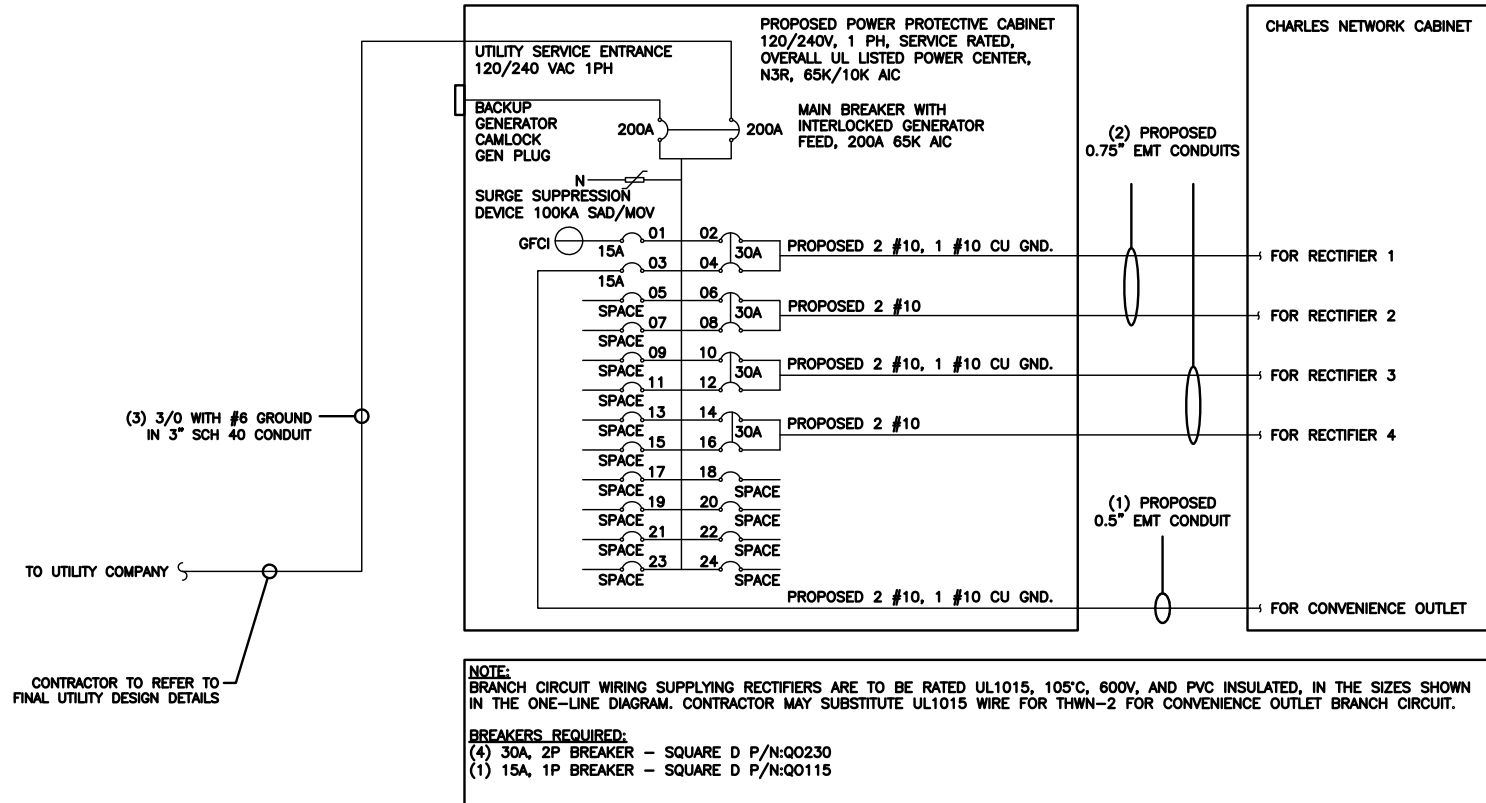
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL0070A
750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER

E-2



NOTES

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

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

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

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

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

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

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

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

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

PPC ONE-LINE DIAGRAM

NO SCALE 1

PROPOSED CHARLES PANEL SCHEDULE

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

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3



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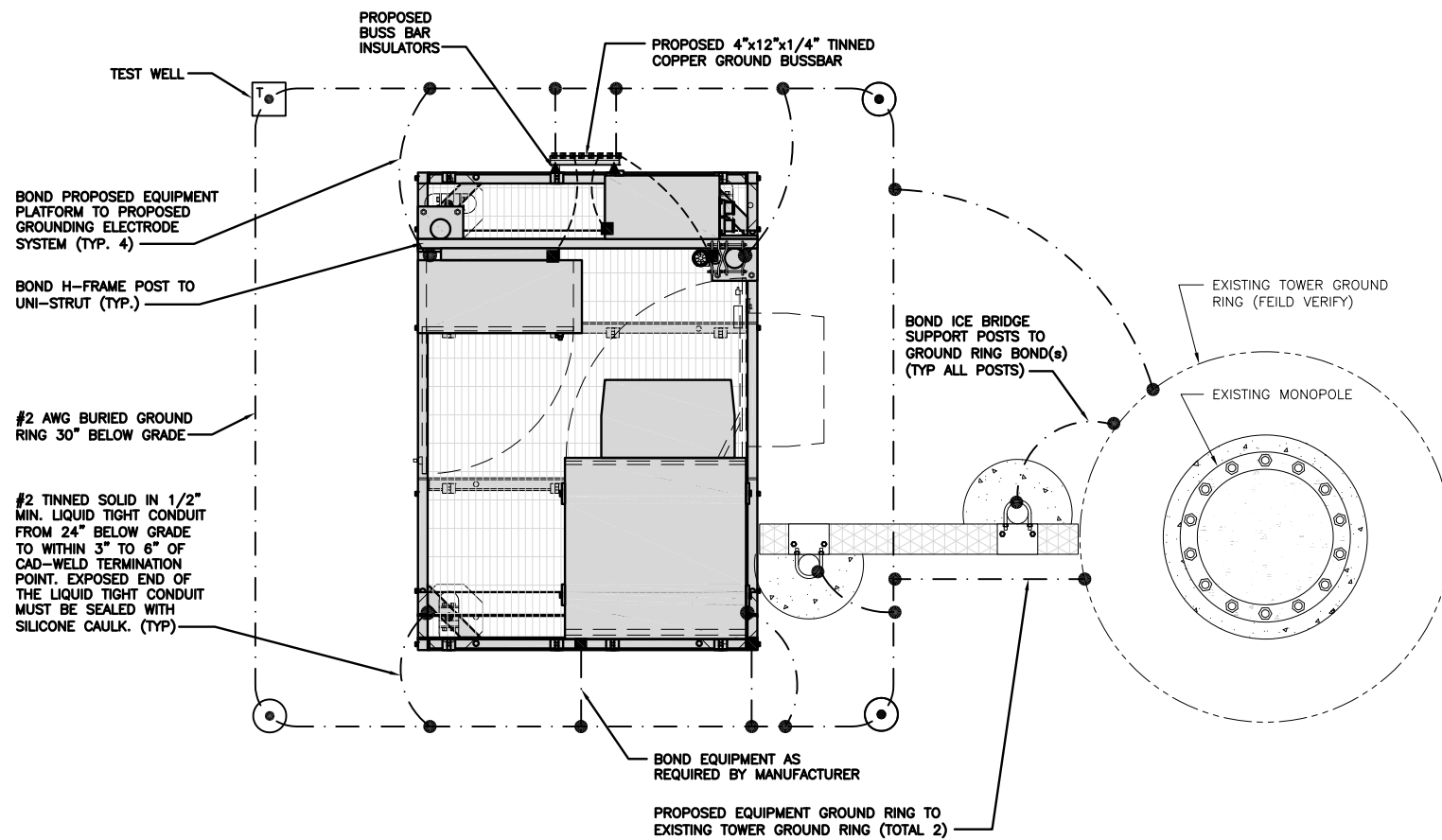
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DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00070A
750 RAINBOW ROAD
WINDSOR, CT 06095

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

SHEET NUMBER
E-3

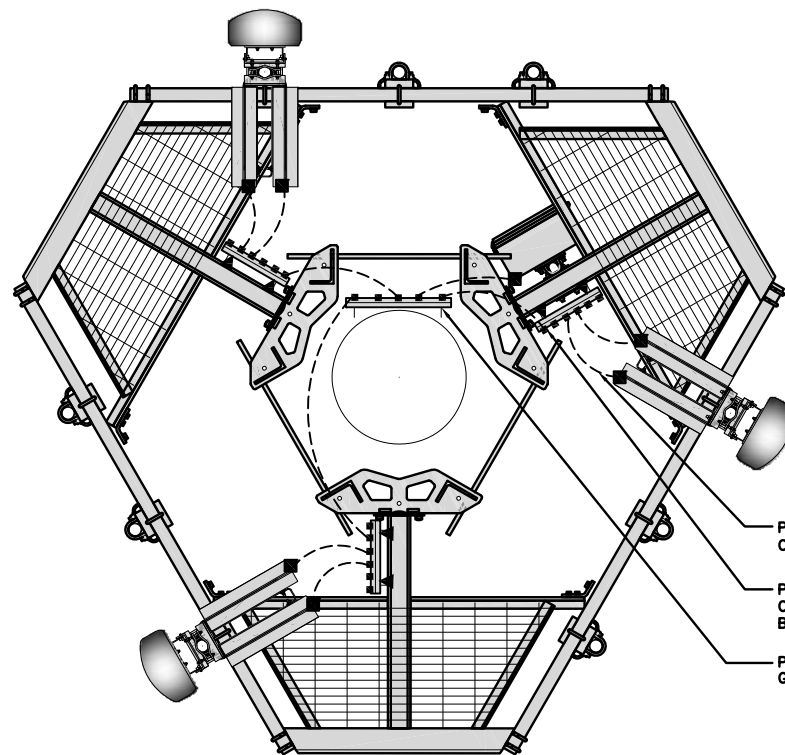


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1

NOTES

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



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2

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

GROUNDING LEGEND

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

GROUNDING KEY NOTES

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

GROUNDING KEY NOTES

NO SCALE 3



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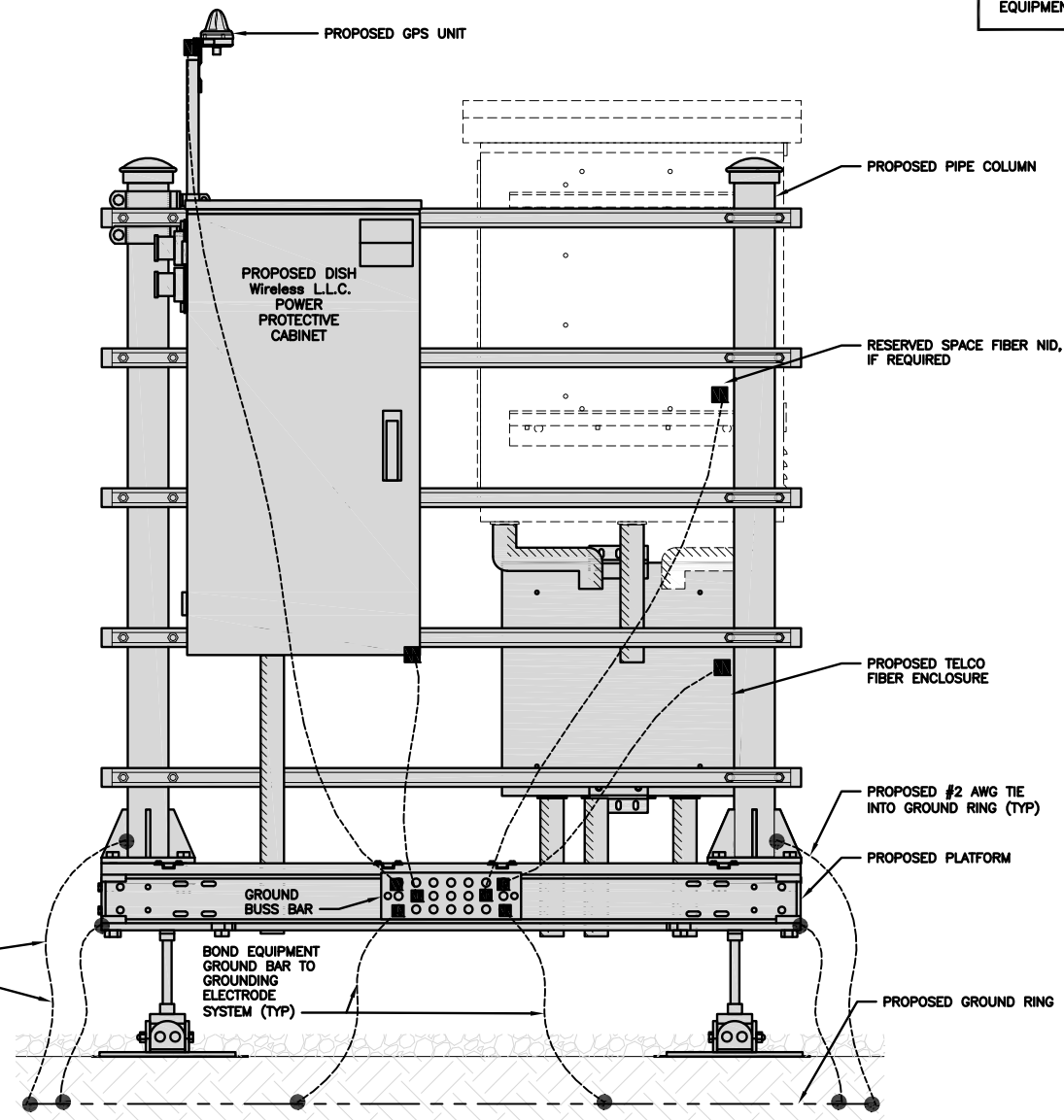
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SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER

G-1

NOTES
EQUIPMENT CABINET OMITTED FOR CLARITY

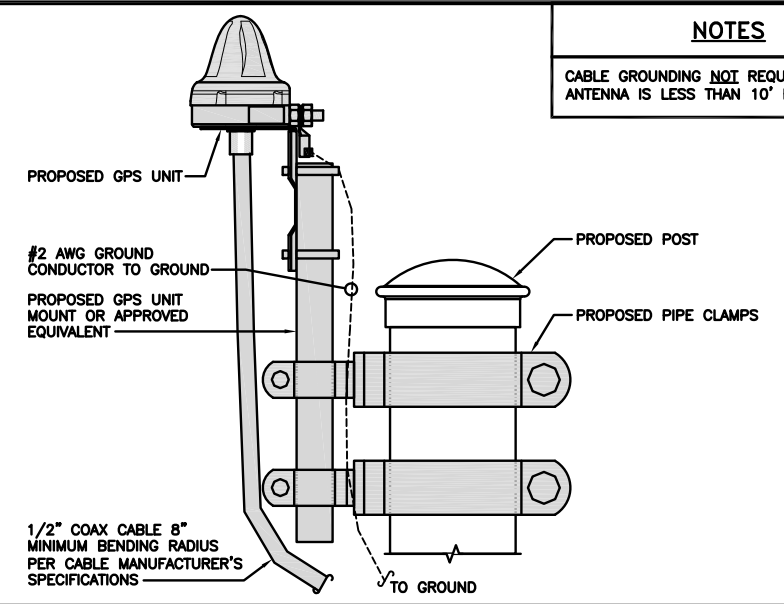


#2 TINNED SOLID IN 1/2" MIN. LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (TYP)

H-FRAME GROUNDING DETAIL

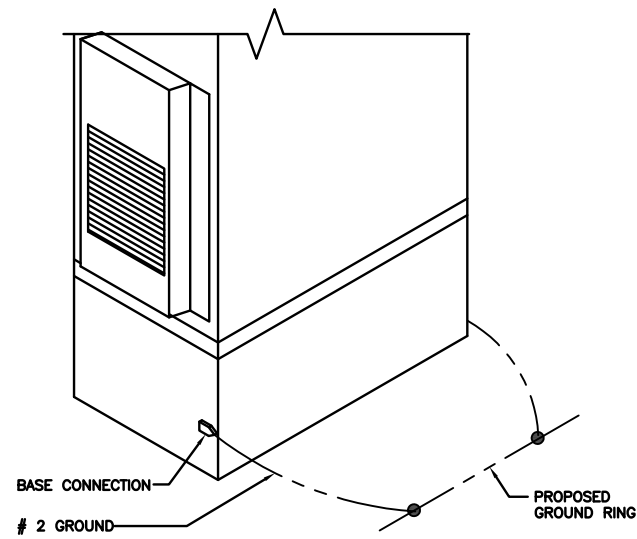
NO SCALE 1

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



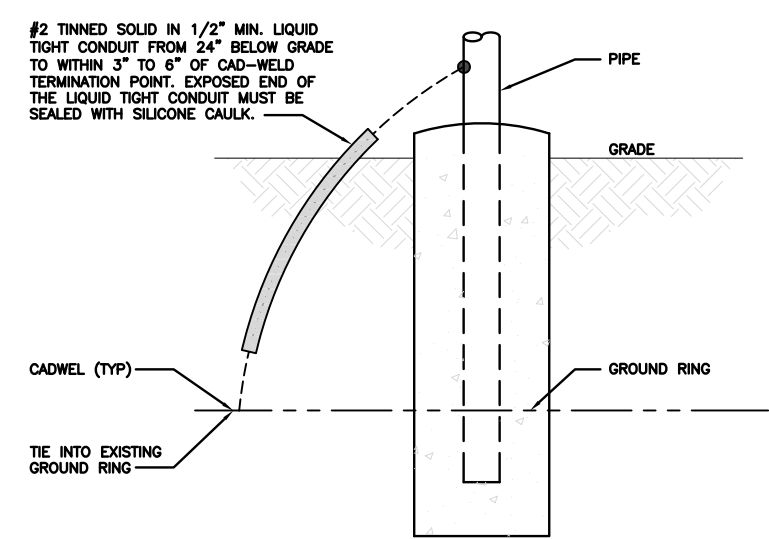
TYPICAL GPS UNIT GROUNDING

NO SCALE 2



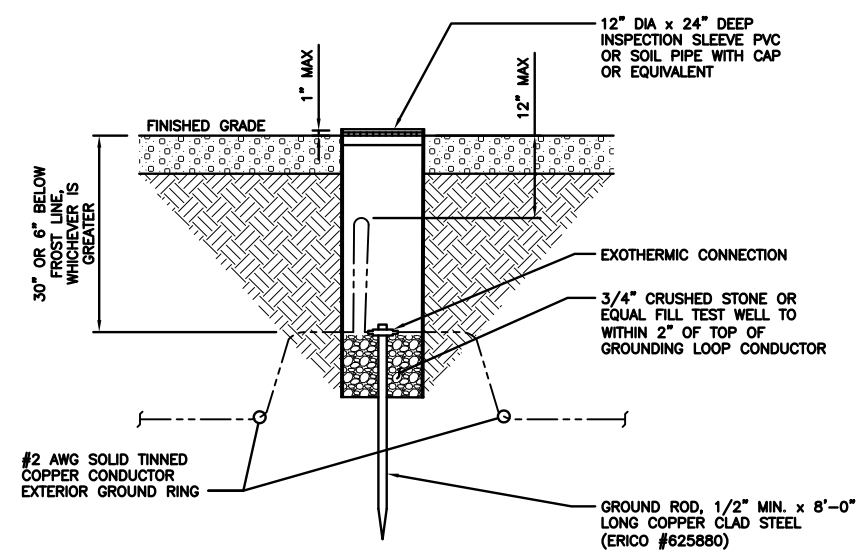
OUTDOOR CABINET GROUNDING

NO SCALE 3



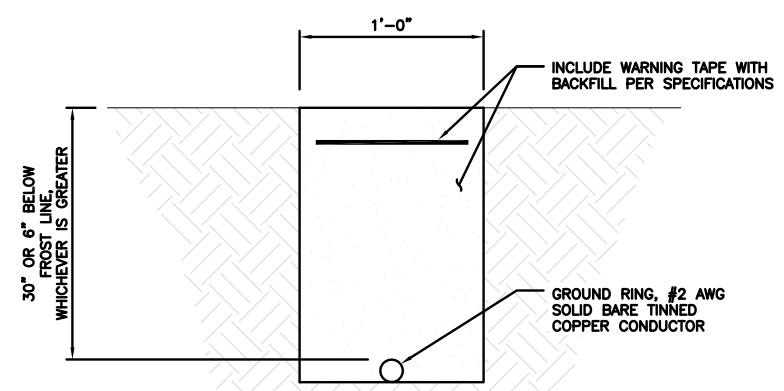
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5



TYPICAL GROUND RING TRENCH

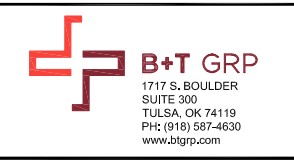
NO SCALE 6



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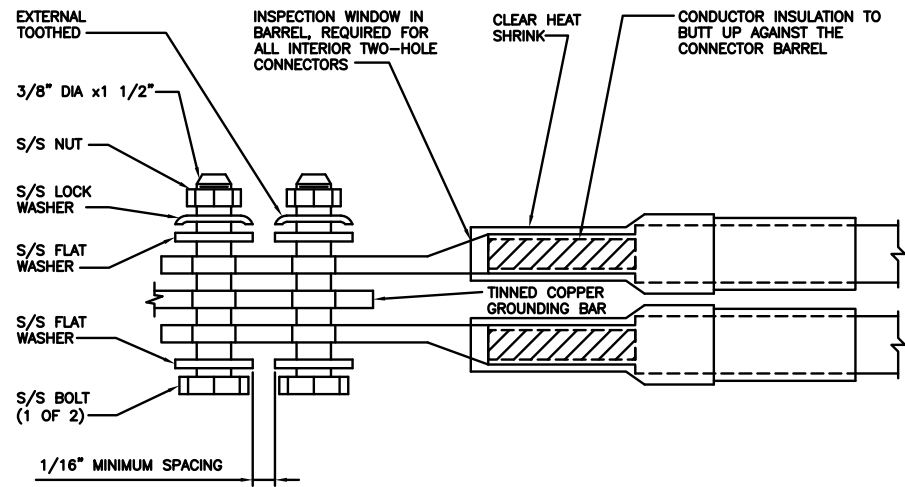
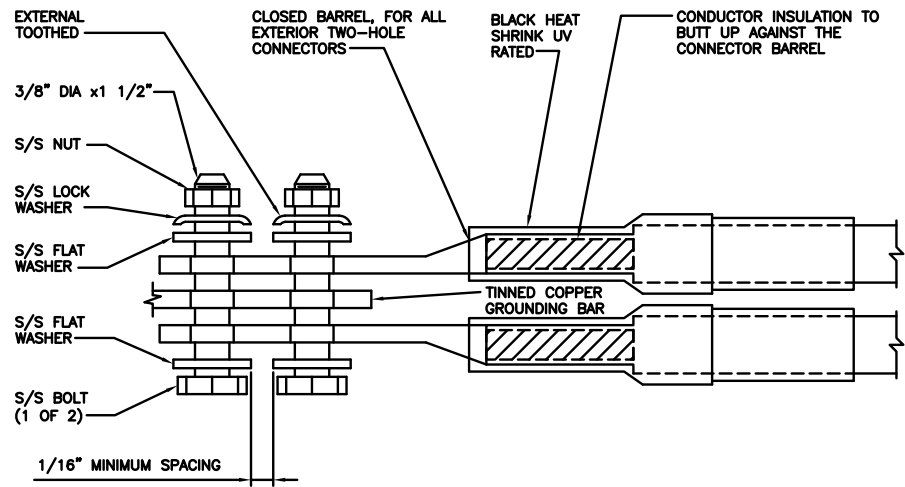
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750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2

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



TYPICAL GROUNDING NOTES

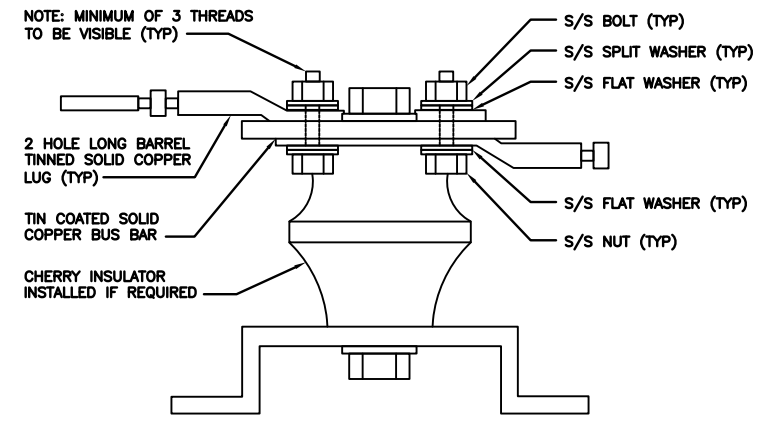
NO SCALE 1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



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

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/17/21	ISSUED FOR REVIEW
0	8/15/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
101655.008.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL0070A
750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

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

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

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

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

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

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

HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

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

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

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

FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

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

POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY

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

RET MOTORS AT ANTENNAS

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

MICROWAVE RADIO LINKS

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

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

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

RF CABLE COLOR CODES

NO SCALE

1

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



AWS
(N66+N70+H-BLOCK)



CBRS TECH
(3 GHz)



NEGATIVE SLANT PORT
ON ANT/RRH



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

NOT USED

NO SCALE

4



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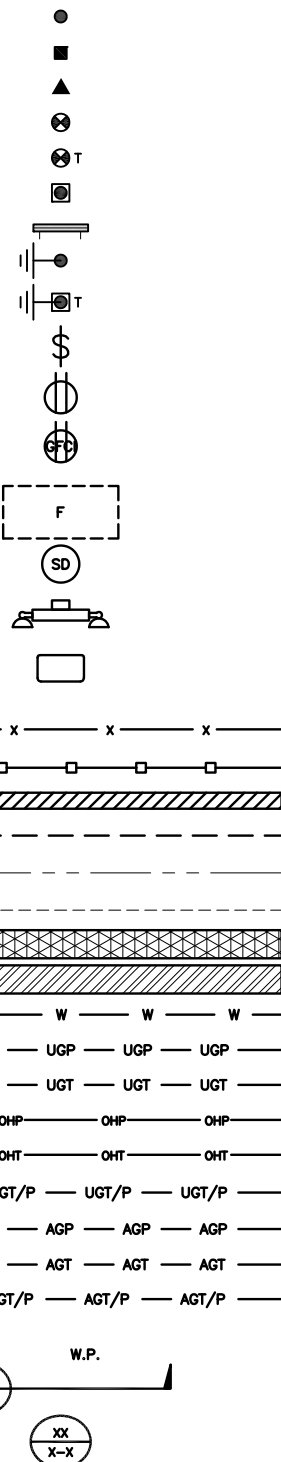
BOBDL00070A
750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER

RF-1

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



LEGEND

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

ABBREVIATIONS



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 PROJECT INFORMATION

BOBDL00070A
 750 RAINBOW ROAD
 WINDSOR, CT 06095

SHEET TITLE
 LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

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

GENERAL NOTES:

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



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

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	6/17/21	ISSUED FOR REVIEW
0	8/15/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
101655.008.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00070A
750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

ELECTRICAL INSTALLATION NOTES:

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

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



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A&E PROJECT NUMBER
101655.008.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00070A
750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-3

GROUNDING NOTES:

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



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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00070A
750 RAINBOW ROAD
WINDSOR, CT 06095

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

Exhibit D

Structural Analysis Report

Date: **May 29, 2021**



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

Subject: **Structural Analysis Report**

Carrier Designation: **DISH Network Co-Locate**
Site Number: BOBDL00070A
Site Name: CT-CCI-T-842877

Crown Castle Designation: **BU Number:** 842877
Site Name: WINDSOR NORTH
JDE Job Number: 650061
Work Order Number: 1966302
Order Number: 556622 Rev. 1

Engineering Firm Designation: **Crown Castle Project Number:** 1966302

Site Data: **750 RAINBOW ROAD, WINDSOR, HARTFORD County, CT**
Latitude 41° 55' 9.43", Longitude -72° 42' 37.57"
101 Foot - Monopole Tower

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

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

LC5: Proposed Equipment Configuration

Sufficient Capacity - 92.4%

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

Structural analysis prepared by: Jared Koski

Respectfully submitted by:

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



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1) INTRODUCTION

This tower is a 101 ft Monopole tower designed by Pennsummit Tubular, LLC.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	2 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
65.0	65.0	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)	
99.0	109.0	2	rfi antennas	CC807-11	2 3 1	1/2 7/8 Elliptical	
	100.0	1	rfs celwave	SC3-W100ASTX			
	99.0	99.0	1	tower mounts			Pipe Mount [PM 601-1]
			2	tower mounts			Side Arm Mount [SO 303-1]
	98.0	1	rfs celwave	SB2-190BB			
	97.0	1	telewave	ANT450D6-9			
93.0	93.0	1	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	1 2 6 1	3/8 3/4 7/8 Conduit	
		2	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe			
		2	ericsson	RRUS 11 B12			
		3	ericsson	RRUS 32 B2			
		3	kathrein	800 10121 w/ Mount Pipe			
		6	kathrein	860 10025			
		6	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Side Arm Mount [SO 102-3]			
	1	tower mounts	T-Arm Mount [TA 702-3]				
91.0	1	ericsson	RRUS 11 B12				

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
83.0	83.0	3	alcatel lucent	B13 RRH 4X30	2 16	1-3/8 1-5/8
		3	alcatel lucent	RRH4X45-AWS4 B66		
		6	andrew	SBNHH-1D65B w/ Mount Pipe		
		6	antel	LPA-80063/6CF w/ Mount Pipe		
		2	commscope	RC2DC-3315-PF-48		
		1	tower mounts	Platform Mount [LP 304-1]		
75.0	75.0	1	rfi antennas	BPA7496-180-11	1	7/8
		1	tower mounts	Pipe Mount [PM 601-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	4713263	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	4858945	CCISITES
4-TOWER MANUFACTURER DRAWINGS	5936703	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	101 - 72.75	Pole	TP25.481x20x0.188	1	-6.425	901.568	31.1	Pass
L2	72.75 - 36	Pole	TP32.236x24.475x0.25	2	-14.323	1521.198	63.5	Pass
L3	36 - 0	Pole	TP38.72x30.96x0.25	3	-21.319	1875.058	92.4	Pass
							Summary	
						Pole (L3)	92.4	Pass
						Rating =	92.4	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	47.0	Pass
1	Base Plate	0	70.5	Pass
1	Base Foundation (Structure)	0	56.0	Pass
1	Base Foundation (Soil Interaction)	0	56.3	Pass
Structure Rating (max from all components) =				92.4%

Notes:

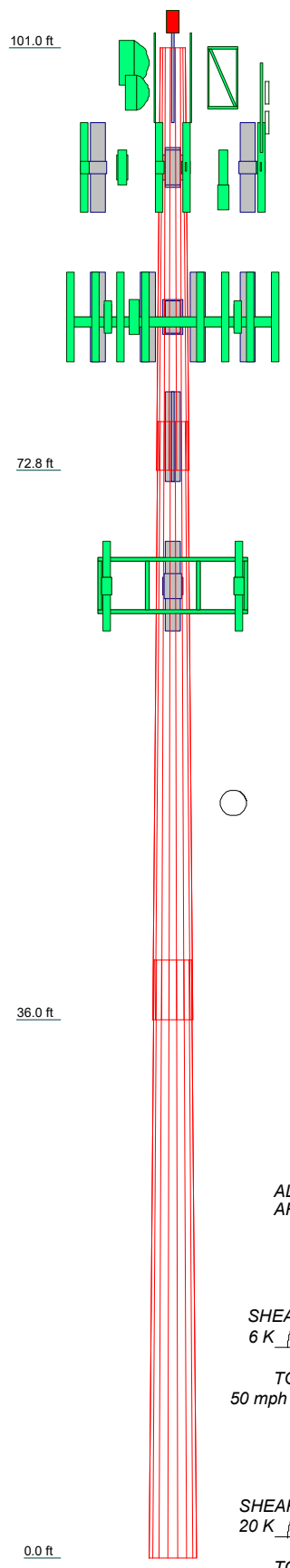
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3	8.1
Length (ft)	28.250	40.000	40.000	
Number of Sides	18	18	18	
Thickness (in)	0.188	0.250	0.250	
Socket Length (ft)	3.250	4.000		
Top Dia (in)	20.000	24.475	30.960	
Bot Dia (in)	25.481	32.236	38.720	
Grade		A607-65		
Weight (K)	1.3	3.0	3.7	



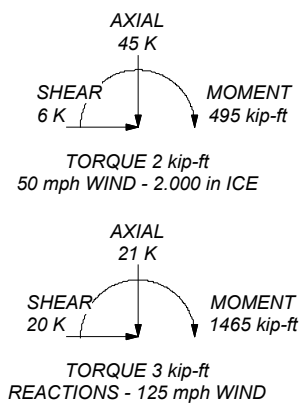
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 92.4%

ALL REACTIONS ARE FACTORED



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

Job:	BU# 842877		
Project:			
Client:	Crown Castle	Drawn by:	JKoski
Code:	TIA-222-H	Date:	05/29/21
Path:	C:\Users\jkoski\Desktop\Work Area\842877\WO 1966302 - SA\Prod\842877.dwg		App'd:
			Scale: NTS
			Dwg No. E-1

Tower Input Data

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

- Tower is located in Hartford County, Connecticut.
- Tower base elevation above sea level: 186.000 ft.
- Basic wind speed of 125 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 2.000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets ✓ Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	101.000-72.750	28.250	3.250	18	20.000	25.481	0.188	0.750	A607-65 (65 ksi)
L2	72.750-36.000	40.000	4.000	18	24.475	32.236	0.250	1.000	A607-65 (65 ksi)
L3	36.000-0.000	40.000		18	30.960	38.720	0.250	1.000	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	20.280	11.791	584.741	7.033	10.160	57.553	1170.251	5.897	3.190	17.013
	25.845	15.053	1216.669	8.979	12.944	93.992	2434.939	7.528	4.155	22.158
L2	25.455	19.223	1425.278	8.600	12.434	114.632	2852.431	9.613	3.868	15.471
	32.695	25.381	3280.682	11.355	16.376	200.336	6565.681	12.693	5.234	20.934
L3	32.187	24.368	2903.498	10.902	15.728	184.611	5810.816	12.186	5.009	20.036
	39.279	30.526	5707.566	13.657	19.670	290.170	11422.642	15.266	6.375	25.499

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 101.000-72.750				1	1	1			
L2 72.750-36.000				1	1	1			
L3 36.000-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf
LCF12-50J(1/2)	C	No	No	Inside Pole	99.000 - 0.000	1	No Ice	0.150
							1/2" Ice	0.150
							1" Ice	0.150
							2" Ice	0.150
LDF4-50A(1/2)	C	No	No	Inside Pole	99.000 - 0.000	1	No Ice	0.150
							1/2" Ice	0.150
							1" Ice	0.150
							2" Ice	0.150
LDF5-50A(7/8)	C	No	No	Inside Pole	99.000 - 0.000	3	No Ice	0.330
							1/2" Ice	0.330
							1" Ice	0.330
							2" Ice	0.330

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		CAAA ft ² /ft	Weight plf
EU 90-FR(ELLIPTICAL)	C	No	No	Inside Pole	99.000 - 0.000	1	No Ice	0.000	0.340
							1/2" Ice	0.000	0.340
							1" Ice	0.000	0.340
							2" Ice	0.000	0.340

LDF5-50A(7/8)	B	No	No	Inside Pole	93.000 - 0.000	6	No Ice	0.000	0.330
							1/2" Ice	0.000	0.330
							1" Ice	0.000	0.330
							2" Ice	0.000	0.330
3" Conduit	B	No	No	Inside Pole	93.000 - 0.000	1	No Ice	0.000	2.800
							1/2" Ice	0.000	2.800
							1" Ice	0.000	2.800
							2" Ice	0.000	2.800
FB-L98-002-XXX(3/8)	B	No	No	Inside Pole	93.000 - 0.000	1	No Ice	0.000	0.065
							1/2" Ice	0.000	0.065
							1" Ice	0.000	0.065
							2" Ice	0.000	0.065
WR-VG86ST-BRD(3/4)	B	No	No	Inside Pole	93.000 - 0.000	2	No Ice	0.000	0.584
							1/2" Ice	0.000	0.584
							1" Ice	0.000	0.584
							2" Ice	0.000	0.584

LDF7-50A(1-5/8)	A	No	No	Inside Pole	83.000 - 0.000	16	No Ice	0.000	0.820
							1/2" Ice	0.000	0.820
							1" Ice	0.000	0.820
							2" Ice	0.000	0.820
HFT1206-24S26-XXX(1-3/8)	A	No	No	Inside Pole	83.000 - 0.000	2	No Ice	0.000	1.620
							1/2" Ice	0.000	1.620
							1" Ice	0.000	1.620
							2" Ice	0.000	1.620

LDF5-50A(7/8)	C	No	No	Inside Pole	75.000 - 0.000	1	No Ice	0.000	0.330
							1/2" Ice	0.000	0.330
							1" Ice	0.000	0.330
							2" Ice	0.000	0.330

Safety Line 3/8	A	No	No	CaAa (Out Of Face)	101.000 - 0.000	1	No Ice	0.037	0.220
							1/2" Ice	0.137	0.750
							1" Ice	0.238	1.280
							2" Ice	0.437	2.340
5/8 rod/step	A	No	No	CaAa (Out Of Face)	101.000 - 0.000	1	No Ice	0.020	0.274
							1/2" Ice	0.120	0.702
							1" Ice	0.220	1.740
							2" Ice	0.420	5.650

**									
CU12PSM9P8XXX(1-3/8)	A	No	No	Inside Pole	65.000 - 0.000	1	No Ice	0.000	1.660
							1/2" Ice	0.000	1.660
							1" Ice	0.000	1.660
							2" Ice	0.000	1.660

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	CAAA In Face ft ²	CAAA Out Face ft ²	Weight K
L1	101.000-72.750	A	0.000	0.000	0.000	1.624	0.182
		B	0.000	0.000	0.000	0.000	0.122
		C	0.000	0.000	0.000	0.000	0.044
L2	72.750-36.000	A	0.000	0.000	0.000	2.113	0.668
		B	0.000	0.000	0.000	0.000	0.221
		C	0.000	0.000	0.000	0.000	0.072
L3	36.000-0.000	A	0.000	0.000	0.000	2.070	0.667
		B	0.000	0.000	0.000	0.000	0.216

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
		C	0.000	0.000	0.000	0.000	0.071

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	101.000-72.750	A	1.872	0.000	0.000	0.000	22.773	0.375
		B		0.000	0.000	0.000	0.000	0.122
		C		0.000	0.000	0.000	0.000	0.044
L2	72.750-36.000	A	1.786	0.000	0.000	0.000	29.625	0.920
		B		0.000	0.000	0.000	0.000	0.221
		C		0.000	0.000	0.000	0.000	0.072
L3	36.000-0.000	A	1.600	0.000	0.000	0.000	27.783	0.898
		B		0.000	0.000	0.000	0.000	0.216
		C		0.000	0.000	0.000	0.000	0.071

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	101.000-72.750	0.000	-0.515	0.000	-2.809
L2	72.750-36.000	0.000	-0.520	0.000	-3.042
L3	36.000-0.000	0.000	-0.524	0.000	-3.132

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
Flash Beacon Lighting	C	None		0.000	102.000	No Ice	2.700	2.700	0.050
						1/2" Ice	3.100	3.100	0.070
						Ice	3.500	3.500	0.090
						1" Ice	4.300	4.300	0.130
						2" Ice			
*** ANT450D6-9	B	From Leg	6.000 0.000 -2.000	0.000	99.000	No Ice	2.862	2.862	0.176
						1/2" Ice	4.370	4.370	0.200
						Ice	5.878	5.878	0.224
						1" Ice	8.893	8.893	0.272
						2" Ice			
CC807-11	A	From Leg	6.000 0.000 10.000	0.000	99.000	No Ice	5.267	5.267	0.049
						1/2" Ice	7.039	7.039	0.086
						Ice	8.828	8.828	0.135
						1" Ice	12.455	12.455	0.267
						2" Ice			
CC807-11	B	From Leg	6.000 0.000 10.000	0.000	99.000	No Ice	5.267	5.267	0.049
						1/2" Ice	7.039	7.039	0.086
						Ice	8.828	8.828	0.135
						1" Ice	12.455	12.455	0.267
						2" Ice			
Side Arm Mount [SO 303-	A	From Leg	3.000	0.000	99.000	No Ice	1.080	5.310	0.115

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
1]			0.000 0.000			1/2" Ice 2.210	7.570 9.930	0.158 0.217
Side Arm Mount [SO 303-1]	B	From Leg	3.000 0.000 0.000	0.000	99.000	1" Ice 3.440 2" Ice No Ice 1.080 1/2" 1.630 Ice 2.210 1" Ice 3.440 2" Ice No Ice 1.320 1/2" 1.580 Ice 1.840 1" Ice 2.400 2" Ice No Ice 1.330 1/2" 2.050 Ice 2.640 1" Ice 3.520 2" Ice No Ice 1.330 1/2" 2.050 Ice 2.640 1" Ice 3.520 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 9.220 1/2" 9.980 Ice 10.760 1" Ice 12.360 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	15.190 15.190	0.379 0.379
Pipe Mount [PM 601-1]	C	From Leg	0.500 0.000 0.000	0.000	99.000	No Ice 1.320 1/2" 1.580 Ice 1.840 1" Ice 2.400 2" Ice No Ice 1.320 1/2" 1.580 Ice 1.840 1" Ice 2.400 2" Ice No Ice 1.320 1/2" 1.580 Ice 1.840 1" Ice 2.400 2" Ice No Ice 1.330 1/2" 2.050 Ice 2.640 1" Ice 3.520 2" Ice No Ice 1.330 1/2" 2.050 Ice 2.640 1" Ice 3.520 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 9.220 1/2" 9.980 Ice 10.760 1" Ice 12.360 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	1.320 1.320	0.065 0.077 0.093 0.134
7'X2" Horizontal Pipe	A	From Leg	0.500 0.000 0.000	0.000	99.000	No Ice 1.330 1/2" 2.050 Ice 2.640 1" Ice 3.520 2" Ice No Ice 1.330 1/2" 2.050 Ice 2.640 1" Ice 3.520 2" Ice No Ice 1.330 1/2" 2.050 Ice 2.640 1" Ice 3.520 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 9.220 1/2" 9.980 Ice 10.760 1" Ice 12.360 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	0.010 0.040 0.090 0.210	0.019 0.290 0.044 0.089
7'X2" Horizontal Pipe	B	From Leg	0.500 0.000 0.000	0.000	99.000	No Ice 1.330 1/2" 2.050 Ice 2.640 1" Ice 3.520 2" Ice No Ice 1.330 1/2" 2.050 Ice 2.640 1" Ice 3.520 2" Ice No Ice 1.330 1/2" 2.050 Ice 2.640 1" Ice 3.520 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 9.220 1/2" 9.980 Ice 10.760 1" Ice 12.360 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	0.010 0.040 0.090 0.210	0.019 0.290 0.044 0.089

800 10121 w/ Mount Pipe	A	From Leg	3.000 0.000 0.000	0.000	93.000	No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 9.220 1/2" 9.980 Ice 10.760 1" Ice 12.360 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	2.950 3.340 3.740 4.590	0.072 0.115 0.166 0.297
800 10121 w/ Mount Pipe	B	From Leg	3.000 0.000 0.000	0.000	93.000	No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 9.220 1/2" 9.980 Ice 10.760 1" Ice 12.360 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	2.950 3.340 3.740 4.590	0.072 0.115 0.166 0.297
800 10121 w/ Mount Pipe	C	From Leg	3.000 0.000 0.000	0.000	93.000	No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 3.600 1/2" 4.000 Ice 4.420 1" Ice 5.290 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 9.220 1/2" 9.980 Ice 10.760 1" Ice 12.360 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	2.950 3.340 3.740 4.590	0.072 0.115 0.166 0.297
HPA-65R-BUU-H8 w/ Mount Pipe	A	From Leg	3.000 0.000 0.000	0.000	93.000	No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 9.220 1/2" 9.980 Ice 10.760 1" Ice 12.360 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	8.330 9.230 10.150 12.050	0.105 0.194 0.297 0.543
HPA-65R-BUU-H8 w/ Mount Pipe	B	From Leg	3.000 0.000 0.000	0.000	93.000	No Ice 12.250 1/2" 13.190 Ice 14.160 1" Ice 16.140 2" Ice No Ice 9.220 1/2" 9.980 Ice 10.760 1" Ice 12.360 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	8.330 9.230 10.150 12.050	0.105 0.194 0.297 0.543
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	3.000 0.000 0.000	0.000	93.000	No Ice 9.220 1/2" 9.980 Ice 10.760 1" Ice 12.360 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	6.250 6.960 7.700 9.220	0.074 0.143 0.224 0.420
(2) 860 10025	A	From Leg	3.000 0.000 0.000	0.000	93.000	No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	0.121 0.173 0.231 0.376	0.001 0.003 0.005 0.014
(2) 860 10025	B	From Leg	3.000 0.000 0.000	0.000	93.000	No Ice 0.142 1/2" 0.196 Ice 0.259 1" Ice 0.408 2" Ice	0.121 0.173 0.231 0.376	0.001 0.003 0.005 0.014

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
(2) 860 10025	C	From Leg	3.000	0.000	0.000	93.000	No Ice	0.142	0.121	0.001
			0.000	0.000			1/2"	0.196	0.173	0.003
			0.000	0.000			Ice	0.259	0.231	0.005
							1" Ice	0.408	0.376	0.014
							2" Ice			
(2) LGP21401	A	From Leg	3.000	0.000	0.000	93.000	No Ice	1.104	0.207	0.014
			0.000	0.000			1/2"	1.239	0.274	0.021
			0.000	0.000			Ice	1.381	0.348	0.030
							1" Ice	1.688	0.521	0.055
							2" Ice			
(2) LGP21401	B	From Leg	3.000	0.000	0.000	93.000	No Ice	1.104	0.207	0.014
			0.000	0.000			1/2"	1.239	0.274	0.021
			0.000	0.000			Ice	1.381	0.348	0.030
							1" Ice	1.688	0.521	0.055
							2" Ice			
(2) LGP21401	C	From Leg	3.000	0.000	0.000	93.000	No Ice	1.104	0.207	0.014
			0.000	0.000			1/2"	1.239	0.274	0.021
			0.000	0.000			Ice	1.381	0.348	0.030
							1" Ice	1.688	0.521	0.055
							2" Ice			
RRUS 11 B12	A	From Leg	3.000	0.000	0.000	93.000	No Ice	2.833	1.182	0.051
			0.000	0.000			1/2"	3.043	1.330	0.072
			0.000	0.000			Ice	3.259	1.485	0.095
							1" Ice	3.715	1.826	0.153
							2" Ice			
RRUS 11 B12	B	From Leg	3.000	0.000	-2.000	93.000	No Ice	2.833	1.182	0.051
			0.000	0.000			1/2"	3.043	1.330	0.072
			0.000	0.000			Ice	3.259	1.485	0.095
							1" Ice	3.715	1.826	0.153
							2" Ice			
RRUS 11 B12	C	From Leg	3.000	0.000	0.000	93.000	No Ice	2.833	1.182	0.051
			0.000	0.000			1/2"	3.043	1.330	0.072
			0.000	0.000			Ice	3.259	1.485	0.095
							1" Ice	3.715	1.826	0.153
							2" Ice			
RRUS 32 B2	A	From Leg	3.000	0.000	0.000	93.000	No Ice	2.731	1.668	0.053
			0.000	0.000			1/2"	2.953	1.855	0.074
			0.000	0.000			Ice	3.182	2.049	0.098
							1" Ice	3.663	2.458	0.157
							2" Ice			
RRUS 32 B2	B	From Leg	3.000	0.000	0.000	93.000	No Ice	2.731	1.668	0.053
			0.000	0.000			1/2"	2.953	1.855	0.074
			0.000	0.000			Ice	3.182	2.049	0.098
							1" Ice	3.663	2.458	0.157
							2" Ice			
RRUS 32 B2	C	From Leg	3.000	0.000	0.000	93.000	No Ice	2.731	1.668	0.053
			0.000	0.000			1/2"	2.953	1.855	0.074
			0.000	0.000			Ice	3.182	2.049	0.098
							1" Ice	3.663	2.458	0.157
							2" Ice			
DC6-48-60-18-8F	A	From Leg	2.000	0.000	0.000	93.000	No Ice	1.212	1.212	0.020
			0.000	0.000			1/2"	1.892	1.892	0.042
			0.000	0.000			Ice	2.105	2.105	0.067
							1" Ice	2.570	2.570	0.126
							2" Ice			
T-Arm Mount [TA 702-3]	C	None			0.000	93.000	No Ice	4.750	4.750	0.339
							1/2"	5.820	5.820	0.432
							Ice	6.980	6.980	0.550
							1" Ice	9.720	9.720	0.868
							2" Ice			
Side Arm Mount [SO 102-3]	C	None			0.000	93.000	No Ice	3.600	3.600	0.075
							1/2"	4.180	4.180	0.105
							Ice	4.750	4.750	0.135
							1" Ice	5.900	5.900	0.195
							2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
4' x 2" Pipe Mount	A	From Leg	2.000 0.000 1.000	0.000	93.000	No Ice	0.785	0.785	0.029
						1/2" Ice	1.028	1.028	0.035
						Ice	1.281	1.281	0.044
						1" Ice	1.814	1.814	0.072
						2" Ice			

(2) LPA-80063/6CF w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	9.831	10.215	0.052
						1/2" Ice	10.400	11.384	0.145
						Ice	10.933	12.269	0.246
						1" Ice	12.026	14.086	0.476
						2" Ice			
(2) LPA-80063/6CF w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	9.831	10.215	0.052
						1/2" Ice	10.400	11.384	0.145
						Ice	10.933	12.269	0.246
						1" Ice	12.026	14.086	0.476
						2" Ice			
(2) LPA-80063/6CF w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	9.831	10.215	0.052
						1/2" Ice	10.400	11.384	0.145
						Ice	10.933	12.269	0.246
						1" Ice	12.026	14.086	0.476
						2" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	4.090	3.300	0.066
						1/2" Ice	4.490	3.680	0.130
						Ice	4.890	4.070	0.204
						1" Ice	5.720	4.870	0.386
						2" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	4.090	3.300	0.066
						1/2" Ice	4.490	3.680	0.130
						Ice	4.890	4.070	0.204
						1" Ice	5.720	4.870	0.386
						2" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	4.090	3.300	0.066
						1/2" Ice	4.490	3.680	0.130
						Ice	4.890	4.070	0.204
						1" Ice	5.720	4.870	0.386
						2" Ice			
B13 RRH 4X30	A	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	2.055	1.320	0.056
						1/2" Ice	2.241	1.475	0.073
						Ice	2.433	1.638	0.093
						1" Ice	2.841	1.997	0.142
						2" Ice			
B13 RRH 4X30	B	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	2.055	1.320	0.056
						1/2" Ice	2.241	1.475	0.073
						Ice	2.433	1.638	0.093
						1" Ice	2.841	1.997	0.142
						2" Ice			
B13 RRH 4X30	C	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	2.055	1.320	0.056
						1/2" Ice	2.241	1.475	0.073
						Ice	2.433	1.638	0.093
						1" Ice	2.841	1.997	0.142
						2" Ice			
RRH4X45-AWS4 B66	A	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	2.660	1.586	0.064
						1/2" Ice	2.878	1.769	0.084
						Ice	3.104	1.959	0.108
						1" Ice	3.577	2.359	0.165
						2" Ice			
RRH4X45-AWS4 B66	B	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	2.660	1.586	0.064
						1/2" Ice	2.878	1.769	0.084
						Ice	3.104	1.959	0.108
						1" Ice	3.577	2.359	0.165
						2" Ice			
RRH4X45-AWS4 B66	C	From Leg	4.000 0.000 0.000	0.000	83.000	No Ice	2.660	1.586	0.064
						1/2" Ice	2.878	1.769	0.084
						Ice	3.104	1.959	0.108
						1" Ice	3.577	2.359	0.165
						2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	CAAA Front ft²	CAAA Side ft²	Weight K	
RC2DC-3315-PF-48	A	From Leg	2.000 0.000 0.000	0.000	83.000	2" Ice			
						No Ice	3.792	2.512	0.032
						1/2"	4.044	2.725	0.063
						Ice	4.303	2.945	0.099
RC2DC-3315-PF-48	C	From Leg	2.000 0.000 0.000	0.000	83.000	1" Ice	4.844	3.414	0.181
						2" Ice			
						No Ice	3.792	2.512	0.032
						1/2"	4.044	2.725	0.063
RC2DC-3315-PF-48	C	From Leg	2.000 0.000 0.000	0.000	83.000	Ice	4.303	2.945	0.099
						1" Ice	4.844	3.414	0.181
						2" Ice			
						No Ice	3.792	2.512	0.032
Platform Mount [LP 304-1]	C	None		0.000	83.000	1/2"	21.370	21.370	1.709
						Ice	25.280	25.280	2.131
						1" Ice	33.170	33.170	3.164
						2" Ice			
4' x 2" Pipe Mount	A	From Leg	2.000 0.000 1.000	0.000	83.000	No Ice	0.785	0.785	0.029
						1/2"	1.028	1.028	0.035
						Ice	1.281	1.281	0.044
						1" Ice	1.814	1.814	0.072
4' x 2" Pipe Mount	C	From Leg	2.000 0.000 1.000	0.000	83.000	2" Ice			
						No Ice	0.785	0.785	0.029
						1/2"	1.028	1.028	0.035
						Ice	1.281	1.281	0.044
4' x 2" Pipe Mount	C	From Leg	2.000 0.000 1.000	0.000	83.000	1" Ice	1.814	1.814	0.072
						2" Ice			
						No Ice	0.785	0.785	0.029
						1/2"	1.028	1.028	0.035
6' x 2" Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	83.000	Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
						2" Ice			
						No Ice	1.425	1.425	0.022
6' x 2" Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	83.000	1/2"	1.925	1.925	0.033
						Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090
						2" Ice			
6' x 2" Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	83.000	No Ice	1.425	1.425	0.022
						1/2"	1.925	1.925	0.033
						Ice	2.294	2.294	0.048
						1" Ice	3.060	3.060	0.090

BPA7496-180-11	A	From Leg	1.000 0.000 0.000	0.000	75.000	2" Ice			
						No Ice	5.830	3.750	0.017
						1/2"	6.213	4.129	0.053
						Ice	6.603	4.515	0.095
Pipe Mount [PM 601-1]	A	From Leg	0.500 0.000 0.000	0.000	75.000	1" Ice	7.404	5.309	0.194
						2" Ice			
						No Ice	1.320	1.320	0.065
						1/2"	1.580	1.580	0.077
Pipe Mount [PM 601-1]	A	From Leg	0.500 0.000 0.000	0.000	75.000	Ice	1.840	1.840	0.093
						1" Ice	2.400	2.400	0.134
						2" Ice			
						No Ice	1.320	1.320	0.065

MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	65.000	1/2"	8.520	4.690	0.194
						Ice	9.040	5.160	0.292
						1" Ice	10.110	6.120	0.522
						2" Ice			
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	65.000	No Ice	8.010	4.230	0.108
						1/2"	8.520	4.690	0.194
						Ice	9.040	5.160	0.292
						1" Ice	10.110	6.120	0.522
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	65.000	2" Ice			
						No Ice	8.010	4.230	0.108
						1/2"	8.520	4.690	0.194
						Ice	9.040	5.160	0.292
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	65.000	1" Ice	10.110	6.120	0.522
						2" Ice			
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	65.000	No Ice	8.010	4.230	0.108
						1/2"	8.520	4.690	0.194

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			0.000			Ice 9.040	5.160	0.292
						1" Ice 10.110	6.120	0.522
						2" Ice		
TA08025-B604	A	From Leg	4.000	0.000	65.000	No Ice 1.964	0.981	0.064
			0.000			1/2" 2.138	1.112	0.081
			0.000			Ice 2.320	1.250	0.100
						1" Ice 2.705	1.548	0.148
						2" Ice		
TA08025-B604	B	From Leg	4.000	0.000	65.000	No Ice 1.964	0.981	0.064
			0.000			1/2" 2.138	1.112	0.081
			0.000			Ice 2.320	1.250	0.100
						1" Ice 2.705	1.548	0.148
						2" Ice		
TA08025-B604	C	From Leg	4.000	0.000	65.000	No Ice 1.964	0.981	0.064
			0.000			1/2" 2.138	1.112	0.081
			0.000			Ice 2.320	1.250	0.100
						1" Ice 2.705	1.548	0.148
						2" Ice		
TA08025-B605	A	From Leg	4.000	0.000	65.000	No Ice 1.964	1.129	0.075
			0.000			1/2" 2.138	1.267	0.093
			0.000			Ice 2.320	1.411	0.114
						1" Ice 2.705	1.723	0.164
						2" Ice		
TA08025-B605	B	From Leg	4.000	0.000	65.000	No Ice 1.964	1.129	0.075
			0.000			1/2" 2.138	1.267	0.093
			0.000			Ice 2.320	1.411	0.114
						1" Ice 2.705	1.723	0.164
						2" Ice		
TA08025-B605	C	From Leg	4.000	0.000	65.000	No Ice 1.964	1.129	0.075
			0.000			1/2" 2.138	1.267	0.093
			0.000			Ice 2.320	1.411	0.114
						1" Ice 2.705	1.723	0.164
						2" Ice		
RDIDC-9181-PF-48	A	From Leg	4.000	0.000	65.000	No Ice 2.312	1.293	0.022
			0.000			1/2" 2.502	1.448	0.041
			0.000			Ice 2.700	1.610	0.063
						1" Ice 3.118	1.957	0.117
						2" Ice		
Commscope MC-PK8-DSH	C	None		0.000	65.000	No Ice 34.240	34.240	1.749
						1/2" 62.950	62.950	2.099
						Ice 91.660	91.660	2.450
						1" Ice 149.080	149.080	3.151
						2" Ice		
(2) 8' x 2" Mount Pipe	A	From Leg	4.000	0.000	65.000	No Ice 1.900	1.900	0.029
			0.000			1/2" 2.728	2.728	0.044
			0.000			Ice 3.401	3.401	0.063
						1" Ice 4.396	4.396	0.119
						2" Ice		
(2) 8' x 2" Mount Pipe	B	From Leg	4.000	0.000	65.000	No Ice 1.900	1.900	0.029
			0.000			1/2" 2.728	2.728	0.044
			0.000			Ice 3.401	3.401	0.063
						1" Ice 4.396	4.396	0.119
						2" Ice		
(2) 8' x 2" Mount Pipe	C	From Leg	4.000	0.000	65.000	No Ice 1.900	1.900	0.029
			0.000			1/2" 2.728	2.728	0.044
			0.000			Ice 3.401	3.401	0.063
						1" Ice 4.396	4.396	0.119
						2" Ice		

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K	
SC3-W100ASTX	C	Paraboloid w/Shroud (HP)	From Leg	1.000 0.000 1.000	0.000		99.000	3.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.069 7.467 7.865 8.661	0.040 0.078 0.117 0.193

SB2-190BB	C	Paraboloid w/Shroud (HP)	From Leg	1.000 0.000 -1.000	0.000		99.000	2.333	No Ice 1/2" Ice 1" Ice 2" Ice	4.280 4.590 4.900 5.520	0.027 0.050 0.074 0.121
**											

Load Combinations

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

Comb. No.	Description
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	101 - 72.75	Pole	Max Tension	30	0.000	0.001	-0.001
			Max. Compression	26	-20.711	-4.037	1.773
			Max. Mx	8	-6.442	-157.365	6.799
			Max. My	2	-6.478	-11.677	149.412
			Max. Vy	8	11.583	-157.365	6.799
			Max. Vx	2	-11.333	-11.677	149.412
			Max. Torque	3			-3.086
L2	72.75 - 36	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-35.035	-4.407	3.549
			Max. Mx	8	-14.338	-708.460	18.454
			Max. My	2	-14.354	-28.168	696.095
			Max. Vy	8	17.486	-708.460	18.454
			Max. Vx	2	-17.370	-28.168	696.095
			Max. Torque	11			3.226
L3	36 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-44.633	-4.530	4.062
			Max. Mx	8	-21.319	-1451.802	30.713
			Max. My	2	-21.320	-45.857	1434.995
			Max. Vy	8	19.556	-1451.802	30.713
			Max. Vx	2	-19.449	-45.857	1434.995
			Max. Torque	11			3.323

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	29	44.633	-5.591	3.244
	Max. H _x	21	16.007	19.389	-0.253
	Max. H _z	2	21.343	-0.427	19.424
	Max. M _x	2	1434.995	-0.427	19.424
	Max. M _z	8	1451.802	-19.530	0.296
	Max. Torsion	11	3.323	-16.875	-9.342
	Min. Vert	25	16.007	9.607	16.675
	Min. H _x	8	21.343	-19.530	0.296
	Min. H _z	14	21.343	0.293	-19.392
	Min. M _x	14	-1430.969	0.293	-19.392
	Min. M _z	20	-1433.466	19.389	-0.253
	Min. Torsion	25	-3.118	9.607	16.675

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	17.786	0.000	0.000	-0.304	-1.559	-0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	21.343	0.427	-19.424	-1434.995	-45.856	2.730
0.9 Dead+1.0 Wind 0 deg -	16.007	0.427	-19.424	-1421.484	-44.885	2.749

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
No Ice						
1.2 Dead+1.0 Wind 30 deg - No Ice	21.343	10.021	-16.925	-1253.358	-753.124	1.285
0.9 Dead+1.0 Wind 30 deg - No Ice	16.007	10.021	-16.925	-1241.533	-745.543	1.304
1.2 Dead+1.0 Wind 60 deg - No Ice	21.343	16.994	-9.904	-737.303	-1265.780	-0.591
0.9 Dead+1.0 Wind 60 deg - No Ice	16.007	16.994	-9.904	-730.291	-1253.416	-0.577
1.2 Dead+1.0 Wind 90 deg - No Ice	21.343	19.530	-0.296	-30.712	-1451.802	-2.307
0.9 Dead+1.0 Wind 90 deg - No Ice	16.007	19.530	-0.296	-30.293	-1437.704	-2.302
1.2 Dead+1.0 Wind 120 deg - No Ice	21.343	16.875	9.342	678.897	-1253.782	-3.318
0.9 Dead+1.0 Wind 120 deg - No Ice	16.007	16.875	9.342	672.693	-1241.545	-3.323
1.2 Dead+1.0 Wind 150 deg - No Ice	21.343	9.500	16.737	1233.502	-699.643	-3.098
0.9 Dead+1.0 Wind 150 deg - No Ice	16.007	9.500	16.737	1222.071	-692.638	-3.112
1.2 Dead+1.0 Wind 180 deg - No Ice	21.343	-0.293	19.392	1430.969	28.132	-2.459
0.9 Dead+1.0 Wind 180 deg - No Ice	16.007	-0.293	19.392	1417.687	28.307	-2.478
1.2 Dead+1.0 Wind 210 deg - No Ice	21.343	-9.913	16.825	1242.262	738.194	-1.157
0.9 Dead+1.0 Wind 210 deg - No Ice	16.007	-9.913	16.825	1230.742	731.731	-1.175
1.2 Dead+1.0 Wind 240 deg - No Ice	21.343	-16.874	9.834	729.399	1249.541	0.585
0.9 Dead+1.0 Wind 240 deg - No Ice	16.007	-16.874	9.834	722.655	1238.310	0.571
1.2 Dead+1.0 Wind 270 deg - No Ice	21.343	-19.389	0.253	25.538	1433.466	2.172
0.9 Dead+1.0 Wind 270 deg - No Ice	16.007	-19.389	0.253	25.354	1420.521	2.168
1.2 Dead+1.0 Wind 300 deg - No Ice	21.343	-16.780	-9.443	-690.037	1240.179	3.051
0.9 Dead+1.0 Wind 300 deg - No Ice	16.007	-16.780	-9.443	-683.533	1229.043	3.057
1.2 Dead+1.0 Wind 330 deg - No Ice	21.343	-9.607	-16.675	-1227.839	706.931	3.104
0.9 Dead+1.0 Wind 330 deg - No Ice	16.007	-9.607	-16.675	-1216.286	700.800	3.118
1.2 Dead+1.0 Ice+1.0 Temp	44.633	0.000	-0.000	-4.062	-4.530	-0.001
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	44.633	0.100	-6.384	-484.183	-15.593	1.213
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	44.633	3.279	-5.557	-422.983	-254.531	0.439
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	44.633	5.591	-3.244	-249.801	-427.902	-0.470
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	44.633	6.429	-0.074	-12.244	-490.373	-1.254
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	44.633	5.552	3.105	226.407	-423.603	-1.684
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	44.633	3.148	5.504	409.011	-240.183	-1.597
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	44.633	-0.074	6.378	475.320	3.549	-1.164
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	44.633	-3.257	5.537	412.615	243.070	-0.417
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	44.633	-5.567	3.230	240.114	416.158	0.467
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	44.633	-6.401	0.066	3.143	478.182	1.227
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	44.633	-5.533	-3.125	-236.768	412.425	1.631
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	44.633	-3.169	-5.492	-415.816	233.434	1.596

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	17.786	0.093	-4.216	-310.196	-11.073	0.598
Dead+Wind 30 deg - Service	17.786	2.175	-3.674	-270.975	-163.857	0.281
Dead+Wind 60 deg - Service	17.786	3.689	-2.150	-159.498	-274.604	-0.130
Dead+Wind 90 deg - Service	17.786	4.239	-0.064	-6.859	-314.782	-0.506
Dead+Wind 120 deg - Service	17.786	3.663	2.028	146.420	-271.993	-0.728
Dead+Wind 150 deg - Service	17.786	2.062	3.633	266.206	-152.303	-0.683
Dead+Wind 180 deg - Service	17.786	-0.063	4.209	308.867	4.893	-0.543
Dead+Wind 210 deg - Service	17.786	-2.152	3.652	268.115	158.277	-0.256
Dead+Wind 240 deg - Service	17.786	-3.663	2.135	157.328	268.739	0.129
Dead+Wind 270 deg - Service	17.786	-4.209	0.055	5.280	308.461	0.480
Dead+Wind 300 deg - Service	17.786	-3.642	-2.050	-149.285	266.700	0.673
Dead+Wind 330 deg - Service	17.786	-2.085	-3.620	-265.444	151.519	0.683

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-17.786	0.000	0.000	17.786	0.000	0.000%
2	0.427	-21.343	-19.424	-0.427	21.343	19.424	0.000%
3	0.427	-16.007	-19.424	-0.427	16.007	19.424	0.000%
4	10.021	-21.343	-16.925	-10.021	21.343	16.925	0.000%
5	10.021	-16.007	-16.925	-10.021	16.007	16.925	0.000%
6	16.994	-21.343	-9.904	-16.994	21.343	9.904	0.000%
7	16.994	-16.007	-9.904	-16.994	16.007	9.904	0.000%
8	19.530	-21.343	-0.296	-19.530	21.343	0.296	0.000%
9	19.530	-16.007	-0.296	-19.530	16.007	0.296	0.000%
10	16.875	-21.343	9.342	-16.875	21.343	-9.342	0.000%
11	16.875	-16.007	9.342	-16.875	16.007	-9.342	0.000%
12	9.500	-21.343	16.737	-9.500	21.343	-16.737	0.000%
13	9.500	-16.007	16.737	-9.500	16.007	-16.737	0.000%
14	-0.293	-21.343	19.392	0.293	21.343	-19.392	0.000%
15	-0.293	-16.007	19.392	0.293	16.007	-19.392	0.000%
16	-9.913	-21.343	16.825	9.913	21.343	-16.825	0.000%
17	-9.913	-16.007	16.825	9.913	16.007	-16.825	0.000%
18	-16.874	-21.343	9.834	16.874	21.343	-9.834	0.000%
19	-16.874	-16.007	9.834	16.874	16.007	-9.834	0.000%
20	-19.389	-21.343	0.253	19.389	21.343	-0.253	0.000%
21	-19.389	-16.007	0.253	19.389	16.007	-0.253	0.000%
22	-16.780	-21.343	-9.443	16.780	21.343	9.443	0.000%
23	-16.780	-16.007	-9.443	16.780	16.007	9.443	0.000%
24	-9.607	-21.343	-16.675	9.607	21.343	16.675	0.000%
25	-9.607	-16.007	-16.675	9.607	16.007	16.675	0.000%
26	0.000	-44.633	0.000	-0.000	44.633	0.000	0.000%
27	0.100	-44.633	-6.384	-0.100	44.633	6.384	0.000%
28	3.279	-44.633	-5.557	-3.279	44.633	5.557	0.000%
29	5.591	-44.633	-3.244	-5.591	44.633	3.244	0.000%
30	6.429	-44.633	-0.074	-6.429	44.633	0.074	0.000%
31	5.552	-44.633	3.105	-5.552	44.633	-3.105	0.000%
32	3.148	-44.633	5.504	-3.148	44.633	-5.504	0.000%
33	-0.074	-44.633	6.378	0.074	44.633	-6.378	0.000%
34	-3.257	-44.633	5.537	3.257	44.633	-5.537	0.000%
35	-5.567	-44.633	3.230	5.567	44.633	-3.230	0.000%
36	-6.401	-44.633	0.066	6.401	44.633	-0.066	0.000%
37	-5.533	-44.633	-3.125	5.533	44.633	3.125	0.000%
38	-3.169	-44.633	-5.492	3.169	44.633	5.492	0.000%
39	0.093	-17.786	-4.216	-0.093	17.786	4.216	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
40	2.175	-17.786	-3.674	-2.175	17.786	3.674	0.000%
41	3.689	-17.786	-2.150	-3.689	17.786	2.150	0.000%
42	4.239	-17.786	-0.064	-4.239	17.786	0.064	0.000%
43	3.663	-17.786	2.028	-3.663	17.786	-2.028	0.000%
44	2.062	-17.786	3.633	-2.062	17.786	-3.633	0.000%
45	-0.063	-17.786	4.209	0.063	17.786	-4.209	0.000%
46	-2.152	-17.786	3.652	2.152	17.786	-3.652	0.000%
47	-3.663	-17.786	2.135	3.663	17.786	-2.135	0.000%
48	-4.209	-17.786	0.055	4.209	17.786	-0.055	0.000%
49	-3.642	-17.786	-2.050	3.642	17.786	2.050	0.000%
50	-2.085	-17.786	-3.620	2.085	17.786	3.620	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	0.00021557
3	Yes	5	0.00000001	0.00009580
4	Yes	5	0.00000001	0.00075984
5	Yes	5	0.00000001	0.00031909
6	Yes	5	0.00000001	0.00071836
7	Yes	5	0.00000001	0.00029968
8	Yes	5	0.00000001	0.00014741
9	Yes	5	0.00000001	0.00006494
10	Yes	5	0.00000001	0.00056364
11	Yes	5	0.00000001	0.00023596
12	Yes	5	0.00000001	0.00075301
13	Yes	5	0.00000001	0.00032404
14	Yes	5	0.00000001	0.00010397
15	Yes	5	0.00000001	0.00004700
16	Yes	5	0.00000001	0.00065290
17	Yes	5	0.00000001	0.00027263
18	Yes	5	0.00000001	0.00067983
19	Yes	5	0.00000001	0.00028568
20	Yes	5	0.00000001	0.00006402
21	Yes	4	0.00000001	0.00096375
22	Yes	5	0.00000001	0.00074388
23	Yes	5	0.00000001	0.00032065
24	Yes	5	0.00000001	0.00058018
25	Yes	5	0.00000001	0.00024382
26	Yes	4	0.00000001	0.00008248
27	Yes	5	0.00000001	0.00048666
28	Yes	5	0.00000001	0.00074882
29	Yes	5	0.00000001	0.00071385
30	Yes	5	0.00000001	0.00045245
31	Yes	5	0.00000001	0.00061567
32	Yes	5	0.00000001	0.00073856
33	Yes	5	0.00000001	0.00044896
34	Yes	5	0.00000001	0.00061971
35	Yes	5	0.00000001	0.00062923
36	Yes	5	0.00000001	0.00041985
37	Yes	5	0.00000001	0.00072006
38	Yes	5	0.00000001	0.00061878
39	Yes	4	0.00000001	0.00025605
40	Yes	4	0.00000001	0.00035239
41	Yes	4	0.00000001	0.00028686
42	Yes	4	0.00000001	0.00017787
43	Yes	4	0.00000001	0.00023484
44	Yes	4	0.00000001	0.00041412
45	Yes	4	0.00000001	0.00020297
46	Yes	4	0.00000001	0.00022671
47	Yes	4	0.00000001	0.00024345
48	Yes	4	0.00000001	0.00013876
49	Yes	4	0.00000001	0.00039251
50	Yes	4	0.00000001	0.00024158

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 72.75	14.578	41	1.108	0.012
L2	76 - 36	8.947	41	1.007	0.006
L3	40 - 0	2.663	41	0.604	0.002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.000	Flash Beacon Lighting	41	14.578	1.108	0.012	45226
100.000	SC3-W100ASTX	41	14.347	1.105	0.012	45226
99.000	ANT450D6-9	41	14.116	1.103	0.011	45226
98.000	SB2-190BB	41	13.886	1.100	0.011	45226
93.000	800 10121 w/ Mount Pipe	41	12.736	1.086	0.010	28266
83.000	(2) LPA-80063/6CF w/ Mount Pipe	41	10.476	1.048	0.008	12562
75.000	BPA7496-180-11	41	8.734	1.001	0.006	8523
65.000	MX08FRO665-21 w/ Mount Pipe	41	6.688	0.914	0.005	5641

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 72.75	66.916	6	5.060	0.055
L2	76 - 36	41.171	6	4.631	0.029
L3	40 - 0	12.278	6	2.785	0.010

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.000	Flash Beacon Lighting	6	66.916	5.060	0.055	10448
100.000	SC3-W100ASTX	6	65.862	5.049	0.054	10448
99.000	ANT450D6-9	6	64.808	5.038	0.053	10448
98.000	SB2-190BB	6	63.755	5.028	0.052	10448
93.000	800 10121 w/ Mount Pipe	6	58.504	4.969	0.046	6529
83.000	(2) LPA-80063/6CF w/ Mount Pipe	6	48.169	4.808	0.035	2900
75.000	BPA7496-180-11	6	40.192	4.600	0.028	1955
65.000	MX08FRO665-21 w/ Mount Pipe	6	30.803	4.210	0.021	1262

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	101 - 72.75 (1)	TP25.481x20x0.188	28.250	0.000	0.0	14.677	-6.425	858.636	0.007
L2	72.75 - 36 (2)	TP32.236x24.475x0.25	40.000	0.000	0.0	24.765	-14.323	1448.760	0.010
L3	36 - 0 (3)	TP38.72x30.96x0.25	40.000	0.000	0.0	30.526	-21.319	1785.770	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	101 - 72.75 (1)	TP25.481x20x0.188	159.360	502.579	0.317	0.000	502.579	0.000
L2	72.75 - 36 (2)	TP32.236x24.475x0.25	715.755	1092.483	0.655	0.000	1092.483	0.000
L3	36 - 0 (3)	TP38.72x30.96x0.25	1464.858	1531.542	0.956	0.000	1531.542	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	101 - 72.75 (1)	TP25.481x20x0.188	11.695	257.591	0.045	0.203	556.359	0.000
L2	72.75 - 36 (2)	TP32.236x24.475x0.25	17.632	434.627	0.041	0.488	1187.925	0.000
L3	36 - 0 (3)	TP38.72x30.96x0.25	19.696	535.730	0.037	0.591	1804.883	0.000

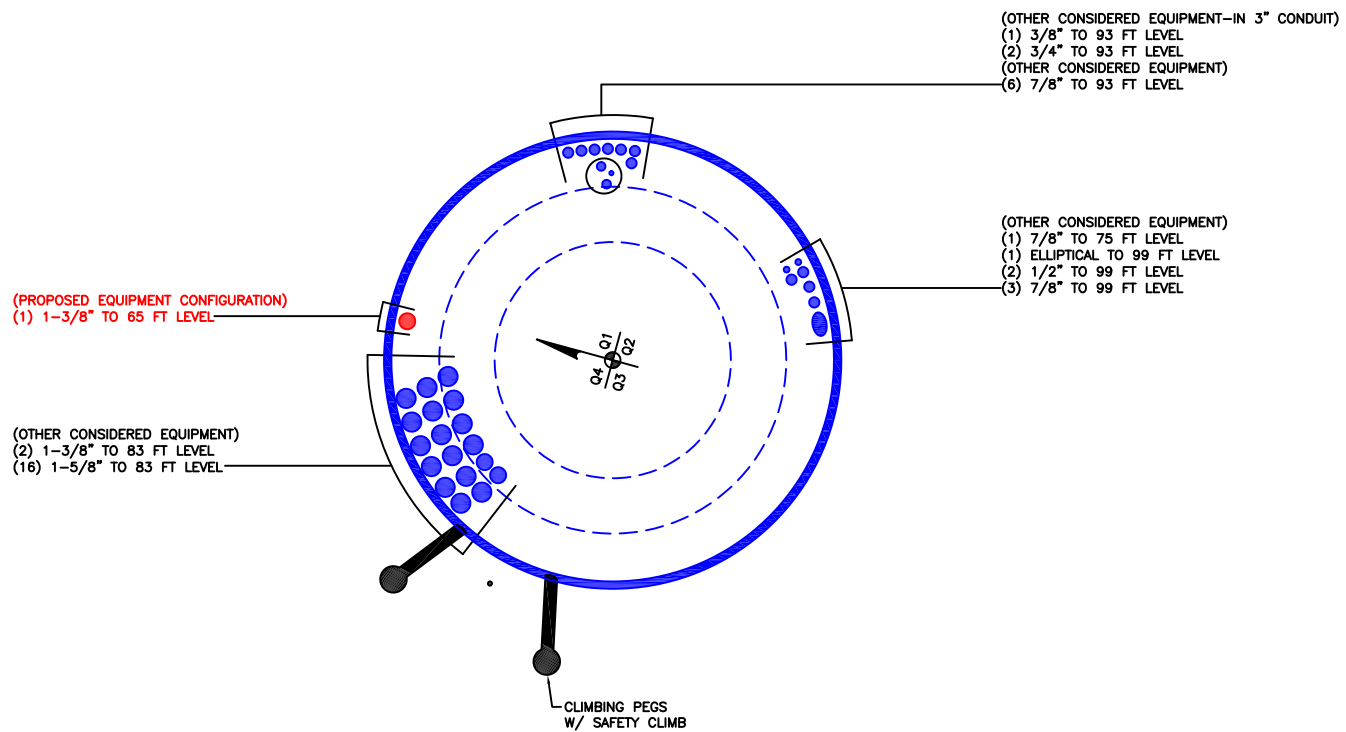
Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	101 - 72.75 (1)	0.007	0.317	0.000	0.045	0.000	0.327	1.050	4.8.2
L2	72.75 - 36 (2)	0.010	0.655	0.000	0.041	0.000	0.667	1.050	4.8.2
L3	36 - 0 (3)	0.012	0.956	0.000	0.037	0.000	0.970	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	101 - 72.75	Pole	TP25.481x20x0.188	1	-6.425	901.568	31.1	Pass
L2	72.75 - 36	Pole	TP32.236x24.475x0.25	2	-14.323	1521.198	63.5	Pass
L3	36 - 0	Pole	TP38.72x30.96x0.25	3	-21.319	1875.058	92.4	Pass
Summary								
Pole (L3)							92.4	Pass
RATING =							92.4	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

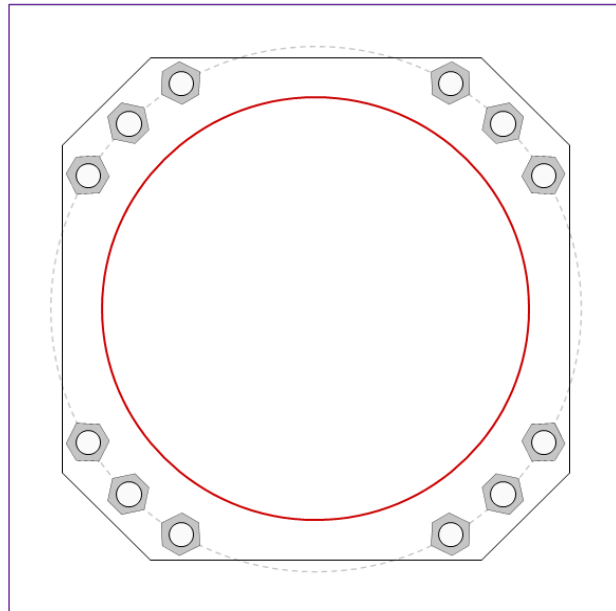


Site Info	
BU #	842877
Site Name	WINDSOR NORTH
Order #	556622 Rev 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2

Applied Loads	
Moment (kip-ft)	1464.86
Axial Force (kips)	21.32
Shear Force (kips)	19.70

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
 (12) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 48" BC
 Anchor Spacing: 6 in

Base Plate Data
 46" W x 2.5" Plate (A572-55; $F_y=55$ ksi, $F_u=70$ ksi); Clip: 8 in

Stiffener Data
 N/A

Pole Data
 38.72" x 0.25" 18-sided pole (A607-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary (units of kips, kip-in)

$Pu_t = 120.19$	$\phi Pn_t = 243.75$	Stress Rating
$Vu = 1.64$	$\phi Vn = 149.1$	47.0%
$Mu = n/a$	$\phi Mn = n/a$	Pass

Base Plate Summary

Max Stress (ksi):	36.63	(Flexural)
Allowable Stress (ksi):	49.5	
Stress Rating:	70.5%	Pass

Drilled Pier Foundation

BU # :	842877
Site Name:	WINDSOR NORTH
Order Number:	556622 Rev 1
TIA-222 Revison:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	1464.86	
Axial Force (kips)	21.34	
Shear Force (kips)	19.67	

Material Properties		
Concrete Strength, f _c :	3	ksi
Rebar Strength, F _y :	60	ksi
Tie Yield Strength, F _y :	40	ksi

Pier Design Data		
Depth	18	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
<i>From 0.5' above grade to 18' below grade</i>		
Pier Diameter	6	ft
Rebar Quantity	16	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	
Tie Spacing		in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results			
Soil Lateral Check			
	Compression	Uplift	
D _{v=0} (ft from TOC)	5.12	-	
Soil Safety Factor	2.25	-	
Max Moment (kip-ft)	1554.90	-	
Rating*	56.3%	-	
Soil Vertical Check			
	Compression	Uplift	
Skin Friction (kips)	209.23	-	
End Bearing (kips)	678.58	-	
Weight of Concrete (kips)	72.96	-	
Total Capacity (kips)	887.81	-	
Axial (kips)	94.30	-	
Rating*	10.1%	-	
Reinforced Concrete Flexure			
	Compression	Uplift	
Critical Depth (ft from TOC)	4.94	-	
Critical Moment (kip-ft)	1554.60	-	
Critical Moment Capacity	3322.03	-	
Rating*	44.6%	-	
Reinforced Concrete Shear			
	Compression	Uplift	
Critical Depth (ft from TOC)	13.15	-	
Critical Shear (kip)	246.33	-	
Critical Shear Capacity	419.00	-	
Rating*	56.0%	-	
Structural Foundation Rating*		56.0%	
Soil Interaction Rating*		56.3%	

*Rating per TIA-222-H Section 15.5

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

[Go to Soil Calculations](#)

Soil Profile													
Groundwater Depth	8			# of Layers	5								

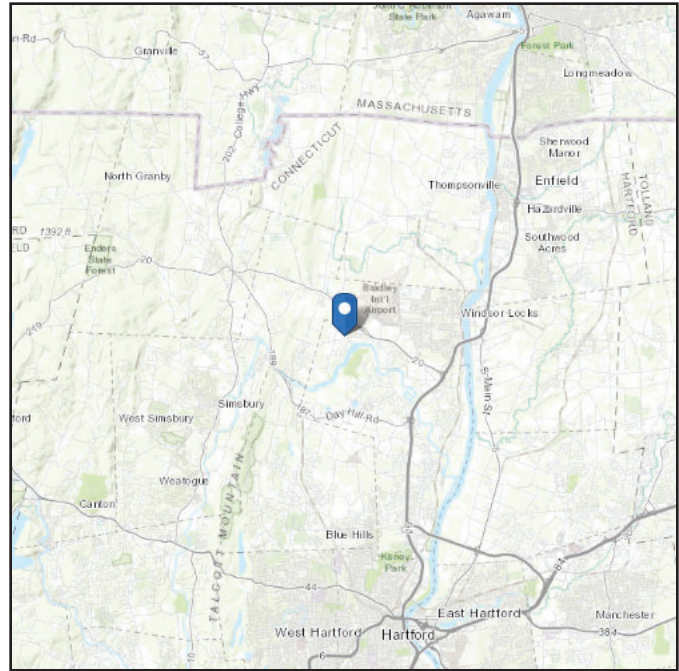
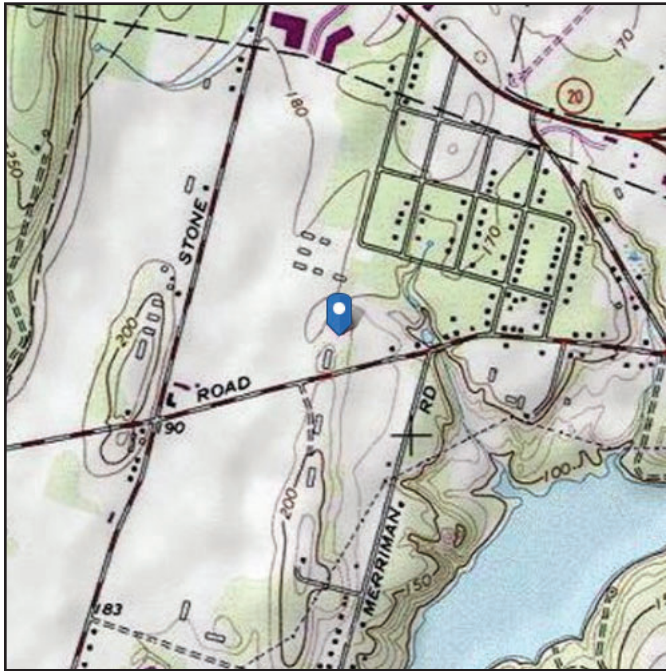
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	Y _{soil} (pcf)	Y _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.333	3.333	135	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.333	5	1.667	135	150	0	34	0.000	0.000	0.00	0.00			Cohesionless
3	5	8	3	135	150	0	34	0.000	0.000	1.00	1.00			Cohesionless
4	8	15	7	75	87.6	0	34	0.000	0.000	1.00	1.00			Cohesionless
5	15	18	3	75	87.6	0	34	0.000	0.000	1.60	1.60	32		Cohesionless

ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 185.5 ft (NAVD 88)
Latitude: 41.919286
Longitude: -72.710436



Wind

Results:

Wind Speed:	120 Vmph	125 Vmph per 2018 Connecticut Building Code Appendix N
10-year MRI	76 Vmph	
25-year MRI	86 Vmph	
50-year MRI	91 Vmph	
100-year MRI	98 Vmph	

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

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

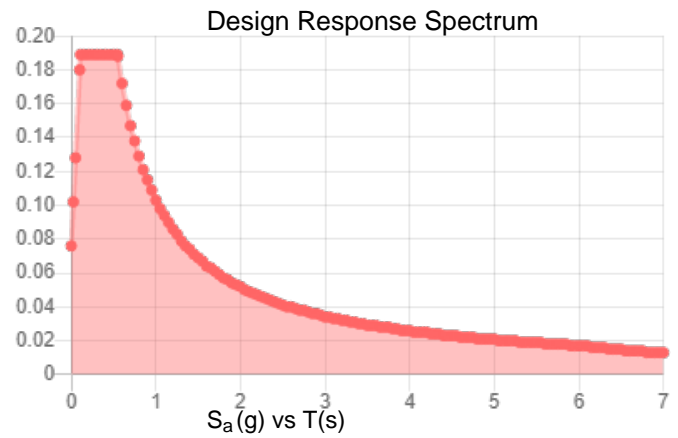
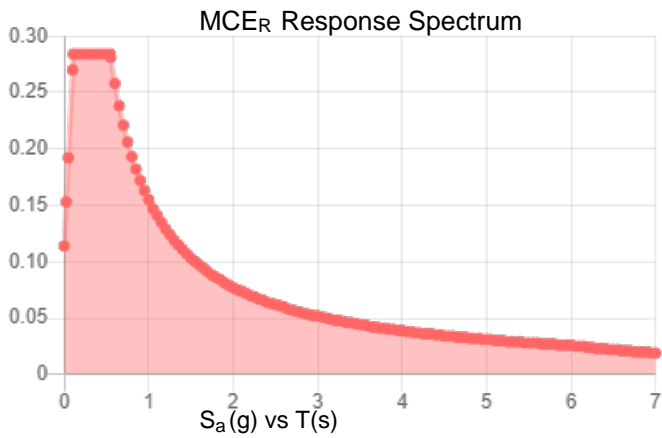
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.177	S_{DS} :	0.189
S_1 :	0.064	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.088
S_{MS} :	0.284	PGA _M :	0.14
S_{M1} :	0.155	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Mon May 24 2021

Date Source:

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

Ice

Results:

Ice Thickness: 1.00 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

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

Date Accessed: Mon May 24 2021

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

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

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Exhibit E

Mount Analysis

Date: **August 2, 2021**

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



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

Subject: **Mount Replacement Analysis Report**

Carrier Designation: **Dish Network Dish 5G**
Carrier Site Number: BOBDL00070A
Carrier Site Name: CT-CCI-T-842877

Crown Castle Designation: **Crown Castle BU Number:** 842877
Crown Castle Site Name: WINDSOR NORTH
Crown Castle JDE Job Number: 650061
Crown Castle Order Number: 556622 Rev. 1

Engineering Firm Designation: **Trylon Report Designation:** 189040

Site Data: **750 Rainbow Road, Windsor, Hartford County, CT, 06095**
Latitude 41°55'9.43" Longitude -72°42'37.57"

Structure Information: **Tower Height & Type:** **101.0 ft Monopole**
Mount Elevation: **65.0 ft**
Mount Type: **8.0 ft Platform**

Dear Darcy Tarr,

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

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

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

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

Mount analysis prepared by: Ionela Neamtu

Respectfully Submitted by:
Cliff Abernathy, P.E.

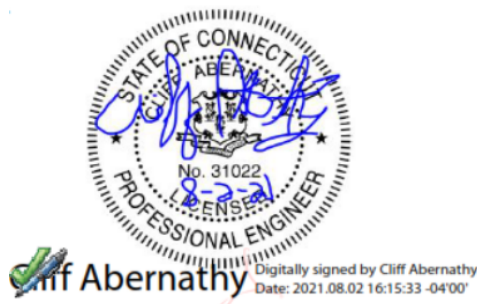


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Supplemental Drawings

1) INTRODUCTION

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

2) ANALYSIS CRITERIA

Building Code:	2015 IBC / 2018 CTSCB
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	2.00 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.179
Seismic S₁:	0.064
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
65.0	65.0	3	JMA Wireless	MX08FRO665-21	8.0 ft Platform [Commscope, MC-PK8-C]
		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	556622 Rev. 1	CCI Sites
Mount Manufacturer Drawings	Commscope	MC-PK8-C	Trylon

3.1) Analysis Method

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

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

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

3.2) Assumptions

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

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

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

4) ANALYSIS RESULTS

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

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2	Mount Pipe(s)	MP1	65.0	32.6	Pass
	Horizontal(s)	H1		10.2	Pass
	Standoff(s)	M2		57.0	Pass
	Bracing(s)	M1		42.5	Pass
	Handrail(s)	M19		13.9	Pass
	Plate(s)	M10		24.1	Pass
	Mount Connection(s)	--		22.9	Pass

Structure Rating (max from all components) =	57.0%
---	--------------

Notes:

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

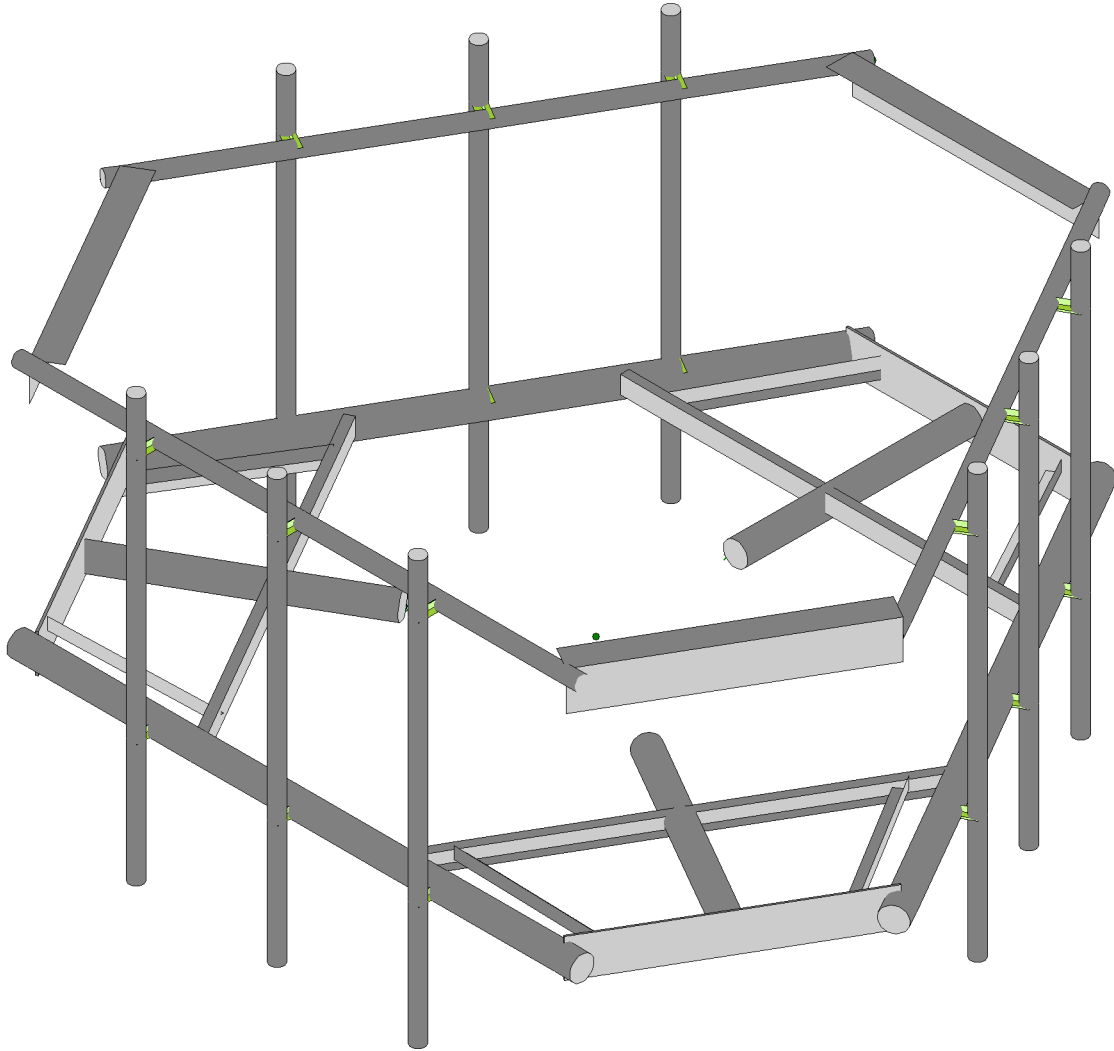
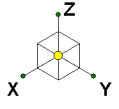
4.1) Recommendations

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

1. Commscope, MC-PK8-C.

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

APPENDIX A
WIRE FRAME AND RENDERED MODELS

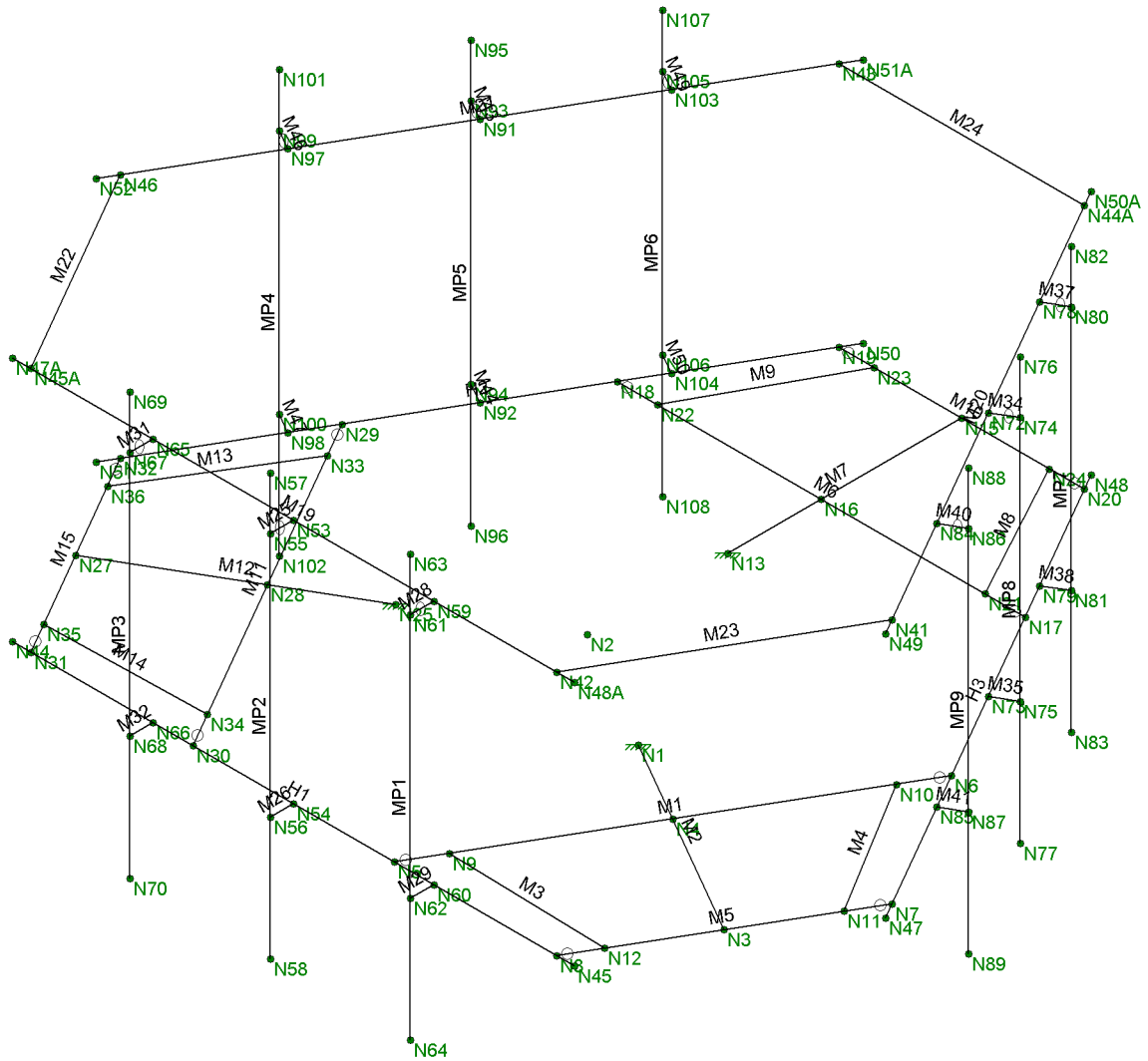
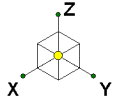


Envelope Only Solution

Trylon
IN
189040

842877_WINDSOR NORTH

SK - 1
Aug 2, 2021 at 10:26 AM
842877_WINDSOR NORTH.r3d



Envelope Only Solution

Trylon

IN

189040

842877_WINDSOR NORTH

SK - 2

Aug 2, 2021 at 10:26 AM

842877_WINDSOR NORTH.r3d

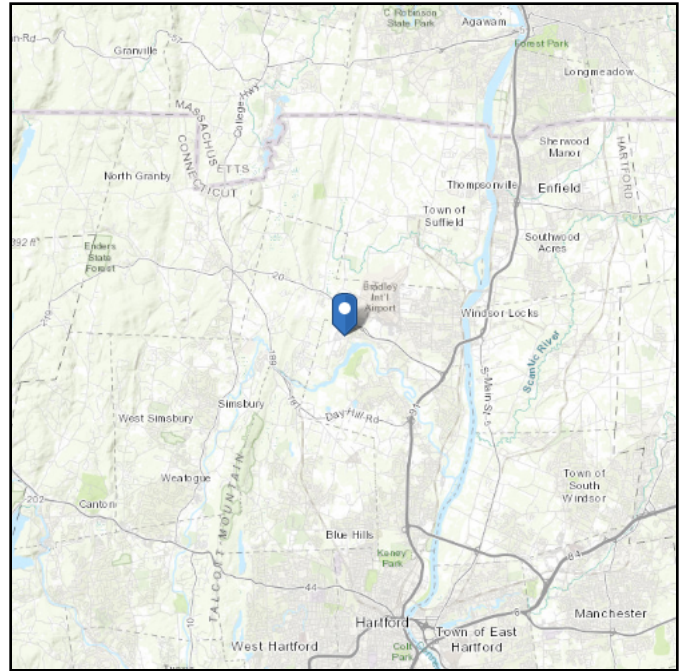
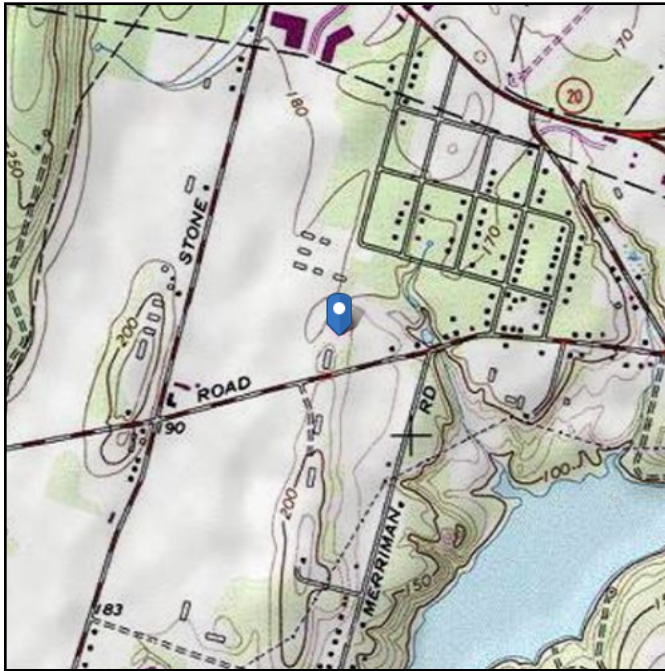
APPENDIX B
SOFTWARE INPUT CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 185.5 ft (NAVD 88)
Latitude: 41.919286
Longitude: -72.710436



Ice

Results:

Ice Thickness: 1.00 in.
Concurrent Temperature: 5 F
Gust Speed: 50 mph

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

Date Accessed: Mon Aug 02 2021

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

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

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Trylon

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

TIA LOAD CALCULATOR 2.0

PROJECT DATA	
Job Code:	189040
Carrier Site ID:	BOBDL00070A
Carrier Site Name:	CT-CCI-T-842877

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

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	65.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	101.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Stiff Soil	--
Ground Elevation:	185.5	ft.

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

WIND PARAMETERS		
Design Wind Speed:	125	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.16	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (G _h):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	43.63	psf

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	2.00	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{iz}):	43.63	psf
Mount Ice Thickness (t_{iz}):	2.14	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	78.53	psf
Round Member Pressure:	47.12	psf
Ice Wind Pressure:	6.98	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel. (S_s):	0.179	g
1 Second Accel. (S_1):	0.064	g
Short Period Des. (S_{DS}):	0.19	g
1 Second Des. (S_{D1}):	0.10	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (C_s):	0.10	--
Amplification Factor (A_S):	1.20	--

LOAD COMBINATIONS [LRFD]

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

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

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

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

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

APPENDIX C
SOFTWARE ANALYSIS OUTPUT

APPENDIX D
ADDITIONAL CALCUATIONS

BOLT TOOL 1.5.2

Project Data	
Job Code:	189040
Carrier Site ID:	BOBDL00070A
Carrier Site Name:	CT-CCI-T-842877

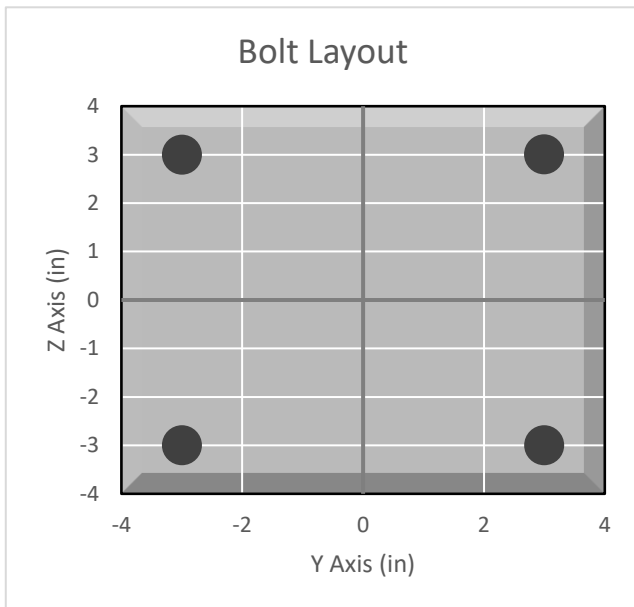
Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	AISC

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

Connection Description
Standoff to Monopole

Bolt Check*		
Tensile Capacity (ϕT_n):	20340.1	lbs
Shear Capacity (ϕV_n):	17257.3	lbs
Tension Force (T_u):	4896.2	lbs
Shear Force (V_u):	813.3	lbs
Tension Usage:	22.9%	--
Shear Usage:	4.5%	--
Interaction:	22.9%	Pass
Controlling Member:	M2	--
Controlling LC:	42	--

*Rating per TIA-222-H Section 15.5



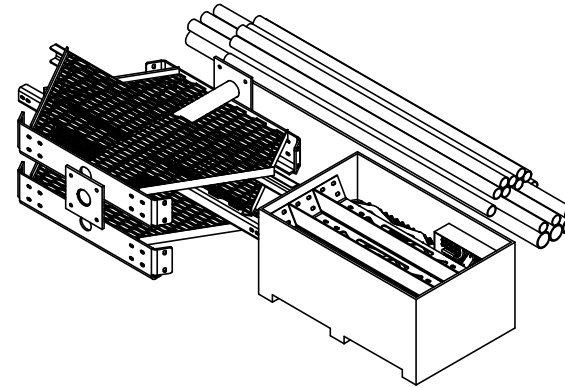
APPENDIX E
SUPPLEMENTAL DRAWINGS

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




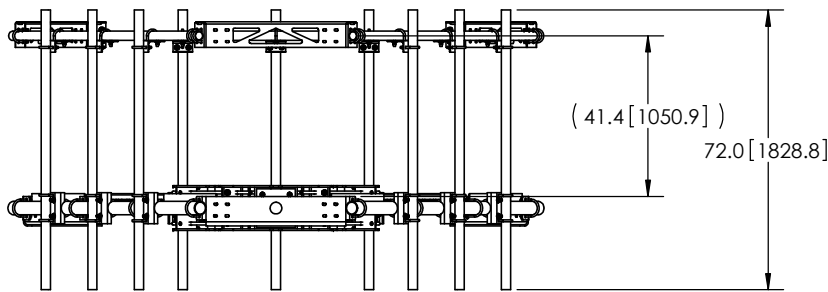
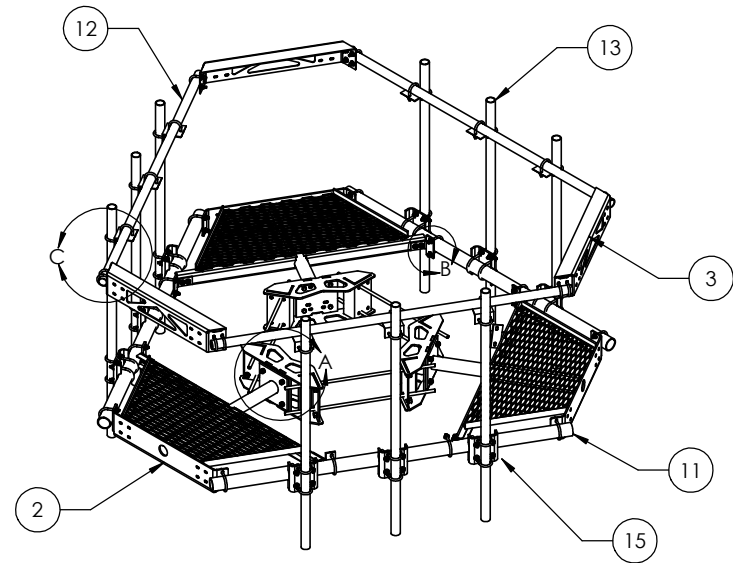
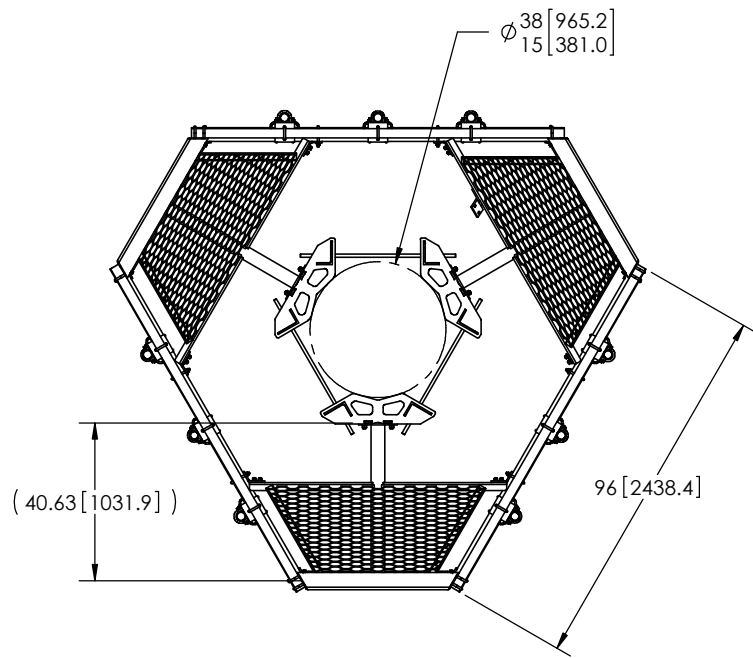
REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
A		INITIAL RELEASE	DRR	12/27/11
B	8000005979	CHANGE NOSE CORNER BRKT, ADD GUB-4240	MSM	11/25/14
C	8000007579	NEW RINGMOUNT WELDMENT DESIGN	RJC	04/07/15

FOR BOM ENTRY ONLY




NOTES:
1. CUSTOMER ASSEMBLY SHEETS 2-3.

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

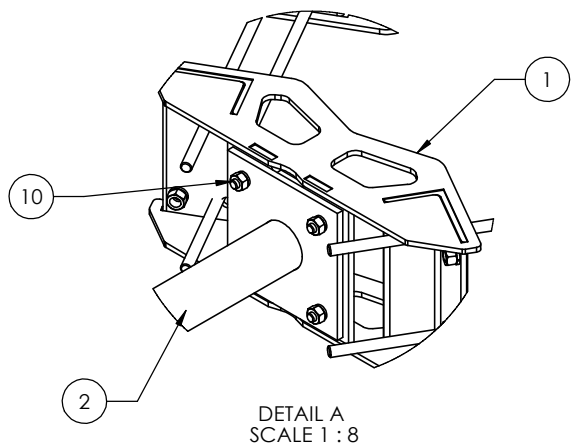


ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1	230.42 LBS
2	MTC300601	Low Profile Co-Location Platform Snub Nose	3	134.21 LBS
3	MT195801	Corner Weldment Snub Nose Handrail	3	27.10 LBS
4	XA2020.01	CROSS OVER ANGLE	9	2.65 LBS
5	GUB-4356	1/2" X 3-5/8" X 6" GALV U-BOLT	18	0.82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

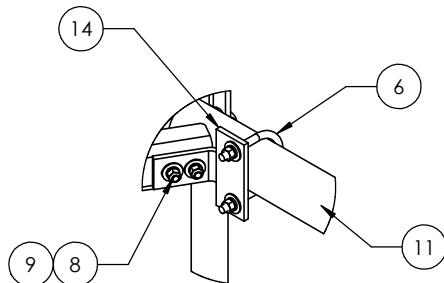
<small>These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.</small>			
<small>ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED:</small> .X = ± .12 ANGLES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

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

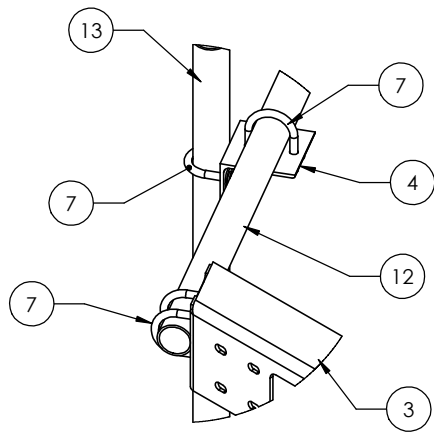
8 7 6 5 4 3 2 1



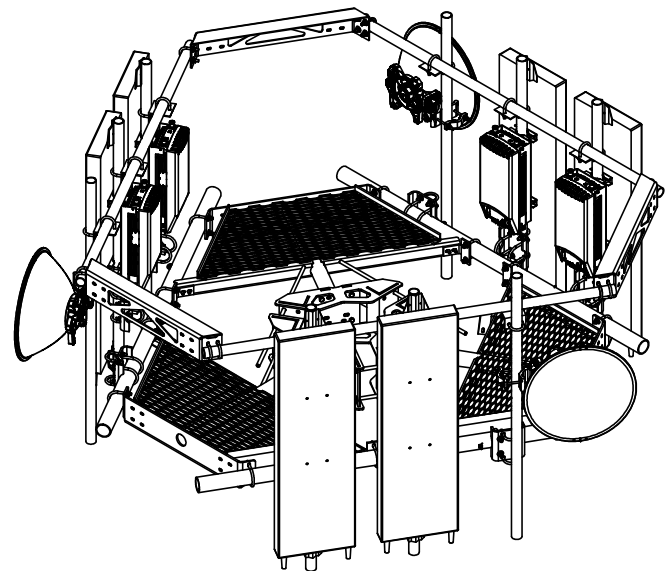
DETAIL A
SCALE 1 : 8



DETAIL B
SCALE 1 : 8




DETAIL C
SCALE 1 : 8



WITH ANTENNAS

NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.

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

8 7 6 5 4 3 2 1

Exhibit F

Power Density/RF Emissions Report

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

Dish Wireless Existing Facility

Site ID: BOBDL00070A

842877

750 Rainbow Road
Windsor, Connecticut 06095

August 30, 2021

EBI Project Number: 6221004798

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	27.45%

August 30, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00070A - 842877

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **750 Rainbow Road** in **Windsor, 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 antenna facility located at 750 Rainbow Road in Windsor, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

- 5) The antennas used in this modeling are the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector A, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector B, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 6) The antenna mounting height centerline of the proposed antennas is 65 feet above ground level (AGL).
- 7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 8) All calculations were done with respect to uncontrolled / general population threshold limits.

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	I	Antenna #:	I	Antenna #:	I
Make / Model:	JMA MX08FRO665-2I	Make / Model:	JMA MX08FRO665-2I	Make / Model:	JMA MX08FRO665-2I
Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz
Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd
Height (AGL):	65 feet	Height (AGL):	65 feet	Height (AGL):	65 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts
ERP (W):	3,065.51	ERP (W):	3,065.51	ERP (W):	3,065.51
Antenna AI MPE %:	4.55%	Antenna BI MPE %:	4.55%	Antenna CI MPE %:	4.55%

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	4.55%
AT&T	7.26%
Verizon	15.64%
Site Total MPE % :	27.45%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	4.55%
Dish Wireless Sector B Total:	4.55%
Dish Wireless Sector C Total:	4.55%
Site Total MPE % :	27.45%

Dish Wireless Maximum MPE Power Values (Sector A)							
Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	65.0	9.24	600 MHz n71	400	2.31%
Dish Wireless 1900 MHz n70	4	542.70	65.0	22.42	1900 MHz n70	1000	2.24%
						Total:	4.55%

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

Summary

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

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

Dish Wireless Sector	Power Density Value (%)
Sector A:	4.55%
Sector B:	4.55%
Sector C:	4.55%
Dish Wireless Maximum MPE % (Sector A):	4.55%
Site Total:	27.45%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **27.45%** 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:
750 RAINBOW ROAD, WINDSOR, CT 06095

NCWPCS MPL 31- YEAR SITES TOWER HOLDING ("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: 842877/WINDSOR NORTH
Customer Site ID: BOBDL00070A/CT-CCI-T-842877
Site Address: 750 RAINBOW ROAD, WINDSOR, CT 06095

Crown Castle

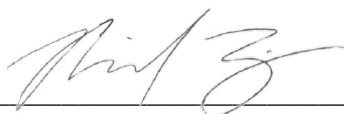
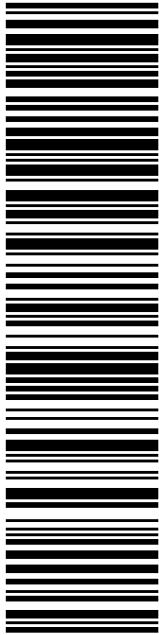
By:  _____ Date: 8/18/2021
Richard Zajac
Site Acquisition Specialist

Exhibit H

Recipient Mailings



USPS TRACKING #

9405 5036 9930 0497 9375 12

Electronic Rate Approved #038555749

SHIP

TO: ERIC BARZ
WINDSOR-TOWN PLANNER
275 BROAD ST
WINDSOR CT 06095-2940

P

PRIORITY MAIL 2-DAY™

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

Expected Delivery Date: 09/11/21
Ref#: DS-842877
0006

C036

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

U.S. POSTAGE PAID

Flat Rate Env
\$7.95
9405 5036 9930 0497 9375 12 0079 5000 0010 6095

Mailed from 01566



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0497 9375 12

Trans. #: 543097934	Priority Mail® Postage: \$7.95
Print Date: 09/08/2021	Total: \$7.95
Ship Date: 09/08/2021	
Expected Delivery Date: 09/11/2021	

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

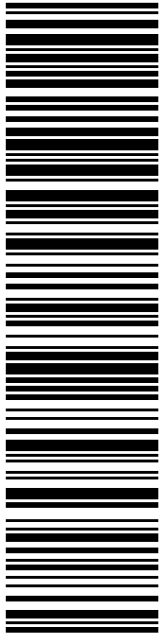
Ref#: DS-842877

To: ERIC BARZ
WINDSOR-TOWN PLANNER
275 BROAD ST
WINDSOR CT 06095-2940

* 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



USPS TRACKING #

9405 5036 9930 0497 9375 29

Electronic Rate Approved #038555749

SHIP

TO: DONALD S TRINKS
MAYOR OF WINDSOR
275 BROAD ST
WINDSOR CT 06095-2940

Expected Delivery Date: 09/11/21

Re#: DS-842877

0006

SHIP

TO: DONALD S TRINKS
MAYOR OF WINDSOR
275 BROAD ST
WINDSOR CT 06095-2940

Expected Delivery Date: 09/11/21

Re#: DS-842877

0006

Expected Delivery Date: 09/11/21

Re#: DS-842877

0006

SHIP

TO: DONALD S TRINKS
MAYOR OF WINDSOR
275 BROAD ST
WINDSOR CT 06095-2940

Expected Delivery Date: 09/11/21

Re#: DS-842877

0006

Expected Delivery Date: 09/11/21

Re#: DS-842877

0006



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0497 9375 29

Trans. #: 543097934	Priority Mail® Postage: \$7.95
Print Date: 09/08/2021	Total: \$7.95
Ship Date: 09/08/2021	
Expected Delivery Date: 09/11/2021	

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

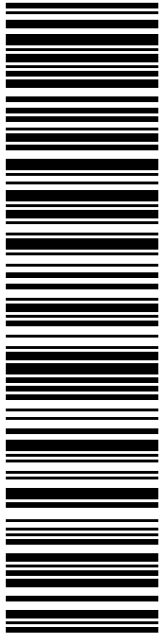
Re#: DS-842877

To: DONALD S TRINKS
MAYOR OF WINDSOR
275 BROAD ST
WINDSOR CT 06095-2940

* 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



USPS TRACKING #

9405 5036 9930 0497 9375 43

Electronic Rate Approved #038555749

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

Expected Delivery Date: 09/11/21
Re#: DS-842877
0006

R013


P

09/08/2021

PRIORITY MAIL 2-DAY™

Expected Delivery Date: 09/11/21
Re#: DS-842877
0006

Mailed from 01566



UNITED STATES POSTAL SERVICE®

Click-N-Ship®

usps.com
\$7.95
US POSTAGE
Flat Rate Envoy

U.S. POSTAGE PAID
Click-N-Ship®



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0497 9375 43

Trans. #: 543097934	Priority Mail® Postage: \$7.95
Print Date: 09/08/2021	Total: \$7.95
Ship Date: 09/08/2021	
Expected Delivery Date: 09/11/2021	

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

Re#: DS-842877

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

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842877



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

09/09/2021

02:16 PM

Product	Qty	Unit Price	Price
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Prepaid Mail	1		\$0.00
Windsor, CT 06095			
Weight: 1 lb 4.40 oz			
Acceptance Date:			
Thu 09/09/2021			
Tracking #:			
9405 5036 9930 0497 9375 29			

Prepaid Mail	1		\$0.00
Windsor, CT 06095			
Weight: 1 lb 4.40 oz			
Acceptance Date:			
Thu 09/09/2021			
Tracking #:			
9405 5036 9930 0497 9375 12			

Prepaid Mail	1		\$0.00
West Henrietta, NY 14586			
Weight: 1 lb 4.40 oz			
Acceptance Date:			
Thu 09/09/2021			
Tracking #:			
9405 5036 9930 0497 9375 43			

Grand Total:			\$0.00
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 USPS is experiencing unprecedented volume
 increases and limited employee
 availability due to the impacts of
 COVID-19. We appreciate your patience.
