nexius

Enabling smarter connections

July 8, 2022

Members of the Connecticut Siting Council VIA EMAIL & FEDEX
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Tower Sharing Request by Dish Wireless, LLC (Dish)
Premises: 150 East Aurora Street, Waterbury, CT 06708
Lat: 41.575002, Long: -73.058204
Dish Site #: BOHVN00119B

Dear Members of the Connecticut Siting Council:

Pursuant to Connecticut General Statutes (C.G.S.) § 16-50aa, Dish Wireless, LLC ("DISH" or "the Applicant") hereby requests an order from the Connecticut Siting Council (the "Council") to approve the proposed shared use of a communications tower/smokestack and associated compound at 150 East Aurora Street in the City of Waterbury (the "Waterbury Facility or Tower"). The tower owner is BH-EBAY LLC, and American Tower Corporation ("ATC") holds easement rights to lease space on the tower/smokestack and surrounding ground space. DISH and ATC have agreed to share the use of the Waterbury Facility as detailed below. ATC has authorized the Applicant to prepare and file this tower share request for the DISH's use of the Waterbury Facility (Attachment 1).

The Waterbury Facility

The Waterbury Facility consists of an approximately one-hundred and nine (109) foot smokestack (the "Tower") and associated equipment. The Tower and compound are located on an approximately 2.55-acre parcel owned by BH-EBAY LLC. The tower/smokestack lease rights are held by ATC. The City of Waterbury approved the installation of antennas on the Tower by permit dated January 7, 2008 (Attachment 3).

DISH's Wireless Facility

DISH proposes to install three (3), 600/1900 MHz 5G antennas, six (6) remote radio head units, and one (1) surge arrestor on a proposed ring mount system at an approximately 82-foot centerline height on the Tower. (Please see Construction Drawings dated May 18th, 2022 at Attachment 4). DISH proposes to install a 5' x 7'

steel equipment platform at the base of the tower. DISH will install an ice bridge between the Tower and the equipment platform.

Connecticut General Statutes § 16-50aa provides that, upon written request for shared use approval, an order approving such use shall be issued "if the Council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns." (C.G.S. § 16-50aa(c)(1)). Upon approval of such shared use, it is exclusive, and no local zoning or land use approvals are required. (C.G.S. § 16-50x).

Shared use of the Waterbury Facility satisfies the approval criteria set forth in C.G.S. § 16-50aa as follows:

A. *Technical Feasibility*: As evidenced in the Structural Analysis Report prepared by Centek dated April 7, 2022 (Attachment 5) and the Mount Analysis prepared by Nexius dated May 10, 2022 (Attachment 6), DISH confirmed that the Tower is designed to support the addition of DISH antennas and tower mounted equipment with the existing loading. The proposed shared use of this Tower is therefore technically feasible.

B. *Legal Feasibility*: Pursuant to C.G.S. § 16-50aa, the Council is authorized to issue an order approving shared use of the existing Waterbury Facility. (C.G.S. § 16- 50aa(c)(1)). Under the authority vested in the Council by C.G.S. § 16-50aa, an order by the Council approving the shared use of a Tower would permit the Applicant to obtain a building permit for the proposed installation.

C. *Environmental Feasibility*: The proposed shared use would have minimal environmental effect, for the following reasons:

1. DISH's proposed installation would have minimal visual impact and would not cause any significant change or alteration in the physical or environmental characteristics of the facility,

2. The installation by DISH will not increase the height of the Tower,

3. The proposed installation will not increase the noise levels at the site boundaries by six decibels or more,

4. Operation of DISH antennas at this site will not exceed the total radio frequency electromagnetic radiation power density level adopted by the

FCC and Connecticut Department of Health. The DISH proposed antenna Installation, combined with the existing wireless carriers' facilities is calculated to be within 10.59% of FCC Standards for General Public/Uncontrolled Maximum Permissible Exposure (MPE). Please see the cumulative assessment of RF power density prepared by EBI dated June 29, 2022 (Attachment 7). The proposed shared use would not require water or sanitary facilities or discharges into any waterbodies. The installation will not generate traffic other than periodic maintenance visits.

D. *Economic Feasibility*: The Applicant and ATC negotiated a lease agreement to share use of the Waterbury Facility on terms amenable to both parties. The proposed tower sharing is therefore economically feasible.

E. *Public Safety*: Based upon the supporting structural and power density documents submitted with this request, the Tower is structurally capable of supporting DISH's installation and emissions are well within the maximum permitted by the FCC and the Connecticut Department of Health. Additionally, the addition of DISH telecommunication service at this Tower is expected to enhance the safety and welfare of local residents and travelers in proximity to the Tower, resulting in an improvement to public safety in this area of the State.

Notice of Tower Share Filing

Pursuant to the August 2013 Tower Share Filing Guide and the Exempt Modifications/Tower Share Filing Memorandum dated June 22, 2017, copies of DISH's tower share filing request were sent to the property owner, (BH-EBAY LLC), the tower manager (ATC) to the chief elected official of the City of Waterbury and the Waterbury Planning, Zoning and Inner Wetlands Office by a tracked private delivery service. Proof of mailing is included at Attachment 8.

Conclusion

The proposed shared use of the Waterbury Facility satisfies the criteria set forth in C.G.S. §16-50aa and advances the General Assembly's and the Council's goal of preventing the proliferation of towers in the State of Connecticut. DISH therefore requests the Siting Council issue an order approving the proposed shared use of the Waterbury Facility.

Respectfully Submitted,

Jonathan McNeal
4 MacArthur Avenue
Devens, MA 01434
Jonathan.mcneal@nexius.com
603-738-0002

Attachments: As Noted.

cc: Melanie Bachman, Executive Director
Paul Pernerewski, Jr, President, Board of Alderman, City of Waterbury;
Neil M. O'Leary, Mayor, City of Waterbury
Robert Nerney, City Planner, Planning, Zoning and Inland Waters Department, City of Waterbury
BH-EBAY, LLC
DISH- *Via Electronic Mail*
ATC-Contracts Management

List of Attachments

Attachment 1- Letter of Authorization
Attachment 2- Assessor Card
Attachment 3- Municipal Zoning Approval
Attachment 4- Construction Drawings
Attachment 5- Structural Analysis
Attachment 6- Mount Analysis
Attachment 7- RF Power Density Assessment
Attachment 8- Proof of Mailing

Attachment 1

AMERICAN TOWER®
CORPORATION

LETTER OF AUTHORIZATION

ATC SITE # / NAME/ PROJECT#: 277186 /150 E AURORA STORAGE AND LIGHT MFG CT /OAA769393
SITE ADDRESS: 150 E AURORA ST, WATERBURY, CT 06708-2039
APN: WATE M:0143 B:0783 L:0021
LICENSEE: DISH WIRELESS L.L.C.

I, Margaret Robinson, Vice President, UST Legal for American Tower*, by and through its wholly owned subsidiary, T8 Ulysses Site Management LLC, Attorney-in-Fact for BH EBAY LLC**, the owner of the property located at the address identified above (the "Tower Facility"), do hereby authorize DISH WIRELESS L.L.C., its successors and assigns, and/or its agent (collectively, the "Licensee") to act as their non-exclusive agent for the sole purpose of filing and consummating any land-use or building permit application(s) as may be required by the applicable permitting authorities for Licensee's telecommunications' installation.

We understand that this application may be denied, modified or approved with conditions. The above authorization is limited to the acceptance by Licensee only of conditions related to Licensee's installation and any such conditions of approval or modifications will be Licensee's sole responsibility.

Signature:

Print Name: Margaret Robinson
Vice President, UST Legal
American Tower*

Commonwealth of MASSACHUSETTS
County of Middlesex

This instrument was acknowledged before me by Margaret Robinson, Vice President, UST Legal for American Tower*, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same.

WITNESS my hand and official seal, this 16th day of June, 2022.

NOTARY SEAL

MELISSA ANN METZLER
Notary Public
Commonwealth of Massachusetts
My Commission Expires March 14, 2025

Notary Public
My Commission Expires: March 14, 2025

*American Tower includes all affiliates and subsidiaries of American Tower Corporation.
**For Authority, see Wireless Communication Easement and Assignment Agreement attached herewith.

Attachment 2

Waterbury

Unique ID: 014307830021 **Card No:** 1 Of 2

Location:	150 EAST AURORA ST	Map Id:	0143-0783-0021	Zone:	IG	Date Printed:	7/7/2022
		Neighborhood:	80000-Industrial General			Last Update:	7/7/2022

Owner Of Record	Volume/Page	Date	Sales Type	Valid	Sale Price
BH EBAY LLC	8504/0242	5/17/2022	Warranty Sale	Yes	1,925,000
170 RODNEY ST, BROOKLYN, NY 11211			Exempt		
Prior Owner History					
150 EAST AURORA STORAGE AND LIGHT MFG LL	5612/0341	12/16/2005	Additional Parcel	No	610,000
STEIN TRUSTEE LLC	5026/0142	6/23/2004	Change of Name	No	0

Permit Number	Date	Permit Description
2022.1499	6/13/2022	install new sub panels and wire cabinet
2022.0362	2/23/2022	T-Moble remove 6-antnnas and 1- hybrid cable install 3-antennas 3-rru's 2-hybrid cables
2018.2221	8/10/2018	UPGRADE ANENNAS & TELE COMMUNICATIONS
2017.2530	9/19/2017	INSTALL 7 WASTE OIL HEATERS
2017.1176	5/11/2017	REPLACE EXISTING ANTENNAS WITH 3 NEW ANTENNAS ADD 3 ANTENNAS & 1 FIBER OPTIC LINE
2016.0269	3/16/2016	ATTACH ANTENNAS TO EXISTING ARRAY ON SMOKESTACK

Supplemental Data		Appraised Value	
Census/Tract		Total Land Value	235,620
Dev Map ID		Total Building Value	679,372
		Total Outbldg Value	17,882
		Total Market Value	932,874

Utilities

Acres

Land Type	Acres	490	Total Value
Primary Site	2.55	0.00	235,620
Total	2.5500	0.00	235,620

State Item Codes

Code	Quantity	Value
32-Indust Building	2.00	475,560
21-Com Land	2.55	164,930
33-Indust Improve	2.00	12,520

Assessment History (Prior Years as of Oct 1)

	2022	2021	2020	2019	2018
Land	164,930	164,930	164,930	164,930	164,930
Building	475,560	475,560	475,560	475,560	475,560
Outbuilding	12,520	12,520	12,520	12,520	12,520
Total	653,010	653,010	653,010	653,010	653,010

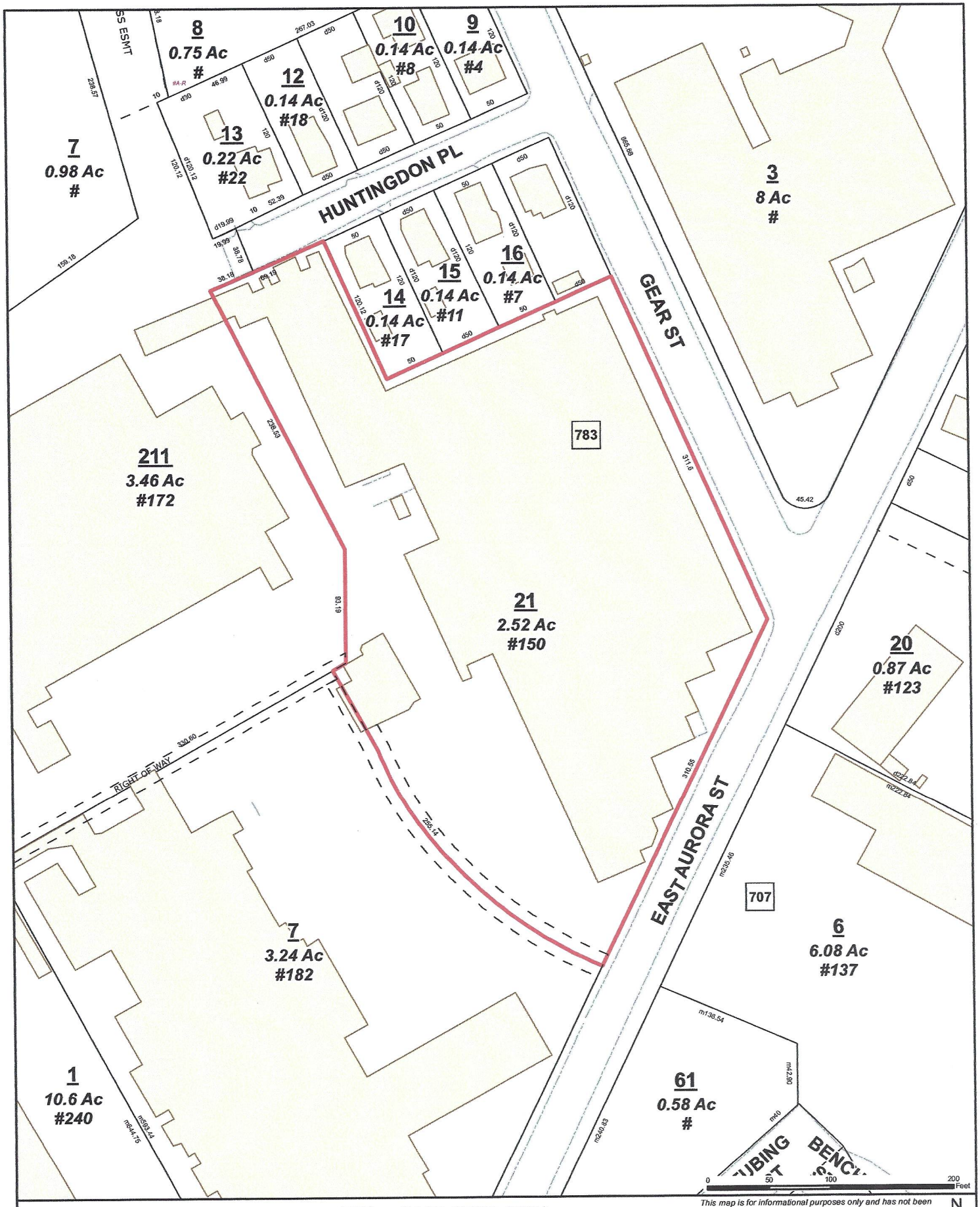
490 Appraised Totals

Type	Acres	Value	Type	Acres	Value
			Totals	0.00	0

Application Date: Expiration Date:

Comments

Information may be deemed reliable, but not guaranteed. Revaluation Date: 10/1/2017



City of Waterbury
Public Works Department

MBL: 0143-0783-0021

ADDRESS: 150 EAST AURORA ST

Attachment 3

DEPARTMENT OF PLANNING
CITY OF WATERBURY
235 GRAND STREET
WATERBURY, CONNECTICUT 06702
Tel. (203) 574-6818 Fax (203) 346-3949

no wetlands

James A. Sequin, AICP
City Planner

APPLICATION FOR A CERTIFICATE OF ZONING COMPLIANCE

(SHADED AREAS FOR STAFF USE)

ADDRESS: 150 E AURORA ST
TAX ID:

DATE: 1-7-08

APPLICANT:

Name:	T-Mobile / OMN. Pt
Address:	100 Filley ST
City, State, Zip	Bloomfield CT 06002
Phone:	516-807-1983 - Nick
Fax:	
Email	

PROPERTY OWNER:

Name:	150 E AURORA ST Storage
Address:	25350 Budde Rd
City, State, Zip	Spring TX 77380
Phone:	
Fax:	
Email	

AS BUILT PLAN ATTACHED?	☐ YES	☐ NO
A-2 SURVEY REQUIRED?	☐ YES	☐ NO
SITE VISIT REQUIRED?	☐ YES	☐ NO

ZONING DISTRICT: **Fee:** $

CHANGE OF USE:
EXISTING USE:
PROPOSED USE:

$75
called 1/9

TYPE OF IMPROVEMENT

- ☐ NEW PRINCIPAL STRUC
- ☐ ADDITION
- ☐ DECK
- ☐ POOL
- ☐ GARAGE
- ☐ FENCE
- ☐ SHED
- ☐ SIGN
- ☒ OTHER

eet.)

Cell Site	110'

EARTH EXCAVATION

	Cubic Yards
CUT	
FILL	
REGRADING	

NICK CONDOULIS
nickcondoulis@costrottaconstruction.com

COSTROTTA CONSTRUCTION MANAGEMENT INC.

99 Maple Place
Freeport, NY 11520

office (516) 223-5404
fax (516) 223-5406
cell (516) 807-1983

DEVELOPMENT STANDARDS:

	Provided
LOT SIZE (Sq. Ft.)	
FRONTAGE ON PAVED CITY STREET (Feet)	
BUILDING COVERAGE (Sq. Ft.)	
SIDE YARD (Feet)	
SIDE YARD (Feet)	
FRONT YARD (Feet)	
REAR YARD (Feet)	
NUMBER OF ONSITE PARKING SPACES	

COMMISSION ACTIONS:

VARIANCE Type:	☒ Not Needed	☐ Approved	☐ Pending
SPECIAL PERMIT Type:	☒ Not Needed	☐ Approved	☐ Pending
SPECIAL EXCEPTION Type:	☒ Not Needed	☐ Approved	☐ Pending

IMPORTANT INFORMATION

An application for a Certificate of Zoning compliance must be accompanied by a plot plan containing all the information necessary to enable the Zoning Administrator to decide whether the proposed building, alteration, addition, or use complies with all the provisions of these regulations.

The Zoning Administrator may rely on the information submitted above in making a determination of compliance. It is the responsibility of the applicant to assure the accuracy of all information submitted.

NOTICE OF RIGHT TO ADVERTISE (CGS 8-3 (f))

No building permit or certificate of occupancy shall be issued for a building, use or structure subject to the zoning regulations of a municipality without certification in writing by the official charged with the enforcement of such regulations that such building, use or structure is in conformity with such regulations or is a valid nonconforming use under such regulations. Such official shall inform the applicant for any such certification that such applicant may provide notice of such certification by either (1) publication in a newspaper having substantial circulation in such municipality stating that the certification has been issued, or (2) any other method provided for by local ordinance. Any such notice shall contain (A) a description of the building, use or structure, (B) the location of the building, use or structure, (C) the identity of the applicant, and (D) a statement that an aggrieved person may appeal to the zoning board of appeals in accordance within thirty days of the publication of the notice.

I certify that the information submitted herein is accurate to the best of my knowledge and that I have been informed of my right to advertise, at my own expense, notice of any certification received.

Signature: _____ Date: 1-7-08

Office Use Only

CERTIFICATION:

Date Rec'd: Date Completed:

☒ Approved ☐ Denied

Reason for denial:

Signature: Date: 1-7-08

Land Use Officer

The City of Waterbury
DEPARTMENT OF INSPECTION
235 Grand Street, Waterbury, CT 06702
(203) 574-6832

PERMIT NUMBER
7285D

Building Permit

Date: 6-27-06

Applicant:
Company Name: Omnipoint Communications
Address: 100 Filley St
City/State/Zip: Bloomfield CT 06002

Location of Work:
Address: 150 East Aurora St

Location of Owner:
Owner's Name: 150 East Aurora Storage
Address: 25350 Budde Rd
City/State/Zip: Spring TX 77380

Leave is hereby granted to M. Omnipoint Communications

to erect a T-Mobile Antenna

as follows: Length _____ ft.; Width _____ ft.; No. of Stories _____; No. of Rooms _____

Building to be used as Commercial

Construction Classification _____ Use Group _____

Designed Live Load: 1st _____ 2nd _____ 3rd _____ Roof _____

Remarks: _____

The conditions on which this permit is granted are, that the said building shall be erected in accordance with the laws of the State of Connecticut, and the ordinances of the City of Waterbury. If any of the statements of said applicant be not true, or if any change is made in said plans or specifications without the consent of the Building Inspector or his duly appointed agents, this permit shall be revocable.

Limited to six months from date. This permit may be sooner revoked for any violation of any ordinance, statute or order of constituted authority. This permit is subject to the condition that should there be any change in the ordinance or statutes or institution of proceedings to establish any building line or other improvements, before said building is completed, then no further work shall be done on said building thereafter conflicting with such new statute, order, ordinance, or institution of proceedings.

E. Gil Haveline
Building Official

ESTIMATED COST: $ 150,000.00
Permit Fee: $ 3,005.00
State Ed Fee: $ 24.00
CO: $ 25.00
CA: $
Penalty Fee: $
TOTAL AMOUNT: $ 3,054.00

Attachment 4

DISH Wireless L.L.C. SITE ID:

BOHVN00119B

DISH Wireless L.L.C. SITE ADDRESS:

150 EAST AURORA ST.
WATERBURY, CT 06708

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 (2) PROPOSED UNIVERSAL RING MOUNTS WITH (3) PROPOSED MOUNTING PIPES (1 PER SECTOR)
- INSTALL PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRUS (2 PER SECTOR)
- INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
- INSTALL (3) PROPOSED BACK-TO-BACK RRH MOUNT (2 PER SECTOR)
- INSTALL (1) PROPOSED HYBRID CABLE (125' LONG)

GROUND SCOPE OF WORK:

- INSTALL (1) 10'x10' PERIMETER FENCE WITH 6' WIDE DOUBLE SWING GATE
- INSTALL (1) PROPOSED METAL PLATFORM
- INSTALL (1) PROPOSED ICE BRIDGE
- INSTALL (1) PROPOSED PPC CABINET
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED POWER CONDUIT
- INSTALL (1) PROPOSED TELCO CONDUIT
- INSTALL (1) PROPOSED TELCO-FIBER BOX
- INSTALL (1) PROPOSED GPS UNIT
- INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)
- INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)
- INSTALL (1) PROPOSED METER SOCKET

SITE INFORMATION

PROPERTY OWNER:	NEWARK YANG LLC
ADDRESS:	150 EAST AURORA ST. WATERBURY, CT 06708
SITE TYPE:	SMOKE STACK
COUNTY:	NEW HAVEN
LATITUDE (NAD 83):	41.575002
LONGITUDE (NAD 83):	-73.058204
ZONING JURISDICTION:	CITY OF WATERBURY
PARCEL NUMBER:	0143-0783-0021
OCCUPANCY GROUP:	u
CONSTRUCTION TYPE:	v-b
POWER COMPANY:	PG&E
TELEPHONE COMPANY:	CROWN CASTLE FIBER TO BE ORDERED

PROJECT DIRECTORY

APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
SITE DESIGNER:	NEXIUS SOLUTIONS, INC. 2595 NORTH DALLAS PKWY, SUITE 300 FRISCO, TX 75034 (972) 581-9888
SITE ACQUISITION:	DAVE GOODFELLOW (860) 573-2758
CONSTRUCTION MANAGER:	CHAD WILCOX (860) 634-9600
RF ENGINEER:	DIPESH PARIKH (312) 929-9086

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 SAN FRANCISCO INTERNATIONAL AIRPORT (BDL):

1. START OUT GOING WEST ON SCHOEPHOESTER RD.
2. MAKE A U-TURN ONTO SCHOEPHOESTER RD.
3. TURN RIGHT ONTO ELLA GRASSO TURNPIKE/CT-75.
4. MERGE ONTO CT-20 E TOWARD HARTFORD/SPRINGFIELD/I-91.
5. MERGE ONTO I-91 S TOWARD HARTFORD.
6. MERGE ONTO I-84 W VIA EXIT 32A TOWARD WATERBURY.
7. MERGE ONTO CT-8 N VIA EXIT 20 TOWARD TORRINGTON.
8. TAKE THE CT-73 EXIT, EXIT 35, ON THE LEFT TOWARD OAKVILLE/WATERTOWN.
9. TURN RIGHT ONTO E AURORA ST.
10. 150 E AURORA ST. IS ON THE LEFT.

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 & 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

FUTURE ADDITIONS RELATED TO RF SIGNS FROM A SAFESITE REPORT, SA, MA AND ANY MODS TO BE DONE. AC POWER & FIBER PATH AND DEMARC'S MAY CHANGE AFTER AN ORDER IS PLACED. PROPOSED GROUND HAS TO BE MEG TESTED AND ACCEPTED

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

811

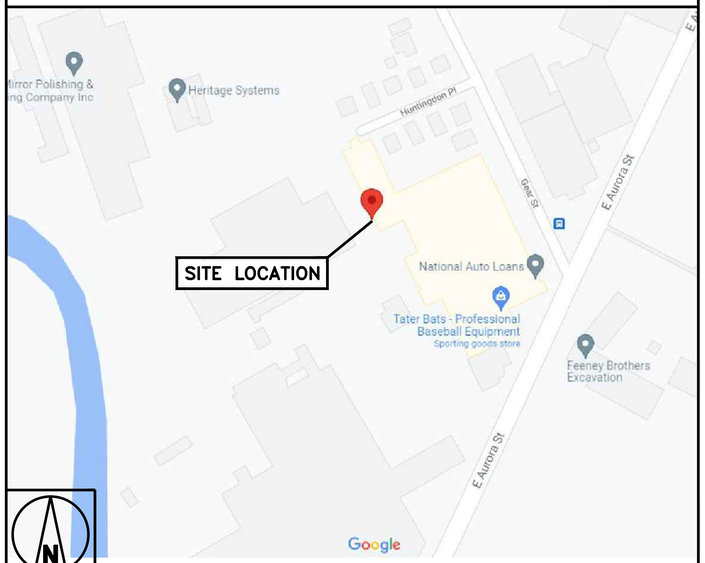
GENERAL NOTES

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.

VICINITY MAP



NO SCALE

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

nexius
2595 NORTH DALLAS PARKWAY
SUITE 300
FRISCO, TX 75034

STATE OF CONNECTICUT
JORDAN D. PHILLIPS
33483
LICENSED
PROFESSIONAL ENGINEER

DRAWN BY:	CHECKED BY:	APPROVED BY:
MC	MDC	MDC

RFDS REV #: REV 1 - 10/14/2021

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	05/18/2022	FINAL CD

A&E PROJECT NUMBER

BOHVN00119B

DISH Wireless L.L.C.
PROJECT INFORMATION

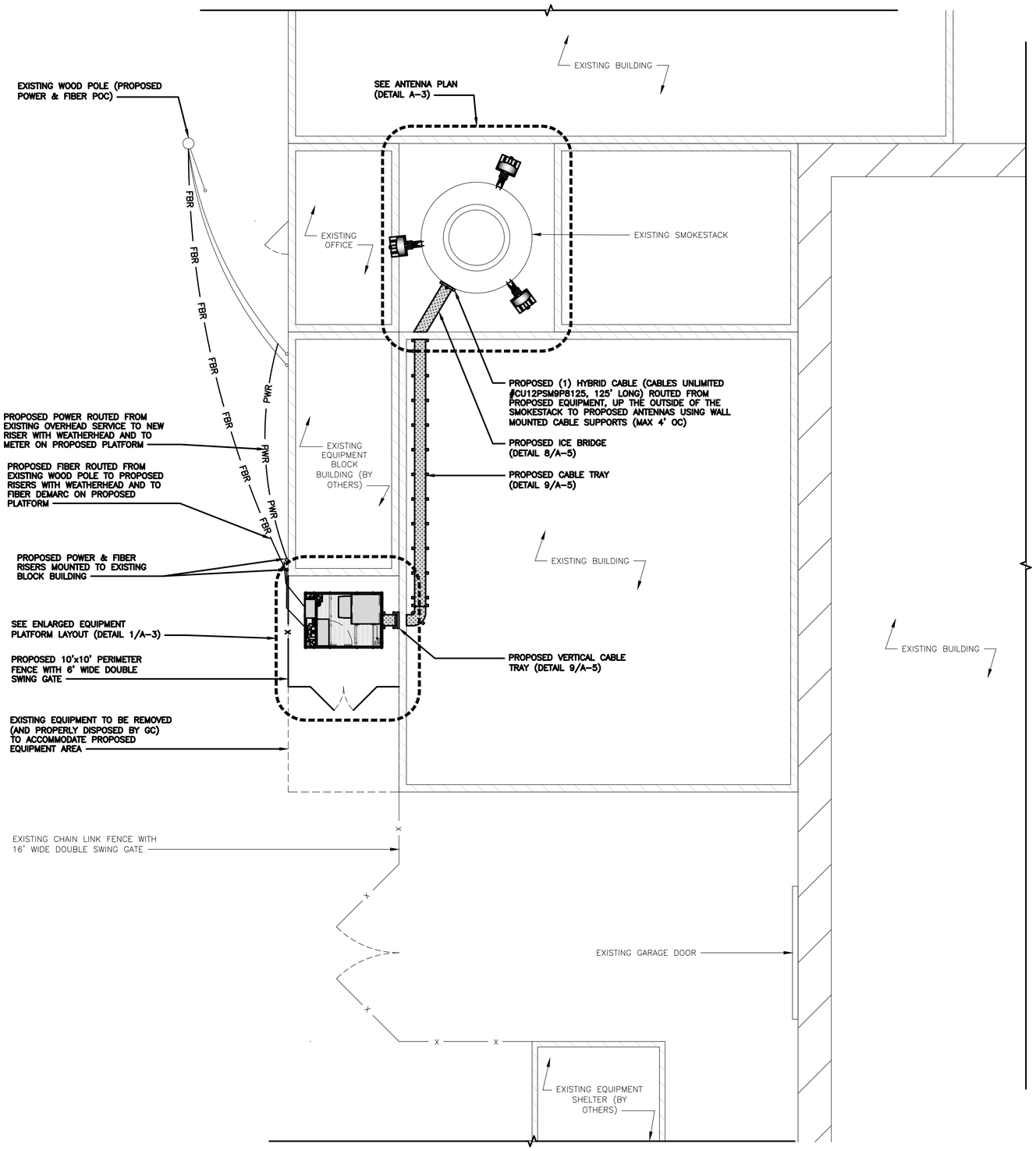
BOHVN00119B
150 EAST AURORA ST.
WATERBURY, CT 06708

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



NOTES

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

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

nexius
2595 NORTH DALLAS PARKWAY
SUITE 300
FRISCO, TX 75034

STATE OF CONNECTICUT
JORDAN D. PHILLIPS
33483
LICENSED
PROFESSIONAL ENGINEER

DRAWN BY:	CHECKED BY:	APPROVED BY:
MC	MDC	MDC

RFDS REV #: REV 1 – 10/14/2021

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	05/18/2022	FINAL CD

A&E PROJECT NUMBER

BOHVN00119B

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00119B
150 EAST AURORA ST.
WATERBURY, CT 06708

SHEET TITLE

OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

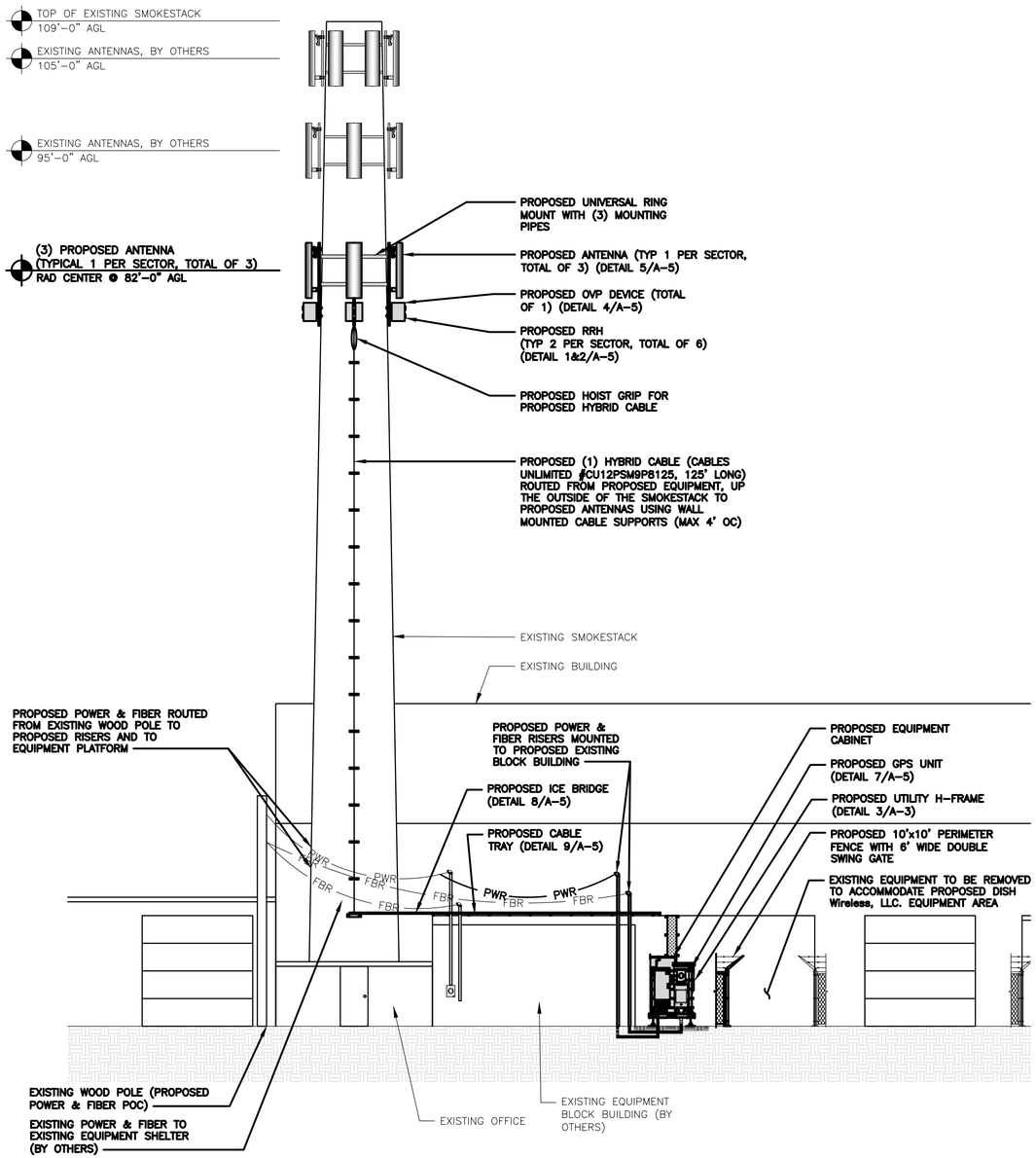
A-1

OVERALL SITE PLAN

6' 4' 2' 0 5' 10'
3/16"=1'-0"

NOTES

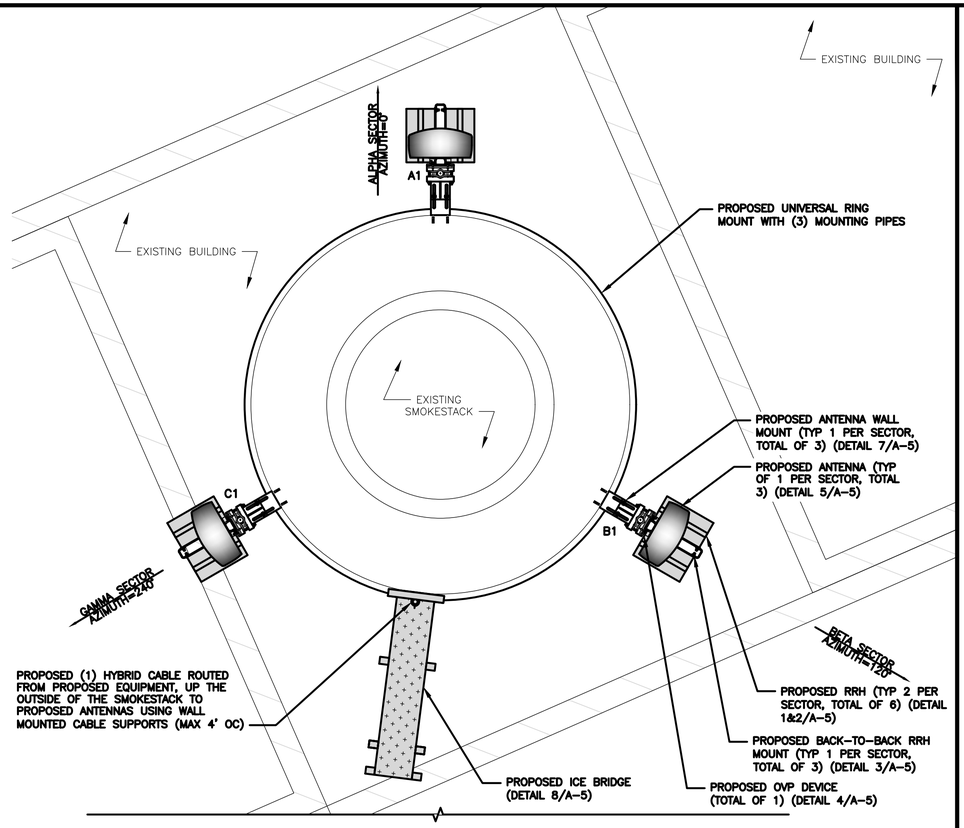
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED WEST ELEVATION

8' 4' 0 8' 16'
1/8"=1'-0"

1



ANTENNA LAYOUT

12" 6" 0 1' 2' 3'
3/4"=1'-0"

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 – MX08FR0665–21	n66 n70 n71	72.0" x 20.0"	0°	82'–0"	(1) HYBRID CABLE CABLES UNLIMITED CU12PSM9P8125_8AWG (125' LONG)
BETA	B1	PROPOSED	JMA – MX08FR0665–21	n66 n70 n71	72.0" x 20.0"	120°	82'–0"	
GAMMA	C1	PROPOSED	JMA – MX08FR0665–21	n66 n70 n71	72.0" x 20.0"	240°	82'–0"	

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	TA08025–B605	n71
	A1	TA08025–B604	n70 | n66
BETA	B1	TA08025–B605	n71
	B1	TA08025–B604	n70 | n66
GAMMA	C1	TA08025–B605	n71
	C1	TA08025–B604	n70 | n66

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.

ANTENNA SCHEDULE

NO SCALE

3

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5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

nexius
2595 NORTH DALLAS PARKWAY
SUITE 300
FRISCO, TX 75034

STATE OF CONNECTICUT
JORDAN D. PHILLIPS
33483
LICENSED
PROFESSIONAL ENGINEER

DRAWN BY:	CHECKED BY:	APPROVED BY:
MC	MDC	MDC

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A&E PROJECT NUMBER

BOHVN00119B

DISH Wireless L.L.C.
PROJECT INFORMATION

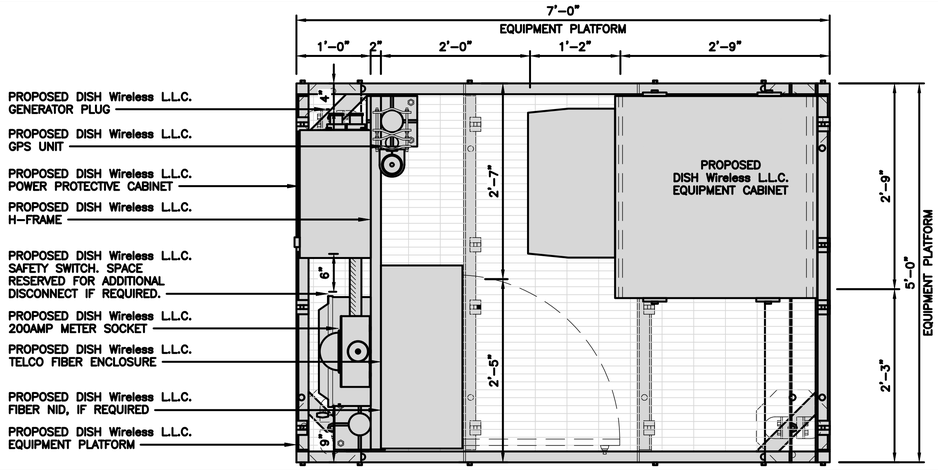
BOHVN00119B
150 EAST AURORA ST.
WATERBURY, CT 06708

SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



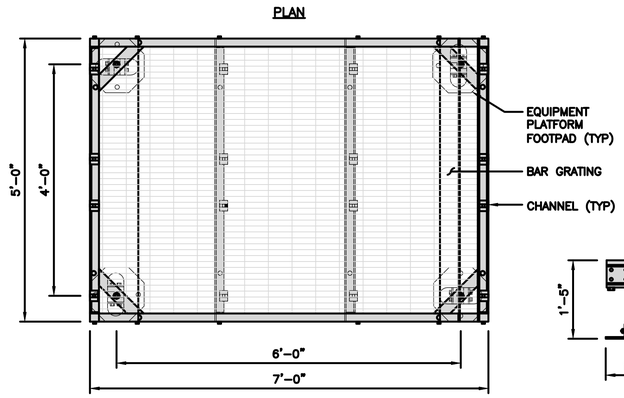
PLATFORM EQUIPMENT PLAN

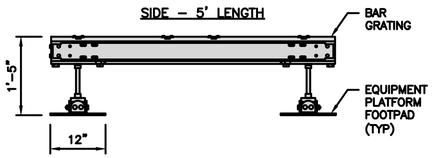
12" 9" 6" 3" 0 1' 2"
1"=1'-0"

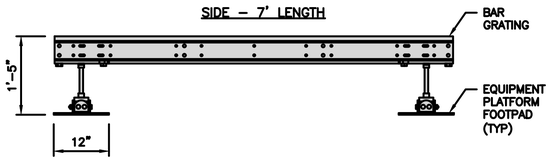
1

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"

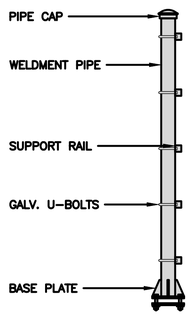






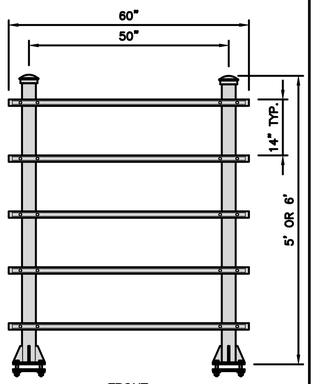
PLATFORM DETAIL | NO SCALE | 2

COMMSCOPE MTC4045HFLD H-FRAME	
UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs



SIDE

NOTE:
OR DISH Wireless L.L.C. APPROVED EQUIVALENT

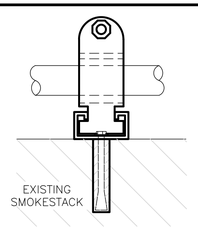


FRONT

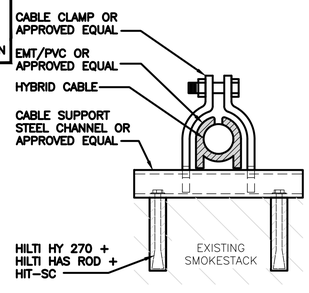
H-FRAME DETAIL | NO SCALE | 3

CABLE WALL MOUNT SUPPORT	
UNISTRUT TYPE	GRAINGER P1000T
UNISTRUT DIMENSIONS (HxWxL)	1 5/8"x 1 5/8"x 12"
WEIGHT/ VOLUME	1.85 LB PER FOOT
ULTIMATE LOAD CAPACITY	718.5 LB

NOTES:
1. ALL HARDWARE AND PARTS SHALL BE HOT DIPPED GALVANIZED WITH LOCK WASHERS AND HEAVY HEX NUTS.
2. VERTICAL CABLE MOUNT: 4'-0" MAX. UNISTRUT SEPARATION
3. HORIZONTAL CABLE MOUNT: 3'-0" MAX UNISTRUT SEPARATION



PLAN

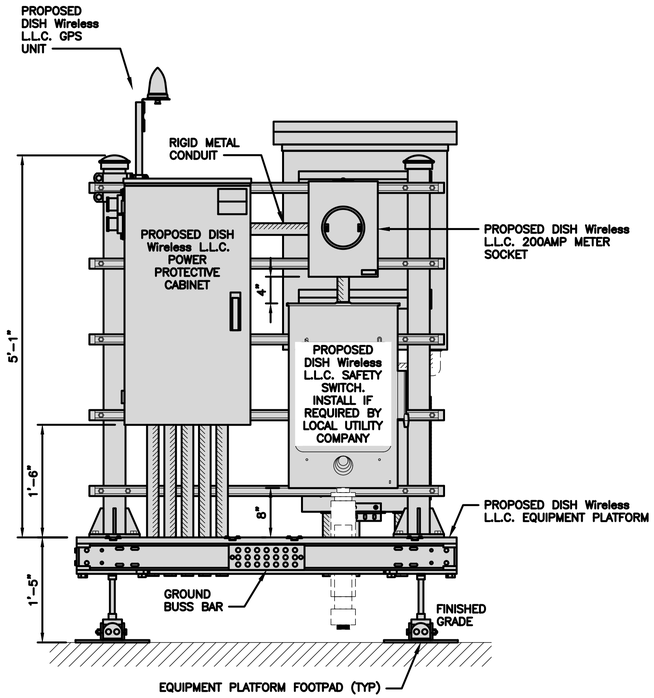


SIDE

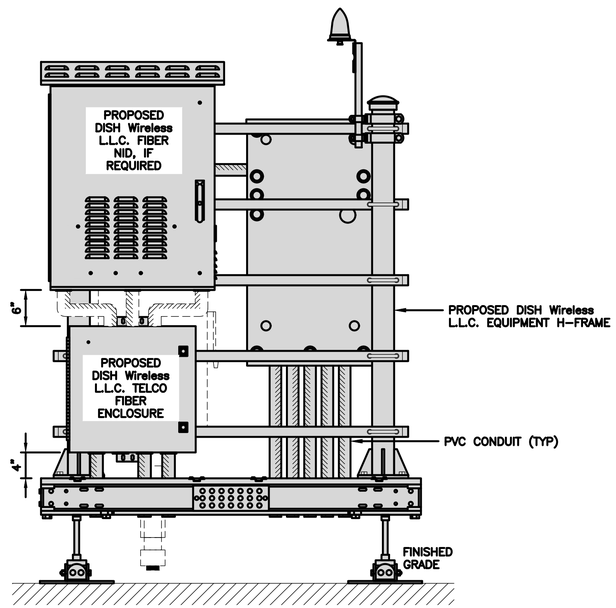
CABLE WALL MOUNT SUPPORT DETAIL | NO SCALE | 4

NOTE

1. EQUIPMENT CABINET OMITTED FOR CLARITY



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION | 12" 9" 6" 3" 0 1' 2" 1"=1'-0" | 5

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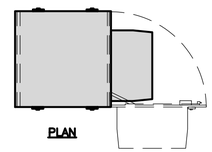
150 EAST AURORA ST.
WATERBURY, CT 06708

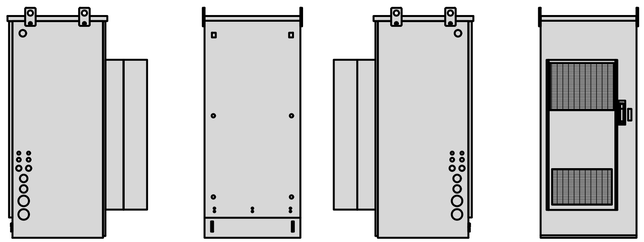
SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

CHARLES INDUSTRY HEX CUBE–PM639155N4

DIMENSIONS (HxWxD):	74"x32"x32"
POWER PLANT:	–48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 LBS

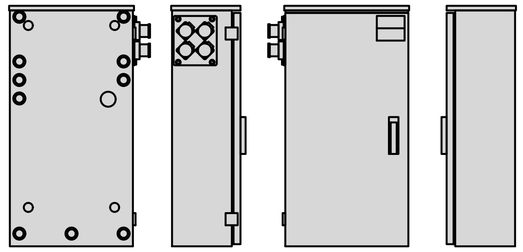




CABINET DETAIL | NO SCALE | 1

RAYCAP PPC RDIAC–2465–P–240–MTS

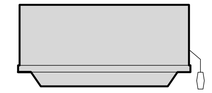
ENCLOSURE DIMENSIONS (HxWxD):	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G

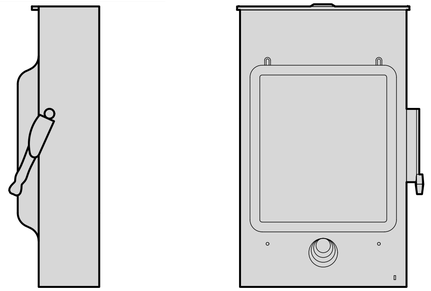


POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

SQUARE D SAFETY SWITCHES D224NRB

ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E–2875

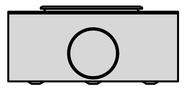


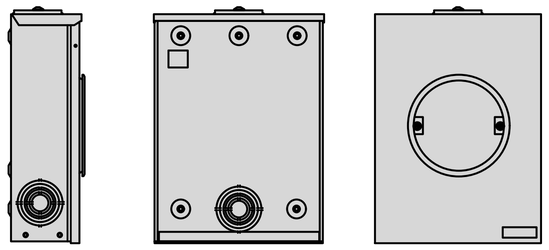


SAFETY SWITCH DETAIL | NO SCALE | 3

EATON METER SOCKET UNRRS213BEUSE

METER SOCKET TYPE	RING
ENCLOSURE DIM (HxWxD)	16"x12"x6"
MAIN AMPERE RATING	200A
WEIGHT	18 LBS

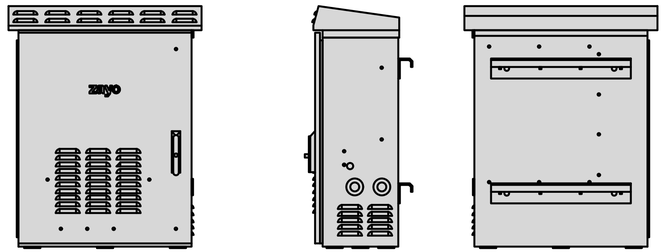




METER SOCKET DETAIL | NO SCALE | 4

ZAYO 5RU CABINET LEFT SWING DOOR ("LIT" SITES)

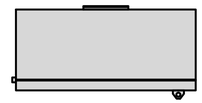
DIMENSIONS (HxWxD)	36.115"x29"x12.9"
WEIGHT	85 LBS
POWER INPUT	20A, –48VDC

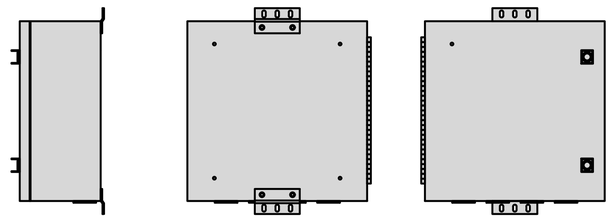


NETWORK INTERFACE UNIT DETAIL | NO SCALE | 5

CHARLES CFIT–PF2020DSH1 FIBER TELCO ENCLOSURE

ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4

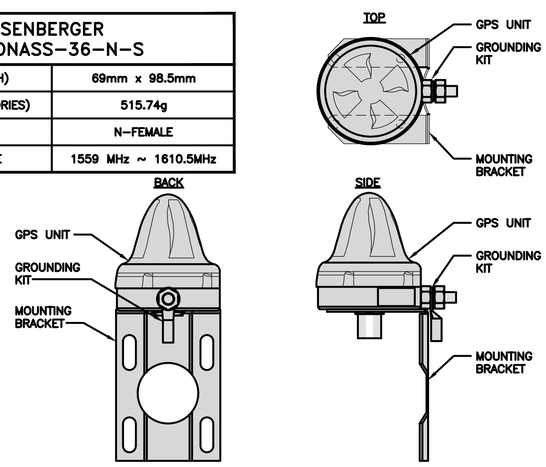




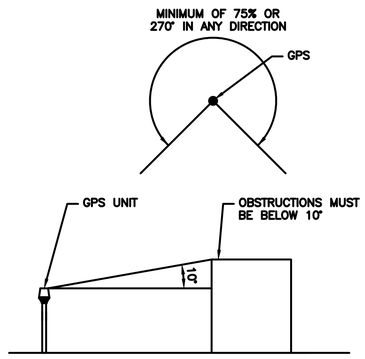
FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

ROSENBERGER GPSGLONASS–36–N–S

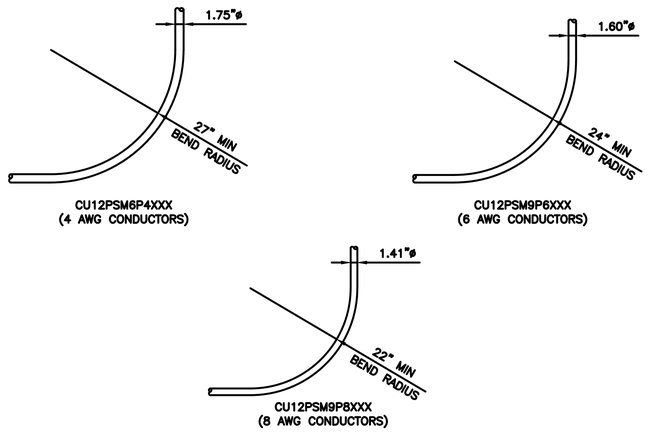
DIMENSION (DIA x H)	69mm x 98.5mm
WEIGHT (WITH ACCESSORIES)	515.74g
CONNECTOR	N–FEMALE
FREQUENCY RANGE	1559 MHz ~ 1610.5MHz



GPS ANTENNA DETAIL | NO SCALE | 7



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 8



CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUSES | NO SCALE | 9

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DISH Wireless L.L.C.
PROJECT INFORMATION
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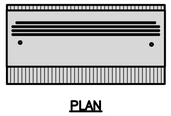
150 EAST AURORA ST.
WATERBURY, CT 06708

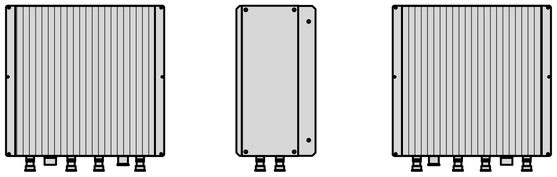
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

FUJITSU DUAL BAND TA08025-B604

DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

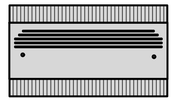

PLAN


BACK SIDE FRONT

RRH DETAIL | NO SCALE | 1

FUJITSU TRIPLE BAND TA08025-B605

DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V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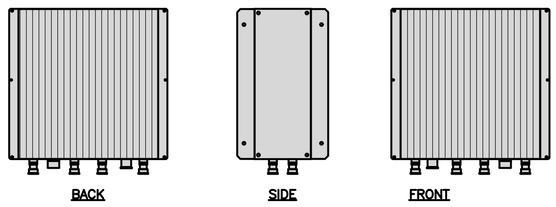
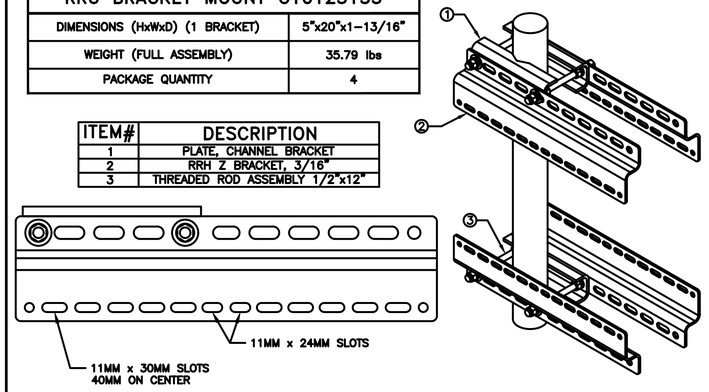

BACK SIDE FRONT

RRH 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"

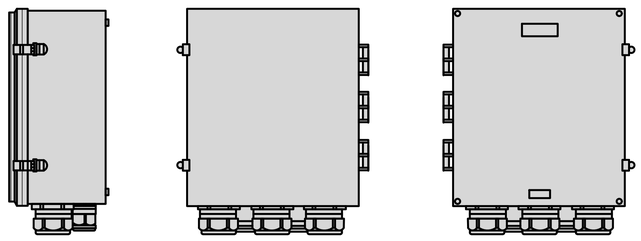


REMOTE RADIO MOUNT DETAIL | NO SCALE | 3

RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION

DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS

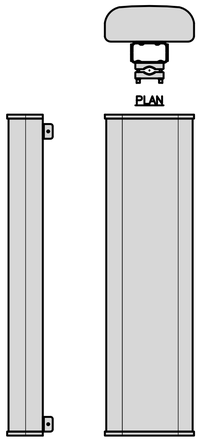

PLAN


SIDE BACK FRONT

SURGE SUPPRESSION DETAIL | NO SCALE | 4

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

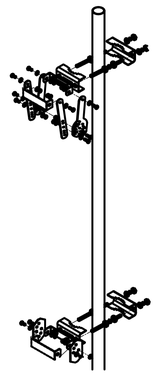
ANTENNA DETAIL | NO SCALE | 5

JMA ANTENNA MOUNT BRACKET #91900318

TOTAL WEIGHT (WITH BRACKETS)	18 lbs (8.18 Kg)
POLE DIAMETER RANGE	2.5" TO 4.5"

NOTE:
KIT #91900318: TOP AND BOTTOM BRACKETS FOR 4-,6-, AND 8-FOOT ANTENNAS

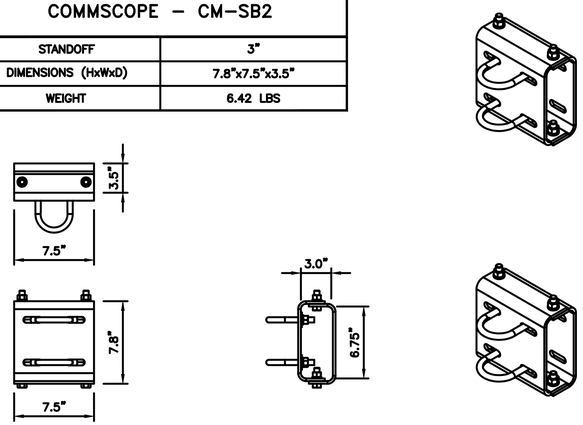
ANTENNA BRACKET NOT PART OF KIT



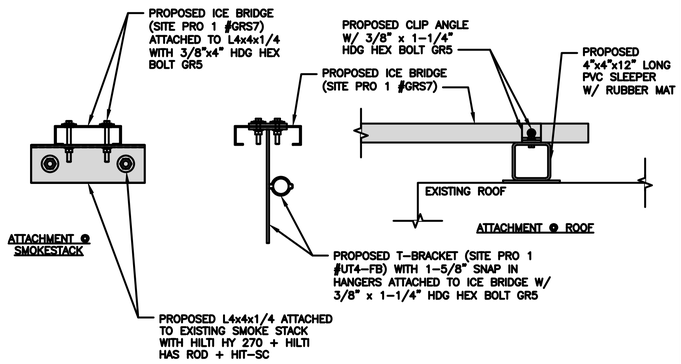
ANTENNA BRACKET DETAIL | NO SCALE | 6

COMMSCOPE - CM-SB2

STANDOFF	3"
DIMENSIONS (HxWxD)	7.8"x7.5"x3.5"
WEIGHT	6.42 LBS



ANTENNA MOUNT DETAIL | NO SCALE | 7

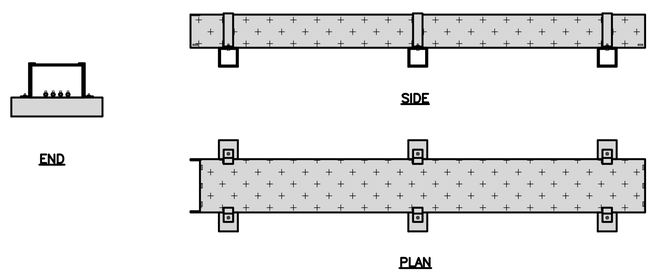


ICE BRIDGE DETAIL | NO SCALE | 8

COMMSCOPE RT-CB4D ROOFTOP COVER KIT

DIMENSIONS (HxWxL)	7"x 11.25"x 96"
WEIGHT/ VOLUME	85.98 LBS
CABLE RUN (QTY)	4

MOUNTING	NON-PENETRATING
INCLUDED PRODUCTS:	RTCB4D.01 CHANNEL (1)
	MT-F1598 SLEEPERS (3)
	RTCUH HARDWARE
	RTHC.01 HOLD-DOWN CLAMPS (6)


END

SIDE

PLAN

ROOFTOP CABLE TRAY DETAIL | NO SCALE | 9

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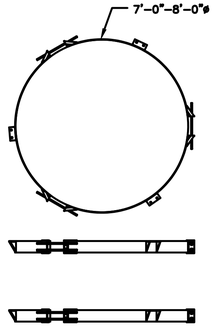
0	05/18/2022	FINAL CD

A&E PROJECT NUMBER
BOHVN00119B

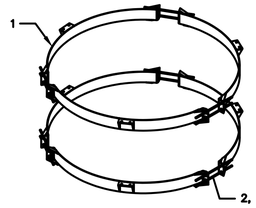
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00119B
150 EAST AURORA ST.
WATERBURY, CT 06708

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

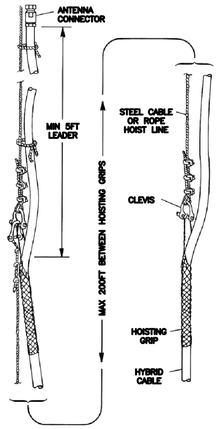


COMMSCOPE – CM-R78				
ITEM	PART NO.	DESCRIPTION	QTY	WEIGHT
1	MTC82117801	MOUNTING CLAMP	6	45.22 LBS
2	MT-382-24	5/8"x24" THREADED ROD	12	1.93 LBS
3	GN-05	5/8" GALV HEX NUT	24	0.04 LBS
4	GWL-05	5/8" GALV LOCK WASHER	24	0.09 LBS
5	GWF-05	5/8" GALV FLAT WASHER	24	0.06 LBS

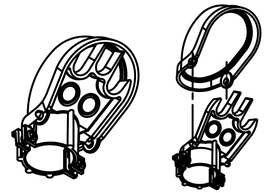


OFFSET PIPE CHIMNEY RING MOUNT DETAIL | NO SCALE | 1

COMMSCOPE – 24312A



HOISTING GRIP DETAIL | NO SCALE | 2

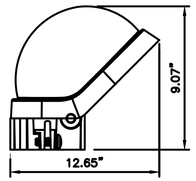


ISOMETRIC

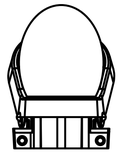
MANUFACTURER: ARLINGTON
MODEL: PVC109
L: 12.65 IN
H: 9.07 IN

NOTES:

1. CONTRACTOR TO COIL 6' AT THE WEATHERHEAD TO LEAVE ENOUGH CONDUCTOR FOR DRIP LOOP & UTILITY TO MAKE FINAL CONNECTION
2. CONTRACTOR TO INSTALL PULL ROPE FOR FIBER



SIDE



REAR

WEATHERHEAD DETAIL | 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

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

nexius
2595 NORTH DALLAS PARKWAY
SUITE 300
FRISCO, TX 75034

DRAWN BY:	CHECKED BY:	APPROVED BY:
MC	MDC	MDC

RFDS REV #: REV 1 – 10/14/2021

CONSTRUCTION DOCUMENTS

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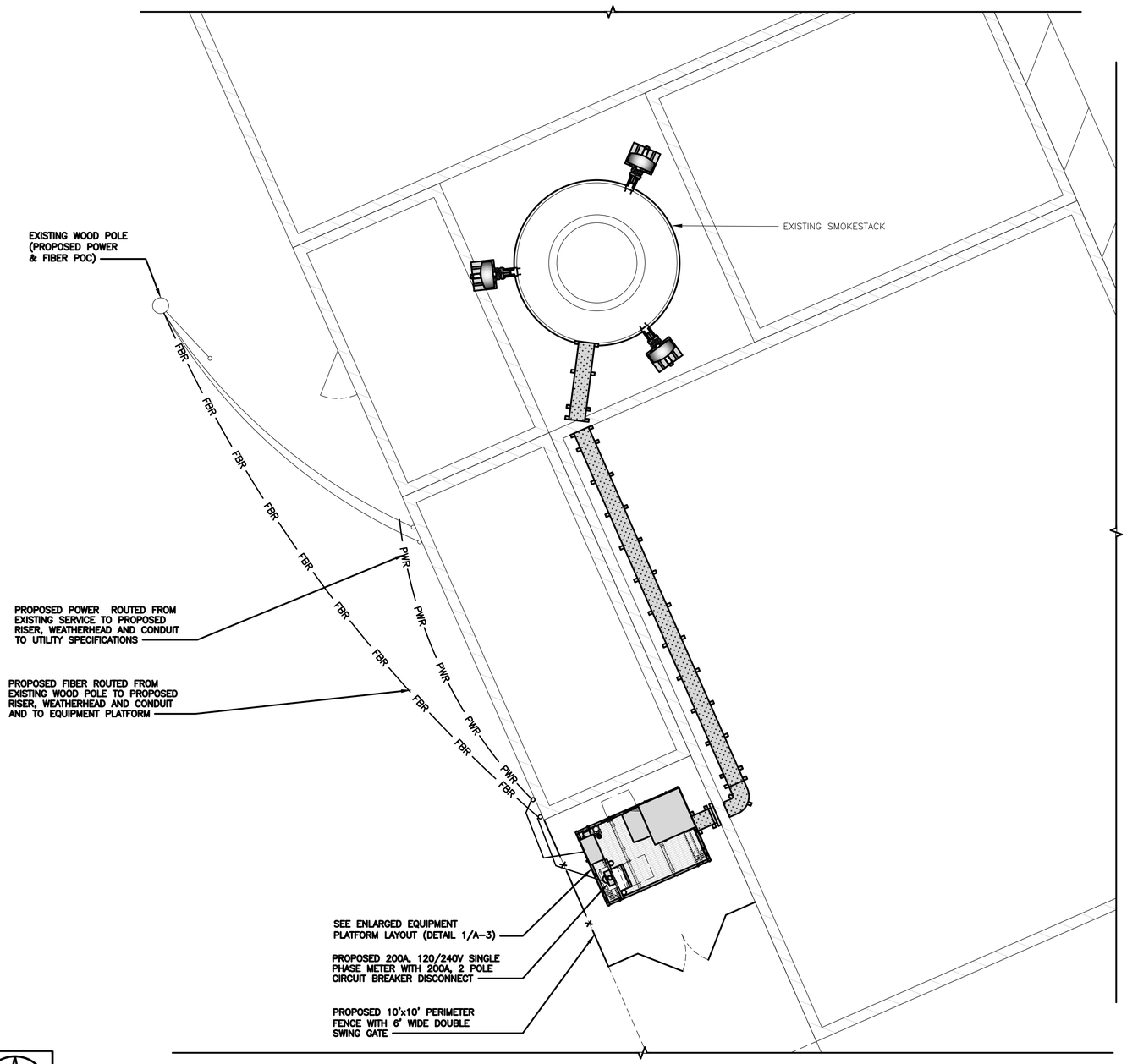
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00119B
150 EAST AURORA ST.
WATERBURY, CT 06708

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.
3. THE GROUND LEASE PROVIDES BROAD/BLANKET UTILITY RIGHTS. "PWR" AND "FBR" PATH DEPICTED ON A-1 AND E-1 ARE BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO FIELD VERIFICATION, PRIOR PROJECT DOCUMENTATION AND OTHER REAL PROPERTY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS NOT AN OPTION, PLEASE NOTIFY TOWER OWNER AS FURTHER COORDINATION MAY BE NEEDED.



UTILITY ROUTE PLAN

12' 8' 4' 0 10' 20'
3/32"=1'-0"

1

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

ELECTRICAL NOTES

NO SCALE

2

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STATE OF CONNECTICUT
MICHAEL R. SNYDER
32295
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Michael Snyder
B440E67B8F774C1...
5/18/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
MC	MDC	MDC

RFDS REV #: REV 1 – 10/14/2021

CONSTRUCTION DOCUMENTS

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DISH Wireless L.L.C.
PROJECT INFORMATION
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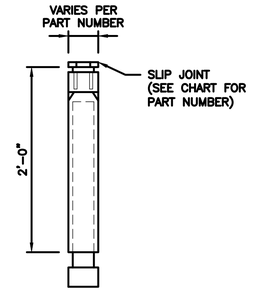
150 EAST AURORA ST.
WATERBURY, CT 06708

SHEET TITLE
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER
E-1

CARLON EXPANSION FITTINGS

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

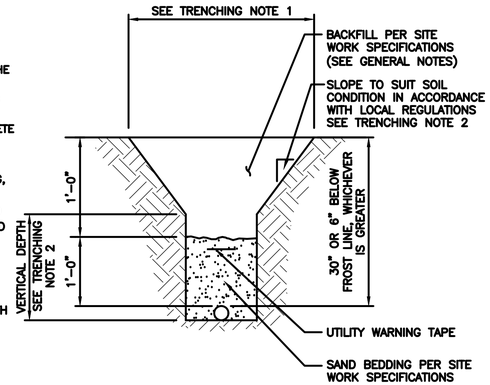


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

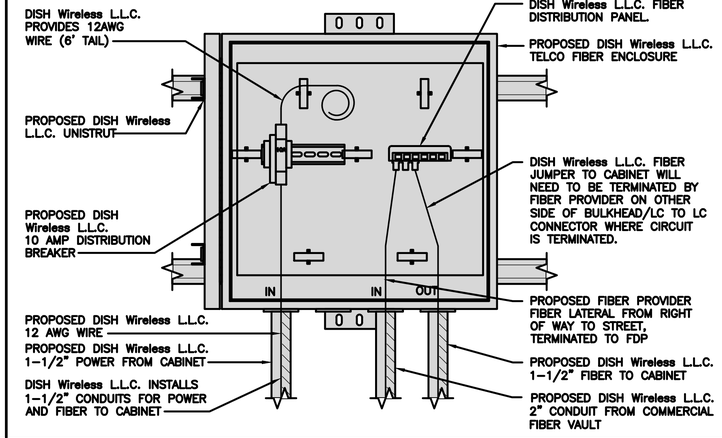
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

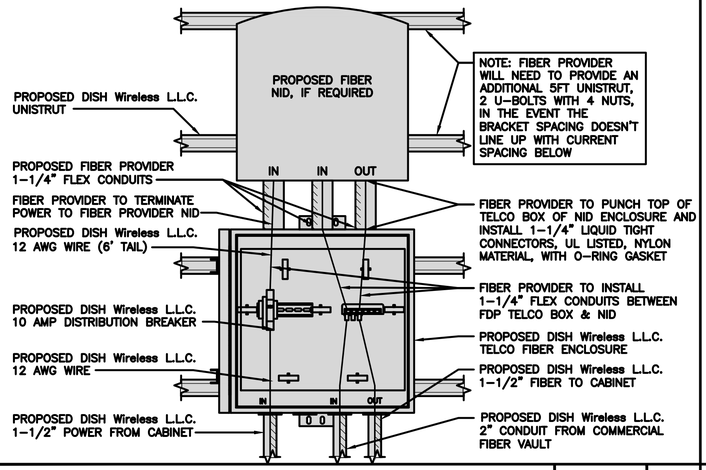
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
3. 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.



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



DARK TELCO BOX – INTERIOR WIRING LAYOUT | NO SCALE | 3



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

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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STATE OF CONNECTICUT
MICHAEL R. SNYDER
32295
LICENSED
PROFESSIONAL ENGINEER
DocuSigned by:
5/18/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
MC	MDC	MDC

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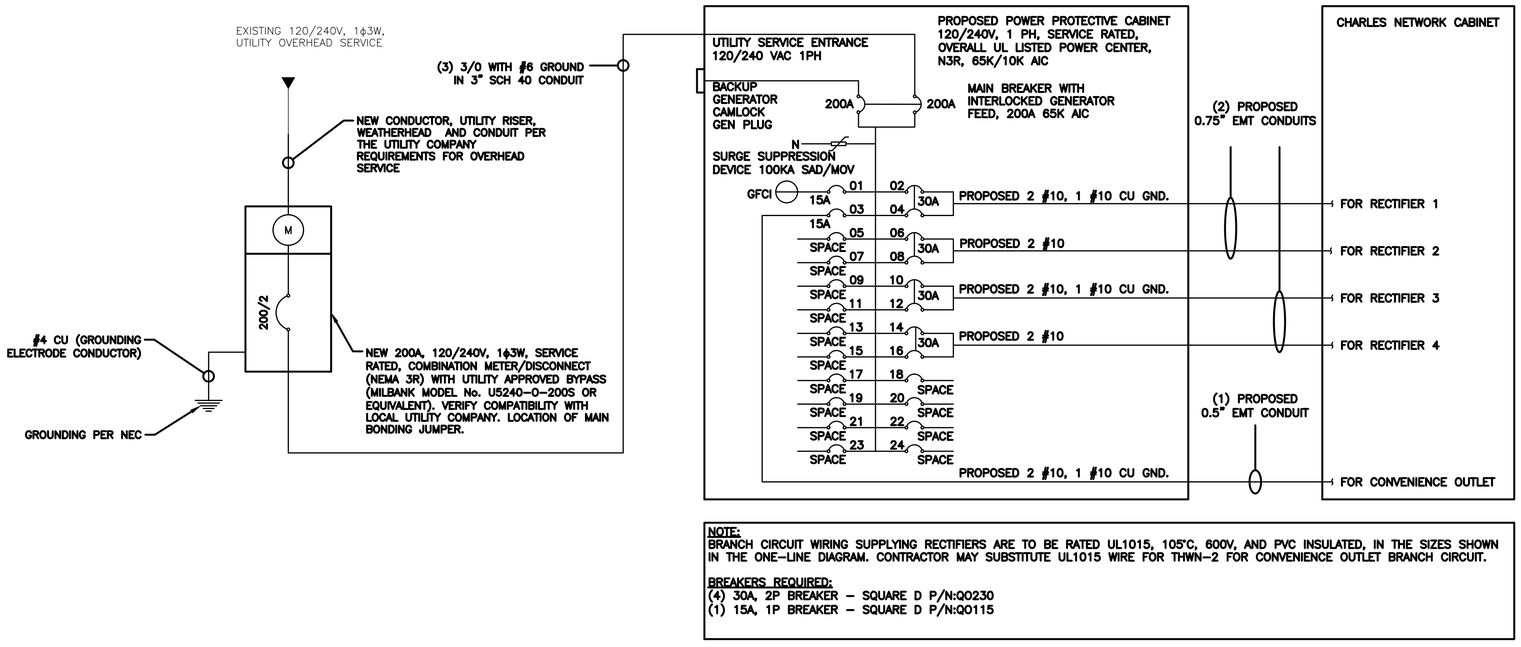
PROJECT INFORMATION
BOHVN00119B
150 EAST AURORA ST.
WATERBURY, CT 06708

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2



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

BREAKERS REQUIRED:
(4) 30A, 2P BREAKER – SQUARE D P/N:QO230
(1) 15A, 1P BREAKER – SQUARE D P/N:QO115

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

PANEL SCHEDULE — NO SCALE — 2

NOT USED — NO SCALE — 3

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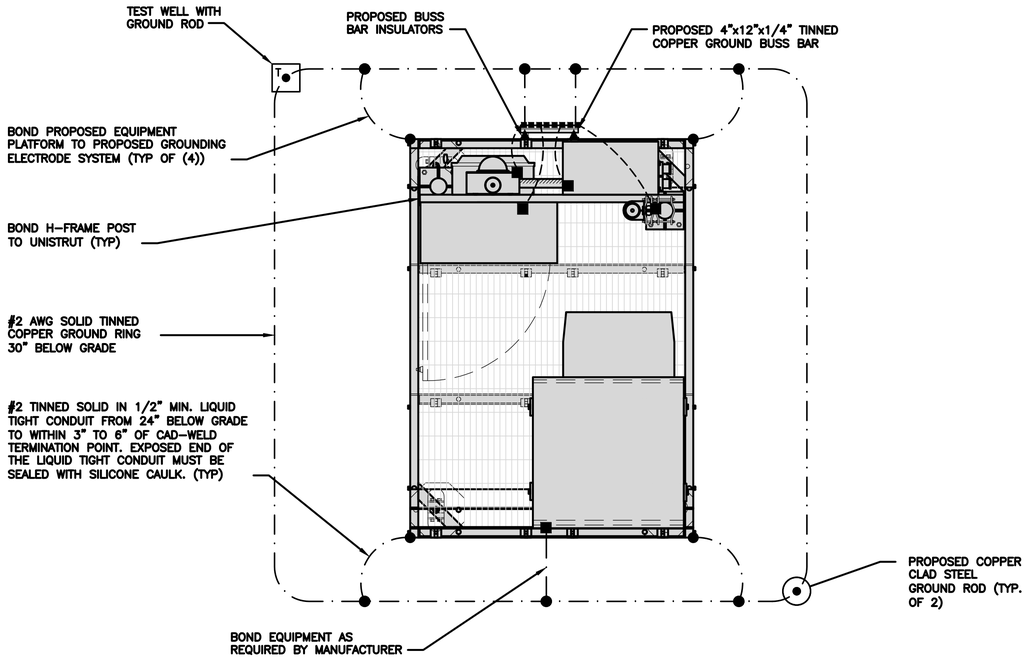
SHEET TITLE
ELECTRICAL ONE–LINE
& PANEL SCHEDULE

SHEET NUMBER
E-3

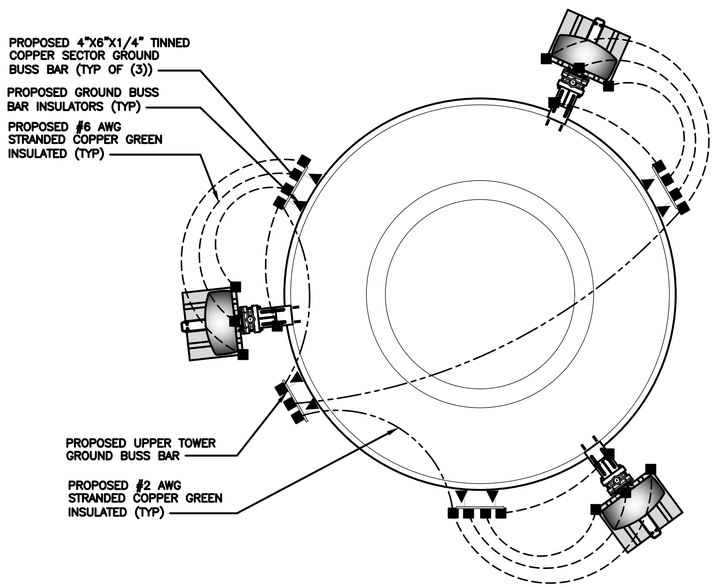


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1

NOTES

ANTENNAS AND OVP SHOWN ARE GENERIC AND NOT REFERENCING TO A SPECIFIC MANUFACTURER. THIS LAYOUT IS FOR REFERENCE PURPOSES 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
- #2 AWG STRANDED & INSULATED
- 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

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

nexius
2595 NORTH DALLAS PARKWAY
SUITE 300
FRISCO, TX 75034

STATE OF CONNECTICUT
MICHAEL R. SNYDER
32295
LICENSED
PROFESSIONAL ENGINEER
DocuSigned by:
B440E878BF774C1...
5/18/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
MC	MDC	MDC

RFDS REV #: REV 1 – 10/14/2021

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	05/18/2022	FINAL CD

A&E PROJECT NUMBER
BOHVN00119B

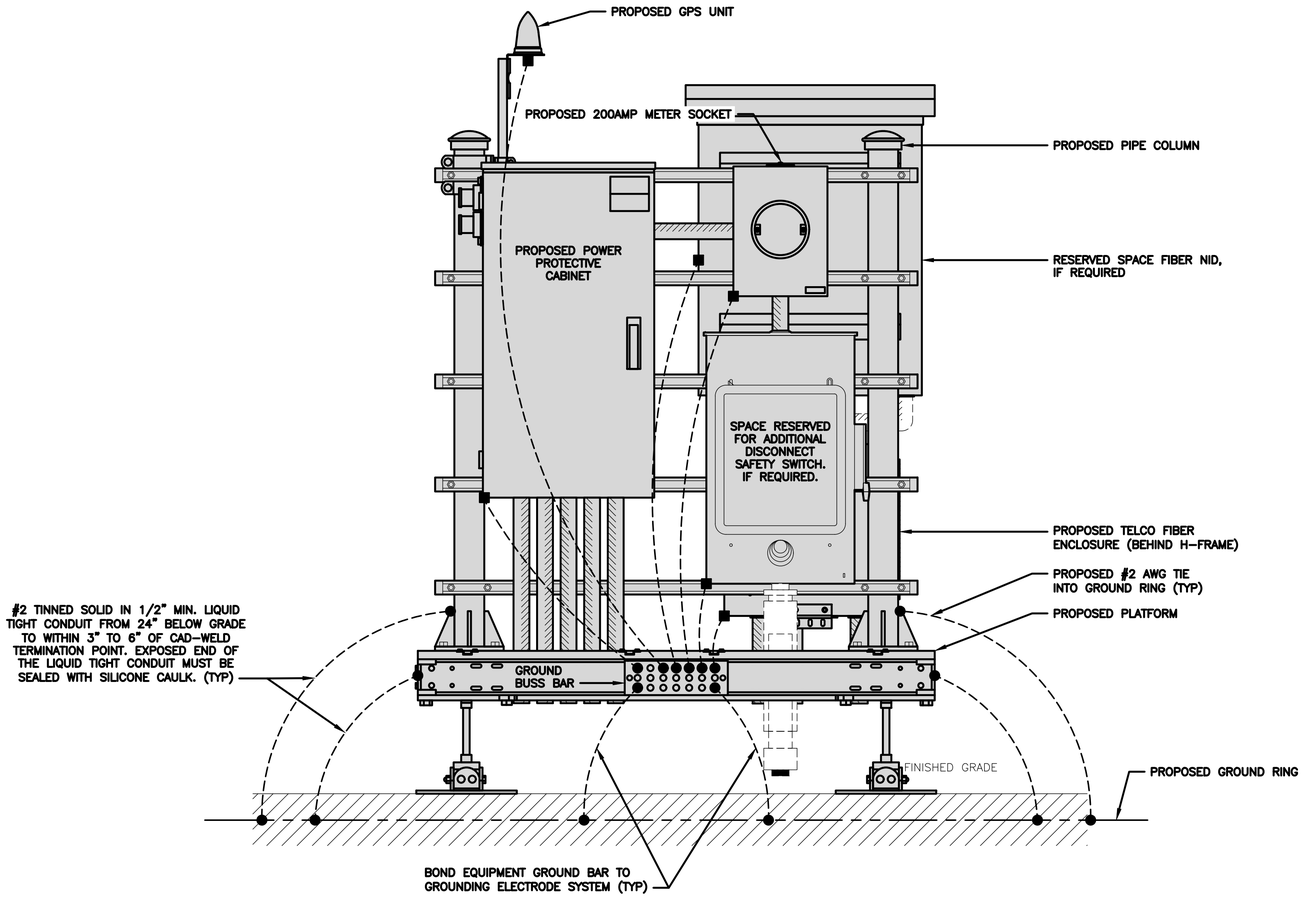
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00119B
150 EAST AURORA ST.
WATERBURY, CT 06708

SHEET TITLE
GROUNDING PLANS AND NOTES

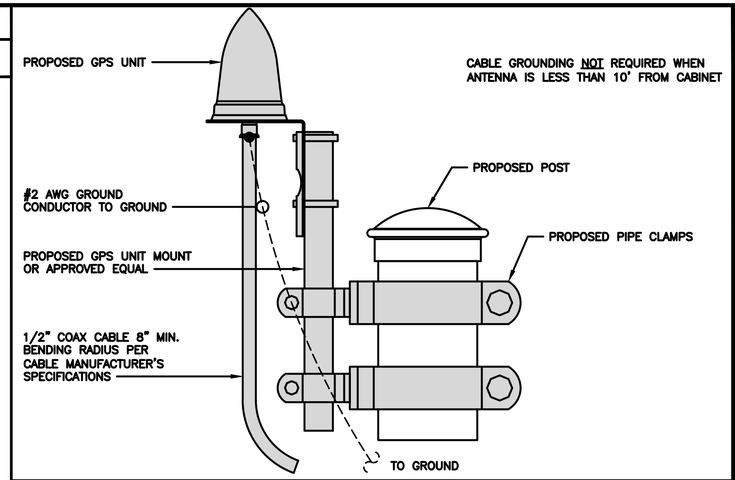
SHEET NUMBER
G-1

NOTES

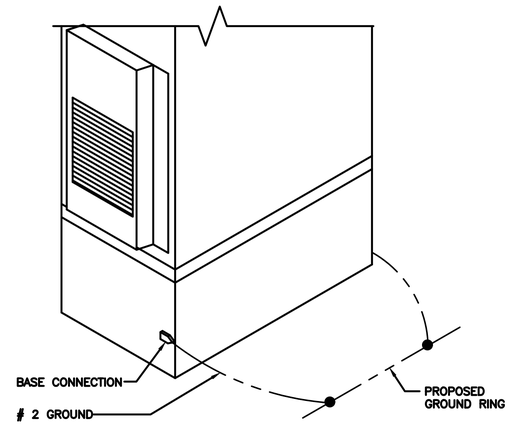
EQUIPMENT CABINET OMITTED FOR CLARITY



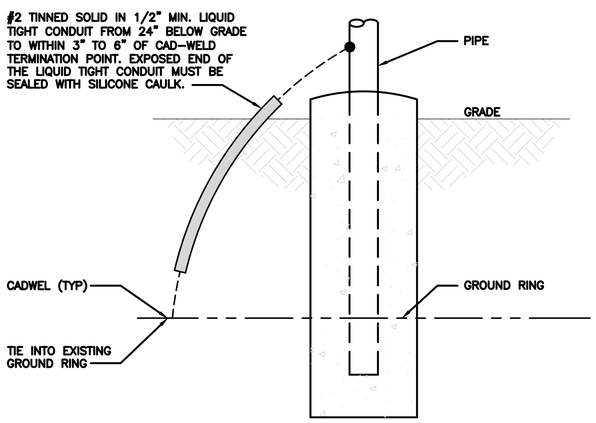
H-FRAME GROUNDING DETAIL | NO SCALE | 1



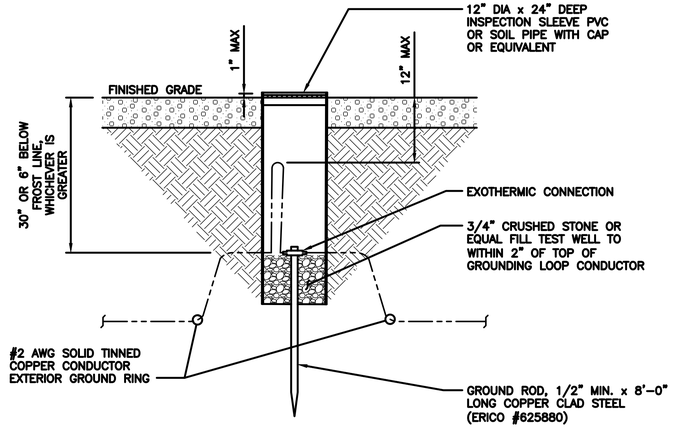
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



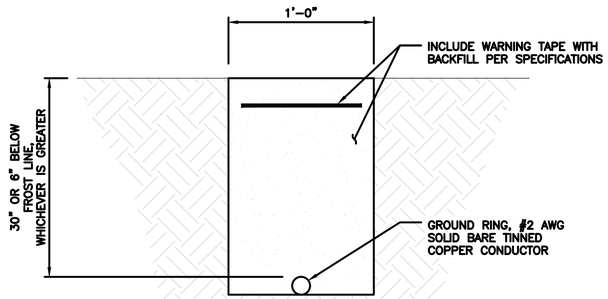
OUTDOOR CABINET GROUNDING | NO SCALE | 3



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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STATE OF CONNECTICUT · MICHAEL R. SNYDER · 32295 · LICENSED PROFESSIONAL ENGINEER

DocuSigned by: 5/18/2022

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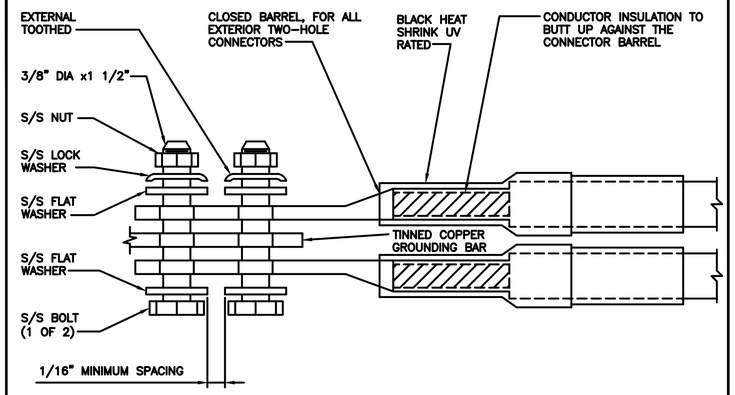
WATERBURY, CT 06708

SHEET TITLE
GROUNDING DETAILS

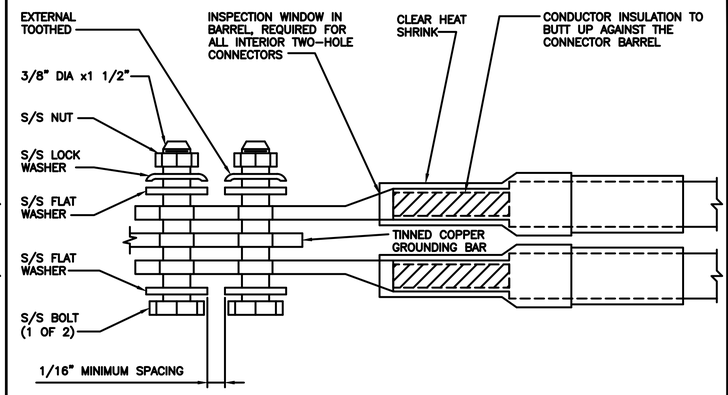
SHEET NUMBER
G-2

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).

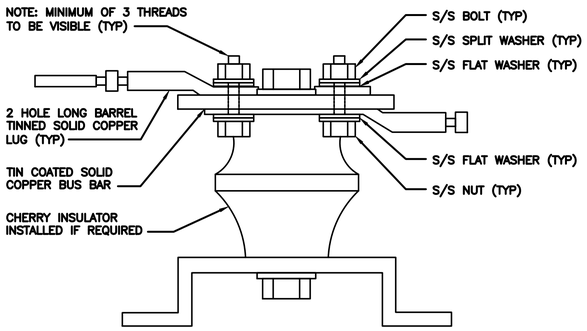
TYPICAL GROUNDING NOTES | NO SCALE | 1



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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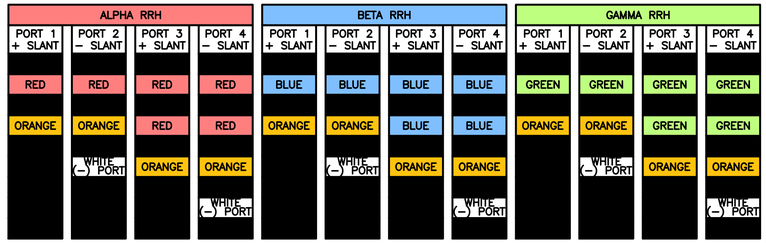
SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-3

HYBRID/DISCREET CABLES — 3/4" TAPE WIDTHS WITH 3/4" SPACING

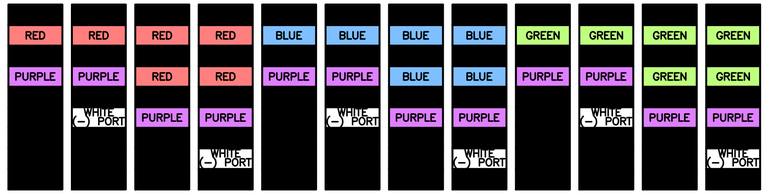
LOW–BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) – OPTIONAL PER MARKET

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



MID–BAND RRH
(AWS BANDS N66+N70)

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



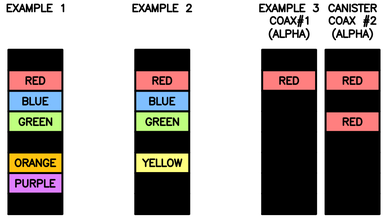
HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.

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

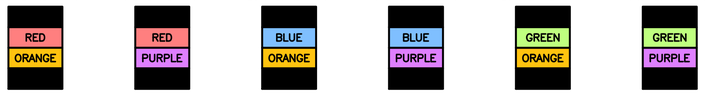
EXAMPLE 2 – HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS.

EXAMPLE 3 – MAIN COAX WITH GROUND MOUNTED RRHs.



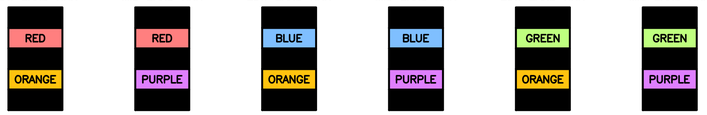
FIBER JUMPERS TO RRHs

LOW–BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.



POWER CABLES TO RRHs

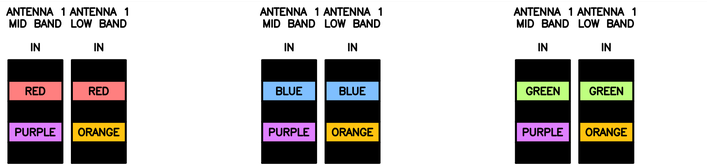
LOW–BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



RET MOTORS AT ANTENNAS

RET CONTROL IS HANDLED BY THE MID–BAND RRH WHEN ONE SET OF RET PORTS EXIST ON ANTENNA.

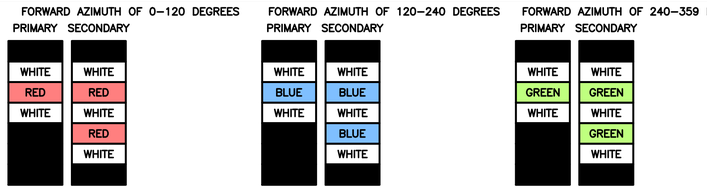
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



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.



RF CABLE COLOR CODES | NO SCALE | 1

LOW BANDS (N71+N26) OPTIONAL – (N29): ORANGE

AWS (N66+N70+H–BLOCK): PURPLE

CBRS TECH (3 GHz): YELLOW

NEGATIVE SLANT PORT ON ANT/RRH: WHITE

ALPHA SECTOR: RED

BETA SECTOR: BLUE

GAMMA SECTOR: GREEN

COLOR IDENTIFIER | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

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150 EAST AURORA ST.
WATERBURY, CT 06708

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 — T

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE — T

SINGLE POLE SWITCH — $

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE — GFCI

FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48–T8 — F

SMOKE DETECTION (DC) — SD

EMERGENCY LIGHTING (DC)

SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED–1–25A400/51K–SR4–120–PE–DDBTXD

CHAIN LINK FENCE — X X X X

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE — W W W W W

UNDERGROUND POWER — UGP UGP UGP UGP UGP

UNDERGROUND TELCO — UGT UGT UGT UGT UGT

OVERHEAD POWER — OHP OHP OHP OHP

OVERHEAD TELCO — OHT OHT OHT OHT

UNDERGROUND TELCO/POWER — UGT/P UGT/P UGT/P UGT/P

ABOVE GROUND POWER — AGP AGP AGP AGP AGP

ABOVE GROUND TELCO — AGT AGT AGT AGT AGT

ABOVE GROUND TELCO/POWER — AGT/P AGT/P AGT/P AGT/P

WORKPOINT — W.P.

SECTION REFERENCE — XX / X–X

DETAIL REFERENCE — XX / X–X

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	UNITERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

ABBREVIATIONS

dish wireless.
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SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH Wireless L.L.C. AND TOWER OWNER NOC & THE DISH Wireless L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.

2. "LOOK UP" – DISH Wireless L.L.C. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:

THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR DISH Wireless L.L.C. AND DISH Wireless L.L.C. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.

3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.

4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND DISH Wireless L.L.C. AND TOWER OWNER STANDARDS, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).

5. ALL SITE WORK TO COMPLY WITH DISH Wireless L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH Wireless L.L.C. AND TOWER OWNER TOWER SITE AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."

6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH Wireless L.L.C. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.

7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.

10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.

11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.

12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF DISH Wireless L.L.C. AND TOWER OWNER, AND/OR LOCAL UTILITIES.

14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.

15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.

16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.

17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.

18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1.FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.

3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.

4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.

5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.

6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.

7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.

11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.

12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF DISH Wireless L.L.C. AND TOWER OWNER

13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

dish wireless.

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DRAWN BY:	CHECKED BY:	APPROVED BY:
MC	MDC	MDC

RFDS REV #: REV 1 – 10/14/2021

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SUBMITTALS

REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER

BOHVN00119B

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00119B

150 EAST AURORA ST.

WATERBURY, CT 06708

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.

dish wireless.

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MC	MDC	MDC

RFDS REV #: REV 1 – 10/14/2021

CONSTRUCTION DOCUMENTS

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A&E PROJECT NUMBER

BOHVN00119B

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00119B
150 EAST AURORA ST.
WATERBURY, CT 06708

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.

dish wireless.

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150 EAST AURORA ST.

WATERBURY, CT 06708

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Attachment 5

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

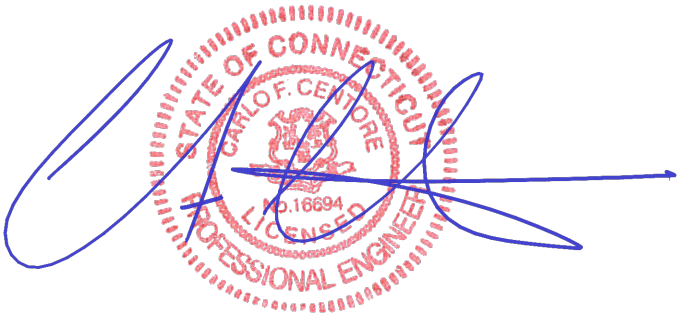
109-ft Existing Masonry Smokestack

Dish Site Ref: BOHVN00119B

150 East Aurora Street
Waterbury, CT 06708

Centek Project No. 22048.00

Date: April 07, 2022



Prepared for:
Nexius
2595 N. Dallas Parkway, Suite 300
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Table of Contents

Introduction

The purpose of this report is to summarize the results of the structural analysis performed on the adequacy of the existing host masonry smokestack to accommodate the equipment upgrade proposed by Dish located at 150 E Aurora Street, Waterbury, Connecticut.

The host structure is a 109.375-ft tall masonry smokestack. The top diameter of the smokestack is 6.42 ft and the bottom diameter is 9.2 ft. The smokestack top wall thickness is 8 inches, and the bottom wall thickness is 17 inches. The T-Mobile and Dish antennas and radio equipment are installed on pipe masts that are attached to the smokestack through round chimney mounts.

The smokestack geometry and structural information were obtained from a structural report prepared by Infinigy, job no. 368-000, dated March 9, 2016. T-Mobile equipment information was obtained from construction documents prepared by Centek Engineering, job no. 18058.51, dated June 29, 2018. The proposed Dish antenna and appurtenance information was taken from the Dish RF data sheet dated 10/14/21.

Equipment Installation Summary

Carrier	Antenna/Equipment	Elevations
T-Mobile	(3) Ericsson AIR21 antennas (3) Ericsson AIR32 antennas (3) Ericsson 4449 B71+B12 RRU	±105-ft
T-Mobile	(3) RFS APXVAARR24-43-U-NA20 antennas	±95-ft
Dish	**(3) JMA MX08FR0665-21 antennas** **(3) Fujitsu TA08025-B605 RRU** **(3) Fujitsu TA08025-B604 RRU**	±82-ft

Equipment – Proposed
Equipment – Existing

Design Loading

Loading was determined per the requirements of the 2015 International Building Code and ASCE 7-10 “Minimum Design Loads for Buildings and Other Structures”.

Wind Speed:	Vult = 125 mph	*[Appendix N of the 2016 CT Building Code]*
Exposure Category:	B	*[2015 IBC, Table 1604.5]*
Risk Category	II	*[ASCE 7-10, Table 1.5-1]*

Results

Smokestack:

Component	Stress Ratio (percentage of capacity)	Result
Compression	38.0%	**PASS**
Tension of Mortar	78.0%	**PASS**

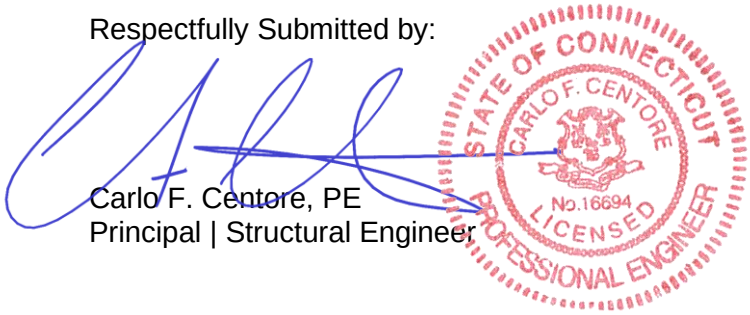
Conclusion

This analysis finds the impacted host smokestack to be **STRUCTURALLY ADEQUATE** to support the proposed Dish modified antenna configuration.

The analysis is based, in part, on the information provided to this office by Dish. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Carlo F. Centore, PE
Principal | Structural Engineer

Prepared by:

Pablo Perez-Gomez
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

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Job: BOHVN00119B
Address: 150 East Aurora St.,
Waterbury, CT, 06708
Smokestack Evaluation

Project No.: 22048.00
Computed By: PPG
Checked By: CFC

Carrier	Elevation (ft)	Antenna/Equipmment	Front Wind Force (lbs)	Side Wind Force (lbs)	Weight (lbs)
T-Mobile	105	Ericsson KRC118023-1_B2A_B4P	208	134	92
T-Mobile	105	Ericsson KRD901146-1_B66A_B2A	224	151	133
T-Mobile	105	Ericsson 4449 B71+B12	60	47	74
T-Mobile	95	RFS APXVAARR24_43-U-NA20	681	247	153
Dish	82	JMA MX08FR0665-21	437	175	64.5
Dish	82	Fujitsu TA08025-B605	71	43	74.95
Dish	82	Fujitsu TA08025-B604	71	38	63.93

NOTE:
The wind force on the host smokestack stucture from the attached antennas was calculated by adding the highest side wind force of given equipment and multiplying it by two (2). It is multiplied by two because it is assumed that the worst case scenerio is when the wind is hitting two sectors on the side and the third sector on the front. However, the front wind load of the third sector can be ignored since that surface area of said sector is already encompased in the surface area calculation of the entire smokestack. For the unknown equipment at elevation ±95-ft., assume the same wind force as the T-Mobile equipment at elevation ±105-ft.

Carier	Elevation (ft)	Side Wind Load Sum (lbs)	2 Sectors (lbs)	Total Weight of All Equipment in 3 sectors (lbs)
T-Mobile	105	285	570	897
T-Mobile	95	247	494	459
Dish	82	256	512	610.14

Given Smockstack Dimensions		
Smokestack Top Elevation, H_{top} =	109.375	ft
Smokestack Top Diameter, D_{top} =	6.42	ft
Smokestack Bottom Diameter, D_{bot} =	9.2	ft
Smokestack Top Wall Thickness, T_{top} =	0.67	ft
Smokestack Bottom Wall Thickness, T_{bot} =	1.42	ft

Calculations		
Smokestack Base Area, A_{base} =	34.64	ft^2
Smokestack Volume, V_s =	2466.18	ft^3
Smokestack Brick Unit Weight, W_{brick} =	125	pcf
Smokestack Total Weight, $W_{smokestack}$ =	308272.19	lbs
Total Weight Applied at Base, W_{total} =	341201.15	lbs
Applied Axial Stress at Base, f_a =	68.4	psi
Ultimate Wind Pressure, F_{ult} =	27.0	psf
ASD Wind Pressure, F_{ASD} =	16.2	psf
Exposure Coefficient, K_z =	0.833	
Wind Area of One Face of Smokestack, A_{face} =	854.22	ft^2

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Smokestack Evaluation

Project No.: 22048.00
Computed By: PPG
Checked By: CFC

Wind Force on Smokestack, $F_{smokestack}$ =	11527.3	lbs
Moment at Base Due to Smokestack, $M_{smokestack}$ =	779165.4	lbs-ft
Section Modulus at Base, $M_{smokestack}$ =	58.91	ft^3
Bending Stress at Base, f_b =	91.84	psi
Moment of inertia at Base, I_b =	271.01	ft^4
Allowable Bearing Pressure of Brick, f_m =	1500	psi
Radius of Gyration, r_b =	2.80	ft
h/r_b Ratio =	39.10	
Allowable Axial Pressure of Smokestack, F_a =	345.74	psi
Allowable Bending Pressure of Smokestack, F_b =	500.00	psi
Applied Tensile Pressure on Smokestack, f_t =	23.44	psi
Applied Tensile Pressure on Smokestack, F_t =	30.00	psi

Results		
$(f_a/F_a) + (f_b/F_b) < 1.0$ =	0.38	PASS
$f_t/F_t < 1.0$ =	0.78	PASS

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Subject: Wind Load on Equipment per ASCE 7-10

Location: Waterbury, CT

Rev. 1: 04/06/22

Prepared by: PPG; Checked by: CFC
Job No. 22048.02

Design Wind Load on Other Structures: (Based on IBC 2015, CSBC 2018 and ASCE 7-10)

Wind Speed =	$V := 125$ mph	(User Input)	(CSBC Appendix-N)
Risk Category =	$BC := II$	(User Input)	(IBC Table 1604.5)
Exposure Category =	$Exp := B$	(User Input)	
Structure Type =	$Structuretype := Round\_Chimney$	(User Input)	
Structure Height =	$Height := 109.375$ ft	(User Input)	
Horizontal Dimension of Structure =	$Width := 7.81$ ft	(User Input)	

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer =

$$zg := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 1200 \\ \text{if } Exp = C \\ \quad \| \ 900 \\ \text{if } Exp = D \\ \quad \| \ 700 \end{array} \right| = 1.2 \cdot 10^3$$

(Table 26.9-1)

3-Sec Gust Speed Power Law Exponent =

$$\alpha := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 7 \\ \text{if } Exp = C \\ \quad \| \ 9.5 \\ \text{if } Exp = D \\ \quad \| \ 11.5 \end{array} \right| = 7$$

(Table 26.9-1)

Integral Length Scale Factor =

$$l := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 320 \\ \text{if } Exp = C \\ \quad \| \ 500 \\ \text{if } Exp = D \\ \quad \| \ 650 \end{array} \right| = 320$$

(Table 26.9-1)

Integral Length Scale Power Law Exponent =

$$E := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ \frac{1}{3} \\ \text{if } Exp = C \\ \quad \| \ \frac{1}{5} \\ \text{if } Exp = D \\ \quad \| \ \frac{1}{8} \end{array} \right| = 0.333$$

(Table 26.9-1)

Turbulence Intensity Factor =

$$c := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 0.3 \\ \text{if } Exp = C \\ \quad \| \ 0.2 \\ \text{if } Exp = D \\ \quad \| \ 0.15 \end{array} \right| = 0.3$$

(Table 26.9-1)

Exposure Constant = $Z_{min} := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| 30 \\ \text{if } Exp = C \\ \quad \| 15 \\ \text{if } Exp = D \\ \quad \| 7 \end{array} \right\| = 30$ (Table 26.9-1)

Topographic Factor = $K_{zt} := 1$ (Eq. 26.8-2)

Wind Directionality Factor = $K_d = 0.95$ (Table 26.6-1)

Velocity Pressure = $q_z := 0.00256 \cdot K_{zt} \cdot K_d \cdot V^2 = 38.00$ (Eq. 29.3-1)

Peak Factor for Background Response = $g_Q := 3.4$ (Sec 26.9.4)

Peak Factor for Wind Response = $g_v := 3.4$ (Sec 26.9.4)

Equivalent Height of Structure = $z := \left\| \begin{array}{l} \text{if } Z_{min} > 0.6 \cdot Height \\ \quad \| Z_{min} \\ \text{else} \\ \quad \| 0.6 \cdot Height \end{array} \right\| = 65.625$ (Sec 26.9.4)

Intensity of Turbulence = $I_z := c \cdot \left(\frac{33}{z} \right)^{\left(\frac{1}{6} \right)} = 0.268$ (Eq. 26.9-7)

Integral Length Scale of Turbulence = $L_Z := l \cdot \left(\frac{z}{33} \right)^{E} = 402.41$ (Eq. 26.9-9)

Background Response Factor = $Q := \sqrt{\frac{1}{1 + 0.63 \cdot \left(\frac{Width + Height}{L_Z} \right)^{0.63}}} = 0.881$ (Eq. 26.9-8)

Gust Response Factor = $G := 0.925 \cdot \left(\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q \right)}{1 + 1.7 \cdot g_v \cdot I_z} \right) = 0.858$ (Eq. 26.9-6)

Force Coefficient = $C_f = 0.839$ (Fig 29.5-1 - 29.5-3)

Wind Force = $F := q_z \cdot G \cdot C_f = 27$ psf

Height Above Grade = $Z := 55$ ft

Exposure Coefficient = $K_z := \left\| \begin{array}{l} \text{if } 15 \le Z \le zg \\ \quad \left\| 2.01 \cdot \left(\frac{Z}{zg} \right)^{\left(\frac{2}{\alpha} \right)} \right. \end{array} \right\| = 0.83$ (Table 29.3-1)

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Subject: Wind Load on Equipment per ASCE 7-10

Location: Waterbury, CT

Rev. 1: 04/06/22

Prepared by: PPG; Checked by: CFC
Job No. 22048.02

Design Wind Load on Other Structures: (Based on IBC 2015, CSBC 2018 and ASCE 7-10)

Wind Speed =	$V := 125$ mph	(User Input)	(CSBC Appendix-N)
Risk Category =	$BC := II$	(User Input)	(IBC Table 1604.5)
Exposure Category =	$Exp := B$	(User Input)	
Height Above Grade =	$Z := 82$ ft	(User Input)	
Structure Type =	$Structuretype := Square\_Chimney$	(User Input)	
Structure Height =	$Height := 6$ ft	(User Input)	
Horizontal Dimension of Structure =	$Width := 1.67$ ft	(User Input)	

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer = $zg := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 1200 \\ \text{if } Exp = C \\ \quad \| \ 900 \\ \text{if } Exp = D \\ \quad \| \ 700 \end{array} \right\| = 1.2 \cdot 10^3$ (Table 26.9-1)

3-Sec Gust Speed Power Law Exponent = $\alpha := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 7 \\ \text{if } Exp = C \\ \quad \| \ 9.5 \\ \text{if } Exp = D \\ \quad \| \ 11.5 \end{array} \right\| = 7$ (Table 26.9-1)

Integral Length Scale Factor = $l := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 320 \\ \text{if } Exp = C \\ \quad \| \ 500 \\ \text{if } Exp = D \\ \quad \| \ 650 \end{array} \right\| = 320$ (Table 26.9-1)

Integral Length Scale Power Law Exponent = $E := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ \frac{1}{3} \\ \text{if } Exp = C \\ \quad \| \ \frac{1}{5} \\ \text{if } Exp = D \\ \quad \| \ \frac{1}{8} \end{array} \right\| = 0.333$ (Table 26.9-1)

Turbulence Intensity Factor = $c := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 0.3 \\ \text{if } Exp = C \\ \quad \| \ 0.2 \\ \text{if } Exp = D \\ \quad \| \ 0.15 \end{array} \right\| = 0.3$ (Table 26.9-1)

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Exposure Constant = $Z_{min} := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| 30 \\ \text{if } Exp = C \\ \quad \| 15 \\ \text{if } Exp = D \\ \quad \| 7 \end{array} \right| = 30$ (Table 26.9-1)

Exposure Coefficient = $K_z := \left\| \begin{array}{l} \text{if } 15 \le Z \le zg \\ \quad \| 2.01 \cdot \left(\frac{Z}{zg} \right)^{\left(\frac{2}{\alpha} \right)} \end{array} \right| = 0.93$ (Table 29.3-1)

Topographic Factor = $K_{zt} := 1$ (Eq. 26.8-2)

Wind Directionality Factor = $K_d = 0.9$ (Table 26.6-1)

Velocity Pressure = $q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 = 33.62$ (Eq. 29.3-1)

Peak Factor for Background Response = $g_Q := 3.4$ (Sec 26.9.4)

Peak Factor for Wind Response = $g_v := 3.4$ (Sec 26.9.4)

Equivalent Height of Structure = $z := \left\| \begin{array}{l} \text{if } Z_{min} > 0.6 \cdot Height \\ \quad \| Z_{min} \\ \text{else} \\ \quad \| 0.6 \cdot Height \end{array} \right| = 30$ (Sec 26.9.4)

Intensity of Turbulence = $I_z := c \cdot \left(\frac{33}{z} \right)^{\left(\frac{1}{6} \right)} = 0.305$ (Eq. 26.9-7)

Integral Length Scale of Turbulence = $L_Z := l \cdot \left(\frac{z}{33} \right)^{E} = 309.993$ (Eq. 26.9-9)

Background Response Factor = $Q := \sqrt{\frac{1}{1 + 0.63 \cdot \left(\frac{Width + Height}{L_Z} \right)^{0.63}}} = 0.971$ (Eq. 26.9-8)

Gust Response Factor = $G := 0.925 \cdot \left(\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q \right)}{1 + 1.7 \cdot g_v \cdot I_z} \right) = 0.908$ (Eq. 26.9-6)

Force Coefficient = $C_f = 1.343$ (Fig 29.5-1 - 29.5-3)

Wind Force = $F := q_z \cdot G \cdot C_f = 41$ psf

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	JMA MX08FR0665-21		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 20$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8$	in	(User Input)
Antenna Weight =	$WT_{ant} := 64.5$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 10$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 10$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 410$	lbs

Wind Load (Side)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 4$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 4$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 164$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 65$	lbs

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Development of Wind & Ice Load on RRHs

RRUS Data:

RRUS Model =	Fujitsu TA08025-B605		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{ant} := 15.75$	in	(User Input)
RRUS Width =	$W_{ant} := 14.96$	in	(User Input)
RRUS Thickness =	$T_{ant} := 9.06$	in	(User Input)
RRUS Weight =	$WT_{ant} := 74.95$	lbs	(User Input)
Number of RRUS =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One RRUS =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 1.6$	sf
RRUS Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 1.6$	sf
Total RRUS Wind Force =	$F_{ant} := F \cdot A_{ant} = 67$	lbs

Wind Load (Side)

Surface Area for One RRUS =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 1$	sf
RRUS Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 1$	sf
Total RRUS Wind Force =	$F_{ant} := F \cdot A_{ant} = 41$	lbs

Gravity Load (without ice)

Weight of All RRUS =	$WT_{ant} \cdot N_{ant} = 75$	lbs

Development of Wind & Ice Load on RRHs

RRUS Data:

RRUS Model =	Fujitsu TA08025-B604		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{ant} := 15.75$	in	(User Input)
RRUS Width =	$W_{ant} := 14.96$	in	(User Input)
RRUS Thickness =	$T_{ant} := 7.87$	in	(User Input)
RRUS Weight =	$WT_{ant} := 63.93$	lbs	(User Input)
Number of RRUS =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One RRUS =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 1.6$	sf
RRUS Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 1.6$	sf
Total RRUS Wind Force =	$F_{ant} := F \cdot A_{ant} = 67$	lbs

Wind Load (Side)

Surface Area for One RRUS =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 0.9$	sf
RRUS Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.9$	sf
Total RRUS Wind Force =	$F_{ant} := F \cdot A_{ant} = 35$	lbs

Gravity Load (without ice)

Weight of All RRUS =	$WT_{ant} \cdot N_{ant} = 64$	lbs

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Subject: Wind Load on Equipment per ASCE 7-10

Location: Waterbury, CT

Rev. 1: 04/06/22

Prepared by: PPG; Checked by: CFC
Job No. 22048.02

Design Wind Load on Other Structures: (Based on IBC 2015, CSBC 2018 and ASCE 7-10)

Wind Speed =	$V := 125$ mph	(User Input)	(CSBC Appendix-N)
Risk Category =	$BC := II$	(User Input)	(IBC Table 1604.5)
Exposure Category =	$Exp := B$	(User Input)	
Height Above Grade =	$Z := 105$ ft	(User Input)	
Structure Type =	$Structuretype := Square\_Chimney$	(User Input)	
Structure Height =	$Height := 4.75$ ft	(User Input)	
Horizontal Dimension of Structure =	$Width := 1$ ft	(User Input)	

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer = $zg := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 1200 \\ \text{if } Exp = C \\ \quad \| \ 900 \\ \text{if } Exp = D \\ \quad \| \ 700 \end{array} \right. = 1.2 \cdot 10^3$ (Table 26.9-1)

3-Sec Gust Speed Power Law Exponent = $\alpha := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 7 \\ \text{if } Exp = C \\ \quad \| \ 9.5 \\ \text{if } Exp = D \\ \quad \| \ 11.5 \end{array} \right. = 7$ (Table 26.9-1)

Integral Length Scale Factor = $l := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 320 \\ \text{if } Exp = C \\ \quad \| \ 500 \\ \text{if } Exp = D \\ \quad \| \ 650 \end{array} \right. = 320$ (Table 26.9-1)

Integral Length Scale Power Law Exponent = $E := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ \frac{1}{3} \\ \text{if } Exp = C \\ \quad \| \ \frac{1}{5} \\ \text{if } Exp = D \\ \quad \| \ \frac{1}{8} \end{array} \right. = 0.333$ (Table 26.9-1)

Turbulence Intensity Factor = $c := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 0.3 \\ \text{if } Exp = C \\ \quad \| \ 0.2 \\ \text{if } Exp = D \\ \quad \| \ 0.15 \end{array} \right. = 0.3$ (Table 26.9-1)

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Subject: Wind Load on Equipment per ASCE 7-10

Location: Waterbury, CT

Rev. 1: 04/06/22

Prepared by: PPG; Checked by: CFC
Job No. 22048.02

Exposure Constant = $Z_{min} := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| 30 \\ \text{if } Exp = C \\ \quad \| 15 \\ \text{if } Exp = D \\ \quad \| 7 \end{array} \right| = 30$ (Table 26.9-1)

Exposure Coefficient = $K_z := \left\| \begin{array}{l} \text{if } 15 \le Z \le zg \\ \quad \| 2.01 \cdot \left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} \end{array} \right| = 1$ (Table 29.3-1)

Topographic Factor = $K_{zt} := 1$ (Eq. 26.8-2)

Wind Directionality Factor = $K_d = 0.9$ (Table 26.6-1)

Velocity Pressure = $q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 = 36.08$ (Eq. 29.3-1)

Peak Factor for Background Response = $g_Q := 3.4$ (Sec 26.9.4)

Peak Factor for Wind Response = $g_v := 3.4$ (Sec 26.9.4)

Equivalent Height of Structure = $z := \left\| \begin{array}{l} \text{if } Z_{min} > 0.6 \cdot Height \\ \quad \| Z_{min} \\ \text{else} \\ \quad \| 0.6 \cdot Height \end{array} \right| = 30$ (Sec 26.9.4)

Intensity of Turbulence = $I_z := c \cdot \left(\frac{33}{z}\right)^{\left(\frac{1}{6}\right)} = 0.305$ (Eq. 26.9-7)

Integral Length Scale of Turbulence = $L_Z := l \cdot \left(\frac{z}{33}\right)^{E} = 309.993$ (Eq. 26.9-9)

Background Response Factor = $Q := \sqrt{\frac{1}{1 + 0.63 \cdot \left(\frac{Width + Height}{L_Z}\right)^{0.63}}} = 0.975$ (Eq. 26.9-8)

Gust Response Factor = $G := 0.925 \cdot \left(\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q\right)}{1 + 1.7 \cdot g_v \cdot I_z}\right) = 0.91$ (Eq. 26.9-6)

Force Coefficient = $C_f = 1.343$ (Fig 29.5-1 - 29.5-3)

Wind Force = $F := q_z \cdot G \cdot C_f = 44$ psf

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson KRC118023-1_B2A_B4P		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56$	in	(User Input)
Antenna Width =	$W_{ant} := 12.1$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.8$	in	(User Input)
Antenna Weight =	$WT_{ant} := 92$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 4.7$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 208$	lbs

Wind Load (Side)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 3$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 3$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 134$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 92$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson KRD901146-1_B66A_B2A		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56.7$	in	(User Input)
Antenna Width =	$W_{ant} := 12.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 133$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.1$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 5.1$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 224$	lbs

Wind Load (Side)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.4$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 3.4$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 151$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 133$	lbs

Development of Wind & Ice Load on RRHs

RRUS Data:

RRUS Model =	Ericsson 4449 B71+B12		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{ant} := 14.9$	in	(User Input)
RRUS Width =	$W_{ant} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{ant} := 10.4$	in	(User Input)
RRUS Weight =	$WT_{ant} := 74$	lbs	(User Input)
Number of RRUS =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One RRUS =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 1.4$	sf
RRUS Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 1.4$	sf
Total RRUS Wind Force =	$F_{ant} := F \cdot A_{ant} = 60$	lbs

Wind Load (Side)

Surface Area for One RRUS =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.1$	sf
RRUS Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 1.1$	sf
Total RRUS Wind Force =	$F_{ant} := F \cdot A_{ant} = 47$	lbs

Gravity Load (without ice)

Weight of All RRUS =	$WT_{ant} \cdot N_{ant} = 74$	lbs

Design Wind Load on Other Structures: (Based on IBC 2015, CSBC 2018 and ASCE 7-10)

Wind Speed =	$V := 125$	mph	(User Input)	(CSBC Appendix-N)
Risk Category =	$BC := II$		(User Input)	(IBC Table 1604.5)
Exposure Category =	$Exp := B$		(User Input)	
Height Above Grade =	$Z := 95$	ft	(User Input)	
Structure Type =	$Structuretype := Square\_Chimney$		(User Input)	
Structure Height =	$Height := 8$	ft	(User Input)	
Horizontal Dimension of Structure =	$Width := 2$	ft	(User Input)	

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer =

$$zg := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 1200 \\ \text{if } Exp = C \\ \quad \| \ 900 \\ \text{if } Exp = D \\ \quad \| \ 700 \end{array} \right\| = 1.2 \cdot 10^3$$ (Table 26.9-1)

3-Sec Gust Speed Power Law Exponent =

$$\alpha := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 7 \\ \text{if } Exp = C \\ \quad \| \ 9.5 \\ \text{if } Exp = D \\ \quad \| \ 11.5 \end{array} \right\| = 7$$ (Table 26.9-1)

Integral Length Scale Factor =

$$l := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 320 \\ \text{if } Exp = C \\ \quad \| \ 500 \\ \text{if } Exp = D \\ \quad \| \ 650 \end{array} \right\| = 320$$ (Table 26.9-1)

Integral Length Scale Power Law Exponent =

$$E := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ \frac{1}{3} \\ \text{if } Exp = C \\ \quad \| \ \frac{1}{5} \\ \text{if } Exp = D \\ \quad \| \ \frac{1}{8} \end{array} \right\| = 0.333$$ (Table 26.9-1)

Turbulence Intensity Factor =

$$c := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| \ 0.3 \\ \text{if } Exp = C \\ \quad \| \ 0.2 \\ \text{if } Exp = D \\ \quad \| \ 0.15 \end{array} \right\| = 0.3$$ (Table 26.9-1)

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Branford, CT 06405 F: (203) 488-8587

Exposure Constant = $Z_{min} := \left\| \begin{array}{l} \text{if } Exp = B \\ \quad \| 30 \\ \text{if } Exp = C \\ \quad \| 15 \\ \text{if } Exp = D \\ \quad \| 7 \end{array} \right| = 30$ (Table 26.9-1)

Exposure Coefficient = $K_z := \left\| \begin{array}{l} \text{if } 15 \le Z \le zg \\ \quad \| 2.01 \cdot \left(\frac{Z}{zg} \right)^{\left(\frac{2}{\alpha} \right)} \end{array} \right| = 0.97$ (Table 29.3-1)

Topographic Factor = $K_{zt} := 1$ (Eq. 26.8-2)

Wind Directionality Factor = $K_d = 0.9$ (Table 26.6-1)

Velocity Pressure = $q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 = 35.06$ (Eq. 29.3-1)

Peak Factor for Background Response = $g_Q := 3.4$ (Sec 26.9.4)

Peak Factor for Wind Response = $g_v := 3.4$ (Sec 26.9.4)

Equivalent Height of Structure = $z := \left\| \begin{array}{l} \text{if } Z_{min} > 0.6 \cdot Height \\ \quad \| Z_{min} \\ \text{else} \\ \quad \| 0.6 \cdot Height \end{array} \right| = 30$ (Sec 26.9.4)

Intensity of Turbulence = $I_z := c \cdot \left(\frac{33}{z} \right)^{\left(\frac{1}{6} \right)} = 0.305$ (Eq. 26.9-7)

Integral Length Scale of Turbulence = $L_Z := l \cdot \left(\frac{z}{33} \right)^{E} = 309.993$ (Eq. 26.9-9)

Background Response Factor = $Q := \sqrt{\frac{1}{1 + 0.63 \cdot \left(\frac{Width + Height}{L_Z} \right)^{0.63}}} = 0.966$ (Eq. 26.9-8)

Gust Response Factor = $G := 0.925 \cdot \left(\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q \right)}{1 + 1.7 \cdot g_v \cdot I_z} \right) = 0.905$ (Eq. 26.9-6)

Force Coefficient = $C_f = 1.343$ (Fig 29.5-1 - 29.5-3)

Wind Force = $F := q_z \cdot G \cdot C_f = 43$ psf

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAARR24_43-U-NA20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 15$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 16$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 681$	lbs

Wind Load (Side)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 5.8$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 247$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 153$	lbs

Attachment 6

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CHIMNEY MOUNT ANALYSIS REPORT

dish wireless.

SITE ID: **BOHVN00119B**
Rev.0a - 05/10/2022
PASS (28%)

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STRUCTURAL ANALYSIS REPORT

Site Information				
Site ID:	BOHVN00119B			
Site Address:	150 EAST AURORA ST., WATERBURY, CT 06708			
Coordinates	**N. Lat.**	41.575002	**W. Lon.**	73.058204

Mount Information	
Size / Type:	Round Chimney Mount
Manufacturer:	CommScope
Model:	**CM-R78**
Tower Profile:	Smokestack

As requested, we have performed a structural analysis/evaluation of the above-mentioned appurtenance mounting system in order to assess the impact of the proposed loading changes. The information provided was evaluated to determine whether the mounting system can adequately support the proposed appurtenance and equipment configuration. We have been provided with the Construction Drawings, as well as additional information and documents as outlined below.

The proposed changes and the source documents used for the structural analysis are presented in Table 1.

TABLE 1 - REFERENCED DOCUMENTS

Type	Preparer	Name	Date
Construction Drawings	Nexius	BOHVN00119B_CD90_20220510_REV B.3	5/10/2022
Structural Analysis	Centek	2022-0407 BOHVN0019B - Smokestack SAR (22048.00)_S&S	4/7/2022
Assembly Drawings	Andrew	CM-R78*	6/9/2010

*_The original manufacturer specifications have been used for mount modelling.

ANALYSIS CRITERIA:

This structural analysis has been performed in accordance with the **State of Connecticut Building Code/2015 International Building Code (IBC) and 2015 IBC Connecticut Amendments** as well as the latest version of **ANSI/TIA-222-G** "Structural Standard for Antenna Supporting Structures and Antennas".

The analysis design criteria considered in this analysis is presented in Table 2.

TABLE 2 – ANALYSIS / DESIGN PARAMETERS

Parameter	Value
Ultimate Wind Speed (3-Sec), V_{ult} =	**120 mph**
Nominal Wind speed (3-Sec), V =	**92.95 mph***
Basic Wind speed with Ice, V_i =	**50 mph**
Design Radial Ice Thickness, t_i =	**0.75 in.**
Exposure Category	**B**
Risk Category (Structure Class)	**II**
Topographic Category	**I**
Seismic Parameter, S_1 =	**0.064**
Seismic Parameter, S_{DS} =	**0.201**

*_ Converted to a basic design wind speed per the TIA-222-G standard.

TABLE 3 - MATERIAL PROPERTIES (TYPICAL U.N.O.) **

Steel Grade	Component Type
ASTM A572 Gr. 50	Plates
ASTM A500 Gr. C	Pipes
ASTM A529 Gr.50	Solid Rods

**_ For specific member steel properties and grades used in this analysis refer to Risa-3D printout.

EQUIPMENT AND LOADING CONFIGURATION:

The proposed equipment is installed on 3 sectors and is as shown below in Table 4. If the equipment listed below differs from the actual field conditions, we should be contacted immediately to review the discrepancies and evaluate their impact.

TABLE 4 - FINAL EQUIPMENT/APPURTENANCE CONFIGURATION

Centerline (ft.)	Qty.	Make / Model	Type
82	**3**	**JMA MX08FR0665-21**	**Antenna**
	3	**FUJITSU TA08025-B604**	**RRU, TMA, Filter**
	3	**FUJITSU TA08025-B605**	**RRU, TMA, Filter**
	1 (Beta)	**RAYCAP RDIDC-9181-PF-48**	**OVP**

***New proposed appurtenance(s) in bold,** all other equipment is existing.

Note: Equipment not listed is assumed to be removed or replaced.

ANALYSIS AND RESULTS:

RISA-3D (v17.0.4), a commercially available structural engineering software package, was used to create a three-dimensional model of the structure and calculate member stresses for various loading cases. Table 5 summarizes the structural analysis results.

TABLE 5 - MOUNT COMPONENT CAPACITY "NEW CM-R78"

Component	Capacity (%) *	Assessment *
Mount Pipe	**28**	**Pass**

*_Capacity percentages ≤ **100%** are considered structurally adequate.

GENERAL ASSUMPTIONS:

- The mounting system is assumed to be in good overall condition without structural deficiencies, including but not limited to missing, bent or damaged members or hardware.
- All bolted connections and miscellaneous brackets are assumed to be properly secured and tightened.
- The structural members, sizes, bolts and steel grades are as per data supplied. Where information was missing or insufficient, general assumptions as per industry standards and practice have been made and noted.
- The supporting structure is assumed to adequately support the mounting system and is not within the scope of this analysis.

CONCLUSIONS AND RECOMMENDATIONS:

Based on the information provided, our assessment concluded that the mounting system is structurally **ADEQUATE** to support the proposed loading, **provided the recommendation below is followed**, and subject to the attached Standard Conditions on page 8.

- ***The proposed installation shall have (1) CommScope "CM-R78" round chimney mount and shall follow the proposed layout provided in Appendix A (please refer attached).***
- ***The chimney ringmounts shall be spaced a maximum of 3 ft c-c.***
- ***The new JMA MX08FR0665-21 panel antenna and other appurtenances shall be installed on (1) new 10.5 ft. long mast pipe CommScope #MT-537 (2.375" OD x 0.120" wall) or Engineering Equivalent. Fasten the pipe using new mount adapter CommScope part #CM-SB2 (1 kit per pipe, 3 total).***
- ***The proposed radios and OVP shall be installed below the antenna.***
- ***Install as per manufacturer instructions.***

Any plans to deviate from the proposed layout and recommendations shall be brought to the attention of the engineer. The new mount(s) shall be installed in accordance with the manufacturer's instructions.

Should you have any questions, comments or require additional information, please do not hesitate to contact us.

Sincerely,

Analysis by:

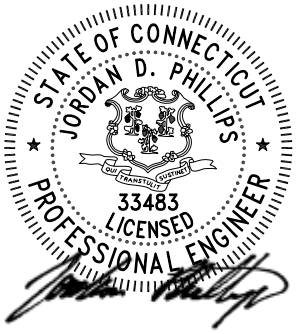
Gaelle Ghanem

gaelle.ghanem@nexius.com

Reviewed by:

Jordan Phillips, P.E.

jordan.phillips@nexius.com



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Standard Conditions for Providing Structural Engineering and Consulting Services on Existing Structures

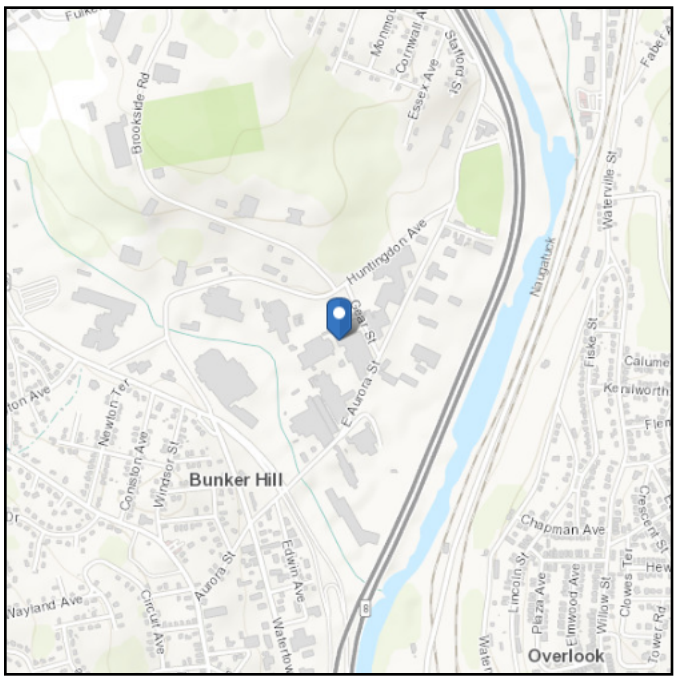
1. The evaluation assumes that the structure has been properly designed, constructed or structurally modified and maintained in accordance with the TIA-222-G Standard or a previous edition of this standard and that all items related to the integrity of the structure have been corrected and addressed.
2. The assumptions documented in this structural analysis report requiring verification shall be validated prior to implementation of the proposed changed condition or modification.
3. The structural analysis has been performed using information as provided to us and potentially field verified and is assumed to be current and accurate. We have been provided a mounting arrangement for the telecom equipment and appurtenances, including but not limited to: antennas, RRH's, RRU'S, TMA's, OVP's, diplexers, filters, etc. Our analysis has been based upon this specified mounting arrangement and therefore we are not responsible for deviations in the arrangement that may occur over time. If variations in the equipment type, quantity or mounting arrangement are proposed, we should be contacted to revise the structural recommendations of this report.
4. If the existing field conditions are different than those presented in this analysis, we should be contacted to evaluate the significance of the deviation(s) and revise the structural assessment accordingly.
5. When the steel grade or strength is unknown and cannot be field tested, our analysis assumes that the standard structural grades have been used by the manufacturer for all assembled parts of the mounting system. Acceptable steel and connection components are specified by the American Institute of Steel Construction (AISC) and as per typical industry standards. It is assumed all welded connections were performed in a certified shop under the latest American Welding Society (AWS) codes and regulations. No field welds are permitted or assumed for the existing pre-manufactured equipment.
6. The structural analysis has been performed assuming that all structural members and hardware are in "like new" good overall condition and free from structural defects. No allowance has been made for: damaged or missing structural members or hardware, corrosion, loose hardware or connections, misaligned parts etc. or any strength reduction due to excessive corrosion, aging or fatigue of any structural components.
7. We cannot be held liable for any members, hardware or parts manufactured from inferior or defective materials, welds or bolts.
8. The structural analysis provided is an assessment of the primary load carrying capacity of the members and hardware. We provided a limited scope of service; in several instances the capacity of every weld, plate, connection detail, etc. cannot be verified. In cases where the structural fabrication details are unknown and the detailed field measurement of members and connections is not be feasible and therefore, we are unable to perform rigorous connection capacity calculations; in such instances it is assumed that the existing manufactured connections develop the full capacity of the primary members being connected.
9. Mounting hardware is analyzed to the best of our ability using the provided/available information or the limited data obtained during field mapping (if authorized by client), at the time of our analysis.
10. We shall not be held responsible for improperly installed parts or loose hardware or that has a tendency of working loose over its lifetime. The analysis has been performed assuming properly installed, fully tightened, secured connections and symmetry of the mounting hardware per manufacturer instructions.
11. We are not liable for temporary or unbalanced loads on the mounting system or mounting hardware or for the means and methods of how the mounting arrangement is accomplished by the contractor. These means and methods may include but are not limited to: rigging of equipment, hardware to lift and locate, temporary hanging of equipment in locations other than the final arrangement, movement and tie-off of tower riggers/personnel and their equipment, etc.
12. We do not take any responsibility and we are not liable for any damage or injury caused through, be it indirect, special, incidental or consequential damages during the construction or installation process of the proposed scope of work.
13. The loading, analysis, design criteria and rigging related to the installation, alteration, modification or the criteria for safety practices associated with the construction activities are not within the scope of this analysis (refer to the ANSI/TIA-322 and ANSI/ASSE A10.48 Standard - latest versions).

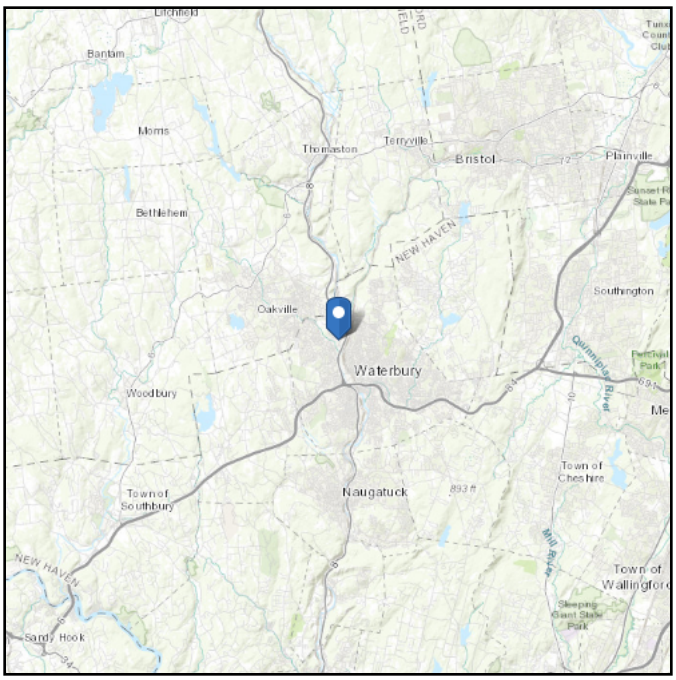
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 296.56 ft (NAVD 88)
Latitude: 41.575002
Longitude: -73.058204





Wind

Results:

Wind Speed	120 Vmph
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

Date Accessed: Fri Apr 29 2022

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 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.

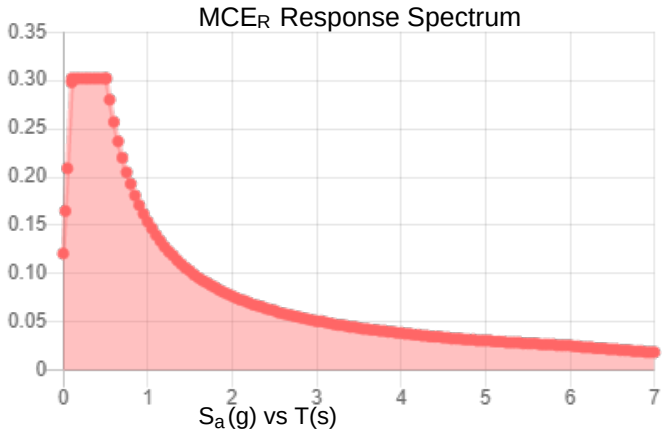
Seismic

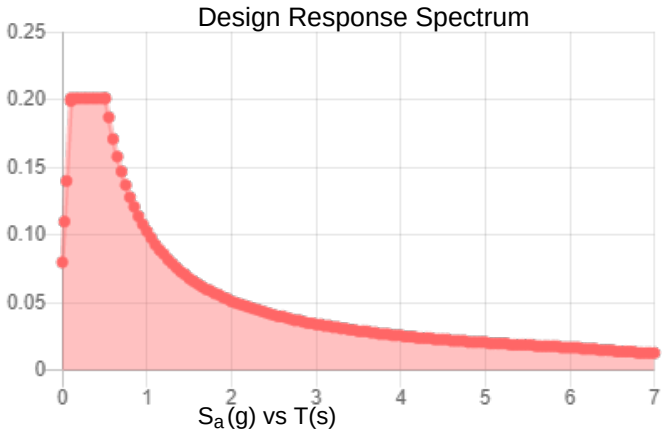
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.189	S_{DS} :	0.201
S_1 :	0.064	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.098
S_{MS} :	0.302	PGA_M :	0.156
S_{M1} :	0.154	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: **Fri Apr 29 2022**

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

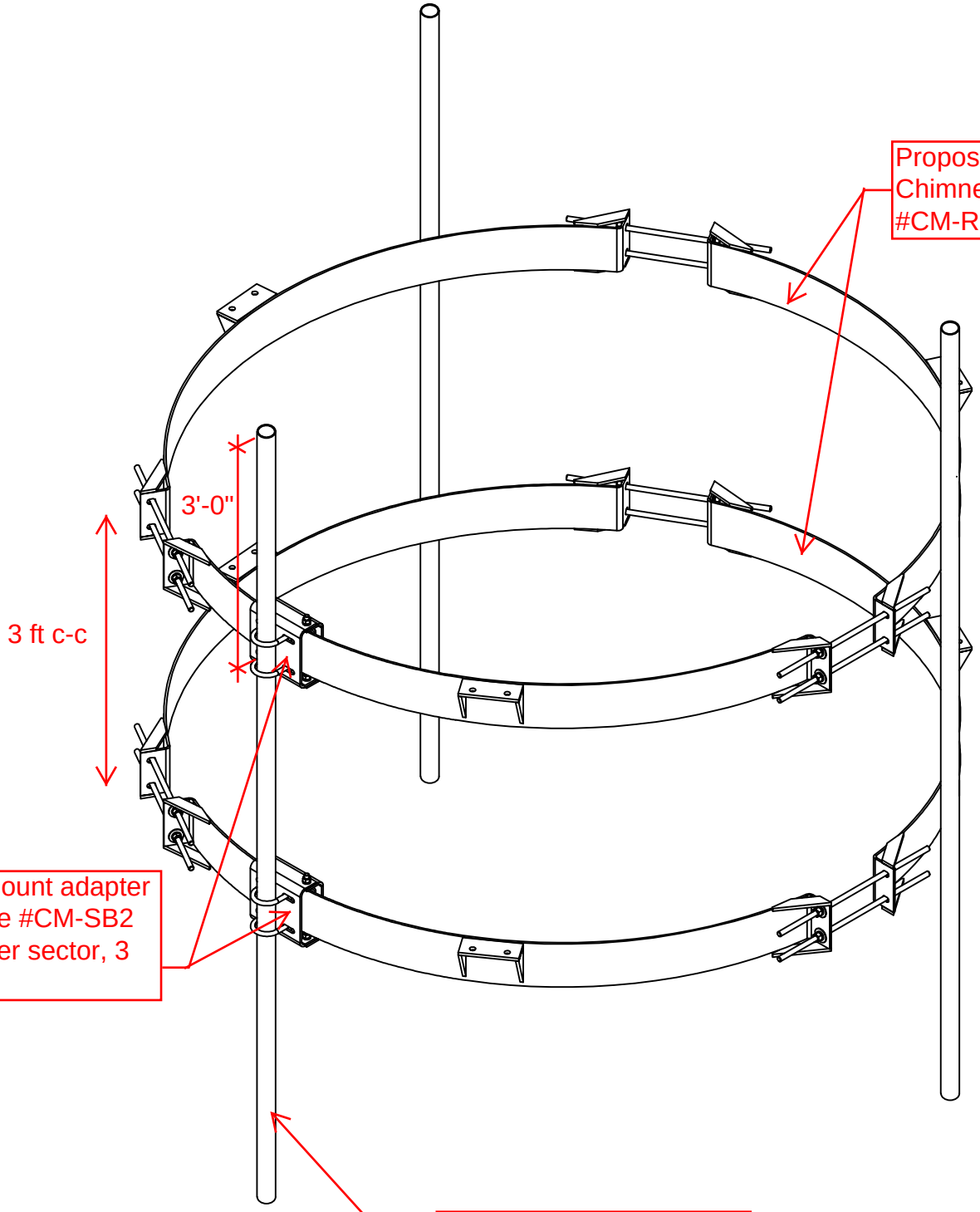
Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	5 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Fri Apr 29 2022

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 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.

Proposed Mount Layout



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Mount Analysis Loading Calculations

Legend
Input
Calculated
Notes

Job Number	BOHVN00119B
TIA-222 Code Rev.	G

Basic Parameters		
Mount Height	82	ft
Exposure Category	B	(B,C, or D)
Nominal Wind Speed	92.95	mph
Ice Wind Speed	50	mph
Design Ice Thickness, t_i	0.75	in
Maintenance Wind Speed	30	mph
Run Earthquake Analysis?	Yes	
Ground Elevation	296.56	ft, ASCE Hazard Tool
S_1	0.064	USGS
S_{DS}	0.201	2.7.5
Vertical Seismic Loads, E_v	0.040	2.7.6
Seismic Response Coefficient, C_s	0.101	2.7.7.1.1
C_s Min	0.030	2.7.7.1.1

Wind Parameters		
Gust Effect Factor, G_h	1.000	2.6.9
K_z	0.934	2.6.5.2
K_{Zt}	1.000	2.6.6.4
K_d	0.950	Table 2-2
I	1.000	Table 2-3
q_z	19.621	psf, 2.6.9.6
C/D	89.820	Table 2-8
t_{iz}	1.643	in, 2.6.8
q_{Iz}	5.677	psf, 2.6.9.6
C/D_{iz}	48.316	Table 2-8
$q_{Maintenance}$	1.839	psf, 2.6.9.6
$C/D_{Maintenance}$	28.989	Table 2-8
Ice Dead, Grating	0.015334091	ksf

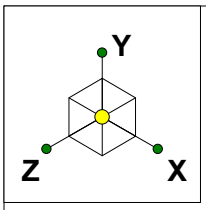
Mounting Pipes (Orientation Drawn Top-Down)

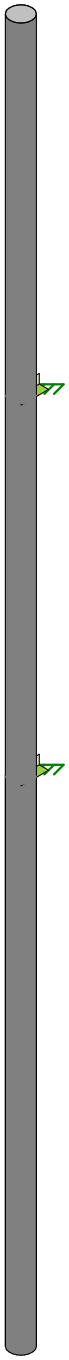
Risa 3D Label	Elevation (ft)	Length (in)	Diameter (in)
M1	82	126	2.375

Appurtenances

Model	Type	Height (in)	Width (in)	Depth (in)	Weight (lbs)
JMA MX08FR0665-21	Antenna	72	20	8	82.5
FUJITSU TA08025-B604	RRU, TMA, Etc.	14.9	15.7	7.8	63.9
FUJITSU TA08025-B605	RRU, TMA, Etc.	14.9	15.7	9	74.95
RAYCAP RDIDC-9181-PF-48	RRU, TMA, Etc.	18.98	14.39	8.15	21.82

Pipe Mount	Antenna	Quantity	Orientation (deg)	Front Exposed (%)	Side Exposed (%)	Type	Height (in)	Width (in)	Depth (in)	Weight (lbs)	Front CaAa (ft^2)	Side CaAa (ft^2)	Front F_A (kips)	Side F_A (kips)	Top %	Bottom %
M1	JMA MX08FR0665-21	1	0	100.0%	100.0%	Antenna	72.000	20.000	8.000	82.500	12.489	5.867	0.245	0.115	17.0%	60.0%
M1	FUJITSU TA08025-B604	1	90	100.0%	100.0%	RRU, TMA, Etc.	14.900	15.700	7.800	63.900	1.949	0.969	0.019	0.038	75.0%	75.0%
M1	FUJITSU TA08025-B605	1	90	100.0%	100.0%	RRU, TMA, Etc.	14.900	15.700	9.000	74.950	1.949	1.118	0.022	0.038	75.0%	75.0%
M1	RAYCAP RDIDC-9181-PF-48	1	90	100.0%	100.0%	RRU, TMA, Etc.	18.980	14.390	8.150	21.820	2.276	1.289	0.025	0.045	90.0%	90.0%
M1																
M1																





Envelope Only Solution

NEXIUS	BOHVN00119B	RENDERING
GG		Apr 29, 2022 at 3:42 PM
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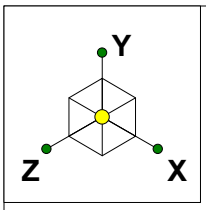

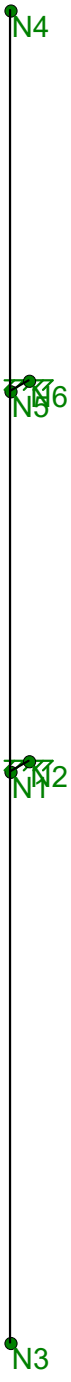

Envelope Only Solution

NEXIUS	BOHVN00119B	NODES
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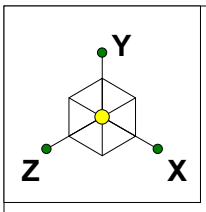
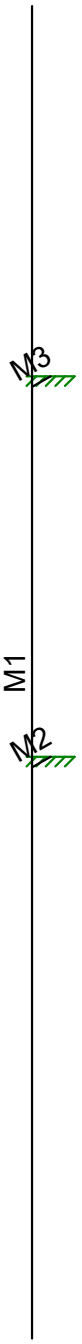
BOHVN00119B		BOHVN00119B.r3d





Envelope Only Solution

NEXIUS	BOHVN00119B	LABELS
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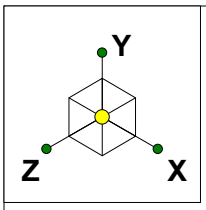

Envelope Only Solution

NEXIUS	BOHVN00119B	SHAPES
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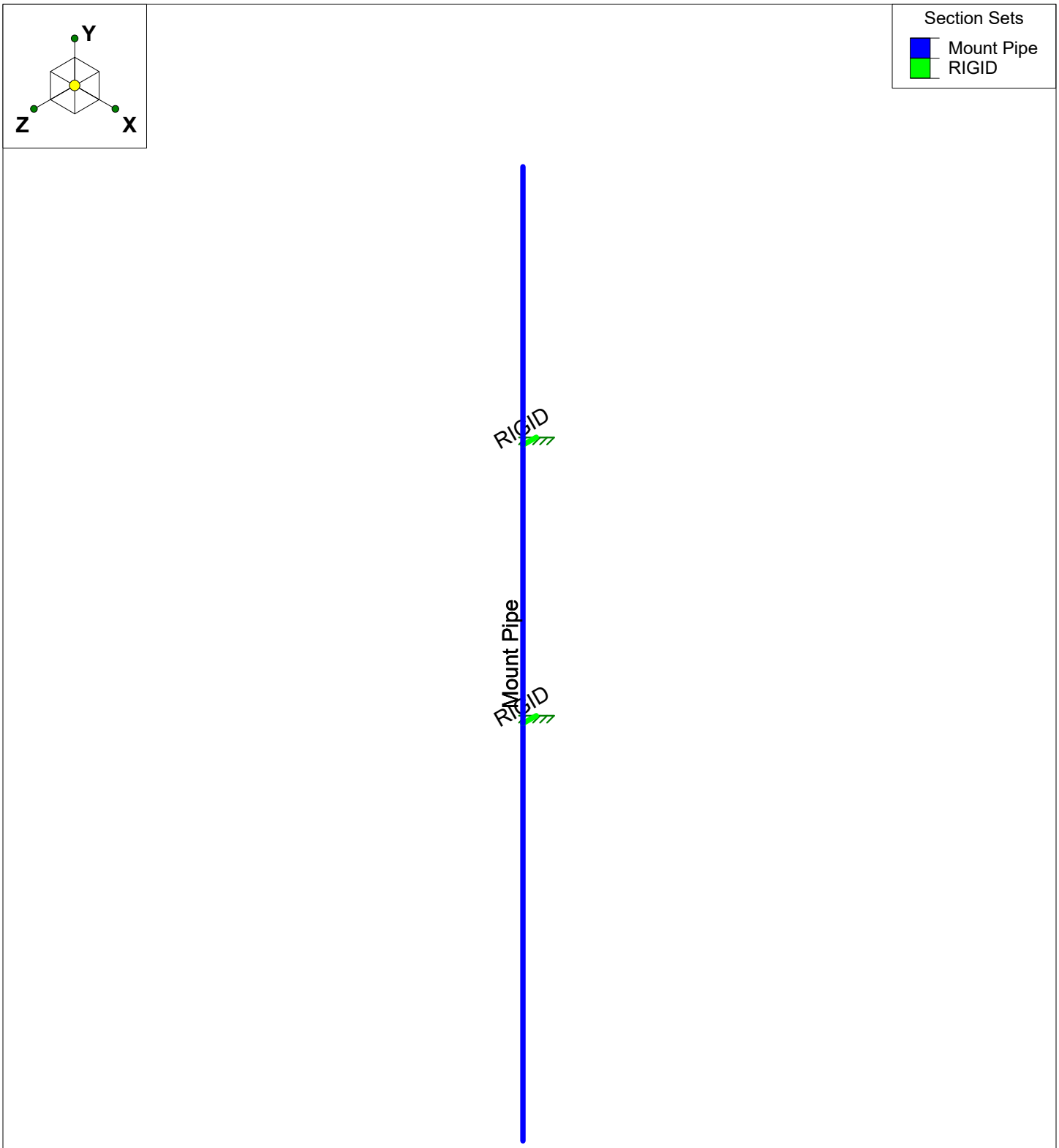
BOHVN00119B		BOHVN00119B.r3d



Envelope Only Solution

NEXIUS	BOHVN00119B	SECTION SETS
GG		Apr 29, 2022 at 3:42 PM
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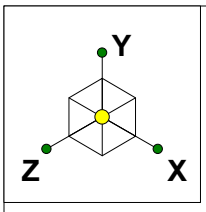
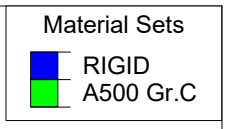
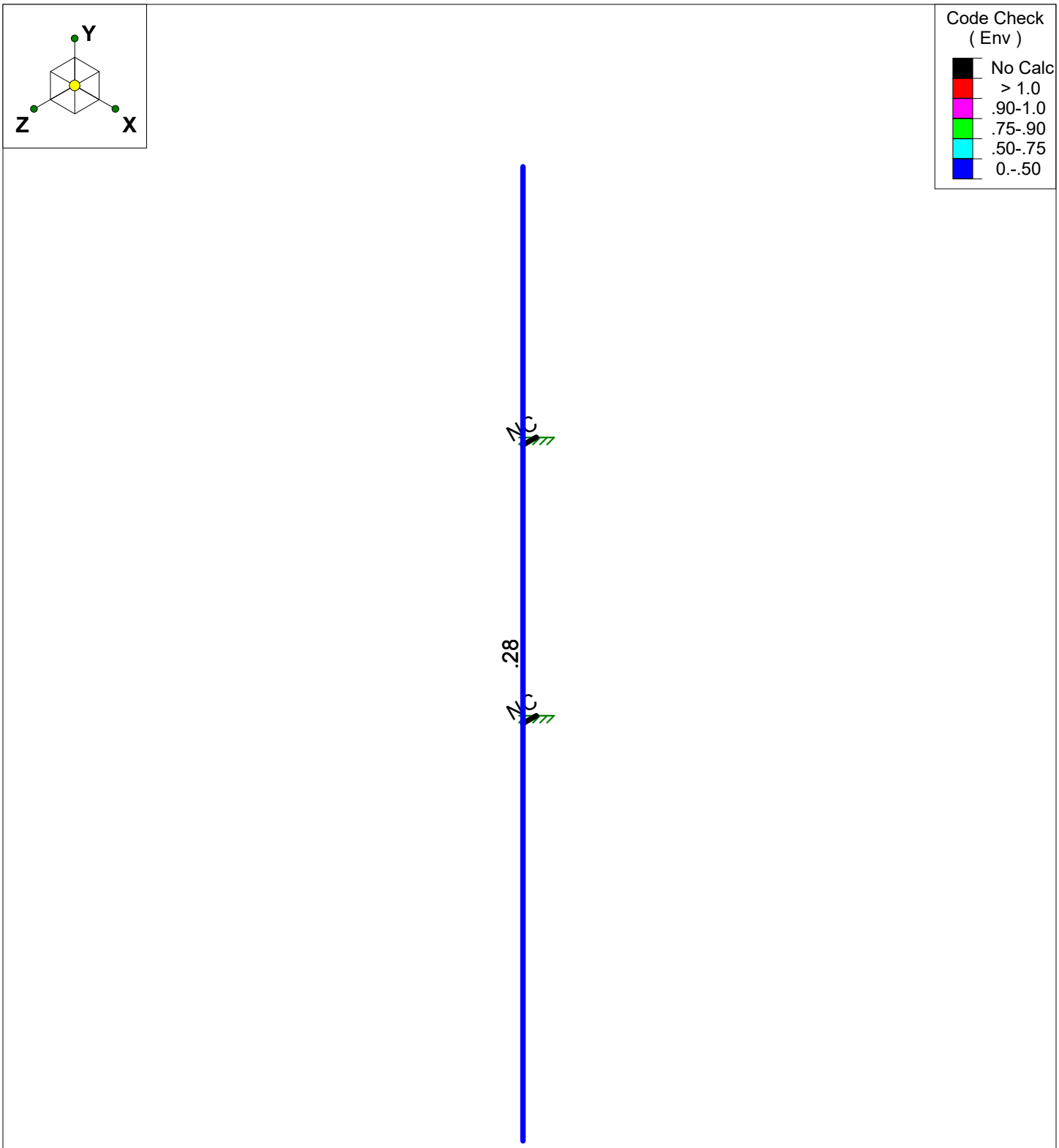




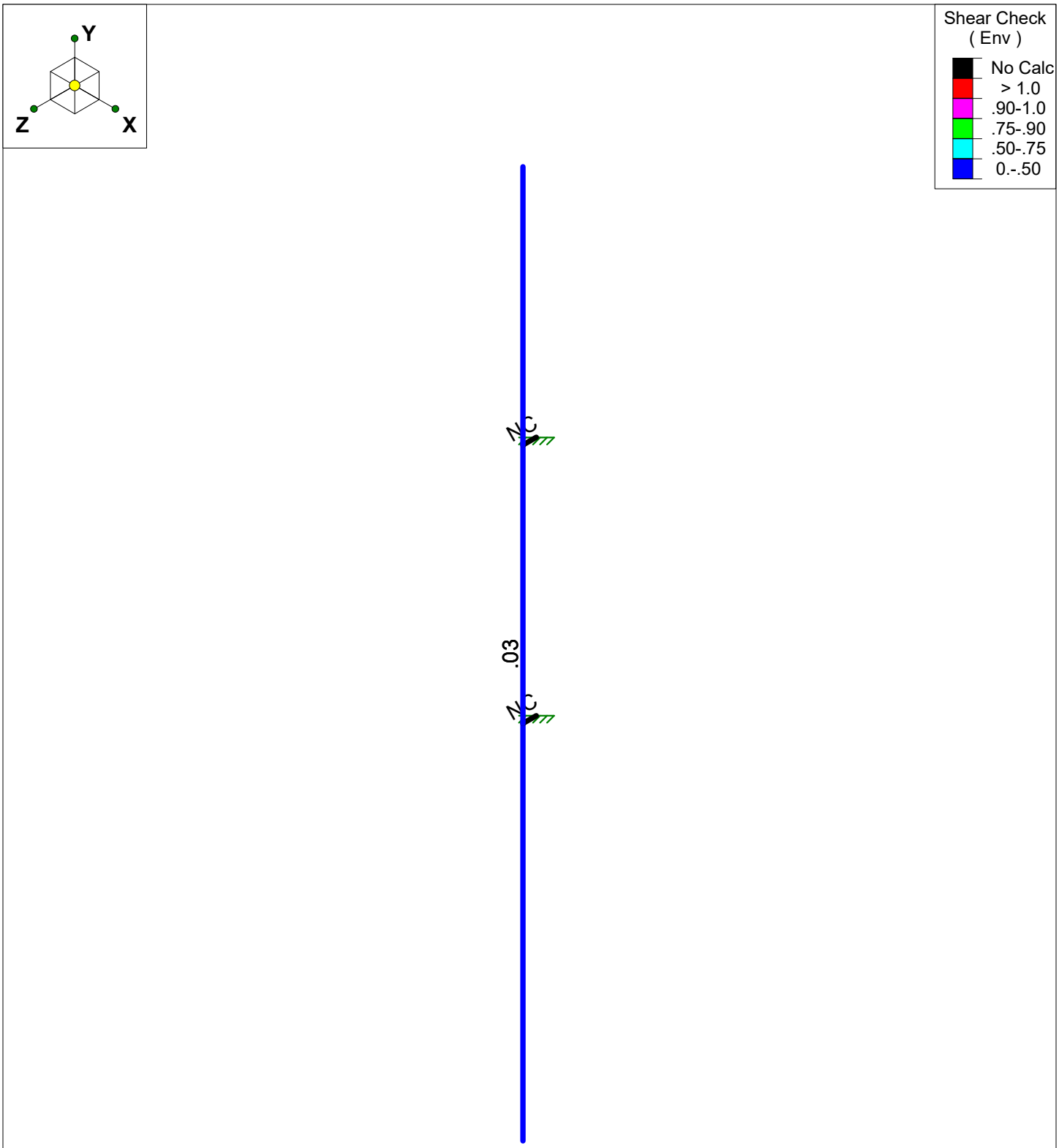
Envelope Only Solution

NEXIUS	BOHVN00119B	MATERIAL SETS
GG		Apr 29, 2022 at 3:43 PM
BOHVN00119B		BOHVN00119B.r3d



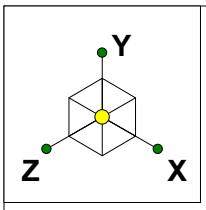
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

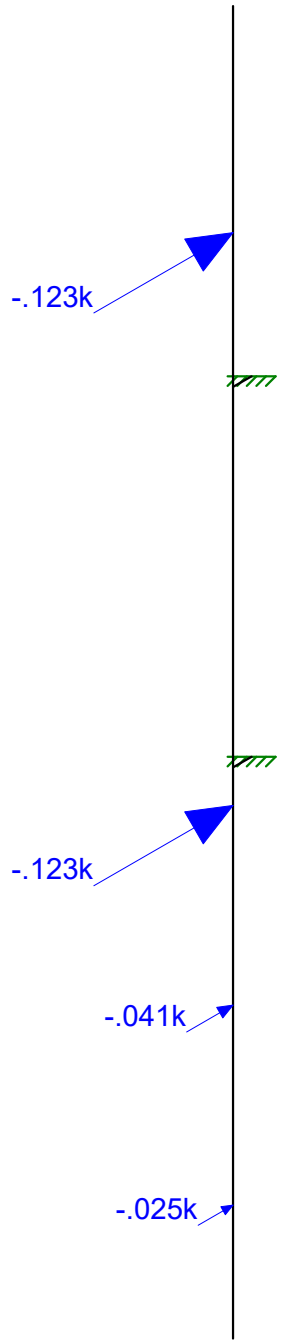
NEXIUS	BOHVN00119B	BENDING
GG		Apr 29, 2022 at 3:43 PM
BOHVN00119B		BOHVN00119B.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

NEXIUS	BOHVN00119B	SHEAR CHECK
GG		Apr 29, 2022 at 3:43 PM
BOHVN00119B		BOHVN00119B.r3d





Loads: BLC 3, Full Wind Antenna (0 Deg)
Envelope Only Solution

NEXIUS	BOHVN00119B	FRONT WIND
GG		Apr 29, 2022 at 3:43 PM
BOHVN00119B		BOHVN00119B.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E...Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.25	65	1.15
8	A913 Gr.65	29000	11154	.3	.65	.49	65	1.1	80	1.1
9	A500 Gr.C	29000	11154	.3	.65	.49	46	1.4	62	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mount Pipe	2.375"x0.120"	Column	Pipe	A500 Gr.C	Typical	.852	.545	.545	1.091

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N2	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N6	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Mount Pipe	10.5									Lateral

Joint Loads and Enforced Displacements (BLC 42 : Man 1 (500 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	N1	L	Y	0

Joint Loads and Enforced Displacements (BLC 43 : Man 2 (500 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	N1	L	Y	0

Joint Loads and Enforced Displacements (BLC 44 : Man 3 (500 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	N1	L	Y	0

Joint Loads and Enforced Displacements (BLC 45 : Man 4 (250 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	N1	L	Y	0

Joint Loads and Enforced Displacements (BLC 46 : Man 5 (250 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	N1	L	Y	0

Joint Loads and Enforced Displacements (BLC 47 : Man 6 (250 lbs))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	N1	L	Y	0

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.041	%17
2	M1	Y	-.064	%75
3	M1	Y	-.075	%75
4	M1	Y	-.022	%90
5	M1	Y	-.041	%60

Member Point Loads (BLC 2 : Ice Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.14	%17
2	M1	Y	-.048	%75
3	M1	Y	-.049	%75
4	M1	Y	-.058	%90
5	M1	Y	-.14	%60

Member Point Loads (BLC 3 : Full Wind Antenna (0 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	-.123	%17
2	M1	Z	-.019	%75
3	M1	Z	-.022	%75
4	M1	Z	-.025	%90
5	M1	Z	-.123	%60

Member Point Loads (BLC 4 : Full Wind Antenna (30 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	-.092	%17
2	M1	Z	-.021	%75
3	M1	Z	-.023	%75
4	M1	Z	-.026	%90
5	M1	Z	-.092	%60
6	M1	X	.053	%17
7	M1	X	.012	%75
8	M1	X	.013	%75
9	M1	X	.015	%90
10	M1	X	.053	%60

Member Point Loads (BLC 5 : Full Wind Antenna (60 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	-.037	%17
2	M1	Z	-.017	%75
3	M1	Z	-.017	%75
4	M1	Z	-.02	%90
5	M1	Z	-.037	%60
6	M1	X	.064	%17
7	M1	X	.029	%75
8	M1	X	.03	%75
9	M1	X	.034	%90
10	M1	X	.064	%60

Member Point Loads (BLC 6 : Full Wind Antenna (90 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	0	%17
2	M1	Z	0	%75
3	M1	Z	0	%75

Member Point Loads (BLC 6 : Full Wind Antenna (90 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
4	M1	Z	0	%90
5	M1	Z	0	%60
6	M1	X	.058	%17
7	M1	X	.038	%75
8	M1	X	.038	%75
9	M1	X	.045	%90
10	M1	X	.058	%60

Member Point Loads (BLC 7 : Full Wind Antenna (120 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.037	%17
2	M1	Z	.017	%75
3	M1	Z	.017	%75
4	M1	Z	.02	%90
5	M1	Z	.037	%60
6	M1	X	.064	%17
7	M1	X	.029	%75
8	M1	X	.03	%75
9	M1	X	.034	%90
10	M1	X	.064	%60

Member Point Loads (BLC 8 : Full Wind Antenna (150 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.092	%17
2	M1	Z	.021	%75
3	M1	Z	.023	%75
4	M1	Z	.026	%90
5	M1	Z	.092	%60
6	M1	X	.053	%17
7	M1	X	.012	%75
8	M1	X	.013	%75
9	M1	X	.015	%90
10	M1	X	.053	%60

Member Point Loads (BLC 15 : Ice Wind Antenna (0 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	-.043	%17
2	M1	Z	-.01	%75
3	M1	Z	-.011	%75
4	M1	Z	-.012	%90
5	M1	Z	-.043	%60

Member Point Loads (BLC 16 : Ice Wind Antenna (30 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	-.033	%17
2	M1	Z	-.01	%75
3	M1	Z	-.01	%75
4	M1	Z	-.012	%90
5	M1	Z	-.033	%60
6	M1	X	.019	%17
7	M1	X	.006	%75
8	M1	X	.006	%75
9	M1	X	.007	%90
10	M1	X	.019	%60

Member Point Loads (BLC 17 : Ice Wind Antenna (60 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	-.014	%17
2	M1	Z	-.007	%75
3	M1	Z	-.007	%75
4	M1	Z	-.008	%90
5	M1	Z	-.014	%60
6	M1	X	.024	%17
7	M1	X	.013	%75
8	M1	X	.013	%75
9	M1	X	.015	%90
10	M1	X	.024	%60

Member Point Loads (BLC 18 : Ice Wind Antenna (90 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	0	%17
2	M1	Z	0	%75
3	M1	Z	0	%75
4	M1	Z	0	%90
5	M1	Z	0	%60
6	M1	X	.023	%17
7	M1	X	.016	%75
8	M1	X	.016	%75
9	M1	X	.019	%90
10	M1	X	.023	%60

Member Point Loads (BLC 19 : Ice Wind Antenna (120 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.014	%17
2	M1	Z	.007	%75
3	M1	Z	.007	%75
4	M1	Z	.008	%90
5	M1	Z	.014	%60
6	M1	X	.024	%17
7	M1	X	.013	%75
8	M1	X	.013	%75
9	M1	X	.015	%90
10	M1	X	.024	%60

Member Point Loads (BLC 20 : Ice Wind Antenna (150 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.033	%17
2	M1	Z	.01	%75
3	M1	Z	.01	%75
4	M1	Z	.012	%90
5	M1	Z	.033	%60
6	M1	X	.019	%17
7	M1	X	.006	%75
8	M1	X	.006	%75
9	M1	X	.007	%90
10	M1	X	.019	%60

Member Point Loads (BLC 27 : Seismic Antenna (0 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	-.008	%38.5
2	M1	Z	-.006	%75
3	M1	Z	-.008	%75

Member Point Loads (BLC 27 : Seismic Antenna (0 Deg)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
4	M1	Z	-.002	%90

Member Point Loads (BLC 28 : Seismic Antenna (90 Deg))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.008	%38.5
2	M1	X	.006	%75
3	M1	X	.008	%75
4	M1	X	.002	%90

Member Point Loads (BLC 41 : Seismic Vertical Antennas)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.017	%38.5
2	M1	Y	-.013	%75
3	M1	Y	-.015	%75
4	M1	Y	-.004	%90

Member Area Loads

Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
No Data to Print ...						

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead	None		-1			5			
2	Ice Dead	None					5	3		
3	Full Wind Antenna (0 ...	None					5			
4	Full Wind Antenna (3...	None					10			
5	Full Wind Antenna (6...	None					10			
6	Full Wind Antenna (9...	None					10			
7	Full Wind Antenna (1...	None					10			
8	Full Wind Antenna (1...	None					10			
9	Full Wind Members (0...	None						3		
10	Full Wind Members (3...	None						3		
11	Full Wind Members (6...	None						3		
12	Full Wind Members (9...	None						3		
13	Full Wind Members (1...	None						3		
14	Full Wind Members (1...	None						3		
15	Ice Wind Antenna (0 ...	None					5			
16	Ice Wind Antenna (30...	None					10			
17	Ice Wind Antenna (60...	None					10			
18	Ice Wind Antenna (90...	None					10			
19	Ice Wind Antenna (12...	None					10			
20	Ice Wind Antenna (15...	None					10			
21	Ice Wind Members (0 ...	None						7		
22	Ice Wind Members (3...	None						7		
23	Ice Wind Members (6...	None						7		
24	Ice Wind Members (9...	None						7		
25	Ice Wind Members (1...	None						7		
26	Ice Wind Members (1...	None						7		
27	Seismic Antenna (0 D...	None					4			
28	Seismic Antenna (90 ...	None					4			
29	Seismic Members (0 ...	None		-.04	-.101					
30	Seismic Members (30...	None	.05	-.04	-.087					
31	Seismic Members (60...	None	.087	-.04	-.05					

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
32	Seismic Members (90...	None	.101	-.04						
33	Seismic Members (12...	None	.087	-.04	.05					
34	Seismic Members (15...	None	.05	-.04	.087					
35	Seismic Members (18...	None		-.04	.101					
36	Seismic Members (21...	None	-.05	-.04	.087					
37	Seismic Members (24...	None	-.087	-.04	.05					
38	Seismic Members (27...	None	-.101	-.04						
39	Seismic Members (30...	None	-.087	-.04	-.05					
40	Seismic Members (33...	None	-.05	-.04	-.087					
41	Seismic Vertical Ante...	None					4			
42	Man 1 (500 lbs)	None				1				
43	Man 2 (500 lbs)	None				1				
44	Man 3 (500 lbs)	None				1				
45	Man 4 (250 lbs)	None				1				
46	Man 5 (250 lbs)	None				1				
47	Man 6 (250 lbs)	None				1				

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4D	Yes	Y		1	1.4																		
2	1.2D + 1.6W 0°	Yes	Y		1	1.2	3	1.6	9	1.6														
3	1.2D + 1.6W 30°	Yes	Y		1	1.2	4	1.6	10	1.6														
4	1.2D + 1.6W 60°	Yes	Y		1	1.2	5	1.6	11	1.6														
5	1.2D + 1.6W 90°	Yes	Y		1	1.2	6	1.6	12	1.6														
6	1.2D + 1.6W 120°	Yes	Y		1	1.2	7	1.6	13	1.6														
7	1.2D + 1.6W 150°	Yes	Y		1	1.2	8	1.6	14	1.6														
8	1.2D + 1.6W 180°	Yes	Y		1	1.2	3	-1.6	9	-1.6														
9	1.2D + 1.6W 210°	Yes	Y		1	1.2	4	-1.6	10	-1.6														
10	1.2D + 1.6W 240°	Yes	Y		1	1.2	5	-1.6	11	-1.6														
11	1.2D + 1.6W 270°	Yes	Y		1	1.2	6	-1.6	12	-1.6														
12	1.2D + 1.6W 300°	Yes	Y		1	1.2	7	-1.6	13	-1.6														
13	1.2D + 1.6W 330°	Yes	Y		1	1.2	8	-1.6	14	-1.6														
14	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	15	1	21	1												
15	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	16	1	22	1												
16	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	17	1	23	1												
17	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	18	1	24	1												
18	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	19	1	25	1												
19	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	20	1	26	1												
20	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	15	-1	21	-1												
21	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	16	-1	22	-1												
22	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	17	-1	23	-1												
23	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	18	-1	24	-1												
24	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	19	-1	25	-1												
25	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		1	1.2	2	1	20	-1	26	-1												
26	1.2D + 1.5Lm_1 + 1.0...	Yes	Y		1	1.2	3	.094	9	.094	42	1.5												
27	1.2D + 1.5Lm_1 + 1.0...	Yes	Y		1	1.2	4	.094	10	.094	42	1.5												
28	1.2D + 1.5Lm_1 + 1.0...	Yes	Y		1	1.2	5	.094	11	.094	42	1.5												
29	1.2D + 1.5Lm_1 + 1.0...	Yes	Y		1	1.2	6	.094	12	.094	42	1.5												
30	1.2D + 1.5Lm_1 + 1.0...	Yes	Y		1	1.2	7	.094	13	.094	42	1.5												
31	1.2D + 1.5Lm_1 + 1.0...	Yes	Y		1	1.2	8	.094	14	.094	42	1.5												
32	1.2D + 1.5Lm_1 + 1.0...	Yes	Y		1	1.2	3	-.094	9	-.094	42	1.5												
33	1.2D + 1.5Lm_1 + 1.0...	Yes	Y		1	1.2	4	-.094	10	-.094	42	1.5												
34	1.2D + 1.5Lm_1 + 1.0...	Yes	Y		1	1.2	5	-.094	11	-.094	42	1.5												
35	1.2D + 1.5Lm_1 + 1.0...	Yes	Y		1	1.2	6	-.094	12	-.094	42	1.5												
36	1.2D + 1.5Lm_1 + 1.0...	Yes	Y		1	1.2	7	-.094	13	-.094	42	1.5												

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
37	1.2D + 1.5Lm_1 + 1.0..	Yes	Y		1	1.2	8	-.094	14	-.094	42	1.5														
38	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	3	.094	9	.094	43	1.5														
39	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	4	.094	10	.094	43	1.5														
40	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	5	.094	11	.094	43	1.5														
41	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	6	.094	12	.094	43	1.5														
42	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	7	.094	13	.094	43	1.5														
43	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	8	.094	14	.094	43	1.5														
44	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	3	-.094	9	-.094	43	1.5														
45	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	4	-.094	10	-.094	43	1.5														
46	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	5	-.094	11	-.094	43	1.5														
47	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	6	-.094	12	-.094	43	1.5														
48	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	7	-.094	13	-.094	43	1.5														
49	1.2D + 1.5Lm_2 + 1.0..	Yes	Y		1	1.2	8	-.094	14	-.094	43	1.5														
50	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	3	.094	9	.094	44	1.5														
51	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	4	.094	10	.094	44	1.5														
52	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	5	.094	11	.094	44	1.5														
53	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	6	.094	12	.094	44	1.5														
54	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	7	.094	13	.094	44	1.5														
55	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	8	.094	14	.094	44	1.5														
56	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	3	-.094	9	-.094	44	1.5														
57	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	4	-.094	10	-.094	44	1.5														
58	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	5	-.094	11	-.094	44	1.5														
59	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	6	-.094	12	-.094	44	1.5														
60	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	7	-.094	13	-.094	44	1.5														
61	1.2D + 1.5Lm_3 + 1.0..	Yes	Y		1	1.2	8	-.094	14	-.094	44	1.5														
62	1.2D + 1.5Lv_1 0°	Yes	Y		1	1.2	45	1.5																		
63	1.2D + 1.5Lv_1 30°	Yes	Y		1	1.2	45	1.5																		
64	1.2D + 1.5Lv_1 60°	Yes	Y		1	1.2	45	1.5																		
65	1.2D + 1.5Lv_1 90°	Yes	Y		1	1.2	45	1.5																		
66	1.2D + 1.5Lv_1 120°	Yes	Y		1	1.2	45	1.5																		
67	1.2D + 1.5Lv_1 150°	Yes	Y		1	1.2	45	1.5																		
68	1.2D + 1.5Lv_1 180°	Yes	Y		1	1.2	45	1.5																		
69	1.2D + 1.5Lv_1 210°	Yes	Y		1	1.2	45	1.5																		
70	1.2D + 1.5Lv_1 240°	Yes	Y		1	1.2	45	1.5																		
71	1.2D + 1.5Lv_1 270°	Yes	Y		1	1.2	45	1.5																		
72	1.2D + 1.5Lv_1 300°	Yes	Y		1	1.2	45	1.5																		
73	1.2D + 1.5Lv_1 330°	Yes	Y		1	1.2	45	1.5																		
74	1.2D + 1.5Lv_2 0°	Yes	Y		1	1.2	46	1.5																		
75	1.2D + 1.5Lv_2 30°	Yes	Y		1	1.2	46	1.5																		
76	1.2D + 1.5Lv_2 60°	Yes	Y		1	1.2	46	1.5																		
77	1.2D + 1.5Lv_2 90°	Yes	Y		1	1.2	46	1.5																		
78	1.2D + 1.5Lv_2 120°	Yes	Y		1	1.2	46	1.5																		
79	1.2D + 1.5Lv_2 150°	Yes	Y		1	1.2	46	1.5																		
80	1.2D + 1.5Lv_2 180°	Yes	Y		1	1.2	46	1.5																		
81	1.2D + 1.5Lv_2 210°	Yes	Y		1	1.2	46	1.5																		
82	1.2D + 1.5Lv_2 240°	Yes	Y		1	1.2	46	1.5																		
83	1.2D + 1.5Lv_2 270°	Yes	Y		1	1.2	46	1.5																		
84	1.2D + 1.5Lv_2 300°	Yes	Y		1	1.2	46	1.5																		
85	1.2D + 1.5Lv_2 330°	Yes	Y		1	1.2	46	1.5																		
86	1.2D + 1.5Lv_3 0°	Yes	Y		1	1.2	47	1.5																		
87	1.2D + 1.5Lv_3 30°	Yes	Y		1	1.2	47	1.5																		
88	1.2D + 1.5Lv_3 60°	Yes	Y		1	1.2	47	1.5																		
89	1.2D + 1.5Lv_3 90°	Yes	Y		1	1.2	47	1.5																		
90	1.2D + 1.5Lv_3 120°	Yes	Y		1	1.2	47	1.5																		
91	1.2D + 1.5Lv_3 150°	Yes	Y		1	1.2	47	1.5																		
92	1.2D + 1.5Lv_3 180°	Yes	Y		1	1.2	47	1.5																		
93	1.2D + 1.5Lv_3 210°	Yes	Y		1	1.2	47	1.5																		

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
94	1.2D + 1.5Lv_3 240°	Yes	Y		1	1.2	47	1.5																
95	1.2D + 1.5Lv_3 270°	Yes	Y		1	1.2	47	1.5																
96	1.2D + 1.5Lv_3 300°	Yes	Y		1	1.2	47	1.5																
97	1.2D + 1.5Lv_3 330°	Yes	Y		1	1.2	47	1.5																
98	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27	1	28		29	1	41	1										
99	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27	.866	28	.5	30	1	41	1										
100	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27	.5	28	.866	31	1	41	1										
101	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27		28	1	32	1	41	1										
102	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27	-.5	28	.866	33	1	41	1										
103	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27	-.866	28	.5	34	1	41	1										
104	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27	-1	28		35	1	41	1										
105	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27	-.866	28	-.5	36	1	41	1										
106	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27	-.5	28	-.866	37	1	41	1										
107	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27		28	-1	38	1	41	1										
108	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27	.5	28	-.866	39	1	41	1										
109	1.2D + 1.0EV +1.0 E...	Yes	Y		1	1.2	27	.866	28	-.5	40	1	41	1										

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N2	max	.334	11	.559	25	.311	2	.307	8	.056	11	.575	11
2		min	-.334	5	.263	2	-.311	8	-.395	2	-.056	5	-.575	5
3	N6	max	.131	12	.205	25	.211	2	.259	2	.022	12	.149	6
4		min	-.131	4	.065	6	-.211	8	-.28	8	-.022	4	-.149	10
5	Totals:	max	.463	11	.764	25	.522	2						
6		min	-.463	5	.328	2	-.522	8						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code C...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
1	M1	2.375"x0.120"	.276	6.016	11	.030	6.016		11	7.755	35.273	2.115	2.115	3....	H1-1b

Attachment 7

EBI Consulting

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

Dish Wireless Existing Facility

Site ID: BOHVN00119B

150 East Aurora Street
Waterbury, Connecticut 06708

June 29, 2022

EBI Project Number: 6222003741

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	10.59%

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting

environmental | engineering | due diligence

June 29, 2022

Attn: Dish Wireless

Emissions Analysis for Site: BOHVN00119B - BOHVN00119B

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **150 East Aurora Street** in **Waterbury, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ 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 ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless Wireless antenna facility located at 150 East Aurora Street in Waterbury, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 4 n71 channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 4 n70 channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 4 n66 channels (AWS Band - 2190 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

5) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative

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

6) The antennas used in this modeling are the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector A, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector B, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antenna mounting height centerline of the proposed antennas is 82 feet above ground level (AGL).

8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

9) All calculations were done with respect to uncontrolled / general population threshold limits.

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Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21
Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz
Gain:	11.35 dBd / 15.75 dBd / 16.75 dBd	Gain:	11.35 dBd / 15.75 dBd / 16.75 dBd	Gain:	11.35 dBd / 15.75 dBd / 16.75 dBd
Height (AGL):	82 feet	Height (AGL):	82 feet	Height (AGL):	82 feet
Channel Count:	12	Channel Count:	12	Channel Count:	12
Total TX Power (W):	440.00 Watts	Total TX Power (W):	440.00 Watts	Total TX Power (W):	440.00 Watts
ERP (W):	2,524.75	ERP (W):	2,524.75	ERP (W):	2,524.75
Antenna A1 MPE %:	**1.99%**	Antenna B1 MPE %:	**1.99%**	Antenna C1 MPE %:	**1.99%**

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Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	1.99%
T-Mobile	8.6%
Site Total MPE % :	10.59%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	1.99%
Dish Wireless Sector B Total:	1.99%
Dish Wireless Sector C Total:	1.99%
Site Total MPE % :	10.59%

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 (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Dish Wireless 600 MHz n71	4	110.82	82.0	2.76	600 MHz n71	400	0.69%
Dish Wireless 1900 MHz n70	4	245.22	82.0	6.11	1900 MHz n70	1000	0.61%
Dish Wireless 2190 MHz n66	4	275.14	82.0	6.85	2190 MHz n66	1000	0.69%
						Total:	1.99%

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

Summary

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

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

Dish Wireless Sector	Power Density Value (%)
Sector A:	1.99%
Sector B:	1.99%
Sector C:	1.99%
Dish Wireless Maximum MPE % (Sector A):	1.99%
Site Total:	10.59%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **10.59%** 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.

Attachment 8

ORIGIN ID:FICA (781) 290-9276
MICHAEL PATTISON

4 MACARTHUR AVE.

DEVENS, MA 01434
UNITED STATES US

SHIP DATE: 20JUN22
ACTWGT: 5.00 LB
CAD: 9458778/INET4490

BILL SENDER

TO **CONTRACT MANAGEMENT**
AMERICAN TOWER CORPORATION
10 PRESIDENTIAL WAY

WOBURN MA 01801
(781) 926-7845 REF: DN11000
INV:
PO: DEPT:

581J2274F/FE4A

FedEx Express

J22202204120 1uv

THU - 23 JUN 4:30P
EXPRESS SAVER

TRK# 0201 **7771 7193 3080**

01 BEDA

01801
MA-US **BOS**

ORIGIN ID:FICA (781) 290-9276
MICHAEL PATTISON

4 MACARTHUR AVE.

DEVENS, MA 01434
UNITED STATES US

SHIP DATE: 20JUN22
ACTWGT: 5.00 LB
CAD: 9458778/INET4490

BILL SENDER

TO **BH EBAY LLC**

170 RODNEY STREET

BROOKLYN NY 11211
(860) 206-5575 REF: DN11000
INV:
PO: DEPT:

581J2274F/FE4A

FedEx Express

J22202204120 1uv

THU - 23 JUN 4:30P
EXPRESS SAVER

TRK# 0201 **7771 7190 9795**

SE GAMA

11211
NY-US **JFK**

ORIGIN ID:FICA (781) 290-9276
MICHAEL PATTISON

4 MACARTHUR AVE.

DEVENS, MA 01434
UNITED STATES US

SHIP DATE: 20JUN22
ACTWGT: 5.00 LB
CAD: 9458778/INET4490

BILL SENDER

TO **PAUL PERNEREWSKI, PRESIDENT**
CITY OF WATERBURY
235 GRAND STREET

WATERBURY CT 06702
(203) 597-3444 REF: DN11000
INV:
PO: DEPT:

581J2274F/FE4A

FedEx Express

J222022041201uw

THU - 23 JUN 4:30P
EXPRESS SAVER

TRK# 0201 **7771 7179 5792**

SE BNHA

06702
CT-US **BDL**

ORIGIN ID:FICA (781) 290-9276
MICHAEL PATTISON

4 MACARTHUR AVE.

DEVENS, MA 01434
UNITED STATES US

SHIP DATE: 20JUN22
ACTWGT: 5.00 LB
CAD: 9458778/INET4490

BILL SENDER

TO **ROBERT NERNEY, CITY PLANNER**
CITY OF WATERBURY
235 GRAND STREET

WATERBURY CT 06702
(203) 597-3444 REF: DN11000
INV:
PO: DEPT:

581J2274F/FE4A

FedEx Express

J222022041201uw

THU - 23 JUN 4:30P
EXPRESS SAVER

TRK# 0201 **7771 7186 4720**

SE BNHA

06702
CT-US BDL

ORIGIN ID:FICA (781) 290-9276
MICHAEL PATTISON

4 MACARTHUR AVE.

DEVENS, MA 01434
UNITED STATES US

SHIP DATE: 20JUN22
ACTWGT: 5.00 LB
CAD: 9458778/INET4490

BILL SENDER

TO **NEIL M. O'LEARY, MAYOR**
CITY OF WATERBURY
235 GRAND STREET

WATERBURY CT 06702
(203) 597-3444 REF: DN11000
INV:
PO: DEPT:

581J2274F/FE4A

FedEx Express

J22202204120tuv

THU - 23 JUN 4:30P
EXPRESS SAVER

TRK# 0201 **7771 7183 8192**

SE BNHA

06702
CT-US **BDL**

ORIGIN ID:FICA (781) 290-9276
MICHAEL PATTISON

4 MACARTHUR AVE.

DEVENS, MA 01434
UNITED STATES US

SHIP DATE: 20JUN22
ACTWGT: 5.00 LB
CAD: 9458778/INET4490

BILL SENDER

TO **MELANIE BACHMAN, EXECUTIVE DIRECTOR**
CONNECTICUT SITING COUNCIL
TEN FRANKLIN SQUARE

NEW BRITAIN CT 06051
(860) 827-2935 REF: DN11000
INV:
PO: DEPT:

581J2274F/FE4A

FedEx Express

J22202204120tuv

THU - 23 JUN 4:30P
EXPRESS SAVER

TRK# 0201 **7771 7194 7097**

SE BDLA

06051
CT-US **BDL**

FedEx® Tracking

SCHEDULED DELIVERY DATE

Tuesday

7/12/2022 before 8:00 pm

No signature required

ON TIME

DELIVERY STATUS

In Transit

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BH - EBAY

TRACKING ID

777171909795

FROM
Devens, MA US

Label Created
6/20/2022 08:43

PACKAGE RECEIVED BY FEDEX
LONDONDERRY, NH
7/7/2022 18:24

IN TRANSIT

OUT FOR DELIVERY

TO
BROOKLYN, NY US

SCHEDULED DELIVERY DATE
7/12/2022 before 8:00 PM

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DELIVERED

Friday

7/8/2022 at 10:04 am

Signed for by: M.INGRID

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DELIVERY STATUS

Delivered

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TRACKING ID

777171933080 ATC

FROM
Devens, MA US

Label Created
6/20/2022 08:45

PACKAGE RECEIVED BY FEDEX
LONDONDERRY, NH
7/7/2022 18:24

IN TRANSIT
WILMINGTON, MA
7/8/2022 07:49

OUT FOR DELIVERY
WILMINGTON, MA
7/8/2022 08:47

DELIVERED
WOBURN, MA US

DELIVERED
7/8/2022 at 10:04 AM

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FedEx® Tracking

SCHEDULED DELIVERY DATE

Tuesday

7/12/2022 before 4:30 pm

No signature required

ON TIME

DELIVERY STATUS

In Transit

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TRACKING ID

777171795792 PERNEREWSKI

FROM
Devens, MA US

Label Created
6/20/2022 08:33

PACKAGE RECEIVED BY FEDEX
LONDONDERRY, NH
7/7/2022 18:24

IN TRANSIT

OUT FOR DELIVERY

TO
WATERBURY, CT US

SCHEDULED DELIVERY DATE
7/12/2022 before 4:30 PM

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SCHEDULED DELIVERY DATE

Tuesday

7/12/2022 before 4:30 pm

No signature required

ON TIME

DELIVERY STATUS

In Transit

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TRACKING ID

777171838192 O'LEARY

FROM
Devens, MA US

Label Created
6/20/2022 08:37

PACKAGE RECEIVED BY FEDEX
LONDONDERRY, NH
7/7/2022 18:24

IN TRANSIT

OUT FOR DELIVERY

TO
WATERBURY, CT US

SCHEDULED DELIVERY DATE
7/12/2022 before 4:30 PM

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SCHEDULED DELIVERY DATE

Tuesday

7/12/2022 before 4:30 pm

No signature required

ON TIME

DELIVERY STATUS

In Transit

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TRACKING ID

777171864720 NERNEY

FROM
Devens, MA US

Label Created
6/20/2022 08:39

PACKAGE RECEIVED BY FEDEX
LONDONDERRY, NH
7/7/2022 18:24

IN TRANSIT

OUT FOR DELIVERY

TO
WATERBURY, CT US

SCHEDULED DELIVERY DATE
7/12/2022 before 4:30 PM

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Shipment facts

Shipment overview